

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FED. RD. DIV. NO.	PROJECT NO.	HEET NO.
6		1
STATE	STATE DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT. SECT. JOB HIGHWAY NO.

2882 02 FM 2623

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT
PROJECT NO.
CSJ:

GUADALUPE
F.M. 2623

LIMITS FROM: EAST OF SH-123
TO: WEST OF FM 20

NET LENGTH OF ROADWAY = 578.28 FT = 0.110 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI
NET LENGTH OF PROJECT = 578.28 FT = 0.110 MI

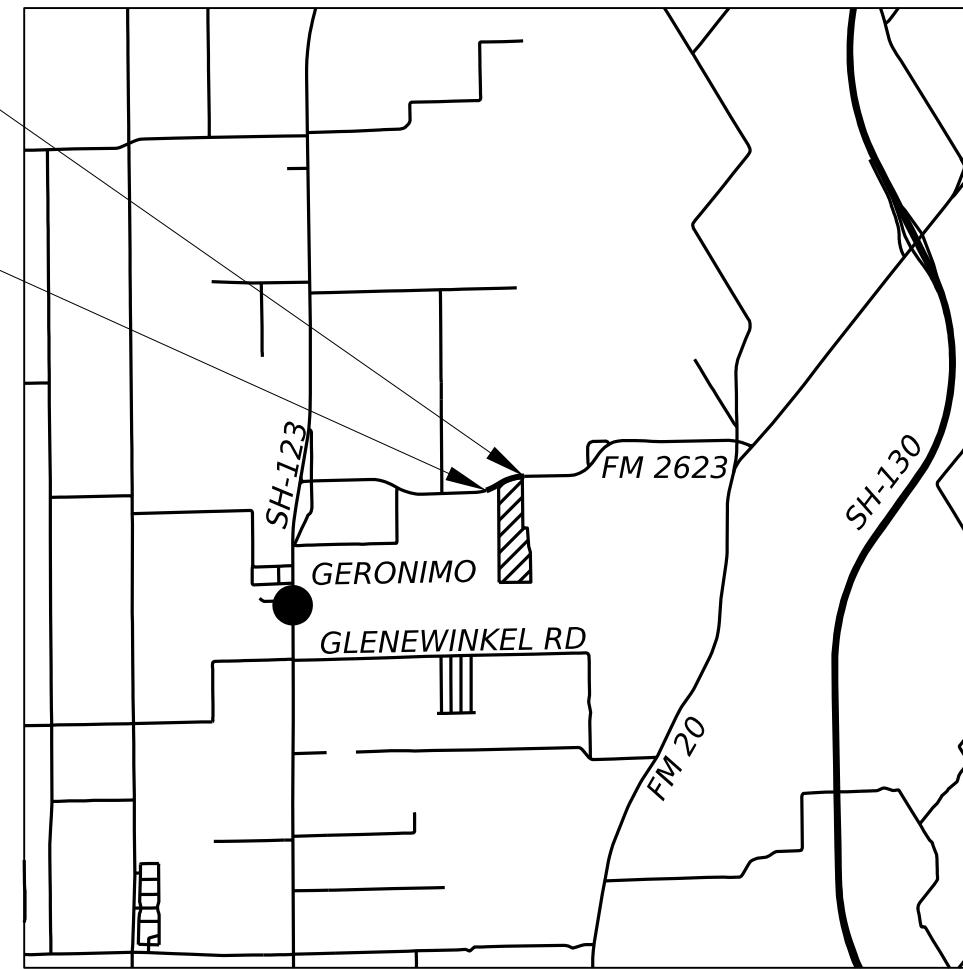
DESIGN SPEED = 45
AREA OF DISTURBED SOIL = 0.686 ACRES
ADT:

ACCESSIBILITY STANDARDS = PROWAG



Pablo M. Terres 12/11/25

FOR WORK CONSISTING OF WIDEN EXISITNG ROAD, CONSTRUCT NEW RIGHT TURN LANE



TIME: \$DATE\$ T:\Engdata\Standards\Design\TITLE SHEET - 2014 Specs.dgn

PROJ. NO. _____ LETTING DATE _____

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, SEPTEMBER 1, 2024 AND THE SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000-005)

LJA Engineering, Inc. **LJA**
FRN - F-1386

© 2025 by Texas Department of Transportation; all rights reserved.

FINAL PLANS

LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: \$ _____
CONTRACTOR: _____

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS.

AREA ENGINEER P.E. DATE

TEXAS DEPARTMENT OF TRANSPORTATION

CONCURRENCE _____
CITY OF SAN ANTONIO

SUBMITTED FOR LETTING _____
TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED FOR LETTING _____
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

REVIEWED FOR LETTING _____
DISTRICT DESIGN DIRECTOR

APPROVED FOR LETTING _____
DISTRICT ENGINEER

DW CK DW CK

GENERAL

1 TITLE SHEET
 2 INDEX OF SHEETS
 3 - 6 GENERAL NOTES
 7 PROJECT LAYOUT
 8 TYPICAL SECTIONS
 9 SUMMARY OF QUANTITIES
 10 SUMMARY OF SMALL SIGNS

TRAFFIC CONTROL PLAN

11 TRAFFIC CONTROL PLAN TYPICAL SECTION
 12 TRAFFIC CONTROL PLAN PHASE 1

TRAFFIC CONTROL STANDARDS

13 - 24 BC(1) - 21 THRU BC(12) - 21
 25 TCP(2-1) - 18
 26 TCP (7-1) - 13
 27 - 30 TLRS(1) - 17 THRU TLRS(4) - 17
 31 WZ(STPM) - 23
 32 WZ(BRK) - 13

ROADWAY DETAILS

33 HORIZONTAL ALIGNMENT
 34 ROADWAY PLAN & PROFILE
 35 - 36 DRIVEWAY PLAN & PROFILE

ROADWAY STANDARDS

37 WIDENING DETAIL
 38 - 39 DRIVEWAY DETAILS

DRAINAGE PLAN

40 DRAINAGE PLAN

TRAFFIC ITEMS

41 SIGNING & PAVEMENT MARKINGS

TRAFFIC STANDARDS

42 - 44 PM(1) - 22 THRU PM(3) - 22
 45 - 47 TSR(3) - 13 THRU TSR(5) - 13
 48 SMD(GEN) - 08
 49 - 51 SMD(SLIP-1) - 08 THRU SMD(SLIP-3) - 08

EROSION CONTROL DETAILS

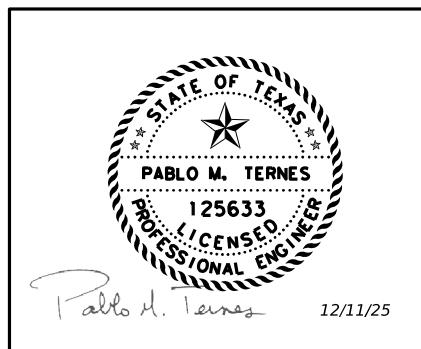
52 EROSION CONTROL PLAN
 53 - 54 SW3P NARRATIVE
 55 EPIC

EROSION CONTROL STANDARDS

56 EC(1) - 16

CROSS SECTIONS

57 - 64 CROSS SECTIONS

DATE:
FILE:

LJA Engineering, Inc. 
 FRN - F-1386


 Texas Department of Transportation

FM 2623

INDEX OF SHEETS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		2

1. The design and construction shall provide for preservation of all existing features in or near the state Right-of-Way being affected by the widening. This includes, but is not limited to, existing driveway gate set-backs, relocation of electronic private property gates, mailbox turnouts, mailboxes and supports, cattle guards, roadway signing, existing rip-rap or other permanent erosion control features, diversionary berms, swales, ditches, amount and configuration of driveway flares and driveway centerline profile, guardrail and end treatments, etc. Existing driveway culverts and safety end treatments if affected by roadway widening shall be reconstructed to preserve existing front slopes. The coordination of items that affect existing private property access, mail delivery, etc. is the responsibility of the developer. The written concurrence of any affected property owners for construction affecting their driveways or mailbox turnouts shall be obtained by the developer and provided to TxDOT prior to TxDOT driveway permits being issued.
2. For work in State Right-of-Way, the developer shall be responsible for coordination of, obtaining permits for, and complying with any and all state and federal regulatory agencies and all applicable laws, rules, and regulations pertaining to the regulation of drainage, preservation of cultural resources, natural resources, and the environment. The developer shall be responsible for determining if the project is in an environmentally sensitive area such as within the recharge or contributing zone of protected aquifers, and shall act in accordance with all resource agency regulations.
 - a. If TxDOT has a CZP or WPAP on file with TCEQ, the developer shall be responsible for amending TxDOT's permit, obtaining TCEQ approval, and providing TxDOT with the approved amended permit. The amended permit shall address the relocation of TxDOT's permanent BMP's, including vegetative filter strips that may be impacted by work done within TxDOT ROW.
 - b. If TxDOT does not have a CZP or WPAP on file with TCEQ, any permanent BMP's, including vegetative filter strips, that may be required in order to treat additional impervious cover placed in TxDOT ROW shall be located in private property and the developer will provide TxDOT with evidence of TCEQ approval of the additional impervious cover.
 - c. The developer shall not operate under resource agency environmental clearance of a previous or ongoing TxDOT project, but shall obtain separate resource/environmental agency clearance.
3. If waste areas or material source areas result from this project, the contractor shall follow all specifications in the plans unless superseded by the requirements of the Texas Aggregate Quarry and Pit Safety Act. In addition, it is requested that these areas not be visible from any highway on the State system.
 - a. Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs.
4. Any trees existing within State Right of Way are the natural resources of the State and will be protected. In the event that trees must be removed, TxDOT written permission will be received in advance and will identify the specific trees by species, diameter and location to be removed. The developer will be fined for any unpermitted removal of trees.
 - a. In the event that there are areas of public ROW dedication or reservation resulting from the platting process, the area within the public ROW dedication does not pass into TxDOT ownership as a result of platting. However, the developer will remove any old fencing, gates, and unsightly vegetation within the area of the ROW dedication, leaving it in an aesthetically pleasing condition. The area of ROW dedication shall not be mowed or otherwise maintained by TxDOT. Prior to removal of trees in the area of ROW dedication, the trees shall first be evaluated in accordance with the requirements of local tree protection ordinances and the written concurrence of the local jurisdiction shall be provided to TxDOT.
5. The developer shall maintain at the project site, and make available upon request, copies of all approved joint environmental plans and permits relating to work in State Right of Way.
6. Prior to beginning grading activity, the contractor will set and maintain roadway stationing, control points, marks, stakes to establish lines, slopes, grades and centerlines.
7. Any slopes in State Right of Way which become steeper than 3:1 as a result of the work will be treated with 4" thick reinforced concrete rip-rap and be protected by installation of guardrail and end treatments. This may require additional rip-rap, guardrail, or end treatments beyond that shown in the plans.
 - a. Unless otherwise shown on the plans, where existing concrete rip-rap is removed, modified or extended, the portion to be removed shall be neatly saw-cut prior to removal and the new rip-rap shall be formed to match the existing lines and grades of the existing rip-rap and shall be doweled into the existing rip-rap with #3 bars placed at 12" on centers. The dowel bars shall be epoxied in place with epoxy meeting TxDOT requirements, to a minimum embedment length of 9". This shall apply to any type of concrete rip-rap including mow strip for cable barrier and guardrail systems.
8. The contractor shall contact the appropriate TxDOT maintenance office a minimum of 48 hours prior to commencing work in State Right of Way to schedule a preconstruction meeting.
 - a. Duane Hofferichter (830) 609-0707 in Comal County (New Braunfels)
 - b. Travis Young (830) 303-0130 in Guadalupe County (Seguin)
 - c. Jason Pfeil, (830) 393-3144 in Wilson County (Floresville)
9. State Right of Way shall not be used as an area for contractor parking or for staging the receipt of materials or equipment.
10. Traffic control and construction barricades shall meet the requirements of the Texas MUTCD.



LJA Engineering, Inc. 
FRN - F-1386


Texas Department of Transportation

FM 2623

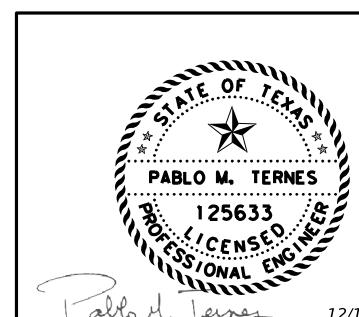
GENERAL NOTES

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		3

CK
DW
CK
DW

11. The contractor shall provide advance notification to the Engineer of impending/upcoming lane closures for all temporary and/or permanent lane, ramp, connector, frontage, shoulder, median crossover, etc. closures or detours.
12. Access to adjoining property shall be maintained at all times.
13. Unless otherwise noted in the plans and/or as directed by the Area Engineer or Maintenance Supervisor, daily lane closures shall be limited according to the following restrictions:
 - a. Nighttime: Maintenance Supervisor and/or Area Engineer approval required (with uniformed off duty law enforcement officers).
 - b. Weekend closures: Maintenance Supervisor and/or Area Engineer approval required.
 - c. Weekdays: lane closures shall not be placed between 7:00 a.m. and 9:00 a.m., and 4:00 p.m. and 6:00 p.m.
14. No lane closures or roadway closures will be permitted for the following key dates and/or special events:
 - a. Between December 15 and January 1.
 - b. Wednesday before thanksgiving thru the Sunday after Thanksgiving
 - c. Saturday and Sunday before Memorial Day and Labor Day
 - d. Saturday or Sunday when July 4 falls on a Friday or Monday.
15. At no time will the roadway travel way be blocked.
16. Lane closures will only be permitted with 48-hour prior approval of the TxDOT Maintenance Supervisor. Lane closures will be permitted only between 9:00 a.m. and 4:00 p.m. Monday through Friday.
 - a. For lane closures on two-lane two-way roadways, including during pilot car operations, flaggers shall be placed at the beginning and end of the work zone as well as at each individual driveway and side road intersection within the limits of the work zone to control, warn, and direct side road and driveway traffic of the change in traffic operations. Whenever one way traffic control is accomplished by traffic signals work zone flaggers will be similarly stationed at each individual driveway and side road intersection within the limits of the work. All flaggers shall be in constant radio contact.
17. A minimum 3:1(H:V) temporary safety slope of stable compacted material shall be required adjacent to the State highway edge of pavement at all times during non-working hours.
18. Only one side of the roadway shall be under construction at a time. Work shall be completed, and pavement edges backfilled on one side of the road before work may begin on the opposite side of the roadway.
19. All milling, paving, and seal coat operations shall proceed in the direction of traffic.
20. Any pavement edge drop-offs between 1 and 2 inches in height shall have CW 8-11 warning signs. Any pavement edge drop-off 2 inches or greater shall have a 3:1 compacted safety slope and CW 8-9a or CW 8-11 signs plus channelizing devices. Pavement edges shall be shouldered up with compacted embankment material and 4 inches of topsoil as soon as possible after paving is completed on the side of the road being widened.
21. Proof-rolling of subgrade is required and shall be witnessed by TxDOT prior to placement of pavement structure unless otherwise approved by the TxDOT Maintenance Supervisor. The requirement for proof-rolling of subgrade is not superseded by any other requirements including those of any geotechnical report.
22. All flexible base shall have a minimum plasticity index of 4.
23. All courses of asphalt concrete pavement (regardless of type) shall be placed with asphalt paving equipment meeting the requirements of The 2024 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges, Item 320, "Equipment for Asphalt Concrete Pavement", unless otherwise approved by the Maintenance Supervisor.
 - a. Tack coat shall be applied in accordance with The 2024 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.
24. All surface aggregates shall meet the requirements of TxDOT friction classification "B" and shall meet PG binder grade 70-22.
25. All surface asphalt concrete pavement shall be under-sealed with a one course surface treatment, unless otherwise directed.
26. All asphaltic concrete pavement used in base courses shall be type "A" OR "B" and will meet PG binder grade 64-22.
27. All pavement widening including shoulders shall match the existing pavement cross slope.
28. All pavement markings shall be Type I thermoplastic (100mil) with under-seal meeting the The 2024 Standard Specifications Item 666, Retro Reflectorized Pavement Markings. The contractor shall place guide marks in accordance with Item 666 and shall make arrangements for TxDOT inspection of the pavement marking layout prior to placement of striping. Equipment used for the placement of striping shall meet the production requirements of item 666 unless otherwise approved in advance by the TxDOT Maintenance Supervisor.
29. All materials and construction methods used in State Right of Way shall meet TxDOT specifications. This supersedes all other specifications in the plans.
30. All Portland cement concrete pavement in State ROW shall meet the requirements of The 2024 Standard Specification Item 360, Concrete Pavement, and shall be batched at concrete plants



LJA Engineering, Inc. 
FRN - F-1386


Texas Department of Transportation

FM 2623

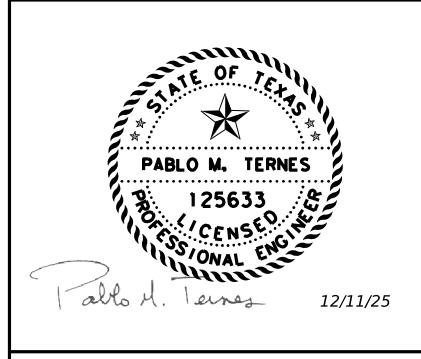
GENERAL NOTES

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		4

having a current approved mix design. Class P concrete shall have 7- and 28-day compressive strength of 3,200 psi and 4,400 psi respectively.

31. When widening existing concrete pavements, joints in the new pavement shall match joints in existing pavement and curb.
32. The contractor shall be responsible for ensuring that TxDOT approved materials, mix designs, approved sources and products are used for all work in State ROW. The contractor shall arrange for the services of a qualified testing laboratory for all items requiring testing and shall notify TxDOT of any discrepancies between test results and TxDOT specs in a timely manner. The contractor shall provide to TxDOT invoices and testing results as soon they are available. Failure to do this shall result in rejection of the work.
33. Sawing of contraction/construction joints in concrete pavement shall be accomplished as soon as personnel can walk on the concrete without damaging the surface regardless of time of day or weather conditions. Stand-by power driven concrete saws shall be provided during the sawing operation. Curing compound shall be re-applied to the sawed joint immediately upon sawing the joint.
34. Guardrail SET's shall be Type 3 unless otherwise approved by the TxDOT Maintenance Supervisor. Guardrail mowstrip placed adjacent to other concrete rip-rap will be separated by a formed construction joint.
35. Any concrete curb to be removed shall be saw-cut at the limits of removal and be removed entirely. Slicing the top portion of the curb off and leaving remaining portion of curb in place is unacceptable.
36. Any damage to TxDOT facilities shall be repaired at no expense to TxDOT, and to TxDOT's satisfaction.
37. Sidewalks placed in the highway right-of-way shall be a minimum width of 5' or comply with the more stringent width as required by city ordinance and shall meet all other requirements of the Americans with Disabilities Act. Pedestrian ramps shall be provided at street and driveway intersections as shown on the current State standard for pedestrian facilities. Color contrast and texturing of pedestrian ramps shall be placed at street intersection ramps only as shown on the current State standard for pedestrian facilities. Pedestrian ramps at driveway intersections will not receive any color contrast or texturing. Metal plating for sidewalk bridges shall match the typical width of the approach sidewalk. This may result in a width that is greater than shown in the standard details included in the plans.
38. The contractor shall use best management practices (BMP's) to minimize erosion and sedimentation in the State Right of Way resulting from the proposed construction. Re-vegetation of disturbed areas shall be completed in accordance with TxDOT Standard Specifications. Permanent vegetative cover must achieve 70% coverage prior to project acceptance. Soil retention blankets may be required to prevent erosion of topsoil prior to vegetation re-establishment.
39. Prior to seeding or re-vegetation the front slopes shall be shouldered up with topsoil to eliminate any pavement edge drop-off.
40. Mud tracked onto the roadway from the site shall be immediately removed to the satisfaction of TxDOT.
41. The Developer/Owner shall clean out, to the State's satisfaction, any drainage structure or storm sewer system that becomes silted as a result of their operations.
42. The adjustment of any utilities in State Right of Way or adjacent private easement shall be the responsibility of the developer/owner.
43. The contractor shall place and maintain existing signs on TxDOT approved temporary mounts until permanent signs are placed.
44. The final placement of permanent signs shall be coordinated prior to placement with the local TxDOT Maintenance Supervisor.
45. For work within the State Right of Way materials or debris within the construction limits and not incorporated in the finished roadway section of Right of Way shall be disposed of in a manner acceptable to the Maintenance Supervisor at no expense to the State. Materials that are not determined to be salvageable by the Maintenance Supervisor become the property of the contractor for proper disposal at their expense. Materials determined to be salvageable shall be returned to the State and delivered to the location as determined by the Maintenance Supervisor.
46. Regardless of errors and omissions in information provided in the plans or cross-sections, the permittee is responsible for providing for positive drainage outfalls within and off the limits of the project.
47. Keep the signals in operation at all times except when necessary for specific installation operations, including any modifications to existing signal heads to maintain clear visibility at all times. When it is necessary for a signal to be turned off, provide off duty police officers to control traffic until the signals are back in satisfactory condition.



LJA Engineering, Inc. 
FRN - F-1386


Texas Department of Transportation

FM 2623

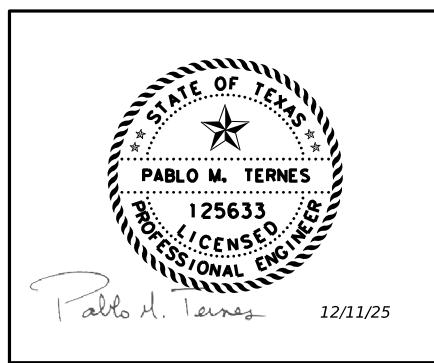
GENERAL NOTES

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		5

48. **For work in City of New Braunfels**, all traffic signals on the State highway system within the New Braunfels City Limits, with the exception of signals on IH 35, are the responsibility of the City of New Braunfels and the City of New Braunfels will perform construction inspection. Contact Garry Ford, P.E. at (830) 221-4645, 48 hours prior to the need for any inspections. Also when non- traffic signal work is being performed within 400 feet of an existing signalized intersection, flashing beacon or school zone flasher or other type of signal, if within the city of New Braunfels area of responsibility, contact Garry Ford, P.E. to determine/verify the location of loop detectors, conduit, ground-boxes, etc. For all other locations, contact TxDOT representative Jorge Ramos, at (210) 731-5136. The contractor is shall repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the engineer reserves the right to perform the repair or replacement work and the contractor shall be billed for this work. When working near aerial electrical lines or utility poles, comply with all federal, State and local regulations.

49. **For areas other than City of New Braunfels** when non- traffic signal work is being performed within 400 feet of an existing signalized intersection, flashing beacon or school zone flasher or other type of signal, contact TxDOT representative Jorge Ramos (210) 731-5136. The contractor shall repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the contractor shall be billed for this work. When working near aerial electrical lines or utility poles, comply with all federal, State and local regulations.

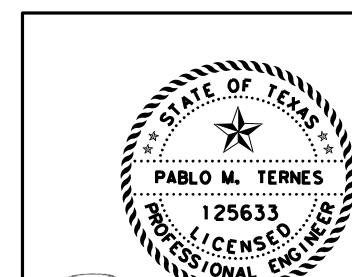
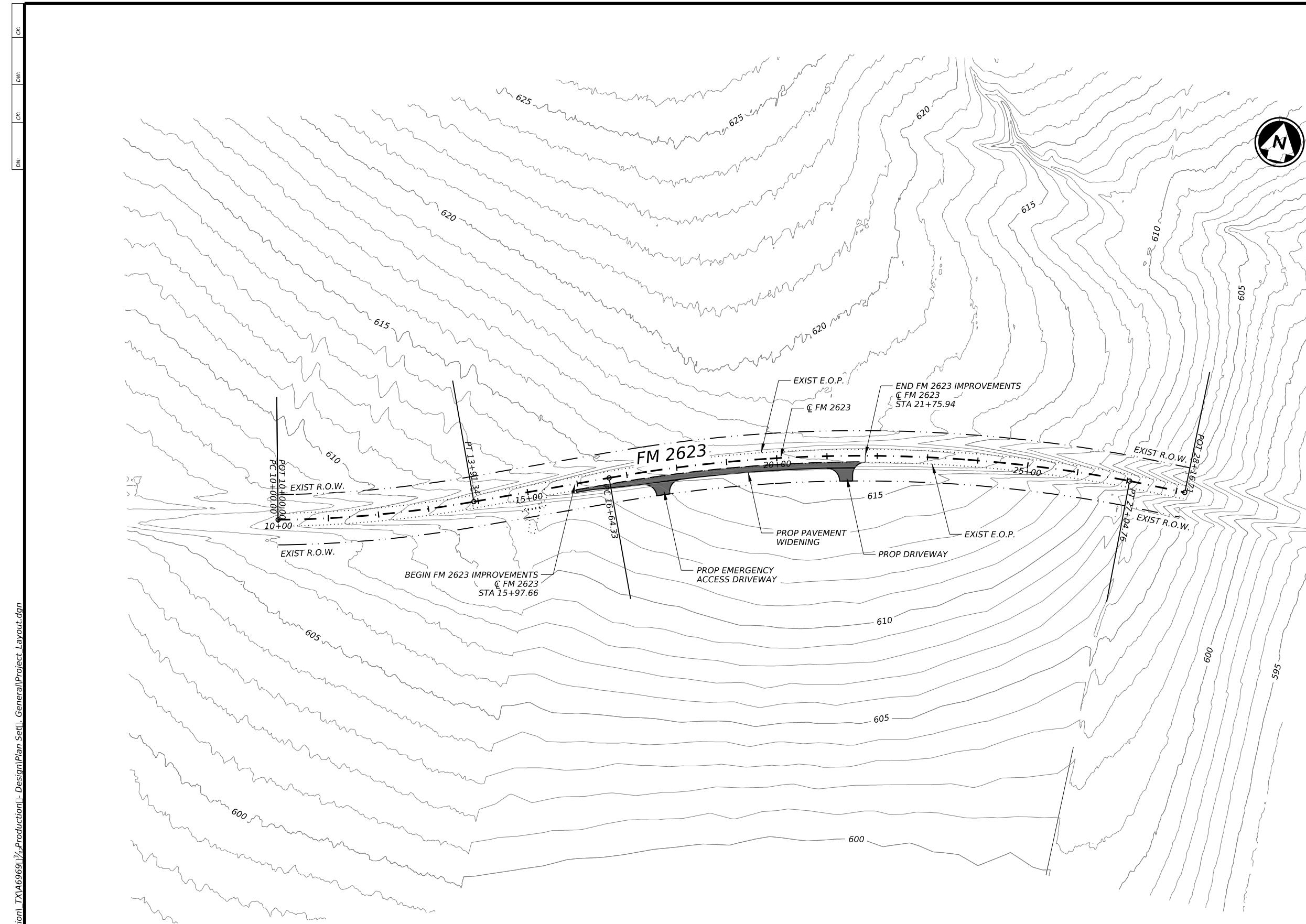


FM 2623

GENERAL NOTES

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		6



0' 50' 100' 200'
SCALE: 1"=200'

LJA Engineering, Inc. **LJA**
FRN - F-1386

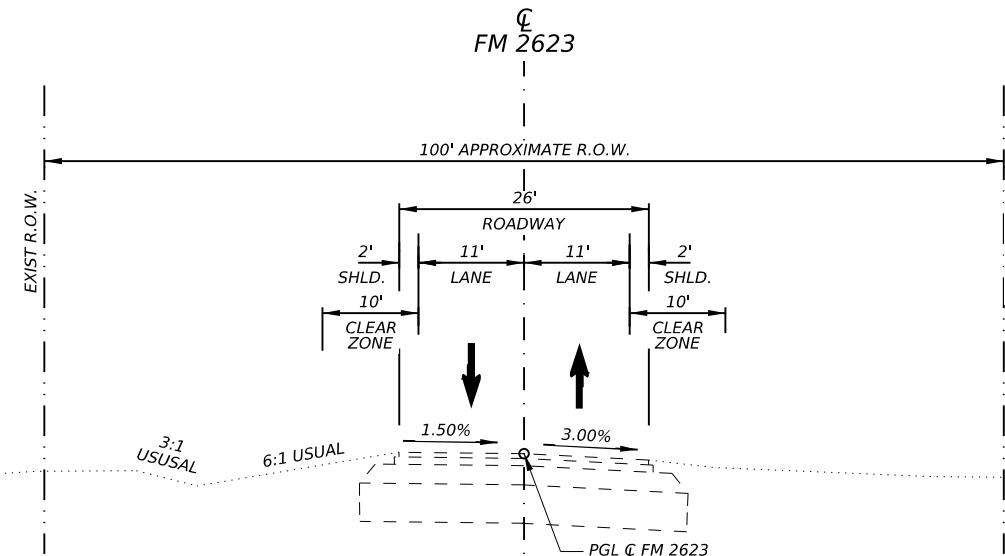
Texas Department of Transportation

FM 2623

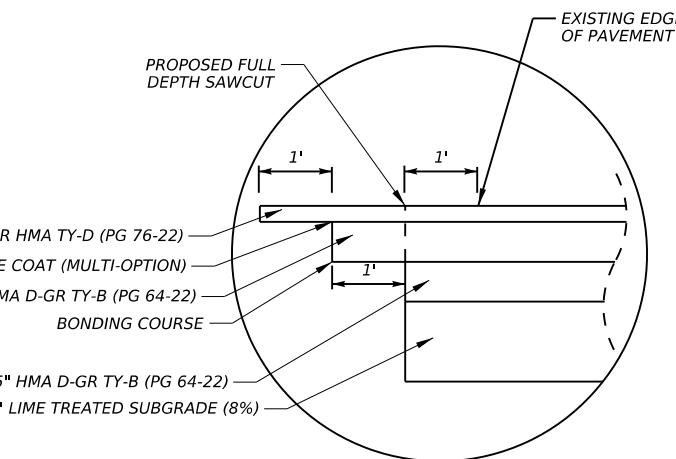
PROJECT LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		7

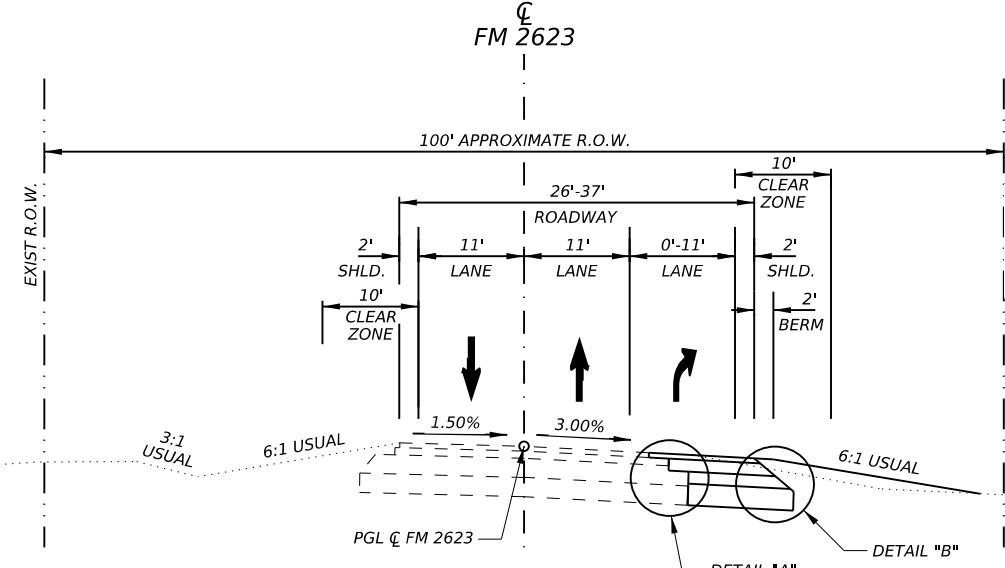


EXISTING FM2623 TYPICAL SECTION



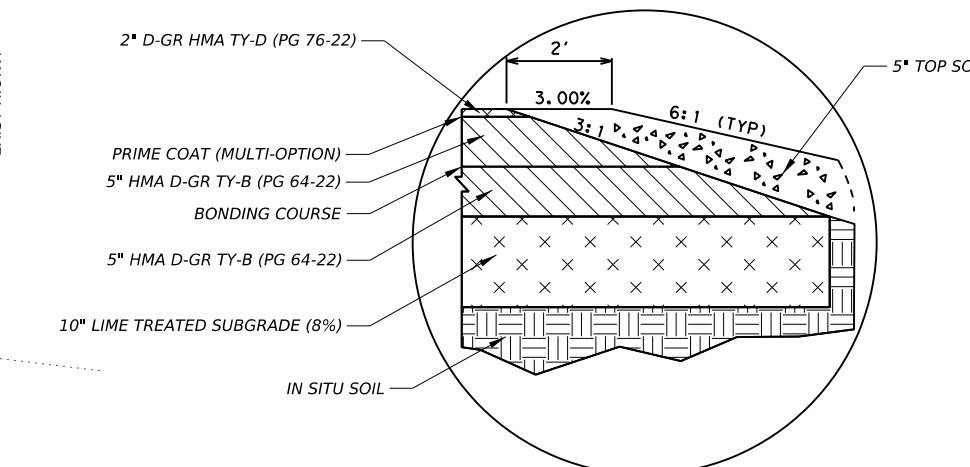
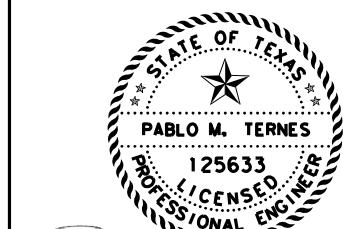
NOTES:

1. TYPICAL SECTIONS NOT DRAWN TO SCALE.
2. STATION LIMITS SHOWN ARE APPROXIMATE AND FOR NORMAL ROADWAY CONDITIONS.

DETAIL "A"
N.T.S.

PROPOSED FM2623 TYPICAL SECTION

FM 2623 - 15+97.66 TO 21+75.94

DETAIL "B"
N.T.S.LJA Engineering, Inc. **LJA**
FRN - F-1386

Texas Department of Transportation

FM 2623

TYPICAL SECTIONS
EXISTING & PROPOSED

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	5

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS		
LOCATION	502 7001	505 7002
BARRICADES, SIGNS AND TRAFFIC HANDLING		TMA (MOBILE OPERATION)
MO	HR	
PHASE 1	2	16
PROJECT TOTALS	2	16

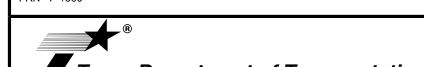
SUMMARY OF ROADWAY ITEMS											
LOCATION	100 7002	110 7001	132 7003	260 7005	260 7008	310 6001	341 7003	341 7056	3084 6001	250 7001	530 7006
PREPARING ROW	EXCAV (ROADWAY)	EMBANK (FNL)(OC)(TY B)	LIME (COM OR QK)(SLURRY)	LIME TRT (EXIST MATL)(10")	PRIME COAT (MULTI OPTION)	D-GR HMA TY-B PG64-22 (EXEMPT)	D-GR HMA TY-D PG76-22	BONDING COURSE	GEOGRID BASE REINFORCEME NT (TYPE 1)	DRIVEWAYS (CONC)	
STA	CY	CY	TON	SY	GAL	TON	TON	GAL	SY	SY	
BEGIN TO END	6	8	222	23	770	138	396	76	142	860	199
PROJECT TOTALS	6	8	222	23	770	138	396	76	142	860	199

SUMMARY OF SIGNING ITEMS		
LOCATION	636 7001	644 6001
ALUMINUM SIGNS (TY A)		IN SM RD SN SUP&AM TY10BWG(1)SA(P)
SF	EA	
BEGIN TO END	26	4
PROJECT TOTALS	26	4

SUMMARY OF PAVEMENT MARKING ITEMS									
LOCATION	666 7017	666 7023	666 7029	666 7041	666 7065	666 7404	666 7422	672 7002	
REFL PAV MRK TY I (W)8"(DOT)(090 MIL)	REFL PAV MRK TY I (W)8"(SLD)(090 MIL)	REFL PAV MRK TY I (W)12"(SLD)(09 0MIL)	REFL PAV MRK TY I (W)(ARROW)(09 0MIL)	REFL PAV MRK TY I (W)(WORD)(090 MIL)	REFL PAV MRK TY I (W) 4"(SLD) (090MIL)	REFL PAV MRK TY I (Y) 6"(SLD) (090MIL)	REFL PAV MRKR TY I-C	ELIM EXT PM & MRKS (4")	
LF	LF	LF	EA	EA	LF	LF	EA	LF	
BEGIN TO END	33	370	12	2	2	502	44	19	736
PROJECT TOTALS	33	370	12	2	2	502	44	19	736

SUMMARY OF EROSION CONTROL ITEMS								
LOCATION	160 7003	164 7010	164 7015	166 7002	168 7001	169 7001	506 7039	506 7041
FURN & PLACE TOPSOIL (5")	DRILL SEED (PERM_RURAL_C _LAY)	DRILL SEED (TEMP_WARM_C _OOL)	FERTILIZER	VEGETATIVE WATERING	SOIL RET BLKT(SL_MOD_C _LAY_SHORT)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	
SY	SY	SY	TON	TGL	SY	LF	LF	
BEGIN TO END	1632	1632	1632	0.11	50	1535	612	612
PROJECT TOTALS	1632	1632	1632	0.11	50	1535	612	612

LJA Engineering, Inc. 
FRN - F-1386


Texas Department of Transportation

FM 2623

SUMMARY OF QUANTITIES

SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	9

SUMMARY OF SMALL SIGNS

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).



 Texas Department of Transportation

**Traffic
Operations
Division
Standard**

SUMMARY OF SMALL SIGNS

SOSS

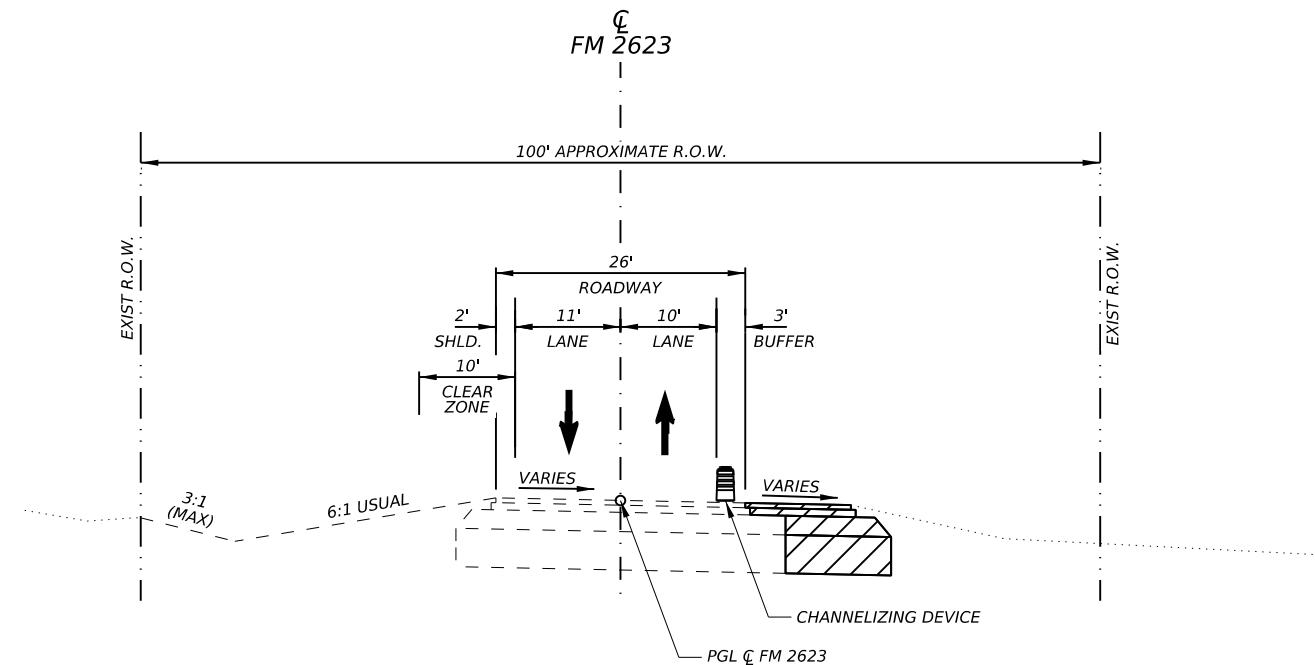
ILE:	sums16.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
①	TxDOT	May 1987		CONT	SECT	JOB		HIGHWAY	
		REVISIONS		-	-	-		FM 2623	
4-16	8-16			DIST	COUNTY			SHEET NO.	
				SAT	GUADALUPE			10	

PRIOR TO BEGINNING ANY CONSTRUCTION:

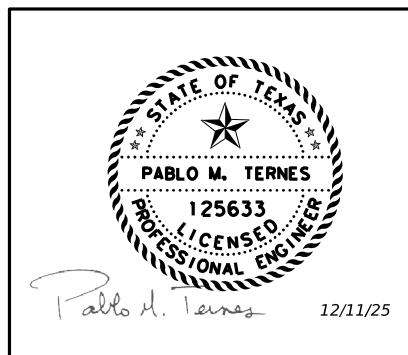
1. PLACE TRAFFIC CONTROL DEVICES AND ADVANCED WARNING SIGNS AS SHOWN IN PLANS. TRAFFIC CONTROL DEVICES AND ADVANCED WARNING SIGNS SHALL BE IN COMPLIANCE WITH THE TMUTCD, BC, AND TCP STANDARDS.
2. PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN PLANS.
3. CONTRACTOR TO LOCATE ALL UTILITIES WITHIN THE WORK ZONE.

PHASE 1 STEP 1:

1. INSTALL PLASTIC DRUMS.
2. CLOSE SHOULDER ON SIDE OF ROADWAY BEING CONSTRUCTED.
3. SAW CUT AND REMOVE EXISTING PAVEMENT AS INDICATED IN THE PLANS. SAW CUT WILL NOT BE PAID FOR SEPARATELY; IT WILL BE CONSIDERED SUBSIDIARY TO SUBGRADE WIDENING.
4. PLACE HMAC BASE IN TWO EQUAL LIFTS.
5. PERFORM LEVEL UP ON SHOULDER/LANE. LEVEL UP SHALL BE PERFORMED UNDER TRAFFIC. CONTRACTOR WILL MAINTAIN TWO-WAY TRAFFIC, ROADWAY SHALL BE FULLY OPEN TO TWO LANES OF TRAFFIC AT THE END OF EACH WORK DAY.
6. BUILD DRIVEWAYS, TURNOUTS AND GRADE DITCH. MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES.
7. PLACE ONE COURSE SURFACE TREATMENT OVER WIDENED ROADWAY SECTION, LAPING ONE FOOT OVER EXISTING PAVEMENT.
8. INSTALL SEEDING, TOPSOIL, AND ESTABLISH VEGETATION.
12. CLEAN UP FOR THIS PHASE OF WORK.



FM 2623 - PHASE 1 STEP 1
STA 12+15.34 TO STA 23+43.18



LJA Engineering, Inc. **LJA**
FRN - F-1386

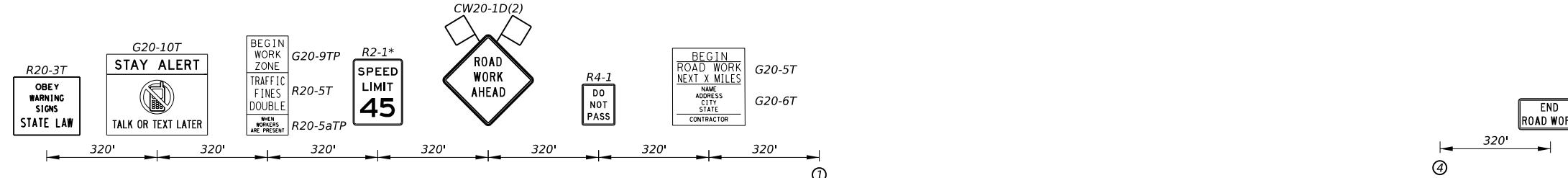
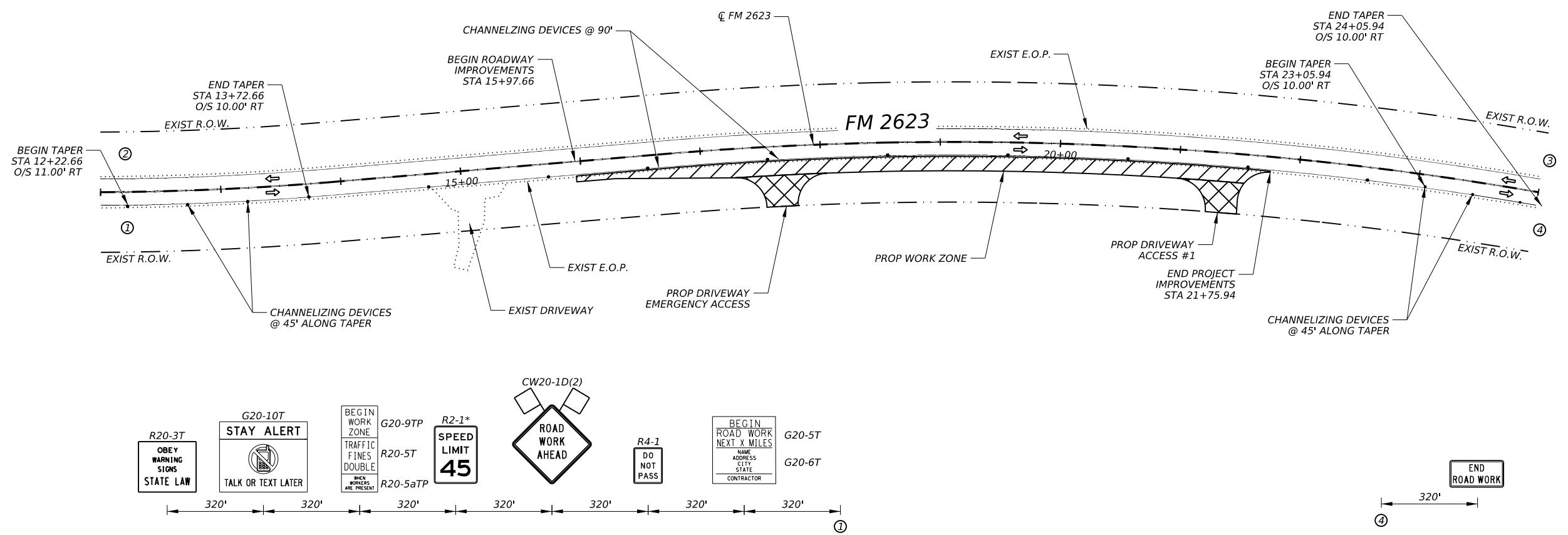
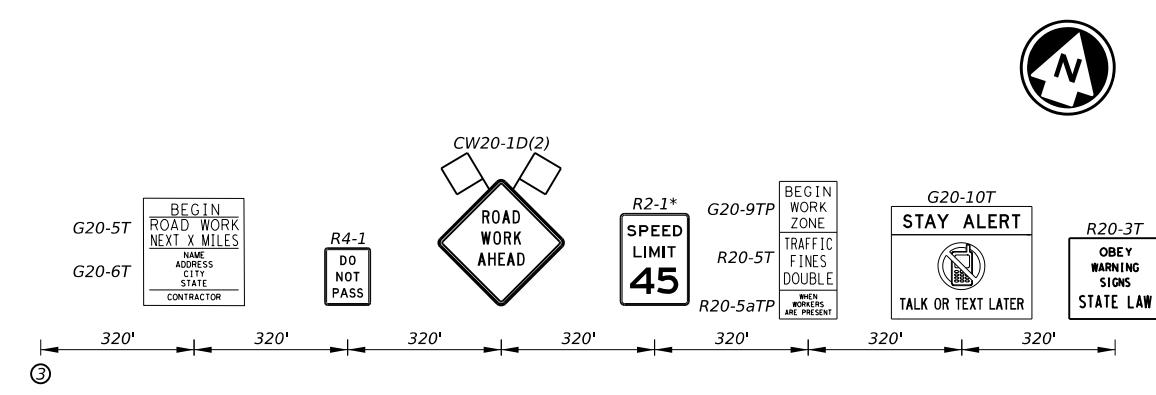
Texas Department of Transportation

FM 2623

TRAFFIC CONTROL PLAN
TYPICAL SECTIONS
PHASE 1

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	11



0' 25' 50' 100'
SCALE: 1"=100'

LJA Engineering, Inc. **LJA**
FRN-F-1386

Texas Department of Transportation

FM 2623

TRAFFIC CONTROL PLAN
PHASE 1-1

BEGIN TO END

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	12

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

- The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
- The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
- Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
- When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
- The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
- The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
- Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

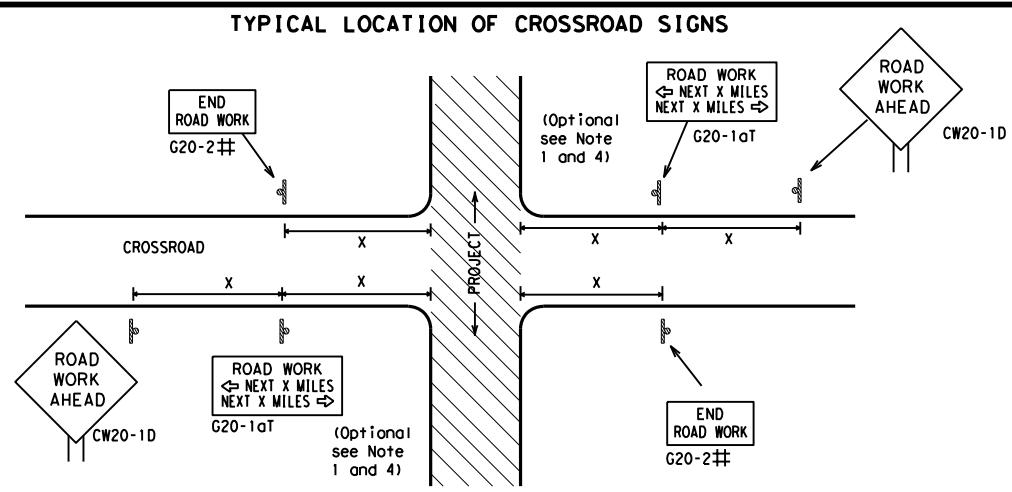
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT

<http://www.txdot.gov>

- COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
- DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
- MATERIAL PRODUCER LIST (MPL)
- ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
- STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
- TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
- TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12

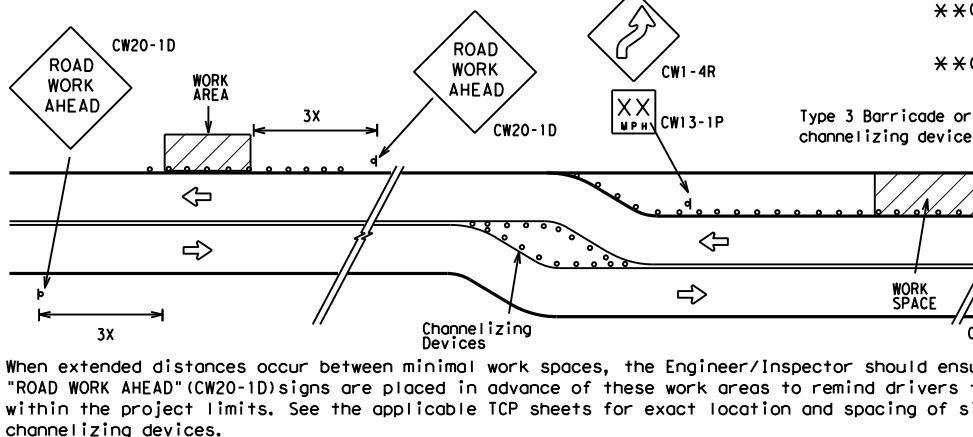
 Texas Department of Transportation	Traffic Safety Division Standard			
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS				
BC (1) - 21				
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
4-03 7-13	-	-	-	FM 2623
9-07 8-14	DIST	COUNTY	SHEET NO.	
5-10 5-21	SAT	GUADALUPE	13	



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

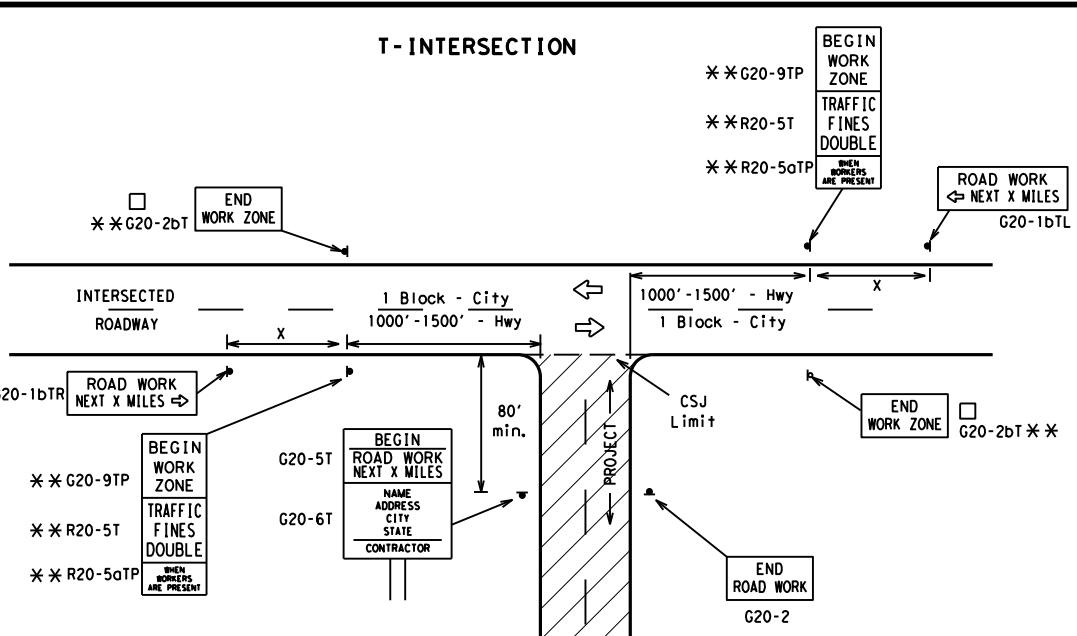
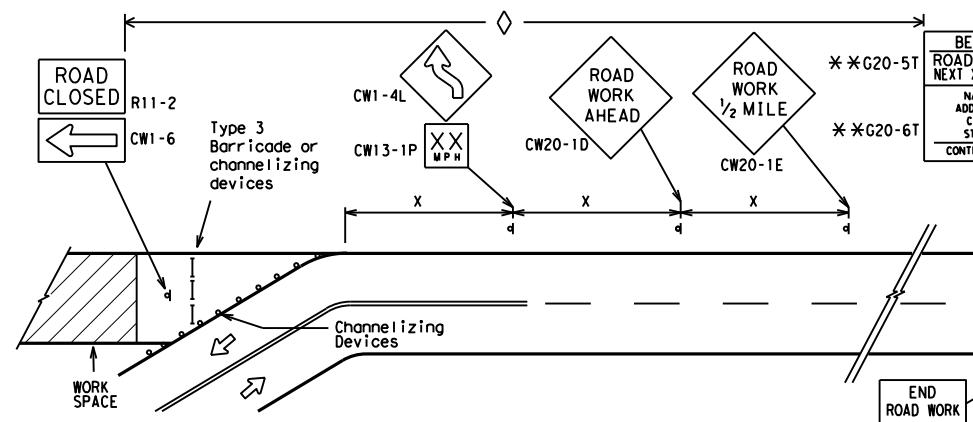
1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "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.

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



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 BC10 also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING ^{1,5,6}		
SIZE		SPACING
Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20 ⁴	48" x 48"	48" x 48"
CW21		
CW22		
CW23		
CW25		
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"
*	*	*

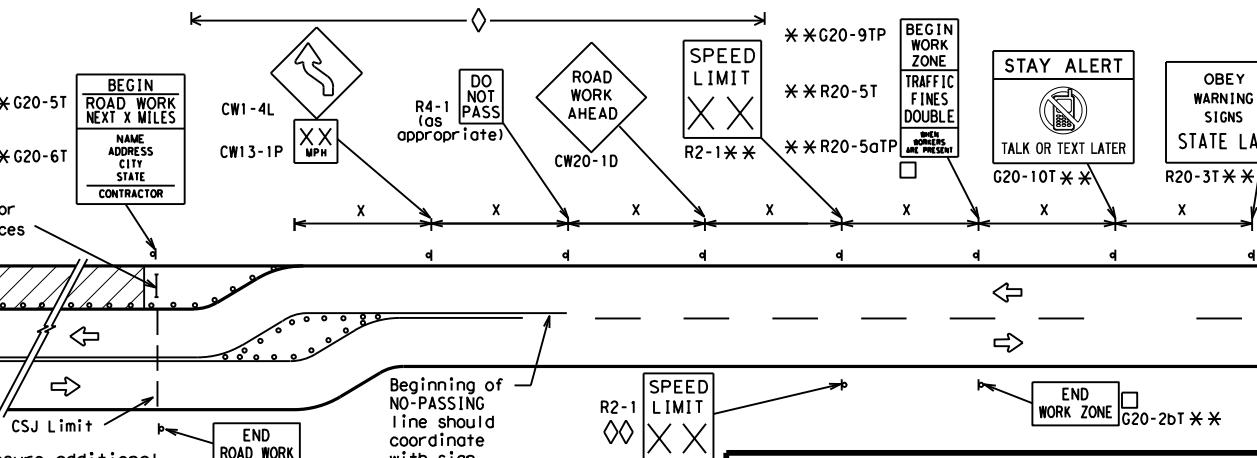
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

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

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

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

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

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

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

SHEET 2 OF 12

Texas Department of Transportation Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC (2) - 21

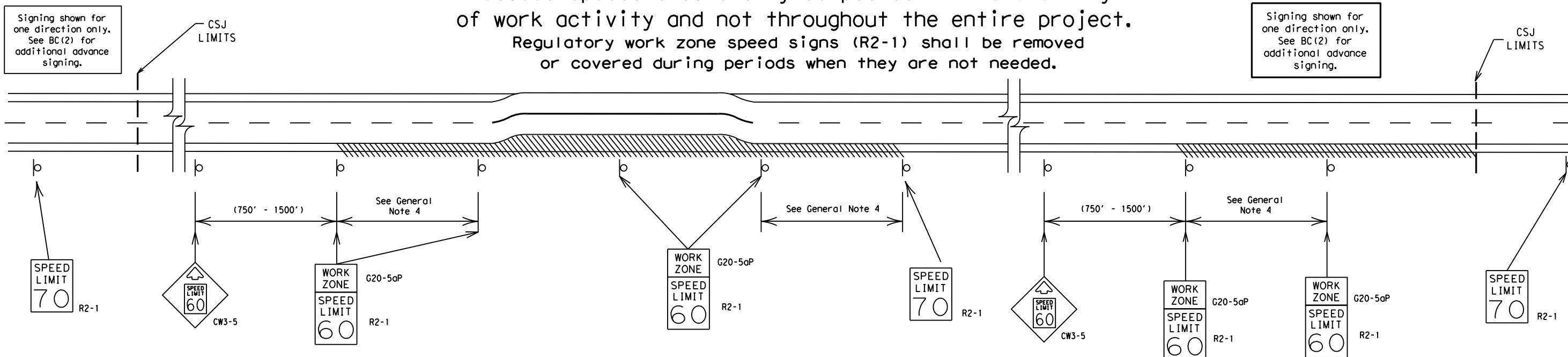
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
	-	-	-	FM 2623
REVISIONS				
9-07	8-14			
7-13	5-21			
DIST	COUNTY			
SAT	GUADALUPE			
				14

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)).

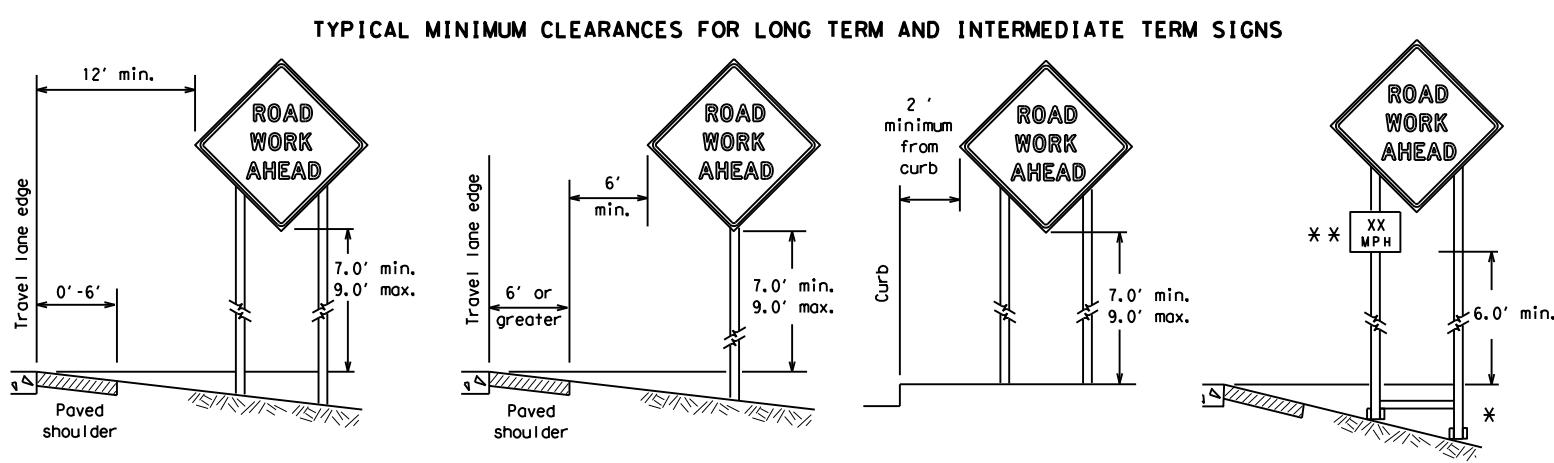
GENERAL NOTES

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.

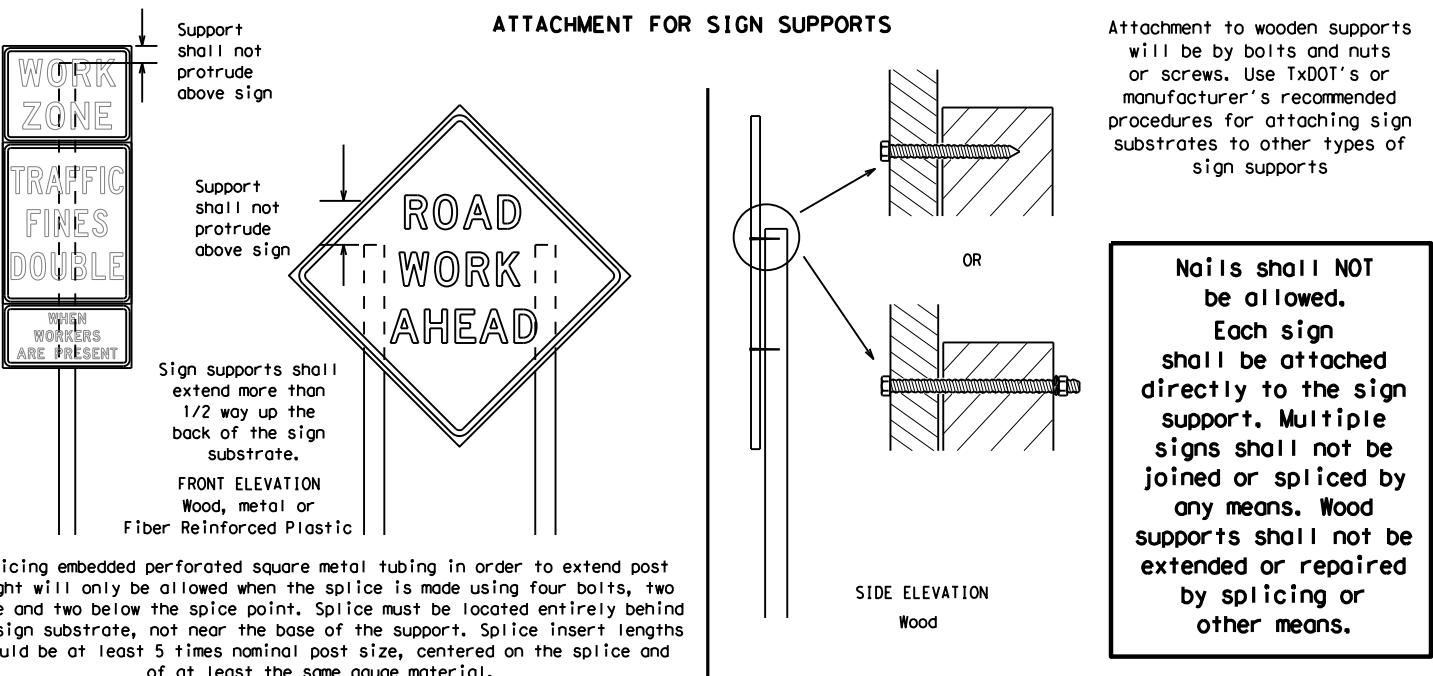
SHEET 3 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
BC (3) - 21			
FILE: bc-21.dgn <input checked="" type="checkbox"/> TxDOT November 2002 REVISIONS 9-07 8-14 7-13 5-21		DN: TxDOT CK: TxDOT DW: TxDOT CK: TxDOT CONT SECT JOB HIGHWAY - - - FM 2623 DIST COUNTY SHEET NO. SAT GUADALUPE 15	



* 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.

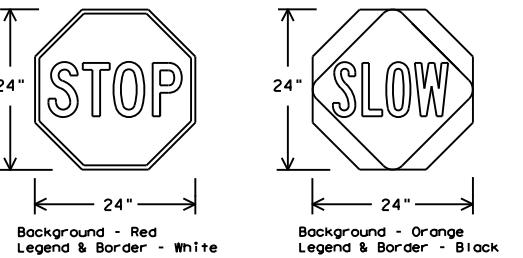
** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.



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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

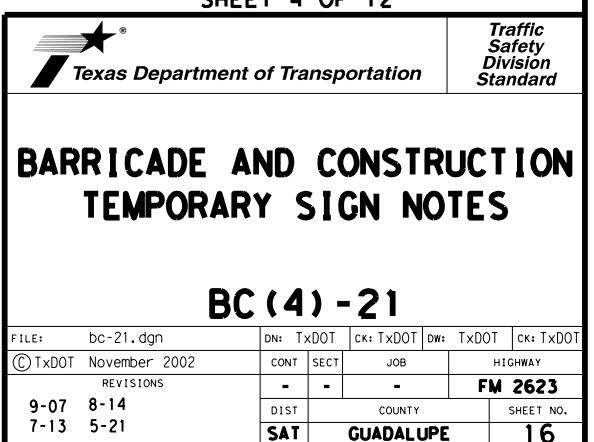
SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

SHEET 4 OF 12



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB		HIGHWAY			
		-	-	-					
REVISIONS									
9-07	8-14								
7-13	5-21								
DIST	COUNTY								
SAT	GUADALUPE								

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

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

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

DATE: 08/04/2002
FILE: S:\Sectors\Transportation\Tx\16969\Production\Design\Plan Sets\TCPBC-21.dgn

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

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

Other Condition List

* 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	AT FM XXXX	SPEED LIMIT XX MPH
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXX TO XXXXXX	RIGHT LANE EXIT
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION
EXPECT DELAYS	PREPARE TO STOP	REDUCE SPEED XXX FT	DRIVE SAFELY
REDUCE SPEED XXX FT	END SHOULDER USE	USE OTHER ROUTES	DRIVE WITH CARE
USE OTHER ROUTES	WATCH FOR WORKERS	STAY IN LANE *	

Location List

Warning 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
--------------------	---------------------	---------------	---------------	-----------------------	--------------	----------------	-----------------	---------------------

** Advance Notice List

--	--	--	--	--	--	--	--	--

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

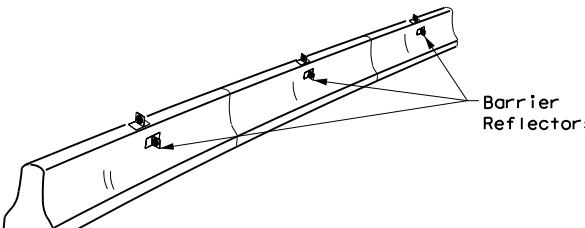
- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS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

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

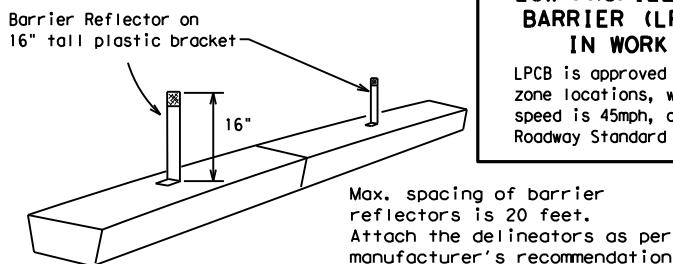
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	REVISIONS	-	-	-
				FM 2623
9-07 8-14				
7-13 5-21				
SAT	COUNTY			SHEET NO.
				18

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.

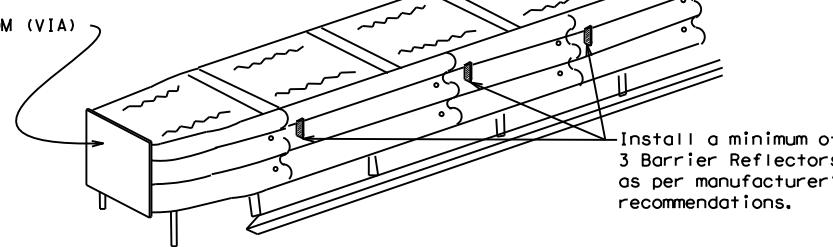


CONCRETE TRAFFIC BARRIER (CTB)

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 edge line being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

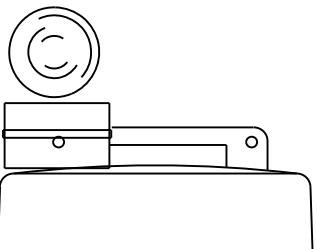
End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

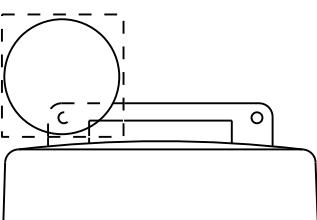
LPCB is approved for use in work zone locations, where the posted speed is 45 mph, or less. See Roadway Standard Sheet LPCB.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS



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



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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

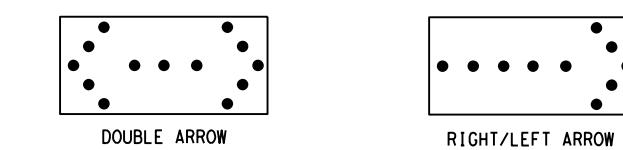
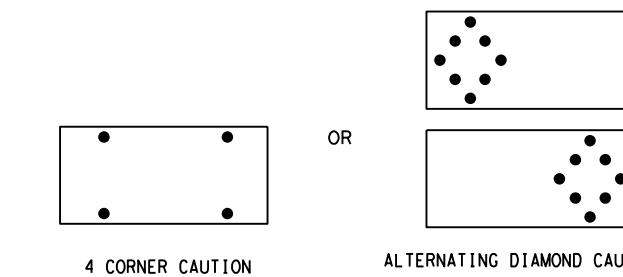
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

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

BC (7) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
	REVISIONS	-	-	
9-07 8-14	DIST	COUNTY		FM 2623
7-13 5-21	SAT	GUADALUPE	SHEET NO.	19

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:

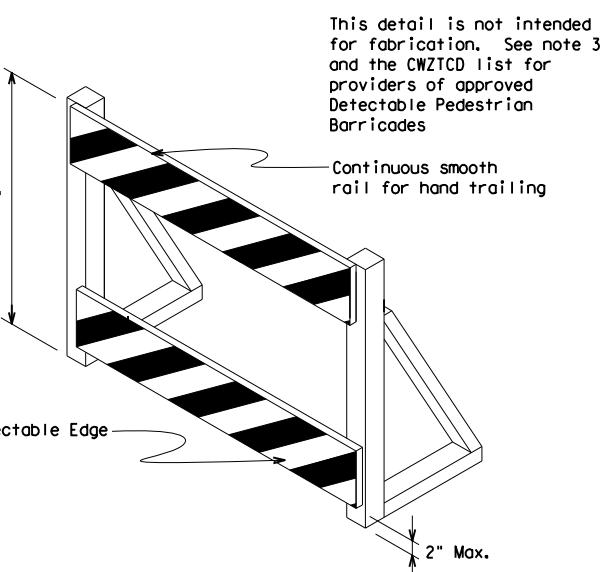
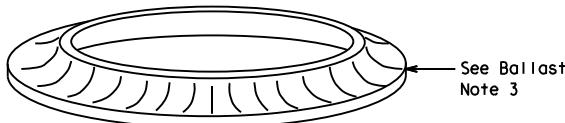
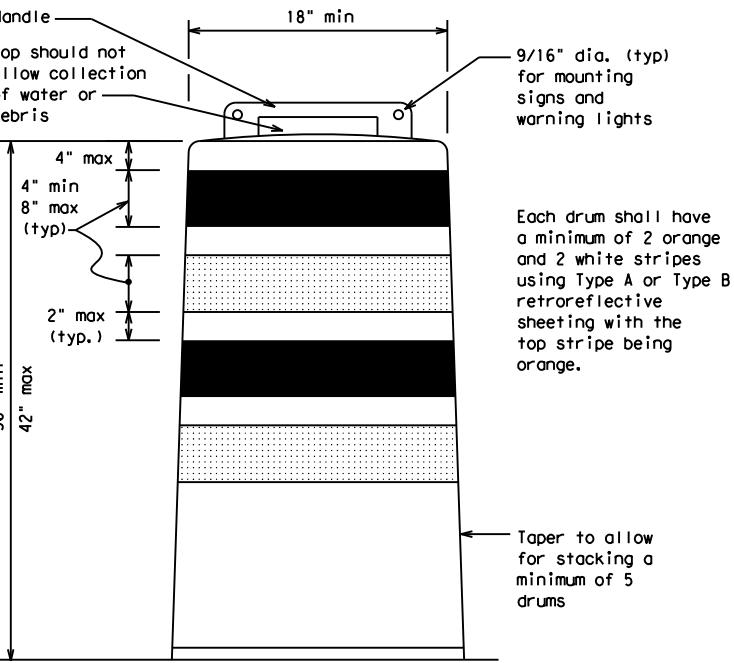
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

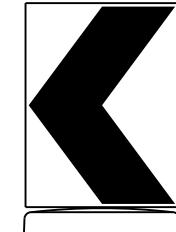
BALLAST

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.

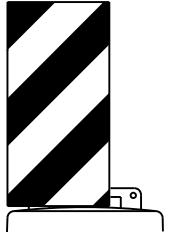


DETECTABLE PEDESTRIAN BARRICADES

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.

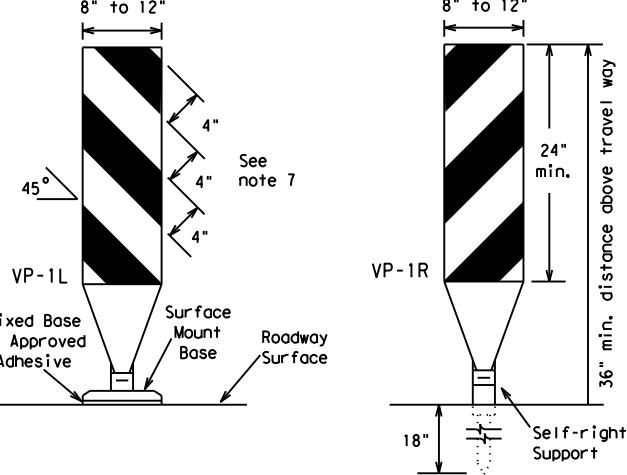
SHEET 8 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
		DN: TxDOT	CK: TxDOT
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS	-	-	HIGHWAY
4-03 8-14	-	-	FM 2623
9-07 5-21	-	-	
7-13	DIST	COUNTY	SHEET NO.
	SAT	GUADALUPE	20

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

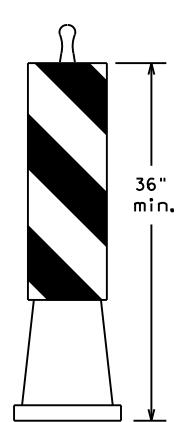
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS	-	-	HIGHWAY
4-03 8-14	-	-	FM 2623
9-07 5-21	-	-	
7-13	DIST	COUNTY	SHEET NO.
	SAT	GUADALUPE	20



FIXED
(Rigid or self-righting)

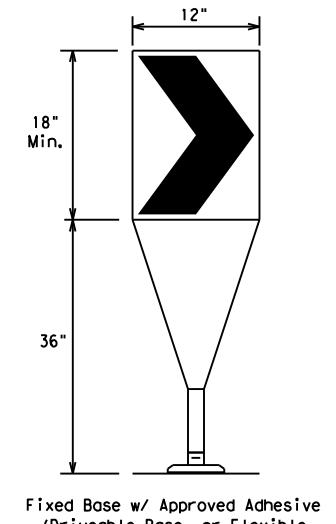
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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.

VERTICAL PANELS (VPs)



PORTABLE

DRIVEABLE



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 of 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.

Posted Speed	Formula	Minimum Desirable Taper Lengths			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	WS^2	150'	165'	180'	30'	60'
35	$L = \frac{WS^2}{60}$	205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45		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

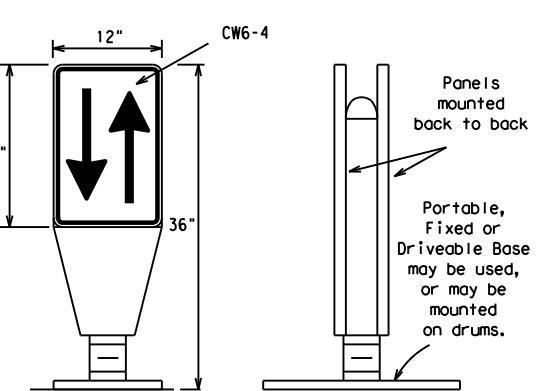


BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB		HIGHWAY			
		REVISIONS							
9-07	8-14	-	-	-		FM 2623			
7-13	5-21								
DIST		COUNTY							
SAT		GUADALUPE							

103



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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

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.

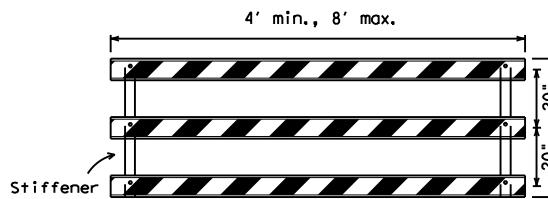
TYPE 3 BARRICADES

- 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.
- Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
- 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.
- 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.
- 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".
- Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
- Warning lights shall NOT be installed on barricades.
- 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.
- 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.

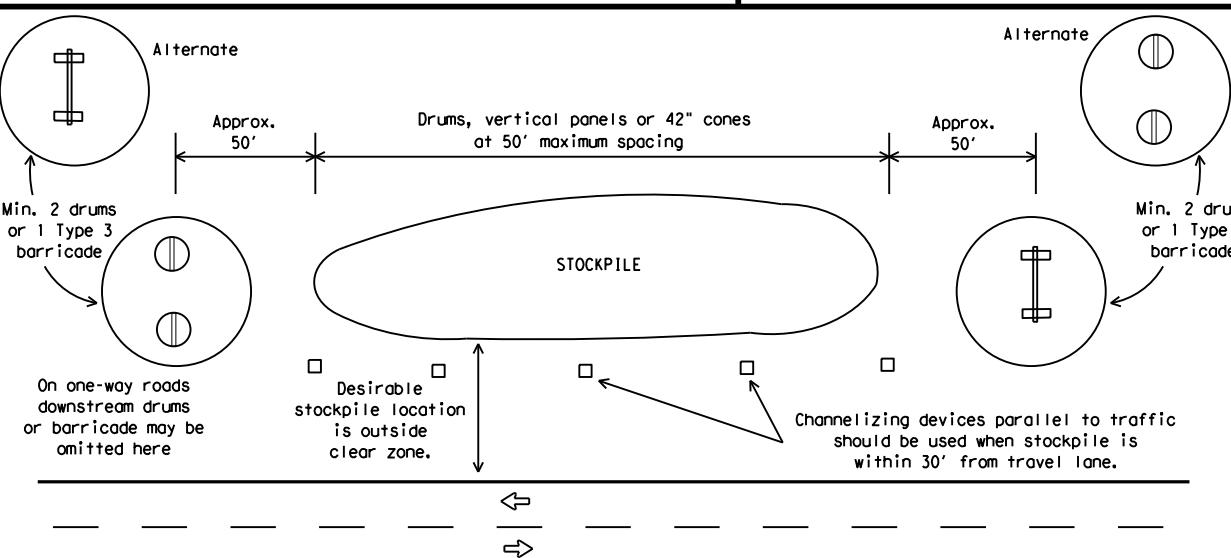


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



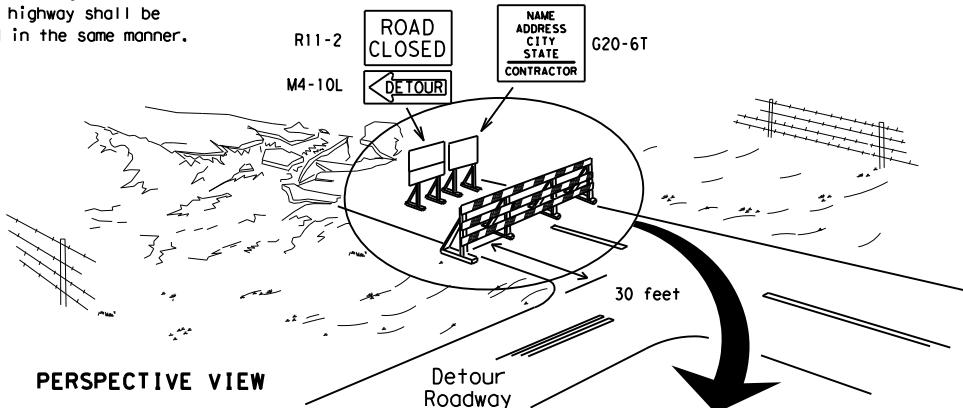
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

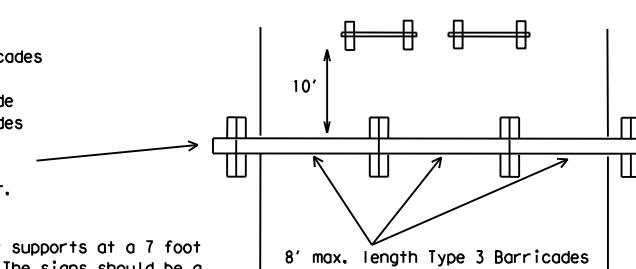


TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



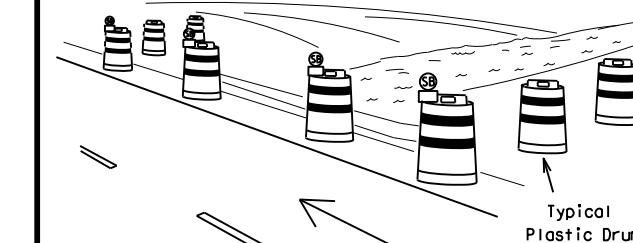
PERSPECTIVE VIEW



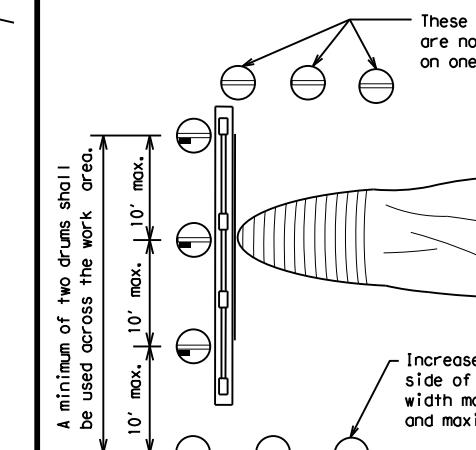
PLAN VIEW

- 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.
- Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW



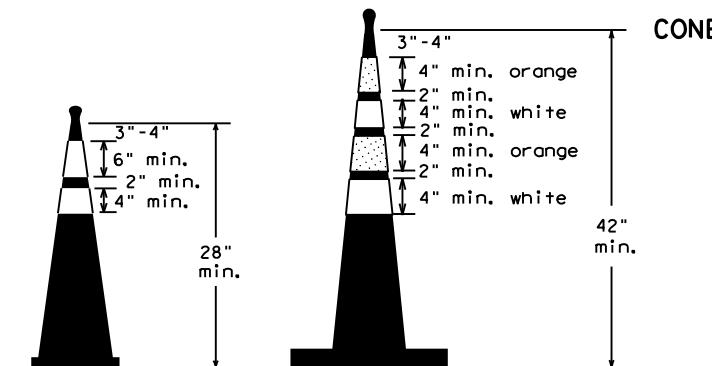
These drums are not required on one-way roadway



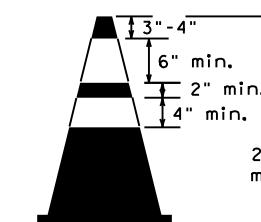
A minimum of two drums shall be used across the work area.
Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

PLAN VIEW

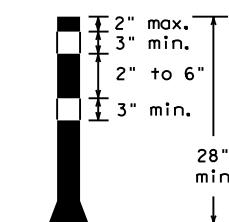
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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.

- Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
- 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.
- 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.
- Cones or tubular markers shall have white or 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.
- 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.
- 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
- Cones or tubular markers used on each project should be of the same size and shape.

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

LEGEND

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

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
© TxDOT November 2002	SECT: JOB	DW: TxDOT
REVISIONS	-	CK: TxDOT
9-07 8-14	-	HIGHWAY
7-13 5-21	-	F M 2623
DIST: COUNTY	SHEET NO.	
SAT: GUADALUPE	22	

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

BC

21

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

00

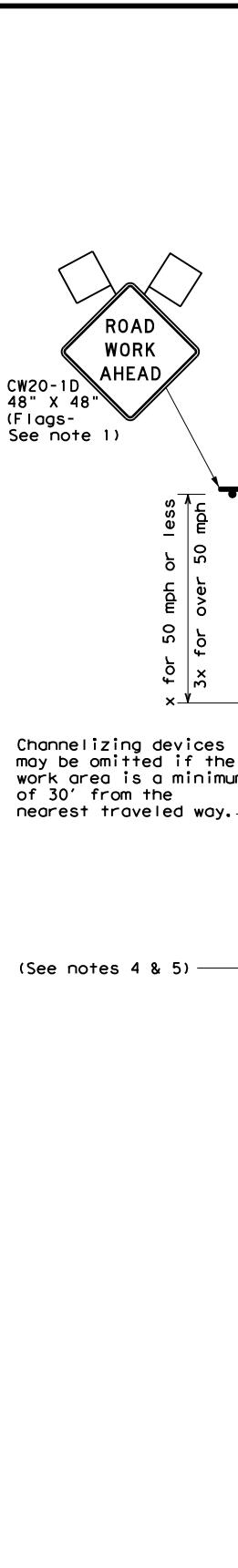
00

00

00

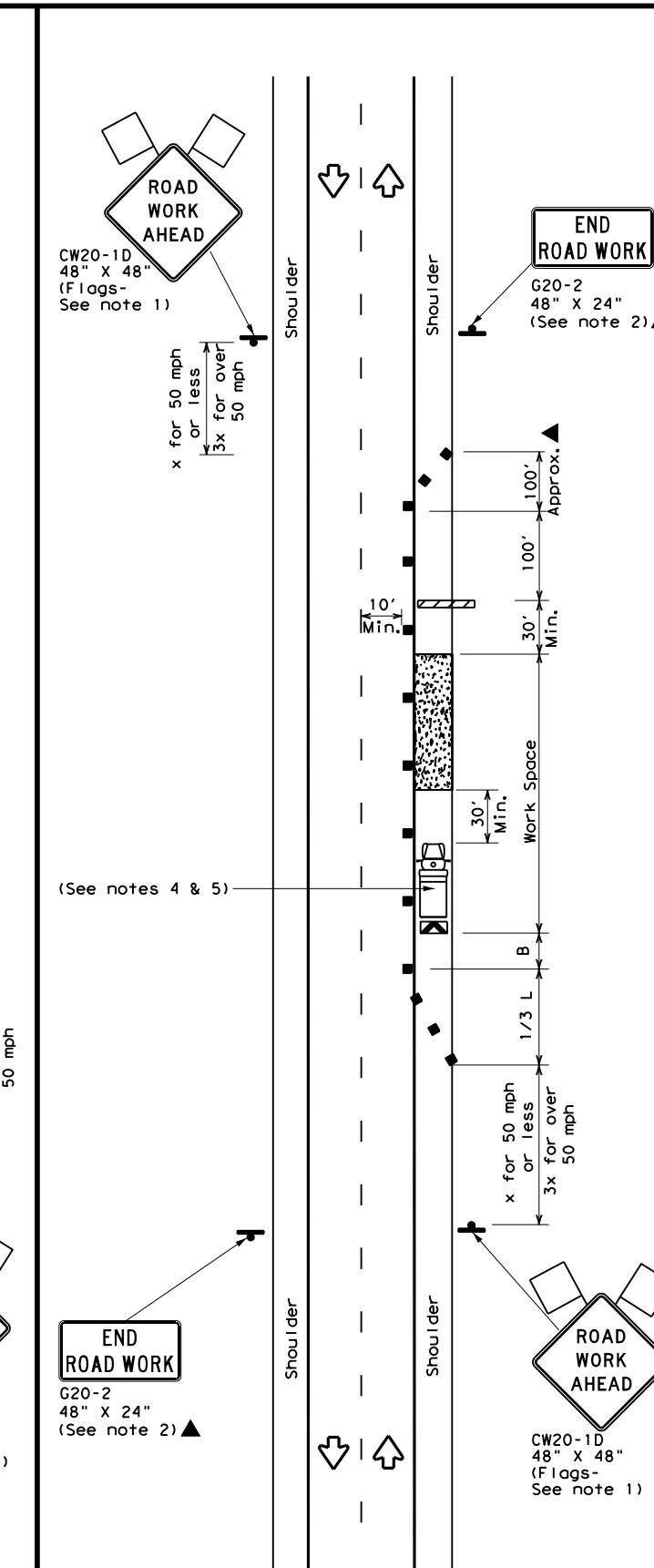
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any other formats or for incorrect results or damages resulting from its use.

RTD: 10/20/98



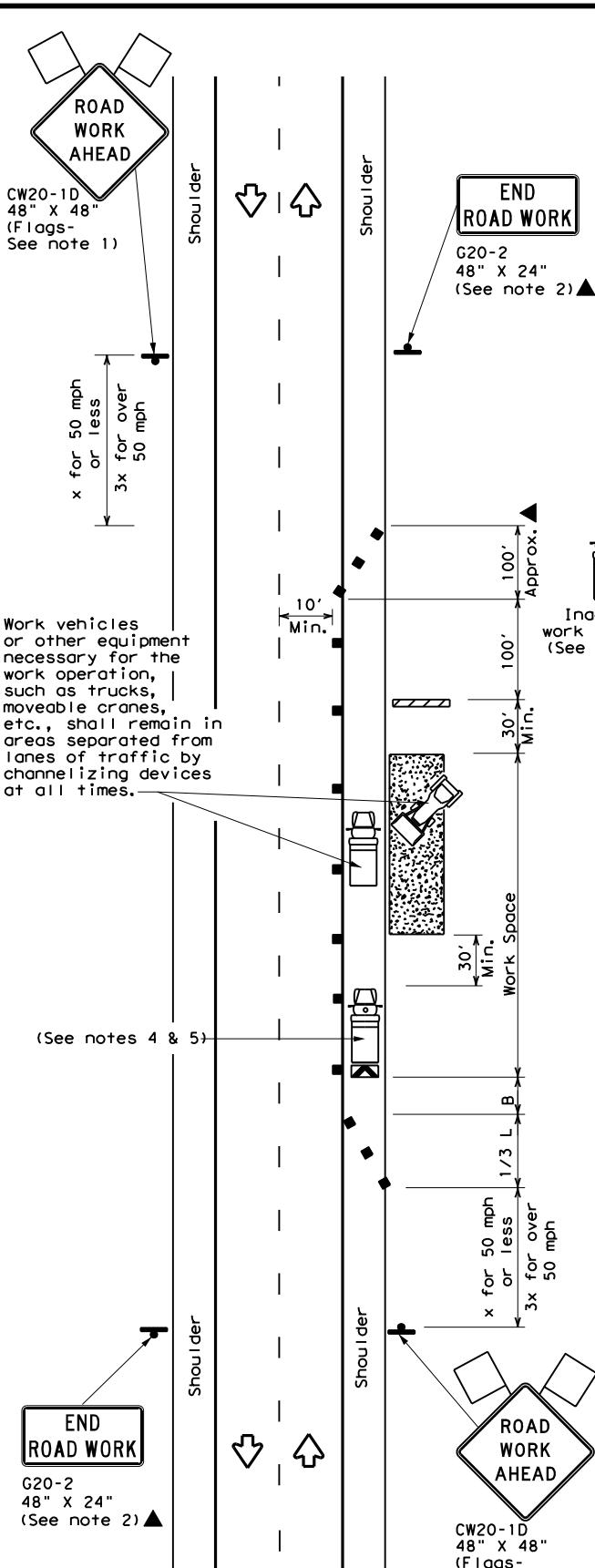
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths *			Suggested Maximum Spacing of Channelizing Devices	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset			
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		450'	495'	540'	45'	90'	320' 195'
50		500'	550'	600'	50'	100'	400' 240'
55		550'	605'	660'	55'	110'	500' 295'
60		600'	660'	720'	60'	120'	600' 350'
65		650'	715'	780'	65'	130'	700' 410'
70		700'	770'	840'	70'	140'	800' 475'
75		750'	825'	900'	75'	150'	900' 540'

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

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

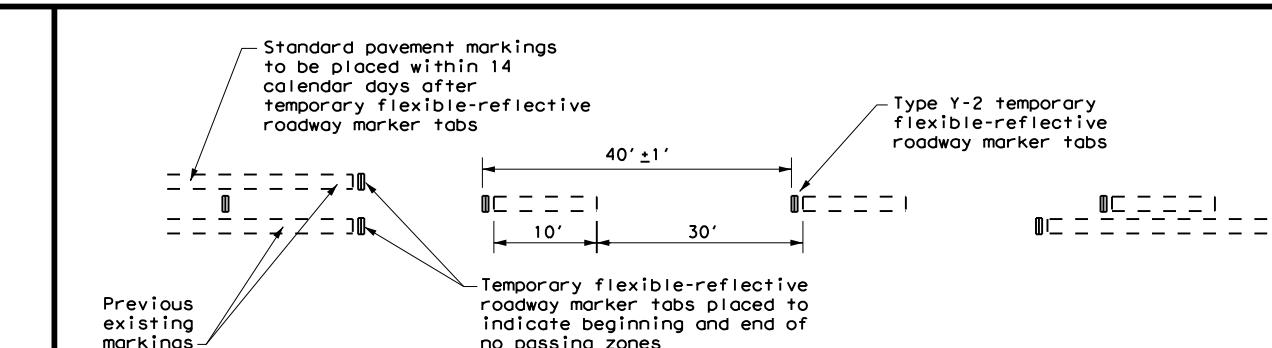
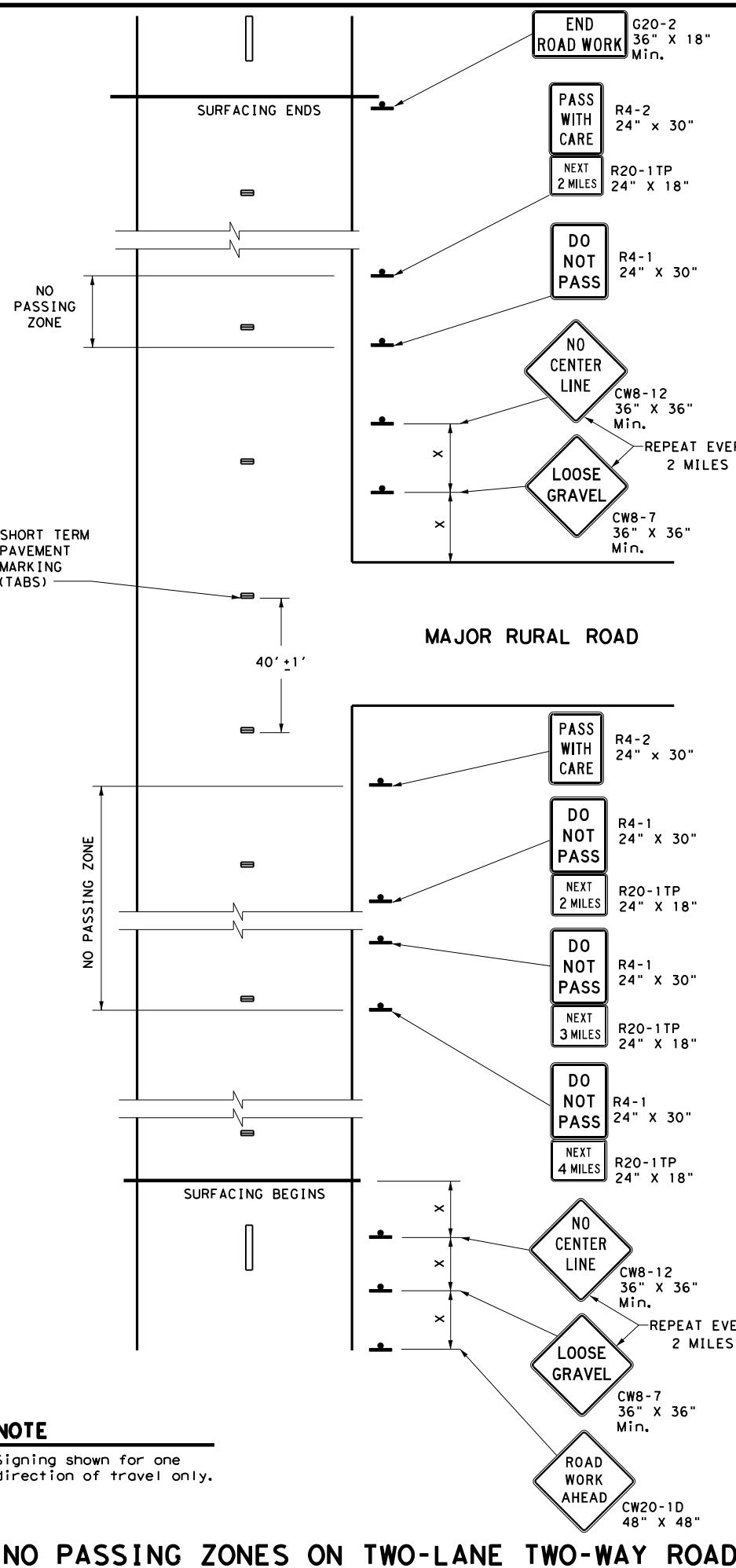


Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
	-	-	-	FM 2623
REVISIONS	DIST	COUNTY	SHEET NO.	
2-94 4-98	1-97	2-12	1-28	SAT GUADALUPE 25



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

- A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.
- B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.
- C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one day's operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.
- D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

- A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.
- B. At the time construction activity obliterates the existing center line markings (low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.
- C. The NO CENTER LINE signs are to remain in place until standard center markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

- A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.
- B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKING

- A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.
- B. Tabs shall not be used to simulate edge lines.
- C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

- A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.
- B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T) sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

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

*** Conventional Roads Only**

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

GENERAL NOTES

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



TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP (7-1)-13

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	-	-	FM 2623	
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	SAT	GUADALUPE		26

METHOD 1: WOOD EMBEDMENT

STEPS:

Step 1. Determine sign height (H_s), width (W_s), average mounting height from bottom of sign to ground (H_{bs}), and temporary guide sign wind zone. Temporary guide sign wind zone is determined from Wind Velocity Worksheet. (Page 30A on the Traffic Standards web page) and Table 1.

TABLE 1	
Wind Zone on Wind Velocity Worksheet	Temporary Guide Sign Wind Zone
90 mph	70 mph
80 mph	70 mph
70 mph	60 mph

Step 2. Determine number of posts and post size from temporary guide sign wind zone using H_s , W_s , H_{bs} below (Figure 1: 60 mph and Figure 2: 70 mph). Determine spacing of posts (A) and distance from edge of sign to outside posts (0.5A) from 'Post Spacing and Sign Placement' detail on TLRS(2).

Step 3. Determine minimum post embedment depth from Table 2. For cohesionless soils, another method should be used to determine embedment depth.

Wooden Post Size	Embedment Depth (ft)
4x6	3
6x8	4
6x10	5

Step 4. Fabricate posts using 'Wood Post' detail on TLRS(2). Attach sign (plywood or extruded aluminum) using a method on TLRS(3). Wooden parts are not required to be painted.

FIGURE 1

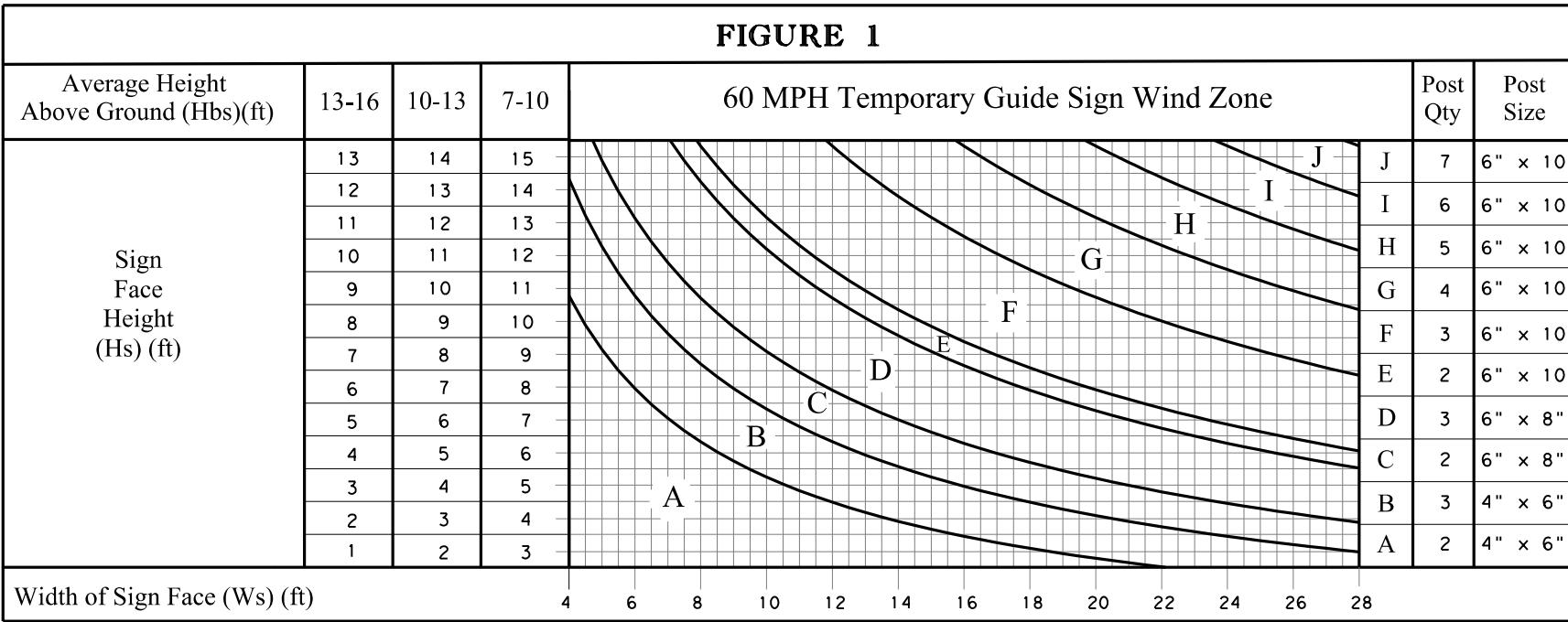
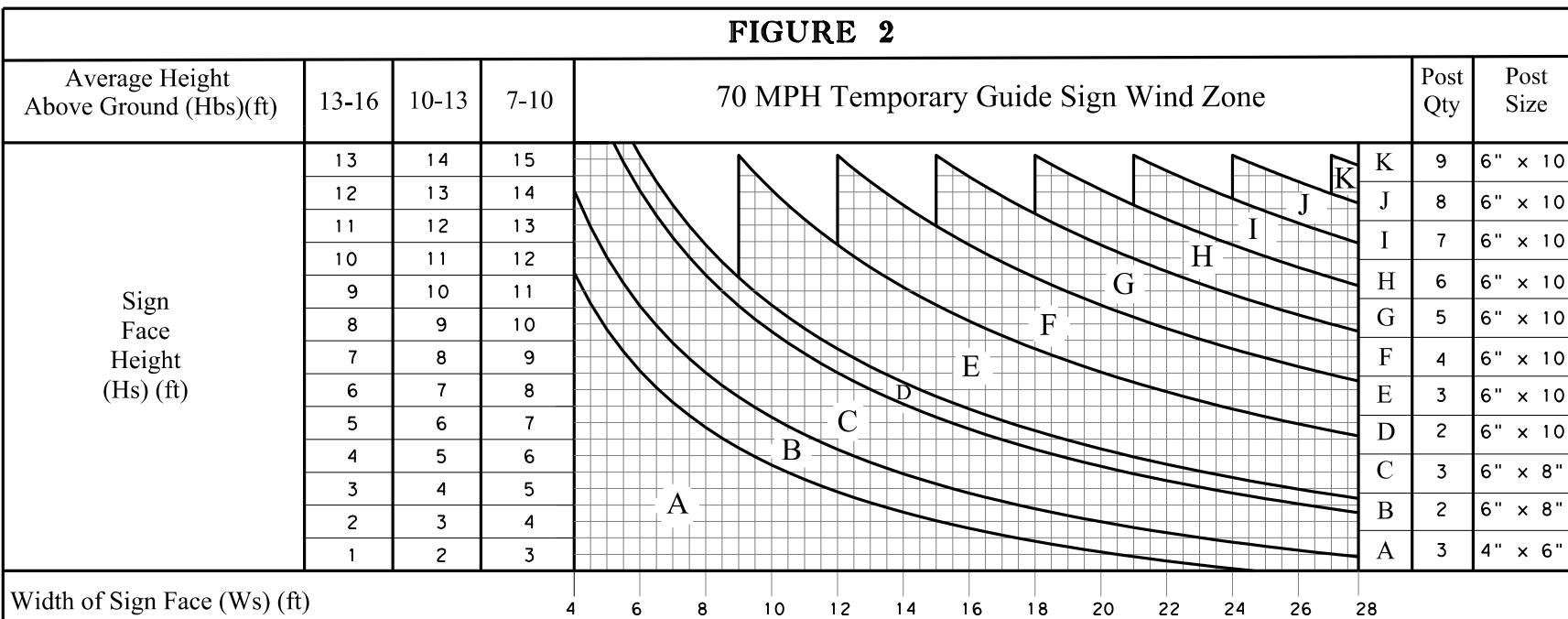


FIGURE 2



GENERAL NOTES

1. See plans for specifications and pay item information. Temporary guide signs required for contractor changes to traffic control plan are subsidiary to item 502.
2. Contractor may use any of the 3 methods (Wood Embedment, Steel Embedment or Wood Skid) as long as sign height requirements are met and approved by the Engineer.
3. See SMD (2-3) for details on attaching panels and plaques to parent signs.
4. Nails are not allowed in temporary sign support structures.

METHOD 2: STEEL EMBEDMENT

STEPS:

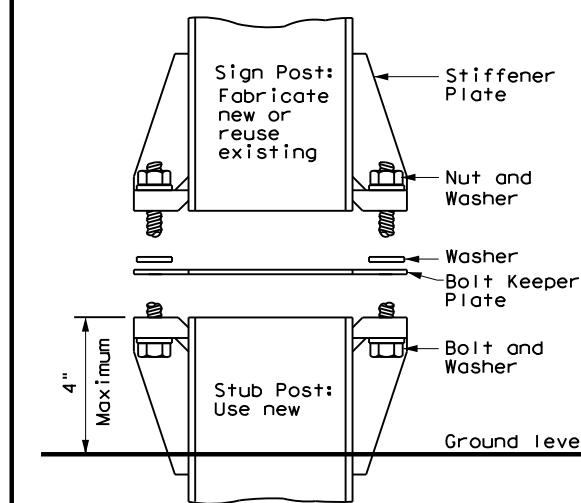
Step 1. Determine sign height (H_s), width (W_s), average mounting height from bottom of sign to ground (H_{bs}), and wind zone from Wind Velocity Worksheet.

Step 2. Determine number of posts, post size, and post spacing from SMD(2-3) and SMD(8W1). Alternatively, the sign posts from an existing sign may be used if 7' minimum height from pavement to bottom of sign can be maintained at new location. In this case, only a new stub post without concrete foundation is required. See Detail A and SMD(2-2) for more information.

Step 3. Determine minimum stub post embedment depth from Table 3. No concrete foundation is required. For cohesionless soils, another method should be used to determine embedment depth.

Steel Support Post Size	Embedment Depth (ft)
W6x9	4
W6x12	4.5
W6x15	5
W8x18	6
W8x21	6.5
W10x22	7.5
W10x26	8
W12x26	8.5
S3x5.7	3
S4x7.7	3.5

Step 4. Attach sign using SMD(2-3) for an extruded aluminum sign or using TLRS(3) for a plywood sign.



DETAIL A

SHEET 1 OF 4

Texas Department of Transportation **Traffic Operations Division Standard**

TEMPORARY LARGE ROADSIDE SIGNS

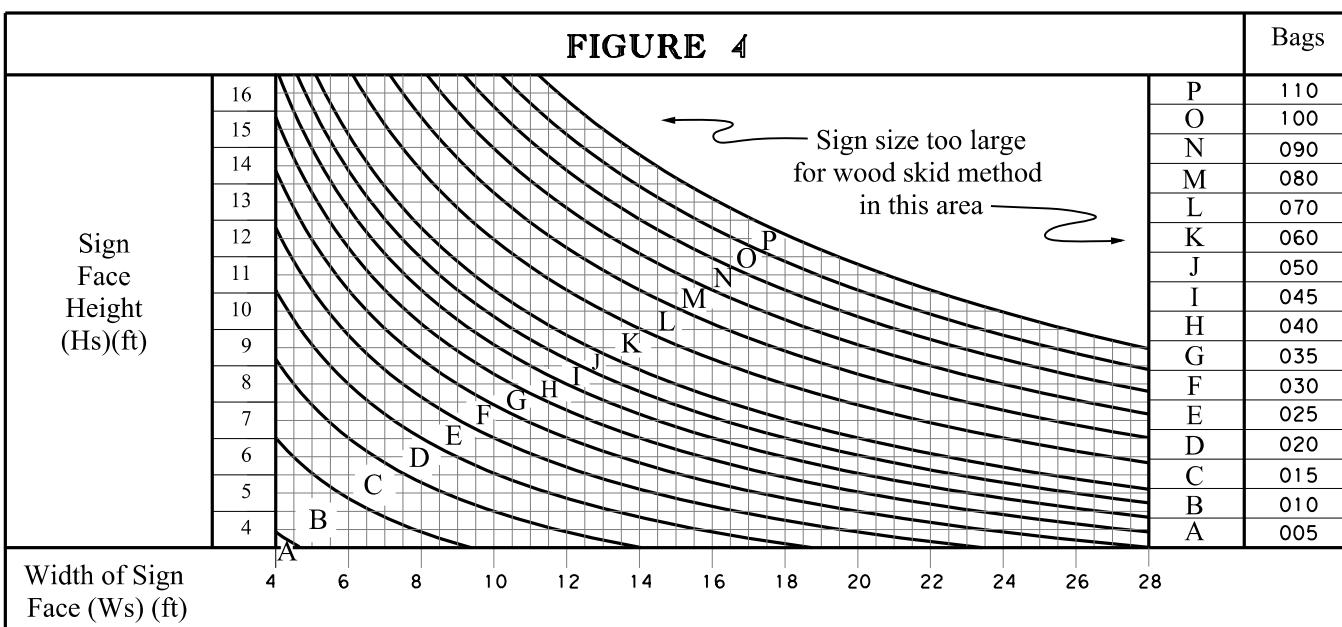
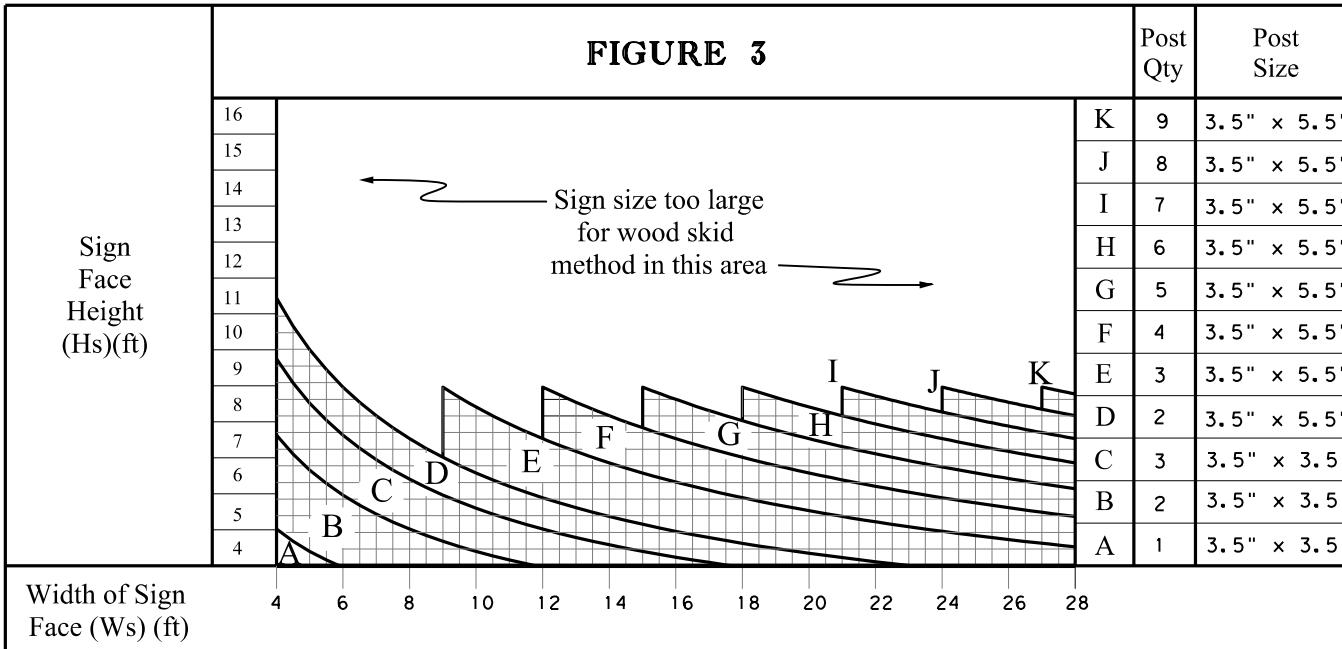
TLRS(1)-17

FILE: tlrs-17.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	-	-	-	FM 2623
DIST	COUNTY	SHEET NO.		
SAT	GUADALUPE	27		

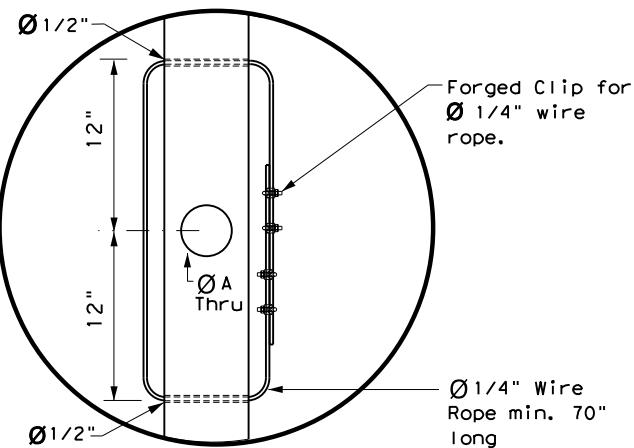
METHOD 3: WOOD SKID

STEPS:

- Determine sign height (H_s) and width (W_s). Note that the wood skid method is only intended for use on level terrain. The skid height from ground to bottom of sign is 7'6". If this causes the distance from edge of pavement to the bottom of the sign to be less than 7', the wood skid method is not to be used.
- Determine number of 4"x6" (nominal 3.5"x 5.5") posts from Figure 3 below. Determine spacing of posts (A) and distance from edge of sign to outside posts (0.5A) from 'Post Spacing and Sign Placement' detail.
- Determine number of 40 pound sandbags from Figure 4.
- Assemble skid as shown on TLRS(4) standard. Attach sign (plywood or extruded aluminum) using a method on TLRS(3). Wooden parts are not required to be painted.



WIRE ROPE BREAKAWAY FEATURE

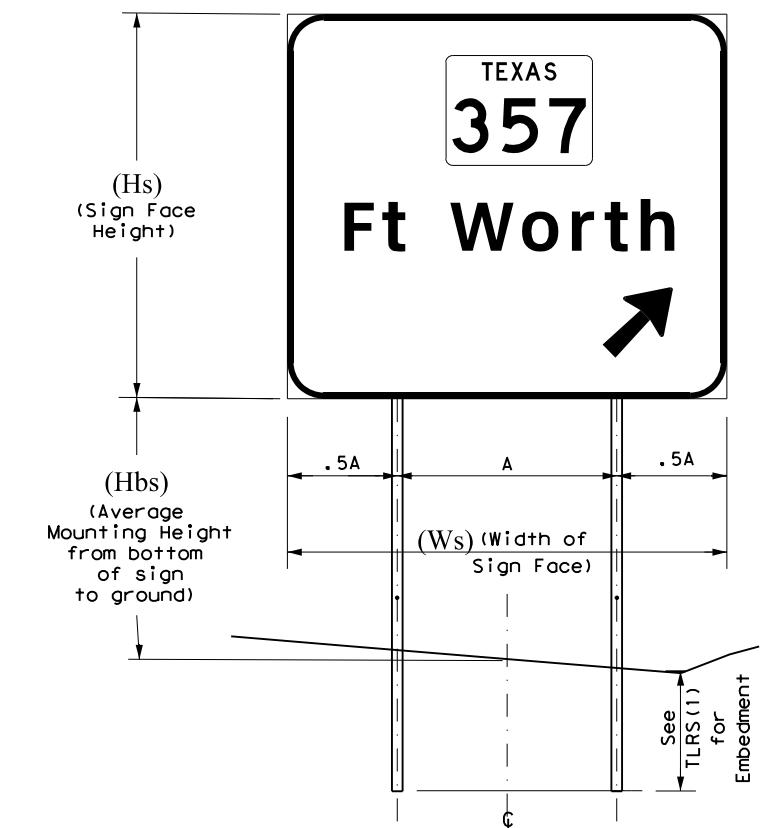


DETAIL B

NOTES:

- Wire rope breakaway feature required on all wooden posts. This breakaway feature includes the clamped cable with 2 holes to mount the cable, 4 cable clips, and hole A which the cable surrounds.
- Breakaway feature is designed so wooden post fractures at hole A, with post staying attached to sign structure via the clamped cable.

POST SPACING AND SIGN PLACEMENT



WOODEN POST SPACING NOTES:

- Spacing between posts: $A = W_s / \# \text{ of posts required}$
- Spacing between edge of sign and outside posts: $0.5A$

STEEL POST SPACING NOTE:

See SMD(2-3) for post spacing unless reusing existing sign posts.

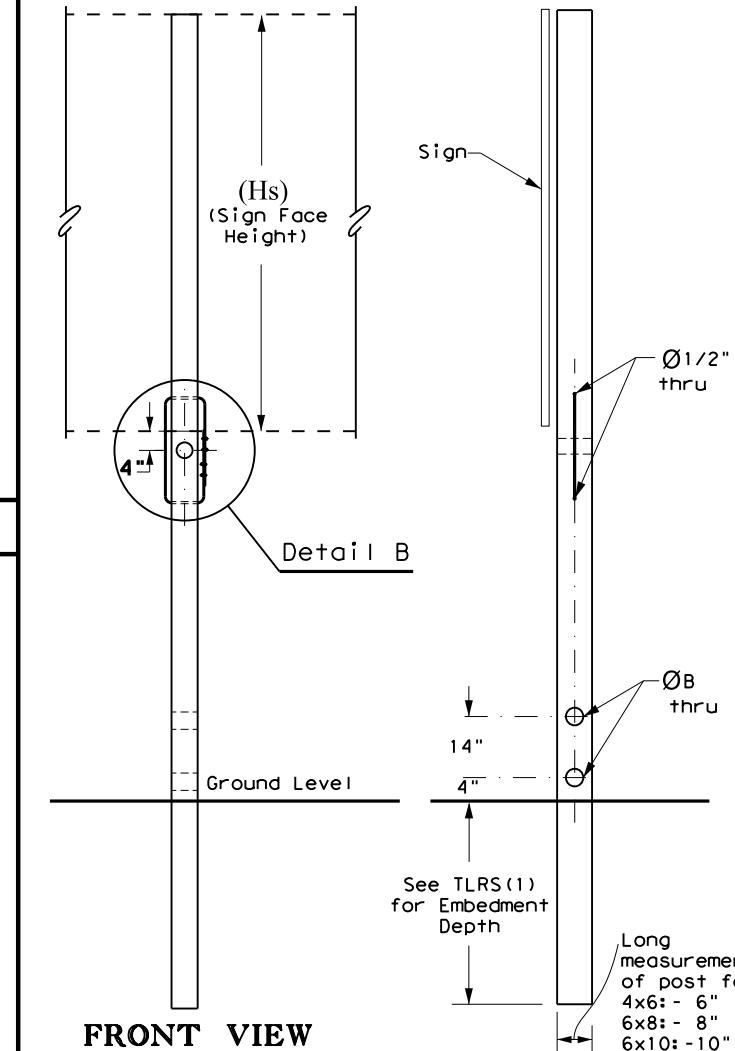
SIGN PLACEMENT NOTE:

See SMD(2-3) for sign placement details.

WOOD POST

TABLE 4

Support Size	$\varnothing A$	$\varnothing B$
4x6	1 1/2"	2"
6x8	3 5/8"	4"
6x10	3 5/8"	4"



FRONT VIEW

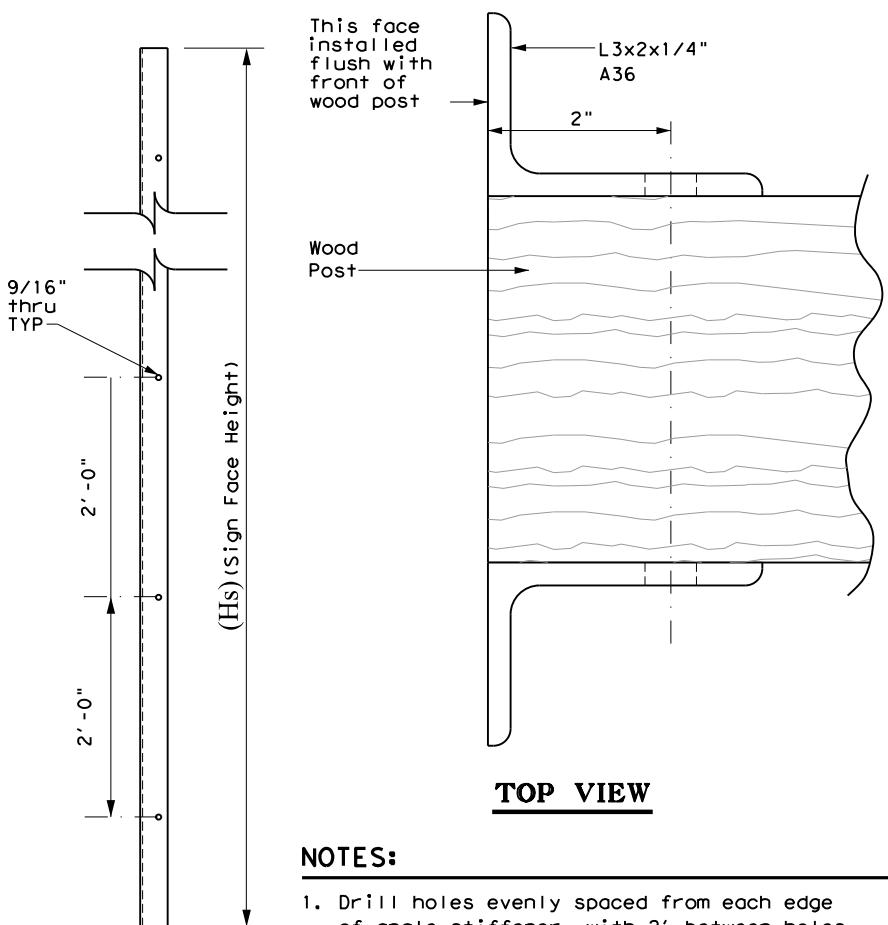
SIDE VIEW

NOTE:
All holes shown here are required for breakaway features to function properly.

SHEET 2 OF 4



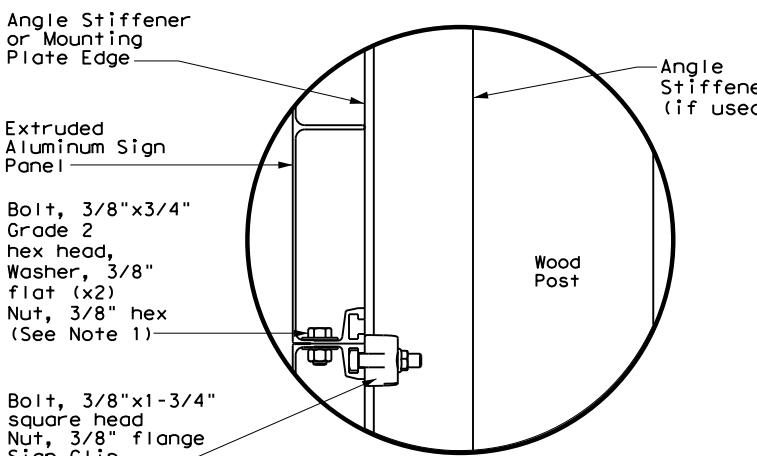
ANGLE STIFFENER METHOD (WOOD POST)



NOTES:

1. Drill holes evenly spaced from each edge of angle stiffener, with 2' between holes.
2. Attach 2 angle stiffeners to each post using A307 1/2" dia. x 2" long lag screws for 4x6 post, or A307 1/2" dia. x 3" long lag screws for 6x8 or 6x10 post.

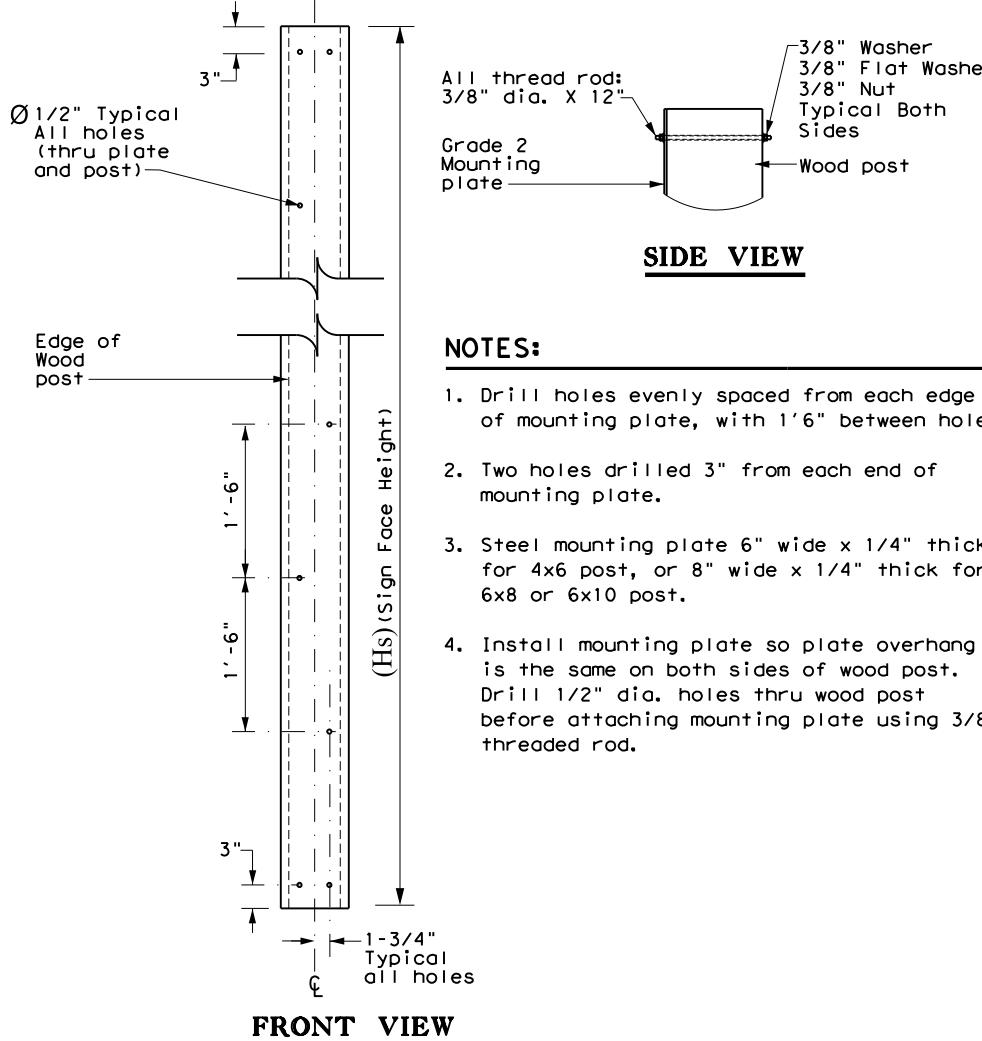
MOUNTING PLATE AND ANGLE STIFFENER ATTACHMENT TO EXTRUDED ALUMINUM SIGN



NOTES:

1. Space this hardware at 24" at each joint between panels.
2. Install this hardware on both sides of the wood post for proper attachment.

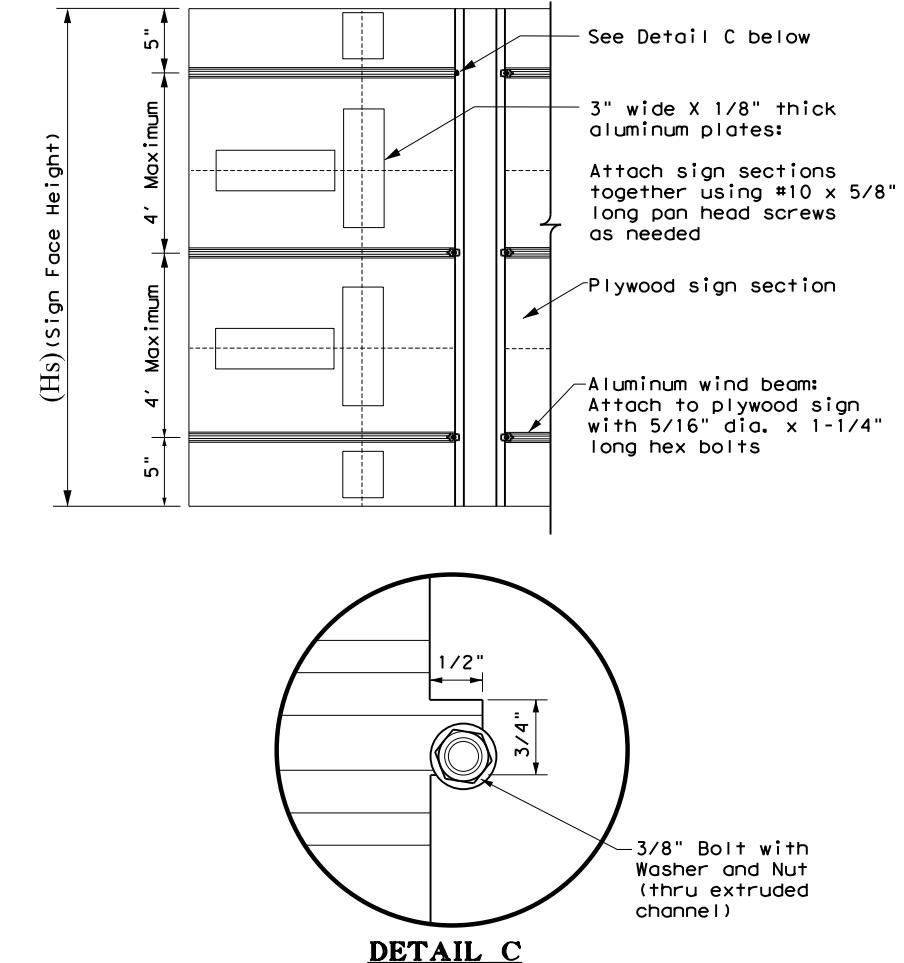
MOUNTING PLATE METHOD (WOOD POST)



NOTES:

1. Drill holes evenly spaced from each edge of mounting plate, with 1' 6" between holes.
2. Two holes drilled 3" from each end of mounting plate.
3. Steel mounting plate 6" wide x 1/4" thick for 4x6 post, or 8" wide x 1/4" thick for 6x8 or 6x10 post.
4. Install mounting plate so plate overhang is the same on both sides of wood post. Drill 1/2" dia. holes thru wood post before attaching mounting plate using 3/8" threaded rod.

MOUNTING A PLYWOOD SIGN



NOTES:

1. Recommended sign thickness 5/8".
2. Attach an aluminum wind beam approx. 5" from the top and bottom of sign thru the width of the sign and then as needed so there is a maximum 4' spacing between beams.
3. Attach sign sections with aluminum plates as needed.
4. Attach sign to post using bolts with sign clips as shown in 'Mounting Plate and Angle Stiffener Attachment to Extruded Aluminum Sign' detail. On the top bolt, cut out a 1/2" wide x 3/4" tall notch and tighten the bolt in the notch with a nut and washer. A sign clip is not used here. See Detail C.
5. This option works for the angle stiffener or mounting plate methods. Clamp plate method not recommended with aluminum wind beams.
6. Alternatively, contractor may drill holes thru plywood sign and attach to post using angle stiffener, mounting plate, or clamp plate method. Vertical bolt spacing should not be greater than 12" with 3/8" bolts.

SHEET 3 OF 4



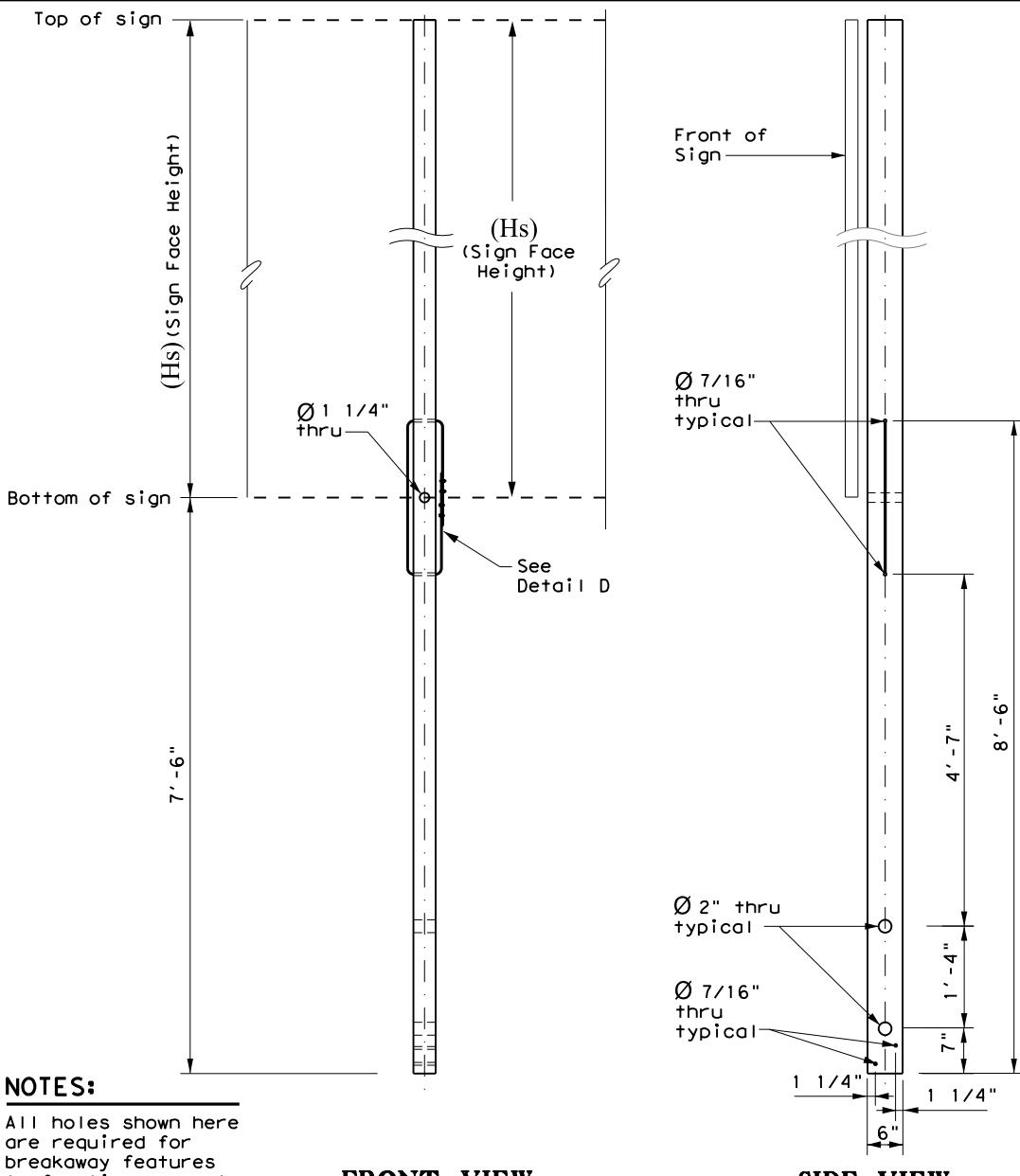
TEMPORARY LARGE ROADSIDE SIGNS: MOUNTING DETAILS

TLRS (3) - 17

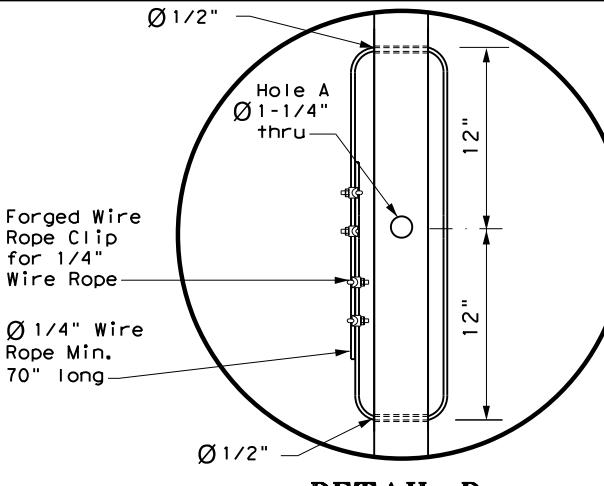
FILE: tlrs-17.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	-	-	-	FM 2623
DIST	COUNTY		SHEET NO.	
SAT	GUADALUPE		29	

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

WOOD POST (4 x 6)

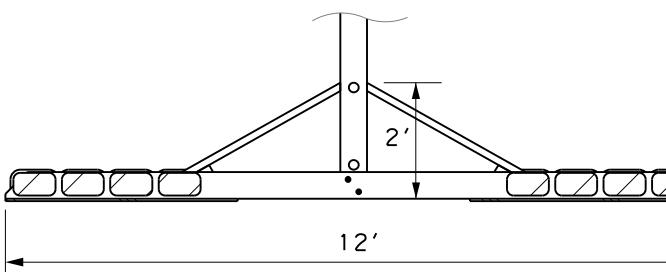


WIRE ROPE BREAKAWAY FEATURE

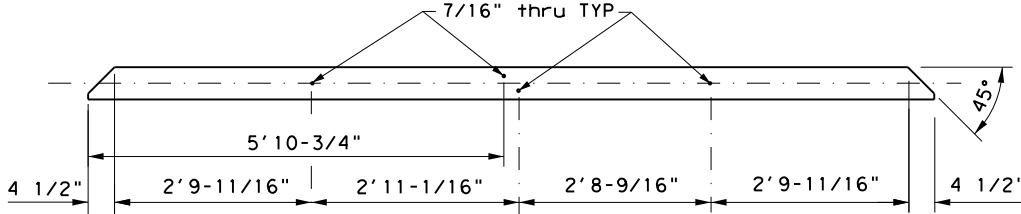


NOTES:

1. Wire rope breakaway feature required on all wooden posts. This breakaway feature includes the clamped cable with 2 holes to mount the cable, 4 cable clips, and hole A which the cable surrounds.
2. Breakaway feature is designed so wood post fractures at hole A, with post staying attached to sign structure via the clamped cable.



SKID (2 x 6)

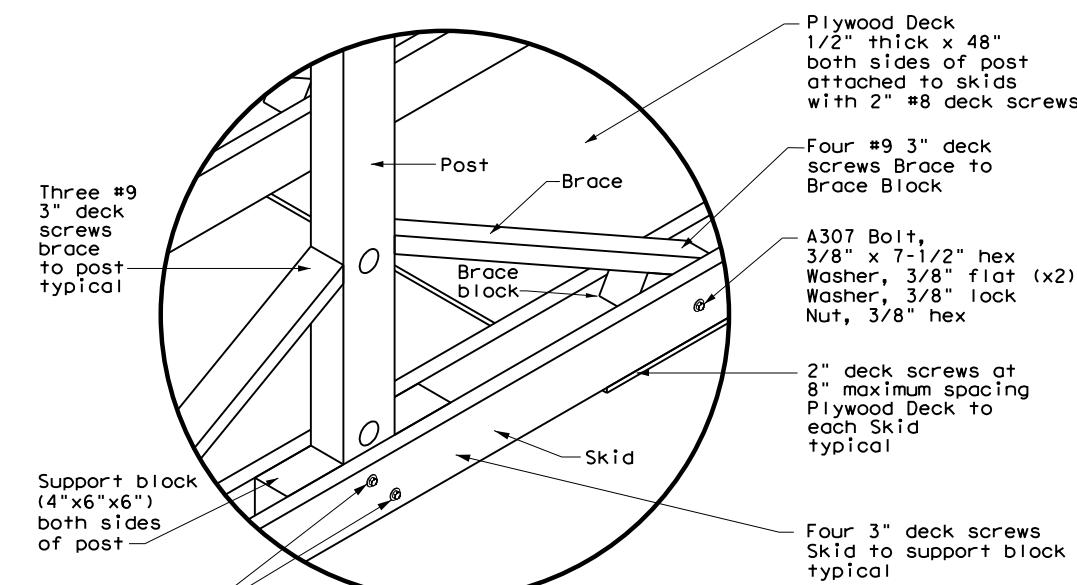
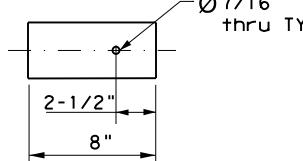


BRACE (2 x 4)

3' - 4"

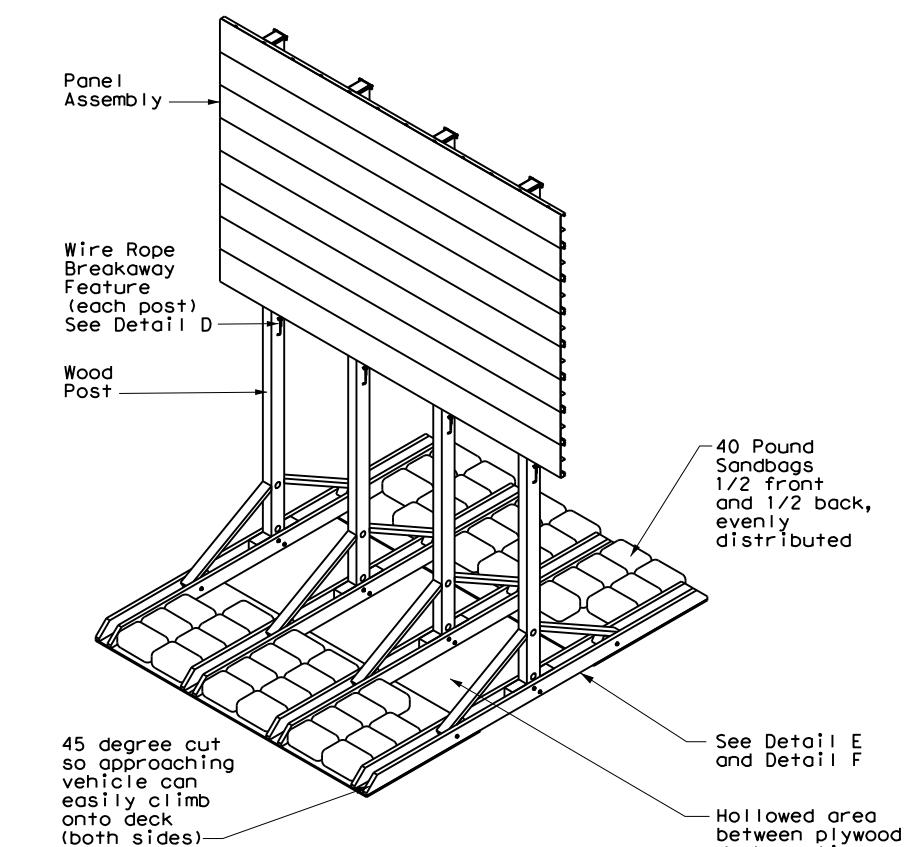
29°

BRACE BLOCK (4 x 4)



A307 Bolt, 3/8" x 7-1/2" hex Washer, 3/8" flat (x2) Washer, 3/8" lock Nut, 3/8" hex

WOOD SKID



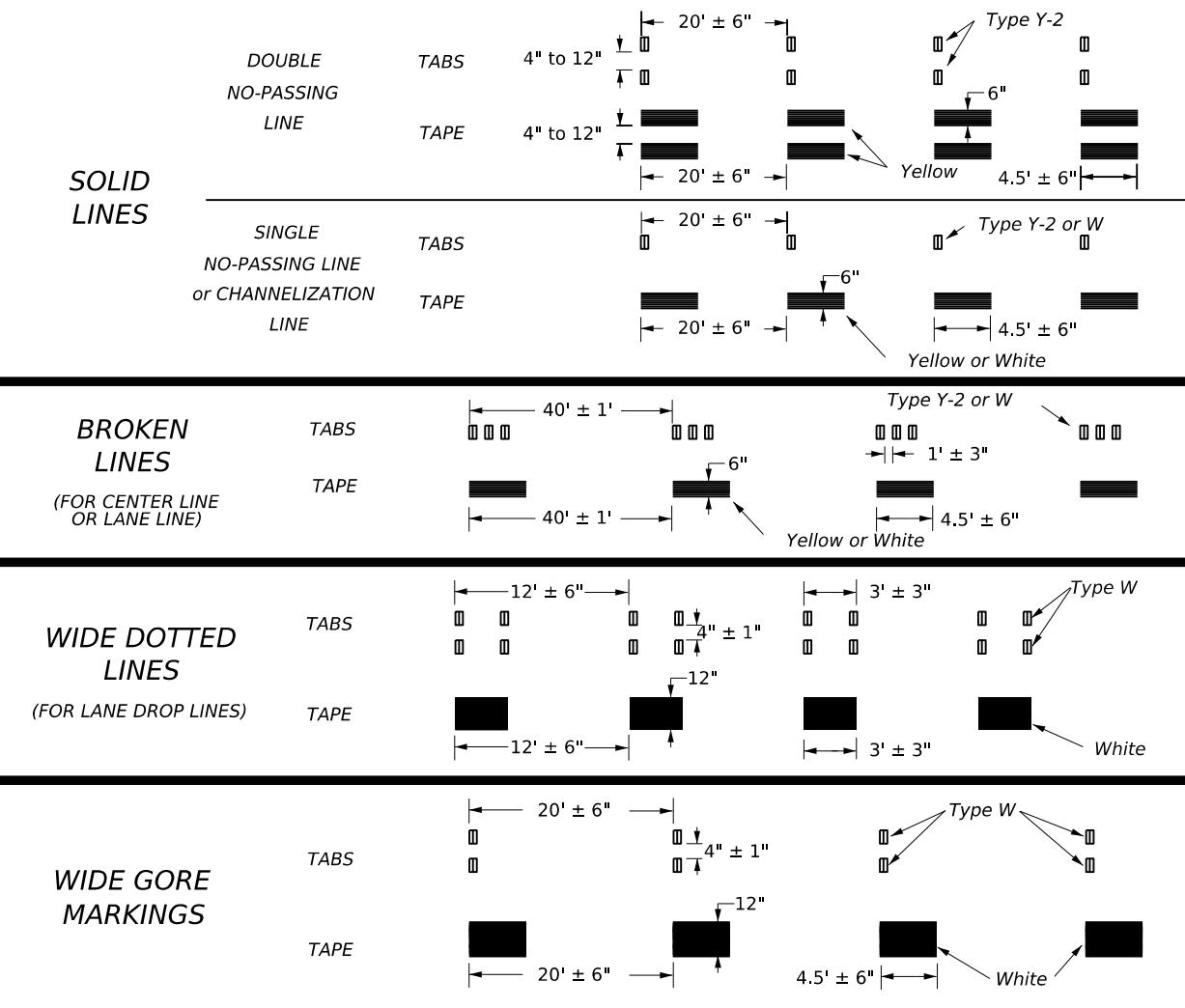
NOTE:

Contractor shall have the option to use another method to support the sandbags, provided the material under the sandbags does not exceed 0.75" in height. Examples include use of marine grade plywood or composite decking. Contractor may drill holes in plywood as needed for drainage.

SHEET 4 OF 4

	Texas Department of Transportation	Traffic Operations Division Standard
TEMPORARY LARGE ROADSIDE SIGNS: WOOD SKID		
TLRS (4) - 17		
FILE: tlrs-17.dgn	DN:	CK:
© TxDOT May 2017	CONT:	JOB:
REVISIONS	SECT:	HIGHWAY
-	-	-
DIST:	COUNTY:	SHEET NO.
SAT	GUADALUPE	30

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



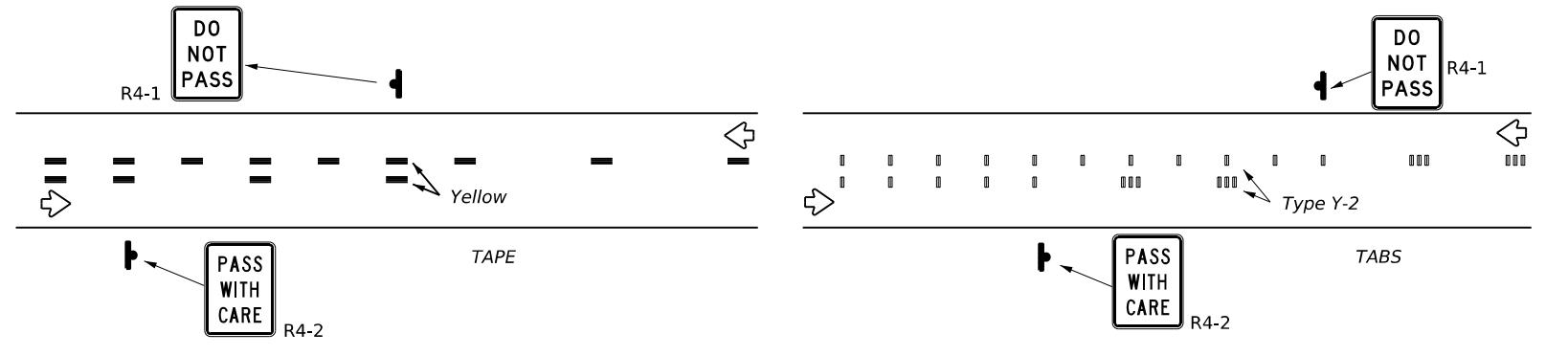
NOTES:

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

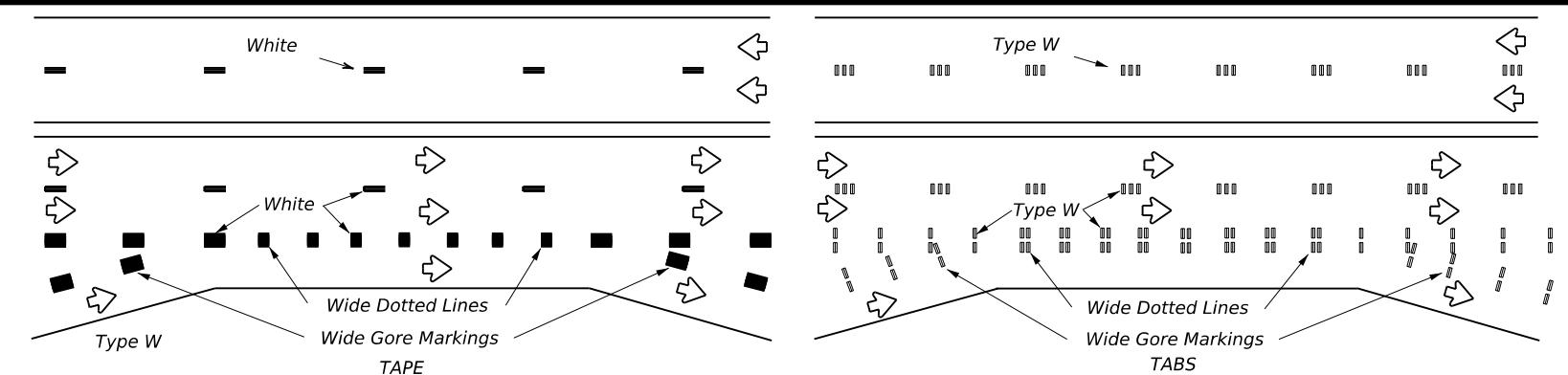
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

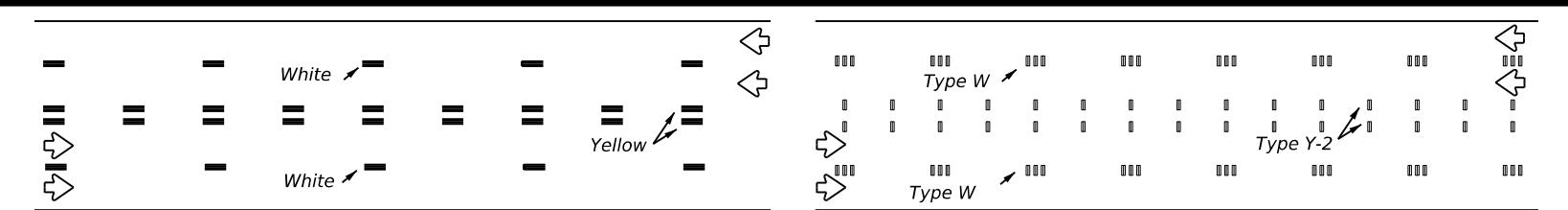
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



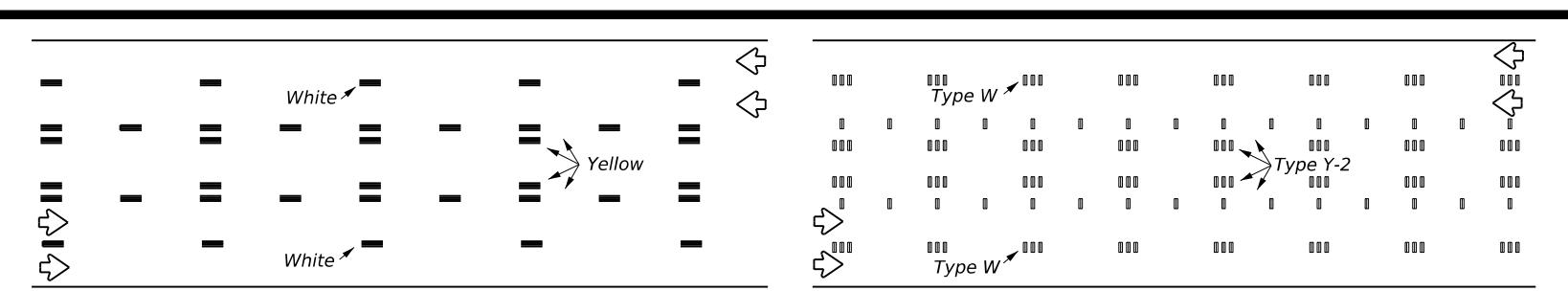
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



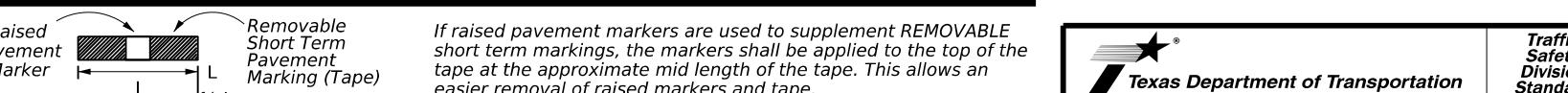
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm



WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE:	wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT	February 2023	CONT	SECT	JOB	HIGHWAY
		-	-	-	FM 2623
4-92	7-13				REVISIONS
1-97	2-23				
3-03					DIST COUNTY SHEET NO.
		SAT			GUADALUPE 31

Alignment Name: BL CL-FM2623
Alignment Description:
Alignment Style: Alignment\Baseline
Station **Northing** **Easting**
Element: Circular
 PC (PC) 1000.000 R1 13792681.06 2305756.633
 PI (PI) 1196.103 R1 13792726.87 2305947.309
 CC (CC) 13795017.55 2305195.216
 PT (PT) 1391.338 R1 13792803 2306128.033
Radius: 2403
Delta: 9.331° **Left**
Degree of Curvature (Arc): 2.384°
Length: 391.338

Tangent: 196.103
Chord: 390.906
Middle Ordinate: 7.962
External: 7.988
Back Tangent Direction: N76.489°E
Back Radial Direction: S13.511°E
Chord Direction: N71.824°E
Ahead Radial Direction: S22.842°E
Ahead Tangent Direction: N67.158°E
Element: Linear
 PT (PT) 1391.338 R1 13792803 2306128.033
 PC (PC) 1664.329 R1 13792908.97 2306379.616
Tangential Direction: N67.158°E
Tangential Length: 272.991
Element: Circular
 PC (PC) 1664.329 R1 13792908.97 2306379.616
 PI (PI) 2190.339 R1 13793114.14 2306863.963
 CC (CC) 13790270.98 2307497.063
 PT (PT) 2704.762 R1 13793133.87 2307389.604
Radius: 2864.9
Delta: 20.808° **Right**
Degree of Curvature (Arc): 2.000°
Length: 1040.433

Tangent: 526.01
Chord: 1034.725
Middle Ordinate: 47.102
External: 47.889
Back Tangent Direction: N67.043°E
Back Radial Direction: S22.957°E
Chord Direction: N77.446°E
Ahead Radial Direction: S2.150°E
Ahead Tangent Direction: N87.850°E
Element: Linear
 PT (PT) 2704.762 R1 13793133.87 2307389.604
 POT (POT) 2816.714 R1 13793136.17 2307501.532
Tangential Direction: N88.823°E
Tangential Length: 111.952



LJA Engineering, Inc. 
FRN-F-1386

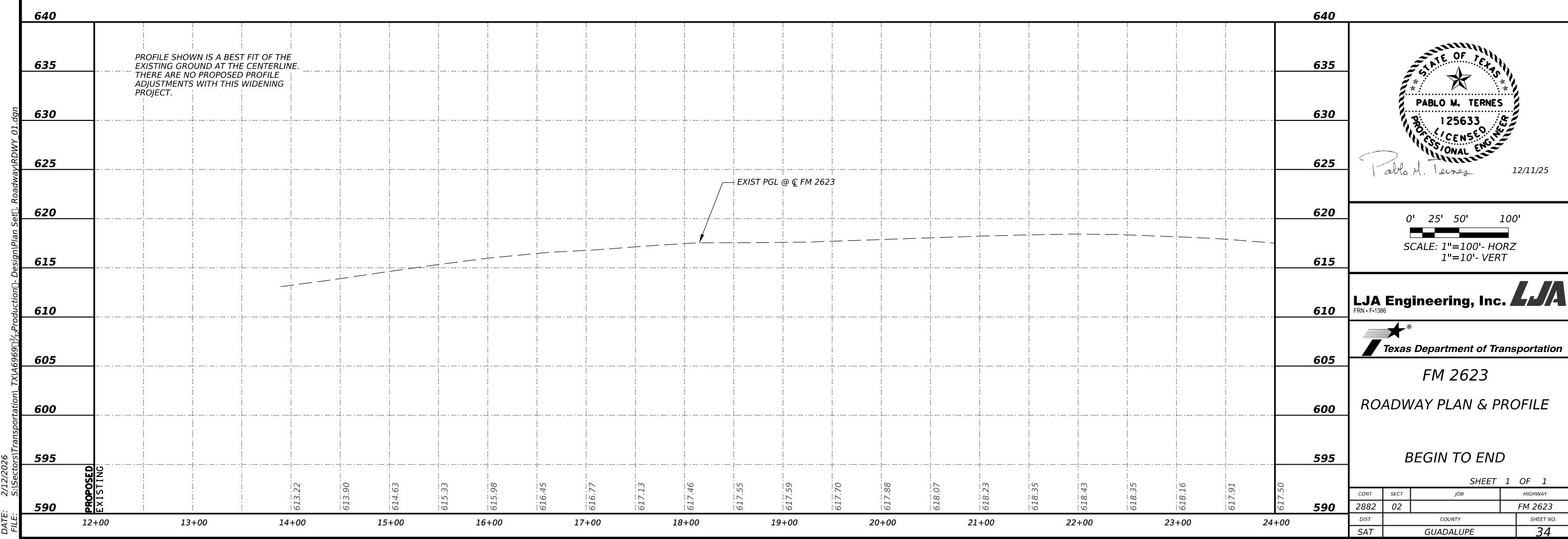
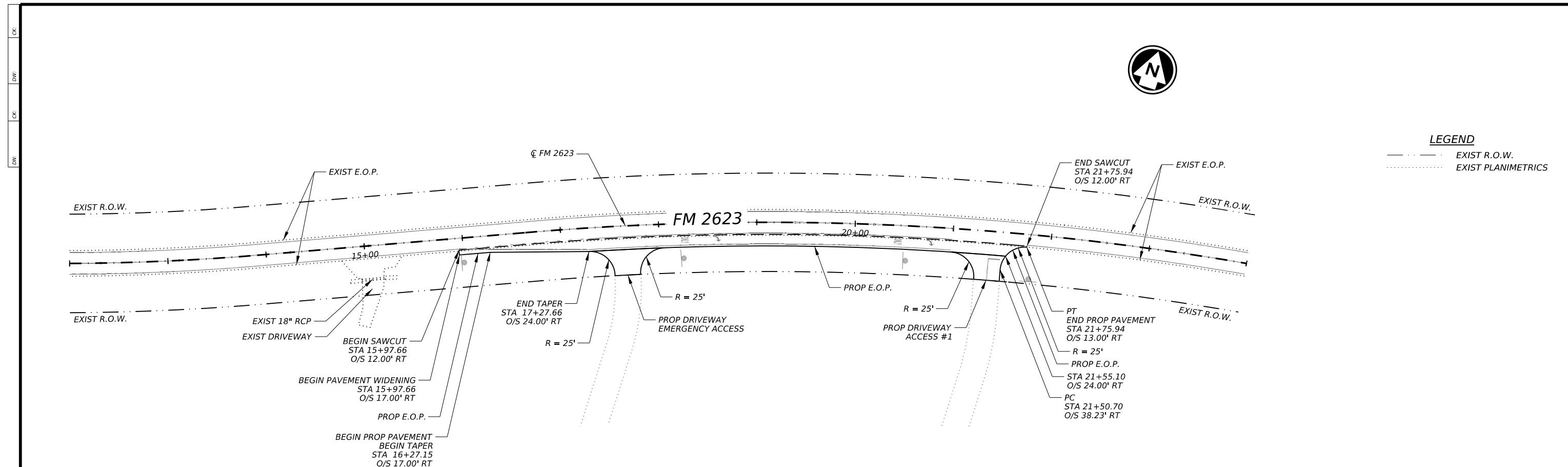
 Texas Department of Transportation

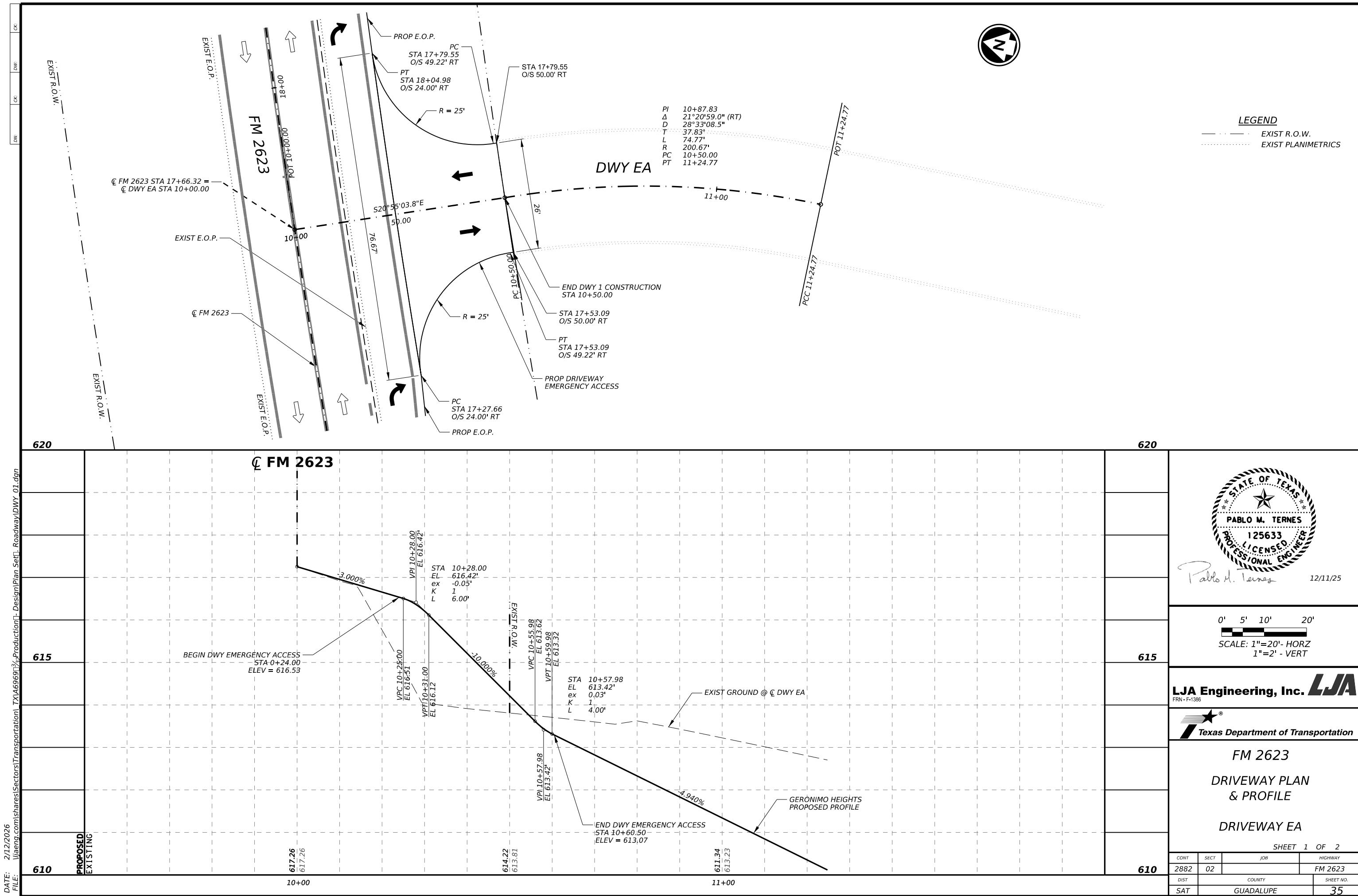
FM 2623

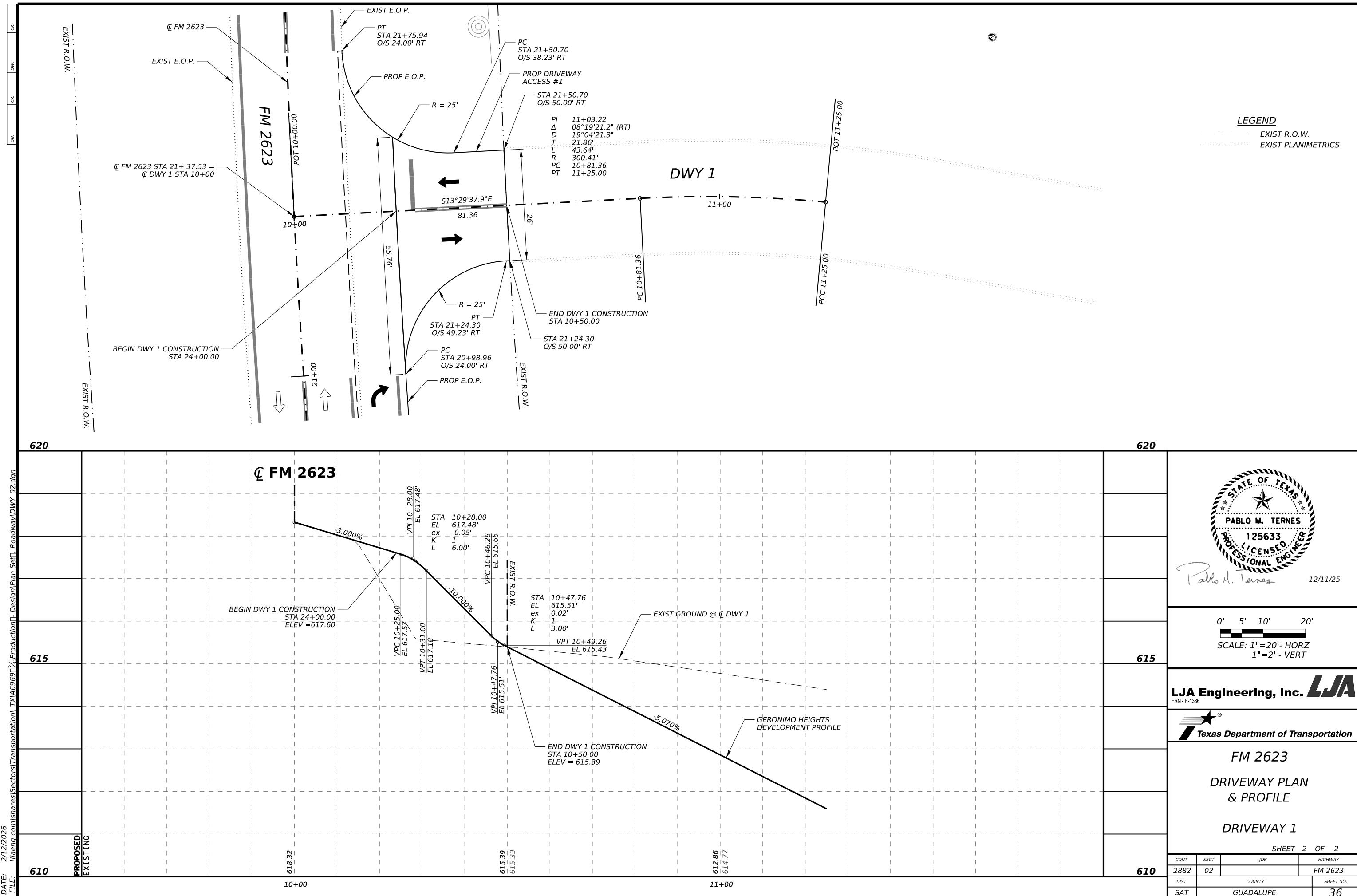
HORIZONTAL DATA

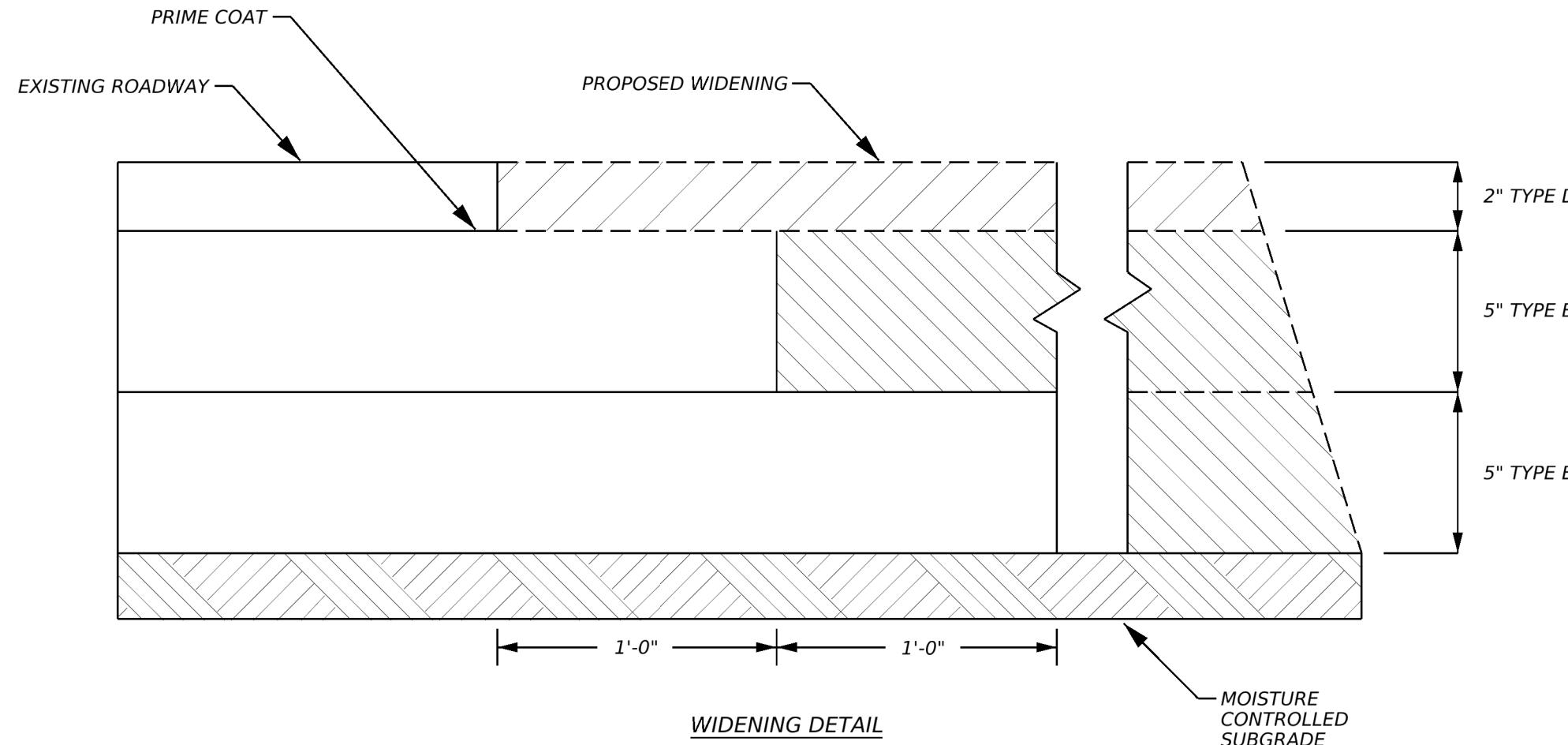
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		33









GENERAL NOTES:

1. ROADWAY WIDENING FOR DECELERATION LANE, STREET, OR DRIVEWAYS WILL COMPLY WITH TXDOT SPECIFICATION 112, 132, 316, 340, AND 530.
2. FINISHED GRADING AT THE EDGE OF EXISTING PROPOSED ROADWAY PAVEMENT AND ALL DISTURBED SOILS WILL INCLUDE A LAYER OF TOP SOIL TO BE PLACED AT A MINIMUM OF 4" DEPTH.
3. APPROVED COMPACTION BY PROOF ROLL WITH TXDOT INSPECTOR.

NOT TO SCALE

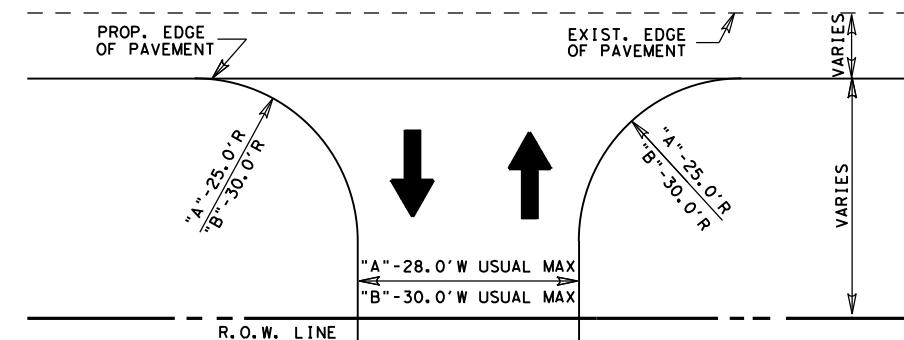
 Texas Department of Transportation

NEW BRAUNFELS AREA OFFICE STANDARD

WIDENING DETAIL

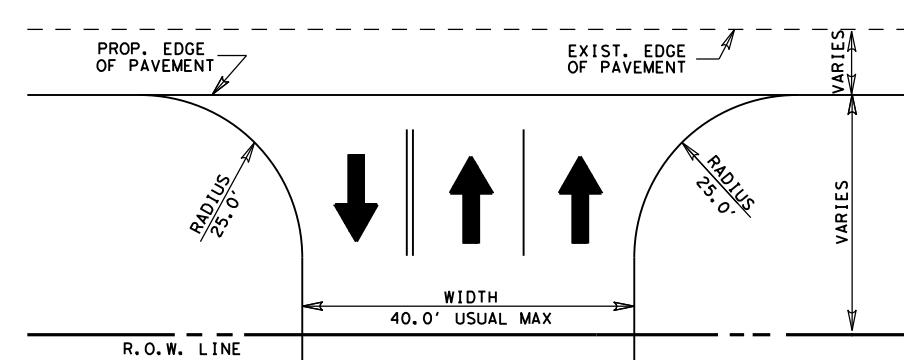
© TXDOT 2026	SHEET	OF	
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
			37

DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



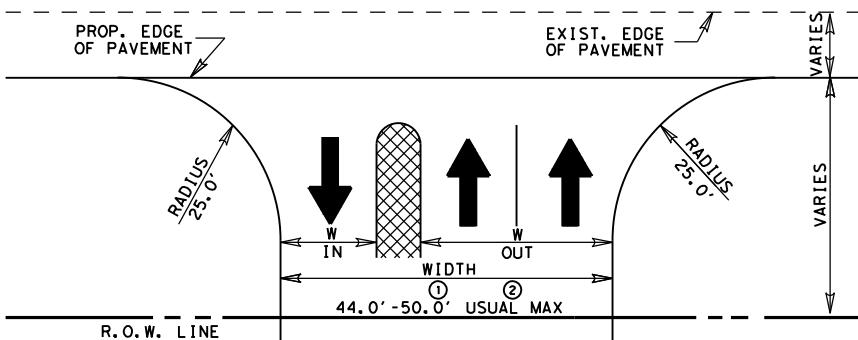
"A" - ONE ENTRY LANE AND ONE EXIT LANE, FEWER THAN 4 LARGE VEHICLES PER HOUR
 "B" - ONE ENTRY LANE AND ONE EXIT LANE, 4 OR MORE SINGLE UNIT VEHICLES^① PER HOUR

① - DRIVEWAY DESIGNS FOR LARGER VEHICLES WILL BE CONSIDERED ON A CASE BY CASE BASIS



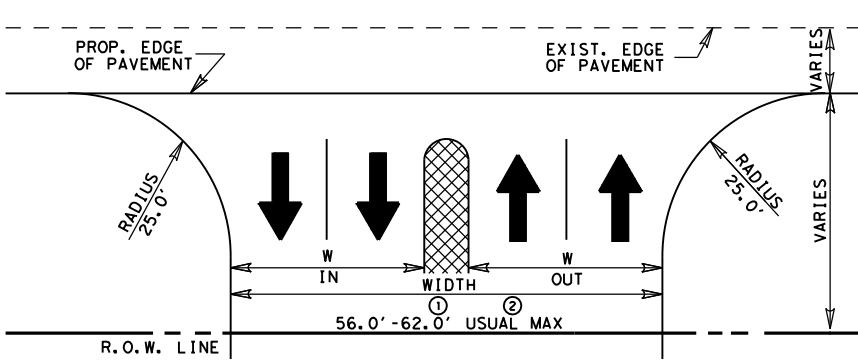
ONE ENTRY LANE AND TWO EXIT LANES (WITHOUT DIVIDERS)

DESIGNS FOR TWO-WAY COMMERCIAL DRIVEWAYS



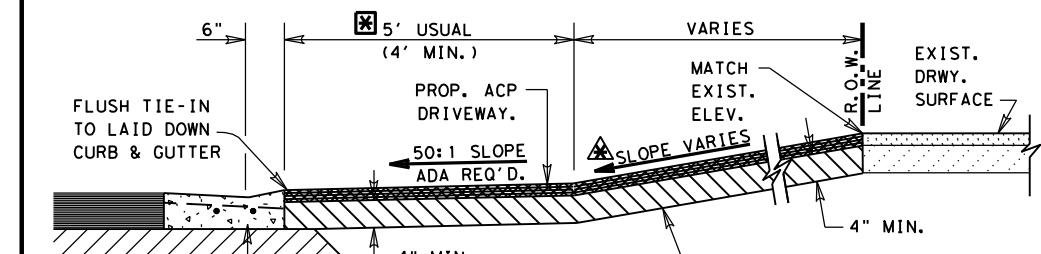
① - 4.0' WIDE DIVIDER, FACE-TO-FACE CURBS
 ② - 10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS

ONE ENTRY LANE AND TWO EXIT LANES (WITH A DIVIDER)

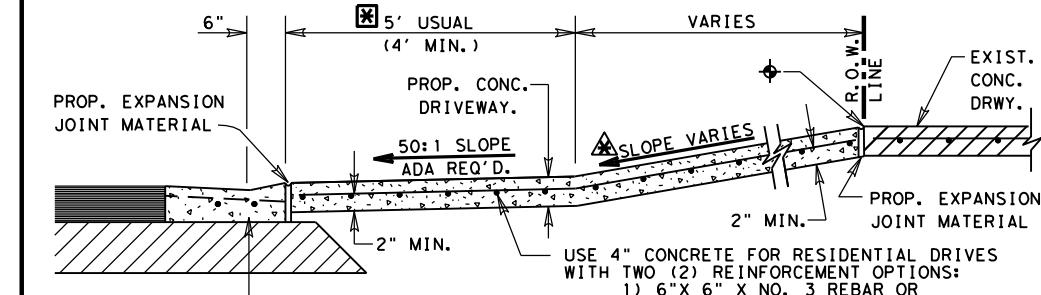


① - 4.0' WIDE DIVIDER, FACE-TO-FACE CURBS
 ② - 10.0' WIDE DIVIDER, FACE-TO-FACE-CURBS

TWO ENTRY LANES AND TWO EXIT LANES (WITH A DIVIDER)



TYPICAL ASPH. CONC. PVM T. DRIVEWAY SECTION



USE 4" CONCRETE FOR RESIDENTIAL DRIVES WITH TWO (2) REINFORCEMENT OPTIONS:
 1) 6" X 6" X NO. 3 REBAR OR
 2) NO. 6 GAUGE WIRE MESH
 USE 6" CONCRETE FOR COMMERCIAL DRIVES WITH ONE (1) REINFORCEMENT OPTION:
 1) NO. 4 REBAR @ 9" C-C

TYPICAL CONCRETE DRIVEWAY SECTION

N. T. S.

CONCRETE SHALL BE SAW CUT TO THE LIMITS OF REMOVAL WHERE APPLICABLE.

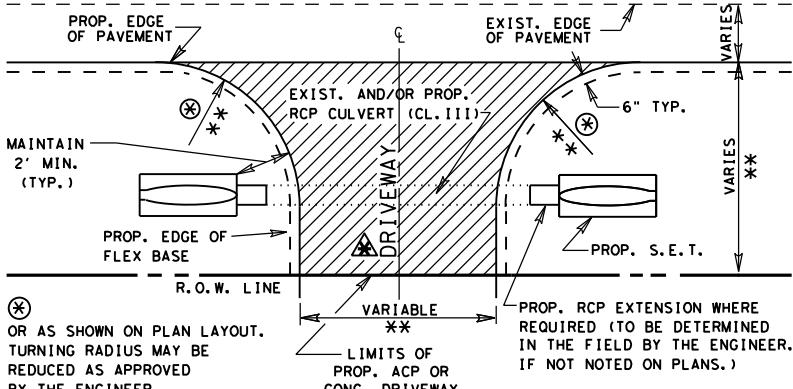
PROP./FUTURE SIDEWALK CROSSING LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. SEE P&P SHEETS FOR PROP. SIDEWALK LOCATION IF SIDEWALKS ARE INCLUDED AS PART OF PROJECT. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

PROPOSED DRIVEWAY SLOPE TABLE
 COMMERCIAL DRIVEWAYS @ A = 6% MAX.
 RESIDENTIAL DRIVEWAYS @ A = 8% MAX.

ENTRANCE'S BASE AND SURFACING MAY BE EXTENDED BEYOND R.O.W. LINE AS REQUIRED TO MEET EXISTING GRADE IN A SATISFACTORY MANNER OF WHICH NO STEEPER THAN 12:1 FOR COMMERCIAL DRIVEWAY AND 8:1 FOR RESIDENTIAL DRIVEWAY SLOPE WILL BE CONSTRUCTED.

PROPOSED DRIVEWAY SLOPE TABLE
 COMMERCIAL DRIVEWAYS @ 12:1 MAX.
 RESIDENTIAL DRIVEWAYS @ 8:1 MAX.

PRIVATE AND COMMERCIAL DRIVES WITHOUT CURB & GUTTER

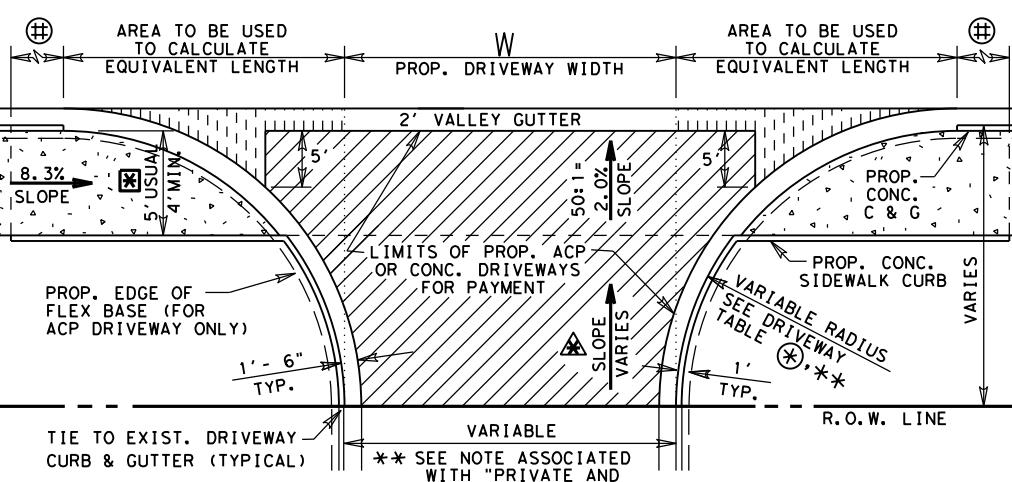


PLAN OF PRIVATE AND COMMERCIAL DRIVES

** FOR PRIVATE RESIDENTIAL DRIVES, TRY TO MATCH EXISTING WITH A MINIMUM WIDTH OF 12 FT. AND A MAXIMUM WIDTH OF 24 FT. WITH 15 FT. USUAL RADIUS. FOR COMMERCIAL DRIVES, USE ABOVE COMMERCIAL DRIVEWAY DETAILS.

SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

PRIVATE AND COMMERCIAL DRIVES WITH CURB & GUTTER



PLAN OF PRIVATE AND COMMERCIAL DRIVES

SEE P&P SHEETS FOR LOCATIONS OF DRIVES N.T.S.

PROP./FUTURE CONC. SIDEWALK LOCATION UNLESS SHOWN ELSEWHERE ON P&P SHEETS. REFER TO STATE STANDARDS - PEDESTRIAN FACILITIES - FOR ADDITIONAL REQUIREMENTS.

④ LIMITS OF SLOPE FOR PROP. CONC. CURB BASED ON 8.3% SLOPE FOR SIDEWALK.

SEE TYPICAL DRIVEWAY SECTIONS NOTES FOR DRIVEWAY SLOPE CRITERIA.

LF EQUIVALENT TABLE FOR PAYMENT LIMITS OF 2' VALLEY GUTTER

LF OF VALLEY GUTTER = W + X ₁ + X ₂
WHERE X ₁ AND X ₂ MAY VARY DEPENDING ON RADIUS
Prop. Driveway Radius X ₁ or X ₂ (Sq Ft Area / 2') Equivalent LF Length
5' 1
8' 2
10' 4
12' 6
15' 9
18' 12
20' 15
22' 18
25' 24
28' 30
30' 34

DRIVEWAY TYPES

TY PB-1
 EXIST. PRIVATE OR COMMERCIAL DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" NEW AND/OR SALVAGE FLEX. BASE, PRIMED AND SURFACED WITH 171#/SY ACP. (HMA-D PG 64-22 SAC B MEETING ITEM 340)

CONCRETE (RESIDENTIAL)
 EXIST. PRIVATE DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 4" CONCRETE. TO BE PAID FOR BY THE SQ. YD.

CONCRETE (COMMERCIAL)
 EXIST. BUSINESS DRIVEWAYS TO BE CONSTRUCTED AS SHOWN WITH 6" CONCRETE. TO BE PAID FOR BY THE SQ. YD.

TXDOT 2021

PHARR DISTRICT STANDARD



DRIVEWAY DETAILS PRIVATE (RESIDENTIAL-COMMERCIAL)

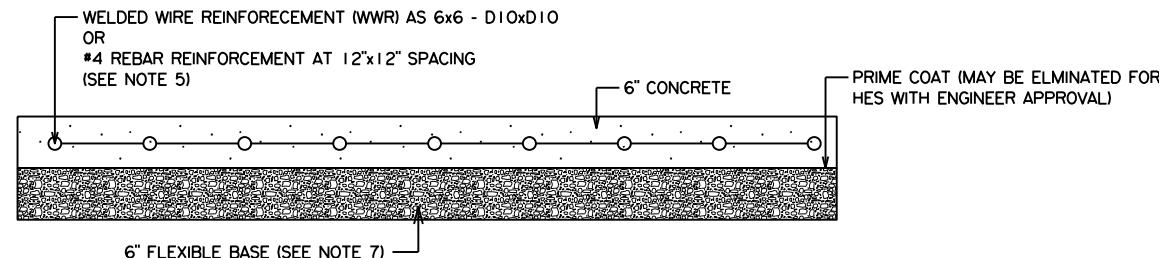
REV. 08/22

FED. RD. NO.	PROJECT NO.	FILE NO.	SHEET NO.
6			38
STATE DIST. NO.	COUNTY	CONT.	SECT.
TEXAS 21		JOB	HIGHWAY NO.

\$ TIMES

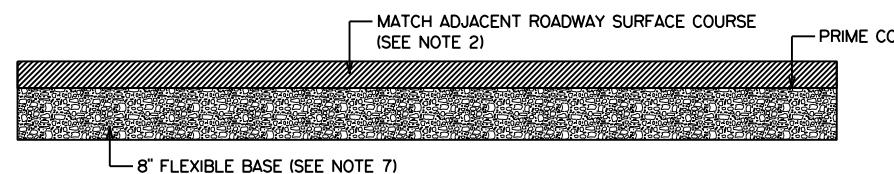
\$ DATES

\$ FILES



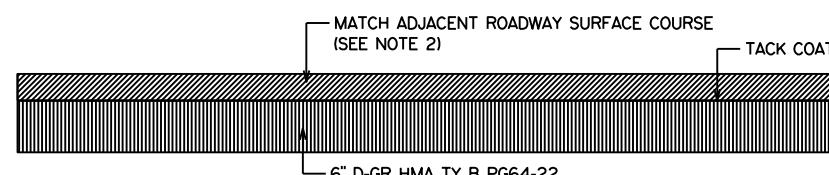
TYPICAL CONCRETE DRIVEWAY

- NOTE: STEEL SHALL BE CENTERED VERTICALLY IN CONCRETE.
PAID AS 'DRIVEWAYS CONC (HES)' OR 'DRIVEWAYS (CONC)'



TYPICAL ROADWAY DRIVEWAY (TYPE 1)

PAID AS DRIVEWAYS ACP (TYPE 1)

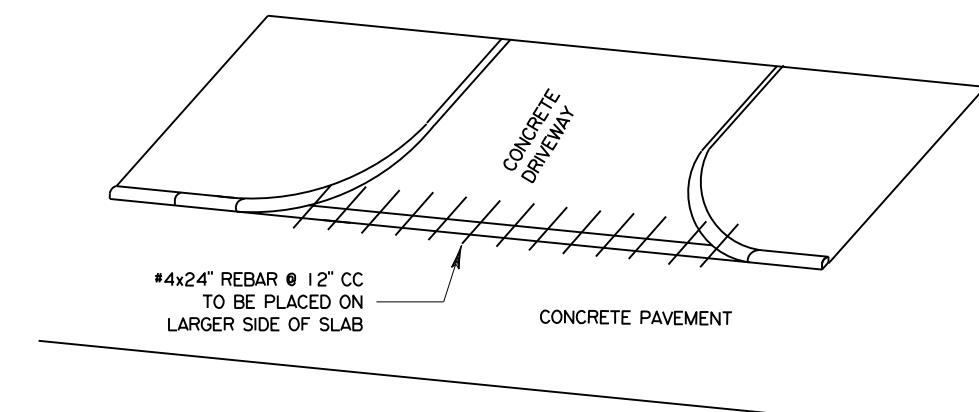


TYPICAL ROADWAY DRIVEWAY (TYPE 2)

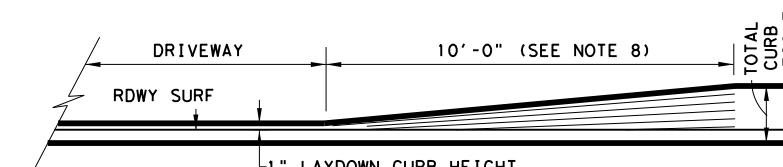
PAID AS DRIVEWAYS ACP (TYPE 2)

NOTES:

1. USE CLASS A CONCRETE UNLESS OTHERWISE NOTED.
2. DENSE GRADED HMA MAY BE USED WHEN APPROVED BY THE ENGINEER IF THE ROADWAY SURFACE COURSE IS A PERFORMANCE MIX.
3. REFER TO PLAN SHEETS FOR GEOMETRIC DESIGN DETAILS.
4. FOR CONCRETE DRIVEWAYS, PROVIDE EXPANSION JOINT 20 FT C-C FOR WIDTH OR LENGTH OVER 25 FT.
5. FIBER REINFORCEMENT IS NOT ALLOWED.
6. MACHINE LAID HMA IS REQUIRED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. FURNISH BASE MEETING THE REQUIREMENTS FOR ANY TYPE OF GRADE IN ACCORDANCE WITH ITEM 247. FLEXIBLE BASE COMPRESSIVE STRENGTHS ARE WAIVED. BASE IS SUBSIDIARY TO THE ITEM.
8. WHERE SIDEWALK IS PRESENT, SLOPE AND LENGTH OF CURB TRANSITION SHOULD MATCH THE SIDEWALK AND MEET ADA REQUIREMENTS.
9. IF ROOTS ARE ENCOUNTERED VERIFY WITH THE ENGINEER PRIOR TO ACCOMODATING OR REMOVING 2 IN. DIAMETER OR LARGER ROOTS. ROOT REMOVAL MUST BE IN ACCORDANCE WITH ITEM 752.4.2. ROOTS MAY REMAIN IN THE BASE. FOR IMPROVEMENTS WITHIN 6 IN. OF A ROOT, THE CONCRETE THICKNESS MAY BE REDUCED BY 1 IN. AND THE BASE INCREASED BY 1 IN. TO MINIMIZE THE IMPACT TO THE ROOTS. ADJUST BASE AND SURFACE PROFILE TO PROVIDE A 1 IN. BASE CUSHION AROUND THE ROOTS. THE SURFACE PROFILE MAY BE ADJUSTED TO THE EXTENT ALLOWED BY ADA. THIS WORK IS SUBSIDIARY.



TIE BAR PLACEMENT WITH CRCP



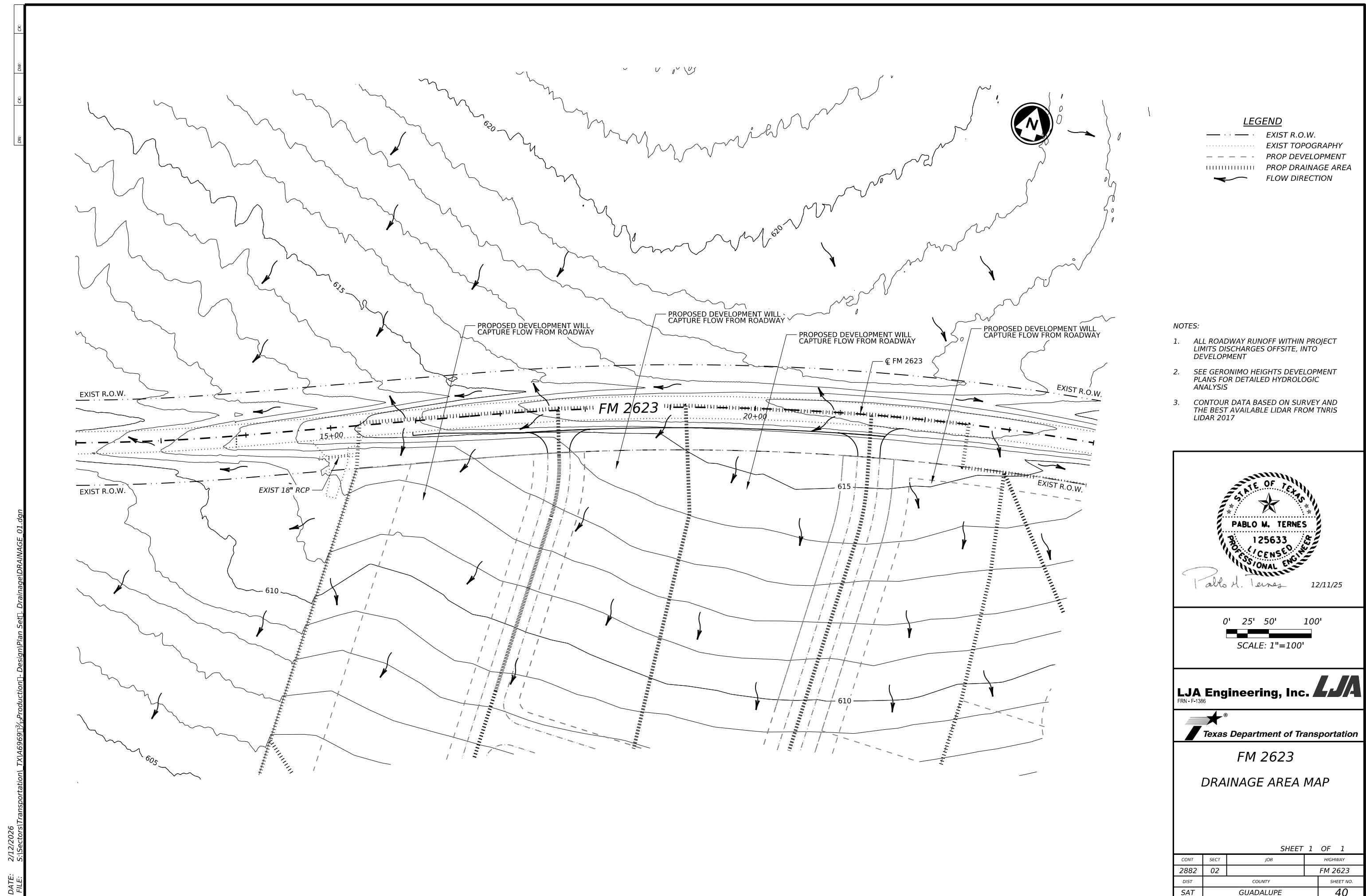
LAYDOWN CURB AT DRIVEWAYS DETAIL

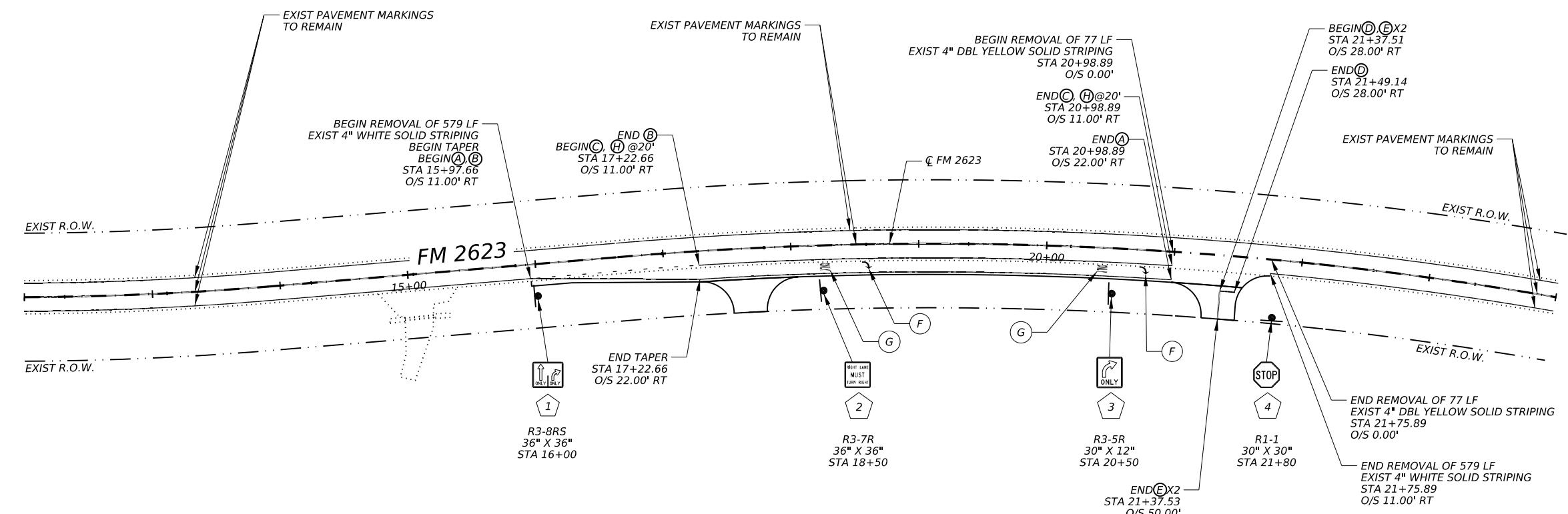


DRIVEWAY DETAILS

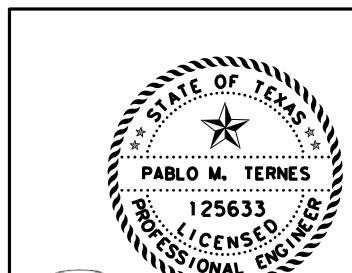
San Antonio District Standard
Sheet (1 of 1)

T:\Engdata\Standards\Drivewaydetails.dgn			PREPARED BY AND FOR USE OF TxDOT.		
ORIGINAL DRAWING DATE: 8/1/2020	STATE DISTRICT	FEDERAL AID PROJECT	•	SHEET	
REVISIONS	6			39	
	COUNTY	CONTROL SECTION	JOB	HIGHWAY	



LEGEND

- (A) REFL PAV MRK TY I (W) 4" (SLD) (90 MIL)
- (B) REFL PAV MRK TY I (W) 8" (DOT) (90 MIL)
- (C) REFL PAV MRK TY I (W) 8" (SLD) (90 MIL)
- (D) REFL PAV MRK TY I (W) 12" (SLD) (90 MIL)
- (E) REFL PAV MRK TY I (Y) 6" (SLD) (90 MIL)
- (F) REFL PAV MRK TY I (W) (ARROW) (90 MIL)
- (G) REFL PAV MRK TY I (W) (WORD) (90 MIL)
- (H) REFL PAV MRK TY I-C
- (#) PROPOSED SMALL SIGN
- SMALL SIGN ASSEMBLY



0' 25' 50' 100'
SCALE: 1"=100'

LJA Engineering, Inc. **LJA**
FRN-F-1386

Texas Department of Transportation

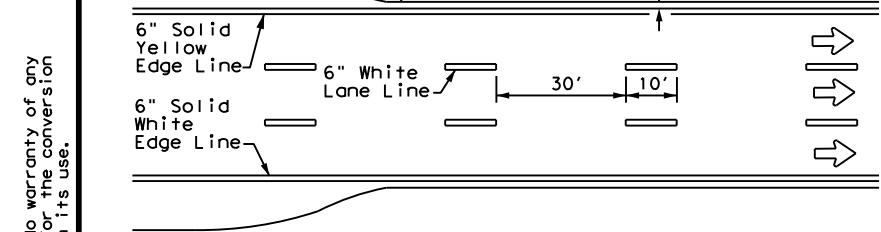
FM 2623

SIGNING & PAVEMENT
MARKINGS

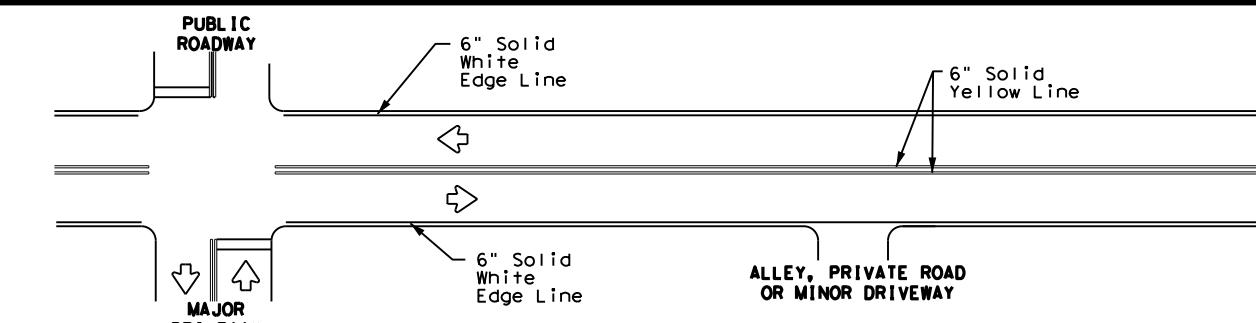
BEGIN TO END

SHEET 1 OF 1

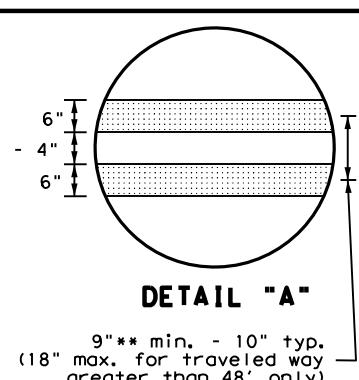
CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	41



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



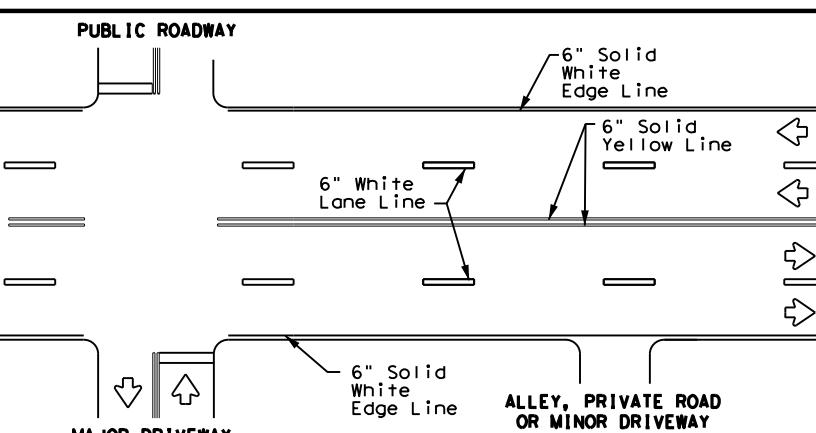
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



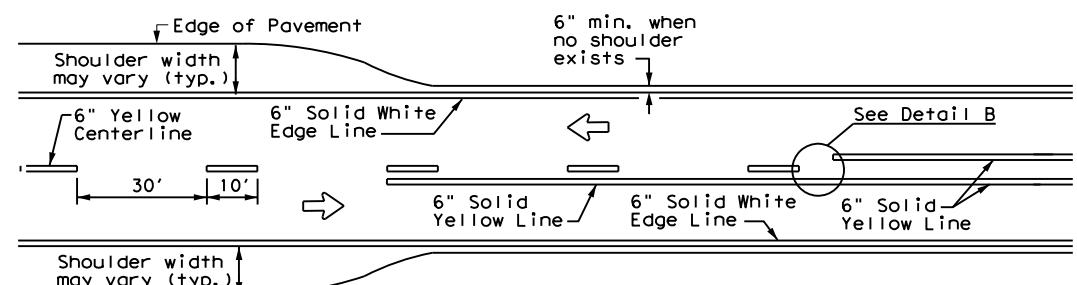
DETAIL "A"

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

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

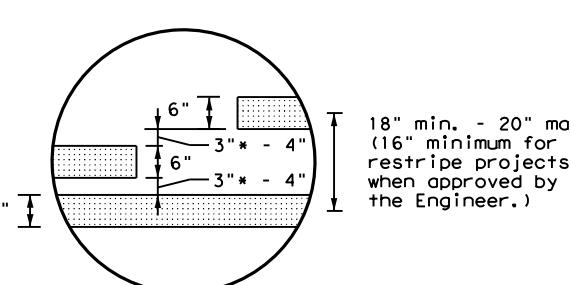


**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



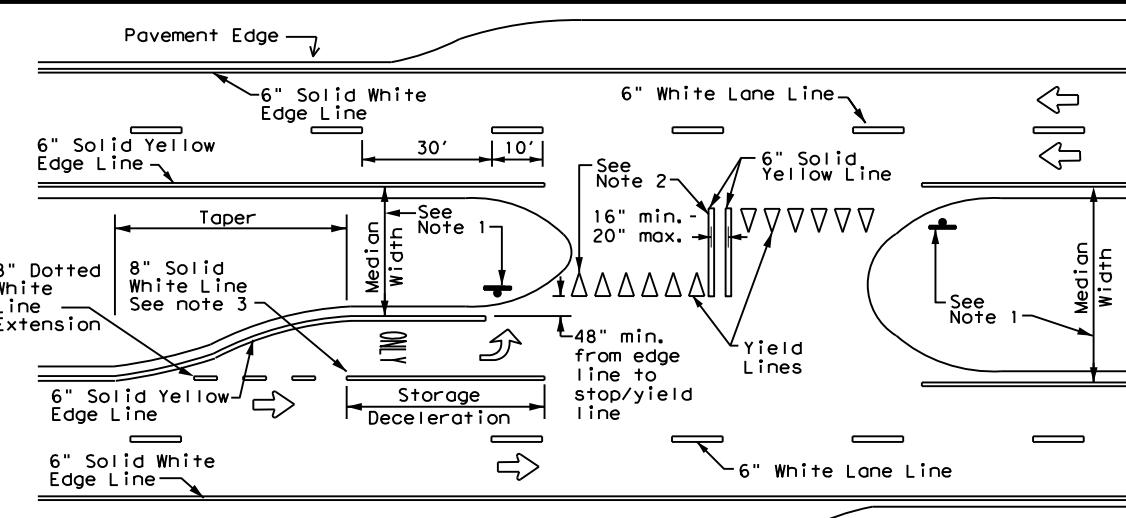
**TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**

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



DETAIL "B"

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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

- 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.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

For posted speed on road being marked equal to or less than 40 MPH.

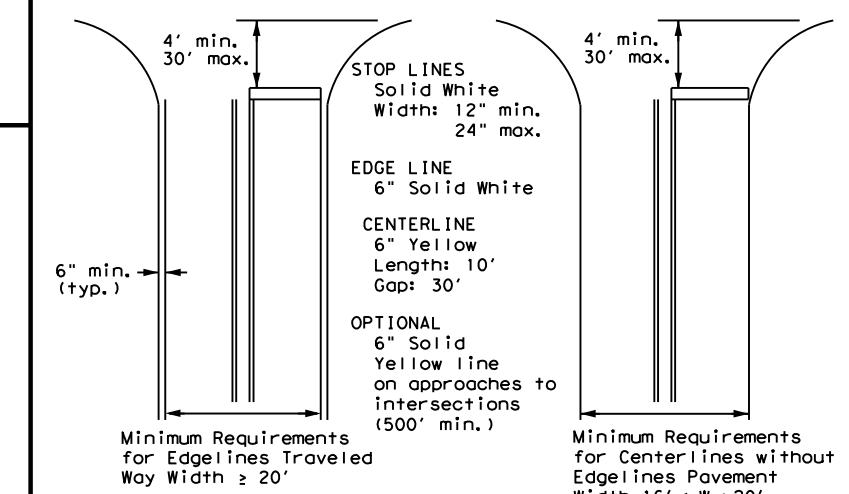
For posted speed on road being marked equal to or greater than 45 MPH.

GENERAL NOTES

- 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.
- 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

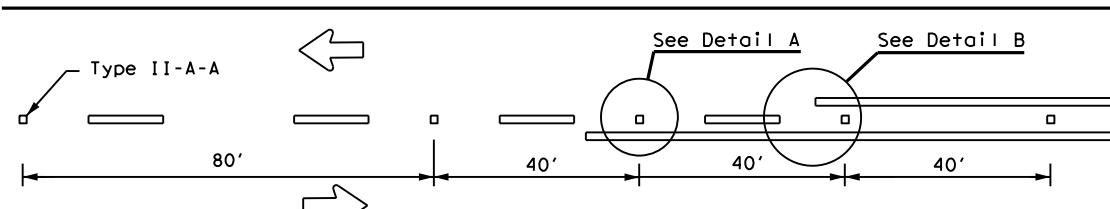
Texas Department of Transportation				Traffic Safety Division Standard
TYPICAL STANDARD PAVEMENT MARKINGS				
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	-	-	-	FM 2623
11-78 8-00 6-20	DIST	COUNTY	Sheet No.	
8-95 3-03 12-22	SAT	GUADALUPE		42
5-00 2-12				

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

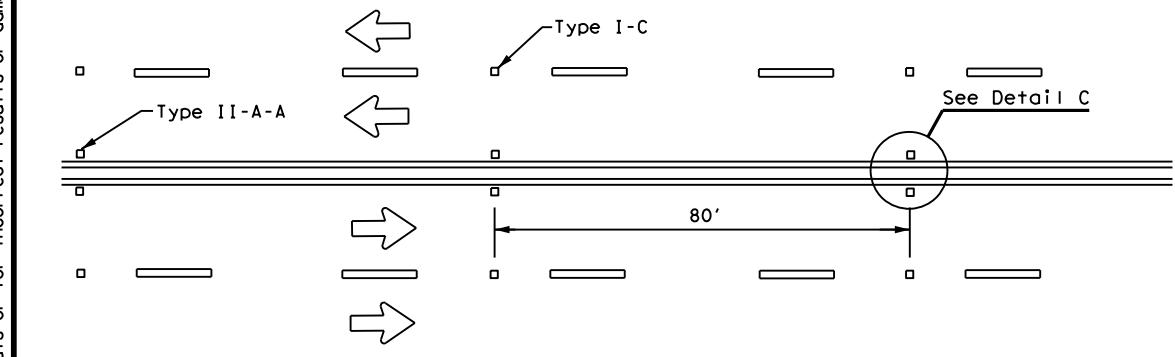
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for incorrect results or damages resulting from its use.

Printed on 8/22/2026

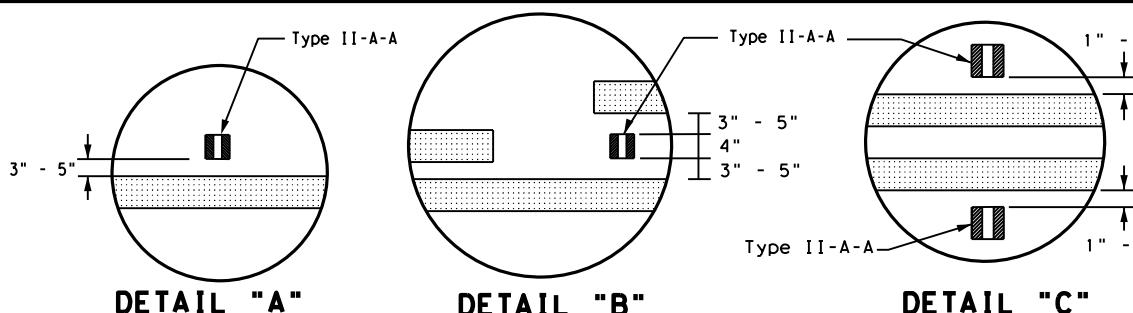
DATE: 2/12/2026
FILE: S:\Sectors\Transportation\Tx\16969\Production\Design\Plan Set\



CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



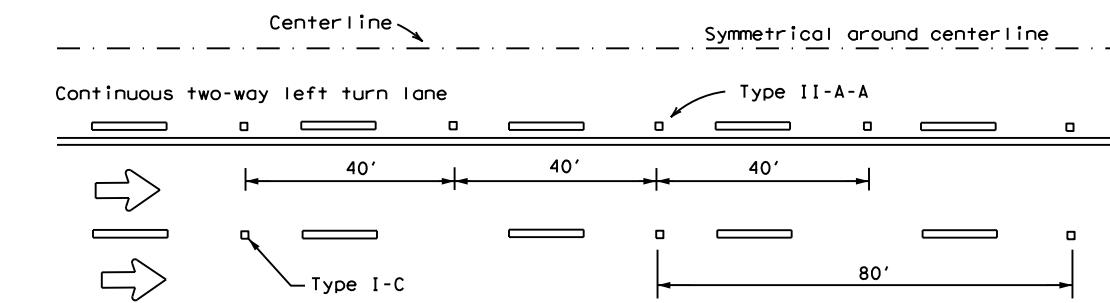
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS



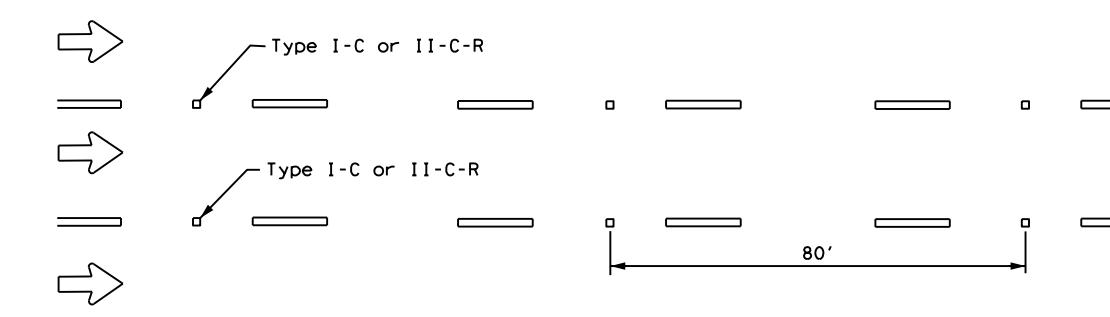
DETAIL "A"

DETAIL "B"

DETAIL "C"

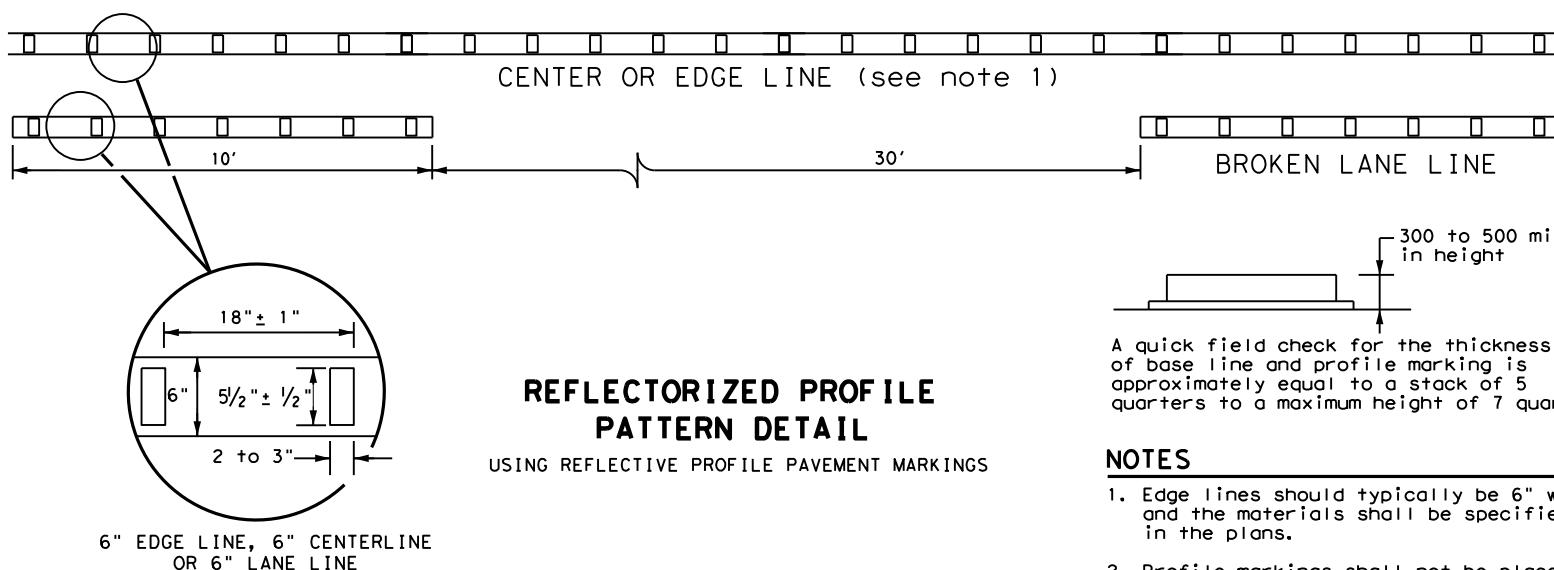


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

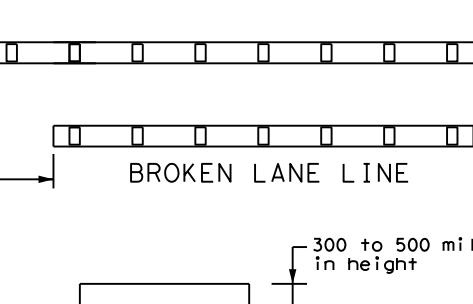
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.
See Note 3.



REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

6" EDGE LINE, 6" CENTERLINE
OR 6" LANE LINE



A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

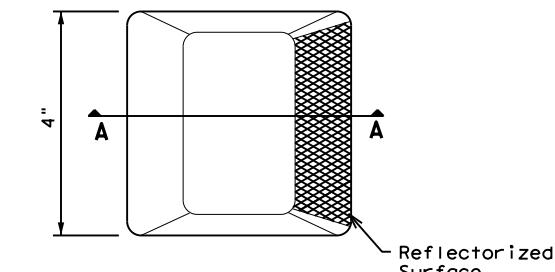
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

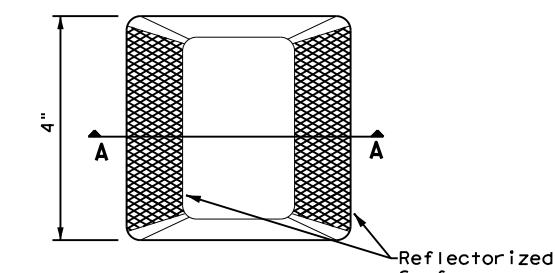
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians,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

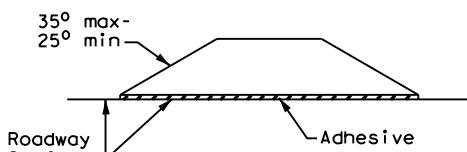
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



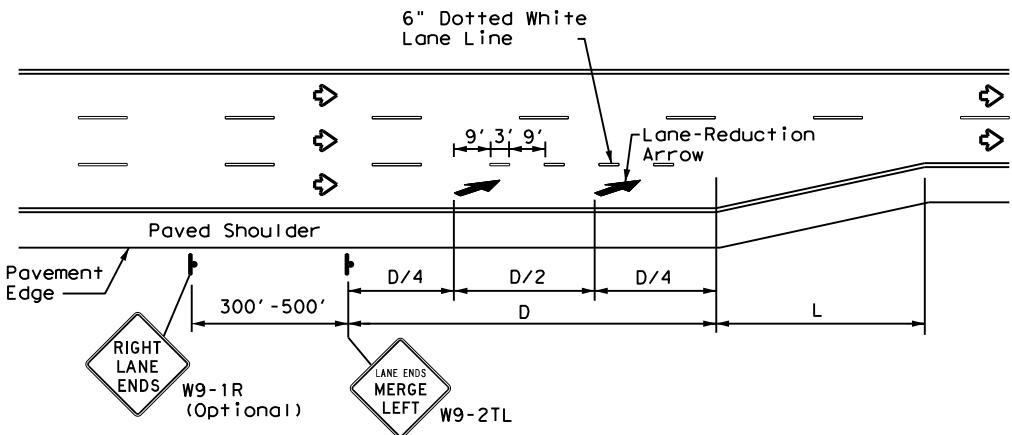
SECTION A

RAISED PAVEMENT MARKERS



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
	-	-	-	FM 2623
REVISIONS				
4-77 8-00 6-20				
4-92 2-10 12-22				
5-00 2-12				
DIST	COUNTY		SHEET NO.	
SAT	GUADALUPE			43

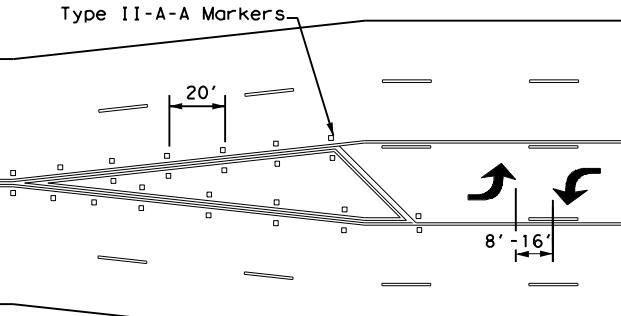
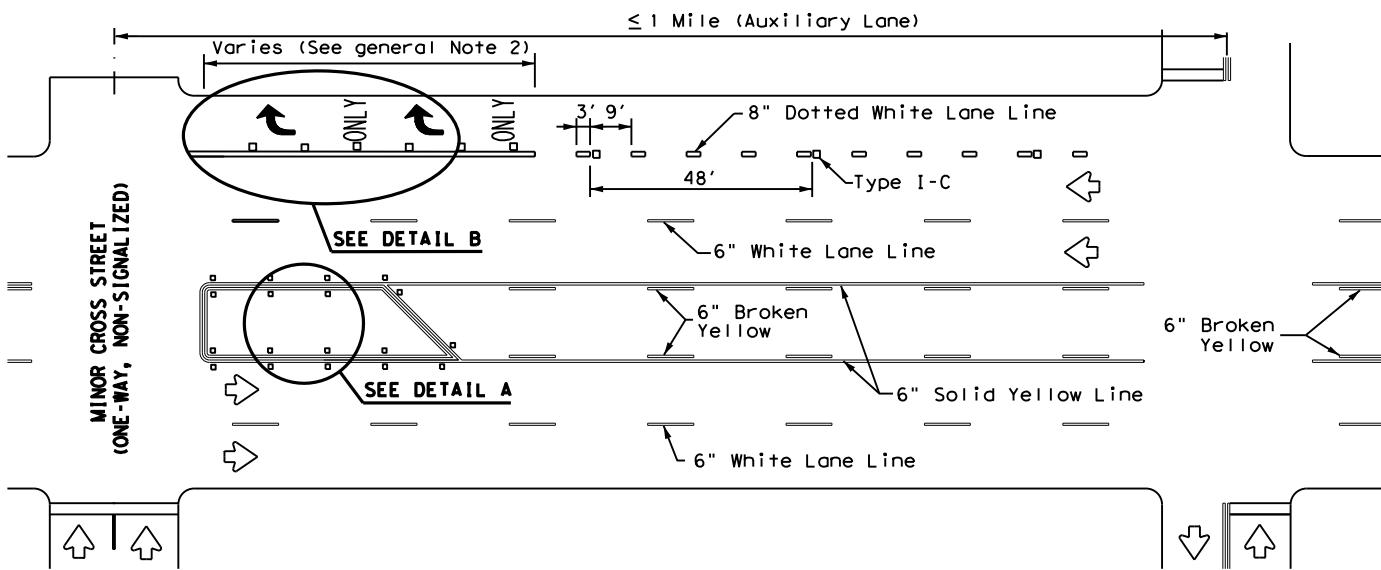


NOTES

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	
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

LANE REDUCTION



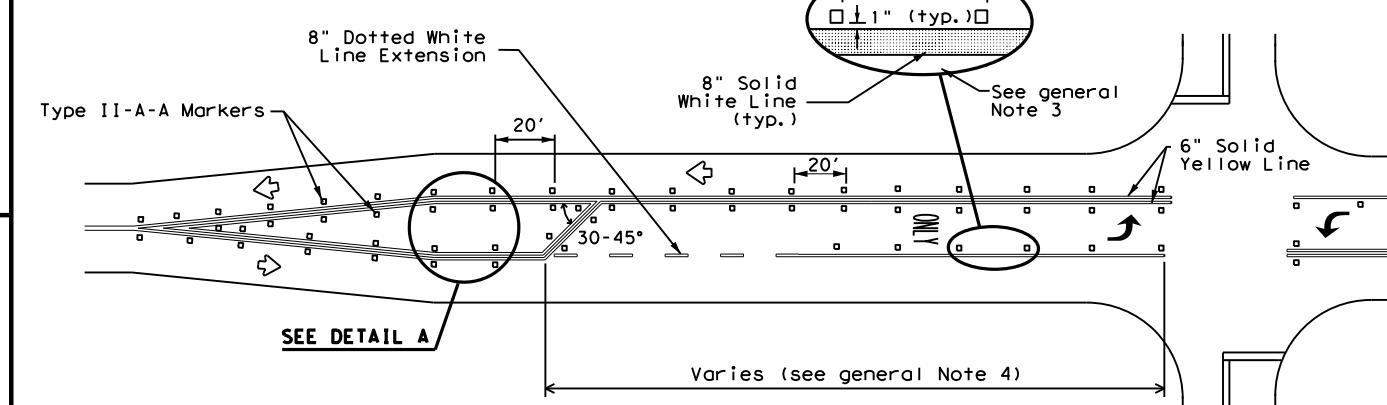
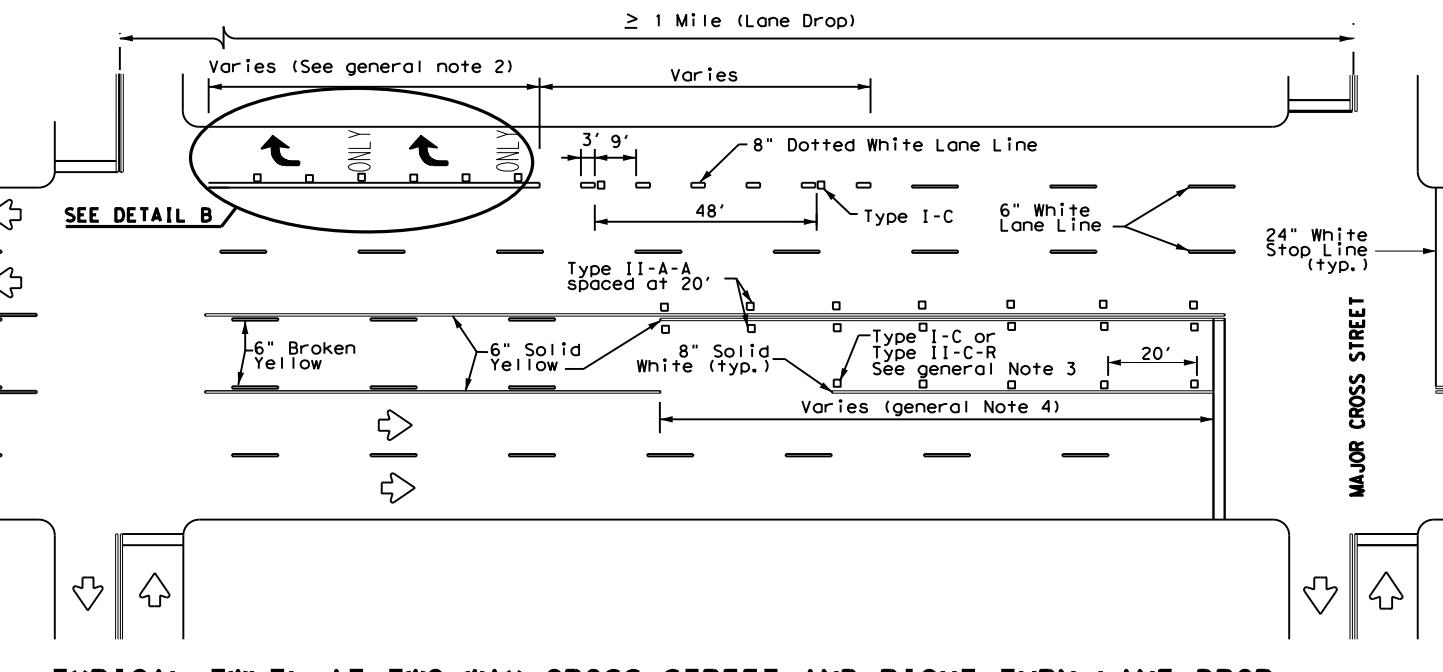
A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

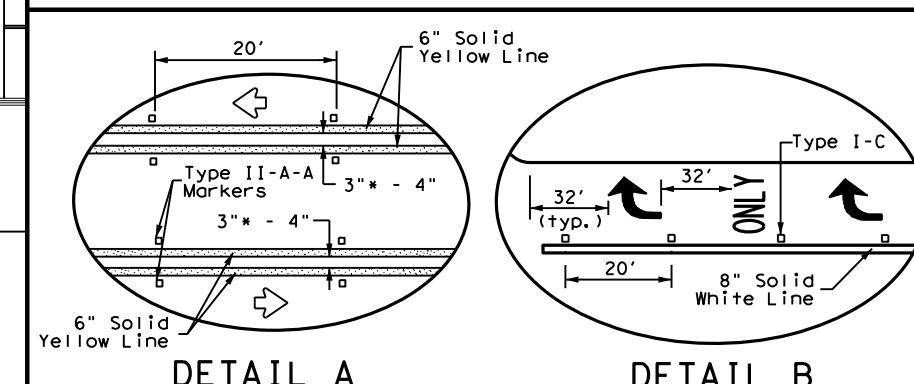
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

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.



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
	-	-	-	FM 2623
REVISIONS	DIST	COUNTY	SHEET NO.	
4-98 3-03 6-20	SAT	GUADALUPE	44	
5-00 2-10 12-22				
8-00 2-12				

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

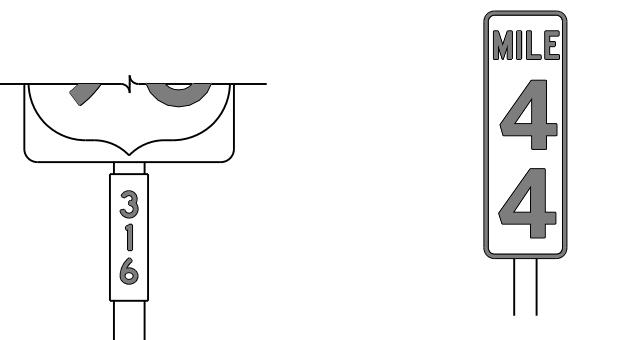
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W
3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

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

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>



Texas Department of Transportation

*Traffic
Operations
Division
Standard*

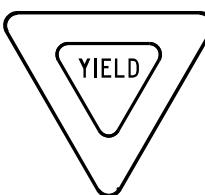
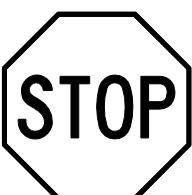
TYPICAL SIGN REQUIREMENTS

TSR (3) - 13

tsr3-13.dgn		DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
xDOT October 2003		CONT	SECT	JOB		HIGHWAY			
REVISIONS 03 7-13 08		-	-	-		FM 2623			
		DIST	COUNTY			SHEET NO.			
		SAT	GUADALUPE			45			

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

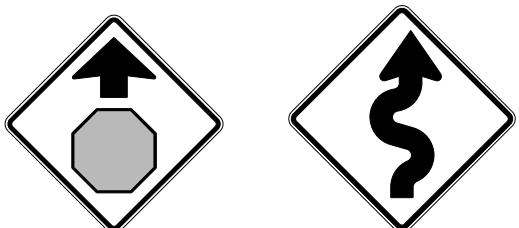
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS

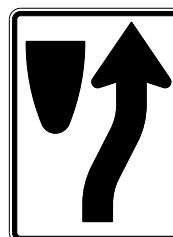


TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>



TYPICAL SIGN REQUIREMENTS

TSR (4) - 13

FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB		HIGHWAY			
		-	-	-					FM 2623
		REVISIONS							
		12-03	7-13						
		9-08							
DIST		COUNTY							
SAT		GUADALUPE							

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

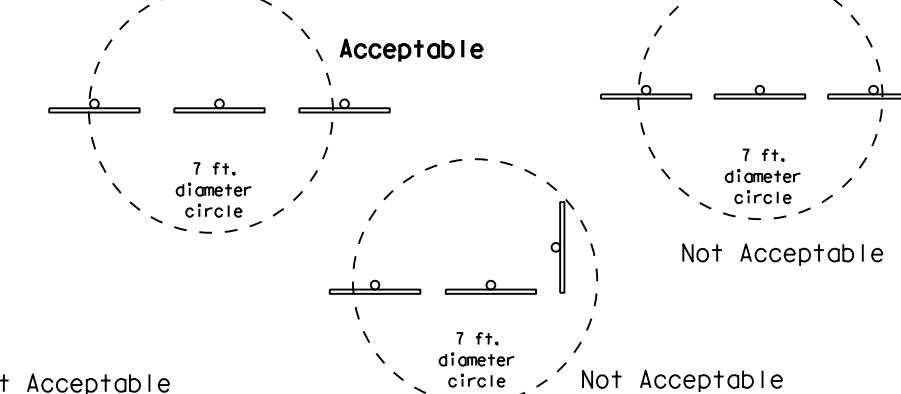
Number of Posts (1 or 2)

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

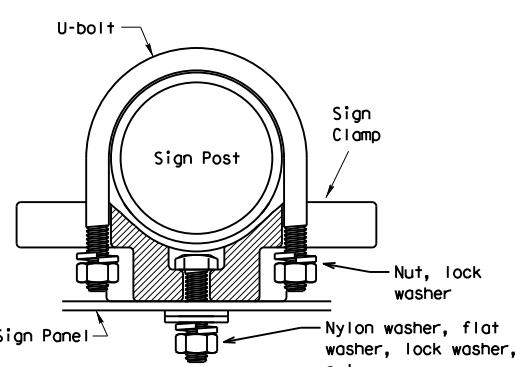
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

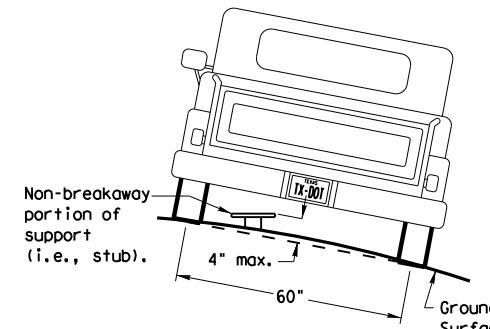


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

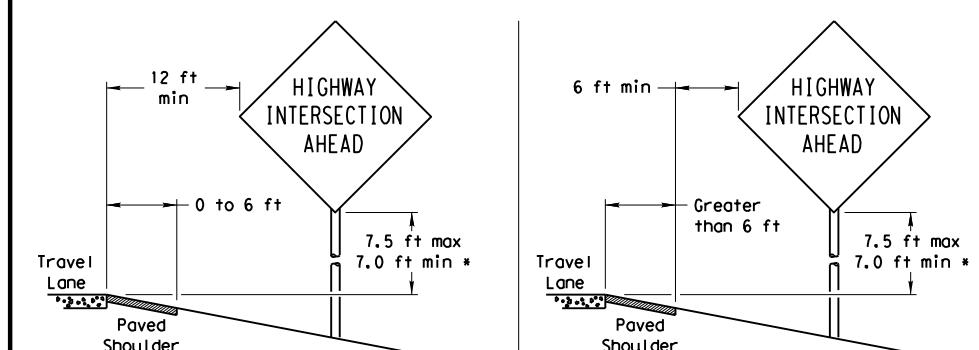
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



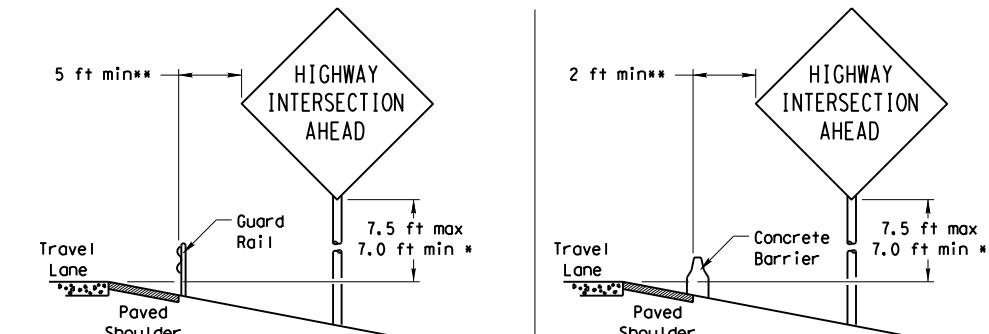
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

SIGN LOCATION

PAVED SHOULDERS

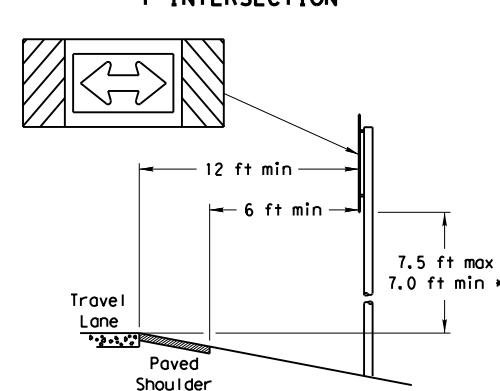


BEHIND BARRIER

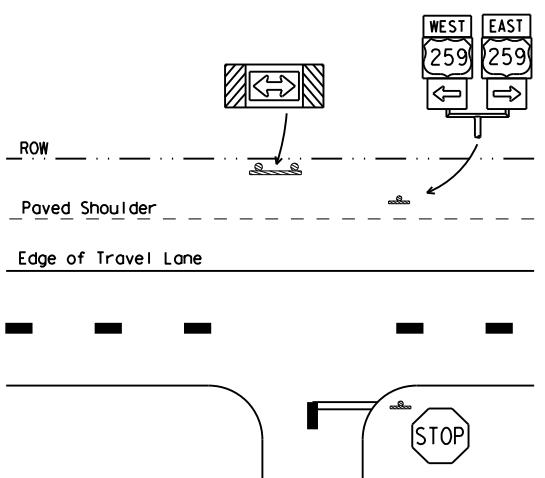


**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

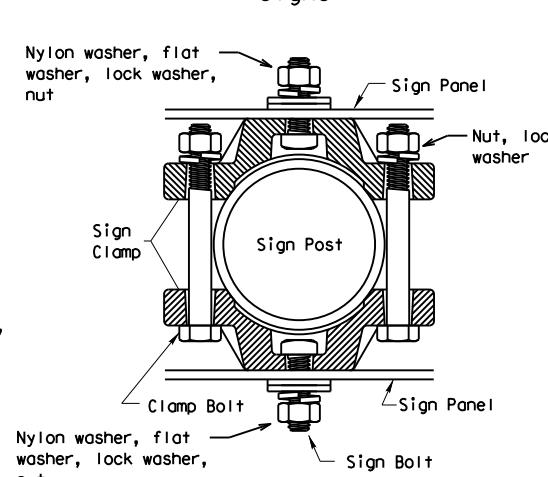
T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

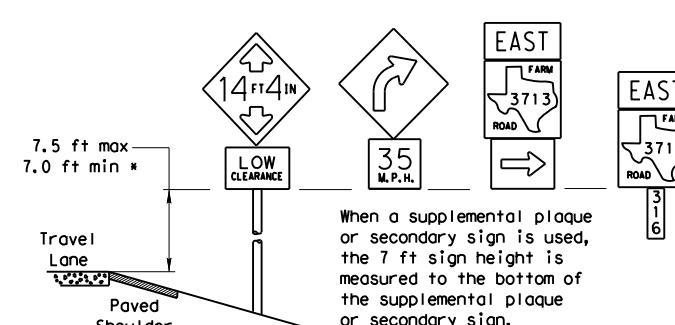


BACK-TO-BACK SIGNS



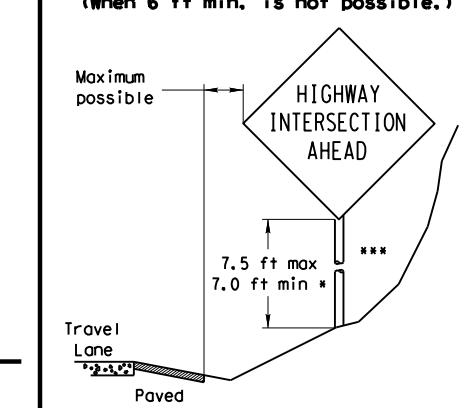
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



When a supplemental plaque or secondary sign is used, the 7 ft. sign height is measured to the bottom of the supplemental plaque or secondary sign.

RESTRICTED RIGHT-OF-WAY (When 6 ft. min. is not possible.)

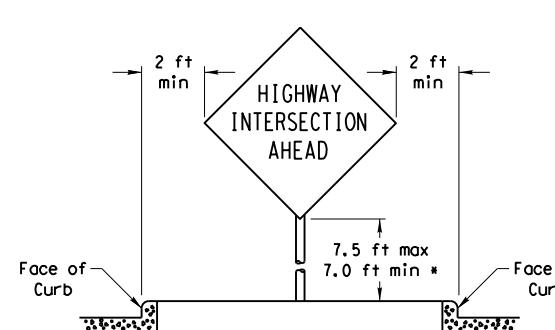


Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

CURB & GUTTER OR RAISED ISLAND



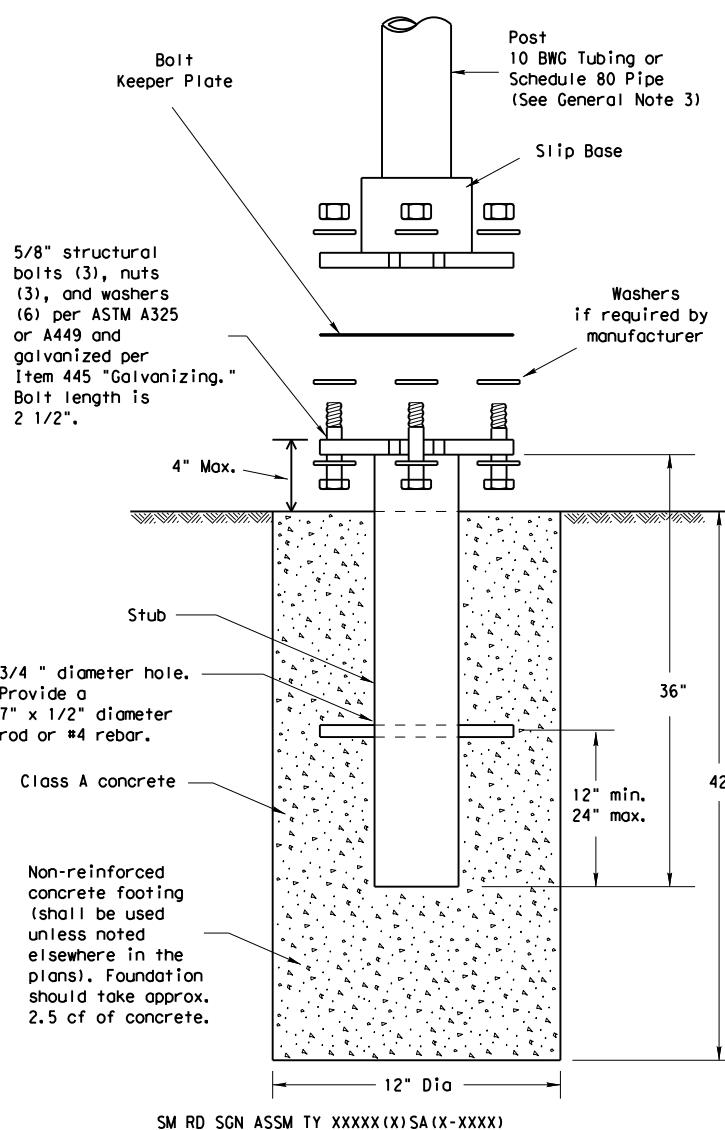
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

© TxDOT July 2002	DN: TxDOT	CK: TxDOT
9-08	REVISIONS	DW: TxDOT
-	-	CK: TxDOT
-	-	HIGHWAY
DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	48

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
10 BWG Tubing (2.875" outside diameter)
0.134" nominal wall thickness
Seamless or electric-resistance welded steel tubing or pipe
Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
Other steels may be used if they meet the following:
55,000 PSI minimum yield strength
70,000 PSI minimum tensile strength
20% minimum elongation in 2"
Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
Schedule 80 Pipe (2.875" outside diameter)
0.276" nominal wall thickness
Steel tubing per ASTM A500 Gr C
Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
46,000 PSI minimum yield strength
62,000 PSI minimum tensile strength
21% minimum elongation in 2"
Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

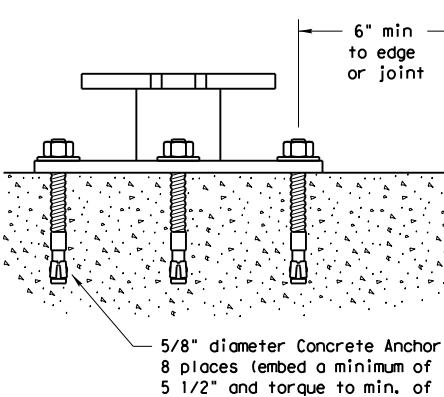
Foundation

1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxy and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

 Texas Department of Transportation
Traffic Operations Division

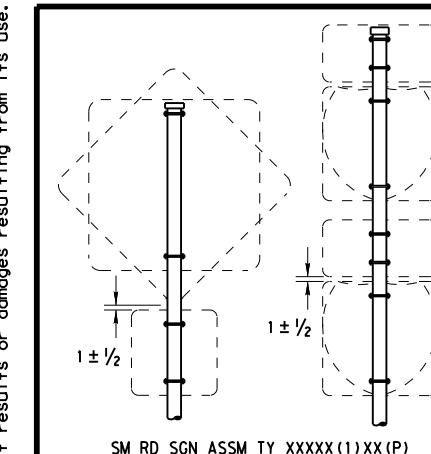
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

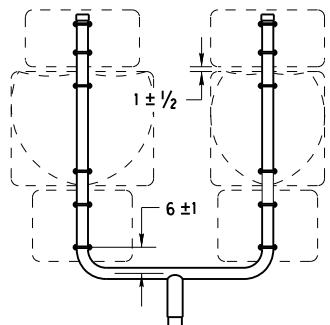
© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
9-08		REVISIONS	CONT	SECT	JOB	HIGHWAY
		-	-	-	-	F M 2623
		DIST	COUNTY			SHEET NO.
		SAT	GUADALUPE			49

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

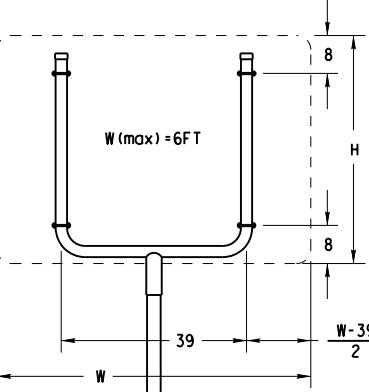
DATE:



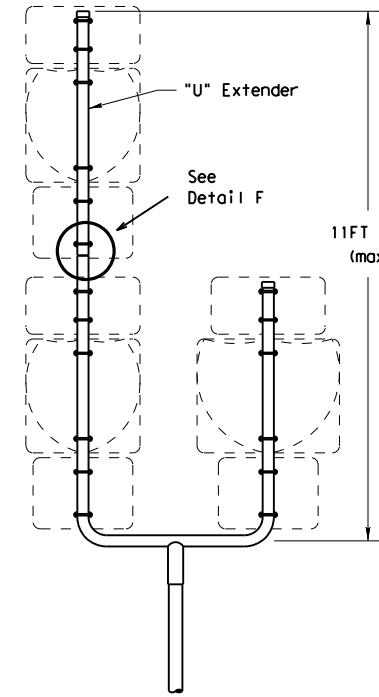
SM RD SGN ASSM TY XXXXX(1)XX(T)



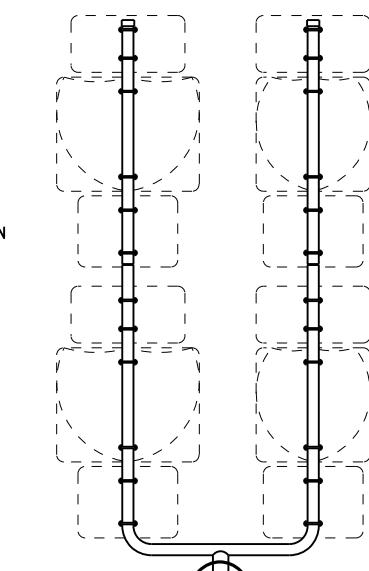
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)



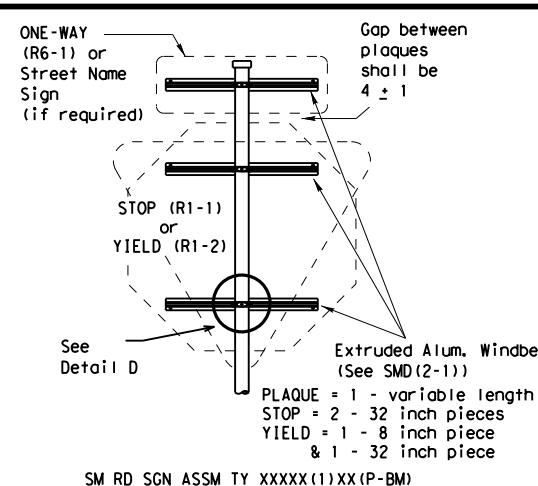
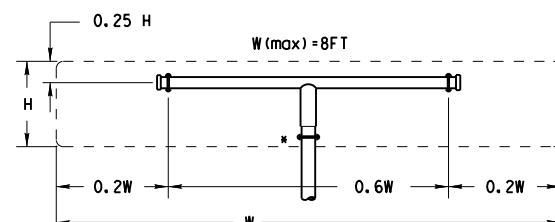
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



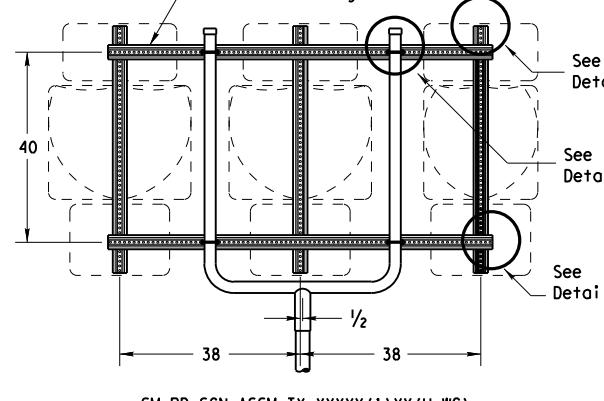
SM RD SGN ASSM TY S80(1)XX(U-2EXT)

All dimensions are in English unless detailed otherwise.

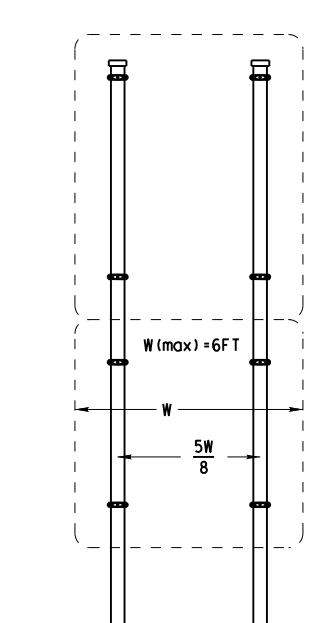
SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)



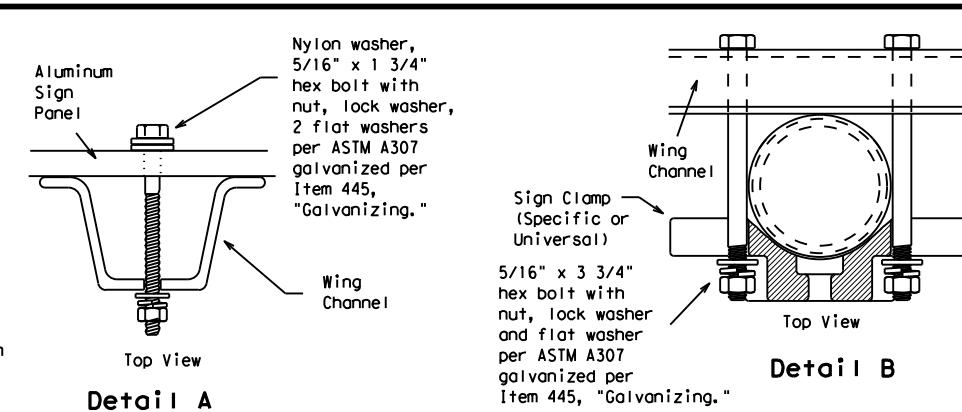
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



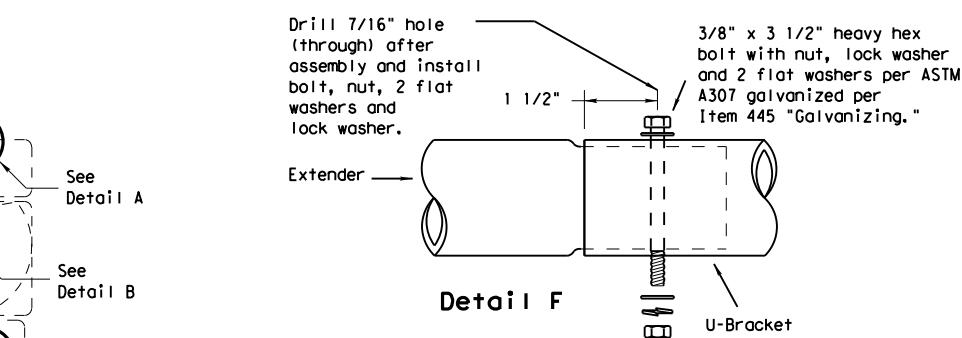
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



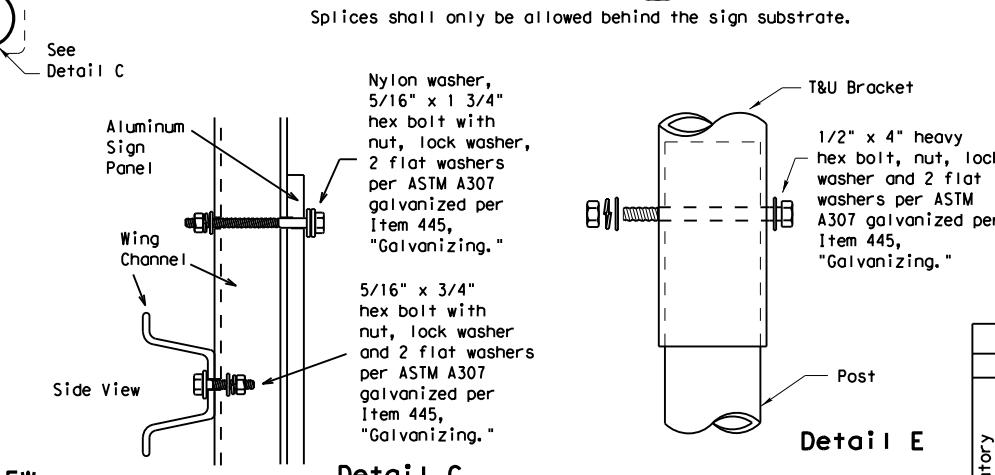
SM RD SGN ASSM TY XXXXX(2)XX(P)



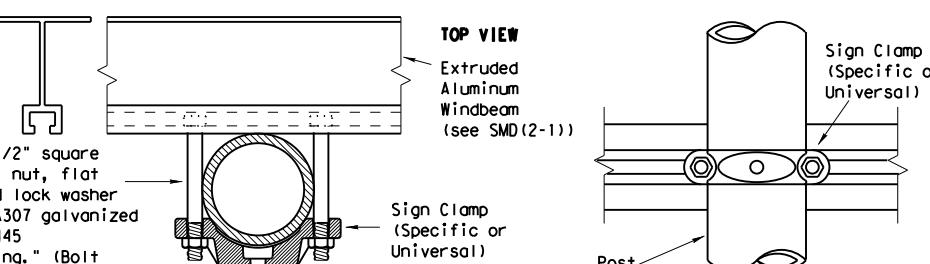
Detail A



Detail B

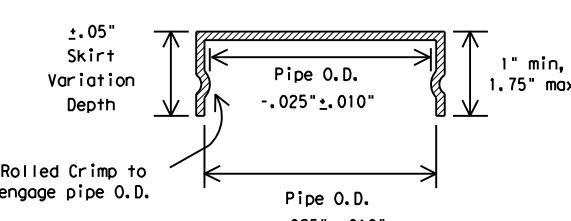


SIDE VIEW



Detail D

FRICITION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
- Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.
- Sign blanks shall be the sizes and shapes shown on the plans.

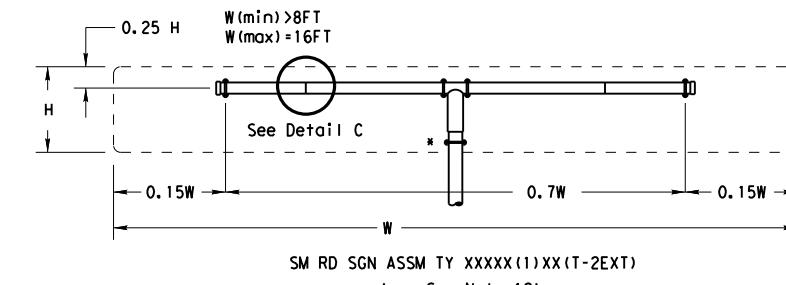
REQUIRED SUPPORT	
	SIGN DESCRIPTION
Regulatory	SUPPORT TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
48x60-inch signs	TY S80(1)XX(T)
48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
48x60-inch signs	TY S80(1)XX(T)
48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

 Texas Department of Transportation
Traffic Operations Division

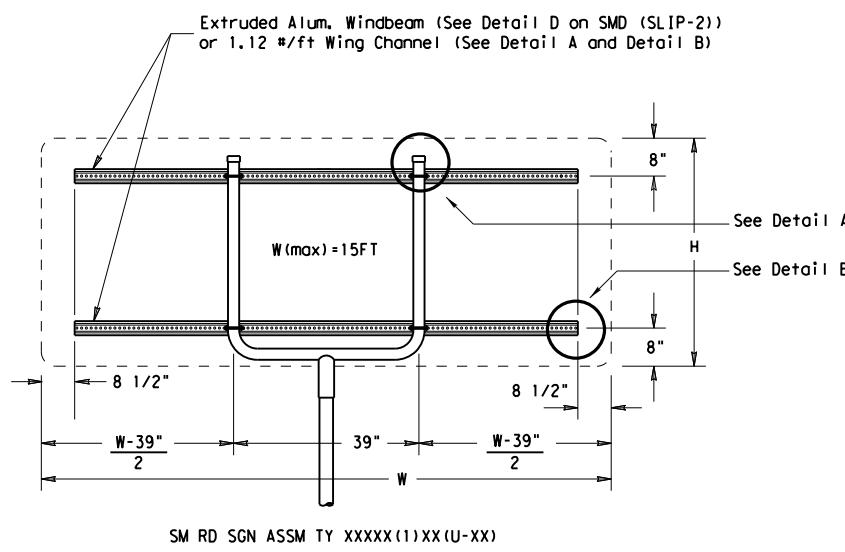
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

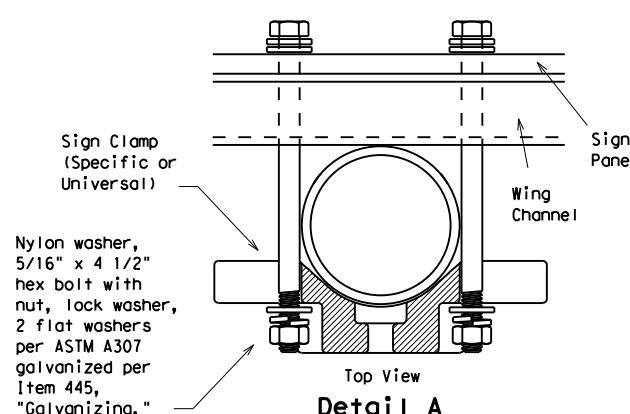
© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		-	-	-	FM 2623
DIST	COUNTY				
SAT	GUADALUPE				
					50



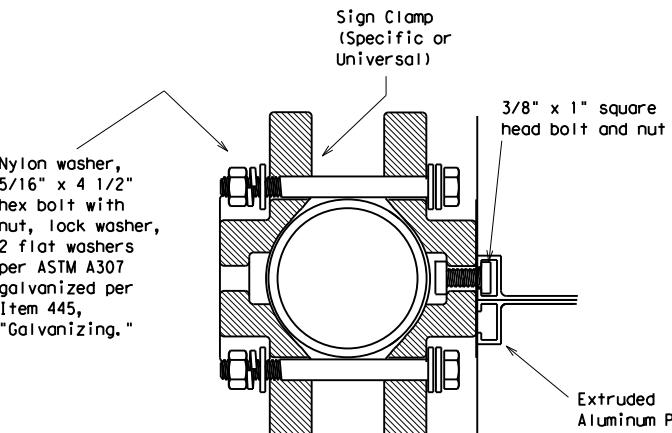
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



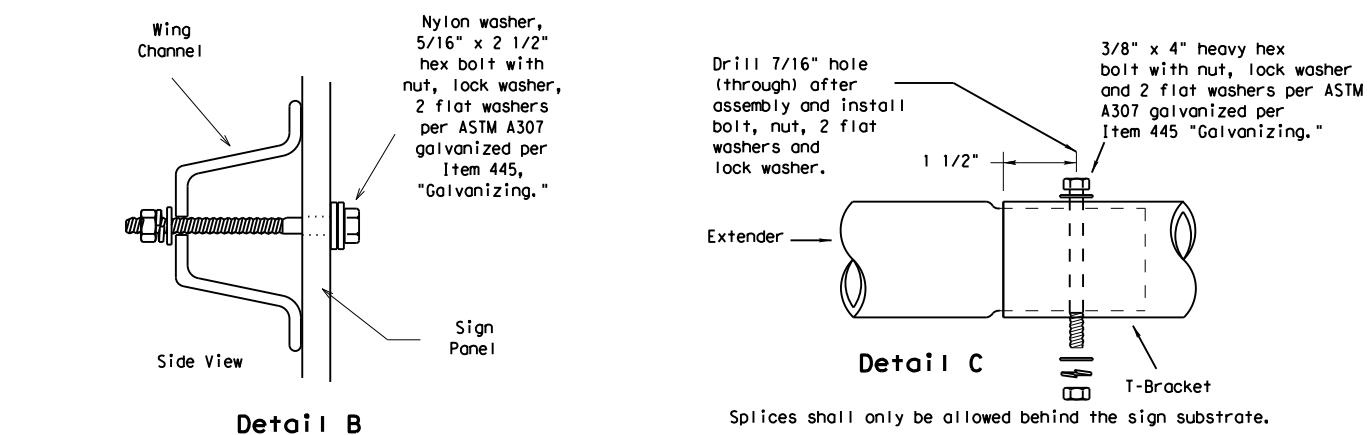
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

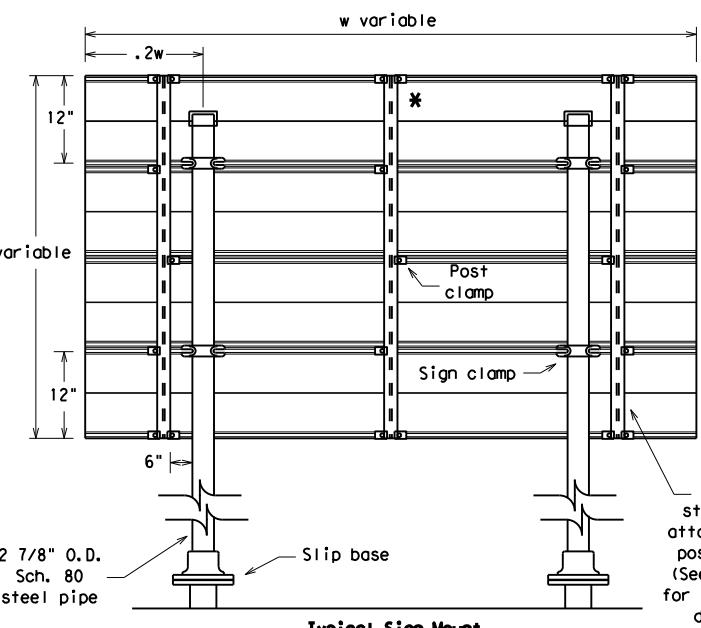


Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA

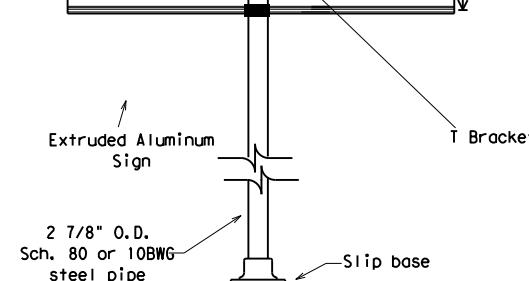
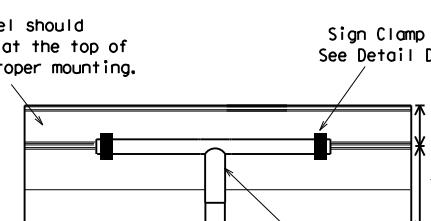
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



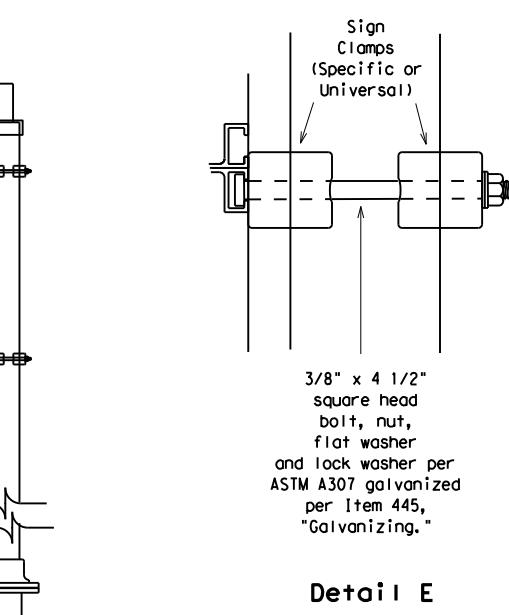
Typical Sign Mount
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

6" panel should be placed at the top of sign for proper mounting.



Extruded Aluminum Sign With T Bracket



See Detail E for clamp installation

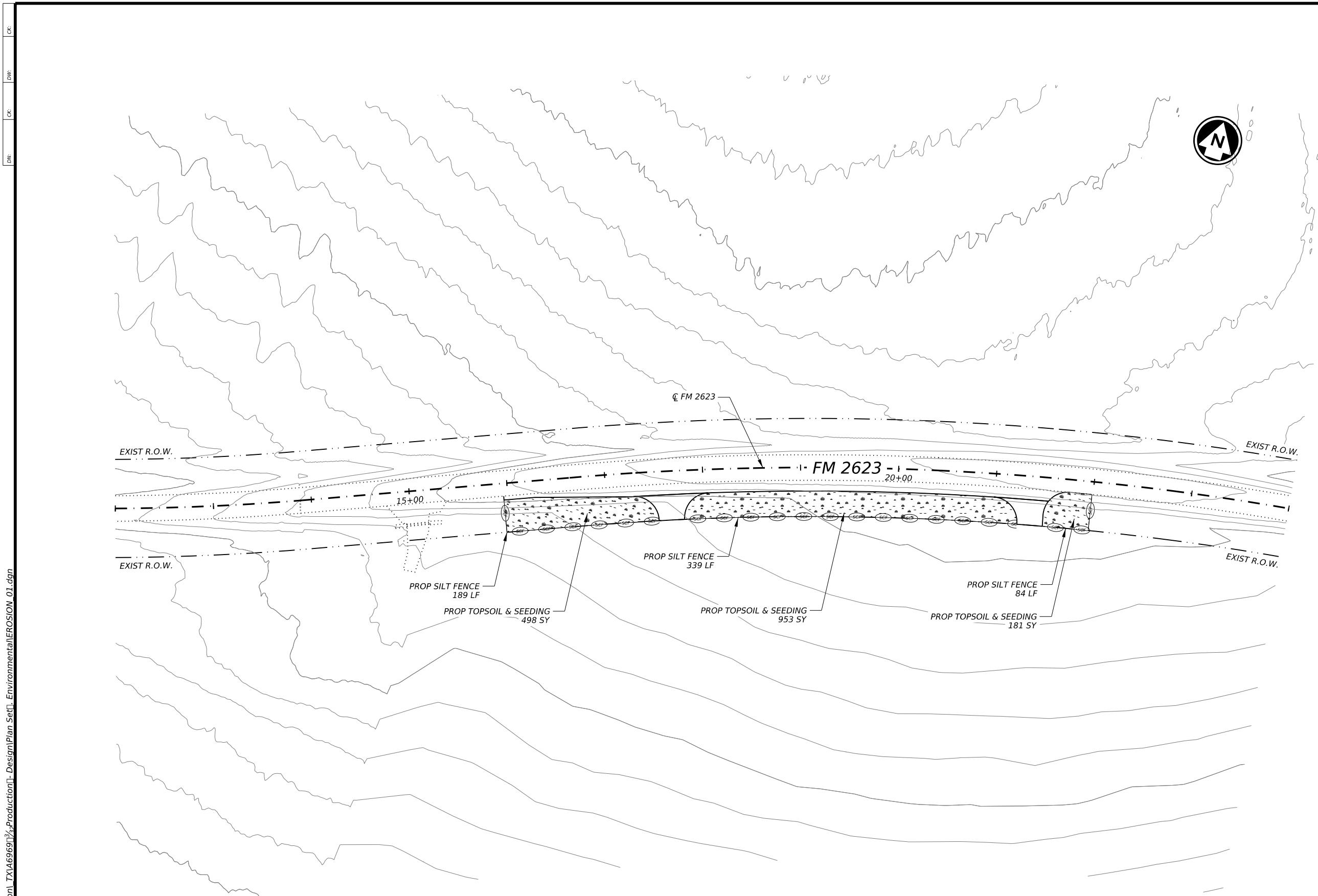
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

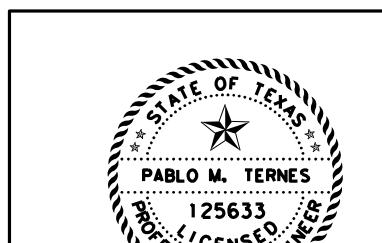
SMD (SLIP-3) - 08

© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB
-	-	-	-	HIGHWAY
DIST	COUNTY	SHEET NO.		
SAT	GUADALUPE	51		



LEGEND

- EXIST R.O.W.
- DITCH FLOWLINE
- PROP SILT FENCE
- PROP TOPSOIL & SEEDING



0' 25' 50' 100'
SCALE: 1"=100'

LJA Engineering, Inc. 
FRN-F-1386

 **Texas Department of Transportation**

FM 2623
EROSION CONTROL PLAN

BEGIN TO END

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
2882	02		FM 2623
DIST		COUNTY	SHEET NO.
SAT		GUADALUPE	52

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

XXXX-XX-XXX

1.2 PROJECT LIMITS:

From: 1.71 miles E of SH-123

To: 2.09 miles W of FM 20

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29°40'12.5", (Long) -97°56'14.3"

END: (Lat) 29°40'16.0", (Long) -97°56'02.2"

1.4 TOTAL PROJECT AREA (Acres): 1.295

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.686

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Construction of driveways and a right turn lane

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Branyon clay, 0 to 1 percent slopes	
Burleson gravelly clay, 1 to 3 percent slopes	
Houston Black clay, 1 to 3 percent slopes	

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures
- Other: _____

- Other: _____
- Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
- Other: _____
- Other: _____
- Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- Development of plans and specifications
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Other: _____
- Other: _____
- Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Other: _____
- Other: _____
- Other: _____



STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

© 2023 July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			53
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
2882	02		FM 2623

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: _____
- Other: _____
- Other: _____
- Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
Permanent Seeding	STA 15+95	STA 21+98

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping
- Other: _____
- Other: _____
- Other: _____
- Other: _____

Type	Stationing	
	From	To
N/A	N/A	N/A

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.5 POLLUTION PREVENTION MEASURES:

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.



12/11/25

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

© 2023 July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
		54
STATE	STATE DIST.	COUNTY
TEXAS	SAT	GUADALUPE
CONT.	SECT.	JOB
2882	02	HIGHWAY NO.
		FM 2623

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

- 1.
- 2.

No Action Required Required Action

Action No.

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

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

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

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

No Permit Required
 Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
 Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
 Individual 404 Permit Required
 Other Nationwide Permit Required: NWP# _____

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

- 1.
- 2.
- 3.
- 4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

No Action Required Required Action

Action No.

- 1.
- 2.
- 3.
- 4.

IV. VEGETATION RESOURCES

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

No Action Required Required Action

Action No.

- 1.
- 2.
- 3.
- 4.

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

No Action Required Required Action

Action No.

- 1.
- 2.
- 3.
- 4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- * Dead or distressed vegetation (not identified as normal)
- * Trash piles, drums, canister, barrels, etc.
- * Undesirable smells or odors
- * Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

VII. OTHER ENVIRONMENTAL ISSUES

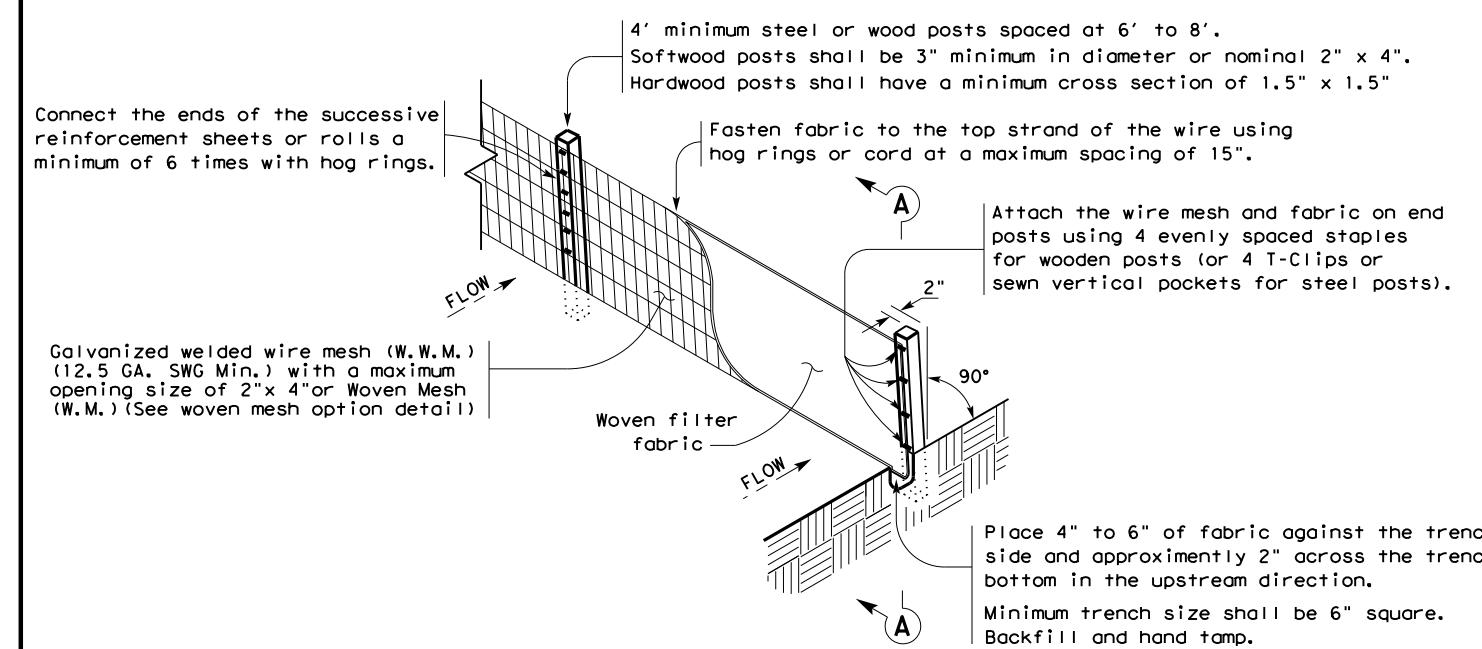
(includes regional issues such as Edwards Aquifer District, etc.)

No Action Required Required Action

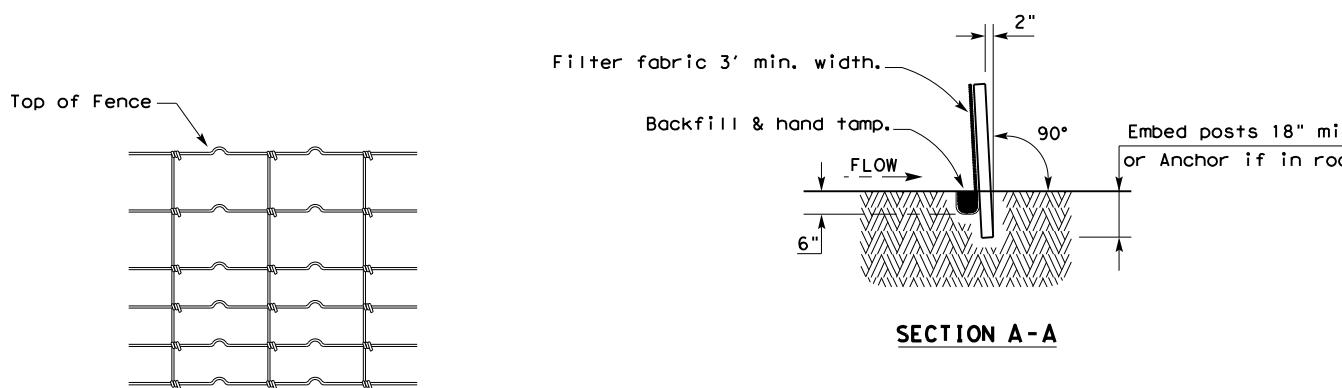
Action No.

- 1.
- 2.
- 3.

 Texas Department of Transportation		Design Division Standard
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS		
EPIC		
FILE: epic.dgn	DN: TxDOT	CK: RG
© TxDOT: February 2015	DW: VP	CK: AR
REVISIONS		HIGHWAY
12-12-2011 (DS)	-	-
05-07-14 ADDED NOTE SECTION IV.	-	-
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.)	-	-
DIST COUNTY		SHEET NO.
SAT	GUADALUPE	
55		



TEMPORARY SEDIMENT CONTROL FENCE



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

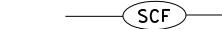
SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

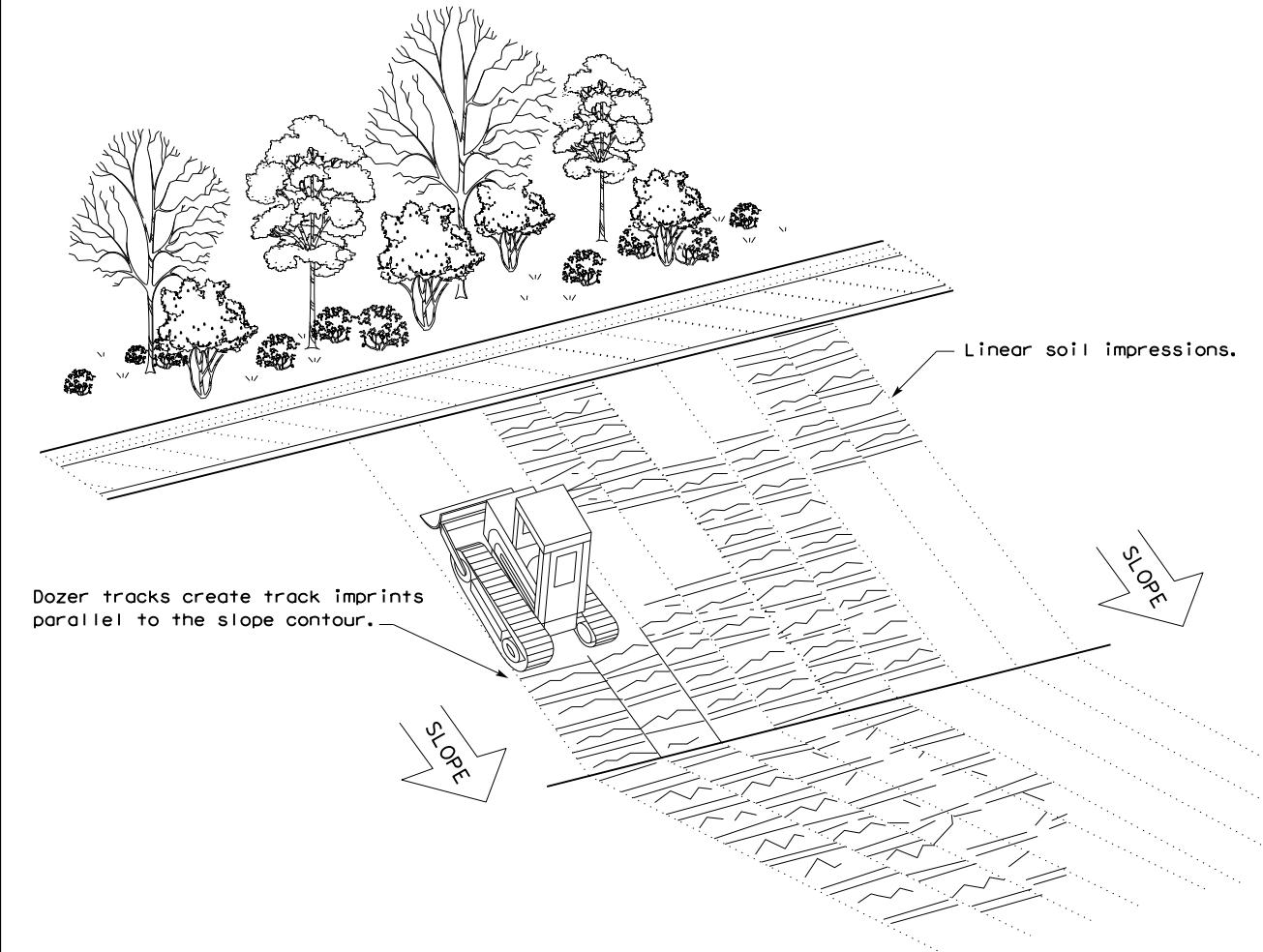
LEGEND

Sediment Control Fence



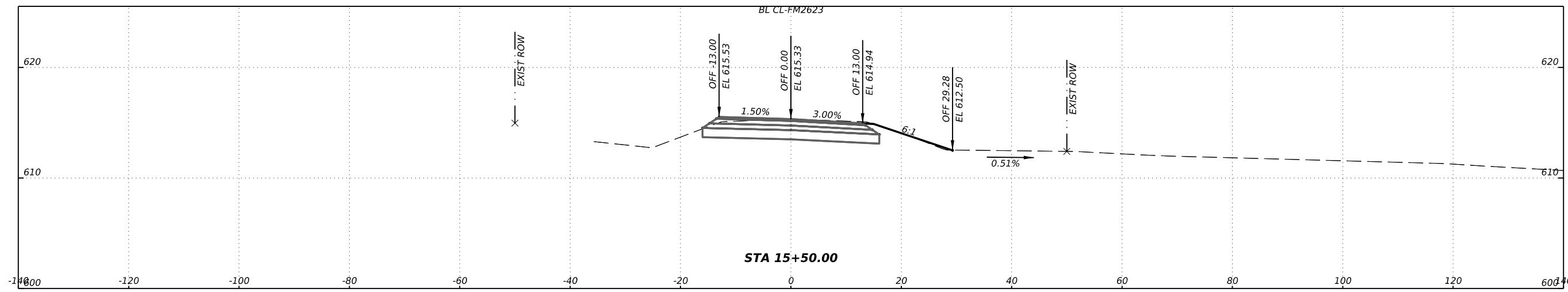
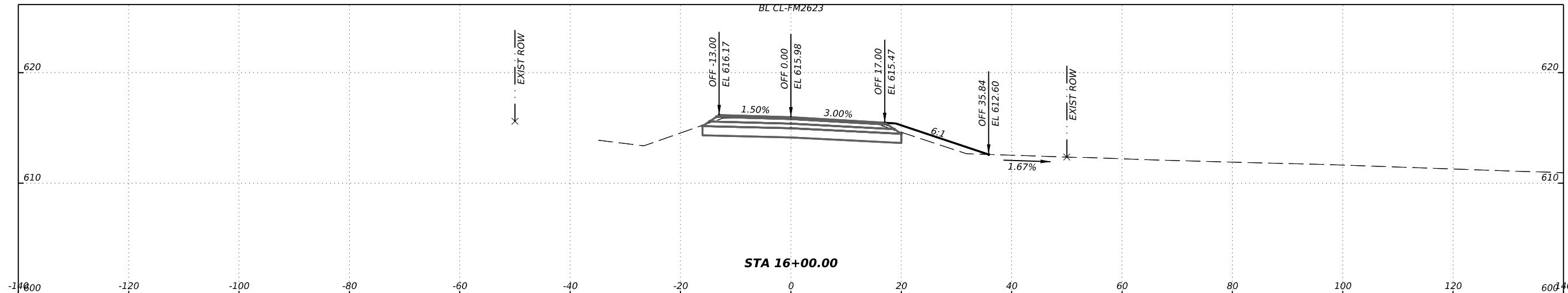
GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

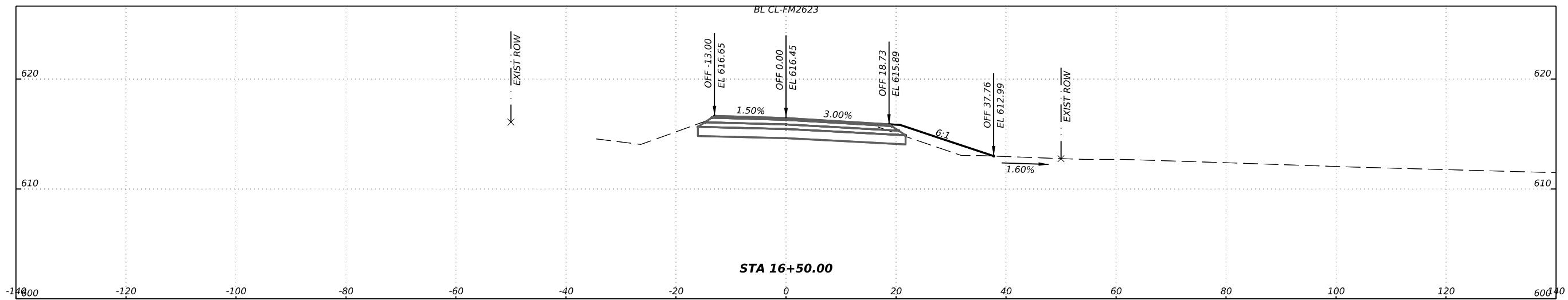
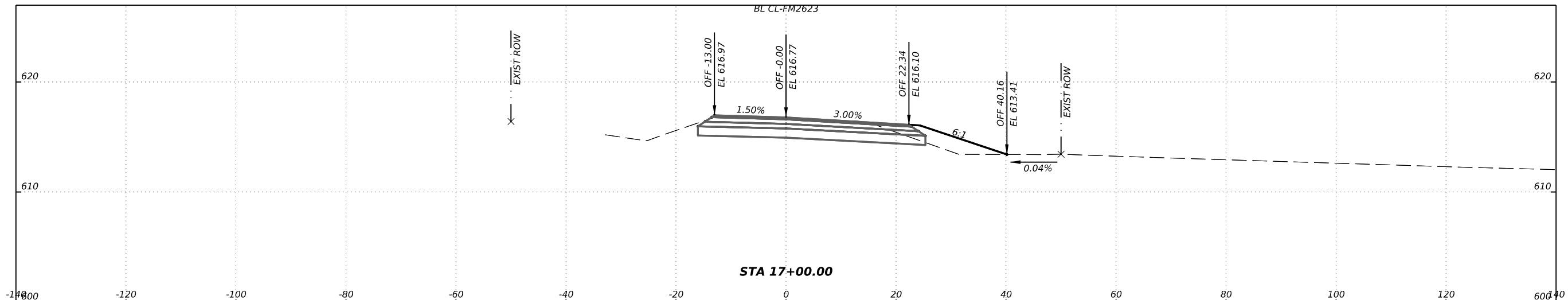


VERTICAL TRACKING

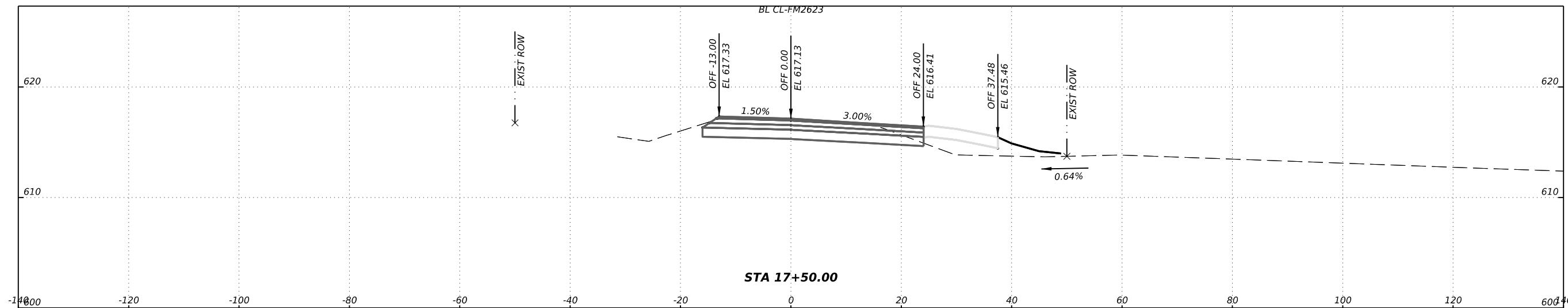
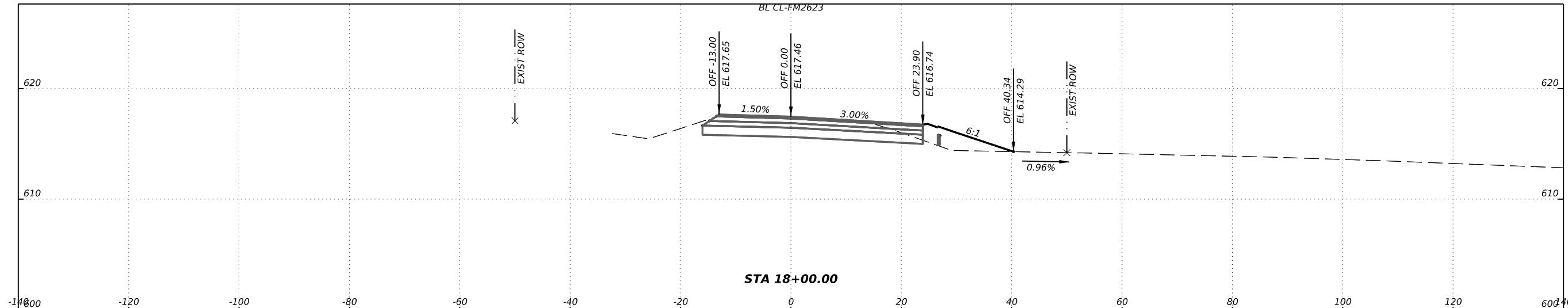
 Texas Department of Transportation		Design Division Standard
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING		
EC(1)-16		
FILE: ec116 DN: TxDOT CK: KM DW: VP DN/CK: LS © TxDOT: JULY 2016 CONT SECT JOB HIGHWAY REVISIONS - - - FM 2623 DIST COUNTY SHEET NO. SAT GUADALUPE 56		



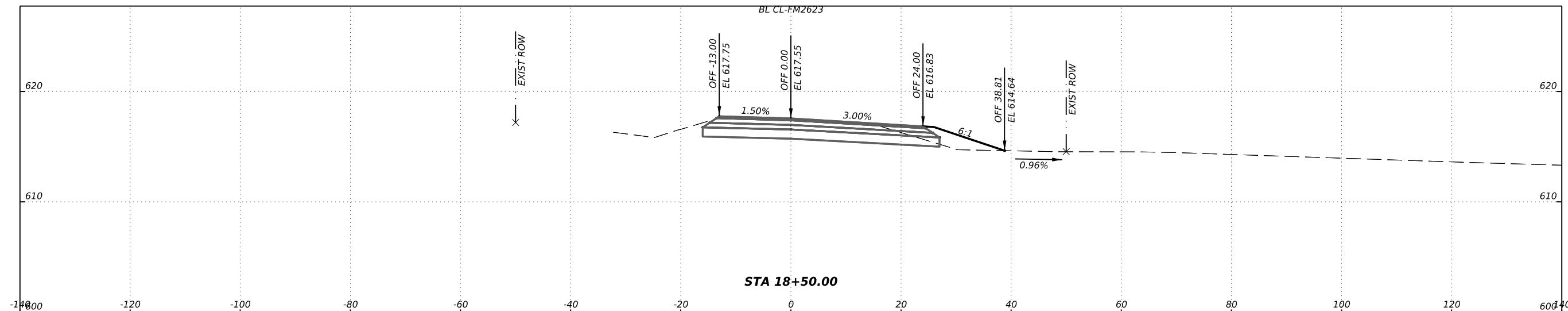
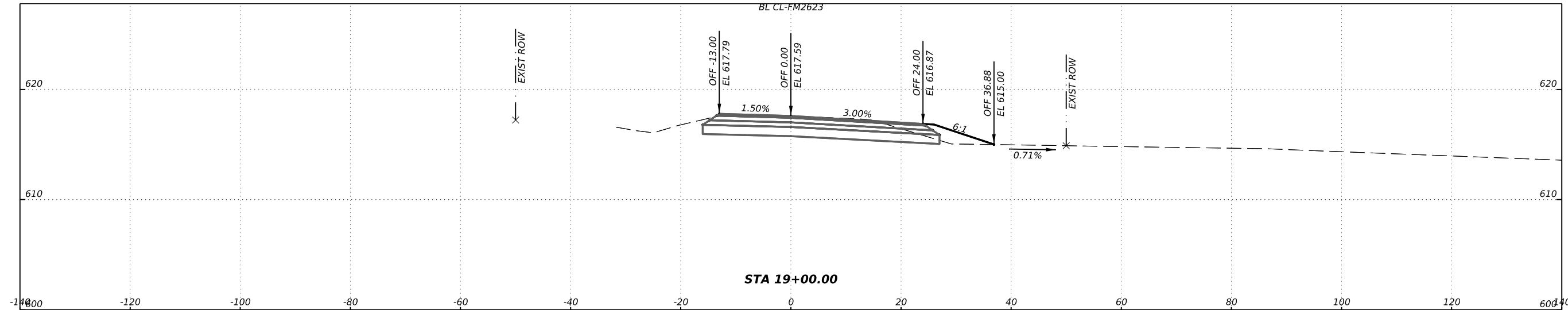
0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



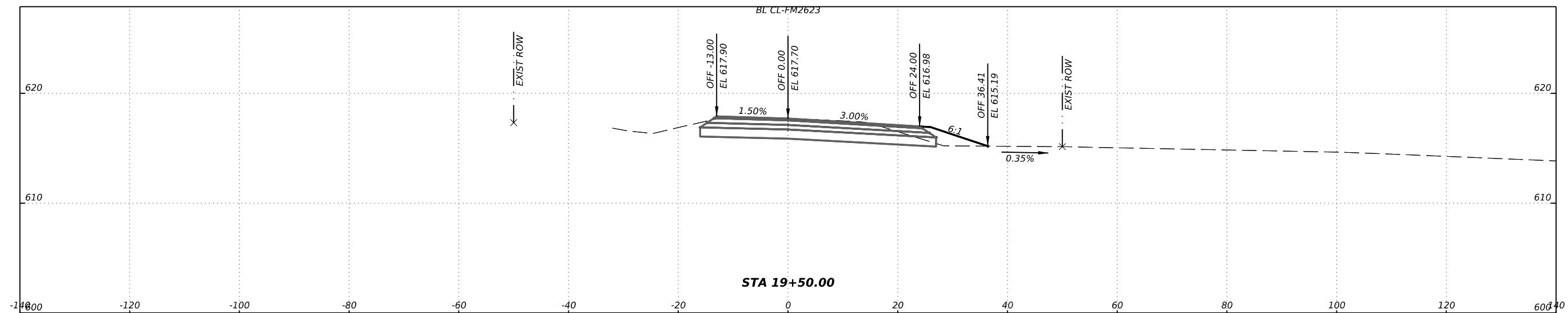
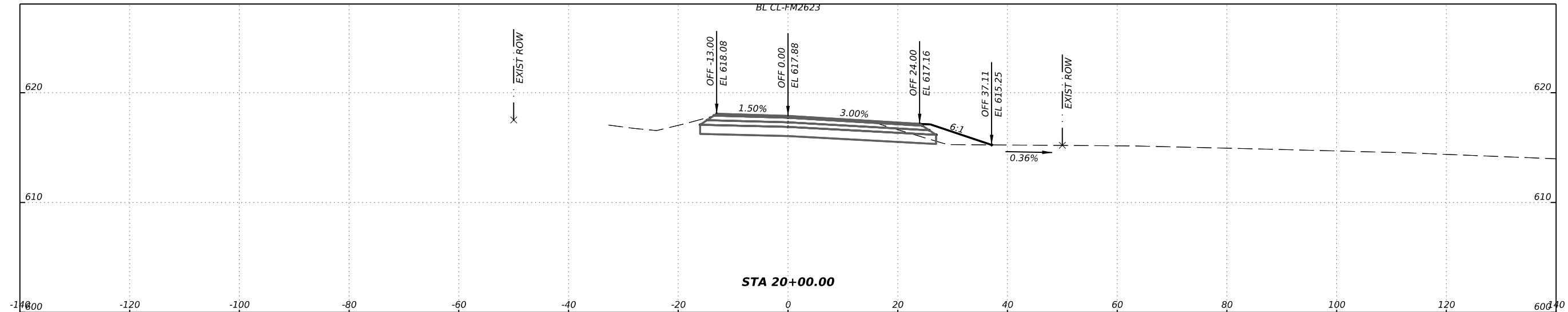
0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



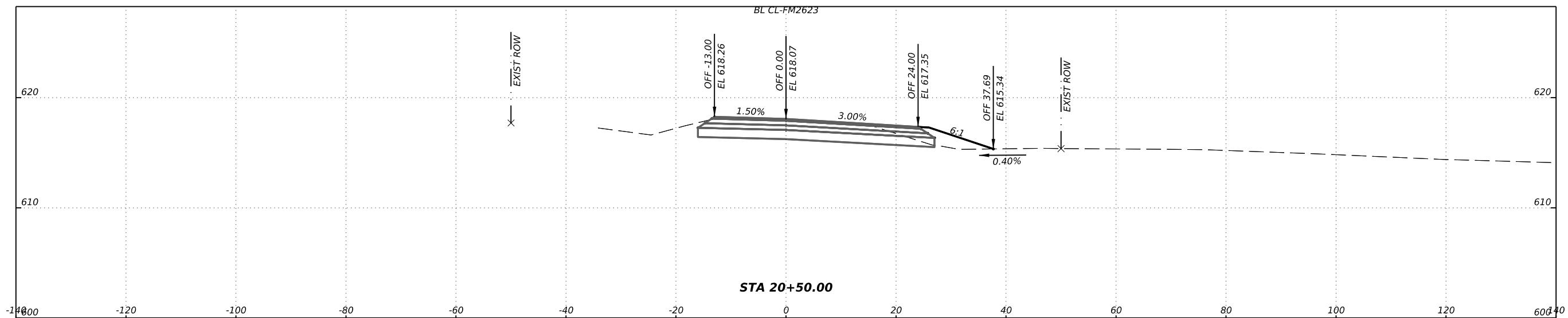
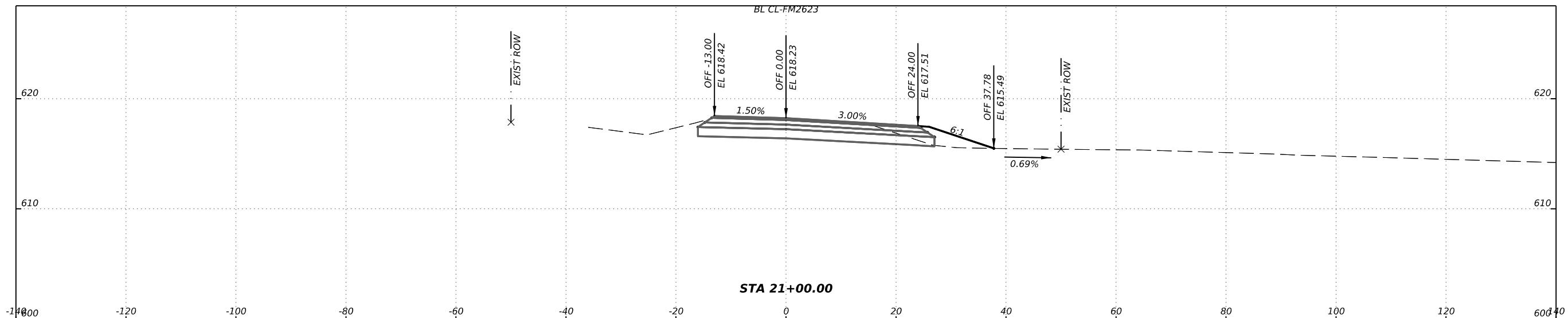
0' 5' 10' 20'

SCALE: 1"=20'- HORZ
1"=10'- VERT

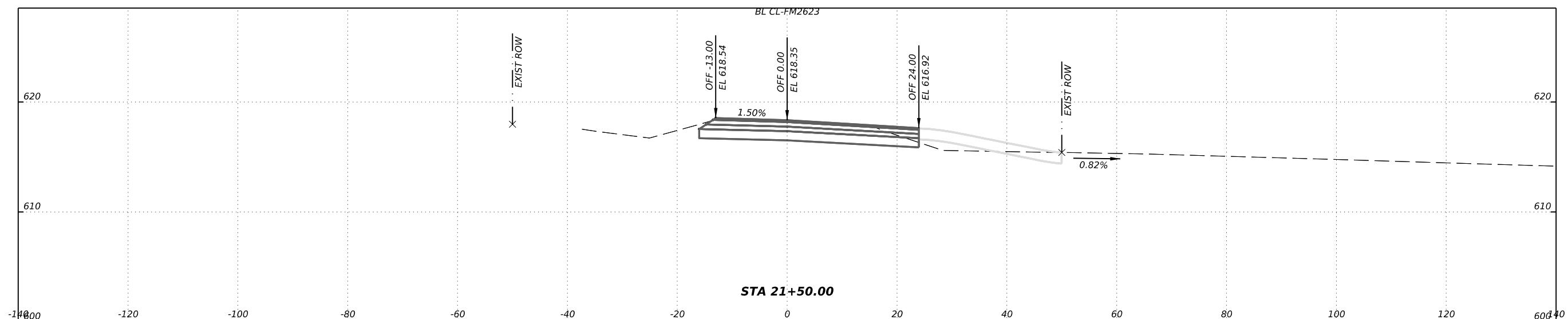
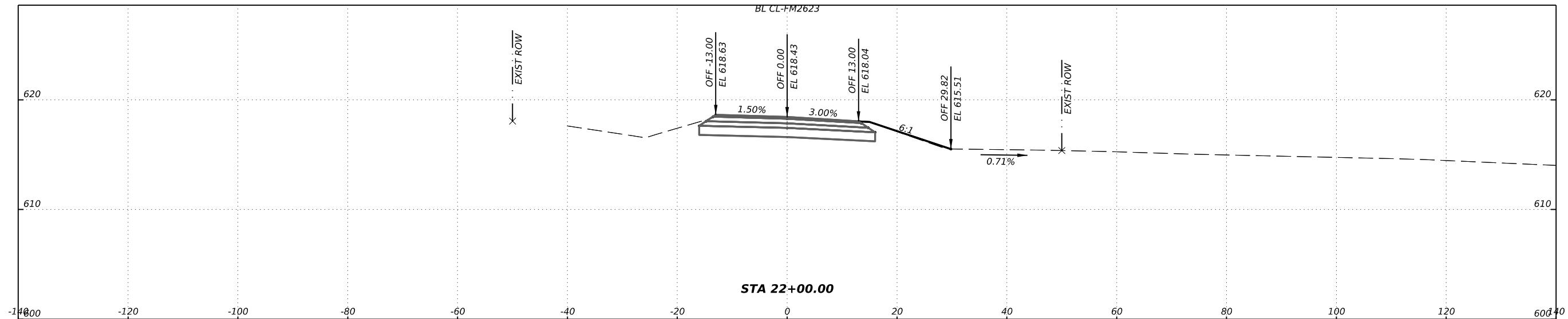
© TxDOT				SHEET	4	OF	8	
CONT	SECT	JOB	HIGHWAY	DIST	COUNTY		SHEET NO.	
2882	02		FM 2623	SAT	GUADALUPE		60	



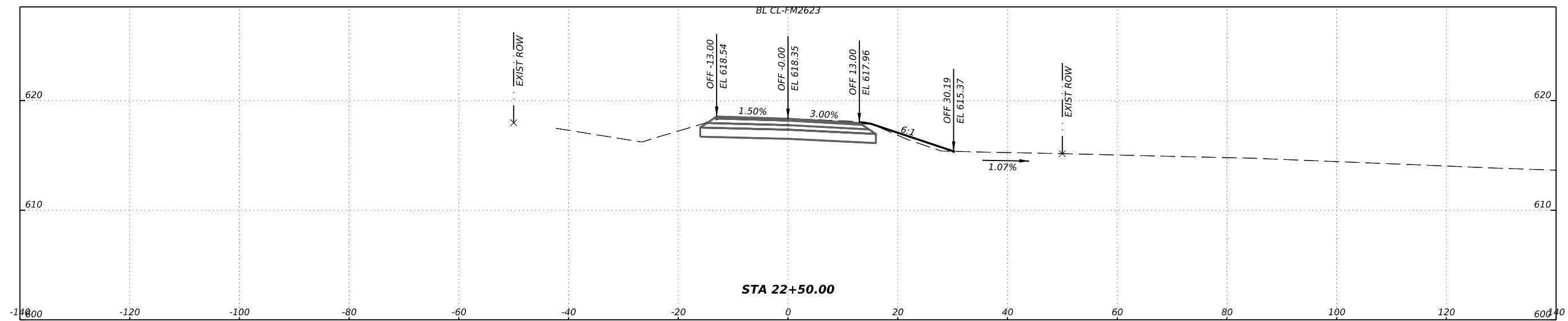
0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT



0' 5' 10' 20'
SCALE: 1"=20'- HORZ
1"=10'- VERT

