# STATE OF TEXAS
## DEPARTMENT OF TRANSPORTATION

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 1 |

## PLANS OF PROPOSED
## STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER
F 2025(072)
CSJ: 0914-00-487

## TRAVIS CO.
## VARIOUS

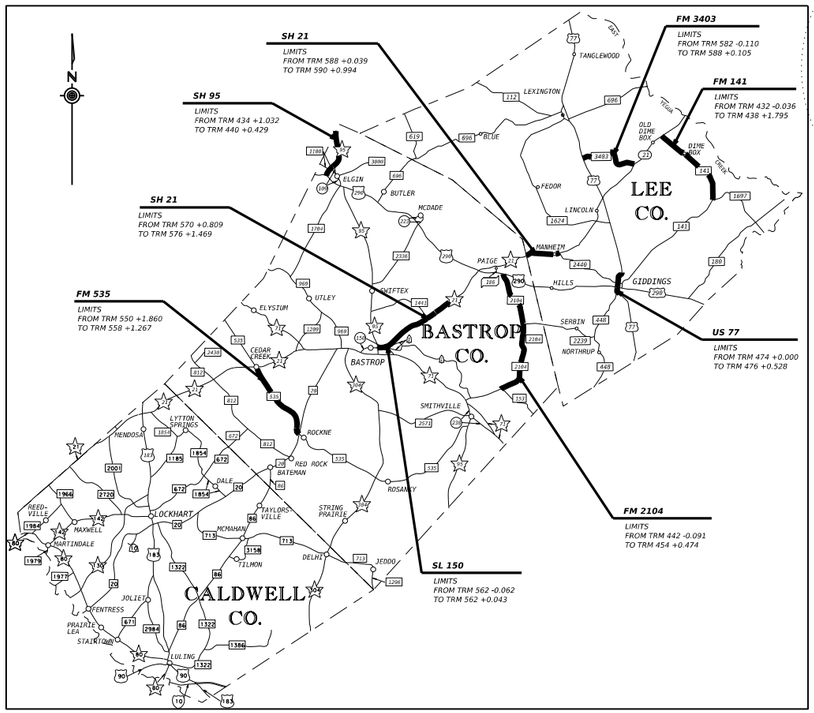
**DESIGN SPEED**
N/A

**A.D.T.**
N/A

| | | LENGTH | |
|---|---|---|---|
| CSJ | COUNTY | HWY | FEET | MILES |
| 0321-03 | BASTROP | SH 95 | 28,548.96 | 5.407 |
| 0472-01 | BASTROP | SH 21 | 35,164.80 | 6.660 |
| 0265-10 | BASTROP | SL 150 | 554.40 | 0.105 |
| 2083-01 | BASTROP | FM 2104 | 66,343.20 | 12.565 |
| 0807-05 | BASTROP | FM 535 | 39,093.12 | 7.404 |
| 3386-01 | LEE | FM 3403 | 32,815.20 | 6.215 |
| 0211-07 | LEE | US 77 | 13,347.84 | 2.528 |
| 0472-02 | LEE | SH 21 | 15,602.40 | 2.955 |
| 0334-05 | LEE | FM 141 | 41,331.48 | 7.828 |
| | | TOTAL | 272,801.40 | 51.667 |

| | | ROADWAY LENGTH | | EXCEPTION | | TOTAL LENGTH | | |
|---|---|---|---|---|---|---|---|---|
| CSJ | HWY | (FT) | (MI) | (FT) | (MI) | (FT) | (MI) | LIMITS |
| 0914-00-487 | VARIOUS | 272,801.40 | 51.667 | 0.000 | 0.000 | 272,801.40 | 51.667 | VARIOUS LOCATIONS IN LEE & BASTROP COUNTIES |
| | | | | | | | | |
| TOTAL | | 272,801.40 | 51.667 | 0.000 | 0.000 | 272,801.40 | 51.667 | |

FOR THE CONSTRUCTION OF TRAFFIC CONTROL DEVICES
CONSISTING OF STRIPING REFRESH IN LEE, BASTROP & CALDWELL CO




LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: SH 77 @ OVERPASS - DOT 763422A
SH 95 @ ROEMER RD - DOT 416281N
FM 141 @ CROSSING - DOT 765335D

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON SEPTEMBER 1, 2024 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, OCTOBER 23,2023).

FILE: $FILE$ $TIME$
DATE: $DATE$

Texas Department of Transportation



## FINAL PLANS

DATE OF LETTING: _____
DATE WORK BEGAN: _____
DATE WORK COMPLETED AND ACCEPTED: _____
FINAL CONTRACT COST: $_____
CONTRACTOR: _____
LIST OF APPROVED CHANGE ORDERS:

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

_____ P.E. _____
DATE

RECOMMENDED FOR LETTING: 9/6/2024

DocuSigned by:
Susana Ceballos P.E.
E181617B5C7414...
DISTRICT DESIGN ENGINEER

SUBMITTED FOR LETTING: 9/5/2024

DocuSigned by:
Diana K. Schulze, P.E.
6775445255A3482...
AREA ENGINEER

APPROVED FOR LETTING: 9/6/2024

DocuSigned by:
Heather Ashley-Nguyen
8912AF18E5A416...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

## PLAN SHEETS

| SHEET NO. | GENERAL |
|---|---|
| 1. | TITLE SHEET |
| 2. | INDEX OF SHEETS |
| 3, 3A-3E. | GENERAL NOTES |
| 4. | ESTIMATE & QUANTITY |
| 5. | BASTROP LOCATION MAP |
| 6. | LEE LOCATION MAP |
| 7. | QUANTITY SUMMARY SHEET |
| 8, 8A-8B. | SH 95 BASTROP TYPICAL SECTION & PAVEMENT MARKINGS |
| 9, 9A-9B. | SH 21 BASTROP TYPICAL SECTION & PAVEMENT MARKINGS |
| 10. | SL 150 BASTROP TYPICAL SECTION & PAVEMENT MARKINGS |
| 11. | FM 2104 BASTROP TYPICAL SECTION & PAVEMENT MARKINGS |
| 12. | FM 535 BASTROP TYPICAL SECTION & PAVEMENT MARKINGS |
| 13. | FM 3403 LEE TYPICAL SECTION & PAVEMENT MARKINGS |
| 14, 14A. | US 77 LEE TYPICAL SECTION & PAVEMENT MARKINGS |
| 15. | SH 21 LEE TYPICAL SECTION & PAVEMENT MARKINGS |
| 16. | FM 141 LEE TYPICAL SECTION & PAVEMENT MARKINGS |
| 17. | RAILROAD DETAILS SH 95 AT ROEMER RD |
| 18. | RAILROAD DETAILS US 77 AT RAILROAD OVERPASS |
| 19. | RAILROAD DETAILS FM 141 AT RAILROAD CROSSING |

## STANDARD SHEETS

| SHEET NO. | TRAFFIC CONTROL PLAN STANDARDS |
|---|---|
| *20. | BC(1)-21 |
| *21. | BC(2)-21 |
| *22. | BC(3)-21 |
| *23. | BC(4)-21 |
| *24. | BC(5)-21 |
| *25. | BC(6)-21 |
| *26. | BC(7)-21 |
| *27. | BC(8)-21 |
| *28. | BC(9)-21 |
| *29. | BC(10)-21 |
| *30. | BC(11)-21 |
| *31. | BC(12)-21 |
| *32. | TCP(3-1)-13 |
| *33. | TCP(3-2)-13 |
| *34. | TCP(3-3)-14 |
| *35. | WZ(RS)-22 |

## STANDARD SHEETS CON'T

| SHEET NO. | PAVEMENT MARKINGS & DELINEATION STANDARDS |
|---|---|
| *36. | PM(1)-22 |
| *37. | PM(2)-22 |
| *38. | PM(3)-22 |
| *39. | PM(4)-22A |
| *40. | PM(5)-22 |
| *41. | RS(1)-23 |
| *42. | RS(2)-23 |
| *43. | RS(3)-23 |
| *44. | RS(4)-23 |

| SHEET NO. | ENVIRONMENTAL ISSUES |
|---|---|
| 45. | ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC) |
| 46. | LOST PINES HABITAT CONSERVATION AREA |

| SHEET NO. | RAILROAD STANDARDS |
|---|---|
| *47. | RCD(1)-22 |
| *48. | RCD(2)-22 |
| *49, 49A. | RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS |
| 50. | RAILROAD SCOPE OF WORK DOT 416281N |
| 51. | RAILROAD SCOPE OF WORK DOT 763422A |
| 52. | RAILROAD SCOPE OF WORK DOT 765335D |

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

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
MARGARET M. LAKE, P.E. P.E.

7/18/2024
DATE

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DATE: $DATE$ $TIME$
FILE: $FILE$

*Austin District*
*Bastrop Area Office*

Texas Department of Transportation

# INDEX OF SHEETS

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| DS: CK: | 0914 | 00 | 487 | VARIOUS |
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| | AUS | TRAVIS | | 2 |

**GENERAL NOTES: Version: August 21, 2024**

**GENERAL**
Contractor questions and requests for documents on this project are to be addressed to the following individual(s):

Bastrop Area Diana.Schulze@txdot.gov
Bastrop Area Shane.Swimm@txdot.gov

Questions and requests for documents will be accepted via the Letting Pre-Bid Q&A web page. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

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

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

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

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

Keep the roadway free of debris and sediment caused by construction activities. Dispose of all material in accordance with federal, state, and local regulations. This work is subsidiary.

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

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed.





Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist.

The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

**ITEM 5 – CONTROL OF THE WORK**

Place construction or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW.

If work is to be performed inside the Railroad ROW, then the Contractor will coordinate with the Railroad for a Railroad Flagger. This work is subsidiary.

Obtain and maintain compliance with additional training requested by UPRR "Property Access Training".

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

**ITEM 6 - CONTROL OF MATERIALS**

The area designated as the potential habitat for the Houston Toad will not be allowed as a source for embankment unless approved by the Engineer. The general area is Bastrop County north of the Colorado River and east of SH 95 unless provided in the plans.

If project is in above area include the "Lost Pine Habitat Conservation Plan Area" map. Please call the Bastrop Area Office to obtain the latest copy of the map.

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

**ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES**

TxDOT will coordinate with TDLR regarding pedestrian elements and sidewalks. The contractor will procure and provide all permits, licenses, and inspections; pay all charges, fees, and taxes regarding TDLR rules governing industrialized housing and buildings.

Roadway closures during key dates, significant traffic generators, and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

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

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

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

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

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

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

**Work within a USACE Jurisdictional Area.**

Do not initiate activities within a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Obtain written approval from the Engineer for activities not specifically addressed in the plans. Provide a signed sketch and description of the location 60 business days prior to begin work at the location. Complete and return any forms provided by TxDOT. Approval of the work is not guaranteed. Un approved work is not a compensable impact.

**Work over or near Bodies of Water (lakes, rivers, ponds, creeks, dry waterways, etc.).**

Keep on site a universal spill kit adequate for the body of water and the work being performed. Debris is not allowed to fall into the ordinary high-water level (OHWL). Debris that falls into the OHWL must be removed at the end of each work day. Debris that falls into the floodway must be removed at the end of each work week or prior to a rain event. When not in use and at the end of each work shift, all material and equipment must be stored more than 100 ft. away from the ordinary high water mark. This work is subsidiary.

**Vehicle Idle Restrictions**

With in the limits of City of Austin, Bastrop County, and Travis County, on road vehicles may not idle more than 5 minutes except for following exemptions: vehicle 14,000 pounds or less, vehicles over 14,000 pounds are certified clean ideal as defined by the EPA, or other exemptions as listed in TAC Title 30, Part 1, Chapter 114, Subchapter J, Division 2, 114.517.





**Law Enforcement Personnel.**

Submit charge summary and invoices using the Department forms.

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

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

A maximum combined rate of $85 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2. Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case-by-case basis at a maximum of 2 hours per officer.

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

**Houston Toad.**

This project is subject to the following restrictions/requirements due to the presence of the Houston Toad. The limits of the toad restrictions are for the entire project limits.

Toad habitat boundaries can be found on the Lost Pines Habitat Conservation Plan Area map shown in this contract.

All workers are required to receive up to 1-hour training prior to working on the jobsite. This training will be conducted on site by a federally permitted TxDOT representative. Provide 72-hour notice to schedule the training.

No work will occur outside of the period of 30 minutes after sunrise to 30 minutes before sunset each day. Night work will require a 72-hour notice prior to beginning of the work to allow the site to be cleared. Night work is not guaranteed and requires TxDOT approval prior to beginning work.

TxDOT will clear the project site daily. Notifications when site is clear will be sent to the project staff. Entry or activity within the work area prior to clearance is not allowed.

A sequence of installation of the Toad Exclusion Fence (TEF) to ensure full site containment and permit compliance must be submitted to TxDOT 96 hours prior to beginning installation. TEF shall be paid using bid items 5116-6001 and 5116-6002 for installation and removal of Amphibian and Reptile Exclusion Fence (AREF).

Install TEF around the perimeter of project specific locations (PSLs) (i.e. staging areas, vehicle or equipment parking areas)the project as shown in the contract or as directed by the Engineer. Hand clearing to install the fence is subsidiary.

Install other toad BMPs as designated by the plans or Engineer prior to begin work. BMPs related to the toad will be inspected daily. All deficiencies shall be corrected immediately. Failure to correct a toad related BMP within 24 hours will result in stoppage of work.

If any toad is found within the project limits, stop work, then immediately notify TxDOT and suspend all work and construction traffic within 300 ft. of the toad. TxDOT representatives will be responsible for relocation of a toad.

All standing water within the right of way and not located in a TEF contained waterway shall be removed prior to sunset on the day of or immediately following the completion of a rain event.

All spills, of any amount, shall be reported to TxDOT. All parked equipment and refuelling shall remain 200 ft. from a waterway.

Permanent seeding for erosion control will use the Permanent Rural Seed Mix for the Austin District in accordance with Item 164. Bermuda grass and Bahia grass shall not be used for erosion control seeding.

Visually inspect all open holes and trenches for toads prior to backfill. Holes and trenches shall be covered at the end of each work day or when no work is occurring. This work is subsidiary.

All material imported to the project shall be free of fire ants. All existing material with fire ants shall be treated with a granular product to eliminate the fire ants. This work is subsidiary.

If the total rainfall in a 48-hour period is 2 in. or greater, the Contractor must suspend work for 24 hour period. Time suspension will not begin until the rain event has ended, and time will not be charged during the 24 hour suspension. Time charges during the rain event will be in accordance with the contract. The suspension will be non-compensable.

During Prep right of way tree trimming / tree removal operations, no stockpiling, burning or mulching of vegetation will be allowed on the Right of Way within the Houston Toad Habitat. Mulching activities with a bobcat style brush mulcher or similar equipment, will be allowed as approved by TxDOT Biologist to facilitate installation of TEF. All vegetation shall be removed by the end of each day to a location outside of toad habitat to process for final disposal.

Trees shall be removed mechanically with equipment, such as a track hoe or grad all capable of pulling the vegetation straight out of the ground for inspection. Root balls of all vegetation must





be removed mechanically. No grinding of stumps will be allowed. To facilitate proper inspection, no dozers, loaders, track loaders, etc. will be allowed to doze down vegetation while preparing the right of way.

No on or off right of way PSLs for material storage, borrow sites, water sources, etc. will be allowed within the toad habitat boundaries unless approved by the TxDOT Biologist. Any material temporarily staged within the ROW shall be stored off the ground and enclosed with TEF as directed. If approved, a project PSL shall be enclosed with TEF. All on or off ROW TEF required by the Engineer or TxDOT Biologist will be compensated in accordance with this contract.

**Back Up Alarm.**

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

**ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING**

Table 1

| Roadway | Limits | Allowable Closure Time |
|---|---|---|
| SH 71 | SH 304 to Tahitian Drive | 8 P to 5 A |
| All | Within 200' of a signalized intersection | 9 P to 5 A |
| All | All (Full Closure, see allowable work below) | 11 P to 4 A |

Table 2

| Roadway | Limits | Allowable Closure Time |
|---|---|---|
| All Roads | Bastrop, Lee & Caldwell Counties | Monday – Thursday (8am – 4pm) |
| All Roads | Bastrop, Lee & Caldwell Counties | Friday (8am – 12pm) |

Table 3 (Mobile Operations)

| Roadway | Allowable Sun Night thru Fri Noon | Allowable Sat thru Sun Morn |
|---|---|---|
| Outside Austin City Limits | 9 A to 3 P and 7 P to 7 A | 6 P to 11 A |
| AADT over 50,000 | 8 P to 6 A | 8 P to 10 A |

For roadways without defined allowable closure times, nighttime lane closures will be allowed from 8 P to 6 A.

Daytime or Friday night lane closures will not be allowed unless otherwise shown on the plans. One lane in each direction will remain open at all times for all roadways unless otherwise shown on the plans.

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

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend.

No closures will be allowed 1 P.M. to 11 P.M. the Sunday of the Super Bowl.

Time charges will not be suspended during the large and special events listed below. These events are provided in the contract to allow scheduling of work around these lane closure restrictions.

All lanes will be open by noon of the day before the large events listed in below table. No closures will be allowed on Friday and the weekends for projects within 20 miles of these large events:

Table 4 (Large Events)

| Event | City | Dates |
|---|---|---|
| Formula 1 @ COTA | Austin | Annually (See Event Website) |
| Moto GP @ COTA | Austin | Annually (See Event Website) |
| ACL Fest | Austin | Annually (See Event Website) |
| SXSW | Austin | Annually (See Event Website) |
| ROT Rally | Bastrop | Annually (See Event Website) |
| UT Football Games | Austin | Annually (See Event Website) |
| Sales Tax Holiday | All | Annually (See Event Website) |
| Rodeo Austin | Austin | Annually (See Event Website) |

All lanes will be open by noon of the day before the special events listed in below table. No closures will be allowed on Friday and the weekends for projects within 10 miles of these special events:

Table 5 (Special Events)

| Event | City | Dates |
|---|---|---|
| Eaker BBQ Competition | Fredericksburg | March 10, 2024 |
| Sherwood Forest Faire | McDade / Paige | Weekends in March and April |
| Smithville Jamboree | Smithville | April 4-6, 2024 |
| Two Step Inn | Georgetown | April 20-24, 2024 |
| Wiener Dog Races | Buda | April 27-28, 2024 |
| Founders Day Festival | Dripping Springs | April 26-28, 2024 |
| Red Poppy Festival | Georgetown | April 26-28, 2024 |
| Crawfish Open | Llano | 3rd Friday and Saturday in April |
| Fair and Rodeo | Liberty Hill | May 18, 2023 |
| Founders Day Ceremony | Fredericksburg | 2nd Weekend in May |





| | | |
|---|---|---|
| Crawfish Festival | Fredericksburg | Saturday before Memorial Day |
| Lakefest Boat Races | Marble Falls | June 10-11, 2023 |
| Watermelon Thump | Luling | Last Full Weekend in June |
| Pie in the Sky | Kyle | Sept 1-2, 2023 |
| Wine and Music Festival | Georgetown | Last Saturday of September |
| Deer Season Opening Weekend | All Counties in Burnet Area Office | 1st Friday and Saturday of Season |
| Christmas Nights of FBG Lights | Fredericksburg | Nov 21, 2023 |
| Christmas on Mercer | Dripping Springs | Dec 2, 2023 |
| Lady of Guadalupe Procession | Fredericksburg | Dec 12, 2023 |
| Texas State Graduation Fall | San Marcos | TBD |
| Texas State Graduation Spring | San Marcos | TBD |

All the large and special events listed in the above tables occur annually. Coordinate with the Department and review the city/event website to plan around the future events.

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

One-way traffic control, including work performed under Item 510, must be set up to provide a maximum of 20 minutes of delay to the traveling public.

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

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

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

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

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

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

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

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify current and future traffic control, if at any time the queue becomes greater than 20 minutes.

Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Cover, relocate, or remove existing small, large, and overhead signs that conflict with traffic control. Cover large and overhead signs to remain using latest standard TS-CD. This work is subsidiary.

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

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

Vertical panels used on roadways with speed limit 55mph or greater must be round in shape or have a self-righting mechanism. The “flat” or “oblong” shaped vertical panels are not allowed.

A series of sequential flashing warning lights, per BC(7), must be installed in a merging taper for long term stationary TCP. This includes all TCP setups, such as those shown on the plans or TCP setups per the standards.

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

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

For non-site-specific signal projects, 2 months of barricades will be paid per work order location.

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

Business access signs will be paid using safety continency. Install as directed by the Engineer. Company logos will not be permitted on the signs. Maintenance of the signs will be subsidiary to Item 502.





**ITEM 505 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR**

The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.

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

TMA quantity includes 2 TMA’s per day according to standard.

**ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS**

The project is exempt from the Texas Pollutant Discharge Elimination System (TPDES) General Permit (TXR15000). Exempt projects are those that disturb less than one acre or routine maintenance activities that maintain the original line and grade, hydraulic capacity, or original purposes of the site. No temporary erosion control measures or Storm Water Pollution Prevention Plan (SW3P) have been included in the plans.

**ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS**

Notify the Engineer at least 24 hr. before beginning work.

All projects, including resurfacing, must increase center-to-center width for center line markings to 18 in. unless the plans or existing is greater than 18 in.

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

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

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

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is

not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

**ITEM 668 – PREFABRICATED PAVEMENT MARKINGS AND RUMBLE STRIPS**

For center line applications of preformed rumble strips on multilane undivided roadways, application shall be continuous even if profile markings are present.

For center line applications of preformed rumble strips on two lane two-way roadways, application shall be continuous even if profile markings are present. The preformed rumble strip must not be placed in conflict with a broken/skip pavement marking.

For edge line applications of preformed rumble strips, use option 7 of standard RS(2) unless option 8 required due to shoulder width.

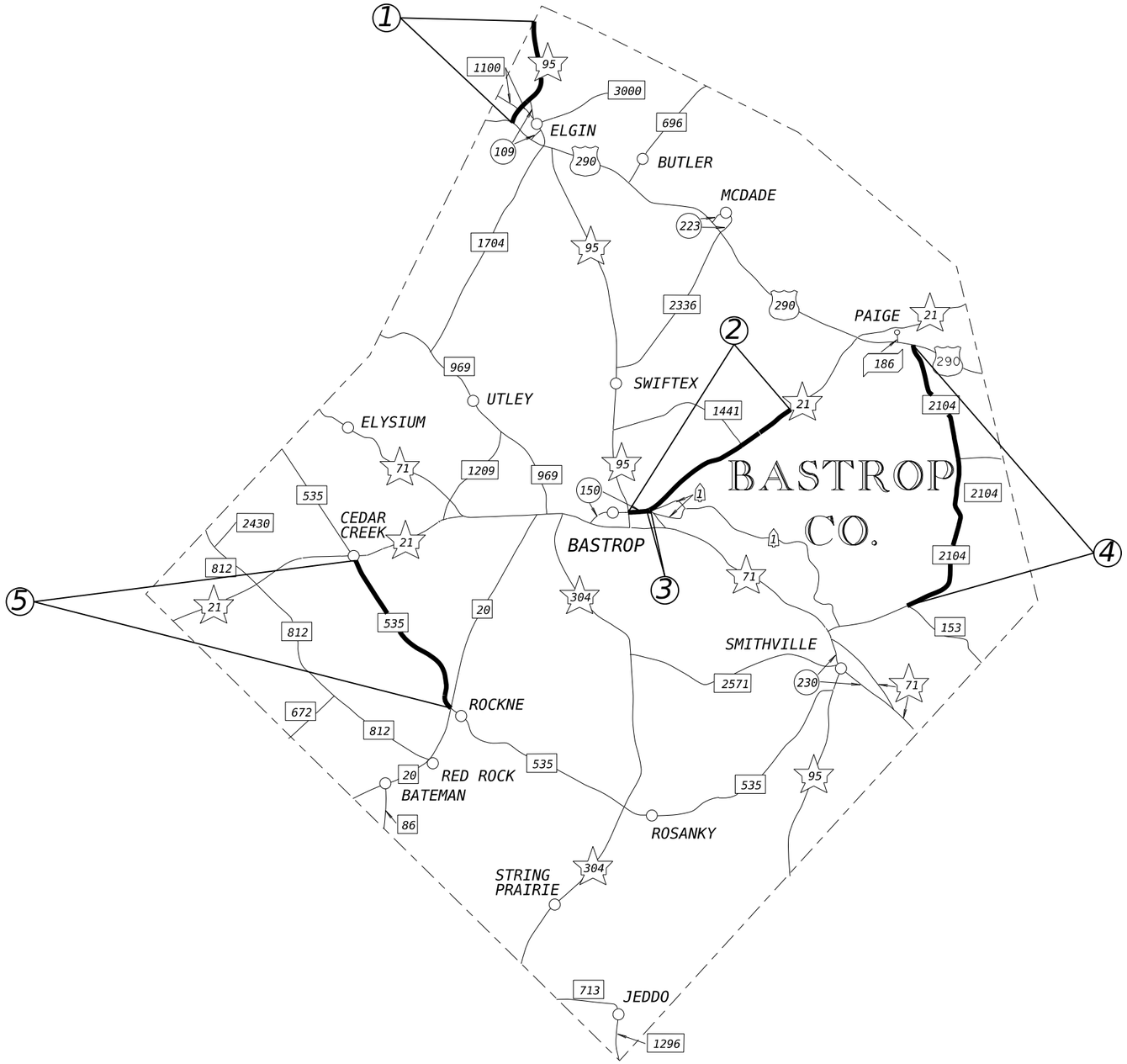
**ITEM 672 – RAISED PAVEMENT MARKERS**

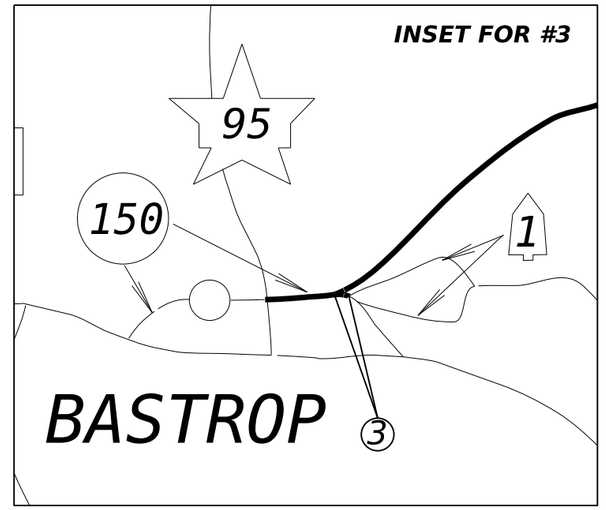
Place Type I-C and II-C-R markers at 40 ft. spacing for all lane lines.

# Estimate & Quantity Sheet

**CONTROLLING PROJECT ID** 0914-00-487 **DISTRICT** Austin **COUNTY** Travis
**HIGHWAY** Various

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | **CONTROL SECTION JOB** | **0914-00-487** | | TOTAL EST. | TOTAL FINAL |
| | | | **PROJECT ID** | **A00188232** | | | |
| | | | **COUNTY** | **Travis** | | | |
| | | | **HIGHWAY** | **Various** | | | |
| **ALT** | **BID CODE** | **DESCRIPTION** | **UNIT** | EST. | FINAL | | |
| | 500-7001 | MOBILIZATION | LS | 1.000 | | 1.000 | |
| | 502-7001 | BARRICADES, SIGNS AND TRAFFIC HANDLING | MO | 3.000 | | 3.000 | |
| | 505-7003 | TMA (MOBILE OPERATION) | DAY | 64.000 | | 64.000 | |
| | 666-7016 | REFL PAV MRK TY I (W)8"(DOT)(060MIL) | LF | 1,259.000 | | 1,259.000 | |
| | 666-7022 | REFL PAV MRK TY I (W)8"(SLD)(060MIL) | LF | 7,131.000 | | 7,131.000 | |
| | 666-7023 | REFL PAV MRK TY I (W)8"(SLD)(090MIL) | LF | 195.000 | | 195.000 | |
| | 666-7034 | REFL PAV MRK TY I (W)24"(SLD)(060MIL) | LF | 1,186.000 | | 1,186.000 | |
| | 666-7040 | REFL PAV MRK TY I (W)(ARROW)(060MIL) | EA | 28.000 | | 28.000 | |
| | 666-7043 | REFL PAV MRK TY I(W)(DBL ARROW)(060MIL) | EA | 5.000 | | 5.000 | |
| | 666-7064 | REFL PAV MRK TY I (W)(WORD)(060MIL) | EA | 20.000 | | 20.000 | |
| | 666-7088 | REF PAV MRK TY I(W)36"(YLD TRI)(060MIL) | EA | 126.000 | | 126.000 | |
| | 666-7115 | REFL PAV MRK TY I (Y)12"(SLD)(060MIL) | LF | 573.000 | | 573.000 | |
| | 666-7122 | REFL PAV MRK TY I (Y)24"(SLD)(090MIL) | LF | 52.000 | | 52.000 | |
| | 666-7265 | RE PROFILE PM TY I(W)6"(SLD)(090MIL) | LF | 57,996.000 | | 57,996.000 | |
| | 666-7269 | RE PROFILE PM TY I(Y)6"(SLD)(090MIL) | LF | 102,965.000 | | 102,965.000 | |
| | 666-7273 | RE PROFILE PM TY I(Y)6"(BRK)(090MIL) | LF | 16,853.000 | | 16,853.000 | |
| | 666-7406 | REFL PAV MRK TY I (W)6"(BRK)(060MIL) | LF | 34,077.000 | | 34,077.000 | |
| | 666-7409 | REFL PAV MRK TY I (W)6"(SLD)(060MIL) | LF | 402,925.000 | | 402,925.000 | |
| | 666-7418 | REFL PAV MRK TY I (Y)6"(BRK)(060MIL) | LF | 16,189.000 | | 16,189.000 | |
| | 666-7419 | REFL PAV MRK TY I (Y)6"(BRK)(090MIL) | LF | 119.000 | | 119.000 | |
| | 666-7421 | REFL PAV MRK TY I (Y)6"(SLD)(060MIL) | LF | 322,935.000 | | 322,935.000 | |
| | 666-7422 | REFL PAV MRK TY I (Y)6"(SLD)(090MIL) | LF | 1,531.000 | | 1,531.000 | |
| | 668-7002 | PRFB RUMBLE STRIP (BLK)(1')(CENTERLINE) | LF | 5,061.000 | | 5,061.000 | |
| | 672-7002 | REFL PAV MRKR TY I-C | EA | 1,002.000 | | 1,002.000 | |
| | 672-7004 | REFL PAV MRKR TY II-A-A | EA | 10,804.000 | | 10,804.000 | |
| | 672-7006 | REFL PAV MRKR TY II-C-R | EA | 1,082.000 | | 1,082.000 | |
| | 12 | RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (PART) | LS | 1.000 | | 1.000 | |
| | 18 | LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PART) | LS | 1.000 | | 1.000 | |
| | | EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART) | LS | 1.000 | | 1.000 | |
| | | SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART) | LS | 1.000 | | 1.000 | |




| BASTROP COUNTY | | | | | | | |
|---|---|---|---|---|---|---|---|
| ROADWAY | | LIMITS | | TRM | | LENGTH | |
| # | HWY | FROM: | TO: | FROM: | TO: | FEET | MILES |
| 1 | SH 95 | US 290 | BASTROP/TRAVIS C/L | 434 +1.032 | 440 + 0.429 | 28,548.96 | 5.407 |
| 2 | SH 21 | SH 95 | DFO 56.235 | 570 +0.809 | 576 +1.469 | 35,164.80 | 6.660 |
| 3 | SL 150 | PARK ROAD 1 | SH 21 | 562 -0.062 | 562 +.043 | 554.40 | 0.105 |
| 4 | FM 2104 | FM 153 | US 290 | 442 -0.091 | 454 +0.474 | 66,343.20 | 12.565 |
| 5 | FM 535 | SH 21 | FM 20 | 550 +1.863 | 558 +1.267 | 39,108.12 | 7.407 |

Austin District
Bastrop Area Office



Texas Department of Transportation

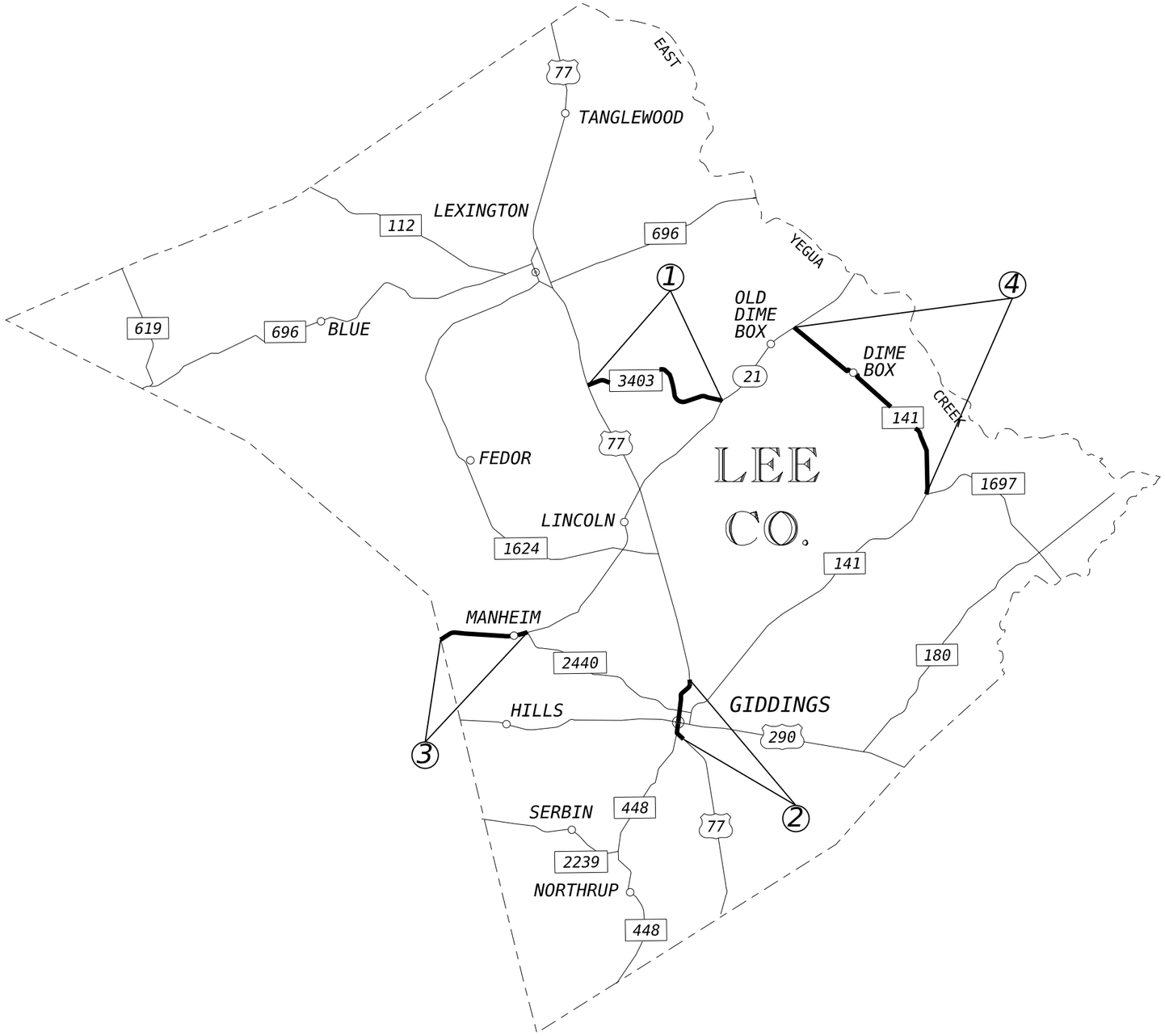
BASTROP COUNTY
LOCATION MAP

N.T.S

SHEET 1 OF 2

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 5 |

DATE: $DATE$ $TIME$
FILE: $FILE$




| LEE COUNTY | | | | | | | |
|---|---|---|---|---|---|---|---|
| ROADWAY | | LIMITS | | TRM | | LENGTH | |
| # | HWY | FROM: | TO: | FROM: | TO: | FEET | MILES |
| 1 | FM 3403 | US 77 | SH 21 E | 582 -0.110 | 588 +0.105 | 32,815.20 | 6.215 |
| 2 | US 77 | LEON ST | DFO 56.235 | 474 +0.000 | 476 +0.528 | 13,347.84 | 2.528 |
| 3 | SH 21 E | BASTROP C/L | FM 2440 | 588 +0.039 | 590 +0.994 | 15,602.40 | 2.955 |
| 4 | FM 141 | SH 21 | FM 1697 | 432 -0.032 | 438 +1.796 | 41,331.84 | 7.828 |

Austin District
Bastrop Area Office



Texas Department of Transportation

LEE COUNTY
LOCATION MAP

2024 SHEET 1 OF 2

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 6 |

DATE: $DATE$ $TIME$
FILE: $FILE$

## SUMMARY OF PAVEMENT MARKING ITEMS

| CATEGORY OF WORK | Barricades | Mobilization | Pavemarking(s) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BID CODE | 502-7001 | 500-7001 | 666-7406 | 666-7421 | 666-7273 | 666-7064 | 666-7022 | 666-7034 | 666-7418 | 666-7419 | 666-7265 | 666-7043 | 666-7409 |
| DESCRIPTION | BARRICADES, SIGNS AND TRAFFIC HANDLING | MOBILIZATION | REFL PAV MRK TY I (W)6"(BRK)(060MIL) | REFL PAV MRK TY I (Y)6"(SLD)(060MIL) | RE PROFILE PM TY I(Y)6"(BRK)(090MIL) | REFL PAV MRK TY I (W)(WORD)(060MIL) | REFL PAV MRK TY I (W)8"(SLD)(060MIL) | REFL PAV MRK TY I (W)24"(SLD)(060MIL) | REFL PAV MRK TY I (Y)6"(BRK)(060MIL) | REFL PAV MRK TY I (Y)6"(BRK)(090MIL) | RE PROFILE PM TY I(W)6"(SLD)(090MIL) | REFL PAV MRK TY I(W)(DBL ARROW)(060MIL) | REFL PAV MRK TY I (W)6"(SLD)(060MIL) |
| ALTERNATE BID GROUP | | | | | | | | | | | | | |
| PLAN SET LOCATION UNIT | MO Monthly | LS Lump Sum | LF Linear Feet | LF Linear Feet | LF Linear Feet | EA Each | LF Linear Feet | LF Linear Feet | LF Linear Feet | LF Linear Feet | LF Linear Feet | EA Each | LF Linear Feet |
| FM141 | | | | 56,496.000 | | | | | 4,650.000 | | | | |
| FM2104 | | | | | 12,811.000 | | | 15.000 | | | | | 132,686.000 |
| FM3403 | | | | | 4,042.000 | | | 30.000 | | | | | 65,630.000 |
| FM535 | | | | 70,382.000 | | 2.000 | 260.000 | 272.000 | 1,451.000 | | | 1.000 | 78,186.000 |
| SH21 | | | 17,279.000 | 72,809.000 | | 6.000 | 4,406.000 | 145.000 | 855.000 | | | | 70,095.000 |
| SH21*LEE | | | 7,801.000 | 32,219.000 | | | | | | | | | 31,205.000 |
| SH95 | | | 2,442.000 | 63,488.000 | | 8.000 | 2,240.000 | 120.000 | 4,677.000 | | 56,993.000 | 2.000 | |
| SL150 | | | | | | 2.000 | | 32.000 | | 119.000 | 1,003.000 | 2.000 | |
| US77 | | | 6,555.000 | 27,541.000 | | 2.000 | 225.000 | 572.000 | 4,556.000 | | | | 25,123.000 |
| | 3.000 | 1.000 | | | | | | | | | | | |
| **PROJECT TOTALS** | **3.000** | **1.000** | **34,077.000** | **322,935.000** | **16,853.000** | **20.000** | **7,131.000** | **1,186.000** | **16,189.000** | **119.000** | **57,996.000** | **5.000** | **402,925.000** |

## SUMMARY OF PAVEMENT MARKING ITEMS

| CATEGORY OF WORK | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BID CODE | 666-7040 | 666-7269 | 666-7422 | 666-7122 | 666-7016 | 666-7088 | 666-7023 | 666-7115 | 668-7002 | 672-7002 | 672-7004 | 672-7006 | 505-7003 |
| DESCRIPTION | REFL PAV MRK TY I (W)(ARROW)(060MIL) | RE PROFILE PM TY I(Y)6"(SLD)(090MIL) | REFL PAV MRK TY I (Y)6"(SLD)(090MIL) | REFL PAV MRK TY I (Y)24"(SLD)(090MIL) | REFL PAV MRK TY I (W)8"(DOT)(060MIL) | REF PAV MRK TY I(W)36"(YLD TRI)(060MIL) | REFL PAV MRK TY I (W)8"(SLD)(090MIL) | REFL PAV MRK TY I (Y)12"(SLD)(060MIL) | PRFB RUMBLE STRIP (BLK)(12 5/32)(CENTERLINE) | REFL PAV MRKR TY I-C | REFL PAV MRKR TY II-A-A | REFL PAV MRKR TY II-C-R | TMA (MOBILE OPERATION) |
| ALTERNATE BID GROUP | | | | | | | | | | | | | |
| PLAN SET LOCATION UNIT | EA Each | LF Linear Feet | LF Linear Feet | LF Linear Feet | LF Linear Feet | EA Each | LF Linear Feet | LF Linear Feet | LF Linear Feet | EA Each | EA Each | EA Each | DAY Day |
| FM141 | | | | | | | | | 1,116.000 | | | | |
| FM2104 | | 59,574.000 | | | | | | | 2,734.000 | | | | |
| FM3403 | | 43,391.000 | | | | | | | 911.000 | | | | |
| FM535 | 1.000 | | | | | | | | 300.000 | 13.000 | 960.000 | | |
| SH21 | 10.000 | | | | 1,082.000 | 126.000 | | | | | 6,587.000 | 1,082.000 | |
| SH21*LEE | | | | | | | | | | 391.000 | 478.000 | | |
| SH95 | 9.000 | | | | 177.000 | | | 573.000 | | 236.000 | 1,974.000 | | |
| SL150 | 6.000 | | 1,531.000 | 52.000 | | | 195.000 | | | 12.000 | 86.000 | | |
| US77 | 2.000 | | | | | | | | | 350.000 | 719.000 | | |
| | | | | | | | | | | | | | 64.000 |
| **PROJECT TOTALS** | **28.000** | **102,965.000** | **1,531.000** | **52.000** | **1,259.000** | **126.000** | **195.000** | **573.000** | **5,061.000** | **1,002.000** | **10,804.000** | **1,082.000** | **64.000** |

NOTE:

| | |
|---|---|
| FM 2104 | RESTRIPE ONLY, NO RPM'S INCLUDED |
| FM 3403 | RESTRIPE ONLY, NO RPM'S INCLUDED |
| FM 535 | RESTRIPE & REPLACE MISSING 25% RPM'S |
| SH 21 BASTROP | RESTRIPE & RPM'S |
| SH 95 | RESTRIPE, PROFILE EDGE & RPM'S |
| SL 150 | RESTRIPE & RPM'S FROM SH 21 TO PARK ENTRANCE |
| US 77 | RESTRIPE & RPM'S |
| SH 21 LEE CO | RESTRIPE & RPM'S |
| FM 141 | RESTRIPE CENTERLINE ONLY |

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
8/29/2024

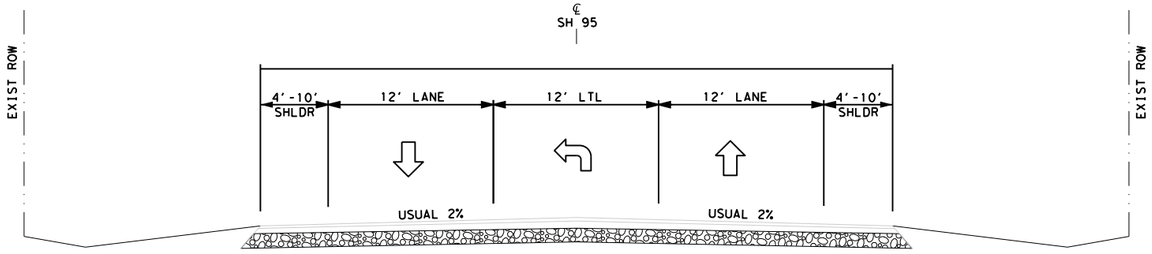
**Austin District**
**Bastrop Area Office**

Texas Department of Transportation

# QUANTITY SUMMARY SHEET

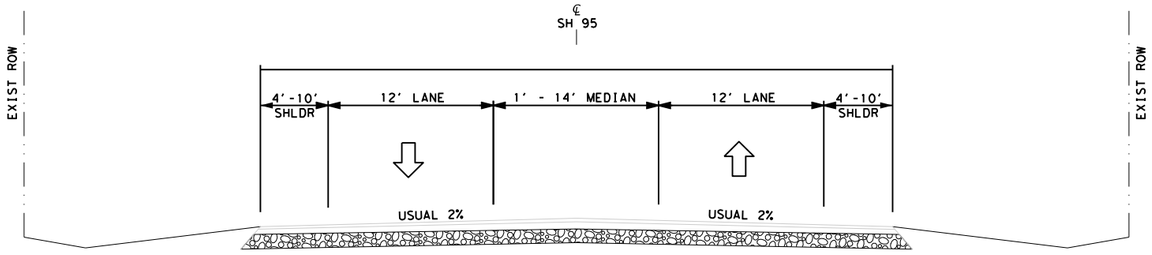
| © 2024 | CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|---|
| | 0914 | 00 | 487 | VARIOUS |
| | DIST | COUNTY | | SHEET NO. |
| | AUS | TRAVIS | | 7 |

| DOUBLE YELLOW | | 2 LN DIVIDED | | 2 LN WITH TWLTL | | SUPER 2 | | TURN/MERGE LANE | | UNSTRIPED | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | OTHER | OTHER | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | TO | FROM | TO | FROM | TO | FROM | TO | FROM | TO | FROM | TO | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | Ty I-C | TY II A-A | 8" W DOT | 8" W SLD | 24" W | 12" Y | YIELD TRI | ARROW | WORD |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 434+1.032 | 436+0.094 | - | - | - | - | - | - | 434+1.032 | 436+0.094 | - | - | 1.062 | 5607 | 11215 | 0 | 11215 | 0 | 31 | 561 | 0 | 620 | 0 | 0 | 5 | 1 | 1 |
| - | - | 436+0.094 | 436+0.183 | - | - | - | - | - | - | - | - | 0.089 | 470 | 940 | 0 | 1880 | 0 | 0 | 94 | 80 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | - | - | 436+0.183 | 436+1.121 | - | - | - | - | 0.938 | 4953 | 9905 | 1238 | 9905 | 0 | 62 | 124 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | 436+1.121 | 436+1.261 | - | - | - | - | - | - | - | - | 0.140 | 739 | 1478 | 0 | 2957 | 0 | 0 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 436+1.261 | 436+1.391 | - | - | - | - | - | - | 0.130 | 686 | 1373 | 0 | 1373 | 343 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| - | - | 436+1.391 | 436+1.542 | - | - | - | - | - | - | - | - | 0.151 | 797 | 1595 | 0 | 3189 | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | - | - | 436+1.542 | 438+0.454 | - | - | - | - | 0.912 | 4815 | 9631 | 1204 | 9631 | 0 | 61 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | 438+0.454 | 438+0.531 | - | - | - | - | - | - | - | - | 0.077 | 407 | 813 | 0 | 1626 | 0 | 0 | 81 | 97 | 0 | 0 | 0 | 0 | 1 | 1 |
| - | - | - | - | 438+0.531 | 440+0.063 | - | - | - | - | - | - | 1.532 | 8089 | 16178 | 0 | 16178 | 4044 | 0 | 404 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 440+0.063 | 440+0.094 | - | - | - | - | - | - | 440+0.063 | 440+0.094 | - | - | 0.031 | 164 | 327 | 0 | 327 | 0 | 5 | 16 | 0 | 100 | 95 | 0 | 0 | 1 | 1 |
| - | - | - | - | - | - | - | - | - | - | 440+0.094 | 440+0.104 | 0.010 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 440+0.104 | 440+0.171 | - | - | - | - | - | - | 440+0.104 | 440+0.171 | - | - | 0.067 | 354 | 708 | 0 | 708 | 0 | 20 | 35 | 0 | 400 | 0 | 0 | 0 | 2 | 2 |
| - | - | - | - | 440+0.171 | 440+0.281 | - | - | - | - | - | - | 0.110 | 581 | 1162 | 0 | 1162 | 290 | 15 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | 440+0.281 | 440+0.439 | - | - | - | - | 440+0.281 | 440+0.439 | - | - | 0.158 | 834 | 1668 | 0 | 3337 | 0 | 42 | 167 | 0 | 1120 | 25 | 573 | 0 | 1 | 2 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | | | | | | | | | | | | 5.407 | 28549 | 56993 | 2442 | 63488 | 4677 | 236 | 1974 | 177 | 2240 | 120 | 573 | 5 | 11 | 8 |




## EXISTING TYPICAL SECTION:

FROM TRM 434 +1.032 TO TRM 436 +0.094
FROM TRM 440 +0.063 TO TRM 440 +0.094




## EXISTING TYPICAL SECTION:

FROM TRM 436 +0.094 TO TRM 436 +0.183
FROM TRM 436 +1.121 TO TRM 436 +1.261
FROM TRM 436 +1.391 TO TRM 436 +1.542
FROM TRM 438 +0.454 TO TRM 438 +0.531
FROM TRM 440 +0.281 TO TRM 440 +0.302

*NOTES:*

1. *SH 95 RESTRIPE, PROFILE EDGE & RPM'S*
2. *TRM 434 +1.032 BEGINS AT US 290 C/L*
3. *RESTRIPE RAMPS AT US 290 & SH 95 INTERSECTION*
4. *RAILROAD CROSSING IS PARARREL TO PROJECT NO WORK WILL TAKE PLACE OUTSIDE OF SOW*
5. *TRM 440 +0.439 ENDS AT COUNTY LINE*

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# SH 95

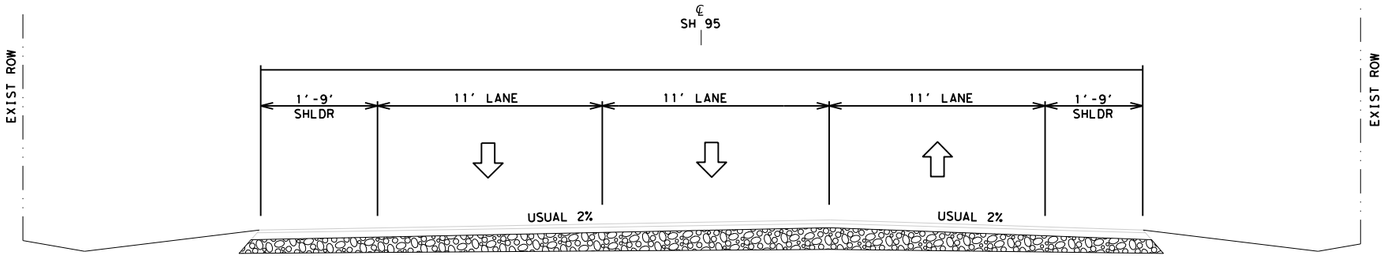
## TYPICAL SECTIONS AND PAVEMENT MARKINGS

N.T.S. SHEET 1 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 8 |

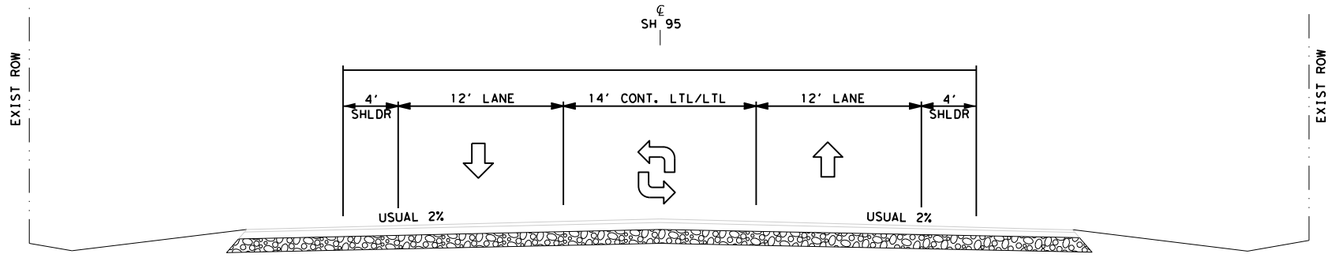
*DATE: $DATE$ $TIME$*
*FILE: $FILE$*

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*



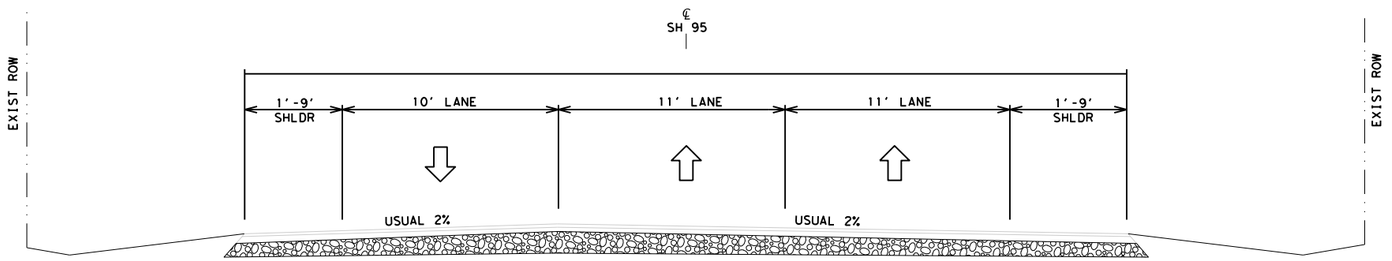

## EXISTING TYPICAL SECTION

FROM TRM 436 +0.183 TO TRM 436 +1.121




## EXISTING TYPICAL SECTION:

FROM TRM 436 +1.261 TO TRM 436 +1.391
FROM TRM 438 +0.531 TO TRM 440 +0.063
FROM TRM 440 +1.171 TO TRM 440 +0.281




## EXISTING TYPICAL SECTION

FROM TRM 436 +1.542 TO TRM 438 +0.454

*NOTES:*

1. *SH 95 RESTRIPE, PROFILE EDGE & RPM'S*
2. *TRM 434 +1.032 BEGINS AT US 290 C/L*
3. *RESTRIPE RAMPS AT US 290 & SH 95 INTERSECTION*
4. *RAILROAD CROSSING IS PARARREL TO PROJECT NO WORK WILL TAKE PLACE OUTSIDE OF SOW*
5. *TRM 440 +0.439 ENDS AT COUNTY LINE*

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# SH 95

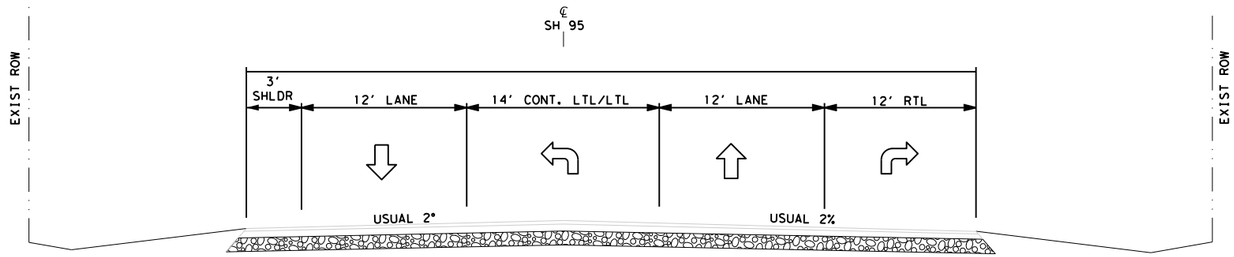
## TYPICAL SECTIONS AND PAVEMENT MARKINGS

N.T.S. SHEET 2 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 8A |

*DATE: $DATE$ $TIME$*
*FILE: $FILE$*

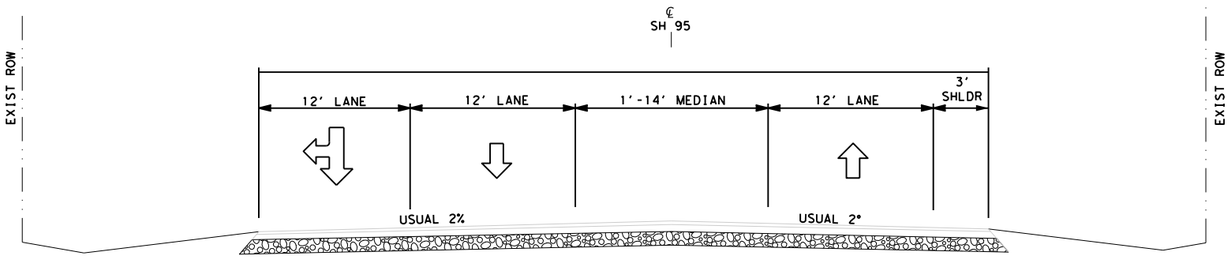
**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*




**EXISTING TYPICAL SECTION:**
FROM TRM 440 +0.104 TO TRM 440 +0.171

*NOTES:*

1. *SH 95 RESTRIPE, PROFILE EDGE & RPM'S*
2. *TRM 434 +1.032 BEGINS AT US 290 C/L*
3. *RESTRIPE RAMPS AT US 290 & SH 95 INTERSECTION*
4. *RAILROAD CROSSING IS PARARREL TO PROJECT NO WORK WILL TAKE PLACE OUTSIDE OF SOW*
5. *TRM 440 +0.439 ENDS AT COUNTY LINE*




**EXISTING TYPICAL SECTION:**
FROM TRM 440 +0.281 TO TRM 440 +0.439

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

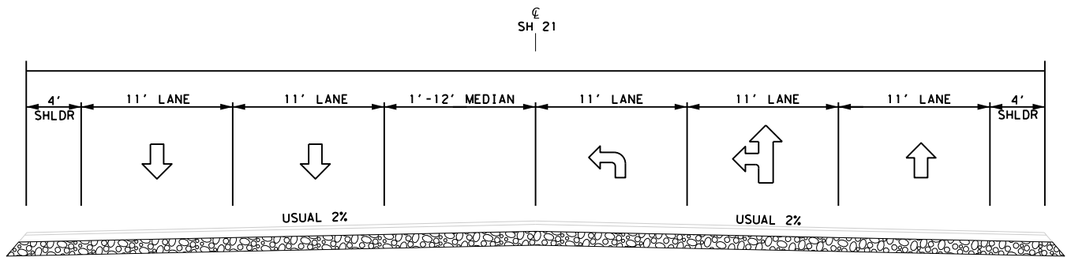
# SH 95

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

N.T.S. SHEET 3 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |

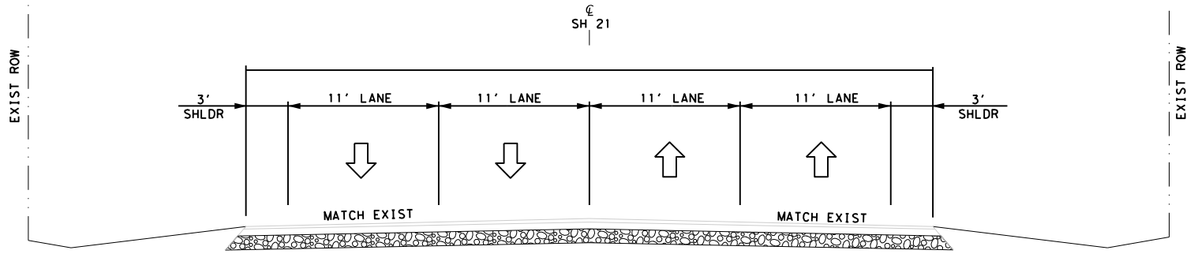
| DIST | COUNTY | SHEET NO. |
|---|---|---|
| AUS | TRAVIS | 8B |



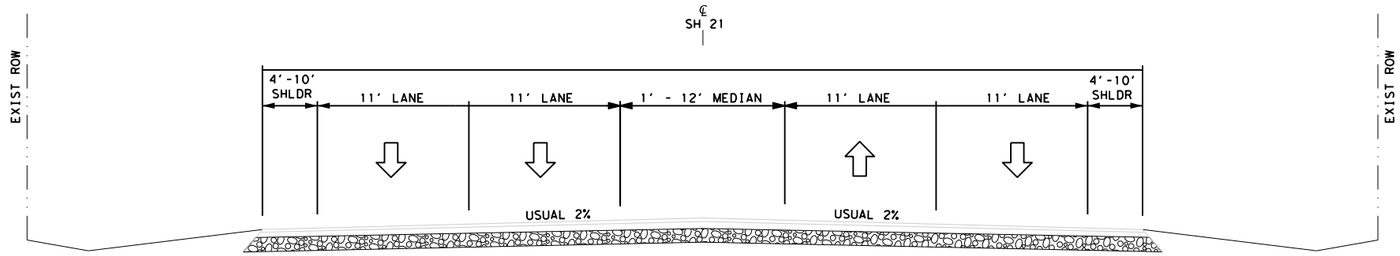

## EXISTING TYPICAL SECTION
FROM TRM 570 +0.809 TO TRM 570 +0.914

*NOTES:*

1. *SH 21 PROPOSED RESTRIPE & RPM'S*
2. *TRM 570 +0.809 BEGINS AT SH 95 C/L*
3. *RESTRIPE RAMPS AT SH 95 & SH 21 INTERSECTION*
4. *RESTRIPE CROSSOVERS*
5. *TRM 576 +1.469 ENDS AT END OF DIVIDED HIGHWAY*




## PROPOSED TYPICAL SECTION
FROM TRM 570 +0.914 TO TRM 570 +1.437




## EXISTING TYPICAL SECTION
FROM TRM 570 +1.437 TO TRM 570 +1.479

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



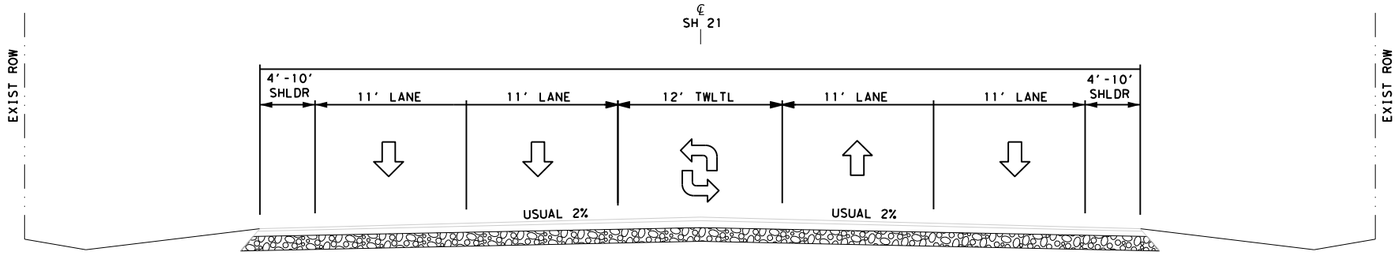
Texas Department of Transportation

# SH 21

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

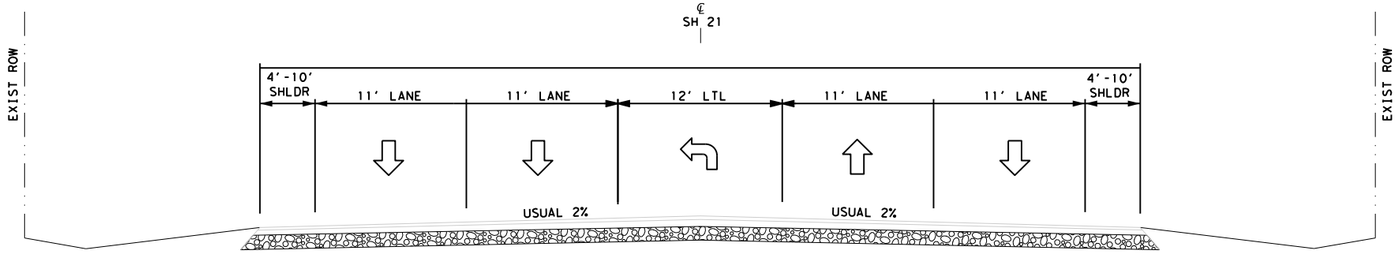
N.T.S. SHEET 4 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 9 |



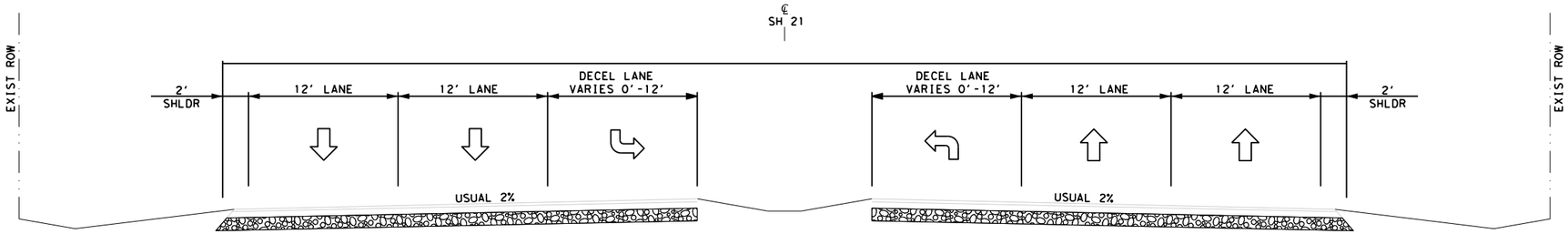

## EXISTING TYPICAL SECTION

FROM TRM 570 +1.479 TO TRM 570 +1.551
FROM TRM 570 +1.629 TO TRM 570 +1.881
FROM TRM 576 +1.364 TO TRM 576 +1.469




## EXISTING TYPICAL SECTION

FROM TRM 570 +1.551 TO TRM 570 +1.582
FROM TRM 570 +1.599 TO TRM 570 +1.629




## EXISTING TYPICAL SECTION:

FROM TRM 570 +1.881 TO TRM 576 +1.364

*NOTES:*

1. *SH 21 PROPOSED RESTRIPE & RPM'S*
2. *TRM 570 +0.809 BEGINS AT SH 95 C/L*
3. *RESTRIPE RAMPS AT SH 95 & SH 21 INTERSECTION*
4. *RESTRIPE CROSSOVERS*
5. *TRM 576 +1.469 ENDS AT END OF DIVIDED HIGHWAY*

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
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DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# SH 21

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

N.T.S. SHEET 5 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 9A |

*DATE: $DATE$ $TIME$*
*FILE: $FILE$*

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

## SH 21 - BASTROP

| CROSSOVER | | 4 LN WITH TWLTL | | 4 LN DIVIDED | | TURN/MERGE LANE | | UNSTRIPED | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | OTHER | OTHER | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | TO | FROM | TO | FROM | TO | FROM | TO | FROM | TO | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | Ty I-C | TY II A-A | 8" W DOT | 8" W SLD | 24" W | YIELD TRI | ARROW | WORD |
| | | | | | | | | | | | | | | | | | | | | | | | |
| - | - | - | - | 570+0.809 | 570+0.839 | 570+0.809 | 570+0.839 | - | - | 0.030 | 158 | 317 | 158 | 634 | 0 | 12 | 32 | 0 | 463 | 0 | 10 | 4 | 1 |
| - | - | - | - | 570+0.839 | 570+0.914 | - | - | - | - | 0.075 | 396 | 792 | 198 | 1584 | 0 | 10 | 79 | 0 | 0 | 0 | 0 | 0 | 0 |
| 570+0.914 | 570+1.437 | - | - | - | - | - | - | - | - | 0.523 | 2761 | 5523 | 1381 | 5523 | 0 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 570+1.437 | 570+1.479 | - | - | - | - | 0.042 | 222 | 444 | 111 | 887 | 0 | 6 | 44 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | 570+1.479 | 570+1.551 | - | - | - | - | - | - | 0.072 | 380 | 760 | 190 | 760 | 190 | 10 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| 570+1.551 | 570+1.582 | - | - | - | - | 570+1.551 | 570+1.582 | - | - | 0.031 | 164 | 327 | 82 | 327 | 0 | 9 | 16 | 0 | 164 | 35 | 0 | 1 | 1 |
| - | - | - | - | - | - | - | - | 570+1.582 | 570+1.599 | 0.017 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 570+1.599 | 570+1.629 | - | - | - | - | 570+1.599 | 570+1.629 | - | - | 0.030 | 158 | 317 | 79 | 317 | 0 | 8 | 16 | 0 | 158 | 35 | 0 | 1 | 1 |
| - | - | 570+1.629 | 570+1.881 | - | - | - | - | - | - | 0.252 | 1331 | 2661 | 665 | 2661 | 665 | 34 | 67 | 0 | 0 | 0 | 0 | 2 | 0 |
| - | - | - | - | 570+1.881 | 572+0.588 | - | - | - | - | 0.707 | 3733 | 7466 | 1866 | 7466 | 0 | 94 | 747 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 572+0.588 | 572+0.731 | 572+0.588 | 572+0.731 | - | - | 0.143 | 755 | 1510 | 378 | 1510 | 0 | 72 | 208 | 55 | 550 | 0 | 0 | | |
| 572+0.731 | 572+0.741 | - | - | - | - | - | - | - | - | 0.010 | 53 | 53 | 0 | 106 | 0 | 0 | 1 | 0 | 0 | 35 | 0 | 0 | 0 |
| - | - | - | - | 572+0.741 | 572+1.084 | - | - | - | - | 0.343 | 1811 | 3622 | 906 | 3622 | 0 | 46 | 362 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 572+1.084 | 572+1.097 | 572+1.084 | 572+1.097 | - | - | 0.013 | 69 | 137 | 34 | 137 | 0 | 6 | 19 | 50 | 69 | 0 | 0 | | |
| 572+1.097 | 572+1.104 | - | - | - | - | - | - | - | - | 0.007 | 37 | 74 | 0 | 74 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 0 |
| - | - | - | - | 572+1.104 | 572+1.227 | - | - | - | - | 0.123 | 649 | 1299 | 325 | 1299 | 0 | 17 | 130 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 572+1.227 | 572+1.254 | 572+1.227 | 572+1.254 | - | - | 0.027 | 143 | 285 | 71 | 285 | 0 | 11 | 39 | 31 | 143 | 0 | 0 | | |
| 572+1.254 | 572+1.263 | - | - | - | - | - | - | - | - | 0.009 | 48 | 95 | 0 | 95 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 0 |
| - | - | - | - | 572+1.263 | 572+1.568 | - | - | - | - | 0.305 | 1610 | 3221 | 805 | 3221 | 0 | 41 | 322 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 572+1.568 | 572+1.585 | 572+1.568 | 572+1.585 | - | - | 0.017 | 90 | 180 | 45 | 180 | 0 | 7 | 25 | 45 | 90 | 0 | 0 | | |
| 572+1.585 | 572+1.597 | - | - | - | - | - | - | - | - | 0.012 | 63 | 127 | 0 | 127 | 0 | 0 | 2 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 572+1.597 | 572+1.807 | - | - | - | - | 0.210 | 1109 | 2218 | 554 | 2218 | 0 | 28 | 222 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 572+1.807 | 572+1.821 | 572+1.807 | 572+1.821 | - | - | 0.014 | 74 | 148 | 37 | 148 | 0 | 6 | 20 | 57 | 74 | 0 | 0 | | |
| 572+1.821 | 572+1.833 | - | - | - | - | - | - | - | - | 0.012 | 63 | 127 | 0 | 127 | 0 | 0 | 2 | 0 | 0 | 0 | 10 | 0 | 0 |
| - | - | - | - | 572+1.833 | 574+0.169 | - | - | - | - | 0.336 | 1774 | 3548 | 887 | 3548 | 0 | 45 | 355 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+0.169 | 574+0.212 | 574+0.169 | 574+0.212 | - | - | 0.043 | 227 | 454 | 114 | 454 | 0 | 18 | 62 | 39 | 229 | 0 | 0 | 0 | 1 |
| 574+0.212 | 574+0.221 | - | - | - | - | 574+0.212 | 574+0.221 | - | - | 0.009 | 48 | 95 | 0 | 95 | 0 | 3 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 574+0.221 | 574+0.235 | 574+0.221 | 574+0.235 | - | - | 0.014 | 74 | 148 | 37 | 148 | 0 | 6 | 20 | 30 | 95 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+0.235 | 574+0.509 | - | - | - | - | 0.274 | 1447 | 2893 | 723 | 2893 | 0 | 37 | 289 | 0 | 0 | 0 | 0 | | |
| - | - | - | - | 574+0.509 | 574+0.543 | - | - | - | - | 0.034 | 180 | 359 | 90 | 359 | 0 | 5 | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 574+0.543 | 574+0.556 | - | - | - | - | - | - | - | - | 0.013 | 69 | 137 | 0 | 137 | 0 | 0 | 2 | 0 | 0 | 0 | 14 | 0 | 0 |
| - | - | - | - | 574+0.556 | 574+0.571 | 574+0.556 | 574+0.571 | - | - | 0.015 | 79 | 158 | 40 | 158 | 0 | 8 | 22 | 0 | 0 | 0 | 0 | | |
| - | - | - | - | 574+0.571 | 574+0.665 | 574+0.571 | 574+0.665 | - | - | 0.094 | 496 | 993 | 248 | 993 | 0 | 48 | 99 | 32 | 496 | 0 | 0 | | |
| - | - | - | - | 574+0.665 | 574+0.890 | - | - | - | - | 0.225 | 1188 | 2376 | 594 | 2376 | 0 | 30 | 238 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+0.890 | 574+0.938 | 574+0.890 | 574+0.938 | - | - | 0.048 | 253 | 507 | 127 | 507 | 0 | 25 | 70 | 42 | 92 | 0 | 0 | | |
| 574+0.938 | 574+0.944 | - | - | - | - | - | - | - | - | 0.006 | 32 | 63 | 0 | 63 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 0 |
| - | - | - | - | 574+0.944 | 574+0.990 | 574+0.944 | 574+0.990 | - | - | 0.046 | 243 | 486 | 121 | 486 | 0 | 24 | 67 | 39 | 90 | 0 | 0 | | |
| - | - | - | - | 574+0.990 | 574+1.148 | - | - | - | - | 0.158 | 834 | 1668 | 417 | 1668 | 0 | 21 | 167 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+1.148 | 574+1.194 | 574+1.148 | 574+1.194 | - | - | 0.046 | 243 | 486 | 121 | 486 | 0 | 24 | 67 | 40 | 84 | 0 | 0 | | |
| 574+1.194 | 574+1.202 | - | - | - | - | - | - | - | - | 0.008 | 42 | 84 | 0 | 84 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 574+1.202 | 574+1.255 | 574+1.202 | 574+1.255 | - | - | 0.053 | 280 | 560 | 140 | 560 | 0 | 27 | 77 | 48 | 84 | 0 | 0 | | |
| - | - | - | - | 574+1.255 | 574+1.529 | - | - | - | - | 0.274 | 1447 | 2893 | 723 | 2893 | 0 | 37 | 289 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+1.529 | 574+1.576 | 574+1.529 | 574+1.576 | - | - | 0.047 | 248 | 496 | 124 | 496 | 0 | 24 | 68 | 39 | 95 | 0 | 0 | | |
| 574+1.576 | 574+1.584 | - | - | - | - | - | - | - | - | 0.008 | 42 | 84 | 0 | 84 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 574+1.584 | 574+1.630 | 574+1.584 | 574+1.630 | - | - | 0.046 | 243 | 486 | 121 | 486 | 0 | 24 | 67 | 43 | 84 | 0 | 0 | | |
| - | - | - | - | 574+1.630 | 574+1.818 | - | - | - | - | 0.188 | 993 | 1985 | 496 | 1985 | 0 | 25 | 199 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 574+1.818 | 574+1.865 | 574+1.818 | 574+1.865 | - | - | 0.047 | 248 | 496 | 124 | 496 | 0 | 24 | 68 | 46 | 68 | 0 | 0 | | |
| 574+1.865 | 574+1.872 | - | - | - | - | - | - | - | - | 0.007 | 37 | 74 | 0 | 74 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 574+1.872 | 574+1.921 | 574+1.872 | 574+1.921 | - | - | 0.049 | 259 | 517 | 129 | 517 | 0 | 25 | 71 | 43 | 83 | 0 | 0 | 0 | |
| - | - | - | - | 574+1.921 | 576+0.084 | - | - | - | - | 0.163 | 861 | 1721 | 430 | 1721 | 0 | 22 | 172 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.084 | 576+0.133 | 576+0.084 | 576+0.133 | - | - | 0.049 | 259 | 517 | 129 | 517 | 0 | 25 | 71 | 51 | 62 | 0 | 0 | 0 | |
| 576+0.133 | 576+0.141 | - | - | - | - | - | - | - | - | 0.008 | 42 | 84 | 0 | 84 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 576+0.141 | 576+0.190 | 576+0.141 | 576+0.190 | - | - | 0.049 | 259 | 517 | 129 | 517 | 0 | 25 | 71 | 36 | 88 | 0 | 0 | 0 | |
| - | - | - | - | 576+0.190 | 576+0.363 | - | - | - | - | 0.173 | 913 | 1827 | 460 | 1827 | 0 | 23 | 183 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.363 | 576+0.415 | 576+0.363 | 576+0.415 | - | - | 0.052 | 275 | 549 | 140 | 549 | 0 | 27 | 76 | 43 | 94 | 0 | 0 | 0 | 0 |
| 576+0.415 | 576+0.425 | - | - | - | - | - | - | - | - | 0.010 | 53 | 106 | 0 | 106 | 0 | 0 | 1 | 0 | 0 | 0 | 10 | 0 | 0 |
| - | - | - | - | 576+0.425 | 576+0.473 | 576+0.425 | 576+0.473 | - | - | 0.048 | 253 | 507 | 130 | 507 | 0 | 25 | 70 | 41 | 95 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.473 | 576+0.517 | - | - | - | - | 0.044 | 232 | 465 | 120 | 465 | 0 | 6 | 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.517 | 576+0.619 | 576+0.517 | 576+0.619 | - | - | 0.102 | 539 | 1077 | 270 | 1077 | 0 | 52 | 148 | 27 | 428 | 0 | 0 | 2 | 2 |
| 576+0.619 | 576+0.628 | - | - | - | - | - | - | - | - | 0.009 | 48 | 95 | 0 | 95 | 0 | 0 | 1 | 0 | 0 | 40 | 0 | 0 | 0 |
| - | - | - | - | 576+0.628 | 576+0.677 | 576+0.628 | 576+0.677 | - | - | 0.049 | 259 | 517 | 130 | 517 | 0 | 25 | 71 | 43 | 94 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.677 | 576+0.927 | - | - | - | - | 0.250 | 1320 | 2640 | 660 | 2640 | 0 | 34 | 264 | 0 | | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+0.927 | 576+0.970 | 576+0.927 | 576+0.970 | - | - | 0.043 | 227 | 454 | 120 | 454 | 0 | 22 | 62 | 40 | 83 | 0 | 0 | 0 | 0 |
| 576+0.970 | 576+0.977 | - | - | - | - | - | - | - | - | 0.007 | 37 | 74 | 0 | 74 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 576+0.977 | 576+1.024 | 576+0.977 | 576+1.024 | - | - | 0.047 | 248 | 496 | 130 | 496 | 0 | 24 | 68 | 40 | 93 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+1.024 | 576+1.247 | - | - | - | - | 0.223 | 1177 | 2355 | 590 | 2355 | 0 | 30 | 235 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+1.247 | 576+1.298 | 576+1.247 | 576+1.298 | - | - | 0.051 | 269 | 539 | 140 | 539 | 0 | 26 | 74 | 47 | 85 | 0 | 0 | 0 | 0 |
| 576+1.298 | 576+1.304 | - | - | - | - | - | - | - | - | 0.006 | 32 | 63 | 0 | 63 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0 |
| - | - | - | - | 576+1.304 | 576+1.345 | 576+1.304 | 576+1.345 | - | - | 0.041 | 216 | 433 | 110 | 433 | 0 | 21 | 60 | 35 | 73 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+1.345 | 576+1.364 | - | - | - | - | 0.019 | 100 | 201 | 50 | 201 | 0 | 3 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | - | - | - | 576+1.364 | 576+1.469 | - | - | - | - | 0.105 | 554 | 1109 | 280 | 2218 | 0 | 14 | 111 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | | | | | | | | | | 6.660 | 35165 | 70095 | 17279 | 72809 | 855 | 1301 | 6587 | 1082 | 4406 | 145 | 126 | 10 | 6 |

NOTES:

1. SH 21 PROPOSED RESTRIPE & RPM'S
2. TRM 570 +0.809 BEGINS AT SH 95 C/L
3. RESTRIPE RAMPS AT SH 95 & SH 21 INTERSECTION
4. RESTRIPE CROSSOVERS
5. TRM 576 +1.469 ENDS AT END OF DIVIDED HIGHWAY

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

Austin District
Bastrop Area Office



Texas Department of Transportation

SH 21

TYPICAL SECTIONS
AND
PAVEMENT MARKINGS

N.T.S.

6 OF 14

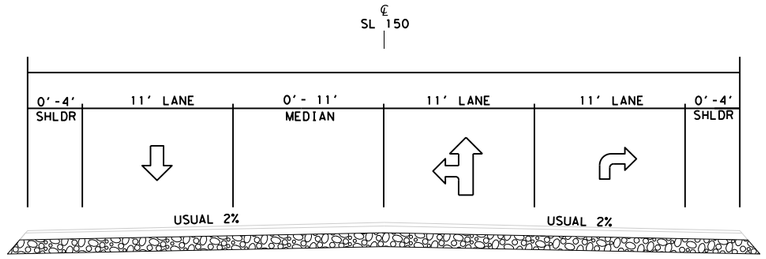
| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 9B |

DATE: $DATE$ $TIME$
FILE: $FILE$

CK DW CK DW

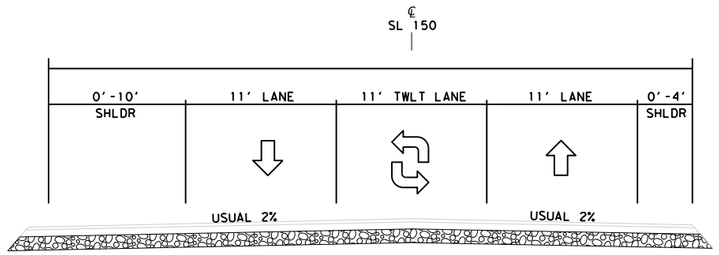
## 0265-10 - SL 150

| 2 LN DIVIDED | | | | 2 LN WITH TWLTL | | | | TURN/MERGE LN | | | | UNSTRIPED | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | WLD TRIANGL | WORD |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 562 | -0.062 | 562 | -0.052 | 0.010 | 52.80 | 0 | | 0 | 0 | | | | | 0 | | 32 | | 6 | 2 | | 2 |
| 562 | -0.052 | 562 | -0.037 | | | | | 562 | -0.052 | 562 | -0.015 | | | | | 0.015 | 79.20 | 158.4 | | 316.8 | 0 | | | 26 | | 195.36 | | | 52 | | | | |
| | | | | 562 | -0.037 | 562 | 0.008 | | | | | | | | | 0.045 | 237.60 | 475.2 | | 475.2 | 118.8 | 12 | | 22 | | 0 | | | | | | | |
| 562 | 0.008 | 562 | 0.043 | | | | | | | | | | | | | 0.035 | 184.80 | 369.6 | | 739.2 | 0 | | | 38 | | 0 | | | | | | | |
| **TOTALS** | | | | | | | | | | | | | | | | **0.105** | **554.40** | **1,003** | | **1,531** | **119** | **12** | | **86** | | **195** | | **32** | **52** | **6** | **2** | | **2** |



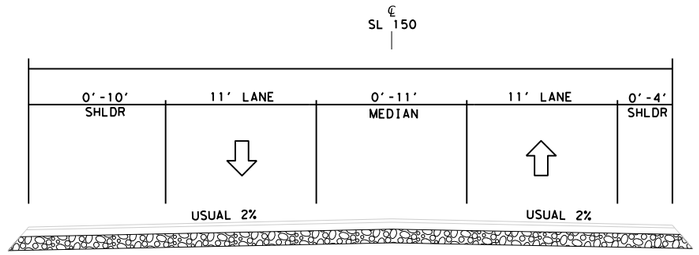

### EXISTING TYPICAL SECTION

FROM TRM 562 -0.052 TO TRM 562 -0.037




### EXISTING TYPICAL SECTION

FROM TRM 562 -0.037 TO TRM 562 +0.008




### EXISTING TYPICAL SECTION

FROM TRM 562 +0.008 TO TRM 562 +0.043

*NOTES:*

1. *SL 150 PROPOSED RESTRIPE & RPM'S*
2. *TRM 562 -0.062 BEGINS AT SH 95 C/L*
3. *RESTRIPE RAMP AT SH 21 & SL 150 INTERSECTION*
4. *TRM 562 +0.043 ENDS AT BASTROP STATE PARK ENTRANCE*

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22BFC808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# SL 150

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

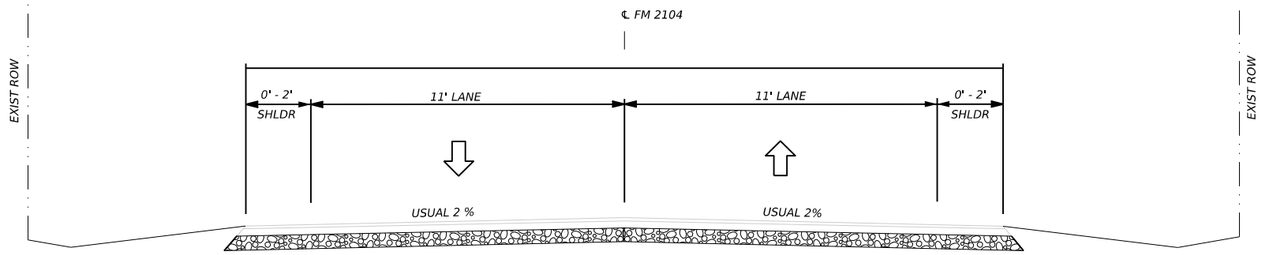
N.T.S. SHEET 7 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |

| DIST | COUNTY | SHEET NO. |
|---|---|---|
| AUS | TRAVIS | 10 |

## 2083-01 - FM 2104

| DOUBLE YELLOW | | | | NB/EB PASSING | | | | SB/WB PASSING | | | | BROKEN YELLOW | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | LD TRIANGL | WORD | RUMBLE STRIPS |
| 442 | -0.091 | 442 | 0.637 | | | | | | | | | | | | | 0.728 | 3,843.84 | 7687.68 | | 7687.68 | 0 | | | | | | | 12 | | | | | | FALSE |
| | | | | | | | | 442 | 0.637 | 442 | 0.808 | | | | | 0.171 | 902.88 | 1805.76 | | 902.88 | 225.72 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 442 | 0.808 | 442 | 1.447 | 0.639 | 3,373.92 | 6747.84 | | 0 | 843.48 | | | | | | | | | | | | | 421.74 |
| | | | | 442 | 1.447 | 442 | 1.646 | | | | | | | | | 0.199 | 1,050.72 | 2101.44 | | 1050.72 | 262.68 | | | | | | | | | | | | | FALSE |
| 442 | 1.646 | 442 | 1.763 | | | | | | | | | | | | | 0.117 | 617.76 | 1235.52 | | 1235.52 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 442 | 1.763 | 444 | 1.687 | | | | | 1.924 | 10,158.72 | 20317.44 | | 10158.72 | 2539.68 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 444 | 1.687 | 444 | 1.811 | 0.124 | 654.72 | 1309.44 | | 0 | 163.68 | | | | | | | | | | | | | 81.84 |
| | | | | 444 | 1.811 | 444 | 1.982 | | | | | | | | | 0.171 | 902.88 | 1805.76 | | 902.88 | 225.72 | | | | | | | | | | | | | FALSE |
| 444 | 1.982 | 446 | 0.306 | | | | | | | | | | | | | 0.324 | 1,710.72 | 3421.44 | | 3421.44 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 446 | 0.306 | 446 | 0.529 | | | | | 0.223 | 1,177.44 | 2354.88 | | 1177.44 | 294.36 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 446 | 0.529 | 446 | 0.781 | 0.252 | 1,330.56 | 2661.12 | | 0 | 332.64 | | | | | | | | | | | | | 166.32 |
| | | | | 446 | 0.781 | 446 | 0.987 | | | | | | | | | 0.206 | 1,087.68 | 2175.36 | | 1087.68 | 271.92 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 446 | 0.987 | 446 | 1.207 | | | | | 0.220 | 1,161.60 | 2323.2 | | 1161.6 | 290.4 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 446 | 1.207 | 446 | 1.658 | 0.451 | 2,381.28 | 4762.56 | | 0 | 595.32 | | | | | | | | | | | | | 297.66 |
| | | | | 446 | 1.658 | 446 | 1.919 | | | | | | | | | 0.261 | 1,378.08 | 2756.16 | | 1378.08 | 344.52 | | | | | | | | | | | | | FALSE |
| 446 | 1.919 | 448 | 0.248 | | | | | | | | | | | | | 0.329 | 1,737.12 | 3474.24 | | 3474.24 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 448 | 0.248 | 448 | 0.329 | | | | | 0.081 | 427.68 | 855.36 | | 427.68 | 106.92 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 448 | 0.329 | 448 | 0.695 | 0.366 | 1,932.48 | 3864.96 | | 0 | 483.12 | | | | | | | | | | | | | 241.56 |
| | | | | 448 | 0.695 | 448 | 0.889 | | | | | | | | | 0.194 | 1,024.32 | 2048.64 | | 1024.32 | 256.08 | | | | | | | | | | | | | FALSE |
| 448 | 0.889 | 448 | 1.221 | | | | | | | | | | | | | 0.332 | 1,752.96 | 3505.92 | | 3505.92 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 448 | 1.221 | 448 | 1.372 | | | | | 0.151 | 797.28 | 1594.56 | | 797.28 | 199.32 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 448 | 1.372 | 448 | 1.771 | 0.399 | 2,106.72 | 4213.44 | | 0 | 526.68 | | | | | | | | | | | | | 263.34 |
| | | | | 448 | 1.771 | 448 | 1.914 | | | | | | | | | 0.143 | 755.04 | 1510.08 | | 755.04 | 188.76 | | | | | | | | | | | | | FALSE |
| 448 | 1.914 | 450 | 0.201 | | | | | | | | | | | | | 0.287 | 1,515.36 | 3030.72 | | 3030.72 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 450 | 0.201 | 450 | 0.357 | | | | | 0.156 | 823.68 | 1647.36 | | 823.68 | 205.92 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 450 | 0.357 | 450 | 1.834 | 1.477 | 7,798.56 | 15597.12 | | 0 | 1949.64 | | | | | | | | | | | | | 974.82 |
| | | | | 450 | 1.834 | 452 | 0.058 | | | | | | | | | 0.224 | 1,182.72 | 2365.44 | | 1182.72 | 295.68 | | | | | | | | | | | | | FALSE |
| 452 | 0.058 | 452 | 0.620 | | | | | | | | | | | | | 0.562 | 2,967.36 | 5934.72 | | 5934.72 | 0 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 452 | 0.620 | 452 | 0.817 | | | | | 0.197 | 1,040.16 | 2080.32 | | 1040.16 | 260.04 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 452 | 0.817 | 452 | 0.869 | 0.052 | 274.56 | 549.12 | | 0 | 68.64 | | | | | | | | | | | | | 34.32 |
| | | | | 452 | 0.869 | 452 | 1.081 | | | | | | | | | 0.212 | 1,119.36 | 2238.72 | | 1119.36 | 279.84 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 452 | 1.081 | 452 | 1.108 | | | | | 0.027 | 142.56 | 285.12 | | 0 | 35.64 | | | | | | | | | | | | | 17.82 |
| | | | | | | | | 452 | 1.108 | 452 | 1.322 | | | | | 0.214 | 1,129.92 | 2259.84 | | 1129.92 | 282.48 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 452 | 1.322 | 452 | 1.374 | 0.052 | 274.56 | 549.12 | | 0 | 68.64 | | | | | | | | | | | | | 34.32 |
| | | | | 452 | 1.374 | 452 | 1.608 | | | | | | | | | 0.234 | 1,235.52 | 2471.04 | | 1235.52 | 308.88 | | | | | | | | | | | | | FALSE |
| | | | | | | | | 452 | 1.608 | 452 | 1.783 | | | | | 0.175 | 924.00 | 1848 | | 924 | 231 | | | | | | | | | | | | | FALSE |
| | | | | | | | | | | | | 452 | 1.783 | 454 | 0.086 | 0.303 | 1,599.84 | 3199.68 | | 0 | 399.96 | | | | | | | | | | | | | 199.98 |
| | | | | 454 | 0.086 | 454 | 0.293 | | | | | | | | | 0.207 | 1,092.96 | 2185.92 | | 1092.96 | 273.24 | | | | | | | | | | | | | FALSE |
| 454 | 0.293 | 454 | 0.474 | | | | | | | | | | | | | 0.181 | 955.68 | 1911.36 | | 1911.36 | 0 | | | | | | | | | | | | | FALSE |
| **TOTALS** | | | | | | | | | | | | | | | | **12.565** | **66,343.20** | **132,686** | | **59,574** | **12,811** | | | | | | | **12** | | | | | | **2,734** |




*EXISTING TYPICAL SECTION*

*TRM 442 -0.091 TO TRM 454 +0.474*

*NOTES:*

1. *FM 2401 PROPOSED RESTRIPE ONLY, NO RPMS INCLUDED*
2. *INCLUDES PROFILE EDGE LINES*
3. *TRM 442 -0.091 BEGINS AT US 290 INTERSECTION*
4. *TRM 454 +474 ENDS AT FM 153 INTERSECTION*

*LENGTHS ARE FOR ESTIMATING PURPOSES
**CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# FM 2104

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

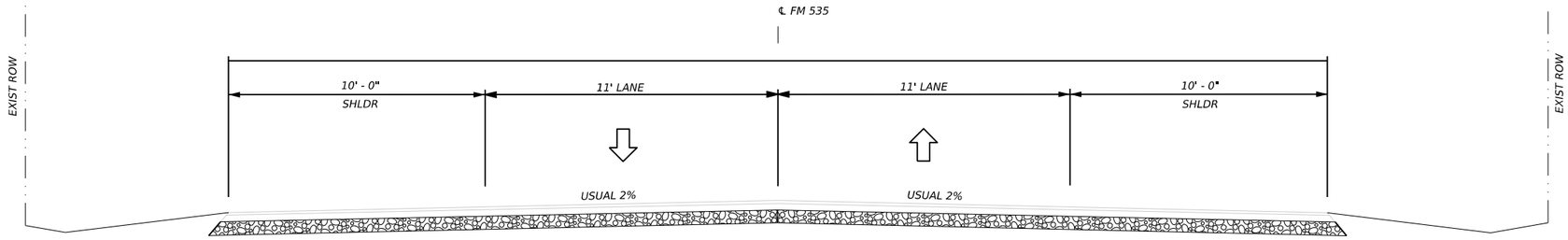
N.T.S. SHEET 8 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 11 |

CK: DW: CK: DW:

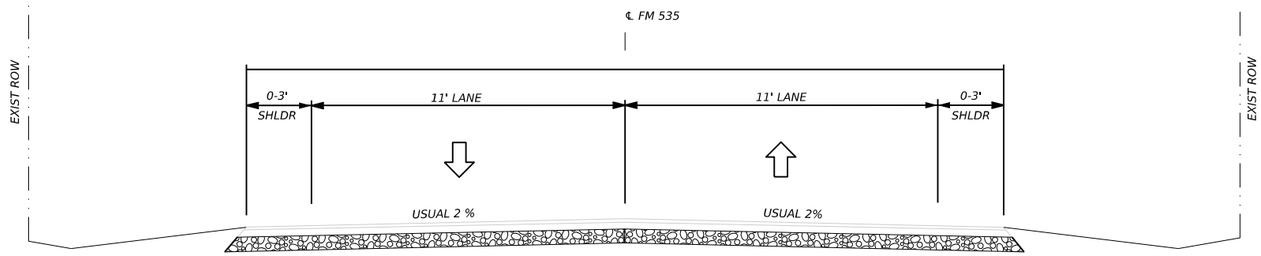
## 0807-05 - FM 535

| DOUBLE YELLOW | | | | NB/EB PASSING | | | | SB/WB PASSING | | | | BROKEN YELLOW | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | LD TRIANGL | WORD | RUMBLE STRIPS |
| 550 | 1.863 | 552 | 1.783 | | | | | | | | | | | | | 1.920 | 10,137.60 | 20275.2 | | 20275.2 | 0 | 8 | | 254 | | 160 | | 245 | | 1 | 1 | | 2 | 0.00 |
| | | | | 552 | 1.783 | 552 | 1.897 | | | | | | | | | 0.114 | 601.92 | 1203.84 | | 601.92 | 150.48 | 0 | | 16 | | | | | | | | | | 0.00 |
| | | | | | | | | | | | | 552 | 1.897 | 554 | 0.045 | 0.148 | 781.44 | 1562.88 | | 0 | 195.36 | 0 | | 10 | | | | | | | | | | 117.22 |
| | | | | | | | | 554 | 0.045 | 554 | 0.257 | | | | | 0.212 | 1,119.36 | 2238.72 | | 1119.36 | 279.84 | 0 | | 28 | | | | | | | | | | 0.00 |
| 554 | 0.257 | 556 | 0.336 | | | | | | | | | | | | | 2.079 | 10,977.12 | 21954.24 | | 21954.24 | 0 | 0 | | 276 | | | | | | | | | | 0.00 |
| | | | | 556 | 0.336 | 556 | 0.533 | | | | | | | | | 0.197 | 1,040.16 | 2080.32 | | 1040.16 | 260.04 | 0 | | 27 | | | | | | | | | | 0.00 |
| | | | | | | | | | | | | 556 | 0.533 | 556 | 0.764 | 0.231 | 1,219.68 | 2439.36 | | 0 | 304.92 | 0 | | 16 | | | | | | | | | | 182.95 |
| | | | | | | | | 556 | 0.764 | 556 | 0.961 | | | | | 0.197 | 1,040.16 | 2080.32 | | 1040.16 | 260.04 | 0 | | 27 | | | | 15 | | | | | | 0.00 |
| 556 | 0.961 | 558 | 1.267 | | | | | | | | | | | | | 2.306 | 12,175.68 | 24351.36 | | 24351.36 | 0 | 5 | | 306 | | 100 | | 12 | | | | 5 | | 0.00 |
| **TOTALS** | | | | | | | | | | | | | | | | **7.404** | **39,093.12** | **78,186** | | **70,382** | **1,451** | **13** | | **960** | | **260** | | **272** | | **1** | **1** | **5** | **2** | **300** |




*EXISTING TYPICAL SECTION*

*TRM 550 +1.863 TO TRM 552 +0.463*




*EXISTING TYPICAL SECTION*

*TRM 552 +0.463 TO TRM 558 +1.267*

*NOTES:*

1. *FM 535 PROPOSED RESTRIPE & REPLACE MISSING RPM'S, APPROX. 25%*
2. *TRM 550 +1.863 BEGINS AT SH 21 INTERSECTION*
3. *TRM 558 +1.267 ENDS AT FM 20 INTERSECTION*

**LENGTHS ARE FOR ESTIMATING PURPOSES*

***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS — MARGARET M LAKE — 118394 — LICENSED — PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# *FM 535*

## *TYPICAL SECTIONS AND PAVEMENT MARKINGS*

*N.T.S.* *SHEET 9 OF 14*

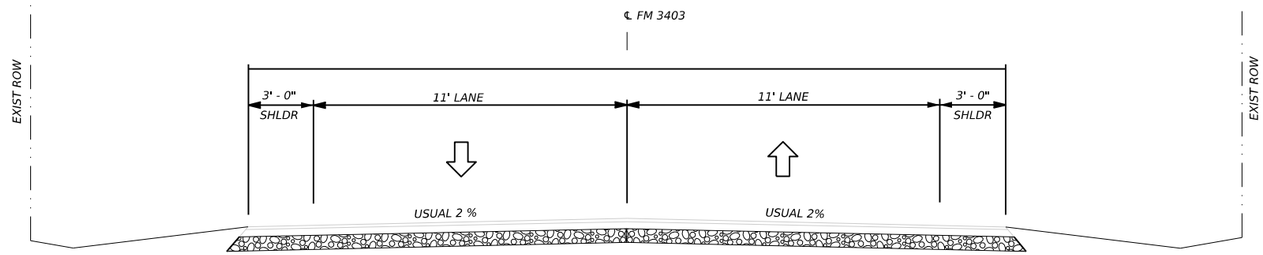
| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 12 |

CK DW CK DW

## 3386-01 - FM 3403

| DOUBLE YELLOW | | | | NB/EB PASSING | | | | SB/WB PASSING | | | | BROKEN YELLOW | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | WD TRIANGL | WORD | RUMBLE STRIPS |
| | | | | 582 | -0.110 | 582 | 0.104 | | | | | | | | | 0.214 | 1,129.92 | 2259.84 | | 1129.92 | 282.48 | | | | | | | 30 | | | | | | | 0 |
| | | | | | | | | 582 | 0.104 | 582 | 0.309 | | | | | 0.205 | 1,082.40 | 2164.8 | | 1082.4 | 270.6 | | | | | | | | | | | | | | 0 |
| 582 | 0.309 | 582 | 0.485 | | | | | | | | | | | | | 0.176 | 929.28 | 1858.56 | | 1858.56 | 0 | | | | | | | | | | | | | 0 |
| | | | | 582 | 0.485 | 582 | 0.704 | | | | | | | | | 0.219 | 1,156.32 | 2312.64 | | 1156.32 | 289.08 | | | | | | | | | | | | | | 0 |
| | | | | | | | | 582 | 0.704 | 582 | 0.896 | | | | | 0.192 | 1,013.76 | 2027.52 | | 1013.76 | 253.44 | | | | | | | | | | | | | | 0 |
| 582 | 0.896 | 582 | 1.085 | | | | | | | | | | | | | 0.189 | 997.92 | 1995.84 | | 1995.84 | 0 | | | | | | | | | | | | | 0 |
| | | | | 582 | 1.085 | 582 | 1.299 | | | | | | | | | 0.214 | 1,129.92 | 2259.84 | | 1129.92 | 282.48 | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | 582 | 1.299 | 584 | 0.273 | 0.974 | 5,142.72 | 10285.44 | | 0 | 1285.68 | | | | | | | | | | | | | 771.408 |
| | | | | | | | | 584 | 0.273 | 584 | 0.466 | | | | | 0.193 | 1,019.04 | 2038.08 | | 1019.04 | 254.76 | | | | | | | | | | | | | 0 |
| 584 | 0.466 | 586 | 1.217 | | | | | | | | | | | | | 2.751 | 14,525.28 | 29050.56 | | 29050.56 | 0 | | | | | | | | | | | | | 0 |
| | | | | 586 | 1.217 | 586 | 1.394 | | | | | | | | | 0.177 | 934.56 | 1869.12 | | 934.56 | 233.64 | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | 586 | 1.394 | 586 | 1.570 | 0.176 | 929.28 | 1858.56 | | 0 | 232.32 | | | | | | | | | | | | | 139.392 |
| | | | | | | | | 586 | 1.570 | 588 | 0.068 | | | | | 0.498 | 2,629.44 | 5258.88 | | 2629.44 | 657.36 | | | | | | | | | | | | | 0 |
| 588 | 0.068 | 588 | 0.105 | | | | | | | | | | | | | 0.037 | 195.36 | 390.72 | | 390.72 | 0 | | | | | | | | | | | | | 0 |

| TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | 6.215 | 32,815.20 | 65,630 | | 43,391 | 4,042 | | | | | | | 30 | | | | | | | 911 |




*EXISTING TYPICAL SECTION*

*TRM 582 -0.110 TO TRM 588 +0.105*

*NOTES:*

1. *FM 3403 PROPOSED RESTRIPE ONLY, NO RPMS INCLUDED*
2. *INCLUDES PROFILE EDGE LINES*
3. *TRM 582 -0.110 BEGINS AT US 77 INTERSECTION*
4. *TRM 588 +0.068 ENDS AT SH 21 INTERSECTION*

*LENGTHS ARE FOR ESTIMATING PURPOSES

**CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# FM 3403

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

N.T.S

SHEET 10 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 13 |

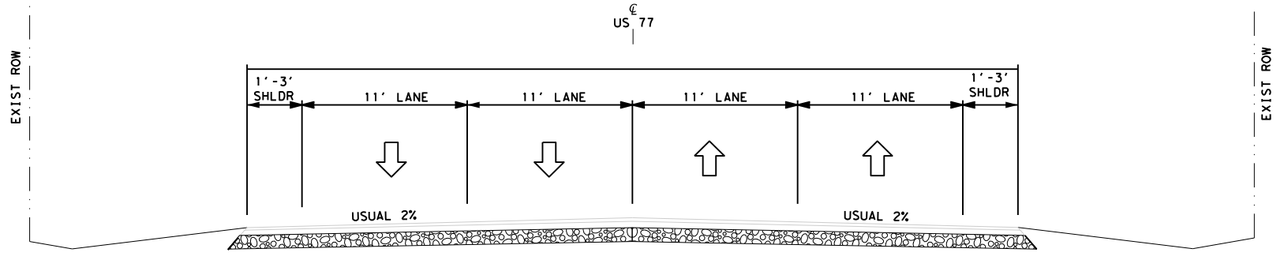
DATE: $DATE$ $TIME$
FILE: $FILE$

## 0211-07 - US 77

| DOUBLE YELLOW | | | | 4 LN WITH TWLTL | | | | 4 LN UNDIVIDED | | | | TURN/MERGE LANE | | | | UNSTRIPED | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | 8" W SLD | 12" W SLD | 24" W SLD | 24" Y SLD | ARROW | DBL ARROW | WLD TRIANGL | WORD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | | | | | | | | |
| | | | | | | | | 474 | 0.000 | 474 | 0.304 | | | | | | | | | 0.304 | 1,605 | 3,210 | 803 | 3,210 | | 41 | | 40 | | | | | | | | |
| | | | | | | | | 474 | 0.304 | 474 | 0.373 | | | | | | | | | 0.069 | 364 | 729 | 182 | 1,457 | | 10 | | 73 | | | | | | | | |
| | | | | 474 | 0.373 | 474 | 1.489 | | | | | | | | | | | | | 1.116 | 5,892 | 11,785 | 2,946 | 11,785 | 2,946 | 148 | | 295 | | 112 | | 35 | | | | |
| | | | | | | | | | | | | | | | | 474 | 1.489 | 474 | 1.505 | 0.016 | 84 | | | | | | | | | 116 | | | | | |
| | | | | 474 | 0.105 | 474 | 1.908 | | | | | | | | | | | | | 0.403 | 2,128 | 4,256 | 1,064 | 4,256 | 1,064 | 54 | | 106 | | | | | | | | |
| 474 | 1.908 | 476 | 0.012 | | | | | | | | | 474 | 1.908 | 476 | 0.012 | | | | | 0.104 | 549 | | 275 | 1,098 | | 28 | | 55 | 135 | | 228 | | 1 | | | 1 |
| | | | | | | | | | | | | | | | | 476 | 0.012 | 476 | 0.028 | 0.016 | 84 | 180 | | | | | | | | | | | | | |
| 476 | 0.028 | 476 | 0.045 | | | | | | | | | 476 | 0.028 | 476 | 0.045 | | | | | 0.017 | 90 | 137 | 45 | 180 | | 5 | | 9 | 90 | 60 | 228 | | 1 | | | 1 |
| | | | | | | | | 476 | 0.045 | 476 | 0.058 | | | | | | | | | 0.013 | 69 | 2,186 | 34 | 275 | | 2 | | 14 | | | | | | | | |
| | | | | 474 | 0.058 | 476 | 0.265 | | | | | | | | | | | | | 0.207 | 1,093 | | 546 | 2,186 | 546 | 28 | | 55 | | | | | | | | |
| | | | | | | | | | | | | | | | | 476 | 0.265 | 476 | 0.278 | 0.013 | 69 | 454 | | | | | | | | | | | | | |
| | | | | | | | | 476 | 0.278 | 476 | 0.321 | | | | | | | | | 0.043 | 227 | 2,186 | 114 | 908 | | 6 | | 45 | | | | | | | | |
| | | | | | | | | 476 | 0.321 | 476 | 0.528 | | | | | | | | | 0.207 | 1,093 | | 546 | 2,186 | | 28 | | 27 | | | | | | | | |
| TOTALS | | | | | | | | | | | | | | | | | | | | 2.528 | 13,348 | 25,123 | 6,555 | 27,541 | 4,556 | 350 | 0 | 719 | 225 | 172 | 572 | 35 | 2 | 0 | 0 | 2 |

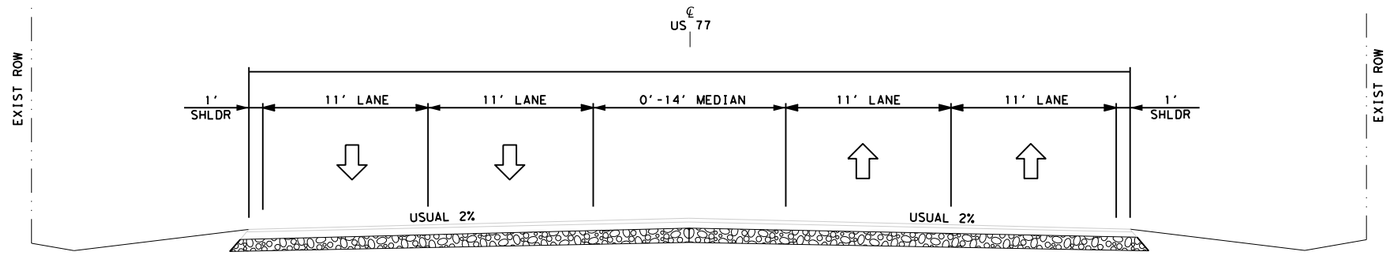
*NOTES:*

1. *US 77 PROPOSED RESTRIPE & RPM'S*
2. *TRM 474 +0.000 BEGINS AT MP 23.985*
3. *INCLUDES STOP BARS & TURN LANES AT US 290 INTERSECTION*
4. *RAILROAD CROSSING IS UNDER US 77 AT THE OVERPASS NO WORK WILL TAKE PLACE OUTSIDE OF SOW*
5. *TRM 476 +0.528 ENDS AT LEON ST*




**EXISTING TYPICAL SECTION**

FROM TRM 474 +0.000 TO TRM 474 +0.304




**EXISTING TYPICAL SECTION**

FROM TRM 474 +0.304 TO TRM 474 +0.373
FROM TRM 476 +0.045 TO TRM 476 +0.058
FROM TRM 476 +0.278 TO TRM 476 +0.321

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

MARGARET M LAKE 118394 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

DocuSigned by:
Margaret Lake
0AC2B7C898E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



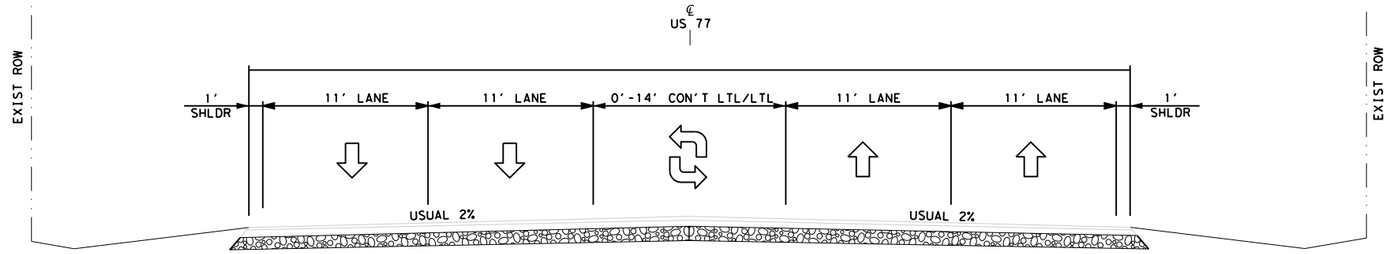
Texas Department of Transportation

*US 77*

*TYPICAL SECTIONS AND PAVEMENT MARKINGS*

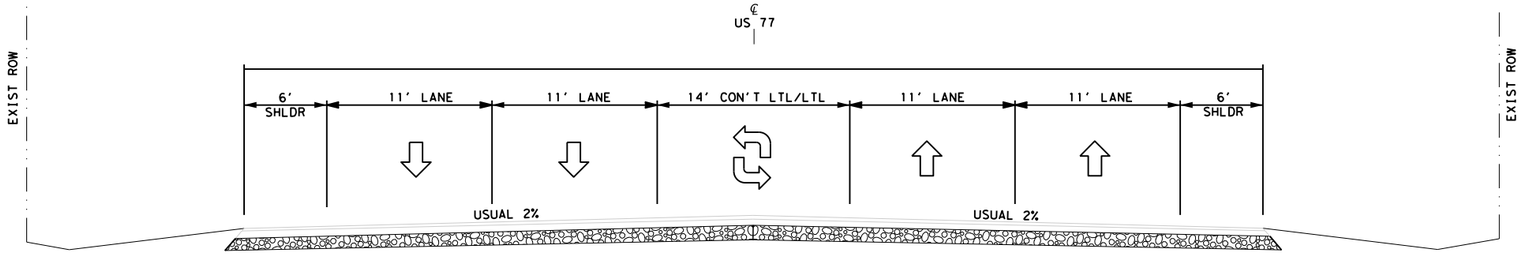
N.T.S. SHEET 11 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 14 |



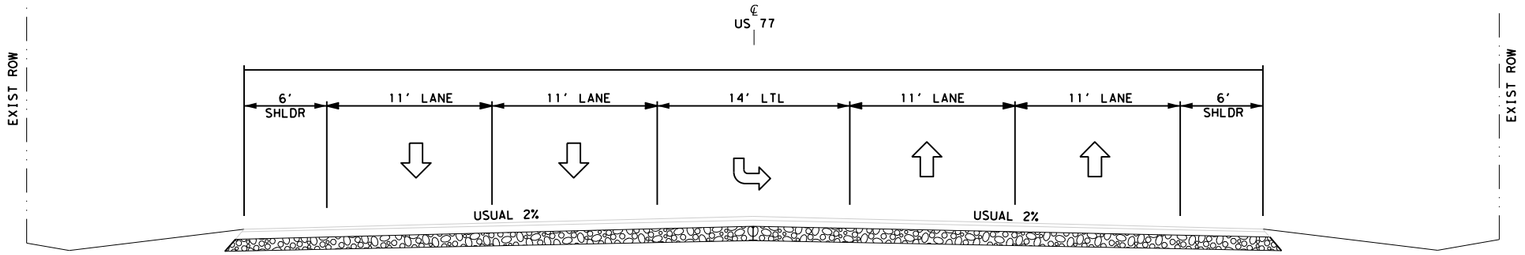

## EXISTING TYPICAL SECTION

FROM TRM 474 +0.373 TO TRM 474 +1.489



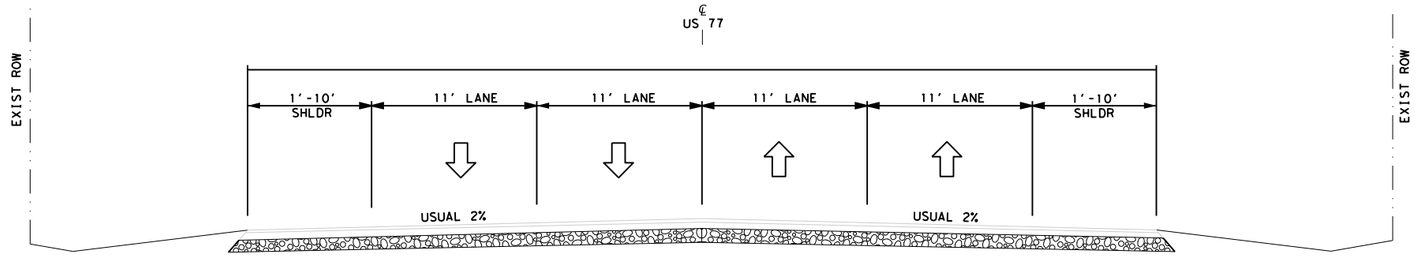

## EXISTING TYPICAL SECTION

FROM TRM 474 +1.505 TO TRM 474 +1.908
FROM TRM 476 +0.058 TO TRM 476 +0.265




## EXISTING TYPICAL SECTION

FROM TRM 474 +1.908 TO TRM 476 +0.012
FROM TRM 476 +0.028 TO TRM 476 +0.045




## EXISTING TYPICAL SECTION

FROM TRM 476 +0.321 TO TRM 476 +0.528

*LENGTHS ARE FOR ESTIMATING PURPOSES
**CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:

*NOTES:*

1. *US 77 PROPOSED RESTRIPE & RPM'S*
2. *TRM 474 +0.000 BEGINS AT MP 23.985*
3. *INCLUDES STOP BARS & TURN LANES AT US 290 INTERSECTION*
4. *RAILROAD CROSSING IS UNDER US 77 AT THE OVERPASS NO WORK WILL TAKE PLACE OUTSIDE OF SOW*
5. *TRM 476 +0.528 ENDS AT LEON ST*

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

*US 77*

*TYPICAL SECTIONS AND PAVEMENT MARKINGS*

N.T.S. SHEET 12 OF 14

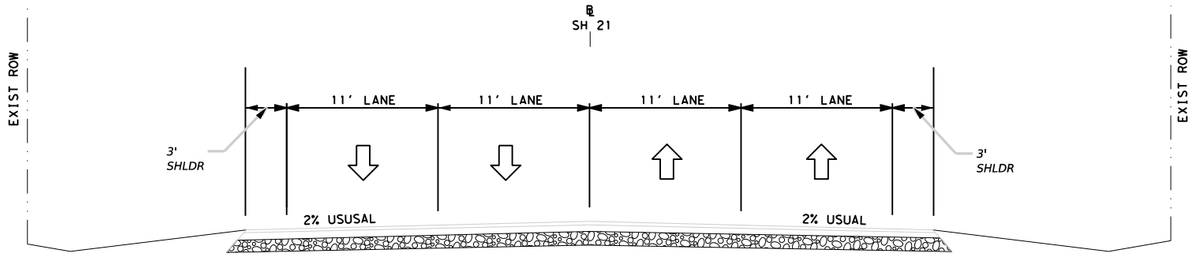
| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 14A |

DATE: $DATE$ $TIME$
FILE: $FILE$

CK DW CK DW

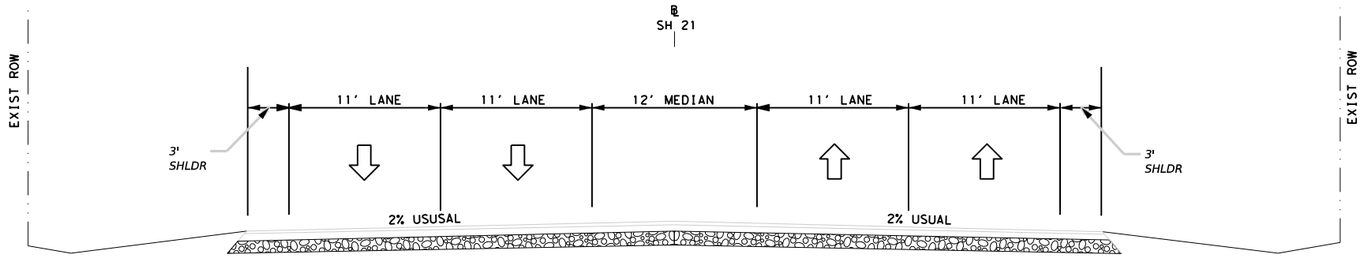
**0473-01 - SH 21 - LEE**

| DOUBLE YELLOW | | | | 4 LN TWO-WAY | | | | 4 LN TWO-WAY WITH MEDIAN | | | | NB/EB PASSING | | | | SB/WB PASSING | | | | BROKEN YELLOW | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | LD TRIANGL | WORD | RUMBLE STRIPS |
| | | | | 588 | 0.039 | 590 | 0.898 | | | | | | | | | | | | | | | | | 2.859 | 15,095.52 | 30191.04 | 7547.76 | 30191.04 | FALSE | 378 | | 377 | | 0 | | 0 | | | | | | FALSE |
| | | | | | | | | 590 | 0.898 | 590 | 0.994 | | | | | | | | | | | | | 0.096 | 506.88 | 1013.76 | 253.44 | 2027.52 | 0 | 13 | | 101 | | | | | | | | | | FALSE |
| TOTALS | | | | | | | | | | | | | | | | | | | | | | | | 2.955 | 15,603.00 | 31,205 | 7,801 | 32,219 | 0 | 391 | | 478 | | 0 | | 0 | | | | | | |




## EXISTING TYPICAL SECTION

FROM TRM 588+0.038 TO TRM 590+0.898




## EXISTING TYPICAL SECTION

FROM TRM 590+0.898 TO TRM 590+0.994

*NOTES:*

1. *SH 21 PROPOSED RESTRIPE & RPMS*
2. *TRM 588 +0.039 BEGINS AT BASTROP/LEE CL*
3. *TRM 590 +0.994 ENDS AT FM 2440 INTERSECTION*

**LENGTHS ARE FOR ESTIMATING PURPOSES*
***CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:*

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

*Austin District*
*Bastrop Area Office*



Texas Department of Transportation

# SH 21 - LEE

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

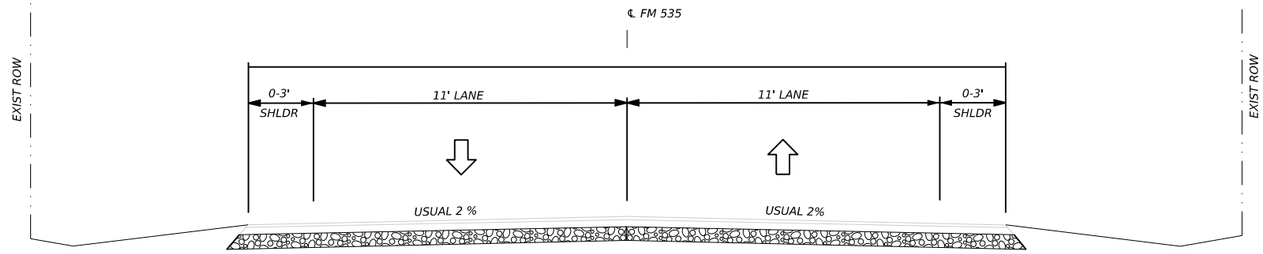
N.T.S

SHEET 13 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 15 |

# 0334-05 - FM 141

| DOUBLE YELLOW | | | | NB/EB PASSING | | | | SB/WB PASSING | | | | BROKEN YELLOW | | | | LENGTH | | 6" WHITE | | 6" YELLOW | | BUTTONS | | | OTHER | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FROM | | TO | | FROM | | TO | | FROM | | TO | | FROM | | TO | | | | | | | | | | | | | | | | | | | | |
| RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | RM | DISPL | MILES | FEET | SOLID | BROKEN | SOLID | BROKEN | TY I-C | TY II C-R | TY II A-A | 8" W DOT | 8" W SLD | 12" W SLD | 24" W SLD | 12" Y SLD | ARROW | DBL ARROW | LD TRIANGL | WORD | RUMBLE STRIPS |
| | | | | | | | | 432 | -0.032 | 432 | 0.232 | | | | | 0.264 | 1,393.92 | 2,788 | | 1,394 | 348 | 0 | 0 | 35 | | | | | | | | | | 0 |
| | | | | | | | | | | | | 432 | 0.232 | 432 | 1.133 | 0.901 | 4,757.28 | 9,515 | | 0 | 1189 | 0 | 0 | 59 | | | | | | | | | | 714 |
| | | | | 432 | 1.133 | 432 | 1.378 | | | | | | | | | 0.245 | 1,293.60 | 2,587 | | 1,294 | 323 | 0 | 0 | 32 | | | | | | | | | | 0 |
| 432 | 1.378 | 434 | 0.592 | | | | | | | | | | | | | 1.214 | 6,409.92 | 12,820 | | 12,820 | 0 | 0 | 0 | 160 | | | | | | | | | | 0 |
| 434 | 0.604 | 436 | 0.610 | | | | | | | | | | | | | 2.006 | 10,591.68 | 21,183 | | 21,183 | 0 | 0 | 0 | 265 | | | | | | | | | | 0 |
| | | | | | | | | 436 | 0.610 | 436 | 0.796 | | | | | 0.186 | 982.08 | 1,964 | | 982 | 246 | 0 | 0 | 25 | | | | | | | | | | 0 |
| | | | | | | | | | | | | 436 | 0.796 | 436 | 0.844 | 0.048 | 253.44 | 507 | | 0 | 63 | 0 | 0 | 3 | | | | | | | | | | 38 |
| | | | | 436 | 0.844 | 436 | 1.122 | | | | | | | | | 0.278 | 1,467.84 | 2,936 | | 1,468 | 367 | 0 | 0 | 37 | | | | | | | | | | 0 |
| | | | | | | | | 436 | 1.122 | 436 | 1.278 | | | | | 0.156 | 823.68 | 1,647 | | 824 | 206 | 0 | 0 | 21 | | | | | | | | | | 0 |
| | | | | | | | | | | | | 436 | 1.278 | 436 | 1.382 | 0.104 | 549.12 | 1,098 | | 0 | 137 | 0 | 0 | 7 | | | | | | | | | | 82 |
| | | | | 436 | 1.382 | 436 | 1.582 | | | | | | | | | 0.200 | 1,056.00 | 2,112 | | 1,056 | 264 | 0 | 0 | 26 | | | | | | | | | | 0 |
| | | | | | | | | 436 | 1.582 | 436 | 1.761 | | | | | 0.179 | 945.12 | 1,890 | | 945 | 236 | 0 | 0 | 24 | | | | | | | | | | 0 |
| | | | | | | | | | | | | 436 | 1.761 | 438 | 0.037 | 0.276 | 1,457.28 | 2,915 | | 0 | 364 | 0 | 0 | 18 | | | | | | | | | | 219 |
| | | | | 438 | 0.037 | 438 | 0.231 | | | | | | | | | 0.194 | 1,024.32 | 2,049 | | 1,024 | 256 | 0 | 0 | 26 | | | | | | | | | | 0 |
| 438 | 0.231 | 438 | 0.967 | | | | | | | | | | | | | 0.736 | 3,886.08 | 7,772 | | 7,772 | 0 | 0 | 0 | 97 | | | | | | | | | | 0 |
| | | | | | | | | 438 | 0.967 | 438 | 1.169 | | | | | 0.202 | 1,066.56 | 2,133 | | 1,067 | 267 | 0 | 0 | 27 | | | | | | | | | | 0 |
| | | | | | | | | | | | | 438 | 1.169 | 438 | 1.249 | 0.080 | 422.40 | 845 | | 0 | 106 | 0 | 0 | 5 | | | | | | | | | | 63 |
| | | | | 438 | 1.249 | 438 | 1.459 | | | | | | | | | 0.210 | 1,108.80 | 2,218 | | 1,109 | 277 | 0 | 0 | 28 | | | | | | | | | | 0 |
| 438 | 1.459 | 438 | 1.796 | | | | | | | | | | | | | 0.337 | 1,779.36 | 3,559 | | 3,559 | 0 | 0 | 0 | 48 | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | GAP | 0.012 | 63.00 | 126 | | 0 | 0 | 0 | 0 | | | | | | | | | | | 0 |
| TOTALS | | | | | | | | | | | | | | | | 7.828 | 41,331.48 | ~~82,663~~ | | 56,496 | 4650 | 0 | | ~~943~~ | | 0 | | 0 | | 0 | 0 | 0 | 0 | 1,116 |




## EXISTING TYPICAL SECTION

TRM 432 -0.036 TO TRM 434 +0.594
TRM 434 +0.603 TO TRM 438 +1.796

NOTES:

1. FM 141 RESTRIPE CENTERLINE STRIPE ONLY
2. TRM 432 -0.036 BEGINS AT SH 21 INTERSECTION
3. TRM 434 +0.592 TO 434 +0.603 IS RAILROAD CROSSING. NO WORK WILL TAKE PLACE BETWEEN TRM'S
4. TRM 438 +1.796 END AT FM 1697

*LENGTHS ARE FOR ESTIMATING PURPOSES
**CENTERLINE AND EDGE LINES WILL BE PLACED AS PROFILE OUTSIDE CITY LIMITS:

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

Austin District
Bastrop Area Office



Texas Department of Transportation

# FM 141

## TYPICAL SECTIONS AND PAVEMENT MARKINGS

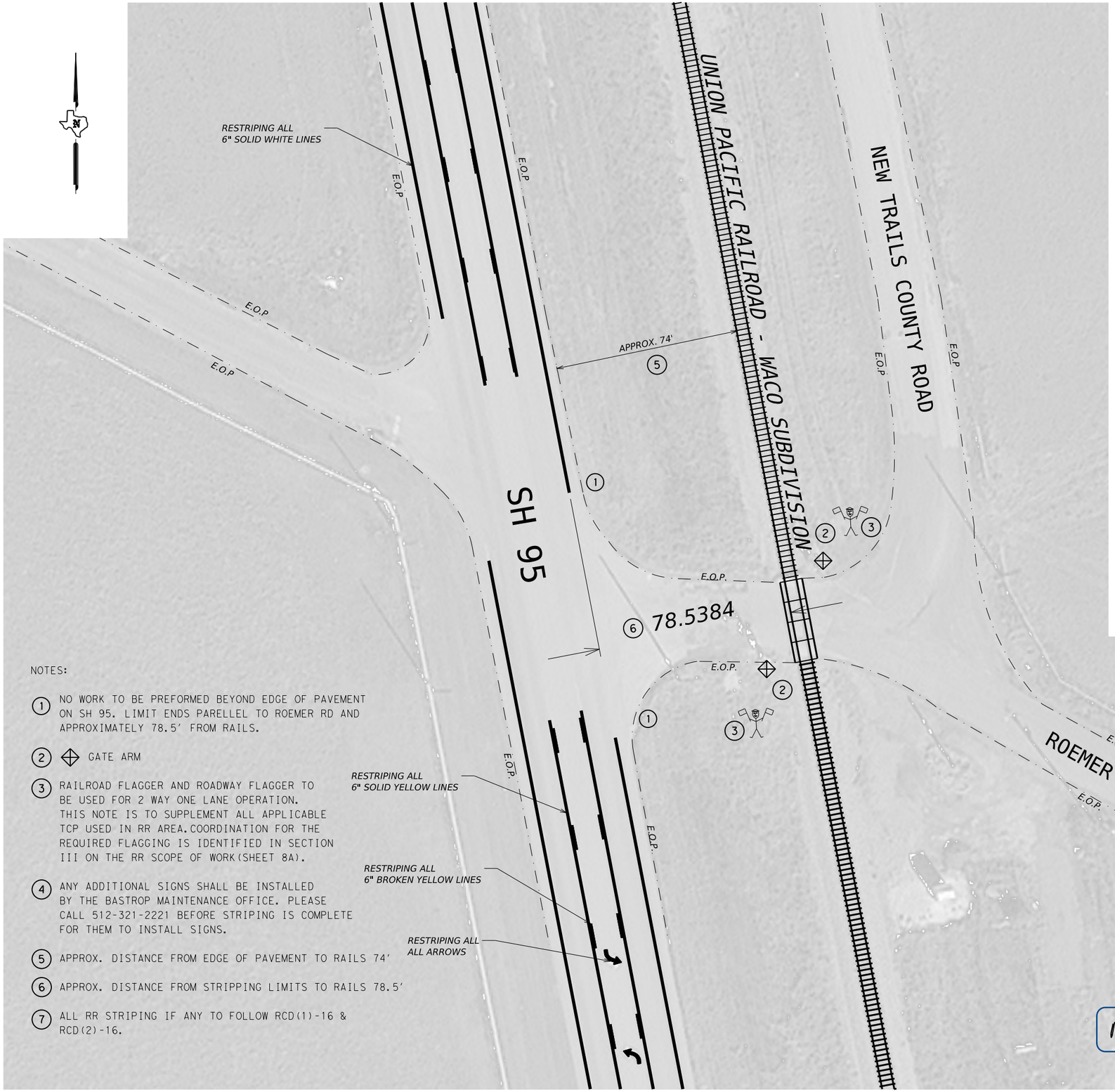
N.T.S.

SHEET 14 OF 14

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | FM 141 |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 16 |

DW CK DW CK

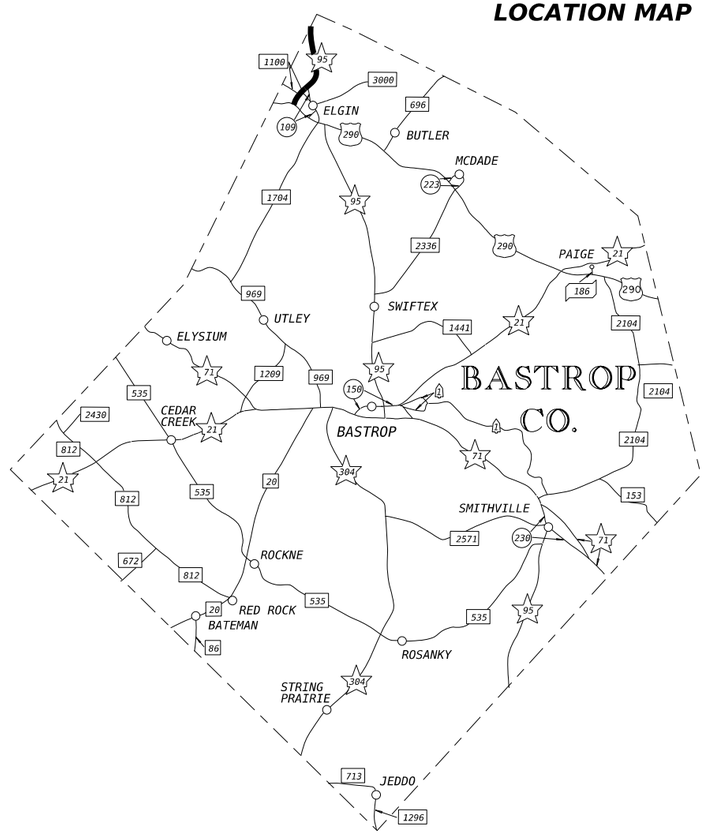
DATE: $DATE$ $TIME$
FILE: $FILE$




NOTES:

1. NO WORK TO BE PREFORMED BEYOND EDGE OF PAVEMENT ON SH 95. LIMIT ENDS PARELLEL TO ROEMER RD AND APPROXIMATELY 78.5′ FROM RAILS.
2. ◈ GATE ARM
3. RAILROAD FLAGGER AND ROADWAY FLAGGER TO BE USED FOR 2 WAY ONE LANE OPERATION. THIS NOTE IS TO SUPPLEMENT ALL APPLICABLE TCP USED IN RR AREA. COORDINATION FOR THE REQUIRED FLAGGING IS IDENTIFIED IN SECTION III ON THE RR SCOPE OF WORK(SHEET 8A).
4. ANY ADDITIONAL SIGNS SHALL BE INSTALLED BY THE BASTROP MAINTENANCE OFFICE. PLEASE CALL 512-321-2221 BEFORE STRIPING IS COMPLETE FOR THEM TO INSTALL SIGNS.
5. APPROX. DISTANCE FROM EDGE OF PAVEMENT TO RAILS 74′
6. APPROX. DISTANCE FROM STRIPPING LIMITS TO RAILS 78.5′
7. ALL RR STRIPING IF ANY TO FOLLOW RCD(1)-16 & RCD(2)-16.

## LOCATION MAP




STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/18/2024

Austin District
Bastrop Area Office



Texas Department of Transportation

# RAILROAD CROSSING DETAILS
# SH 95 AT ROEMER RD
# DOT 416281N

N.T.S

SHEET 1 OF 1

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 17 |

DATE: $DATE$ $TIME$
FILE: $FILE$

CK
DW
CK
DW

GAEKE ST
E.O.P
E.O.P
DAVID LN
E.O.P.
E.O.P.
E.O.P.
E.O.P.
US 77
RESTRIPING ALL
ALL ARROWS
E.O.P
COLENE ST
E.O.P
E.O.P.
E.O.P.
N. BURLESON ST
W BOUNDARY ST
E.O.P
UNION PACIFIC - GIDDINGS SUBDIVISION
US 77
E.O.P.
E.O.P.
RESTRIPING ALL
6" SOLID YELLOW LINES
RESTRIPING ALL
6" BROKEN YELLOW LINES
RESTRIPING ALL
6" BROKEN WHITE LINES
RESTRIPING ALL
6" SOLID WHITE LINES
E.O.P
W. CROCKET

② 80.3608
45.5099°

STATE OF TEXAS
MARGARET W LAKE
118394
LICENSED
PROFESSIONAL ENGINEER

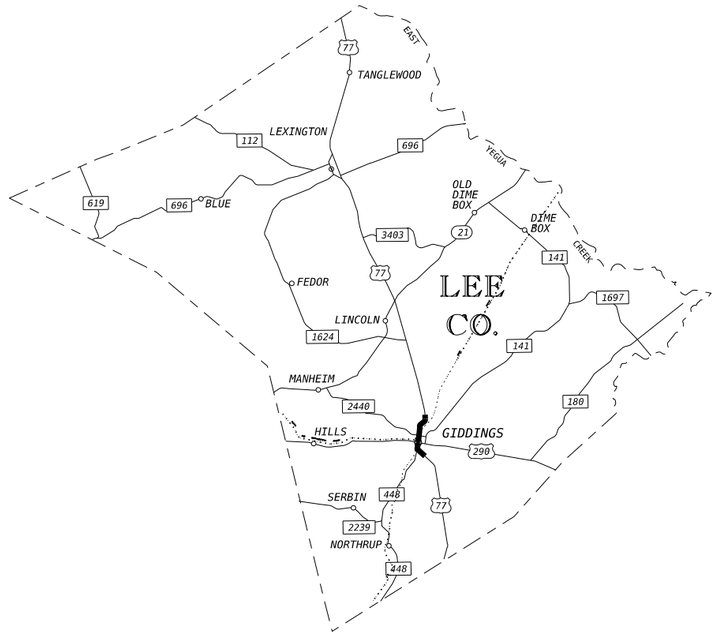
DocuSigned by:
Margaret Lake
0AC22B7C808E4F6...
7/22/2024

1 RESTRIPING US 77

2 APPROX DISTANCE AND ANGLE
OF RAILROAD CROSSING UNDER US 77

NAILS CREEK RD
E.O.P
E.O.P
E. BOUNDARY ST
E.O.P
E.O.P
N. GRIMES ST
E.O.P.
E.O.P.
E.O.P.
E.O.P.
ON ST

## LOCATION MAP




DATE: $DATE$ $TIME$
FILE: $FILE$

Austin District
Bastrop Area Office



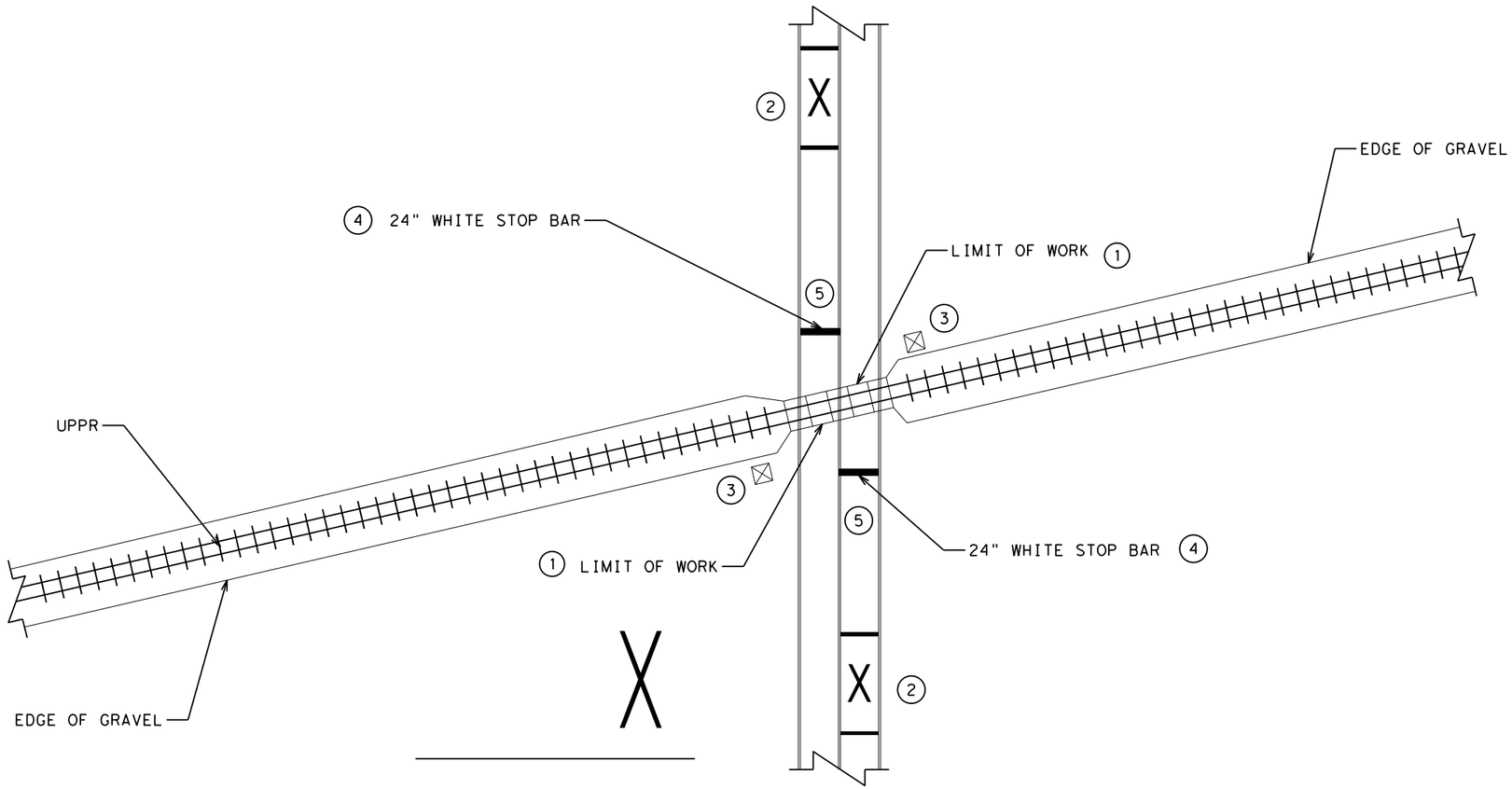
Texas Department of Transportation

# RAILROAD CROSSING DETAILS
# US 77 AT RAILROAD XING
# DOT 763422A

N.T.S

SHEET 1 OF 1

| CONT | SECT | JOB | HIGHWAY |
|---|---|---|---|
| 0914 | 00 | 487 | VARIOUS |
| DIST | COUNTY | | SHEET NO. |
| AUS | TRAVIS | | 18 |




NOTES:

1. NO WORK TO BE PREFORMED BETWEEN LIMITS OF WORK. LIMIT ENDS AT CONCRETE PANELS BESIDE TRACKS.
2. ALL RR STRIPING TO FOLLOW RCD(1)-16 & RCD(2)-16.
3. ◈ GATE ARM
4. STOP BAR SHALL BE PLACED 8 FEET FROM GATE ARM ON EACH APPROACH.
5. RAILROAD FLAGGER AND ROADWAY FLAGGER TO BE USED FOR 2 WAY ONE LANE OPERATION. THIS NOTE IS TO SUPPLEMENT ALL APPLICABLE TCP USED IN RR AREA. COORDINATION FOR THE REQUIRED FLAGGING IS IDENTIFIED IN SECTION III ON THE RR SCOPE OF WORK (SHEET 8A).
6. ANY ADDITIONAL SIGNS SHALL BE INSTALLED BY THE BASTROP MAINTENANCE OFFICE. PLEASE CALL 512-321-2221 BEFORE STRIPING IS COMPLETE FOR THEM TO INSTALL SIGNS.

DATE: $DATE$ $TIME$
FILE: $FILE$

STATE OF TEXAS
MARGARET M LAKE
118394
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Margaret Lake
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7/18/2024

N.T.S. SHEET 1 OF 1

**Austin District**
**Bastrop Area Office**

Texas Department of Transportation

# FM 141 RAILROAD CROSSING DETAIL



| CONT | SECT | JOB | HIGHWAY |
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## BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

## WORKER SAFETY NOTES:

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

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

## COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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



Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

# BC(1)-21

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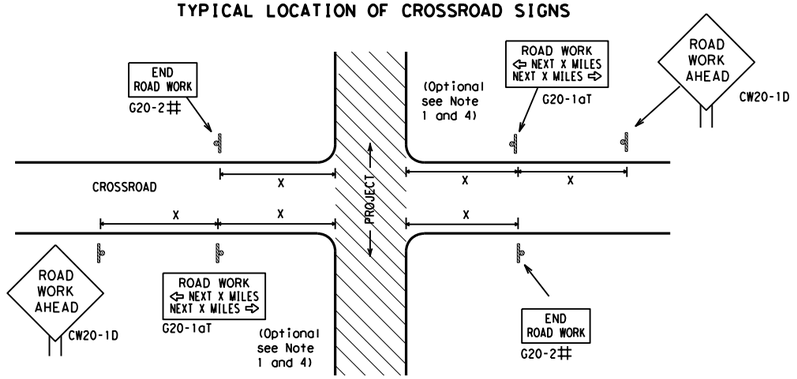
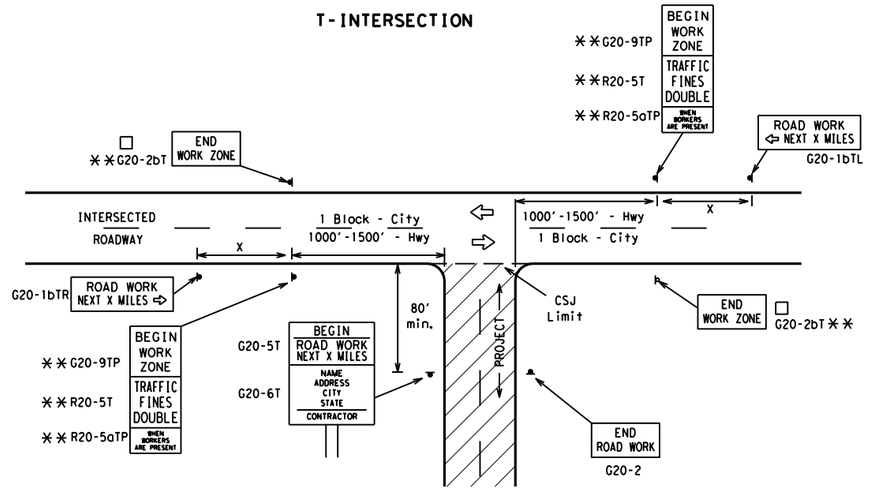
## TYPICAL LOCATION OF CROSSROAD SIGNS




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

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

## T-INTERSECTION




## CSJ LIMITS AT T-INTERSECTION

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

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

### SIZE

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

### SPACING

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

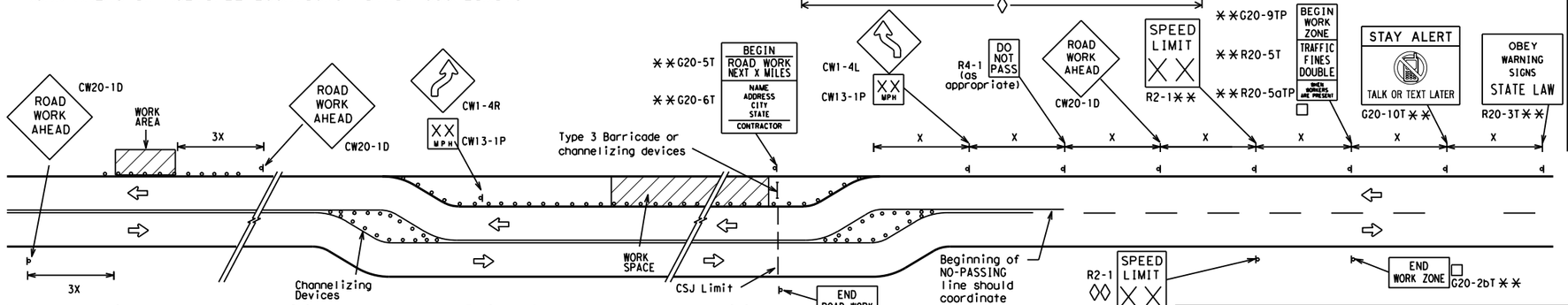
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

## GENERAL NOTES

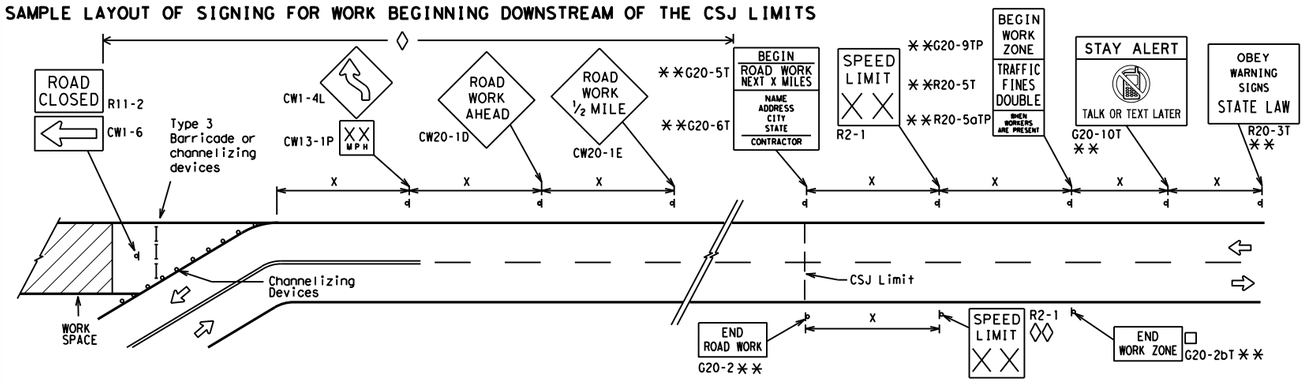
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

## WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS




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

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




## SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



## NOTES

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

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

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

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

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

## LEGEND

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

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Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION PROJECT LIMIT

# BC(2)-21

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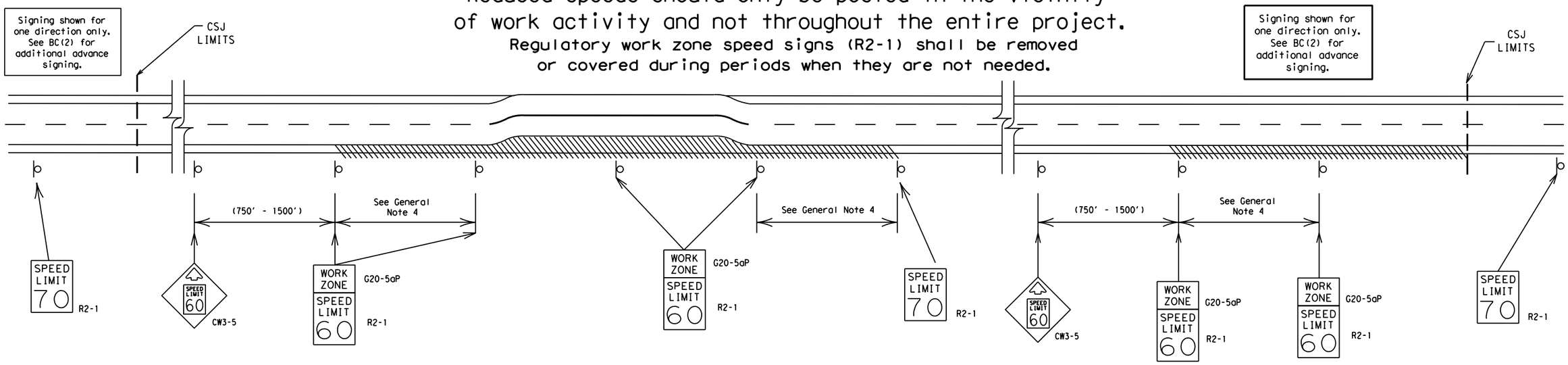
# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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




## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

### GENERAL NOTES

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



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## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

## BC(3)-21

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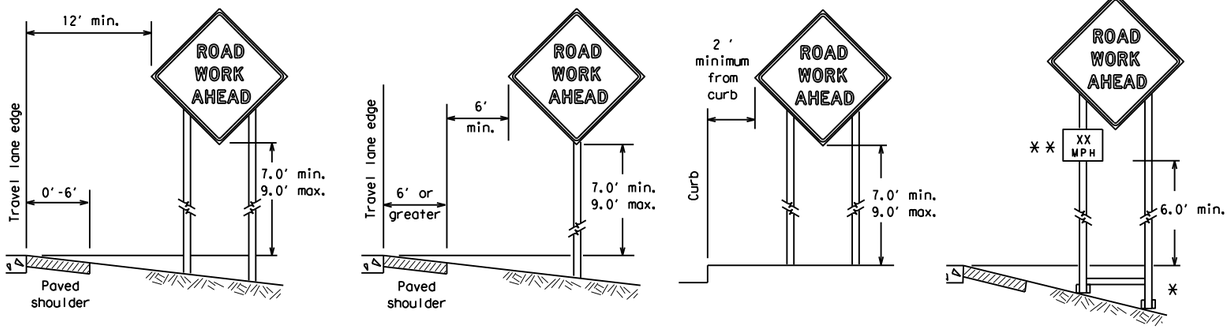
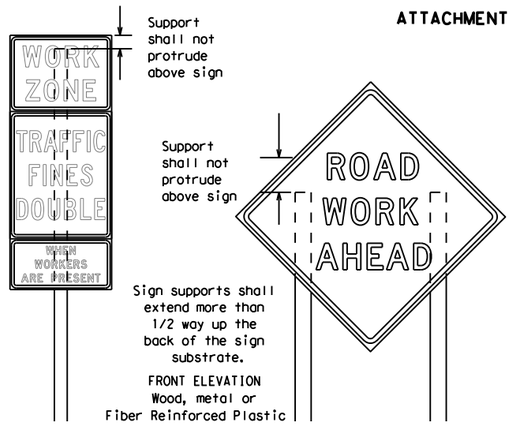
## TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

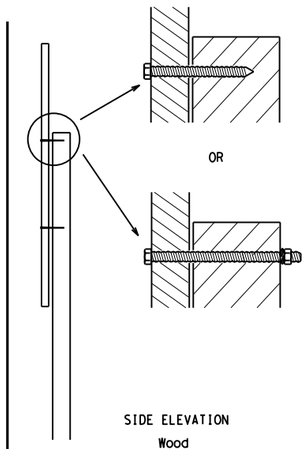



* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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



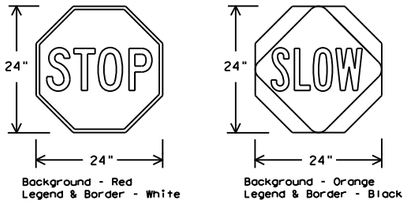

Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

**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.**

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.

## STOP/SLOW PADDLES

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




Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

## CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

## GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

## SIGN MOUNTING HEIGHT

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

## SIZE OF SIGNS

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

## SIGN SUBSTRATES

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

## REFLECTIVE SHEETING

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

## SIGN LETTERS

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

## REMOVING OR COVERING

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

## SIGN SUPPORT WEIGHTS

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

## FLAGS ON SIGNS

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



Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

# BC(4)-21

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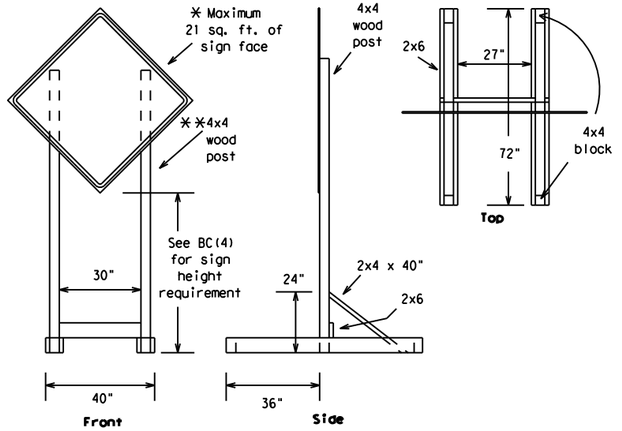
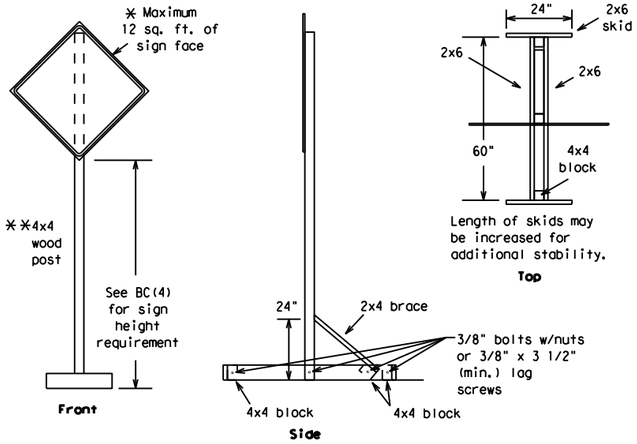
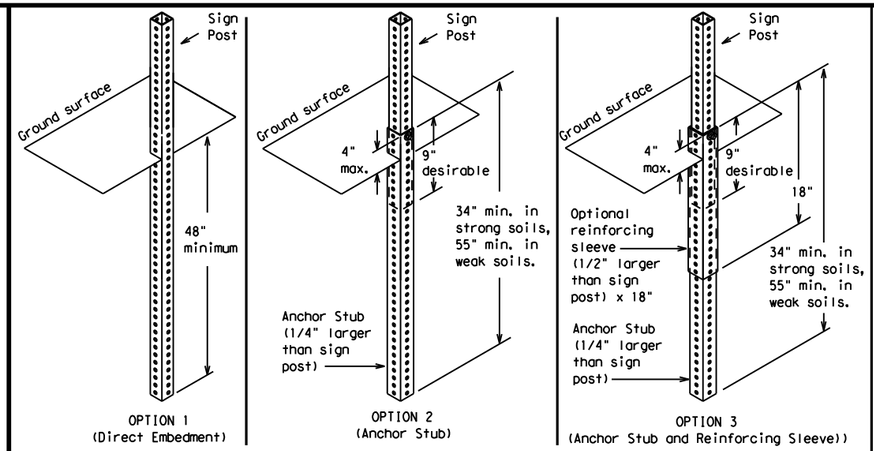


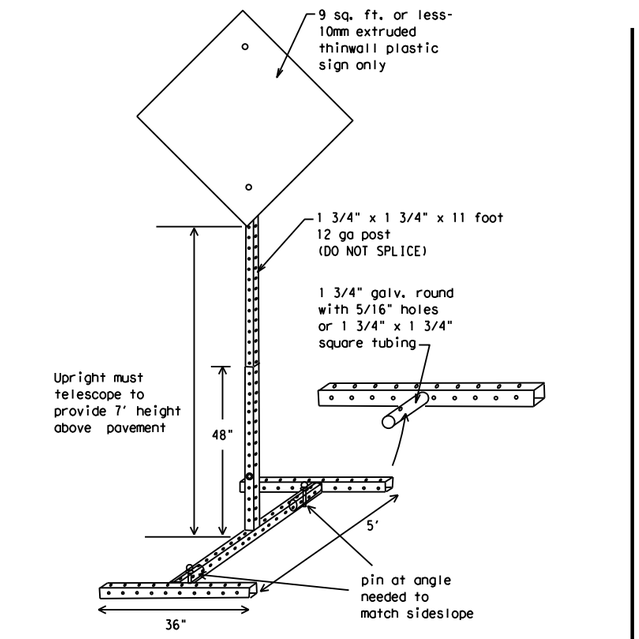

## SKID MOUNTED WOOD SIGN SUPPORTS

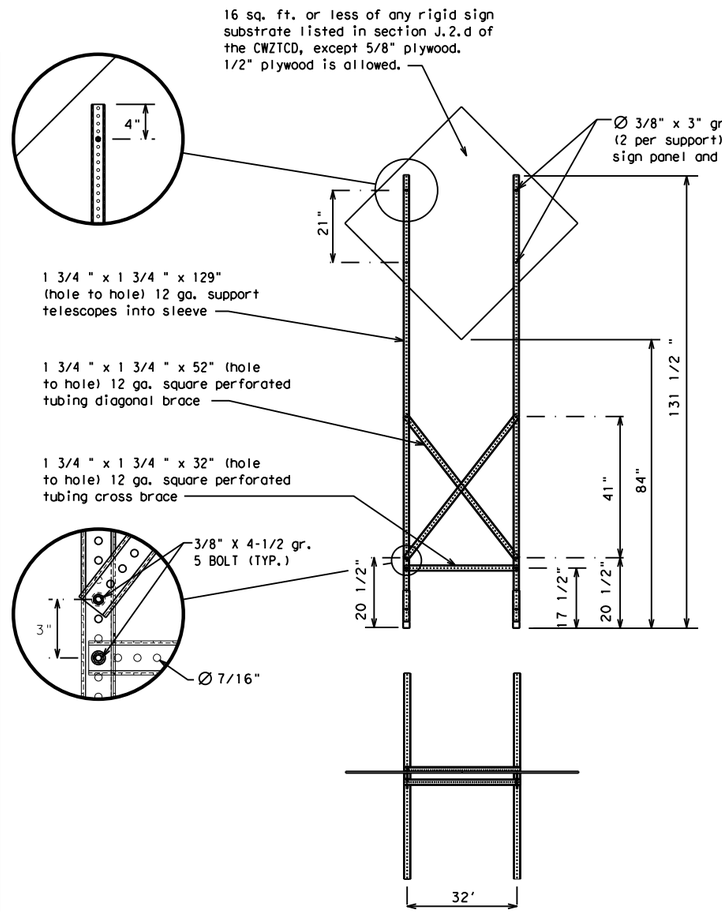
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

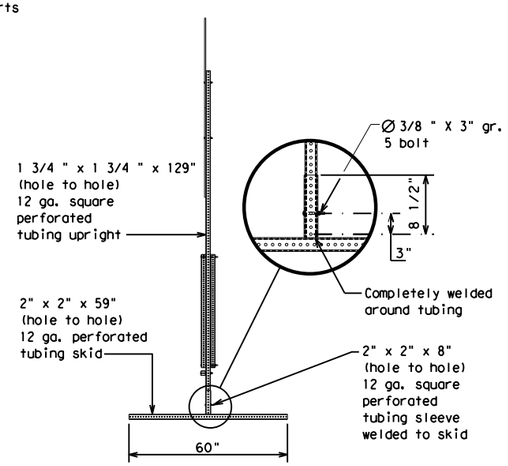



## GROUND MOUNTED SIGN SUPPORTS

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.




## 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.

## SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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



Texas Department of Transportation | Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

# BC(5)-21

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

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

### Other Condition List

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

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

## Phase 2: Possible Component Lists

### Action to Take/Effect on Travel List

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

### Location List

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

### Warning List

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

### ** Advance Notice List

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

** See Application Guidelines Note 6.

### APPLICATION GUIDELINES

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

### WORDING ALTERNATIVES

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

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

### FULL MATRIX PCMS SIGNS

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



Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

# BC(6)-21

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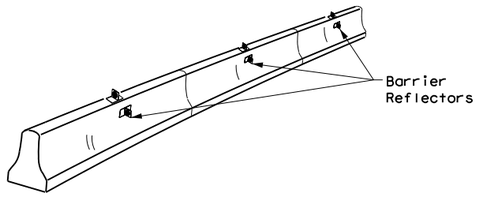
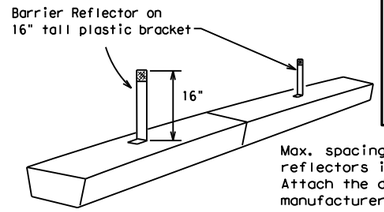
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



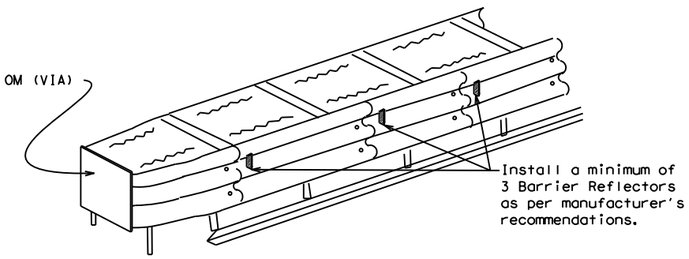

## CONCRETE TRAFFIC BARRIER (CTB)

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.




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

## LOW PROFILE CONCRETE BARRIER (LPCB)




## DELINEATION OF END TREATMENTS

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**

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

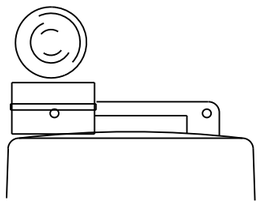
**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**

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

# BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

## WARNING LIGHTS

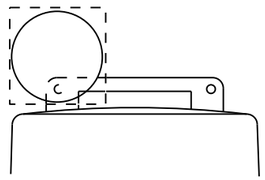
1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this 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.



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

## 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.



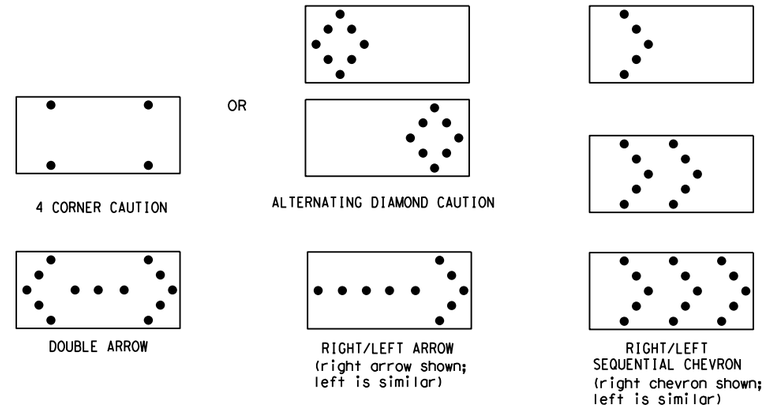
Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

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

Texas Department of Transportation

Traffic Safety Division Standard

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

# BC(7)-21

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## GENERAL NOTES

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

## GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

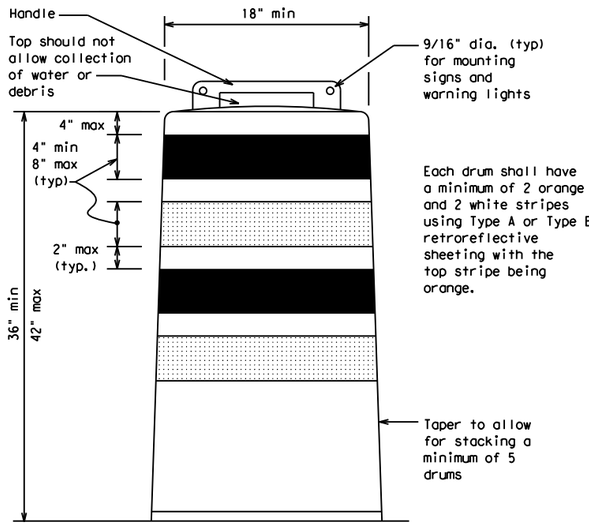
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

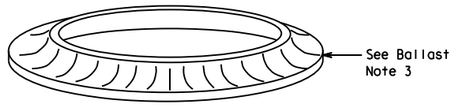
## RETROREFLECTIVE SHEETING

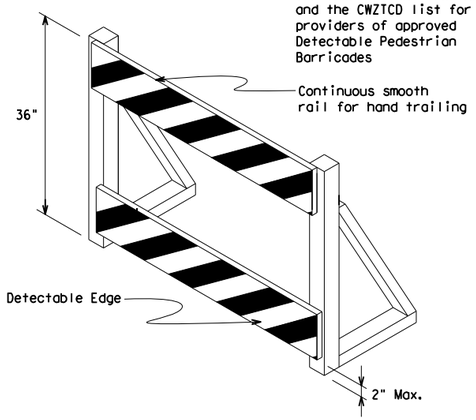
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

## BALLAST

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

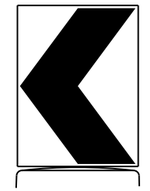


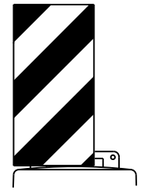




## DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

## SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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



Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

# BC(8)-21

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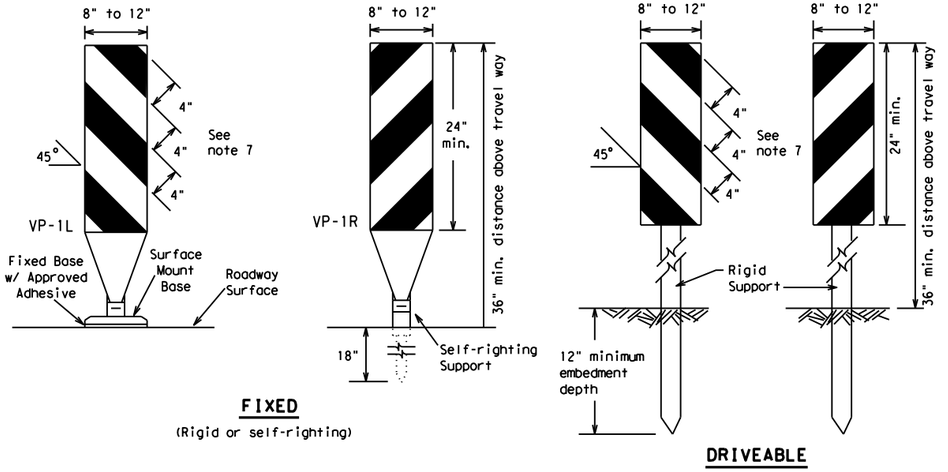



**FIXED**
(Rigid or self-righting)

**DRIVEABLE**

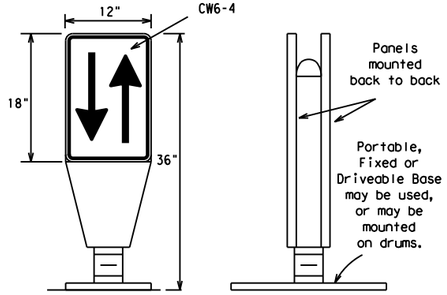



(Rigid or self-righting)

**PORTABLE**

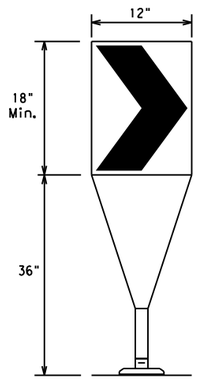
## VERTICAL PANELS (VPs)

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




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

## OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



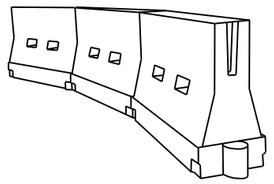

Fixed Base w/ Approved Adhesive
(Driveable Base, or Flexible Support can be used)

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

## CHEVRONS

## GENERAL NOTES

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



## LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

## WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

## SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

# BC(9)-21

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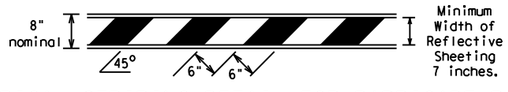
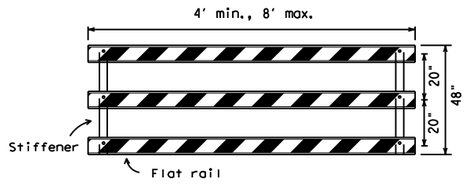
## TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



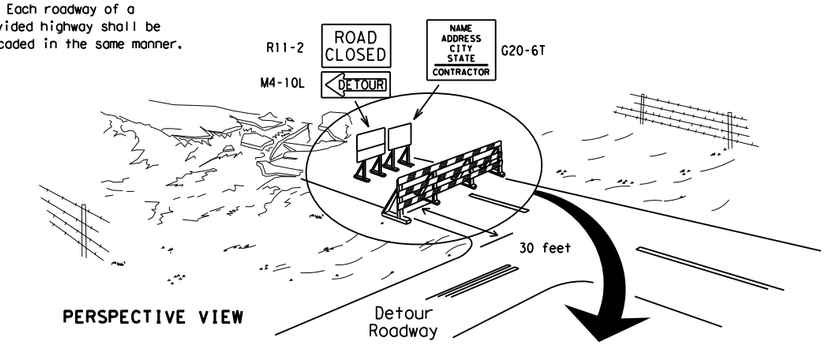

**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**




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

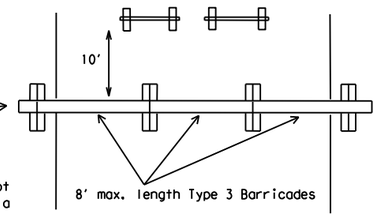
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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




PERSPECTIVE VIEW

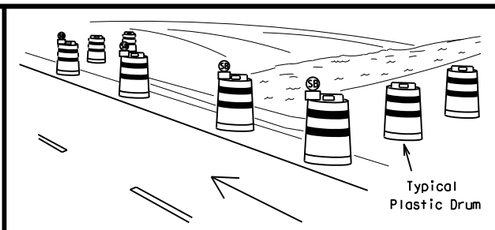
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.




PLAN VIEW

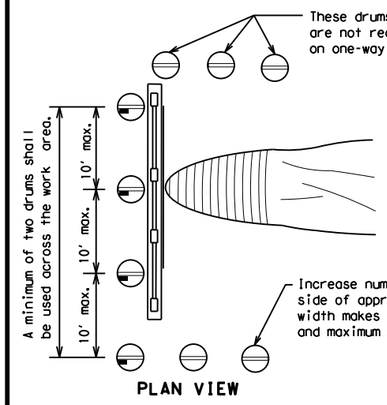
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**




PERSPECTIVE VIEW

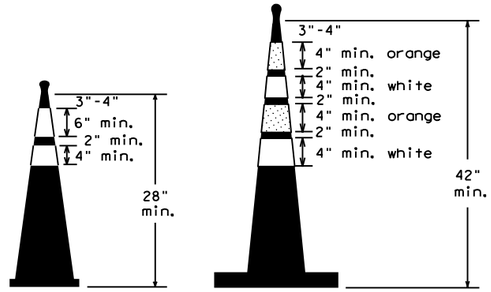
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



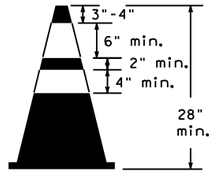

PLAN VIEW

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

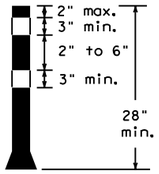
**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**




Two-Piece cones




One-Piece cones

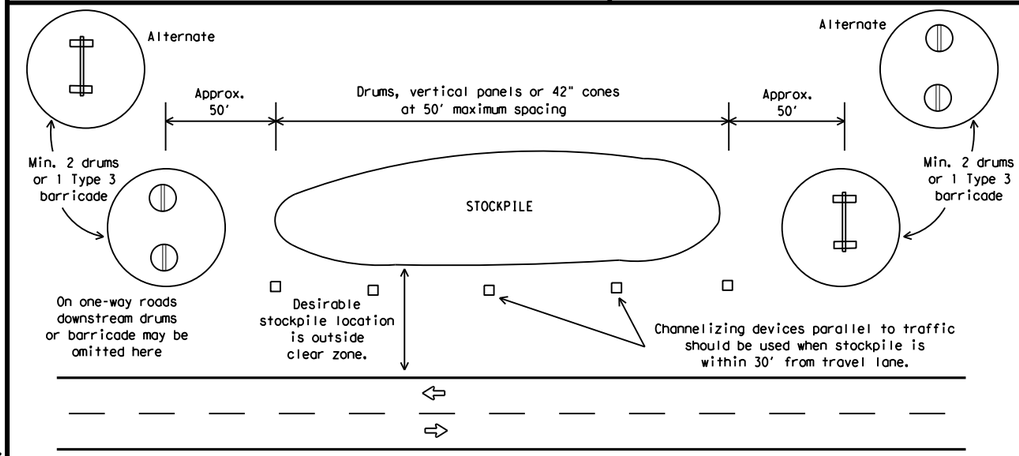



Tubular Marker

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

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

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




**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

# BC(10)-21

| FILE: bc-21.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| © TxDOT November 2002 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 9-07 8-14 | DIST | COUNTY | | SHEET NO. |
| 7-13 5-21 | AUS | TRAVIS | | 29 |

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# WORK ZONE PAVEMENT MARKINGS

## GENERAL

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

## RAISED PAVEMENT MARKERS

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

## PREFABRICATED PAVEMENT MARKINGS

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

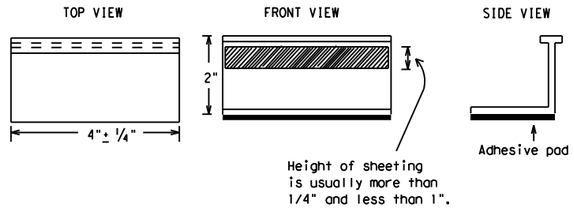
## MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

## REMOVAL OF PAVEMENT MARKINGS

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

# Temporary Flexible-Reflective Roadway Marker Tabs




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

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

## RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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



Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

# BC(11)-21

| FILE: bc-21.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| ©TxDOT February 1998 | CONT | SECT | JOB | HIGHWAY |
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| 2-98 9-07 5-21 | DIST | COUNTY | | SHEET NO. |
| 1-02 7-13 | AUS | TRAVIS | | 30 |
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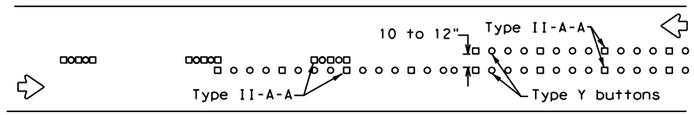
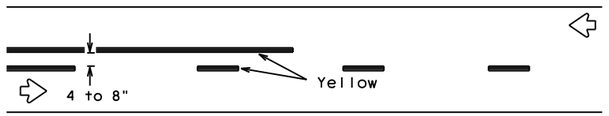
# PAVEMENT MARKING PATTERNS

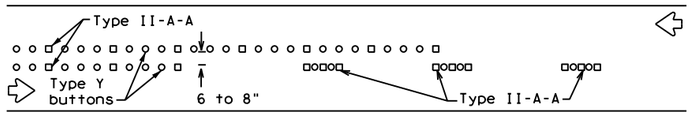

REFLECTORIZED PAVEMENT MARKINGS - PATTERN A




RAISED PAVEMENT MARKERS - PATTERN A



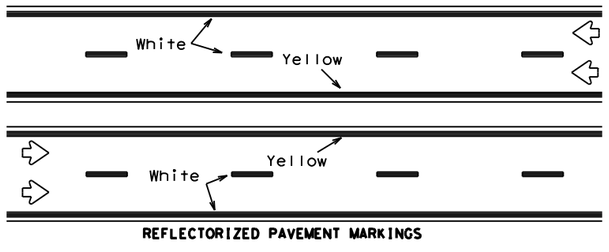

REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



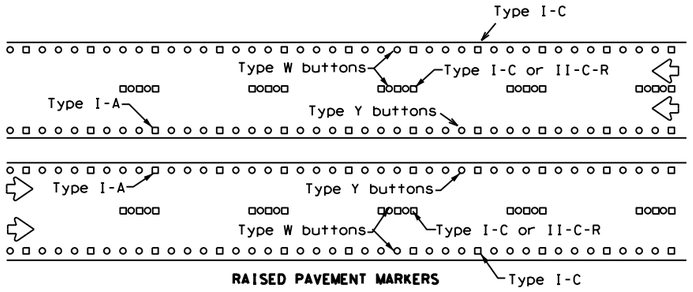

RAISED PAVEMENT MARKERS - PATTERN B

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



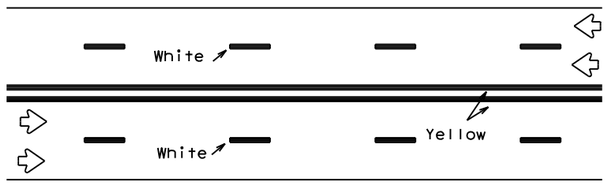

REFLECTORIZED PAVEMENT MARKINGS



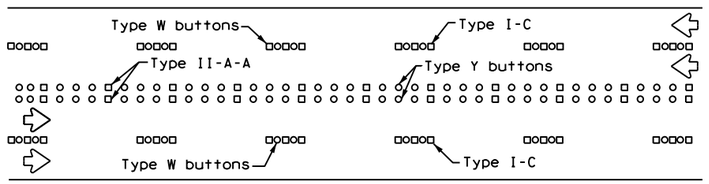

RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



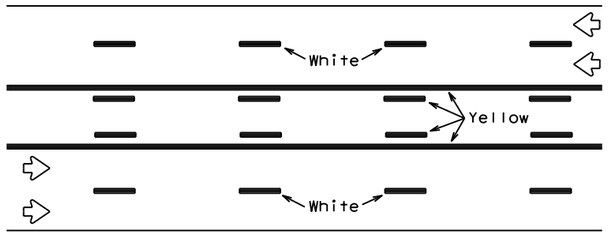

REFLECTORIZED PAVEMENT MARKINGS



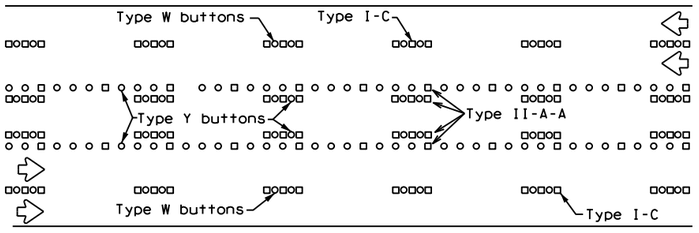

RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS




REFLECTORIZED PAVEMENT MARKINGS




RAISED PAVEMENT MARKERS

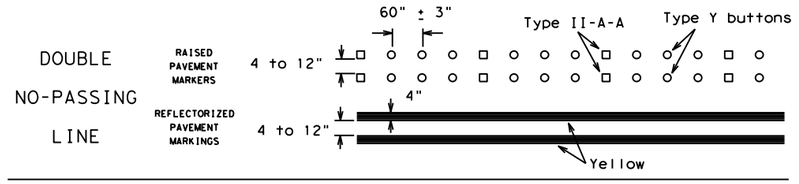
Prefabricated markings may be substituted for reflectorized pavement markings.

## TWO-WAY LEFT TURN LANE

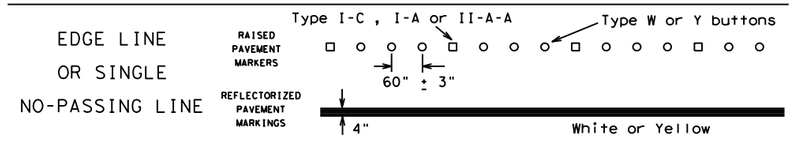
# STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

## SOLID LINES

DOUBLE NO-PASSING LINE

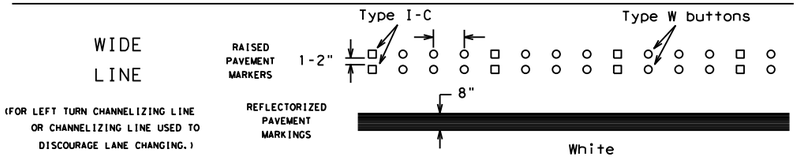



EDGE LINE OR SINGLE NO-PASSING LINE



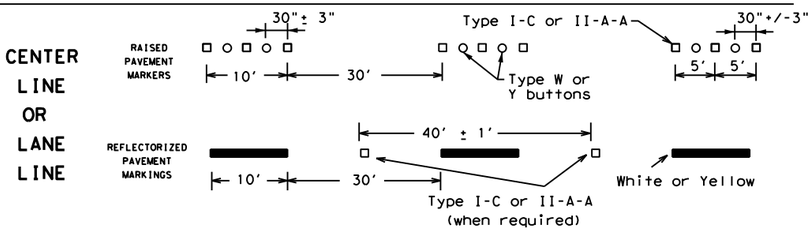

WIDE LINE

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

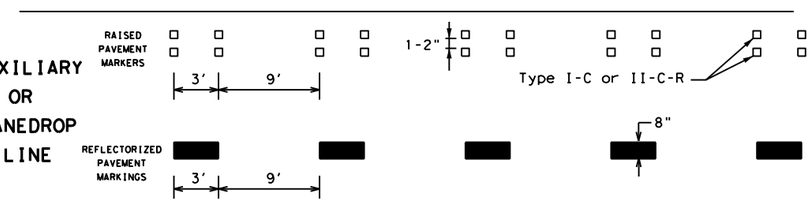



## BROKEN LINES

CENTER LINE OR LANE LINE

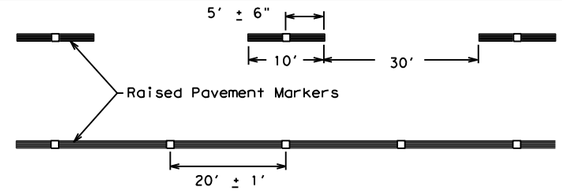



AUXILIARY OR LANEDROP LINE




### 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."

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

# BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

## BC(12)-21

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|---|---|---|---|---|
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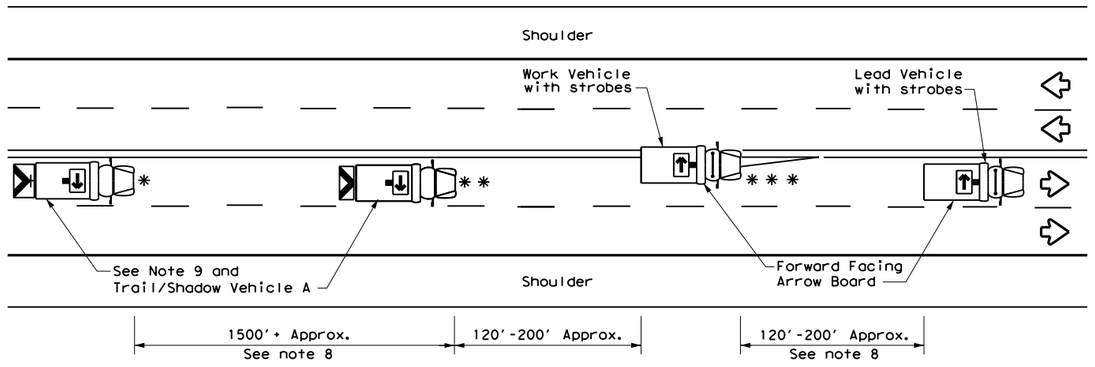
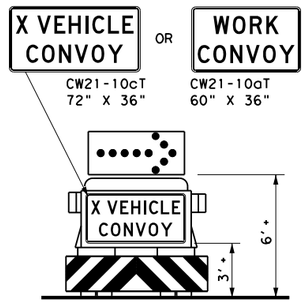


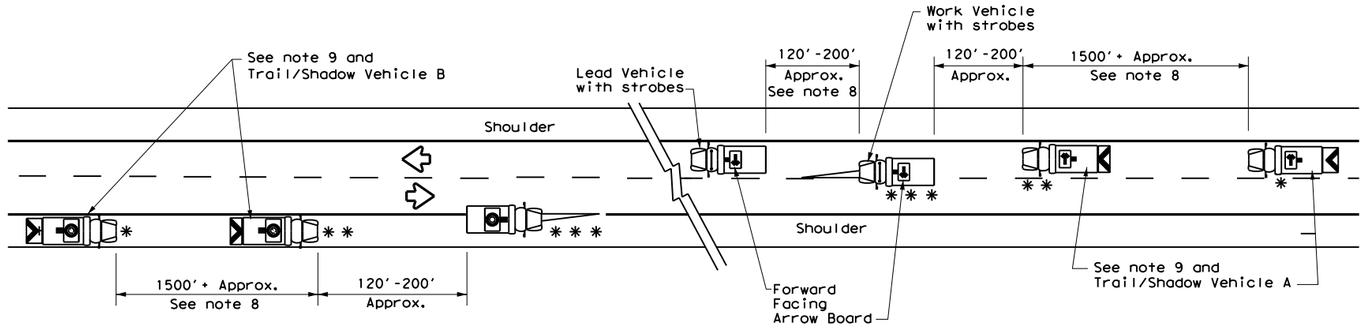

TCP (3-1a)

## UNDIVIDED MULTILANE ROADWAY




## TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

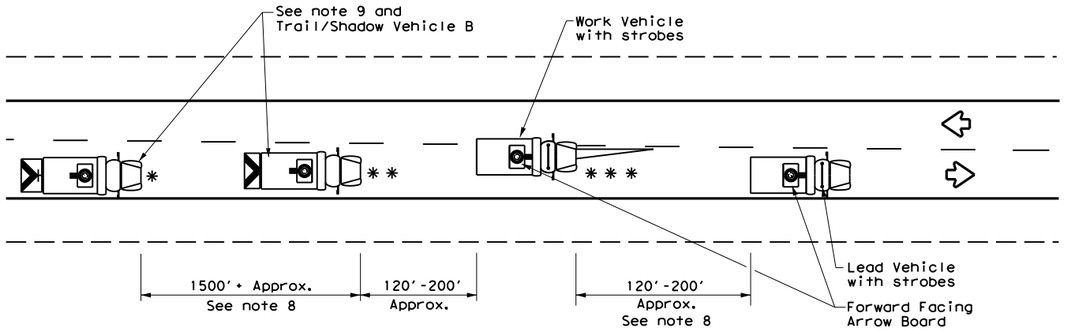



WORK ON SHOULDER

WORK ON TRAVEL LANE

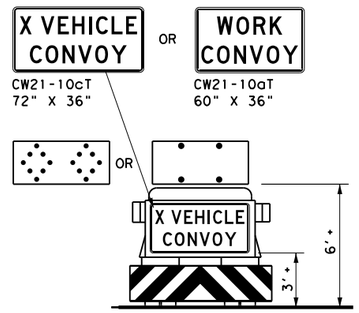
TCP (3-1b)

## TWO-WAY ROADWAY WITH PAVED SHOULDERS




TCP (3-1c)

## TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS




## TRAIL/SHADOW VEHICLE B

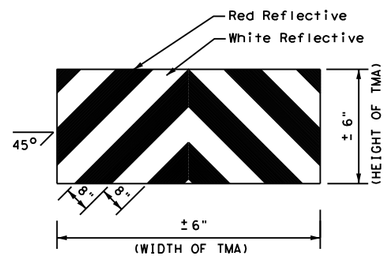
with Flashing Arrow Board in CAUTION display

| LEGEND | | | |
|---|---|---|---|
| * | 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 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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| REVISIONS 2-94 4-98 8-95 7-13 1-97 | 0914 | 00 | 487 | VARIOUS |
| | DIST | COUNTY | | SHEET NO. |
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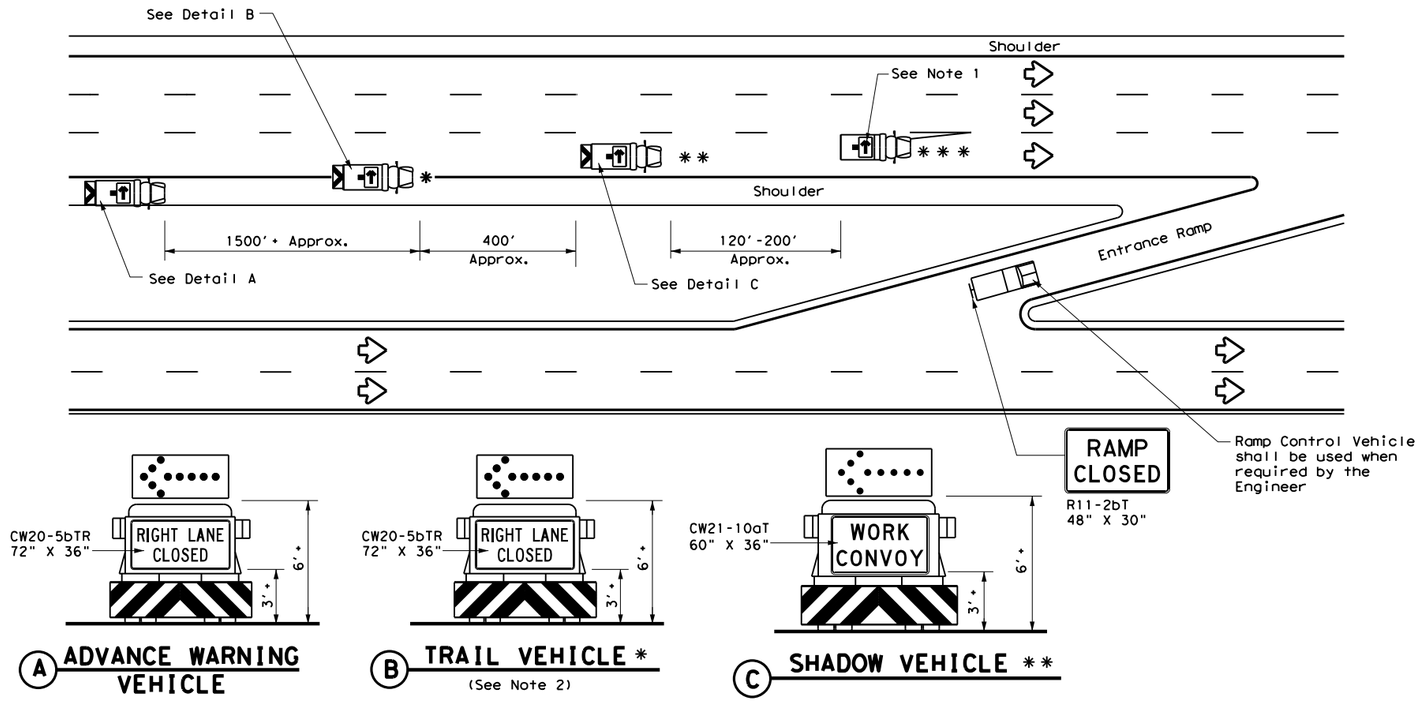
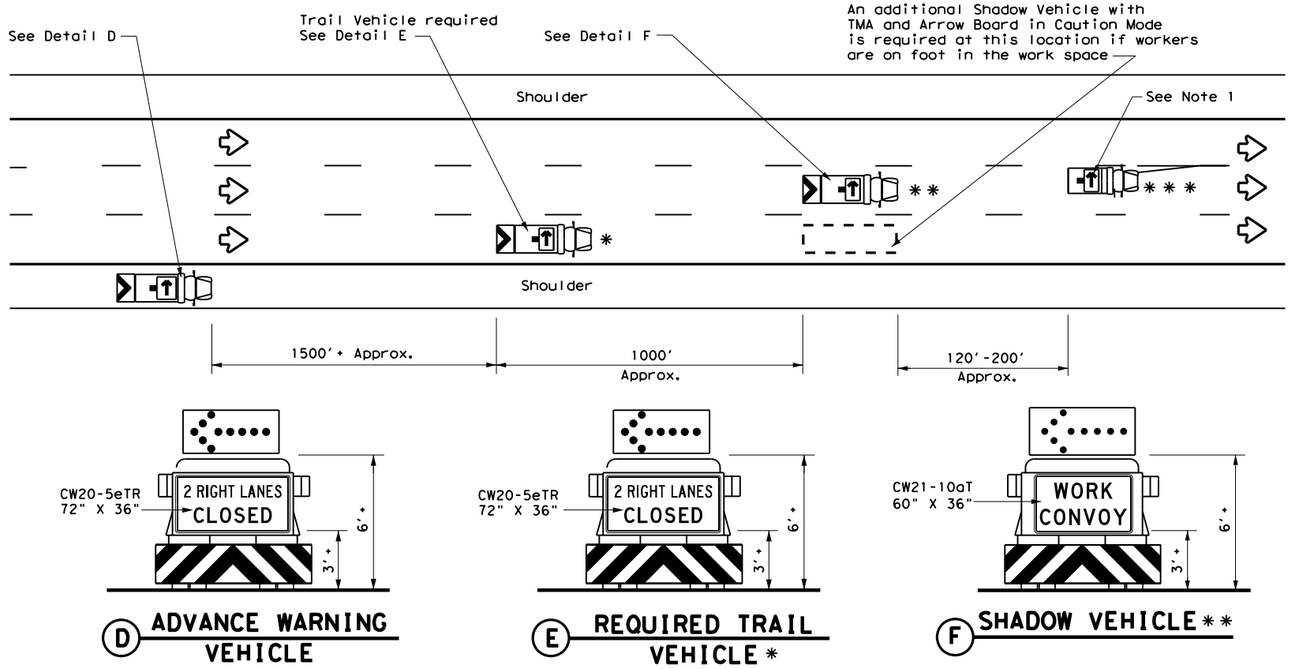



## RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



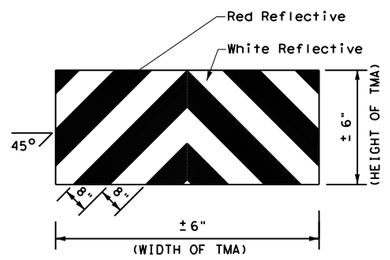

## INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

### GENERAL NOTES

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




STRIPING FOR TMA

Texas Department of Transportation

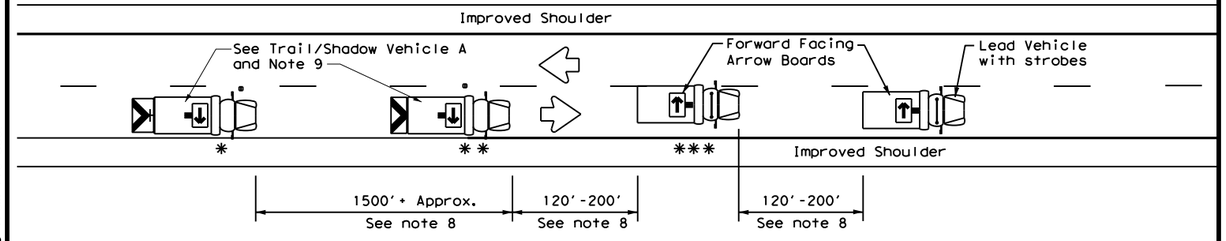
Traffic Operations Division Standard

# TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

# TCP(3-2)-13

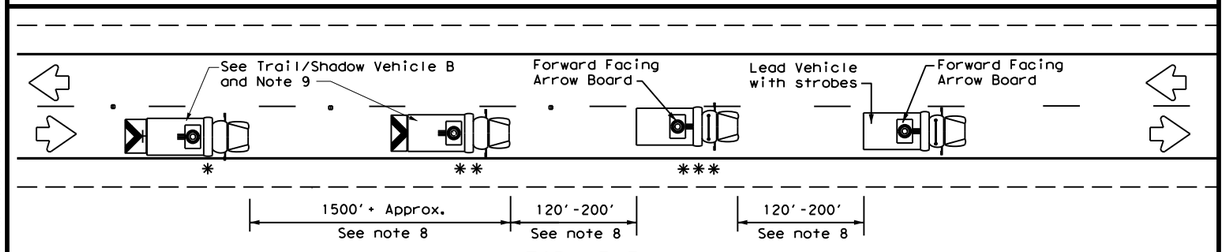
| FILE: tcp3-2.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| © TxDOT December 1985 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 2-94 4-98 | DIST | COUNTY | | SHEET NO. |
| 8-95 7-13 | AUS | TRAVIS | | 33 |
| 1-97 | | | | |

176



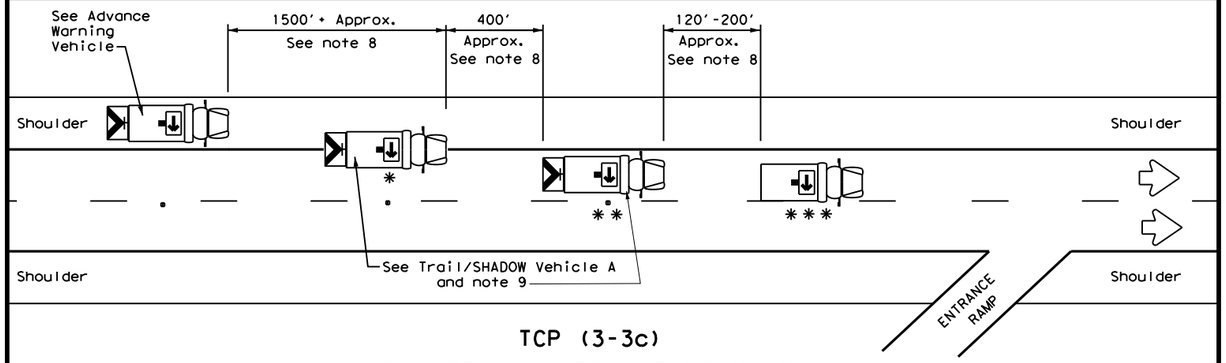

TCP (3-3a)

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



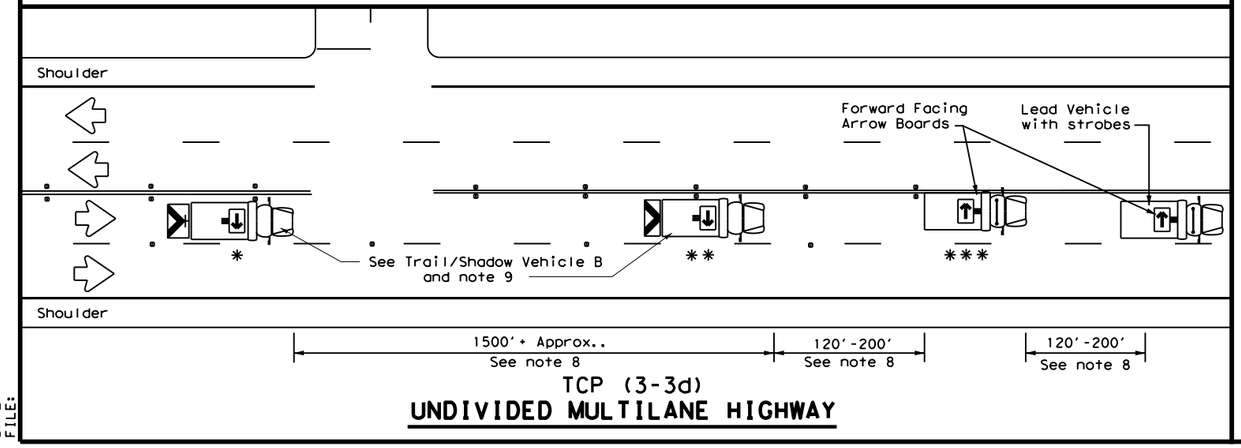

TCP (3-3b)

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




TCP (3-3c)

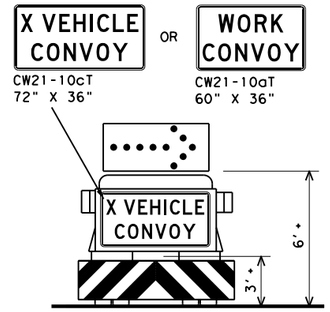
## DIVIDED MULTILANE HIGHWAY




TCP (3-3d)

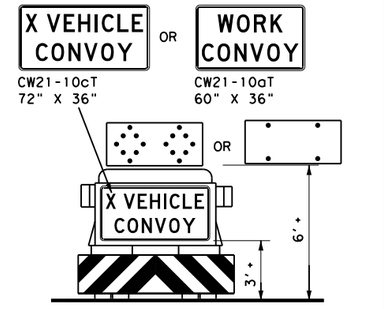
## UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



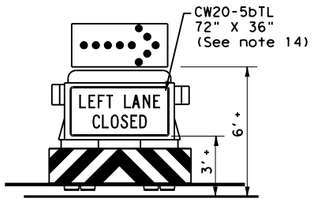

## TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

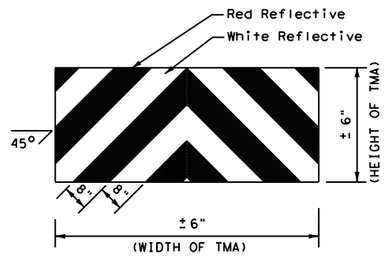



## TRAIL/SHADOW VEHICLE B

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

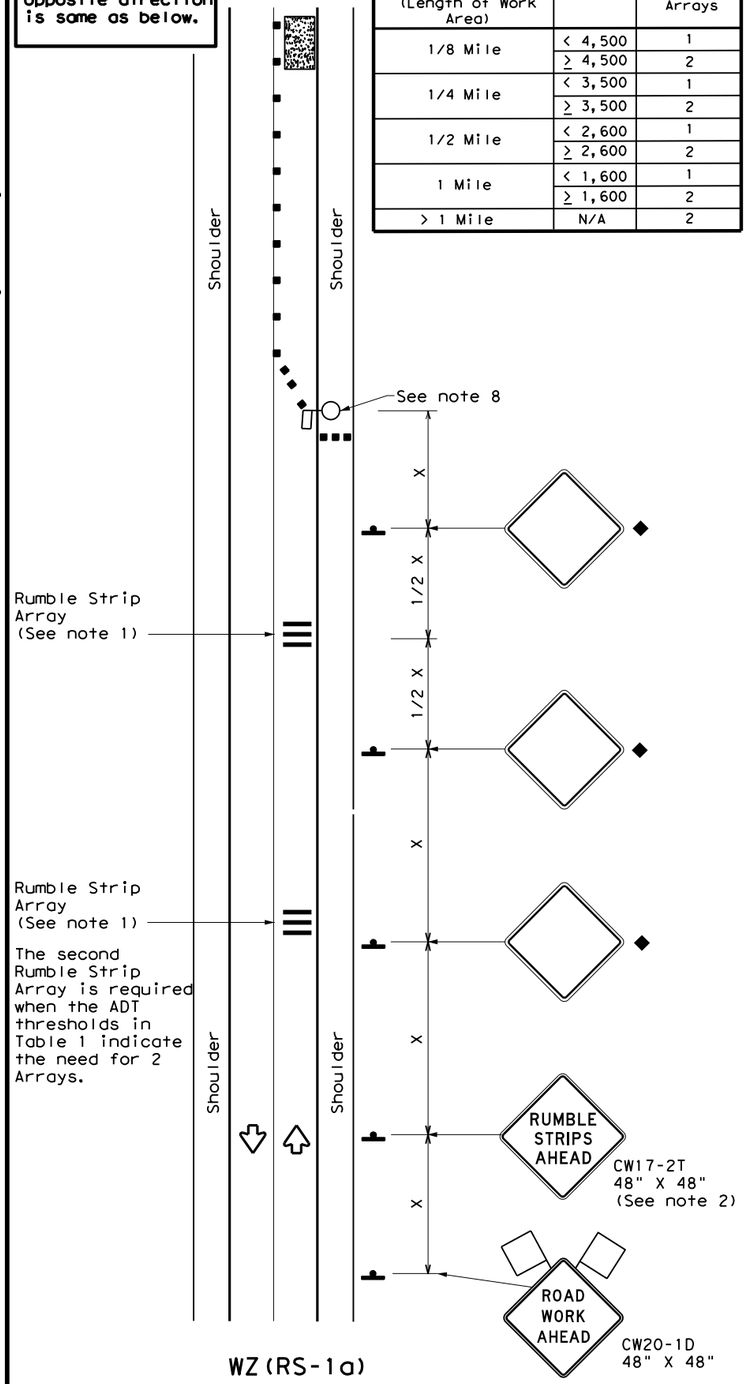
# TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
# TCP(3-3)-14

| FILE: tcp3-3.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| ©TxDOT September 1987 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 2-94 4-98 | DIST | COUNTY | | SHEET NO. |
| 8-95 7-13 | AUS | TRAVIS | | 34 |
| 1-97 7-14 | | | | |

DATE:
FILE:

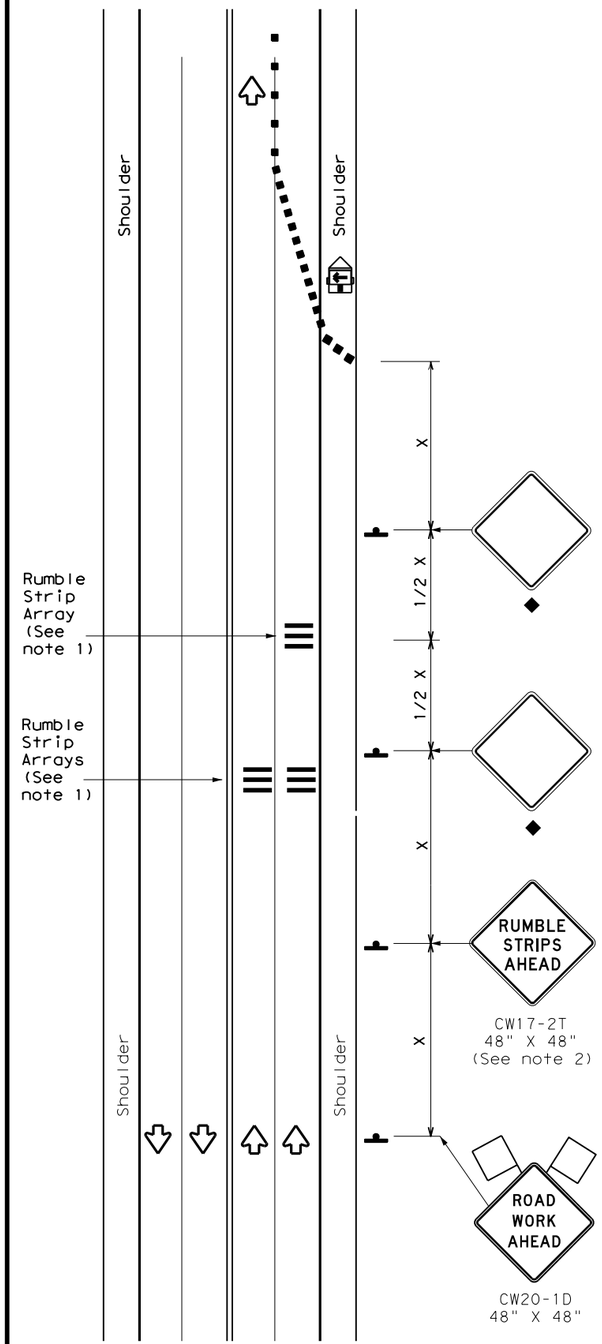
**Warning sign and rumble strip sequence in opposite direction is same as below.**

| 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)

## RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION




WZ(RS-1b)

## 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. Remove Temporary Rumble Strips before removing the advanced 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 Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

| 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.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

| TABLE 2 | |
|---|---|
| Speed | Approximate distance between strips in an array |
| ≤ 40 MPH | 10' |
| > 40 MPH & ≤ 55 MPH | 15' |
| = 60 MPH | 20' |
| ≥ 65 MPH | * 35' + |

Texas Department of Transportation

*Traffic Safety Division Standard*

# TEMPORARY RUMBLE STRIPS

## WZ(RS)-22

| FILE: wzrs22.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| © TxDOT November 2012 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS 2-14 1-22 4-16 | 0914 | 00 | 487 | VARIOUS |
| | DIST | COUNTY | | SHEET NO. |
| | AUS | TRAVIS | | 35 |

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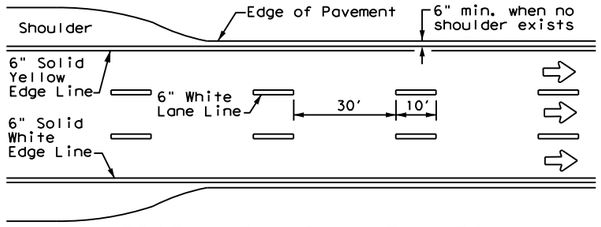
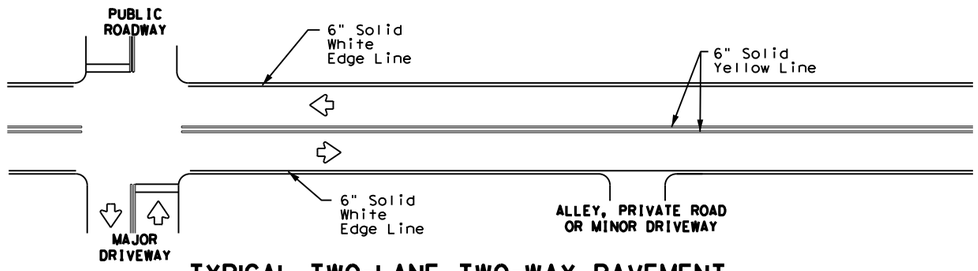
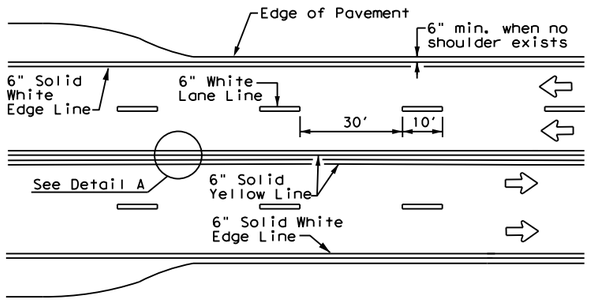
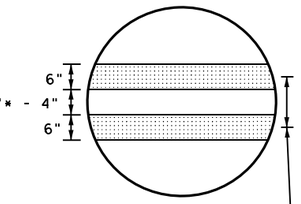



## EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS




## TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

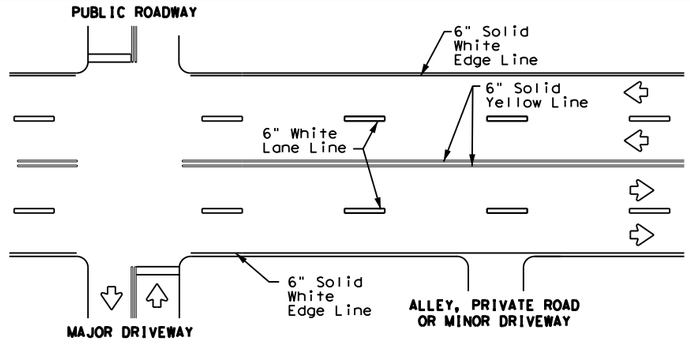


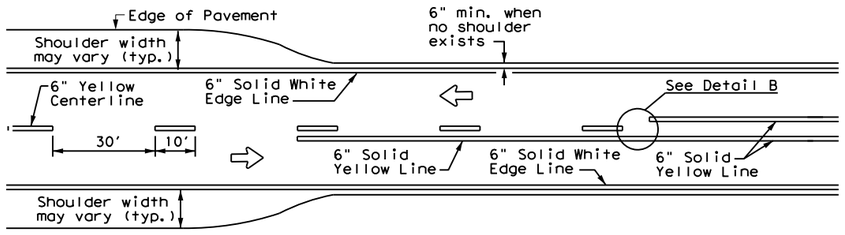

## CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

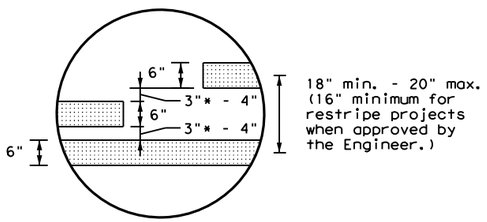
** 8" minimum for restripe projects when approved by the Engineer.



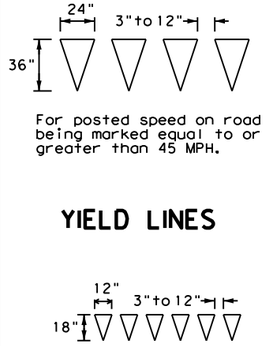

## TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

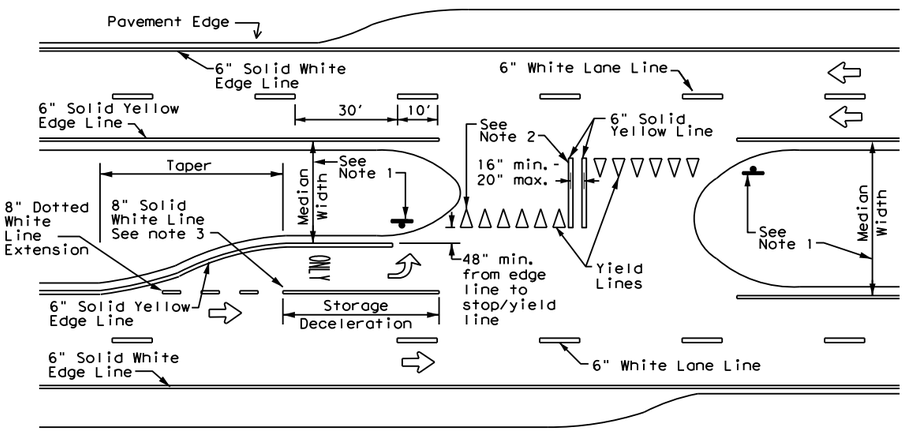



## TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS




* 2" minimum for restripe projects when approved by the Engineer.




## FOUR LANE DIVIDED ROADWAY CROSSOVERS

### NOTES

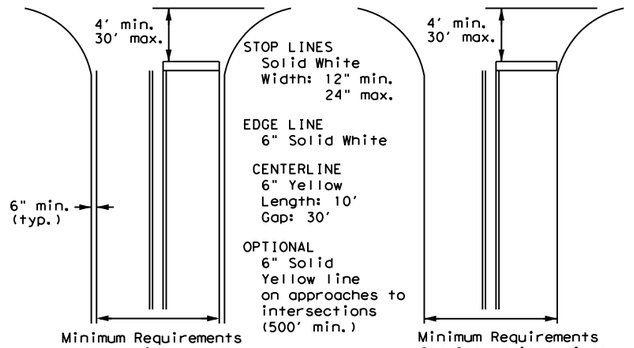
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

### GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

| MATERIAL SPECIFICATIONS | |
|---|---|
| PAVEMENT MARKERS (REFLECTORIZED) | DMS-4200 |
| EPOXY AND ADHESIVES | DMS-6100 |
| BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS | DMS-6130 |
| TRAFFIC PAINT | DMS-8200 |
| HOT APPLIED THERMOPLASTIC | DMS-8220 |
| PERMANENT PREFABRICATED PAVEMENT MARKINGS | DMS-8240 |

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.




NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

## GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

*Traffic Safety Division Standard*

# TYPICAL STANDARD PAVEMENT MARKINGS

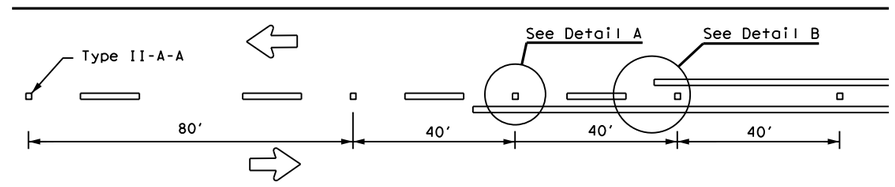
## PM(1)-22

| FILE: pm1-22.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| © TxDOT December 2022 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 11-78 8-00 6-20 | DIST | COUNTY | | SHEET NO. |
| 8-95 3-03 12-22 | AUS | TRAVIS | | 36 |
| 5-00 2-12 | | | | |

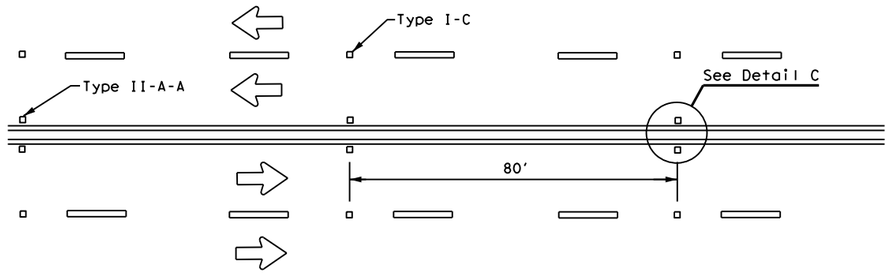
22A

DATE:
FILE:

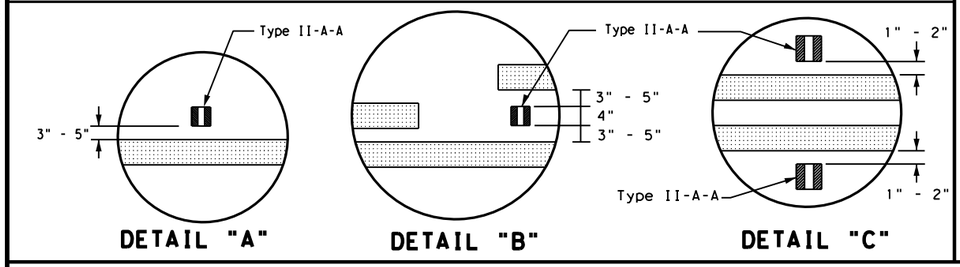
# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

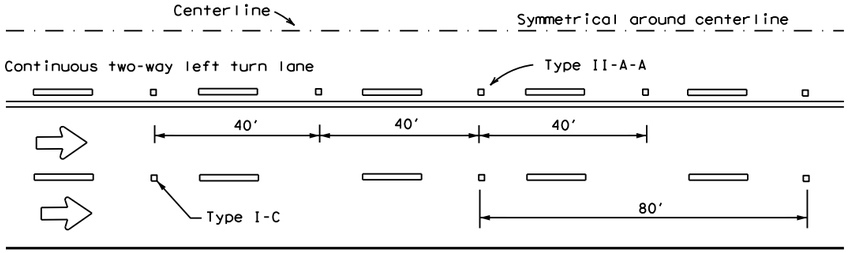



## CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

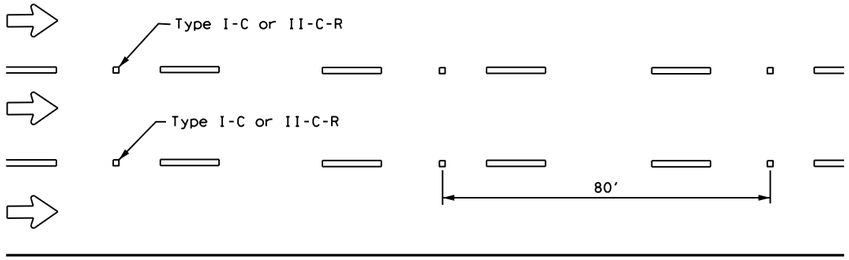



## CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS



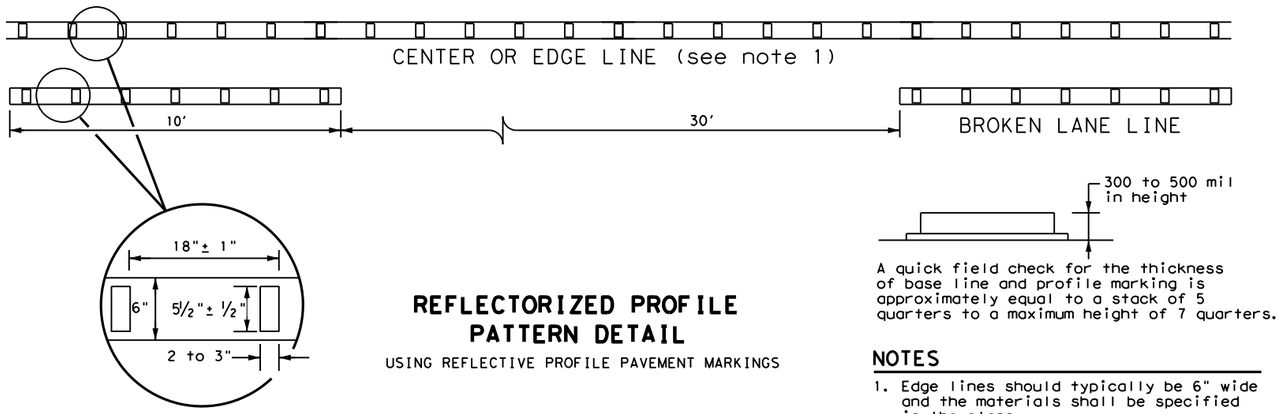

## CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE




## 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.

See Note 3.




## REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

### NOTES

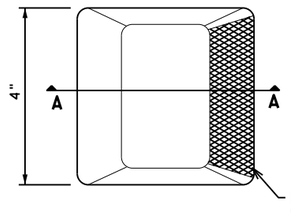
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

### GENERAL NOTES

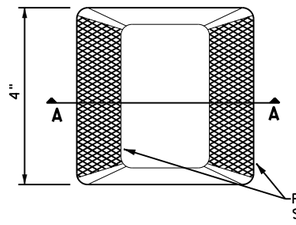
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

| 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 |

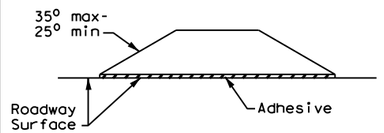
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.




Type I (Top View)




Type II (Top View)




SECTION A

## RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

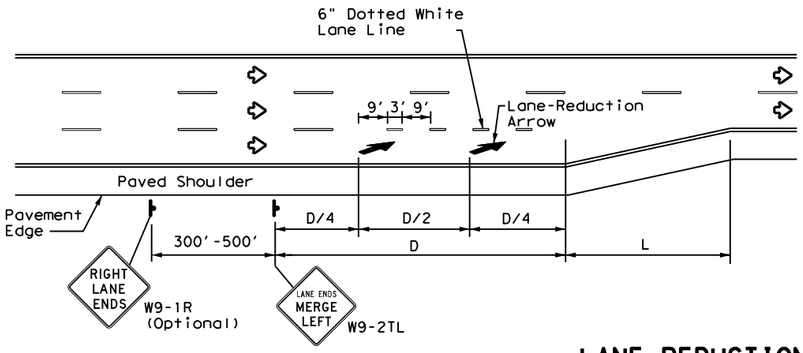
# POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

| FILE: pm2-22.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| ©TxDOT December 2022 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12 | 0914 | 00 | 487 | VARIOUS |
| | DIST | COUNTY | | SHEET NO. |
| | AUS | TRAVIS | | 37 |

22B



DATE:
FILE:

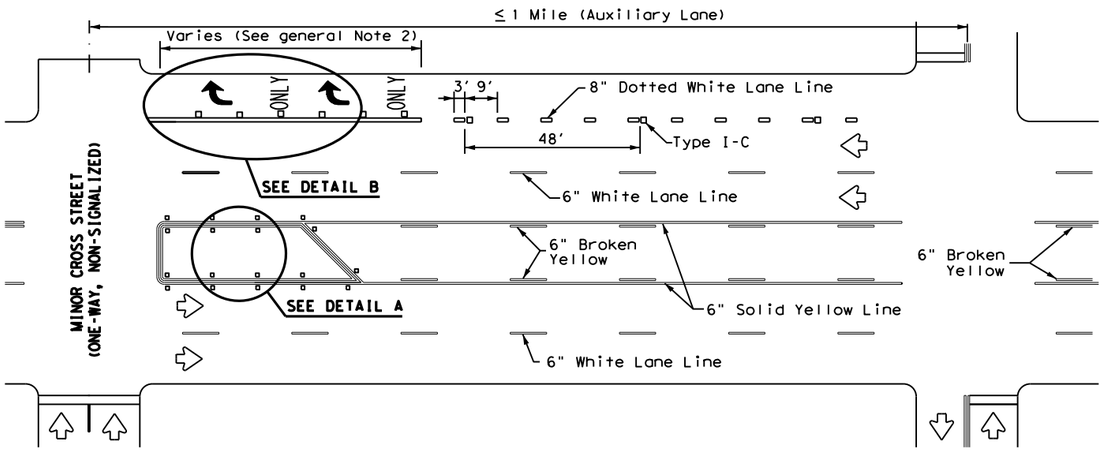



## LANE REDUCTION

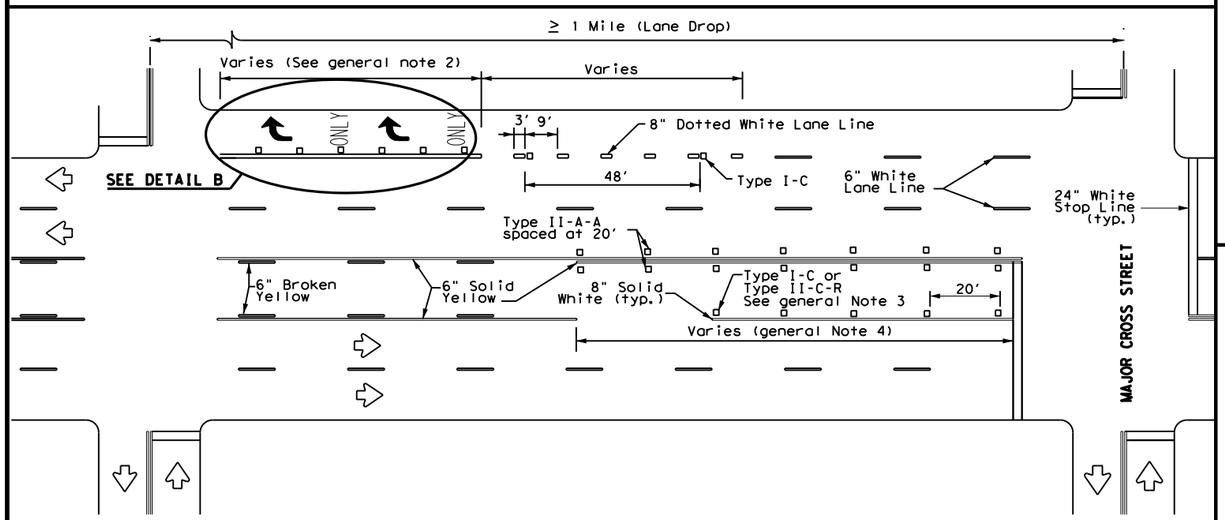
### NOTES

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 RIGHT LANE ENDS (W9-1R) 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.

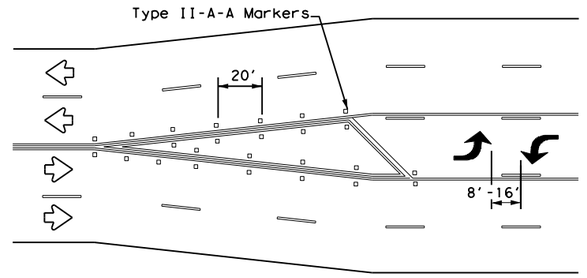
| ADVANCED WARNING SIGN DISTANCE (D) | | |
|---|---|---|
| Posted Speed | D (ft) | L (ft) |
| 30 MPH | 460 | $L=\frac{WS^2}{60}$ |
| 35 MPH | 565 | |
| 40 MPH | 670 | |
| 45 MPH | 775 | L=WS |
| 50 MPH | 885 | |
| 55 MPH | 990 | |
| 60 MPH | 1,100 | |
| 65 MPH | 1,200 | |
| 70 MPH | 1,250 | |
| 75 MPH | 1,350 | |




## TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE




## TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP




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.

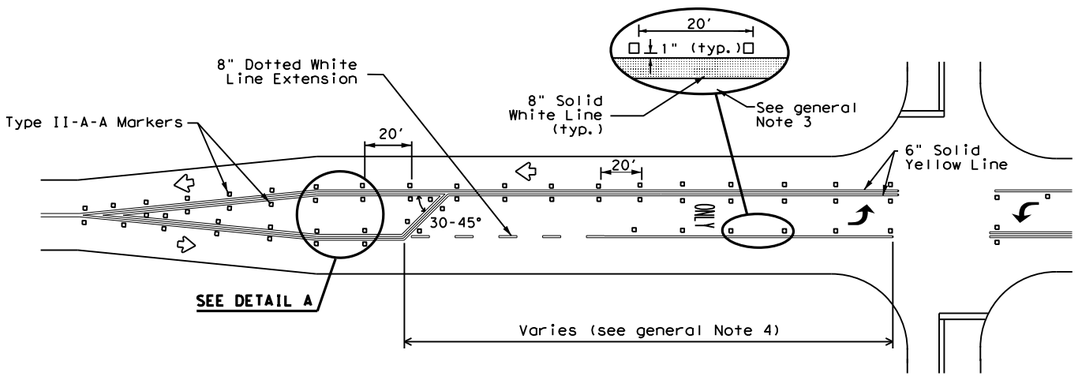
## TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

### GENERAL NOTES

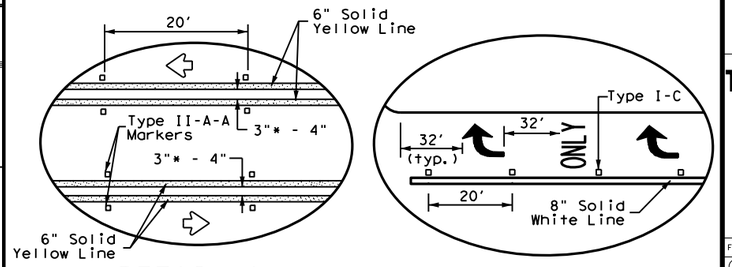
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

| 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 TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS




* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

# TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

# PM(3)-22

| FILE: pm3-22.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| © TxDOT December 2022 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS 4-98 3-03 6-20 | 0914 | 00 | 487 | VARIOUS |
| 5-00 2-10 12-22 | DIST | COUNTY | | SHEET NO. |
| 8-00 2-12 | AUS | TRAVIS | | 38 |

22C

DATE:
FILE:

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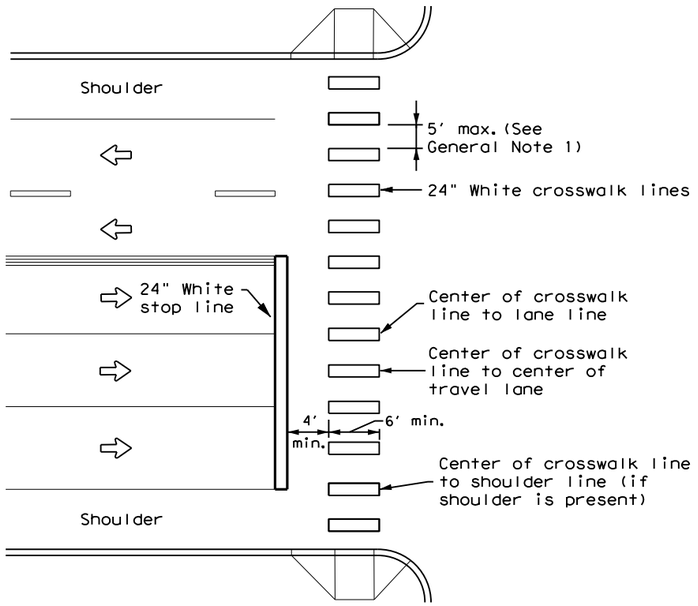


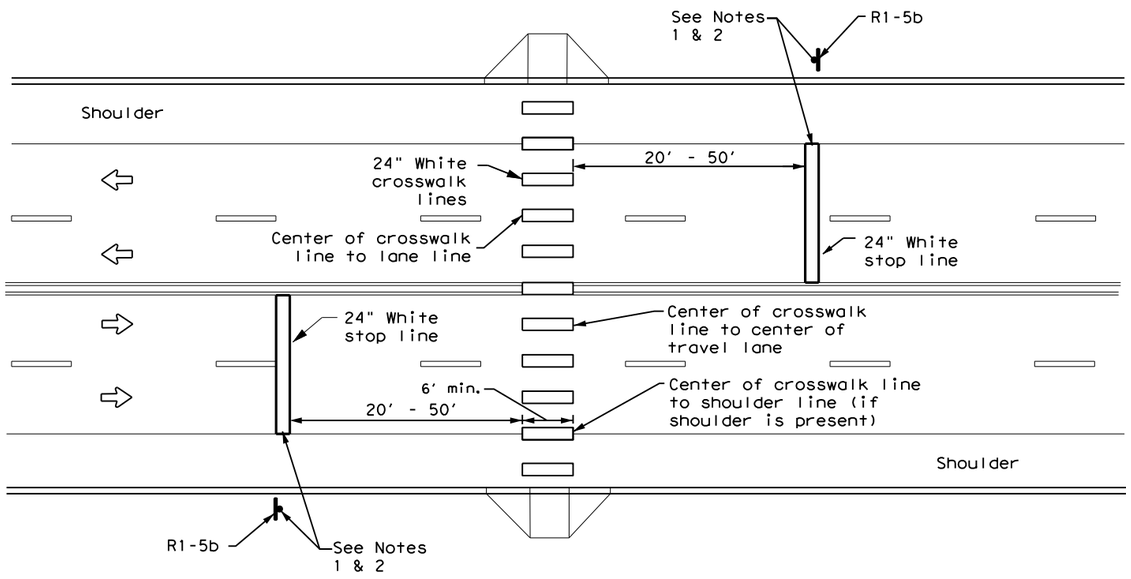

**HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH**

## GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

| 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.




**UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK**

## NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

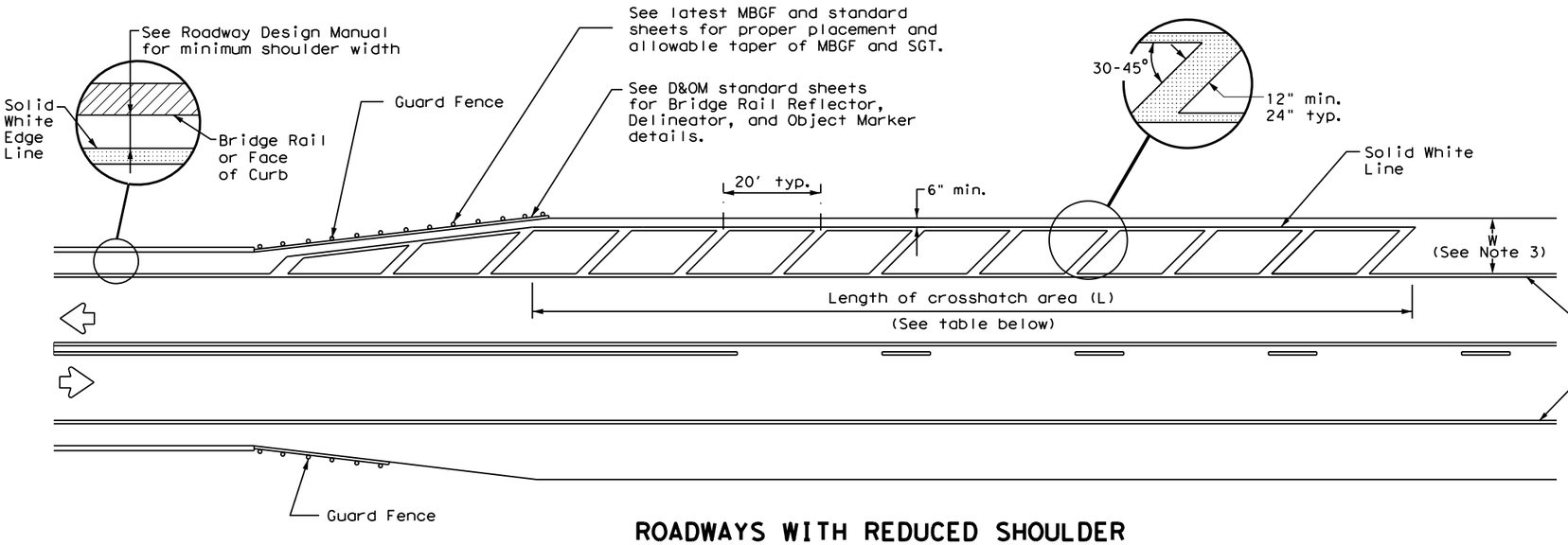
# CROSSWALK PAVEMENT MARKINGS

# PM(4)-22A

| FILE: pm4-22a.dgn | DN: | CK: | DW: | CK: |
|---|---|---|---|---|
| © TxDOT December 2022 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 6-20 | DIST | COUNTY | | SHEET NO. |
| 6-22 | AUS | TRAVIS | | 39 |
| 12-22 | | | | |

22D

DATE:
FILE:




## ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

| CROSSHATCH LENGTH (L) | |
|---|---|
| Posted Speed (MPH) | L (ft) |
| 30 | 300 ft |
| 35 | |
| 40 | |
| 45 | |
| 50 | 500 ft |
| 55 | |
| 60 | |
| 65 | |
| 70 | |
| 75 | |

## NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

| MATERIAL SPECIFICATIONS | |
|---|---|
| PAVEMENT MARKERS (REFLECTORIZED) | DMS-4200 |
| EPOXY AND ADHESIVES | DMS-6100 |
| BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS | DMS-6130 |
| TRAFFIC PAINT | DMS-8200 |
| HOT APPLIED THERMOPLASTIC | DMS-8220 |
| PERMANENT PREFABRICATED PAVEMENT MARKINGS | DMS-8240 |

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

Texas Department of Transportation

Traffic Safety Division Standard

# PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

PM(5)-22

| FILE: pm5-22.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| ©TxDOT December 2022 | CONT | SECT | JOB | HIGHWAY |
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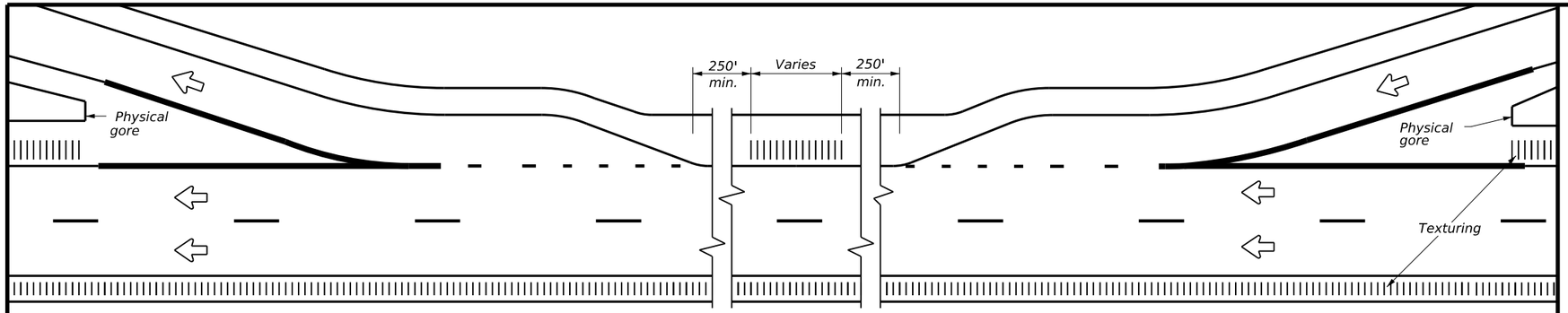
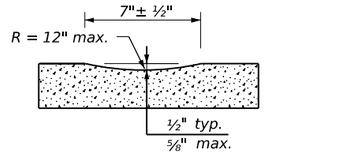
| | DIST | COUNTY | | SHEET NO. |
| | AUS | TRAVIS | | 40 |

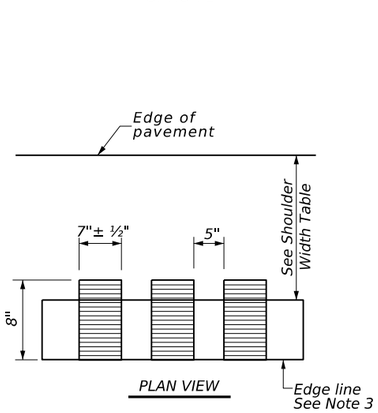
22E



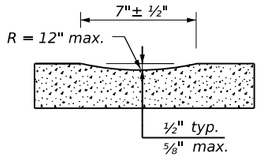

## TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS



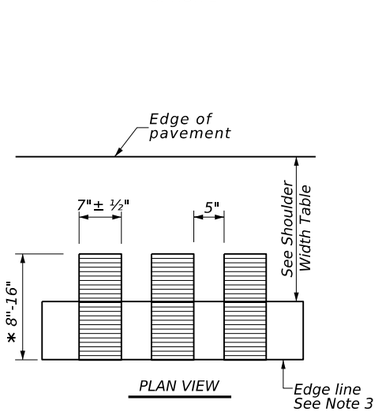

PROFILE VIEW
OPTION 1




CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

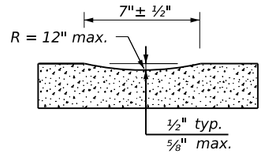



PROFILE VIEW
OPTION 2

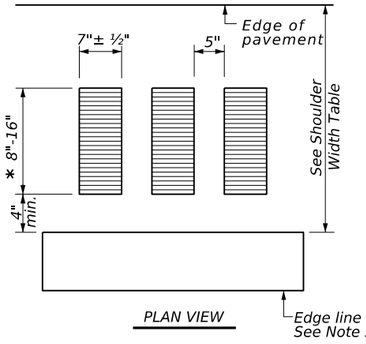



* This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

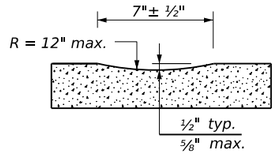



PROFILE VIEW
OPTION 3

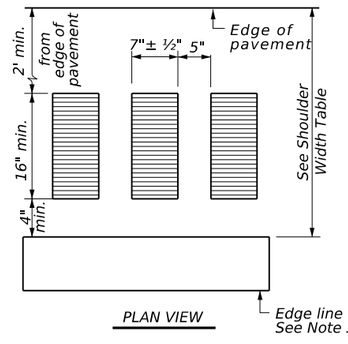



* This distance may vary based on width of shoulder

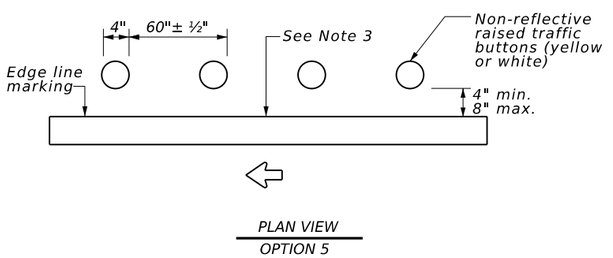
CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)




PROFILE VIEW
OPTION 4

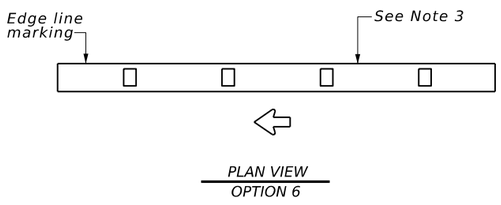



CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)




PLAN VIEW
OPTION 5

RAISED EDGE LINE
(Rumble Strips)




PLAN VIEW
OPTION 6

PROFILE EDGE LINE MARKINGS
(Rumble Strips)

### 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 sheets PM(2) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edge line rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

### WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble stripe.

### WHEN INSTALLING RAISED OR PROFILE EDGE LINE 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 edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line 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. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

### 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 |

Texas Department of Transportation

Traffic Safety Division Standard

# EDGE LINE RUMBLE STRIPS ON FREEWAYS AND DIVIDED HIGHWAYS RS(1)-23

| FILE: rs(1)-23.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
|---|---|---|---|---|
| © TxDOT January 2023 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 4-06 1-23 | DIST | COUNTY | | SHEET NO. |
| 2-10 | AUS | TRAVIS | | 41 |
| 10-13 | | | | |

DATE:
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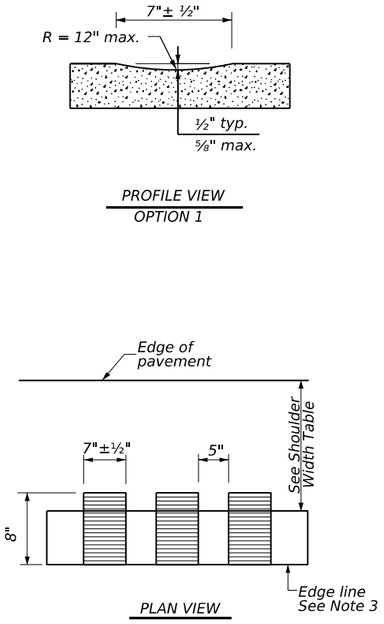
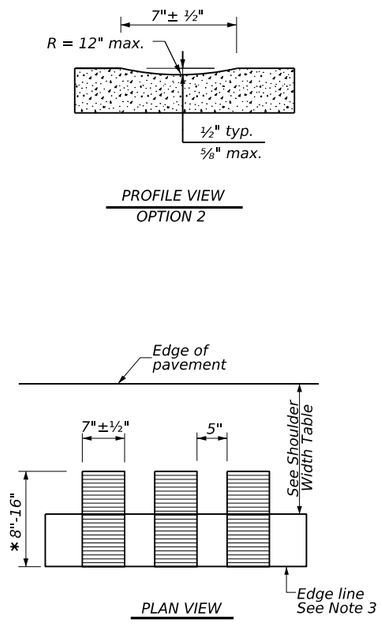
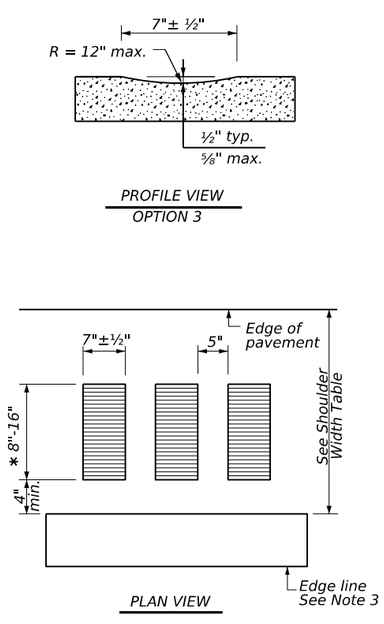



CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



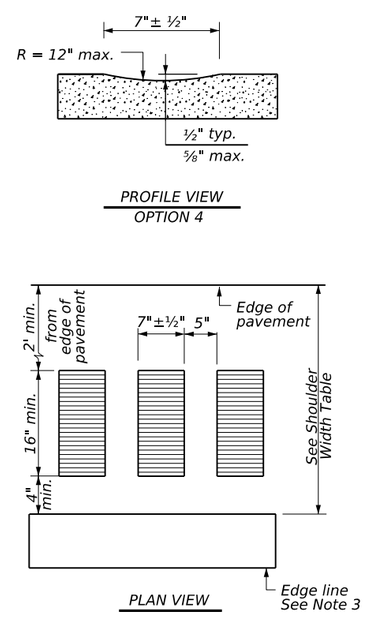

∗ This distance may vary based on width of shoulder

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

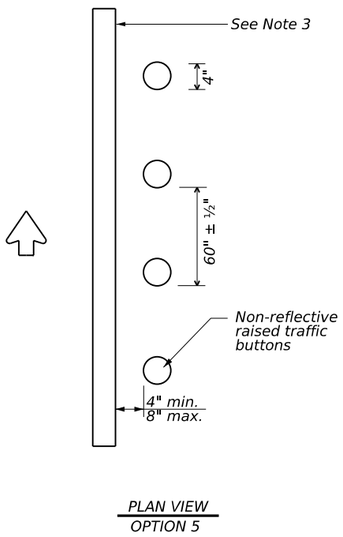



∗ This distance may vary based on width of shoulder

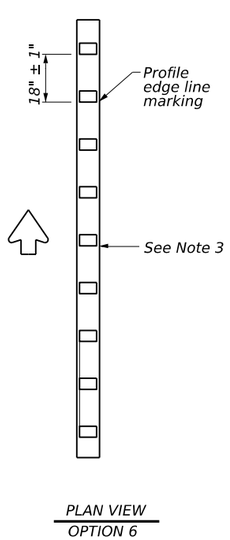
CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



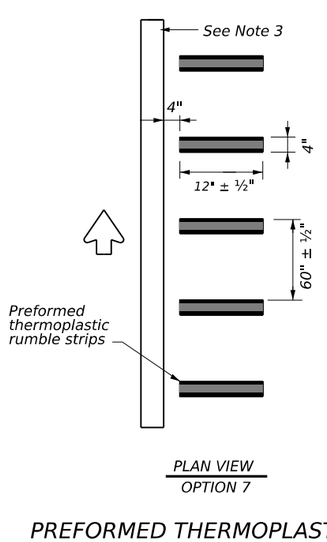

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



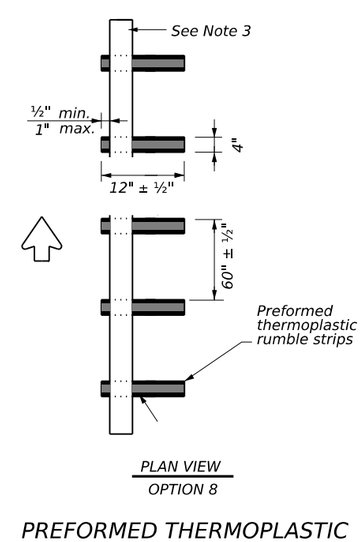

RAISED EDGE LINE (Rumble Strips)




PROFILE EDGE LINE MARKINGS (Rumble Strips)




PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)




PREFORMED THERMOPLASTIC EDGE LINE (Rumble Strips)

| 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, 6 or 8 | Option 1, 2, 3 5, 6 or 7 | Option 2, 4, 5 6 or 7 |

### 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) and FPM(1) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the Shoulder Width Table below for determining what options may be used for edge line rumble strips.
5. Breaks in edge line rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections, or driveways with high usage of large trucks when installed on conventional highways.
6. Rumble strips shall not be placed across exit or entrance ramps, acceleration or deceleration lanes, crossovers, gore areas, or intersections with other roadways.
7. Consideration should be given to noise levels when edgeline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Consideration shall be given to bicyclists. See RS(6).

### WHEN INSTALLING MILLED DEPRESSION EDGE LINE RUMBLE STRIPS:

9. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
10. Pavement markings can be applied over milled shoulder rumble strips to create an edge line rumble strip.

### WHEN INSTALLING RAISED OR PROFILE EDGE LINE 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 edge line when used as a rumble strip. The color of the button should match the color of the adjacent edge line 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. The minimum distance between the edge line and the buttons should be used if the shoulder is less than 8 feet in width.
15. Raised profile thermoplastic markings used as edge lines may substitute for buttons.

Texas Department of Transportation

Traffic Safety Division Standard

# EDGE LINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS
# RS(2)-23

| FILE: rs(2)-23.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
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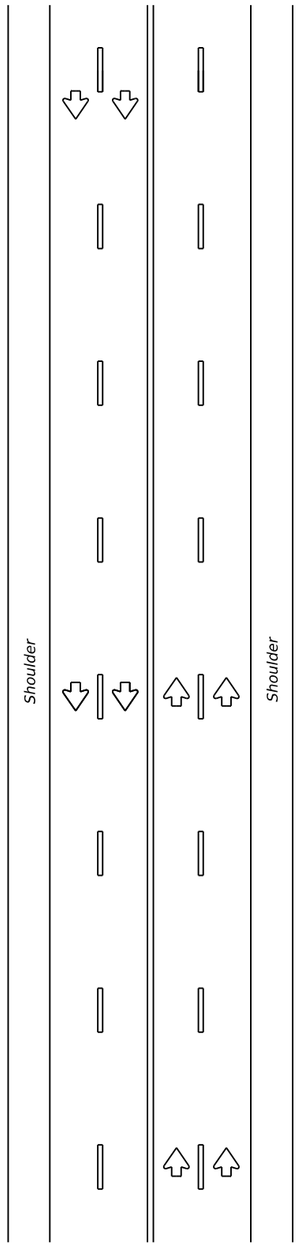
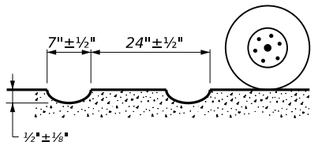
| ©TxDOT January 2023 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0914 | 00 | 487 | VARIOUS |
| 10-13 | DIST | COUNTY | | SHEET NO. |
| 1-23 | AUS | TRAVIS | | 42 |

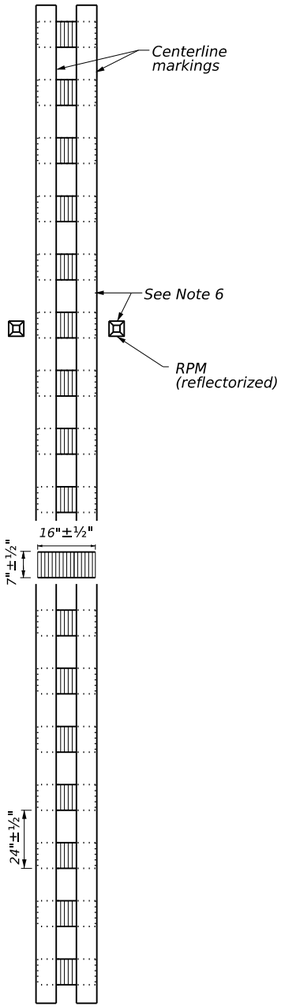
# CENTERLINE RUMBLE STRIPS




MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

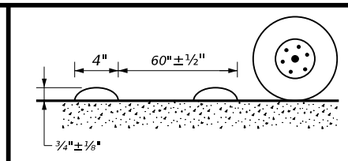



PROFILE VIEW

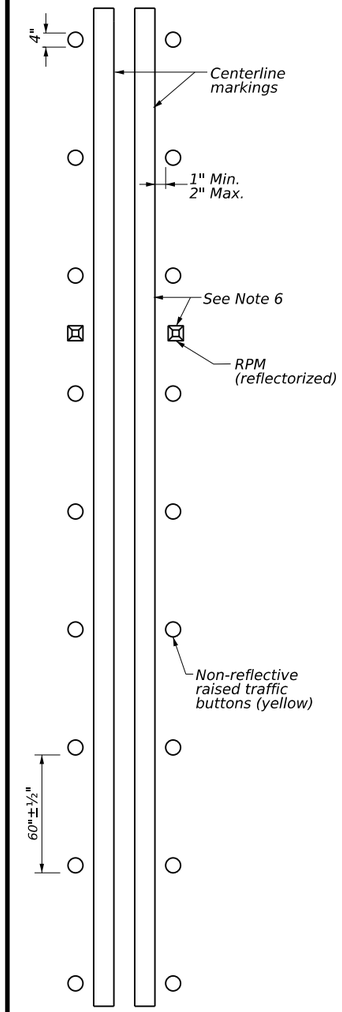



PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

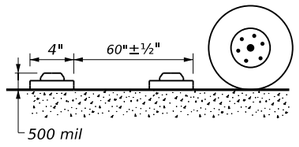



PROFILE VIEW

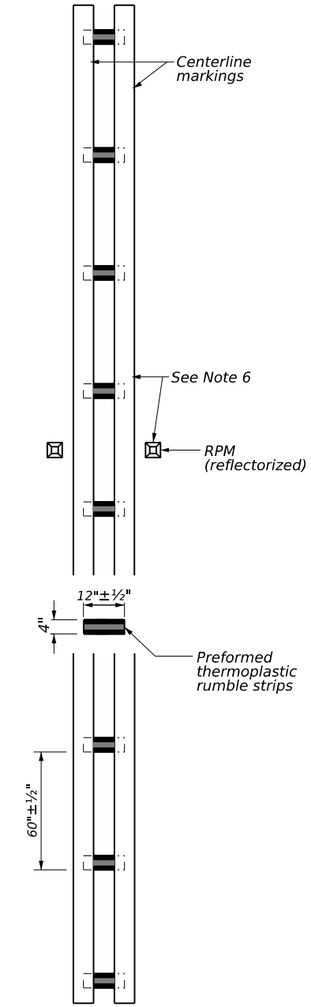



PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

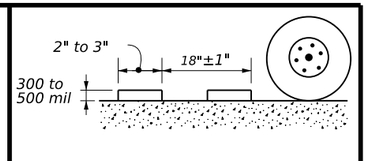



PROFILE VIEW

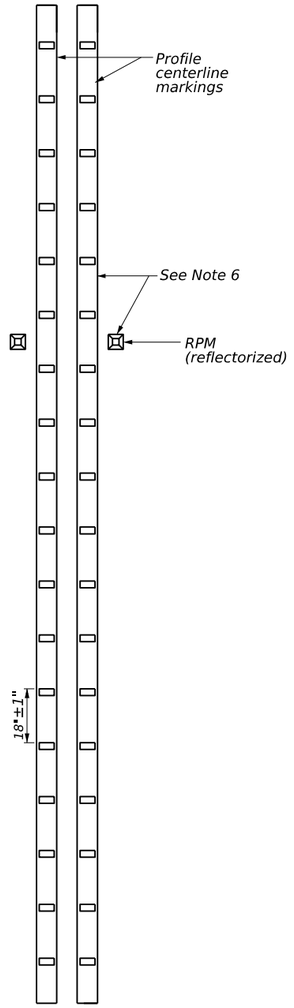



PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS




PROFILE VIEW




PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

***GENERAL NOTES***

1. *This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.*
2. *Centerline and edge line rumble strips or profile markings shall not be placedon 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 beused if approved by the Traffic Safety Division.*
5. *Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways 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 to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) 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.*
11. *Consideration shall be given to bicyclists. See RS(6).*

***WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:***

12. *See standard sheet RS(2).*



DATE:
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Texas Department of Transportation

Traffic Safety Division Standard

# CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

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| ©TxDOT January 2023 | CONT | SECT | JOB | HIGHWAY |
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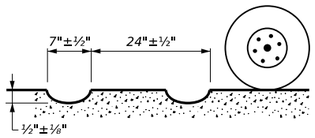
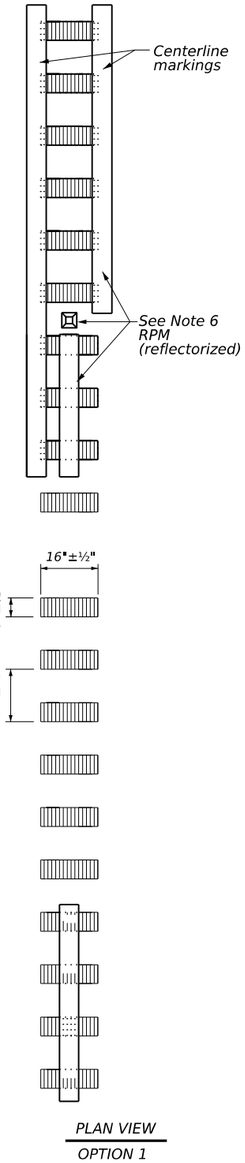
# CENTERLINE RUMBLE STRIPS

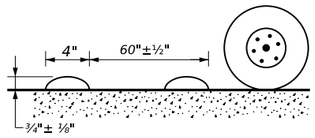



PROFILE VIEW

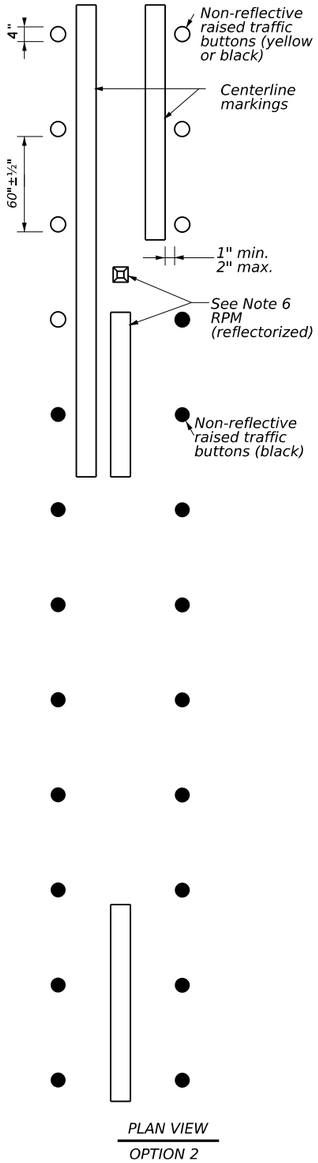



PLAN VIEW
OPTION 1

TWO LANE TWO-WAY HIGHWAYS

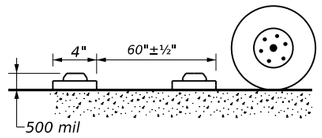



PROFILE VIEW

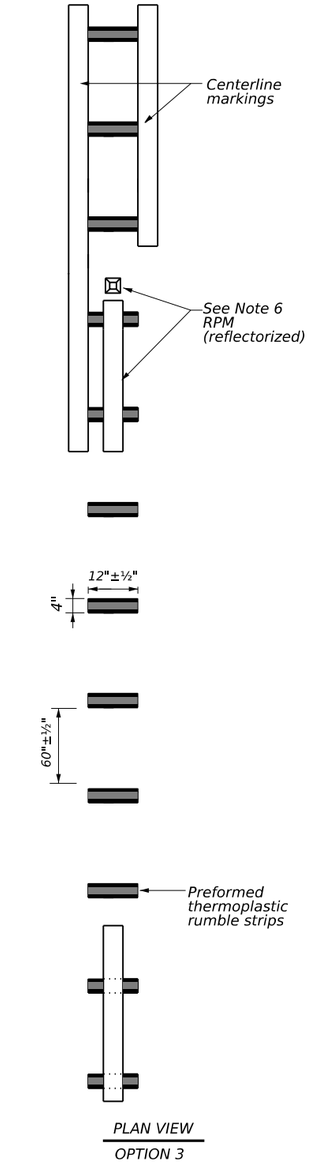



PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

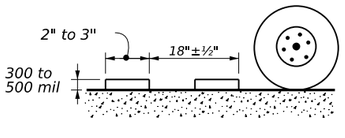



PROFILE VIEW

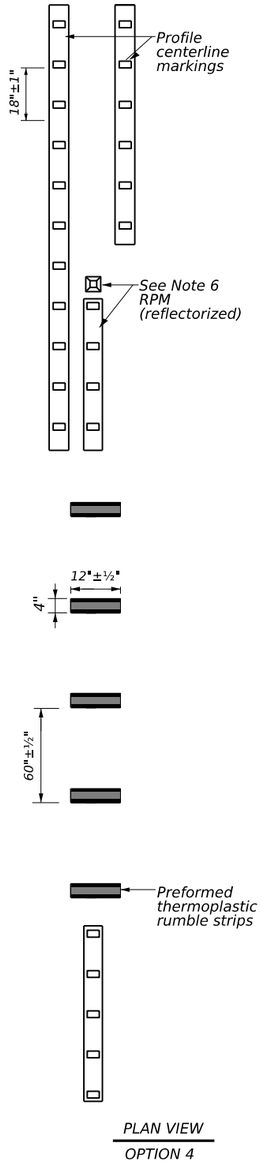



PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS

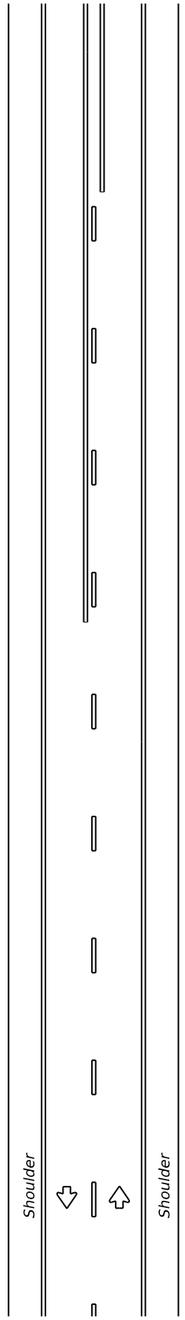



PROFILE VIEW




PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS




TWO LANE TWO-WAY HIGHWAYS

## GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line 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 Safety 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 or 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 to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) 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.
12. Consideration shall be given to bicyclists. See RS(6).

## WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

13. See standard sheet RS(2).



DATE:
FILE:

Texas Department of Transportation

Traffic Safety Division Standard

# CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

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DATE:
FILE:

## I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☒ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

## II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

| Erosion | Sedimentation | Post-Construction TSS |
|---|---|---|
| ☐ Temporary Vegetation | ☐ Silt Fence | ☐ Vegetative Filter Strips |
| ☐ Blankets/Matting | ☐ Rock Berm | ☐ Retention/Irrigation Systems |
| ☐ Mulch | ☐ Triangular Filter Dike | ☐ Extended Detention Basin |
| ☐ Sodding | ☐ Sand Bag Berm | ☐ Constructed Wetlands |
| ☐ Interceptor Swale | ☐ Straw Bale Dike | ☐ Wet Basin |
| ☐ Diversion Dike | ☐ Brush Berms | ☐ Erosion Control Compost |
| ☐ Erosion Control Compost | ☐ Erosion Control Compost | ☐ Mulch Filter Berm and Socks |
| ☐ Mulch Filter Berm and Socks | ☐ Mulch Filter Berm and Socks | ☐ Compost Filter Berm and Socks |
| ☐ Compost Filter Berm and Socks | ☐ Compost Filter Berm and Socks | ☐ Vegetation Lined Ditches |
| | ☐ Stone Outlet Sediment Traps | ☐ Sand Filter Systems |
| | ☐ Sediment Basins | ☐ Grassy Swales |

## III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

## IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

## V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. Houston Toad Habitat - See General Notes - Item 7

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

| | | | | | |
|---|---|---|---|---|---|
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| ©TxDOT: February 2015 | CONT | SECT | JOB | HIGHWAY | |
| REVISIONS<br>12-12-2011 (DS)<br>05-07-14 ADDED NOTE SECTION IV.<br>01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES. | 0914 | 00 | 487 | VARIOUS | |
| | DIST | COUNTY | | SHEET NO. | |
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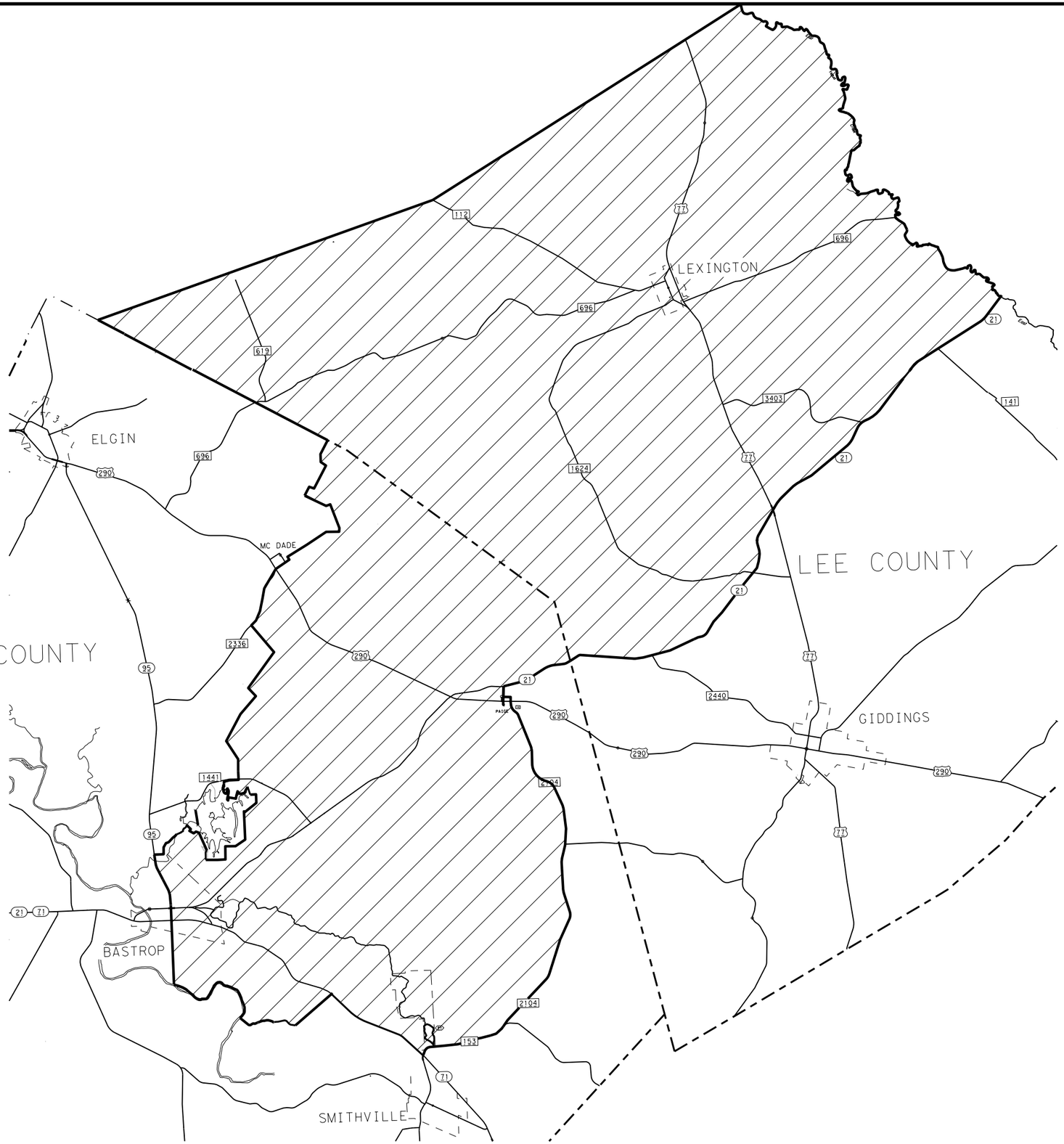


HOUSTON TOAD KNOWN AND POTENTIAL HABITAT

NOTES:

1- INCLUDED IN THIS PLAN SET FOR INFORMATIONAL PURPOSES.

DATE: $DATE$ $TIME$
FILE: $FILE$

***Austin District***
***Bastrop Area Office***

Texas Department of Transportation

# LOST PINE HABITAT CONSERVATION PLAN AREA



| CONT | SECT | JOB | HIGHWAY |
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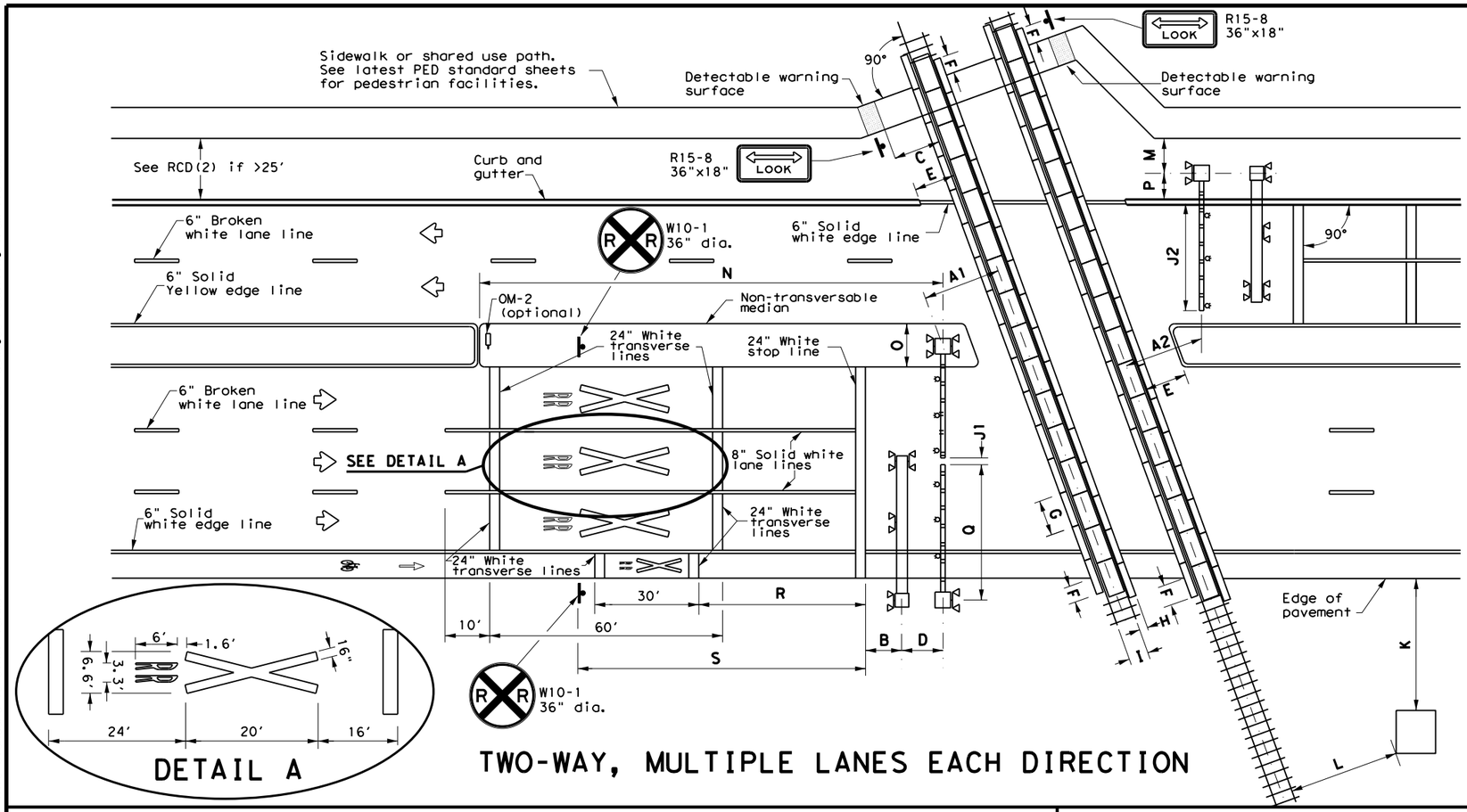






DETAIL A

TWO-WAY, MULTIPLE LANES EACH DIRECTION

## NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Near edge of detectable warning surface to nearest rail: 12' minimum.

D: Center of gate mast to center of cantilever mast: 6' typical.
NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical.
NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum.
NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'- 8'1/2".

J1: Tip of gate to tip of gate: 2' maximum.

J2: 90% of traveled roadway to be covered by gate.

K: Nearest edge of RR cabinet from edge of pavement: 30' typical.
NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabinet from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

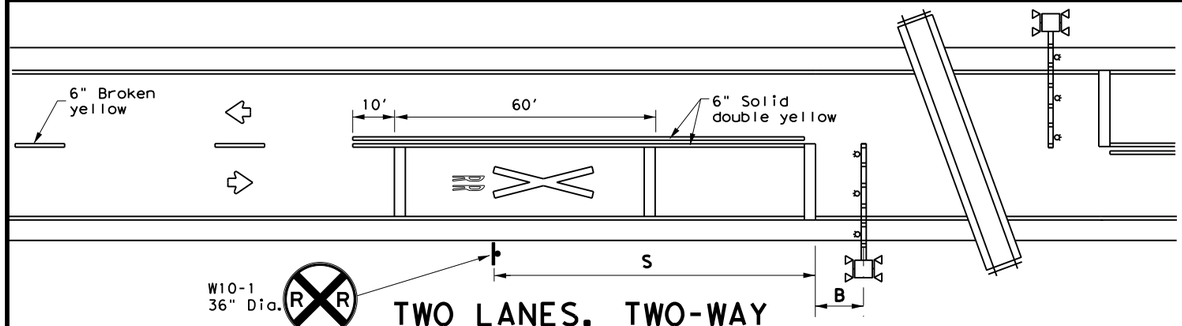
O: Width of median for RR gate assembly: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 5'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 7' minimum.
Center of RR mast to edge of pavement (no shoulder): 9'-3" minimum.
NOTE: Final location determined by the railroad company.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32' under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.



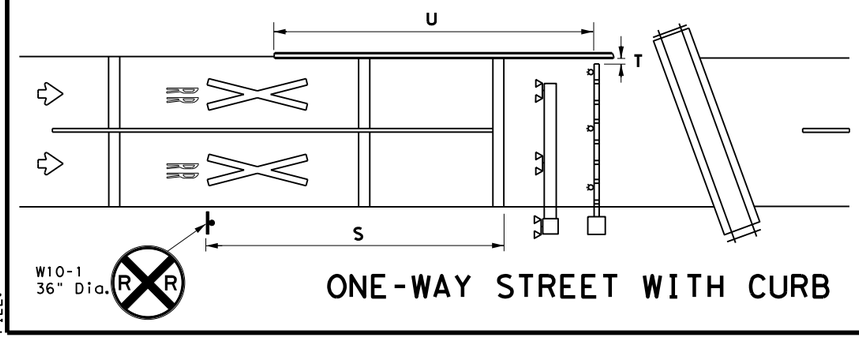

TWO LANES, TWO-WAY

| TABLE 1 | |
|---|---|
| Approach Speed (mph) | Desirable Placement (feet) |
| 20 | 100 |
| 25 | 100 |
| 30 | 100 |
| 35 | 100 |
| 40 | 125 |
| 45 | 175 |
| 50 | 250 |
| 55 | 325 |
| 60 | 400 |
| 65 | 475 |
| 70 | 550 |
| 75 | 650 |

| LEGEND | |
|---|---|
| | Sign |
| | Object Marker |
| | Traffic Flow |
| | Cantilever |
| | Gate Assembly |
| | Mast Flasher Pair |

## GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

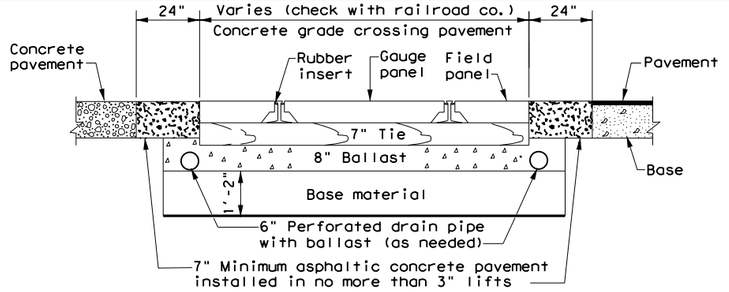



ONE-WAY STREET WITH CURB

## NOTES

T: Tip of gate to edge of curb: 1' maximum for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations.

U: Non-traversable curb length from gate: 100' minimum for a Quiet Zone SSM, 10' minimum for all other locations.




CROSSING SURFACE CROSS SECTION

Texas Department of Transportation

Traffic Safety Division Standard

# RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT

# RCD(1)-22

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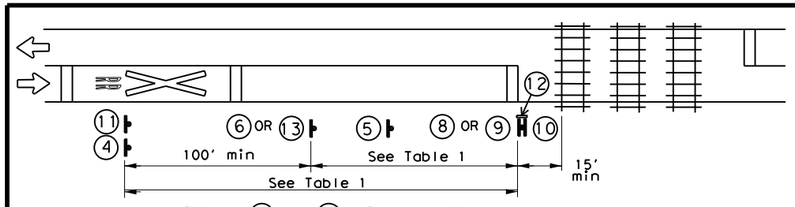
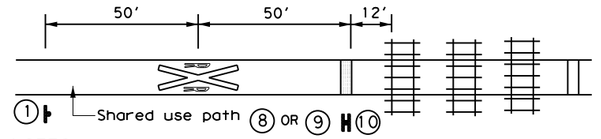



(if no 6 or 13 sign used)

## PASSIVE CROSSING

**NOTES**

1. STOP or YIELD sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.
3. See the Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings section of the TMUTCD for further details about sign mounting arrangements.




**NOTES**

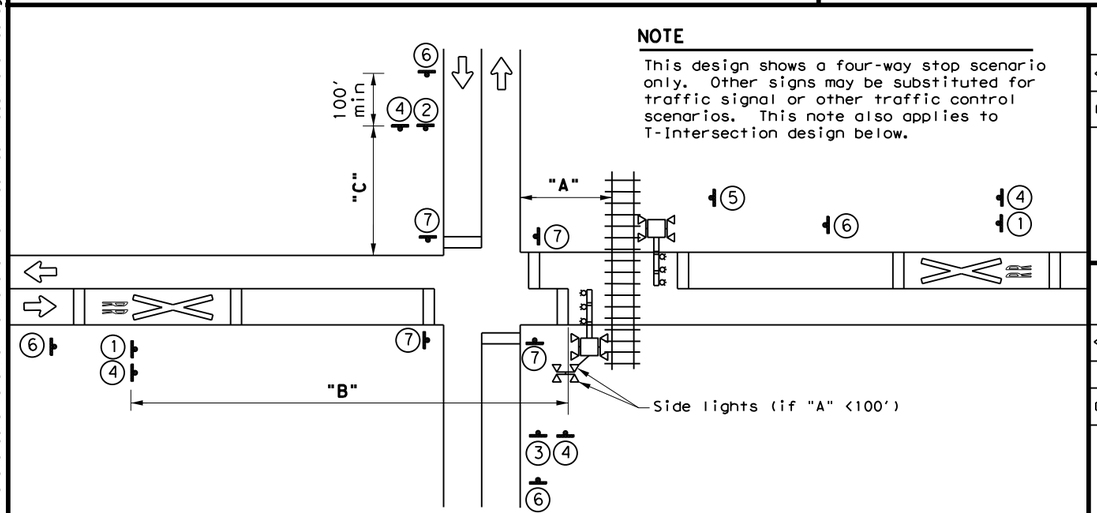
1. A shared use path is considered a separate pathway crossing when more than 25' from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller signs preferred. See the Design of Bicycle Signs section within the TMUTCD for sizing details.

## PATHWAY CROSSING

| TABLE 1 | |
|---|---|
| Approach Speed (mph) | Desirable Placement (feet) |
| 20 | 100 |
| 25 | 100 |
| 30 | 100 |
| 35 | 100 |
| 40 | 125 |
| 45 | 175 |
| 50 | 250 |
| 55 | 325 |
| 60 | 400 |
| 65 | 475 |
| 70 | 550 |
| 75 | 650 |

**GENERAL NOTES**

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS (R15-2P) plaque (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per the Placement of Warning Signs section of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

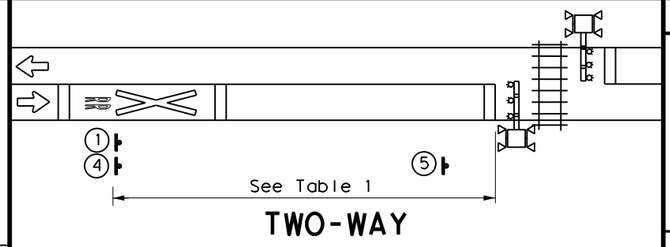



**NOTE**

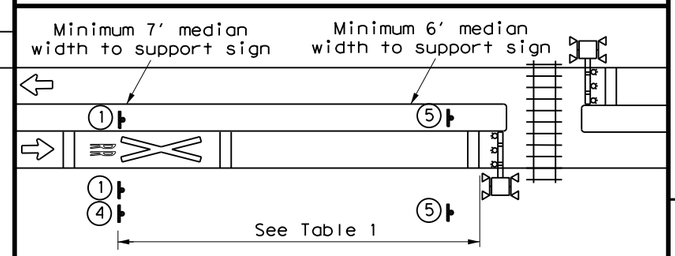
This design shows a four-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

| | "A" <100' | "A" ≥100' |
|---|---|---|
| "B" | See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection. | See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection. |
| "C" | See Table 1. | GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1. |

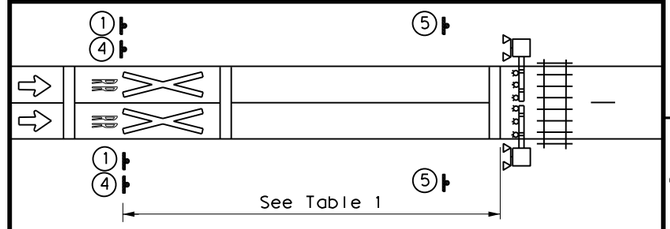
## GRADE CROSSING NEAR A PARALLEL STREET




## TWO-WAY




## TWO-WAY WITH MEDIAN



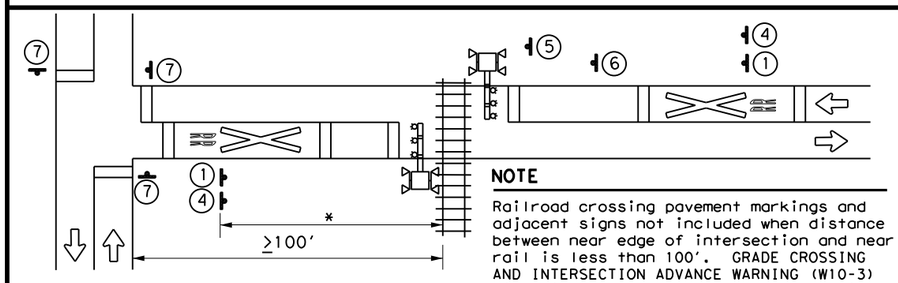

## ONE-WAY

## SIGNS

| | | | | |
|---|---|---|---|---|
| ** | ** | ** | IF NEEDED | |
| 1 W10-1 36" Dia. | 2 W10-2L 36" X 36" | 3 W10-2R 36" X 36" | 4 W10-5 36" X 36" / LOW GROUND CLEARANCE W10-5P 30" X 24" | |
| IF NEEDED | IF NEEDED | | | |
| DO NOT STOP ON TRACKS | | STOP R1-1 36" X 36" / ALL WAY R1-3P 18" X 6" | RAIL ROAD CROSSING 3 TRACKS | R15-1 48" X 9" / R15-2P 27" X 18" |
| 5 R8-8 24" X 30" | 6 W3-1 30" X 30" | 7 | STOP | R1-1 36" X 36" |
| | | | | 8 |
| RAIL ROAD CROSSING 3 TRACKS | RAIL ROAD CROSSING 3 TRACKS | R | REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H | |
| R15-1 48" X 9" / R15-2P 27" X 18" | R15-1 48" X 9" / R15-2P 27" X 18" | W10-1 36" Dia. / NO GATES OR LIGHTS W10-13P 30" X 24" | Sign may be placed perpend. to travel lanes. | |
| YIELD | 10 | 11 ** | 12 I-13 15" X 9" | |
| 9 R1-2 48" X 48" X 48" | | | | |
| IF NEEDED | | | | |
| 13 W3-2 30" X 30" | | | | |

** Includes a NO TRAIN HORN (W10-9P) plaque if crossing is in a Quiet Zone. If needed, is mounted below W10-2/W10-3/W10-4 signs.

NO TRAIN HORN W10-9P 30" X 24"

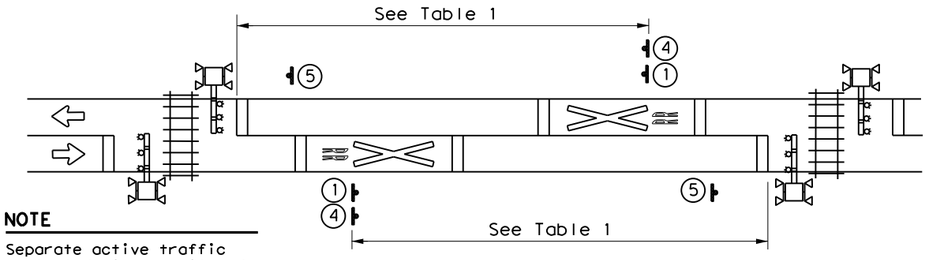



*Use Table 1 if sufficient space exists.

**NOTE**

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100'. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

## T-INTERSECTION




**NOTE**

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100' apart.

## TWO ADJACENT CROSSINGS

Texas Department of Transportation

*Traffic Safety Division Standard*

# RAILROAD CROSSING DETAILS SIGNING & STRIPING

# RCD(2)-22

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| 2-16 11-22 | DIST | COUNTY | | SHEET NO. |
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## PART 1 - GENERAL

### 1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

### 1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

### 1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

## PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

## PART 3 - CONSTRUCTION

### 3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

### 3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

### 3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

### 3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

### 3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

### 3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

### 3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

### 3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.



Texas Department of Transportation | Rail Division

# RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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### 3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

### 3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

### 3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

### 3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

### 3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

### 3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

### 3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

### 3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.



Texas Department of Transportation — Rail Division

# RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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| © TxDOT October 2018 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS March 2020 | 0914 | 00 | 487 | VARIOUS |
| | DIST | COUNTY | | SHEET NO. |
| | AUS | TRAVIS | | 49A |

DATE:
FILE:

## I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☑ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 416281N
Crossing Type: AT GRADE
RR Company Operating Track at Crossing: UPRR, BNSF
RR Company Owning Track at Crossing: UPRR
RR MP: 931.670
RR Subdivision: WACO
City: ELGIN
County: BASTROP
CSJ at this Crossing: 0914-00-487
Latitude: 30.3909295
Longitude: -97.3706425

Scope of Work, including any TCP, to be performed by State Contractor:

THERE WILL BE NO WORK WITHIN THE RAILROAD ROW, RE-STRIPING OF SH 95 WHICH RUNS PARALLEL WITH RAILROAD ROW BEGINNING AT SH95 MP 3.131 AND ENDING AT SH 95 MP 51.608.

Scope of Work to be performed by Railroad Company:

NONE

## II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) TxDOT will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

## III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

## IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

**Escalated Limits**

| Type of Insurance | Amount of Coverage (Minimum) |
|---|---|
| Workers Compensation | $500,000 / $500,000 / $500,000 |
| Commercial General Liability | $2,000,000 / $4,000,000 |
| Business Automobile | $2,000,000 |

**Railroad Protective Liability Limits**

☑ Not Required
☐ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures — $2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures — $5,000,000 / $10,000,000
☐ Other: _____

## V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☑ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
  ☐ BNSF: _____
  https://bnsf.railpermitting.com
  ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
  ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

## VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

## VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

## VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

## IX. EMERGENCY NOTIFICATION

**In Case of Railroad Emergency**

Call: UNION PACIFIC RR
Railroad Emergency Line at: 888.877.7267
Location: DOT 416281N
RR Milepost: 931.67
Subdivision: WACO

**RRD Review Only**
Initials: _____
Date: 07/11/2024

Texas Department of Transportation — Rail Division

# RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FILE: rr-scope-of-work.pdf | | DN: TxDOT | CK: | DW: | | CK: | |
| © TxDOT June 2014 | | CONT | SECT | JOB | | HIGHWAY | |
| REVISIONS | | 0914 | 00 | 487 | | VA | |
| 4/2024 | | DIST | COUNTY | | | SHEET NO. | |
| | | AUS | TRAVIS | | | 50 | |

## I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 763422A
Crossing Type: HIGHWAY OVERPASS
RR Company Operating Track at Crossing: UPRR
RR Company Owning Track at Crossing: UPRR
RR MP: 58.480
RR Subdivision: GIDDINGS
City: GIDDINGS
County: LEE
CSJ at this Crossing: 0914-00-487
Latitude: 30.1919716
Longitude: -96.9352533

Scope of Work, including any TCP, to be performed by State Contractor:

REFRESH PAVEMENT MARKINGS AND TCP

Scope of Work to be performed by Railroad Company:

NONE

## II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

☐ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) TxDOT will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

## III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

## IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

**Escalated Limits**

| Type of Insurance | Amount of Coverage (Minimum) |
|---|---|
| Workers Compensation | $500,000 / $500,000 / $500,000 |
| Commercial General Liability | $2,000,000 / $4,000,000 |
| Business Automobile | $2,000,000 |

**Railroad Protective Liability Limits**

| | |
|---|---|
| ☐ Not Required | |
| ☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures | $2,000,000 / $6,000,000 |
| ☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures | $5,000,000 / $10,000,000 |
| ☐ Other: _____ | |

## V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
https://bnsf.railpermitting.com
- ☐ CPKCR
https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

## VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

## VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

## VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

## IX. EMERGENCY NOTIFICATION

**In Case of Railroad Emergency**
Call: UNION PACIFIC RR
Railroad Emergency Line at: 888.877.7267
Location: DOT 763422A
RR Milepost: 58.48
Subdivision: GIDDINGS

**RRD Review Only**
Initials: _____
Date: 07/11/2024

Texas Department of Transportation — Rail Division

# RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FILE: rr-scope-of-work.pdf | | DN: TxDOT | CK: | DW: | | CK: | |
| © TxDOT June 2014 | | CONT | SECT | JOB | | HIGHWAY | |
| REVISIONS | | 0914 | 00 | 487 | | VA | |
| 4/2024 | | DIST | COUNTY | | | SHEET NO. | |
| | | AUS | TRAVIS | | | 51 | |

## I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☑ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 765335D
Crossing Type: AT GRADE
RR Company Operating Track at Crossing: UPRR, BNSF
RR Company Owning Track at Crossing: UPRR
RR MP: 45.080
RR Subdivision: GIDDINGS
City: GIDDINGS
County: LEE
CSJ at this Crossing: 0914-00-487
Latitude: 30.3562430
Longitude: -97.8227349

Scope of Work, including any TCP, to be performed by State Contractor:

RE-STRIPING CENTER LINE OF SH 141, TCP & FLAGGING.

Scope of Work to be performed by Railroad Company:

NONE

## II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 1

On this project, night or weekend flagging is:

☐ Expected
☑ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) TxDOT will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☐ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

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☑ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

## III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

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**Escalated Limits**

| Type of Insurance | Amount of Coverage (Minimum) |
|---|---|
| Workers Compensation | $500,000 / $500,000 / $500,000 |
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| Business Automobile | $2,000,000 |

**Railroad Protective Liability Limits**

| | |
|---|---|
| ☐ Not Required | |
| ☑ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures | $2,000,000 / $6,000,000 |
| ☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures | $5,000,000 / $10,000,000 |
| ☐ Other: _____ | |

## V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☐ Not Required
☑ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
  https://bnsf.railpermitting.com
- ☐ CPKCR
  https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

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**In Case of Railroad Emergency**
Call: UNION PACIFIC RR
Railroad Emergency Line at: 888.877.7267
Location: DOT 765335D
RR Milepost: 45.080
Subdivision: GIDDINGS

**RRD Review Only**
Initials: _____
Date: 07/15/2024

Texas Department of Transportation — Rail Division

# RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FILE: rr-scope-of-work.pdf | | DN: TxDOT | CK: | DW: | | CK: | |
| © TxDOT June 2014 | | CONT | SECT | JOB | | HIGHWAY | |
| REVISIONS | | 0914 | 00 | 487 | | VA | |
| 4/2024 | | DIST | COUNTY | | | SHEET NO. | |
| | | AUS | TRAVIS | | | 52 | |