

COUNTY OF EL PASO
ROAD AND BRIDGE

DESIGN SPEED: 55 MPH

100% SUBMITTAL

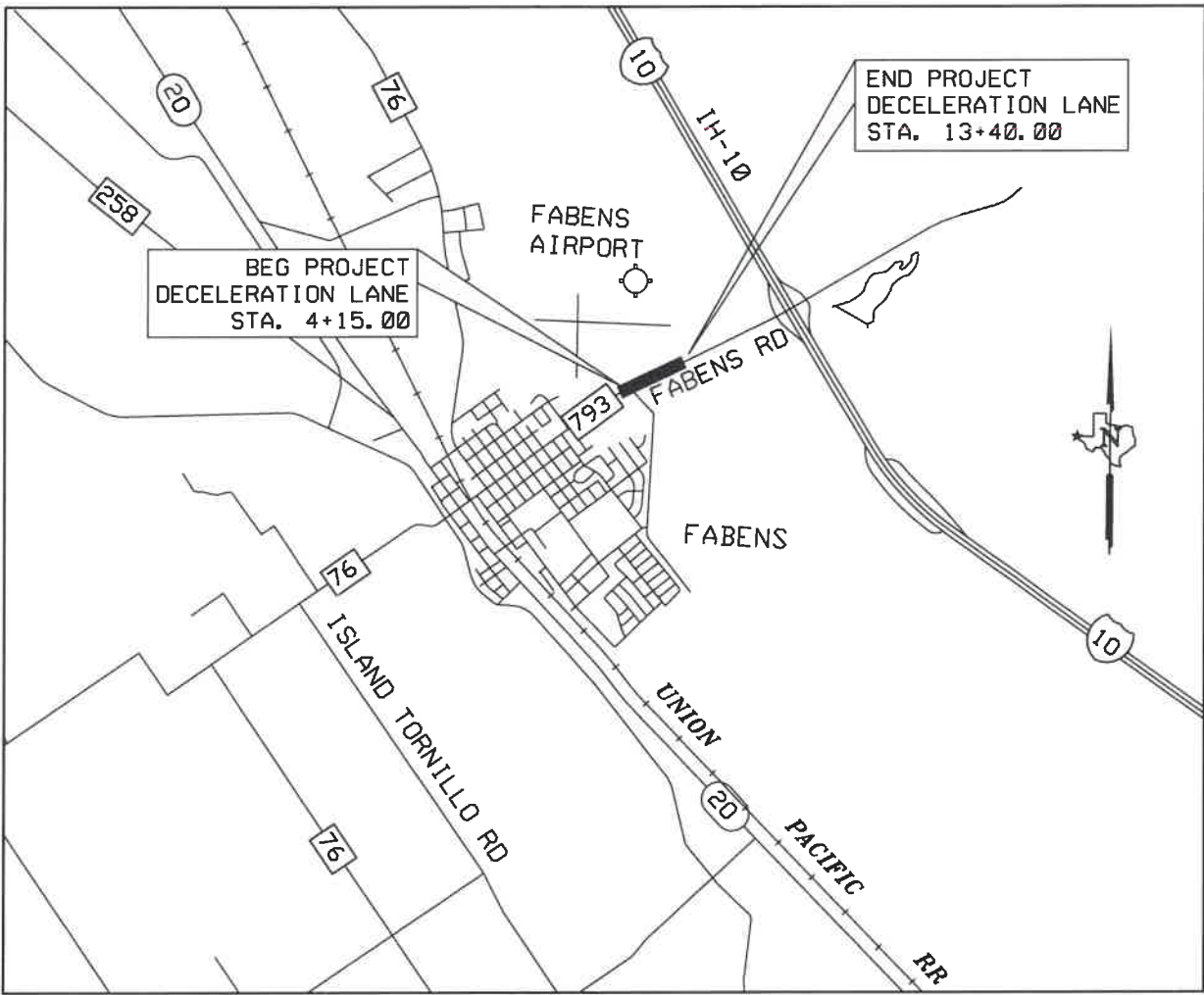
PLANS OF PROPOSED
FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

PROJECT LIMITS ALONG FM 793 (FABENS ROAD): APPROXIMATELY 254 FT SOUTH OF THE FABENS AIRPORT ENTRANCE AND 671 FT. NORTH OF THE AIRPORT ENTRANCE.
LENGTH OF ROADWAY: 550 FT. = 0.104 MILES
NET LENGTH OF PROJECT: 925 FT. = 0.175 MILES

INDEX OF SHEETS

- GENERAL**
1 COVER
2 PROJECT LAYOUT
3 GENERAL NOTES
4 TYPICAL SECTIONS
5 CONTROL PLAN
6 QUANTITY SUMMARY SHEET
- TRAFFIC CONTROL**
7 TRAFFIC CONTROL LINE DIAGRAM
8 TRAFFIC CONTROL PLAN DRIVEWAY ENTRANCE/EXIT
9 TRAFFIC CONTROL PLAN DRIVEWAY ENTRANCE/EXIT
- TRAFFIC CONTROL STANDARDS**
10 TCP(1-3)-18
11 TCP(2-1)-18
12-23 BC(1-12)-14
24 WZ(STPM)-13
25 WZ(BRK)-13
- UTILITIES AND DEMOLITION**
26 EXISTING UTILITY AND DEMOLITION PLAN
- ROADWAY**
27 PLAN AND PROFILE FM 793 (FABENS ROAD)
28 ROADWAY DETAILS
- ROADWAY STANDARDS**
29 CCCC-12
- ROADWAY AND GRADING CROSS SECTIONS**
30-34 ROADWAY CROSS SECTIONS
- SIGNS AND PAVEMENT MARKINGS**
35 SIGNS AND PAVEMENT MARKINGS PLAN
36 SIGN DETAILS
- PAVEMENT MARKINGS STANDARDS**
37-39 PM(1-3)-12
40 SMD(GEN)-08
41-43 SMD(SLIP1-3)-08
- DRAINAGE**
44 EXISTING DRAINAGE VS PROPOSED FLOWS
- EROSION CONTROL**
45 EPIC
46 STORMWATER POLLUTION PREVENTION PLAN
47 EROSION CONTROL PLAN
48 EC(1)-16
49 EC(3)-16
50-52 EROSION CONTROL LOGS

FOR CONSTRUCTION OF FABENS AIRPORT DECELERATION LANE (FM 793) IMPROVEMENTS
CONSISTING OF GRADING, PAVING, DRAINAGE, SIGNING AND PAVEMENT MARKINGS



PROJECT AREA MAP

SCALE: N. T. S.

EXCEPTIONS: NONE
EQUATIONS: NONE
RR X-INGS: NONE

Ryan Lee

EXECUTIVE DIRECTOR
CAMINO REAL REGIONAL MOBILITY AUTHORITY



Roxanna Rivera Medina 11/2/2020
Roxanna R. Medina, P.E. #100696

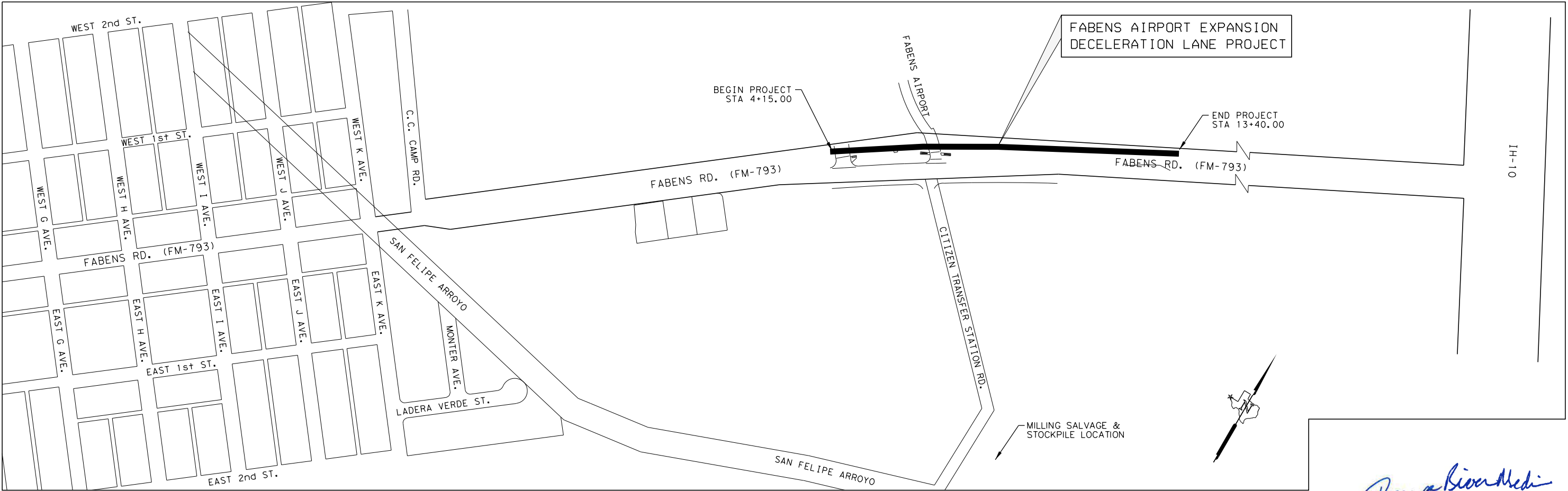
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF
TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS
LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS
PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID
CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012)



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WARNING!
BEFORE YOU DIG

CONTRACTOR SHALL FIELD LOCATE
ALL EXISTING UNDERGROUND
IMPROVEMENTS IN THE PROJECT AREA

UTILITY LOCATOR SERVICES

TEXAS 811	1-811
FABENS WATER DISTRICT	1-915-764-2212
TEXAS GAS SERVICE	1-800-700-2443
WINDSTREAM	1-806-637-5574
EL PASO ELECTRIC COMPANY	1-800-252-1133
SPECTRUM	1-915-772-1123
EL PASO COUNTY PUBLIC WORKS	
DEPARTMENT (ROAD & BRIDGE)	1-915-546-2015
TXDOT AREA ENGINEER	1-915-857-5041



HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

PROJECT LAYOUT

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	2
CONTROL	SECTION	JOB	

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

GENERAL NOTES:

General Requirements

This Contract is for the addition of a deceleration lane and center left-turn lane striping from FM 793 to the Fabens Airport entrance. The project includes the construction of a right-turn (deceleration) lane of asphaltic concrete pavement, demolition of existing HMAC, base and concrete, grading, reconstruct a concrete driveway, signage, restriping of the northbound left-turn lane, shoulders and center line within the project area, and refurbish existing loose aggregate.

Once a work order has been issued by the Camino Real Regional Mobility Authority, submit a Proposed Sequence of Construction for the entire project to the Engineer.

TABLE 1

COMPACTION REQUIREMENTS OUTSIDE ROADWAY

ITEM	DESCRIPTION	OUTSIDE ROADWAY COURSE DENSITY
132 ^{1,2}	EMBANKMENT (FINAL)(DENSITY CONTROL) (TY C)	(SEE BELOW)

1. In a depth of 12 in. below natural ground scarify and compact to a 100% minimum.
2. From natural ground to 6 in. below finished subgrade, 95% minimum compaction..

TABLE 2

BASIS OF ESTIMATE

ITEM	DESCRIPTION	RATE
314	EMUL ASPH (BS OR SUBGR TRT) (SS-1H)	0.25 GAL/SQ. YD
340	D-GR HMA (SQ) TY-C SAC-B PG 70- 22 (SMALL QUANTITY)	1 IN = 110 LB/SQ. YD
340	D-GR HMA (SQ) TY-B PG 64-22 (SMALL QUANTITY)	1 IN = 110 LB/SQ. YD

1. Deviation from the rates shown will require approval.

Geotechnical Report available for review at Huitt-Zollars’s Offices at 5822 Cromo Drive, Suite 210, El Paso, Texas 79912.

Repair any existing pavement, utilities, structures, etc., damaged because of construction operations, at no additional cost to Owner.

When not in use, do not leave vehicles, equipment, or materials within 15 feet of any lane nor within 9 feet of any service road.

Maintain travel surfaces used in hauling operations clear and free of dirt or other material.

If construction barriers or fencing block a pedestrian path the contractor is responsible for providing an alternate safe and code compliant pathway.

Sweep and remove all litter, construction debris and surplus material on the right-of-way within the project limits to keep the jobsite neat at all times. Keep roadways and sidewalks free of sediment.

When working near aerial electrical lines and/or utility poles, provide adequate safety measures, as needed, to comply with the appropriate sections of Federal and State regulations.

Locate and protect all existing utilities, utility meters, valves, manholes, hydrants, street signs, illumination poles, traffic signal boxes and cabinets from damage during construction activities. Contractor is required to coordinate with all utility companies before starting any construction activities.

The Contractor shall be responsible to contact the utilities listed to coordinate with during construction for adjustment of their facilities within the FM 793 Deceleration Lane Project area during construction. The Contractor will work with the utility companies to coordinate schedules for the relocation of utilities, if necessary, listed below:

COMPANY	CONTACT	EMAIL	PHONE NUMBERS
Windstream Communication	James Blackwell	James.Blackwell@windstream.com	806-637-5574
EL PASO ELECTRIC COMPANY	Raul Guel	Raul.Guel@epelectric.com	915-525-2773
SPECTRUM CABLE	Raul Rojas	Raul_Rojas@kinetic-eng.com	915-373-6326
TEXAS GAS	Francisco Campa	francisco.campa-perez@onegas.com	915-680-7275
Fabens Water District	Horacio Juarez	juarezh@cdmsmith.com	915-764-2212

ITEM 3L – AWARD AND EXECUTION OF CONTRACT

The Contractor warrants to the Owner that materials and equipment furnished under the contract will be of good quality and new unless otherwise required or permitted by the contract documents, that the work

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

will be free from defects not inherent in the quality required or permitted, and that the work will conform to the requirements of the contract documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Neither the final certificate of payment nor any provisions in the contract documents, nor partial or entire use of the facility by the Owner shall constitute an acceptance of work not done in accordance with the contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified, The Owner will give notice of observed defects with reasonable promptness.

ITEM 4L – SCOPE OF THE WORK

Maintain the entire project area in a neat, orderly manner throughout duration of the project.

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

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

Maintain all Contract Items until final acceptance of the project.

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

The contractor shall maintain a set of “as-built” record drawings for this project. At the completion of the project, the contractor must turn over the “as-built” record drawings to the engineer.

ITEM 5L – CONTROL OF THE WORK

Refer to design plans for horizontal and vertical reference points. Verify all dimensions and grades before proceeding. Report any discrepancies found immediately. Any discrepancies not reported will be at no additional cost to the County.

The project datum is as follows:

1. The Texas Coordinate System of 1983 (NAD 83 State Plane Coordinates) Central Zone (4203) and the North American Vertical Datum of 1988 (NAVD 88), with values in U.S. Survey Feet, will be used as the basis for all coordinates derived for this project, unless otherwise directed by the State.
2. The Combined Surface Adjustment Factor (CSF) for this project is 1.00023100 scaled at N=0, E=0. Unit of measurement is the U.S. Survey Foot.

3. Reference all City, County, and State monuments found within the project limits. Restore any monuments that are disturbed during construction at no additional cost.

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

ITEM 7L – LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

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

All waste materials to be disposed of in compliance with Local, State, and Federal regulations. Contractor to submit a list of all approved waste sites to the County for review prior to waste disposal.

ITEM 8L – PROSECUTION AND PROGRESS

Complete the Contract in 60 working days in accordance with Section 8L.3.1.4., “Standard Workweek.”

A bar chart schedule is required for this project. Provide updates as directed by the Engineer.

A formal request to the County of El Paso shall be made to extend normal working hours.

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

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

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

Perform any erosion control measures before beginning the next phase, or land, unless otherwise authorized.

ITEM 9L – MEASUREMENT AND PAYMENT

Submit material-on-hand payment requests **three (3)** working days before estimate cut-off for payment consideration on that month’s estimate.

ITEM 100 – PREPARING RIGHT OF WAY

The limits of preparing the right-of-way will be measured from STA 4+15.00 to STA 13+40.00 along the centerline of construction.

Clear vegetation, riprap and obstructions prior to grading operations at approved locations.

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

This Item shall cover all items requiring removal as directed by the Engineer not governed otherwise by individual removal pay items elsewhere in the plans. Measurement is by station (STA).

ITEM 104 – REMOVING CONCRETE

Removal of all existing concrete curb and driveways shall be paid for under this Item.

All work required to saw-cut the existing pavement, driveways, etc. as shown on the plans, or as directed by the Owner or its designated representative, will not be paid-for directly, but shall be considered subsidiary to this Item. Contractor to neatly saw-cut at all limits of construction for a clean tie-in and shall extend the sidewalk, curb, and curb and gutter demolition to the nearest joint within public right of way.

ITEM 105 – REMOVING TREATED AND UNTREATED BASE AND ASPHALT PAVEMENT

The asphalt pavement millings shall be salvaged and stockpiled for the County of El Paso. Deliver the millings to the stockpile yard location where Citizen Transfer Station Road terminates; south of the Mike Maros St, Fabens, Texas 79838. Contractor to confirm delivery of millings to location prior to making delivery.

ITEM 110 – EXCAVATION

To eliminate all drop-off conditions, construct tapers as directed. This work will not be paid directly, but will be considered subsidiary to pertinent bid items.

All requirements to saw-cut the existing pavement, concrete sidewalks, driveways, etc., as shown in the plans, or as directed, will be considered subsidiary to this item.

Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

ITEM 132 – EMBANKMENT

All embankments (backfill and site grading) necessary for sidewalk, driveway, and wheelchair ramp construction shall not be paid-for directly, but is subsidiary to the various respective bid Items.

Moisture shall be within +/- 3% of maximum moisture content.

ITEM 314 EMULSIFIED ASPHALT TREATMENT

Emulsified asphalt, to be applied to the existing pavement as a tack coat, shall be mixed according to the existing ambient temperature. At high ambient temperatures, the mixture shall consist of 75% emulsified asphalt to 25% water. At low ambient temperatures, the mixture shall consist of 75% emulsified asphalt to 25% water.

Only CSS-1H will be used, unless otherwise approved by the Engineer.

The type of asphalt and the respective application rates will be specified before application. Different application rates may be specified for the type of asphalt being used.

The emulsified asphalt and water mixture shall be applied and incorporated into the top portion of sub base or base course layers, as shown in the plans, or as directed by the Engineer.

Emulsified asphalt placed as prime material on flexible base will be applied as a mixture of 5%-10% emulsified asphalt to 95%-90% water. Place emulsified asphalt in various applications and incorporate into the top 6-inches of flexible base during finishing operations.

Emulsified asphalt will be applied with an approved type of self-propelled pressure distributor.

The type of asphalt and respective application rates will be specified or revised by the engineer prior to application.

ITEM 340 – DENSE GRADED HOT MIX ASPHALT (SMALL QUANTITY)

This Item shall govern for all hot mix asphalt operations.

A pre-activity meeting shall be conducted by the Contractor prior to commencing the activities for this Item.

Verification tests will be performed by the Contractor using Texas Test Method Tex-530-C subsidiary to this Item. This test shall be performed as early as possible in the project.

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

The stripping characteristic of the hot mix asphalt will be tested according to test method Tex-530-C (boil test).

The maximum percent stripping agent in the produced mixture will be within the range of 7% to 12%, unless otherwise approved by the Engineer.

Before paving operations, and as directed by the Engineer, apply emulsified asphalt treatment to the surface that is to be over laid. The tack coat will be a mixture of 75% emulsion and 25% water. This mixture will be applied at a rate not to exceed 0.25 gal/sy. This application will be applied after the brooming of the surface after the placement and curing of any crack sealing and before asphalt placement begins. The tack coat will be considered subsidiary to the various bid Items of the contract.

The respective application rates will be specified or revised by the Engineer prior to application.

ITEM 421 – HYDRAULIC CEMENT CONCRETE

Use approved concrete mix designs and concrete aggregate sources.

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

Concrete mixes will have a minimum temperature of 55°F

ITEM 479 – ADJUSTING MANHOLES AND VALVES

Adjusting of existing utility manholes, valve covers, ground boxes, etc. will be done in coordination with the respective utility company.

ITEM 502 – BARRICADES, SIGNS AND TRAFFIC HANDLING

Additional signs and barricades, placed as directed, will be considered subsidiary to Item 502.

The Contractor assumes the responsibility for any and additional barricade signs and devices for any approved change to the sequence of work or Traffic Control Plan.

Furnish and maintain the barricades and warning signs, including the necessary temporary and portable traffic control devices, during the various phases of construction. Place and construct these barricades and warning signs in accordance with the latest “Texas Manual on Uniform Traffic Control Devices” for typical construction layouts.

Furnishing, placement, relocation and removal of plastic-mesh pedestrian fencing required, or as directed, will be subsidiary to this Item. All such fencing will be orange in color and 4-ft. high with 4-ft. spacing, as approved by the Owner.

Sheeting used for all signs, barricades, channelizing devices and construction warning signs must conform to TxDOT Departmental Material Specification 8300.

The G20-1T, G20-1AT, G20-1BTL(R) w/plaque or G20-5T along with the G20-6T Contractor’s name sign shall be located at or near the project limits and will remain in position for the duration of the project even though certain other advance warning signs, etc., will be repositioned, removed, or covered within the project limits as construction necessitates or as directed by the County.

Maintain shoulders in a condition capable of serving as emergency paths as approved. This work will be subsidiary to this Item.

Shadow vehicles equipped with truck-mounted attenuators are required as shown on traffic control plan (TCP) standards (1-series) and (2-series). The truck-mounted attenuators will be any of the following: Alpha 1000 by Energy Absorption Systems, Inc., Ren-Gard Ck-1128 by Renco, Inc., Syro-45 by Syro or MPS 350 III TMA by Syro or equal.

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

Provide flashing arrow boards as indicated in the plans or as directed by the Owner.

Cover work zone signs when work related to the signs is not in progress, or when any hazard related to the signs no longer exists.

Do not mount signs on drums or barricades, except those listed in the latest Barricades and Construction standard sheets.

Keep the delineation devices, signs, and pavement markings clean. This work is subsidiary to the Item, “Barricades, Signs, and Traffic Handling.”

Provide one high-intensity, yellow, rotating dome light on equipment such as distributors, spreader boxes, lay-down machines, rollers back hoes, road graders, loaders, etc. Mount lights high enough to be visible from all directions and in use when the equipment is within 30 feet of the travel way provide emergency flashers on all other equipment such as trucks, trailers, autos, etc., and use in the work site.

Use Type “A” flashing warning lights and/or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed by the Owner.

For additional information pertaining to channelization, signing, spacing details and flagging procedures required to regulate, warn and guide traffic through the project, refer to the “Barricade and Construction Standards” and to the current “Texas Manual on Uniform Traffic Control Devices.”

The Contractor shall coordinate all scheduled lane closures with surrounding businesses to include Fabens Airport.

Portable changeable message signs shall be in place five (5) days before roadways are closed to provide sufficient advanced warning.

TMA’s will not be paid separately and will be subsidiary to this Item.

ITEM 506 – TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

The SW3P shall consist of erosion or water pollution control measures deemed necessary. Any such additional erosion or water pollution control measure shall be implemented by the Contractor as prescribed by this Item and in accordance with the appropriate specification. Payment for erosion control measures for which applicable Items are not included in the Contract shall be made in accordance with Article 9, "Measurement and Payment".

The total disturbed area for this project is 0.31 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLS), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Contractor will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor shall obtain authorization from the TCEQ for any Contractor PSLS for construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLS within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLS on the right of way to the Engineer.

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

Any excess tracking onto public travel ways shall be removed, as directed by the Owner, and shall be considered subsidiary work to this Item.

Place silt fences at all inlets and culverts as shown on the plans, or as directed. The quantities shown in the plans represent linear feet of fence per inlet and linear feet of fence per culvert structure and may be adjusted to match field conditions, as directed by the Owner.

Silt fence will be paid-for at the time of their initial placement and removal. Any required replacement will not be a substitute for proper maintenance and will be allowed only as directed by the Owner.

Sediment deposit removal and stabilization required for the various SW3P Items are subsidiary to the various SW3P bid Items.

Quantities are approximate and may be adjusted in the field as conditions dictate, as directed by the Engineer.

Provide adequate and proper placement of all SW3P measures, their required maintenance and any other incidental work required as part of this storm water pollution prevention plan. All such work will be accomplished to ensure the prevention of storm water pollution to the waters of the United States as provided-for in the plans, or as directed by the Owner, and is subsidiary to the various bid Items.

ITEM 529 – CONCRETE CURB

Use Type II cement and Class A concrete for these Items, unless otherwise shown in the plans. Wire mesh will not be allowed. Reinforce all concrete for these Items using bar reinforcement conforming to Item 440, as shown in the plans or as directed.

Concrete curb with openings will be paid for under Item 529 6008.

ITEM 530 – INTERSECTIONS, DRIVEWAYS, TURNOUTS

Contractor shall verify all driveway locations and dimensions before construction to allow for all necessary field adjustments where applicable. Any such location adjustments will not be paid for directly, but will be subsidiary to this Item.

All driveways shall be constructed Class A concrete with a thickness of 6 inches. Reinforcement and spacing shall follow plan details.

Contractor shall request 3-day break for driveway pours.

The Contractor shall provide proper corner clearances for proposed driveways at all intersections and side streets as detailed on the plans unless otherwise directed by the Owner.

Embankment required for construction of driveways and turnouts will be placed as directed by the Engineer, and will be subsidiary to this Item.

ITEM 585 – RIDE QUALITY FOR PAVEMENT SURFACES

Use Surface Test Type A to govern ride quality.

ITEM 624 – GROUND BOXES

Materials for relocating or adjusting conduit and conductors are subsidiary to this item. This item includes testing the completed installation of operation.

ITEM 644 – SMALL ROADSIDE ASSEMBLIES

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

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

Bolt Clamp Type shall be used for triangular slip base.

Roll pin will be required as shown on SMD (Slip-1)-08.

Verify all post lengths to ensure the proper sign height. Remove and replace any sign installed incorrectly.

Provide Texas Universal Triangular Slip Base for all signs.

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

Signs on small sign assemblies are subsidiary to this item and will not be paid for separately.

All signs removed will remain property of the County of El Paso.

ITEM 662 – WORK ZONE PAVEMENT MARKINGS

In those areas where existing pavement markings necessitate removal to accommodate, the traffic handling as described in the Traffic Control Plans, field locate and record, by survey, the existing pavement markings as directed. Place final striping on these locations.

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

ITEM 666 – REFLECTORIZED PAVEMENT MARKINGS

The proposed permanent striping shall be placed at the time areas of pavement are completed and open to traffic, as directed by the Engineer.

FABENS AIRPORT DECELERATION LANE IMPROVEMENTS

COUNTY: EL PASO

HIGHWAY: FM 793 (FABENS ROAD)

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677 and will be subsidiary to this pay item.

Air blasting is required as pavement surface preparation.

In those areas where existing pavement markings necessitate removal to accommodate the traffic handling as described in the traffic control plans, field-locate and record by survey the existing pavement marking, as directed and the final striping will then be placed in these locations.

All glass beads and pavement markings shall be purchased on the open market.

Permanent pavement markings shall be placed no later than two weeks after final surfacing.

The contractor shall be responsible for field-locating and recording by survey, the existing stripe alignment so that final pavement markings may be placed in the exact location as the existing or as directed by the Engineer.

The Contractor shall be responsible for all striping to be in satisfactory condition as determined by the Engineer prior to the final acceptance of the project.

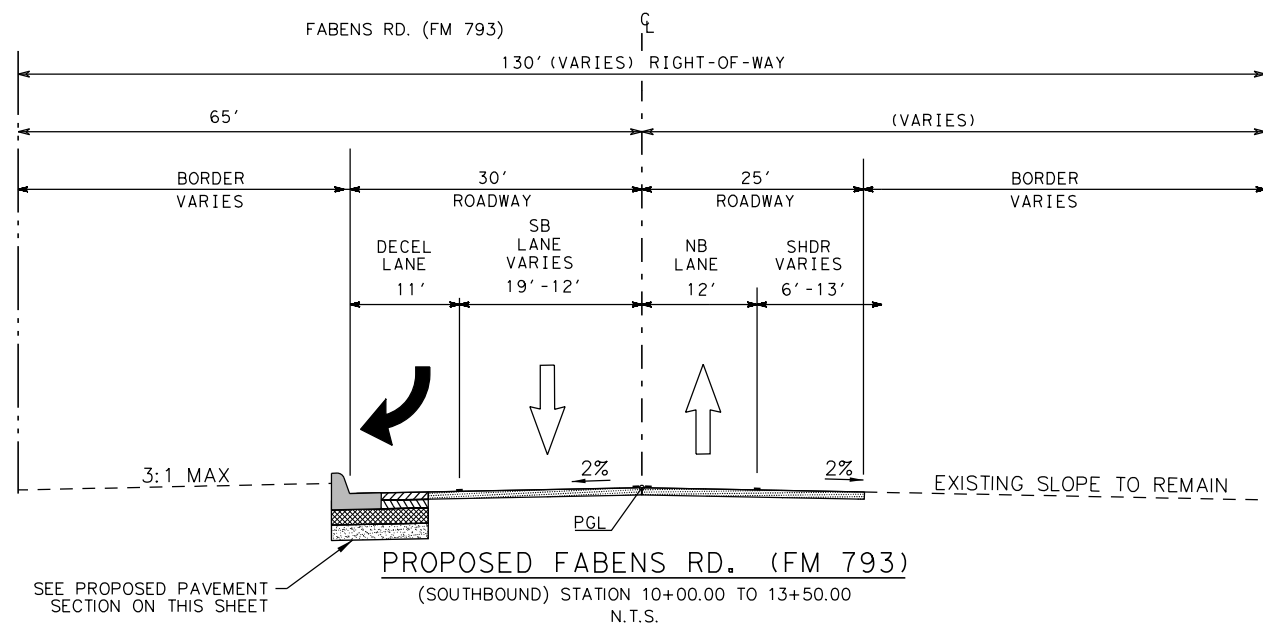
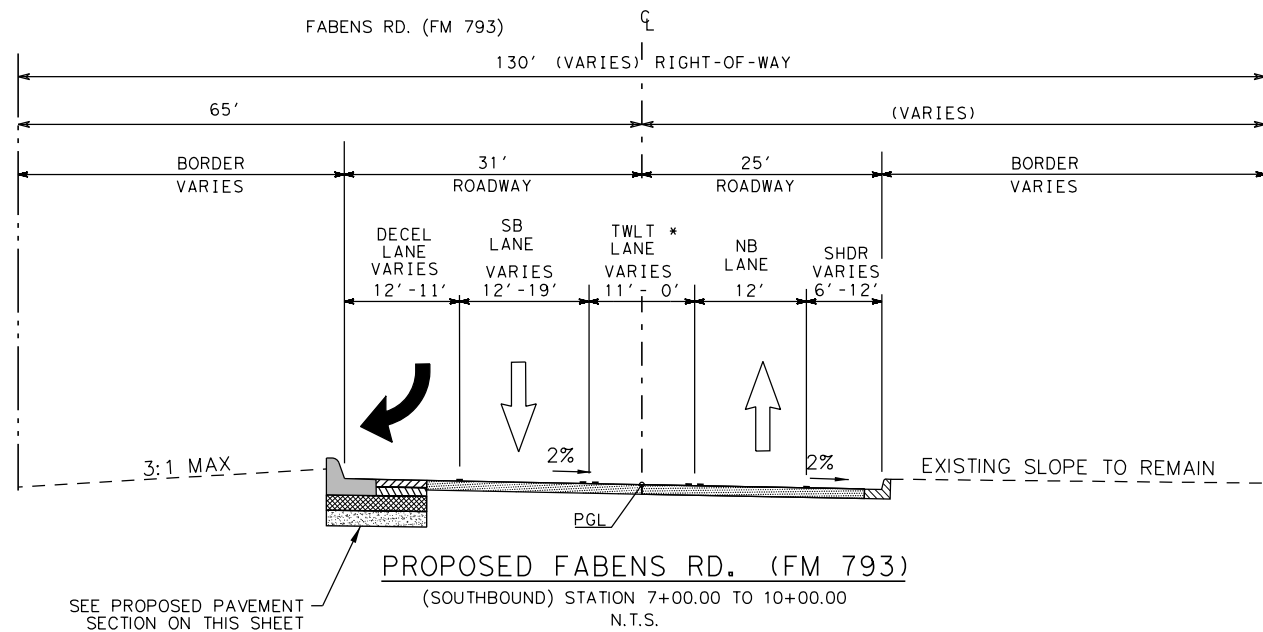
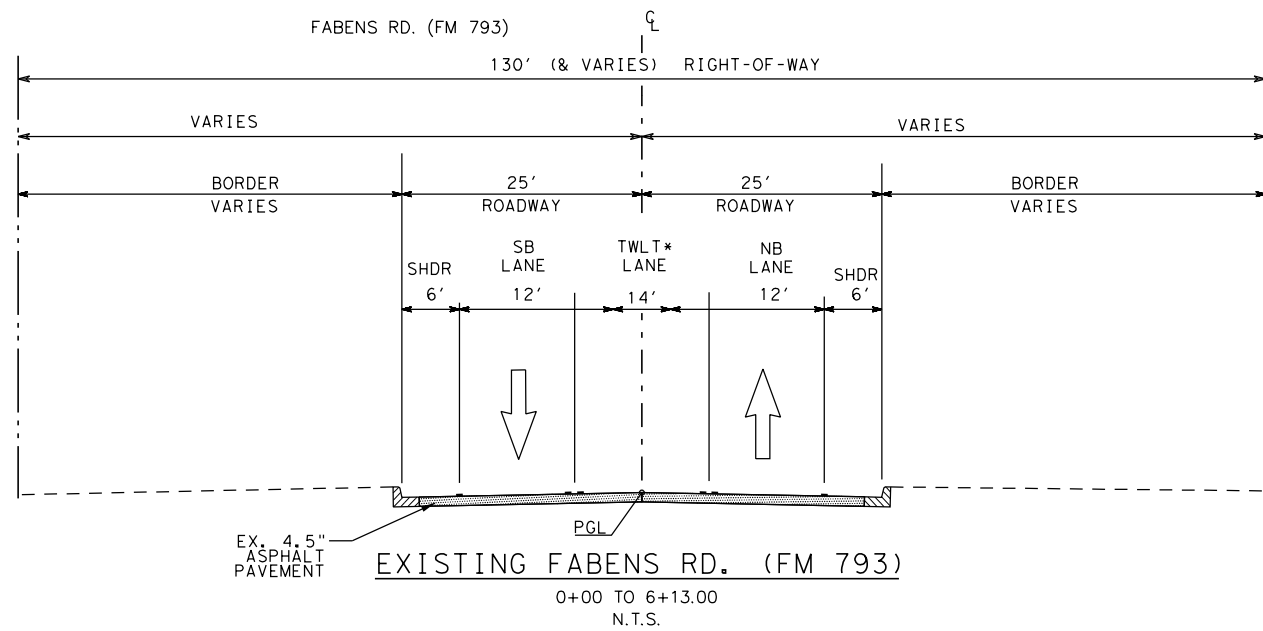
ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

All PCMS shall be protected at all times per TXDOT Standard BC (6)-14.

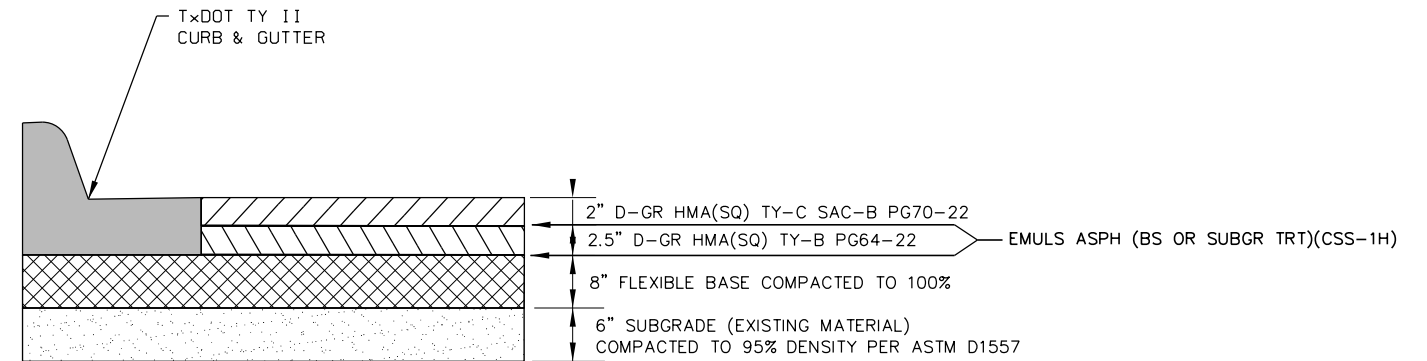
Contractor shall use a PCMS for each approach on FM 793 when closing a shoulder or traffic lane and use the appropriate message applicable to the condition.

PCMS shall be paid under item 6001 by the day. A day will include up to 8 hours of work.

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* TWLT LANE - TWO WAY LEFT-TURN LANE



PROPOSED HMAC PAVEMENT SECTION

N.T.S.



HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING

5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912

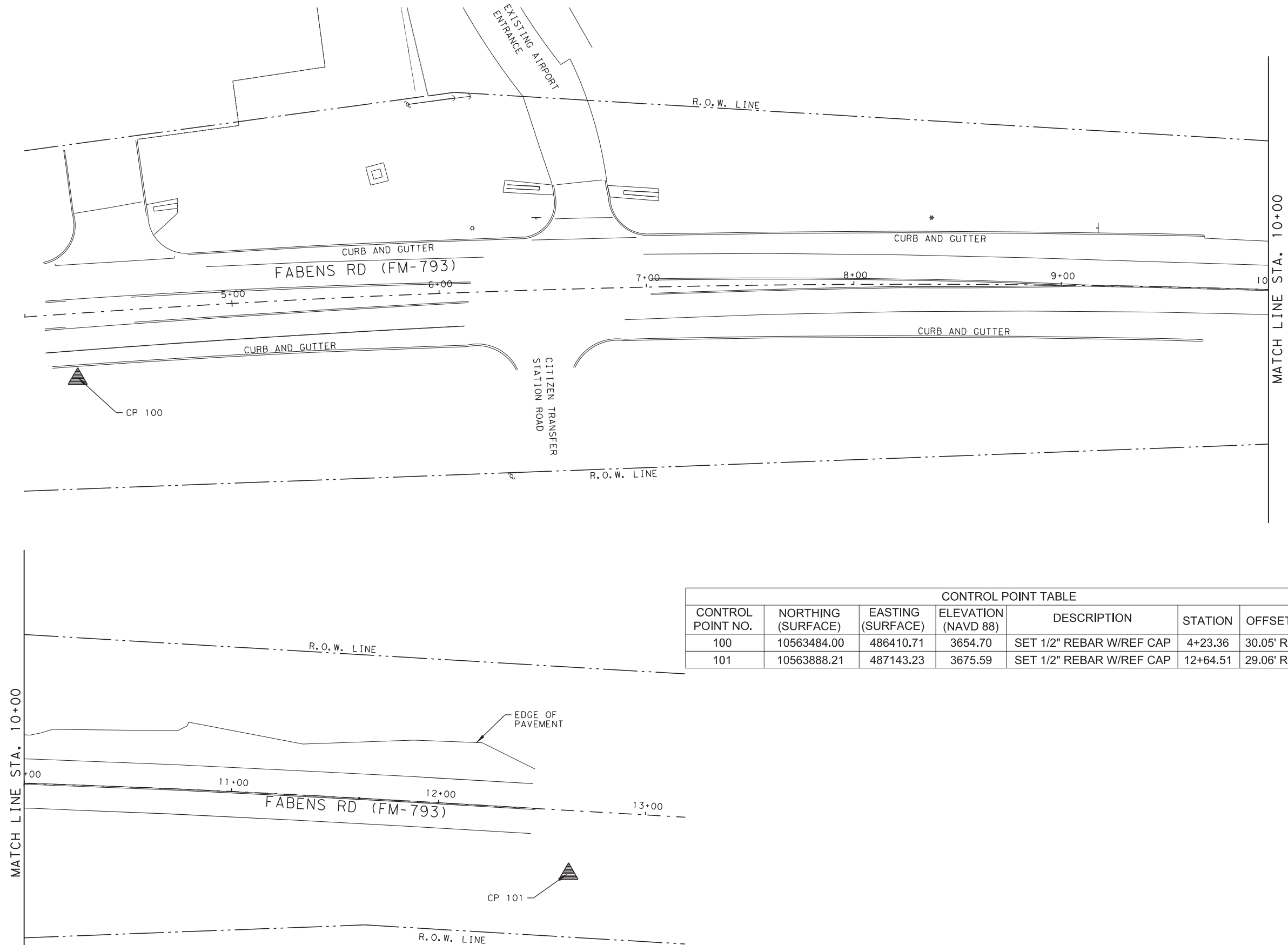
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FABENS AIRPORT DECELERATION LANE

TYPICAL SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			4

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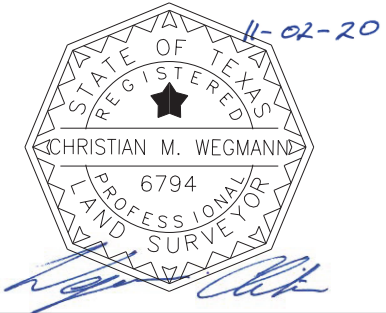
CONTROL POINT TABLE						
CONTROL POINT NO.	NORTHING (SURFACE)	EASTING (SURFACE)	ELEVATION (NAVD 88)	DESCRIPTION	STATION	OFFSET
100	10563484.00	486410.71	3654.70	SET 1/2" REBAR W/REF CAP	4+23.36	30.05' RT
101	10563888.21	487143.23	3675.59	SET 1/2" REBAR W/REF CAP	12+64.51	29.06' RT



HORIZONTAL AND VERTICAL CONTROL LEGEND

- RIGHT-OF-WAY LINE
- BASE LINE
- SET CONTROL POINT

- SURVEY DATUM NOTE:
- HORIZONTAL DATUM IS THE TEXAS COORDINATE SYSTEM OF 1983, CENTRAL ZONE (4203). UNIT OF MEASURE USED IS THE U.S. SURVEY FOOT.
 - VERTICAL DATUM IS NAVD 1988 (GEOID 12B).
 - MEASUREMENTS ARE DERIVED FROM TEXAS RTK CO-OP SYSTEM FOR EL PASO COUNTY, BASED ON NAD83 CORS96
 - COORDINATES SHOWN HEREON ARE SURFACE VALUES. THEY HAVE BEEN SCALED FROM GRID VALUES BY A COMBINED SCALE FACTOR OF 1.000231.



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Firm No. F-761

FABENS AIRPORT DECELERATION LANE
HORIZONTAL/VERTICAL
CONTROL PLAN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			5

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DEMOLITION SUMMARY							
ITEM NO.	100 6002	104 6017	104 6022	105 6046	624 6028	644 6076	677 6001
DESCRIPTION	PREPARE ROW	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVING STAB BASE ASPH PAV (0"-10")	REMOVE GROUND BOX	REMOVE SM RD SN SUP&AM	ELIM EXT PAV MRK & MRKS (4")
UNIT	STA	SY	LF	SY	EA	EA	LF
SHEET 1 OF 1	8	88	342	212	1	2	3684
TOTAL	8	88	342	212	1	2	3684

TRAFFIC CONTROL PLAN				
ITEM NO.	500 6001	502 6001	662 6075	6001 6001
DESCRIPTION	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC CONTROL	WK ZN PAV MRK REMOV (W) 24" (SLD)	PORTABLE CHANGEABLE MESSAGE SIGN
UNIT	LS	MO	LF	DAY
SHEET 1 OF 1	1	3.0	22	10
TOTAL	1	3.0	22	10

PAVEMENT MARKINGS SUMMARY												
644 6001	644 6004	666 6012	666 6036	666 6048	666 6054	666 6078	666 6120	666 6126	666 6170	666 6178	666 6182	666 6184
IN SM RD SN SUP&AM TY10BWG (1) SA (P)	IN SM RD SN SUP&AM TY10BWG (1) SA (T)	REFL PAV MRK TY I (W) 4" (SLD) (100 MIL)	REFL PAV MRK TY I (W) 8" (SLD) (100 MIL)	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	REFL PAV MRK TY I (W) ARROW (100 MIL)	REFL PAV MRK TY I (W) WORD (100 MIL)	REFL PAV MRK TY I (Y) 4" (BRK) (100 MIL)	REFL PAV MRK TY I (Y) 4" (SLD) (100 MIL)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W) ARROW
EA	EA	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	EA
1	2	960	382	12	6	2	100	2026	960	382	12	6

PAVEMENT MARKINGS SUMMARY (CONTINUED)												
666 6192	666 6205	666 6207	666 6224	666 6226	666 6230	666 6231	666 6232	672 6007	672 6009	678 6001	678 6004	678 6008
REFL PAV MRK TY II (W) WORD	REFL PAV MRK TY II (Y) 4" (BRK)	REFL PAV MRK TY II (Y) 4" (SLD)	PAVEMENT SEALER 4"	PAVEMENT SEALER 8"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (4")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF	LF	LF
2	100	2026	3086	382	12	6	2	19	32	2451	382	12

EROSION CONTROL PLAN							
ITEM NO.	506 6020	506 6024	506 6035	506 6038	506 6039	506 6040	506 6043
DESCRIPTION	CONSTRUCTION EXITS (INSTALL) (TY1)	CONSTRUCTION EXITS (REMOVE)	SAND BAGS FOR EROSION CONTROL	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
UNIT	SY	SY	EA	LF	LF	LF	LF
SHEET 1 OF 1	116	116	18	1939	1939	136	136
TOTAL	116	116	18	1939	1939	136	136

ROADWAY SUMMARY												
ITEM NO	110 6001	132 6006	150 6001	216 6001	247 6230	314 6005	340 6011	340 6048	432 6023	529 6008	530 6020	624 6002
DESCRIPTION	EXCAVATION (ROADWAY)	EMBANKMENT FINAL (DENS CONT) (TY C)	BLADING	PROOF ROLLING	FL BS (CMP IN PLC) (TY A GR 1-2) (8")	EMULS ASPH (BS OR SUBGR TRT) (CSS-1H)	D-GR HMA (SQ) TY-B PG64-22	D-GR HMA (SQ) TY-C SAC-B PG70-22	RIPRAP (STONE COMMON) (TY I) (8 IN)	CONC CURB & GUTTER (TY II)	DRIVEWAYS (CONC) (TY I)	GROUND BOX TY A (122311)W APRON
UNIT	CY	CY	HR	HR	SY	GAL	TON	TON	CY	LF	SY	EA
SHEET 1	384	59	8	8	482	241	67	53	95	560	96	1
TOTAL	384	59	8	8	482	241	67	53	95	560	96	1



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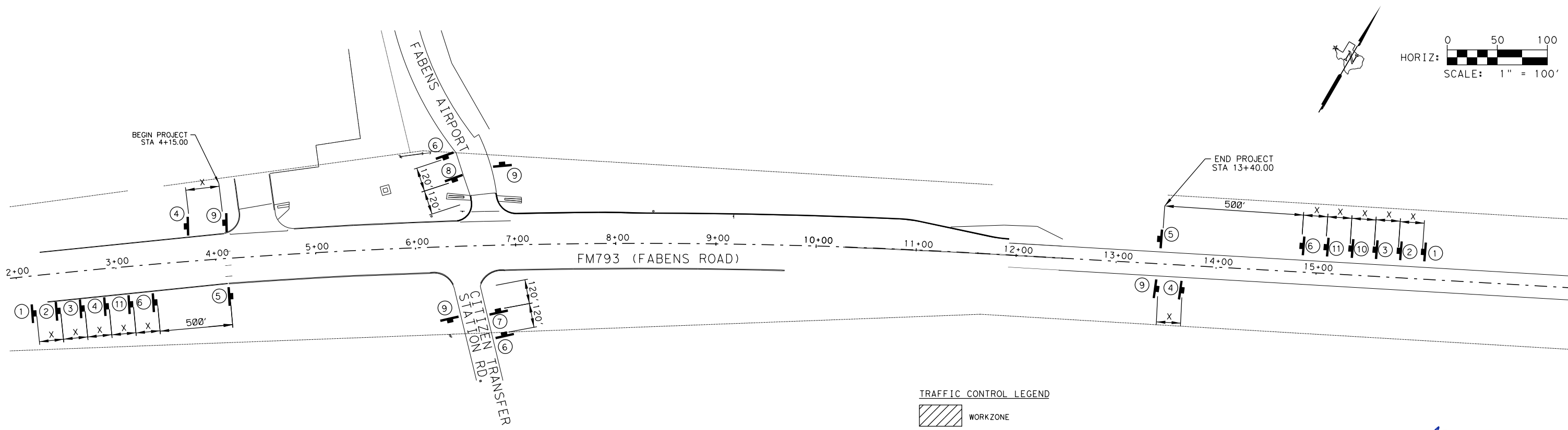
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Firm No. F-761

FABENS AIRPORT DECELERATION LANE

QUANTITY SUMMARY SHEET

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			6

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TRAFFIC CONTROL LEGEND

- WORKZONE
- TRAFFIC CONTROL SIGN

STREET	POSTED SPEED
FABENS ROAD	55

NOTES

- PROJECT LIMIT SIGNS SHALL BE LOCATED AT APPROXIMATE LOCATIONS SHOWN AND SHALL REMAIN IN PLACE FOR THE FULL DURATION OF THE PROJECT OR AS DIRECTED BY THE ENGINEER.
- MINIMUM SPACING TO (X) EQUALS 500' BETWEEN CONSTRUCTION, UNLESS OTHERWISE NOTED.
- ANY CONFLICTING SIGNS SHALL BE COVERED BY CONTRACTOR OR AS DIRECTED BY THE ENGINEER.
- CONTRACTOR SHALL IMPLEMENT TCP (1-3)-18 AND TCP (2-1)-18 FOR PROJECT.
- * CONTRACTOR SHALL USE A PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) FOR EACH APPROACH OF FM793 WHEN CLOSING A SHOULDER OR TRAFFIC LANE AND USE THE APPROPRIATE MESSAGE APPLICABLE TO THE CONDITION.
- REFER TO TXDOT STANDARD TCP (1-3)-18 FOR SPACING OF SIGNS AND CHANNELIZING DEVICES.

WARNING!
BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN PROJECT AREA
REFER TO INDEX SHEET FOR UTILITY COMPANY CONTACT INFORMATION



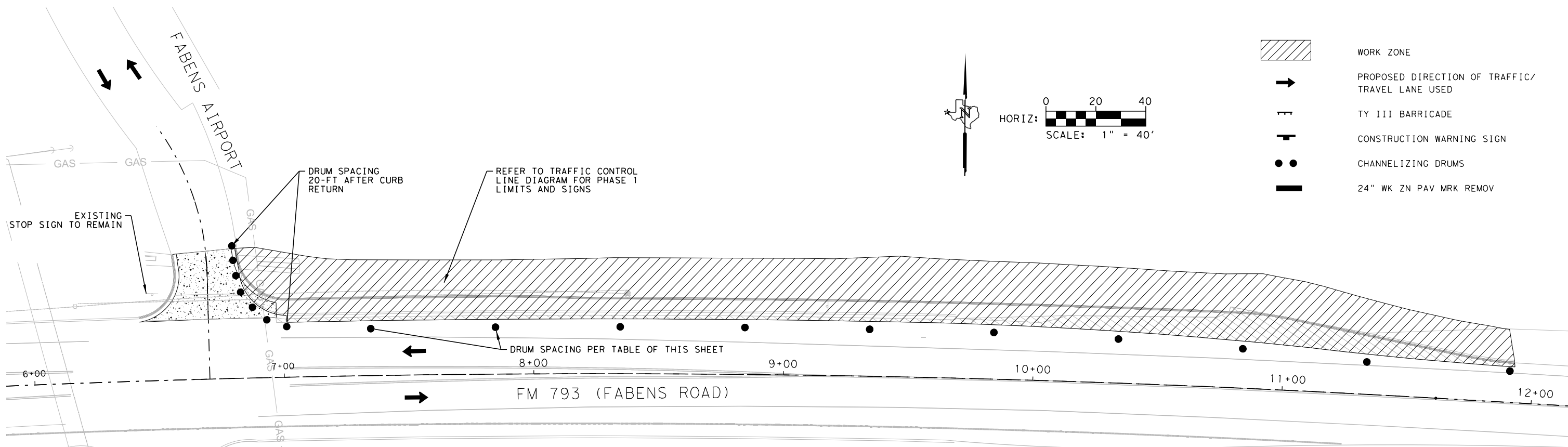
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Firm No. F-761

FABENS AIRPORT DECELERATION LANE

TRAFFIC CONTROL
LINE DIAGRAM

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	7

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SHEET TOTALS				
ITEM	CODE	DESCRIPTION	UNIT	QUANT
* 502	6001	BARRICADES, SIGNS AND TRAFFIC CONTROL	MO	3.0
662	6075	WK ZN PAV MRK REMOV (W)24" (SLD)	LF	22
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	10

NOTE:
* REFER TO SHEET 2 OF 2 FOR
WORK ZONE PAVEMENT MARKINGS

- NOTE:
- SIGN LOCATION MAY BE ADJUSTED DUE TO SITE CONDITIONS AS APPROVED BY THE ENGINEER.
 - REFER TO BARRICADE AND CONSTRUCTION (BC) STANDARDS FOR TEMPORARY PAVEMENT MARKING DETAILS AND MINIMUM SPACING OF CONSTRUCTION WARNING AND CROSSROAD SIGNS.
 - REFER TO TCP STANDARDS FOR TRAFFIC CONTROL DURING THE INSTALLATION AND REMOVAL OF TEMPORARY AND PERMANENT PAVEMENT STRIPING AND MARKINGS.
 - REFER TO THE LINE DIAGRAM FOR ADDITIONAL SIGNAGE AND DESCRIPTION OF WORK TO BE PERFORMED IN EACH PHASE.
 - ANY CONFLICTING SIGNS SHALL BE COVERED BY CONTRACTOR OR AS DIRECTED BY THE ENGINEER.
 - THE CONTRACTOR SHALL REFER TO TABLE FOR APPROPRIATE SPACING OF CHANNELIZING DEVICES.
 - THE INSTALLATION AND REMOVAL OF TEMPORARY PAVEMENT MARKINGS SHALL BE PAID UNDER ITEM 662.
 - THE CONTRACTOR SHALL COORDINATE ALL SCHEDULED LANE CLOSURES WITH SURROUNDING BUSINESSES TO INCLUDE ANY EPFD FIRE STATIONS, FABENS AIRPORT, AND AFFECTED SCHOOL DISTRICTS AND SCHOOLS.
 - DAILY LANE CLOSURES WILL BE ALLOWED ONLY DURING CONSTRUCTION HOURS. BY END OF WORK DAY, CHANNELIZING DEVICES SHALL BE MOVED BACK TO THE SHOULDER AREA TO REOPEN THE CLOSED LANE UNTIL CONSTRUCTION RESUMES THE FOLLOWING DAY.
 - CONTRACTOR SHALL IMPLEMENT TXDOT STANDARD TCP(2-1)-18 FOR WORK ALONG FM 793 (FABENS ROAD).

SPEED (MPH)	FORMULA	MINIMUM DESIREABLE TAPER LENGTH			SUGGESTED MAX SPACING OF CHANNELIZING DEVICES		MIN SIGN SPACING "X" DISTANCE
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER OR CURVE	ON A TANGENT	
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'
55	$L = WS$	550'	605'	660'	55'	110'	500'



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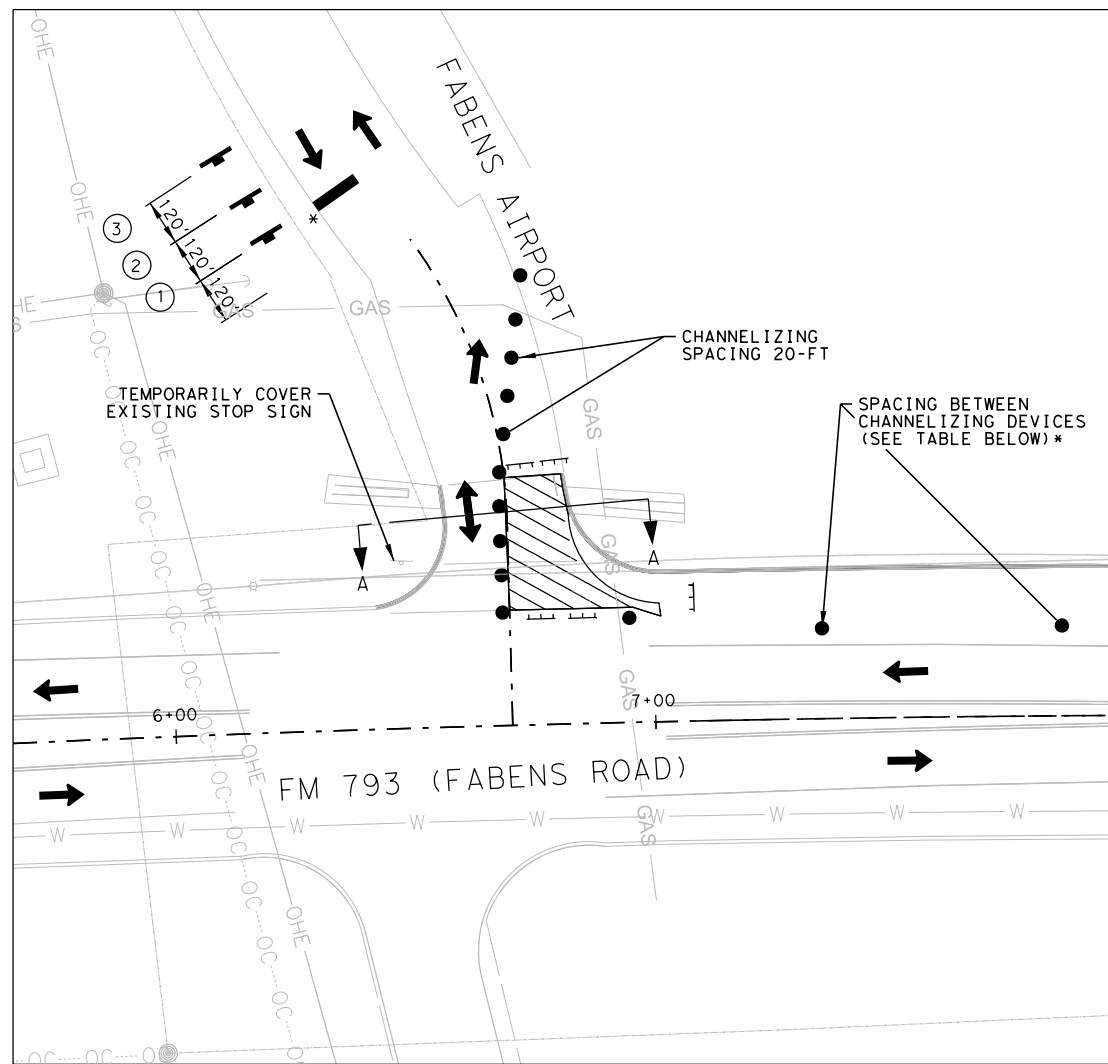
FABENS AIRPORT DECELERATION LANE

TRAFFIC CONTROL PLAN
PHASE ONE - DECELERATION LANE

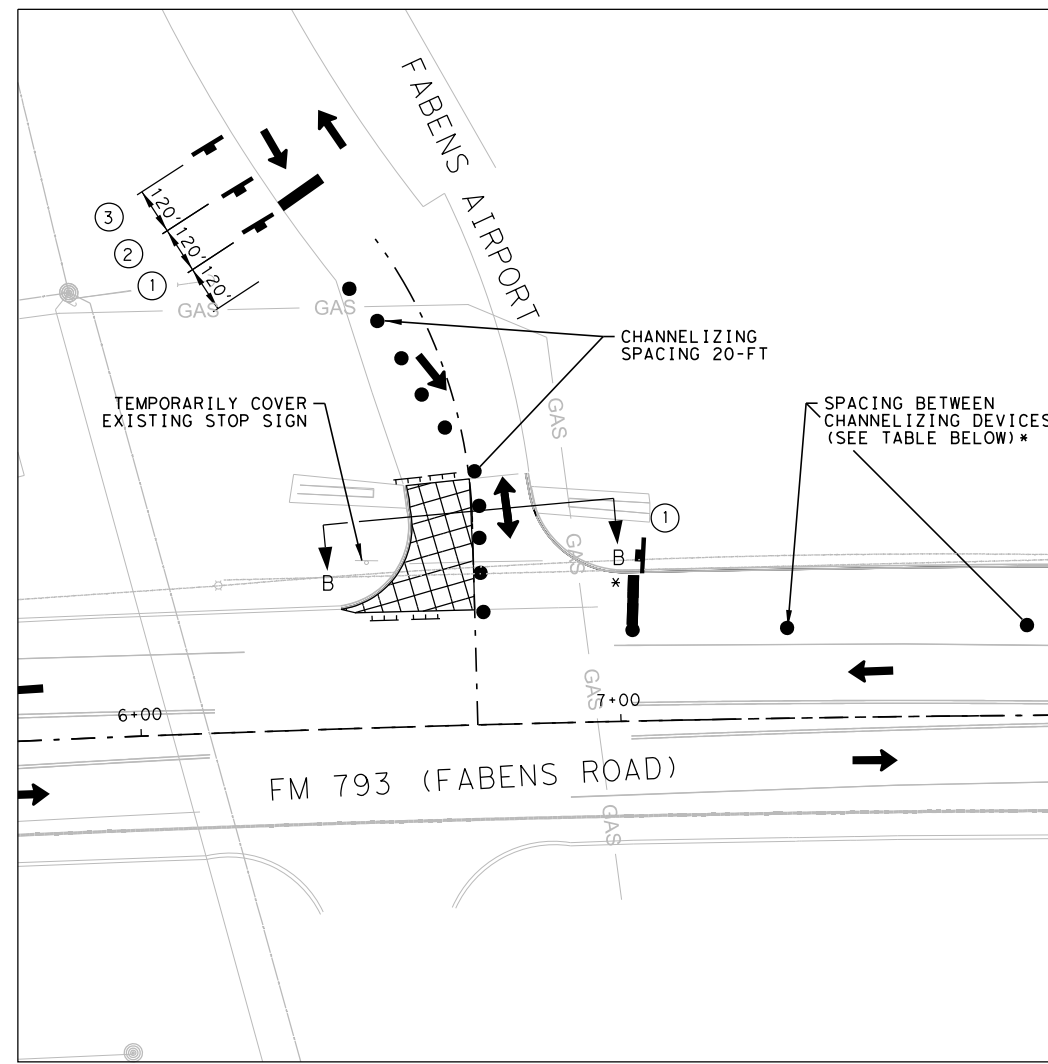
SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			8

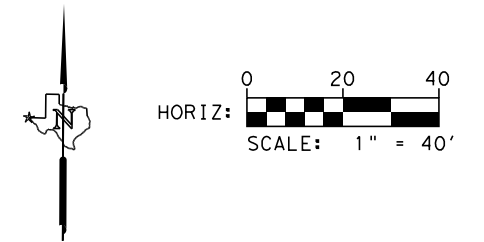
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PHASE 2A



PHASE 2B

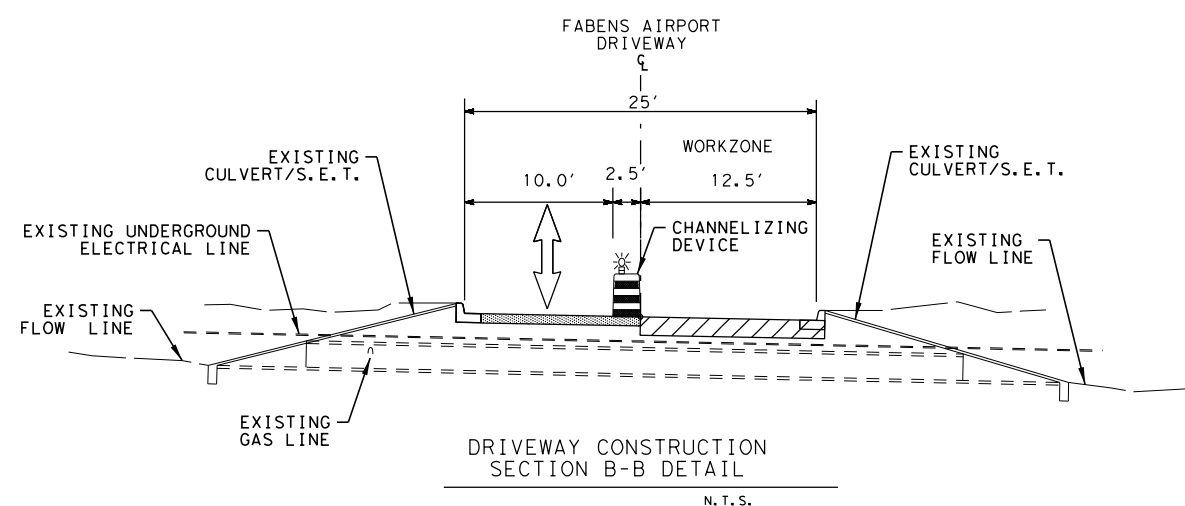
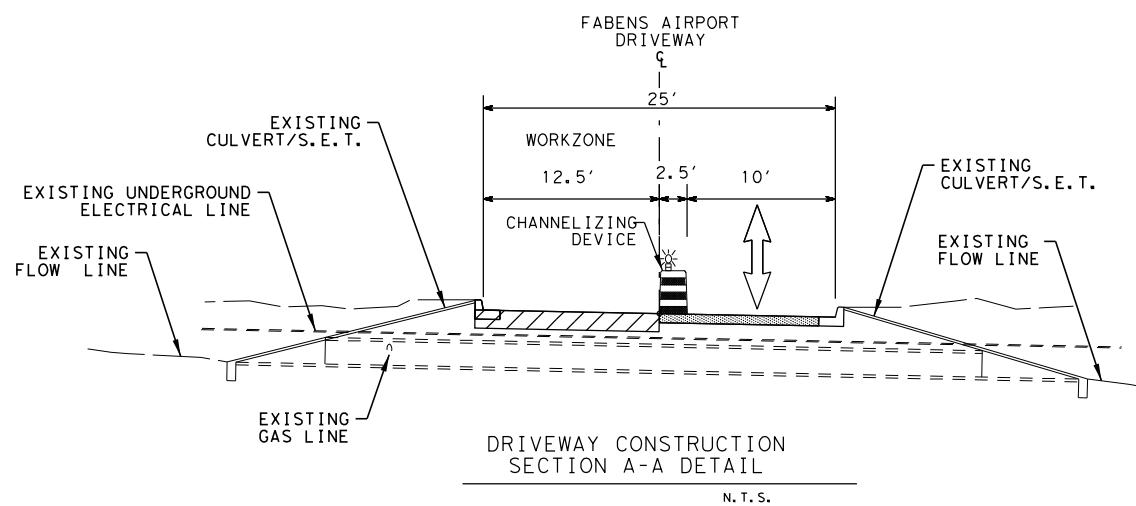
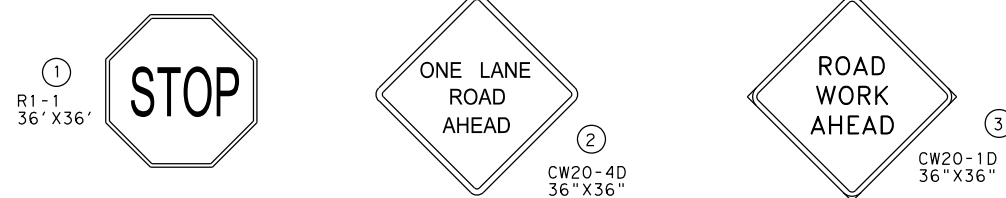


- PHASE 2A WORK ZONE
- PHASE 2B WORK ZONE
- PROPOSED DIRECTION OF TRAFFIC/ TRAVEL LANE USED
- TY III BARRICADE
- CONSTRUCTION WARNING SIGN
- CHANNELIZING DRUMS
- 24" WK ZN PAV MRK REMOV *

NOTE:
* REFER TO SHEET 1 OF 2
FOR WORK ZONE PAVEMENT MARKING QUANTITIES



SPEED (MPH)	FORMULA	MINIMUM DESIREABLE TAPER LENGTH			SUGGESTED MAX SPACING OF CHANNELIZING DEVICES		MIN SIGN SPACING "X" DISTANCE
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER OR CURVE	ON A TANGENT	
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'
*55	$L = WS$	550'	605'	660'	55'	110'	500'



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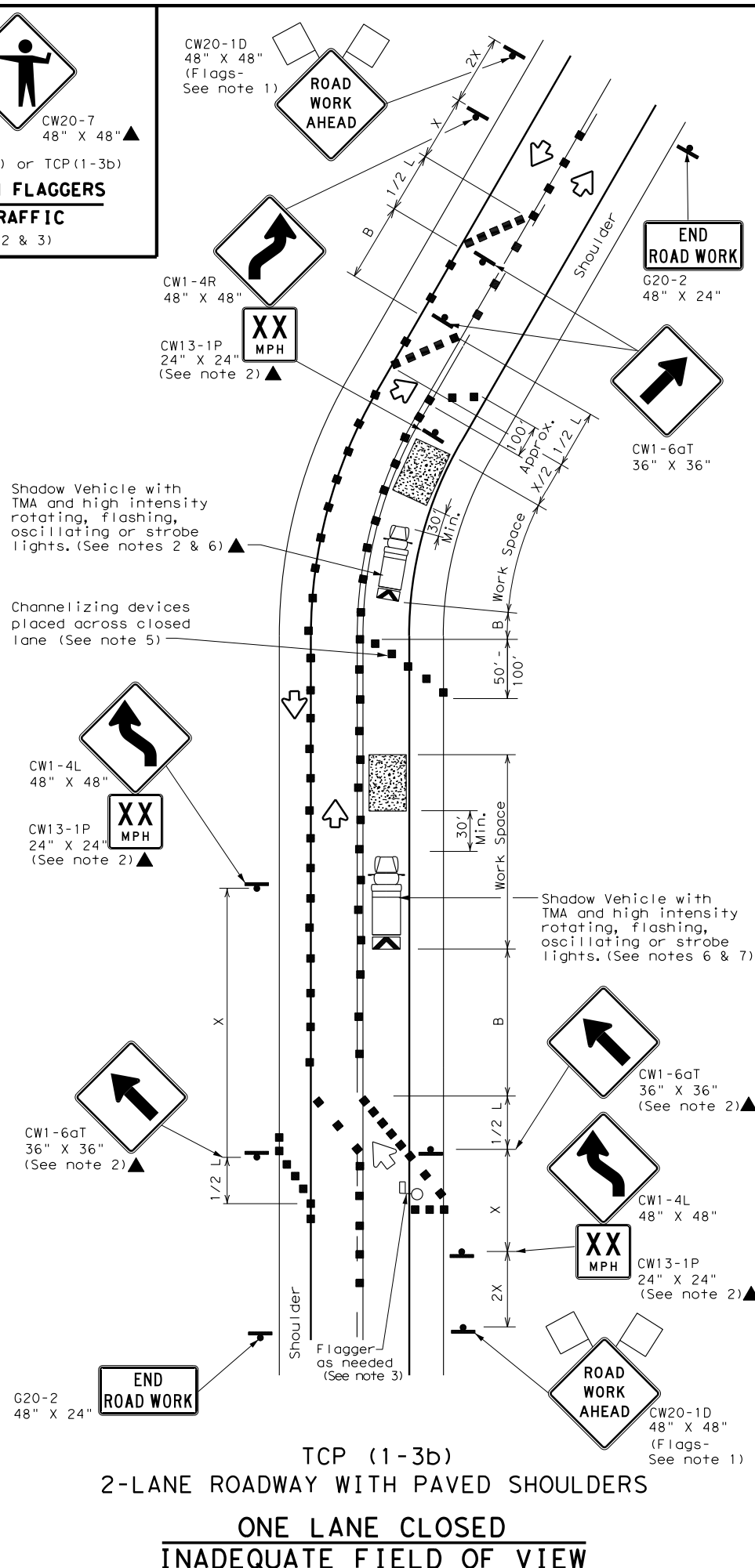
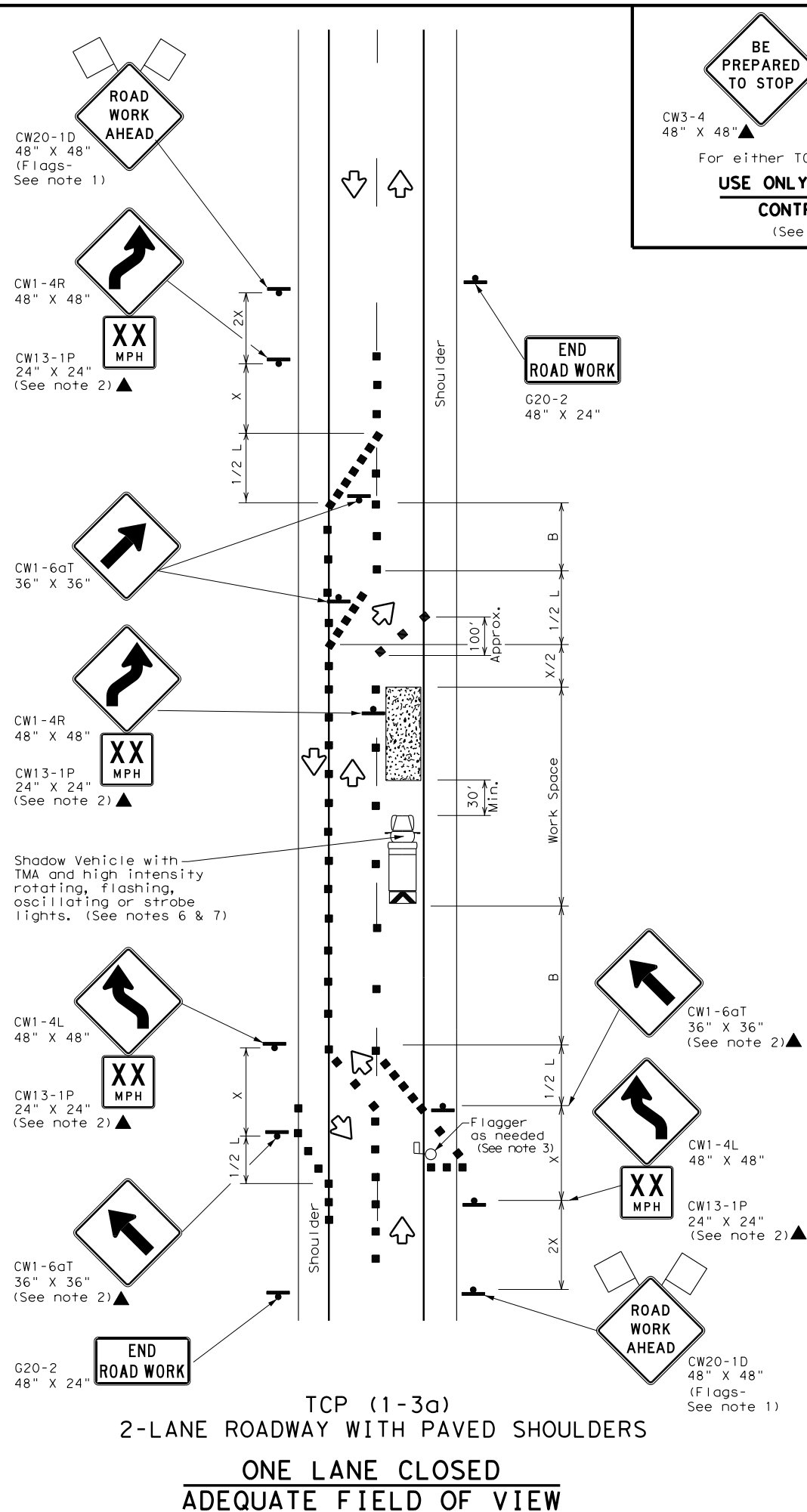
FABENS AIRPORT DECELERATION LANE











TRAFFIC CONTROL PLAN
PHASE 2A AND 2B
DRIVEWAY ENTRANCE/EXIT

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	9
CONTROL	SECTION	JOB	

DATE:
FILE:



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

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

* Conventional Roads Only


×× Taper lengths have been rounded off.

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

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

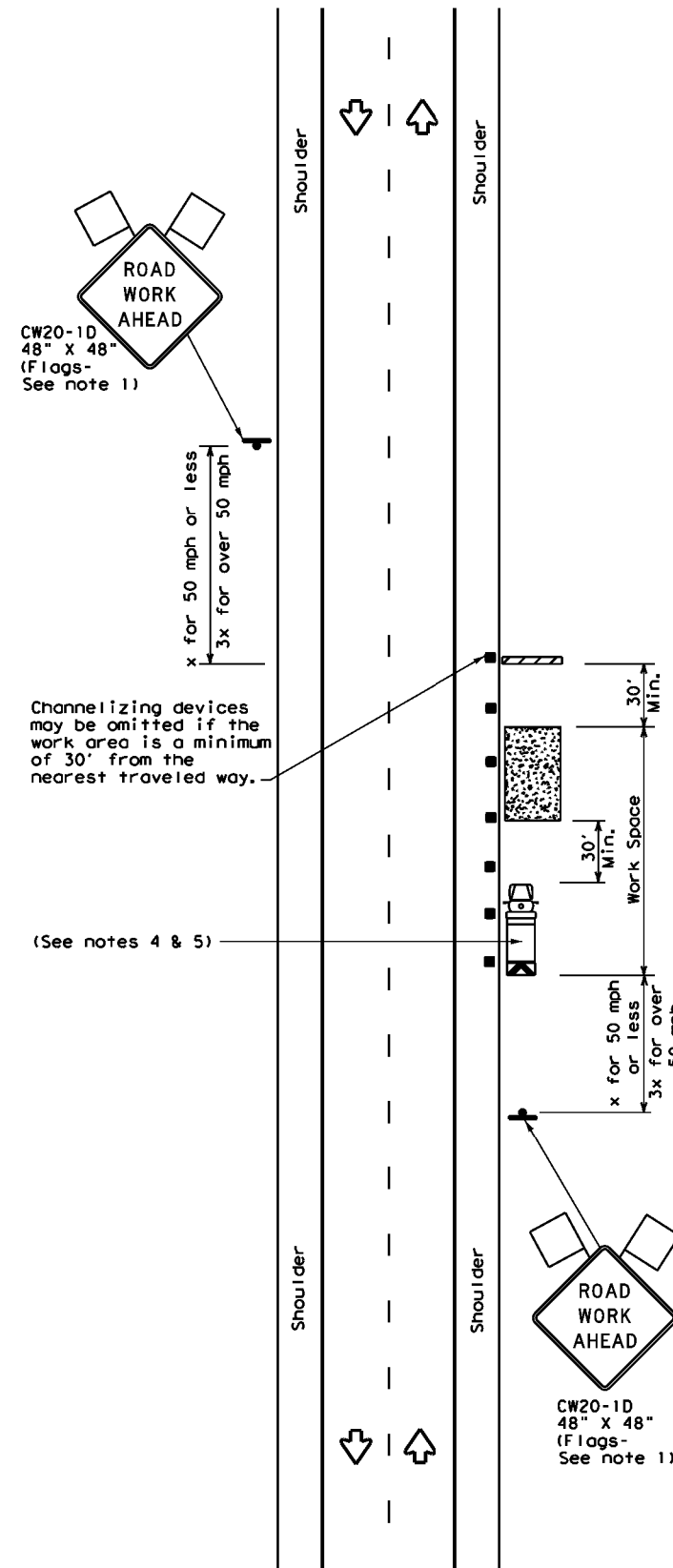
GENERAL NOTES

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

 <p>Texas Department of Transportation</p>	<p>Traffic Operations Division Standard</p>																																
<h1 style="margin: 0;">TRAFFIC CONTROL PLAN</h1> <h2 style="margin: 0;">TRAFFIC SHIFTS ON</h2> <h2 style="margin: 0;">TWO LANE ROADS</h2> <h1 style="margin: 0;">TCP (1-3) - 18</h1>																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">FILE#: tcp1-3-18.dgn</td> <td style="width: 16.5%;">DN#:</td> <td style="width: 16.5%;">CK#:</td> <td style="width: 16.5%;">DW#:</td> <td style="width: 16.5%;">CK#:</td> </tr> <tr> <td>© TxDOT December 1985</td> <td>CONT</td> <td>SECT</td> <td>JOB</td> <td>HIGHWAY</td> </tr> <tr> <td colspan="5" style="text-align: center;">REVISIONS</td> </tr> <tr> <td>2-94 4-98</td> <td colspan="2" rowspan="3" style="text-align: center; vertical-align: middle;">DIST</td> <td colspan="2" rowspan="3" style="text-align: center; vertical-align: middle;">COUNTY</td> </tr> <tr> <td>8-95 2-12</td> </tr> <tr> <td>1-97 2-18</td> </tr> <tr> <td colspan="3"></td> <td colspan="2" style="text-align: right;">SHEET NO</td> </tr> <tr> <td colspan="3"></td> <td colspan="2" style="text-align: right; font-size: 1.5em;">10</td> </tr> </table>		FILE#: tcp1-3-18.dgn	DN#:	CK#:	DW#:	CK#:	© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY	REVISIONS					2-94 4-98	DIST		COUNTY		8-95 2-12	1-97 2-18				SHEET NO					10	
FILE#: tcp1-3-18.dgn	DN#:	CK#:	DW#:	CK#:																													
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY																													
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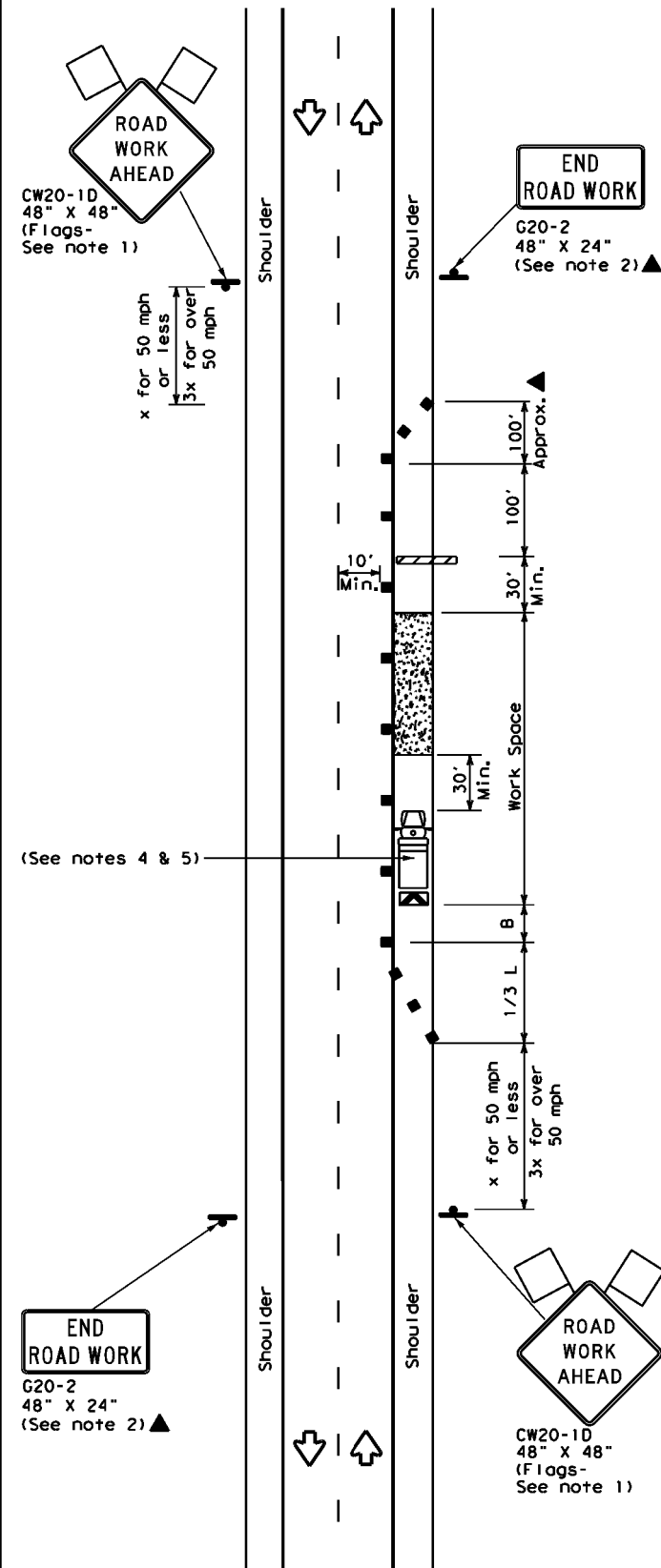
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DATE: FILE:



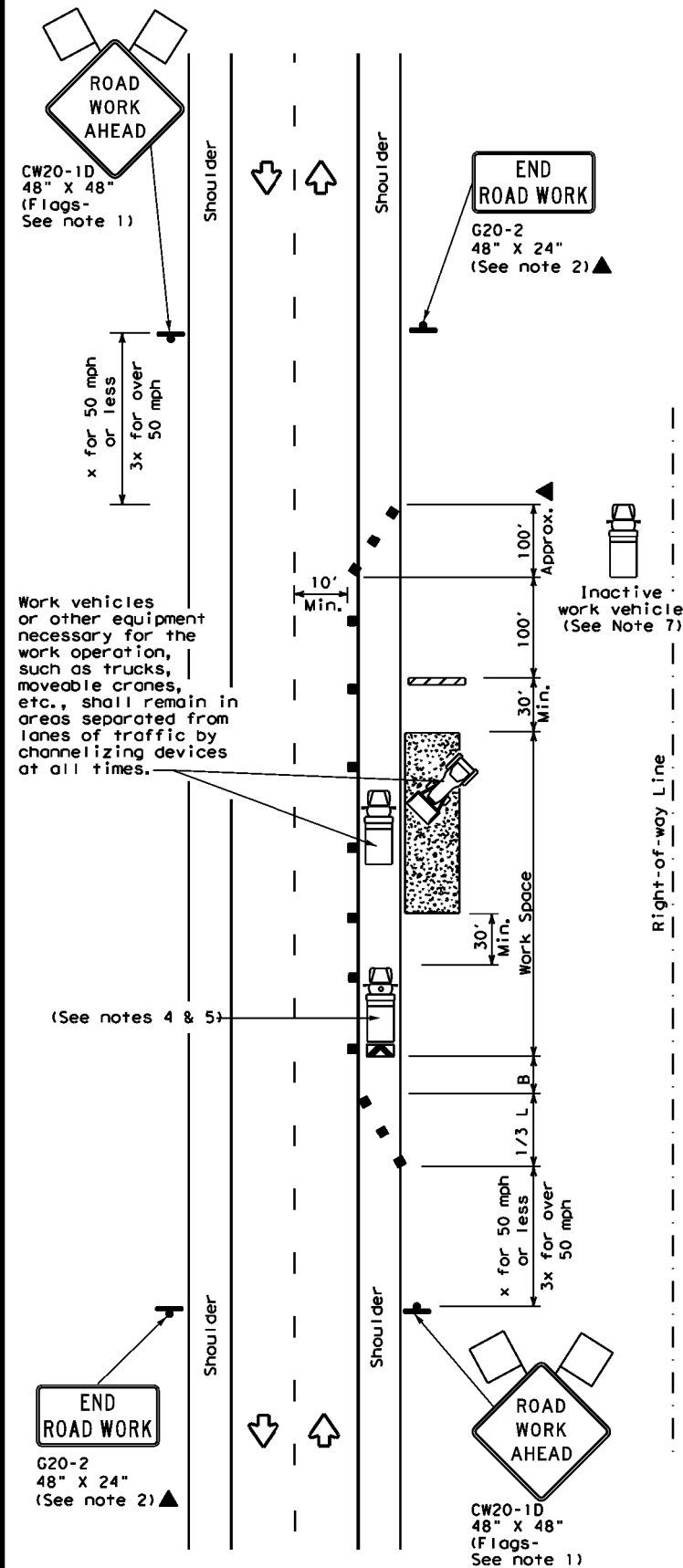
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

** Taper lengths have been rounded off.

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

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
- All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated 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 CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK**

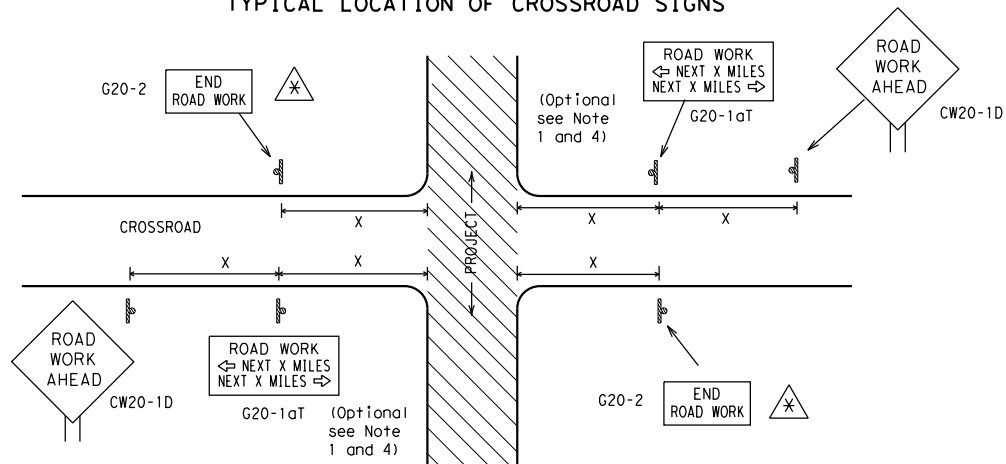
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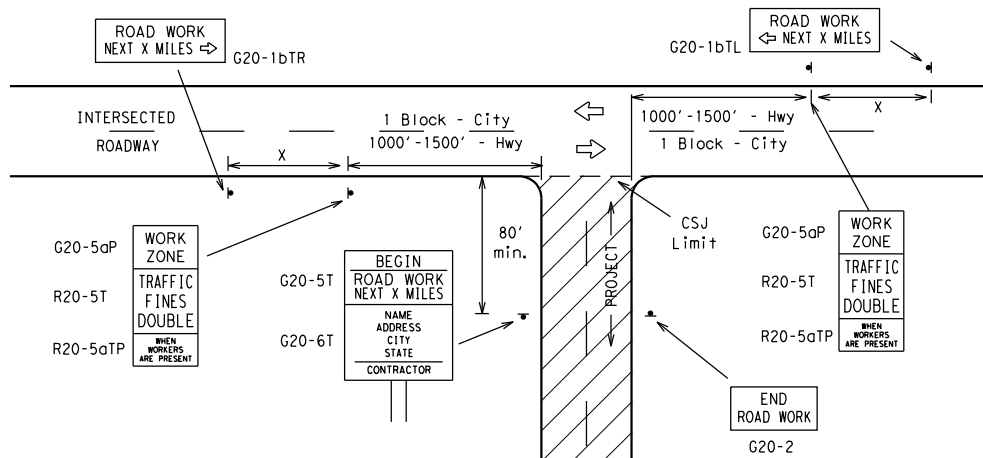
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

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

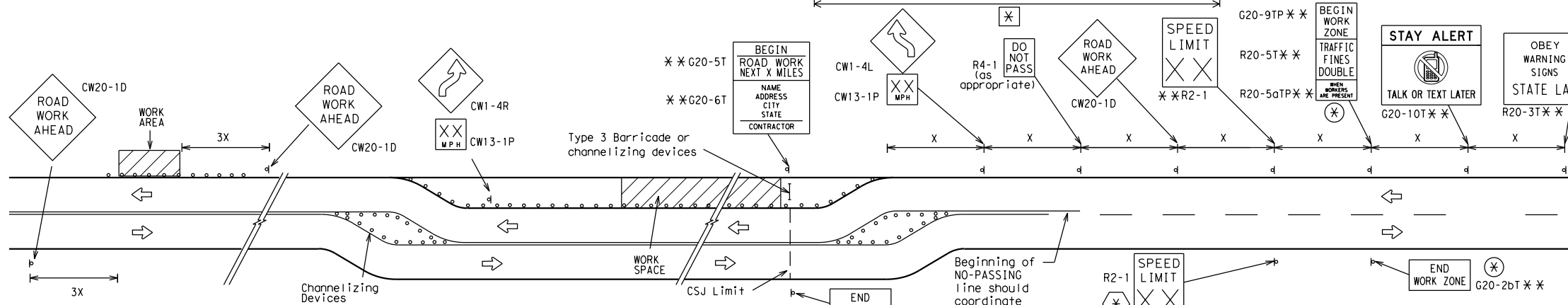
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

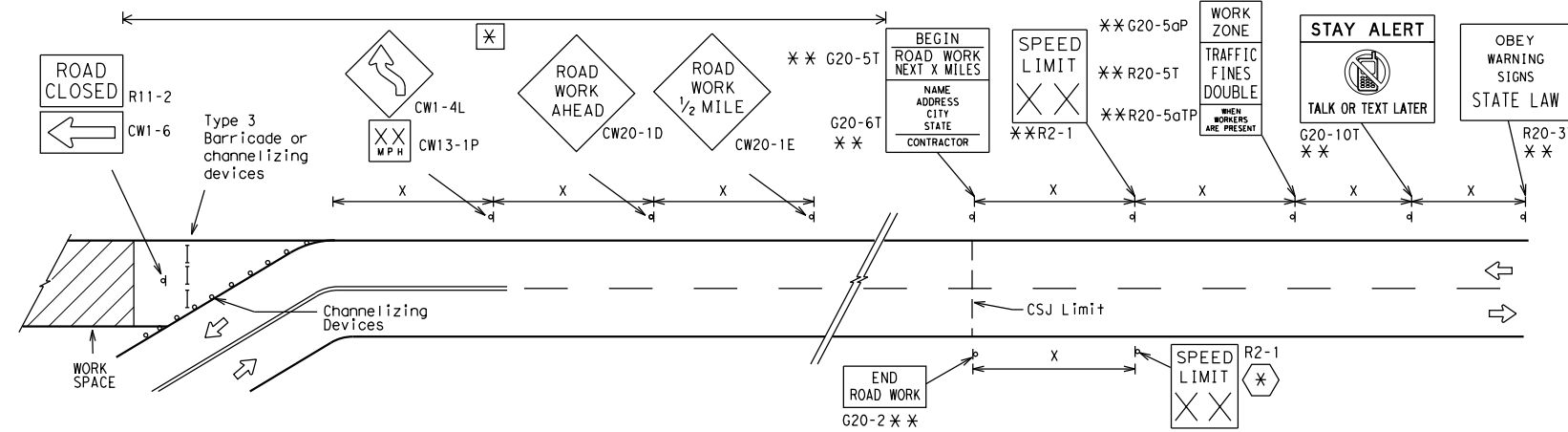
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



NOTES

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

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

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

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

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

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2) - 14

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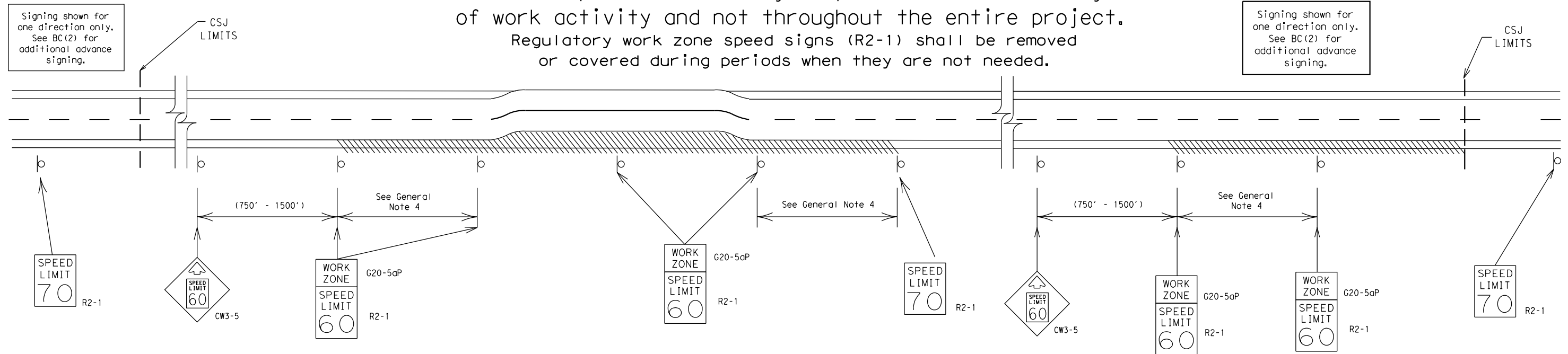
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

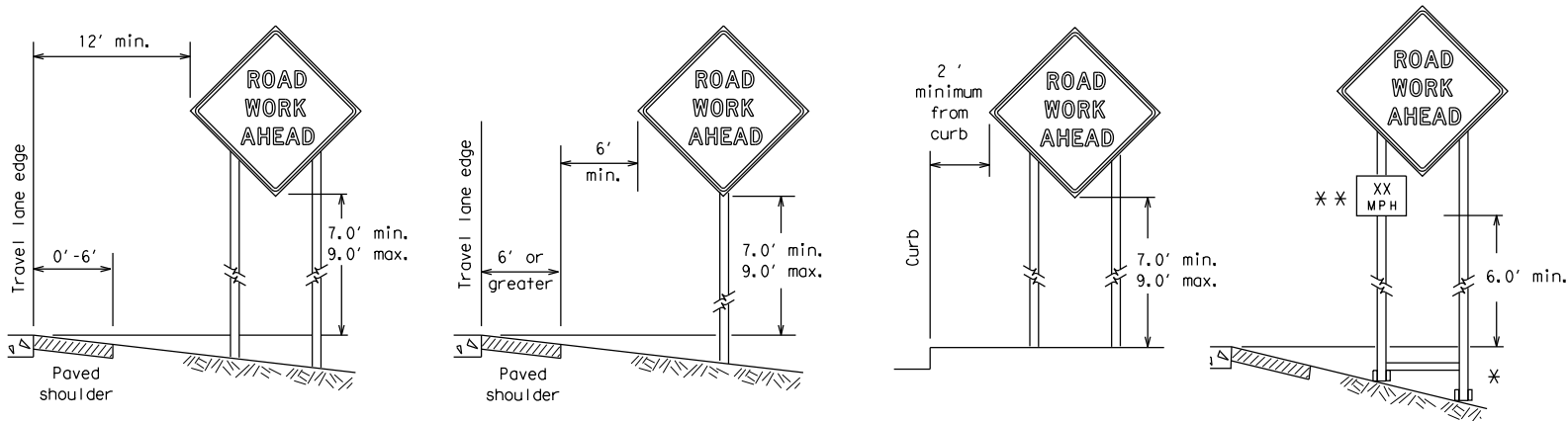
40 mph and greater	0.2 to 2 miles
35 mph and less	0.2 to 1 mile
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-5aP)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

SHEET 3 OF 12

				Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT					
BC (3) - 14					
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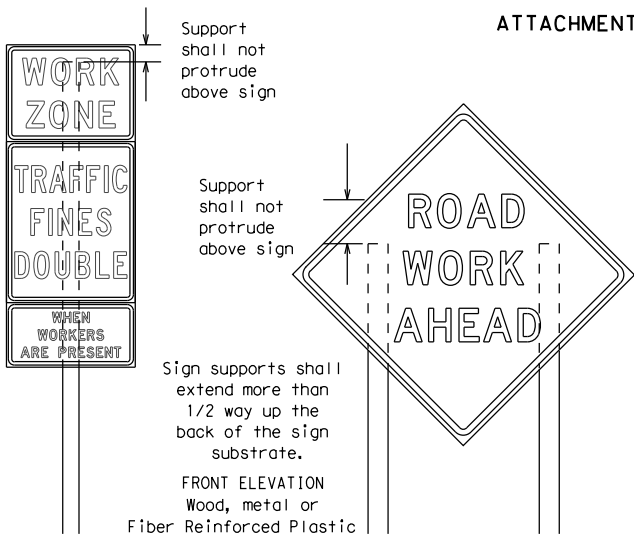
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



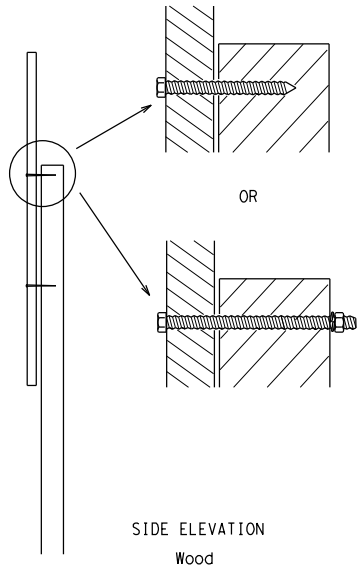
✱ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

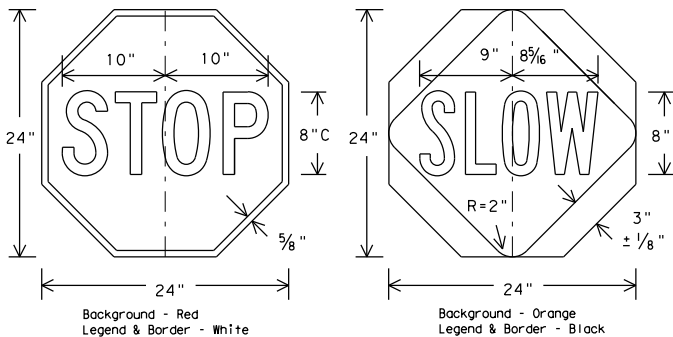


Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the 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" as detailed below.
- When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
- 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.



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, 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.
- 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 sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- 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). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

SHEET 4 OF 12



Texas Department of Transportation

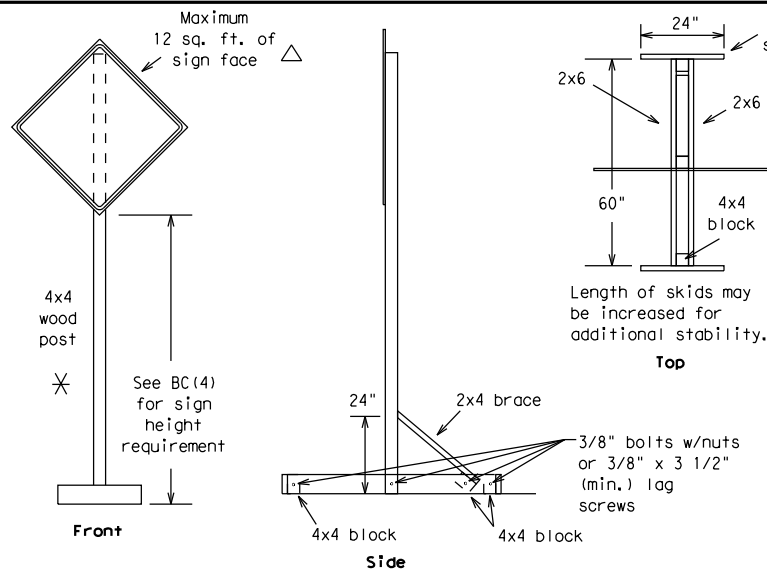
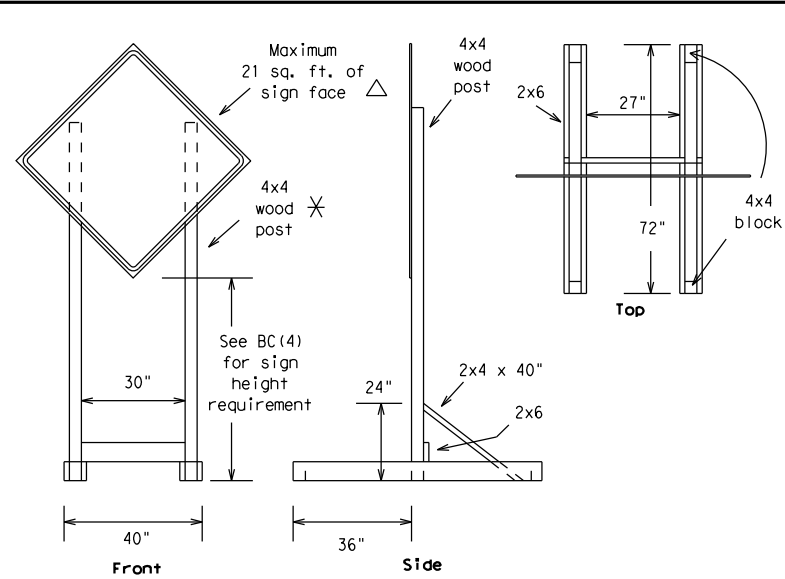
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 14

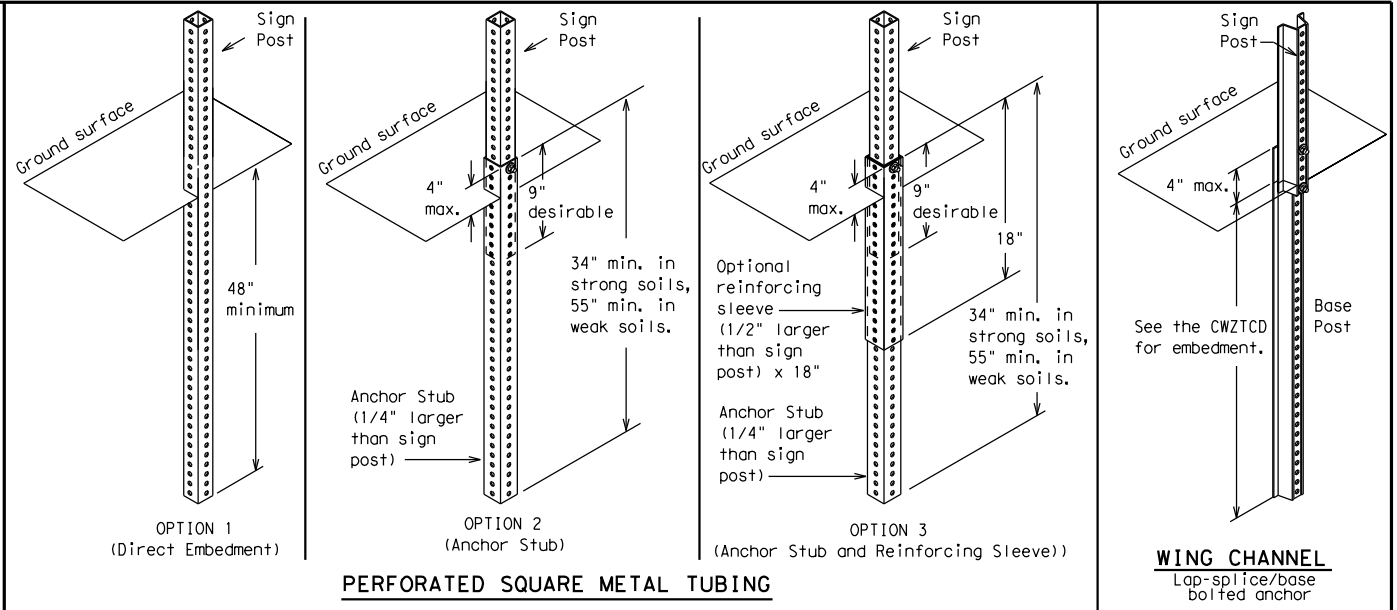
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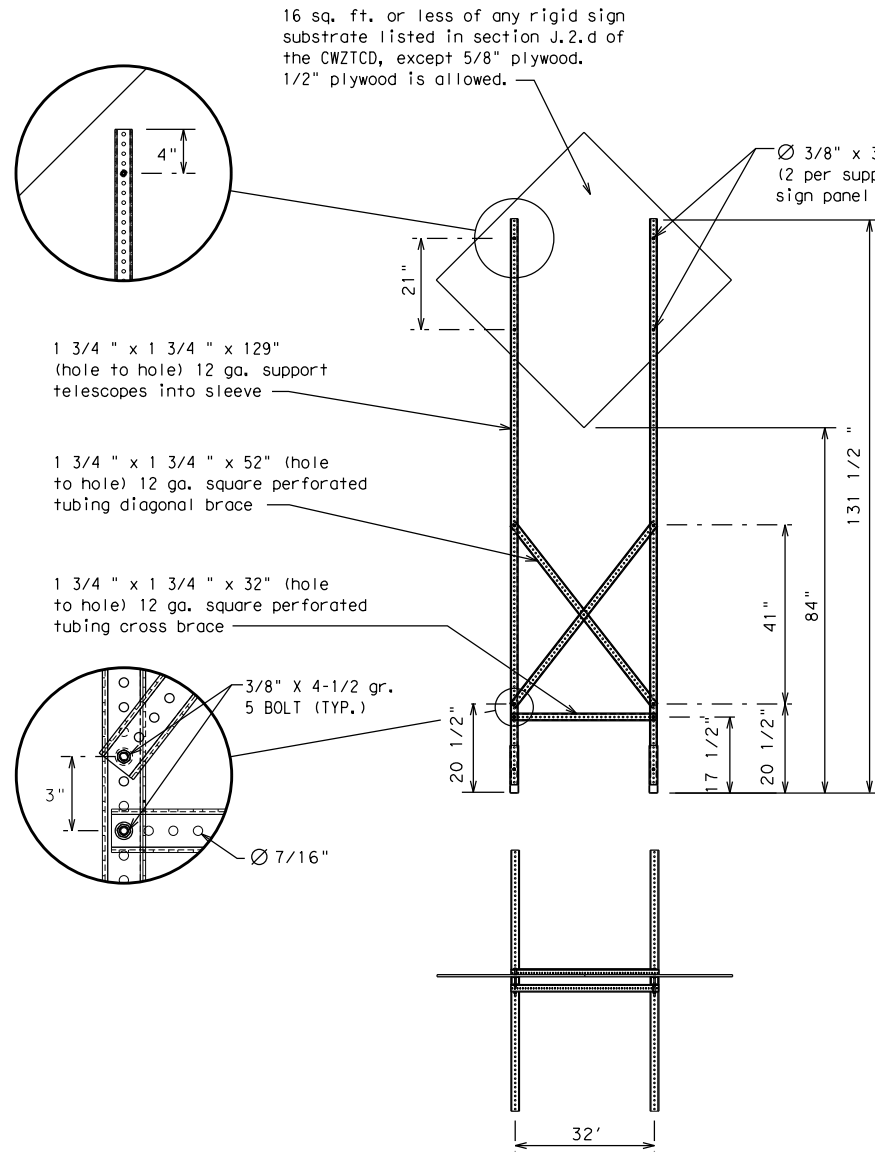
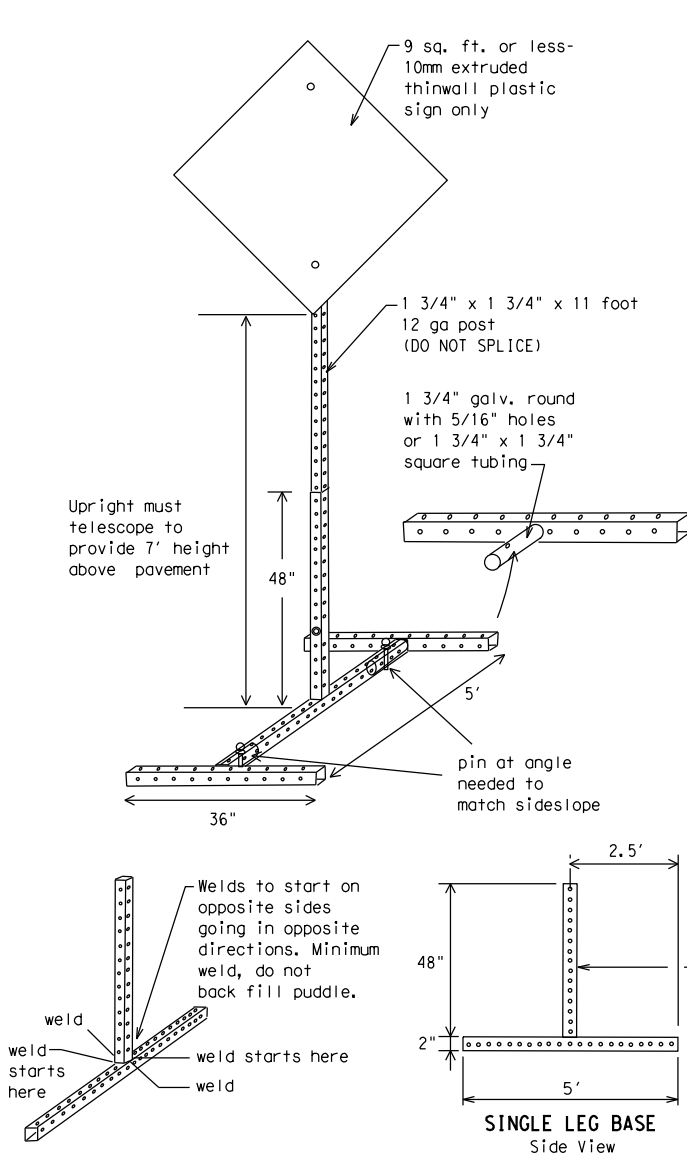
SKID MOUNTED WOOD SIGN SUPPORTS

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

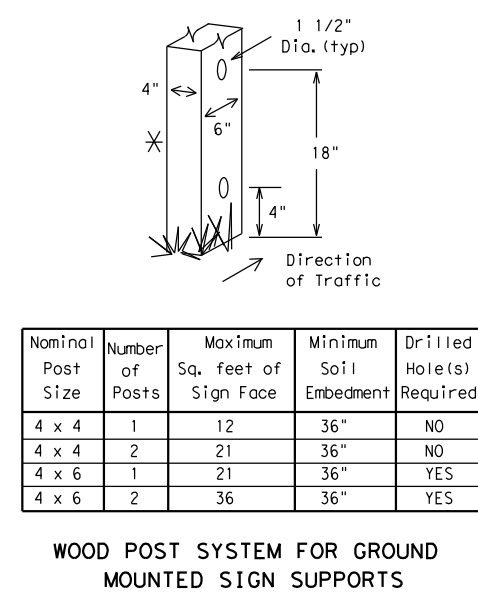


GROUND MOUNTED SIGN SUPPORTS

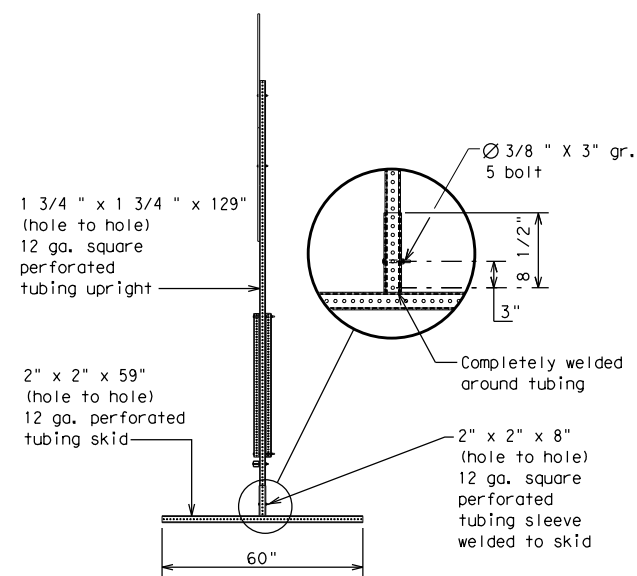
Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

- See BC(4) for definition of "Work Duration."
- ✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY
CLOSED
X MILE

FRONTAGE
ROAD
CLOSED

ROAD
CLOSED
AT SH XXX

SHOULDER
CLOSED
XXX FT

ROAD
CLSD AT
FM XXXX

RIGHT LN
CLOSED
XXX FT

RIGHT X
LANES
CLOSED

RIGHT X
LANES
OPEN

CENTER
LANE
CLOSED

DAYTIME
LANE
CLOSURES

NIGHT
LANE
CLOSURES

I-XX SOUTH
EXIT
CLOSED

VARIOUS
LANES
CLOSED

EXIT XXX
CLOSED
X MILE

EXIT
CLOSED

RIGHT LN
TO BE
CLOSED

MALL
DRIVEWAY
CLOSED

X LANES
CLOSED
TUE - FRI

XXXXXXXX
BLVD
CLOSED

Other Condition List

ROADWORK
XXX FT

ROAD
REPAIRS
XXXX FT

FLAGGER
XXXX FT

LANE
NARROWS
XXXX FT

RIGHT LN
NARROWS
XXXX FT

TWO-WAY
TRAFFIC
XX MILE

MERGING
TRAFFIC
XXXX FT

CONST
TRAFFIC
XXX FT

LOOSE
GRAVEL
XXXX FT

UNEVEN
LANES
XXXX FT

DETOUR
X MILE

ROUGH
ROAD
XXXX FT

ROADWORK
PAST
SH XXXX

ROADWORK
NEXT
FRI-SUN

BUMP
XXXX FT

US XXX
EXIT
X MILES

TRAFFIC
SIGNAL
XXXX FT

LANES
SHIFT

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE
RIGHT

FORM
X LINES
RIGHT

DETOUR
NEXT
X EXITS

USE
XXXXX
RD EXIT

USE
EXIT XXX

USE EXIT
I-XX
NORTH

STAY ON
US XXX
SOUTH

USE
I-XX E
TO I-XX N

TRUCKS
USE
US XXX N

WATCH
FOR
TRUCKS

WATCH
FOR
TRUCKS

EXPECT
DELAYS

EXPECT
DELAYS

PREPARE
TO
STOP

REDUCE
SPEED
XXX FT

END
SHOULDER
USE

USE
OTHER
ROUTES

WATCH
FOR
WORKERS

STAY
IN
LANE

Location List

AT
FM XXXX

BEFORE
RAILROAD
CROSSING

NEXT
X
MILES

PAST
US XXX
EXIT

XXXXXXXX
TO
XXXXXXXX

US XXX
TO
FM XXXX

Warning List

SPEED
LIMIT
XX MPH

MAXIMUM
SPEED
XX MPH

MINIMUM
SPEED
XX MPH

ADVISORY
SPEED
XX MPH

RIGHT
LANE
EXIT

USE
CAUTION

DRIVE
SAFELY

DRIVE
WITH
CARE

** Advance Notice List

TUE-FRI
XX AM-
X PM

APR XX-
XX
X PM-X AM

BEGINS
MONDAY

BEGINS
MAY XX

MAY X-X
XX PM -
XX AM

NEXT
FRI-SUN

XX AM
TO
XX PM

NEXT
TUE
AUG XX

TONIGHT
XX PM-
XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

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


FULL MATRIX PCMS SIGNS

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

WORDING ALTERNATIVES

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

SHEET 6 OF 12



Texas Department of Transportation

Traffic Operations Division Standard

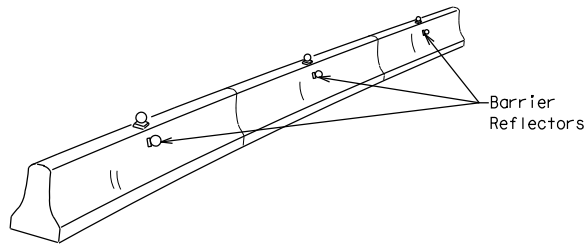
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 14

FILE:	bc-14.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB		HIGHWAY			
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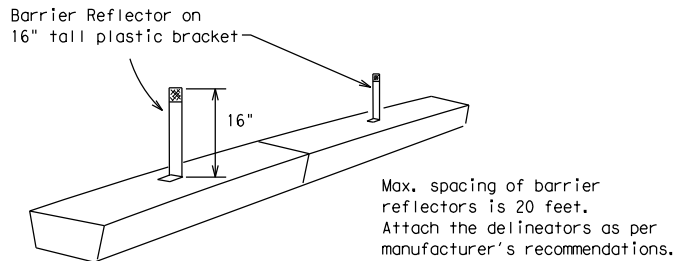
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

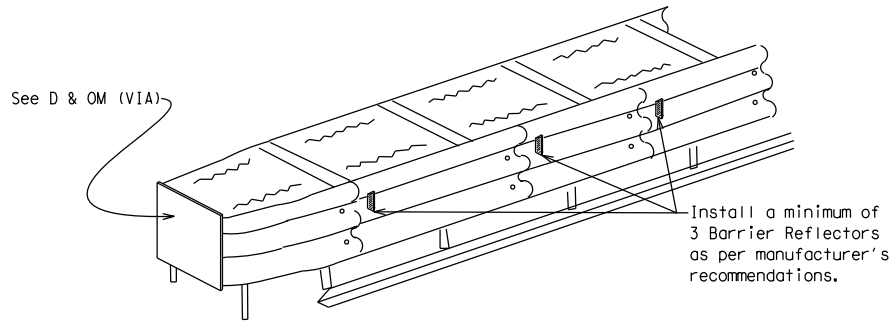


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

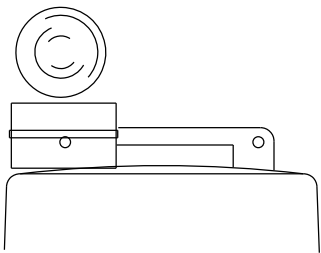
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

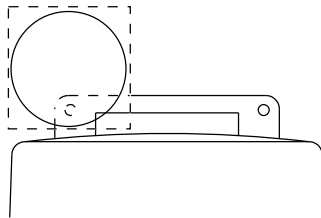
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



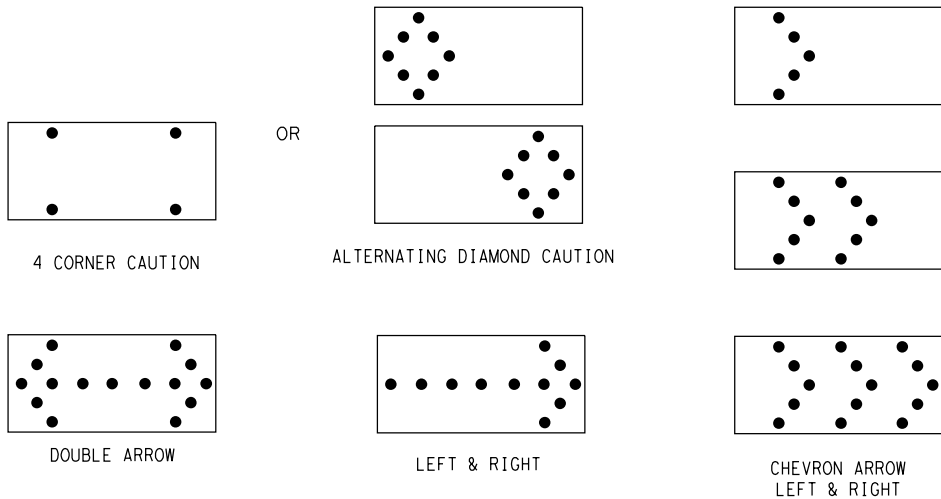
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



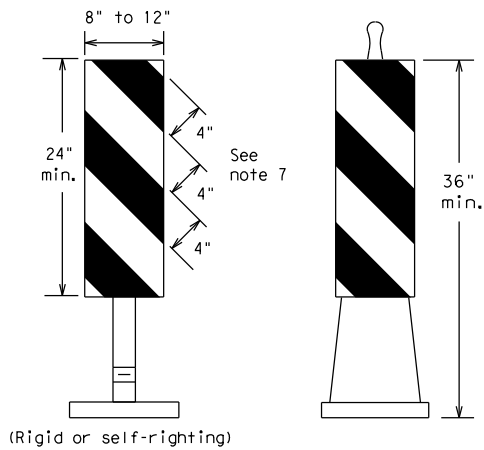
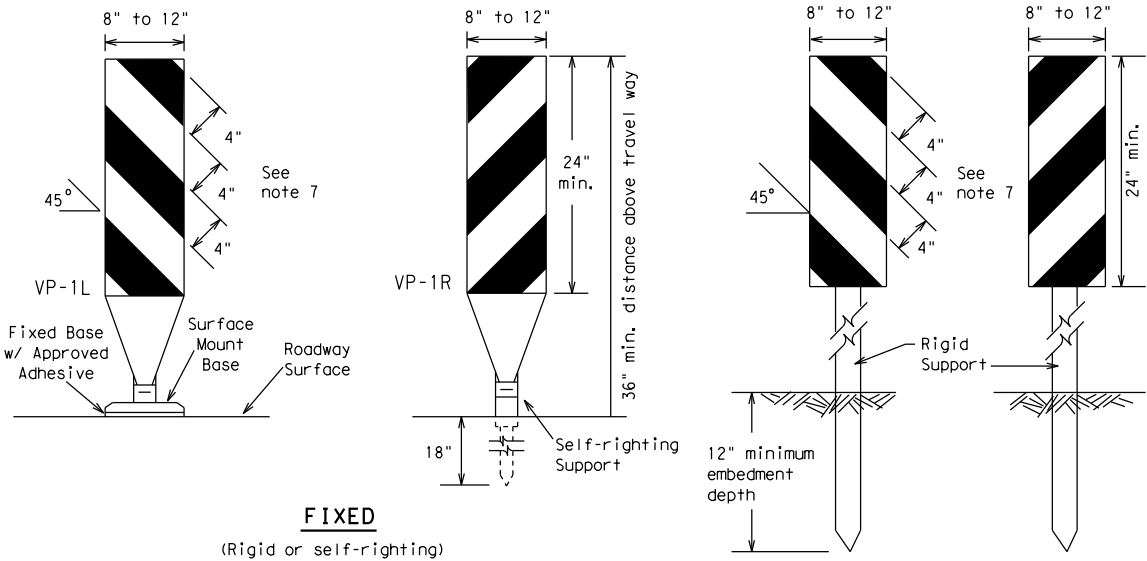
BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC (7) - 14

FILE:	bc-14.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB		HIGHWAY		CS	
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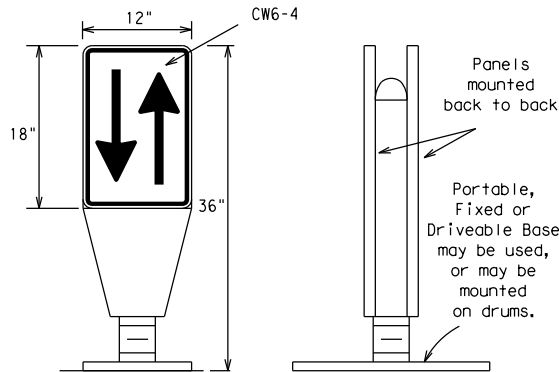
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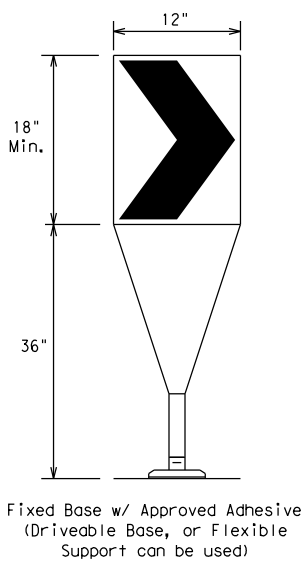
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



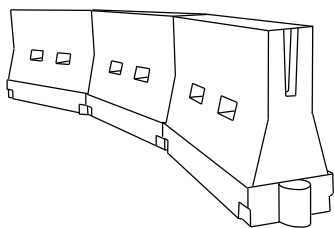
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

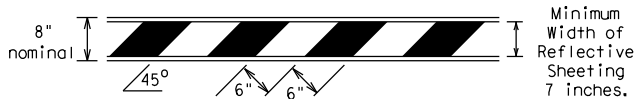
FILE: bc-14.dgn		DN: TxDOT		CK: TxDOT		DW: TxDOT		CK: TxDOT	
© TxDOT November 2002		CONT	SECT	JOB			HIGHWAY		
REVISIONS							CS		
9-07	8-14	DIST	COUNTY				SHEET NO.		
7-13		ELP	EL PASO				20		

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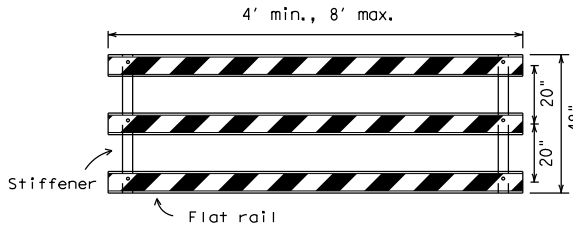
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

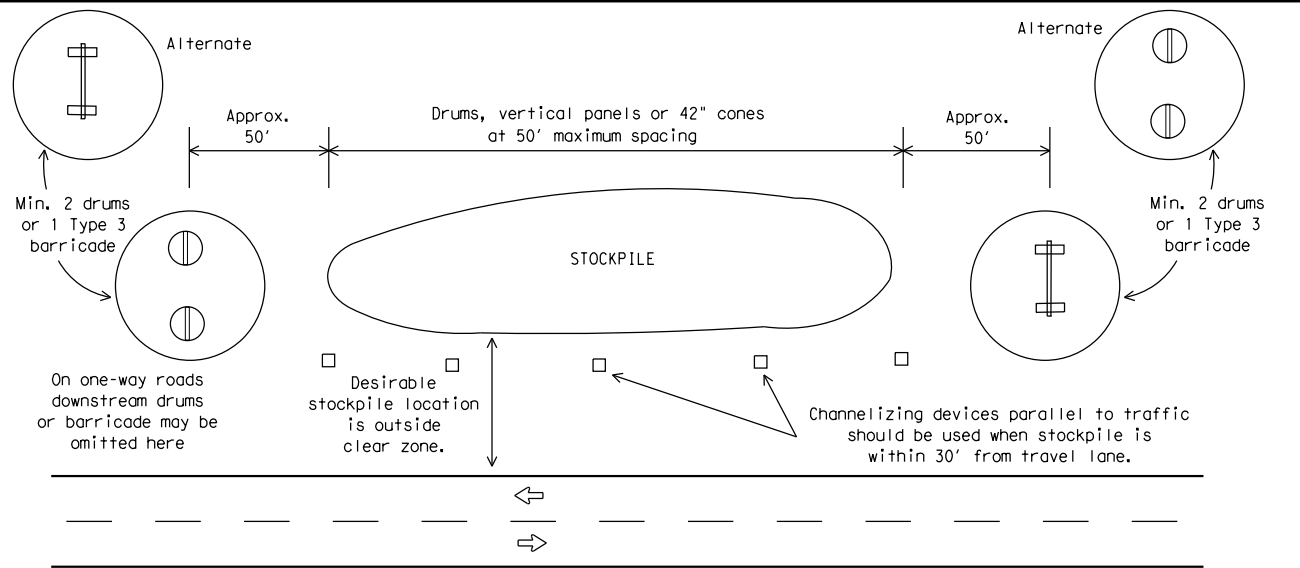


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



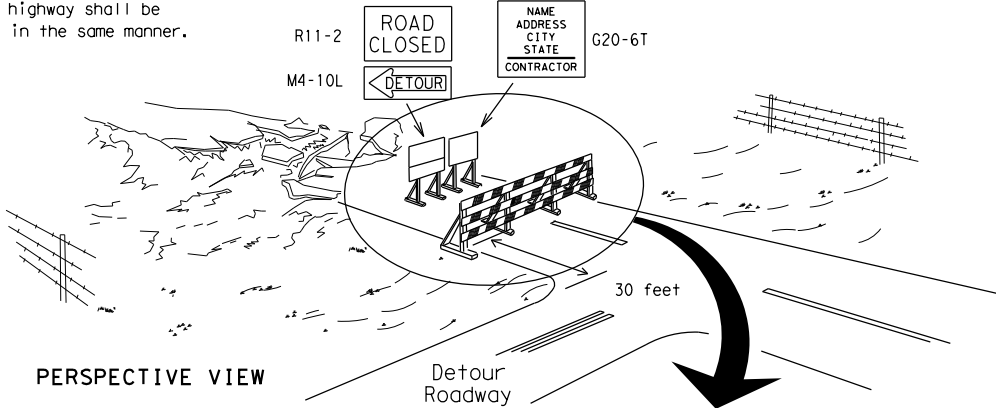
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

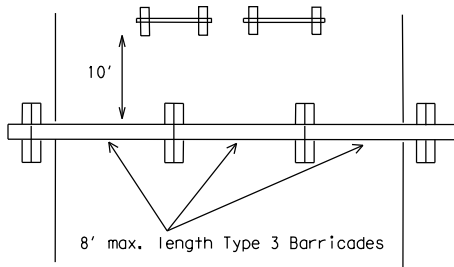
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

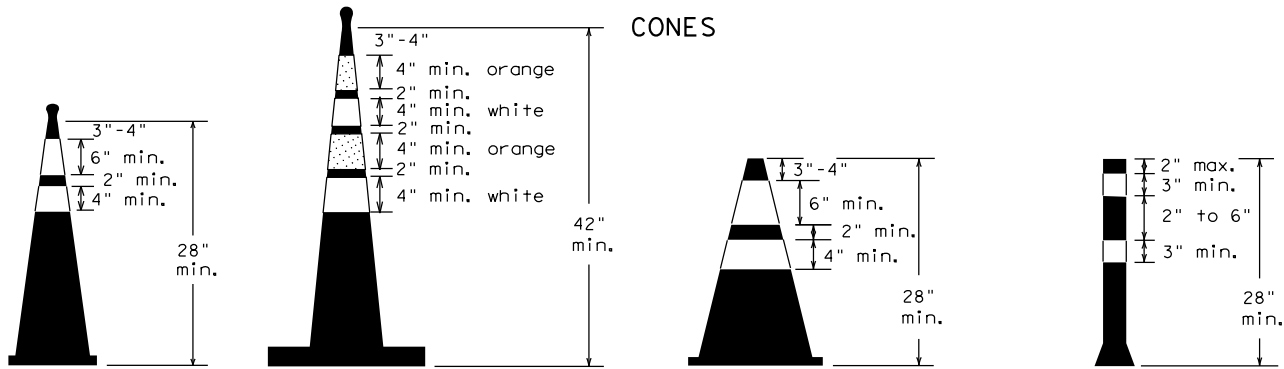
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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



PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



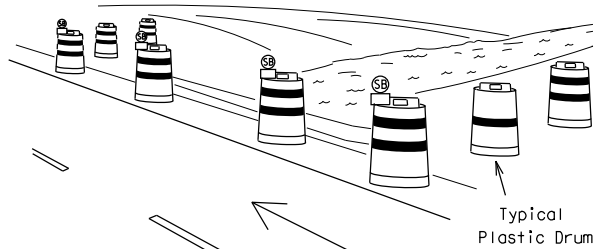
Two-Piece cones

One-Piece cones

Tubular Marker

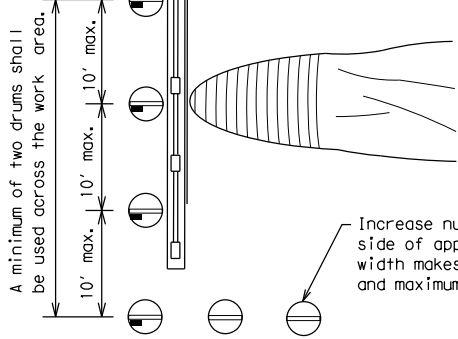
28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



PERSPECTIVE VIEW

These drums are not required on one-way roadway



PLAN VIEW

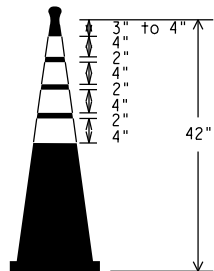
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

LEGEND

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


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



EDGE LINE CHANNELIZER

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

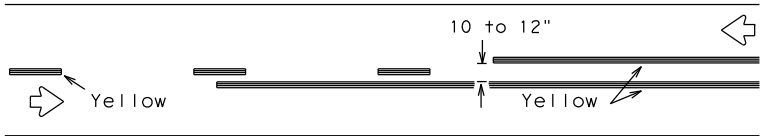
SHEET 10 OF 12

 Texas Department of Transportation				Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES					
BC (10) - 14					
FILE: bc-14.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002		CONT	SECT	JOB	HIGHWAY
REVISIONS					CS
9-07	8-14	DIST		COUNTY	SHEET NO.
7-13		ELP		EL PASO	21

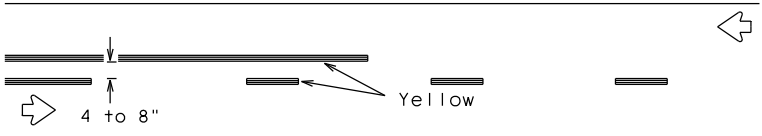
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PAVEMENT MARKING PATTERNS



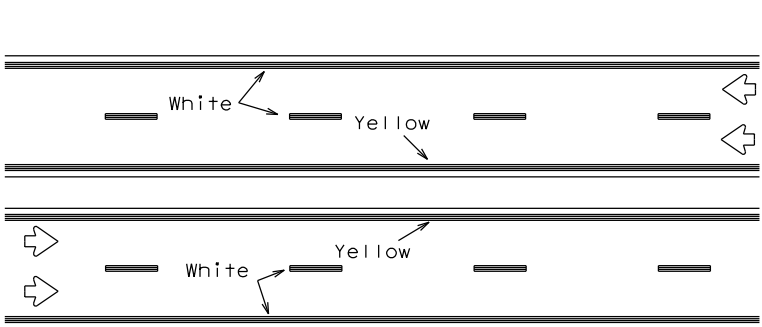
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

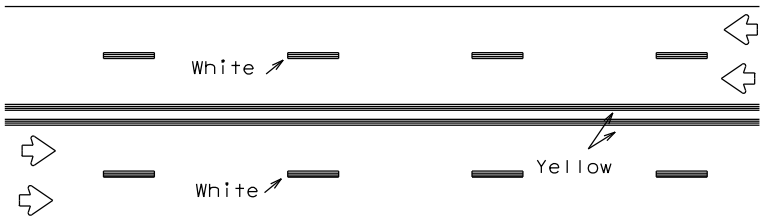
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.

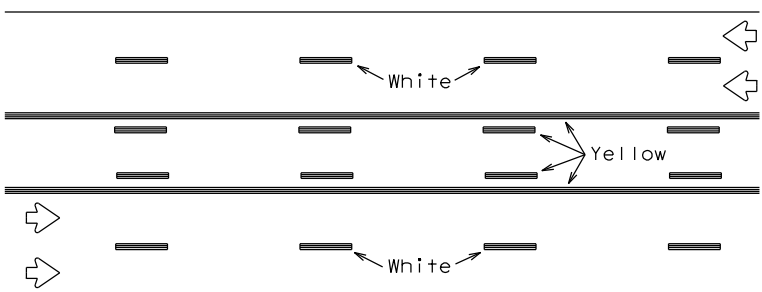
EDGE & LANE LINES FOR DIVIDED HIGHWAY



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.

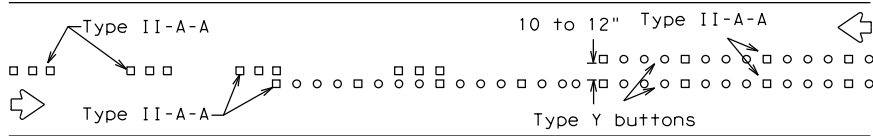
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



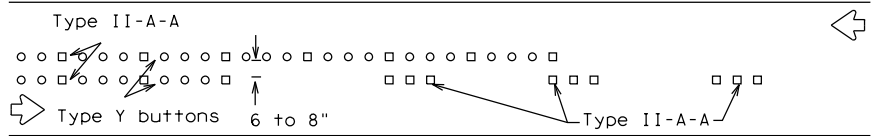
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.

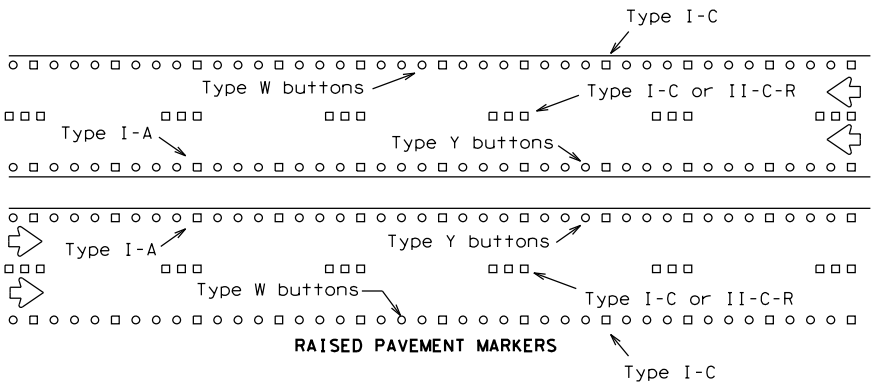
TWO-WAY LEFT TURN LANE



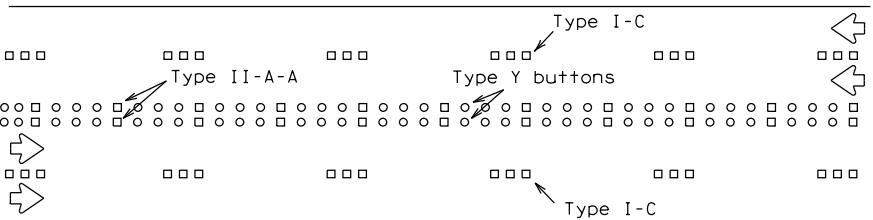
RAISED PAVEMENT MARKERS - PATTERN A



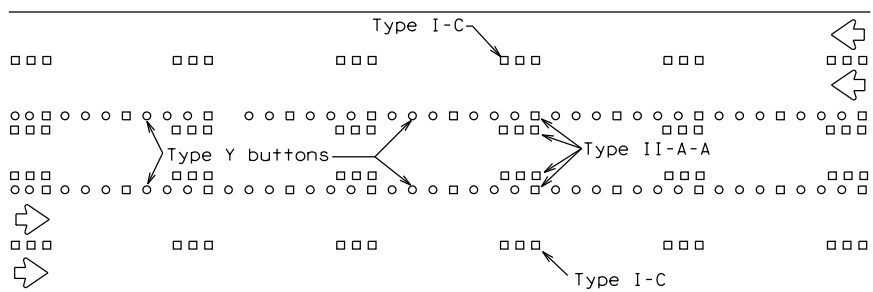
RAISED PAVEMENT MARKERS - PATTERN B



RAISED PAVEMENT MARKERS

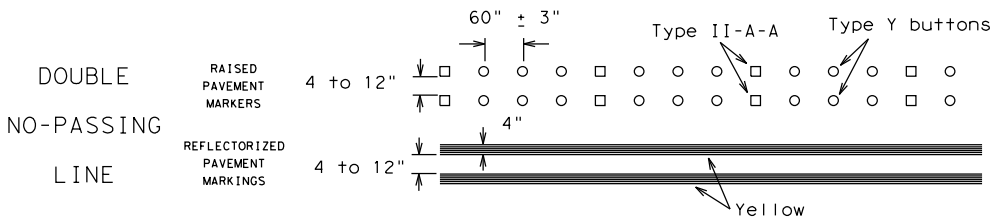


RAISED PAVEMENT MARKERS

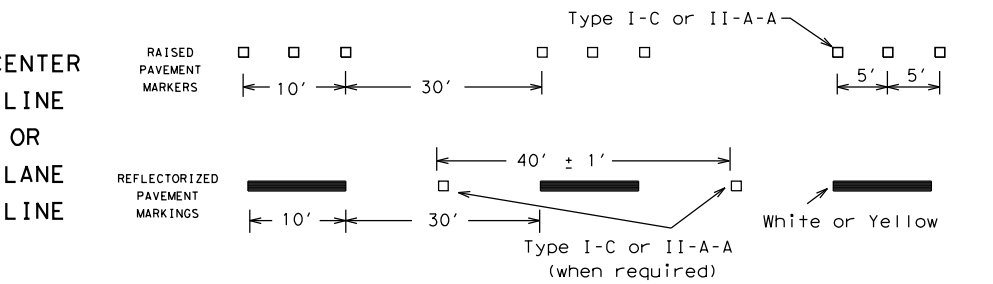
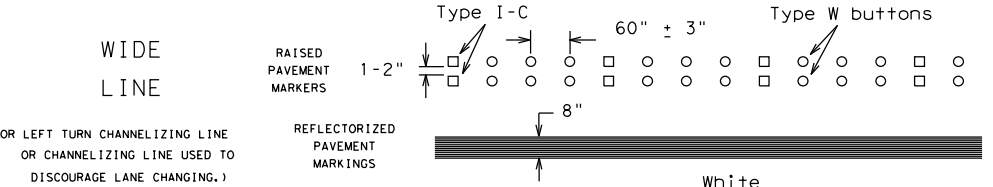
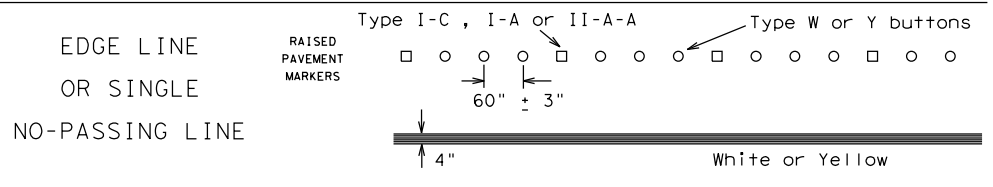


RAISED PAVEMENT MARKERS

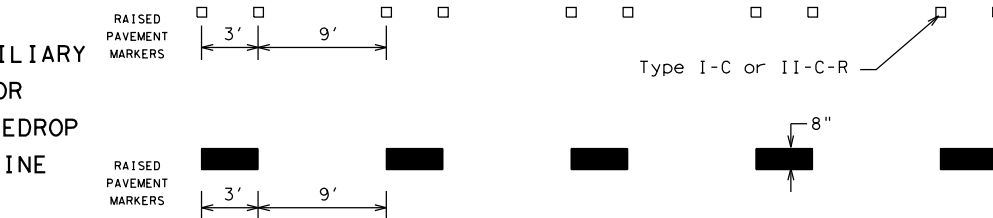
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

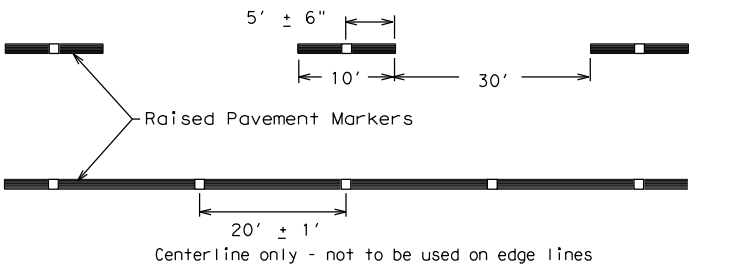


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 14

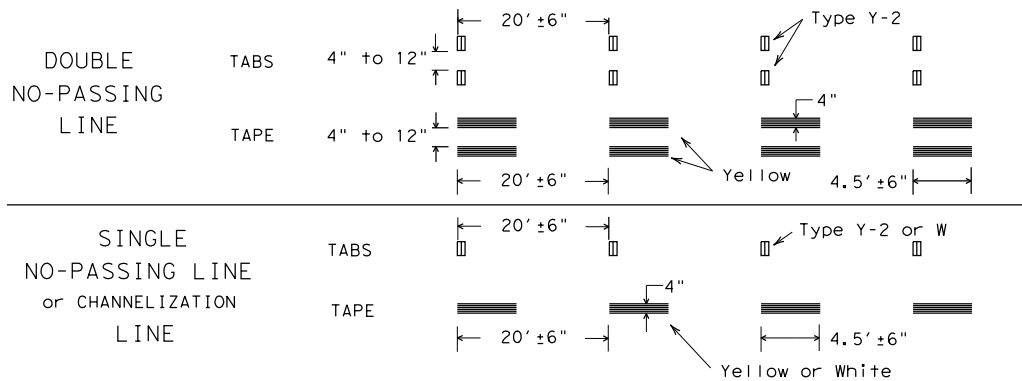
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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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2-98 7-13				
11-02 8-14				
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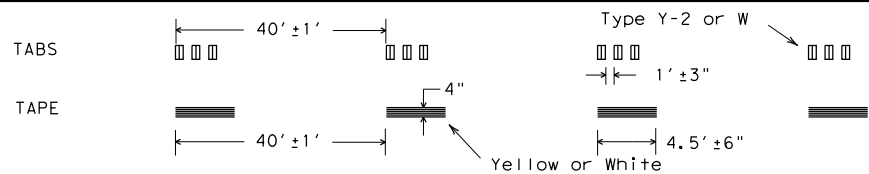
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES



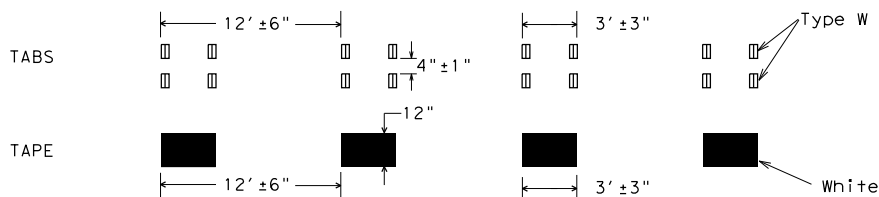
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

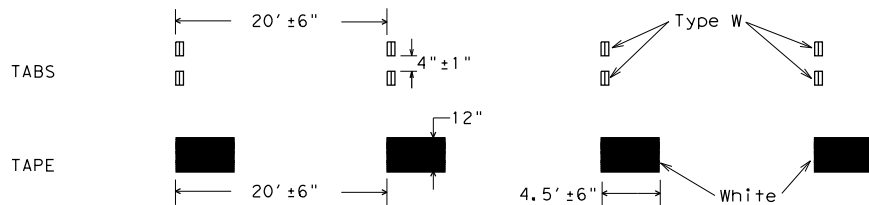


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



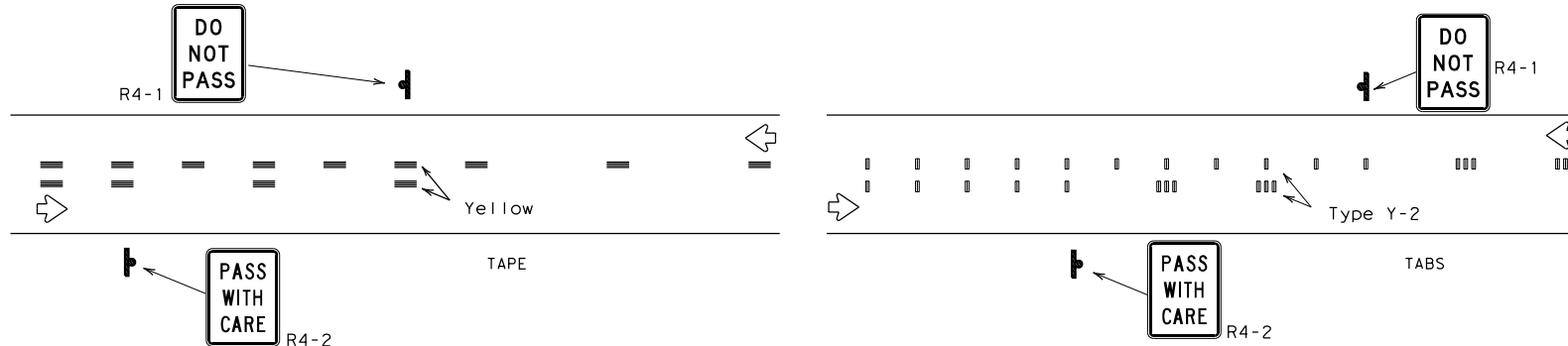
NOTES:

- 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.

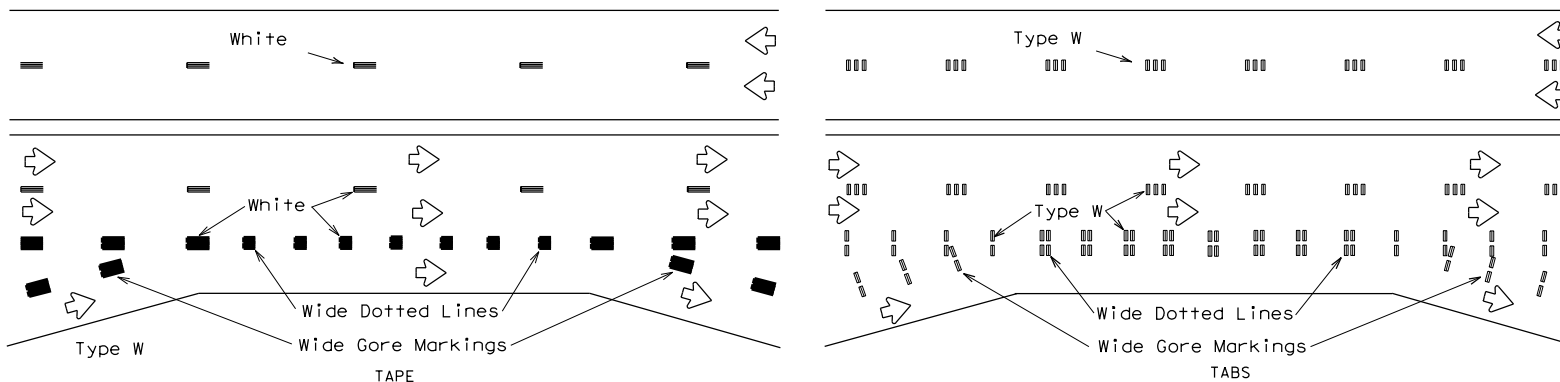
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

- 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.

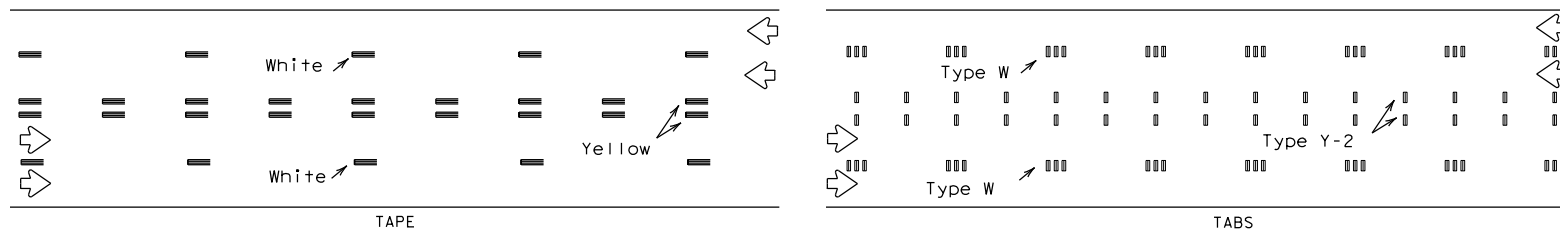
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



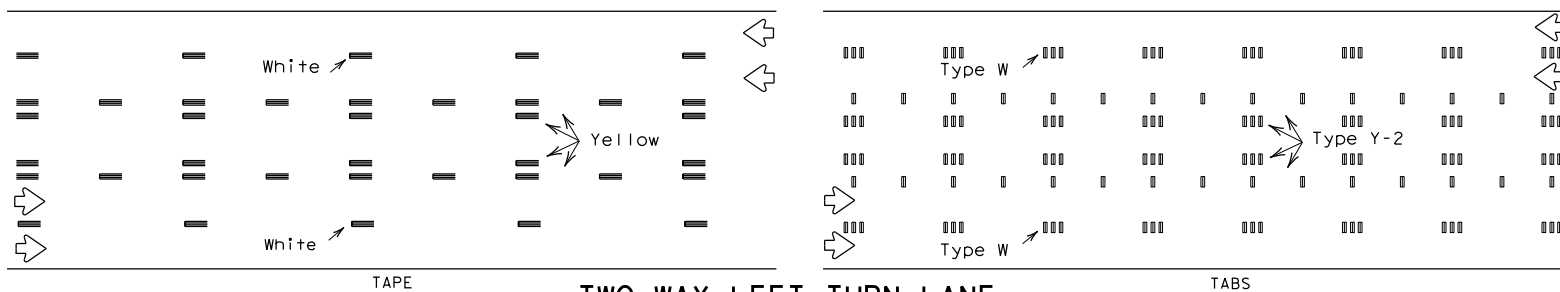
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



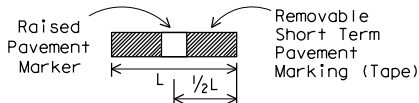
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

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



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Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

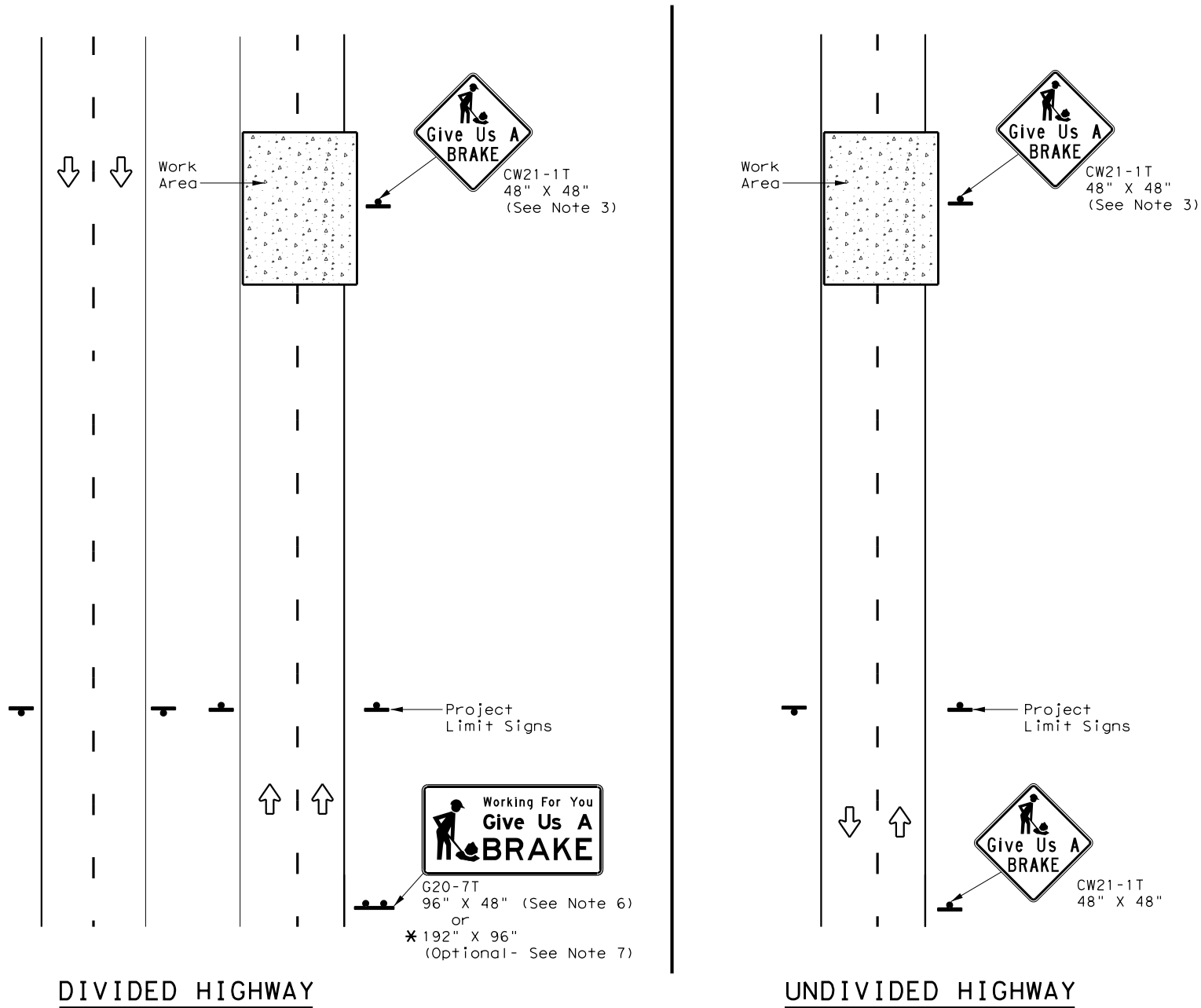
WZ (STPM) - 13

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3-03		ELP	EL PASO		24				
7-13									

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SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS									
BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL		DRILLED SHAFT	
						Size	(LF)	24" DIA. (LF)	
Orange	G20-7T		96" X 48"	Type B _{FL} or C _{FL}	32	▲	▲	▲	▲
Orange	G20-7T		192" X 96"	Type B _{FL} or C _{FL}	128	W8x18	16 17	12	


▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS		
PLYWOOD SIGN BLANKS		DMS-7100
ALUMINUM SIGN BLANKS		DMS-7110
SIGN FACE MATERIALS		DMS-8300
COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B _{FL} OR TYPE C _{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

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



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Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE

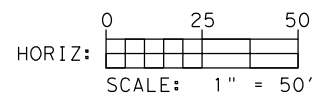
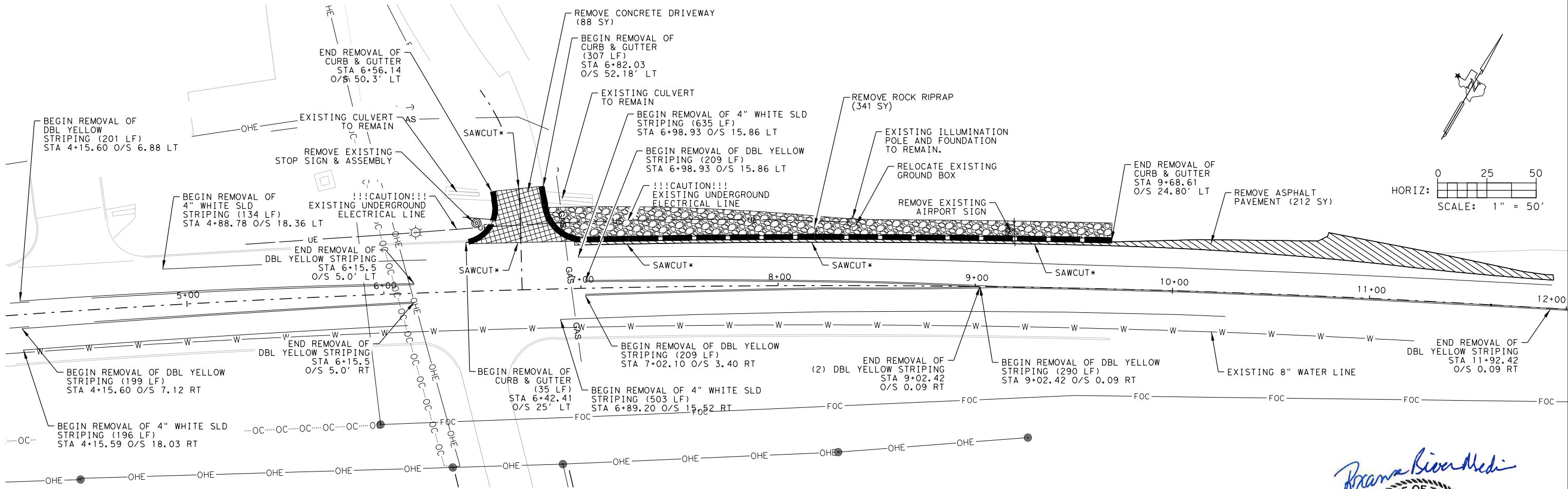
"GIVE US A BRAKE"

SIGNS

WZ (BRK) - 13

FILE:	wzbrk-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	August 1995	CONT	SECT	JOB		HIGHWAY			
REVISIONS						CS			
6-96	5-98	7-13	DIST	COUNTY			SHEET NO.		
8-96	3-03		ELP	EL PASO			25		
116									

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UTILITY LEGEND

- W — W — WATER LINE
- GAS — GAS LINE
- OC — OC — OVERHEAD COMMUNICATION
- OHE — EPEC OVERHEAD
- FOC — WINDSTREAM
- UE — UNDERGROUND ELECTRIC
- — PROPOSED CURB LINE

- EXIST. POWER POLE
- ⊙ EXIST. SIGN
- ⊙ EXIST. LIGHT POLE
- GUY WIRE

SHEET TOTALS				
ITEM	CODE	DESCRIPTION	UNIT	QUANT
100	6002	PREPARE ROW	STA	8
104	6017	REMOVING CONC (DRIVEWAYS)	SY	88
104	6022	REMOVING CONC (CURB AND GUTTER)	LF	342
105	6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	212
624	6028	REMOVE GROUND BOX	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	2
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	3684

NOTES:

1. ALL WATER / GAS VALVE MANHOLE RIM ELEVATIONS, AND GROUND BOXES WITHIN THE CONSTRUCTION LIMITS TO BE RELOCATED AND/OR VERTICALLY BE ADJUSTED TO NEW ROADWAY GRADE.
2. ALL GAS VALVE HANDHOLE RIM ELEVATIONS TO BE ADJUSTED TO NEW ROADWAY GRADE. COST FOR THIS ADJUSTMENT WILL NOT BE PAID DIRECTLY, BUT WOULD BE CONSIDERED SUBSIDIARY TO THE VARIOUS CONTRACTOR BID ITEMS.
3. ALL GROUND BOXES WITHIN CONSTRUCTION LIMITS TO BE RELOCATED AND/OR VERTICALLY ADJUSTED PER ROADWAY PLAN. EXISTING POWER POLES AND GUY WIRES TO BE RELOCATED BY OTHERS. REFER TO SIGNING AND STRIPING SHEETS FOR SIGN REMOVALS. EXISTING GROUND BOXES AND UTILITY RIM ELEVATIONS WITHIN PARKWAY AND SIDEWALK SHALL BE VERTICALLY ADJUSTED TO PROPOSED SIDEWALK AND PARKWAY GRADE.
4. ALL FIRE HYDRANTS LESS THAN 1.5 FEET FROM BACK-OF-CURB TO BE RELOCATED BY AFFILIATED UTILITIES.
5. CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN THE PROJECT AREA
6. REFER TO INDEX SHEET FOR UTILITY COMPANY CONTACT INFORMATION
- * 7. THE CONTRACTOR SHALL NEATLY SAW-CUT AT ALL LIMITS OF CONSTRUCTION FOR A CLEAN TIE-IN AND SHALL EXTEND THE CURB AND GUTTER DEMOLITION TO THE NEAREST JOINT WITHIN THE PUBLIC RIGHT-OF-WAY. ANY DAMAGE TO EXISTING HMA OR CONCRETE WILL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.
8. THE RELOCATION OF SIGNS/ASSEMBLY AND REMOVAL OF EXISTING SIGN FOUNDATIONS WILL BE PAID UNDER ITEM 644.
9. REFER TO FM793 (FABENS ROADWAY) PLAN AND PROFILE, FOR MORE INFORMATION ON UTILITY CONFLICTS.

DEMOLITION LEGEND

- ASPHALT PAVEMENT REMOVAL
- CONCRETE REMOVAL
- LANDSCAPE AGGREGATE
- CURB AND GUTTER REMOVAL

WARNING!
BEFORE YOU DIG
CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND IMPROVEMENTS IN THE PROJECT AREA

UTILITY LOCATOR SERVICES	
TEXAS 811	1-811
FABENS WATER DISTRICT	1-915-764-2212
TEXAS GAS SERVICE	1-800-700-2443
WINDSTREAM	1-806-637-5574
EL PASO ELECTRIC COMPANY	1-800-252-1133
SPECTRUM	1-915-772-1123
EL PASO COUNTY PUBLIC WORKS DEPARTMENT (ROAD & BRIDGE)	1-915-546-2015
TXDOT AREA ENGINEER	1-915-857-5041



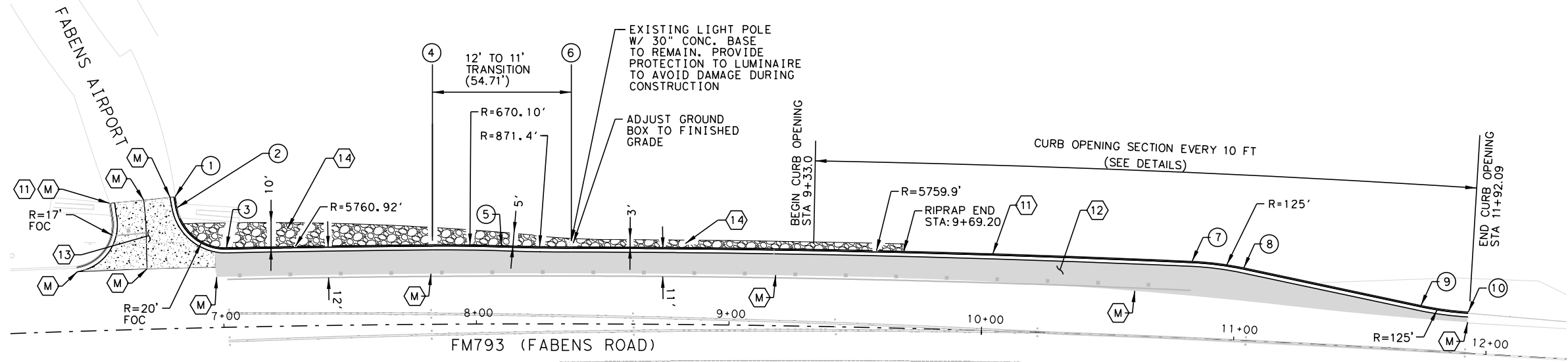
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

EXISTING CONDITIONS AND DEMOLITION

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	26
CONTROL	SECTION	JOB	

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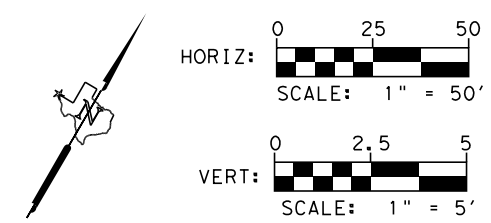


POINT ELEVATIONS				
POINT ID	STATION (FM 793)	OFFSET	DESC	ELEVATION (FT)
1	POT 6+81.43	52.16 L	TBC	3660.96
2	PC 6+82.14	47.76 L	TBC	3660.98
3	PRC 7+01.71	31.50 L	TBC	3660.61
4	PCC 7+82.82	31.50 L	TBC	3662.43
5	PRC 8+10.17	31.00 L	TBC	3663.08
6	PRC 8+37.53	30.50 L	TBC	3663.69
7	PCC 10+82.16	30.50 L	TBC	3670.21
8	PT 11+02.52	28.84 L	TBC	3670.91
9	PCC 11+73.18	17.72 L	TBC	3673.50
10	PT 11+92.09	15.50 L	TBC	3674.11

TBC = TOP BACK OF CURB

- NOTE:
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE CONSTRUCTION LIMITS OF THE STATION AREA WITH THE DEMOLITION PLANS SO THAT EXACT BOUNDARIES OF DEMOLITION MAY BE DETERMINED.
 - CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES BEFORE STARTING ANY CONSTRUCTION OPERATIONS IN THE PROJECT AREA.
 - THE FINISHED GRADE AT NEWLY CONSTRUCTION SURFACES AROUND THE PERIMETER OF STATION IMPROVEMENTS SHALL BE FLUSH WITH EXISTING ADJACENT SURFACE GRADE UNLESS OTHERWISE SHOWN ON PLANS.

SHEET TOTALS				
ITEM	CODE	DESCRIPTION	UNIT	QUANT
110	6001	EXCAVATION (ROADWAY)	CY	384
132	6006	EMBANKMENT FINAL (DENS CONT) (TY C)	CY	59
150	6001	BLADING	HR	8
216	6001	PROOF ROLLING	HR	8
247	6230	FL BS (CMP IN PLC) (TY A GR 1-2) (8")	SY	482
314	6005	EMULS ASPH (BS OR SUBGR TRT) (CSS-1H)	GAL	241
340	6011	D-GR HMA (SQ) TY-B PG64-22	TON	67
340	6048	D-GR HMA (SQ) TY-C SAC-B PG70-22	TON	53
432	6023	RIPRAP (STONE COMMON) (DRY) (8 IN)	CY	95
529	6008	CONC CURB & GUTTER (TY II)	LF	560
530	6020	DRIVEWAYS (CONC) (TY I)	SY	96
624	6002	GROUND BOX TY A (122311)W/APRON	EA	1



- LEGEND
- 11 PROPOSED TYPE II CURB AND GUTTER PER TXDOT DETAIL.
 - 12 REFER TO THE PROPOSED HMA PAVEMENT SECTION ON THE TYPICAL SECTION SHEET.
 - 13 REFER TO DRIVEWAY DETAILS.
 - 14 INSTALL STONE RIPRAP
 - M MATCH EXISTING.

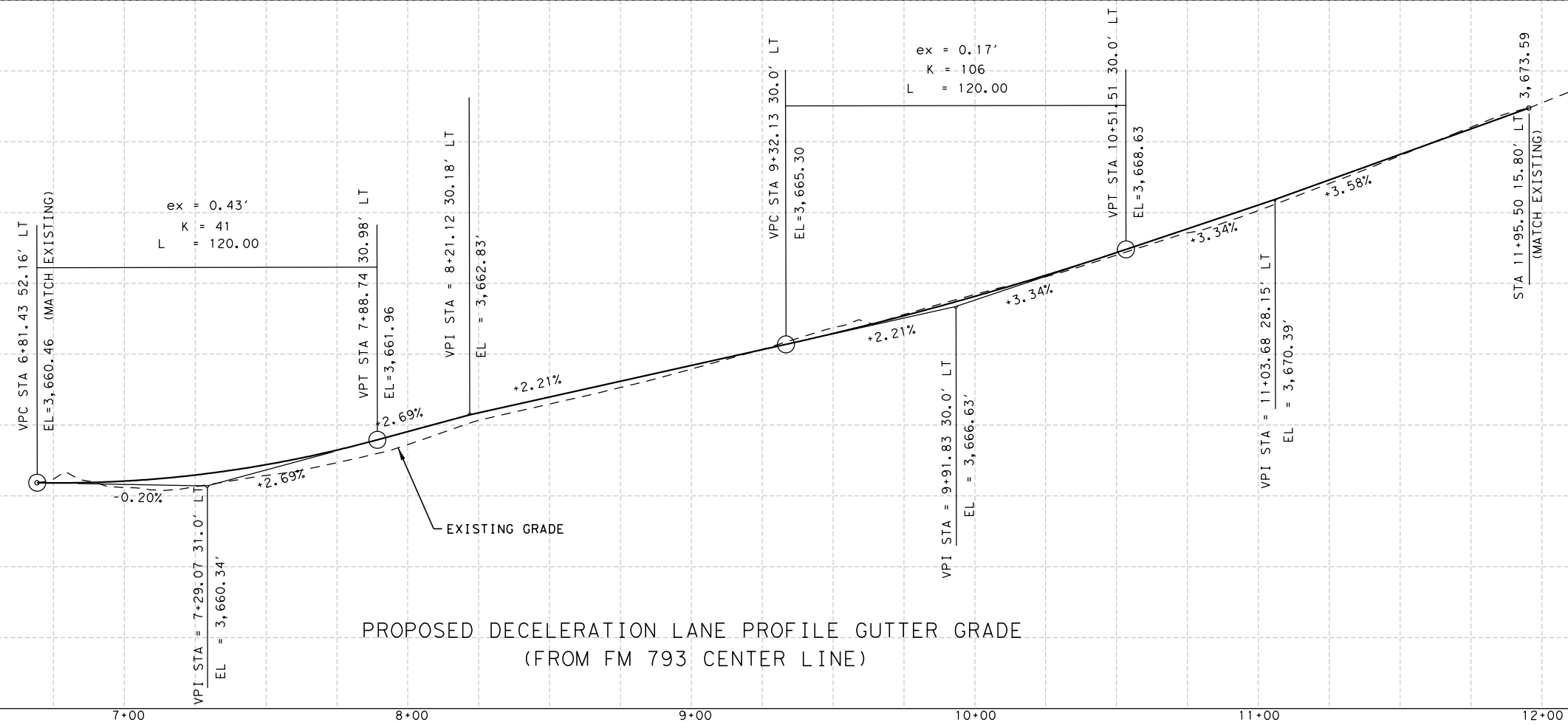


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FABENS AIRPORT DECELERATION LANE

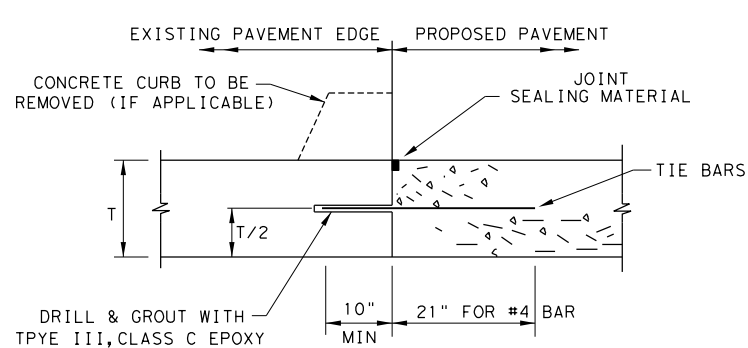
PLAN AND PROFILE

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			27



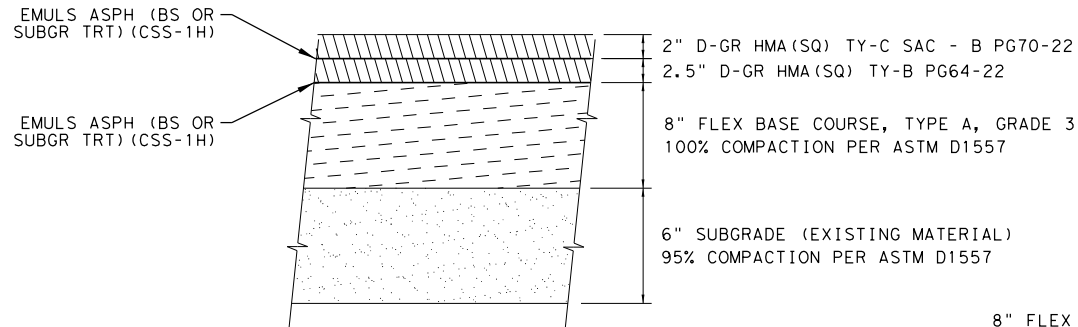
PROPOSED DECELERATION LANE PROFILE GUTTER GRADE
(FROM FM 793 CENTER LINE)

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1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #4 TIE BARS.

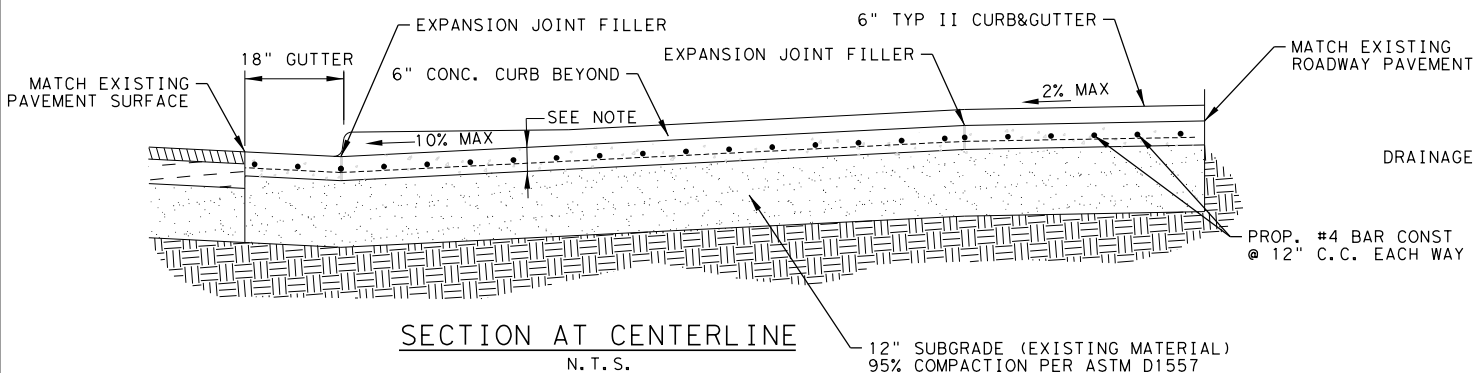
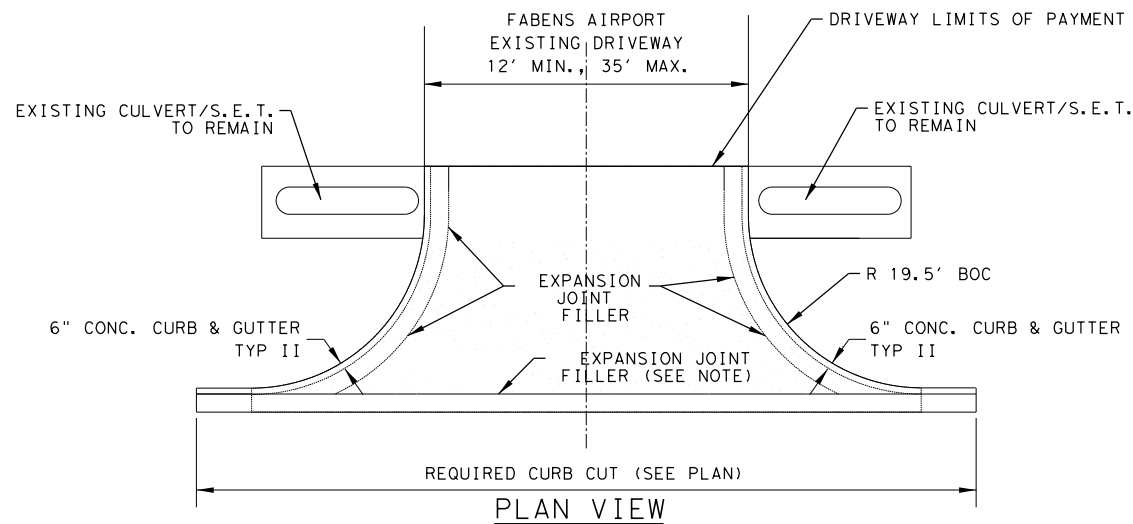
LONGITUDINAL WIDENING JOINT DETAIL
N. T. S.



PAVEMENT NOTES

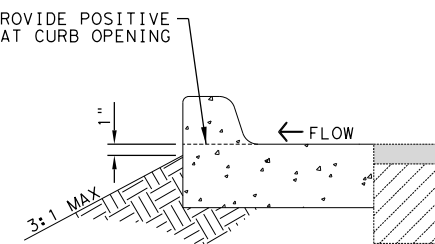
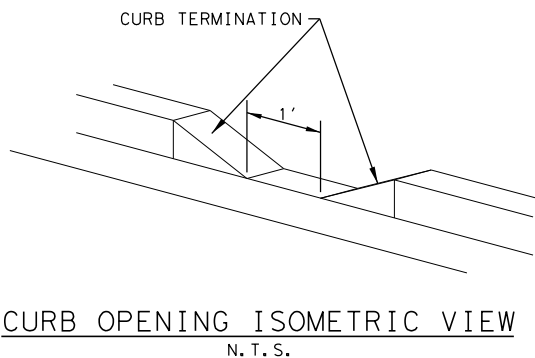
1. SUBGRADE TO BE COMPACTED TO 95% OF MAXIMUM DENSITY AS PER ASTM D1557.
2. EMULS ASPH (BS OR SUBGR TRT) (CSS-1H) TO BE 0.25 GAL. PER SQUARE YARD (MINIMUM COVERAGE).
3. COMPACTION TESTS WHERE REQUIRED BY THE ENGINEER
4. STRICT VERTICAL CONTROL OF ALL CURB AND GUTTER ELEVATIONS WILL BE MAINTAINED.

TYPICAL PAVEMENT SECTION DETAIL
N. T. S.

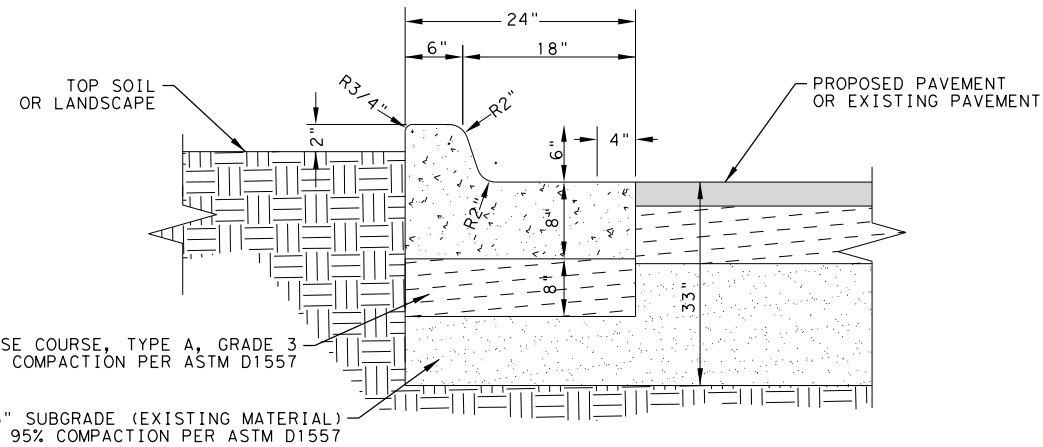


- NOTES:
1. 6" CONC. WITH #4 BAR CONT. @ 12" C.C. EACH WAY.
 2. BASE COURSE AND SUBGRADE TO BE EXTENDED INSIDE PRIVATE PROPERTY ACCORDING TO DRIVEWAY DETAILS.
 3. DRIVEWAY SHALL BE CONSTRUCTED OF CONCRETE (TYPE III).
 4. REFER TO LONGITUDINAL WIDENING JOINT DETAILS.

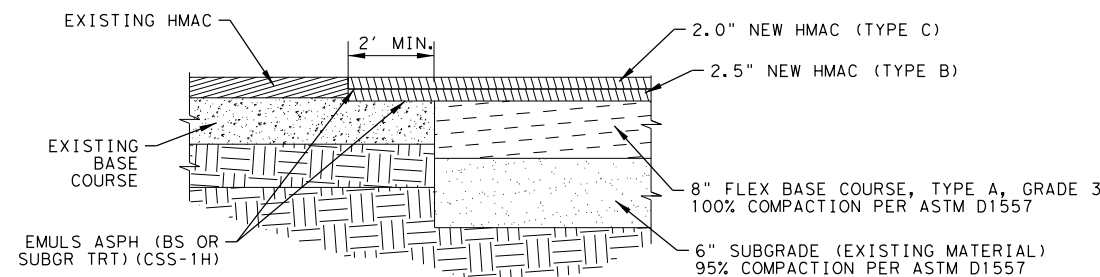
TYPICAL DRIVEWAY DETAIL
N. T. S.



CURB OPENING SECTION
N. T. S.

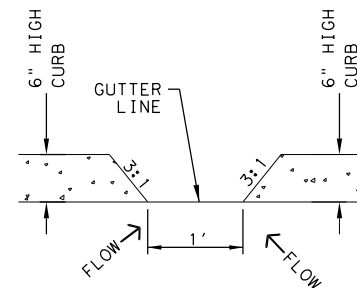


TYPE 'A' - 6" HIGH CURB AND GUTTER
N. T. S.



- NOTES:
1. ROLL AND/OR HEAT TO CREATE SMOOTH TRANSITION.

PAVEMENT JUNCTION
N. T. S.



CURB OPENING DETAIL
N. T. S.

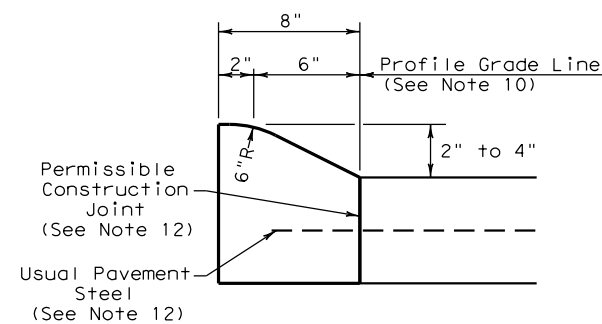


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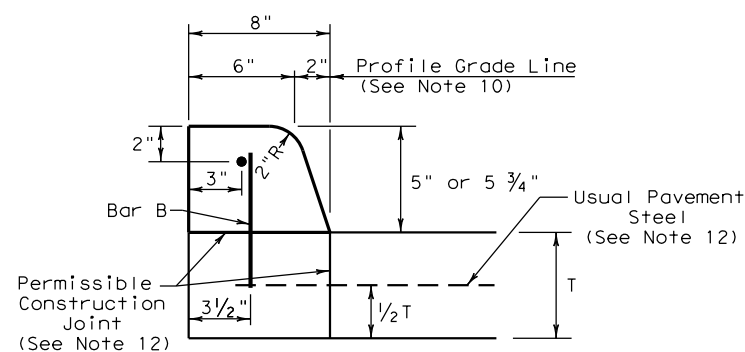
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Firm No. F-761

FABENS AIRPORT DECELERATION LANE
ROAD DETAIL

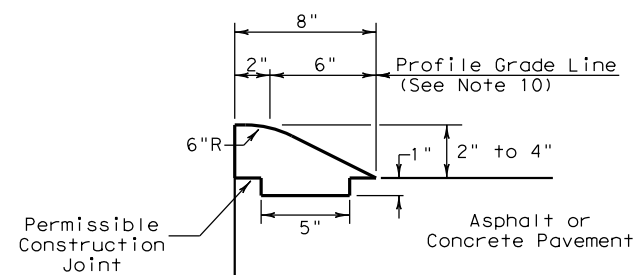
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6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	28
CONTROL	SECTION	JOB	

DATE:
FILE:

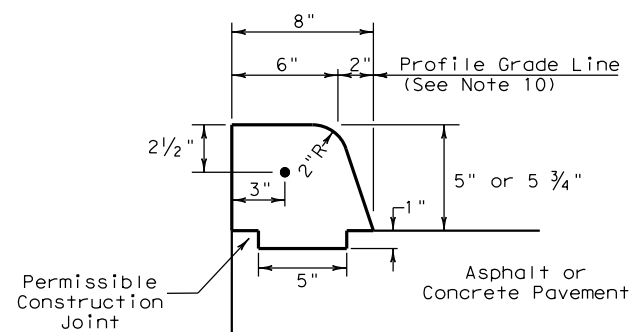
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



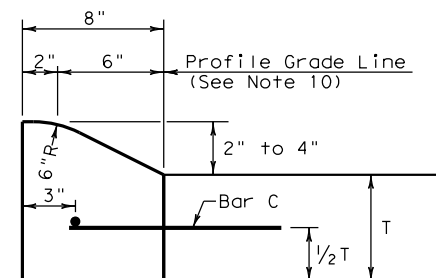
TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT



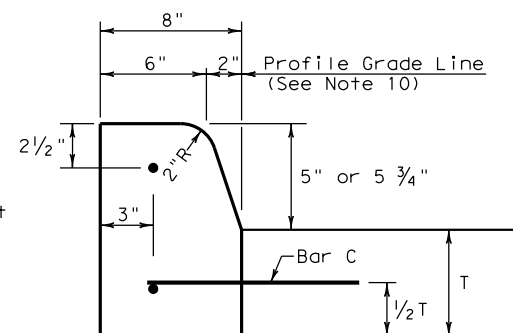
TYPE III CURB (KEYED)
2" - 4" HEIGHT



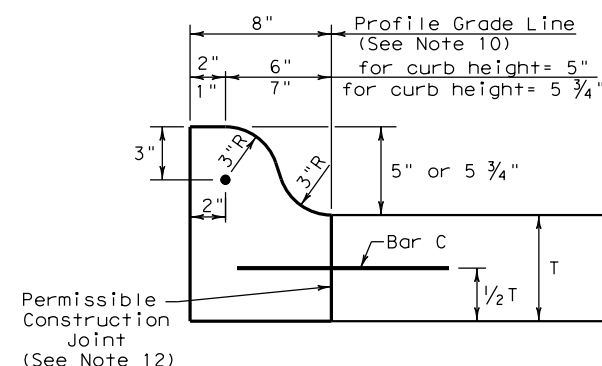
TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT



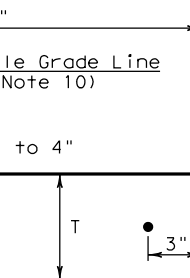
TYPE I CURB
2" - 4" HEIGHT



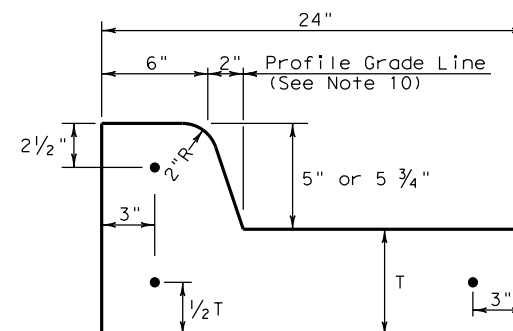
TYPE II CURB
5" - 5 3/4" HEIGHT



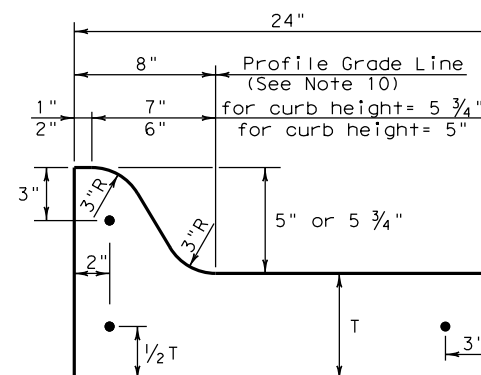
TYPE IIa CURB
5" - 5 3/4" HEIGHT



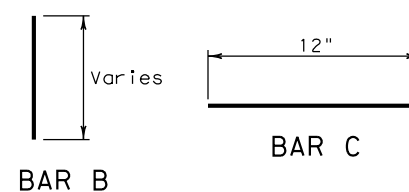
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



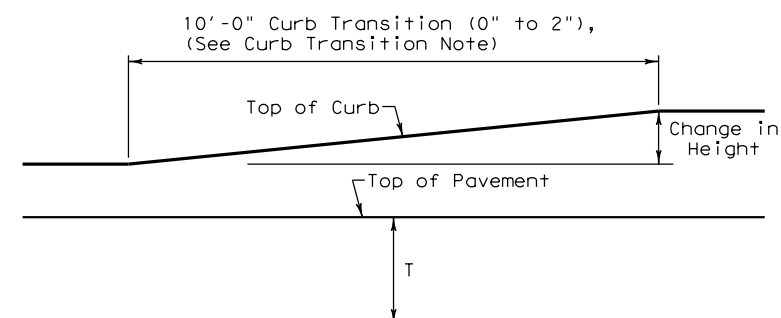
TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT

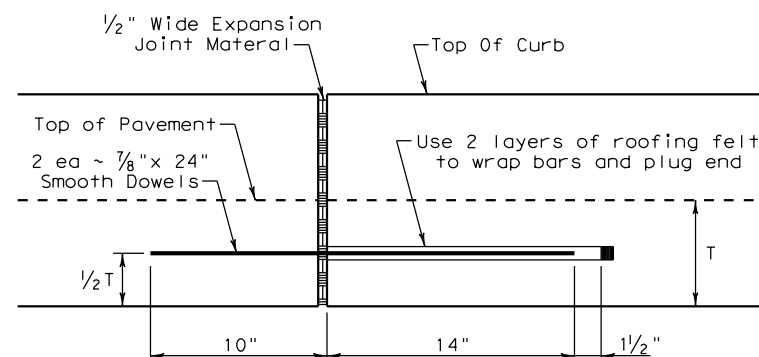


Curb Transition Note:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION

Note: To be paid for as Highest Curb

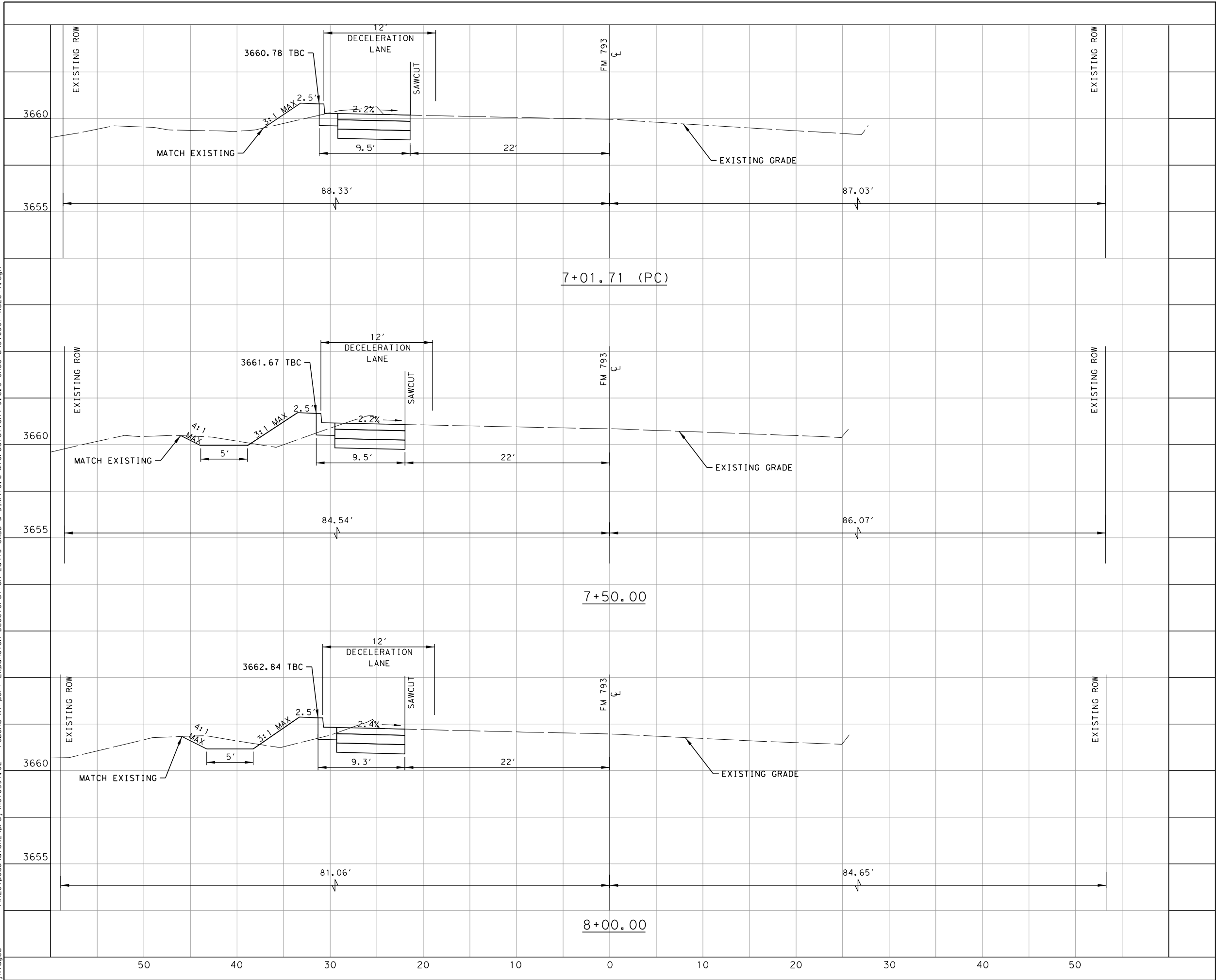


EXPANSION JOINT DETAIL

General Notes

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of $\frac{1}{4}$ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.

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NOTES:

1. PROPOSED FLOW LINE SHALL PROVIDE POSITIVE FLOW TO MEET THE EXISTING CULVERT.
2. PLACE REFURBISHED LOOSE AGGREGATE ON SIDE-SLOPES AS SHOWN ON SHEET 28.



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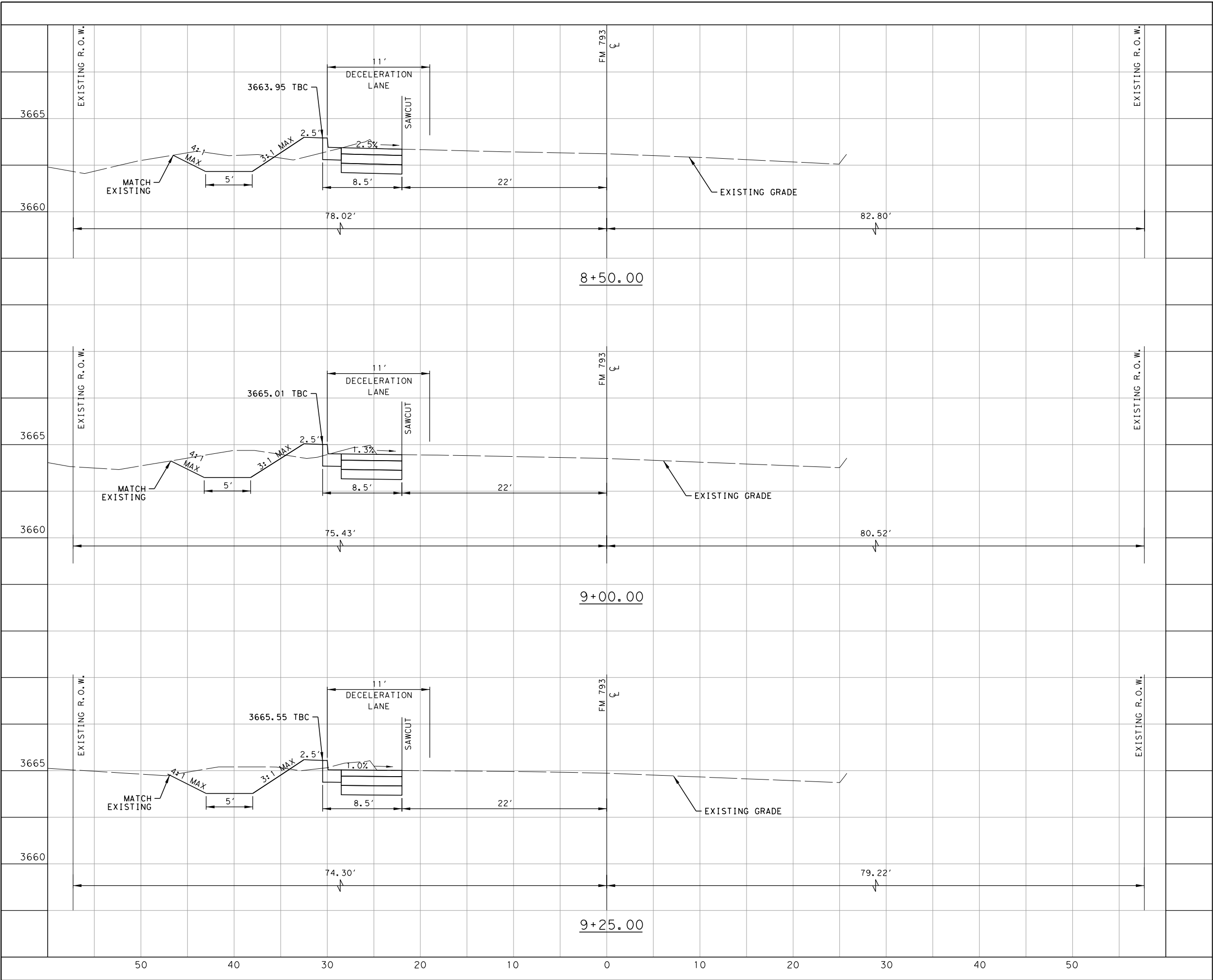
FABENS AIRPORT DECELERATION LANE

CROSS SECTIONS
7+01.71 TO 8+00.00

SHEET 1 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			30

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NOTES:

1. PROPOSED FLOW LINE SHALL PROVIDE POSITIVE FLOW TO MEET THE EXISTING CULVERT.
2. PLACE REFURBISHED LOOSE AGGREGATE ON SIDE-SLOPES AS SHOWN ON SHEET 28.

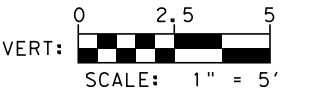
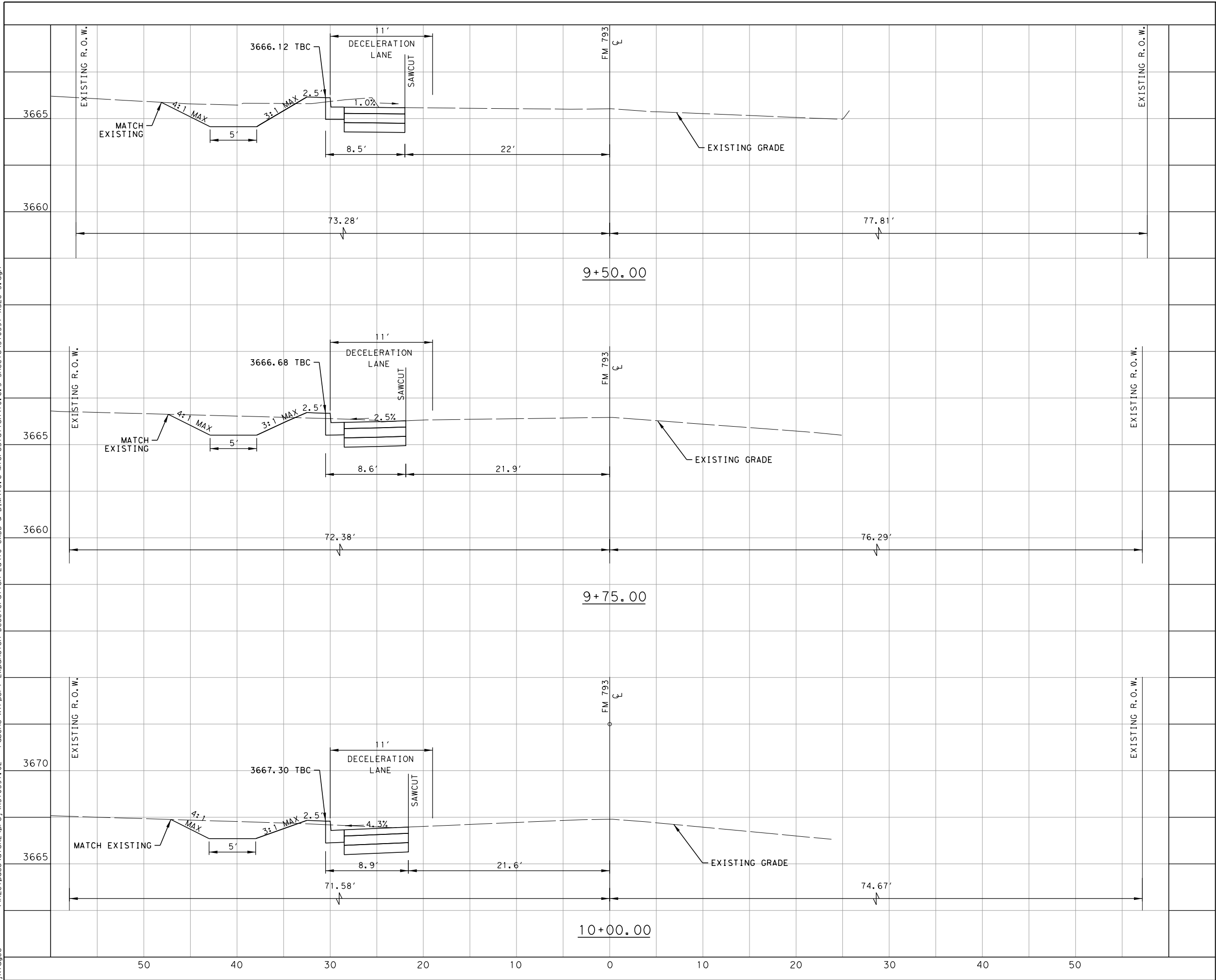


FABENS AIRPORT DECELERATION LANE

CROSS SECTIONS
8+50.00 TO 9+25.00

SHEET 2 OF 5			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			31

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- NOTES:
1. PROPOSED FLOW LINE SHALL PROVIDE POSITIVE FLOW TO MEET THE EXISTING CULVERT.
 2. PLACE REFURBISHED LOOSE AGGREGATE ON SIDE-SLOPES AS SHOWN ON SHEET 28.



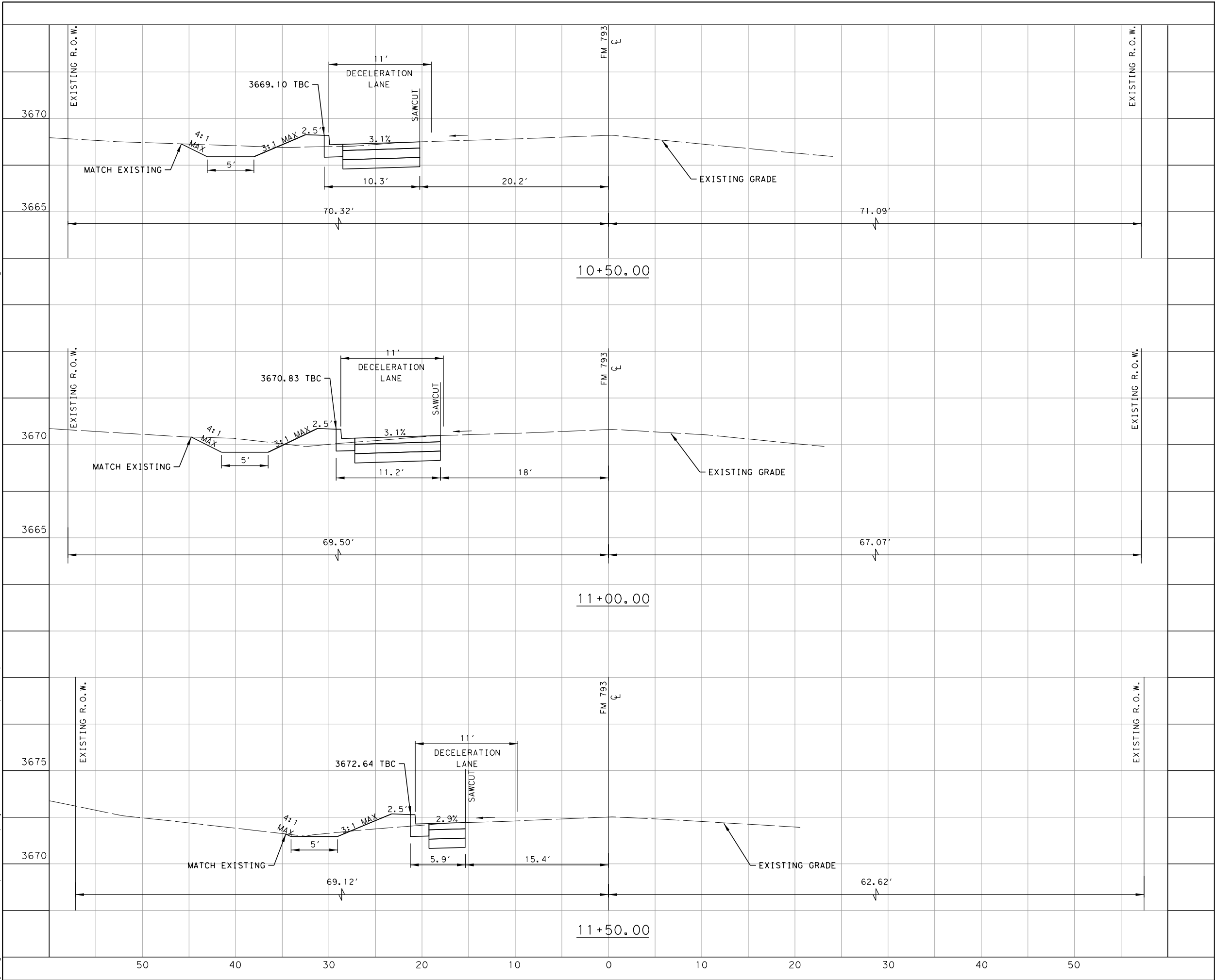
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FABENS AIRPORT DECELERATION LANE

CROSS SECTIONS
9+50.00 TO 10+00.00

SHEET 3 OF 5			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			32

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NOTES:

1. PROPOSED FLOW LINE SHALL PROVIDE POSITIVE FLOW TO MEET THE EXISTING CULVERT.
2. PLACE REFURBISHED LOOSE AGGREGATE ON SIDE-SLOPES AS SHOWN ON SHEET 28.

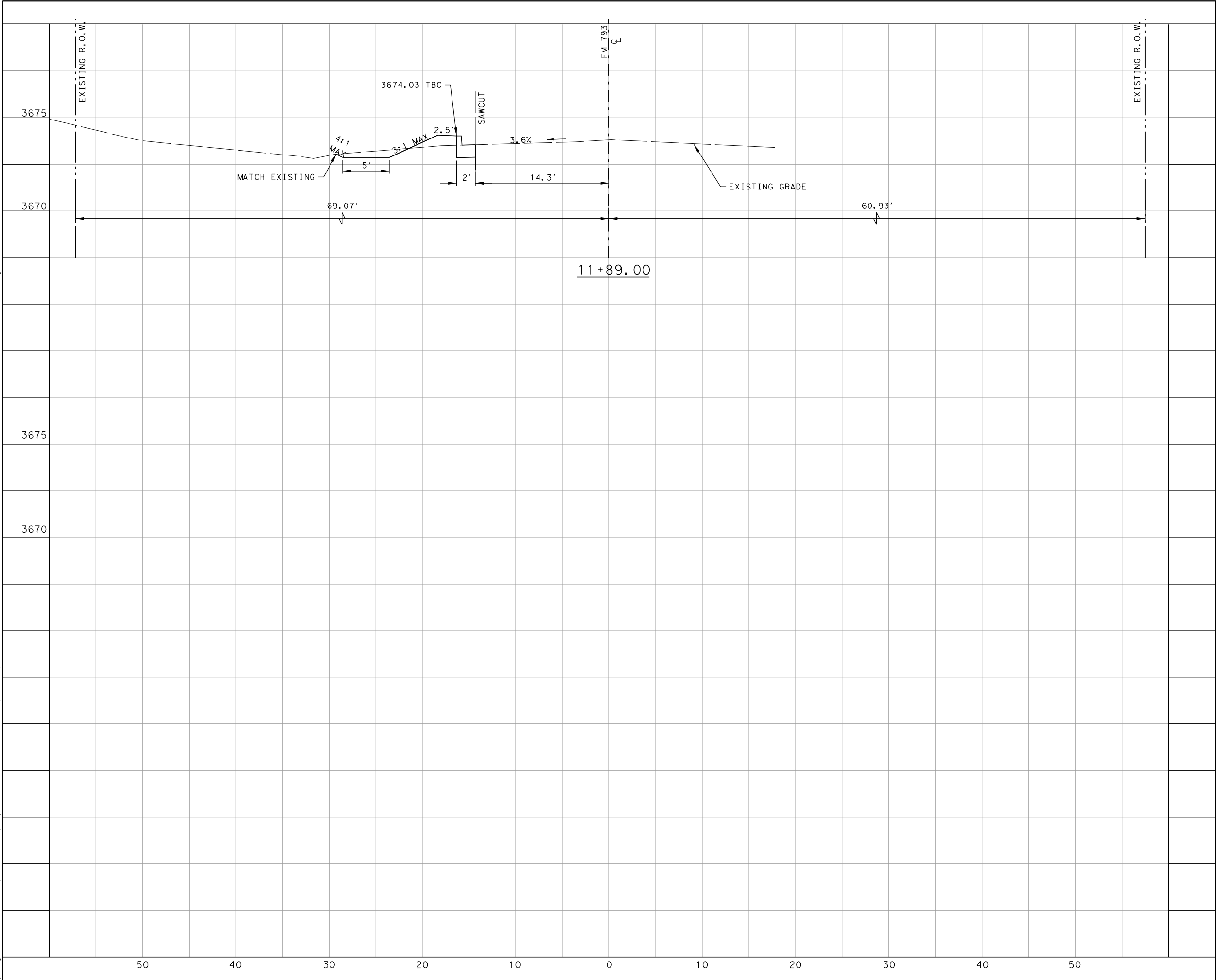


FABENS AIRPORT DECELERATION LANE

CROSS SECTIONS
10+50.00 TO 11+50.00

SHEET 4 OF 5			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			33

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- NOTES:
1. PROPOSED FLOW LINE SHALL PROVIDE POSITIVE FLOW TO MEET THE EXISTING CULVERT.
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FABENS AIRPORT DECELERATION LANE

CROSS SECTIONS
11+89.00

SHEET 5 OF 5

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			34

- NOTES:
- ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED FOR RELOCATION OR REMOVAL.
 - SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED IN THE FIELD.
 - ALL SIGNS SHALL BE INSTALLED ON BREAKAWAY POSTS (SLIP BASE). REFER TO SIGN POSTS DETAILS.
 - REPLACE ALL EXISTING STRIPING THAT IS DISTURBED DURING CONSTRUCTION, UNLESS OTHERWISE INDICATED.
 - ANY DAMAGE DONE TO ROADWAY DURING THE REMOVAL OF EXISTING PAVEMENT MARKINGS MUST BE REPAIRED BEFORE PLACING OF NEW PAVEMENT MARKINGS, INCLUDING SEALING PAVEMENT. THIS SHALL BE SUBSIDIARY TO PAVEMENT MARKING ITEMS.
 - PROPOSED PAVEMENT MARKINGS AND SIGNS SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) AND STANDARD HIGHWAY SIGN DESIGNS (SHSD) FOR TEXAS.

- LEGEND
- (A) REFL PAV MRK TY I (W) 4" (SLD) (100 MIL)
 - (B) REFL PAV MRK TY I (Y) 4" (SLD) (100 MIL)
 - (C) REFL PAV MRK TY I (Y) 4" (BRK) (100 MIL)
 - (D) REFL PAV MRK TY II (W) 4" (SLD)
 - (E) REFL PAV MRK TY II (Y) 4" (BRK)
 - (F) REFL PAV MRK TY II (Y) 4" (SLD)
 - (G) REFL PAV MRK TY I (W) 8" (SLD) (100 MIL)
 - (H) REFL PAV MRK TY II (W) 8" (SLD)
 - (I) REFL PAV MRKR TY II-A-A
 - (J) REFL PAV MRKR TY I-C
 - (K) REFL PAV MRK TY I (W) ARROW (100 MIL)
 - (L) REFL PAV MRK TY II (W) ARROW
 - (M) REFL PAV MRK TY I (W) WORD (100 MIL)
 - (N) REFL PAV MRK TY II (W) WORD
 - 1 SIGN ID



SHEET TOTALS				
ITEM	CODE	DESCRIPTION	UNIT	QUANT
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
666	6012	REFL PAV MRK TY I (W) 4" (SLD) (100 MIL)	LF	960
666	6036	REFL PAV MRK TY I (W) 8" (SLD) (100 MIL)	LF	382
666	6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	12
666	6054	REFL PAV MRK TY I (W) ARROW (100 MIL)	EA	6
666	6078	REFL PAV MRK TY I (W) WORD (100 MIL)	EA	2
666	6120	REFL PAV MRK TY I (Y) 4" (BRK) (100 MIL)	LF	100
666	6126	REFL PAV MRK TY I (Y) 4" (SLD) (100 MIL)	LF	2026
666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	960
666	6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	382
666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	12
666	6184	REFL PAV MRK TY II (W) ARROW	EA	6
666	6192	REFL PAV MRK TY II (W) WORD	EA	2
666	6205	REFL PAV MRK TY II (Y) 4" (BRK)	LF	100
666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	2026

* NOTE:
REFER TO SIGN DETAIL SHEET.

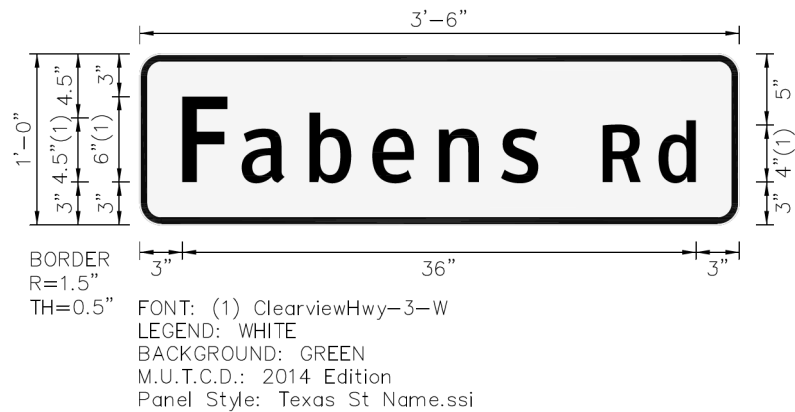


HUITT-ZOLIARS
HUITT-ZOLIARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

SIGNS AND
PAVEMENT MARKINGS PLAN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			35



1 TYP. D3-1 (GREEN)



2 D24-2TR (MOD)
48"X36"

NOTES:

1. ALL EXISTING SIGN TO REMAIN UNLESS OTHERWISE NOTED FOR RELOCATION OR REMOVAL.
2. SIGN LOCATIONS ARE APPROXIMATE AND CAN BE ADJUSTED IN THE FIELD.
3. ALL SIGNS SHALL BE INSTALLED ON BREAKAWAY POSTS (SLIP BASE). REFER TO SIGN POSTS DETAILS.
4. PROPOSED SIGNS SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND STANDARD HIGHWAY SIGN DESIGNS (SHSD) FOR TEXAS.

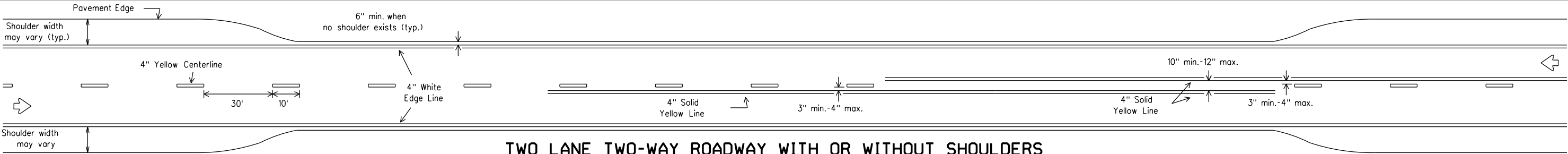


FABENS AIRPORT DECELERATION LANE
SIGN DETAILS

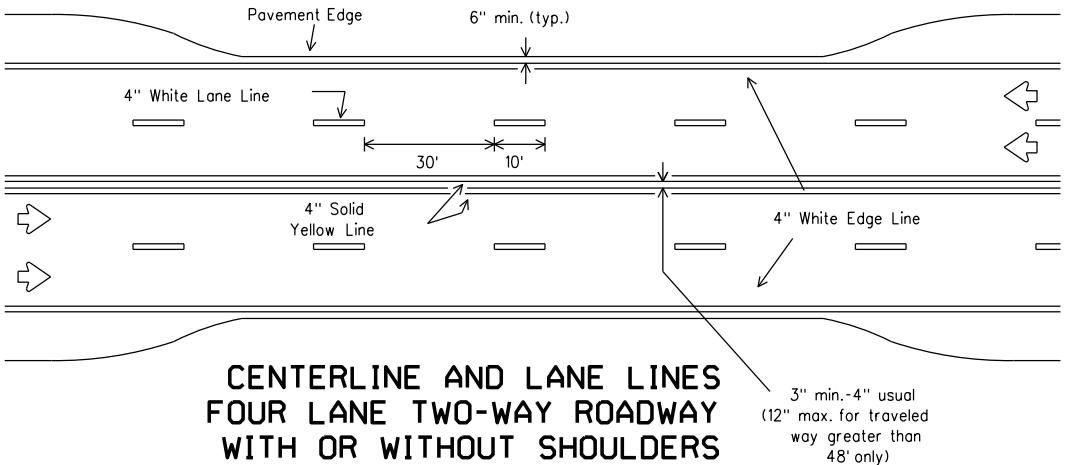
SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	36
CONTROL	SECTION	JOB	

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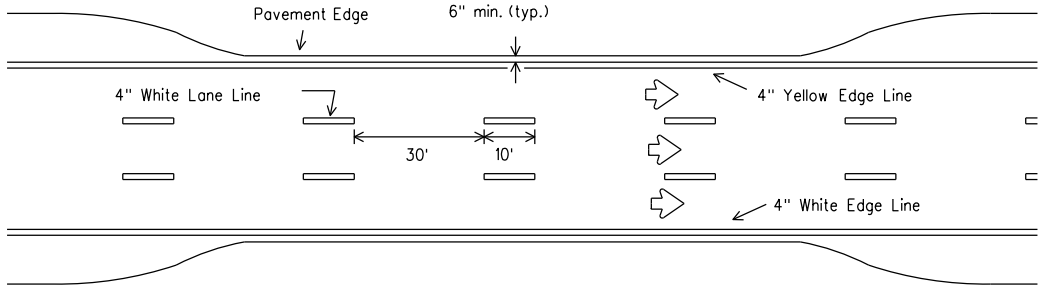
DATE: FILE:



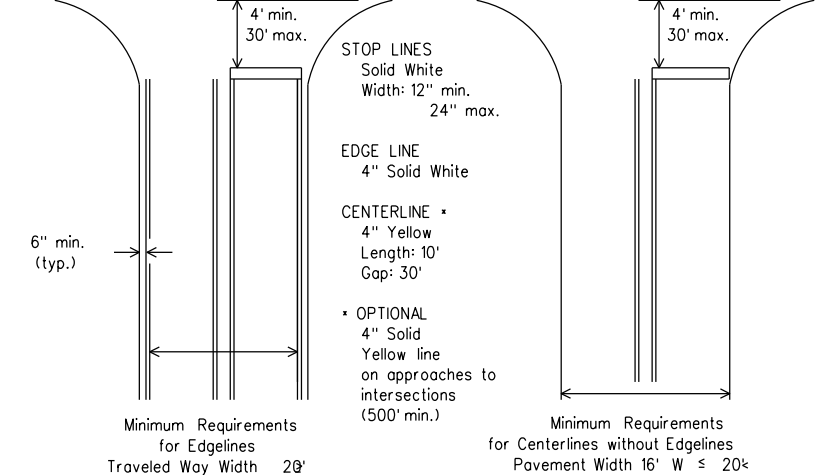
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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



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



GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

TABLE 1 - TYPICAL LENGTH (L)

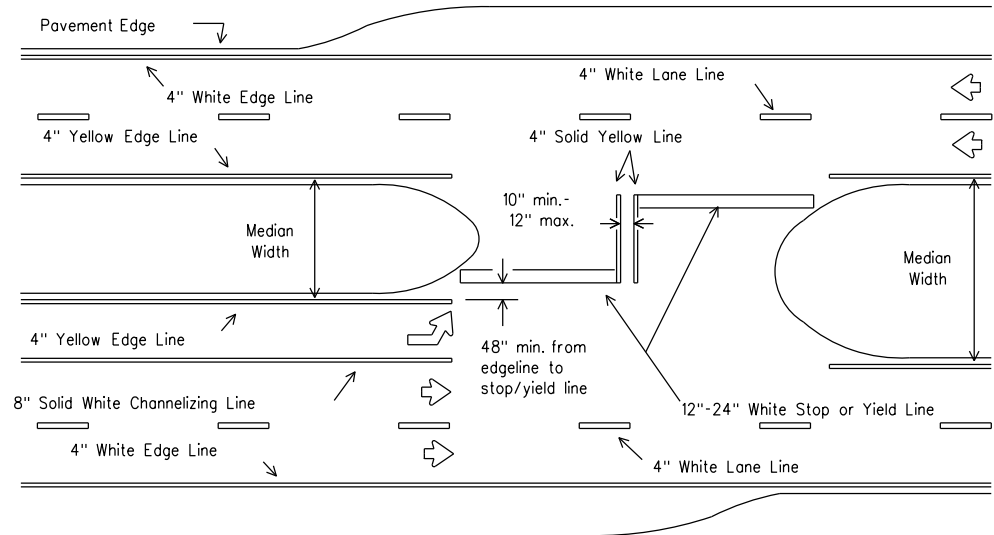
Posted Speed x	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	$L = WS$

x 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.

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

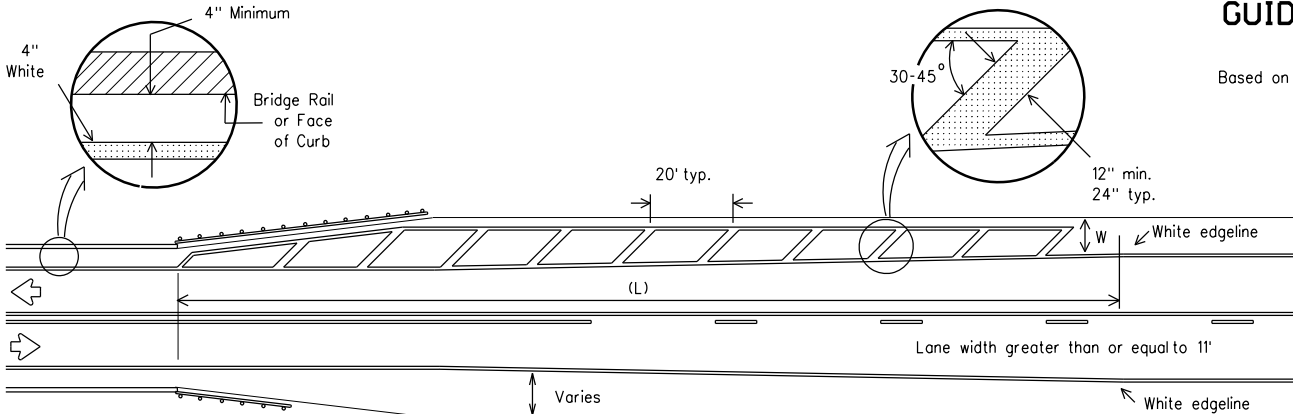
EXAMPLES:

An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the cross-hatching should be:
 $L = 8 \times 70 = 560$ ft.
A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:
 $L = 4(40) \nabla 60 = 106.67$ ft. rounded to 110 ft.



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



NOTES:

- No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
- For crosshatching length (L) see Table 1.
- The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
- The crosshatching is not required if delineators or barrier reflectors are used along the structure.
- For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER
WIDTHS ACROSS BRIDGE OR CULVERT

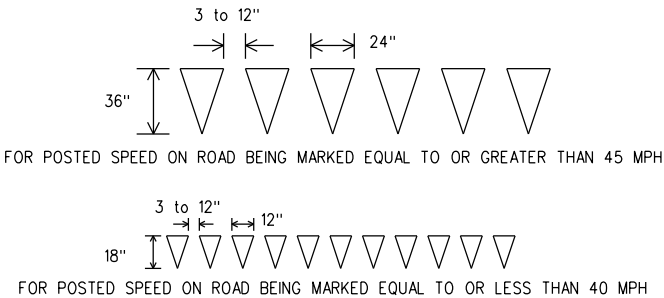
GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS

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

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



YIELD LINES



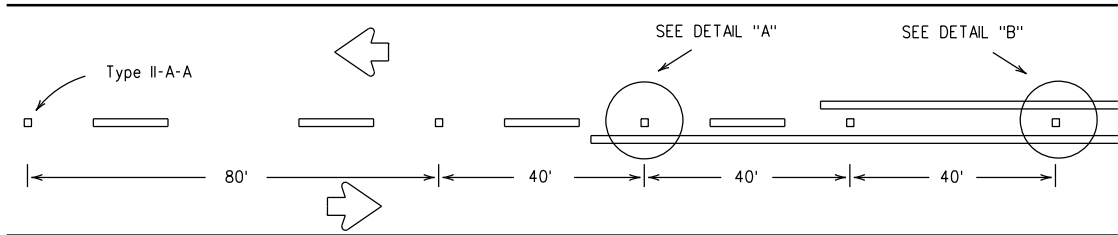
TYPICAL STANDARD
PAVEMENT MARKINGS

PM(1)-12

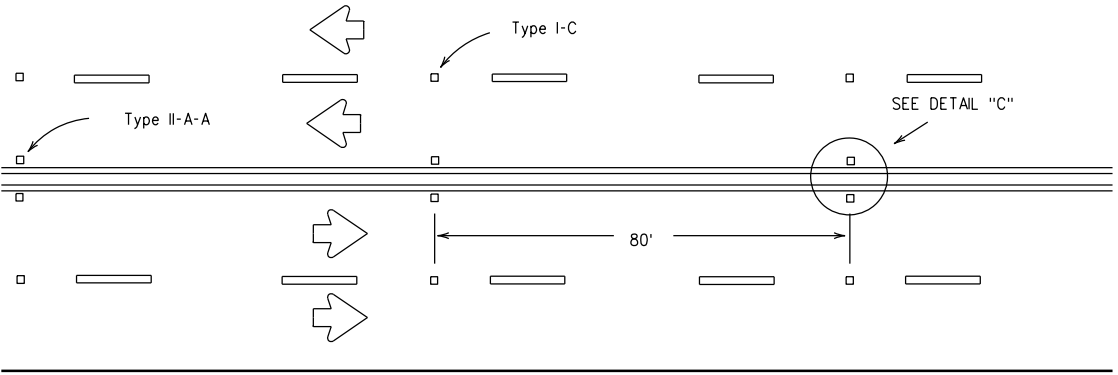
© TxDOT November 1978	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12				CS
5-00				
8-00			COUNTY	SHEET NO.
3-03	ELP		EL PASO	37

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REFLECTIVE RAISED PAVEMENT MARKERS
FOR VEHICLE POSITIONING GUIDANCE

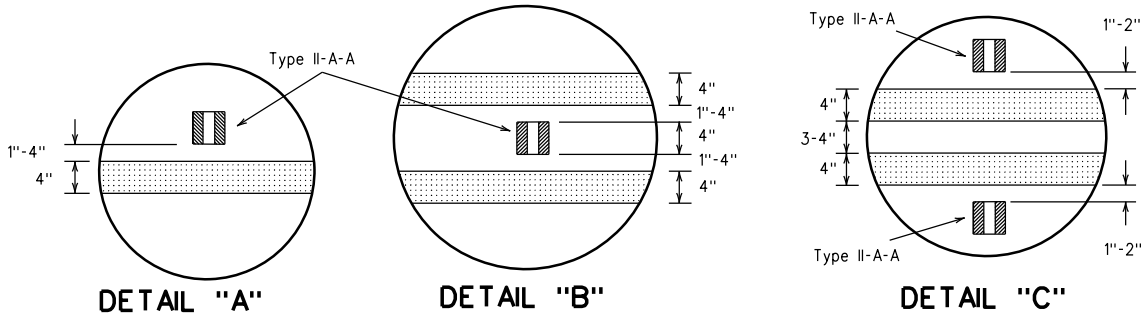


CENTERLINE FOR ALL TWO LANE ROADWAYS



CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS

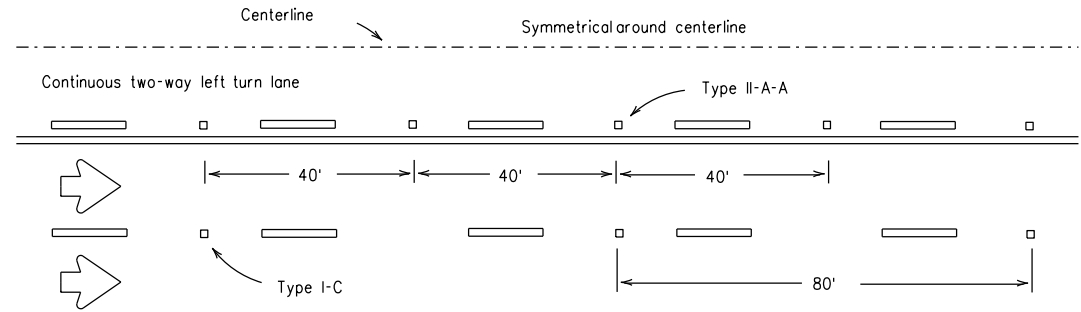
Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.



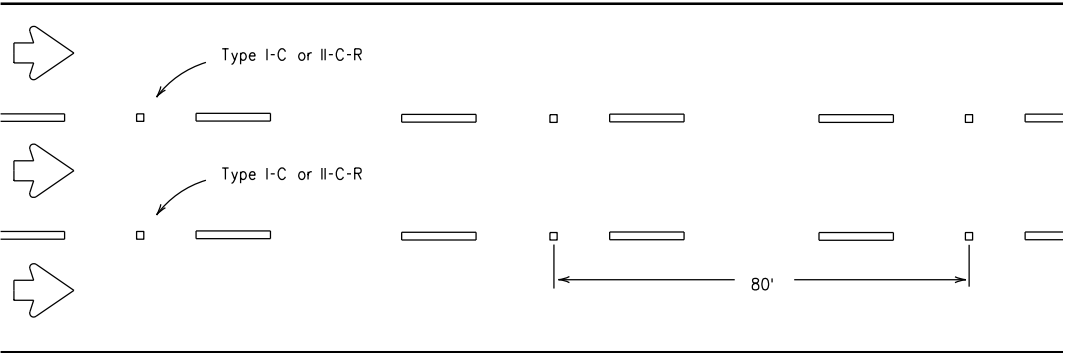
DETAIL "A"

DETAIL "B"

DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

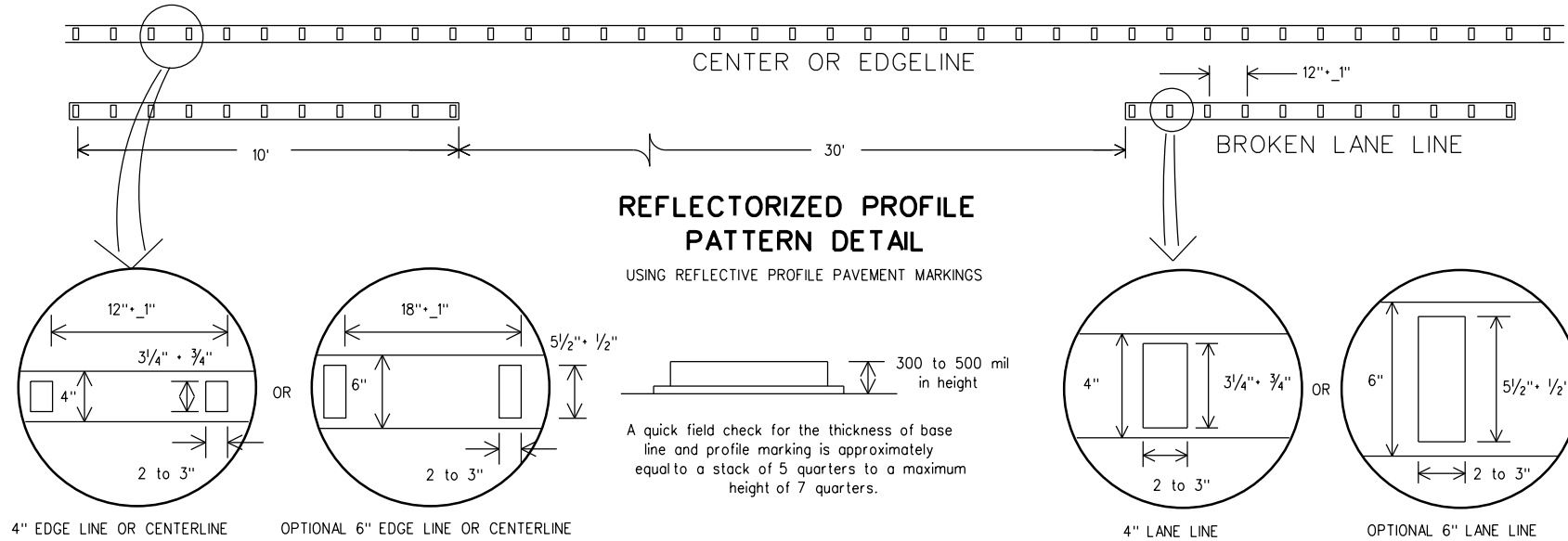


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

GENERAL NOTES

- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

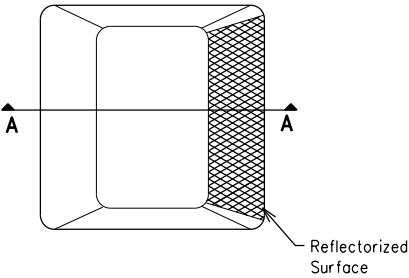
NOTE:

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

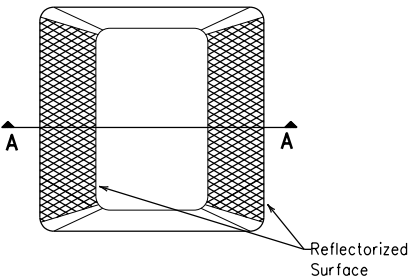
MATERIAL SPECIFICATIONS

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

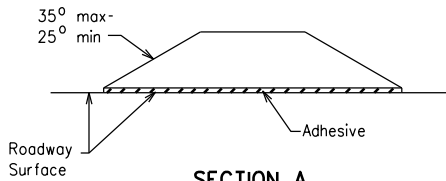
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

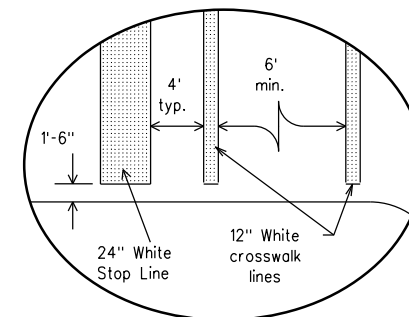
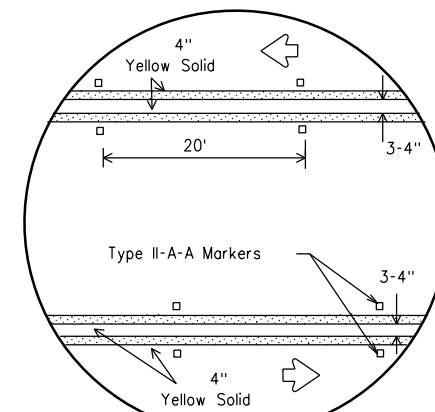
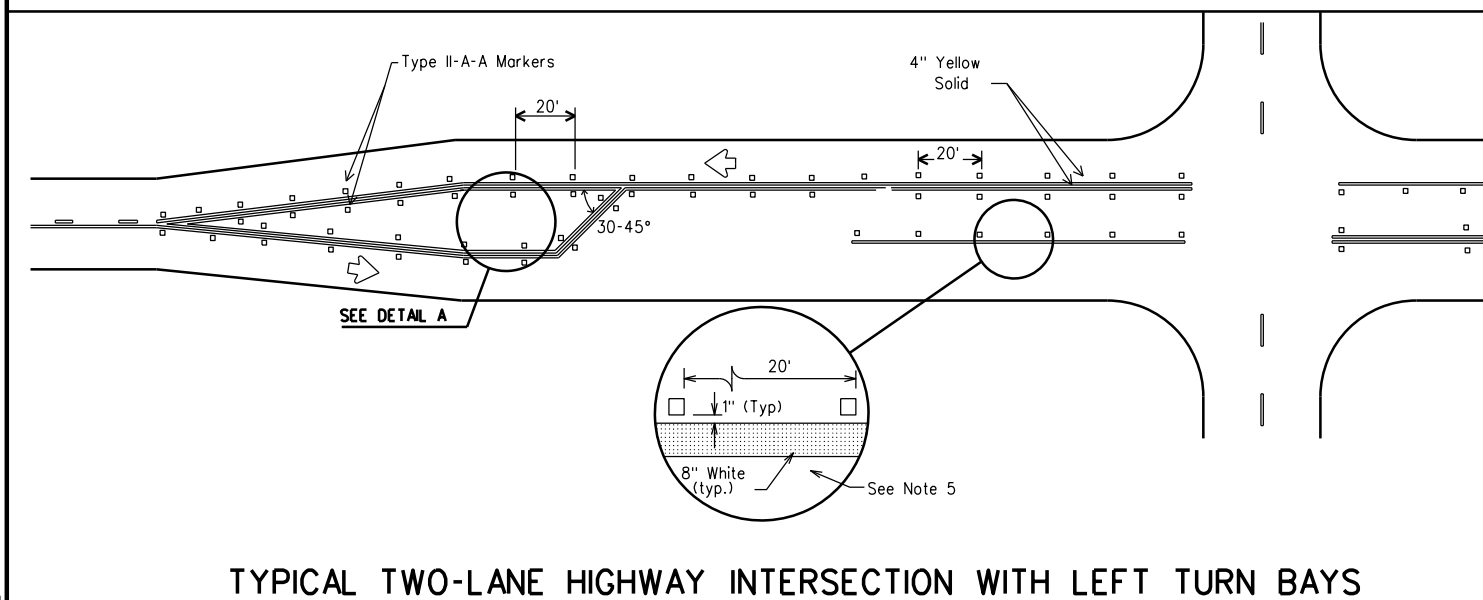
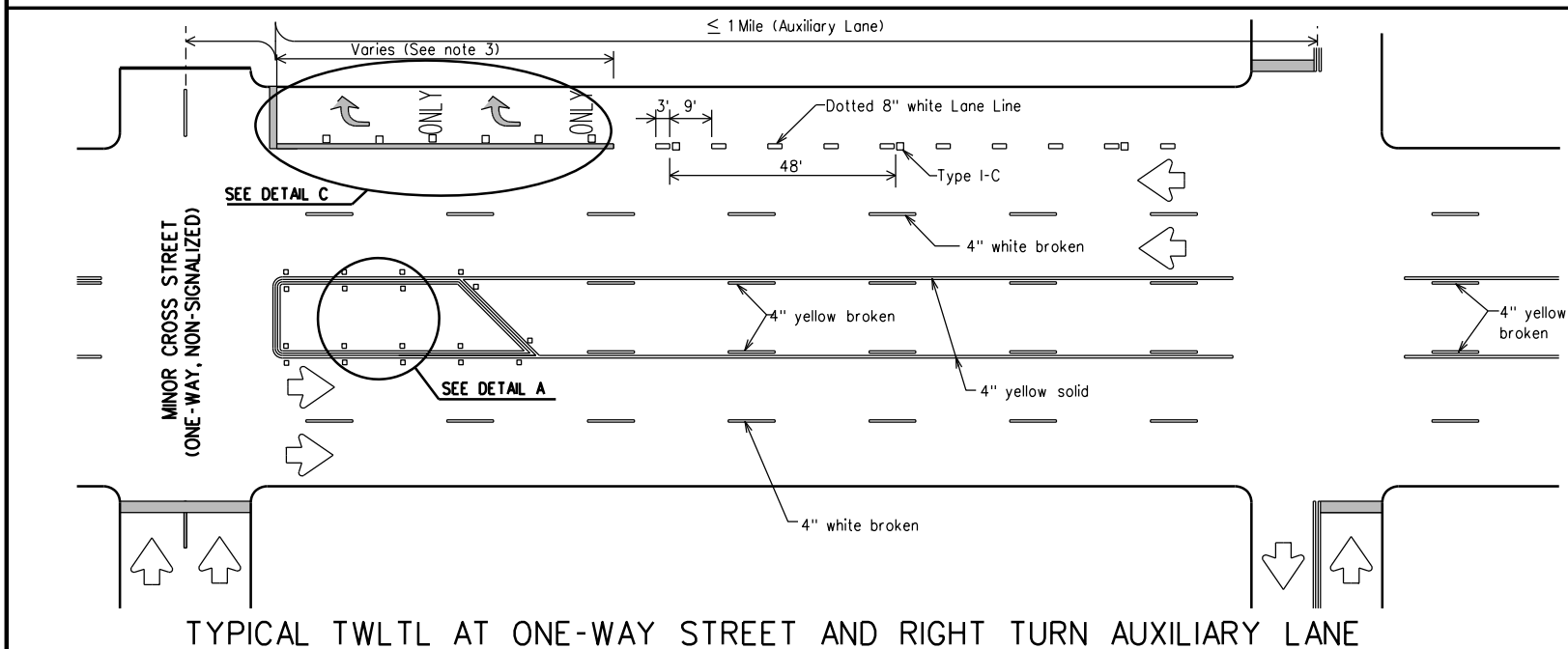
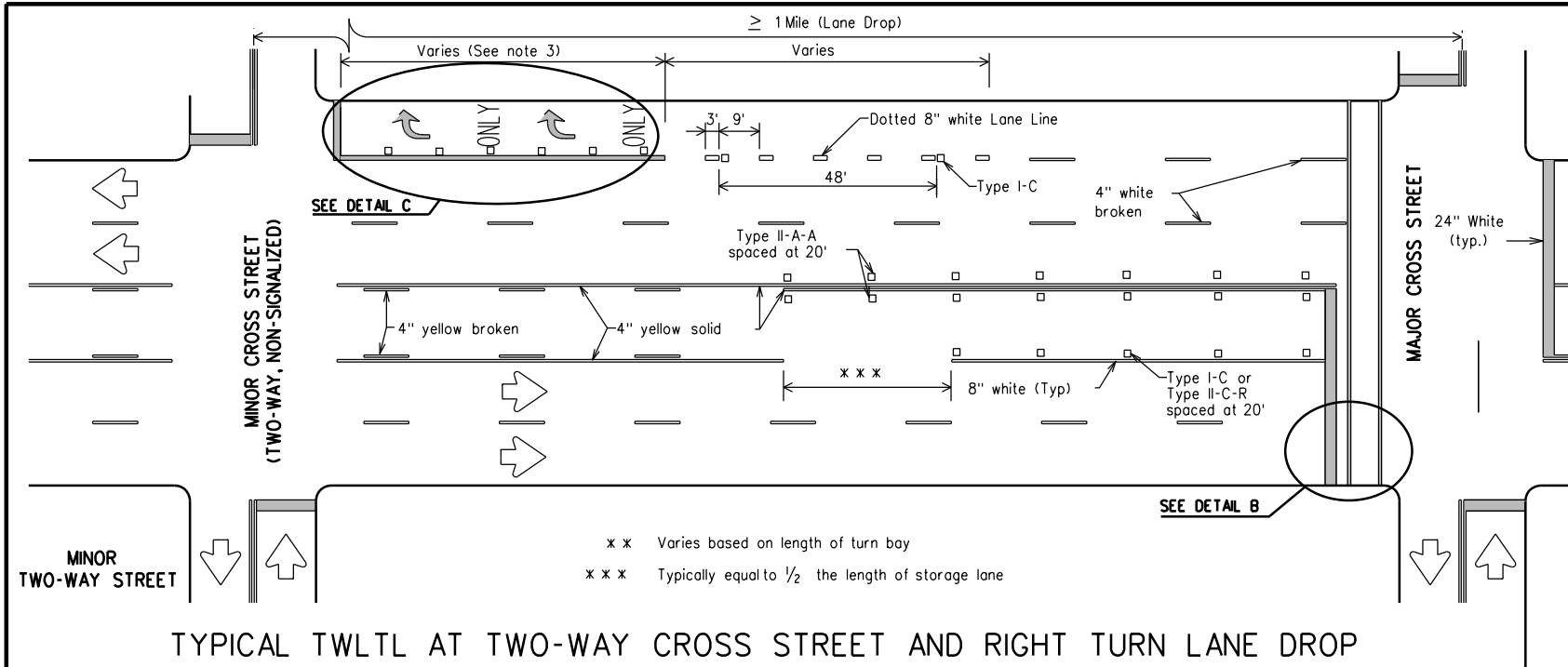


POSITION GUIDANCE USING
RAISED MARKERS
REFLECTORIZED PROFILE
MARKINGS

PM(2)-12

© TxDOT April 1977	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-92 2-10				CS
5-00 2-12				
8-00			COUNTY	SHEET NO.
2-08	ELP		EL PASO	38

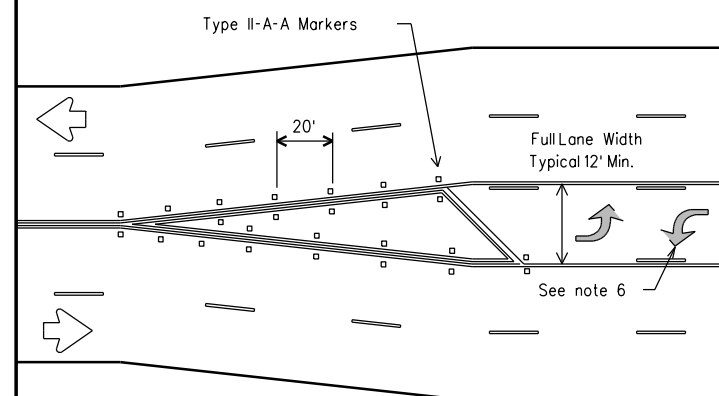
DATE: _____
FILE: _____



Final placement of Stop Bar
and Crosswalk shall be approved
by the Engineer in the field.

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

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



 **Texas Department of Transportation**
Traffic Operations Division

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REVISONS		CONT	SECT	JOB	HIGHWAY
5-00	2-12				CS
8-00					
5-03		DIST		COUNTY	SHEET NO.
2-10		ELP		EL PASO	39

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

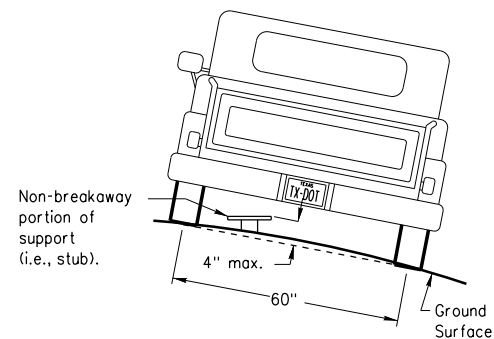
Anchor Type

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

Sign Mounting Designation

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

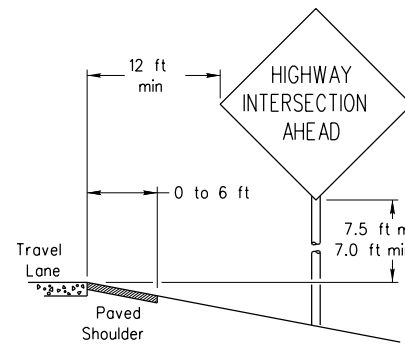
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

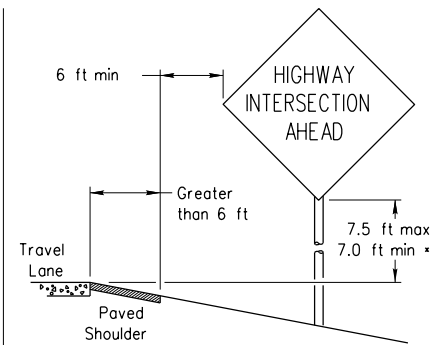
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

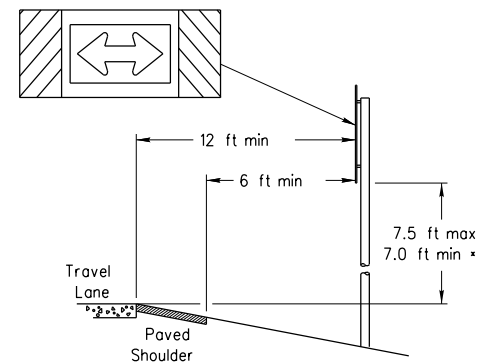
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

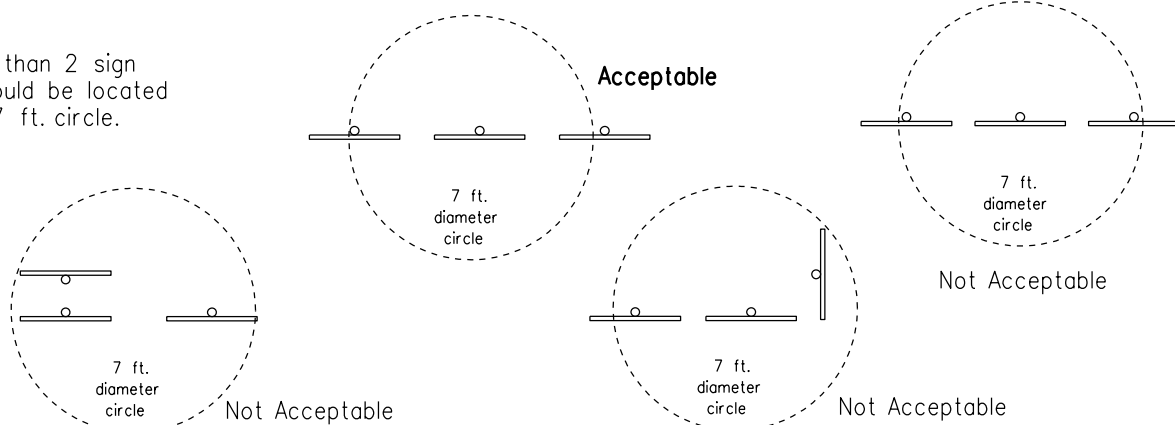
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION



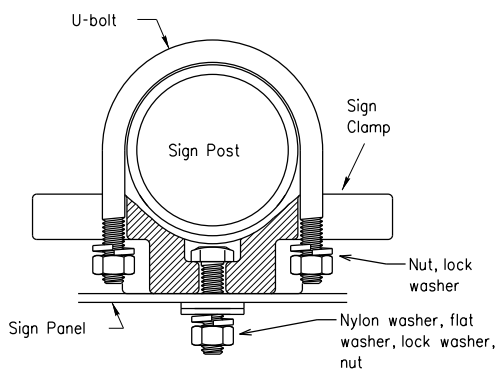
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

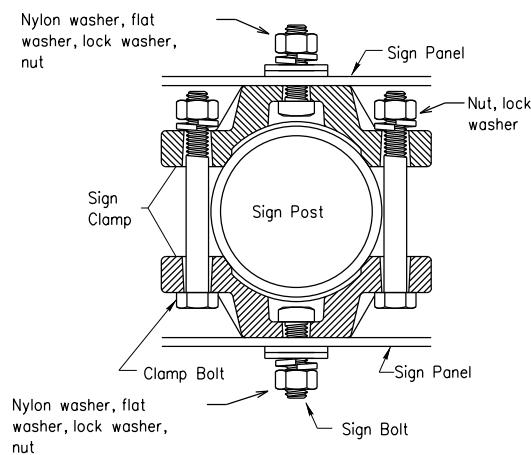


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

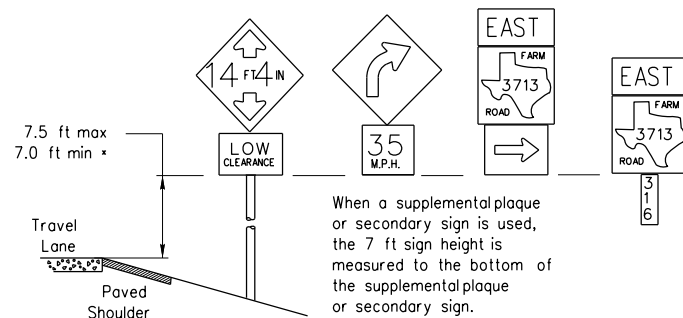
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



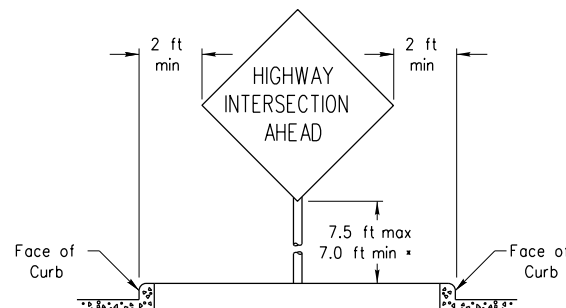
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

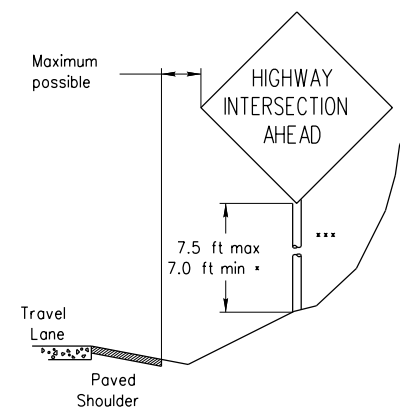


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



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



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

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

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



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

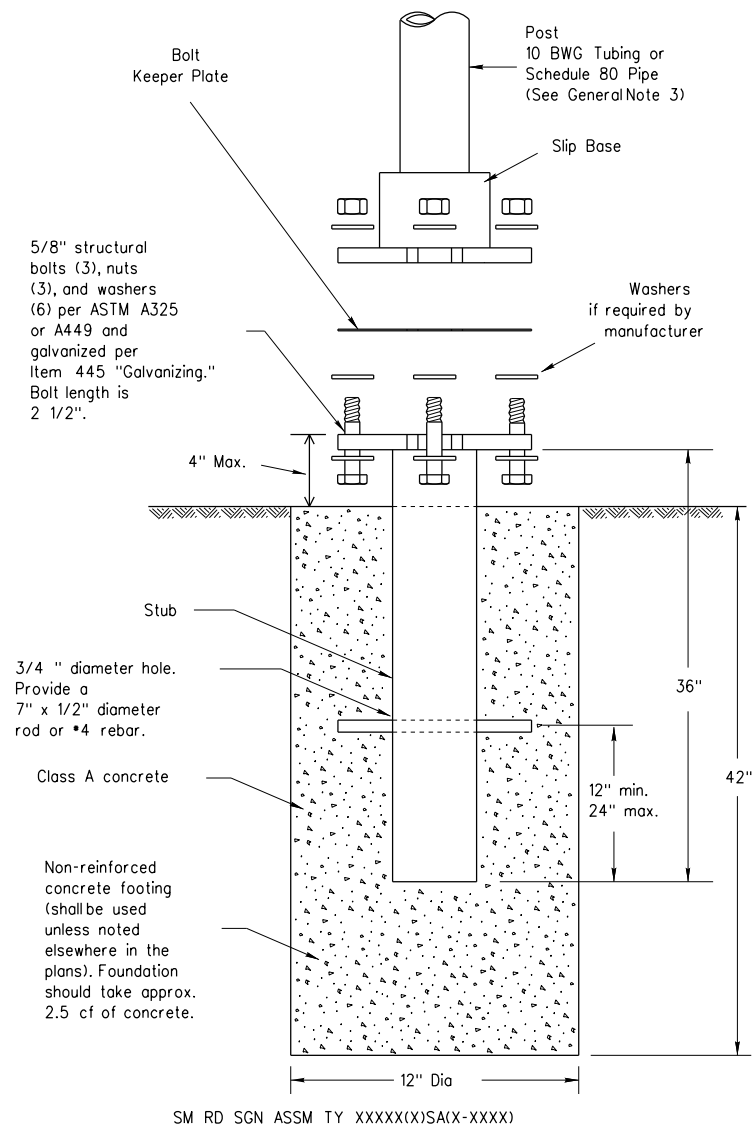
SMD(GEN)-08

© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB
				HIGHWAY
				CS
		DIST	COUNTY	SHEET NO.
		ELP	EL PASO	40

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DATE:
FILE:

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

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

GENERAL NOTES:

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

ASSEMBLY PROCEDURE

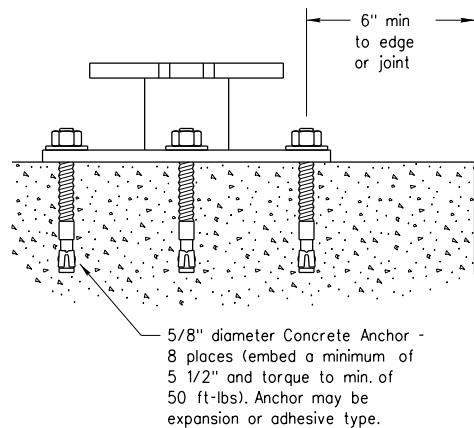
Foundation

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

Support

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

CONCRETE ANCHOR



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



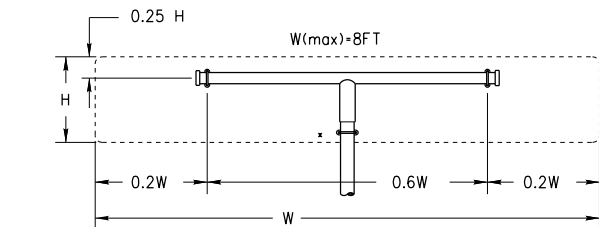
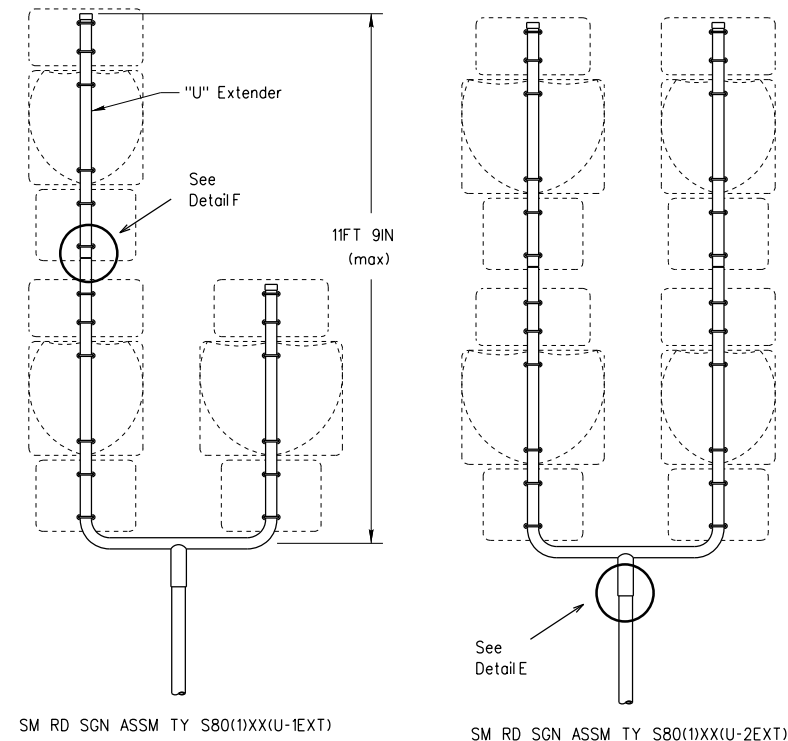
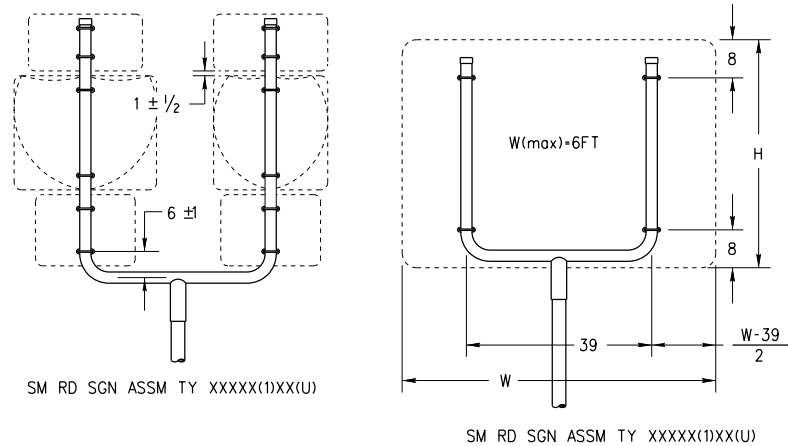
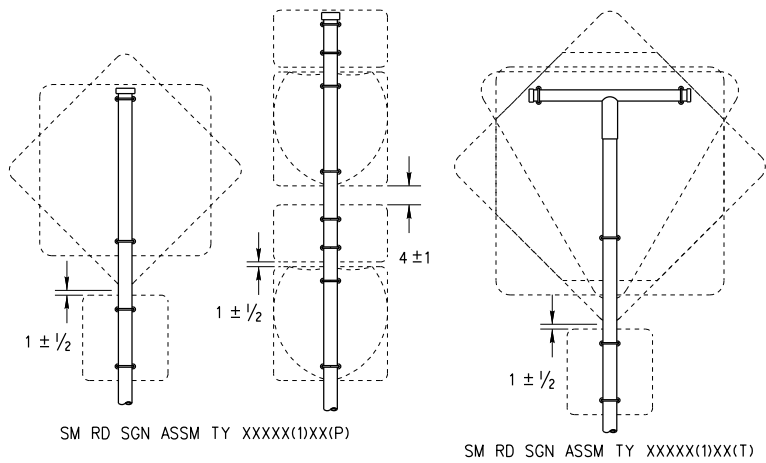
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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9-08	REVISIONS	CONT	SECT	JOB
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				CS
		DIST	COUNTY	SHEET NO.
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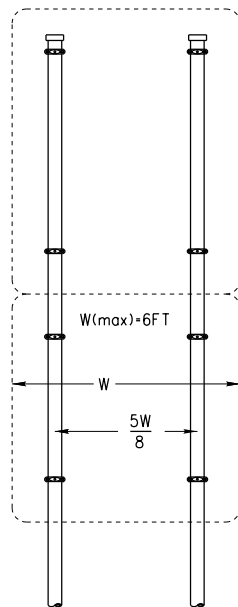
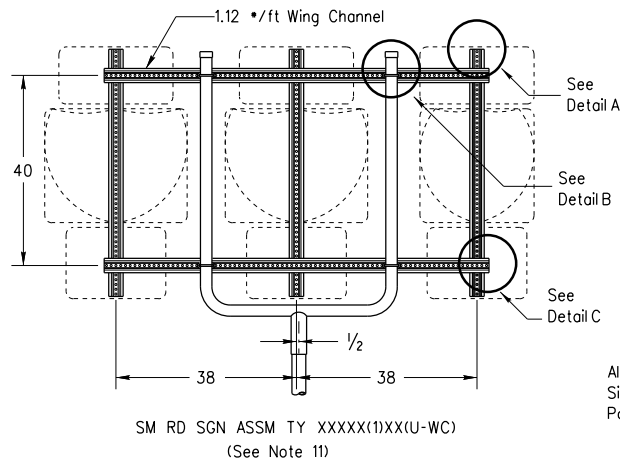
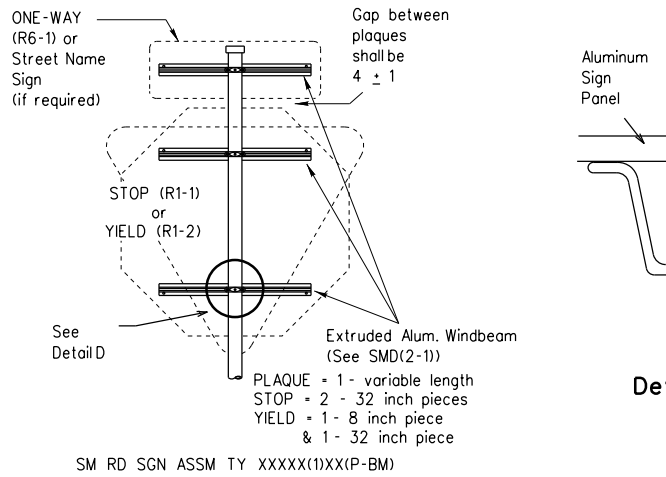
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DATE: FILE:

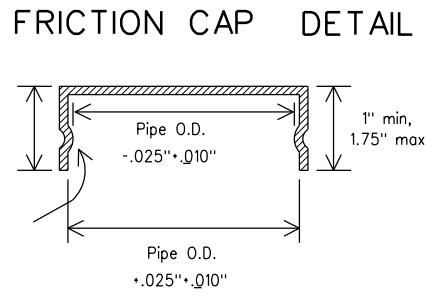
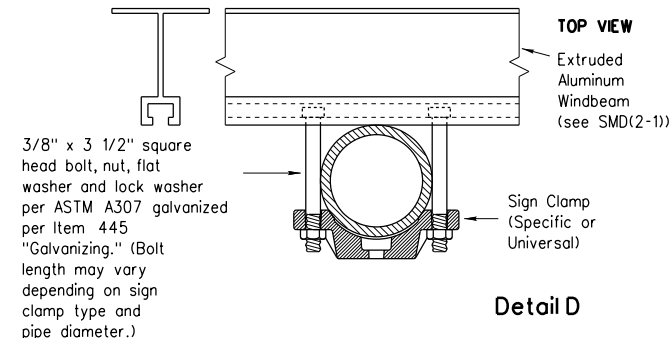
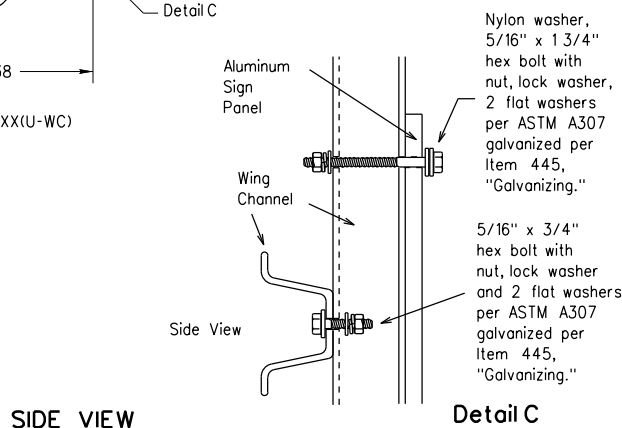
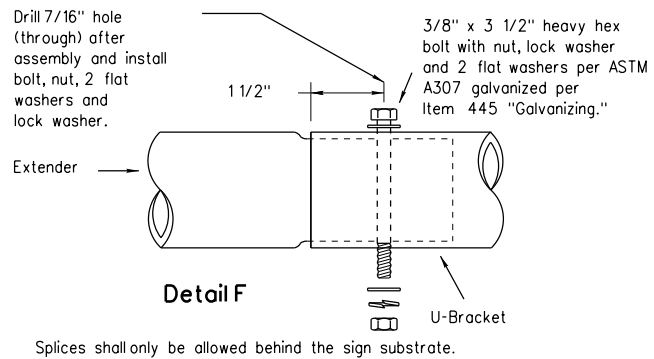
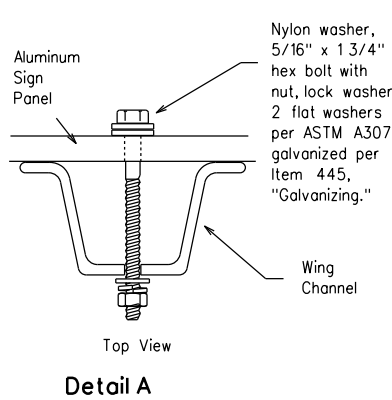


SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english
unless detailed otherwise.



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



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

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

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

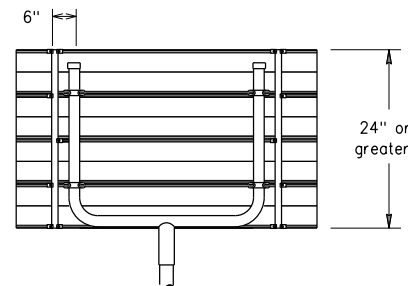
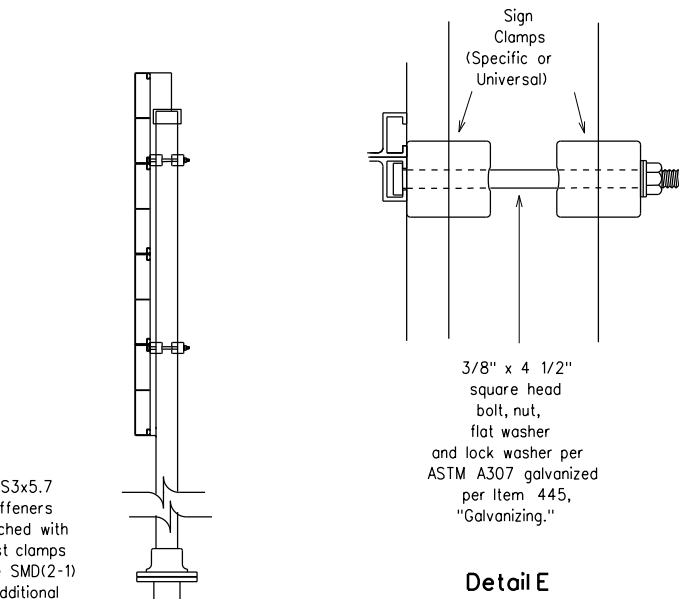
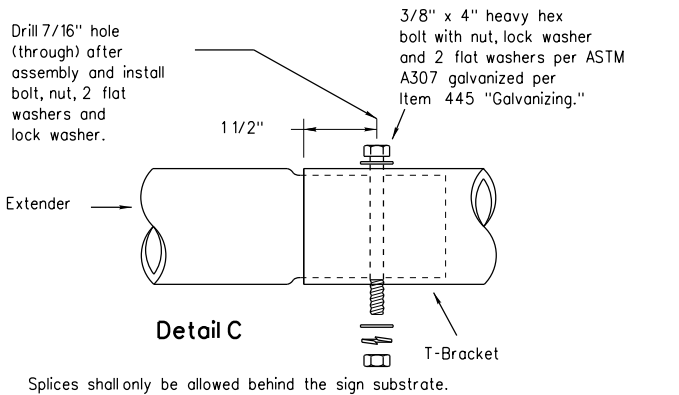
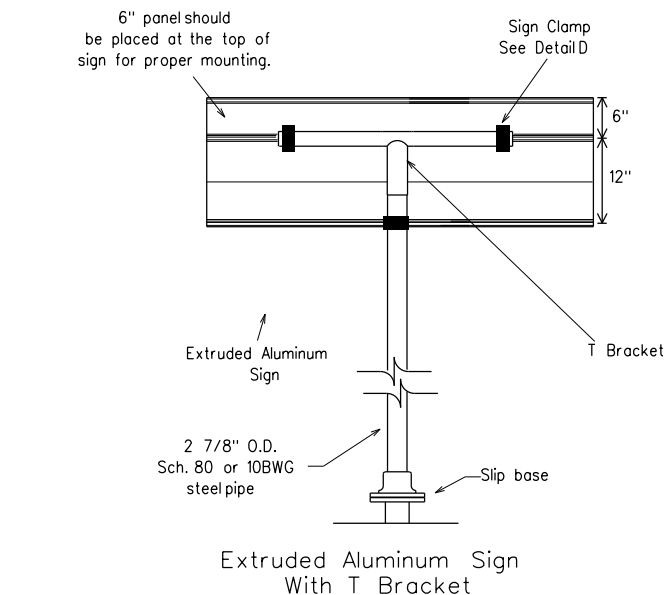
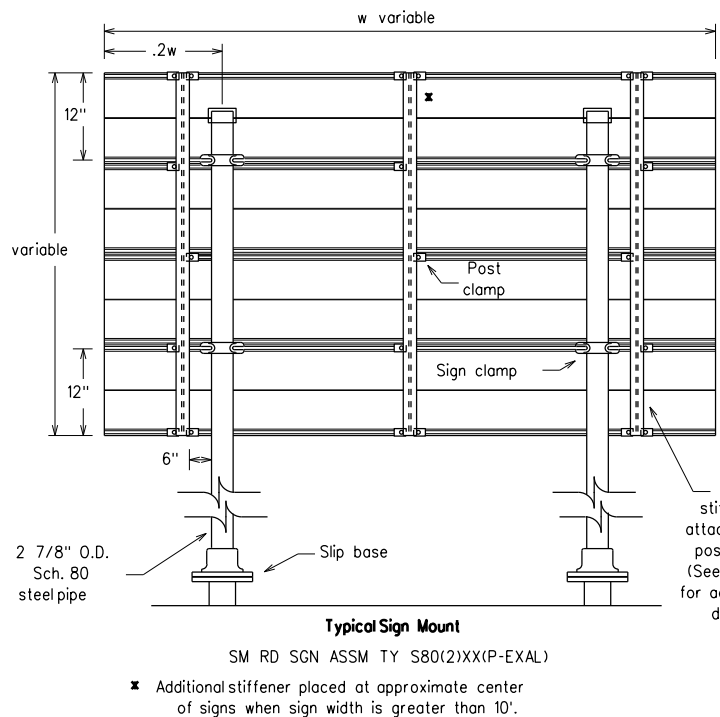
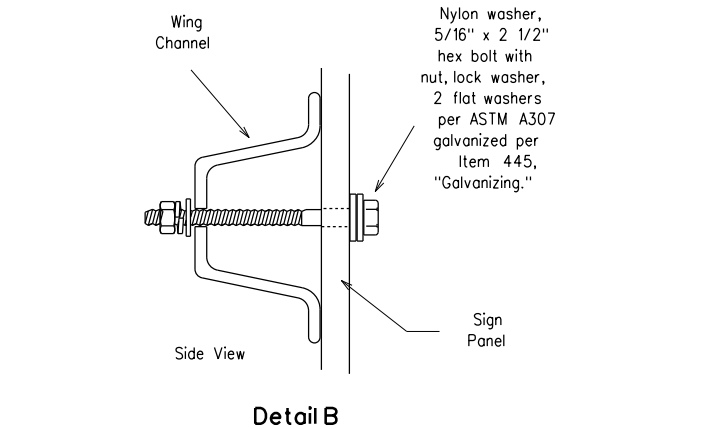
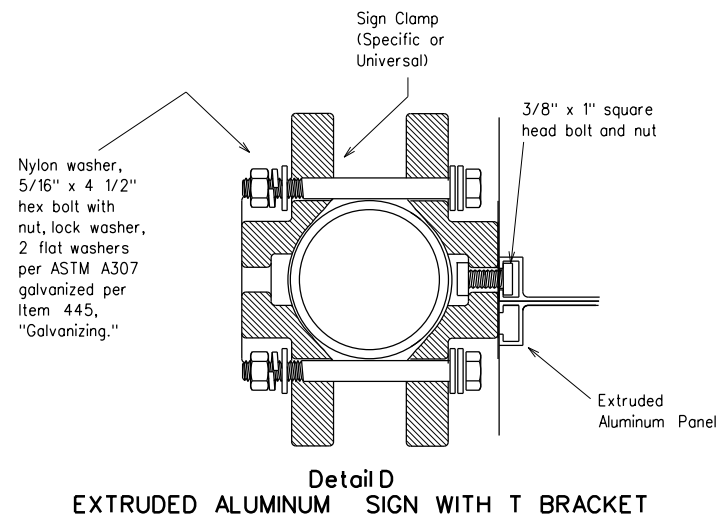
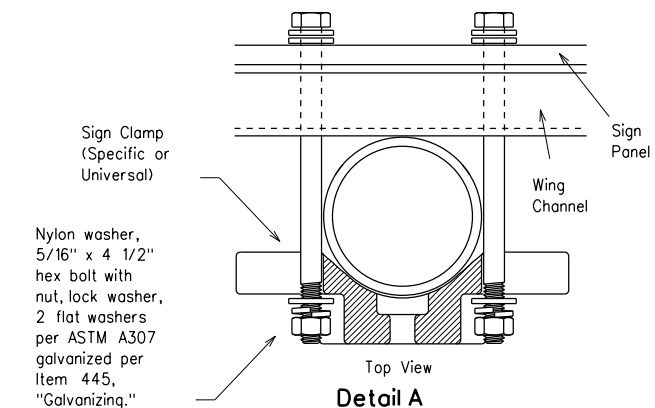
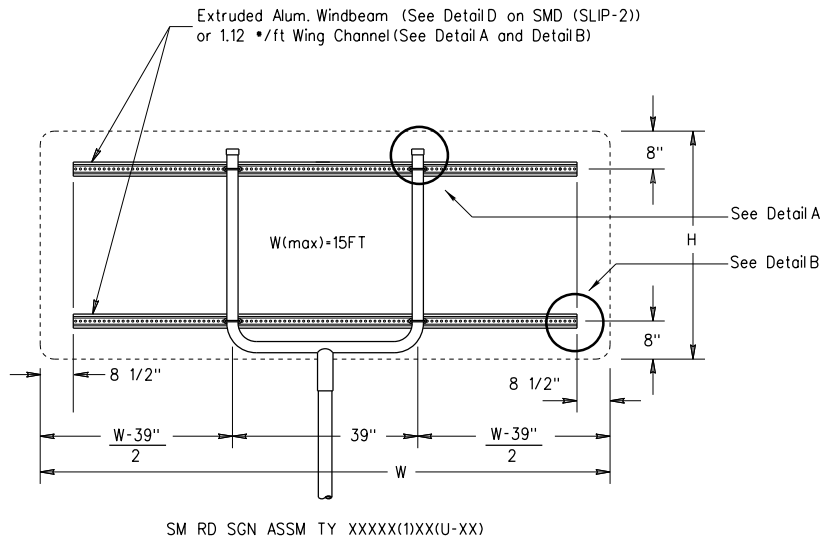
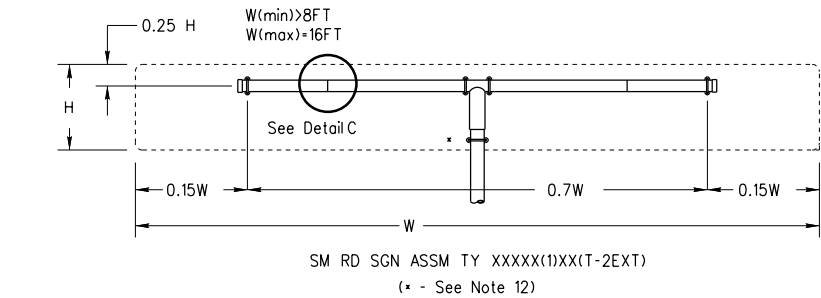


SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-2)-08

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				CS
				SHEET NO.
				42

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DATE: FILE:



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details
See Detail E for clamp installation

GENERAL NOTES:

- | SIGN SUPPORT | • OF POSTS | MAX. SIGN AREA |
|--------------|------------|----------------|
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- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

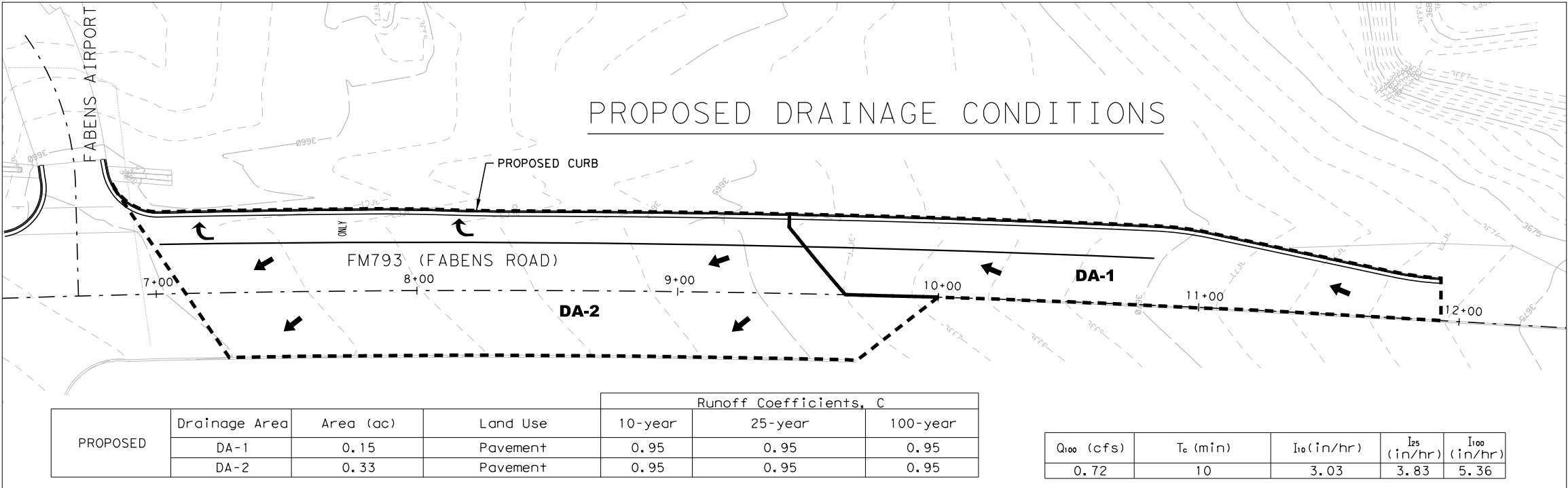
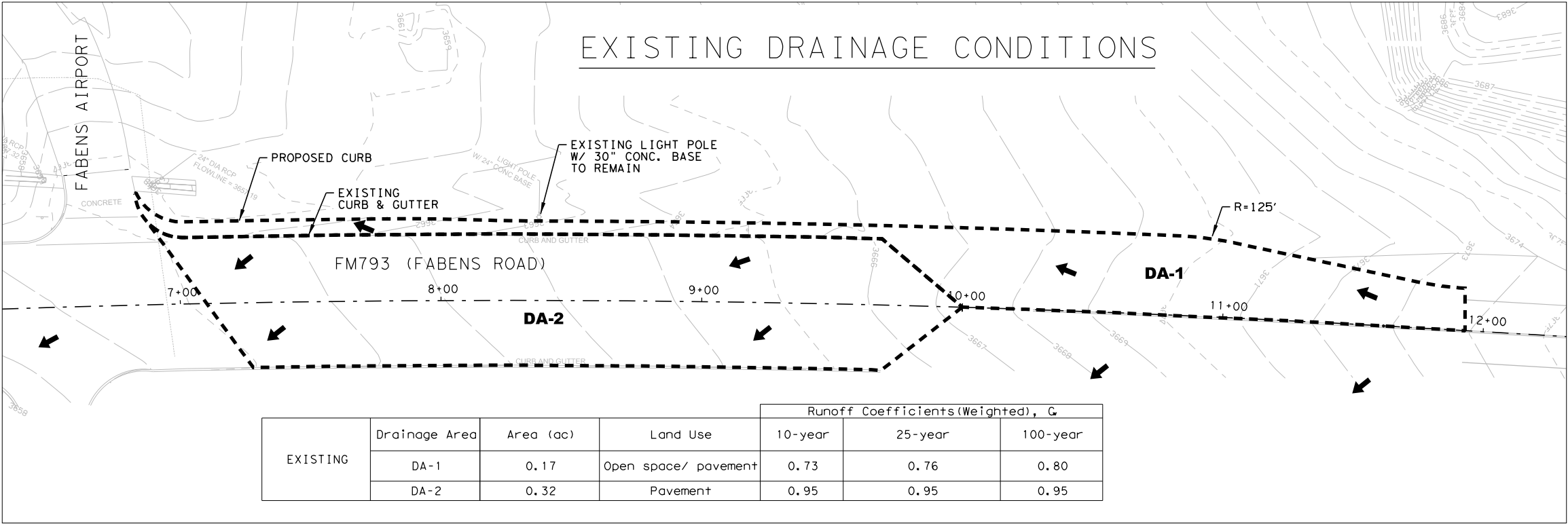
REQUIRED SUPPORT		
SIGN DESCRIPTION		SUPPORT
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	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs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



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-3)-08

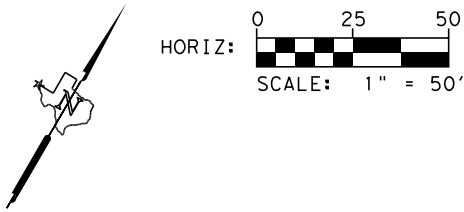
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9-08	REVISIONS	CONT	SECT	JOB
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				CS
				SHEET NO.
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PEAK FLOWS FOR RETURN FREQUENCIES USING RATIONAL METHOD					
CONDITIONS	Drainage Area	A (ac)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₁₀₀ (cfs)
EXISTING	DA-1	0.17	0.37	0.48	0.72
	DA-2	0.32	0.92	1.16	1.62
PROPOSED	DA-1	0.15	0.44	0.55	0.77
	DA-2	0.33	0.95	1.20	1.68

FLOW DIFFERENCE BETWEEN PROPOSED AND EXISTING RUNOFF (cfs), Q ₁₀₀					
Location	Drainage Area	C ₁₀₀	Existing, Q ₁₀₀	Proposed, Q ₁₀₀ (cfs)	TOTAL ADDITIONAL FLOW (cfs)
To Culvert - Left	DA-1	0.80	0.72	0.77	0.05
To Inlet (downstream FM793) -Right	DA-2	0.95	1.62	1.68	0.06



HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

DRAINAGE ANALYSIS

SHEET OF			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	44
CONTROL	SECTION	JOB	

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

- COUNTY OF EL PASO ROAD AND BRIDGE
- TXDOT EL PASO DISTRICT

☐ No Action Required ☒ Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- 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.

-
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-
-

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

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input 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 type="checkbox"/> Vegetation Lined Ditches
<input checked="" type="checkbox"/> Erosion Control Logs	<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.

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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.

- LIMIT DISTURBANCES OF VEGETATION TO ONLY WHAT IS NECESSARY FOR CONSTRUCTION ACTIVITIES, INCLUDING STAGING AREAS, FIELD OFFICE SITES, AND WORK ROADS.
-
-
-

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

☒ No Action Required ☐ Required Action

Action No.

-
-
-
-

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	NOT: Notice of Termination
NWP: Nationwide Permit	TxDOT: Texas Department of Transportation
NOI: Notice of Intent	T&E: Threatened and Endangered Species
	USACE: U.S. Army Corps of Engineers
	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 indicationg possible materials or contamination discovered on site. Hazardous Materials or Contamination issues Specific to this Project:

☐ no action required ☒ required action

ACTION NO.

- IN CASE OF SPILLS OF HAZARDOUS MATERIALS THAT HAVE IMMEDIATE POTENTIAL TO CONTAMINATE SURFACE WATER, FIELD PERSONNEL WILL IMMEDIATELY CONTACT THE ECI, ECM OR HAZARDOUS MATERIALS MANAGER (HMM) OR SUPERVISOR, AND TAKE REASONABLE MEASURES TO PREVENT THE MATERIAL FROM ENTERING THE SURFACE WATER (E.G., PLACEMENT OF A SPILL BOOM OR SOIL BERN) PROVIDED THAT THERE IS NO POTENTIAL SAFETY OR HEALTH HAZARD, THE SAFETY REPRESENTATIVE WILL ASSESS THE SCENE TO DETERMINE IF A THREAT TO HUMAN HEALTH IS PRESENT AND WILL ACT ACCORDINGLY. FOR EMERGENCIES THAT PRESENT A POTENTIAL SAFETY OR HEALTH HAZARD, CALL SWS ENVIRONMENT SERVICES AT 800-336-0909 (24-HR EMERGENCY OR NON -EMERGENCY). SEE HAZARDOUS MATERIALS MANAGEMENT PLAN FOR DETAILS.
- NO REFUELING WITHIN 100 FEET OF A WATER BODY. VEHICLE OR EQUIPMENT MAINTENANCE THAT MAY INVOLVE THE RELEASE OF FLUIDS (E.G., OIL CHANGES HOSE REPLACEMENT) WILL BE CONDUCTED IN AN AREA AT LEAST 50 FEET FROM WATER BODIES AS PRACTICABLE BUT NO CASE CLOSER THAN 50 FEET.
- OPERATION OF EQUIPMENT CONTAINING OIL AND OTHER HAZARDOUS MATERIALS WITHIN A WATER BODY WILL BE MINIMIZED OR AVOIDED. IF NO PRACTICABLE ALTERNATIVE IS AVAILABLE, THE CONSTRUCTION SUPERVISOR WITH THE RESPONSIBILITY FOR THE OPERATION WILL CONTACT THE ENVIRONMENTAL COMPLIANCE INSPECTOR PRIOR TO PLACING THE EQUIPMENT IN THE WATER.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

ACTION NO.

- UTILIZE A COMBINATION OF WATERING, CHEMICAL STABILIZATION AND REDUCED VEHICLE SPEED, 20 MPH, TO MINIMIZE AND CONTROL DUST IMPACT TO AIR QUALITY DURING CONSTRUCTION ACTIVITIES.
- USE EMISSION CONTROL DEVICES AND LIMIT UNNECESSARY IDLING OF CONSTRUCTION VEHICLES TO MINIMIZE EXHAUST EMISSIONS.



HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

ENVIRONMENTAL PERMIT,
ISSUES AND COMMENTS
EPIC

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			45

11/29/2020 9:01:10 AM \\nzel\poso\dl\sk2\proj\310391_02 - Fabens Airport Expansion-Deceleration La\10_CADD & BIM\10.6 MicroStation\10.6.5 Sheets\310391*SWPPP.dgn

STORM WATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TPDES General Permit TXR150000.The operator,The Texas Department of Transportation ensures that:Project specifications provide that adequate BMPs have been developed for this project. The contractor shall be the party responsible for implementing the BMPs described herein. The contractor shall implement changes approved by the Project Engineer to the SWP3 within the times specified in the SWP3 or the TPDES General Permit. Operators affected by modifications to specifications will be notified in a timely manner.

1.SITE OR PROJECT DESCRIPTION:

NATURE OF THE CONSTRUCTION ACTIVITY:

CONSTRUCTION OF A DECELERATION LANE INTO PROPOSED COMMERCIAL PRIVATE PROPERTY.

POTENTIAL POLLUTANTS AND SOURCES:

Sediment laden storm water	Construction vehicles and storage
Construction debris and waste	Various construction activities
Trash	Restroom facilities
	Construction site and Receptacles

SEQUENCE OF ACTIVITIES THAT WILL DISTURB SOILS:

- 1.Install traffic control devices.
- 2.Prepare ROW for new deceleration lane, driveway, adjust natural ground grading, & remove existing grading.
- 3.Construct 12' wide deceleration lane, concrete curb and gutter, and driveway.
- 4.Clean up and remove traffic control devices.

AREAS:

TOTAL AREA OF PROJECT: 1.13 ACRES
TOTAL AREA OF SOIL DISTURBANCE: 0.31 ACRES
TOTAL AREA OFF-SITE: 0.19 ACRES
WEIGHTED RUNOFF COEFFICIENT (BEFORE AND AFTER CONSTRUCTION): 0.85/0.90

DATA DESCRIBING THE SOIL:

The project area is located at the entrance to the Fabens Airport.
The project is in a developed and disturbed area. Cover consists of mostly natural ground along FM 793.

GENERAL LOCATION MAP: SEE TITLE SHEET

DETAILED SITE MAP: SEE SW3P SHEETS.

THE LOCATION AND DESCRIPTION OF CONCRETE AND ASPHALT PLANTS:

Supporting Concrete and Asphalt Plant Facilities shall be located off site.

NAME OF RECEIVING WATERS: Rio Grande

A COPY OF TPDES CGP TXR150000 IS INCLUDED IN THE SWP3 FILE.

REMARKS: This project will require a Construction Site Notice.

401 WATER QUALITY CERTIFICATION: ☐ YES ☒ NO

2.BEST MANAGEMENT PRACTICES (BMPs):

EROSION AND SEDIMENT CONTROLS: Erosion and sediment controls have been designed to retain sediment on-site.Controls shall be utilized to reduce off site transport of suspended sediments and pollutants if it is necessary to pump water from the site.Control measures shall be installed per specifications or as directed. Sediment must be removed from controls per the plan requirements or manufacturers recommendations,but no later than the time that design capacity has been reduced by 50%. If sediment escapes the site, accumulations will be removed to minimize further negative effects. Controls will be developed to limit the off site transportation of litter, construction debris, and construction materials.

INTERIM(INT), PERMANENT(PER), AND 401 CERTIFICATION BMP'S:					
EROSION CONTROLS:			SEDIMENT CONTROLS:		
<input type="checkbox"/> Compaction & Tracking of slopes	401	INT PER	<input checked="" type="checkbox"/> Silt Fence	401	INT PER
<input type="checkbox"/> Diversion Dike	—	— —	<input type="checkbox"/> Rock Berm	—	— —
<input type="checkbox"/> Preserve Existing Vegetation	—	— —	<input type="checkbox"/> Buffer Zones	—	— —
<input type="checkbox"/> Soil Stabilization	—	— —	<input type="checkbox"/> Vegetative Filter Strips	—	— —
<input type="checkbox"/> Permanent Vegetation	—	— —	<input checked="" type="checkbox"/> Ditch Block	—	X —
<input type="checkbox"/> No Erosion Controls are Required.			<input type="checkbox"/> No Sediment Controls are Required.		

POST CONSTRUCTION TSS CONTROL (401 CERTIFICATION ONLY):			
<input type="checkbox"/> Vegetation Lined Drainage Ditch	<input type="checkbox"/> Grassy Swales		
<input type="checkbox"/> Retention/Irrigation	<input type="checkbox"/> Vegetative Filter Strips		
<input type="checkbox"/> Erosion Control Compost	<input checked="" type="checkbox"/> No Post Construction TSS Control Required.		

SEQUENCE OR SCHEDULE OF IMPLEMENTATION:

1. Install erosion control measures
2. Install silt fences
3. Maintain erosion and sediment control devices until all disturbed areas are established.
- 4.
- 5.
- 6.

The El Paso District of the Texas Department ofTransportation uses Site-Manager, a computer based construction record-keeping system. Documentation describing major grading activities, temporary or permanent cessation of construction, and stabilization measures is a part of this system and is incorporated by reference into this SWPPP.
Stabilization measures must be initiated within 14 days when practicable in portions of the site where construction has temporarily or permanently ceased, if earth disturbing activities will not be resumed within 21 days.

3.STRUCTURAL CONTROL PRACTICES: Structural control practices for this project are listed elsewhere herein.

4.PERMANENT STORM WATER CONTROLS: Structural control practices installed during construction will be maintained and inspected after construction has ceased on the site and until final stabilization is attained. Unless specified in the plans, after project acceptance 1xDOT will assume maintenance responsibilities for the controls and measures. Other permanent controls include existing and proposed:riprap at culvert inlets and outlets,diversion dikes, swales, retaining walls, and other similar devices.

5.OTHER CONTROLS: OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST: The off site vehicle tracking of sediments shall be minimized by removal of excess dirt from the road and at entrances to the work site. The generation of dust will be minimized as directed by the Project Engineer by dampening haul roads and covering haul trucks with a tarpaulin.

CONSTRUCTION AND WASTE MATERIALS: The contractor will maintain a clean, orderly construction site.Construction waste including trash, rubble, scrap and vegetation shall be disposed of in lidded dumpsters or in a manner approved by the Project Engineer. Disposal methods must meet Federal, State, and Local waste management guidelines. No construction waste will be buried or burned on site. Spoils disposal, material storage, and materials resulting from the destruction of existing roads and structures shall be stored in areas designated by the Project Engineer and protected from run-off. All waterways shall be cleared of temporary embankment,temporary bridges,matting, false work, piling, debris, or other obstructions placed during construction operations, that are not part of the finished work, as soon as practicable.All excess soil generated by the construction will be collected and disposed of by the contractor. Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, water body, or stream bed.

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION: Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants. If potential pollutant sources are identified after the start of construction, controls and measures shall be implemented as directed by the Project Engineer.

DEDICATED ASPHALT PLANTS: Asphalt or asphaltic material for this project will be produced off site.If the project requires a dedicated asphalt plant and the plant within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be wasted or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water.Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

DEDICATED CONCRETE PLANTS: Cement or Concrete material for this project will be produced off site. If the project requires a dedicated concrete plant and the plant is within 1 mile of the project limits it will be considered an off site PSL. Consideration shall be given to on site plant and storage facilities and measures implemented as directed by the Project Engineer. Concrete trucks shall be wasted or washed out in locations designated by the Project Engineer. The locations shall be protected by a berm sufficient to contain all waste and wash water.Wash water shall not be allowed to enter any storm drainage system or waterway. The residual material and contaminated soil shall be collected and disposed of in accordance with Federal, State, and Local guidelines. Staging areas and vehicle maintenance areas shall be located and constructed in a manner to minimize the runoff of pollutants.

HAZARDOUS MATERIALS AND SPILL REPORTING: The contractor shall take appropriate measures to prevent, minimize, and control the spillage or leakage of hazardous materials and any associated wastes on site and in maintenance and staging areas. hazardous materials shall include but are not limited to paints, acids, solvents, asphalt products, chemical additives, curing compounds, oils, fuels, and lubricants. Hazardous materials shall not be stored, accumulated, or transported in open containers subject to precipitation or spillage, but shall be stored,accumulated, or transported in closed containers of the type recommended by the manufacturer. In the event of a spill the Project Engineer should be contacted immediately.All spills shall be immediately cleaned and any contaminated soil removed and disposed of in accordance with Local, State, and Federal laws. Fuel tanks shall be protected by a secondary containment, such as a lined berm, capable of containing 1.5 times the capacity of the tank, or as approved by the Project Engineer.

OFF SITE PSLs: All off site project specific locations including dedicated asphalt plants, concrete plants, or utility installations, required by the contractor, are the contractor's responsibility. The contractor shall secure all permits required by local, state, or federal laws for off site PSLs. The contractor shall provide diagrams and areas of disturbance for all PSL's within 1 mile of the project.

SANITARY FACILITIES:All sanitary or septic wastes that are generated onsite shall be treated and disposed of in accordance with state and local regulations. Raw sewage or septage shall not be discharged or buried on site. Precaution shall be taken to prevent illicit discharges to storm water. Licensed waste management contractors shall be required to dispose of sanitary waste. Porta johns will be required for the construction site or as directed by the Project Engineer.

VELOCITY DISSIPATION DEVICES: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as shown in the plans or as directed by the Project Engineer to provide a non-erosive flow velocity from the structure to a watercourse so that the natural physical and biological characteristics and functions are maintained and protected.

6. APPROVED STATE AND LOCAL PLANS: This SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or permits approved by federal, state, or local officials.

7. MAINTENANCE: Control measures shall be properly installed according to specifications. If inspections or other information indicates a control has been installed, used, or is performing inadequately,the contractor must replace or modify the control as soon as practicable after discovery. Control measures shall be maintained in effective operating condition. If inspections determine that BMPs are not operating effectively maintenance will be performed as necessary to continue the effectiveness of the controls. Maintenance must be accomplished as soon as practicable. Controls adjacent to creeks, culverts, bridges, and water crossings shall have priority. Controls that have been disabled, run over, removed, or otherwise rendered ineffective must be corrected immediately upon discovery.

8. INSPECTION OF CONTROLS: A 1xDOT inspector will inspect disturbed areas of the site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, and structural controls for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion controls measures identified in the SWP3 will be inspected to ensure that they are operating correctly. Locations where vehicles enter or exit the site will be inspected for evidence of off-site vehicle tracking. Inspections will be conducted every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater. The SWP3 will be modified based on the result of these inspections. Revisions will be completed within 7 Calendar days following the inspection. Revised implementation schedules will be described in the SWP3 and implemented as soon as practicable. Rain gages will be maintained on site for the duration of the project. Reports summarizing the scope of the inspections are included in the SWP3 file.

9. NON-STORM WATER COMPONENTS: The contractor shall be required to implement appropriate pollution prevention controls and measures for all eligible non-storm water components of the discharge as approved and directed by the Project Engineer.



HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5822 CROMO DR., SUITE 210 EL PASO, TEXAS 79912
Firm No. F-761

FABENS AIRPORT DECELERATION LANE

STORMWATER POLLUTION PREVENTION PLAN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			46

SWPPP NOTES:

1. ALL STORM WATER POLLUTION PREVENTION MEASURES ON FM 793 (FABENS ROAD) AND FABENS AIRPORT ROAD SHALL BE PLACE, MAINTAINED, AND REMOVED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ALL DEBRIS SHALL BE RECOVERED AND REMOVED AS DIRECTED BY THE ENGINEER SUBSIDIARY TO THE VARIOUS SWPPP BID ITEMS.
2. PRIOR TO THE FINAL REMOVAL OF ALL SWPPP MEASURES CALLED FOR IN THE PLANS, THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND SHALL RENDER ALL SUCH AREAS TO THE ENGINEER SUBSIDIARY TO VARIOUS SWPPP BID ITEMS.
3. CONSTRUCTION EXITS TO BE PLACE IN ACCORDANCE WITH CONSTRUCTION SEQUENCE AND AS DIRECTED BY THE ENGINEER.
4. NO SURFACE WATER LOCATED IN PROXIMITY OF PROJECT LIMITS.
5. CONTRACTOR SHALL INSTALL BULLETIN BOARD WITH SWPPP INFORMATION, ACCESSIBLE TO THE TRAVELING PUBLIC AND CONTRACTOR'S PERSONNEL WITHIN THE PROJECT SITE



LEGEND

- ASPHALT PAVEMENT REMOVAL
- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- FLOW DIRECTION
- CONSTRUCTION EXIT (TY1)

SHEET TOTALS				
ITEM	CODE	DESCRIPTION	UNIT	QUANT
506	6020	CONSTRUCTION EXITS (INSTALL) (TY1)	SY	116
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	116
506	6035	SAND BAGS FOR EROSION CONTROL	EA	18
506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1939
506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1939
506	6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	136
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	136



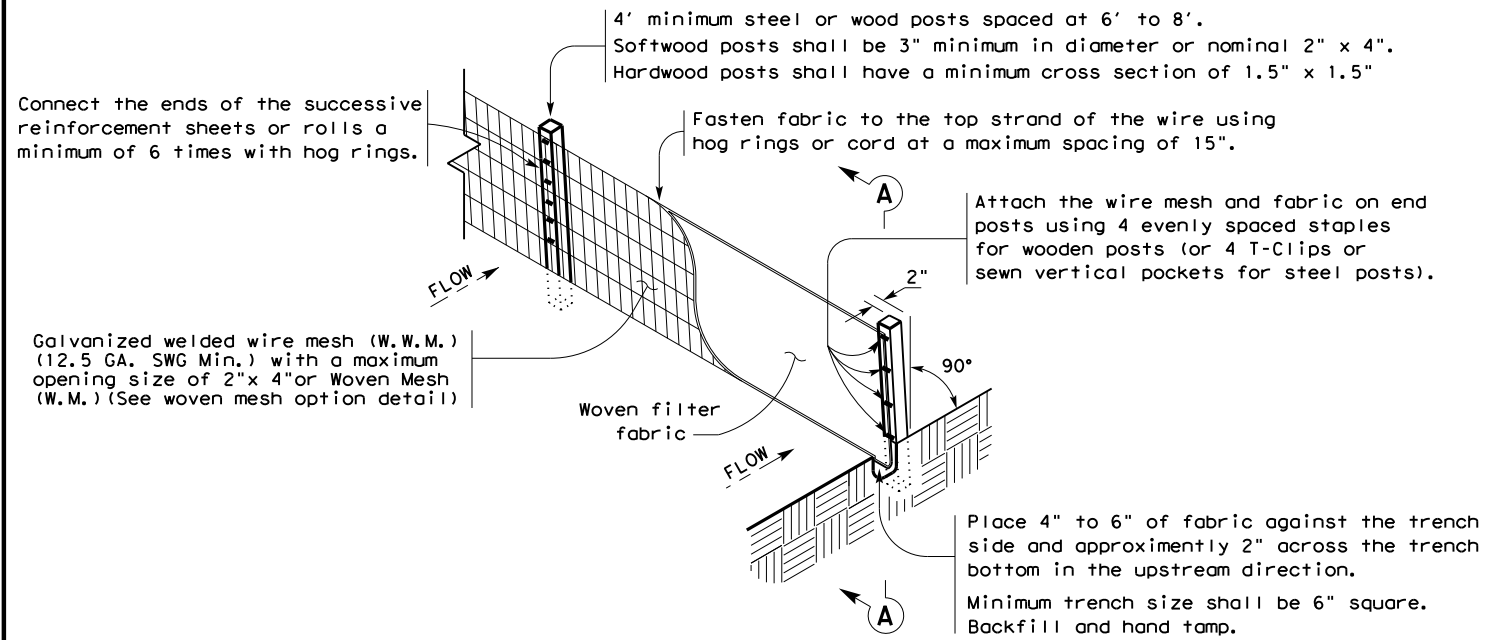
FABENS AIRPORT DECELERATION LANE

EROSION CONTROL PLAN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY
6			CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	ELP	EL PASO	
CONTROL	SECTION	JOB	
			47

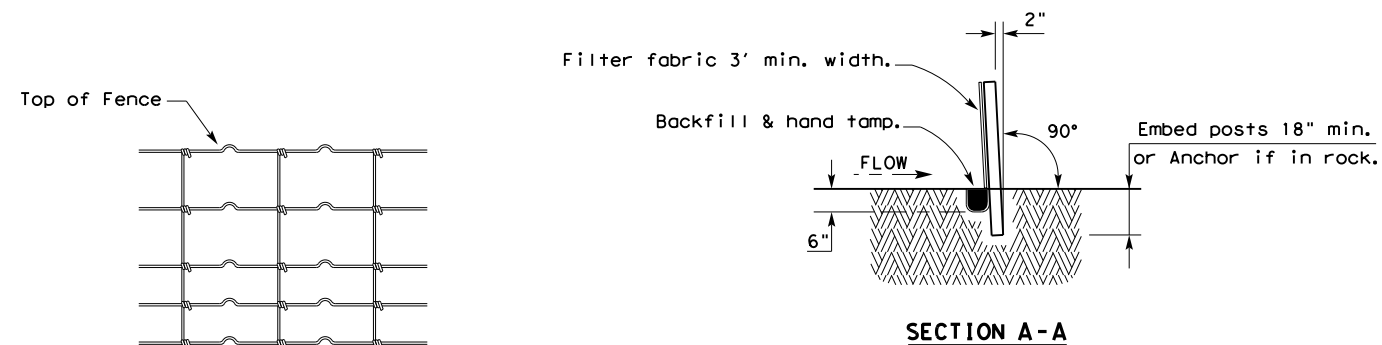
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DATE
FILE



TEMPORARY SEDIMENT CONTROL FENCE

SCF



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.

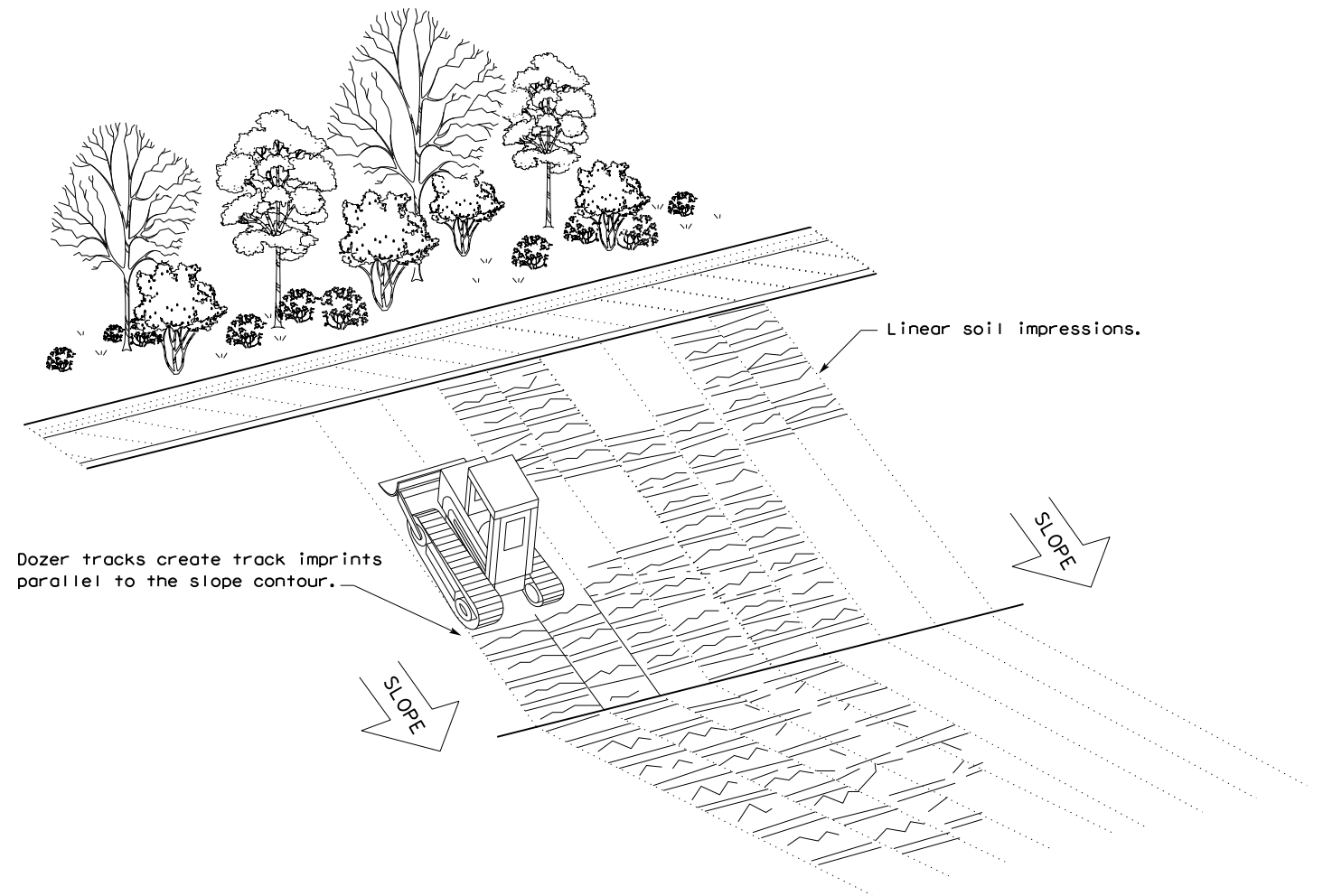
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING



Design
Division
Standard

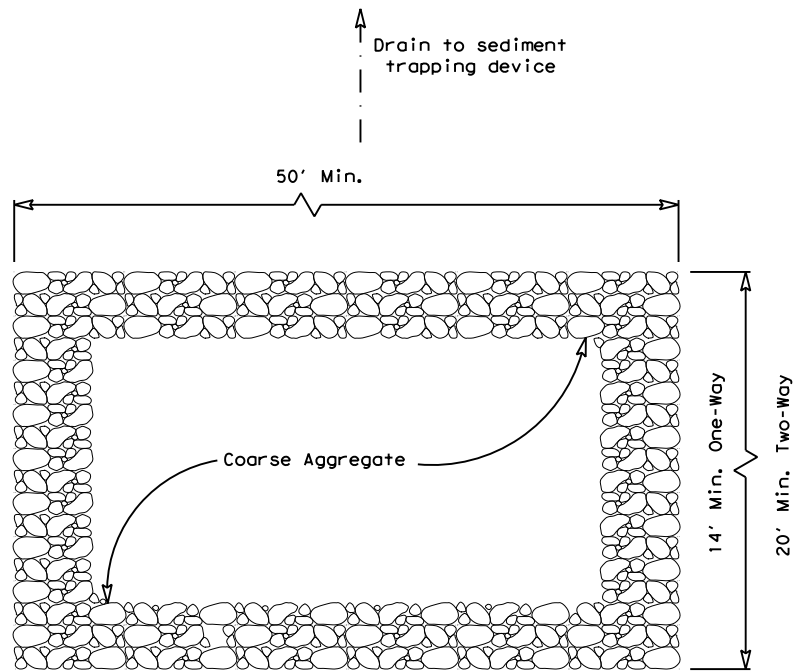
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING

EC(1)-16

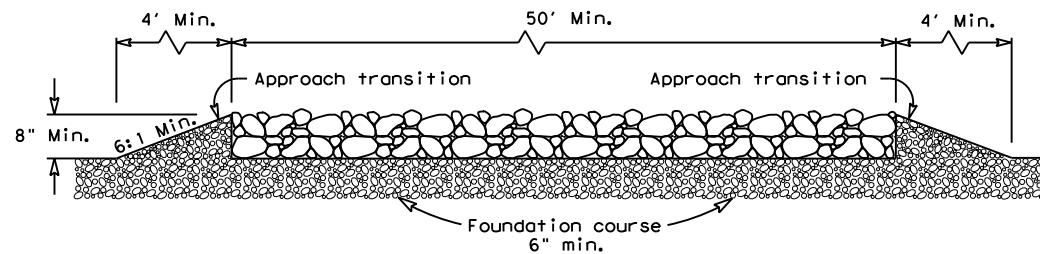
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	
			48	

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DATE: \$DATES
FILE: \$FILES



PLAN VIEW

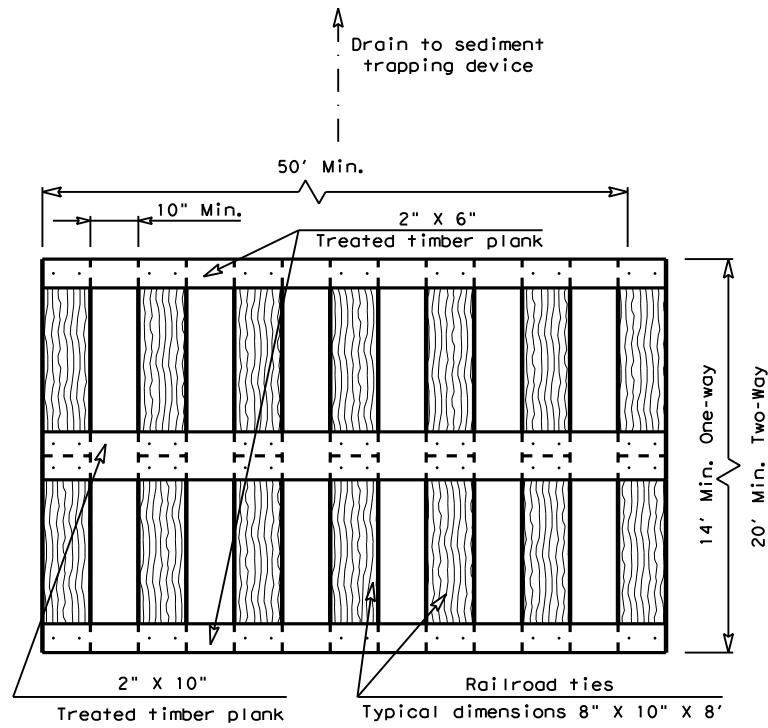


ELEVATION VIEW

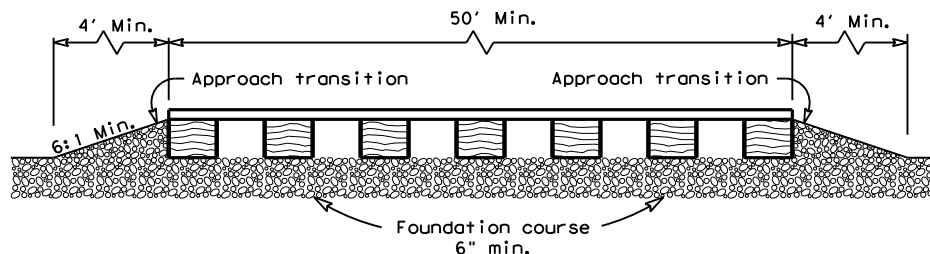
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materials approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



PLAN VIEW

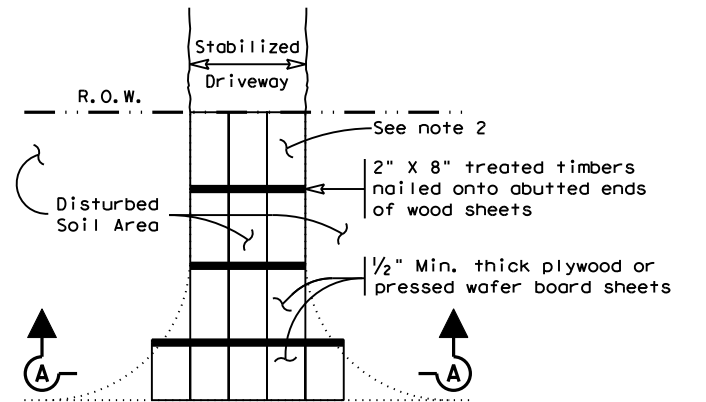


ELEVATION VIEW

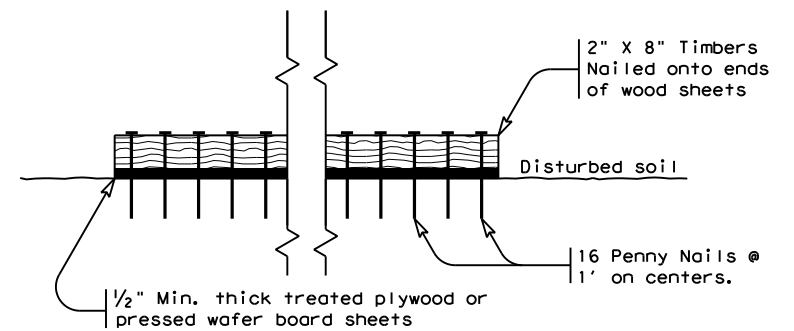
CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with 1/2" x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.




PLAN VIEW



SECTION A-A
CONSTRUCTION EXIT (TYPE 3)
SHORT TERM

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



Texas Department of Transportation

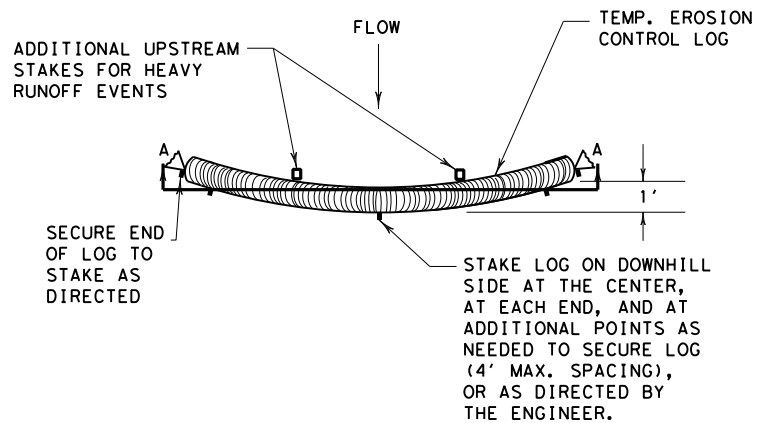
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
CONSTRUCTION EXITS
EC(3)-16

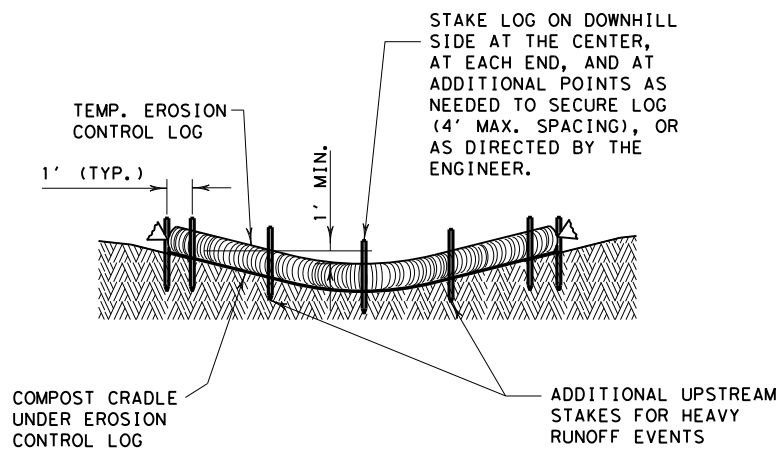
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© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	
			49	

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FILE:



PLAN VIEW



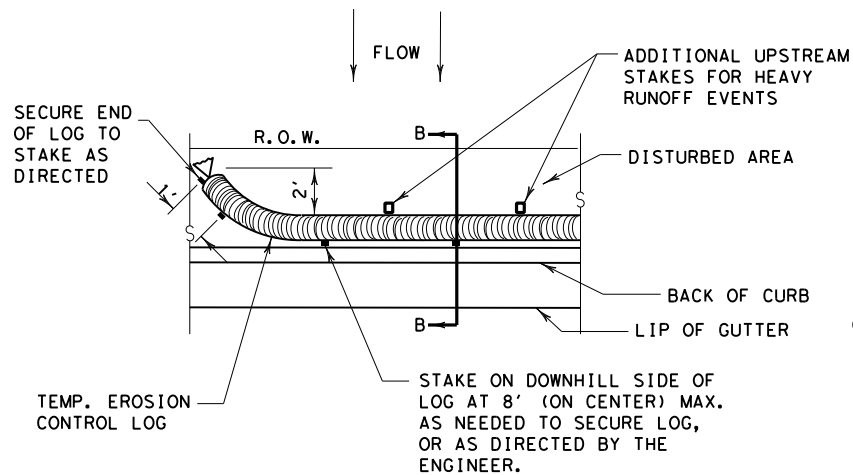
SECTION A-A

EROSION CONTROL LOG DAM

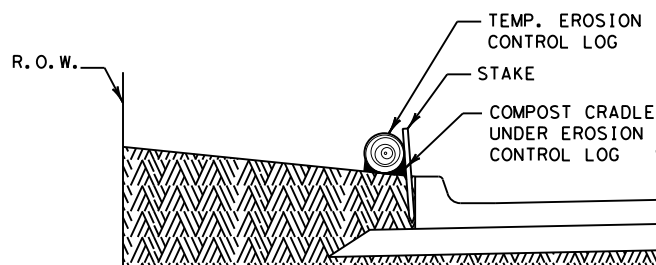
CL-D

LEGEND

- CL-D EROSION CONTROL LOG DAM
- CL-BOC EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI EROSION CONTROL LOG AT DROP INLET
- CL-CI EROSION CONTROL LOG AT CURB INLET
- CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



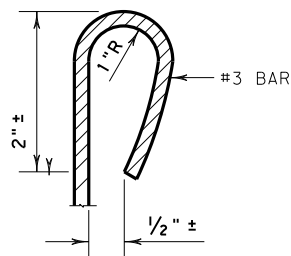
PLAN VIEW



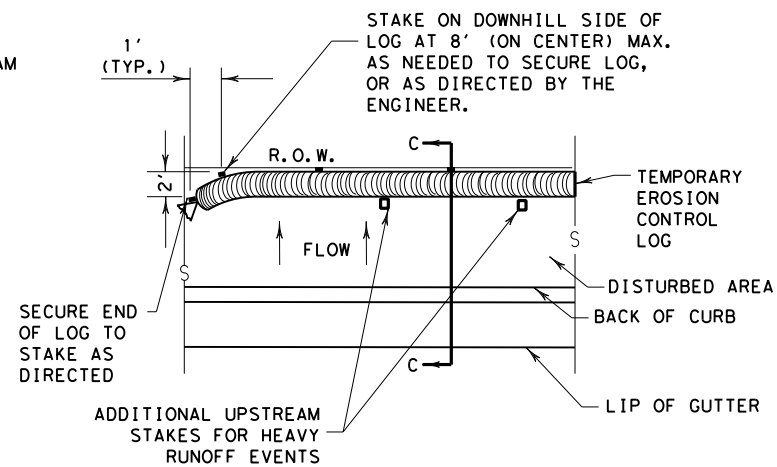
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

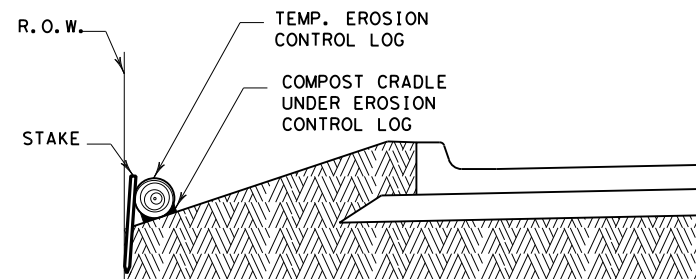
CL-BOC



REBAR STAKE DETAIL



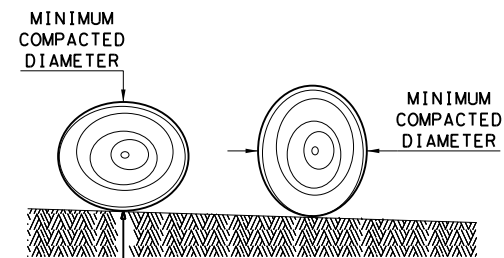
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SHEET 1 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC(9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS		DIST	COUNTY
		SHEET NO.	
		50	

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

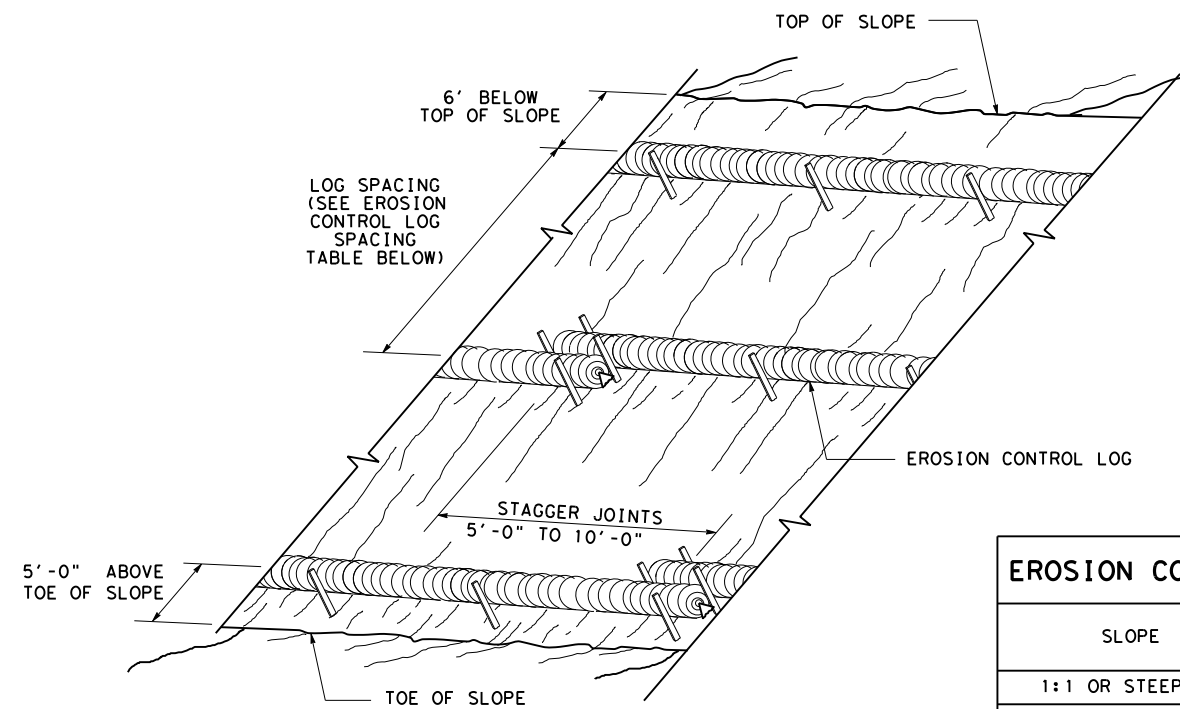
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

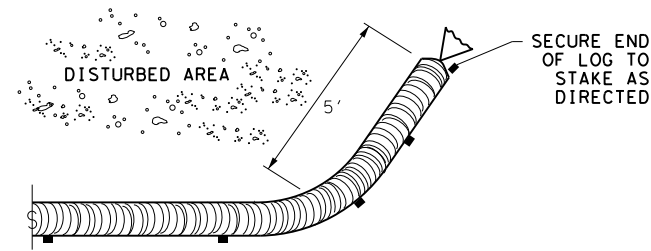
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DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

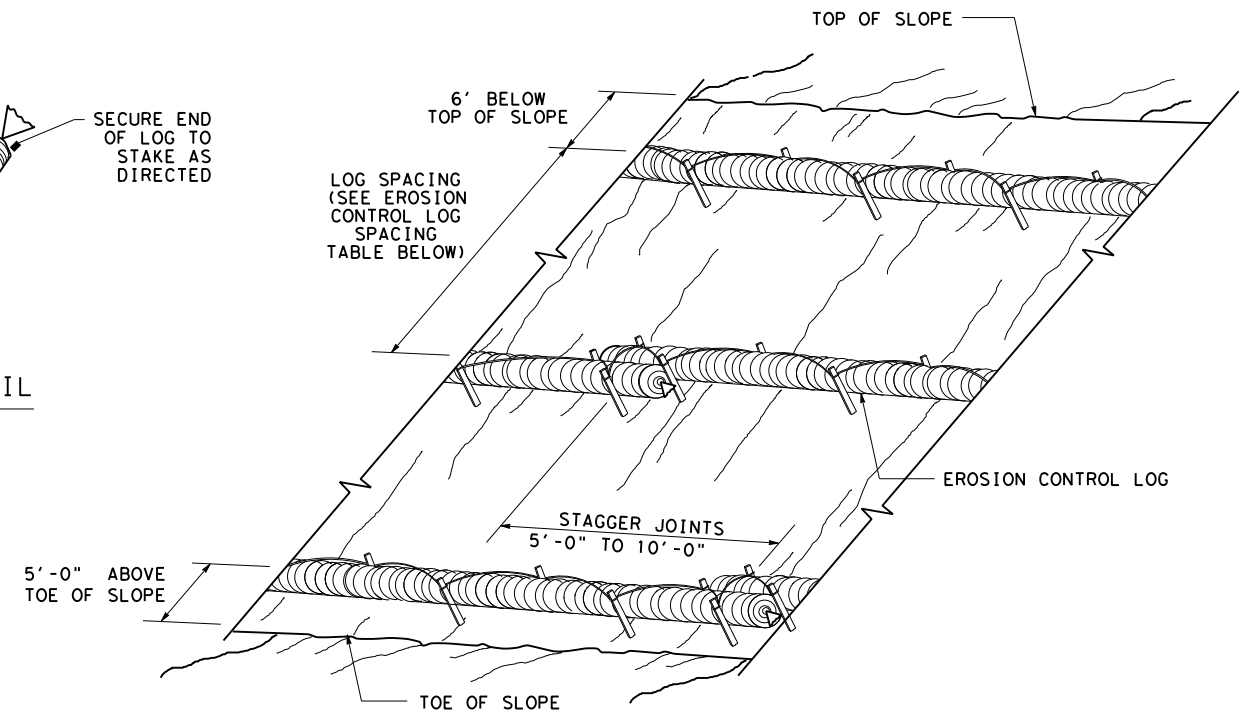
CL-SST



END SECTION RAP DETAIL

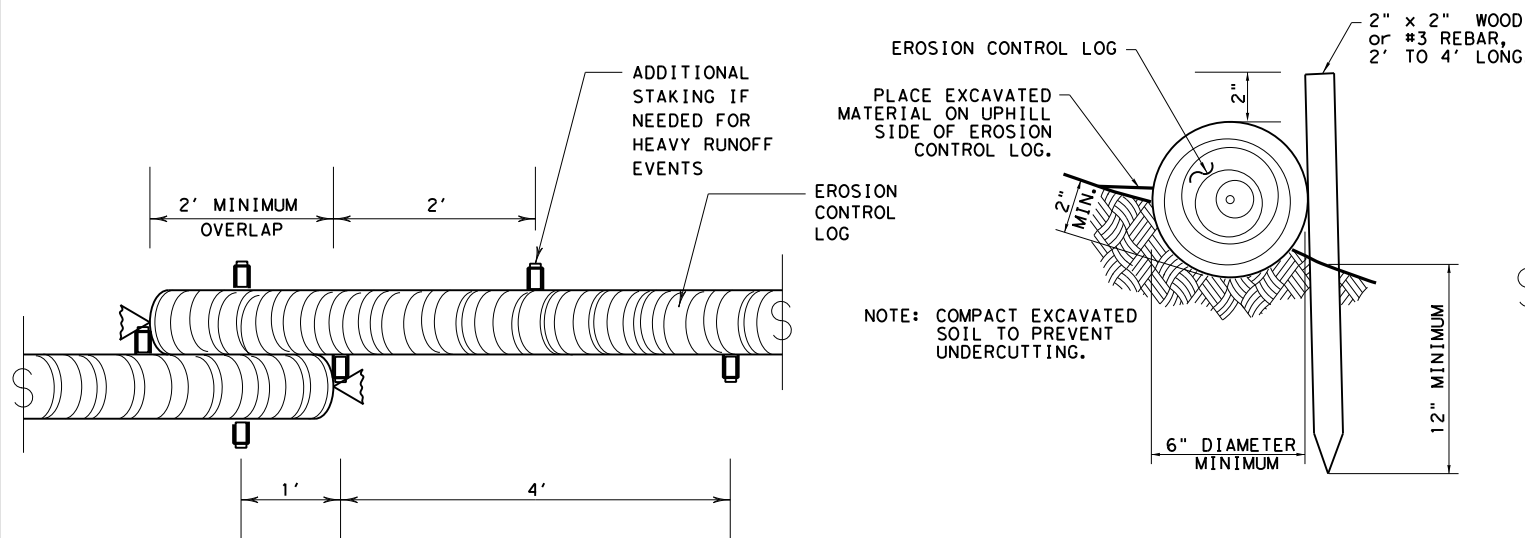
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



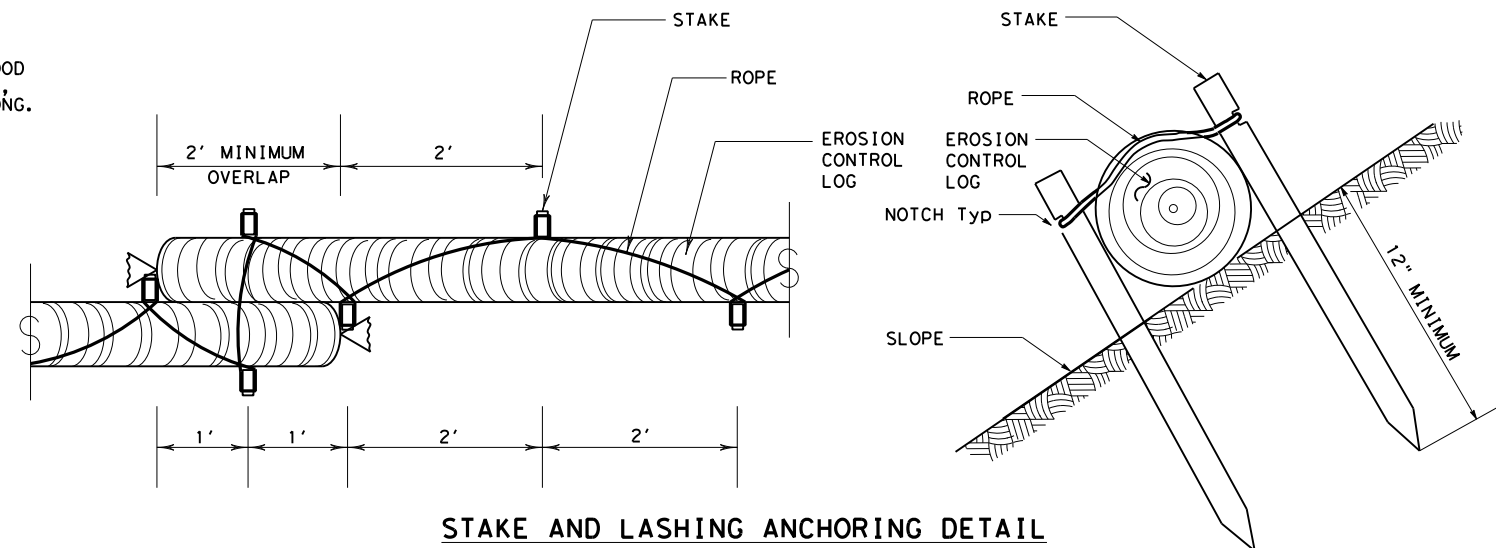
EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

CL-SST



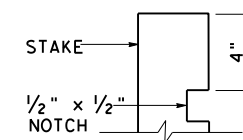
STAKE AND LASHING ANCHORING DETAIL

CL-SSL

SHEET 2 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC(9) - 16			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
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REVISIONS	DIST	COUNTY	SHEET NO.
			51

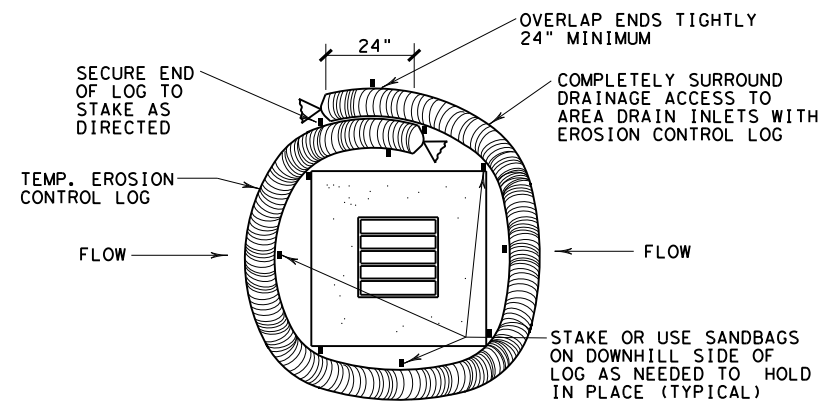
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE NOTCH DETAIL

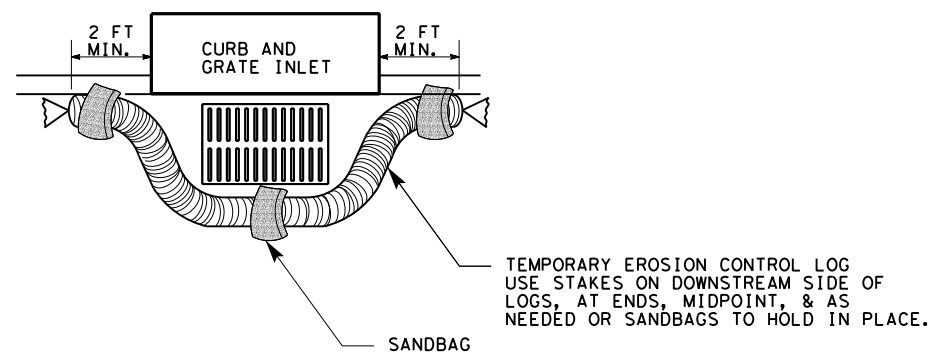
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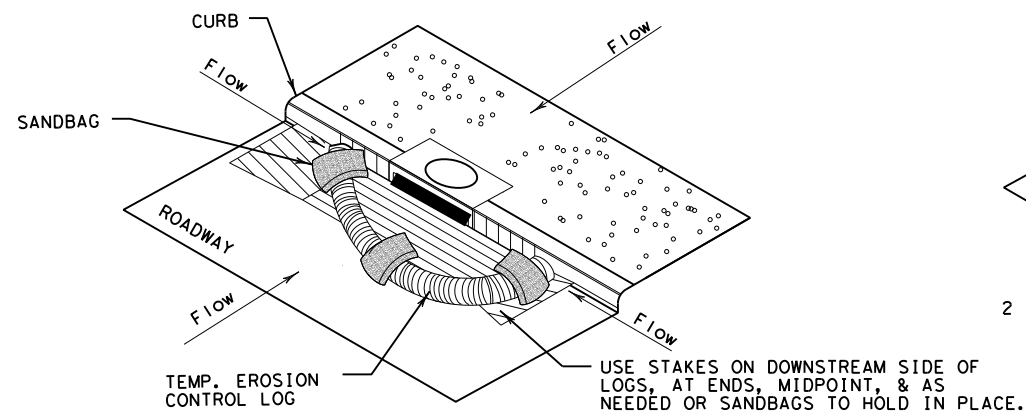
EROSION CONTROL LOG AT DROP INLET

CL-DI



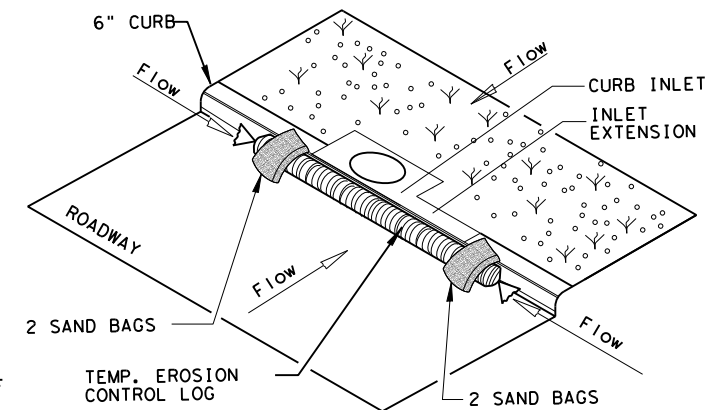
EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



EROSION CONTROL LOG AT CURB INLET

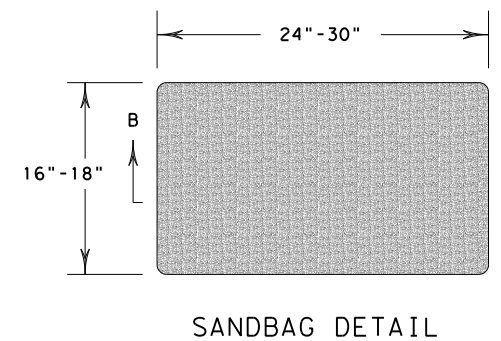
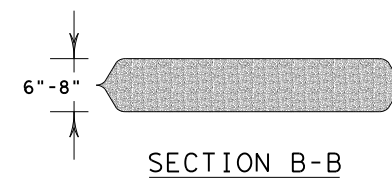
CL-CI




EROSION CONTROL LOG AT CURB INLET

CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



SHEET 3 OF 3

 <i>Texas Department of Transportation</i>			<i>Design Division Standard</i>		
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16					
FILE: ec916		DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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REVISIONS		DIST	COUNTY		SHEET NO.
					52