FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	STP 2021(808)HES, etc.		1
STATE	STATE DIST.	COUNTY	
TX	AUS	HAYS	
CONT.	SECT.	JOB	HIGHWAY NO.
1776	01	036, ETC	RM 967

FUNCTIONAL CLASSIFICATION = URBAN MAJOR COLLECTOR

DESIGN SPEED = 45 MPH

1776-01-036 ADT = 14,190 (2019) 17,028 (2039)
1776-01-037 ADT = 18,222 (2019) 22,595 (2039)

STATE OF TEXAS
TRANSPORTATION DEPARTMENT

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

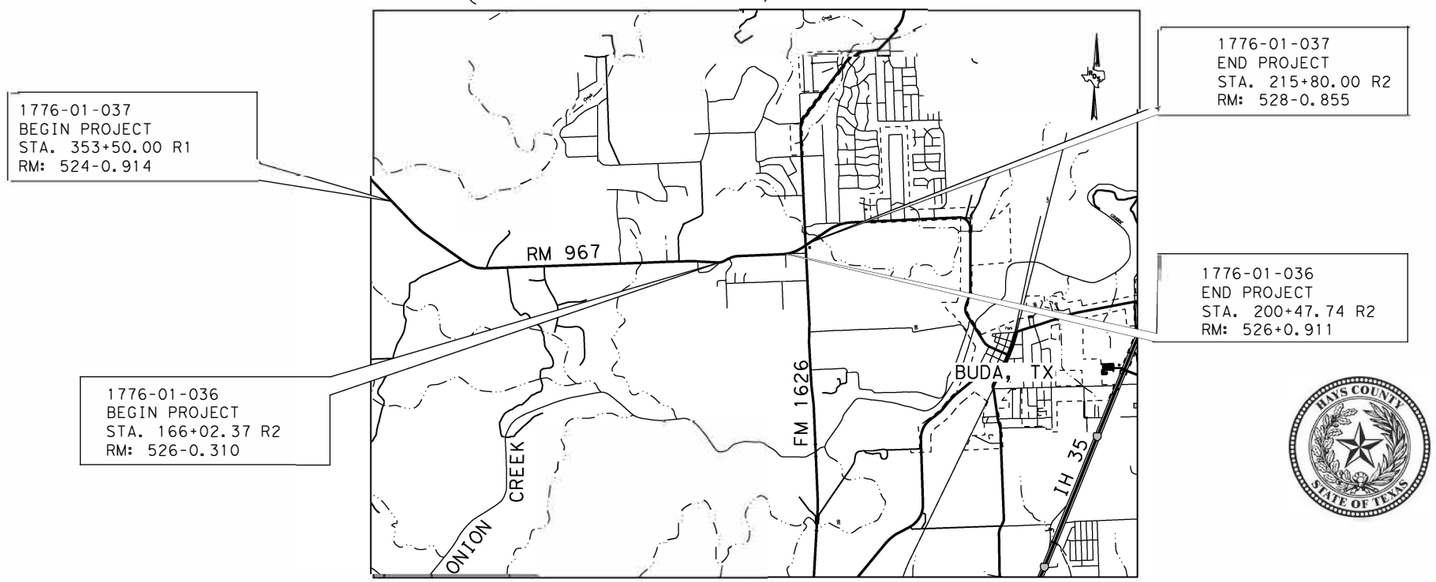
RM 967
HAYS COUNTY
FEDERAL PROJECT NUMBER
STP 2021(808)HES, ETC..
CSJ: 1776-01-036, ETC.

LIMITS: 1776-01-036: FROM BEACON HILL ROAD TO WILEY WAY
1776-01-037: FROM 7,836' WEST OF RUBY RANCH ROAD TO 341' EAST OF FM 1626

FOR THE CONSTRUCTION OF: SAFETY IMPROVEMENT PROJECTS
CONSISTING OF: INSTALL CONTINUOUS TURN LANE AND CONSTRUCT PAVED SHOULDERS (>=5ft)

1776-01-036
- NET LENGTH OF ROADWAY = 3,445.37 FT (0.653 MILES)
- NET LENGTH OF BRIDGE = 0.00 FT (0.000 MILES)
- NET LENGTH OF PROJECT = 3,445.37 FT (0.653 MILES)

1776-01-037
- NET LENGTH OF ROADWAY = 18,284.63 FT (3.463 MILES)
- NET LENGTH OF BRIDGE = 0.00 FT (0.000 MILES)
- NET LENGTH OF PROJECT = 18,284.63 FT (3.463 MILES)



N. T. S.

EXCEPTIONS: NONE
EQUATIONS: STA 455+00.00 = STA 100+00.00
RAILROAD CROSSINGS: NONE
WATERSHED: ONION CREEK
AREA OF DISTURBANCE: 21.3 ACRE

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

AREA ENGINEER _____ DATE _____

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION NOT REQUIRED.

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

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON 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).

wsb
WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

APPROVED BY:
HAYS COUNTY

_____ _____
COMMISSIONER MARK JONES DATE
HAYS COUNTY COMMISSIONER, PRECINCT 2

HAYS COUNTY
STATE OF TEXAS

FINAL PLANS

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

Texas Department of Transportation

RECOMMENDED FOR LETTING: 6/21/2021

DocuSigned by:
William L Senora Jr, P.E.
917B7C376B3C4D5...
AREA ENGINEER

RECOMMENDED FOR LETTING: 6/21/2021

DocuSigned by:
Keith Taylor, P.E.
AED5DE1266E7456...
FOR DISTRICT DESIGN ENGINEER

APPROVED FOR LETTING: 6/21/2021

DocuSigned by:
Heather Ashley-Nguyen
8912A18E454416...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

INDEX OF SHEETS

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED
PROFESSIONAL ENGINEER

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

OMAR VENZOR, P.E. — 5/17/2021 DATE

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

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

DANIEL A. ROGERS, P.E. — 5/17/2021 DATE

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

INDEX OF SHEETS

DATE: 5/17/2021 SHEET 1 OF 1

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	2

Filename: ...\Cad\Plan\015012-000*INDI.dgn
Date: 5/17/2021

GENERAL NOTES: Version: April 14, 2021

Item	Description	**Rate
**204	**Sprinkling**	
	(Dust)	30 GAL/CY
	(Item 132)	30 GAL/CY
	(Item 247)	30 GAL/CY
**210	**Rolling (Flat Wheel)**	
	(Item 247)	1 HR/200 TON
	(Item 316)	1 HR/6000 SY
**210	**Rolling (Tamping and Heavy Tamping)**	1 HR/200 CY
**210	**Rolling (Lt Pneumatic Tire)**	
	(Item 132)	1 HR/500 CY
	(Item 247)	1 HR/200 TON
	(Item 316 - Seal Coat)	1 HR/6000 SY
	(Item 316 - Two Course)	1 HR/3000 SY
247	**Flexible Base (CMP IN PLC)**	132 LB/CF
310	**Prime Coat**	0.20 GAL/SY
314	**Emulsified Asphalt Treatment (SS-1 or MS-2)**	0.30 GAL/SY
316	**Underseals Asphalts (Multi Option)**	0.20 GAL/SY
	Surface Treatments	
	Seal Coat	
	Grade 4	
	Asphalt	0.38 GAL/SY
	Aggregate	1 CY/120 SY
	Grade 5	
	Asphalt	0.32 GAL/SY
	Aggregate	1 CY/150 SY
	Two Course Surface Treatment	
	Asphalt 1st Application	0.28 GAL/SY
	Asphalt 2nd Application	0.24 GAL/SY
	Aggregate 1st Application Grade 4	1 CY/110 SY
	Aggregate 2nd Application Grade 4	1 CY/130 SY
340/341/344	**Dense-Graded Hot-Mix Asphalt and Superpave**	110 LB/SY/IN
342	**Permeable Friction Course (PFC)**	
	Aggregate	84.6 LB/SY/IN
	Asphalt	5.4 LB/SY/IN
346	**Stone-Matrix Asphalt**	113 LB/SY/IN
347	**Thin Surface Mixtures (TOM)**	
	Asphalt	7.0 LB/SY/IN
	Aggregate (SAC B)	106.0 LB/SY/IN
	Aggregate (SAC A)	109.0LB/SY/IN
350	**Microsurfacing**	25 LB/SY
3084	**Bonding Course**	0.09 GAL/SY
3085	**Underseal Course**	0.20 GAL/SY
	Tack Coat	0.08 GAL/SY

** For Informational Purposes Only

Project Number: STP 2021 (808) HES, etc. **Sheet: 3**
County: Hays **Control:1776-01-036, etc.**
Highway: RM 967

The following standard detail sheet or sheets have been modified:

Modified Standards
SCC-3&4 (MOD)
SCC-9 (MOD)

GENERAL
Contractor questions on this project are to be addressed to the following individual(s):
Michelle.RomageChambers@txdot.gov
Tommy.Abrego@txdot.gov

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

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

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

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

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

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

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

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

Intelligent Transportation Systems (ITS) Infrastructure may exist within the limits of this project and that the system must remain operational throughout construction. The exact location of ITS Infrastructure is not known. Contact the TxDOT Area Engineer's or Inspection Team's Office for the location(s) at least 48 hours before commencing any work that might affect present ITS Infrastructure. Use caution if working in these areas to avoid damaging or interfering with

existing facilities. Repair any damage to this system within 8 hours of occurrence at no cost to the Department. In the event of system damage, notify TxDOT/CTECC at (512) 974-0883 within one hour of occurrence. Failure of the Contractor to repair damage to any infrastructure that conveys any corridor information to TxDOT/CTECC will result in the Contractor being billed for the full cost of emergency repairs.

Provide a smooth, clean sawcut along the existing asphalt pavement structure, as directed. Consider subsidiary to the pertinent Items.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Engineer.

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

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 5 – CONTROL OF THE WORK
Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Provide a 72 hour advance email notice to AUS_Locate@txdot.gov to request illumination, traffic signal, ITS, or toll equipment utility locates.

Electronic Shop Drawing Submittals:
Submit electronic shop drawing submittals according to the current Guide to Electronic Shop Drawing Submittal (TxDOT.gov > Business > Resources - Bridge > Shop Drawings). Pre-approved producers can be found online at TxDOT.gov > Business > Resources - Material Producer List. Use the following contact list for all submittals that are not required to be sent to Bridge Division and to copy the Engineer for all submittals to the Bridge Division.

Submittal Contact List
South Austin Michelle.RomageChambers@txdot.gov AUS_SA-ShopReview@txdot.gov

ITEM 6 - CONTROL OF MATERIALS
Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

For structures with paint containing hazardous materials, provide locations of paint removal 60 days prior to begin removal.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
TxDOT will coordinate with TDLR regarding pedestrian elements and sidewalks. The contractor will procure and provide all permits, licenses, and inspections; pay all charges, fees, and taxes regarding TDLR rules governing industrialized housing and buildings.

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

Refer to the SW3P and EPIC plan sheets for additional requirements and permits.

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

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Track all exposed soil, stockpiles, and slopes. Tracking consists of operating a tracked vehicle or equipment up and down the slope, leaving track marks perpendicular to the direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

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

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

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

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

PSL in Edwards Aquifer Recharge and Contributing Zone
Obtain written approval from the Engineer for all on or off right of way PSLs not specifically addressed in the plans. Provide a signed SW3P sketch of the location 30 business days prior to

use of the PSL. Include a list of materials, equipment and portable facilities that will be stored at the PSL.

PSL in USACE Jurisdictional Area
Do not initiate activities in a PSL associated with a U.S. Army Corps of Engineers (USACE) jurisdictional area that have not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here means materials are delivered to or from the PSL. The jurisdictional area includes all waters of the U.S. including wetlands or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. Consult with the USACE regarding activities, including PSLs that have not been previously evaluated by the USACE. Provide the Department with a copy of all USACE coordination and approvals before initiating activities.

Proceed with activities in PSLs that do not affect a USACE jurisdictional area if self-determination has been made that the PSL is non-jurisdictional or proper clearances have been obtained in USACE jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. Document any determinations that PSL activities do not affect a USACE jurisdictional area. Maintain copies of PSL determinations for review by the Department or any regulatory agency. The Contractor must document and coordinate with the USACE, if required, before any excavation material hauled from or embankment material hauled into a USACE jurisdictional area by either (1) or (2) below.

1. **Restricted Use of Materials for the Previously Evaluated Permit Areas.** When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
    a. suitable excavation of required material in the areas shown on the plans and cross sections as specified in Standard Specification Item 110, Excavation is used for permanent or temporary fill within a USACE jurisdictional area;
    b. suitable embankment from within the USACE jurisdictional area is used as fill within a USACE evaluated area;
    c. Unsuitable excavation or excess excavation that is disposed of at an approved location within a USACE evaluated area.

2. **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of all USACE coordination and approvals before initiating any activities in a jurisdictional area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:
    a. Standard Specification Item 132, Embankment is used for temporary or permanent fill within a USACE jurisdictional area;
    b. Unsuitable excavation or excess excavation that is disposed of outside a USACE evaluated area.

Migratory Birds and Bats.

Migratory birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting between March 1 and September 15. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to TxDOT 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 50 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey. Submit a survey request to TxDOT 30 business days prior to begin work.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat and tree/brush requirements.

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

Law Enforcement Personnel.
Law Enforcement will not be paid directly, but is subsidiary to item 502.

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

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer.

ITEM 8 – PROSECUTION AND PROGRESS
Electronic versions of schedules will be saved in Primavera P6 format.

Working days will be charged in accordance with 8.3.1.1 "Five-Day Workweek."

ITEM 100 - PREPARING RIGHT OF WAY
Prep ROW must not begin until accessible trees designated for preservation have been protected, items listed in the EPIC have been addressed, and SW3P controls installed in accessible areas.

Backfill material will be Type B Embankment using ordinary compaction.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush.

Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas within 30 ft. of edge of pavement under construction. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 14 ft. vertical clearance under all trees. This work is subsidiary.

ITEM 110 – EXCAVATION
The Engineer will define unsuitable material.

ITEM 132 – ALL EMBANKMENT
The Engineer will define unsuitable material. Material which the Contractor might deem to be unsuitable due to moisture content will not be considered unsuitable material.

Prior to begin embankment of existing area, correct or replace unstable material to a depth of 6 in. below existing grade. Embankment areas will be inspected prior to beginning work.

Rock or broken concrete produced by the project is allowed in earth embankments. The size of the rock or broken concrete will not exceed the layer thickness requirements in Section 132.3.4., "Compaction Methods." The material will not be placed vertically within 5 ft. of the finished subgrade elevation.

Embankment placed vertically within 5 ft. of the finished subgrade elevation or within the edges of the subgrade and treated with lime, cement, or other calcium based additives must have a sulfate content less than 3000 ppm. Allow 5 business days for testing. Treatment of sulfate material 3000 ppm to 7000 ppm requires 7 days of mellowing and continuous water curing, in accordance TxDOT guidelines for Treatment of Sulfate-Rich Soils and Bases in Pavement Structures (9/2005). Material over 7000 ppm is not allowed.

ITEM 132 – EMBANKMENT TY C
Do not furnish shale clays. The Engineer must approve the embankment material before use on the project. Existing material from within the project limits or approved by the engineer may be used vertically beyond 5 ft. of the finished subgrade elevation or beyond the edge of the subgrade.

Furnish embankment with sulfate content less than 3000 ppm if treated with calcium-based chemicals or within 5 ft. of the finished subgrade elevation.

TY C Requirements

Percent Passing 3"	LL Max	PI Max	PI Min
100	55	20	6

ITEM 160 - TOPSOIL
Off-site topsoil will have a minimum PI of 25.

No Sandy Loam allowed.

Obtain approval of the actual depth of the topsoil sources for both on-site and off-site sources.

Construct topsoil stockpiles of no more than five (5) feet in height.

Seed or track slopes within 14 days of placement.

Windrowing of topsoil obtained from the Right of Way (ROW) is not allowed.

ITEM 168 – VEGETATIVE WATERING
Water all areas of project to be seeded or sodded.

Maintain the seedbed in a condition favorable for the growth of grass. Watering can be postponed immediately after a rainfall on the site of ½ inch or greater, but will be resumed before the soil dries out. Continue watering until final acceptance.

Vegetative watering rates and quantities are based on ¼ inch of watering per week over a 3-month watering cycle. The actual rates used and paid for will be as directed and will be based on prevailing weather conditions to maintain the seedbed.

Obtain water at a source that is metered (furnish a current certification of the meter being used) or furnish the manufacturer's specifications showing the tank capacity for each truck used. Notify the Engineer, each day that watering takes place, before watering, so that meter readings or truck counts can be verified.

ITEM 169 – SOIL RETENTION BLANKETS
Type A blankets containing straw fibers are not allowed. Type B and D blankets shall be a spray type blanket.

ITEM 204 – SPRINKLING
Apply water for dust control as directed. When dust control is not being maintained, cease operations until dust control is maintained. Consider subsidiary to the pertinent Items.

ITEM 216 - PROOF ROLLING
Correct and perform "Proof Rolling" retest at the Contractor's expense, to the satisfaction of the Engineer, when initial "Proof Rolling" yields a failing result.

ITEM 247 - FLEXIBLE BASE
The lift thickness will be 4" to 6" unless shown in the plans. When compacted in multiple lifts, the density of the bottom and middle lifts will be 95% and 98% of the maximum dry density, respectively.

Correction of subgrade soft spots is subsidiary.

Complete per plans the subgrade, ditches, slopes, and drainage structures prior to the placement of base.

Do not use a vibratory roller to compact base placed directly on top of a drainage structure.

ITEM 300s – SURFACE COURSES AND PAVEMENTS
Asphalt season is May 1 thru September 15. Emulsified Asphalt season is April 1 thru October 15. The latest work start date for asphalt season is August 1.

If an under seal is not provided, furnish a tack coat. Apply tack coat at 0.06 GAL/SY (residual). Apply non-tracking tack coat using manufacturer recommend rates.

ITEM 302 – AGGREGATES FOR SURFACE TREATMENTS
Previously tested aggregates delivered to the project, which are found to contain excessive quantities of dust (more than 0.5 percent passing the no. 40 sieve) during pre-coating, stockpiling or hauling operations, will be rejected. Use test method Tex-200-F, Part II, for testing.

Table 3 Los Angeles Abrasion, % Max, is lowered from 35 to 30 and is applicable to all aggregates.

When TY E is allowed, furnish coarse fractionated recycled asphalt pavement (CF-RAP). CF-RAP aggregate stockpiles must be approved on a stockpile-by-stockpile basis, unless approved by the Engineer. Do not exceed stockpiles greater than 2000 tons. CF-RAP will meet the below gradation requirement (after ignition burn off of asphalt) or finer than Grade 4. CF-RAP will meet deleterious material and decantation requirements in accordance with Table 3.

CF-RAP Requirements

Percent Retained				
5/8”	**1/2"**	**3/8"**	**#4**	**#8**
0	10-25	60-80	85-100	90-100

ITEM 305 – SALVAGING, HAULING, AND STOCKPILING RECLAIMABLE ASPHALT PAVEMENT
Stockpile the material at _____ (location address).

ITEM 310 – PRIME COAT
Apply blotter material to all driveways and intersections. This work is subsidiary.

When Multi Option is allowed, provide MC 30, EC 30 or AE-P. MC 30 is not allowed in Travis County.

Rolling to ensure penetration is required.

ITEM 314 - EMULSIFIED ASPHALT TREATMENT
Process the top 1.5 inches of base material. Use 30% of total volume emulsified asphalt in the mixture.
Use emulsified asphalt, AEP or equal, for dust control. This work is subsidiary.

ITEM 316 – SEAL COAT

Ensure that all underseals are covered by HMACP before exposing to traffic for roadways listed in Table 1 of Item 502 or ADT greater than 5,000.

Aggregates (Multi Option) for seal coats not exposed to traffic and underseals shall be Type E, PA, PB, A or B. The Grade shall range between 4 and 5.

Use a medium pneumatic roller in accordance with Item 210.

Surface all transitions, tapers, climbing lanes and intersections to the limits as directed.

Remove and dispose of off the ROW the audible/profile markings, reflectorized markings, and raised markers. Blade pavement edges to remove vegetation. Any areas with excessive asphalt or aggregate will be removed. Continue sweeping excess aggregate off the roadway, riprap, and shoulder up to two weeks after completing the work. This work is subsidiary.

ITEM 320 - EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT
Use of motor grader is allowed for placement of mixtures greater than 10 inches from the riding surface, when hotmix is used in lieu of flexbase, or as allowed by the engineer.

ITEM 340/3078 THRU 348/3082 - HOT-MIX ASPHALT PAVEMENT
Core holes may be filled with an Asphaltic patching material meeting the requirements of DMS-9203 or with SCM meeting requirements of DMS-9202.

Install transverse butt joints with 50 ft. H: 1 in. V transition from the new ACP to the existing surface. Install a butt joint with 24 in. H: 1 in. V transition from the new ACP to a driveway, pullout or intersection. Saw cut the existing pavement at the butt joints. This work is subsidiary.

Use a device to create a maximum 3H:1V notched wedge joint on all longitudinal joints of 2 in. or greater. This work is subsidiary.

Prior to milling, core the existing pavement to verify thickness. This work is subsidiary.

Ensure placement sequence to avoid excess distance of longitudinal joint lap back not to exceed one day’s production rates.

Submit any proposed adjustments or changes to a JMF before production of the new JMF.

Tack every layer. Do not dilute tack coat. Apply it evenly through a distributor spray bar. Provide a minimum transition of 10’ for intersections, 10’ for commercial driveways, and 6’ for residential driveways unless otherwise shown on the plans.

Irregularities will require the replacement of a full lane width using an asphalt paver. Replace the entire sublot if the irregularities are greater than 40% of the sublot area.

Lime or an approved anti-stripping agent must be used when crushed gravel is utilized to meet a SAC “A” requirement.

When using RAP or RAS, include the management methods of processing, stockpiling, and testing the material in the QCP submitted for the project. If RAP and RAS are used in the same mix, the QCP must document that both of these materials have dedicated feeder bins for each recycled material. Blending of RAP and RAS in one feeder bin or in a stockpile is not permitted.

Asphalt content and binder properties of RAP and RAS stockpiles must be documented when recycled asphalt content greater than 20% is utilized.

No RAS is allowed in surface courses.

Department approved warm-mix additives is required for all surface mix application when RAP is used. Dosage rates will be approved during JMF approval.

The Hamburg Wheel Test will have a minimum rut depth of 3mm.

ITEM 340/3078 & 341/3076 - DENSE-GRADED HOT-MIX ASPHALT
Use the SGC for design and production testing of all mixtures. Design all Dense-Graded Type D mixtures as a surface mix, maximum 15% RAP and no RAS.

When using substitute binders, mold specimens for mix design and production at the temperature required for the substitute binder used to produce the HMA.

The Hamburg Wheel minimum number of passes for PG 64 or lower is reduced to 7,000. The Engineer may accept Hamburg Wheel test results for production and placement if no more than 1 of the 5 most recent tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

ITEM 351 – FLEXIBLE PAVEMENT STRUCTURE REPAIR
Use HMA D-GR Type B PG 64-22 SAC B for repairs 3 in. or greater and HMA D-GR Type C PG 64-22 SAC B for repairs less than 3 in. unless otherwise shown on the plans.

ITEM 354 - PLANING AND TEXTURING PAVEMENT
Stockpile salvaged materials at SH 45 at US 183 South, or as directed by the engineer.

Taper permanent transverse faces 50 ft. per 1 in. Taper temporary transverse faces 25 ft. per 1 in. Taper permanent longitudinal faces 6 ft. per 1 in. HMA may be used as temporary tapers. Provide minimum 1 in. butt joints at bridge ends and paving ends. This work is subsidiary.

ITEM 400 - EXCAVATION AND BACKFILL FOR STRUCTURES
Unless shown on the plans, the following backfill will apply to cutting and restoring flexible pavement. Backfill with cement-stabilized backfill. The cement-stabilized backfill is subsidiary. Cap the backfill with Type B hot-mix to a depth equal to the adjacent hot-mix. At locations where the backfill surface is final, place 1-1/2 in. Type D for the surface. The minimum hot-mix depth will be 4 in.

Saw-cut the pavement at the edge of the excavation. This work is subsidiary.

ITEM 416 - DRILLED SHAFT FOUNDATIONS
Stake all Foundations, for approval, before beginning drilling operations.

Calculate the vertical signal head clearance before placing any signal pole foundation.

For mast-arm signal and strain pole anchor bolts, set two in tension and two in compression.

Obtain approval of placement prior to placing concrete.

Remove spoils from a flood plain at the end of each work day.

ITEM 424 - PRECAST CONCRETE STRUCTURAL MEMBERS (FABRICATION)
Submit shop drawings for the following non-stressed members:
Cross drainage culverts under traffic

ITEM 427 - SURFACE FINISHES FOR CONCRETE
Provide a rub finish to Surface Area I.

ITEM 432 - RIPRAP
Mow strip riprap will be 4 in. and all other riprap will be 5 in. unless otherwise shown on the plans or in the pay items. Mow strip for cable barrier may be placed monolithically with the barrier foundations if using concrete in accordance with Item 543. Fiber reinforcement is not allowed except in mow strip for cable barrier if foundation and mow strip are placed monolithically.

Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.

ITEM 465 – JUNCTION BOXES, MANHOLES, AND INLETS
Maintain drainage at curb inlets until the final roadway surface is placed.

For inlets not placed in roadway, construct cast-in-place reinforced concrete apron as shown in the standards. This work is subsidiary.

Backfill shall use cohesionless material per Item 400 or flowable fill if width between structure and extent of excavation is 2 ft. or less. This is subsidiary.

ITEM 466 - HEADWALLS AND WINGWALLS
Remove all loose formwork and materials from the waterway at the end of each work week or prior to a rain event. Debris that falls into the waterway must be removed at the end of each work day. Upon completion of the structure, stencil the National Bridge Inventory (NBI) number (structure number) using black paint and 4 in. tall numbers at 4 locations designated by TxDOT. This work is subsidiary.

ITEM 467 - SAFETY END TREATMENT
Field adjust pipe end to maintain the necessary slope. Field cutting of pipe end is allowed. Coat all metal field cuts or exposed reinforcement with asphalt paint.

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING
Nighttime lane closures will be allowed from 7 P to 6 A. Unless stated, daytime or Friday night lane closures will not be allowed and one lane in each direction will remain open at all times for all roadways.

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend. Closures the Sunday of the Super Bowl will not be allowed from 1 P to 11 P. No closures will be allowed on Friday and the weekends for projects within 20 miles of Formula 1 at COTA, ACL Fest, SXSW, ROT Rally, UT home football games, sales tax holiday or other special events that could be impacted by the construction. All lanes will be open by noon of the day before these special events.

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

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

Provide 2 hour notice prior to implementation and immediately upon removal of the closure. Submit the request 48 hours prior to implementation.

Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

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

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

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

Cover, relocate or remove existing signs that conflict with traffic control. Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts

are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify traffic control, if at any time the queue becomes greater than 20 minutes. Have a contingency plan of how modification will occur. Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

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

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

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

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

ITEM 504 - FIELD OFFICE AND LABORATORY
All labs and offices will include cleaning at least once a week. The cleaning will include sweeping and mopping of floors, cleaning the toilet and lavatory, and emptying wastebaskets. Space heaters are not considered adequate heating.

Projects with HMAC, furnish a Type D structure for the Engineer’s exclusive use. The structure will include high speed internet service with WIFI signal, one desk, two chairs, and one file cabinet. Provide a minimum of three 120-volt circuits with 20-amp breakers and at most two grounded convenience outlets per circuit.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
Install, maintain, remove erosion, sedimentation and environmental control measures in areas of the right of way utilized by the contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

ITEM 508 – CONSTRUCTING DETOURS
Detour typical section must match the adjacent roadway section, unless shown on the plans.

Flexible base will be Type A Grade 5 placed using ordinary compaction. Base compressive strengths are waived for roadways not listed in Item 502, Table 1.

ITEM 512 – PORTABLE TRAFFIC BARRIER
Any increase in temporary barrier quantities that occur due to Contractor changes in the sequence of work or the traffic control plan will not be paid.

ITEM 528, 531, & 536 – MISCELLANEOUS CONSTRUCTION
Reinforcement will be in accordance with Item 432.3.1 unless shown on the plans. Fiber reinforcement is not allowed. Class A and B Concrete are allowed to use Coarse Aggregate Grades 1-8. Expansion joints will be placed every 40 ft. Expansion joints must be 1" wide asphalt board and flush with the surface. The bottom of the joint shall be at half the depth of the concrete. Sidewalk cross slope must not exceed 1.5%.

Unless shown on the plans or in the pay items, all concrete will be 5 in. thick and have 2 in. sand, base, or RAP bedding. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Base compressive strengths are waived. RAP must be 100% passing a 1 in. sieve. Bedding must be placed using ordinary compaction.

If roots are encountered verify with the Engineer prior to accommodating or removing 2 in. diameter or larger roots. Root removal must be in accordance with Item 752.4.2. Roots may remain in the bedding or base. For improvements within 6 in. of a root, the concrete thickness may be reduced by 1 in. and the bedding increased by 1 in. to minimize impacts to the roots. Adjust bedding and surface profile to provide a 1 in. bedding cushion around the roots. The surface profile may be adjusted to the extent allowed by ADA. This work is subsidiary.

ITEM 530 – INTERSECTIONS, DRIVEWAYS, AND TURNOUTS
Notify property owners a minimum of 48 hr. in advance of beginning work on their driveway. Provide a list of each notification and contact prior to each closure. Only close driveways for reconstruction if duration and alternate access are approved. Install and maintain material across a work zone as temporary access. Temporary access must not have grade breaks that exceed 8%. This work is subsidiary.

Grade breaks must not exceed 8%. Sidewalk crossing slope will be 1.5% and 5 ft. wide with width reduction in approved locations.

For ACP or SURF TREAT, the pavement structure will match the adjacent roadway unless detailed on the plans. HMA, including surface, may use a maximum allowable amount of 40% RAP and 5% RAS for private driveways, public driveways for 2-lane roadways or smaller, and turnouts. Blending of 2 or more sources is allowed. Furnish base meeting the requirement for any type or grade in accordance with Item 247. Compressive strengths for flexible base are waived. Base must be placed using ordinary compaction.

For CONC, the pavement structure will be 6 in. thick and have 3 in. base bedding unless detailed on the plans. Furnish base meeting ACP or SURF TREAT requirements. Class A concrete is required and may use Coarse Aggregate Grades 1-8. Expansion joints will be placed every 20 ft.

Expansion joints will be constructed as detailed in the latest TxDOT Concrete Curb and Curb and Gutter Standard. Reinforcement will be in accordance with concrete riprap for Item 432.3.1., unless specified on the plans.

ITEM 533 – MILLED RUMBLE STRIPS
For edge line rumble strips: Use Option 1 for shoulder width equal to or less than 2 ft. Use Option 3 for shoulder width greater than 2 ft. but less than 4 ft. Use Option 4 for shoulder width equal to or greater than 4 ft.

ITEM 540, 542, & 544 - METAL BEAM GUARD FENCE AND GUARDRAIL END TREATMENTS
Furnish round timber posts for guard fence. Steel posts for low fill culverts are subsidiary. Stake the locations for approval prior to installation. Adjust the limits of the fence to meet field conditions. Install delineators before opening the road to traffic.

Retain all materials. Contractor may reuse all existing materials that are structurally sound and dent free. All reused material shall be from this project and in compliance with current standards. Structurally sound rust spots with the largest dimension of 4 in. may be cleaned and repaired in accordance with 540.3.5. Contractor may punch or field drill holes in the metal rail element to accommodate post spacing. Additional holes for splice or connections are not allowed. The holes shall be spaced in accordance with the latest standard and shall not be closer than the minimum spacing shown on the current standard.

Remove, replace, and install mow strip block out material. Construct new block outs and backfill unused block outs with class B concrete. This work is subsidiary.

Repair of mow strip damage, not caused by contractor negligence, and installation of new mow strip will be paid with appropriate bid items. Backfill and shoulder up of area around fence and mow strip will be paid using embankment item.

ITEM 585 - RIDE QUALITY FOR PAVEMENT SURFACES
Use Surface Test Type B Pay Schedule 3 to evaluate ride quality of travel lanes, including service roads.

ITEM 600s – LIGHTING, SIGNING, MARKINGS, AND SIGNALS
Use materials from Material Producer List as shown on the TxDOT website (TxDOT.gov > Business > Resources). Furnish new material as required per Standard Specification.

Meet the requirements of the NEC, Texas MUTCD, TxDOT standards, and TxDOT Standard Specifications. If existing elements shown to remain do not meet the codes or specifications, provide notice to the Engineer.

For signal shop contact Charles Vaughn Jr (Charles.Vaughn@txdot.gov) and Douglas Turner (Douglas.L.Turner@txdot.gov).

Provide a 7 day advance email notice to the Engineer to request illumination or traffic signal punch list inspection.

Provide a 14 day advance email notice to the Engineer with signal technician contact information and signal locations prior to assuming maintenance and operations of illumination or traffic signal.

Provide a 60 day advance email notice to the Engineer to request signal timing if timing is not provided in the plans.

Prior to relief of maintenance, a Test Period is required for signals and ITS equipment in accordance with Item 680.3.1.8. Response time to reported trouble calls shall be less than 2 hours. Complete repairs within 24 hours. Notify the Engineer and maintain a logbook in the controller cabinet of each trouble call. Do not clear the error log in the conflict monitor without approval.

ITEM 618 - CONDUIT
Fit PVC and HDPE conduit terminations with bell ends.

Shift the locations of conduit and ground boxes to accommodate field conditions.

Install conduit in an area not exceeding 2 feet in any direction from a straight line.

Install conduit at a minimum depth of 2 ft. below finished grade. Installation of the conduit by jacking or boring method will be at a depth of at least 1 ft. below below subgrade.

Install a high tension, non-metallic pull rope in all conduit runs. The pull ropes are for future use. Cap all empty conduit using standard weather tight conduit caps as directed. This work is subsidiary.

Use a coring device when drilling holes through concrete structures.

Structurally mounted junction boxes will be as shown on the plans. When used for traffic signal installations, these boxes will be 12" x 12" x 8". This work is subsidiary.

When using existing conduit, ensure that all conduits have bushings and cleaned of dirt, mud, grease, and other debris. Re-strap existing or relocated conduit per the specification. This work is subsidiary. Abandon existing underground conduit that is unusable is allowed if all conductors are removed. Replacement conduit will be paid using the existing bid items.

ITEM 620 - ELECTRICAL CONDUCTORS
Provide and install 10 amp time delay fuses.

For Flashing Beacons (Item 685) and Pedestal Poles (Item 687), provide single-pole breakaway disconnects.

Install a minimum size 8 AWG equipment grounding conductor (EGC) in all conduits including loop detectors and traffic signal cables. Payment and the size of the EGC will be in accordance with standard ED (3)-14 note 12.

Permanently mark “illumination” on the luminaire conductors installed inside a traffic signal pole. Make the marks easily visible from the hand hole.

ITEM 624 – GROUND BOXES
Aggregate for fill under the box shall be crushed, have a maximum size of 2 in., minimum size of ½ in., and requirements per Item 302 are waived.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Triangular slip base that use set screws to secure the post will require 1 of the set screws to penetrate the post by drilling a hole in the post at the location of the screw. All set screws shall be treated with anti-seize compound.

ITEM 658 – DELINEATOR AND OBJECT MARKER ASSEMBLIES
Installation and maintenance of portable CTB reflectors will be subsidiary to the barrier.

ITEM 662 - WORK ZONE PAVEMENT MARKINGS
Notify the Engineer at least 24 hours in advance of work for this item.

Maintain removable and short term markings daily. Remove within 48 hours after permanent striping has been completed.

Item 668 is not allowed for use as Item 662.

ITEM 666 - RETROREFLECTORIZED PAVEMENT MARKINGS
Notify the Engineer at least 24 hr. before beginning work.

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

When using black shadow to cover existing stripe apply a non-retroreflective angular abrasive bead drop. The marking color shall be adjusted to resemble the pavement color. If Item 677 is not used prior to placement of black shadow, scrape the top of the marking with a blade or large piece of equipment unless surface is a seal coat. The scraping of the marking is subsidiary.

ITEM 677 - ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS
Dispose of removed materials and debris at locations off the right of way.

Elimination using a pavement marking will not be allowed in lieu of methods listed in specification.

Remove pavement markings on concrete surfaces by a blasting method. Flail milling will be allowed when total quantity of removal on concrete surfaces is less than 1000 ft.

Strip seal is only method allowed on seal coat surface unless project includes placement of a new surface. If total quantity of removal on a seal coat surface is less than 2000 ft., elimination using a pavement marking is allowed if a test section is approved by the Engineer. Test section shall demonstrate the thermo marking color matches the existing pavement color.

Remove pavement markings outside the limits of the new surface by a blasting method.

Use a TRAIL or a non-retroreflective paint to cover stripe remnants that remain after elimination. The test requirements for these materials are waived. The paint color shall be adjusted to resemble the existing pavement color. Installation and maintenance is subsidiary.

ITEM 680 - HIGHWAY TRAFFIC SIGNALS
Provide a 45 day advance email notice to AUS_Signal-Shop@txdot.gov to obtain TxDOT provided material from 7901 North IH 35, 78753.

Provide a 7 day advance email notice to the Engineer before beginning any work involving traffic signals.

Installation includes all components to provide a fully operational signal.

Luminaire arms shall be aligned with the signal head support. If multiple signal head supports, the luminaire arm shall be aligned with the support over the higher volume roadway.

Install 250W EQ LED illumination fixtures as shown in the plans. Test in accordance with Item 616. This work is subsidiary

Furnish all materials and install signs mounted on the traffic signal wire, traffic signal poles, mast arms, and pedestal pole assemblies. This work is subsidiary.

Use a Vulcan swinger sign mounting bracket or equivalent for all signs mounted on span wires.

Place the traffic signal into operation after the entire traffic signal has been completed and required striping is complete. The Austin District Signal Shop will be present to program the controller and assist with detection setup.

Remove all conflicting signs, including stop signs, when signal is placed into operation. Removal of stop sign assemblies and foundations are subsidiary.

Prior to relief of maintenance, a Test Period is required for all traffic signals in accordance with Item 680.3.1.8. Response time to reported trouble calls will be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Engineer of each trouble call. Do not clear the error log in the conflict monitor without approval.

Connect all field wiring to the controller assembly. The Austin District Signal Shop will assist in determining how the detector loop lead-in cables are to be connected, and will also program the controller for operation, program the video detection, hook up the conflict monitor, detector units and other equipment, and turn on the controller.

Stand-Alone Multi-Location Signal Projects:
When the Engineer determines that the work required by this contract has been satisfactorily completed on any individual signalized intersection, final cleanup has been performed, and the traffic signal equipment supplied by the Contractor has operated continuously and satisfactorily for at least 30 days, the Contractor will be released from further maintenance on that particular intersection. Each traffic signal will have its own unique test period. This partial acceptance will be made in writing and will not void or alter any of the terms of the contract.

ITEM 682 – VEHICLE AND PEDESTRIAN SIGNAL HEADS
Install signal head attachments so the wiring to each passes from the signal pole through the attachment hardware to the signal head. Use UV rated tie wraps.

Traffic signal heads will be aluminum unless otherwise shown on the plans. Back plates will be black aluminum.

Provide louvers, which have five vanes with a black finish on inside surfaces when required. Fasten a hardware cloth screen, securely, with ⅝" or smaller mesh size to the front face of each louver to prevent bird nesting.

Use the four-point mounting system (TY A) for signal heads, except in cases of skewed or vertical heads when (TY B) will be used.

ITEM 684 – TRAFFIC SIGNAL CABLES
For each cable run, coil an extra 2 ft. of cable in each steel pole and 5 ft. in the controller cabinet.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and mast-arm signal poles from the terminal strip to each signal head as shown on the plans.

ITEM 687 – PEDESTAL POLE ASSEMBLIES
Verify the required pole height prior to ordering material.

ITEM 688 - PEDESTRIAN DETECTORS
Removal of damaged ground boxes at end of lead in cable is subsidiary to the new ground box.

Test period for the pedestrian detectors shall be in accordance with item 680.3.1.8.

Pedestrian push buttons will be mounted at 42 in. above the walking surface and have permanent type signs within the detector unit (9 in. x 12 in. sign and push button station on signal poles and 5 in. x 7 in. sign and push button station on pedestrian poles), which explains their purpose and

indicates which crosswalk signal is actuated. Provide speech walk message as shown in the plans or per Engineer.

ITEM 730 – ROADSIDE MOWING
Perform roadside mowing along the Roadway for the length of the project, as directed.

Complete spot mowing, as directed.

ITEM 734 - LITTER REMOVAL
Complete Litter Removal Cycles along the Roadway for the length of the project, as directed.

Complete Litter Removal Cycles prior to any mowing cycles.

Remove all litter on the right of way, within project limits.

ITEM 738 – CLEANING AND SWEEPING HIGHWAYS
Complete cleaning and sweeping cycles at the intervals, as directed. Complete one cycle at the end of construction and prior to final acceptance by the Department.

ITEM 752 – TREE AND BRUSH REMOVAL

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush even if Item 752 is not included as a pay item.

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.

Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work methods has been provided to the employees. This work is subsidiary.

Shredded vegetation may be blended, at a rate not to exceed 15 percent by volume, with Item 160 if the maximum dimension is not greater than 2 in.

ITEM 3084 – BONDING COURSE
The minimum application rates are listed in Table BC. Miscellaneous Tack is allowed for use with dense-graded Type B HMA. If a tack bid item is not provided, use bonding course item.

The target shear bond strengths are listed in Table BCS. The informational test cores shall be taken once a shift for first 5 lots of placement or a change to placement method of bonding course, bonding material, or hot mix material. The remaining informational test cores shall be taken once every 3 lots for surface mix. Informational tests are not required for non-surface mix beyond the first 5 lots unless there is a change to placement method of bonding course, bonding material, or hot mix material. Results from these informational tests will not be used for specification compliance.

Table BC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Emulsified Asphalt	0.06
TRAIL – Hot Asphalt	0.12
Spray Applied Underseal Membrane	0.10

Table BCS (For Informational Tests)

Material	Target Shear Bond Strength (Tex-249-F psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	N/A
All Other Materials	40.0

ITEM 3085 – UNDERSEAL COURSE
The minimum application rates are listed in Table UC. The target shear bond strengths are listed in Table UCS. The informational test cores shall be taken once a shift for first 5 lots of placement or a change to placement method of bonding course, bonding material, or hot mix material. The remaining informational test cores shall be taken once every 3 lots for surface mix. Informational tests are not required for non-surface mix beyond the first 5 lots unless there is a change to placement method of bonding course, bonding material, or hot mix material. Results from these informational tests will not be used for specification compliance.

Table UC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Hot Asphalt	0.15
Spray Applied Underseal Membrane	0.20
Seal Coat – Tier II emulsion	0.25
Seal Coat – Tier II asphalt	0.23

Table UCS

Material	Minimum Shear Strength (psi)
SMA – Stone-Matrix Asphalt	60.0
PFC – Permeable Friction Course	40.0
All Other Materials	40.0

ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN
Provide 3 PCMS. Provide a replacement within 12 hours. PCMS will be available for traffic control, event notices, roadway conditions, service announcements, etc.

Place PCMS 10 calendar days prior to begin work stating “Road Work Begin Soon, Contact 832-7000 For Info”.

Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as “RIGHT LN CLOSED XXX FT”.

ITEM 6054 - SPREAD SPECTRUM RADIOS FOR TRAFFIC SIGNALS
Provide and install spread spectrum coaxial cable as indicated in the plans. Install the coaxial cable in a continuous run from the antenna to the radio in the controller cabinet with no cable exposed.

Provide the latest version of the applicable SSR diagnostic software to the Department.

Provide training per the special specification.

ITEM 6185 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
A TMA/TA shall be used when installing and removing a TCP setup. The same TMA/TA used for the TCP installation/removal shall be used and paid in the same manner as the TCP setup.

The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the project.

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

QUANTITY SHEET

CONTROLLING PROJECT ID 1776-01-036 **DISTRICT** Austin **COUNTY** Hays
HIGHWAY RM 967

			CONTROL SECTION JOB		**1776-01-036**		**1776-01-037**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00066477**		**A00066704**			
			COUNTY		**Hays**		**Hays**			
			HIGHWAY		**RM 967**		**RM 967**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW		STA	34.500		153.400		187.900	
	104-6017	REMOVING CONC (DRIVEWAYS)		SY	252.000		751.000		1,003.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)		LF	99.000		372.000		471.000	
	104-6026	REMOVE CONC (GUTTER)		LF	67.000				67.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)		SY	59.000		108.000		167.000	
	104-6044	REMOVING CONC (FLUME)		SY	468.000		316.000		784.000	
	110-6001	EXCAVATION (ROADWAY)		CY	4,093.000		18,438.000		22,531.000	
	110-6002	EXCAVATION (CHANNEL)		CY			20.000		20.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)		CY	1,955.000		5,874.000		7,829.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")		SY	13,646.000		67,423.000		81,069.000	
	164-6007	BROADCAST SEED (PERM) (URBAN) (CLAY)		SY	13,646.000		67,423.000		81,069.000	
	164-6071	BROADCAST SEED (TEMP)(WARM OR COOL)		SY	6,823.000		33,715.000		40,538.000	
	166-6002	FERTILIZER		TON	0.860		4.270		5.130	
	168-6001	VEGETATIVE WATERING		MG	342.000		1,691.000		2,033.000	
	169-6001	SOIL RETENTION BLANKETS (CL 1) (TY A)		SY	13,646.000		67,423.000		81,069.000	
	247-6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)		CY	3,024.300		8,535.100		11,559.400	
	310-6001	PRIME COAT (MULTI OPTION)		GAL	1,817.000		5,129.000		6,946.000	
	351-6009	FLEXIBLE PAVEMENT STRUCTURE REPAIR(14")		SY	932.000		5,632.000		6,564.000	
	354-6002	PLAN & TEXT ASPH CONC PAV(0" TO 2")		SY			822.000		822.000	
	400-6006	CUT & RESTORING PAV		SY			97.000		97.000	
	432-6002	RIPRAP (CONC)(5 IN)		CY	102.000		222.300		324.300	
	432-6022	RIPRAP (STONE COMMON)(DRY)(6 IN)		CY	2.000		48.000		50.000	
	432-6046	RIPRAP (MOW STRIP)(5 IN)		CY			41.500		41.500	
	462-6047	CONC BOX CULV (4 FT X 2 FT)(EXTEND)		LF			32.000		32.000	
	462-6114	CONC BOX CULV (9 FT X 3 FT)(EXTEND)		LF	22.000				22.000	
	464-6003	RC PIPE (CL III)(18 IN)		LF	276.000		347.000		623.000	
	464-6005	RC PIPE (CL III)(24 IN)		LF	183.000		244.000		427.000	
	464-6007	RC PIPE (CL III)(30 IN)		LF			66.000		66.000	
	464-6010	RC PIPE (CL III)(48 IN)		LF			228.000		228.000	
	464-6012	RC PIPE (CL III)(60 IN)		LF			9.000		9.000	
	465-6005	JCTBOX(COMPL)(PJB)(3FTX3FT)		EA			1.000		1.000	
	465-6158	INLET(COMPL)(PAZD)(FG)(3FTX3FT-3FTX3FT)		EA			1.000		1.000	
	466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)		EA			1.000		1.000	
	466-6103	HEADWALL (CH - PW - 0) (DIA= 48 IN)		EA			2.000		2.000	
	466-6105	HEADWALL (CH - PW - 0) (DIA= 60 IN)		EA			1.000		1.000	
	467-6131	SET (TY I)(S= 4 FT)(HW= 2 FT)(3:1) (C)		EA			2.000		2.000	
	467-6293	SET (TY I)(S= 9 FT)(HW= 3 FT)(4:1) (C)		EA	2.000				2.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 1776-01-036 **DISTRICT** Austin **COUNTY** Hays
HIGHWAY RM 967

				1776-01-036		1776-01-037		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB							
		PROJECT ID		**A00066477**		**A00066704**			
		COUNTY		**Hays**		**Hays**			
		HIGHWAY		**RM 967**		**RM 967**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	18.000		20.000		38.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	10.000		10.000		20.000	
	467-6396	SET (TY II) (24 IN) (RCP) (8: 1) (C)	EA			1.000		1.000	
	467-6419	SET (TY II) (30 IN) (RCP) (4: 1) (C)	EA			1.000		1.000	
	467-6423	SET (TY II) (30 IN) (RCP) (6: 1) (P)	EA			2.000		2.000	
	476-6013	JACK BOR OR TUN PIPE(24 IN)(RC)(CL III)	LF			60.000		60.000	
	480-6001	CLEAN EXIST CULVERTS	EA			1.000		1.000	
	496-6004	REMOV STR (SET)	EA	29.000		35.000		64.000	
	496-6005	REMOV STR (WINGWALL)	EA	2.000				2.000	
	496-6007	REMOV STR (PIPE)	LF	658.000		822.000		1,480.000	
	496-6008	REMOV STR (BOX CULVERT)	LF	12.000		6.000		18.000	
	500-6001	MOBILIZATION	LS			100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		6.000		14.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	160.000		792.000		952.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	160.000		792.000		952.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY			624.000		624.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY			624.000		624.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	710.000		3,342.000		4,052.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	710.000		3,342.000		4,052.000	
	508-6001	CONSTRUCTING DETOURS	SY	303.000		295.000		598.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF			2,220.000		2,220.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF			1,110.000		1,110.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF			2,220.000		2,220.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	51.000		143.000		194.000	
	529-6038	CONC CURB (RIBBON)	LF	84.000				84.000	
	530-6004	DRIVEWAYS (CONC)	SY	249.000		643.000		892.000	
	530-6005	DRIVEWAYS (ACP)	SY	468.000		1,376.000		1,844.000	
	530-6008	TURNOUTS (ACP)	SY	71.000		109.000		180.000	
	531-6001	CONC SIDEWALKS (4")	SY	36.000		64.000		100.000	
	531-6004	CURB RAMPS (TY 1)	EA			2.000		2.000	
	531-6005	CURB RAMPS (TY 2)	EA			2.000		2.000	
	531-6006	CURB RAMPS (TY 3)	EA			1.000		1.000	
	531-6010	CURB RAMPS (TY 7)	EA	3.000				3.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			500.000		500.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA			3.000		3.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF			250.000		250.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA			6.000		6.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 1776-01-036 **DISTRICT** Austin **COUNTY** Hays
HIGHWAY RM 967

			CONTROL SECTION JOB	**1776-01-036**		**1776-01-037**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00066477**		**A00066704**			
			COUNTY	**Hays**		**Hays**			
			HIGHWAY	**RM 967**		**RM 967**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	544-6002	GUARDRAIL END TREATMENT (MOVE & RESET)	EA			2.000		2.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA			4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA			2.000		2.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA			2.000		2.000	
	560-6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	8.000		12.000		20.000	
	560-6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1.000				1.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF			95.000		95.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF			500.000		500.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	65.000		160.000		225.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	555.000		1,000.000		1,555.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	725.000		1,725.000		2,450.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	280.000		1,392.000		1,672.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	35.000				35.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	70.000				70.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	2.000		2.000		4.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	8.000		16.000		24.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	14.000		14.000		28.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		2.000		4.000	
	658-6046	INSTL OM ASSM (OM-2X)(WC)GND	EA			3.000		3.000	
	658-6047	INSTL OM ASSM (OM-2Y)(WC)GND	EA			4.000		4.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA			8.000		8.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	13,237.000		52,381.000		65,618.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF			624.000		624.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF			53.000		53.000	
	662-6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF			349.000		349.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	12,288.000		56,770.000		69,058.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	1,414.000		4,181.000		5,595.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	211.000		407.000		618.000	
	666-6053	REFL PAV MRK TY I (W)(ARROW)(090MIL)	EA	21.000		39.000		60.000	
	666-6071	REFL PAV MRK TY I(W)(LNDP ARW)(090MIL)	EA			2.000		2.000	
	666-6077	REFL PAV MRK TY I (W)(WORD)(090MIL)	EA	9.000		23.000		32.000	
	666-6104	REFL PAV MRK TY I (W)(BIKE ARW)(090MIL)	EA	7.000		11.000		18.000	
	666-6110	REFL PAV MRK TY I(W)(BIKE SYML)(090MIL)	EA	7.000		11.000		18.000	
	666-6116	REFL PAV MRK TY I (W)(BIKE DOT)(090MIL)	EA	50.000		309.000		359.000	
	666-6167	REFL PAV MRK TY II (W) 4" (BRK)	LF			230.000		230.000	
	666-6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	8,744.000		37,616.000		46,360.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	1,414.000		4,181.000		5,595.000	

QUANTITY SHEET

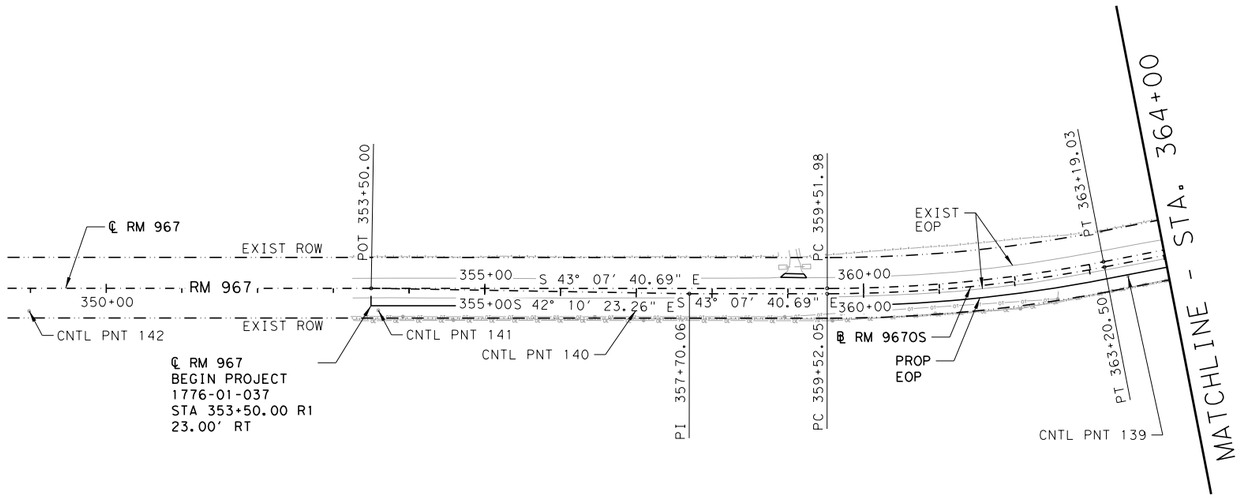
CONTROLLING PROJECT ID 1776-01-036 **DISTRICT** Austin **COUNTY** Hays
HIGHWAY RM 967

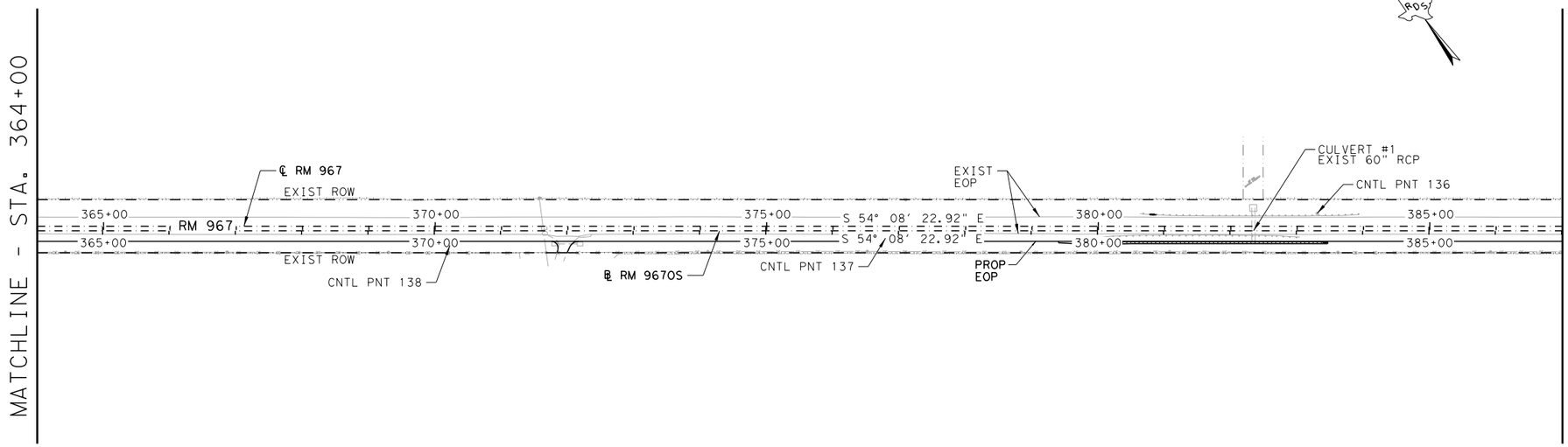
			CONTROL SECTION JOB		**1776-01-036**		**1776-01-037**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00066477**		**A00066704**			
			COUNTY		**Hays**		**Hays**			
			HIGHWAY		**RM 967**		**RM 967**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)		LF	211.000		407.000		618.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)		EA	21.000		39.000		60.000	
	666-6190	REFL PAV MRK TY II (W) (LNDP ARW)		EA			2.000		2.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)		EA	9.000		23.000		32.000	
	666-6200	REFL PAV MRK TY II (W) (BIKE ARROW)		EA	7.000		11.000		18.000	
	666-6202	REFL PAV MRK TY II (W) (BIKE SYMBOL)		EA	7.000		11.000		18.000	
	666-6204	REFL PAV MRK TY II (W) (BIKE DOT)		EA	50.000		309.000		359.000	
	666-6205	REFL PAV MRK TY II (Y) 4" (BRK)		LF	1,553.000		2,427.000		3,980.000	
	666-6207	REFL PAV MRK TY II (Y) 4" (SLD)		LF	7,640.000		55,876.000		63,516.000	
	666-6299	RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)		LF			230.000		230.000	
	666-6311	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)		LF	1,553.000		2,427.000		3,980.000	
	666-6342	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)		LF	8,744.000		37,616.000		46,360.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)		LF	7,640.000		55,876.000		63,516.000	
	672-6007	REFL PAV MRKR TY I-C		EA	72.000		212.000		284.000	
	672-6009	REFL PAV MRKR TY II-A-A		EA	384.000		2,802.000		3,186.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")		LF	9,635.000		53,776.000		63,411.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")		LF			332.000		332.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)		EA	1.000		1.000		2.000	
	682-6001	VEH SIG SEC (12")LED(GRN)		EA	2.000		1.000		3.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)		EA	1.000		1.000		2.000	
	682-6003	VEH SIG SEC (12")LED(YEL)		EA	2.000		1.000		3.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)		EA	1.000		1.000		2.000	
	682-6005	VEH SIG SEC (12")LED(RED)		EA	2.000		1.000		3.000	
	682-6050	BACKPLATE W/REFL BRDR(5 SEC)		EA	1.000		1.000		2.000	
	682-6060	BACKPLATE W/REFL BRDR(3 SEC)		EA	1.000				1.000	
	684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)		LF	445.000		1,530.000		1,975.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)		LF	1,235.000		3,074.000		4,309.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)		LF	245.000		1,596.000		1,841.000	
	687-6003	RELOCATE PED POLE ASSEMBLY		EA	2.000		2.000		4.000	
	690-6001	REMOVAL OF CONDUIT		LF	260.000		570.000		830.000	
	690-6006	REMOVAL OF GROUND BOXES		EA	2.000		3.000		5.000	
	690-6009	REMOVAL OF CABLES		LF	260.000		570.000		830.000	
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS		EA	1.000				1.000	
	3076-6001	D-GR HMA TY-B PG64-22		TON	2,574.400		10,798.400		13,372.800	
	3076-6038	D-GR HMA TY-D PG64-22 (LEVEL-UP)		TON			830.900		830.900	
	3076-6048	D-GR HMA TY-D PG76-22		TON	1,604.000		7,412.200		9,016.200	
	3076-6051	D-GR HMA TY-D PG76-22 (LEVEL-UP)		TON	111.900		830.900		942.800	

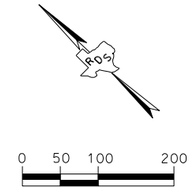
QUANTITY SHEET

CONTROLLING PROJECT ID 1776-01-036 **DISTRICT** Austin **COUNTY** Hays
HIGHWAY RM 967

				CONTROL SECTION JOB	1776-01-036		1776-01-037		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00066477		A00066704			
				COUNTY	Hays		Hays			
				HIGHWAY	RM 967		RM 967			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL	EST.	FINAL		
	3076-6066	TACK COAT	GAL		1,481.000		6,841.000		8,322.000	
	3085-6001	UNDERSEAL COURSE	GAL		1,676.000		7,745.000		9,421.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA				4.000		4.000	
	6089-6002	CAT 5 ETHERNET CABLE	LF		135.000				135.000	
	6155-6002	RADAR COMMUNICATION CABLE	LF		585.000		1,520.000		2,105.000	
	6185-6002	TMA (STATIONARY)	DAY				40.000		40.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY				10.000		10.000	
	7251-6001	Subsurface Util Locate (Outside Rdbed)	EA		5.000		5.000		10.000	
	18	EROSION CONTROL_MAINTENANCE	LS				1.000		1.000	
		SAFETY CONTINGENCY	LS				1.000		1.000	
		UNIFORMED PEACE OFFICERS	LS				1.000		1.000	

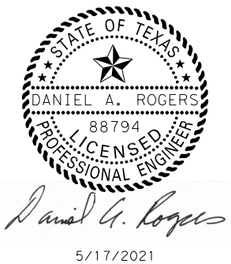






ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83 SOUTH CENTRAL ZONE (4204). ALL DISTANCES AND COORDINATES ARE SURFACE COORDINATE VALUES AND CAN BE ADJUSTED TO GRID COORDINATES WITH THE COMBINED SCALE FACTOR 1.00008.

HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)						
POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 142	348+98.32	29.96' RT	2303852.69	13951388.08	921.50'	IRON ROD SET
CNTL PNT 141	353+59.30	28.99' RT	2304168.53	13949936.31	930.27'	IRON ROD SET
CNTL PNT 140	356+99.39	29.02' RT	2304401.00	13950804.07	928.10'	IRON ROD SET
CNTL PNT 139	363+47.19	24.78' RT	2304878.21	13950360.79	923.08'	IRON ROD SET
CNTL PNT 138	370+22.26	29.04' RT	2305422.82	13949961.87	911.69'	IRON ROD SET
CNTL PNT 137	376+79.16	18.19' RT	2305961.56	13949585.84	899.51'	IRON ROD SET
CNTL PNT 136	383+30.11	19.25' LT	2306511.06	13949234.85	891.69'	IRON ROD SET



Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PROJECT LAYOUT

DATE: 5/17/2021				SHEET 1 OF 6
STATE	STATE DIST. NO.			COUNTY
TEXAS	AUS			HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	4

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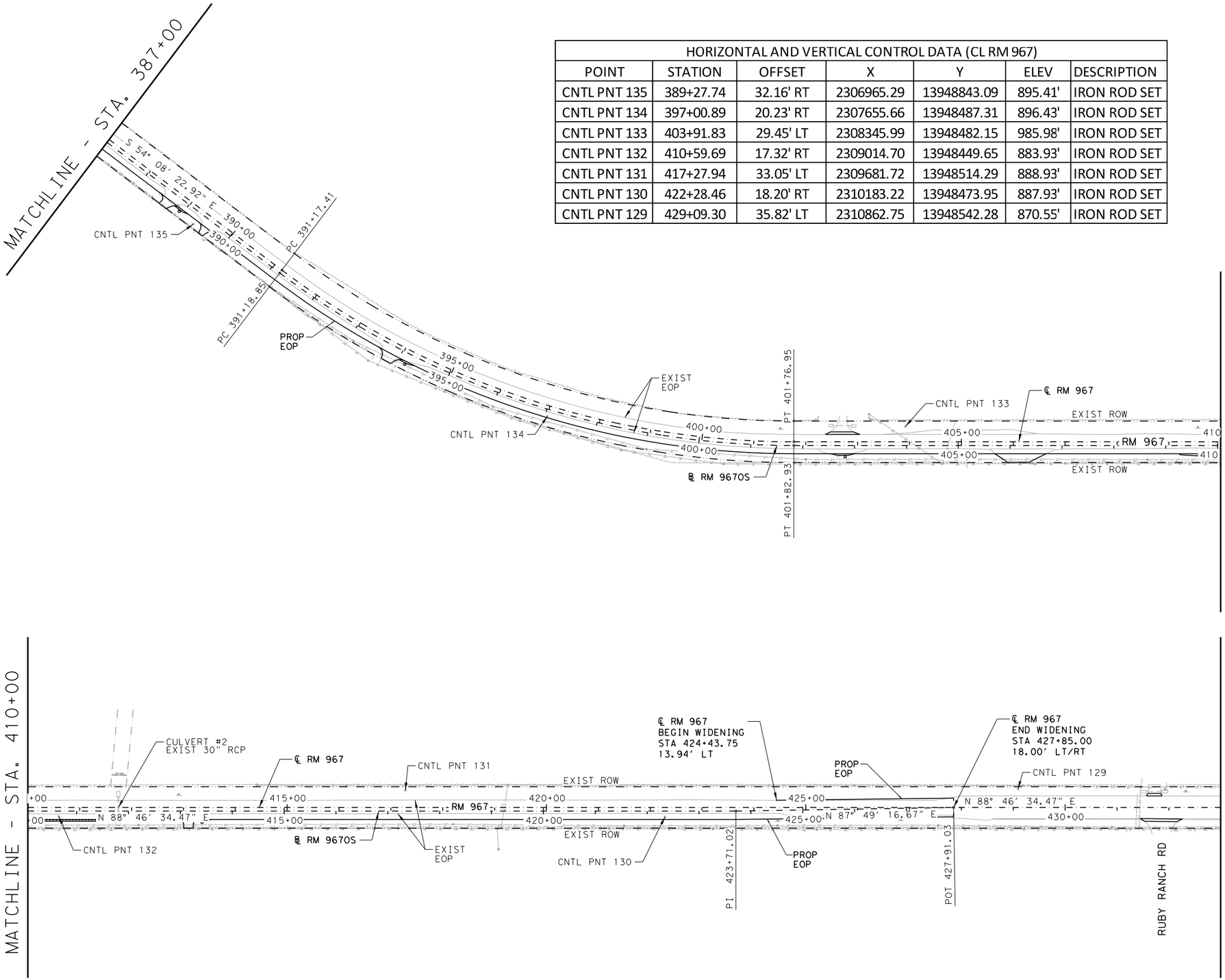
Date: 5/17/2021

HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)						
POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 135	389+27.74	32.16' RT	2306965.29	13948843.09	895.41'	IRON ROD SET
CNTL PNT 134	397+00.89	20.23' RT	2307655.66	13948487.31	896.43'	IRON ROD SET
CNTL PNT 133	403+91.83	29.45' LT	2308345.99	13948482.15	985.98'	IRON ROD SET
CNTL PNT 132	410+59.69	17.32' RT	2309014.70	13948449.65	883.93'	IRON ROD SET
CNTL PNT 131	417+27.94	33.05' LT	2309681.72	13948514.29	888.93'	IRON ROD SET
CNTL PNT 130	422+28.46	18.20' RT	2310183.22	13948473.95	887.93'	IRON ROD SET
CNTL PNT 129	429+09.30	35.82' LT	2310862.75	13948542.28	870.55'	IRON ROD SET



ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83 SOUTH CENTRAL ZONE (4204). ALL DISTANCES AND COORDINATES ARE SURFACE COORDINATE VALUES AND CAN BE ADJUSTED TO GRID COORDINATES WITH THE COMBINED SCALE FACTOR 1.00008.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PROJECT LAYOUT

DATE: 5/17/2021				SHEET 2 OF 6
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	5

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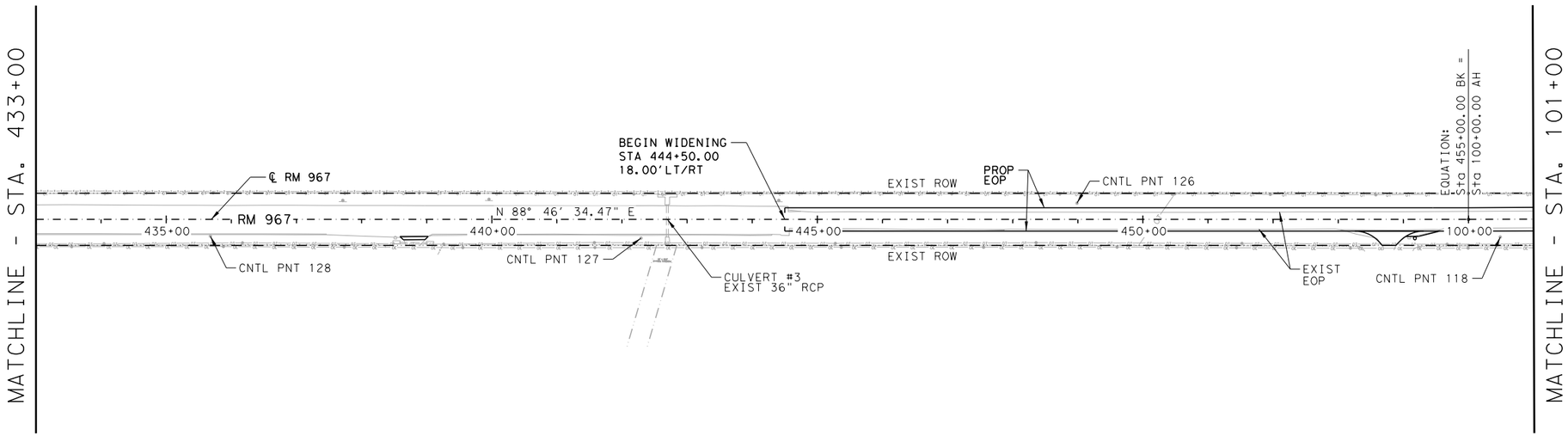
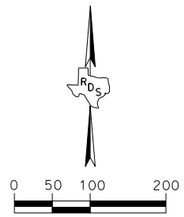
Date: 5/17/2021





HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)						
POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 128	435+67.78	25.77' RT	2311522.40	13948494.77	866.41'	IRON ROD SET
CNTL PNT 127	442+29.19	28.78' RT	2312183.72	13948505.89	856.15'	IRON ROD SET
CNTL PNT 126	448+98.81	24.90' LT	2312582.04	13948573.85	863.30'	IRON ROD SET
CNTL PNT 118	100+48.74	27.20' RT	2313503.04	13948535.84	866.24'	IRON ROD SET

ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83 SOUTH CENTRAL ZONE (4204). ALL DISTANCES AND COORDINATES ARE SURFACE COORDINATE VALUES AND CAN BE ADJUSTED TO GRID COORDINATES WITH THE COMBINED SCALE FACTOR 1.00008.

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PROJECT LAYOUT

DATE: 5/17/2021				SHEET 3 OF 6
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	6

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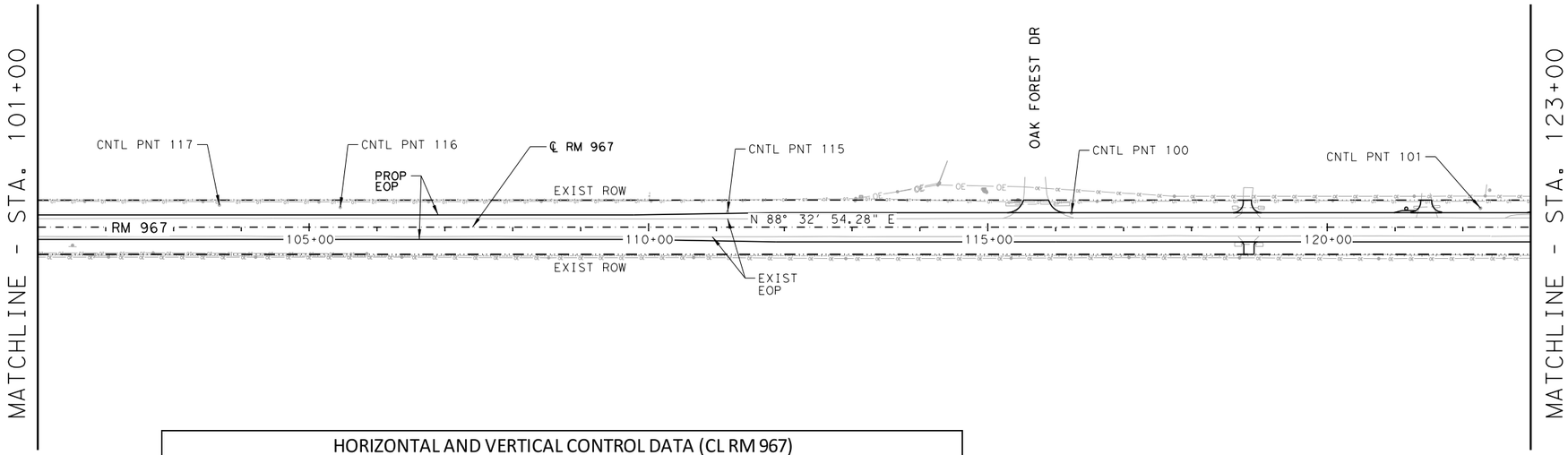
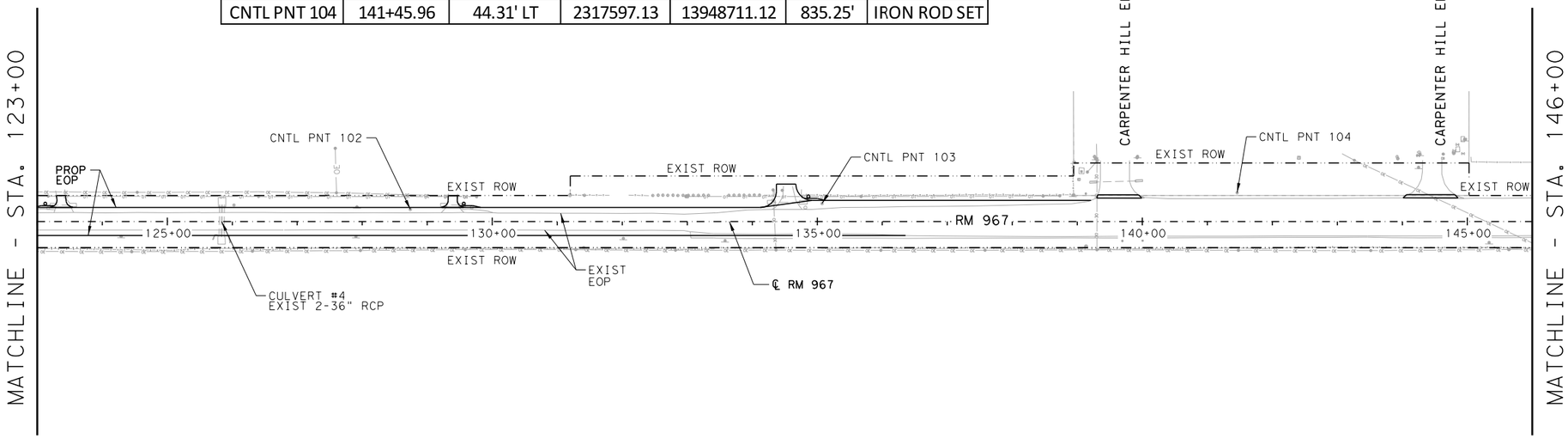
Date: 5/17/2021



HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)						
POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 117	103+67.70	32.57' LT	2313820.38	13948603.68	860.42'	IRON ROD SET
CNTL PNT 116	105+45.79	29.20' LT	2313998.50	13948604.81	855.88'	IRON ROD SET
CNTL PNT 115	111+16.50	22.69' LT	2314569.19	13948612.77	838.09'	IRON ROD SET
CNTL PNT 100	116+23.27	20.85' LT	2315075.85	13948623.76	822.49'	IRON ROD SET
CNTL PNT 101	122+25.87	28.14' LT	2315678.06	13948646.31	808.63'	IRON ROD SET
CNTL PNT 102	128+73.99	18.64' LT	2316326.22	13948653.23	810.01'	IRON ROD SET
CNTL PNT 103	135+07.35	27.65' LT	2316959.15	13948678.29	822.88'	IRON ROD SET
CNTL PNT 104	141+45.96	44.31' LT	2317597.13	13948711.12	835.25'	IRON ROD SET



ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83 SOUTH CENTRAL ZONE (4204). ALL DISTANCES AND COORDINATES ARE SURFACE COORDINATE VALUES AND CAN BE ADJUSTED TO GRID COORDINATES WITH THE COMBINED SCALE FACTOR 1.00008.

Texas Department of Transportation

HAYS COUNTY

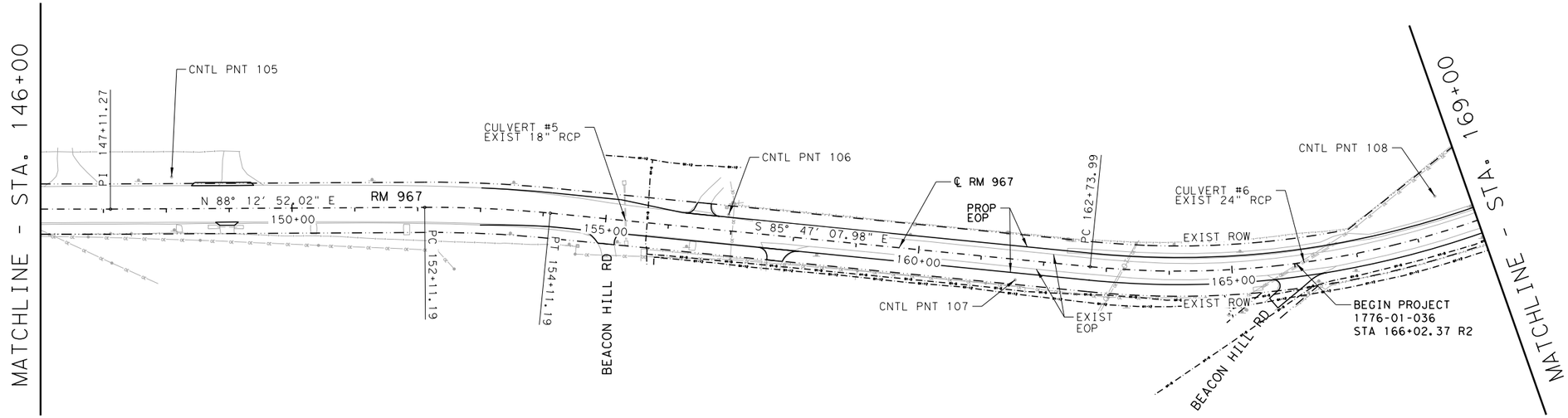
WSB & ASSOCIATES, INC.
FIRM # 16849

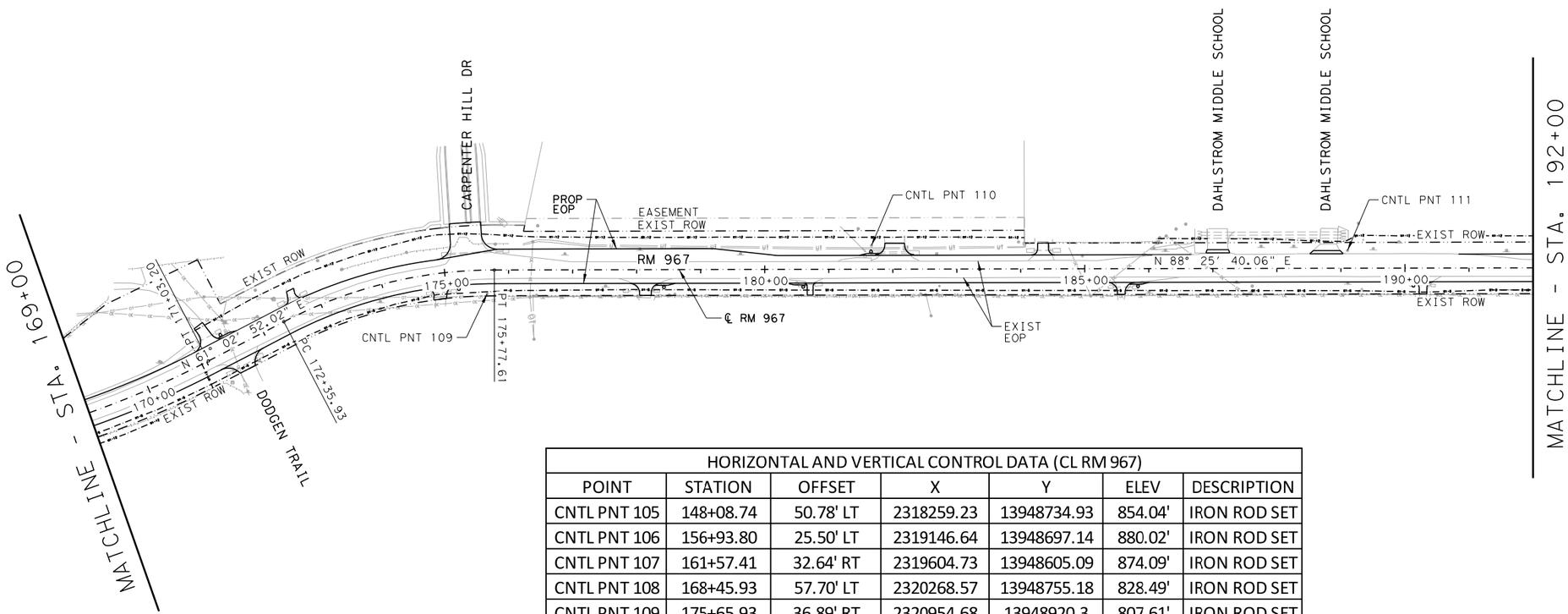
RM 967

PROJECT LAYOUT

DATE: 5/17/2021				SHEET 4 OF 6
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	7

Filename: ...\Cad\Plan\015012-000*PL4.dgn
Date: 5/17/2021





0 50 100 200

ALL BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM NAD83 SOUTH CENTRAL ZONE (4204). ALL DISTANCES AND COORDINATES ARE SURFACE COORDINATE VALUES AND CAN BE ADJUSTED TO GRID COORDINATES WITH THE COMBINED SCALE FACTOR 1.00008.

HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)

POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 105	148+08.74	50.78' LT	2318259.23	13948734.93	854.04'	IRON ROD SET
CNTL PNT 106	156+93.80	25.50' LT	2319146.64	13948697.14	880.02'	IRON ROD SET
CNTL PNT 107	161+57.41	32.64' RT	2319604.73	13948605.09	874.09'	IRON ROD SET
CNTL PNT 108	168+45.93	57.70' LT	2320268.57	13948755.18	828.49'	IRON ROD SET
CNTL PNT 109	175+65.93	36.89' RT	2320954.68	13948920.3	807.61'	IRON ROD SET
CNTL PNT 110	181+66.83	36.71' LT	2321552.73	13949010.44	795.20'	IRON ROD SET
CNTL PNT 111	189+10.43	27.46' LT	2322296.3	13949021.59	777.40'	IRON ROD SET

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FIRM # 16849

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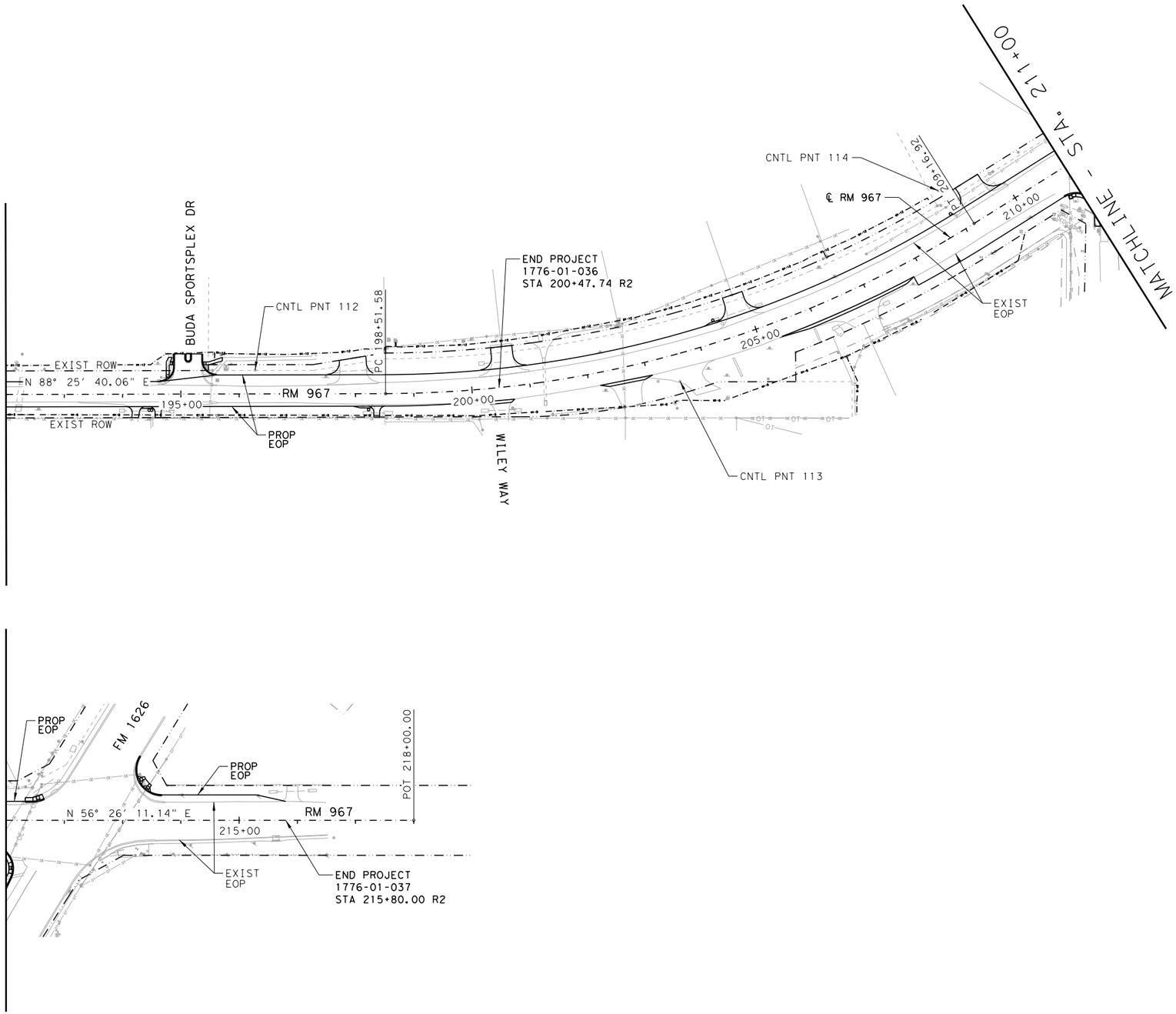
PROJECT LAYOUT

DATE: 5/17/2021 SHEET 5 OF 6

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	8

Filename: ...\Cad\Plan\015012-000*PL5.dgn
Date: 5/17/2021



0 50 100 200

HORIZONTAL AND VERTICAL CONTROL DATA (CL RM 967)						
POINT	STATION	OFFSET	X	Y	ELEV	DESCRIPTION
CNTL PNT 112	196+27.68	40.62' LT	2323012.92	13949054.43	769.16'	IRON ROD SET
CNTL PNT 113	203+51.42	42.62' RT	2323742.48	13949053.67	767.78'	PK NAIL SET
CNTL PNT 114	208+95.39	87.68' LT	2324177.38	13949391.99	759.54'	IRON ROD SET

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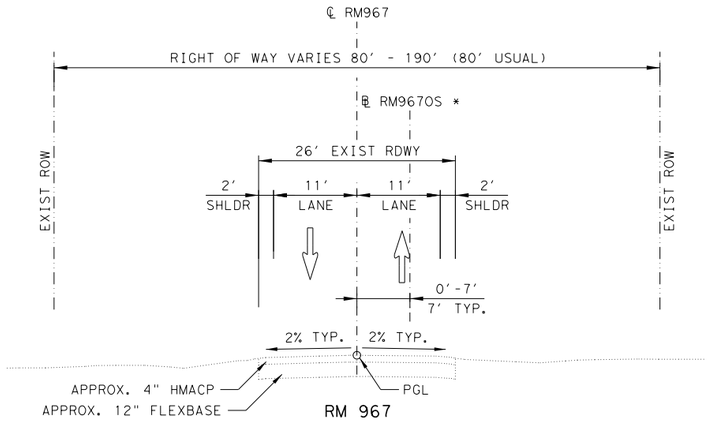
RM 967

PROJECT LAYOUT

DATE: 5/17/2021			SHEET 6 OF 6
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	9

Filename: ...\Cad\Plan\015012-000*PL6.dgn
Date: 5/17/2021

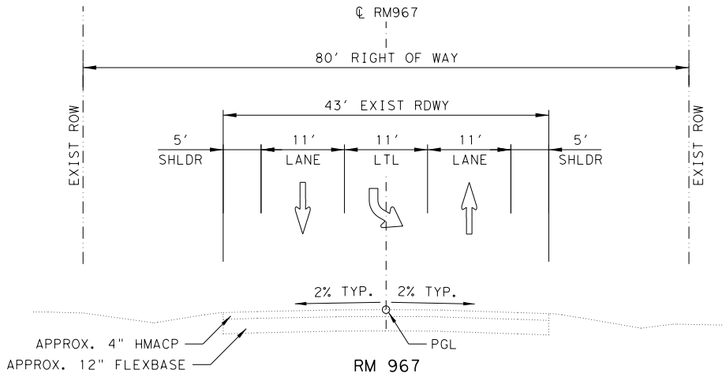


RM 967

EXISTING TYPICAL SECTION

* STA 353+50.00 R1 TO STA 427+91.03 R1

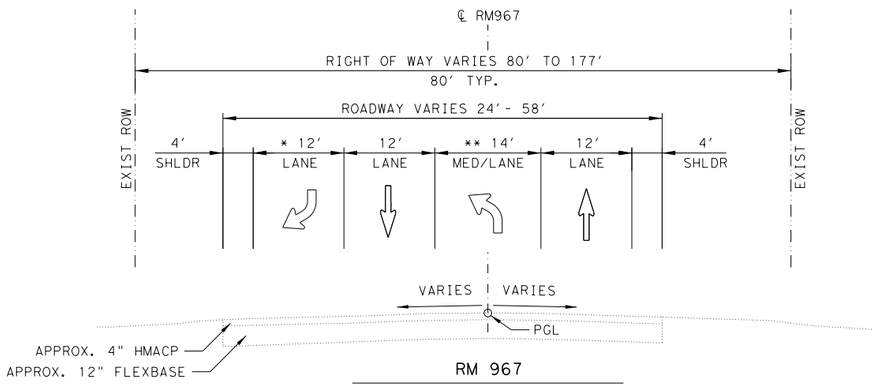
STA 353+50.00 R1 TO STA 427+85.00 R1
STA 444+57.07 R1 TO STA 133+00.00 R2
STA 157+54.50 R2 TO STA 185+20.26 R2
STA 191+83.62 R2 TO STA 196+92.05 R2



RM 967

EXISTING TYPICAL SECTION

STA 427+85.00 R1 TO STA 444+57.07 R1



RM 967

EXISTING TYPICAL SECTION

* STA 140+00.00 TO STA 151+76.00

STA 133+00.00 TO STA 157+54.50
STA 185+20.26 TO STA 191+83.62
STA 196+92.05 TO STA 205+33.17

** STA 136+89.57 TO STA 154+46.95
** STA 204+00.00 TO STA 205+33.17

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RM 967

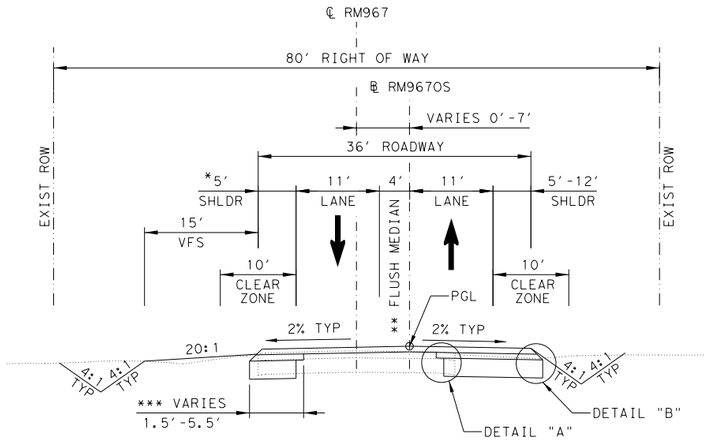
EXISTING
TYPICAL SECTIONS

DATE: 5/17/2021 SHEET 1 OF 1

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	10

Filename: ...\Cad\Plan\015012-000*TS01.dgn
Date: 5/17/2021



RM 967

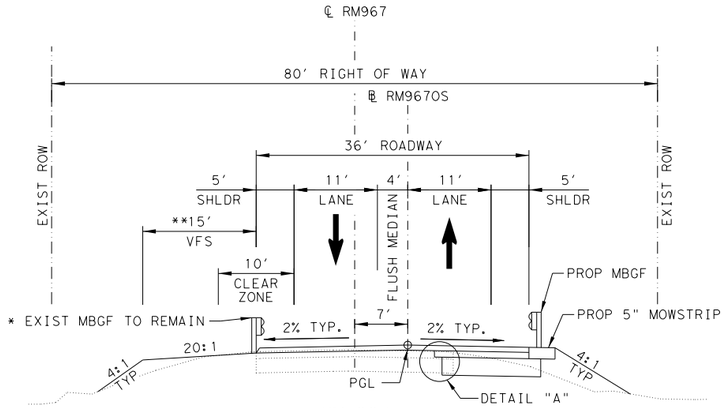
PROPOSED TYPICAL SECTION

STA 353+50.00 R1 TO STA 379+95.00 R1
STA 383+46.00 R1 TO STA 409+76.00 R1
STA 412+52.00 R1 TO STA 427+85.00 R1

* VARIES 2' TO 5'
STA 353+50.00 R1 TO
STA 359+51.98

** VARIES 0' TO 4'
STA 353+50.00 R1 TO
STA 359+51.98

*** STA 424+43.75 R1 TO
STA 427+85.00 R1

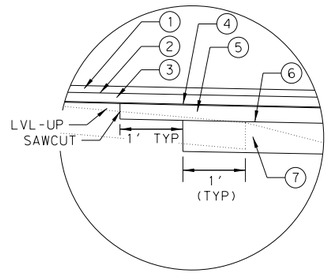


RM 967

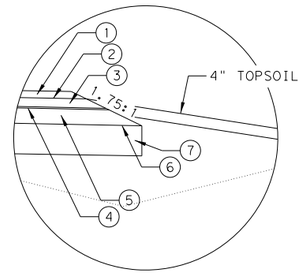
PROPOSED TYPICAL SECTION

STA 379+95.00 R1 TO STA 383+46.00 R1
* STA 409+76.00 R1 TO STA 412+52.00 R1

* EXIST MBGF NOT PRESENT
IN THIS LOCATION

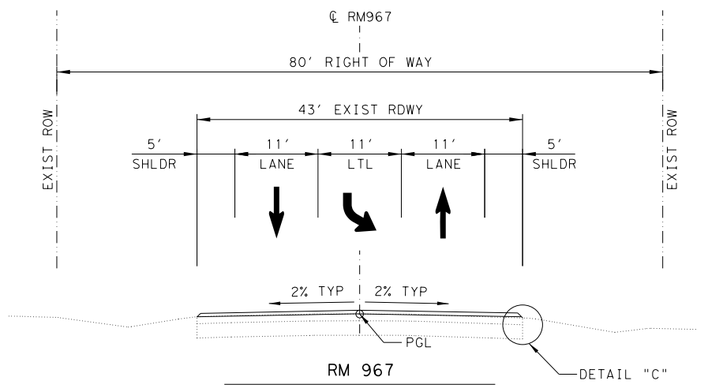


DETAIL "A"



DETAIL "B"

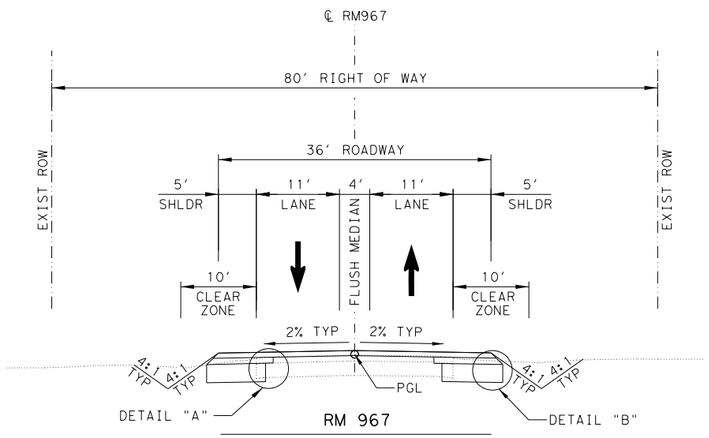
1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE
5. 4" D-GR HMA (TY B)
6. PRIME COAT
7. 12" FLEX BASE (2 EQUAL LIFTS)



RM 967

PROPOSED TYPICAL SECTION

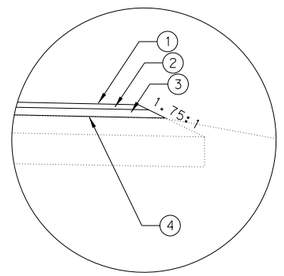
STA 427+85.00 R1 TO STA 444+50.00 R1



RM 967

PROPOSED TYPICAL SECTION

STA 444+50.00 R1 TO STA 109+78.05 R2



DETAIL "C"

1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE

STATE OF TEXAS
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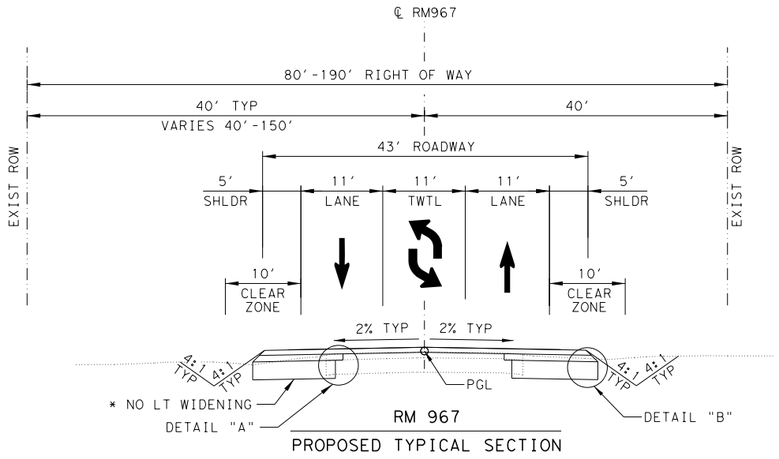
FIRM # 16849

RM 967

PROPOSED
TYPICAL SECTIONS

DATE: 5/17/2021				SHEET 1 OF 4
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	11

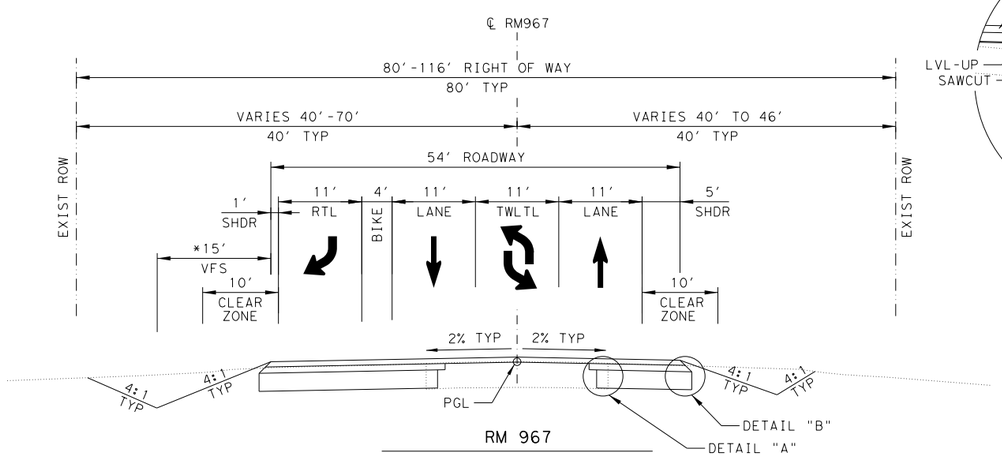
Filename: ...\Cad\Plan\015012-000*TS02.dgn
Date: 5/17/2021



RM 967

PROPOSED TYPICAL SECTION

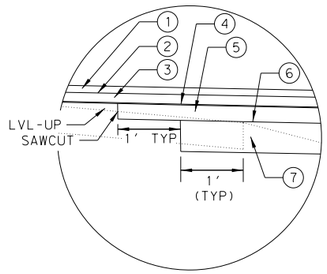
STA 109+78.05 R2 TO STA 134+92.12 R2
STA 164+00.00 R2 TO STA 175+00.00 R2
STA 180+20.00 R2 TO STA 195+00.00 R2
* STA 186+66.29 R2 TO STA 190+83+84 R2



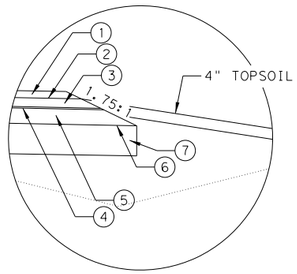
RM 967

PROPOSED TYPICAL SECTION

* STA 134+92.12 R2 TO STA 136+35.70 R2
STA 195+00.00 R2 TO STA 200+00.00 R2

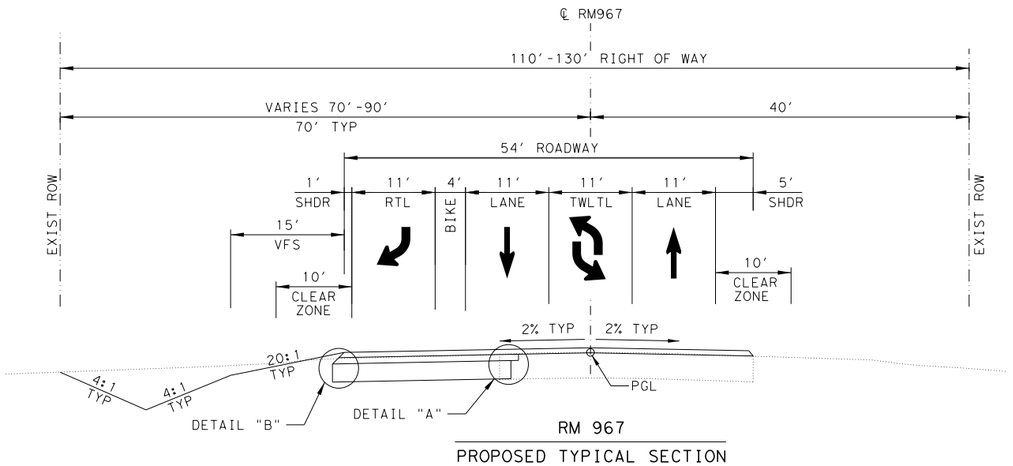


DETAIL "A"



DETAIL "B"

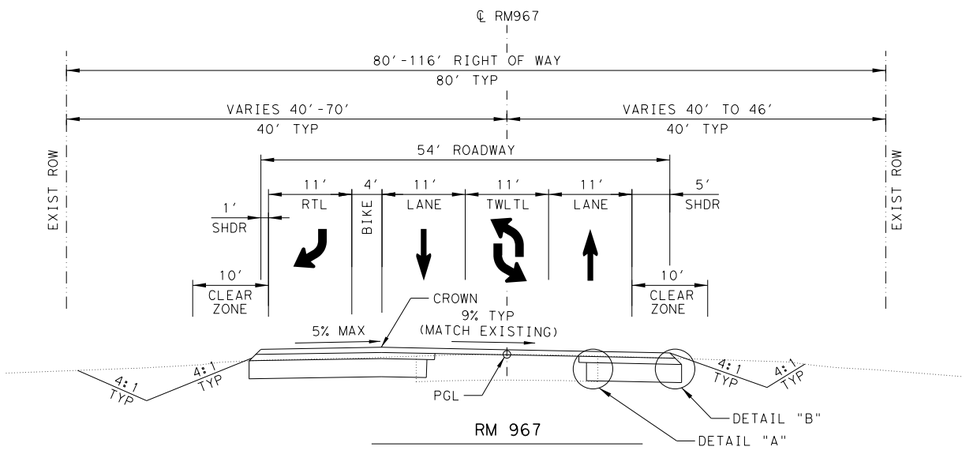
① 1" TOM
② TACK COAT
③ 1.5" D-GR HMA (TY D)
④ UNDERSEAL COURSE
⑤ 4" D-GR HMA (TY B)
⑥ PRIME COAT
⑦ 12" FLEX BASE (2 EQUAL LIFTS)



RM 967

PROPOSED TYPICAL SECTION

STA 136+35.70 R2 TO STA 139+21.12 R2



RM 967

PROPOSED TYPICAL SECTION

STA 175+00.00 R2 TO STA 180+20.00 R2

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FIRM # 16849

RM 967

PROPOSED
TYPICAL SECTIONS

DATE: 5/17/2021				SHEET 2 OF 4
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	12

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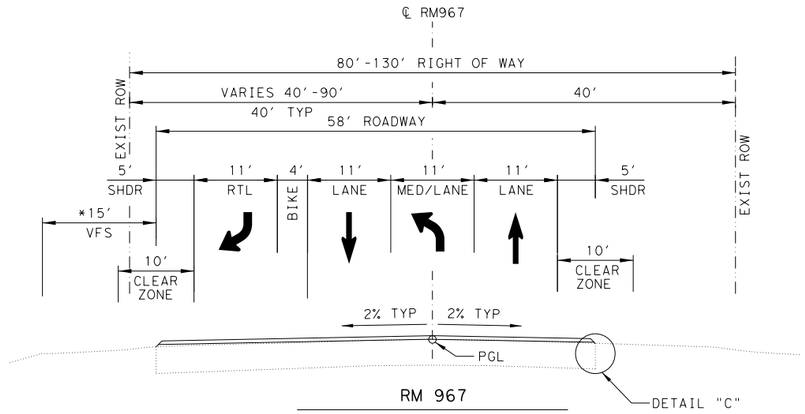
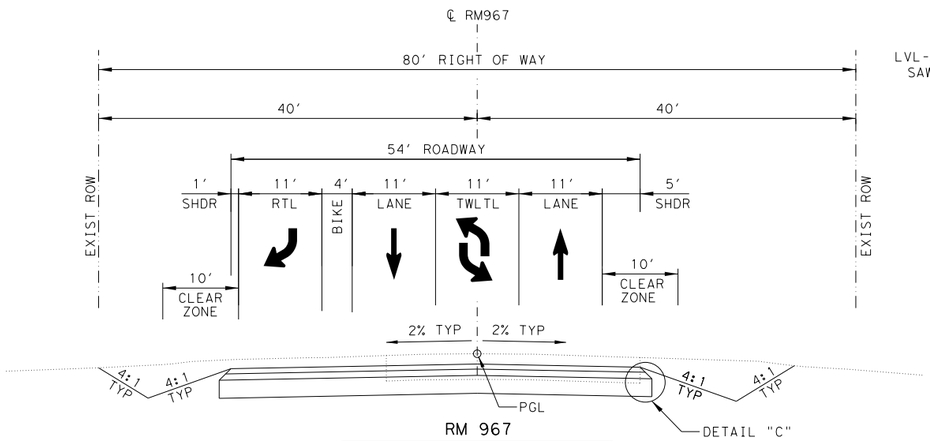
Date: 5/17/2021



RM 967

PROPOSED TYPICAL SECTION

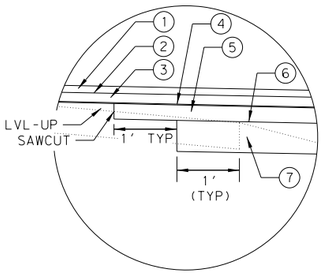
* STA 139+21.12 R2 TO STA 145+00.00 R2
STA 139+21.12 R2 TO STA 153+00.00 R2



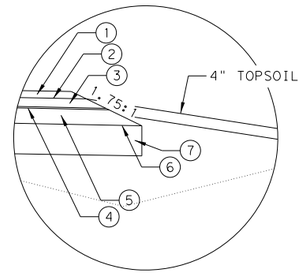
RM 967

PROPOSED TYPICAL SECTION

STA 153+00.00 R2 TO STA 156+20.00 R2

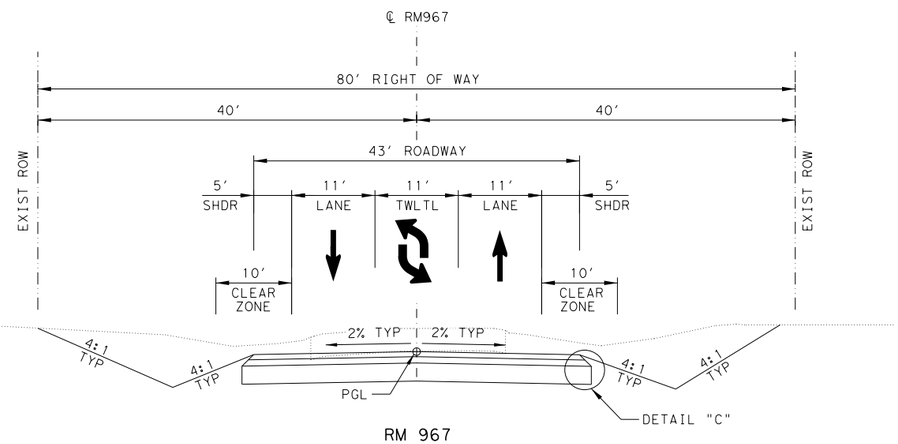


DETAIL "A"



DETAIL "B"

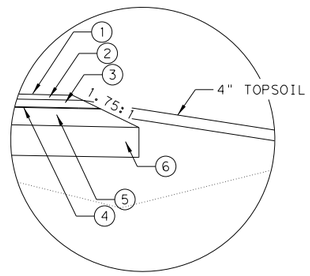
1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE
5. 4" D-GR HMA (TY B)
6. PRIME COAT
7. 12" FLEX BASE (2 EQUAL LIFTS)



RM 967

PROPOSED TYPICAL SECTION

STA 156+20.00 R2 TO STA 164+00.00 R2



DETAIL "C"

1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE
5. 4" D-GR HMA (TY B)
6. 9" D-GR HMA (TY B)(2 EQUAL LIFTS)

STATE OF TEXAS
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PROPOSED
TYPICAL SECTIONS

DATE: 5/17/2021				SHEET 3 OF 4
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	13

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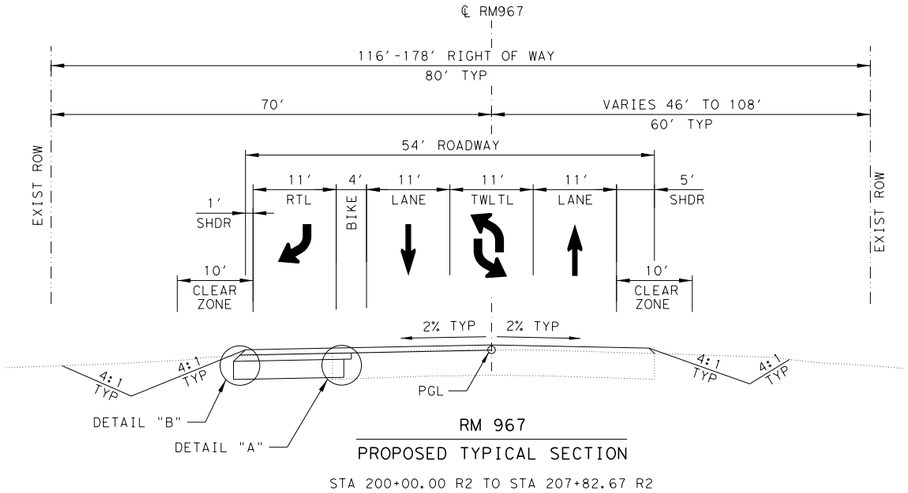
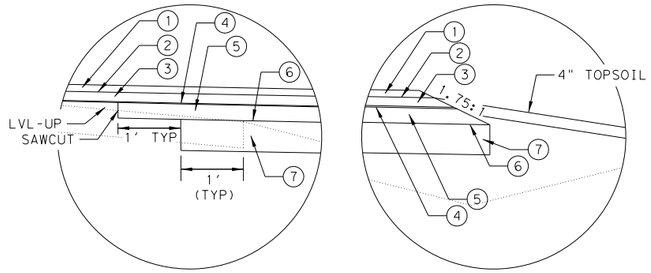
Date: 5/17/2021



RM 967

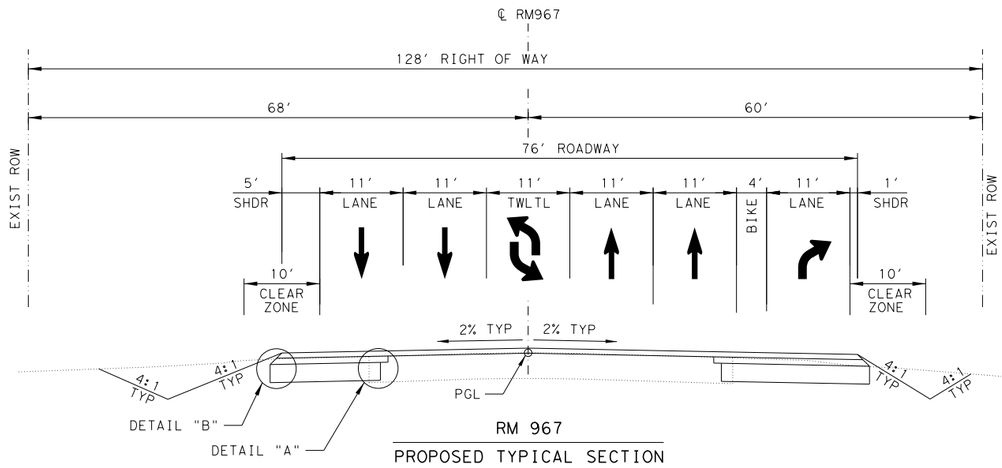
PROPOSED TYPICAL SECTION

STA 200+00.00 R2 TO STA 207+82.67 R2



DETAIL "A" DETAIL "B"

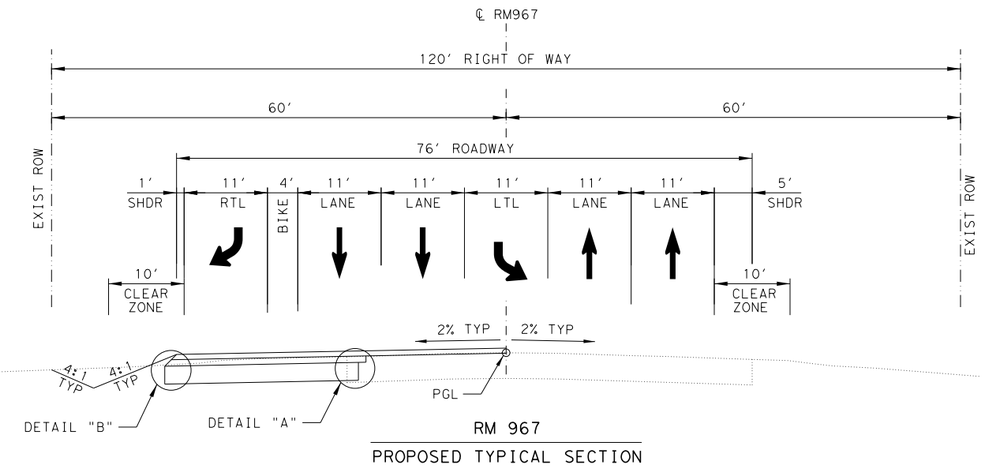
1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE
5. 4" D-GR HMA (TY B)
6. PRIME COAT
7. 12" FLEX BASE (2 EQUAL LIFTS)



RM 967

PROPOSED TYPICAL SECTION

STA 207+82.67 R2 TO STA 211+66.64 R2



RM 967

PROPOSED TYPICAL SECTION

STA 213+67.39 R2 TO STA 215+80.00 R2

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WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PROPOSED
TYPICAL SECTIONS

DATE: 5/17/2021				SHEET 4 OF 4
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	14

Filename: ...\Cad\Plan\015012-000*TS05.dgn
Date: 5/17/2021

LOCATION	SUMMARY OF ROADWAY ITEMS												
	100 6002	104 6017	104 6022	104 6026	104 6036	104 6044	110 6001	132 6003	247 6366	310 6001	347 6001	347 6006	347 6008
	PREPARING ROW	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVE CONC (GUTTER)	REMOVING CONC (SIDEWALK OR RAMP)	REMOVING CONC (FLUME)	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(ORD COMP)(TY B)	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	PRIME COAT (MULTI OPTION)	TOM (ASPHALT) PG 76-22	TOM - C (AGGREGATE) SAC - B	TACK COAT
	STA	SY	LF	LF	SY	SY	CY	CY	CY	GAL	TON	TON	GAL
PLAN & PROFILE SHEETS													
SHEET 1	7.5						555	267	384.3	231	10.8	162.9	246.0
SHEET 2	10						684	438	512.2	308	14.4	217.2	328.0
SHEET 3	10						836	429	511.2	307	14.4	218.0	329.0
SHEET 4	10						1007	413	511.2	307	14.3	215.6	326.0
SHEET 5	10						490	1058	516.4	310	14.5	218.9	331.0
SHEET 6	10	245					1014	388	492.3	296	14.7	221.3	334.0
SHEET 7	10						1030	401	511.2	307	14.5	219.2	331.0
SHEET 8	6.9						429	315	365.3	220	15.4	232.9	352.0
SHEET 9							39	94			17.8	268.2	405.0
SHEET 10	6.5						633	99	399.8	240	15.4	232.3	351.0
SHEET 11	10						993	53	600.2	361	14.2	214.6	324.0
SHEET 12	10						1096	182	763.3	458	16.0	241.2	365.0
SHEET 13	10						1246	141	857	514	16.9	256.0	387.0
SHEET 14	10						1279	109	818	491	17.6	265.4	401.0
SHEET 15	3.2						274	330	169	102	22.3	336.7	509.0
SHEET 16	3						1332	84			22.3	336.6	508.0
SHEET 17	10					314	4442	227	218	131	17.4	263.2	398.0
SHEET 18	1					2			4	3	0.1	1.0	2.0
SHEET 21	5.5	242					375	401	293	177	12.3	186.0	281.0
SHEET 22	9.8	264	147				684	445	609	366	14.6	220.4	333.0
FM 1626 DETAILS			225		108								
TOTAL CSJ: 1776-01-037	153.4	751	372	0	108	316	18438	5874	8535.1	5129	299.9	4527.6	6841
SHEET 18	9					468	1732	805	1015.1	610	18.6	281.2	425
SHEET 19	10						1156	326	1004.1	603	18.5	279.8	423
SHEET 20	10						747	334	600.3	361	18.2	275.4	416
SHEET 21	5.5	252					458	490	404.8	243	9.5	143.4	217
BUDA SPORTSPLEX DETAILS			99	67	59								
TOTAL CSJ: 1776-01-036	34.5	252	99	67	59	468	4093	1955	3024.3	1817	64.8	979.8	1481
PROJECT TOTALS	**187.9**	**1003**	**471**	**67**	**167**	**784**	**22531**	**7829**	**11559.4**	**6946**	**364.7**	**5507.4**	**8322**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021				SHEET 1 OF 10
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	15

Filename: ...\Cad\Plan\015012-000+QTY01.dgn
Date: 5/17/2021

SUMMARY OF ROADWAY ITEMS (CONT.)

LOCATION	351 6009	354 6002	432 6002	432 6046	529 6008	529 6038	530 6004	530 6005	530 6008	531 6001	531 6004	531 6005	531 6006
	FLEXIBLE PAVEMENT STRUCTURE REPAIR(14")	PLAN & TEXT ASPH CONC PAV(0" TO 2")	RIPRAP (CONC)(5 IN)	RIPRAP (MOW STRIP)(5 IN)	CONC CURB & GUTTER (TY II)	CONC CURB (RIBBON)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP)	TURNOUTS (ACP)	CONC SIDEWALKS (4")	CURB RAMPS (TY 1)	CURB RAMPS (TY 2)	CURB RAMPS (TY 3)
	SY	SY	CY	CY	LF	LF	SY	SY	SY	SY	EA	EA	EA
PLAN & PROFILE SHEETS													
SHEET 1	197	411						17					
SHEET 2	263												
SHEET 3	265			9.4				38					
SHEET 4	261		17.1	13.3				75	16				
SHEET 5	265							56	8				
SHEET 6	277		5.2	10.5			131	31	11				
SHEET 7	267		21.7	8.3				39	9				
SHEET 8	337												
SHEET 9	506							78					
SHEET 10	327												
SHEET 11	238							114	25				
SHEET 12	239												
SHEET 13	239						83	69	16				
SHEET 14	269						36	132	16				
SHEET 15	614							82					
SHEET 16	469							151					
SHEET 17	48		153.3					129					
SHEET 18	1		0.5										
SHEET 21	279						177	266	8				
SHEET 22	271	411	5.5				216	99					
FM 1626 DETAILS					143					64	2	2	1
TOTAL CSJ: 1776-01-037	5632	822	203.3	41.5	143	0	643	1376	109	64	2	2	1
SHEET 18	240		83.5					162	16				
SHEET 19	240						79	146	33				
SHEET 20	309							134	14				
SHEET 21	143		17.5				170	26	8				
BUDA SPORTSPLEX DETAILS					51	84				36			
TOTAL CSJ: 1776-01-036	932	0	101.0	0	51	84	249	468	71	36	0	0	0
PROJECT TOTALS	**6564**	**822**	**304.3**	**41.5**	**194**	**84**	**892**	**1844**	**180**	**100**	**2**	**2**	**1**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 2 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036, ETC	RM 967	16

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

SUMMARY OF ROADWAY ITEMS (CONT.)

LOCATION	531 6010	540 6001	540 6016	542 6001	542 6002	544 6001	560 6001	560 6002	3076 6001	3076 6048	3076 6051	3085 6001
	CURB RAMPS (TY 7)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)	MAILBOX INSTALL-S (TWG-POST) TY 1	MAILBOX INSTALL-D (TWG-POST) TY 1	D-GR HMA TY-B PG64-22	D-GR HMA TY-D SAC-B PG76-22	D-GR HMA TY-D PG76-22 (LEVEL-UP)	UNDERSEAL COURSE
	EA	LF	EA	LF	EA	EA	EA	EA	TON	TON	TON	GAL
PLAN & PROFILE SHEETS												
SHEET 1									286.1	265.0	37.3	615.0
SHEET 2									382.9	353.4	78.7	820.0
SHEET 3		51.0	1	70	2	1			378.4	354.7	99.4	823.0
SHEET 4		236.5	1	180	1		2		375.4	350.9	68.4	814.0
SHEET 5							1		385.9	356.1	33.2	828.0
SHEET 6		70.0				1	1		364.9	360.1	91.1	835.0
SHEET 7		142.5	1				1		376.9	356.6	128.4	827.0
SHEET 8									280.0	379.0	80.8	879.0
SHEET 9										436.5		1013.0
SHEET 10									312.3	378.0	78.7	877.0
SHEET 11							1		472.6	349.2	60.1	810.0
SHEET 12									585.5	392.5	16.6	911.0
SHEET 13							2		648.8	416.5		966.0
SHEET 14							2		620.0	431.9	29	1002.0
SHEET 15									126.2	547.8	16.6	1271.0
SHEET 16									1388.7	547.7		1270.0
SHEET 17									3147.4	428.3		994.0
SHEET 18									2.9	1.5	6.3	4.0
SHEET 21							1		218.5	302.7	6.3	702.0
SHEET 22							1		445.0	358.7		832.0
FM 1626 DETAILS												
TOTAL CSJ: 1776-01-037	0	500	3	250	3	2	12	0	10798.4	7367.1	830.9	17093
SHEET 18							2		759.0	457.6	33.2	1062
SHEET 19							4		750.6	455.3	20.7	1056
SHEET 20							1	1	761.0	448.1	37.3	1040
SHEET 21							1		303.8	233.4	20.7	542
BUDA SPORTSPLEX DETAILS	3											
TOTAL CSJ: 1776-01-036	3	0	0	0	0	0	8	1	2574.4	1594.4	111.9	3700
PROJECT TOTALS	**3**	**500**	**3**	**250**	**3**	**2**	**20**	**1**	**13372.8**	**8961.5**	**942.8**	**20793**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 6/3/2021 SHEET 3 OF 10

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	17

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 6/3/2021

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	400 6006	508 6001	512 6001	512 6025	512 6049	544 6001	544 6002	544 6003	662 6063	662 6071	662 6075	662 6093	662 6095	677 6001	677 6003	6001 6002	6185 6002	6185 6005
	CUT & RESTORING PAV	CONSTRUCTING DETOURS	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PORT CTB (REMOVE)(SGL SLP)(TY 1)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (MOVE & RESET)	GUARDRAIL END TREATMENT (REMOVE)	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (W)8"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (Y)4"(BRK)	WK ZN PAV MRK REMOV (Y)4"(SLD)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	SY	SY	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	LF	LF	EA	DAY	DAY
PHASE 1																2		
SHEET 1									1492				1702	3384				
SHEET 2									1960				2308	3526				
SHEET 3									2000				2000	2670				
SHEET 4	85								4000				3892	7239				
SHEET 5									2142				2656	4071				
SHEET 6	12	295	1110			2			2714				2866	6743	226			
SHEET 7									4					2				
SHEET 8									648				1276	1571				
SHEET 9									1142			45	1465	1298	106			
PHASE 2																2		
SHEET 1									3880				3880	5867				
SHEET 2									4000				4000	3830				
SHEET 3									3997				3996	5917				
SHEET 4									4000				4354	4299				
SHEET 5									2201				2668	619				
SHEET 6									2000				2000					
SHEET 7									4001				3892					
SHEET 8									2577				3070	453				
SHEET 9			1110	1110	2220	2	2	4	3289				4066	434				
SHEET 10									4				4					
SHEET 11									3237			202	2767	1282				
SHEET 12									1438	624	53	102	882	571				
PHASE 3																		
SHEET 1									1653				3024					
SHEET 2									2				2					
TOTAL CSJ: 1776-01-037	97	295	2220	1110	2220	4	2	4	52381	624	53	349	56770	53776	332	4	20	10
PHASE 1																		
SHEET 7		303							3996				3746	5599				
SHEET 8									2005				1676	3102	48			
PHASE 2																		
SHEET 10									3899				3880					
SHEET 11									2987				2638	934	260			
PHASE 3																		
SHEET 2									350				348					
TOTAL CSJ: 1776-01-036	0	303	0	0	0	0	0	0	13237	0	0	0	12288	9635	308	0	0	0
PROJECT TOTALS	**97**	**598**	**2220**	**1110**	**2220**	**4**	**2**	**4**	**65618**	**624**	**53**	**349**	**69058**	**63411**	**640**	**4**	**20**	**10**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 4 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036, ETC	RM 967	18

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

	SUMMARY OF DRAINAGE ITEMS													
LOCATION	110 6002	432 6002	432 6022	462 6047	462 6114	464 6003	464 6005	464 6007	464 6010	464 6012	465 6005	465 6158	466 6099	466 6103
	EXCAVATION (CHANNEL)	RIPRAP (CONC)(5 IN)	RIPRAP (STONE COMMON)(DRY)(6 IN)	CONC BOX CULV (4 FT X 2 FT)(EXTEND)	CONC BOX CULV (9 FT X 3 FT)(EXTEND)	RC PIPE (CL III)(18 IN)	RC PIPE (CL III)(24 IN)	RC PIPE (CL III)(30 IN)	RC PIPE (CL III)(48 IN)	RC PIPE (CL III)(60 IN)	JCTBOX(COMPL)(PJB)(3FTX3FT)	INLET(COMPL)(PAZD)(FG)(3FTX3FT-3FTX3FT)	HEADWALL (CH - PW - 0) (DIA= 30 IN)	HEADWALL (CH - PW - 0) (DIA= 48 IN)
	CY	CY	CY	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA
P&P SHEET 1														
P&P SHEET 2														
P&P SHEET 3						24								
P&P SHEET 4						42								
P&P SHEET 5														
P&P SHEET 6						92								
P&P SHEET 7						28								
P&P SHEET 8														
P&P SHEET 9														
P&P SHEET 10														
P&P SHEET 11														
P&P SHEET 12								58						
P&P SHEET 13						20	76							
P&P SHEET 14						21	50							
P&P SHEET 15														
P&P SHEET 16														
P&P SHEET 17						30								
P&P SHEET 18														
P&P SHEET 21						90								
P&P SHEET 22							68							
CULVERT #1		6.0	8							9				
CULVERT #2	20	4.0	8					8					1	
CULVERT #3			3											
CULVERT #4		9.0	20						228					2
CULVERT #5			2											
CULVERT #6							50				1	1		
CULVERT #8			7	32										
TOTAL CSJ: 1776-01-037	20	19.0	48	32	0	347	244	66	228	9	1	1	1	2
P&P SHEET 18						68	122							
P&P SHEET 19						62	61							
P&P SHEET 20						74								
P&P SHEET 21						72								
CULVERT #7		1.0	2		22									
TOTAL CSJ: 1776-01-036	0	1.0	2	0	22	276	183	0	0	0	0	0	0	0
PROJECT TOTALS	**20**	**20.0**	**50**	**32**	**22**	**623**	**427**	**66**	**228**	**9**	**1**	**1**	**1**	**2**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 5 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	19

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

SUMMARY OF DRAINAGE ITEMS (CONT.)

LOCATION	466 6105	467 6131	467 6293	467 6363	467 6395	467 6396	467 6419	467 6423	476 6013	480 6001	496 6004	496 6005	496 6007	496 6008
	HEADWALL (CH - PW - 0) (DIA= 60 IN)	SET (TY I)(S= 4 FT)(HW= 2 FT)(3:1) (C)	SET (TY I)(S= 9 FT)(HW= 3 FT)(4:1) (C)	SET (TY II) (18 IN) (RCP) (6: 1) (P)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	SET (TY II) (24 IN) (RCP) (8: 1) (C)	SET (TY II) (30 IN) (RCP) (4: 1) (C)	SET (TY II) (30 IN) (RCP) (6: 1) (P)	JACK BOR OR TUN PIPE(24 IN)(RC)(CL III)	CLEAN EXIST CULVERTS	REMOV STR (SET)	REMOV STR (WINGWALL)	REMOV STR (PIPE)	REMOV STR (BOX CULVERT)
	EA	EA	EA	EA	EA	EA	EA	EA	LF	EA	EA	EA	LF	LF
P&P SHEET 1														
P&P SHEET 2														
P&P SHEET 3				2							2		33	
P&P SHEET 4				4							2		44	
P&P SHEET 5														
P&P SHEET 6				2										
P&P SHEET 7				2							2		45	
P&P SHEET 8														
P&P SHEET 9														
P&P SHEET 10														
P&P SHEET 11														
P&P SHEET 12								2			2		64	
P&P SHEET 13				2	6						8		104	
P&P SHEET 14				2	2						4		63	
P&P SHEET 15														
P&P SHEET 16														
P&P SHEET 17				2										
P&P SHEET 18											2		174	
P&P SHEET 21				4							3		110	
P&P SHEET 22					2						2		59	
CULVERT #1	1										1		4	
CULVERT #2							1				2		2	
CULVERT #3														
CULVERT #4											2		100	
CULVERT #5										1				
CULVERT #6						1			60		1		20	
CULVERT #8		2									2			6
TOTAL CSJ: 1776-01-037	1	2	0	20	10	1	1	2	60	1	35	0	822	6
P&P SHEET 18				4	6						9		191	
P&P SHEET 19				6	4						12		283	
P&P SHEET 20				4							4		109	
P&P SHEET 21				4							4		75	
CULVERT #7			2									2		12
TOTAL CSJ: 1776-01-036	0	0	2	18	10	0	0	0	0	0	29	2	658	12
PROJECT TOTALS	**1**	**2**	**2**	**38**	**20**	**1**	**1**	**2**	**60**	**1**	**64**	**2**	**1480**	**18**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 6 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036, ETC	RM 967	20

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

	SUMMARY OF PAVEMENT MARKING ITEMS											
LOCATION	666 6299	666 6342	666 6311	666 6345	666 6035	666 6047	666 6053	666 6071	666 6077	666 6104	666 6110	666 6116
	RE PM W/RET REQ TY I (W)4"(BRK)(090MIL)	REF PROF PAV MRK TY I(W)4"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)4"(BRK)(090MIL)	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	REFL PAV MRK TY I (W)(ARROW)(090MIL)	REFL PAV MRK TY I(W)(LNDP ARW)(090MIL)	REFL PAV MRK TY I (W)(WORD)(090MIL)	REFL PAV MRK TY I (W)(BIKE ARW)(090MIL)	REFL PAV MRK TY I(W)(BIKE SYML)(090MIL)	REFL PAV MRK TY I (W)(BIKE DOT)(090MIL)
	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
SHEET 1		3504		7003								
SHEET 2		4000		8000								
SHEET 3		3898		7578								
SHEET 4		4000		7999								
SHEET 5		3917		6135	770		4		4			
SHEET 6		2000		4000								
SHEET 7		3916	493	5084	305		6		2			
SHEET 8		4996	700	3800	1156		10		6	1	1	
SHEET 9		4786	828	3821	852		10		4	3	3	50
SHEET 10		5										
SHEET 11		1284	326	1304	277		3	1	1	3	3	126
SHEET 12	230	1310	80	1152	821	407	6	1	6	4	4	133
TOTAL CSJ: 1776-01-037	230	37616	2427	55876	4181	407	39	2	23	11	11	309
SHEET 10		4170	650	3631	550		9		5	2	2	50
SHEET 11		3285	577	2705	587	211	9		3	2	2	
TOTAL CSJ: 1776-01-036	0	7455	1227	6336	1137	211	18	0	8	4	4	50
PROJECT TOTALS	**230**	**45071**	**3654**	**62212**	**5318**	**618**	**57**	**2**	**31**	**15**	**15**	**359**

	SUMMARY OF PAVEMENT MARKING ITEMS											
LOCATION	666 6167	666 6170	666 6205	666 6207	666 6178	666 6182	666 6184	666 6190	666 6192	666 6200	666 6202	666 6204
	REFL PAV MRK TY II (W) 4" (BRK)	REFL PAV MRK TY II (W) 4" (SLD)	REFL PAV MRK TY II (Y) 4" (BRK)	REFL PAV MRK TY II (Y) 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)	REFL PAV MRK TY II (W) (LNDP ARW)	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (W) (BIKE ARROW)	REFL PAV MRK TY II (W) (BIKE SYMBOL)	REFL PAV MRK TY II (W) (BIKE DOT)
	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
SHEET 1		3504		7003								
SHEET 2		4000		8000								
SHEET 3		3898		7578								
SHEET 4		4000		7999								
SHEET 5		3917		6135	770		4		4			
SHEET 6		2000		4000								
SHEET 7		3916	493	5084	305		6		2			
SHEET 8		4996	700	3800	1156		10		6	1	1	
SHEET 9		4786	828	3821	852		10		4	3	3	50
SHEET 10		5										
SHEET 11		1284	326	1304	277		3	1	1	3	3	126
SHEET 12	230	1310	80	1152	821	407	6	1	6	4	4	133
TOTAL CSJ: 1776-01-037	230	37616	2427	55876	4181	407	39	2	23	11	11	309
SHEET 10		4170	650	3631	550		9		5	2	2	50
SHEET 11		3285	577	2705	587	211	9		3	2	2	
TOTAL CSJ: 1776-01-036	0	7455	1227	6336	1137	211	18	0	8	4	4	50
PROJECT TOTALS	**230**	**45071**	**3654**	**62212**	**5318**	**618**	**57**	**2**	**31**	**15**	**15**	**359**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 7 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036, ETC	RM 967	21

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

	SUMMARY OF PAVEMENT MARKING ITEMS							
LOCATION	644 6001	644 6068	644 6076	658 6046	658 6047	658 6061	672 6007	672 6009
	IN SM RD SN SUP&AM TY10BWG(1)SA (P)	RELOCATE SM RD SN SUP&AM TY 10BWG	REMOVE SM RD SN SUP&AM	INSTL OM ASSM (OM-2X)(WC)GND	INSTL OM ASSM (OM-2Y)(WC)GND	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
	EA	EA	EA	EA	EA	EA	EA	EA
SHEET 1	1							176
SHEET 2				2		4		200
SHEET 3						2		190
SHEET 4				1		2		200
SHEET 5							39	154
SHEET 6								100
SHEET 7	2	1			1		16	128
SHEET 8	3	3			1		58	95
SHEET 9	3	3	2				43	96
SHEET 10								
SHEET 11	2	2			2		14	33
SHEET 12	5	5					42	29
TOTAL CSJ: 1776-01-037	16	14	2	3	4	8	212	1401
SHEET 10	3	10	1				28	91
SHEET 11	3	4	1				30	68
TOTAL CSJ: 1776-01-036	6	14	2	0	0	0	58	159
PROJECT TOTALS	**22**	**28**	**4**	**3**	**4**	**8**	**270**	**3120**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021				SHEET 8 OF 10
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	22

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	160 6003	164 6007	164 6071	166 6002	168 6001	169 6001	506 6002	506 6011	506 6020	506 6024	506 6038	506 6039
	FURNISHING AND PLACING TOPSOIL (4")	BROADCAST SEED (PERM) (URBAN) (CLAY)	BROADCAST SEED (TEMP)(WARM OR COOL)	FERTILIZER *	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY A)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	TON	MG	SY	LF	LF	SY	SY	LF	LF
SHEET 1	8077	8077	4039	0.51	202	8077	48	48	156	156	240	240
SHEET 2	8841	8841	4421	0.56	222	8841	174	174			192	192
SHEET 3	8803	8803	4402	0.56	221	8803	48	48			192	192
SHEET 4	7800	7800	3900	0.49	195	7800	78	78	156	156	192	192
SHEET 5	3172	3172	1586	0.2	80	3172	50	50	156	156	100	100
SHEET 6	4743	4743	2372	0.3	119	4743					50	50
SHEET 7	8231	8231	4116	0.52	206	8231	174	174			164	164
SHEET 8	5576	5576	2788	0.35	140	5576	60	60			185	185
SHEET 9	5668	5668	2834	0.36	142	5668	90	90			193	193
SHEET 10												
SHEET 11	3375	3375	1688	0.22	85	3375	70	70			90	90
SHEET 12	3137	3137	1569	0.2	79	3137			156	156	73	73
TOTAL CSJ: 1776-01-037	67423	67423	33715	4.27	1691	67423	792	792	624	624	1671	1671
SHEET 10	8555	8555	4278	0.54	214	8555	100	100			200	200
SHEET 11	5091	5091	2545	0.32	128	5091	60	60			155	155
TOTAL CSJ: 1776-01-036	13646	13646	6823	0.86	342	13646	160	160	0	0	355	355
PROJECT TOTALS	**81069**	**81069**	**40538**	**5.13**	**2033**	**81069**	**952**	**952**	**624**	**624**	**4052**	**4052**

* FOR CONTRACTOR'S INFORMATION ONLY

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021 SHEET 9 OF 10

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	23

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

	SUMMARY OF TRAFFIC SIGNAL ITEMS													
LOCATION	618	618	618	618	620	620	620	620	624	680	682	682	682	682
	6046	6047	6053	6054	6007	6008	6009	6010	6010	6011	6001	6002	6003	6004
	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3")	CONDT (PVC) (SCH 80) (3") (BORE)	ELEC CONDR (NO.8) BARE	ELEC CONDR (NO.8) INSULATED	ELEC CONDR (NO.6) BARE	ELEC CONDR (NO.6) INSULATED	GROUND BOX TYD (162922)W/APRON	INSTALL HWY TRF SIG (UPGRADE)	VEH SIG SEC (12")LED(GRN)	VEH SIG SEC (12")LED(GRN ARW)	VEH SIG SEC (12")LED(YEL)	VEH SIG SEC (12")LED(YEL ARW)
	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
CSJ: 1776-01-036														
RM 967 & Buda Sportsplex Drive	140		65	555	725	280	35	70	2	1	2	1	2	1
CSJ: 1776-01-037														
RM 967 & FM 1626	95	500	160	1000	1725	1392			2	1	1	1	1	1
PROJECT TOTALS	**235**	**500**	**225**	**1555**	**2450**	**1672**	**35**	**70**	**4**	**2**	**3**	**2**	**3**	**2**

	SUMMARY OF TRAFFIC SIGNAL ITEMS												
LOCATION	682	682	682	684	684	684	687	690	690	690	690	6089	6155
	6005	6050	6060	6028	6031	6033	6003	6001	6006	6009	6027	6002	6002
	VEH SIG SEC (12")LED(RED)	BACKPLATE W/REFL BRDR(5 SEC)	BACKPLATE W/REFL BRDR(3 SEC)	TRF SIG CBL (TYA)(14 AWG)(2 CONDR)	TRF SIG CBL (TYA)(14 AWG)(5 CONDR)	TRF SIG CBL (TYA)(14 AWG)(7 CONDR)	RELOCATE PED POLE ASSEMBLY	REMOVAL OF CONDUIT	REMOVAL OF GROUND BOXES	REMOVAL OF CABLES	REMOVAL OF SIGNAL RELATED SIGNS	CAT 5 ETHERNET CABLE	RADAR COMMUNICATION CABLE
	EA	EA	EA	LF	LF	LF	EA	LF	EA	LF	EA	LF	LF
CSJ: 1776-01-036													
RM 967 & Buda Sportsplex Drive	2	1	1	445	1235	245	2	260	2	260	1	135	585
CSJ: 1776-01-037													
RM 967 & FM 1626	1	1		1530	3074	1596	2	570	3	570			1520
PROJECT TOTALS	**3**	**2**	**1**	**1975**	**4309**	**1841**	**4**	**830**	**5**	**830**	**1**	**135**	**2105**

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SUMMARY OF QUANTITIES

DATE: 5/17/2021			SHEET 10 OF 10
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	24

Filename: ...\Cad\Plan\015012-000*QTY01.dgn
Date: 5/17/2021

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain", T = "T", U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
1	1	R4-1	DO NOT PASS	24"x30"	X		10BWG	1	SA	P		
7	2	R4-1	DO NOT PASS	24"x30"	X		10BWG	1	SA	P		
7	3	R3-9b	CENTER LANE ONLY	24"x36"	X		10BWG	1	SA	P		
7	4	W3-3		30"x30"	X		10BWG	1	SA	P		
8	5	R2-1	SPEED LIMIT 60	24"x30"	X		10BWG	1	SA	P		
8	6	R2-1	SPEED LIMIT 55	24"x30"	X		10BWG	1	SA	P		
8	7	S1-1		36"x36"	X		10BWG	1	SA	P		
		SW16-9P	AHEAD	24"x12"								
8	8	R3-9b	CENTER LANE ONLY	24"x36"	X		10BWG	1	SA	P		
8	9	R3-7R	RIGHT LANE MUST TURN RIGHT	36"x36"	X		10BWG	1	SA	P		
8	10	R3-7R	RIGHT LANE MUST TURN RIGHT	36"x36"	X		10BWG	1	SA	P		
9	11	R3-9b	CENTER LANE ONLY	24"x36"	X		10BWG	1	SA	P		
9	12	R4-4	BEGIN RIGHT TURN LANE YIELD TO BIKES	36"x30"	X		10BWG	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 5

FILE:	DN:	CK:	DW:	CK:
REVISIONS	CONT	SECT	JOB	HIGHWAY
	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		25

DATE: 5/17/2021 3:36:26 PM
FILE: K:\015012-000\Cad\Plan\015012-000_SOSS01.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE (FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80)	POSTS (1 or 2)	ANCHOR TYPE (UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic)	MOUNTING DESIGNATION: PREFABRICATED (P = "Plain", T = "T", U = "U")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE (TY N, TY S)
9	13	W2-2		30"x30"	X		10BWG	1	SA	P		
9	14	R3-9b		24"x36"	X		10BWG	1	SA	P		
9	15	S3-2		36"x36"	X		10BWG	1	SA	P		
9	16	W2-2		30"x30"	X		10BWG	1	SA	P		
9	17	W1-4L		30"x30"	X		10BWG	1	SA	P		
		W13-1P		18"x18"								
10	18	D14-4T		48"x48"	X		10BWG	1	SA	U		
10	19	D20-1TR		24"x24"	X		10BWG	1	SA	P		
10	20	S1-1		36"x36"	X		10BWG	1	SA	P		
		SW16-9P	AHEAD	24"x12"								
10	21	D1-1	CO. RD. 155 →	66"x12"	X		10BWG	1	SA	T		
10	22	D14-4T		48"x48"	X		10BWG	1	SA	U		
10	23	D1-1	← CO. RD. 155	66"x12"	X		10BWG	1	SA	T		
10	24	R3-7R		36"x36"	X		10BWG	1	SA	P		

DATE:
FILE:

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

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

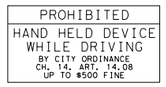
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	DN:	CK:	DW:	CK:
	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		26

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE (FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80)	POSTS (1 or 2)	ANCHOR TYPE (UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic)	MOUNTING DESIGNATION: PREFABRICATED (P = "Plain", T = "T", U = "U")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext (BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels)	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE (TY N, TY S)
10	25	W1-4L		30"x30"	X		10BWG	1	SA	P		
		W13-1P		18"x18"								
10	26	R4-4		36"x30"	X		10BWG	1	SA	P		
10	27	R2-1		24"x30"	X		10BWG	1	SA	P		
10	28	R3-9B		24"x36"	X		10BWG	1	SA	P		
10	29	S1-1		36"x36"	X		10BWG	1	SA	P		
10	30	S5-1		24"x48"	X		10BWG	1	SA	P		
		S7-1T		24"x18"								
11	31	R3-9B		24"x36"	X		10BWG	1	SA	P		
11	32	I-2aT		30"x24"	X		10BWG	1	SA	P		
11	33	TBD		60"x42"	X		10BWG	1	SA	P		
11	34	W1-2L		30"x30"	X		10BWG	1	SA	P		
		W13-1P		18"x18"								
11	35	R3-7R		36"x36"	X		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

DATE:
FILE:

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	DN:	CK:	DW:	CK:
REVISIONS	CONT	SECT	JOB	HIGHWAY
	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		27

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
11	36	S5-1	SCHOOL SPEED LIMIT 35 WHEN FLASHING CELL PHONE USE PROHIBITED UP TO $200 FINE	24"x48"	X		10BWG	1	SA	P		
		S7-1T		24"x18"								
11	37	S1-1		36"x36"	X		10BWG	1	SA	P		
11	38	R3-7R	RIGHT LANE MUST TURN RIGHT	36"x36"	X		10BWG	1	SA	P		
11	39	R4-4	BEGIN RIGHT TURN LANE YIELD TO BIKES	36"x30"	X		10BWG	1	SA	P		
11	40	D2-1	DRIFTWOOD 12	72"x12"	X		10BWG	1	SA	T		
11	41	R3-9B	CENTER LANE ONLY	24"x36"	X		10BWG	1	SA	P		
12	42	W9-2T	LANE ENDS MERGE LEFT	36"X36"	X		10BWG	1	SA	P		
12	43	W1-2R		30"x30"	X		10BWG	1	SA	P		
		W13-1P	50 MPH	18"x18"								
12	44	M3-4	WEST	24"x12"	X		10BWG	1	SA	P		
		M1-6R	RANCH 967 ROAD	24"x24"								
12	45	R3-7R	RIGHT LANE MUST TURN RIGHT	36"x36"	X		10BWG	1	SA	P		
12	46	M1-6F	FARM 1626 ROAD	24"x24"	X		10BWG	1	SA	P		
		M6-4		21"x15"								
12	47	R4-4	BEGIN RIGHT TURN LANE YIELD TO BIKES	36"x30"	X		10BWG	1	SA	P		

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

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

DATE:
FILE:

Texas Department of Transportation

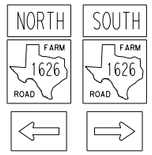
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	DN:	CK:	DW:	CK:
	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		28

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain", T = "T", U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
12	48	R4-4		36"x30"	X		10BWG	1	SA	P		
12	49	D1-3		73"x36"	X		10BWG	2	SA	P		
12	50	M3-1		24"x12"	X		10BWG	1	SA	U		
		M3-3		24"x12"								
		M1-6F		24"x24"								
		M1-6F		24"x24"								
		M6-1		21"x15"								
		M6-1		21"x15"								
12	51	R3-7R		36"x36"	X		10BWG	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 5

FILE:	DN:	CK:	DW:	CK:
	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		29

DATE:
FILE:

GENERAL NOTES

1. THE CONTRACTOR MAY PROPOSE/RECOMMEND SIGNED AND SEALED MODIFICATIONS BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION TO THE SEQUENCE OF WORK BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS PAY ITEMS, IMPACT TO TRAFFIC, AND EFFECT ON OVERALL PROJECT IN TIME AND COST, ETC. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE OF WORK UNTIL THE CONTRACTOR OBTAINS WRITTEN APPROVAL FROM THE ENGINEER.

2. THE PROVISIONS FOR ROUTING TRAFFIC DURING CONSTRUCTION AND THE SEQUENCE OF CONSTRUCTION OPERATIONS SHALL BE IN GENERAL CONFORMITY WITH THE DETAILS SHOWN ON THE PLANS. ALL TRAFFIC HANDLING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE T.M.U.T.C.D. AND APPLICABLE TXDOT TCP AND WORK ZONE STANDARDS THROUGHOUT THE DURATION OF THE CONSTRUCTION OF THE PROJECT.

3. THE SPACING OF SIGNS MAY BE MODIFIED TO MEET TRAFFIC CONDITIONS AS DIRECTED.

4. PROVIDE ACCESS TO ADJACENT PROPERTIES AT ALL TIMES THROUGHOUT CONSTRUCTION. THIS WORK WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.

5. COVER OR REMOVE ALL CONFLICTING SIGNS.

6. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN POSITIVE DRAINAGE THROUGHOUT THE PROJECT PHASING, INCLUDING REMOVING DEBRIS FROM THE BARRIER SLOT AND DRAINAGE APPURTENANCES AS WELL AS PARTIALLY COMPLETED DRAINAGE SYSTEMS TO AVOID FLOODING TO THE ROADWAY AND PRIVATE PROPERTY.

7. DO NOT LEAVE CONSTRUCTION WARNING SIGNS ON ANY AREA WHICH CONSTRUCTION OPERATIONS ARE NOT BEING CARRIED OUT.

8. NO EQUIPMENT, STOCKPILED MATERIAL, ETC. SHALL BE PERMITTED TO REMAIN IN THE CLEAR ZONE AFTER WORKING HOURS.

9. INCORPORATE AND MAINTAIN A 3H:1V SAFETY WEDGE INTO THE PROPOSED CONSTRUCTION FOR ANY ROADWAY EDGE OF 2 INCHES OR GREATER ADJACENT TO A ROADWAY UNDER TRAFFIC.

TCP SEQUENCE OF WORK

PHASE 1:

1. INSTALL ADVANCE WARNING SIGNS, AS PER THE ADVANCE WARNING LAYOUT AND THE BC SHEETS PRIOR TO COMMENCING WORK.

2. INSTALL ALL EROSION CONTROL DEVICES. THIS WORK MUST BE DONE BEFORE ANY CLEARING OR CONSTRUCTION CAN TAKE PLACE AND MUST BE APPROVED BEFORE ANY FURTHER WORK CAN BEGIN.

3. CONSTRUCT TEMPORARY PAVEMENT AS SHOWN ON PLANS.

4. PERFORM BASE REPAIR AND PLACE LEVEL-UP PAVEMENT PRIOR TO SAWCUT.
USE ONE WAY TRAFFIC CONTROL, AS NEEDED, AT NIGHT OR WEEKENDS ONLY, TO INSTALL CULVERTS 4 AND 6.

5. ELIMINATE EXISTING PAVEMENT MARKINGS, INSTALL WORKZONE PAVEMENT MARKERS AND INSTALL SIGNS AND DEVICES AS PER TRAFFIC CONTROL LAYOUT.

6. CONSTRUCT PROPOSED ELEMENTS WITHIN LIMITS SHOWN ON THE TCP PHASING SHEETS, INCLUDING PAVEMENT, SIGNING, MODIFICATIONS FOR CULVERTS 2 THRU 8 AND OTHER DRAINAGE, TOPSOIL, SEEDING, ETC.
CONSTRUCT PAVEMENT UP TO FINAL HMAC COURSE.

7. BUDA SPORTSPLEX INTERSECTION AND ALL WORK EAST OF FM1626 TO BE CONSTRUCTED WITH 9" OF TY-B HMAC INSTEAD OF 12" FLEXBASE AT LIMITS IDENTIFIED ON P&P SHEETS.LOWEST 6" OF TY-B HMAC MAY BE BLADE PLACED.
CONSTRUCTION TO BE EXPEDITED AND COMPLETED OVERNIGHT TO MINIMIZE IMPACT TO TRAFFIC.
CONTRACTOR TO COORDINATE CONSTRUCTION AT THESE LOCATIONS WITH THE ENGINEER.

PHASE 2:

1. ELIMINATE EXISTING PAVEMENT MARKINGS AND INSTALL WORK ZONE PAVEMENT MARKERS.

2. MOVE PCTB AS IDENTIFIED ON THE TRAFFIC CONTROL PLANS.

3. CONSTRUCT PROPOSED ELEMENTS WITHIN LIMITS SHOWN ON THE TCP PHASING SHEETS, INCLUDING CULVERT 1 MODIFICATIONS, PAVEMENT, SIGNING, DRAINAGE, TOPSOIL, SEEDING, ETC. CONSTRUCT PAVEMENT UP TO FINAL HMAC COURSE. PLACE LEVEL-UP PAVEMENT PRIOR TO WIDENING SO THAT PROPOSED PAVEMENT DOES NOT INTERFERE WITH WATER RUNOFF.

4. THE RIGHT TURN LANE TO FM1626 TO BE CONSTRUCTED WITH 9" OF TY-B HMAC INSTEAD OF 12" FLEXBASE. LOWEST 6" OF TY-B HMAC MAY BE BLADE PLACED. CONSTRUCTION TO BE EXPEDITED AND COMPLETED OVERNIGHT TO MINIMIZE IMPACT TO TRAFFIC. CONTRACTOR TO COORDINATE CONSTRUCTION AT THESE LOCATIONS WITH THE ENGINEER.

PHASE 3:

1. ELIMINATE EXISTING PAVEMENT MARKINGS AND INSTALL WORK ZONE PAVEMENT MARKERS.

2. MOVE PCTB AS IDENTIFIED ON THE TRAFFIC CONTROL PLANS.

3. CONSTRUCT FINAL FULL DEPTH RECONSTRUCTION SECTION AS SHOWN IN TCP SHEETS. CONSTRUCT PAVEMENT UP TO FINAL HMAC COURSE.

3. INSTALL FINAL PAVEMENT COURSE USING TXDOT STANDARD TCP (7-1)-13.

4. PLACE FINAL PERMANENT STRIPING AND OPEN ROADWAY TO TRAFFIC.

5. PERFORM PROJECT CLEANUP.

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
SEQUENCE OF CONSTRUCTION

DATE: 5/17/2021 SHEET 1 OF 1

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	30

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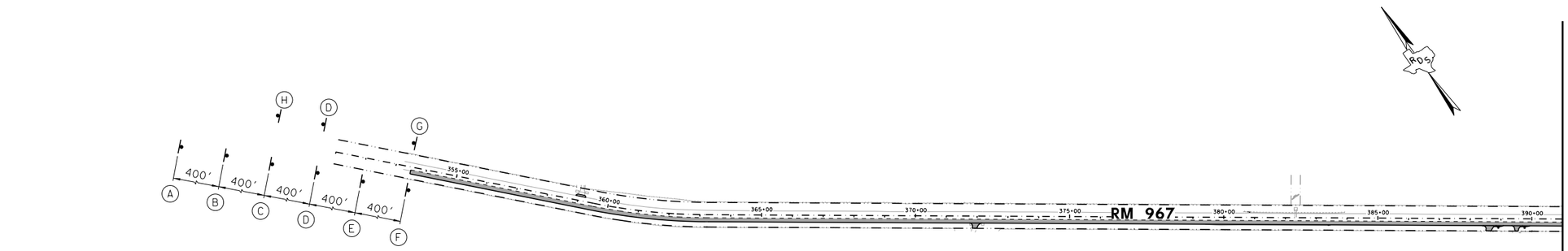
Date: 5/17/2021



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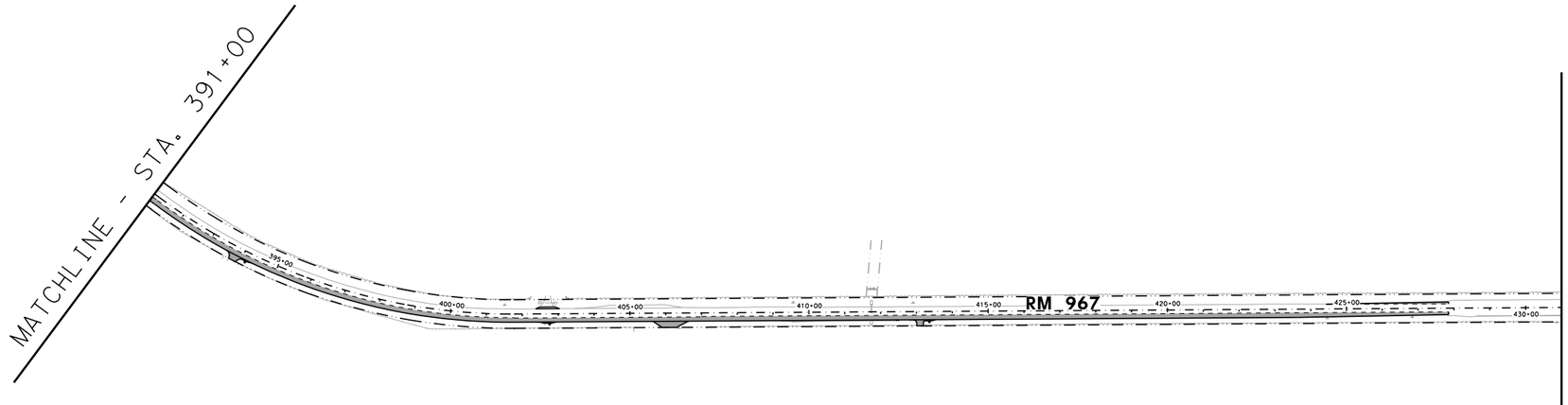

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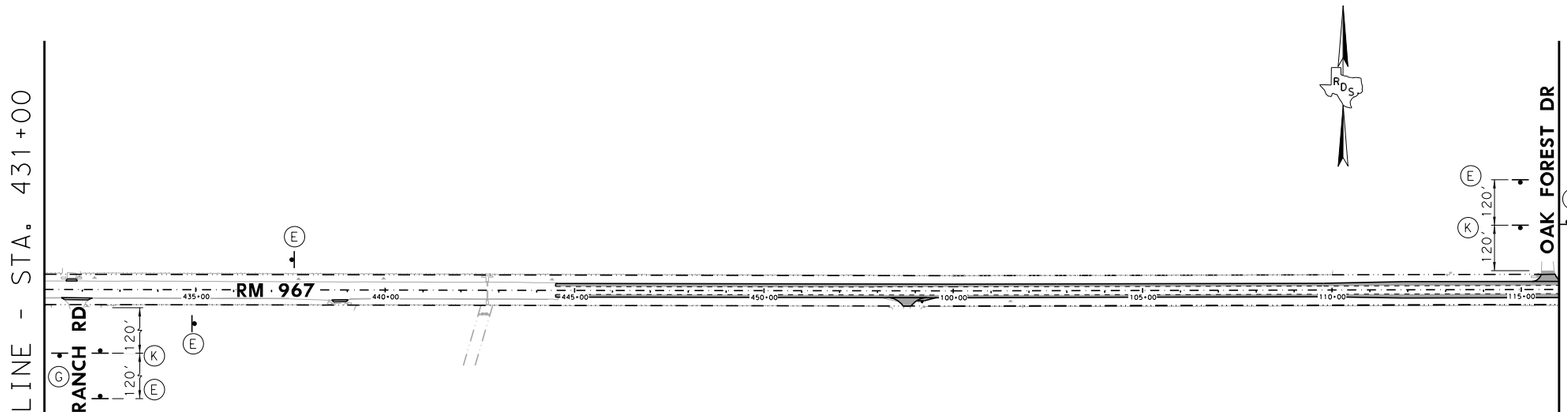


MATCHLINE - STA. 431+00

MATCHLINE - STA. 116+00

A	B	C	D	F	G	H	I
OBEY WARNING SIGNS STATE LAW R20-3 48"x42"	STAY ALERT TALK OR TEXT LATER G20-10T 60"x48"	BEGIN WORK ZONE G20-9TP 24"x24" TRAFFIC FINES DOUBLE R20-5T 24"x30" WHEN WORKERS ARE PRESENT R20-5aTP PLAQUE 24"X12"	SPEED LIMIT XX R2-1 24"X36" E ROAD WORK AHEAD CW20-1D 48"x48"	BEGIN ROAD WORK NEXT X MILE G20-5T 48"x24" NAME ADDRESS CITY STATE CONTRACTOR G20-6 48"x30"	END ROAD WORK G20-2A 48"x24"	END WORK ZONE G20-2b 48"X24"	ROAD WORK NEXT X MILES ⇨ G20-1bTR 72"x24"

J	K
ROAD WORK ⇦ NEXT X MILES G20-1bTL 72"x24"	ROAD WORK ⇦ NEXT X MILES NEXT X MILES ⇨ G20-1aT 72"x36"

0 100 200 400

SIGN SPACING

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

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

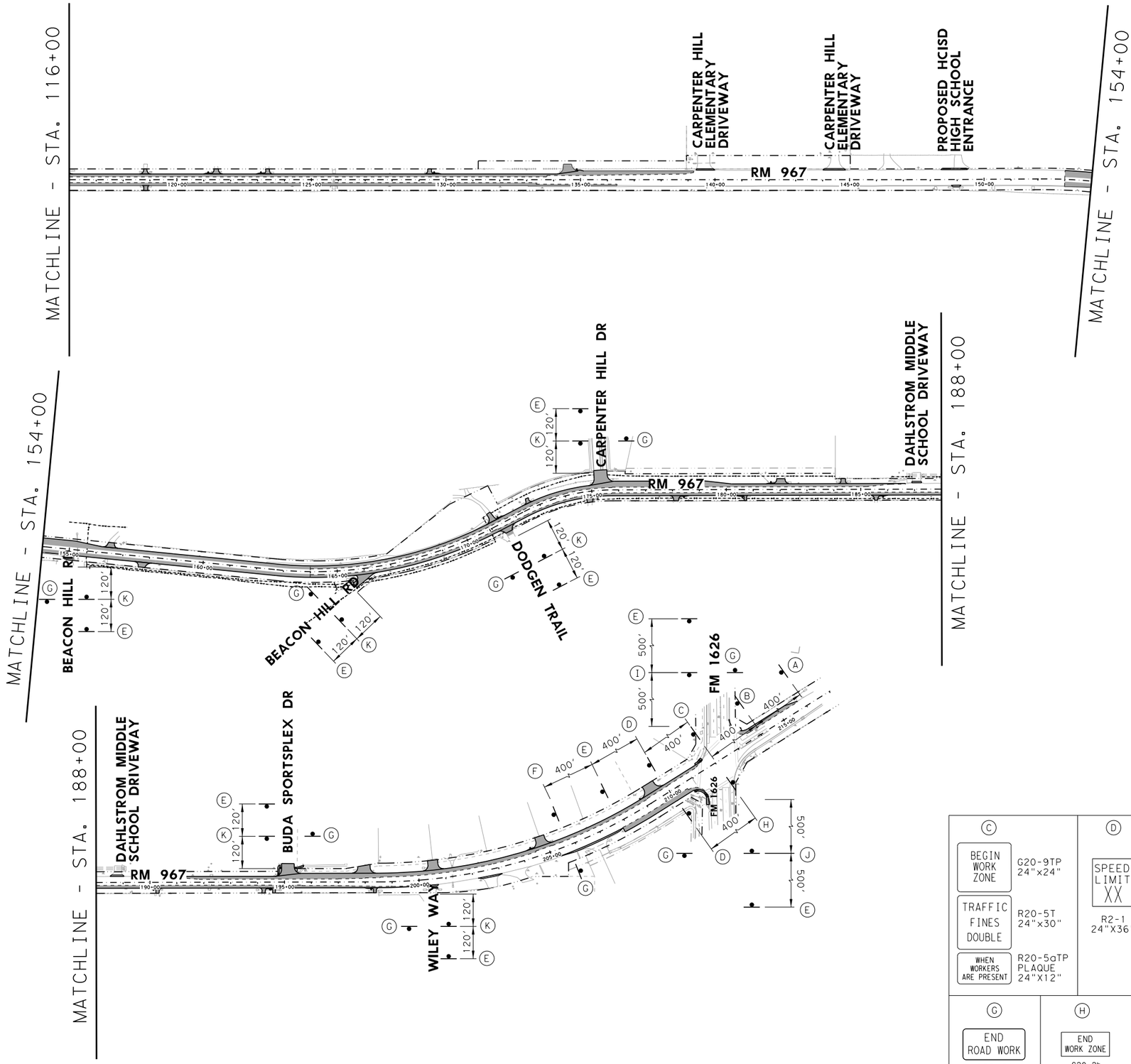
RM 967

TRAFFIC CONTROL PLAN
ADVANCE WARNING SIGNS

DATE: 5/17/2021 SHEET 1 OF 2

STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	31

Filename: ...\Cad\Plan\015012-000+AWS01.dgn
Date: 5/17/2021



SIGN SPACING

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

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Filename: ...\Cad\Plan\015012-000*AWS02.dgn
Date: 5/17/2021

(A) OBEY WARNING SIGNS STATE LAW — R20-3 48"×42"

(B) STAY ALERT / TALK OR TEXT LATER — G20-10T 60"×48"

(C) BEGIN WORK ZONE — G20-9TP 24"×24"
TRAFFIC FINES DOUBLE — R20-5T 24"×30"
WHEN WORKERS ARE PRESENT — R20-5aTP PLAQUE 24"X12"

(D) SPEED LIMIT XX — R2-1 24"X36"

(E) ROAD WORK AHEAD — CW20-1D 48"×48"

(F) BEGIN ROAD WORK NEXT X MILE — G20-5T 48"×24"
NAME ADDRESS CITY STATE CONTRACTOR — G20-6 48"×30"

(G) END ROAD WORK — G20-2A 48"×24"

(H) END WORK ZONE — G20-2b 48"X24"

(I) ROAD WORK NEXT X MILES ⇨ — G20-1bTR 72"×24"

(J) ROAD WORK ⇦ NEXT X MILES — G20-1bTL 72"×24"

(K) ROAD WORK ⇦ NEXT X MILES NEXT X MILES ⇨ — G20-1aT 72"×36"

Texas Department of Transportation

HAYS COUNTY

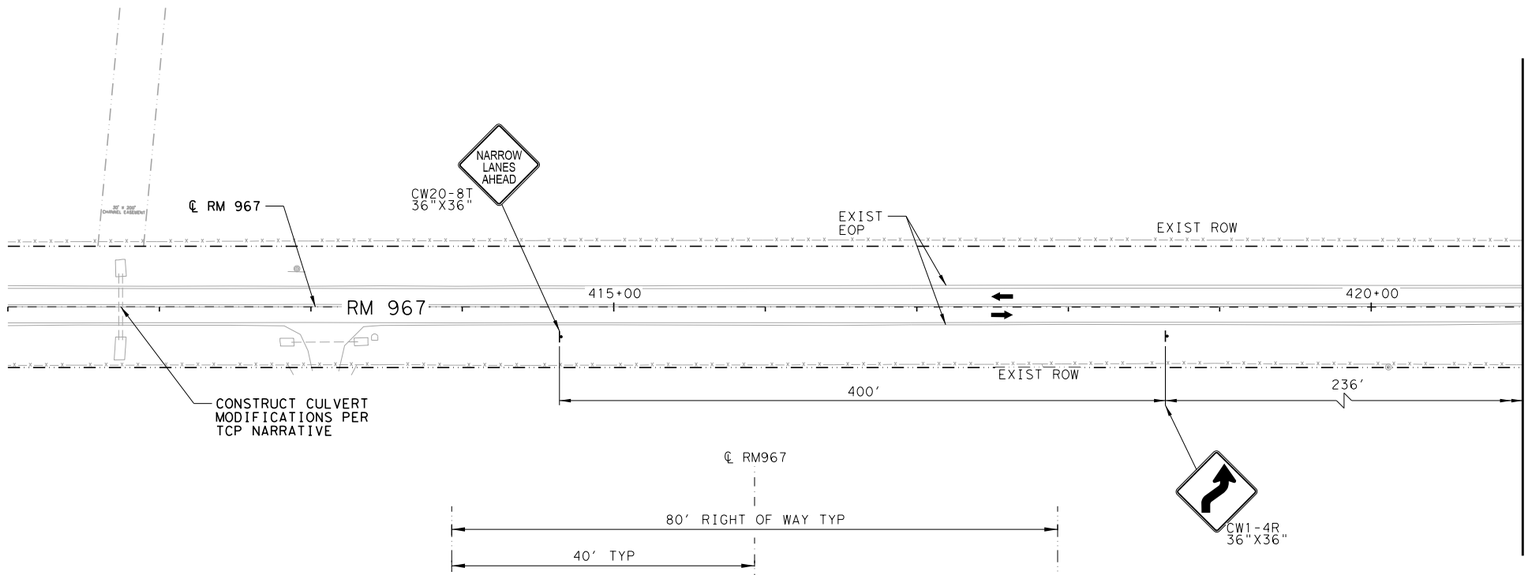
WSB & ASSOCIATES, INC.
FIRM # 16849

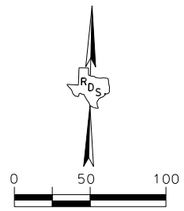
RM 967

TRAFFIC CONTROL PLAN ADVANCE WARNING SIGNS

DATE: 5/17/2021 SHEET 2 OF 2

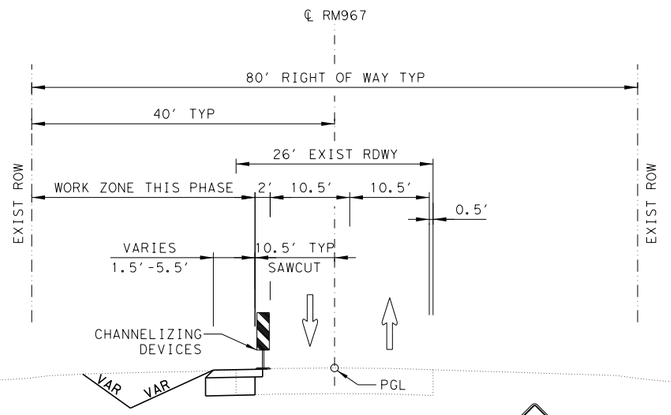
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	32



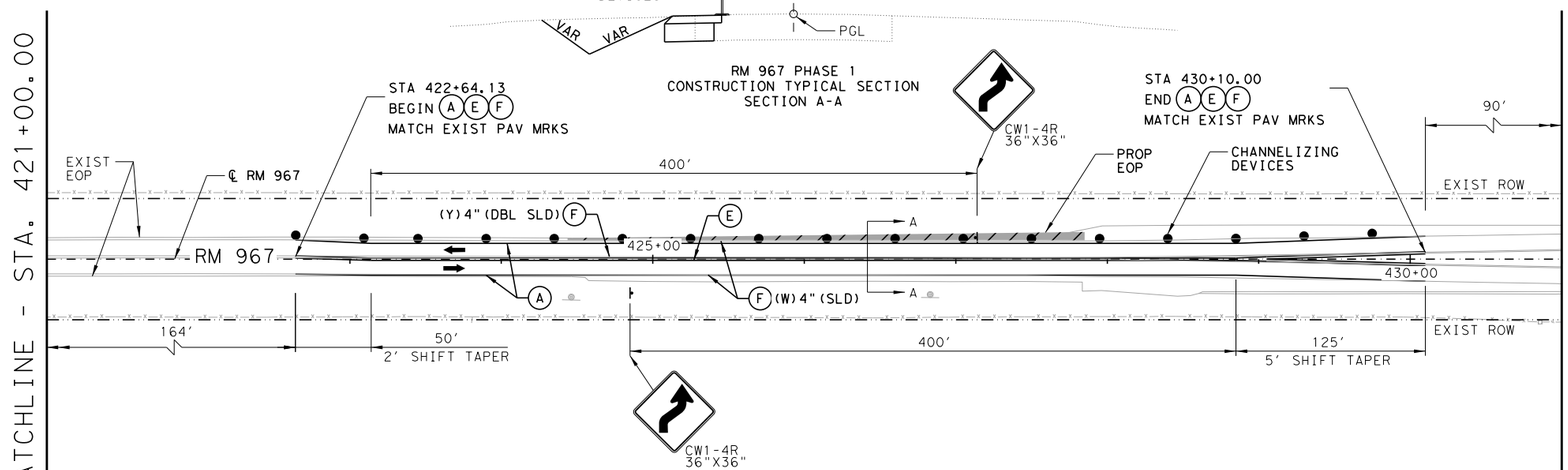


LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)



RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 1
STA 411+00.00 TO
STA 431+00.00

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

DATE: 5/17/2021			SHEET 1 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036,ETC	RM 967	33

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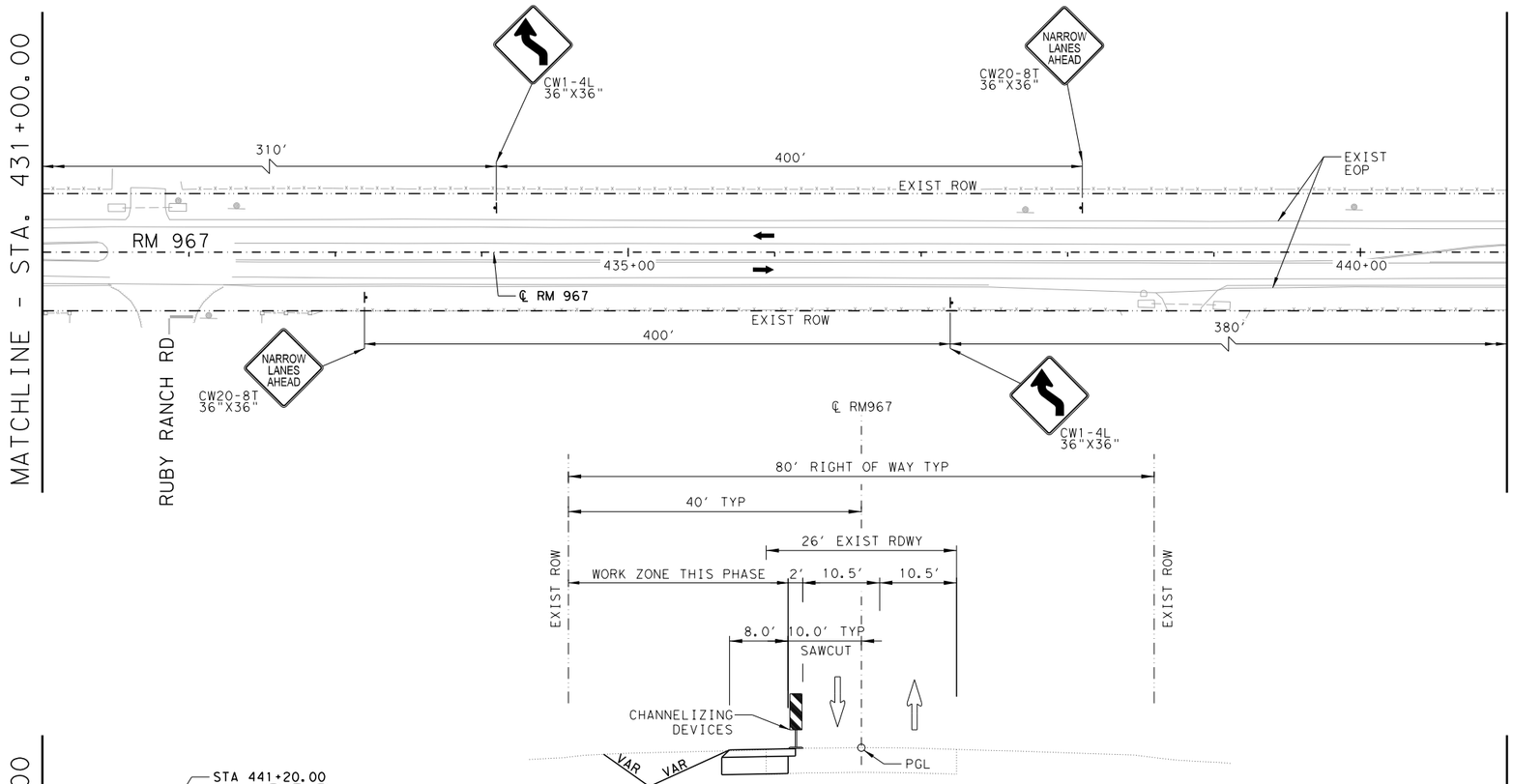

RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A

0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

RM 967

TRAFFIC CONTROL PLAN
PHASE 1
STA 431+00.00 TO
STA 451+00.00

DATE: 5/17/2021 SHEET 2 OF 9

STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	34

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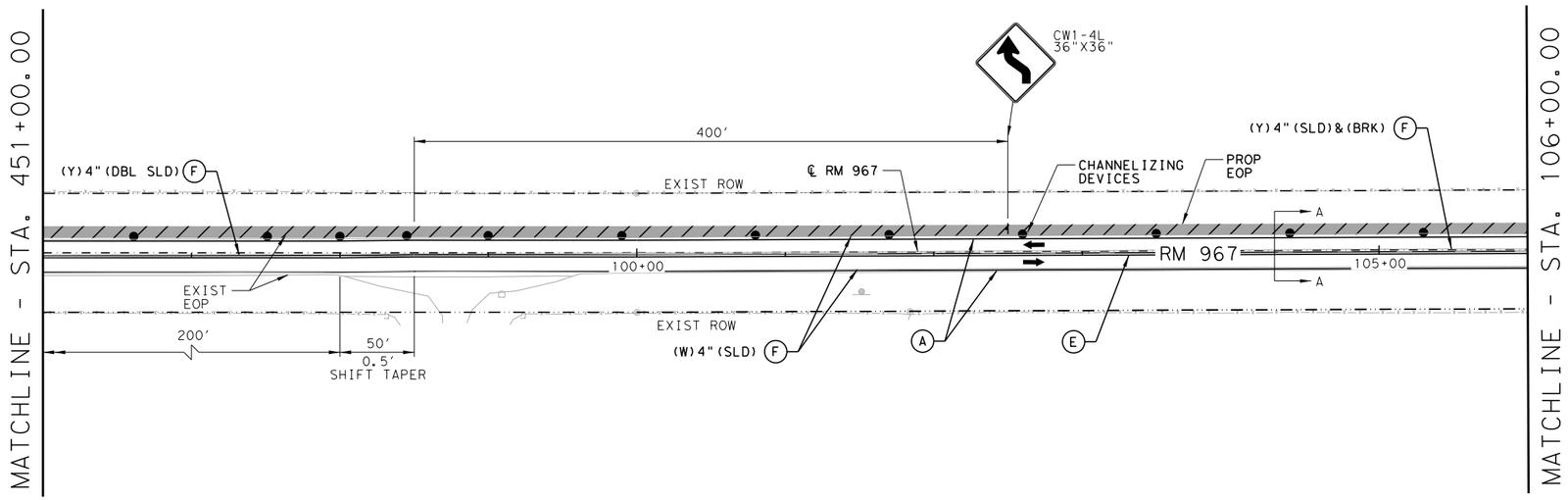
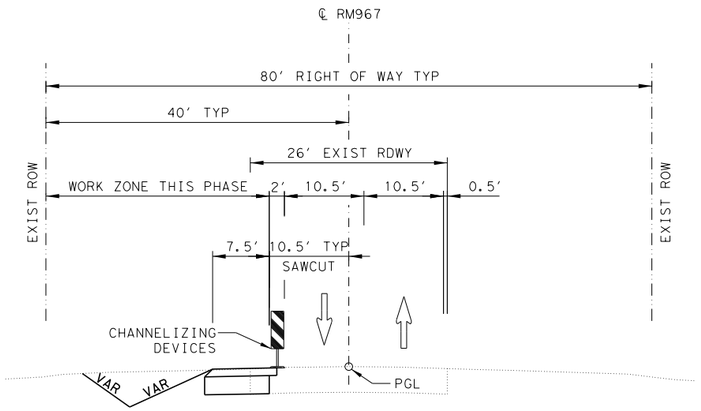
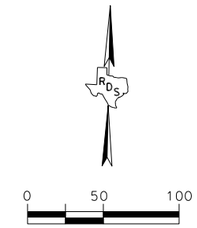




RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 1
STA 451+00.00 TO
STA 106+00.00

DATE: 5/17/2021				SHEET 3 OF 9
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	35

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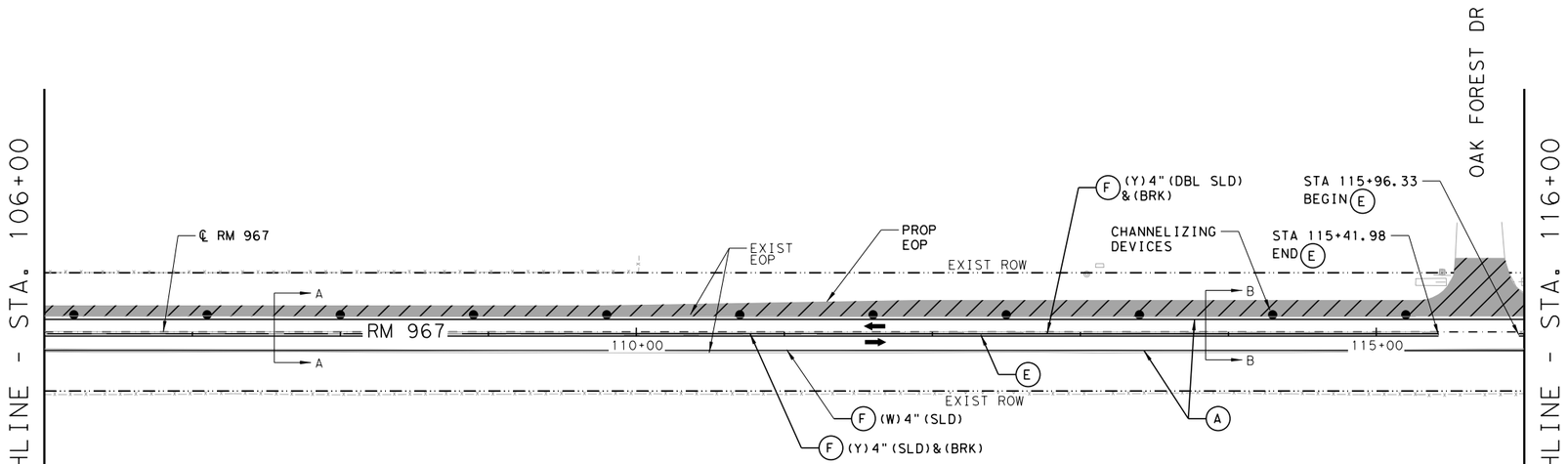
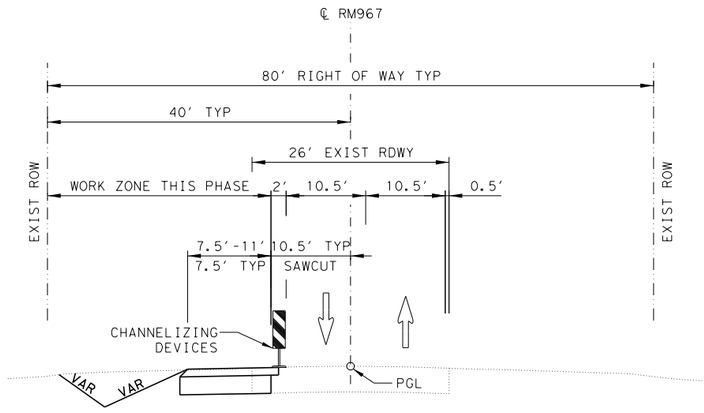
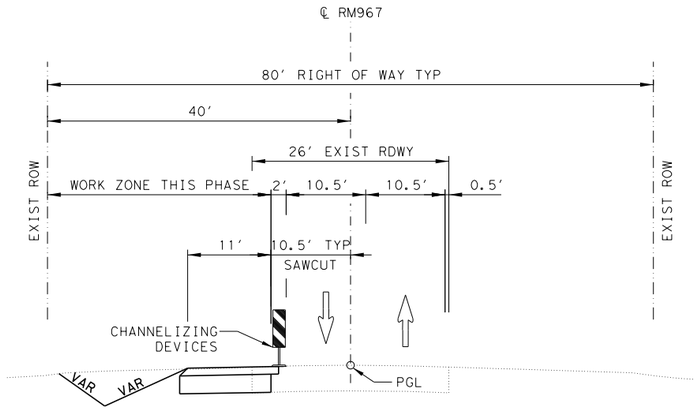
Date: 5/17/2021

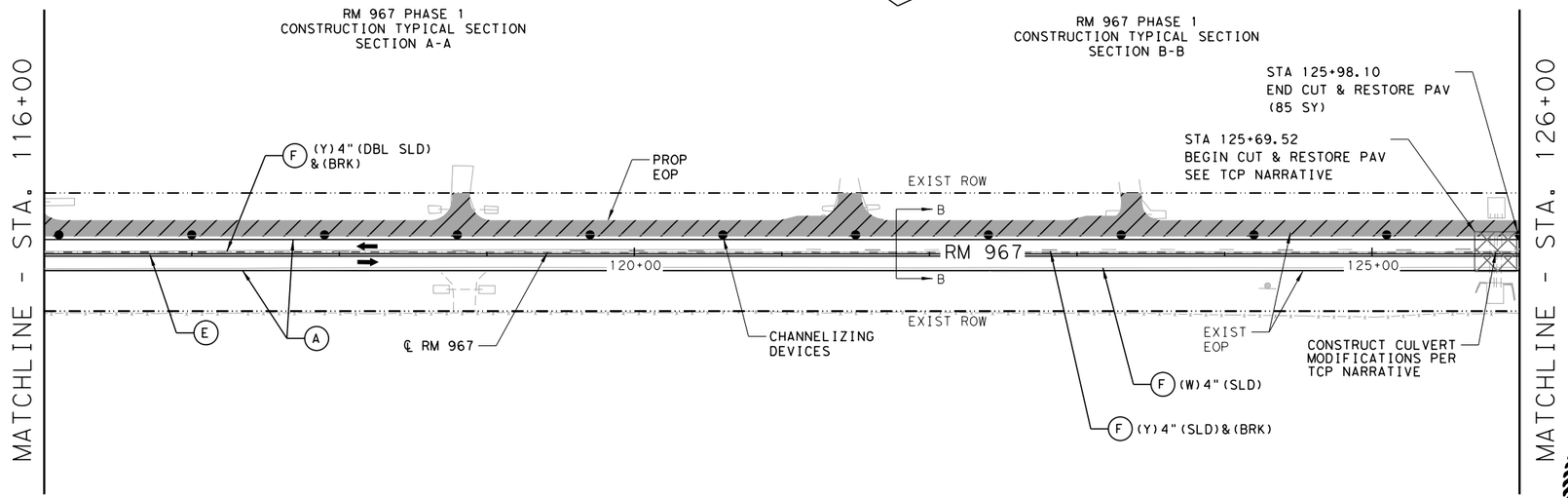




RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION B-B



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

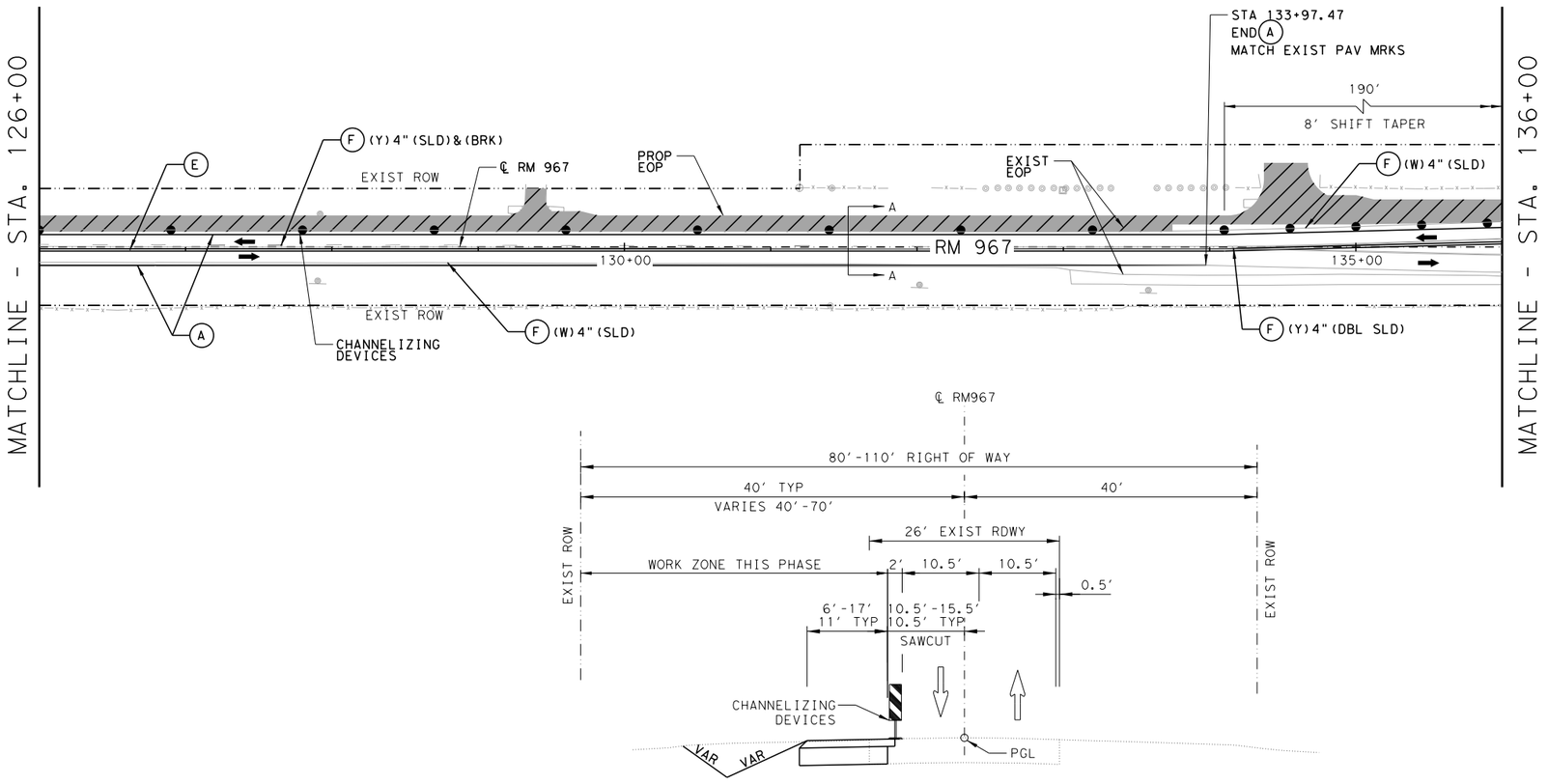
TRAFFIC CONTROL PLAN
PHASE 1
STA 106+00.00 TO
STA 126+00.00

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

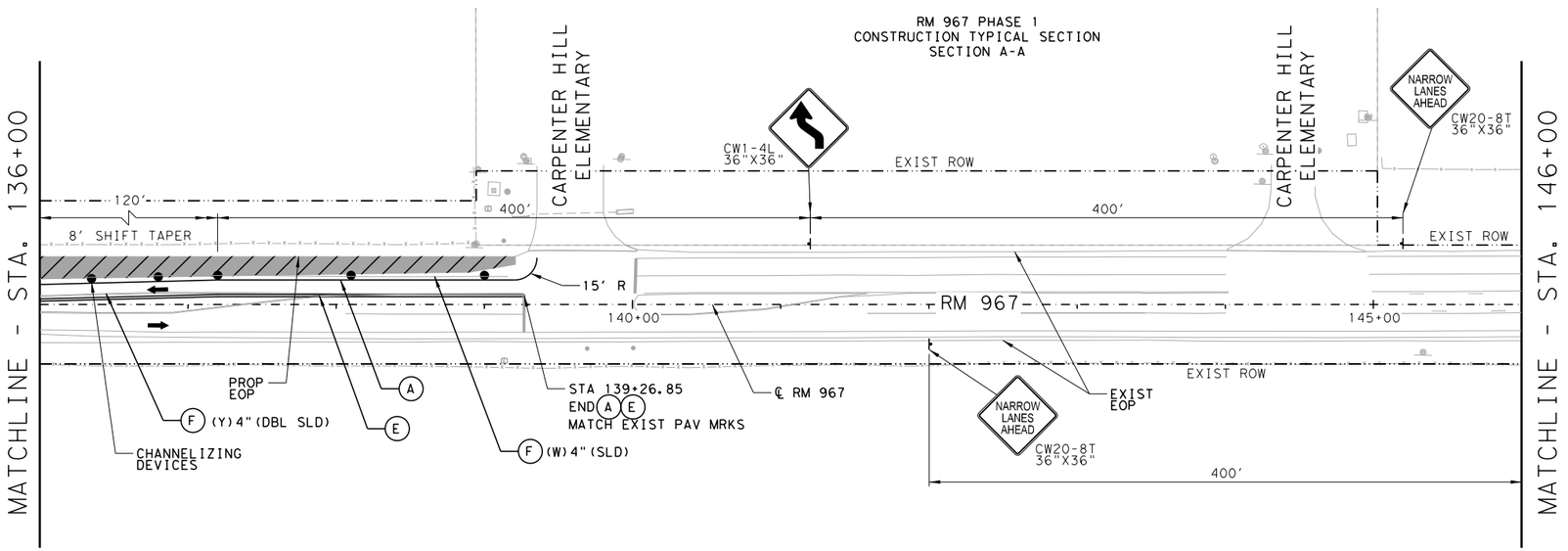
5/17/2021

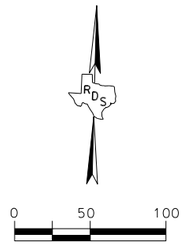
DATE: 5/17/2021			SHEET 4 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	36

Filename: ...\Cad\Plan\015012-000*TC14.dgn
Date: 5/17/2021



RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A





LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 1
STA 126+00.00 TO
STA 146+00.00

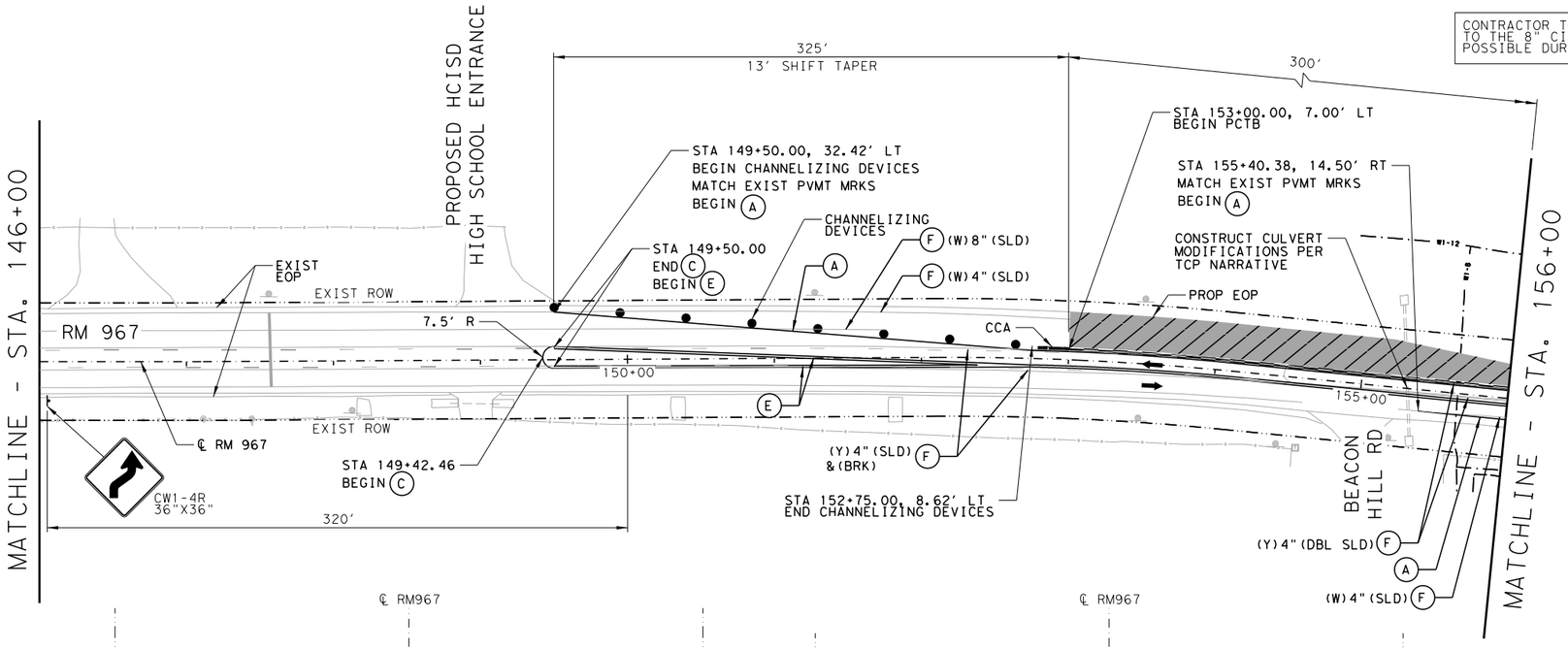
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

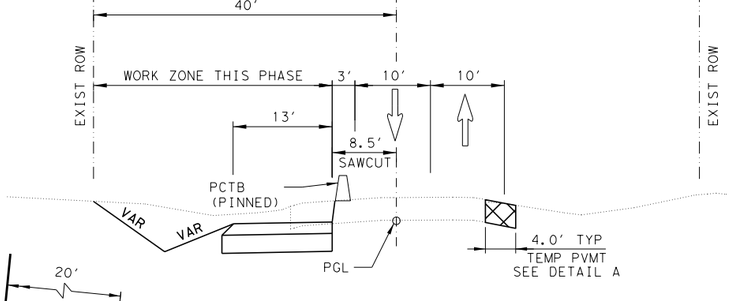
Daniel A. Rogers
5/17/2021

DATE: 5/17/2021			SHEET 5 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	37

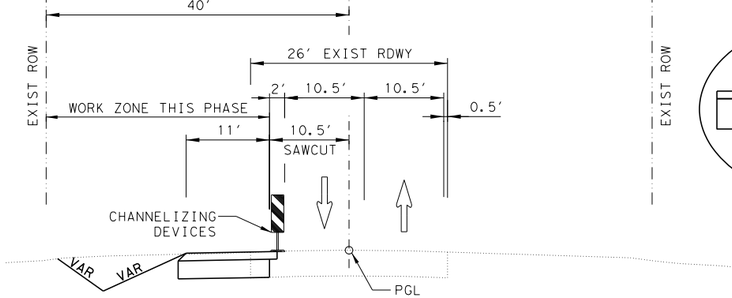
Filename: ...\Cad\Plan\015012-000*TC15.dgn
Date: 5/17/2021

CONTRACTOR TO BE AWARE THAT ADJUSTMENTS TO THE 8" CITY OF BUDA WATERLINE IS POSSIBLE DURING CONSTRUCTION.

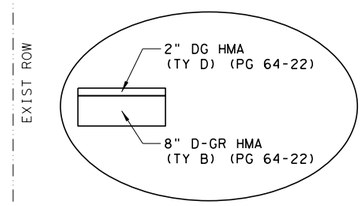




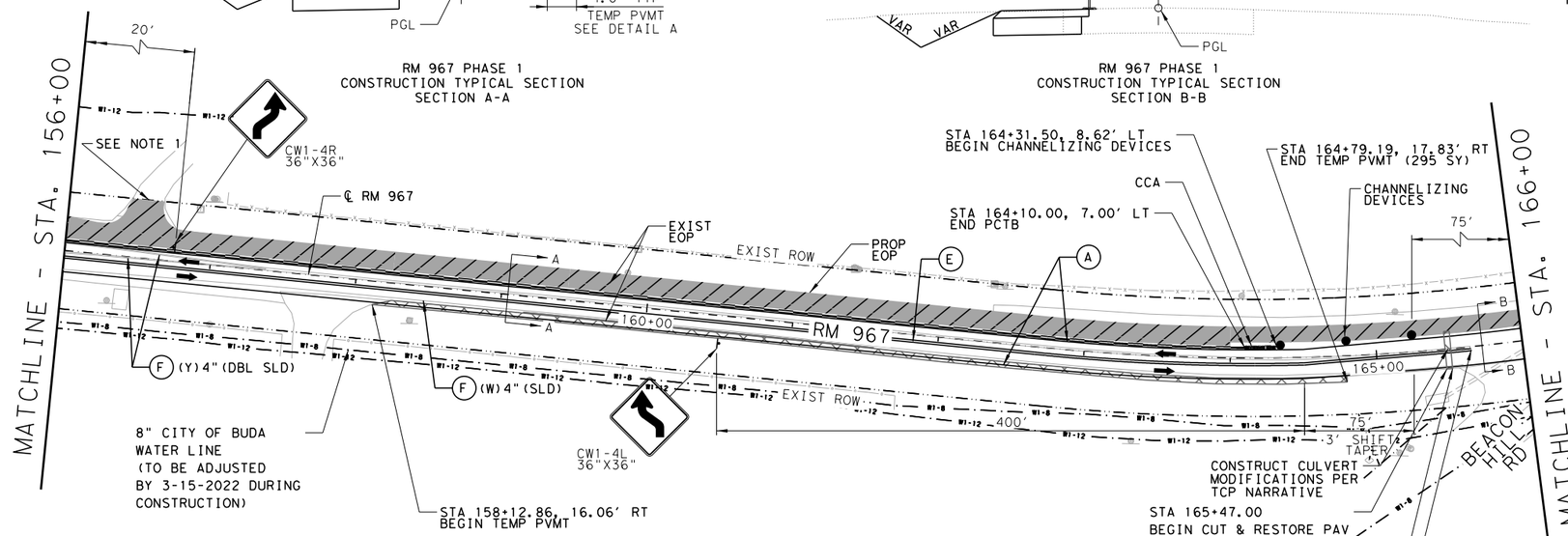
RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



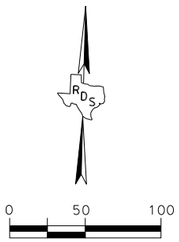
RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION B-B



DETAIL A
TEMPORARY PAVEMENT
TYPICAL SECTION



NOTES:
1. CONTRACTOR TO COORDINATE DRIVEWAY ACCESS WITH UTILITY OPERATOR.



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

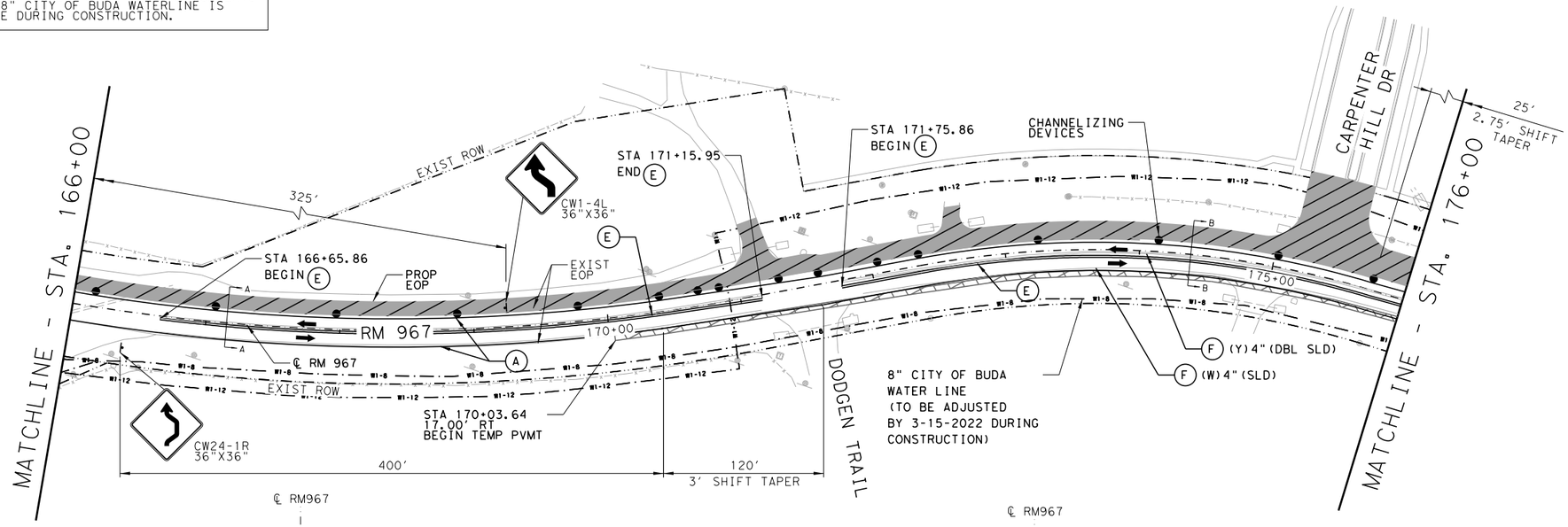
TRAFFIC CONTROL PLAN PHASE 1 STA 146+00.00 TO STA 166+00.00

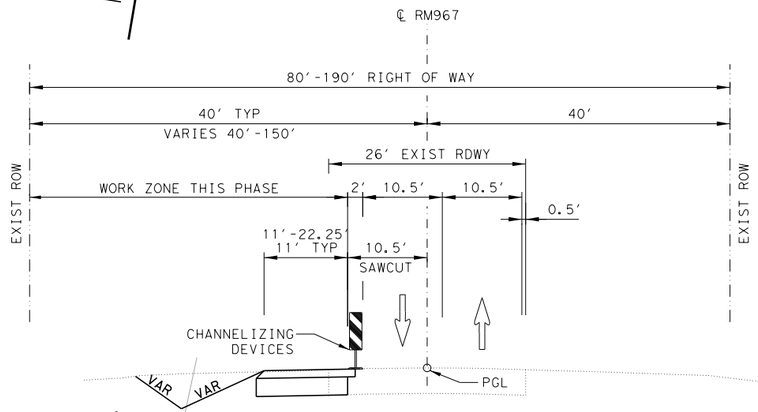
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER
6/17/2021

DATE: 6/17/2021			SHEET 6 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	38

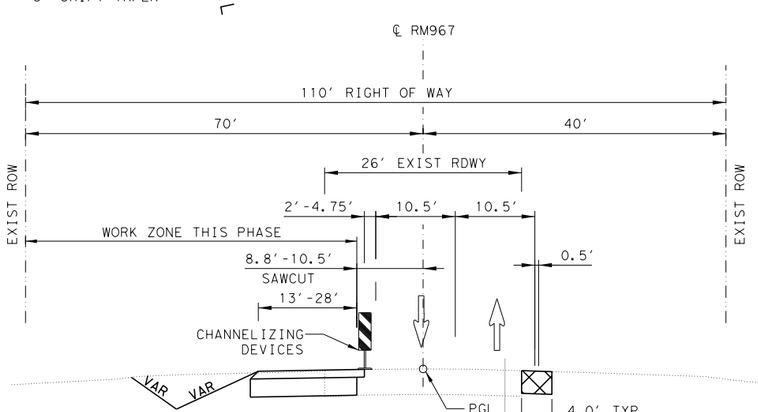
Filename: ...\Cad\Plan\015012-000*TC16.dgn
Date: 6/17/2021

CONTRACTOR TO BE AWARE THAT ADJUSTMENTS TO THE 8" CITY OF BUDA WATERLINE IS POSSIBLE DURING CONSTRUCTION.

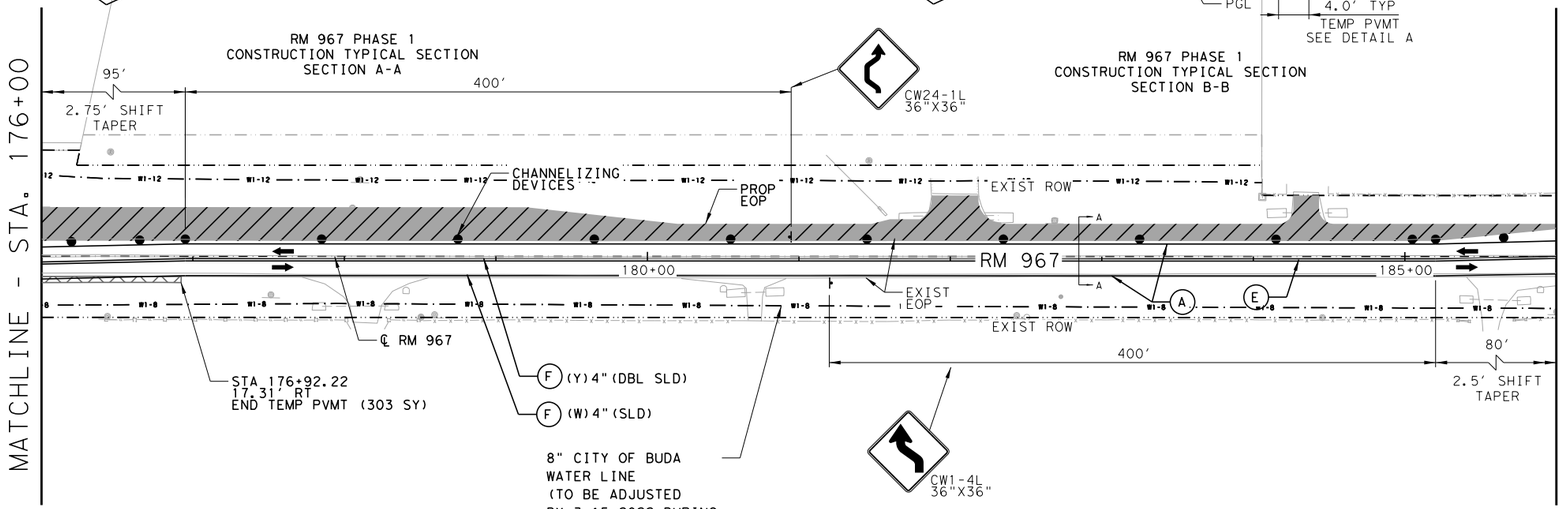




RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



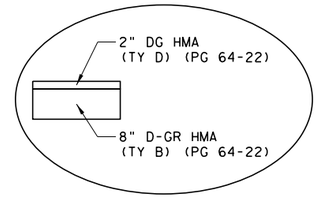
RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION B-B



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)



DETAIL A
TEMPORARY PAVEMENT
TYPICAL SECTION

Daniel A. Rogers
6/17/2021

Texas Department of Transportation

HAYS COUNTY

wsb
WSB & ASSOCIATES, INC.
FIRM # 16849

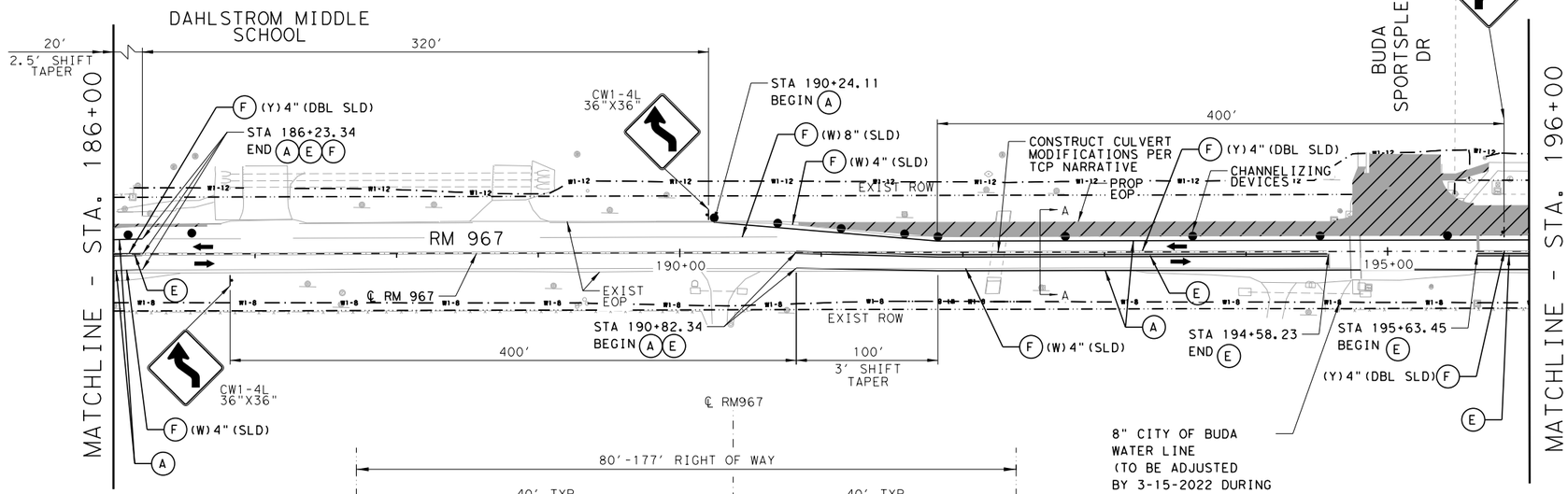
RM 967

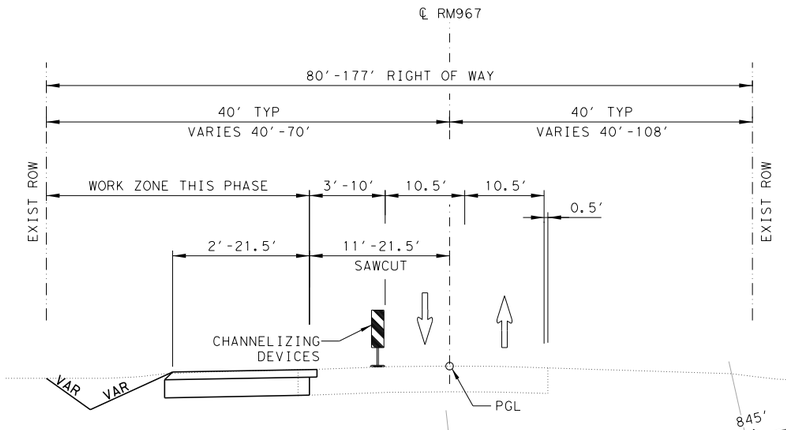
TRAFFIC CONTROL PLAN
PHASE 1
STA 166+00.00 TO
STA 186+00.00

DATE: 6/17/2021			SHEET 7 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	39

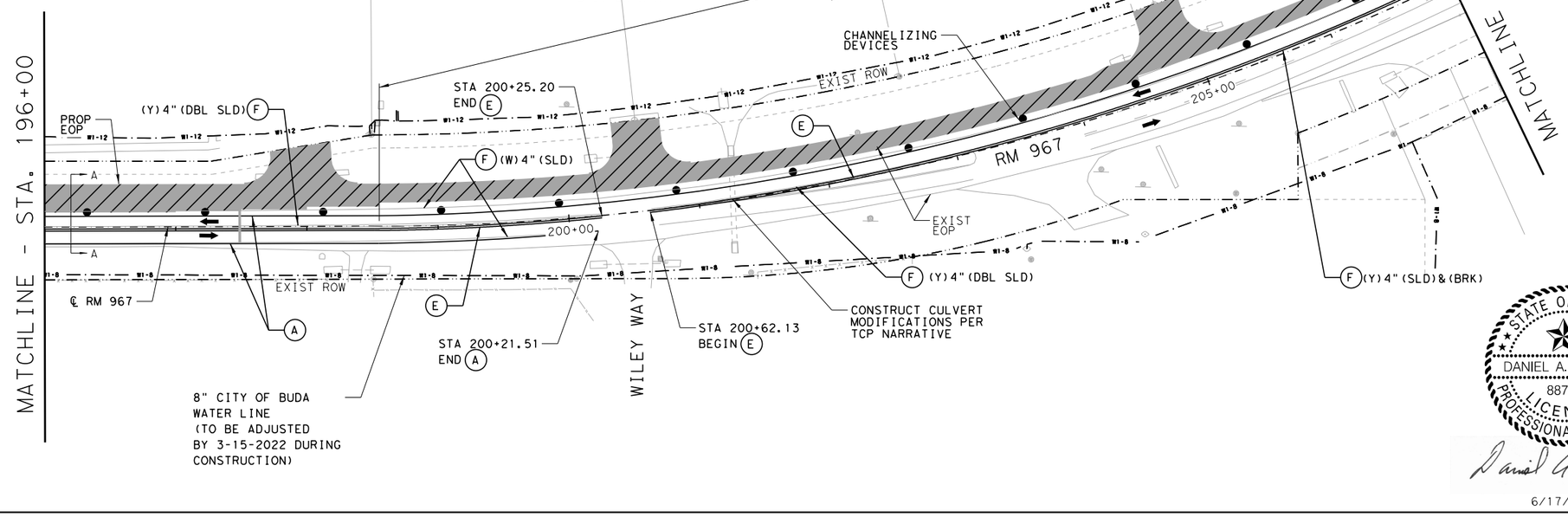
Filename: ...\Cad\Plan\015012-000*TC17.dgn
Date: 6/17/2021

CONTRACTOR TO BE AWARE THAT ADJUSTMENTS TO THE 8" CITY OF BUDA WATERLINE IS POSSIBLE DURING CONSTRUCTION.





RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

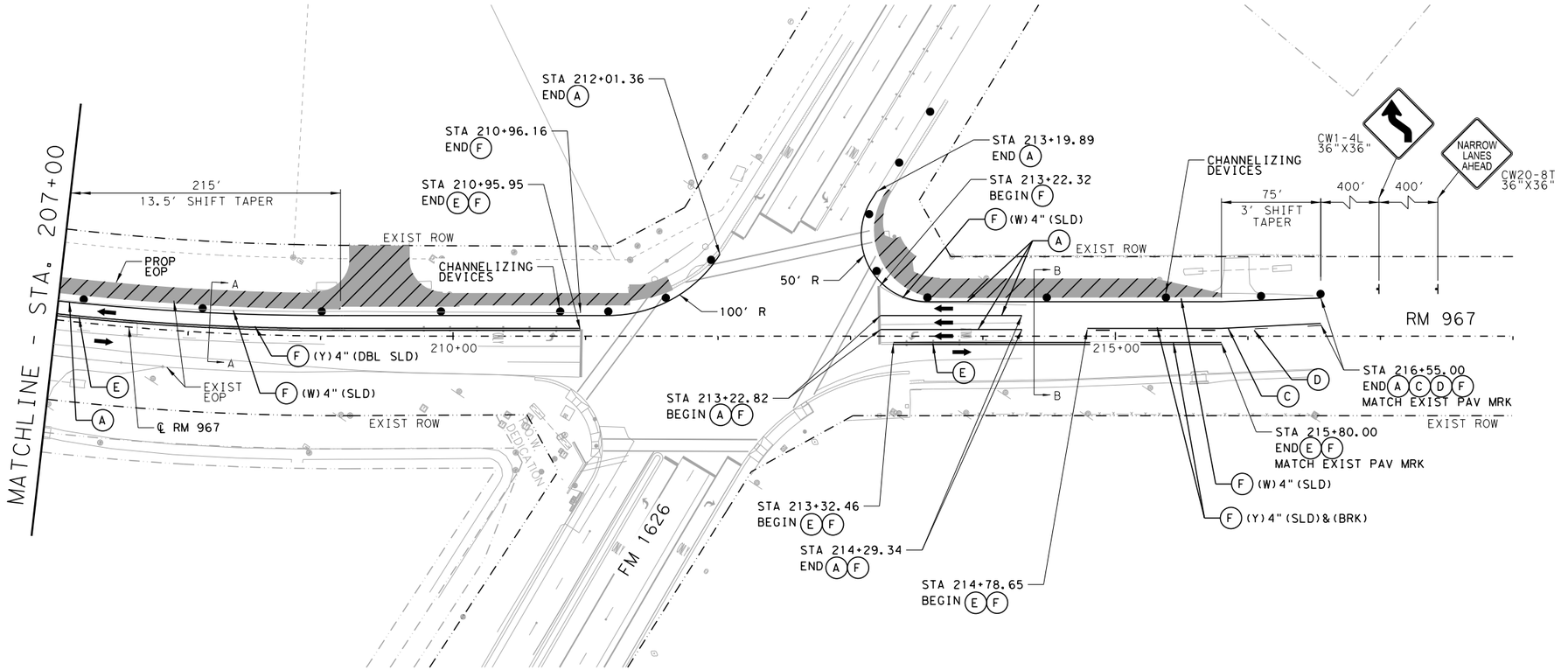
TRAFFIC CONTROL PLAN PHASE 1 STA 186+00.00 TO STA 207+00.00

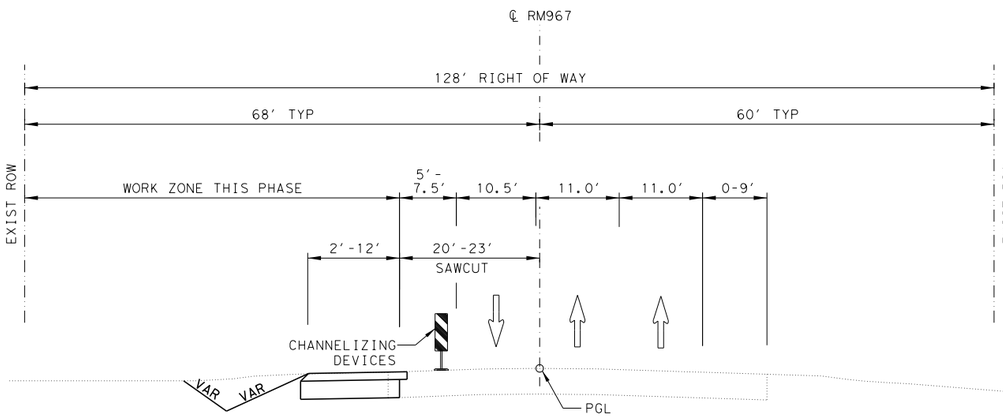
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

6/17/2021

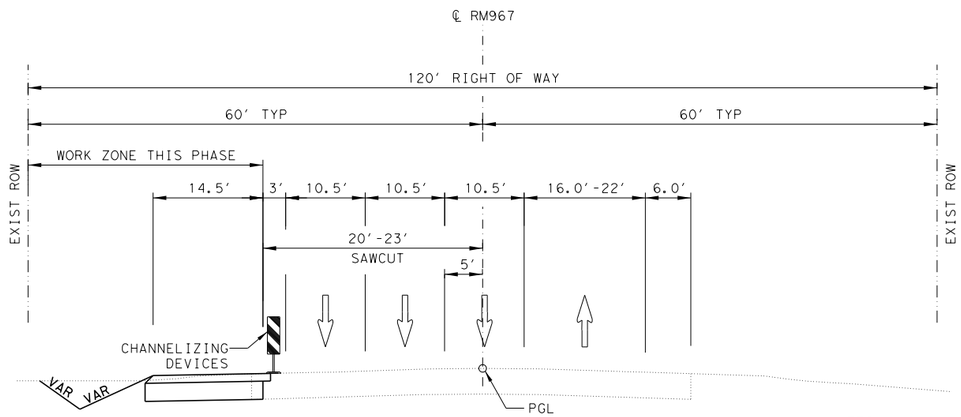
DATE: 6/17/2021			SHEET 8 OF 9
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	40

Filename: ...\Cad\Plan\015012-000*TC18.dgn
Date: 6/17/2021

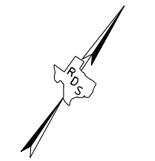




RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION A-A



RM 967 PHASE 1
CONSTRUCTION TYPICAL SECTION
SECTION B-B



0 50 100

LEGEND

- CHANNELIZING DEVICE
  50' C-C ON TAPER
  100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

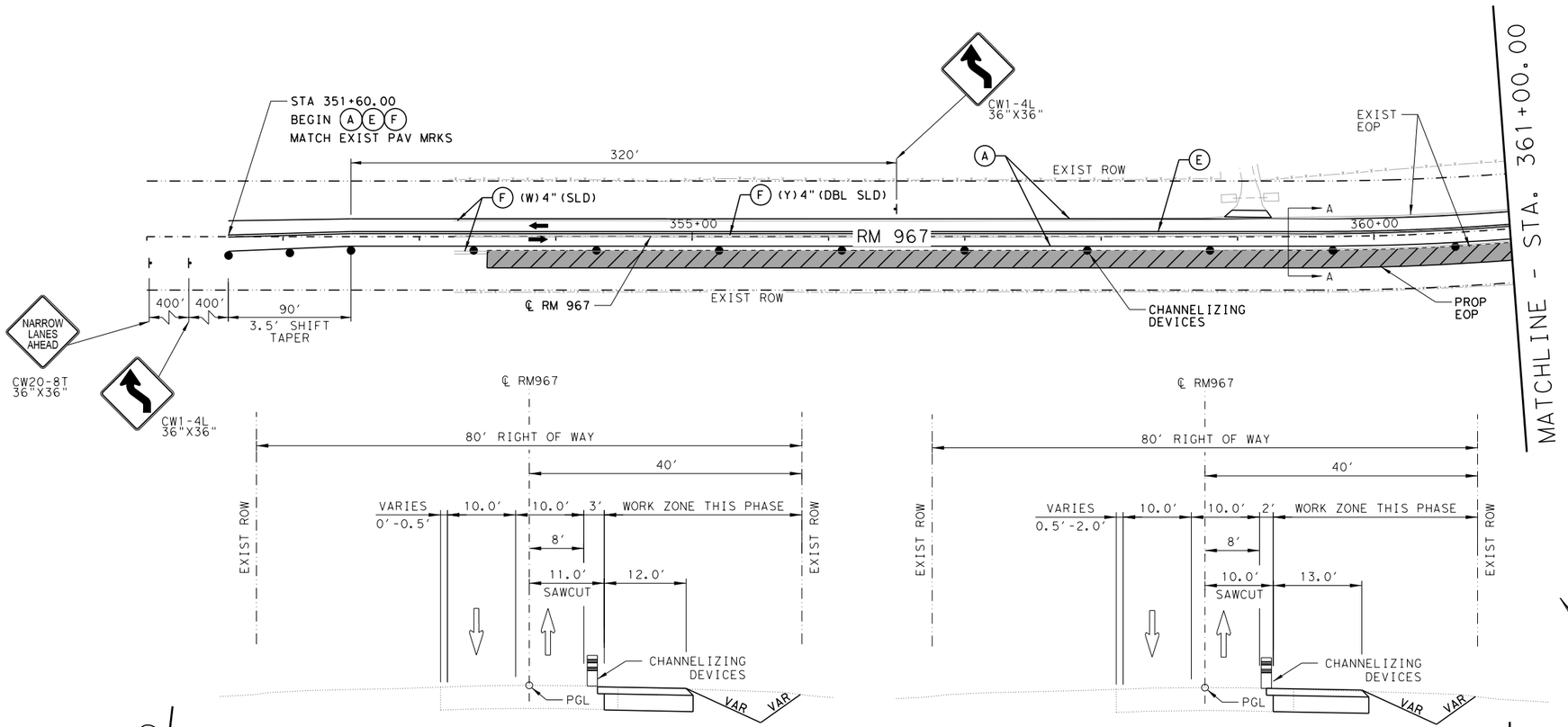
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 1
STA 207+00.00 TO
END PROJECT

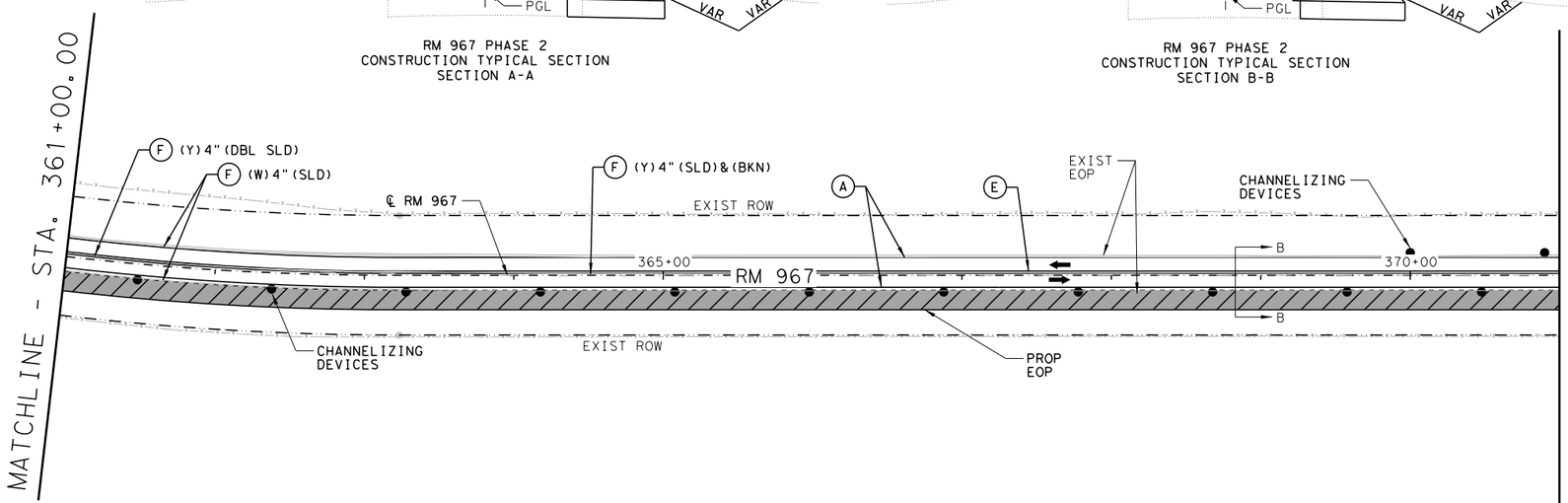
DATE: 5/17/2021				SHEET 9 OF 9
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	41

Filename: ...\Cad\Plan\015012-000*TC19.dgn
Date: 5/17/2021



RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A

RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION B-B



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

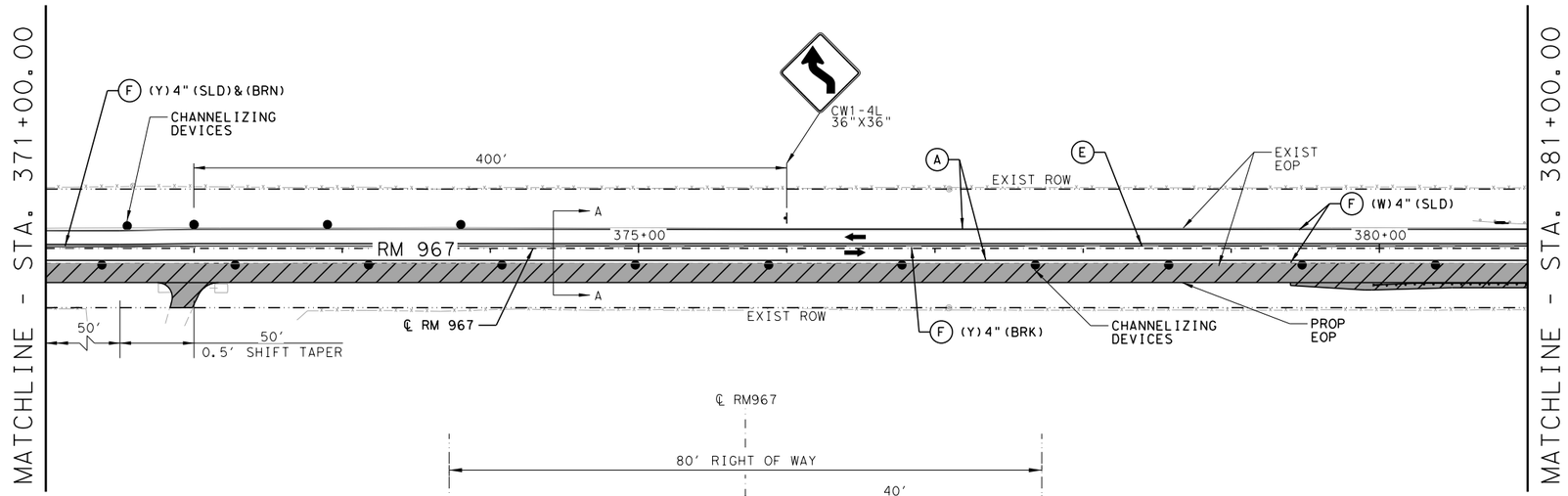
TRAFFIC CONTROL PLAN
PHASE 2
BEGIN PROJECT TO
STA 371+00.00

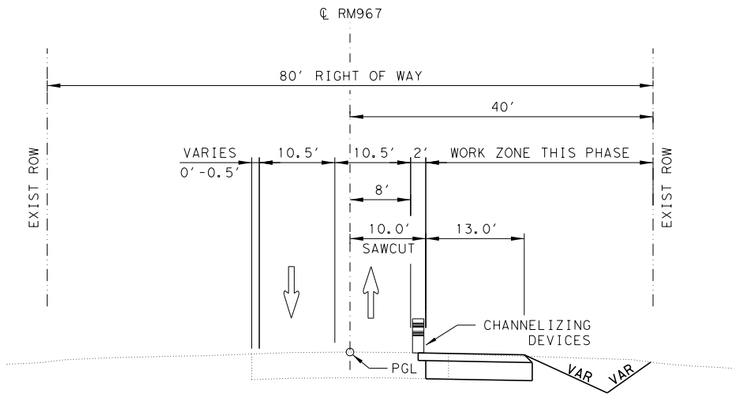
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

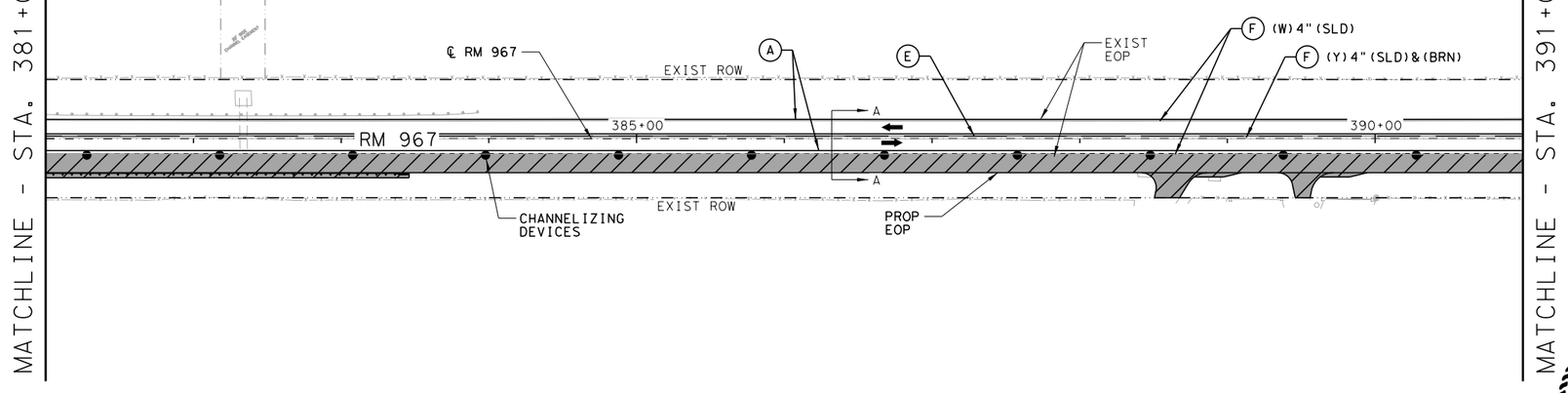
DATE: 5/17/2021			SHEET 1 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	42

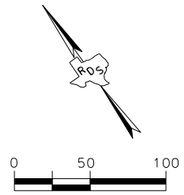
Filename: ...\Cad\Plan\015012-000*TC21.dgn
Date: 5/17/2021





RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A





LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

RM 967

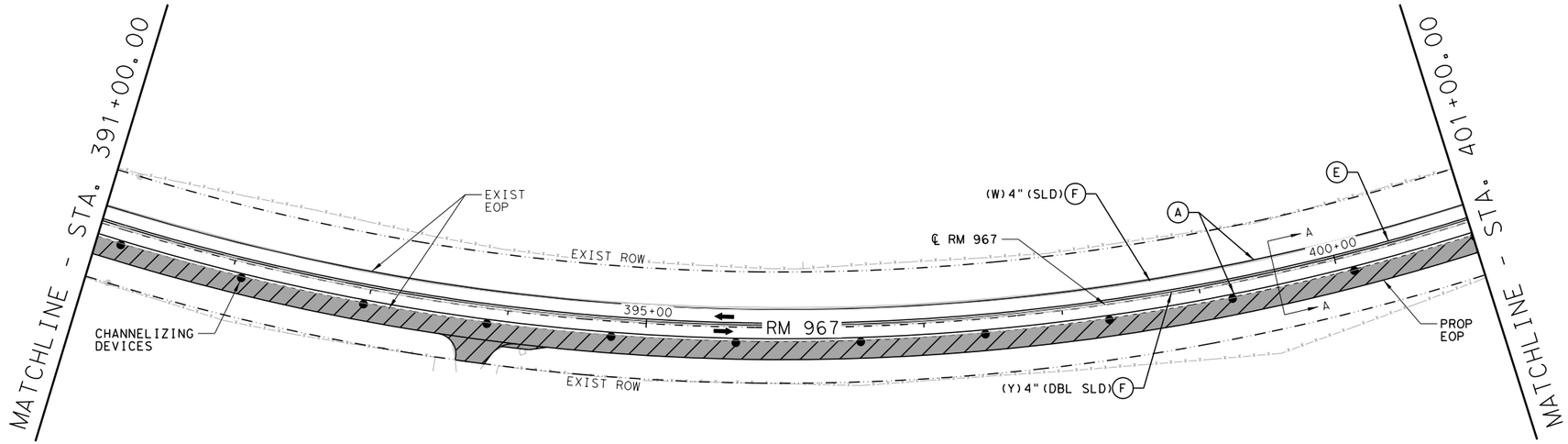
TRAFFIC CONTROL PLAN
PHASE 2
STA 371+00.00 TO
STA 391+00.00

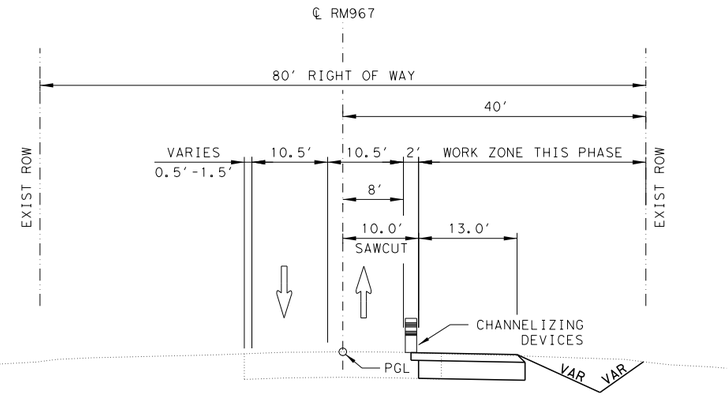
DATE: 5/17/2021 SHEET 2 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

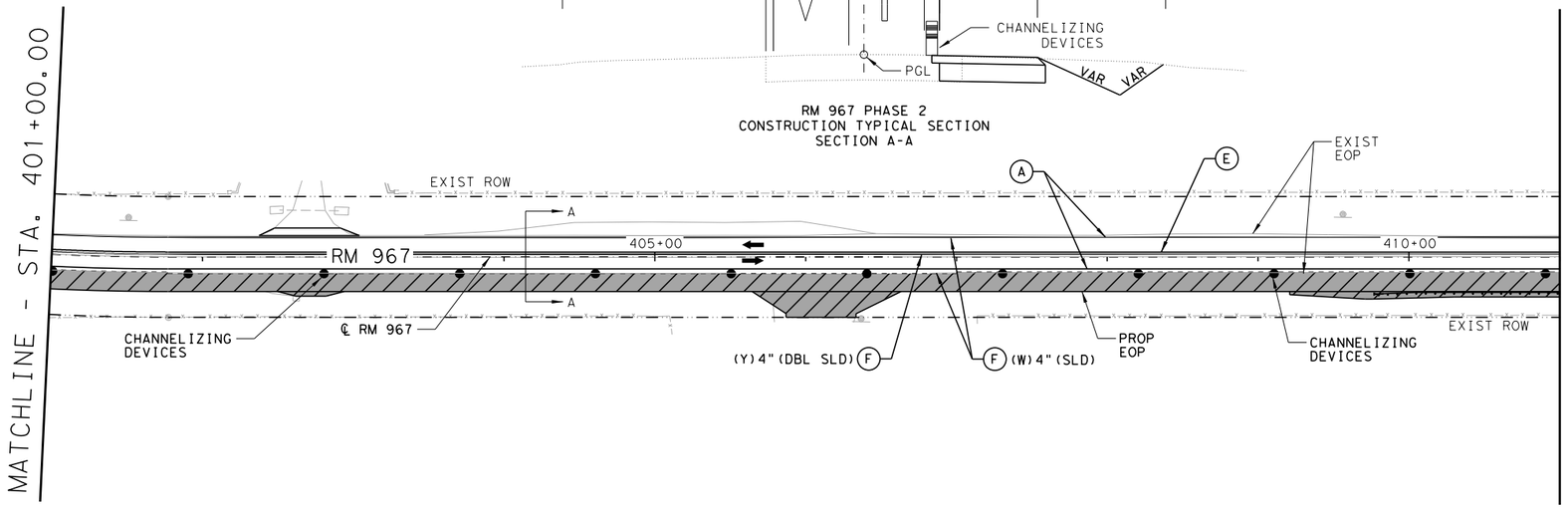
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	43

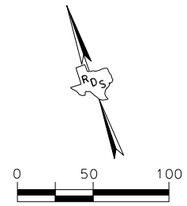
Filename: ...\Cad\Plan\015012-000*TC22.dgn
Date: 5/17/2021





RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A





LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 2
STA 391+00.00 TO
STA 411+00.00

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

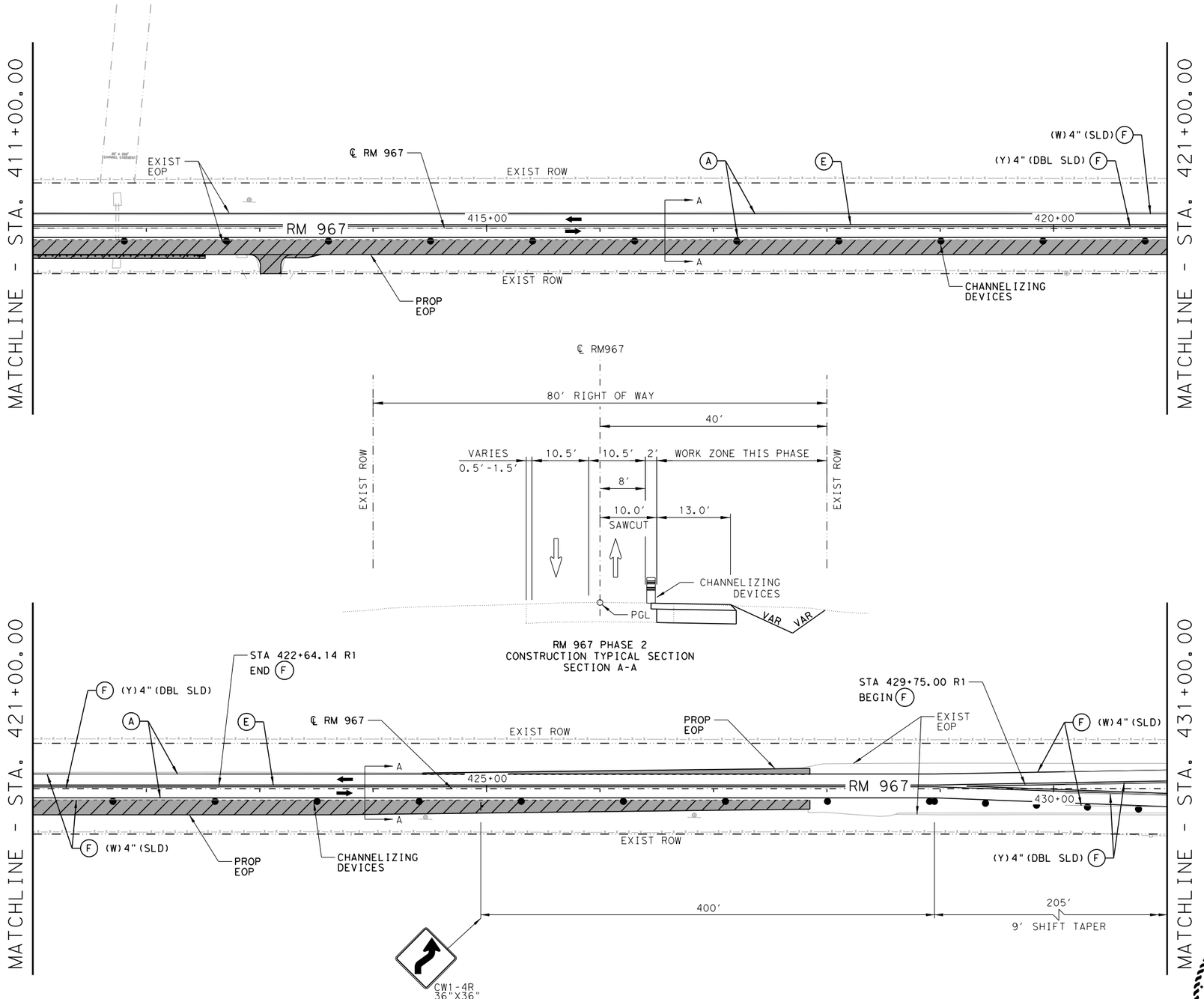
5/17/2021

DATE: 5/17/2021 SHEET 3 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	44

Filename: ...\CadPlan\015012-000+TC23.dgn
Date: 5/17/2021



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

NOTE: CONTRACTOR TO WORK AROUND CHANNELIZING DEVICES.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

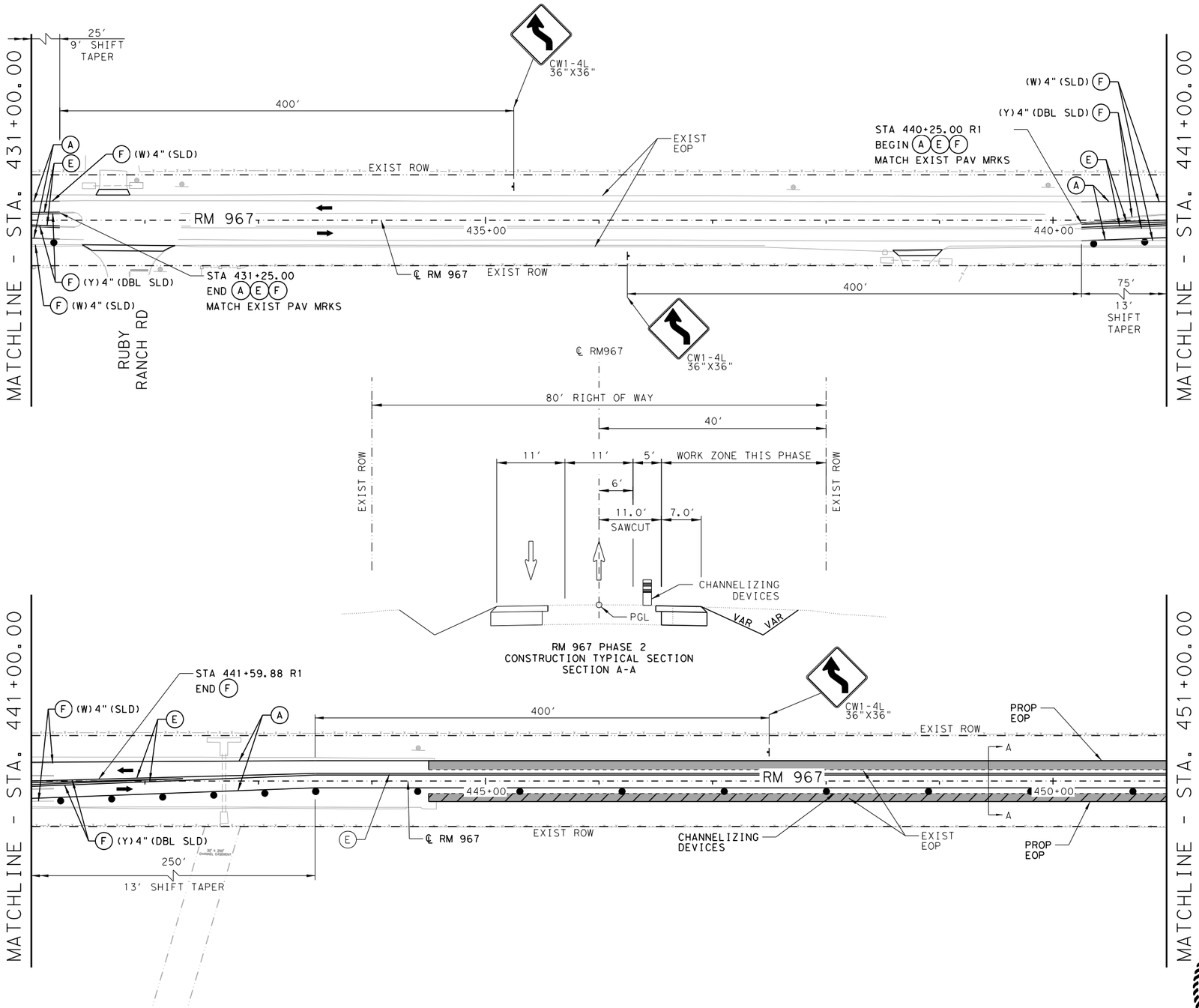
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 2
STA 411+00.00 TO
STA 431+00.00

DATE: 5/17/2021				SHEET 4 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	45

Filename: ...\Cad\Plan\015012-000*TC24.dgn
Date: 5/17/2021



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

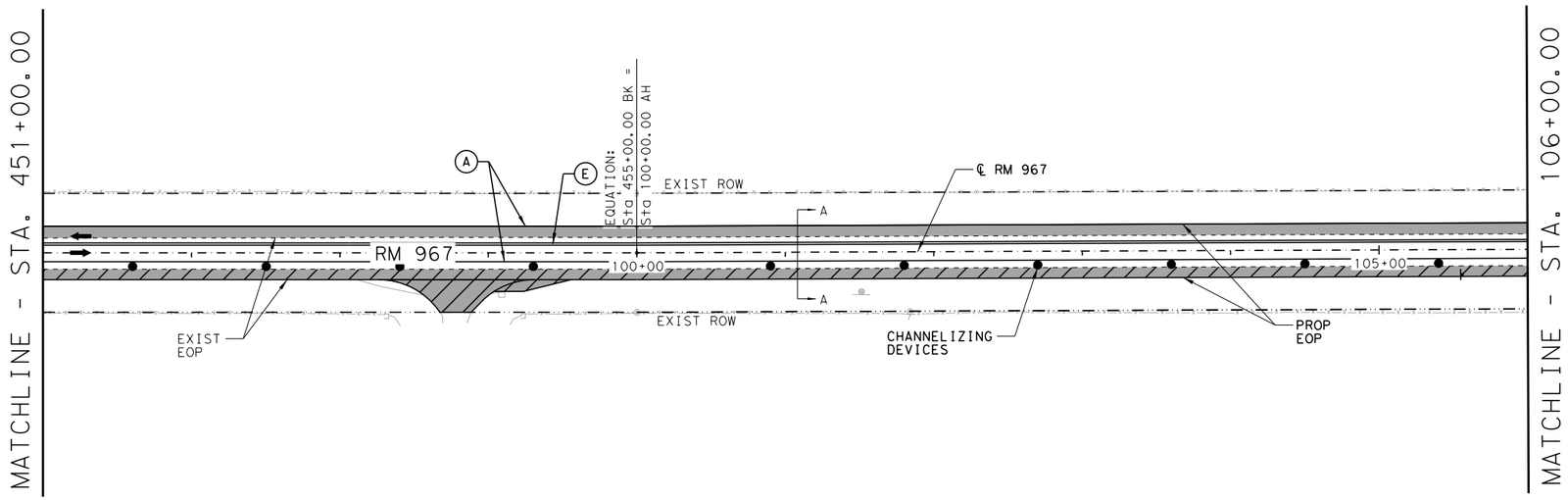
TRAFFIC CONTROL PLAN
PHASE 2
STA 431+00.00 TO
STA 451+00.00

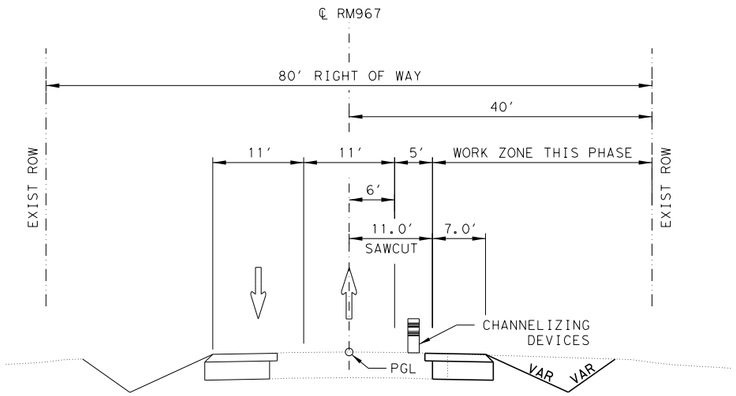
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

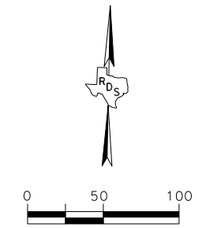
DATE: 5/17/2021			SHEET 5 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	46

Filename: ...\Cad\Plan\015012-000+TC25.dgn
Date: 5/17/2021





RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

RM 967

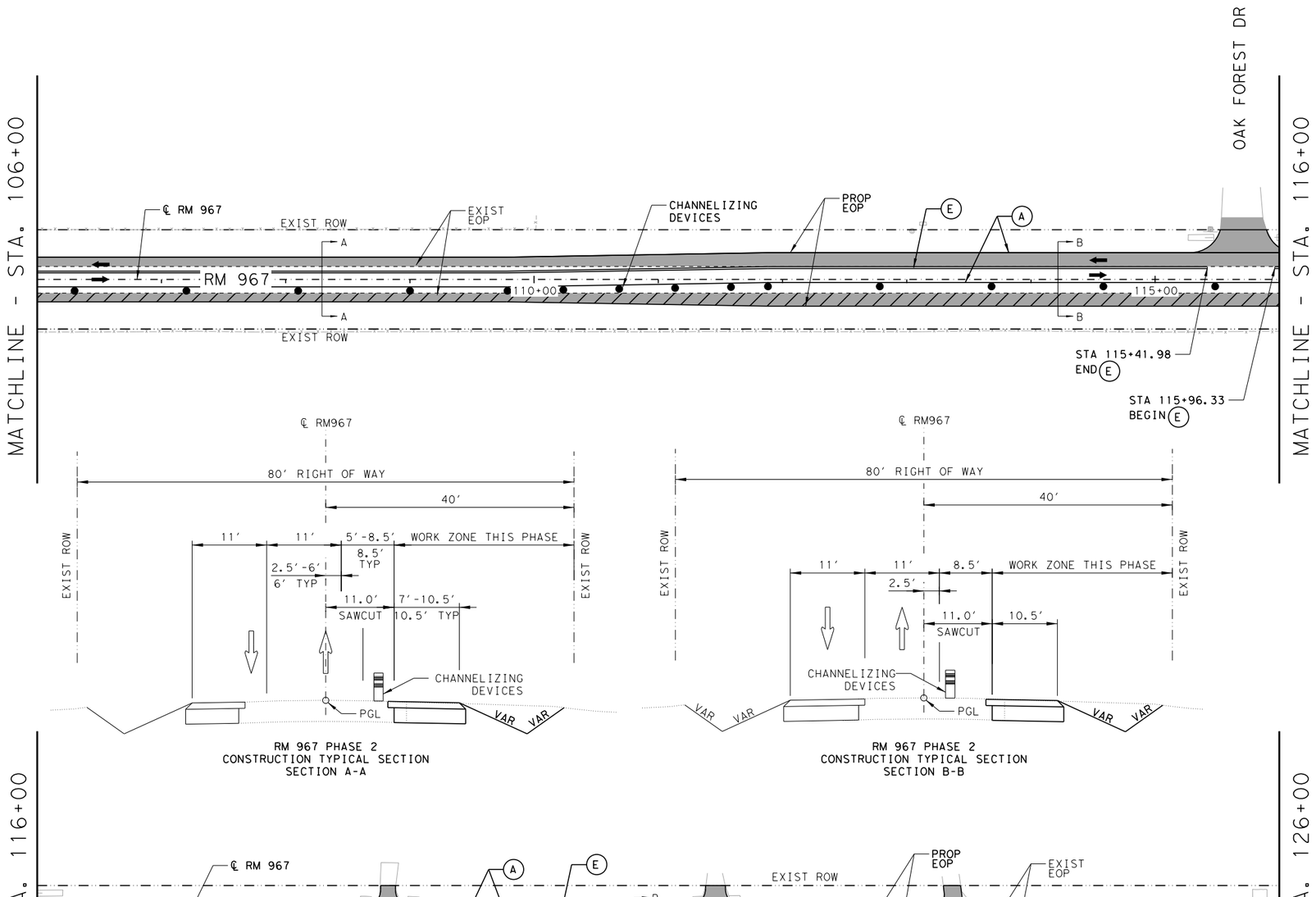
TRAFFIC CONTROL PLAN PHASE 2 STA 451+00.00 TO STA 106+00.00

DATE: 5/17/2021 SHEET 6 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

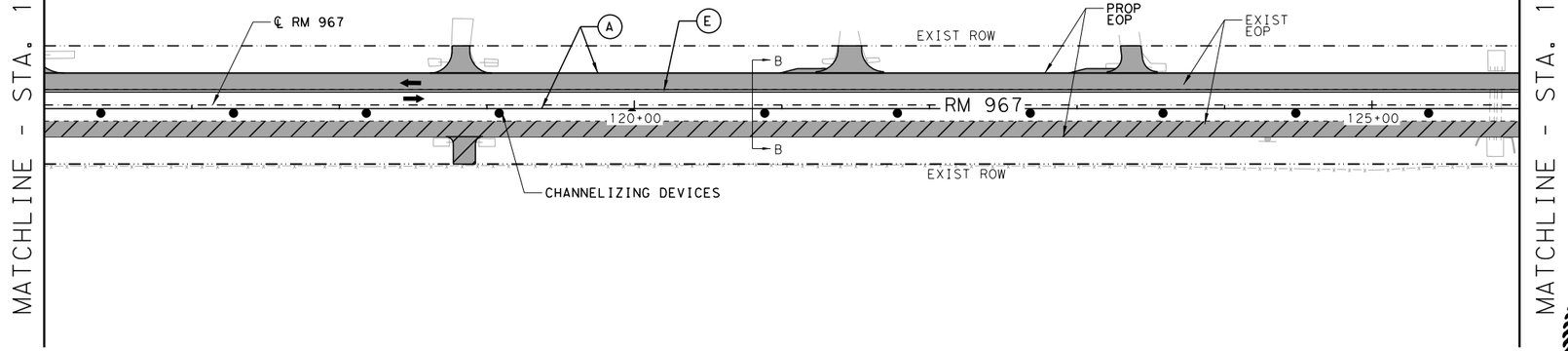
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	47

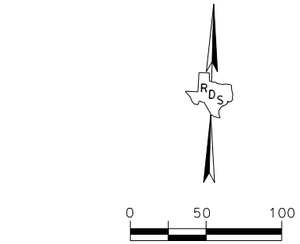
Filename: ...\Cad\Plan\015012-000*TC26.dgn
Date: 5/17/2021



RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A

RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION B-B





LEGEND

- CHANNELIZING DEVICE 50′ C-C ON TAPER 100′ C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

RM 967

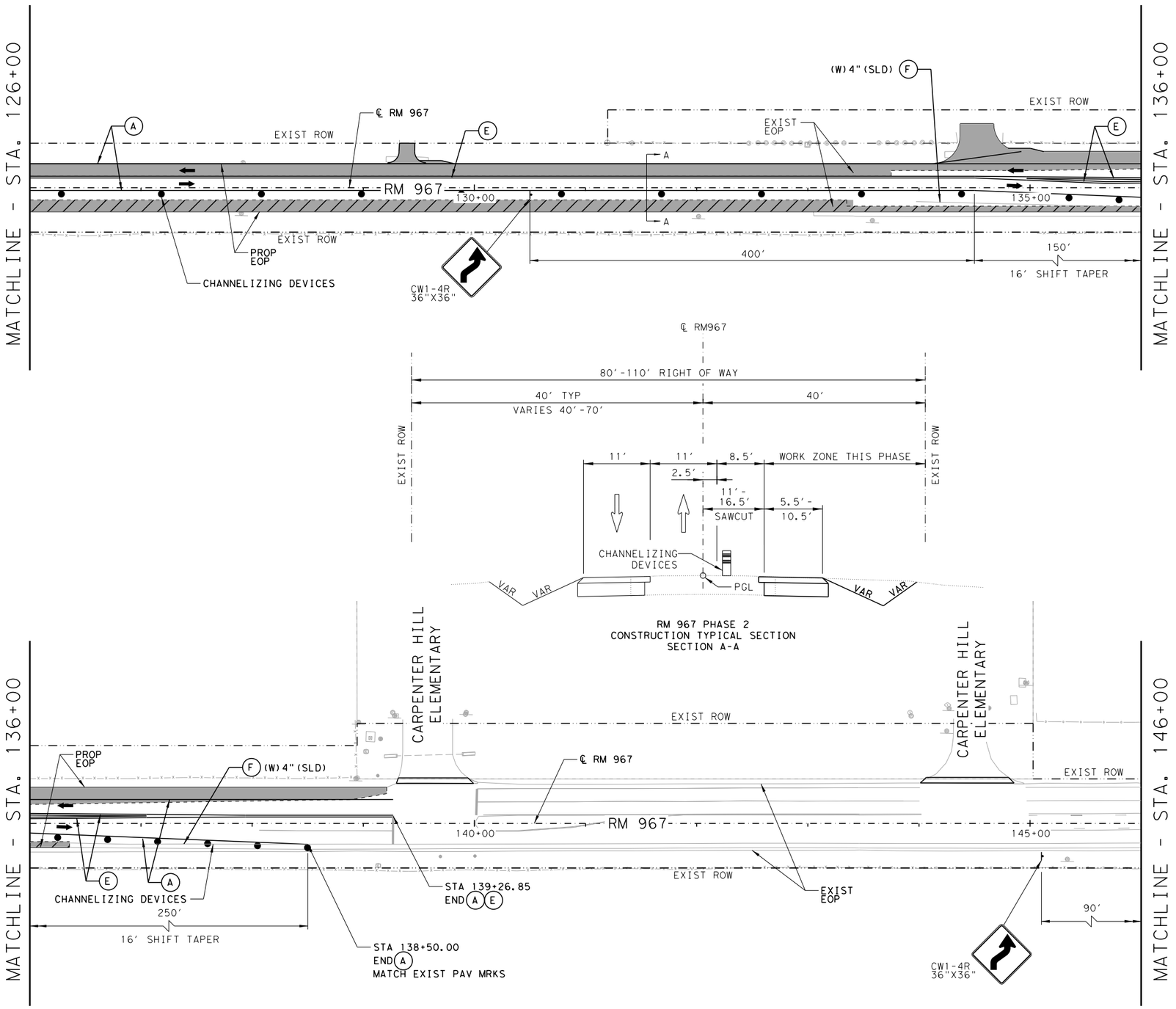
TRAFFIC CONTROL PLAN PHASE 2 STA 106+00.00 TO STA 126+00.00

DATE: 5/17/2021 SHEET 7 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	48

Filename: ...\CadPlan\015012-000*TC27.dgn
Date: 5/17/2021



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN
PHASE 2
STA 126+00.00 TO
STA 146+00.00

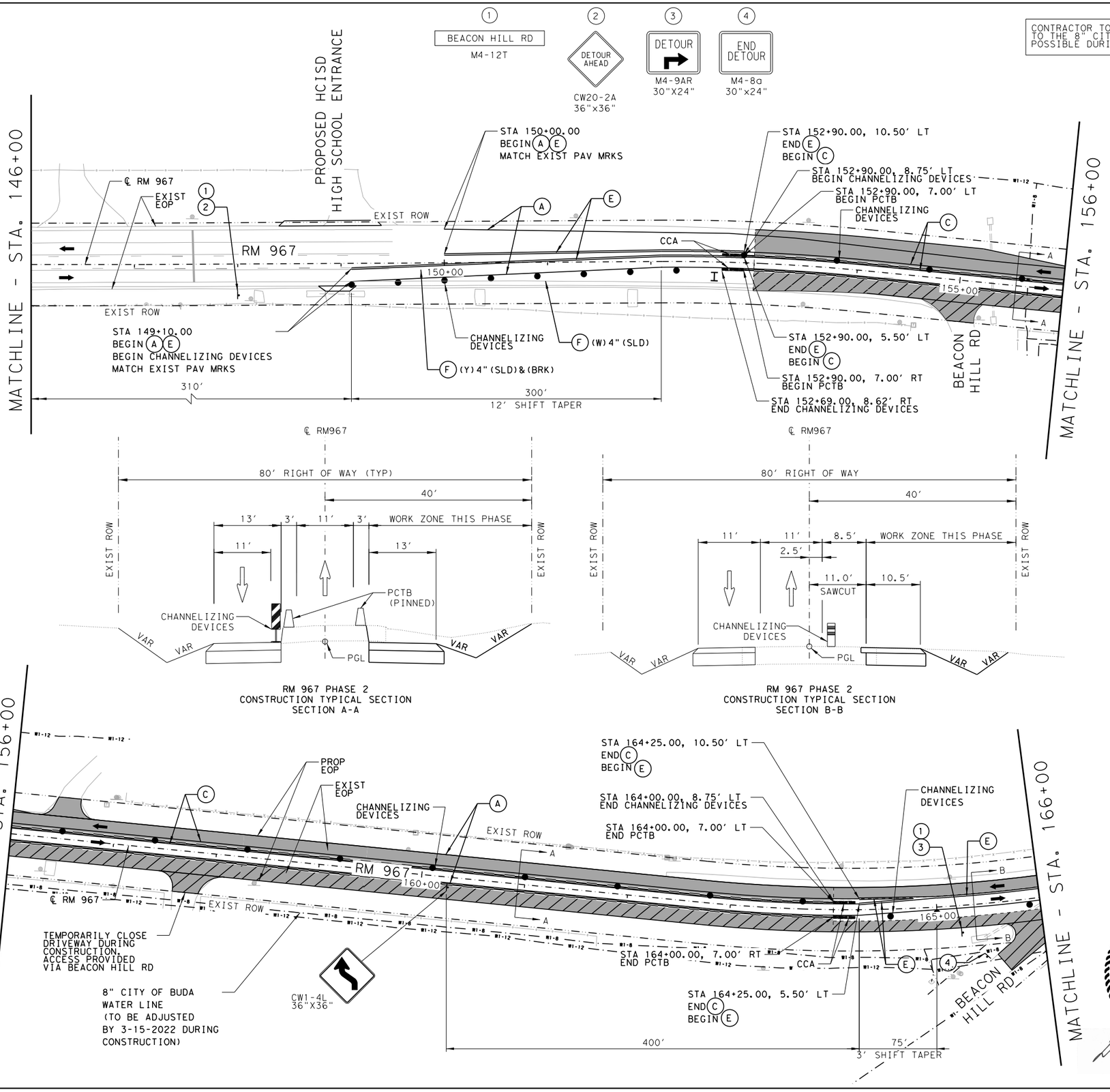
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

DATE: 5/17/2021			SHEET 8 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	49

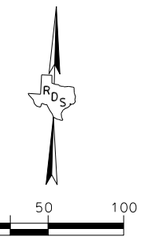
Filename: ...\Cad\Plan\015012-000*TC28.dgn
Date: 5/17/2021

CONTRACTOR TO BE AWARE THAT ADJUSTMENTS TO THE 8" CITY OF BUDA WATERLINE IS POSSIBLE DURING CONSTRUCTION.



RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A

RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION B-B



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN PHASE 2 STA 146+00.00 TO STA 166+00.00

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER
6/17/2021

DATE: 6/17/2021			SHEET 9 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	50

Filename: ...\Cad\Plan\015012-000*TC29.dgn
Date: 6/17/2021

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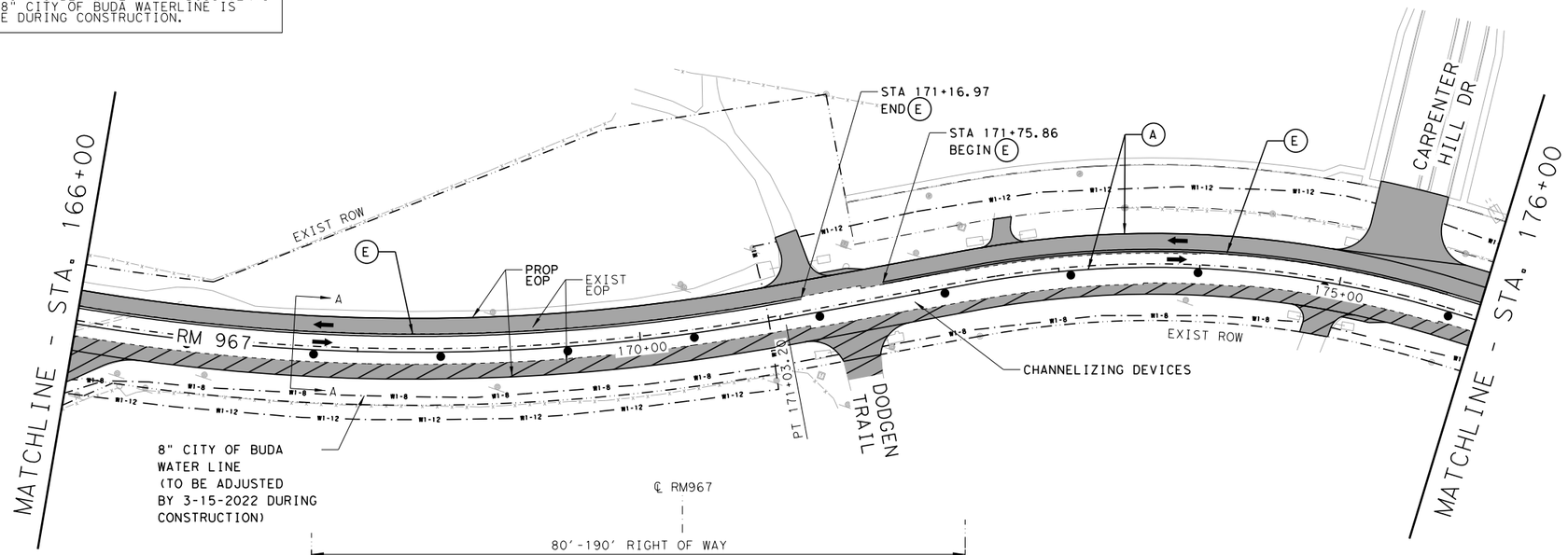
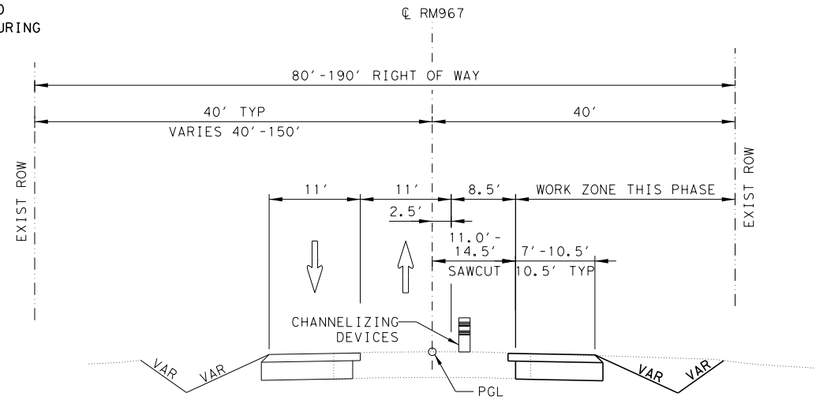
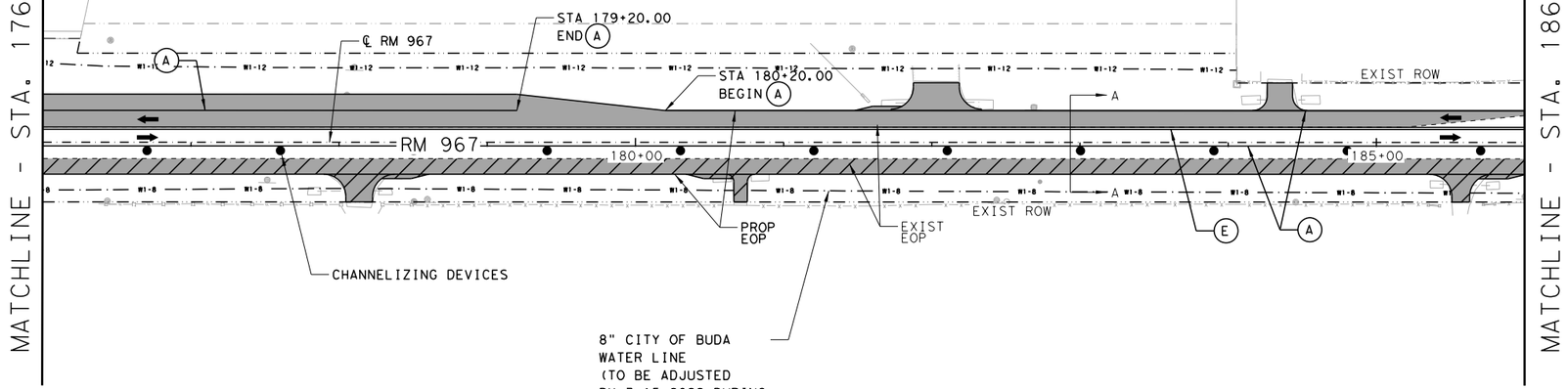




RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A



0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN PHASE 2 STA 166+00.00 TO STA 186+00.00

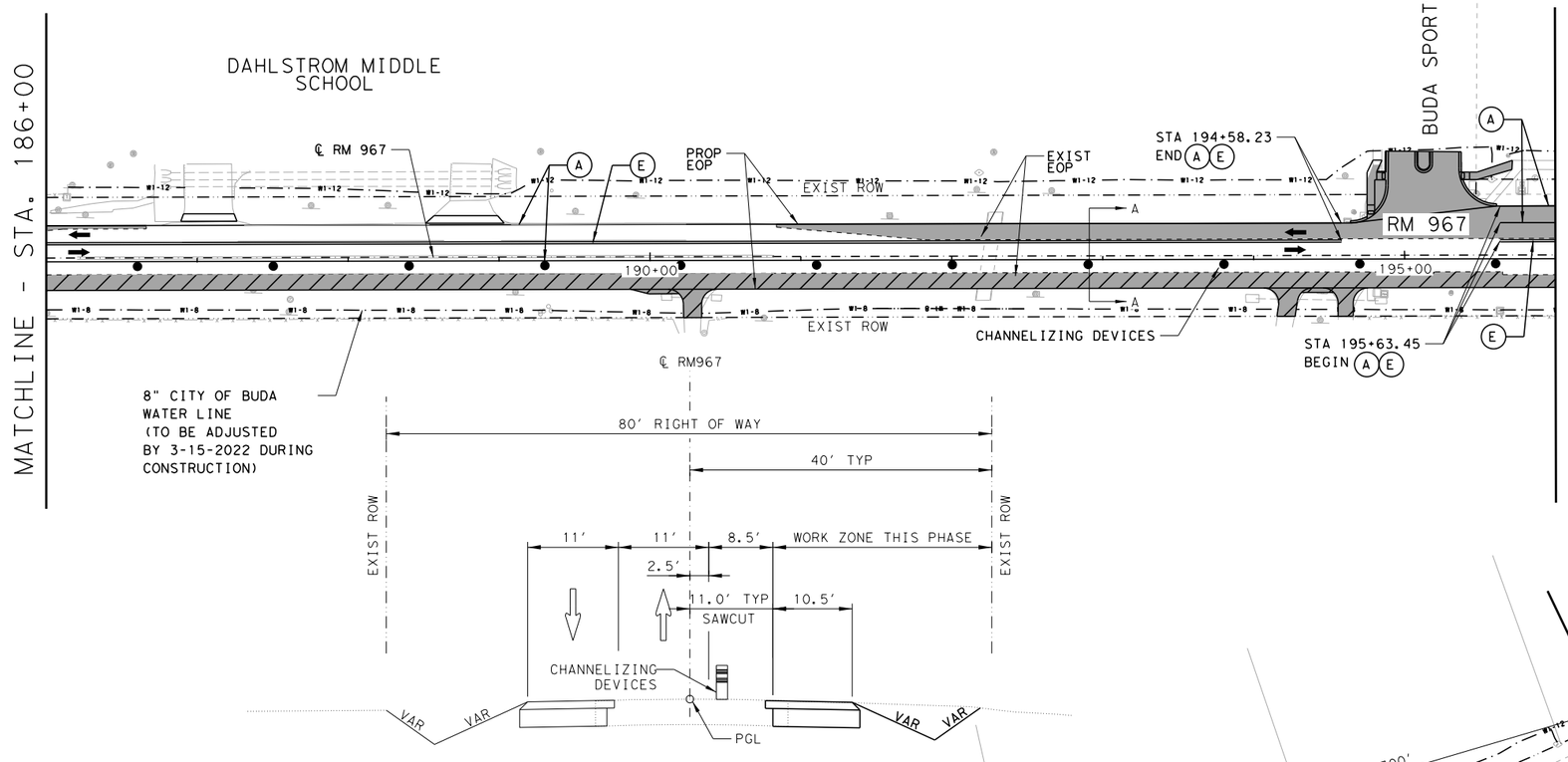
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

6/17/2021

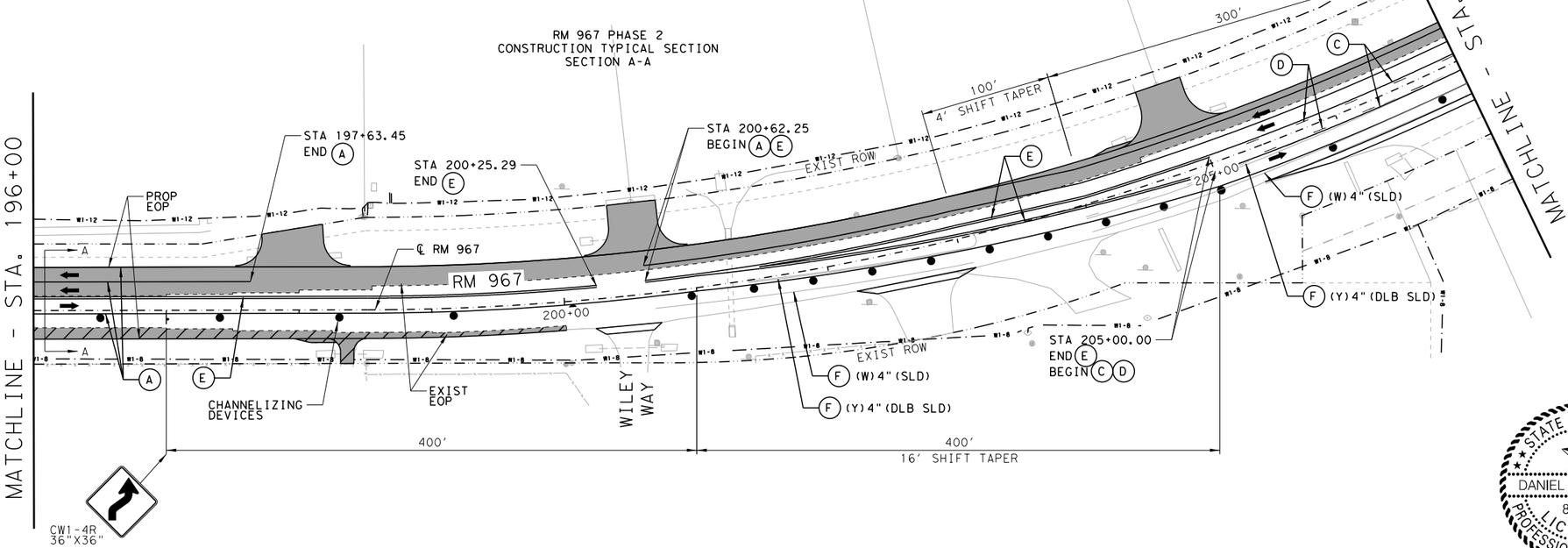
DATE: 6/17/2021			SHEET 10 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	51

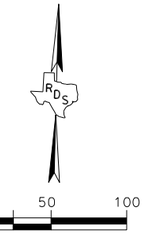
Filename: ...\Cad\Plan\015012-000*TC210.dgn
Date: 6/17/2021

CONTRACTOR TO BE AWARE THAT ADJUSTMENTS TO THE 8" CITY OF BUDA WATERLINE IS POSSIBLE DURING CONSTRUCTION.



RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A





LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

TRAFFIC CONTROL PLAN PHASE 2 STA 186+00.00 TO STA 207+00.00

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

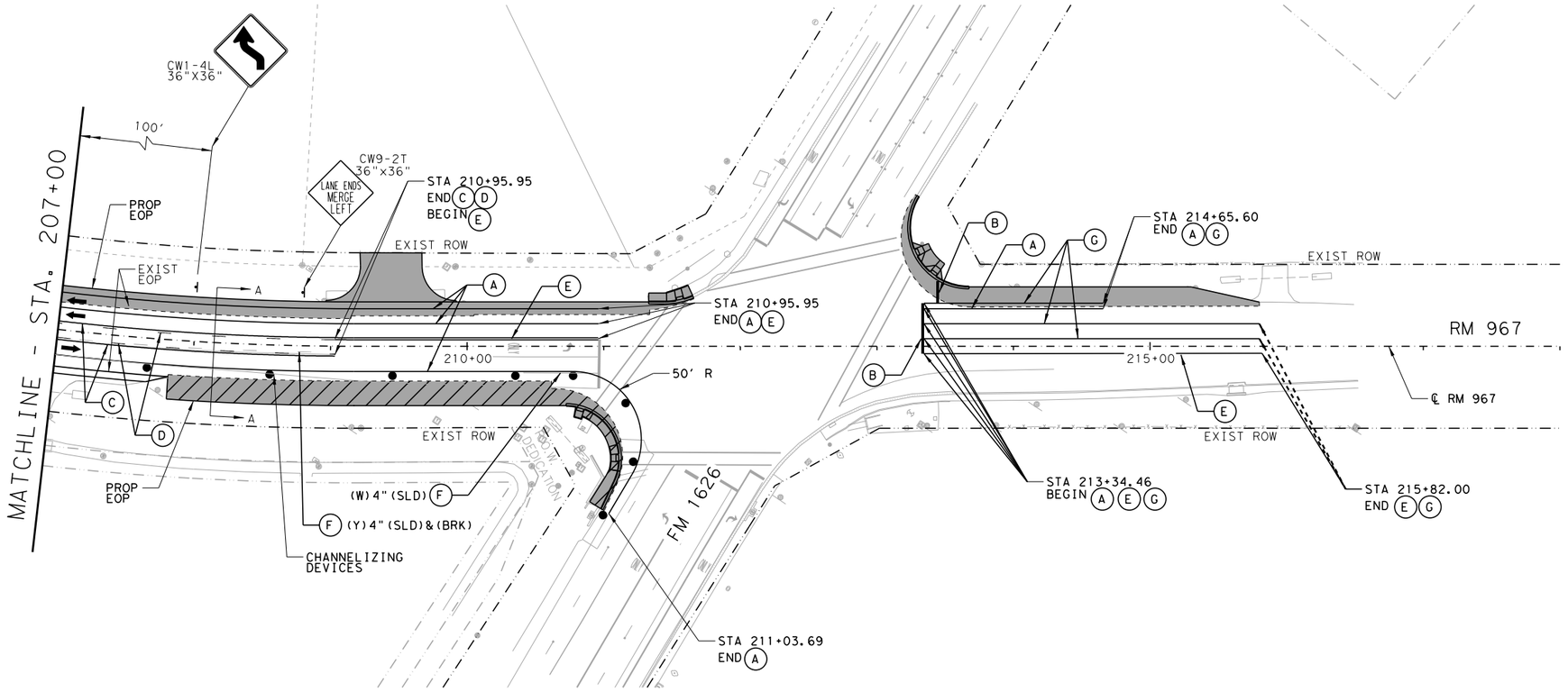
Daniel A. Rogers
6/17/2021

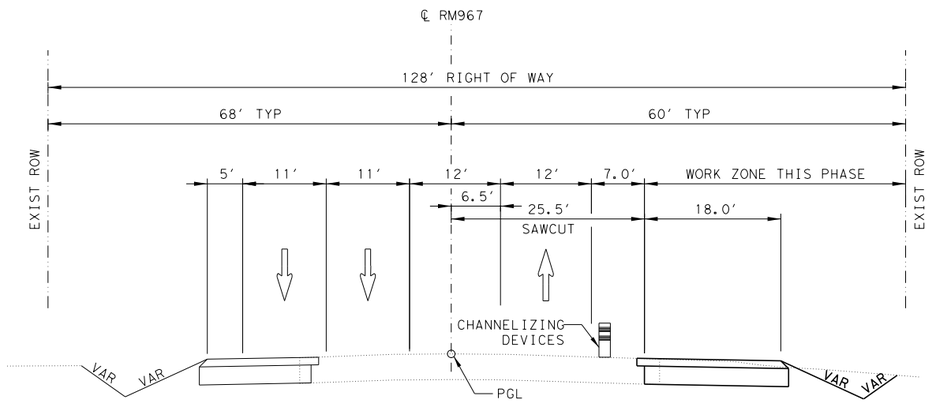
DATE: 6/17/2021 SHEET 11 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	52

Filename: ...\Cad\Plan\015012-000*TC211.dgn
Date: 6/17/2021





RM 967 PHASE 2
CONSTRUCTION TYPICAL SECTION
SECTION A-A

NOTES:

1. USE EXPEDITED CONSTRUCTION METHODS (9" OF TY-B HMAC INSTEAD OF 12" FLEXBASE) TO COMPLETE THIS WORK.
2. LOWEST 6" OF TY-B HMAC MAY BE BLADE PLACED.

0 50 100

LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

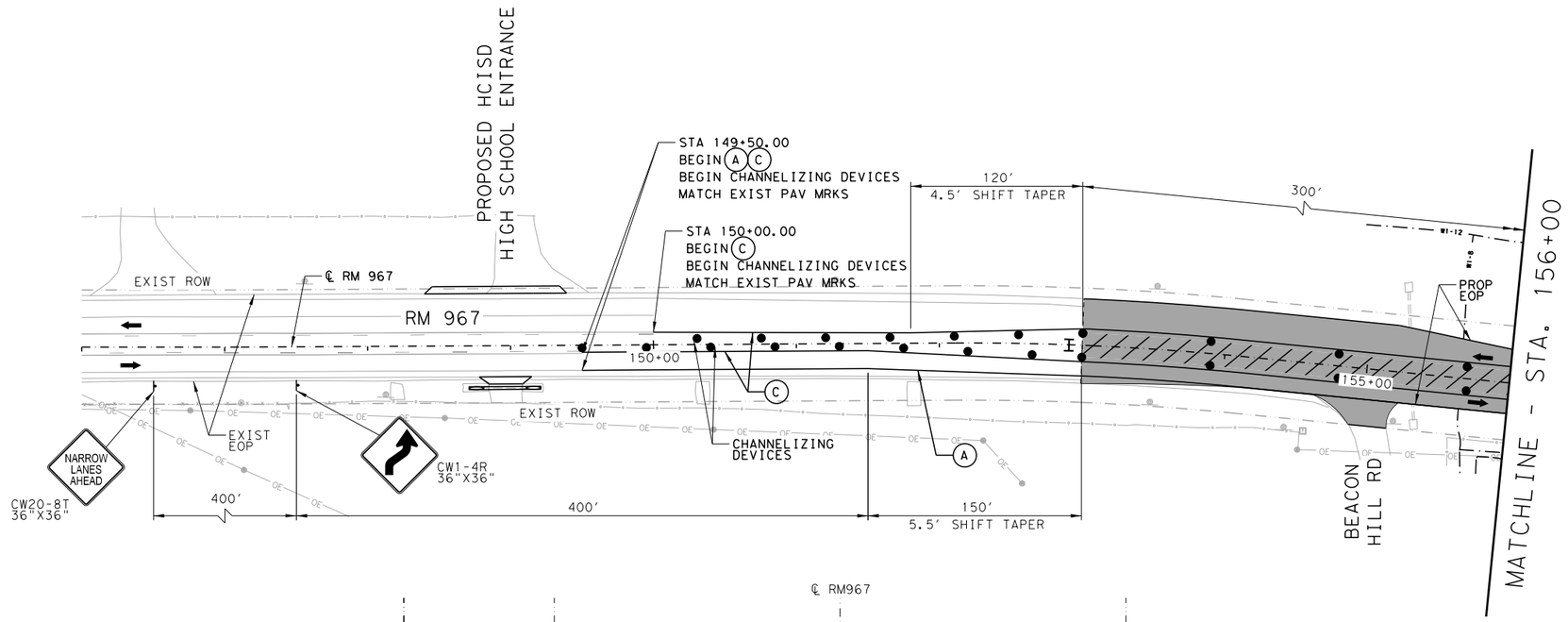
WSB & ASSOCIATES, INC.
FIRM # 16849

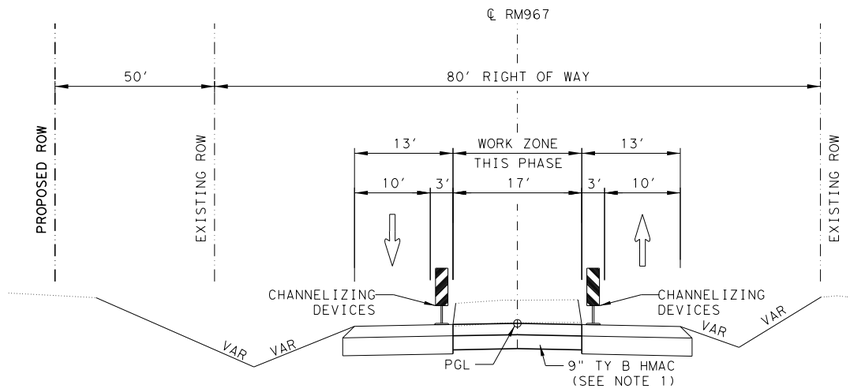
RM 967

TRAFFIC CONTROL PLAN
PHASE 2
STA 207+00.00 TO
END PROJECT

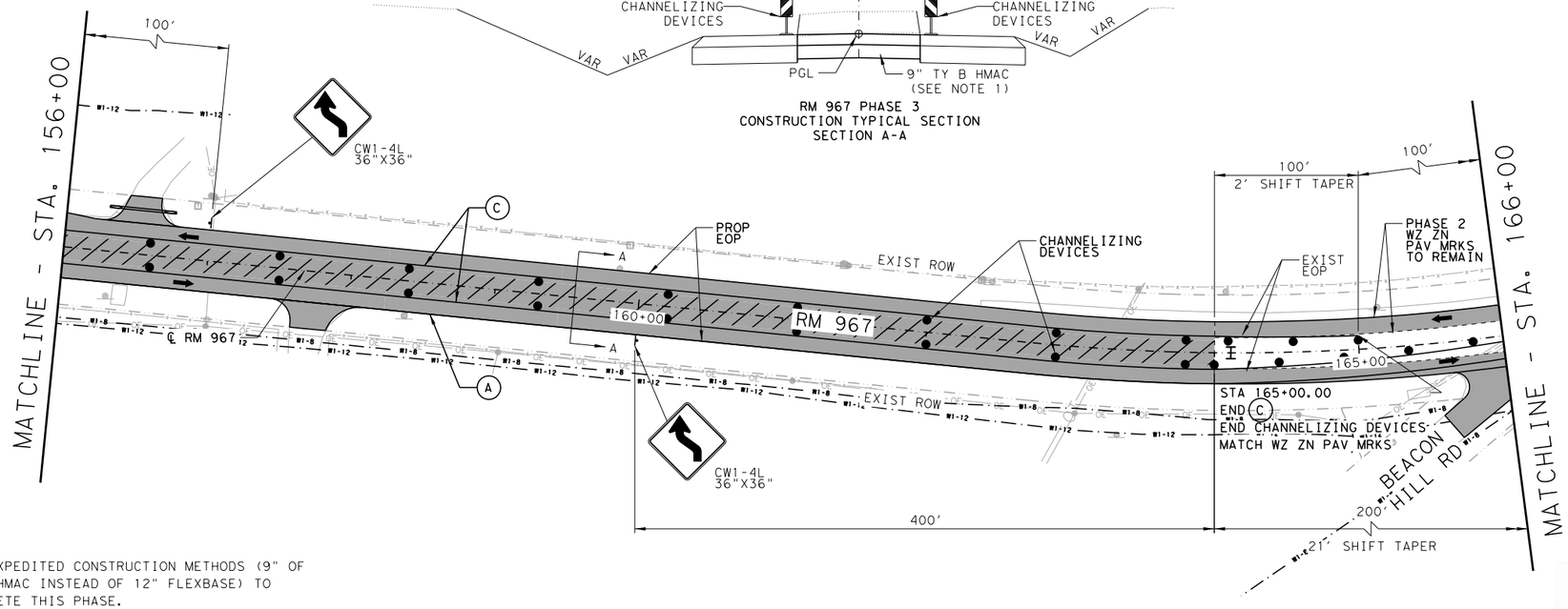
DATE: 5/17/2021				SHEET 12 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	53

Filename: ...\Cad\Plan\015012-000*TC212.dgn
Date: 5/17/2021



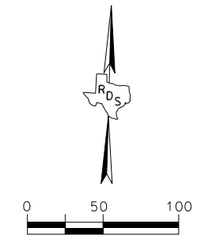


RM 967 PHASE 3
CONSTRUCTION TYPICAL SECTION
SECTION A-A



NOTES:

1. USE EXPEDITED CONSTRUCTION METHODS (9" OF TY-B HMAC INSTEAD OF 12" FLEXBASE) TO COMPLETE THIS PHASE.
2. LOWEST 6" OF TY-B HMAC MAY BE BLADE PLACED.



LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
- CONSTRUCTION THIS PHASE
- CONSTRUCTION PREVIOUS PHASE
- TEMPORARY PAVEMENT
- DIRECTION OF TRAFFIC
- (A) WK ZN PAV MRK REMOV (W) 4" (SLD)
- (B) WK ZN PAV MRK REMOV (W) 24" (SLD)
- (C) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (D) WK ZN PAV MRK REMOV (Y) 4" (BKR)
- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

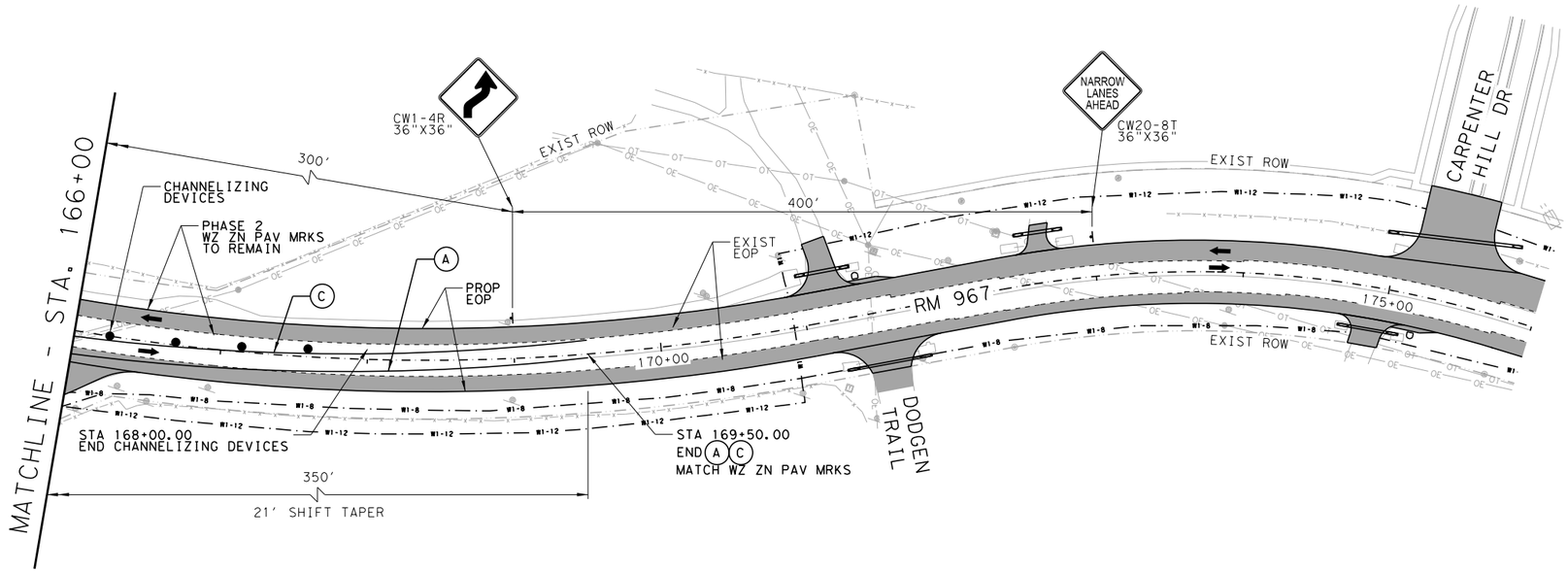
TRAFFIC CONTROL PLAN
PHASE 3
STA 146+00.00 TO
STA 166+00.00

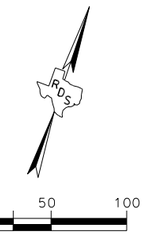
STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

DATE: 5/17/2021			SHEET 1 OF 2
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	54

Filename: ...\Cad\Plan\015012-000*TC31.dgn
Date: 5/17/2021





LEGEND

- CHANNELIZING DEVICE 50' C-C ON TAPER 100' C-C ON TANGENT
- PORTABLE CONCRETE TRAFFIC BARRIER
- CRASH CUSHION ATTENUATOR
- CONSTRUCTION SIGN
- BARRICADE TYPE III
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- (E) DBL WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (F) ELIM EXT PAV MRK & MRKS
- (G) WK ZN PAV MRK REMOV (W) 8" (SLD)

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

RM 967

TRAFFIC CONTROL PLAN
PHASE 3
STA 166+00.00 TO
STA 176+00.00

DATE: 5/17/2021 SHEET 2 OF 2

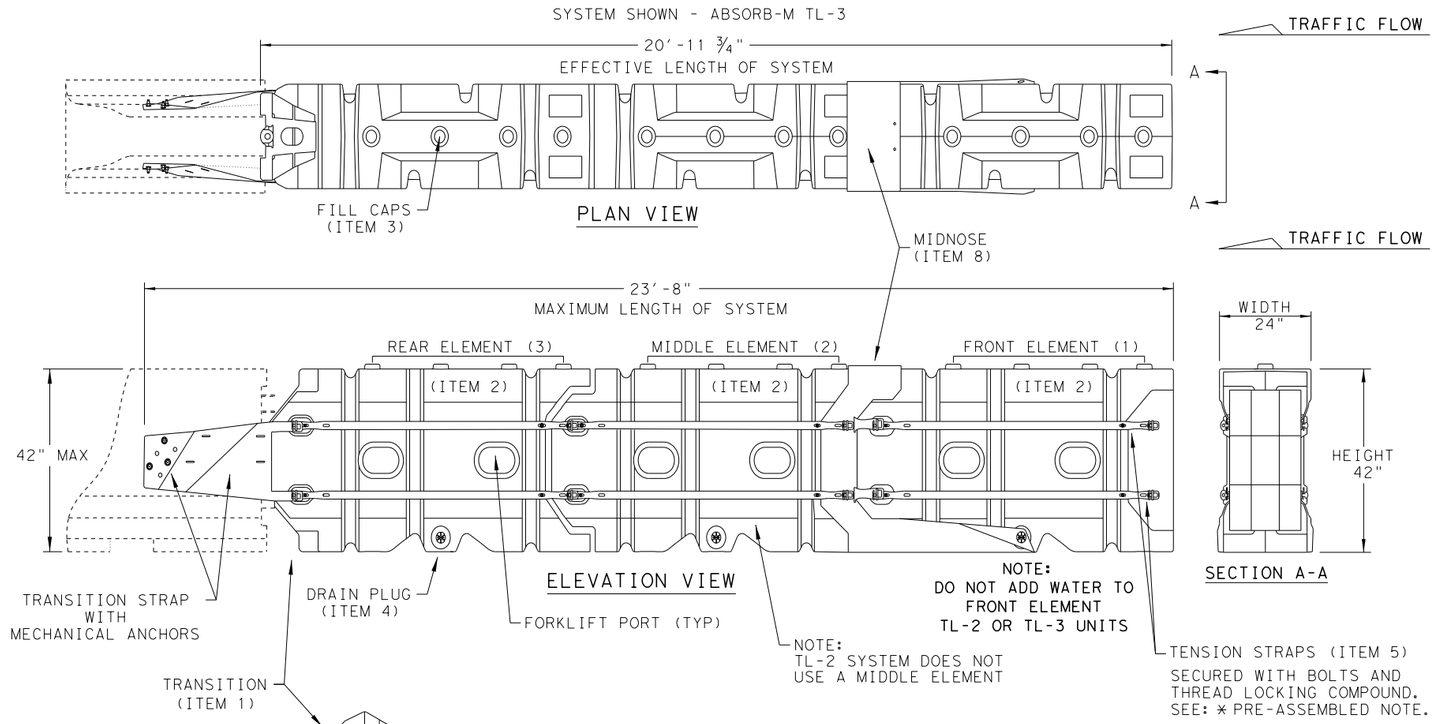
STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	55

Filename: ...\Cad\Plan\015012-000*TC32.dgn
Date: 5/17/2021

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\ABSORBM-19.dgn

SYSTEM SHOWN - ABSORB-M TL-3



THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

NOTE:
CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.

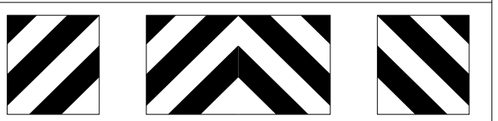
GENERAL NOTES

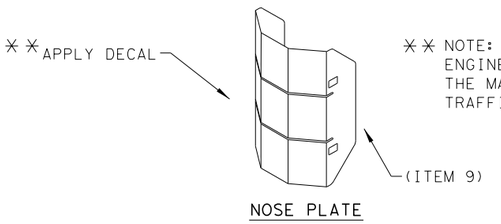
1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE





NOSE PLATE

** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

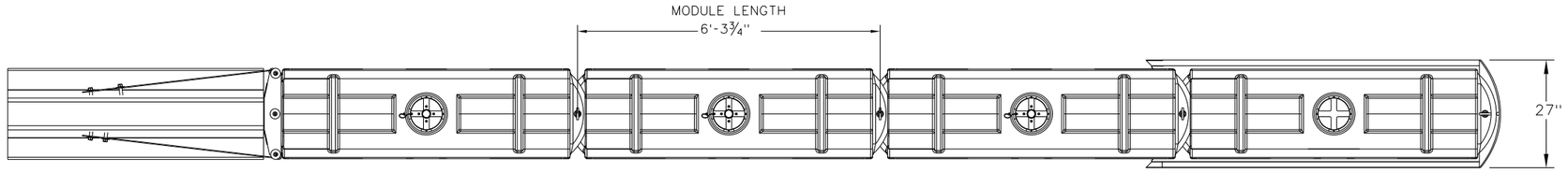
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

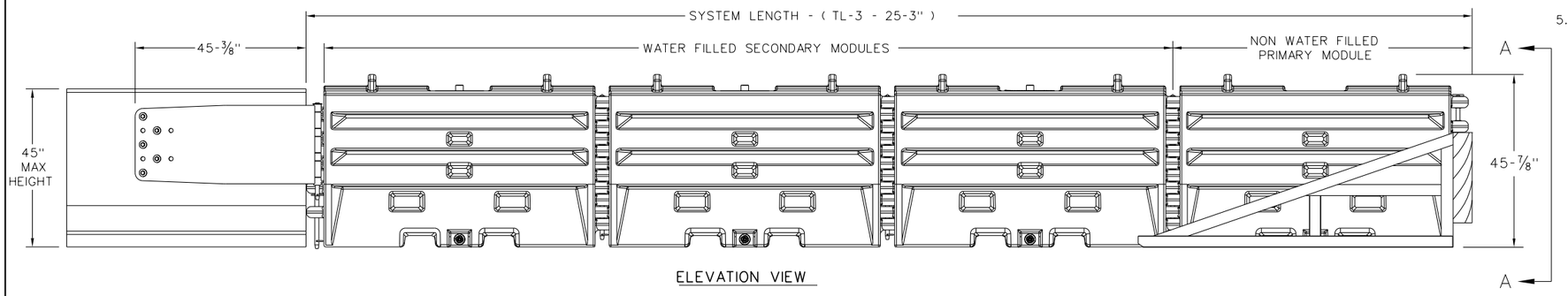
Texas Department of Transportation — Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		56



PLAN VIEW

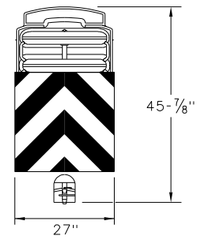


ELEVATION VIEW

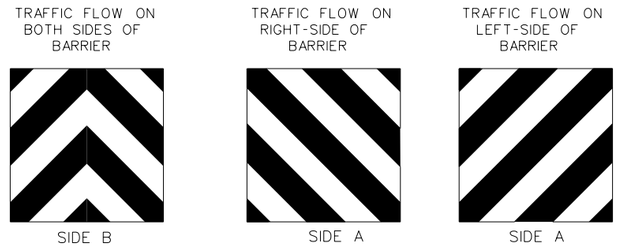
GENERAL NOTES

1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES)(14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:
   - CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
   - STEEL BARRIER
   - PLASTIC BARRIER
   - CONCRETE BRIDGE ABUTMENTS
   - W-BEAM GUARD RAIL
   - THRIE BEAM GUARD RAIL

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"

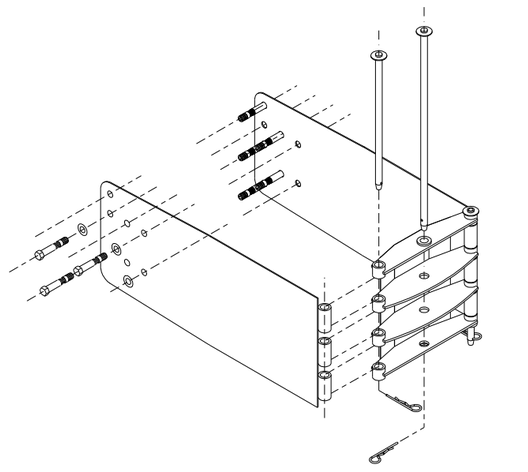


SECTION A-A



NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY:TL-3
45131	TRANSITION FRAME,GALVANIZED	1
45150	TRANSITION PANEL,GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1

Texas Department of Transportation

Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		57

DATE: 5/17/2021
FILE: K:\01502-000\Cad\Plan\STND\sled19.dgn

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	I	38	7.0' LT.	153+00		UNI	EXIST PVMT		PCTB													
2	I	38	7.0' LT.	164+10		UNI	EXIST PVMT		PCTB													
												TOTALS										

LEGEND:

L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.

http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwylse.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN:TxDOT	CK:		CK:
	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		
	AUS	HAYS		
	FEDERAL AID PROJECT			SHEET NO.
				57a

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

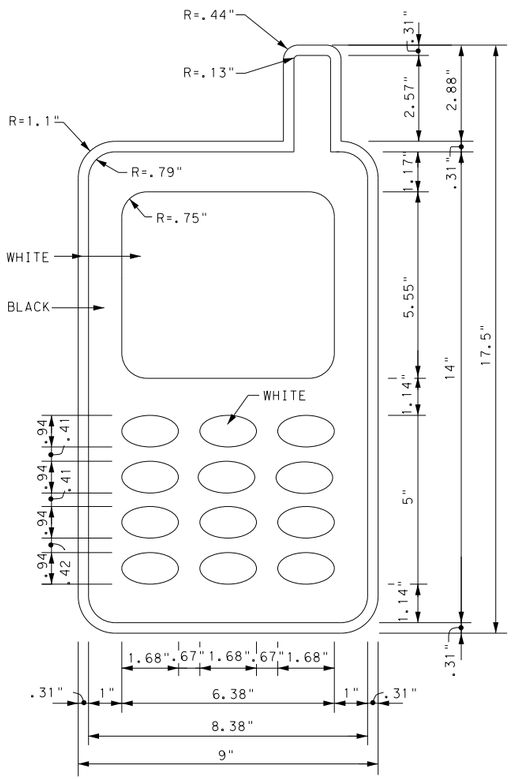
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

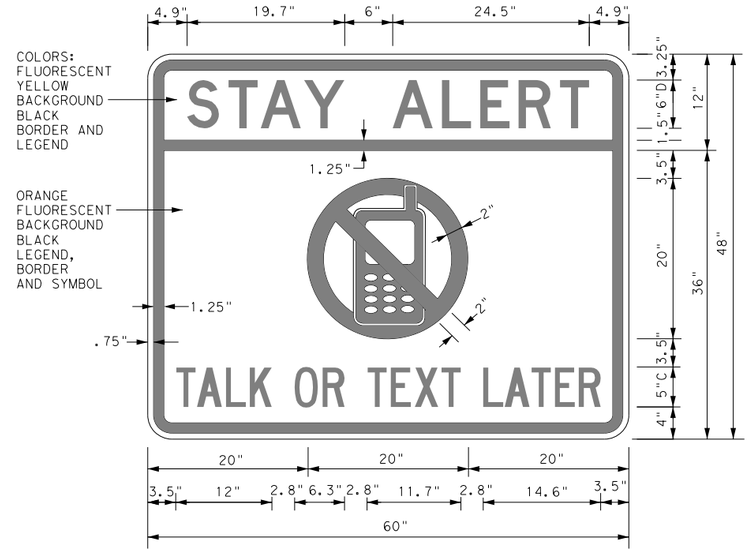
12. The Engineer has the final decision on the location of all traffic control devices.

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

WORKER SAFETY APPAREL NOTES:

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





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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
4-03 5-10 8-14 9-07 7-13	DIST	COUNTY		SHEET NO.
	AUS	HAYS		58

95

DATE: 5/17/2021 3:37:12 PM
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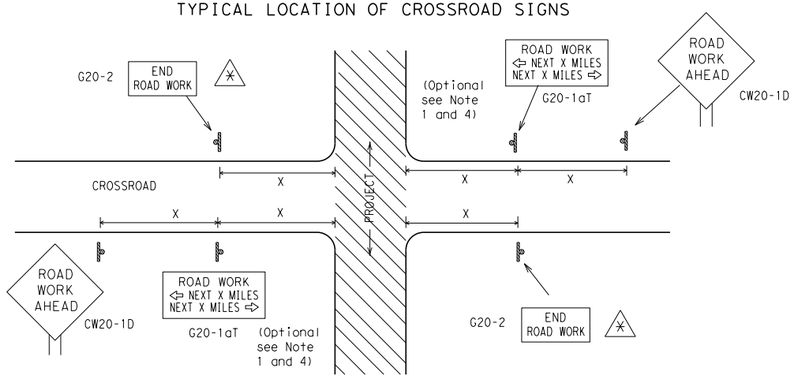
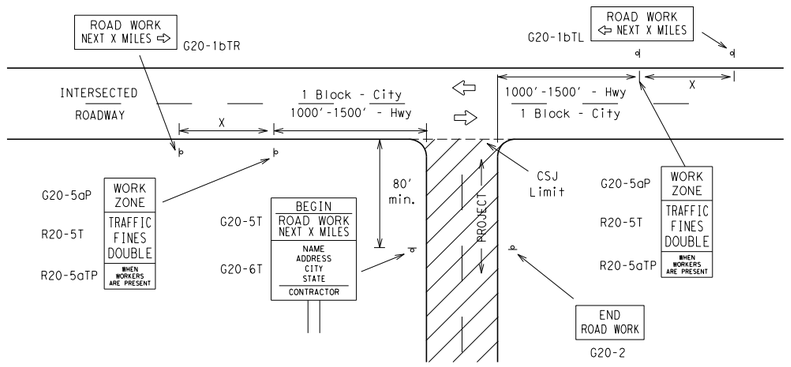
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

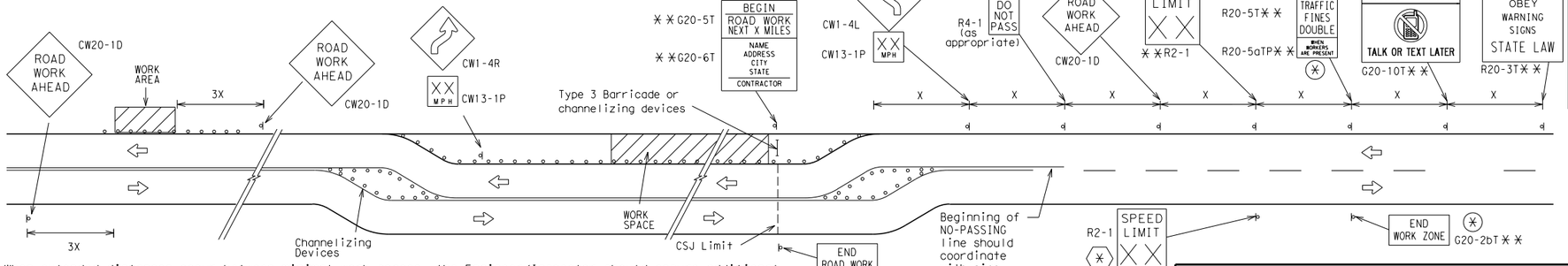
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

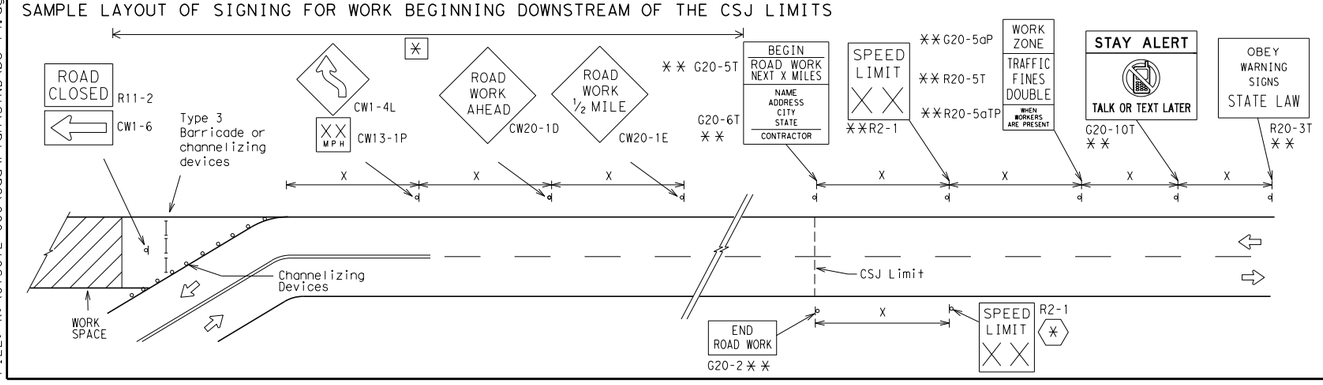
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

✳✳ 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.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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7-13	AUS	HAYS		59

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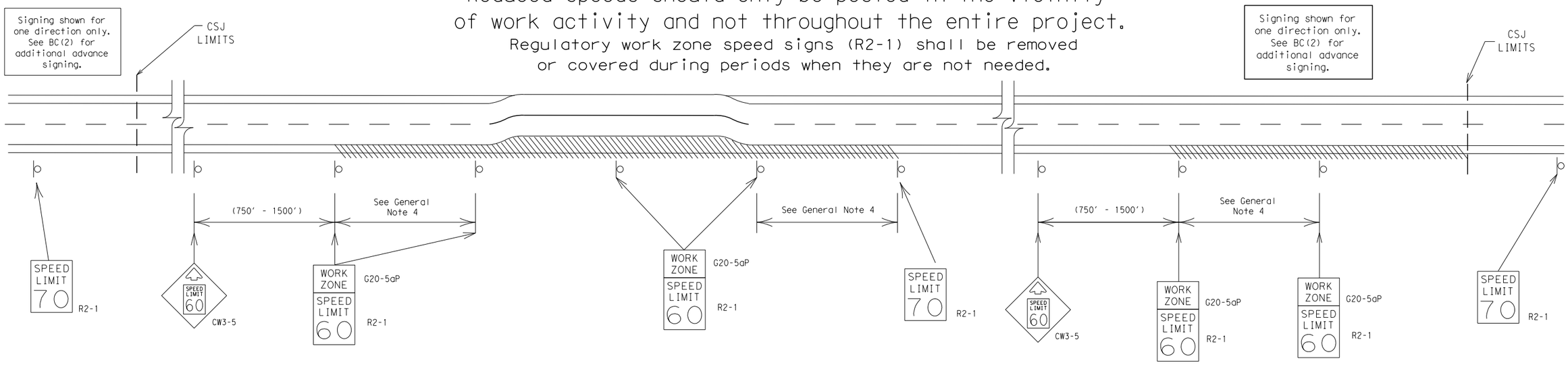
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12

Texas Department of Transportation

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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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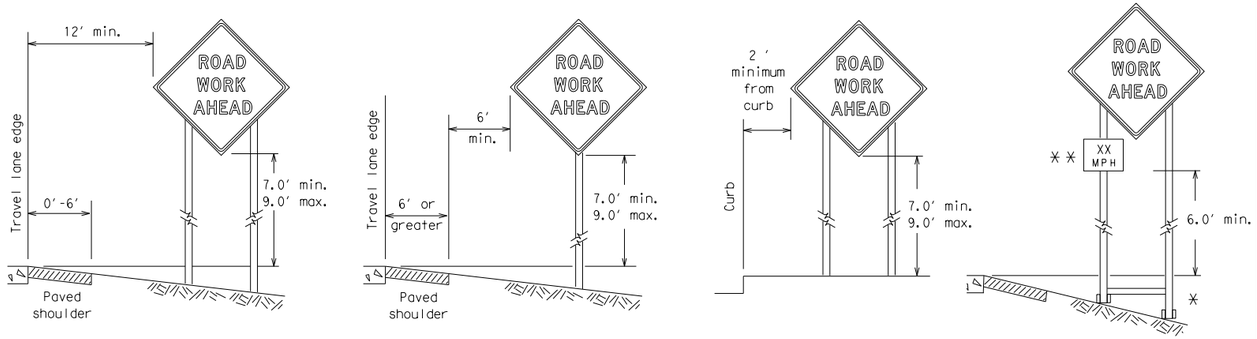
97

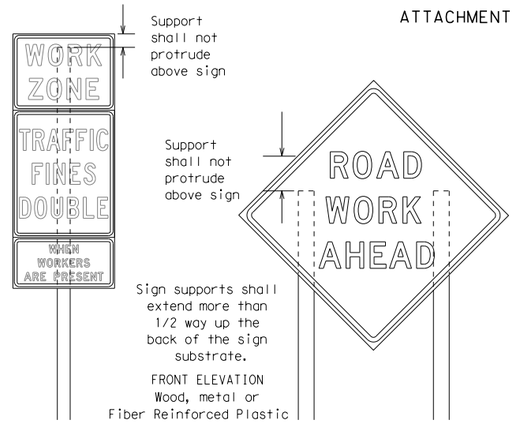
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

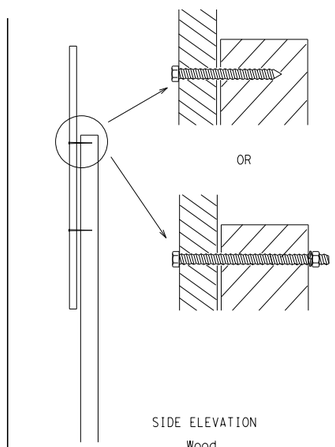


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





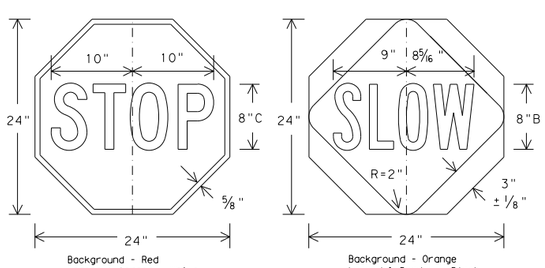
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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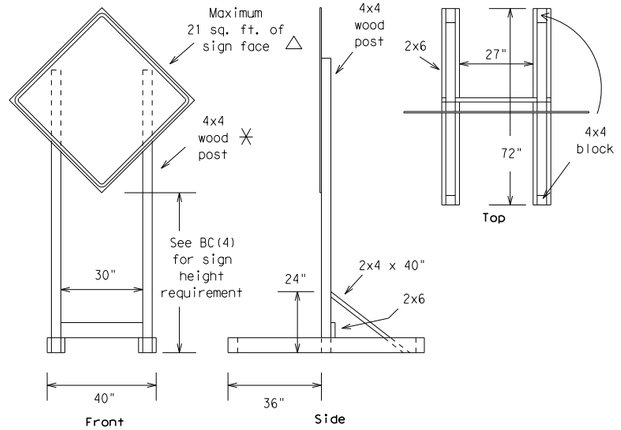
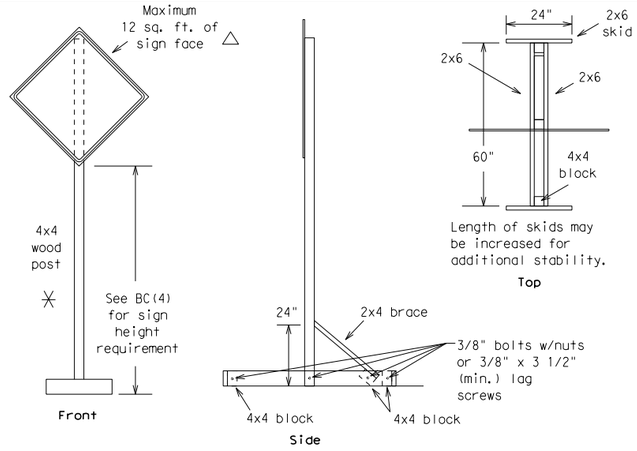
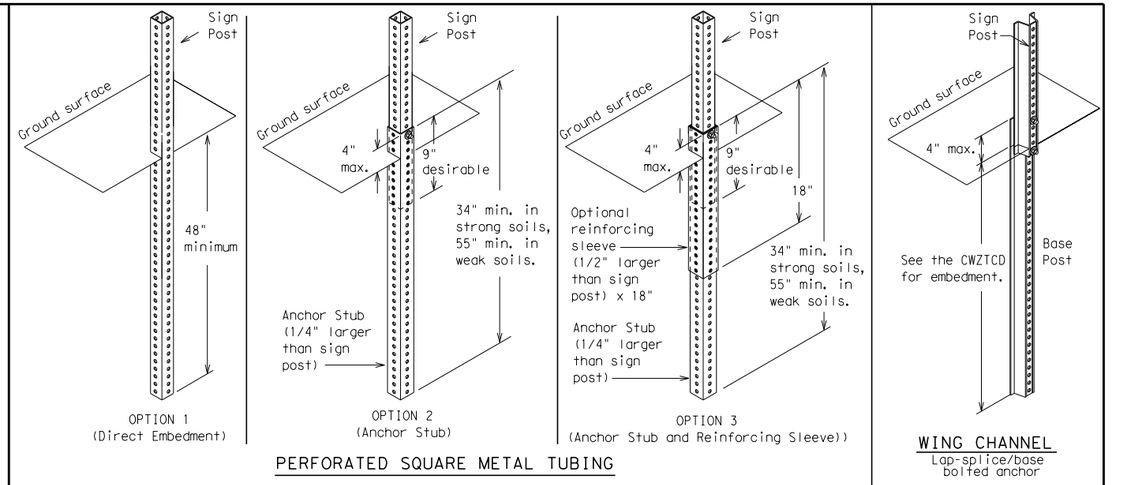




SKID MOUNTED WOOD SIGN SUPPORTS

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

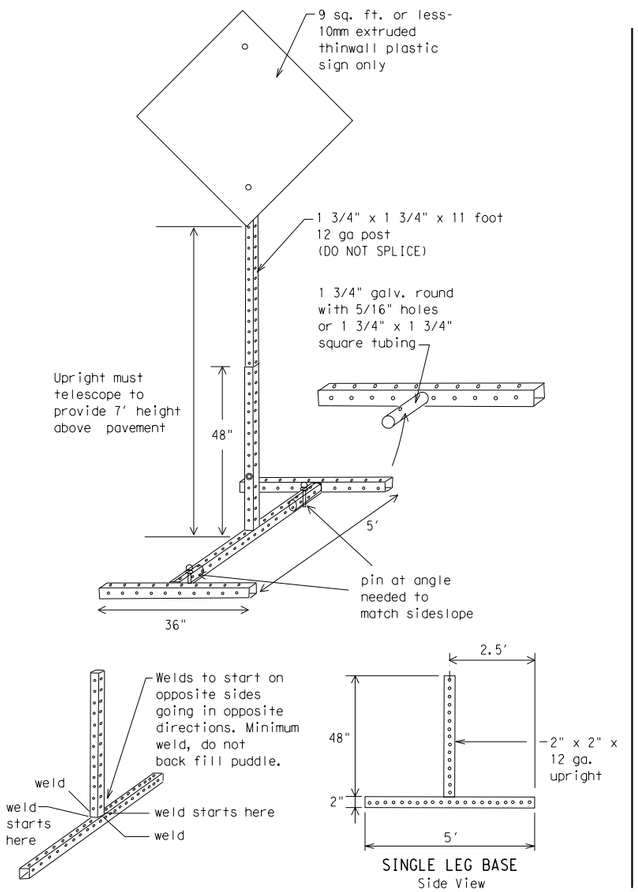


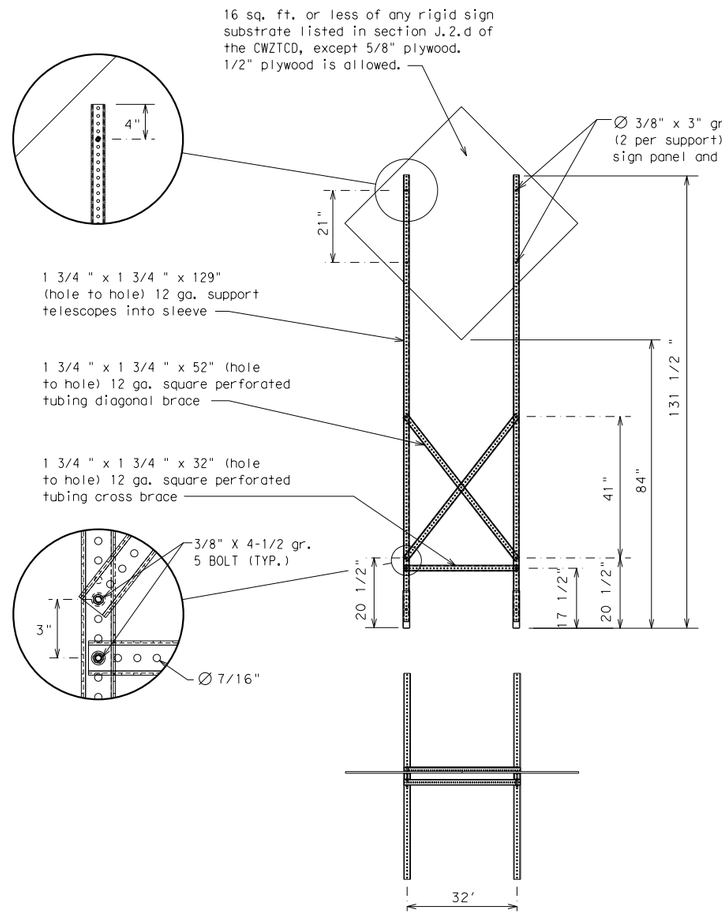
PERFORATED SQUARE METAL TUBING

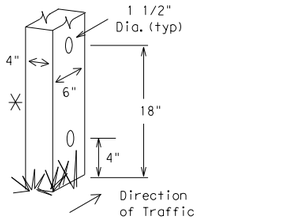
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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

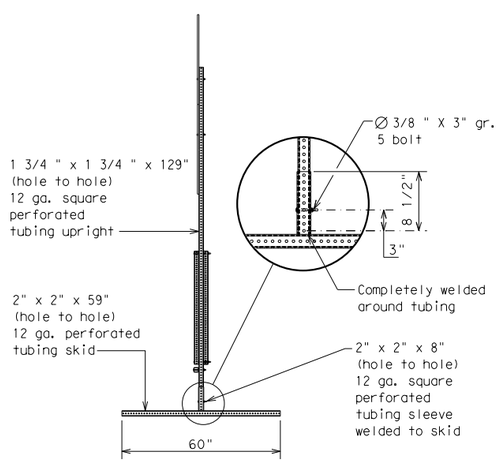






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	HAYS		63

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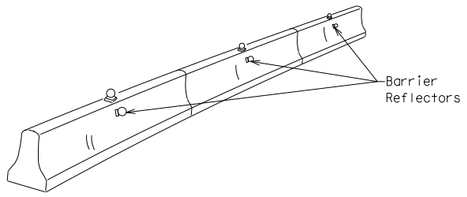
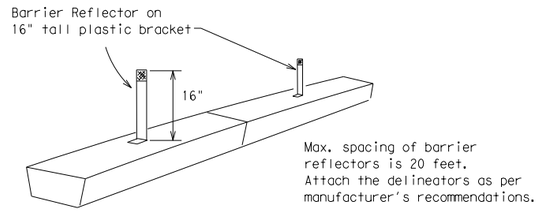
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

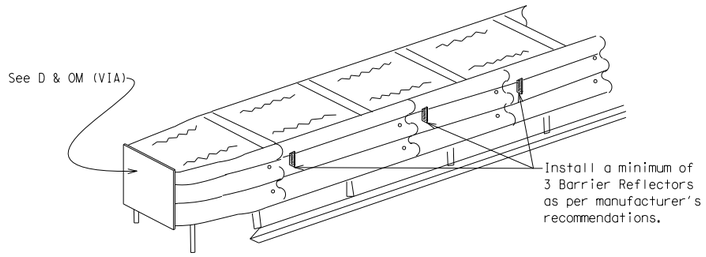


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

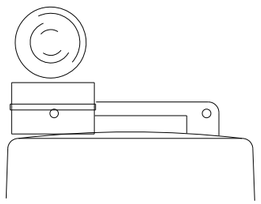


DELINEATION OF END TREATMENTS

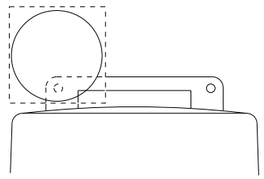
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

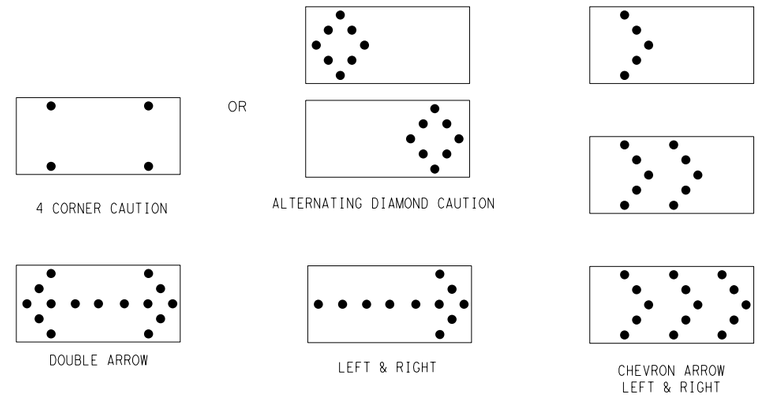
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

Texas Department of Transportation — Traffic Operations Division Standard

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

BC(7)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	AUS	HAYS		64

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

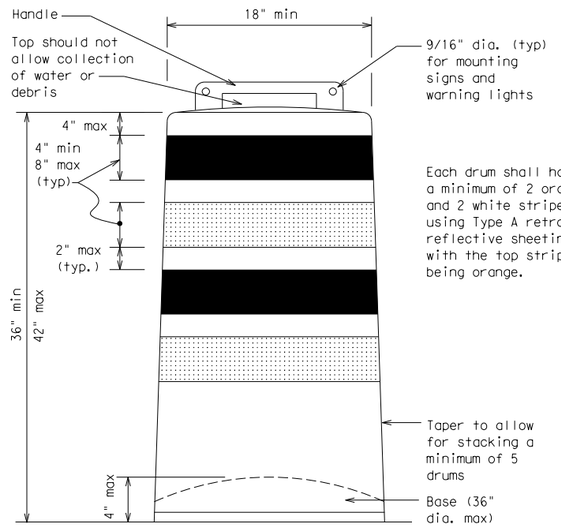
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

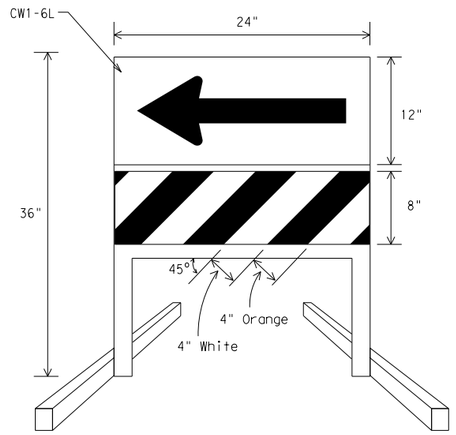
RETROREFLECTIVE SHEETING

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

BALLAST

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

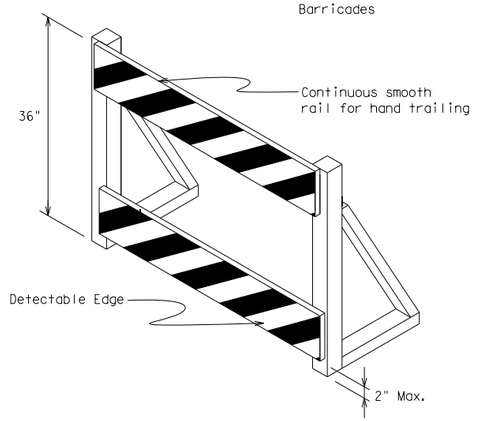




DIRECTION INDICATOR BARRICADE

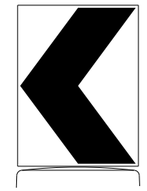
1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3.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

This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

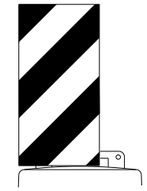


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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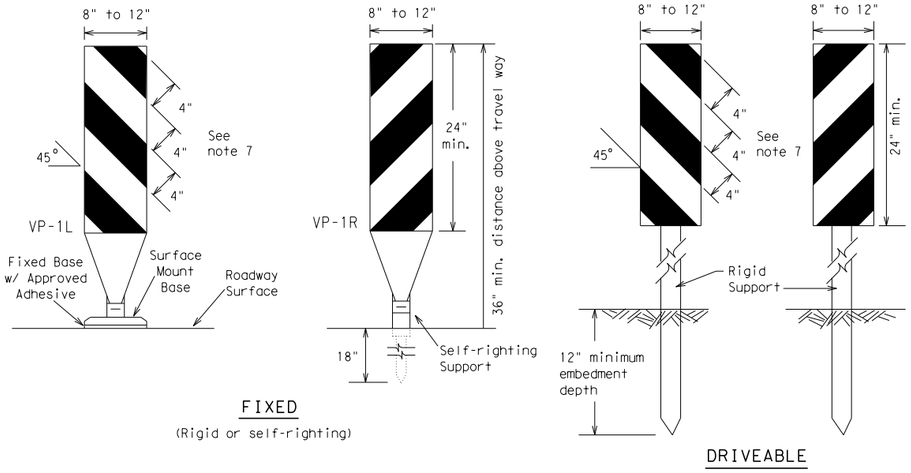
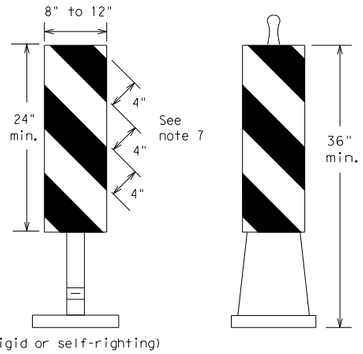


FIXED

(Rigid or self-righting)

DRIVEABLE

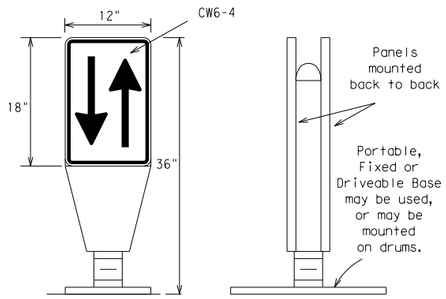


(Rigid or self-righting)

PORTABLE

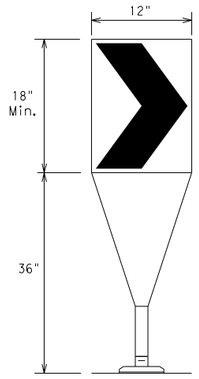
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



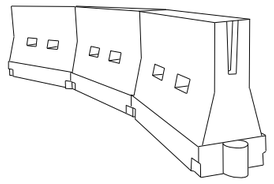
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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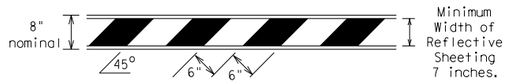
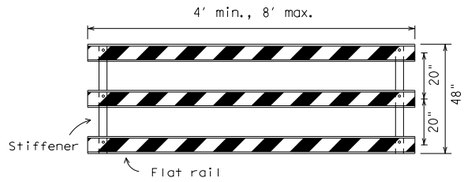
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



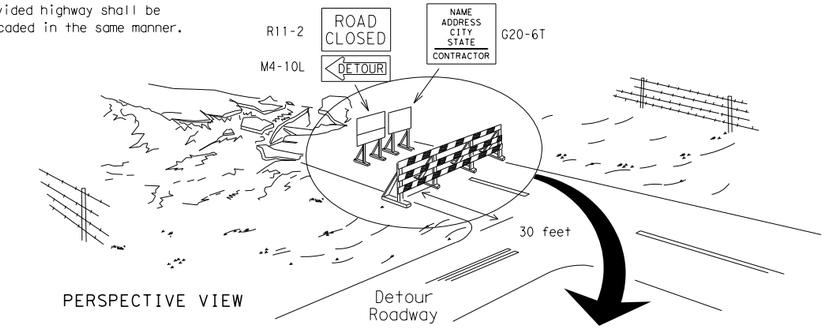
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

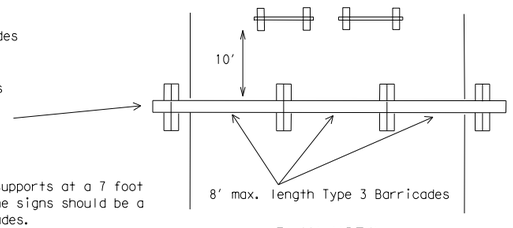
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

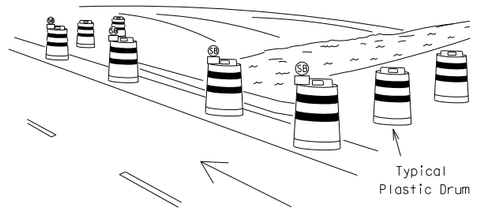
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

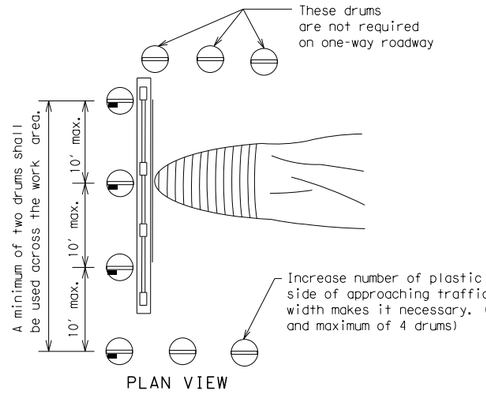
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

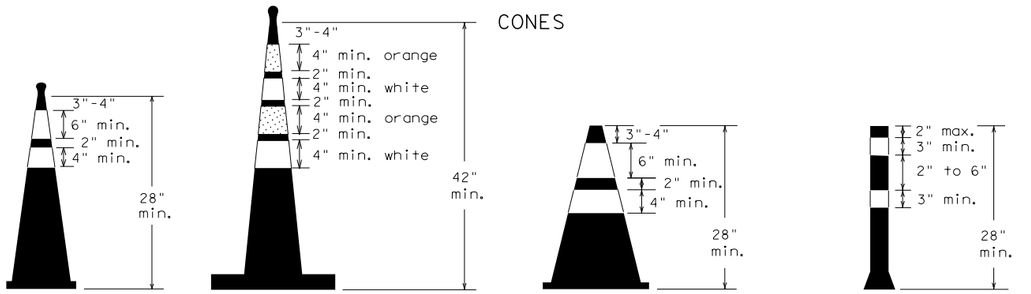
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

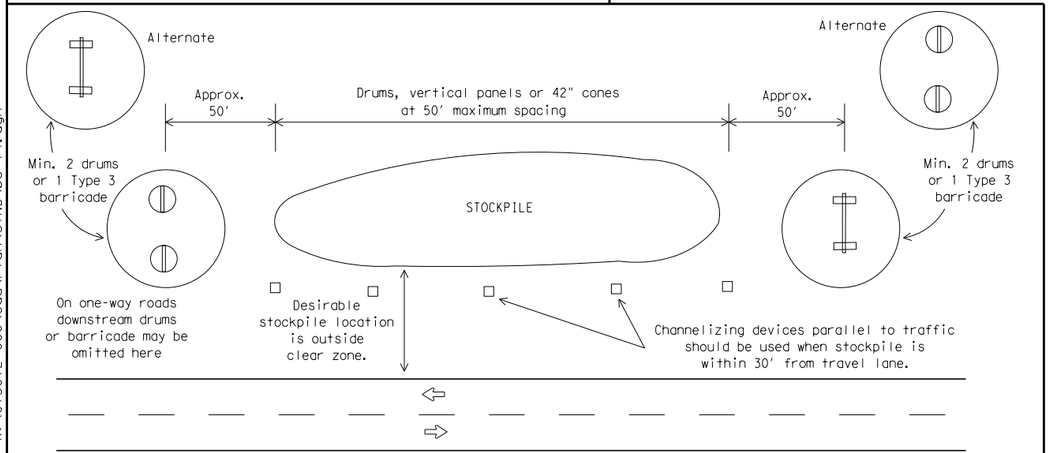
One-Piece cones

Tubular Marker

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

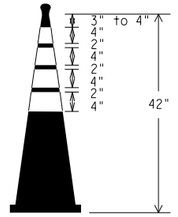
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

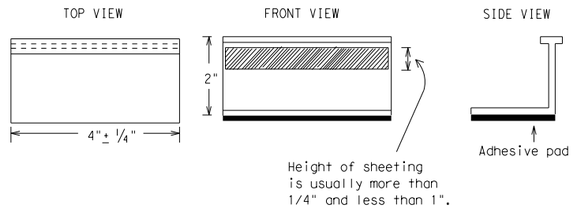
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	AUS	HAYS		68
11-02 8-14				

105

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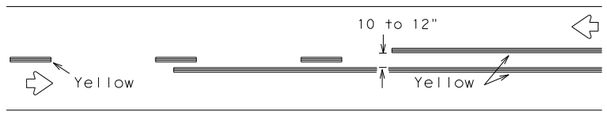
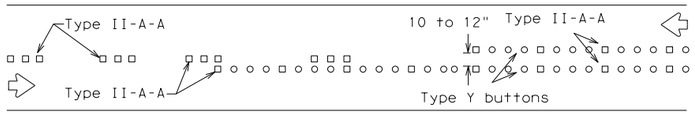
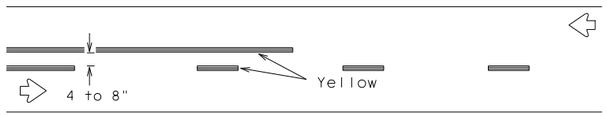
PAVEMENT MARKING PATTERNS



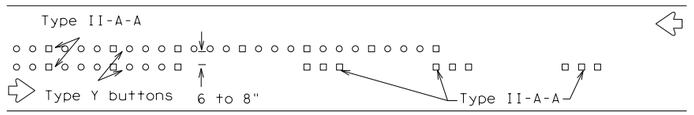
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



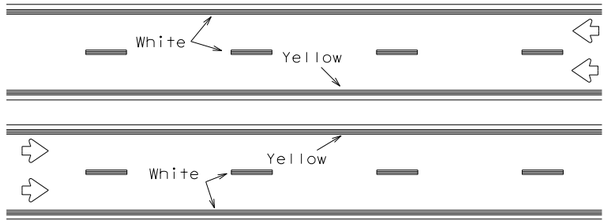
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



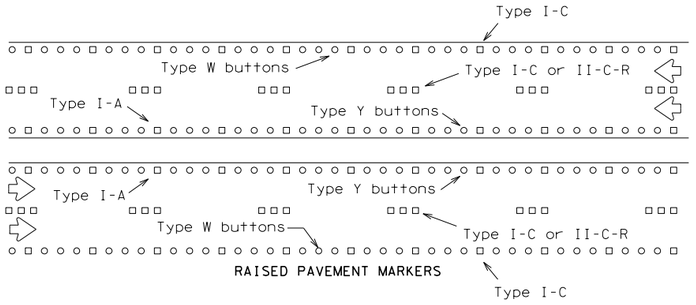
RAISED PAVEMENT MARKERS - PATTERN B

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

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



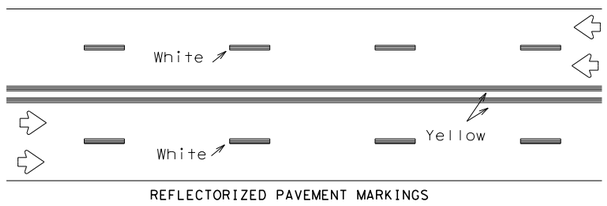
REFLECTORIZED PAVEMENT MARKINGS



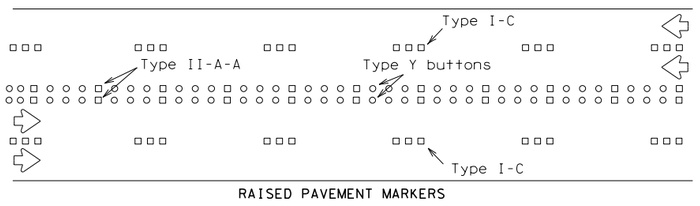
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



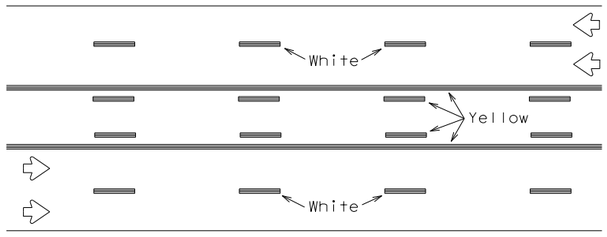
REFLECTORIZED PAVEMENT MARKINGS



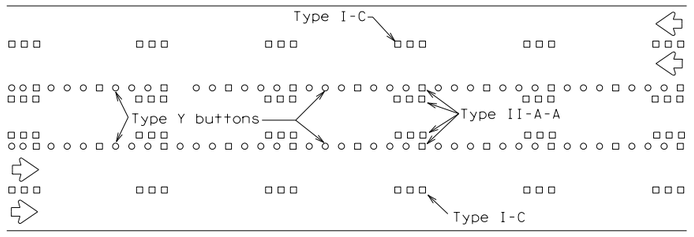
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

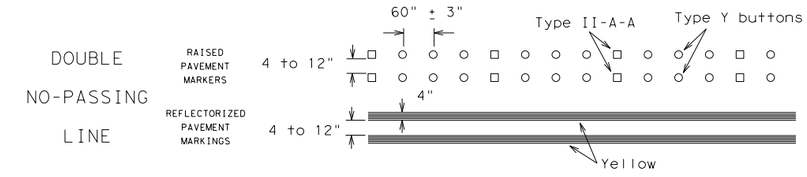
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

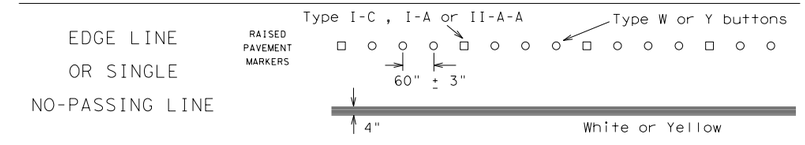
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

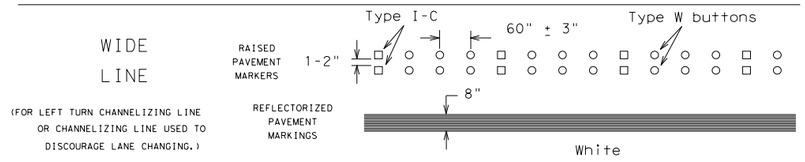


EDGE LINE OR SINGLE NO-PASSING LINE



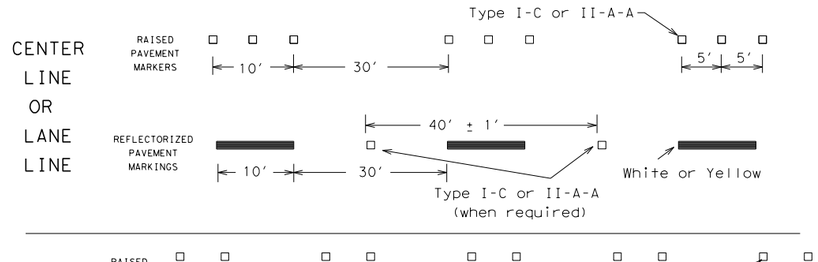
WIDE LINE

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

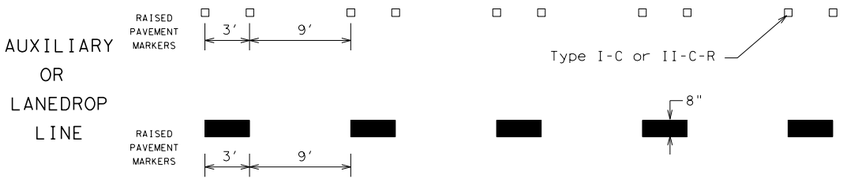


BROKEN LINES

CENTER LINE OR LANE LINE

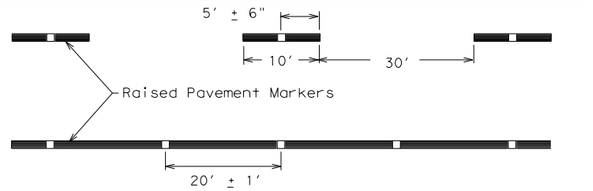


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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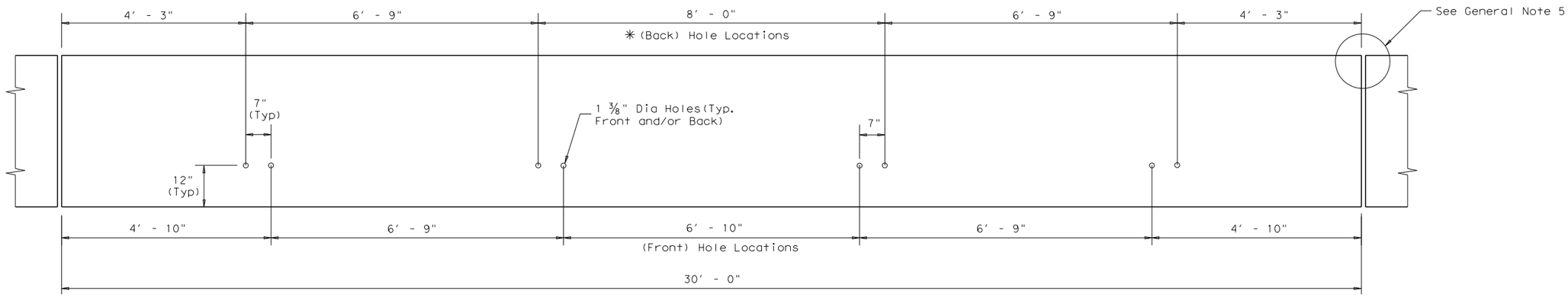
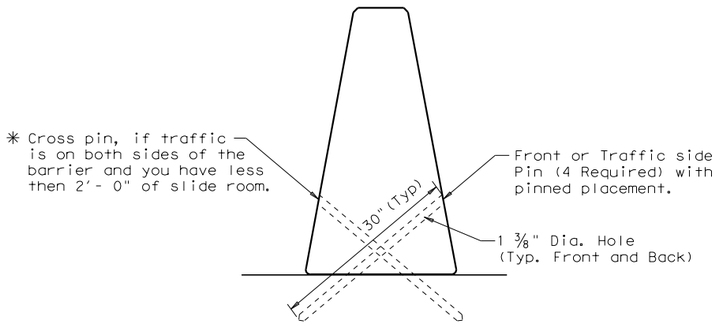


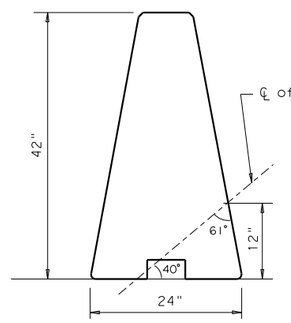
DETAIL 1

Precast SSCB(42")
Showing hole locations

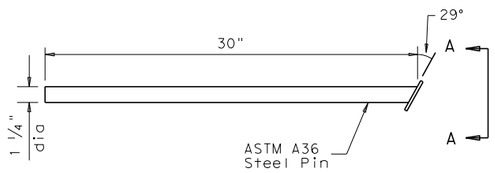


DETAIL 2

Placement on (ACP)
Asphalt Conc. Pavement
or Treated Base Material
(30" Pin required)

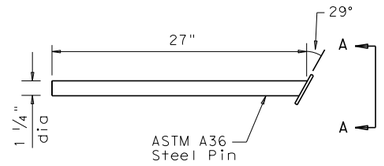


HOLE LOCATION DETAIL



(30") PIN DETAIL

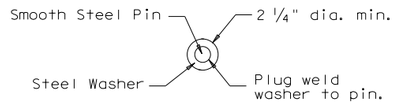
See Detail 2



(27") PIN DETAIL

See Detail 3

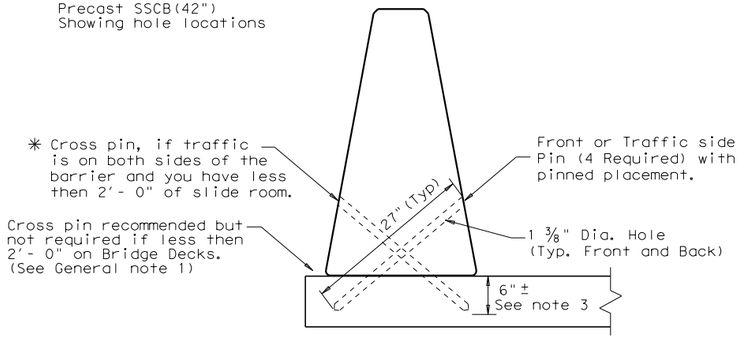
Note:
Steel washer welded to pin at 29° angle so that the washer is flush with barrier surface. (See View A-A)



VIEW A-A

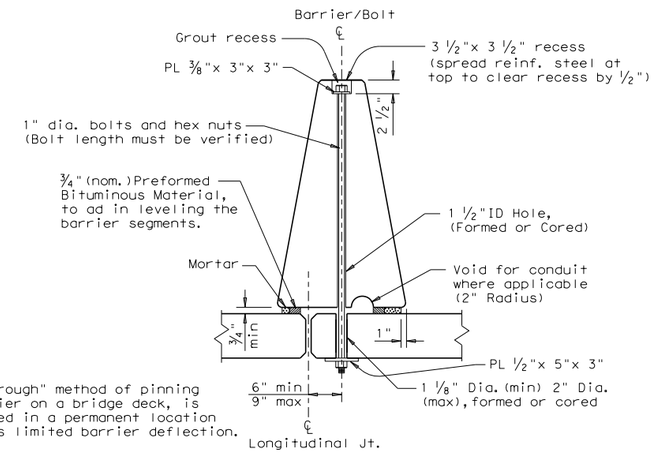
DETAIL 3

Bridge Deck or CRCP
(27" Pin required).



CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding ½" shall be patched.



Note:
The "Bolt Through" method of pinning precast barrier on a bridge deck, is primarily used in a permanent location that requires limited barrier deflection.

PRECAST SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

For bolt through locations, use the (Front) hole locations shown on Detail 1.

GENERAL NOTES

1. These details provide a method of laterally restraining precast concrete barrier to limit deflections under normally expected passenger vehicle impacts. These details are intended for use in work zones, primarily on bridge decks, or pavement where temporary barrier must be placed less then 2 ft. from the longitudinal edge of the deck or dropoff and parallel to the direction of travel. Other applications of these details are acceptable as directed by the Engineer.
2. Each precast concrete barrier section shall have a minimum of four or total of eight 1 ⅜ in. ID holes formed or cored through the barrier. The center lines of the holes are shown in the hole location detail. If rebar is encountered, the entry point may be shifted 2" plus or minus longitudinally along the barrier. The eight holes are spaced along the length of the barrier as shown in Detail 1.
3. The drilling of the travel surface is accomplished by placing the pre-drilled barrier section on the travel surface in the desired position. Then the hole is drilled with the bit passing though the hole in the barrier. The bit is to be inserted into the hole in the barrier so that the travel surface is drilled to a point which is slightly more than the pin length.
4. Note that steel washers have been welded to the top of the steel pins to aid in the removal of the pins, when the barrier is removed.
5. See SSCB(2) standard sheet for reinforcement requirements and joint connection types.
6. The forming or coring of holes in the barrier, drilling of holes in bridge deck or pavement, fabrication and materials for the 1 ¼ in. pins, installation of pins, and any repair to the barrier shall be considered as subsidiary to the barrier bid items.
7. The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."
8. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
9. Weight of barrier is approx. 700 lbs per foot.

Texas Department of Transportation

Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER
(TYPE 1)
PINNED PLACEMENT

SSCB(5)-10

FILE: sscb510.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		70

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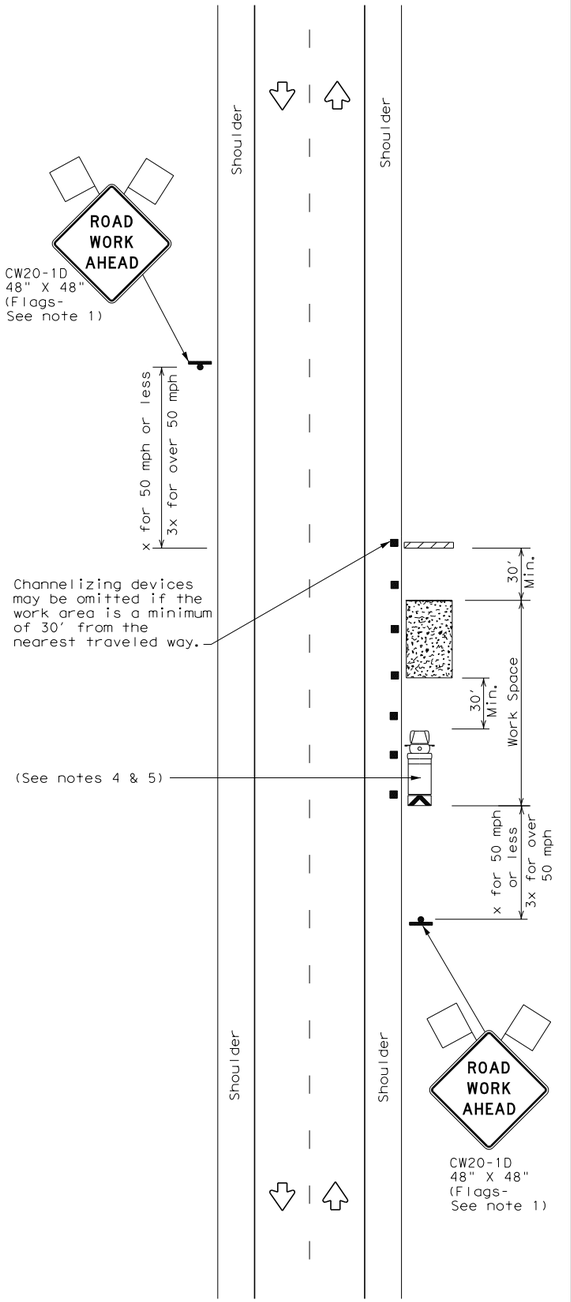
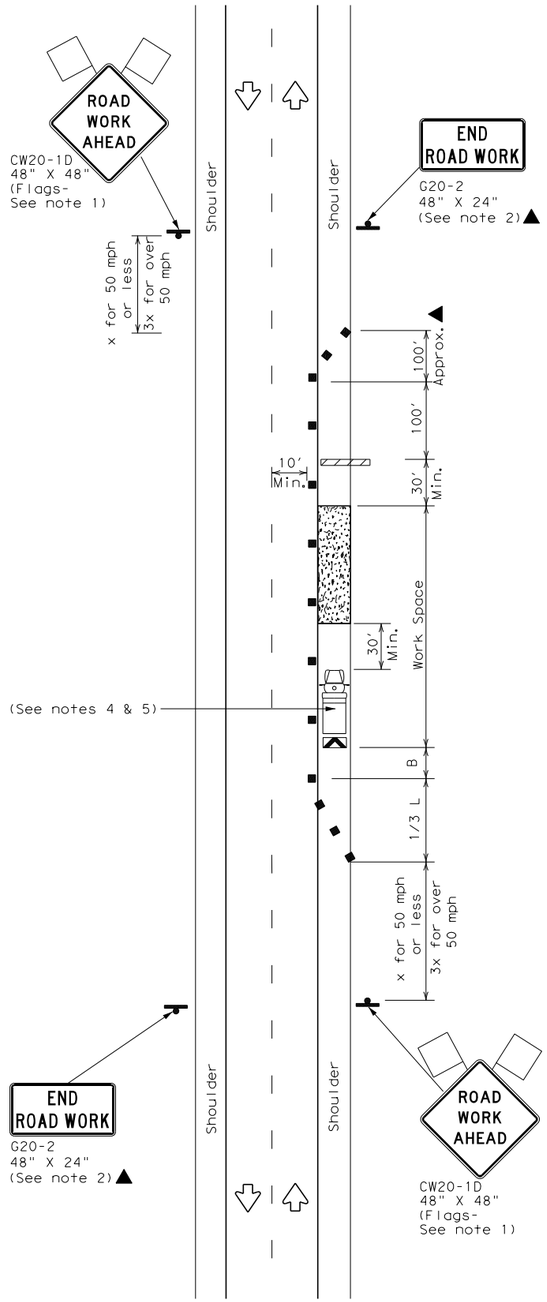


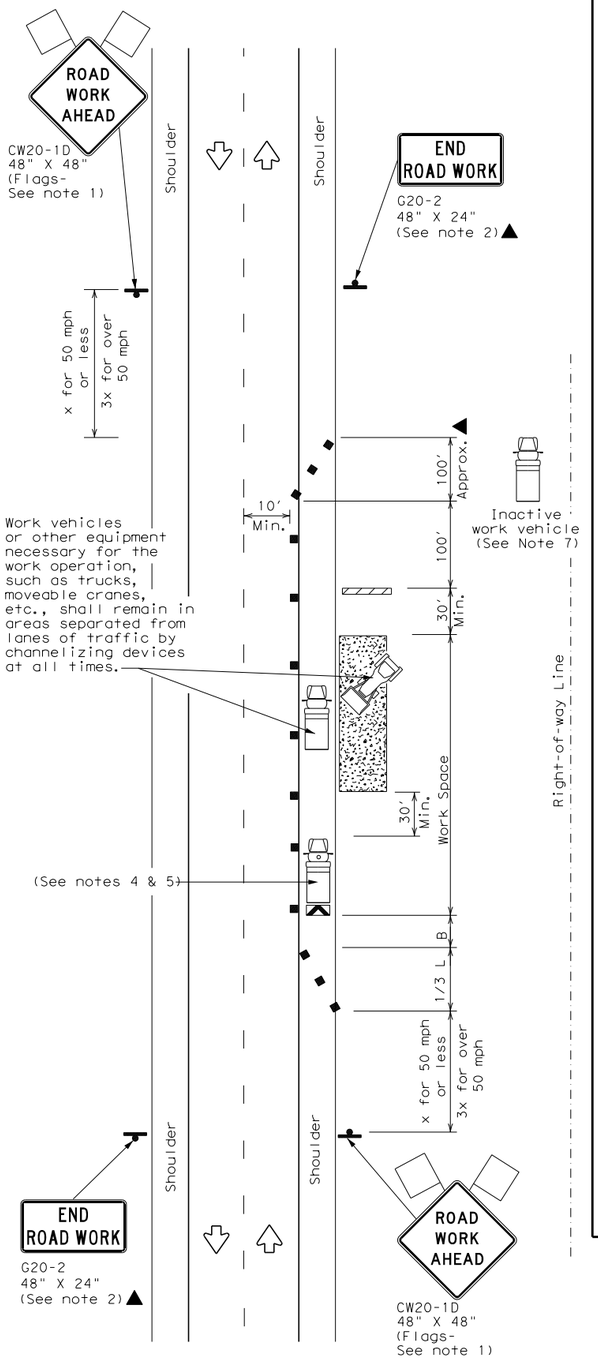
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
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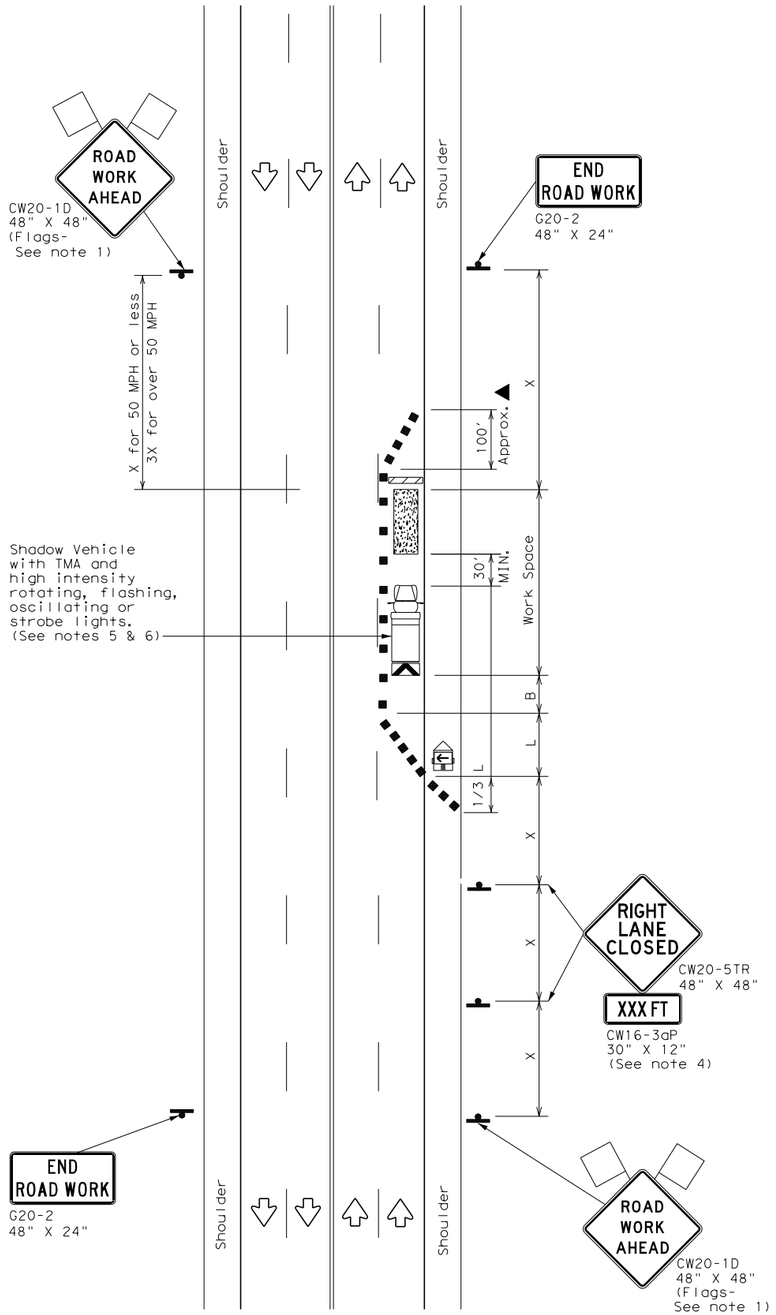
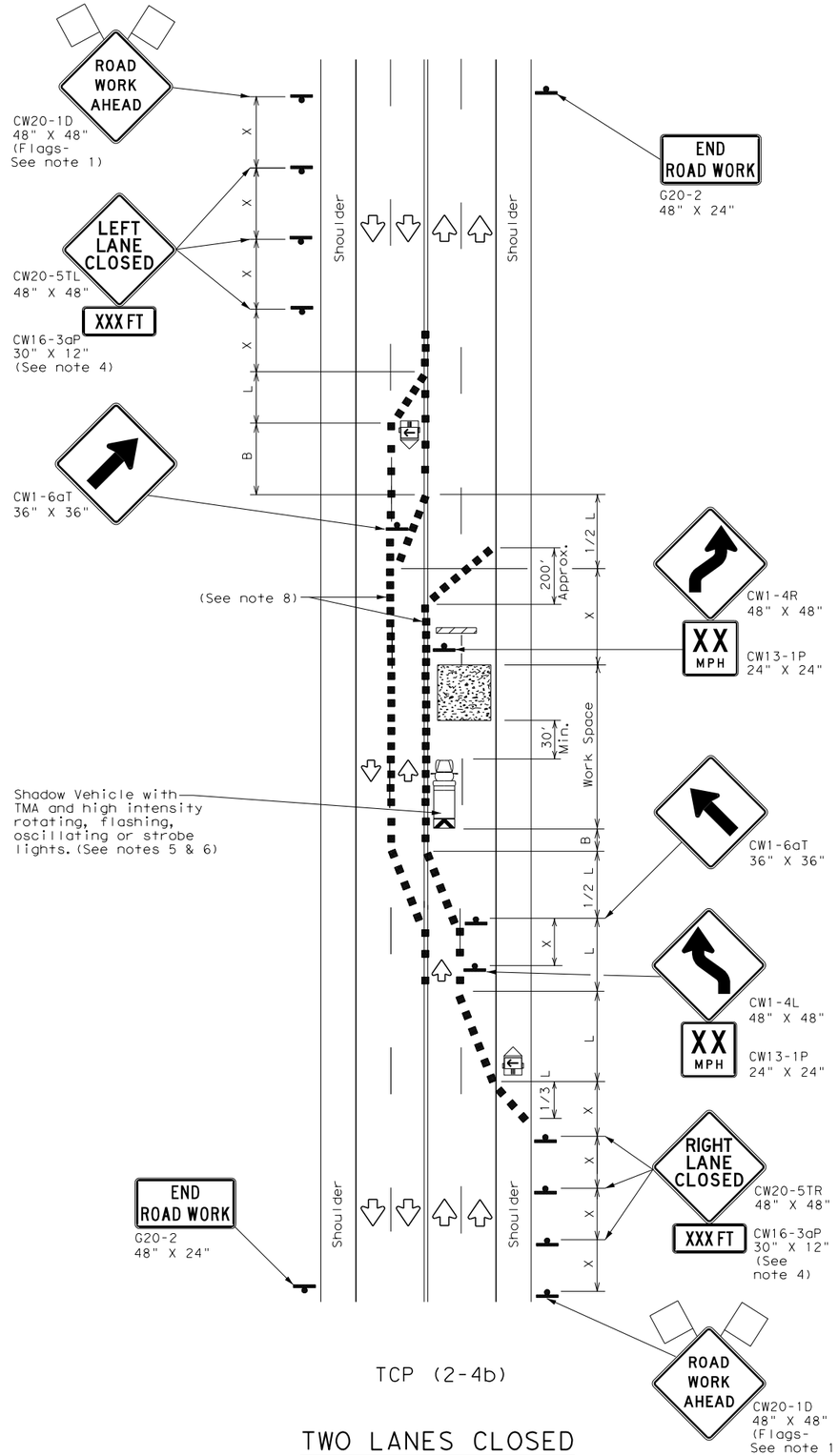


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations 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 speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1776	01	036,ETC	RM967
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	AUS	HAYS		72

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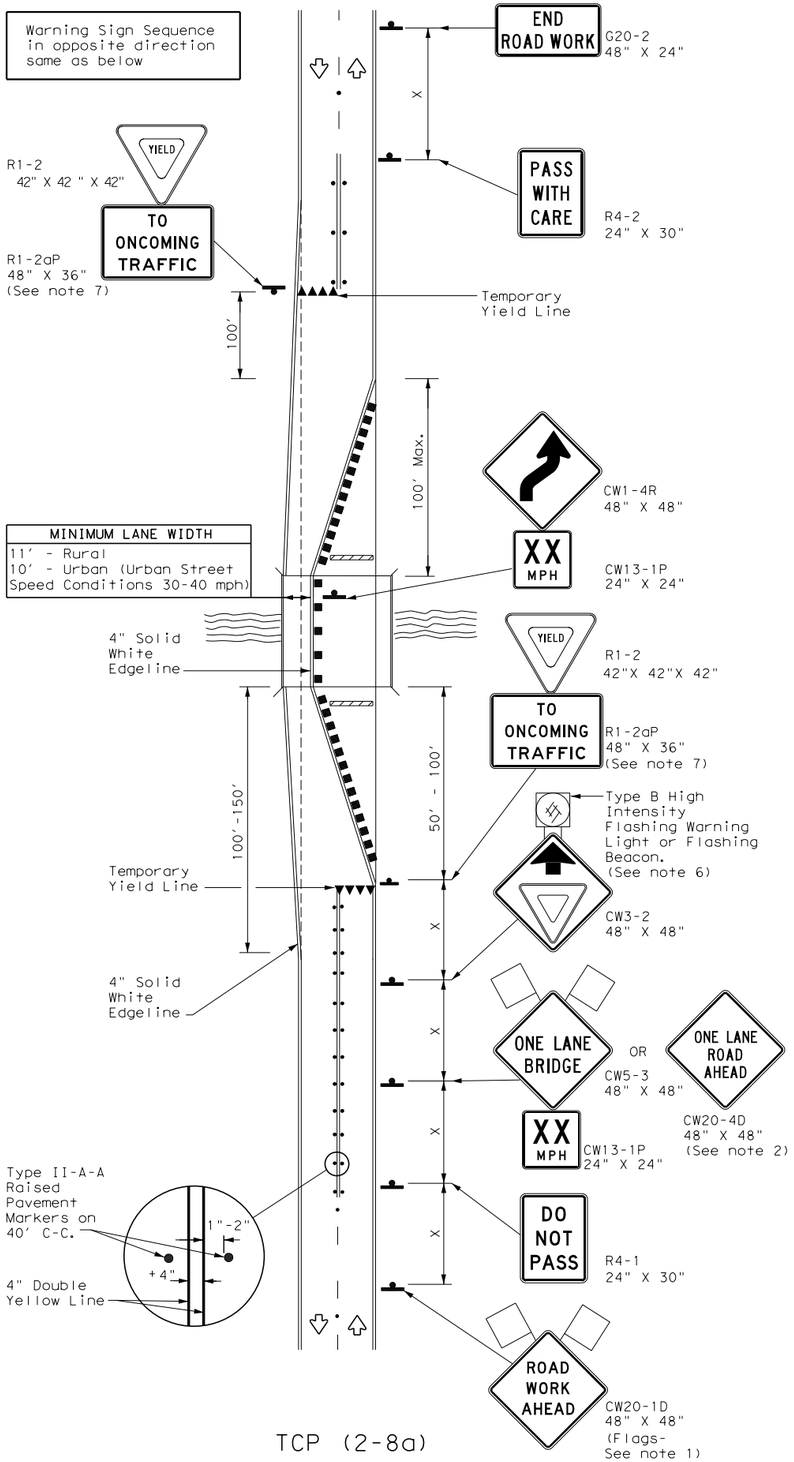
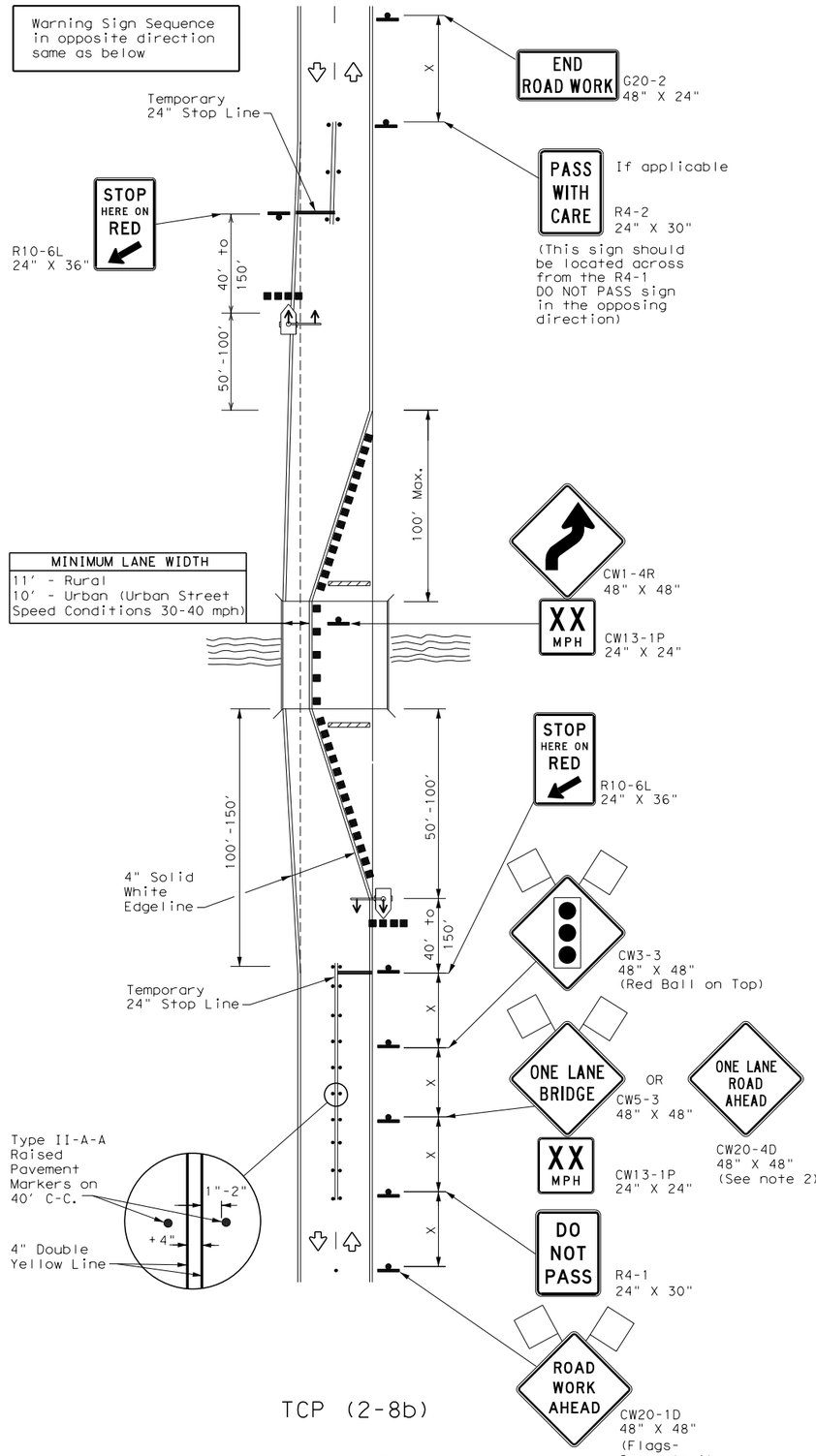


TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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

✳ Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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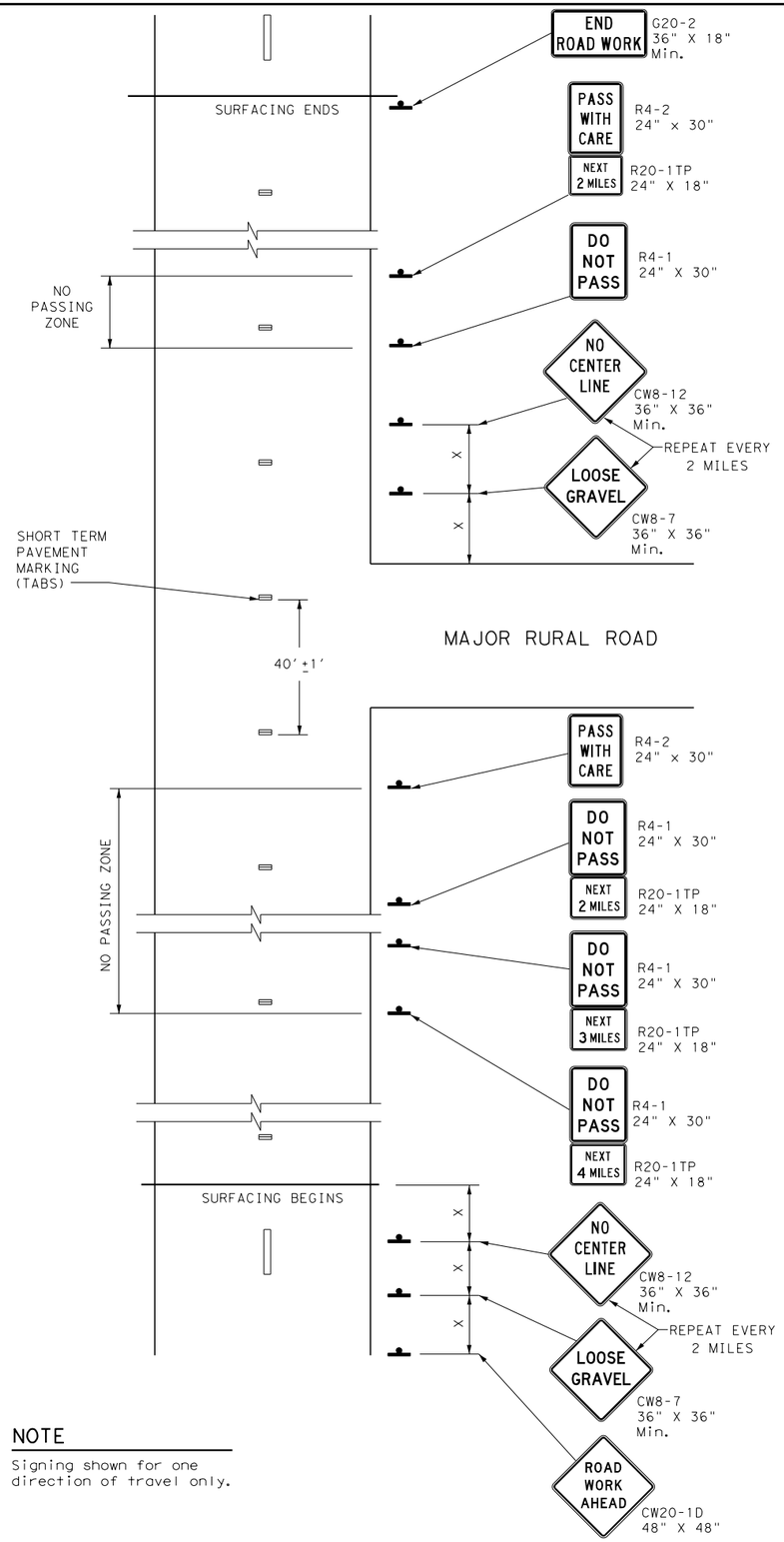
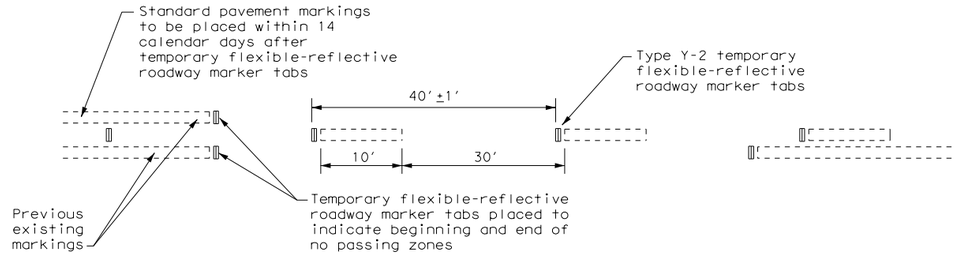


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
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210

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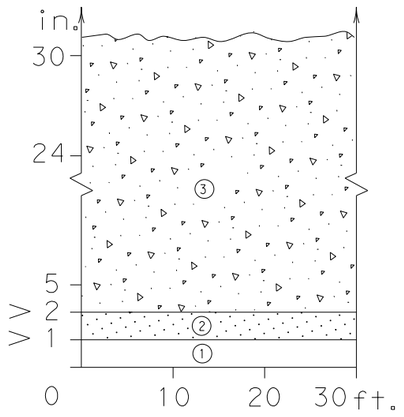
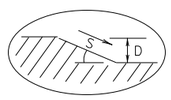
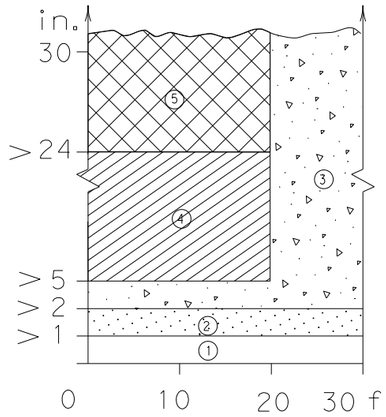
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

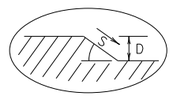


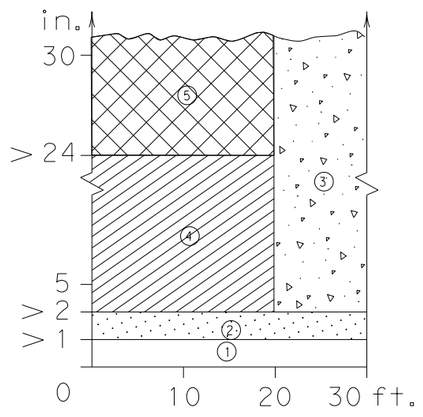
Edge Condition I
S = (3:1) (or flatter)



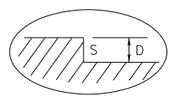


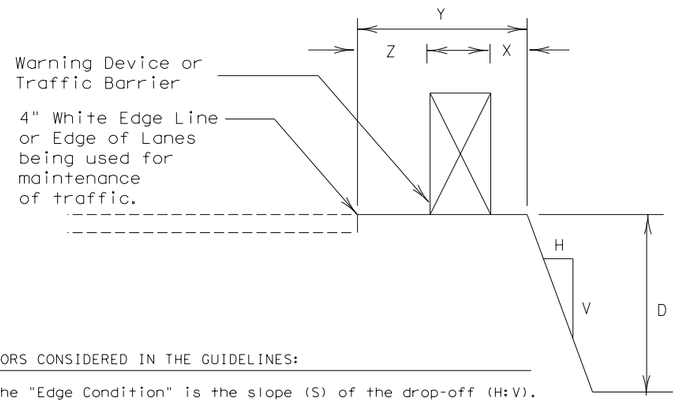
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

Edge Condition Notes:

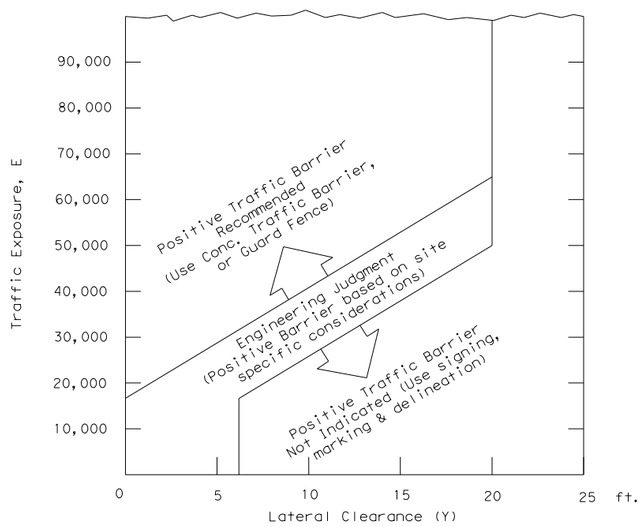
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



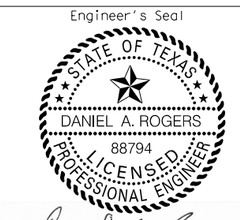
1 E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the dura-tion time in years of the dropoff condition.

2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal



Date 5/17/2021

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

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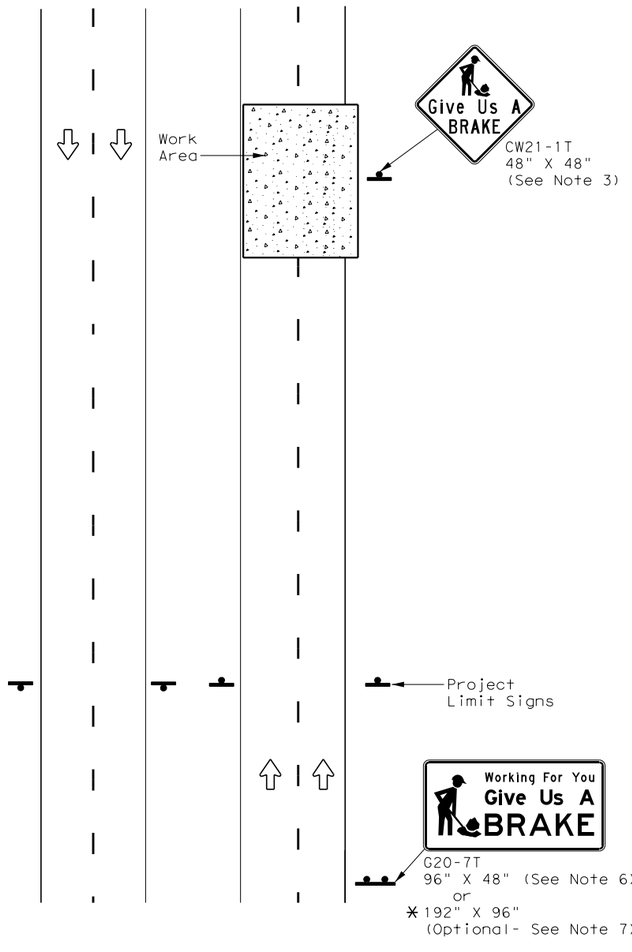
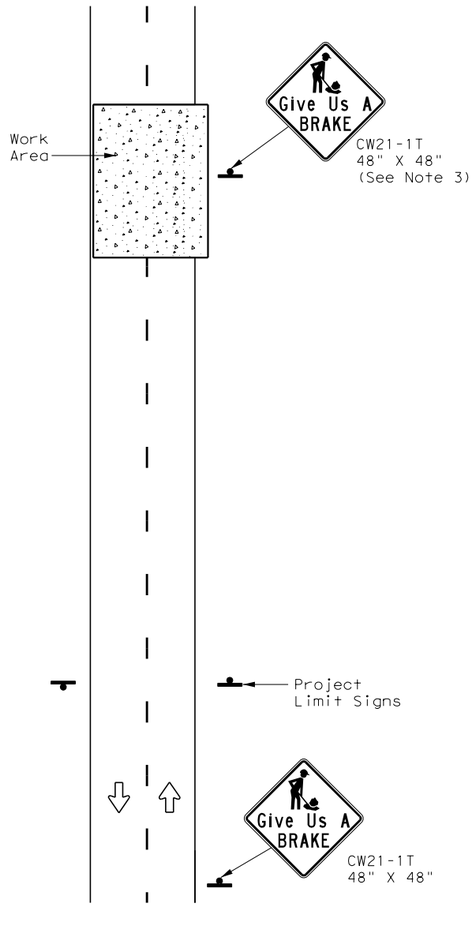


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS

PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

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©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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8-96 3-03	AUS	HAYS		76

116

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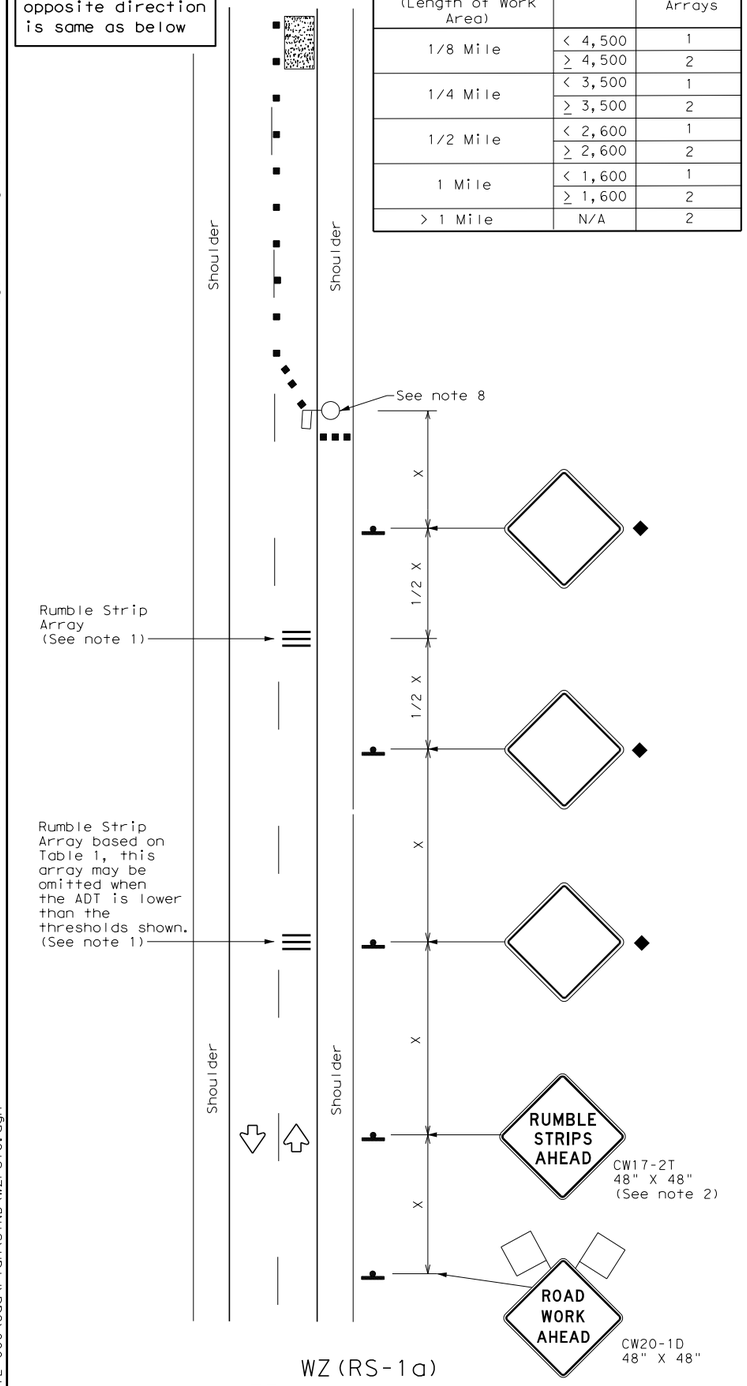
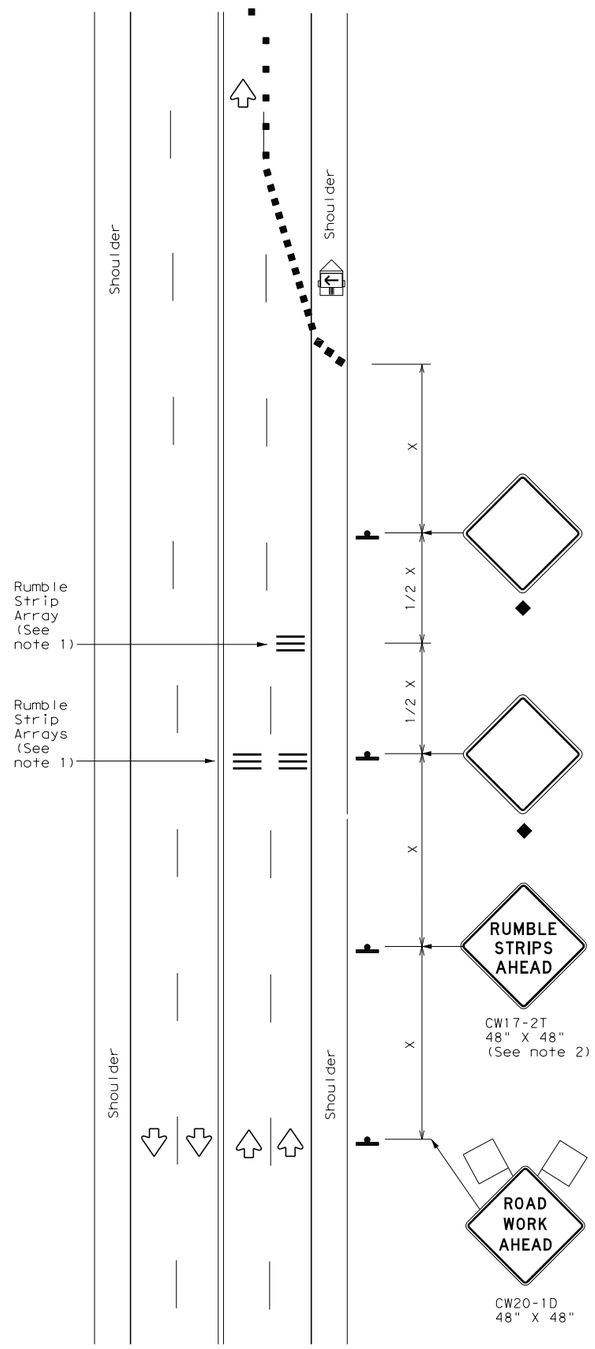
Warning sign and rumble strip sequence in opposite direction is same as below

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



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
2-14	DIST	COUNTY		SHEET NO.
4-16	AUS	HAYS		77

117

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DATE: 5/17/2021 3:37:26 PM
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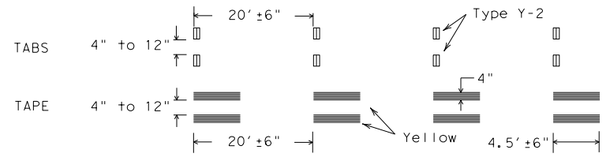
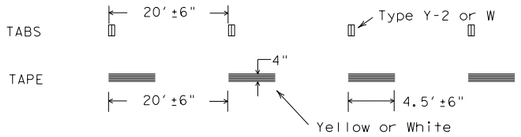
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

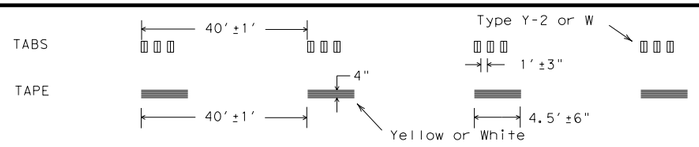


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



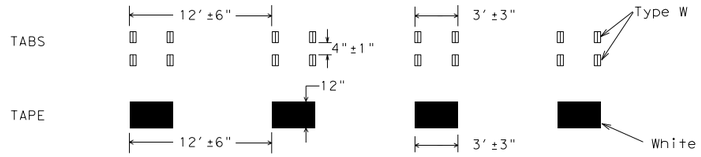
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

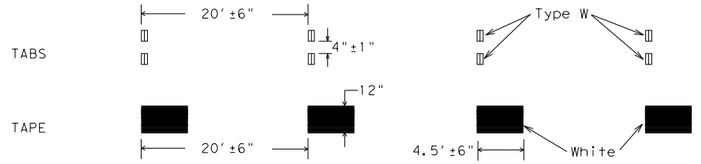


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



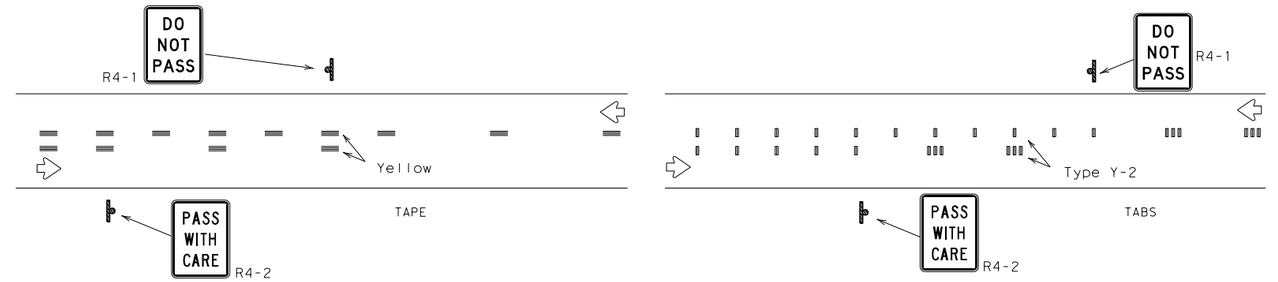
NOTES:

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

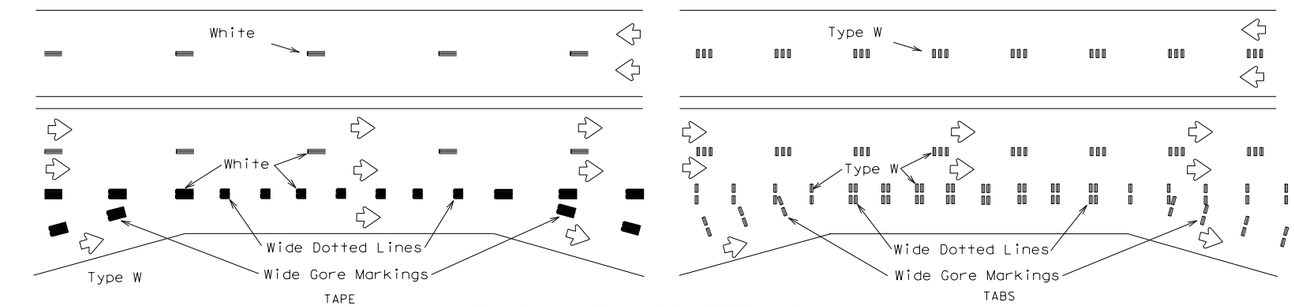
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

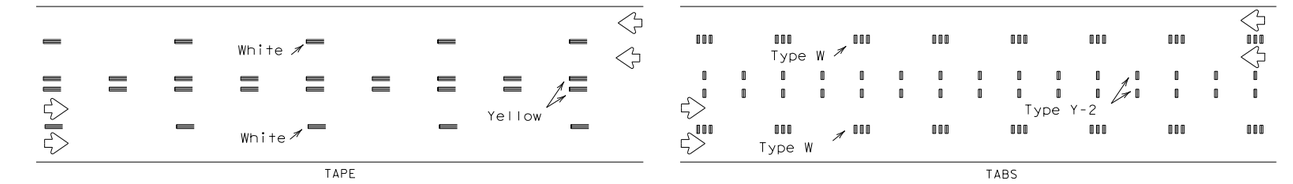
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



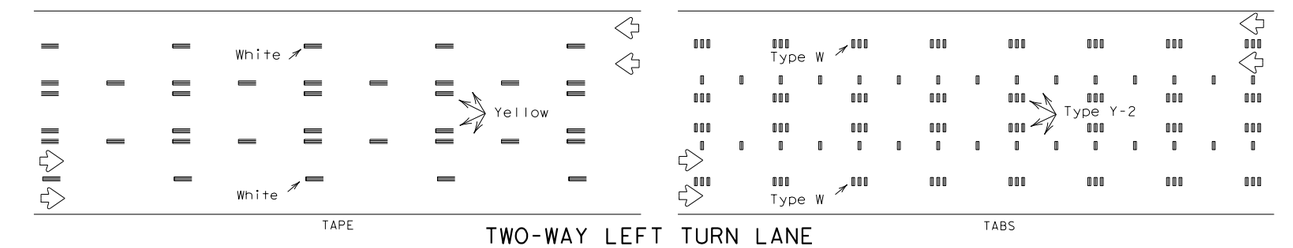
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



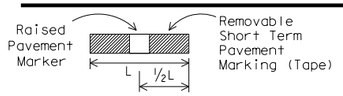
LANE LINES FOR DIVIDED HIGHWAY



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

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation

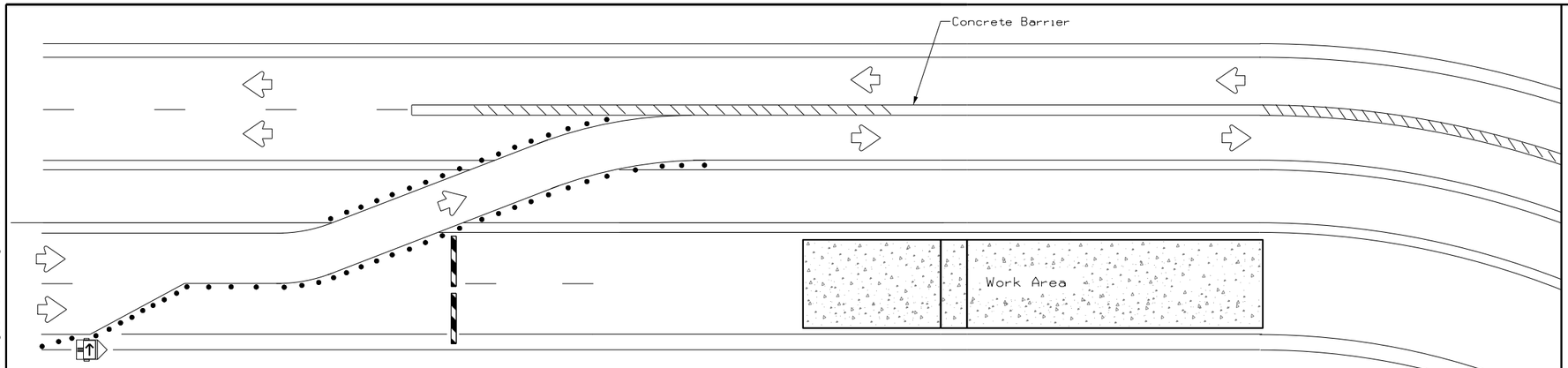
Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		1776	01	036,ETC	RM967
1-97		DIST	COUNTY		SHEET NO.
3-03		AUS	HAYS		78
7-13					

111



NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

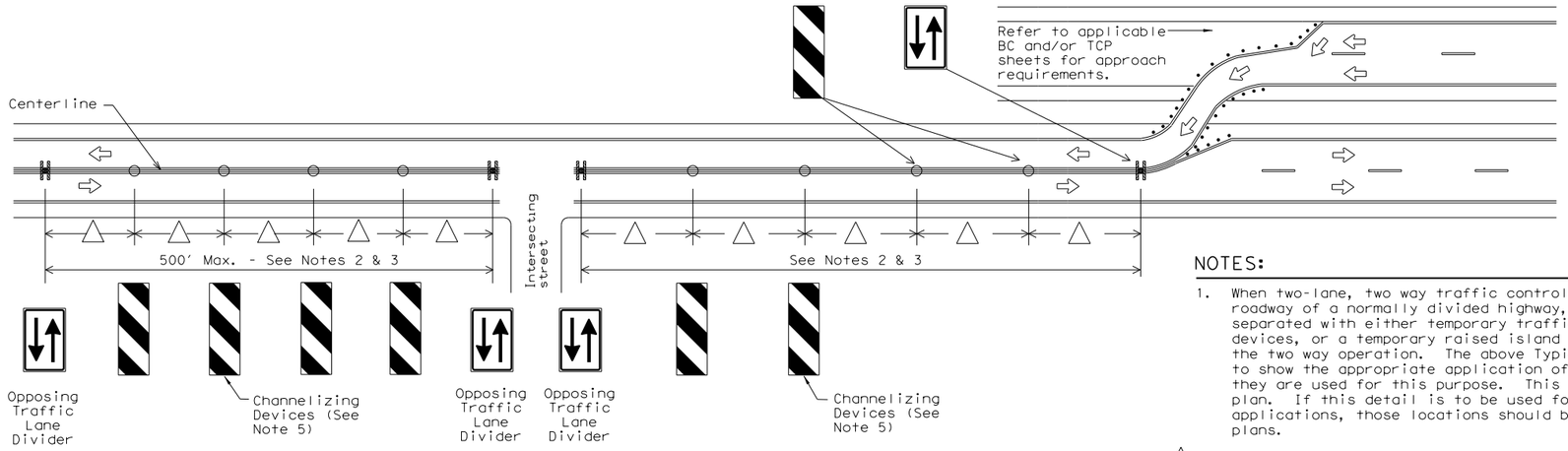
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. △ Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		79

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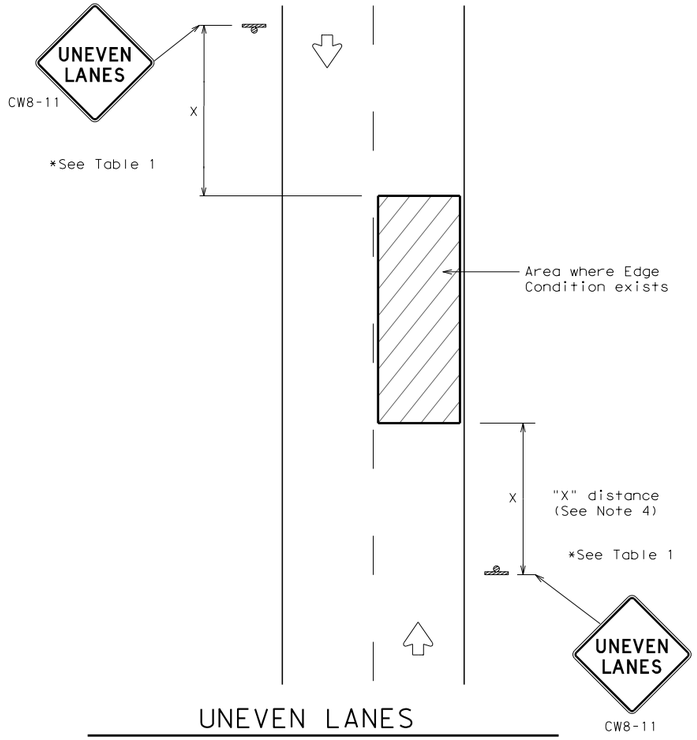
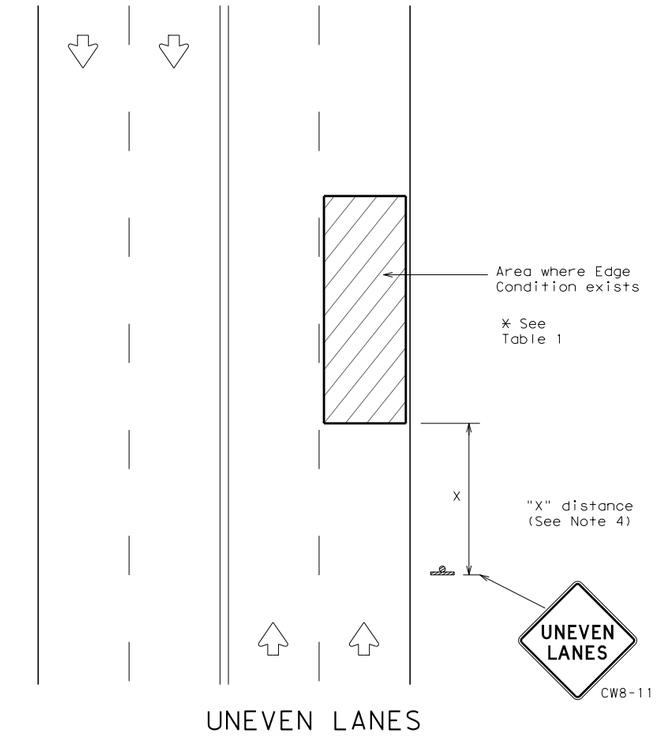
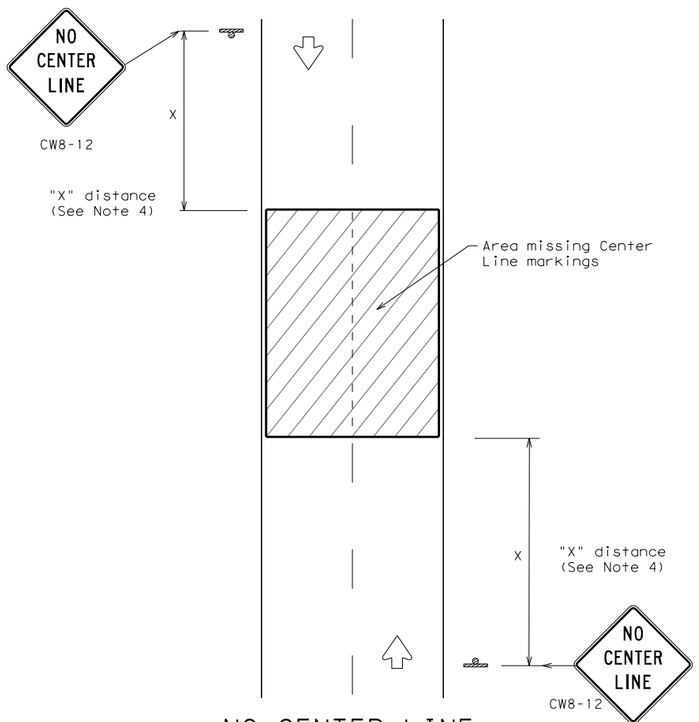


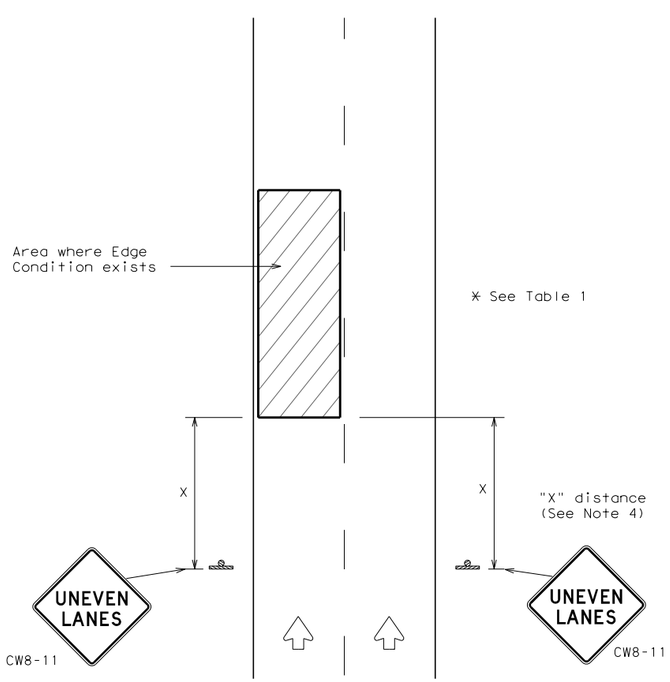
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

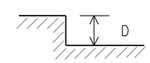
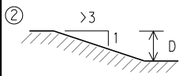
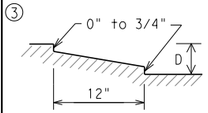
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	AUS	HAYS		80

112

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HORIZONTAL ALIGNMENT DATA (℄ RM 967)

Chain 967 contains:
BL01 CUR 9671 CUR 9672 BL02 BL03 CUR 9673 CUR 9674 CUR 9675 CUR 9676 BL04

Beginning chain 967 description

==========

Point BL01 N 13,955,128.1722 E 2,300,390.3789 Sta 298+01.75

Course from BL01 to PC 9671 S 43° 07′ 40.69" E Dist 6,150.2240

Curve Data

Curve 9671

P.I. Station	361+36.07	N	13,950,505.2042	E	2,304,720.7107
Delta =	11° 00′ 42.23"	(LT)			
Degree =	3° 00′ 00.00"				
Tangent =	184.0958				
Length =	367.0577				
Radius =	1,909.8593				
External =	8.8522				
Long Chord =	366.4930				
Mid. Ord. =	8.8114				
P.C. Station	359+51.98	N	13,950,639.5626	E	2,304,594.8572
P.T. Station	363+19.03	N	13,950,397.3588	E	2,304,869.9108
C.C.		N	13,951,945.1999	E	2,305,988.7273
Back = S	43° 07′ 40.69" E				
Ahead = S	54° 08′ 22.92" E				
Chord Bear = S	48° 38′ 01.80" E				

Course from PT 9671 to PC 9672 S 54° 08′ 22.92" E Dist 2,798.3735

Curve Data

Curve 9672

P.I. Station	396+66.48	N	13,948,436.3864	E	2,307,582.8433
Delta =	37° 05′ 02.62"	(LT)			
Degree =	3° 30′ 00.00"				
Tangent =	549.0756				
Length =	1,059.5446				
Radius =	1,637.0223				
External =	89.6294				
Long Chord =	1,041.1469				
Mid. Ord. =	84.9768				
P.C. Station	391+17.41	N	13,948,758.0409	E	2,307,137.8462
P.T. Station	401+76.95	N	13,948,448.1130	E	2,308,131.7936
C.C.		N	13,950,084.7619	E	2,308,096.8318
Back = S	54° 08′ 22.92" E				
Ahead = N	88° 46′ 34.47" E				
Chord Bear = S	72° 40′ 54.22" E				

Course from PT 9672 to BL02 N 88° 46′ 34.47" E Dist 5,323.0489

Equation: Sta 455+00.00 (BK) = Sta 100+00.00 (AH) — End Region 1 / Begin Region 2

Point BL02 N 13,948,561.7973 E 2,313,453.6284 Sta 100+00.00

Course from BL02 to BL03 N 88° 32′ 54.28" E Dist 4,711.2737

Point BL03 N 13,948,681.1447 E 2,318,163.3902 Sta 147+11.27

Course from BL03 to PC 9673 N 88° 12′ 52.02" E Dist 499.9168

Curve Data

Curve 9673

P.I. Station	153+11.28	N	13,948,699.8401	E	2,318,763.1056
Delta =	6° 00′ 00.00"	(RT)			
Degree =	3° 00′ 00.17"				
Tangent =	100.0899				
Length =	199.9969				
Radius =	1,909.8300				
External =	2.6209				
Long Chord =	199.9056				
Mid. Ord. =	2.6174				
P.C. Station	152+11.19	N	13,948,696.7215	E	2,318,663.0643
P.T. Station	154+11.19	N	13,948,692.4846	E	2,318,862.9249
C.C.		N	13,946,787.8188	E	2,318,722.5720
Back = N	88° 12′ 52.02" E				
Ahead = S	85° 47′ 07.98" E				
Chord Bear = S	88° 47′ 07.98" E				

Course from PT 9673 to PC 9674 S 85° 47′ 07.98" E Dist 862.8061

Curve Data

Curve 9674

P.I. Station	167+00.57	N	13,948,597.7279	E	2,320,148.8257
Delta =	33° 10′ 00.00"	(LT)			
Degree =	3° 59′ 59.34"				
Tangent =	426.5812				
Length =	829.2046				
Radius =	1,432.4600				
External =	62.1681				
Long Chord =	817.6756				
Mid. Ord. =	59.5823				
P.C. Station	162+73.99	N	13,948,629.0772	E	2,319,723.3980
P.T. Station	171+03.20	N	13,948,804.2273	E	2,320,522.0943
C.C.		N	13,950,057.6638	E	2,319,828.6690
Back = S	85° 47′ 07.98" E				
Ahead = N	61° 02′ 52.02" E				
Chord Bear = N	77° 37′ 52.02" E				

Course from PT 9674 to PC 9675 N 61° 02′ 52.02" E Dist 132.7348

Curve Data

Curve 9675

P.I. Station	174+10.10	N	13,948,952.7919	E	2,320,790.6398
Delta =	27° 22′ 48.04"	(RT)			
Degree =	8° 00′ 48.22"				
Tangent =	174.1661				
Length =	341.6780				
Radius =	715.0000				
External =	20.9068				
Long Chord =	338.4362				
Mid. Ord. =	20.3129				
P.C. Station	172+35.93	N	13,948,868.4815	E	2,320,638.2404
P.T. Station	175+77.61	N	13,948,957.5704	E	2,320,964.7404
C.C.		N	13,948,242.8396	E	2,320,984.3576
Back = N	61° 02′ 52.02" E				
Ahead = N	88° 25′ 40.06" E				
Chord Bear = N	74° 44′ 16.04" E				

Course from PT 9675 to PC 9676 N 88° 25′ 40.06" E Dist 2,273.9671

Curve Data

Curve 9676

P.I. Station	203+98.53	N	13,949,034.9672	E	2,323,784.6002
Delta =	31° 59′ 28.92"	(LT)			
Degree =	3° 00′ 10.52"				
Tangent =	546.9547				
Length =	1,065.3408				
Radius =	1,908.0000				
External =	76.8485				
Long Chord =	1,051.5558				
Mid. Ord. =	73.8731				
P.C. Station	198+51.58	N	13,949,019.9606	E	2,323,237.8514
P.T. Station	209+16.92	N	13,949,337.3576	E	2,324,240.3627
C.C.		N	13,950,927.2423	E	2,323,185.5022
Back = N	88° 25′ 40.06" E				
Ahead = N	56° 26′ 11.14" E				
Chord Bear = N	72° 25′ 55.60" E				

Course from PT 9676 to BL04 N 56° 26′ 11.14" E Dist 883.0812

Point BL04 N 13,949,825.5796 E 2,324,976.2103 Sta 218+00.00

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Ending chain 967 description

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

HORIZONTAL ALIGNMENT DATA

DATE: 5/17/2021			SHEET 1 OF 3
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	81

Filename: ...\Cad\Plan\015012-000*ALI.dgn
Date: 5/17/2021

HORIZONTAL ALIGNMENT DATA (℄ RM 967)

Chain 9670S contains:
OS01 OS02 CUR OS01 CUR OS2 OS03 OS04

Beginning chain 9670S description

Point OS01 N 13,951,078.9314 E 2,304,183.3007 Sta 353+50.00

Course from OS01 to OS02 S 42° 10′ 23.26" E Dist 420.0583

Point OS02 N 13,950,767.6179 E 2,304,465.3166 Sta 357+70.06

Course from OS02 to PC OS01 S 43° 07′ 40.69" E Dist 181.9953

Curve Data

Curve OS01

P.I. Station	361+36.85	N	13,950,499.9263	E	2,304,716.0632
Delta =	11° 00′ 42.23" (LT)				
Degree =	2° 59′ 19.34"				
Tangent =	184.7916				
Length =	368.4449				
Radius =	1,917.0775				
External =	8.8857				
Long Chord =	367.8781				
Mid. Ord. =	8.8447				
P.C. Station	359+52.05	N	13,950,634.7925	E	2,304,589.7341
P.T. Station	363+20.50	N	13,950,391.6733	E	2,304,865.8271
C.C.		N	13,951,945.3644	E	2,305,988.8721
Back = S	43° 07′ 40.69" E				
Ahead = S	54° 08′ 22.92" E				
Chord Bear = S	48° 38′ 01.80" E				

Course from PT OS01 to PC OS2 S 54° 08′ 22.92" E Dist 2,798.3525

Curve Data

Curve OS2

P.I. Station	396+70.27	N	13,948,429.3379	E	2,307,580.6454
Delta =	37° 05′ 02.61" (LT)				
Degree =	3° 29′ 06.35"				
Tangent =	551.4235				
Length =	1,064.0752				
Radius =	1,644.0223				
External =	90.0126				
Long Chord =	1,045.5989				
Mid. Ord. =	85.3401				
P.C. Station	391+18.85	N	13,948,752.3678	E	2,307,133.7455
P.T. Station	401+82.93	N	13,948,441.1146	E	2,308,131.9431
C.C.		N	13,950,084.7619	E	2,308,096.8318
Back = S	54° 08′ 22.92" E				
Ahead = N	88° 46′ 34.47" E				
Chord Bear = S	72° 40′ 54.22" E				

Course from PT OS2 to OS03 N 88° 46′ 34.47" E Dist 2,188.0937

Point OS03 N 13,948,487.8457 E 2,310,319.5378 Sta 423+71.02

Course from OS03 to OS04 N 87° 49′ 16.67" E Dist 420.0134

Point OS04 N 13,948,503.8131 E 2,310,739.2476 Sta 427+91.03

HORIZONTAL ALIGNMENT DATA (OAK FOREST DR)

Chain OAK contains:
OAK01 OAK02

Beginning chain OAK description

Point OAK01 N 13,948,661.5768 E 2,315,022.6725 Sta 9+40.00

Course from OAK01 to OAK02 S 1° 27′ 05.72" E Dist 60.0000

Point OAK02 N 13,948,601.5961 E 2,315,024.1924 Sta 10+00.00

Ending chain OAK description

HORIZONTAL ALIGNMENT DATA (BEACON HILL RD)

Chain BEACON contains:
BEA01 BEA02

Beginning chain BEACON description

Point BEA01 N 13,948,649.9432 E 2,320,093.7436 Sta 10+00.00

Course from BEA01 to BEA02 S 47° 11′ 48.09" W Dist 109.4092

Point BEA02 N 13,948,575.6015 E 2,320,013.4711 Sta 11+09.41

Ending chain BEACON description

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

HORIZONTAL ALIGNMENT DATA

DATE: 5/17/2021 SHEET 2 OF 3

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	82

Filename: ...\Cad\Plan\015012-000*ALI.dgn
Date: 5/17/2021

HORIZONTAL ALIGNMENT DATA
(CARPENTER HILL RD)

Chain CARPEN contains:
 CAR01 CUR CARPEN1 CAR02

Beginning chain CARPEN description

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================================================================================

Point CAR01            N  13,949,383.9953 E   2,320,913.5251 Sta       5+69.00

Course from CAR01 to PC CARPEN1 S 10° 29′ 14.33" W Dist 45.0527

                                  Curve Data
                                 *----------*
Curve CARPEN1
P.I.  Station              6+71.03  N     13,949,283.6708  E      2,320,894.9540
Delta       =      15° 26′ 58.74" (LT)
Degree      =      13° 38′ 26.74"
Tangent     =             56.9761
Length      =            113.2609
Radius      =            420.0336
External    =              3.8467
Long Chord  =            112.9181
Mid. Ord.   =              3.8118
P.C.  Station              6+14.05  N     13,949,339.6951  E      2,320,905.3247
P.T.  Station              7+27.31  N     13,949,226.9083  E      2,320,899.8825
C.C.                                N     13,949,263.2415  E      2,321,318.3417
Back        = S  10° 29′ 14.33" W
Ahead       = S   4° 57′ 44.41" E
Chord Bear  = S   2° 45′ 44.96" W

Course from PT CARPEN1 to CAR02 S 4° 57′ 44.41" E Dist 272.6864

Point CAR02            N  13,948,955.2440 E   2,320,923.4701 Sta      10+00.00

================================================================================
Ending chain CARPEN description
```

HORIZONTAL ALIGNMENT DATA
(SPORTPLEX DR)

Chain SPORT contains:
 SPLX01 SPLX02

Beginning chain SPORT description

```
================================================================================

Point SPLX01           N  13,949,100.6326 E   2,322,896.7605 Sta       9+10.00

Course from SPLX01 to SPLX02 S 1° 34′ 19.94" E Dist 90.0000

Point SPLX02           N  13,949,010.6664 E   2,322,899.2298 Sta      10+00.00

================================================================================
Ending chain SPORT description
```

HORIZONTAL ALIGNMENT DATA
(WILEY WAY)

Chain WILEY contains:
 WLY01 WLY02

Beginning chain WILEY description

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================================================================================

Point WLY01            N  13,949,035.4235 E   2,323,433.4650 Sta      10+00.00

Course from WLY01 to WLY02 S 6° 59′ 29.89" E Dist 80.0000

Point WLY02            N  13,948,956.0184 E   2,323,443.2029 Sta      10+80.00

================================================================================
Ending chain WILEY description
```

STATE OF TEXAS
DANIEL A. ROGERS
88794
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5/17/2021

Texas Department of Transportation

HAYS COUNTY

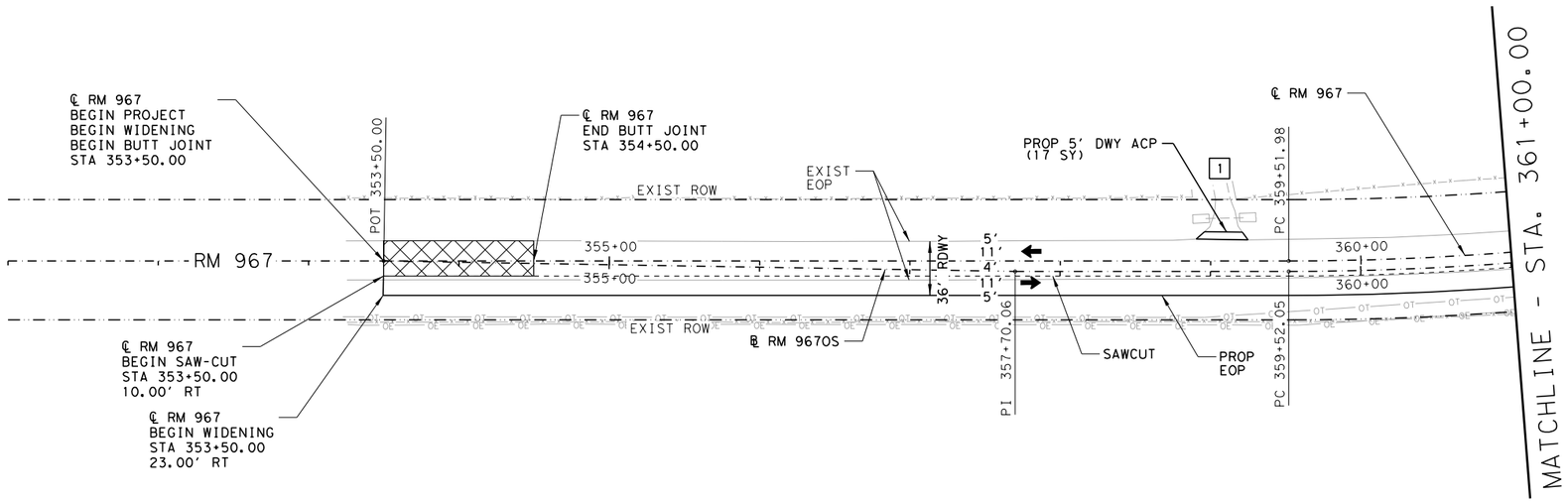
WSB & ASSOCIATES, INC.
FIRM # 16849

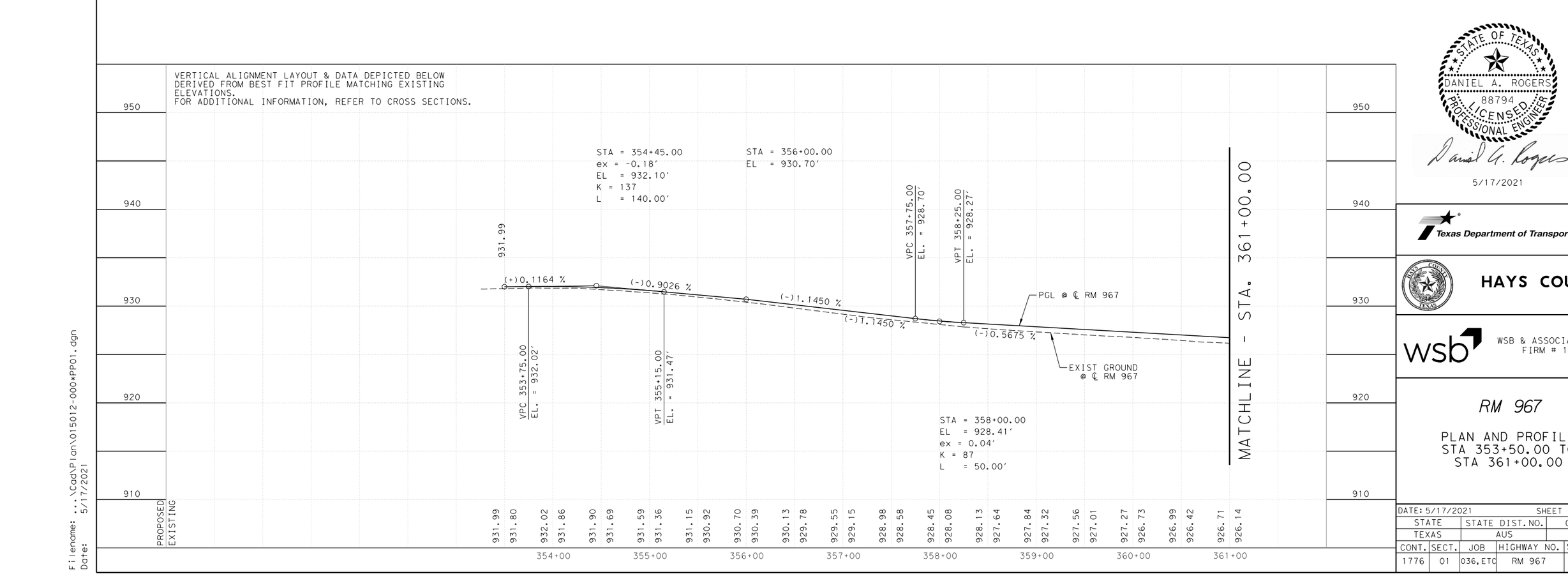
RM 967

HORIZONTAL ALIGNMENT DATA

DATE: 5/17/2021				SHEET 3 OF 3
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	83

Filename: ...\Cad\Plan\015012-000*AL1.dgn
Date: 5/17/2021





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V: 0 5 10

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

Texas Department of Transportation

HAYS COUNTY

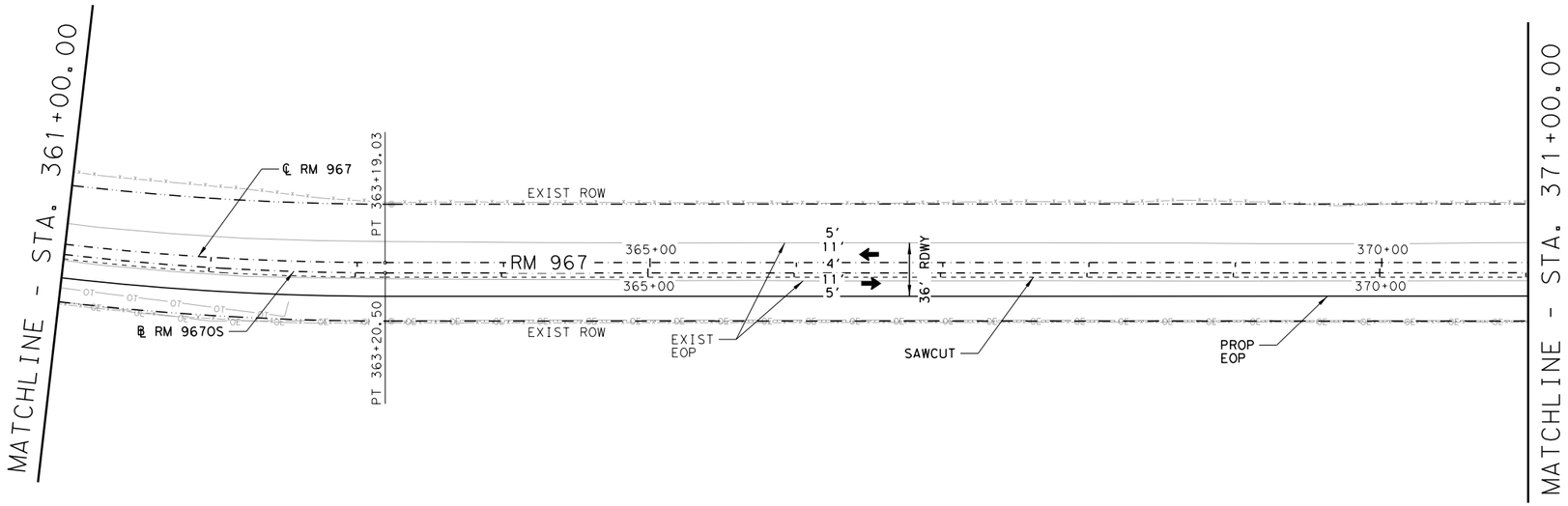
WSB & ASSOCIATES, INC.
FIRM # 16849

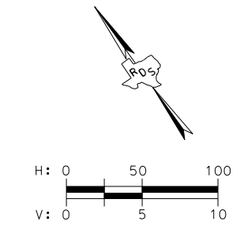
RM 967

PLAN AND PROFILE
STA 353+50.00 TO
STA 361+00.00

DATE: 5/17/2021			SHEET 1 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	84

Filename: ...\Cad\Plan\015012-000*PP01.dgn
Date: 5/17/2021





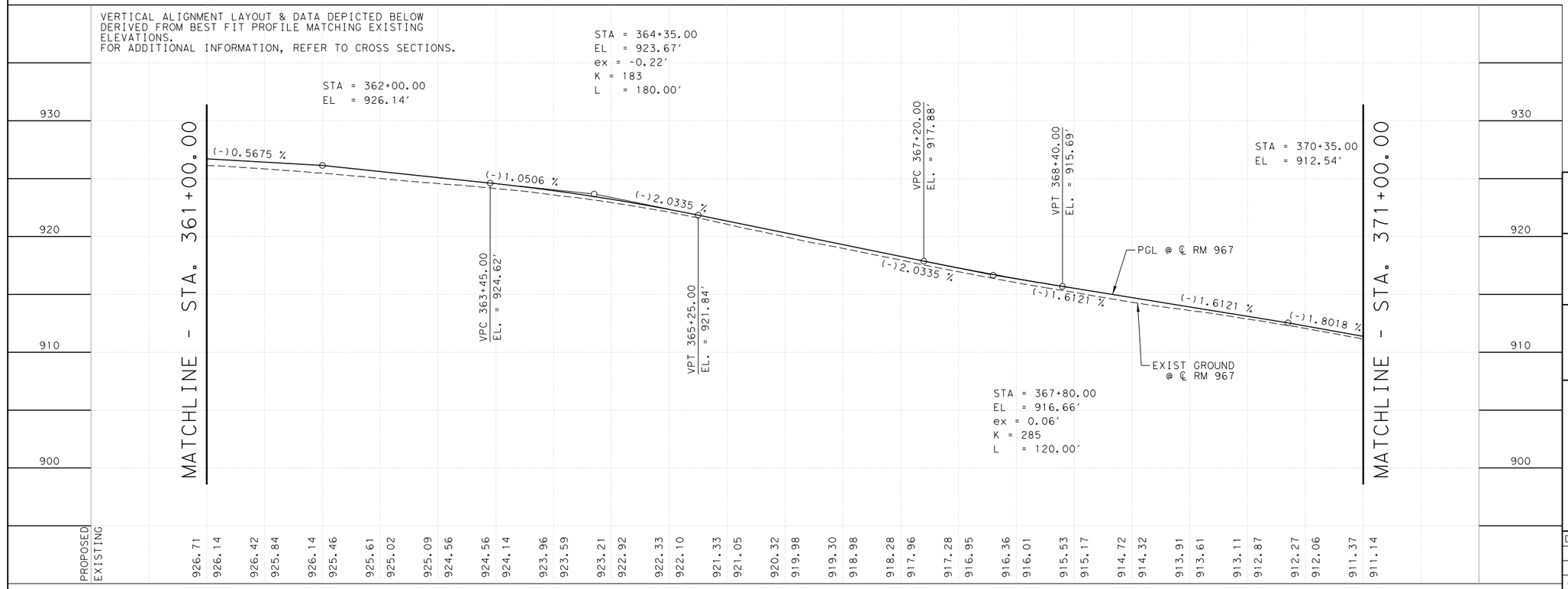
NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW DERIVED FROM BEST FIT PROFILE MATCHING EXISTING ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.



Texas Department of Transportation

HAYS COUNTY

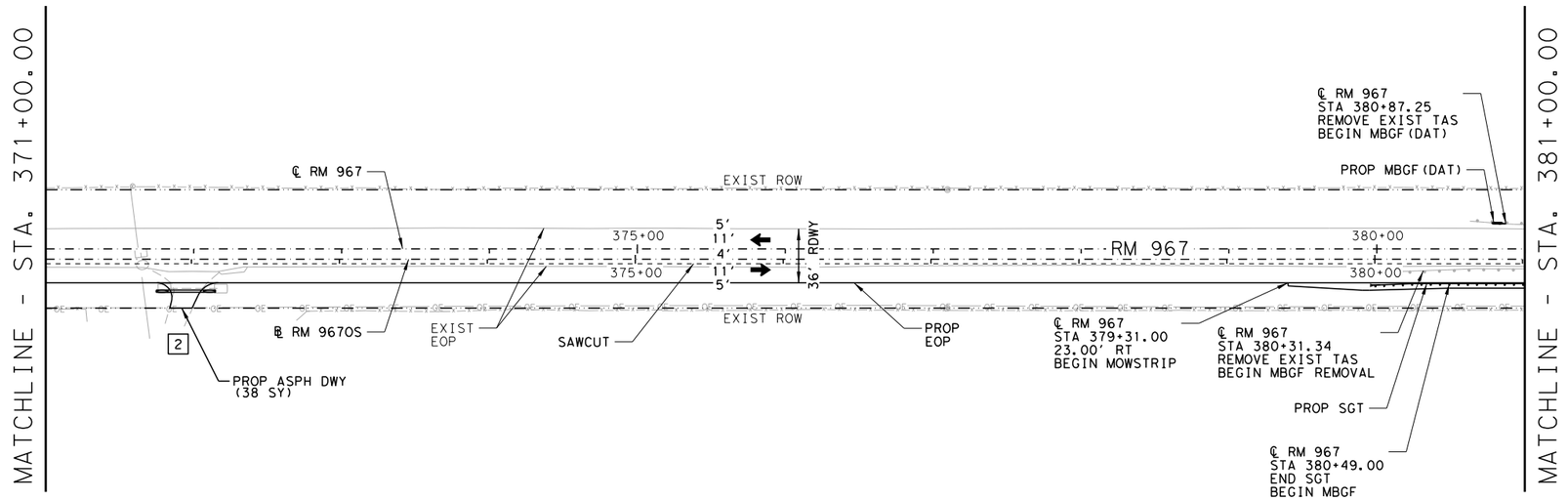
WSB & ASSOCIATES, INC.
FIRM # 16849

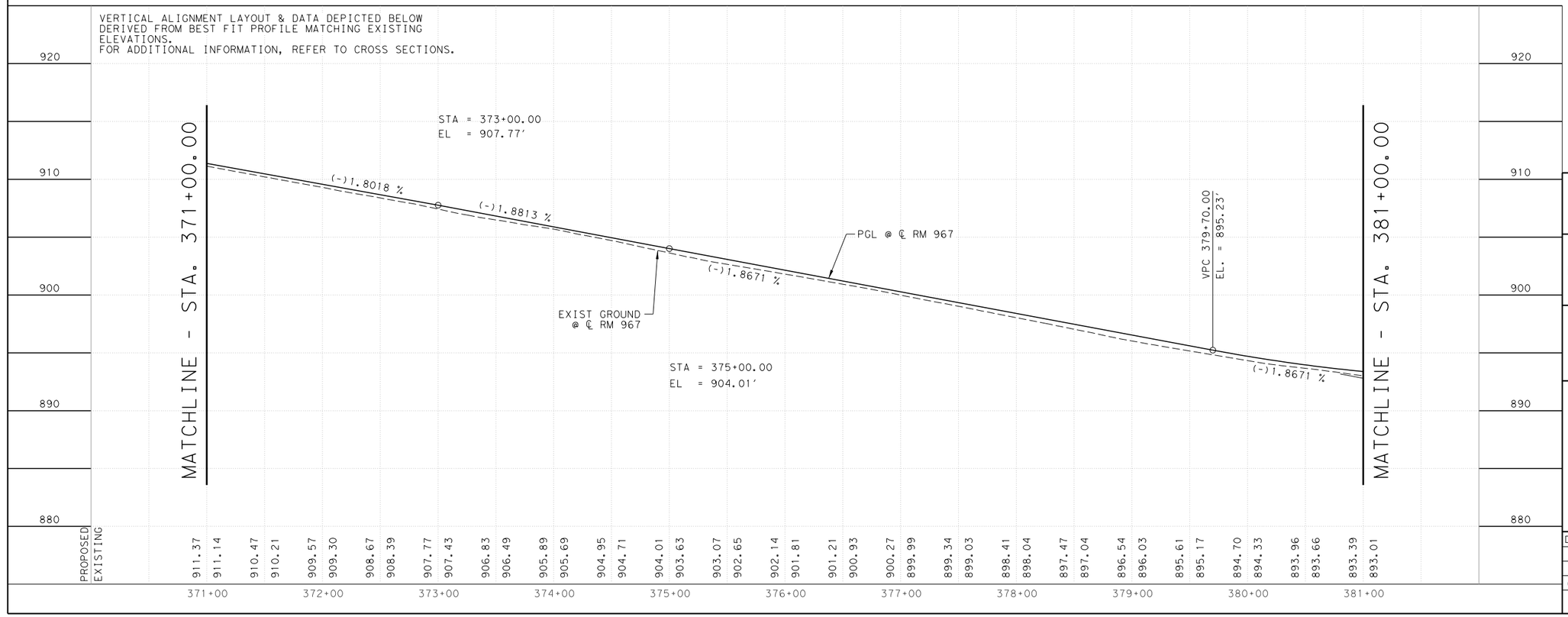
RM 967

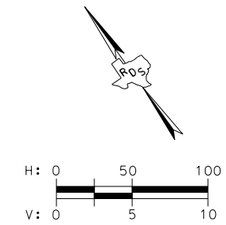
PLAN AND PROFILE
STA 361+00.00 TO
STA 371+00.00

DATE: 5/17/2021			SHEET 2 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 01	036, ETC	RM 967	85

Filename: ...\Cad\Plan\015012-000*PP02.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

Texas Department of Transportation

HAYS COUNTY

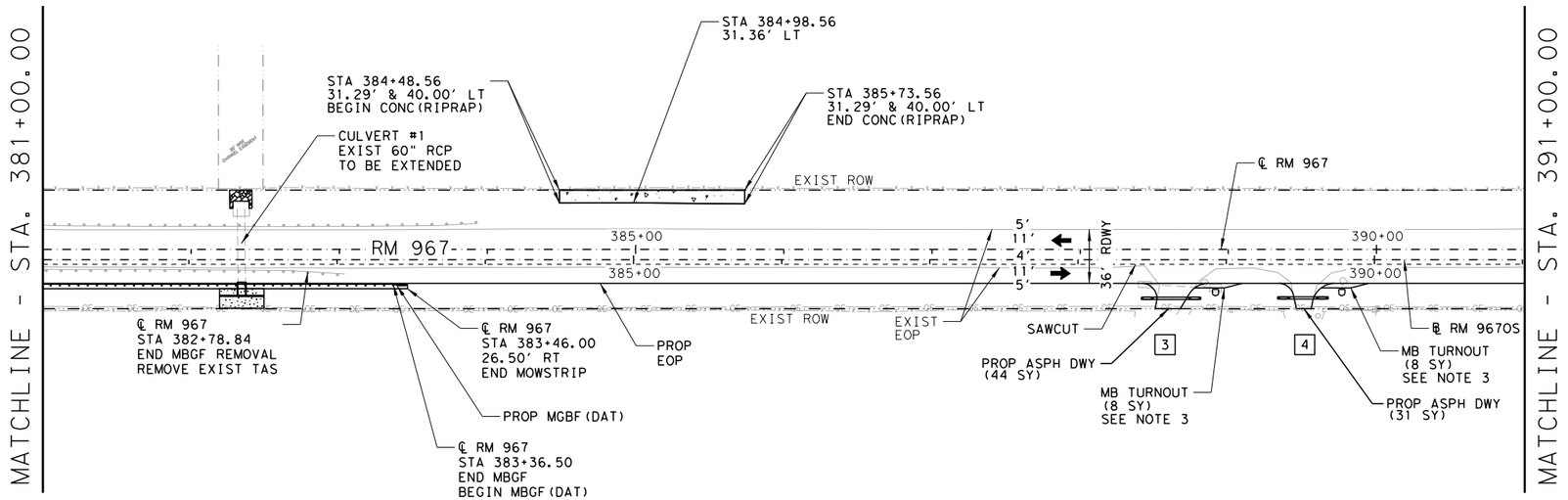
WSB & ASSOCIATES, INC.
FIRM # 16849

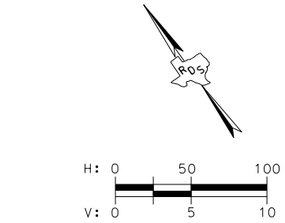
RM 967

PLAN AND PROFILE
STA 371+00.00 TO
STA 381+00.00

DATE: 5/17/2021			SHEET 3 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	86

Filename: ...\Cad\Plan\015012-000*PP03.dgn
Date: 5/17/2021





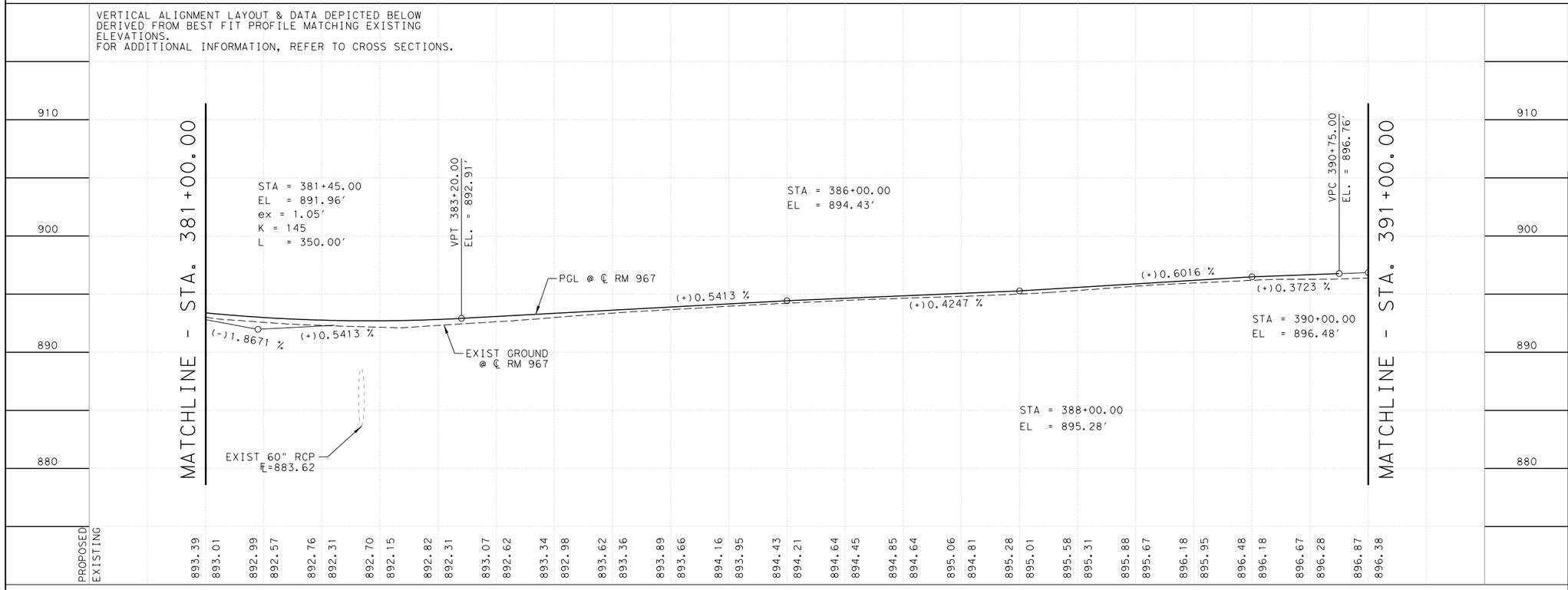
NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW
DERIVED FROM BEST FIT PROFILE MATCHING EXISTING
ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.



5/17/2021

Texas Department of Transportation

HAYS COUNTY

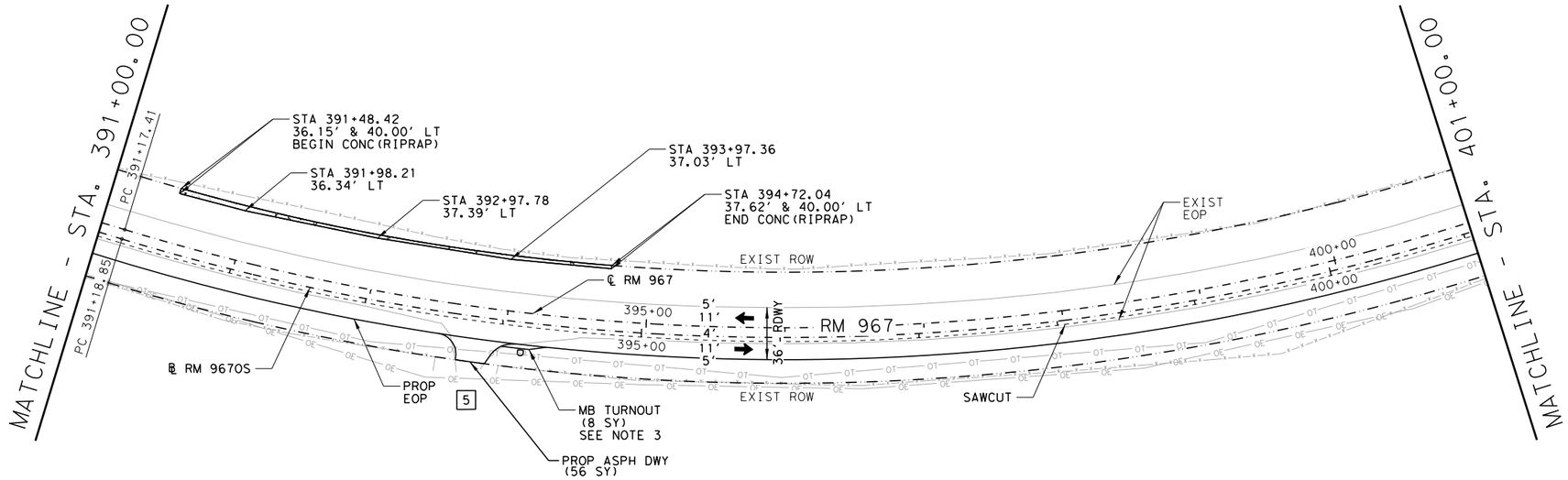
WSB & ASSOCIATES, INC.
FIRM # 16849

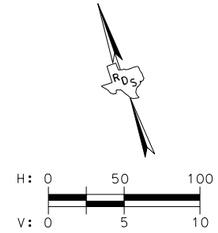
RM 967

PLAN AND PROFILE
STA 381+00.00 TO
STA 391+00.00

DATE: 5/17/2021			SHEET 4 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	87

Filename: ...\Cad\Plan\015012-000*PP04.dgn
Date: 5/17/2021





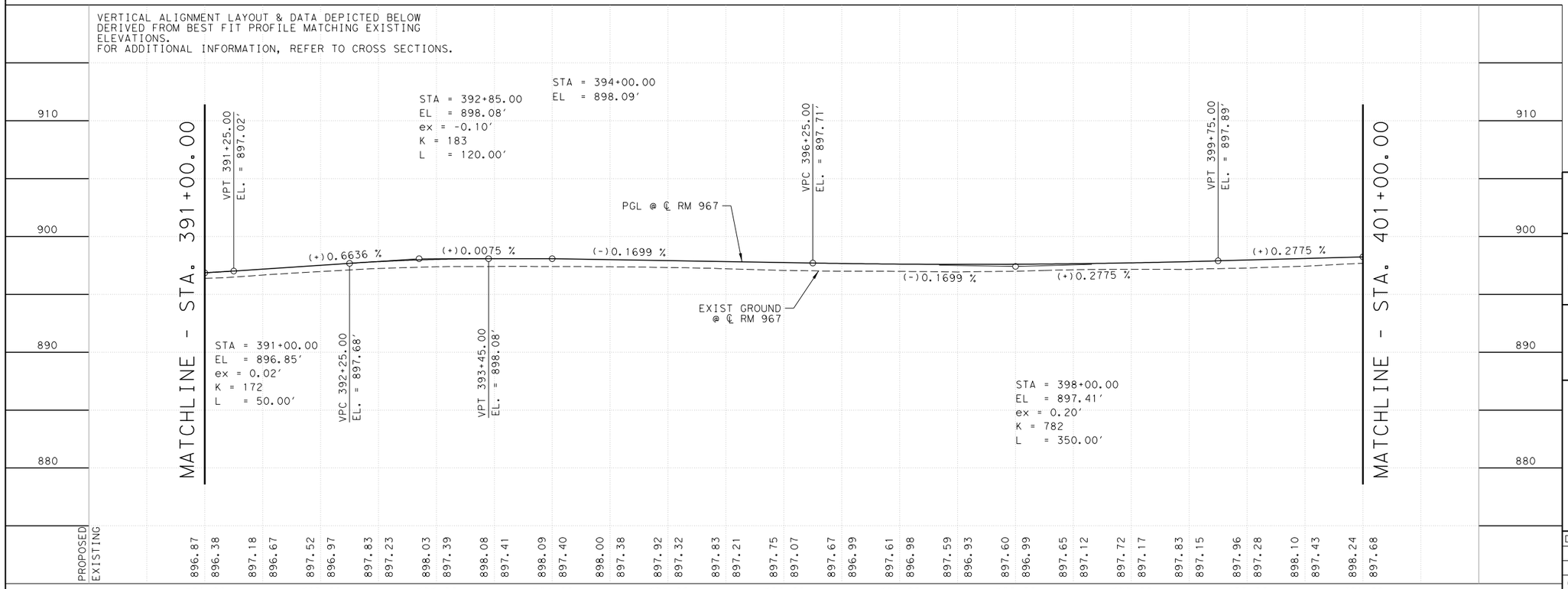
NOTES:

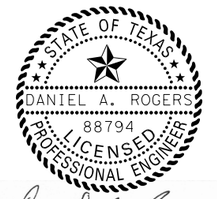
1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW
DERIVED FROM BEST FIT PROFILE MATCHING EXISTING
ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.





5/17/2021

Texas Department of Transportation

HAYS COUNTY

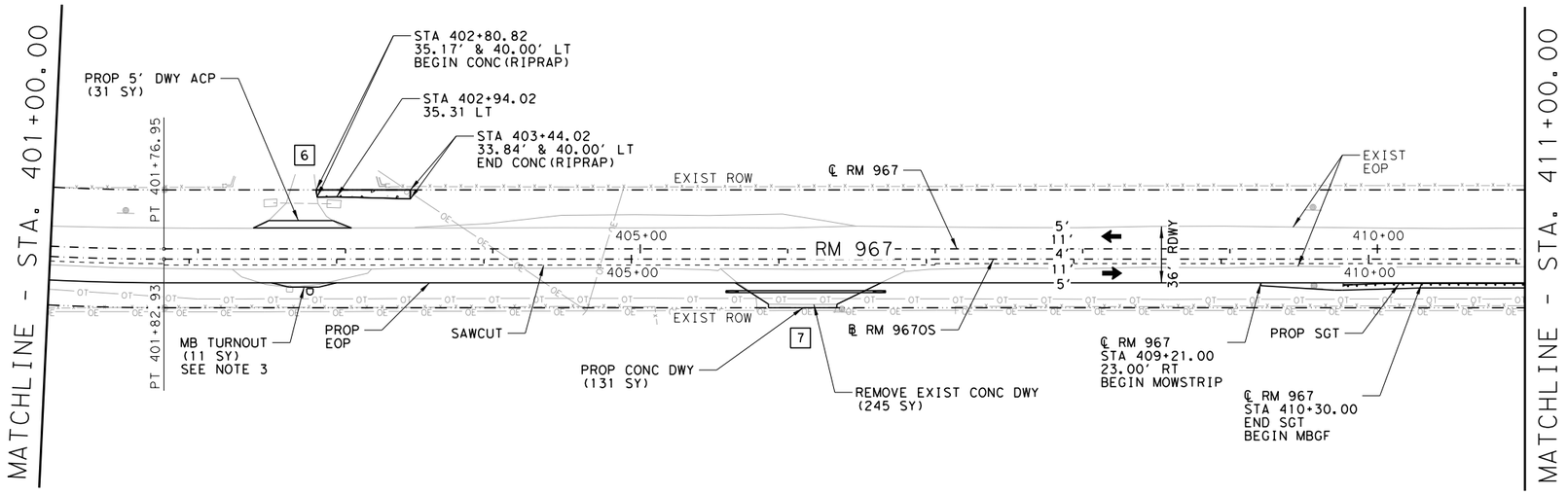
WSB & ASSOCIATES, INC.
FIRM # 16849

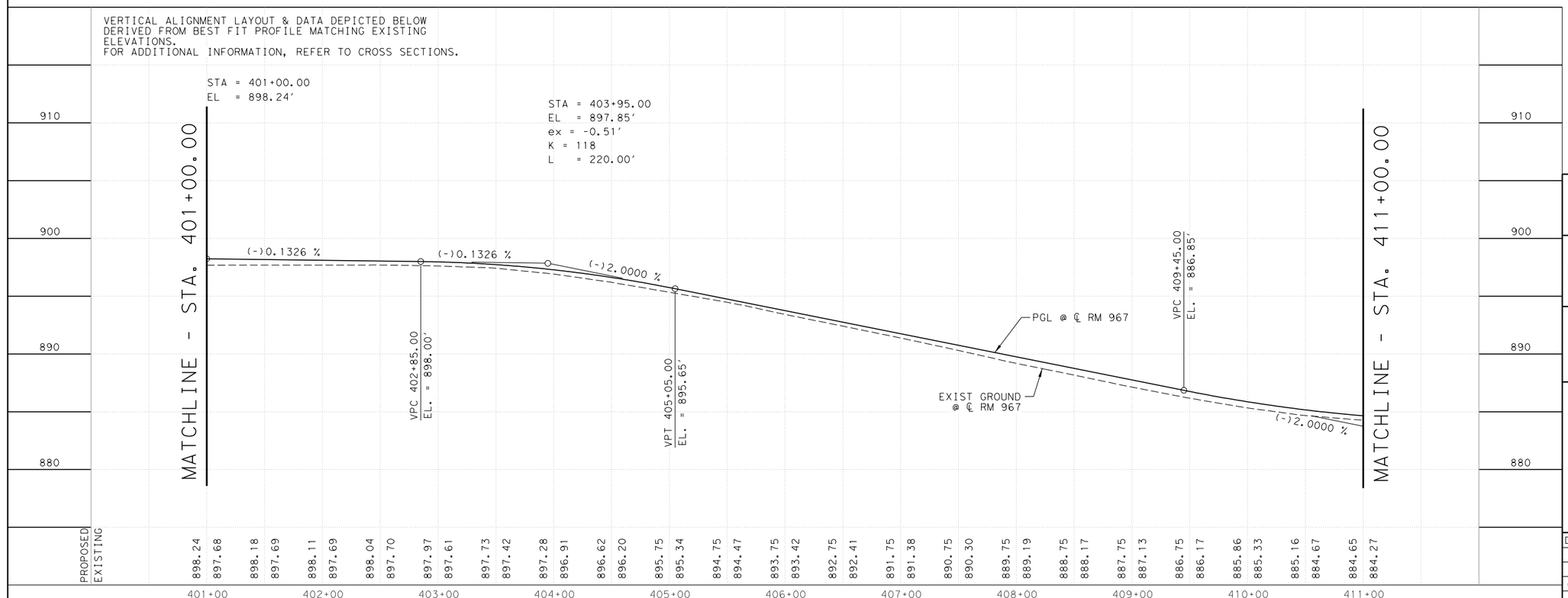
RM 967

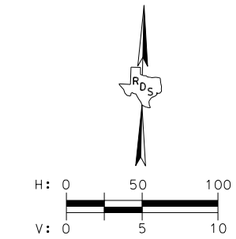
PLAN AND PROFILE
STA 391+00.00 TO
STA 401+00.00

DATE: 5/17/2021			SHEET 5 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	88

Filename: ...\Cad\Plan\015012-000*PP05.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

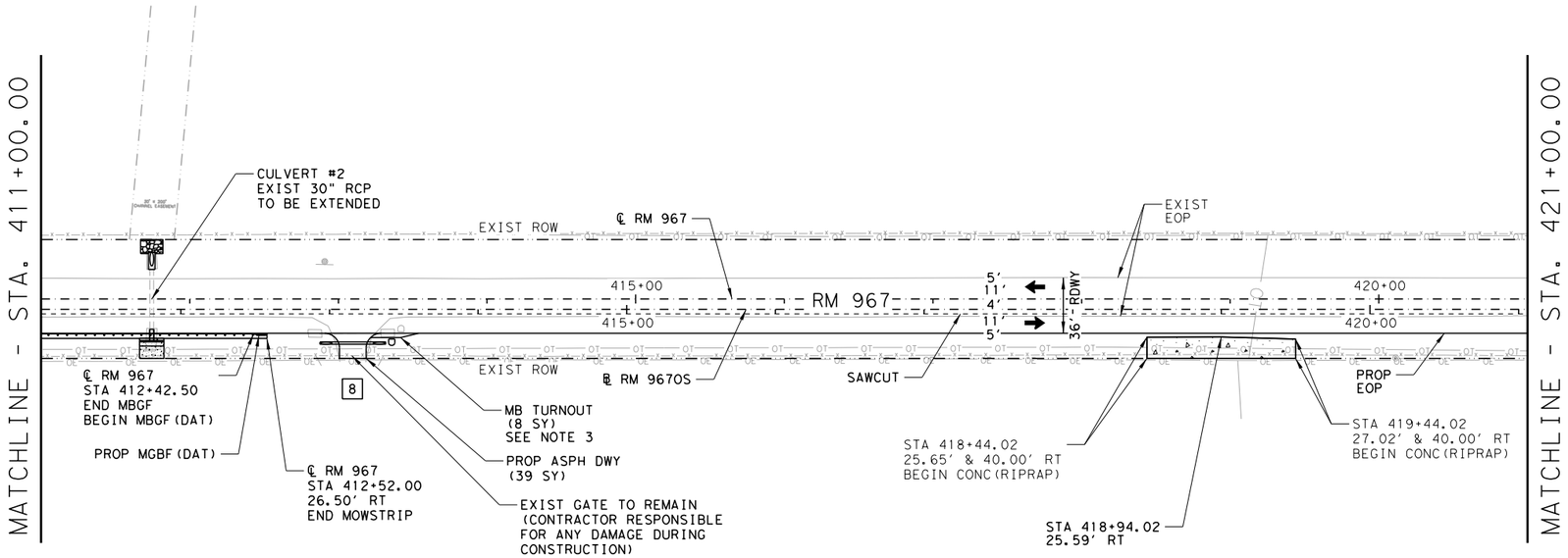
WSB & ASSOCIATES, INC.
FIRM # 16849

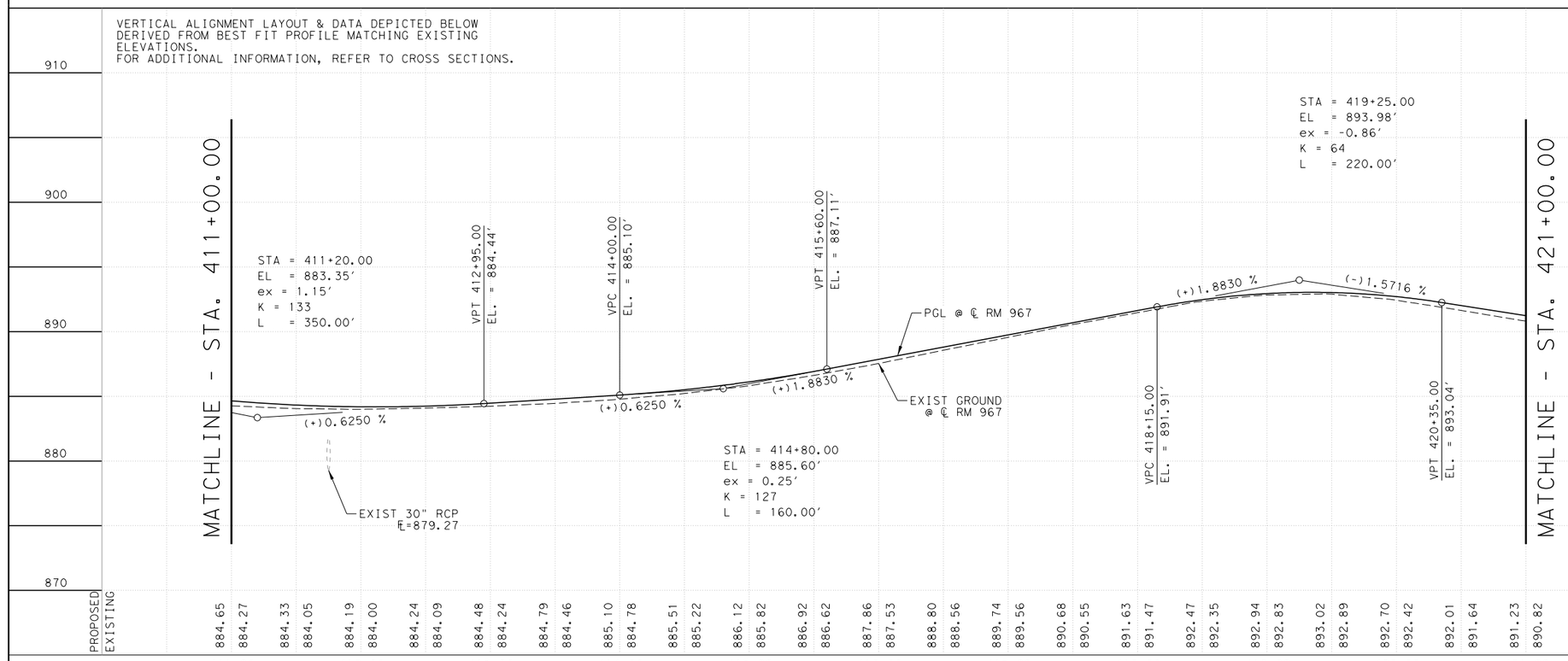
RM 967

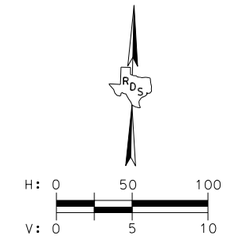
PLAN AND PROFILE
STA 401+00.00 TO
STA 411+00.00

DATE: 5/17/2021			SHEET 6 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	89

Filename: ...\Cad\Plan\015012-000*PP06.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
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3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
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LEGEND:

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- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

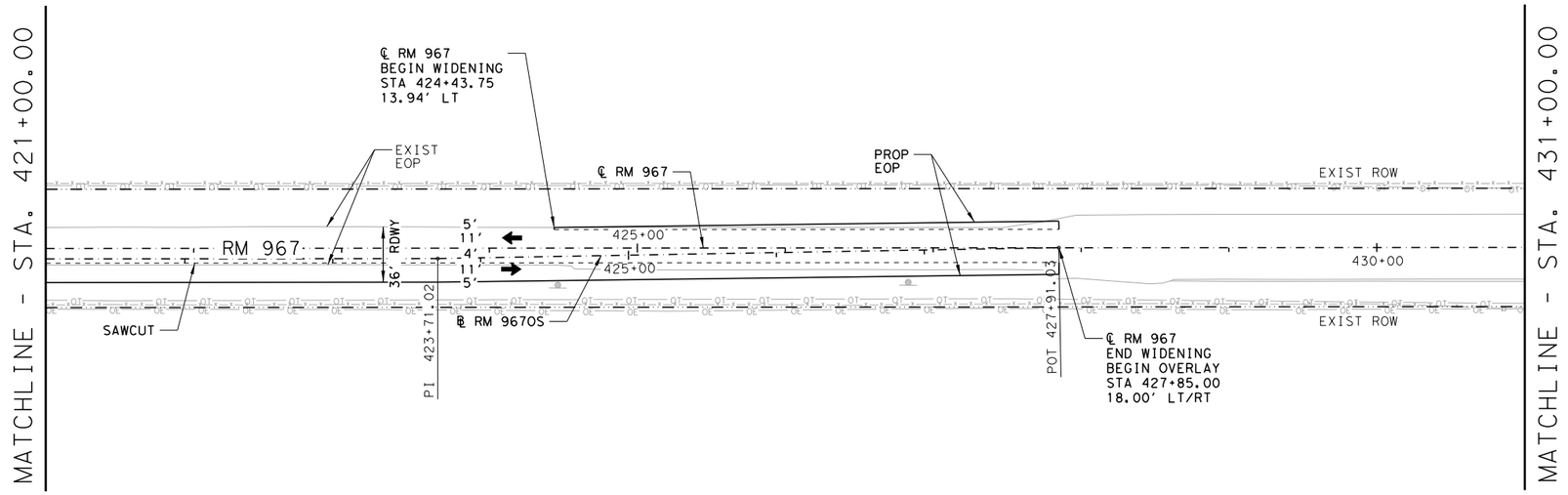
WSB & ASSOCIATES, INC.
FIRM # 16849

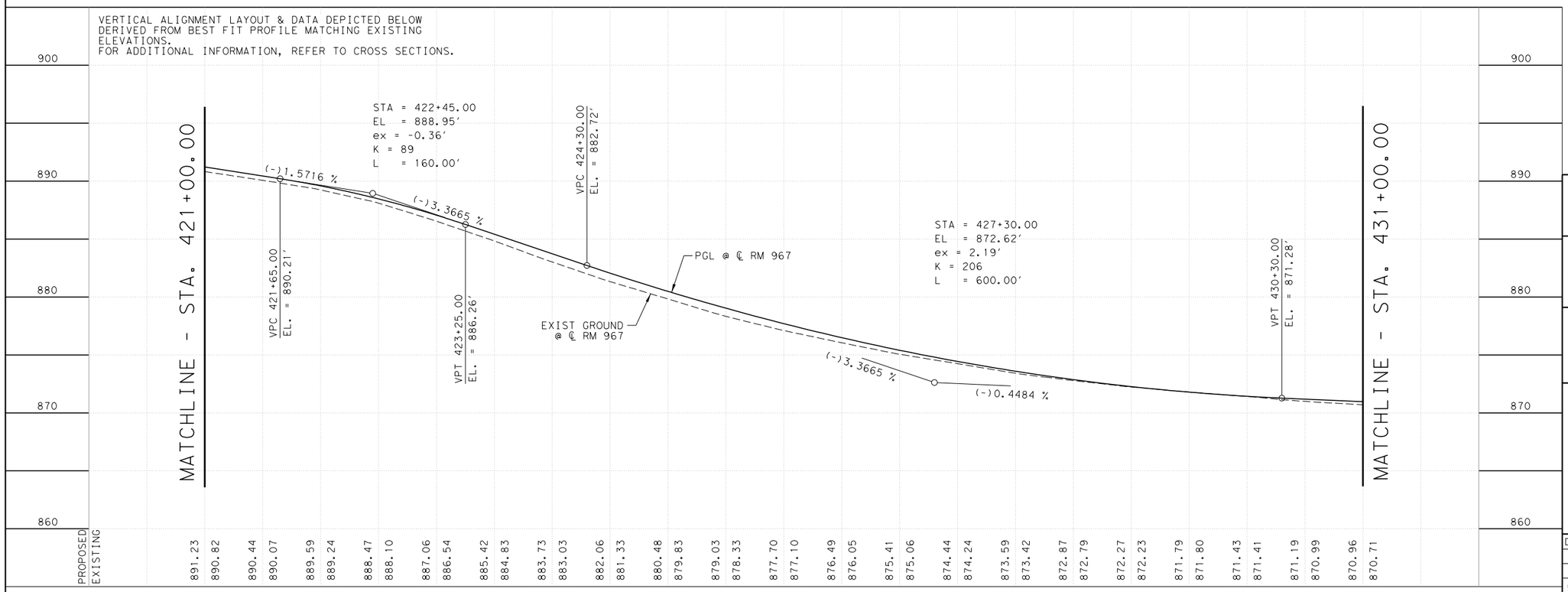
RM 967

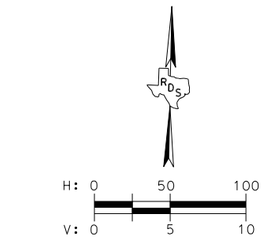
PLAN AND PROFILE
STA 411+00.00 TO
STA 421+00.00

DATE: 5/17/2021			SHEET 7 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	90

Filename: ...\Cad\Plan\015012-000*PP07.dgn
Date: 5/17/2021







NOTES:

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- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

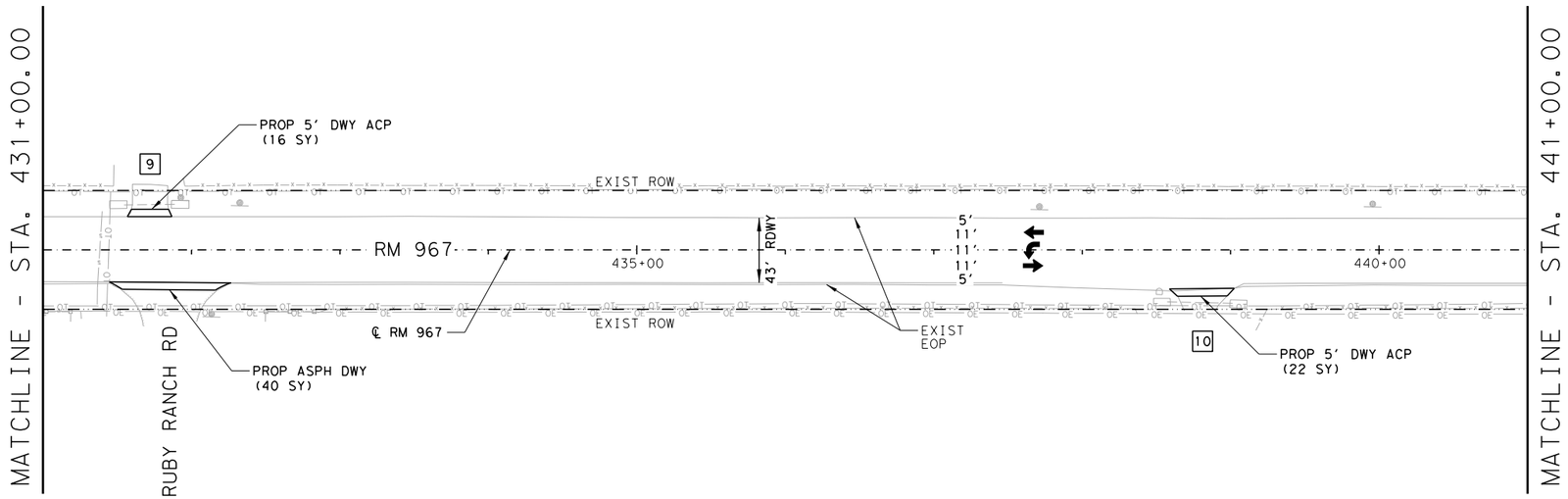
PLAN AND PROFILE
STA 421+00.00 TO
STA 431+00.00

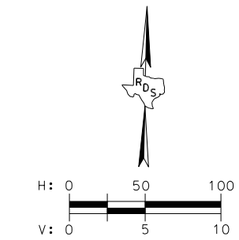
DATE: 5/17/2021 SHEET 8 OF 22

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	91

Filename: ...\Cad\Plan\015012-000*PP08.dgn
Date: 5/17/2021





NOTES:

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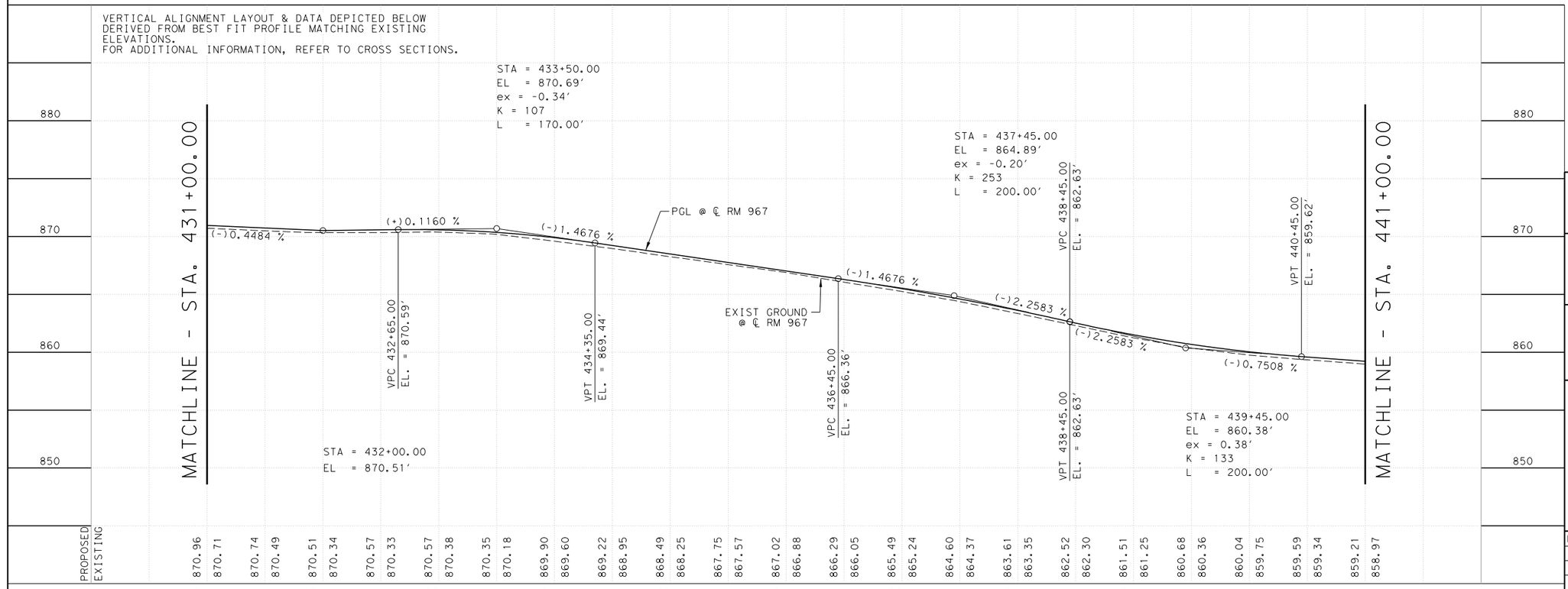
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW
DERIVED FROM BEST FIT PROFILE MATCHING EXISTING
ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.



Filename: ...\Cad\Plan\015012-000*PP09.dgn
Date: 5/17/2021

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

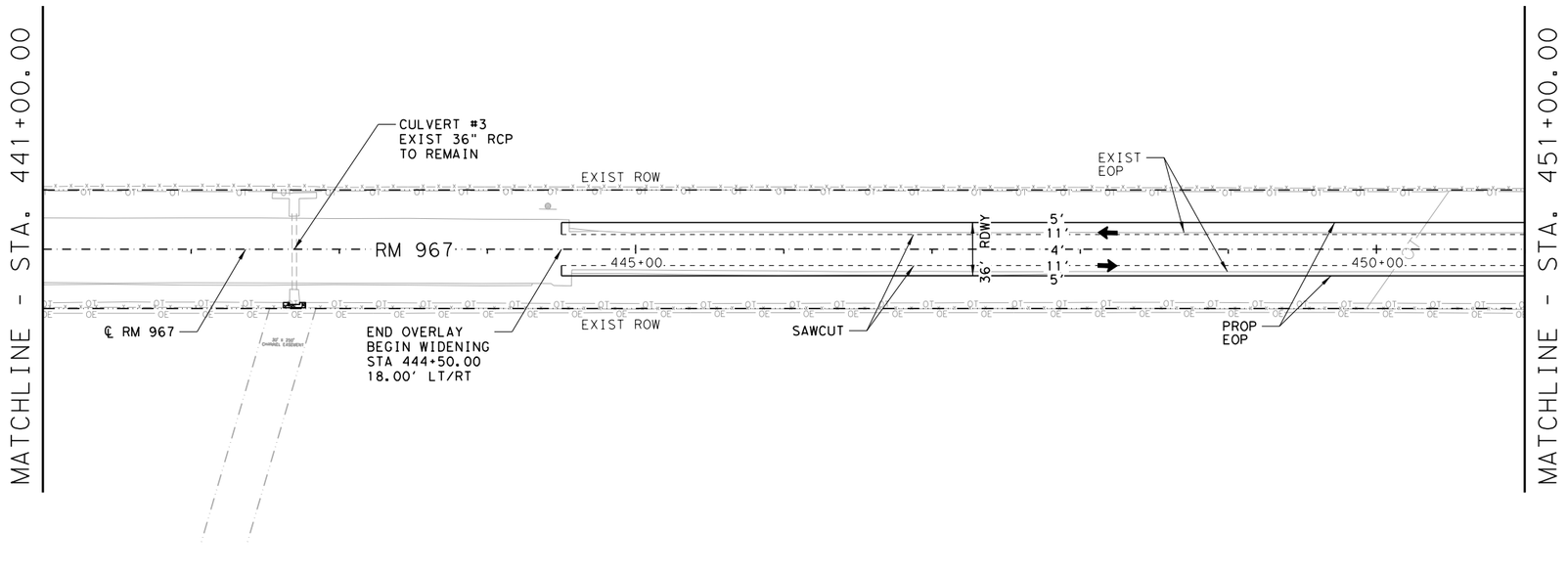
HAYS COUNTY

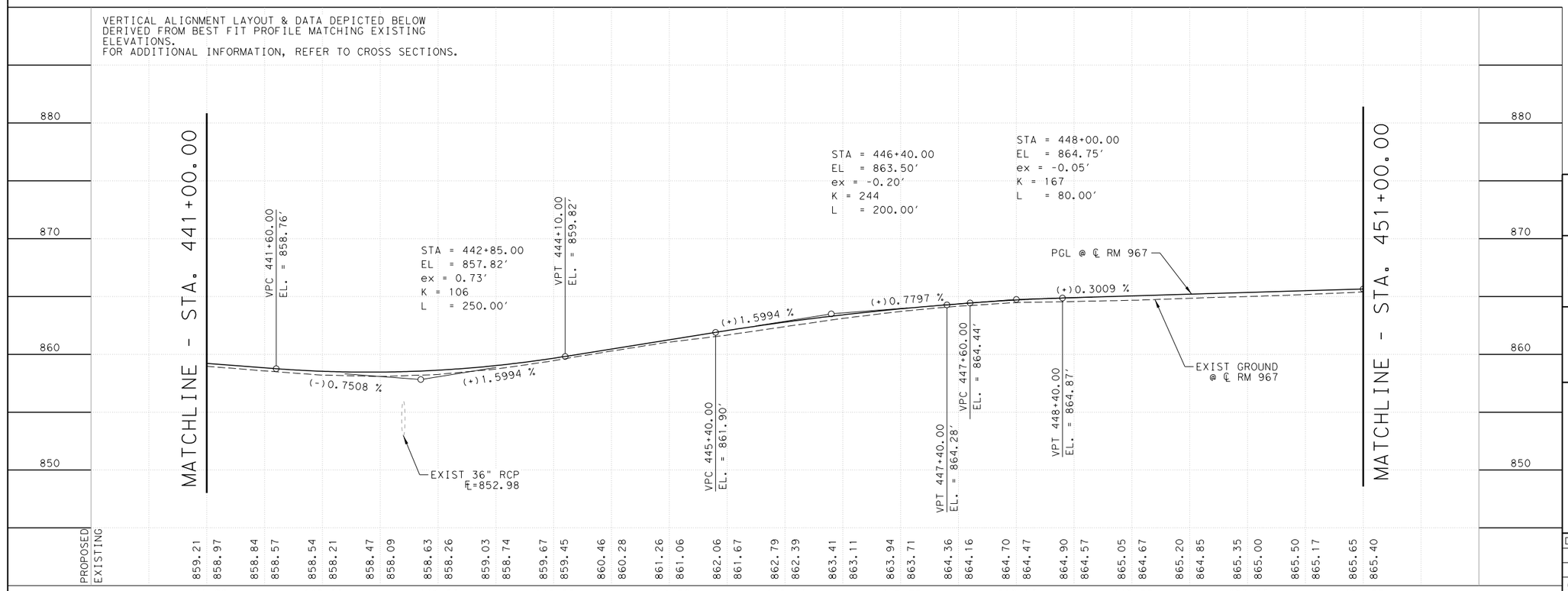
WSB & ASSOCIATES, INC.
FIRM # 16849

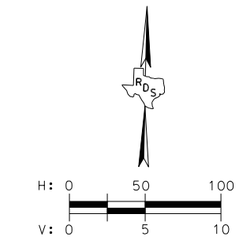
RM 967

PLAN AND PROFILE
STA 431+00.00 TO
STA 441+00.00

DATE: 5/17/2021			SHEET 9 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	92







NOTES:

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3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

5/17/2021

Texas Department of Transportation

HAYS COUNTY

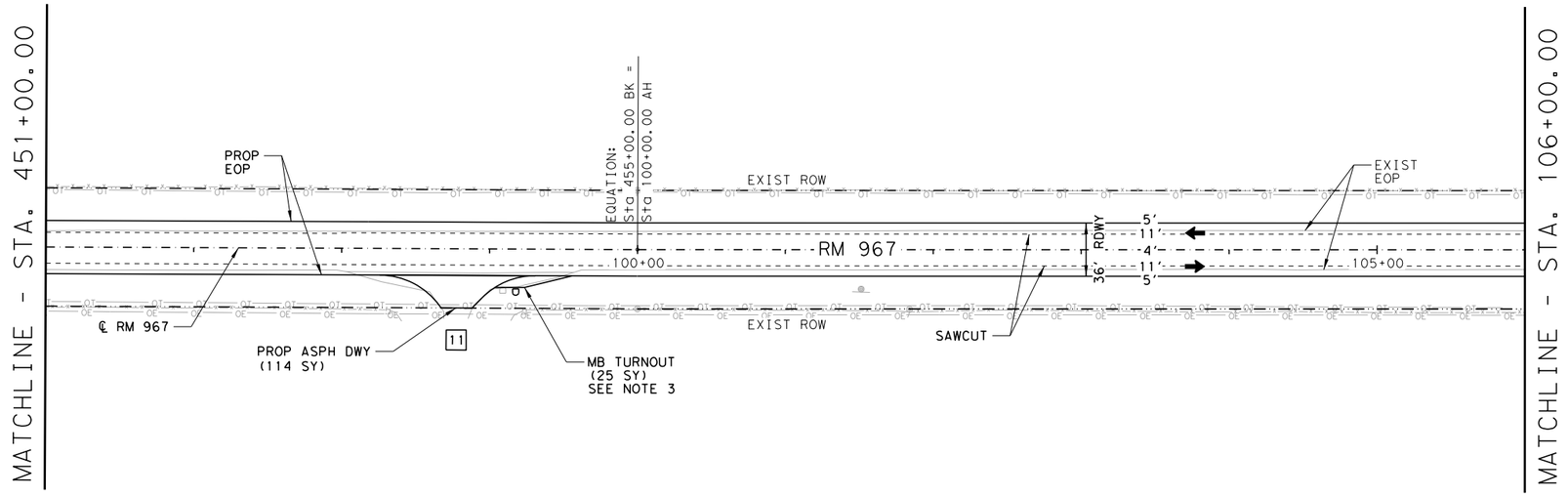
WSB & ASSOCIATES, INC.
FIRM # 16849

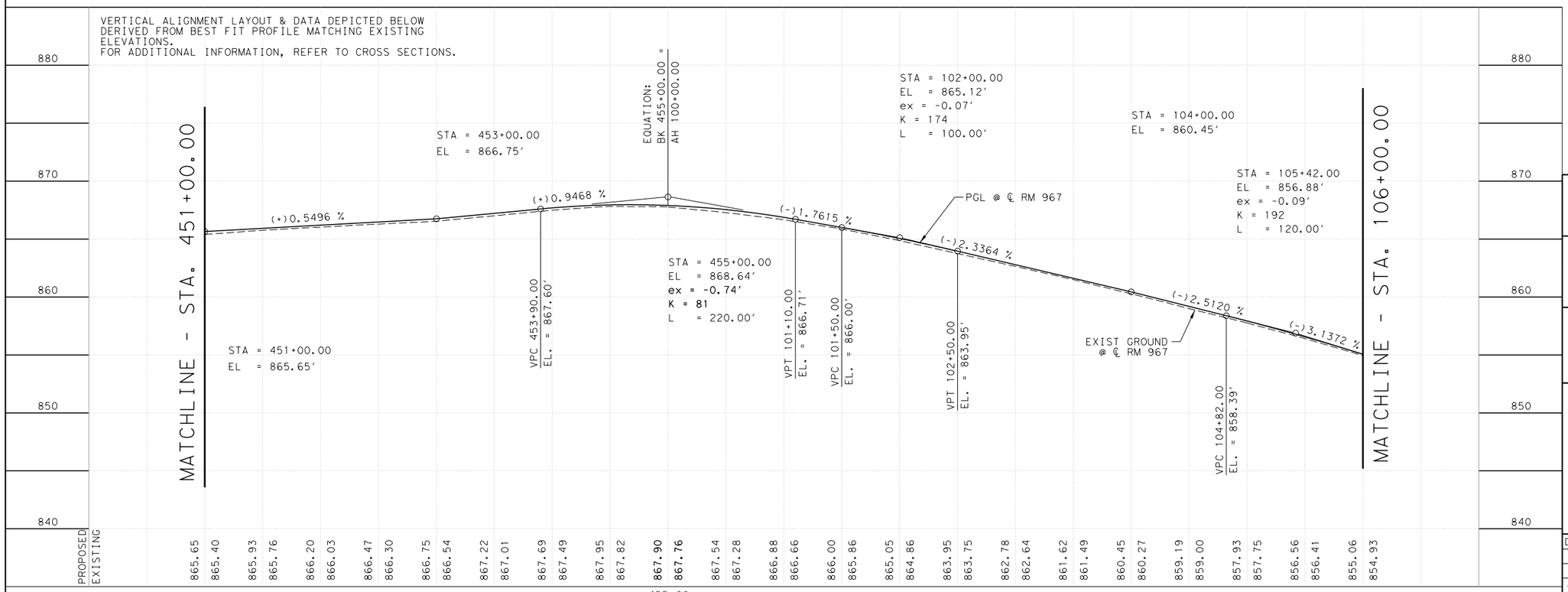
RM 967

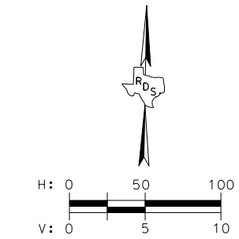
PLAN AND PROFILE
STA 441+00.00 TO
STA 451+00.00

DATE: 5/17/2021			SHEET 10 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	93

Filename: ...\Cad\Plan\015012-000*PP10.dgn
Date: 5/17/2021







NOTES:

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- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

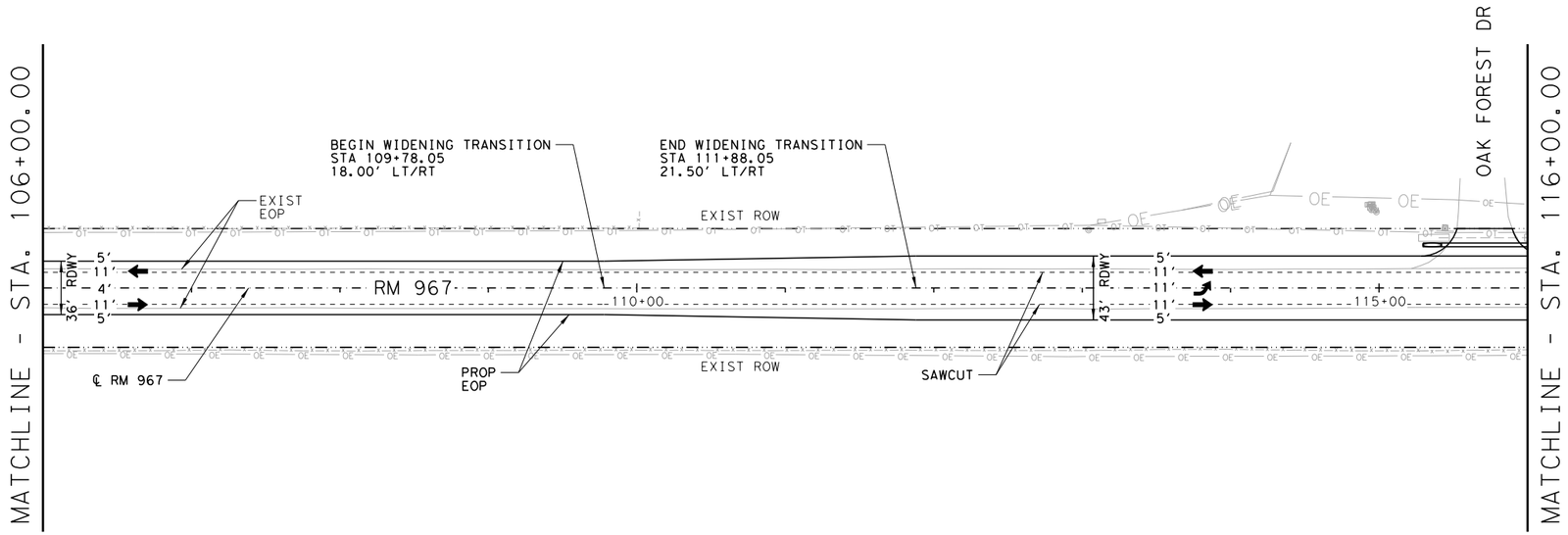
WSB & ASSOCIATES, INC.
FIRM # 16849

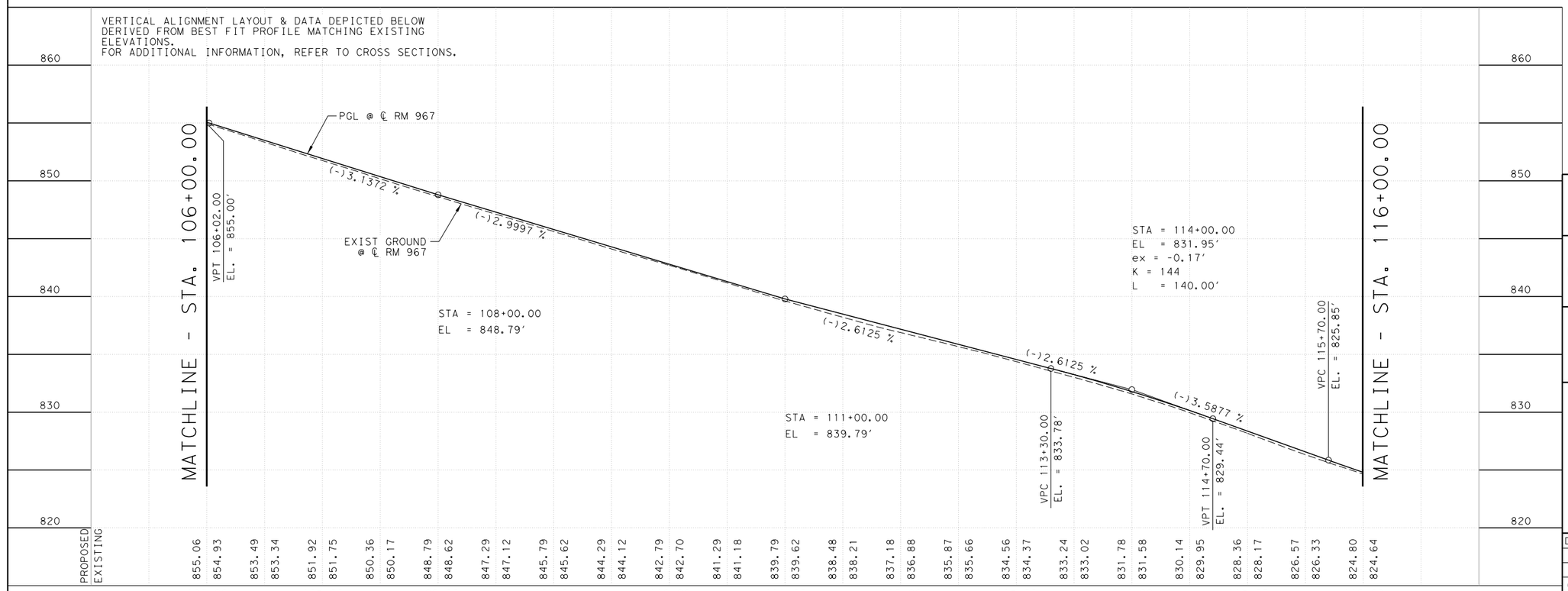
RM 967

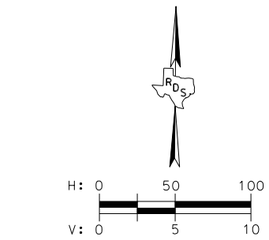
PLAN AND PROFILE
STA 451+00.00 TO
STA 106+00.00

DATE: 5/17/2021			SHEET 11 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	94

Filename: ...\Cad\Plan\015012-000*PP11.dgn
Date: 5/17/2021







NOTES:

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- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

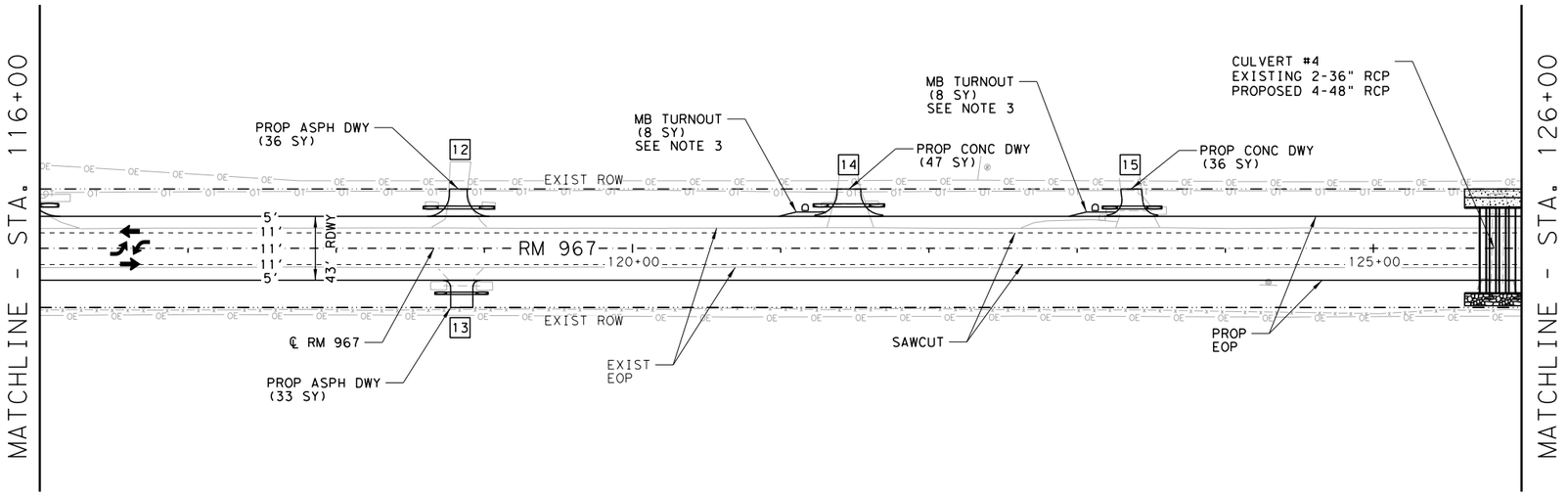
WSB & ASSOCIATES, INC.
FIRM # 16849

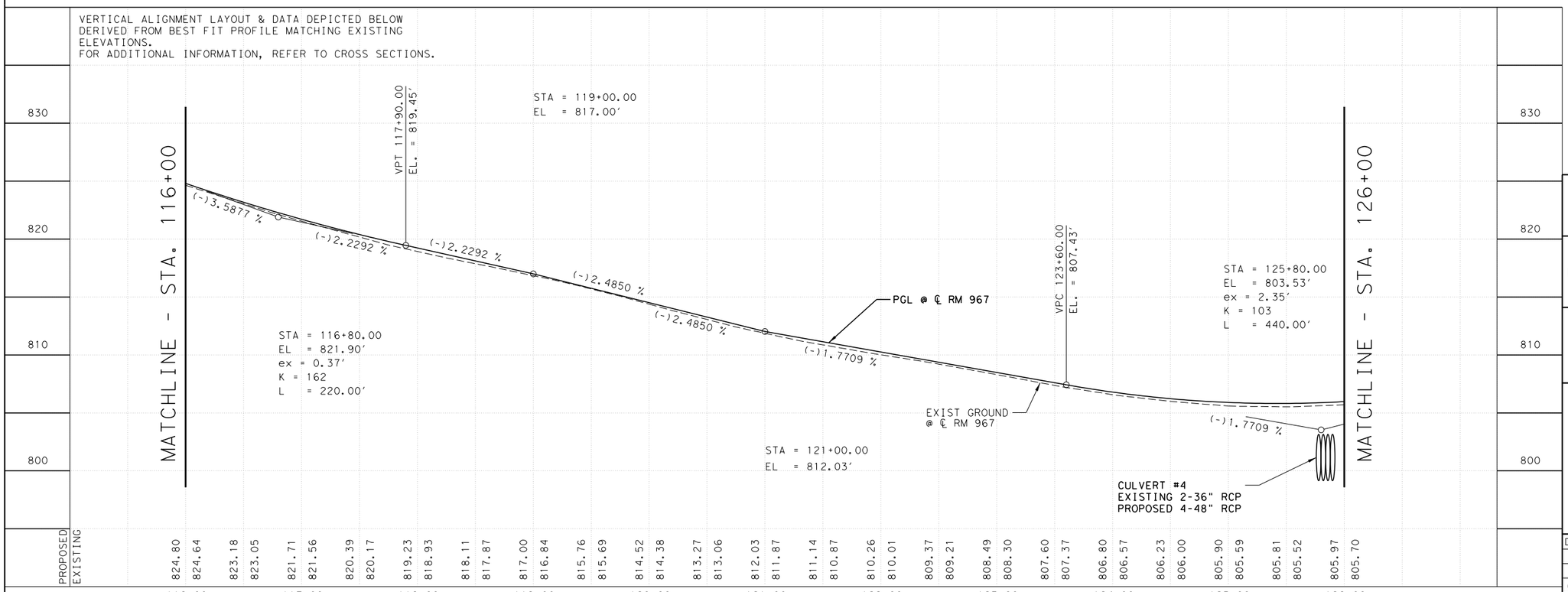
RM 967

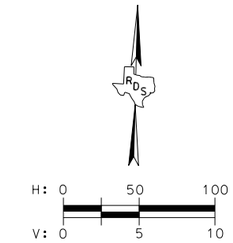
PLAN AND PROFILE
STA 106+00.00 TO
STA 116+00.00

DATE: 5/17/2021			SHEET 12 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	95

Filename: ...\Cad\Plan\015012-000*PP12.dgn
Date: 5/17/2021







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- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

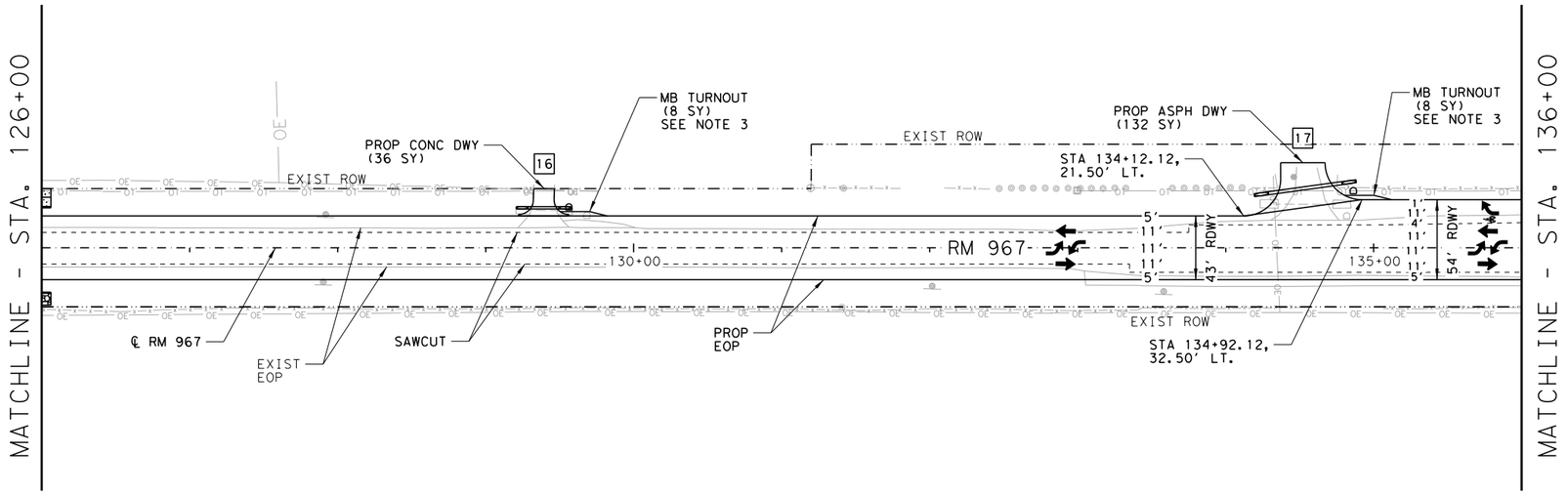
WSB & ASSOCIATES, INC.
FIRM # 16849

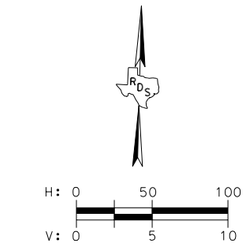
RM 967

PLAN AND PROFILE STA 116+00.00 TO STA 126+00.00

DATE: 5/17/2021			SHEET 13 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	96

Filename: ...\Cad\Plan\015012-000*PP13.dgn
Date: 5/17/2021





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- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
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- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW
DERIVED FROM BEST FIT PROFILE MATCHING EXISTING
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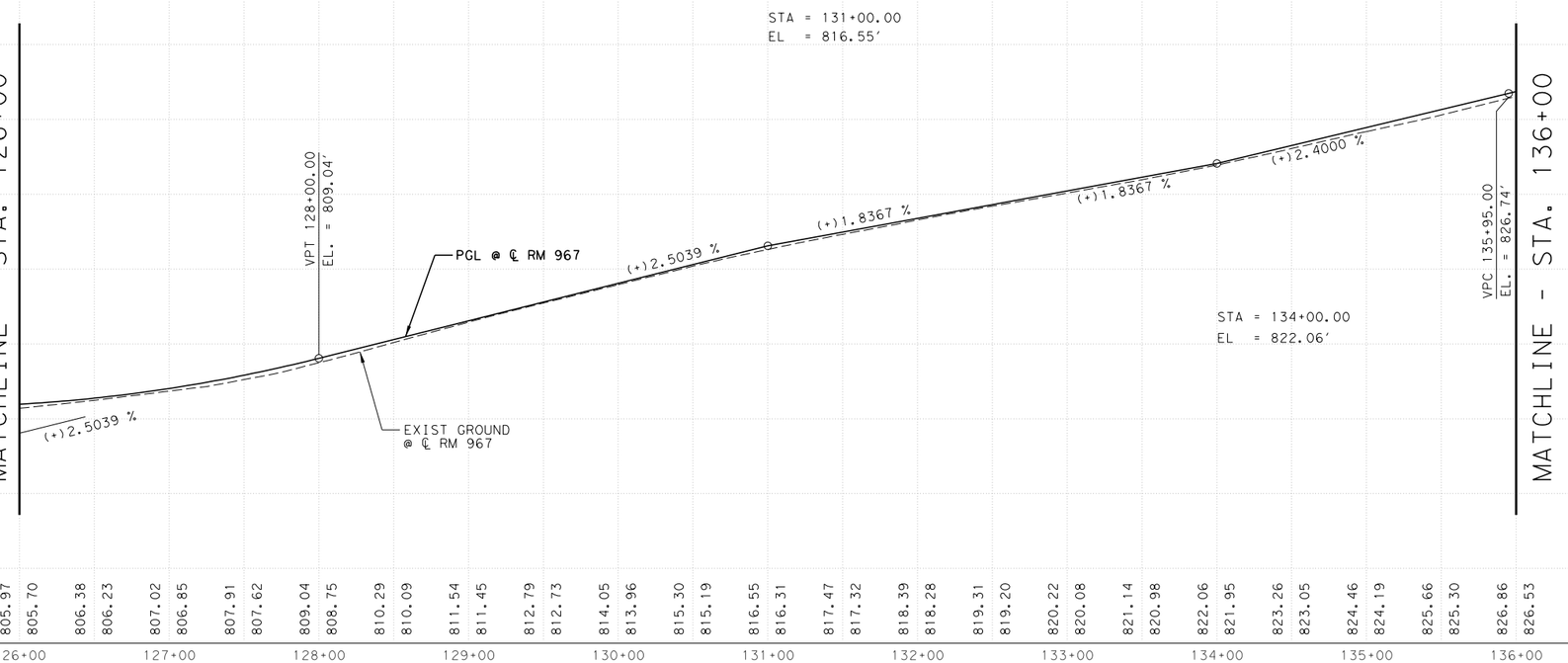


5/17/2021

Texas Department of Transportation

HAYS COUNTY

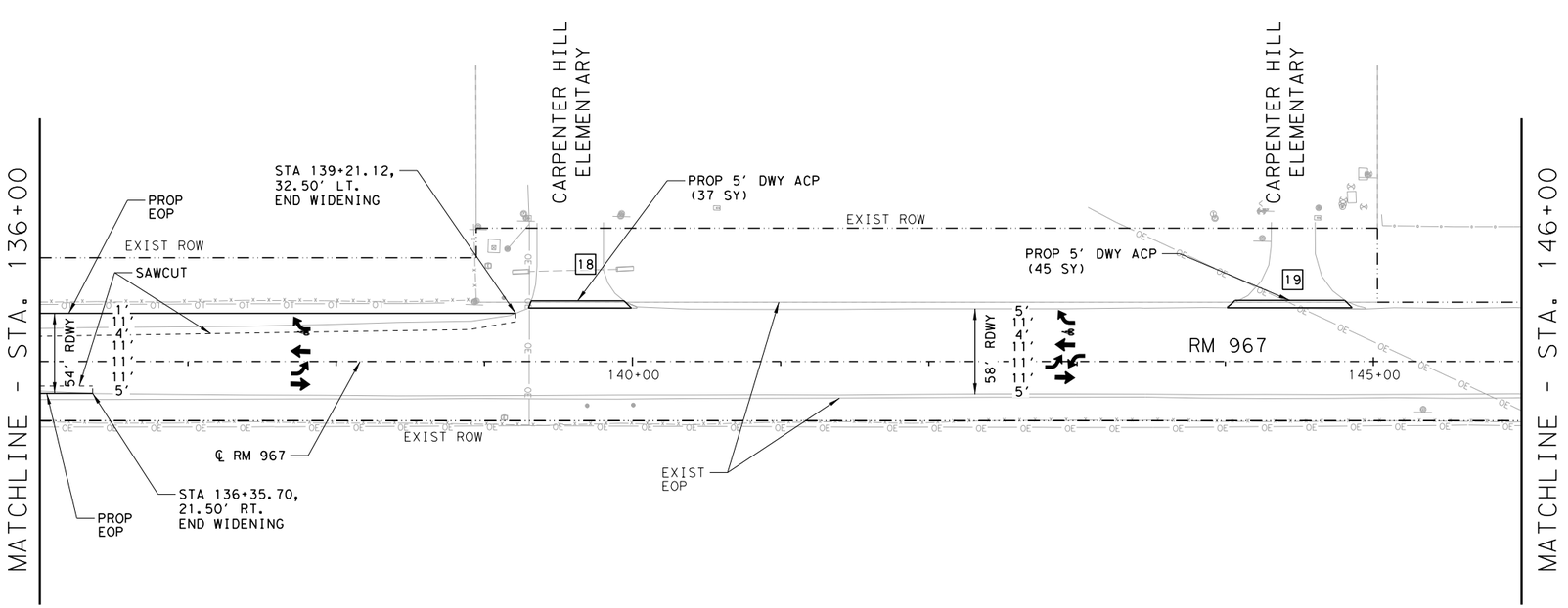
WSB & ASSOCIATES, INC.
FIRM # 16849

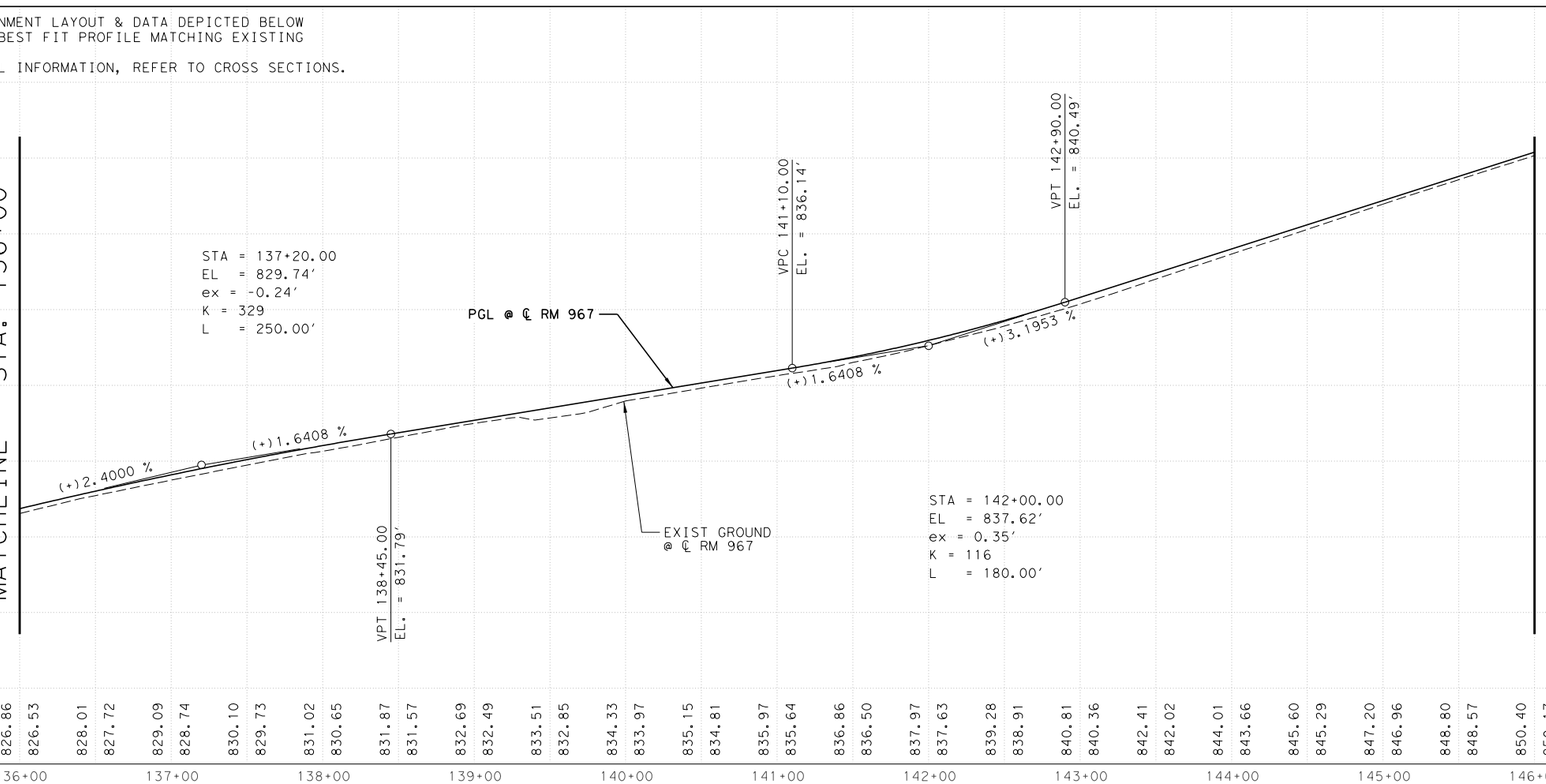
RM 967

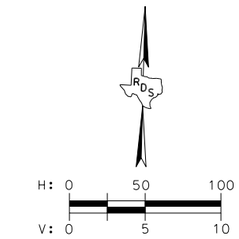
PLAN AND PROFILE
STA 126+00.00 TO
STA 136+00.00

DATE: 5/17/2021			SHEET 14 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	97

Filename: ...\Cad\Plan\015012-000*PP14.dgn
Date: 5/17/2021







NOTES:

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LEGEND:

- OE — OVERHEAD TELEPHONE
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- WIRE FENCE
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- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

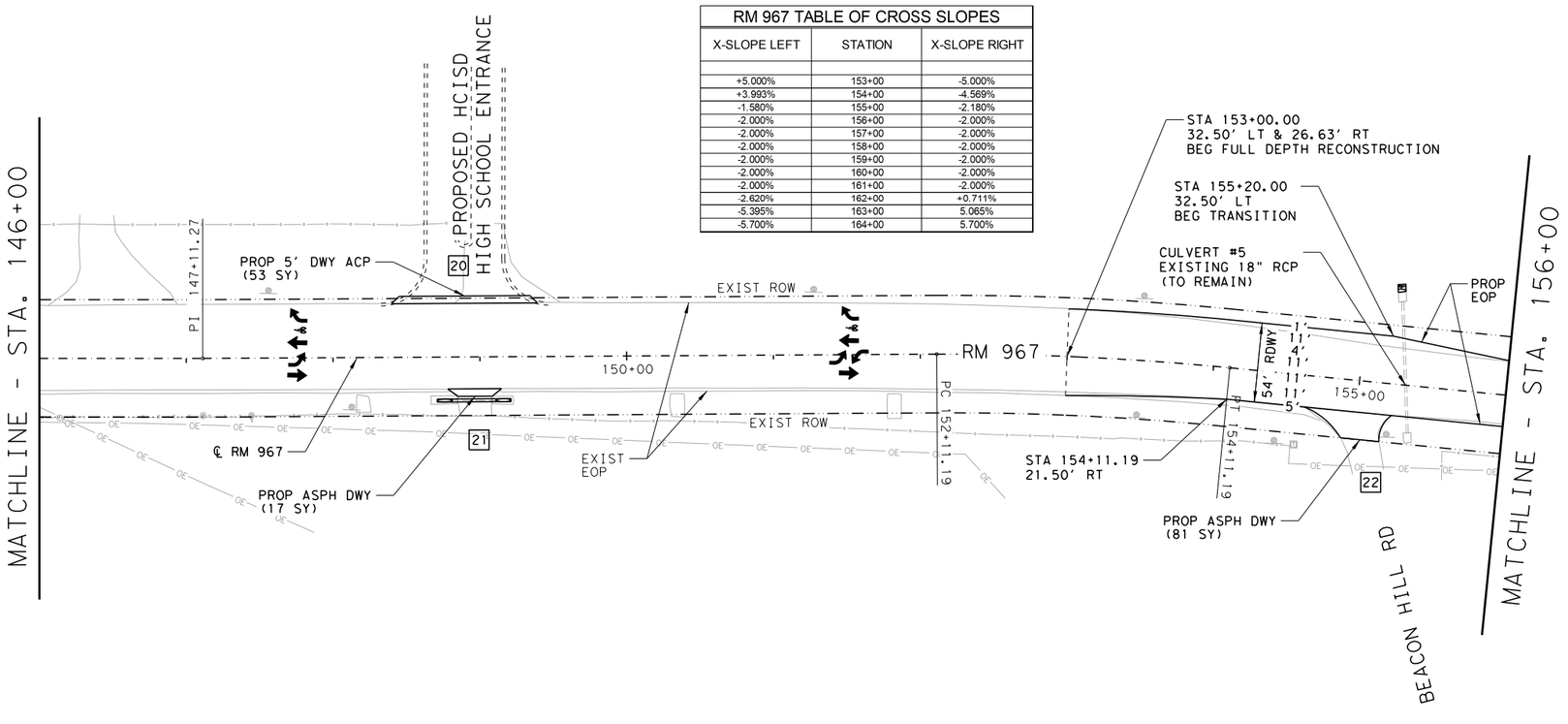
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PLAN AND PROFILE
STA 136+00.00 TO
STA 146+00.00

DATE: 5/17/2021			SHEET 15 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	98

Filename: ...\Cad\Plan\015012-000*PP15.dgn
Date: 5/17/2021



RM 967 TABLE OF CROSS SLOPES

X-SLOPE LEFT	STATION	X-SLOPE RIGHT
+5.000%	153+00	-5.000%
+3.993%	154+00	-4.569%
-1.580%	155+00	-2.180%
-2.000%	156+00	-2.000%
-2.000%	157+00	-2.000%
-2.000%	158+00	-2.000%
-2.000%	159+00	-2.000%
-2.000%	160+00	-2.000%
-2.000%	161+00	-2.000%
-2.620%	162+00	+0.711%
-5.395%	163+00	5.065%
-5.700%	164+00	5.700%

NOTES:

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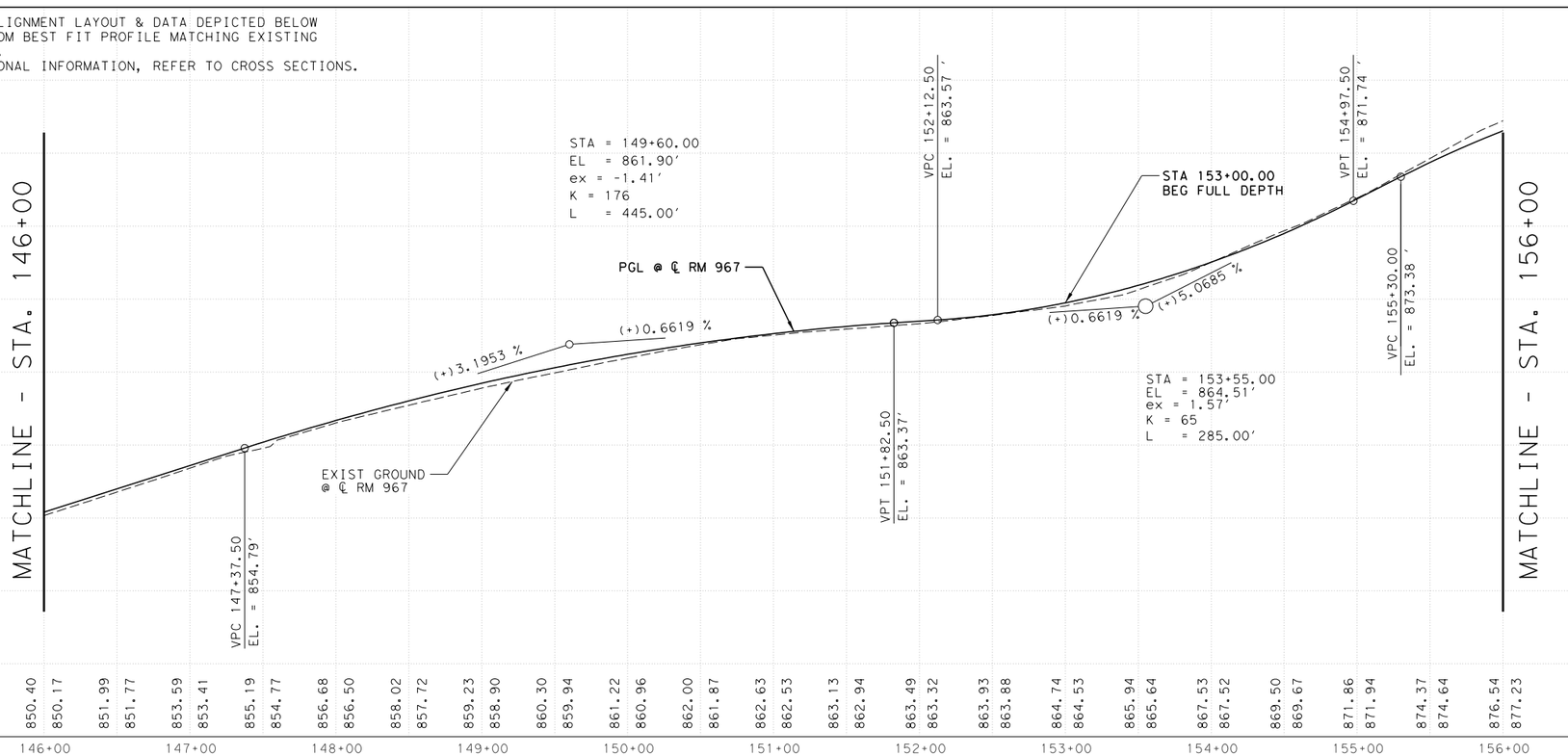
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW DERIVED FROM BEST FIT PROFILE MATCHING EXISTING ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.



5/17/2021

Texas Department of Transportation

HAYS COUNTY

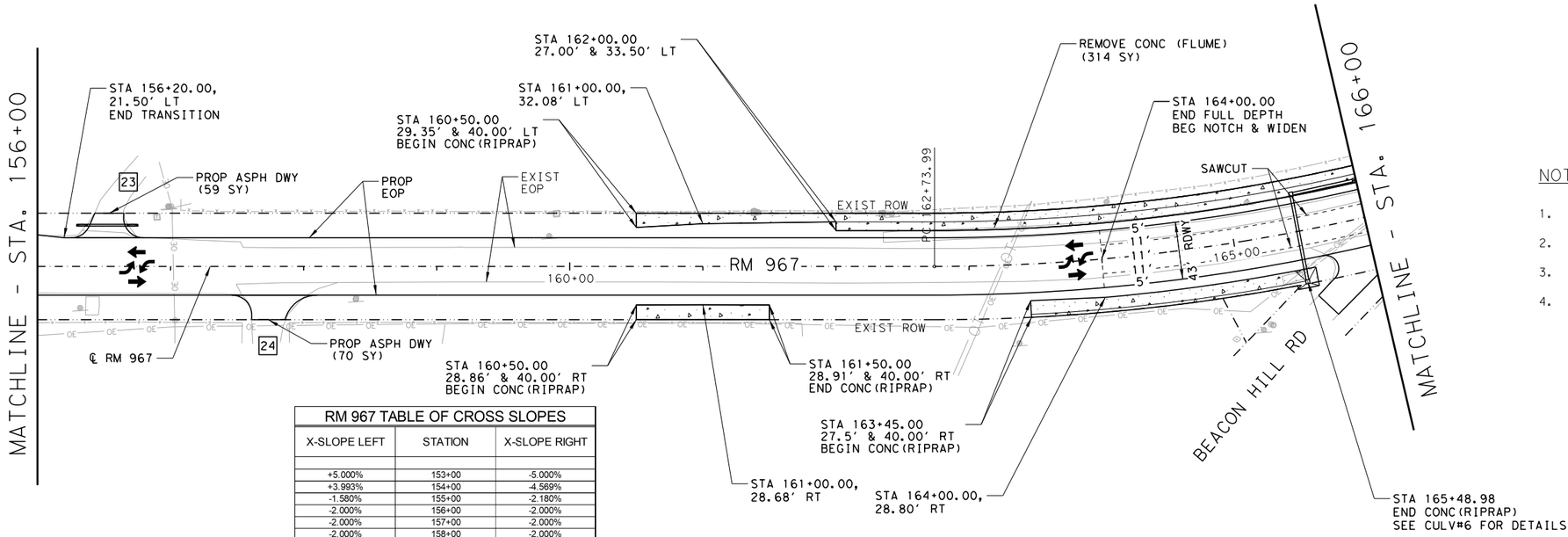
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

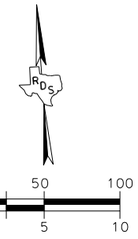
PLAN AND PROFILE
STA 146+00.00 TO
STA 156+00.00

DATE: 5/17/2021			SHEET 16 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	99

Filename: ...\Cad\Plan\015012-000*PP16.dgn
Date: 5/17/2021



RM 967 TABLE OF CROSS SLOPES		
X-SLOPE LEFT	STATION	X-SLOPE RIGHT
+5.000%	153+00	-5.000%
+3.993%	154+00	-4.569%
-1.580%	155+00	-2.180%
-2.000%	156+00	-2.000%
-2.000%	157+00	-2.000%
-2.000%	158+00	-2.000%
-2.000%	159+00	-2.000%
-2.000%	160+00	-2.000%
-2.000%	161+00	-2.000%
-2.620%	162+00	+0.711%
-5.395%	163+00	5.065%
-5.700%	164+00	5.700%

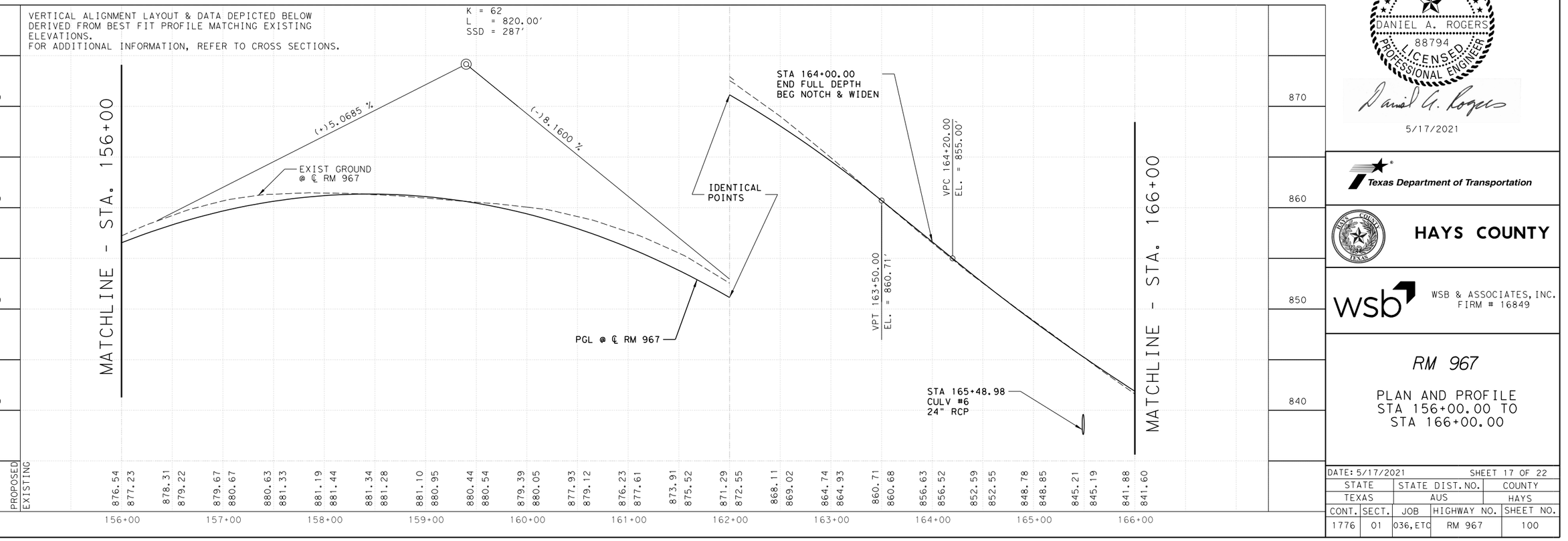


NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX



STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

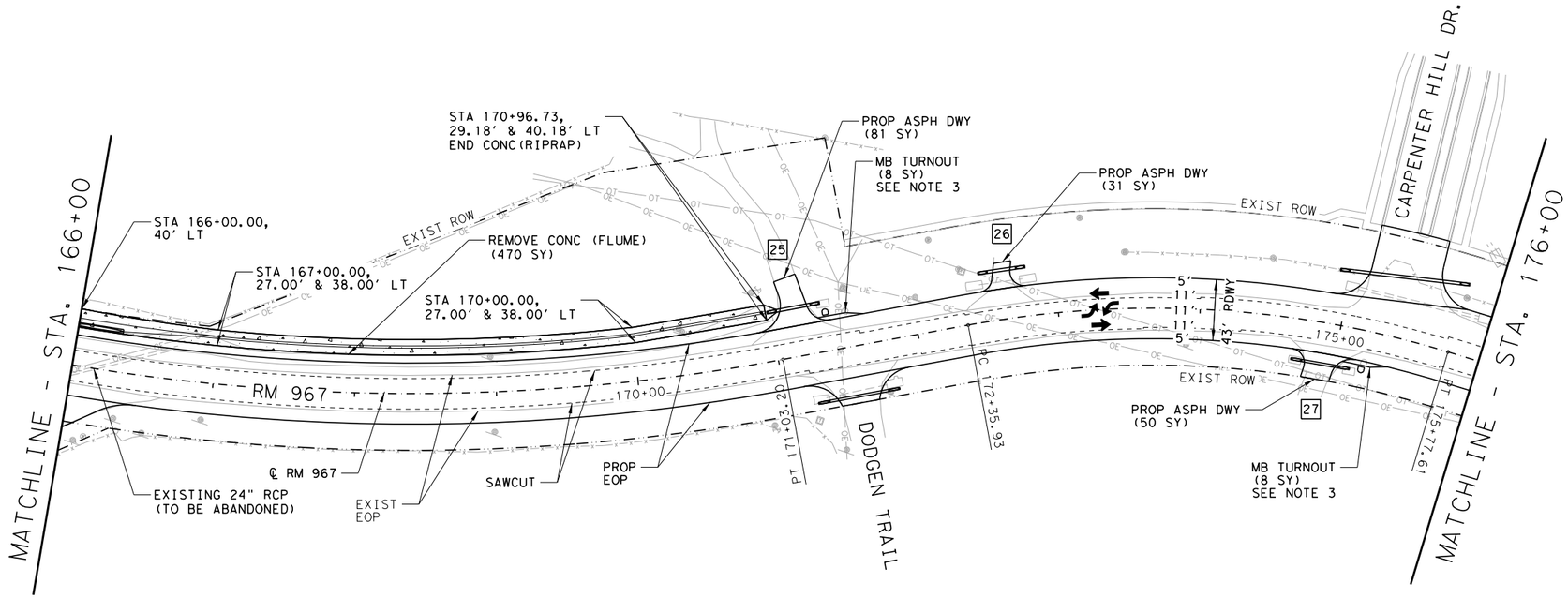
WSB & ASSOCIATES, INC.
FIRM # 16849

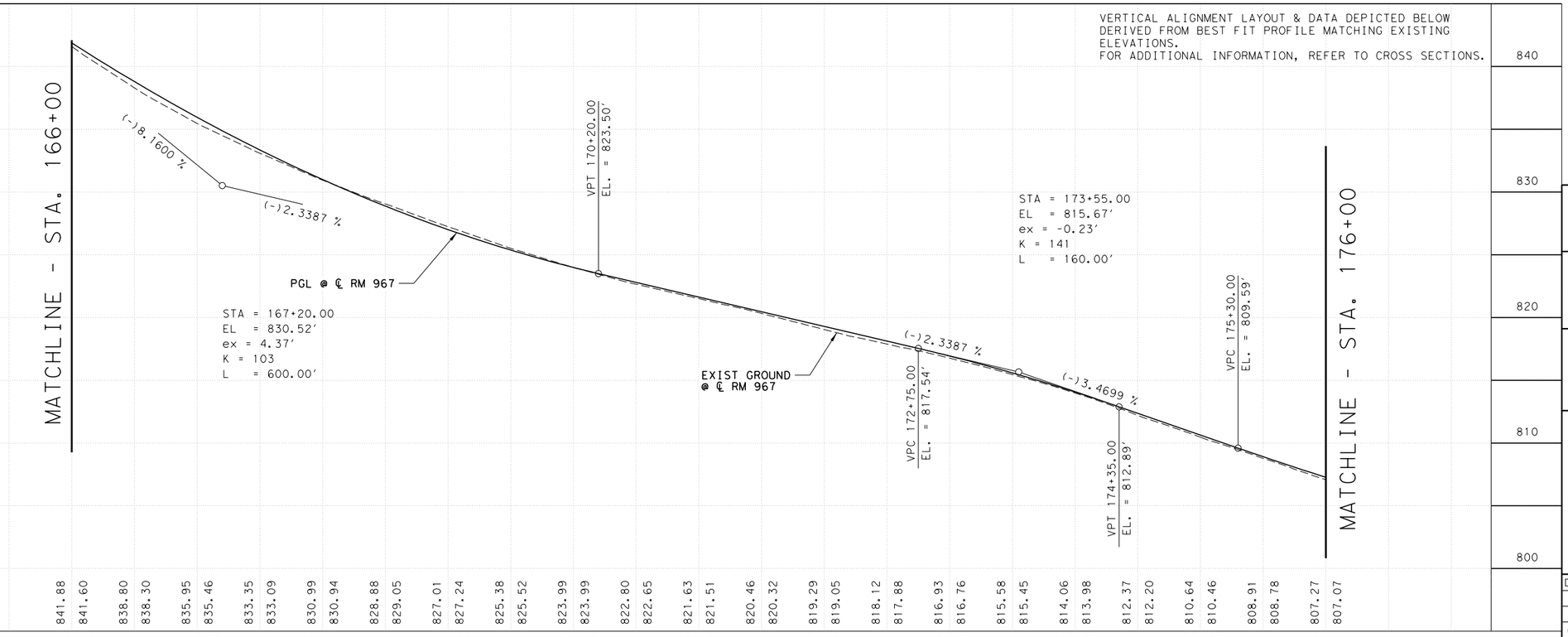
RM 967

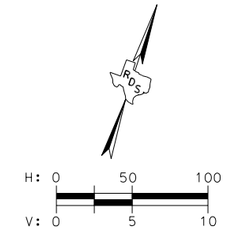
PLAN AND PROFILE
STA 156+00.00 TO
STA 166+00.00

DATE: 5/17/2021			SHEET 17 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	100

Filename: ...\Cad\Plan\015012-000*PP17.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

wsb

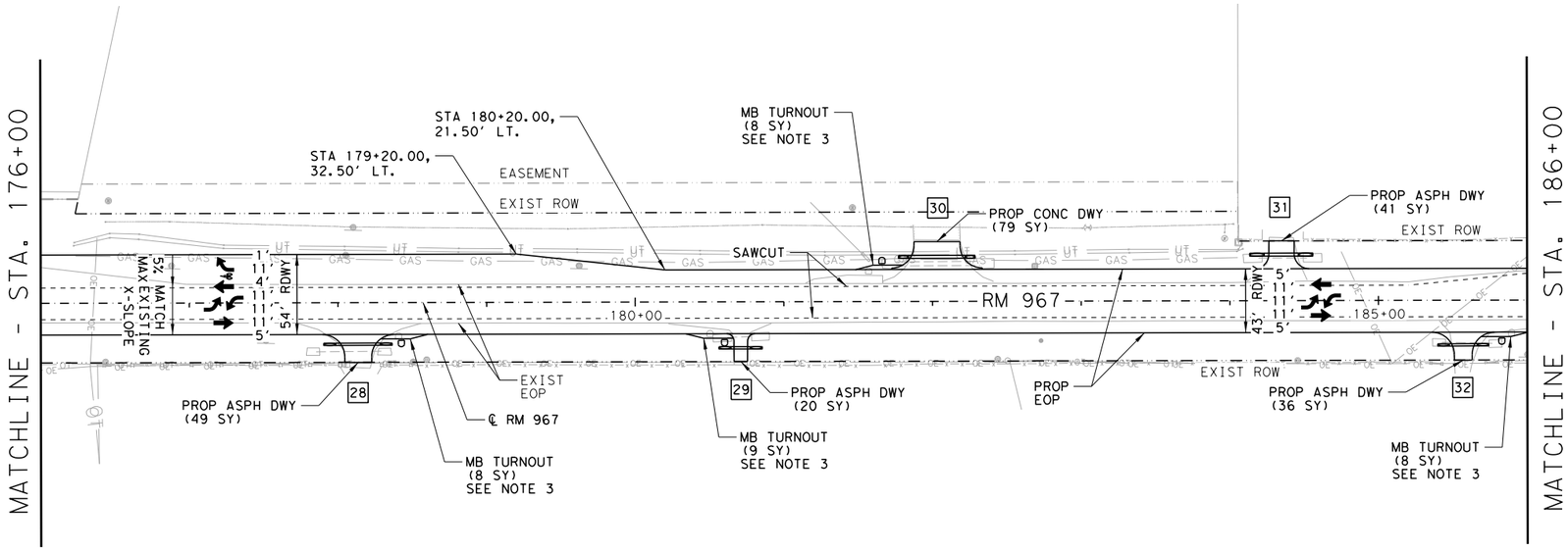
WSB & ASSOCIATES, INC.
FIRM # 16849

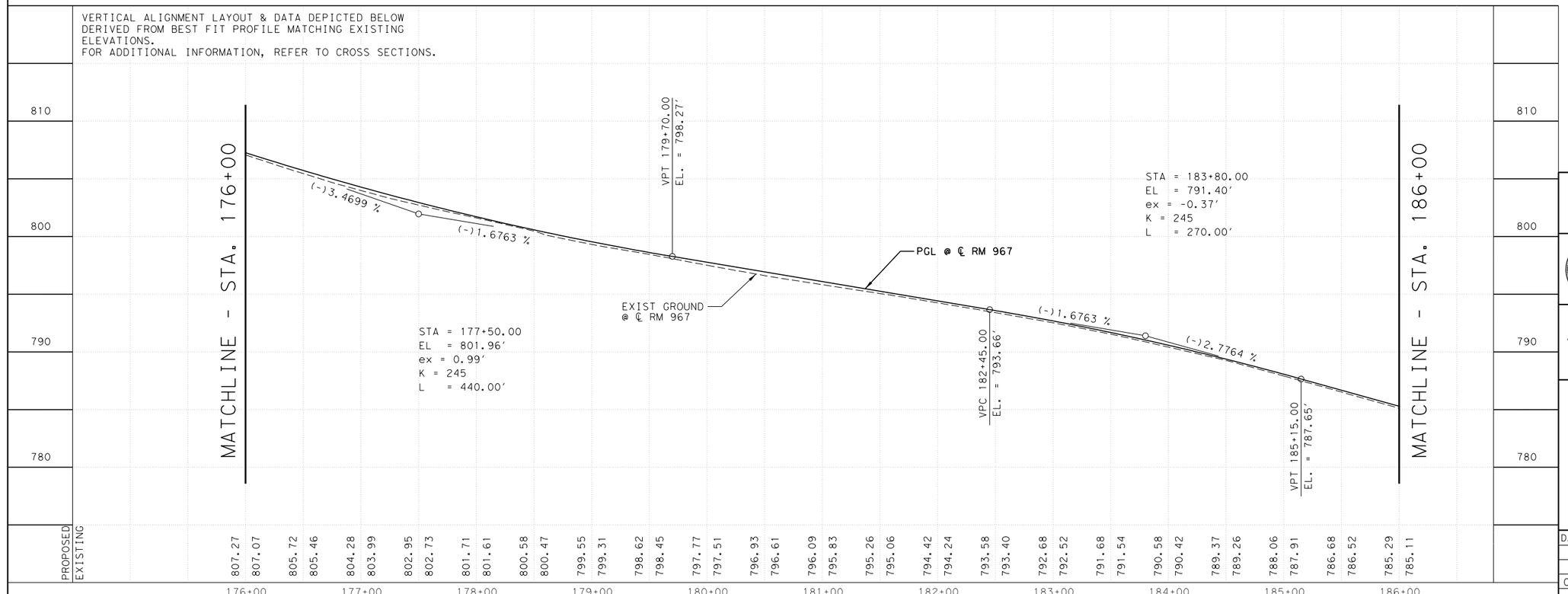
RM 967

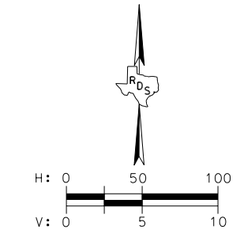
PLAN AND PROFILE
STA 166+00.00 TO
STA 176+00.00

DATE: 5/17/2021			SHEET 18 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	101

Filename: ...\Cad\Plan\015012-000*PP18.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

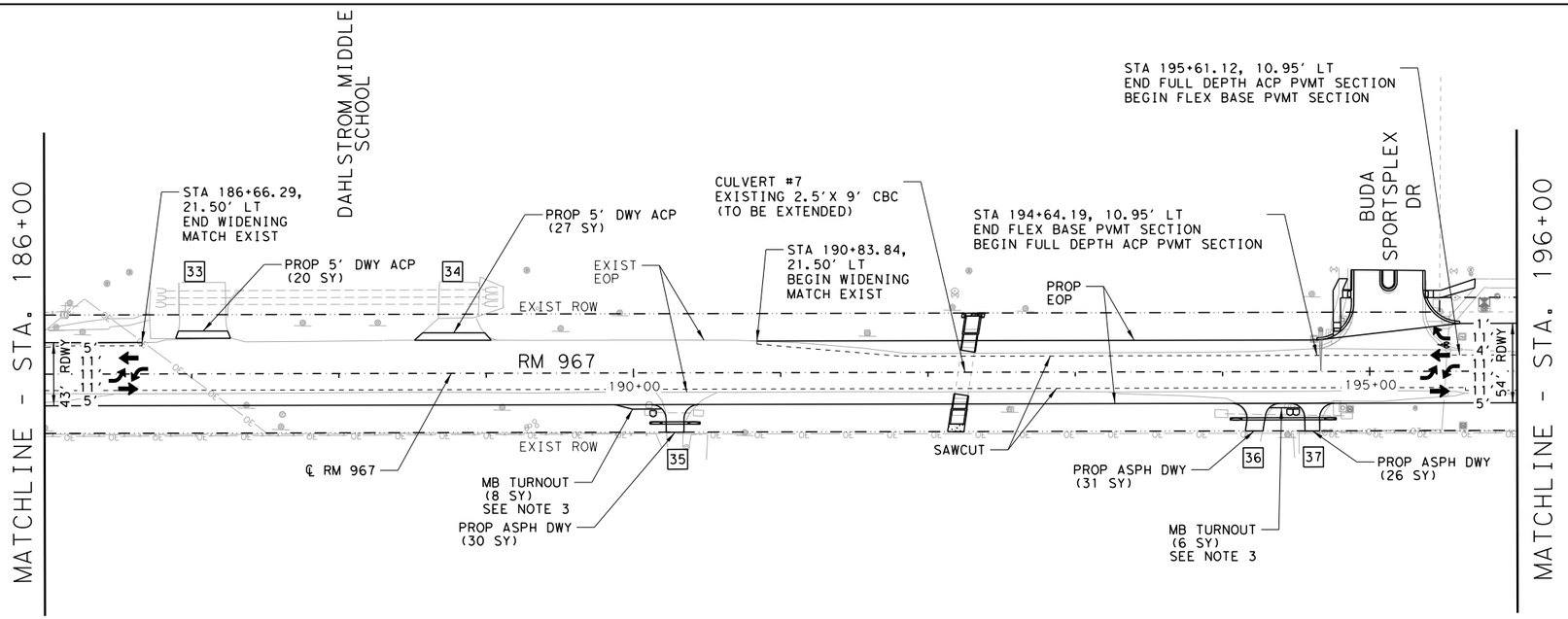
WSB & ASSOCIATES, INC.
FIRM # 16849

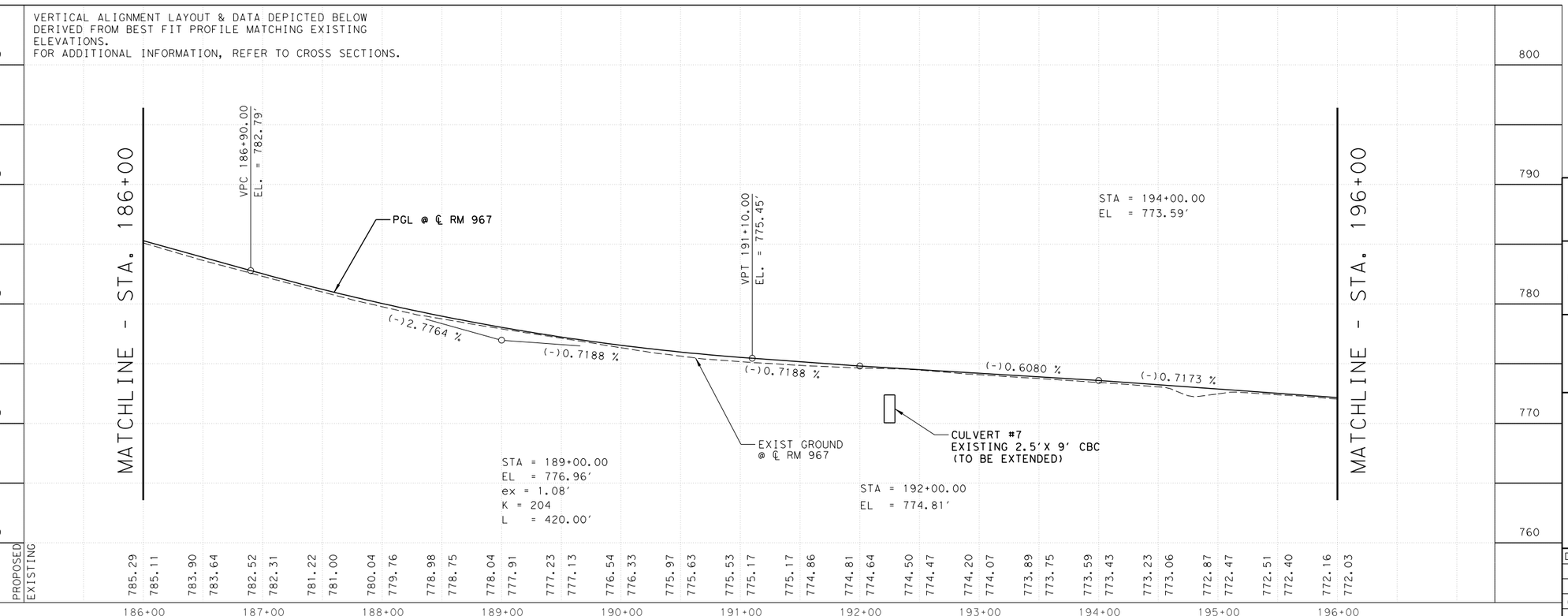
RM 967

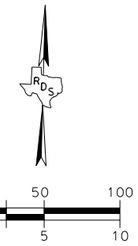
PLAN AND PROFILE
STA 176+00.00 TO
STA 186+00.00

DATE: 5/17/2021			SHEET 19 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	102

Filename: ...\Cad\Plan\015012-000*PP19.dgn
Date: 5/17/2021







NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

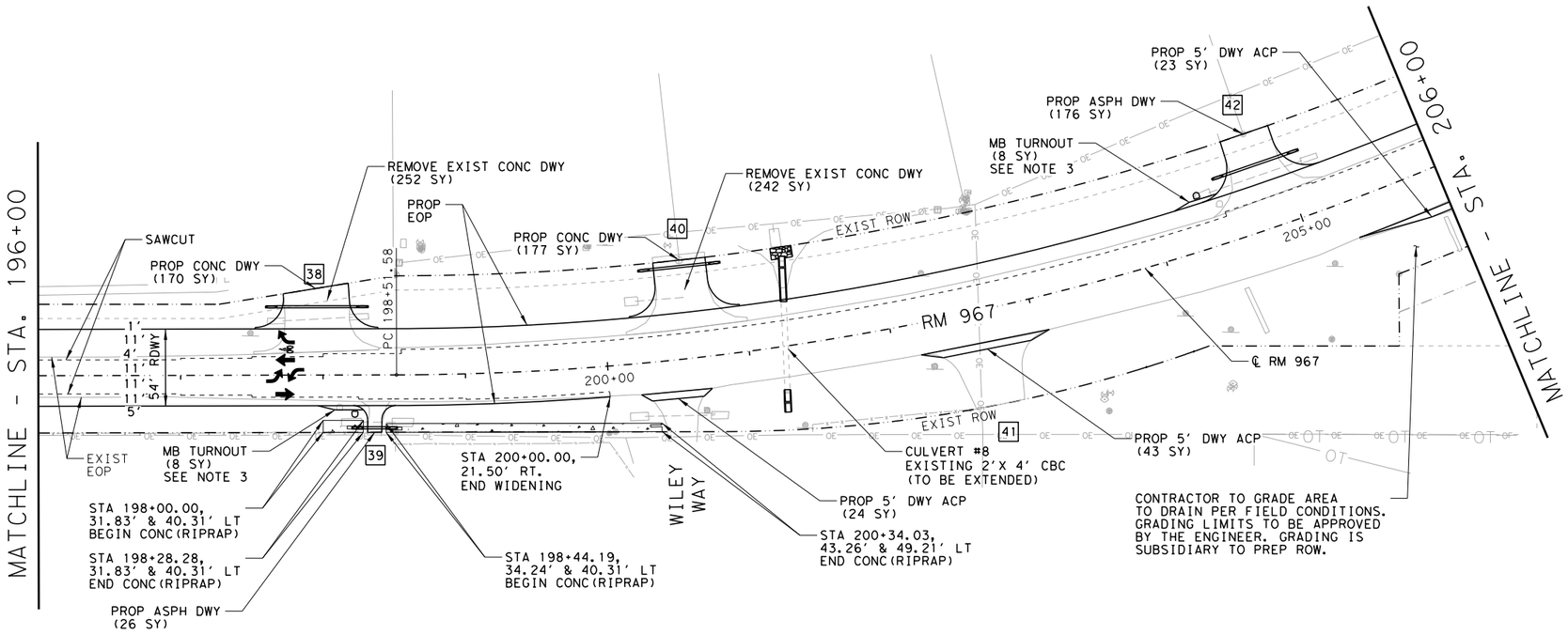
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

PLAN AND PROFILE STA 186+00.00 TO STA 196+00.00

DATE: 5/17/2021			SHEET 20 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	103

Filename: ...\Cad\Plan\015012-000*PP20.dgn
Date: 5/17/2021



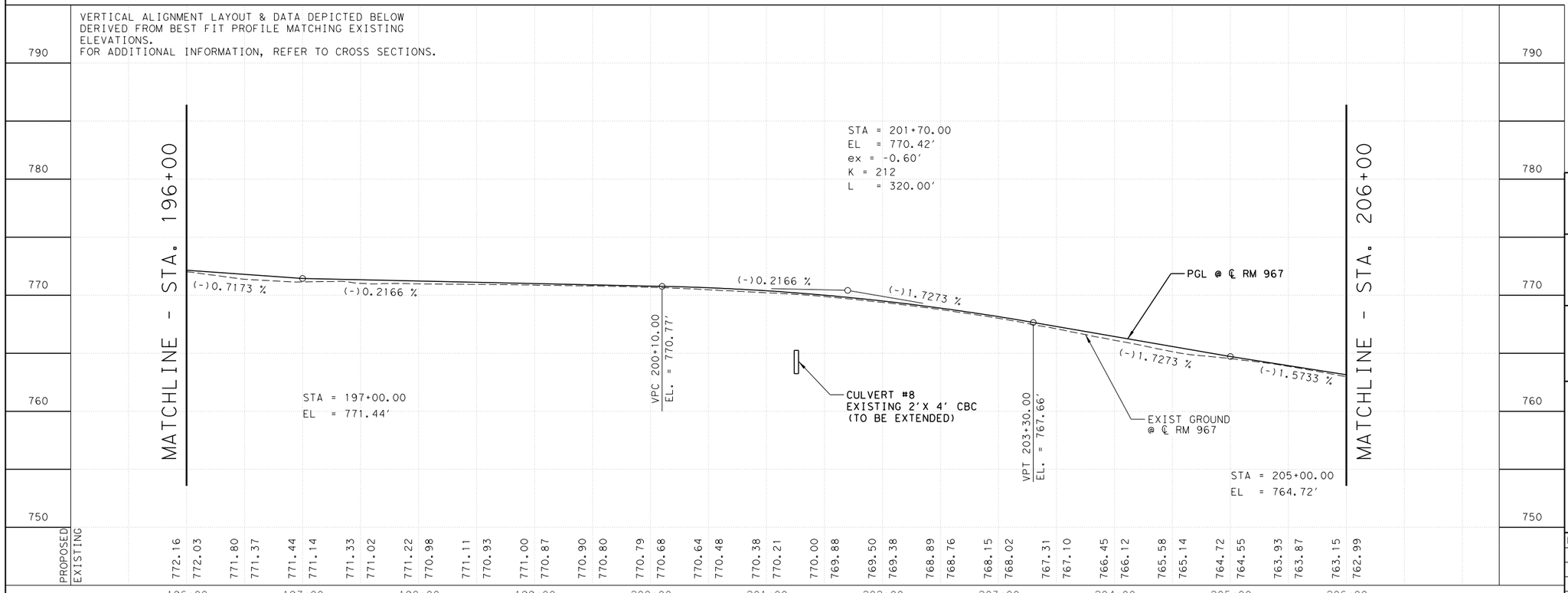
NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- ## DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW DERIVED FROM BEST FIT PROFILE MATCHING EXISTING ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.



5/17/2021

Texas Department of Transportation

HAYS COUNTY

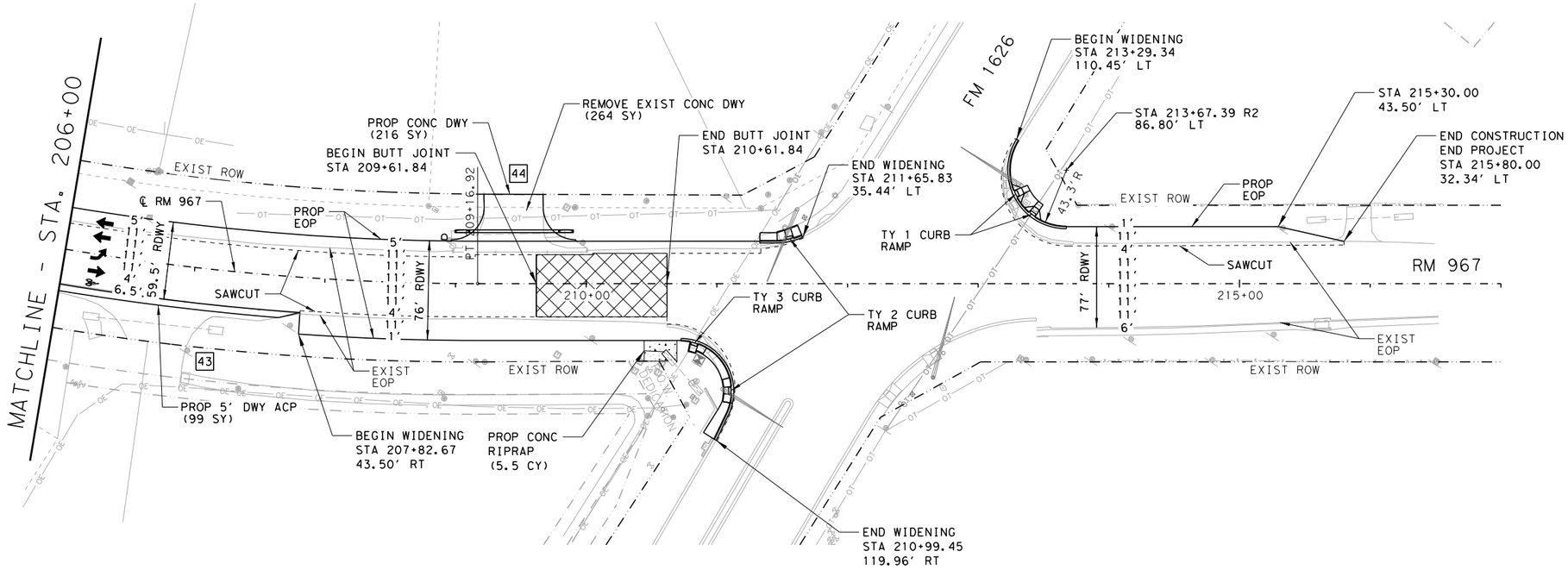
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

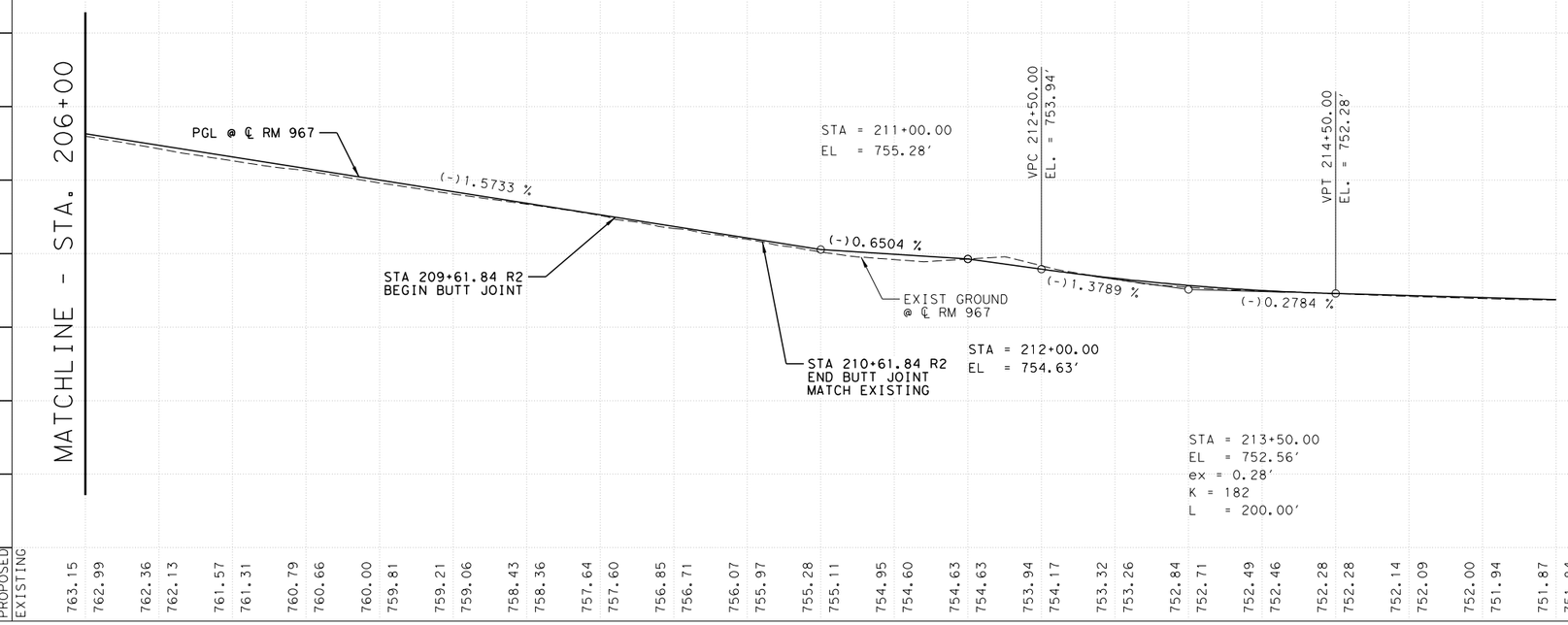
PLAN AND PROFILE
STA 196+00.00 TO
STA 206+00.00

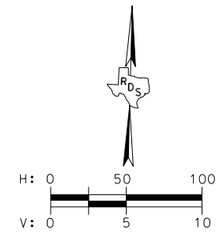
DATE: 5/17/2021			SHEET 21 OF 22
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	104

Filename: ...\Cad\Plan\015012-000*PP21.dgn
Date: 5/17/2021



VERTICAL ALIGNMENT LAYOUT & DATA DEPICTED BELOW
DERIVED FROM BEST FIT PROFILE MATCHING EXISTING
ELEVATIONS.
FOR ADDITIONAL INFORMATION, REFER TO CROSS SECTIONS.





NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE INTERSECTION/DRIVEWAY DETAILS FOR CULVERT DETAILS AND MORE INFORMATION.
4. LOCATION OF FLEXIBLE PAVEMENT REPAIR TO BE DETERMINED IN THE FIELD BY ENGINEER.

LEGEND:

- OE — OVERHEAD TELEPHONE
- OT — OVERHEAD ELECTRIC
- WIRE FENCE
- CHAIN LINK FENCE
- BUTT JOINT
- DRIVEWAY NUMBER
- DIRECTION OF TRAFFIC
- MAIL BOX

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

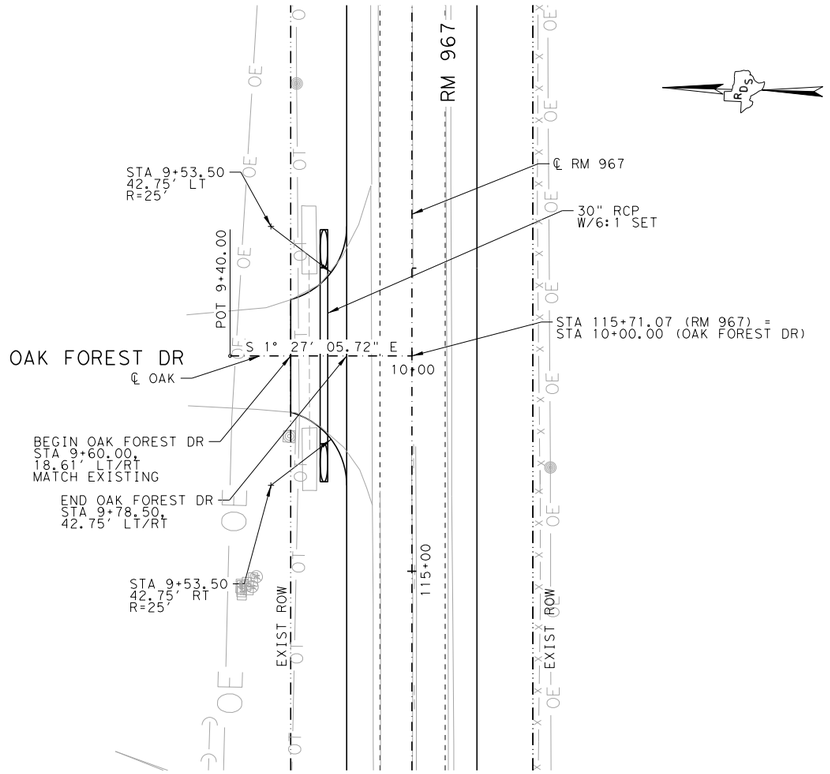
PLAN AND PROFILE
STA 206+00.00 TO
END PROJECT

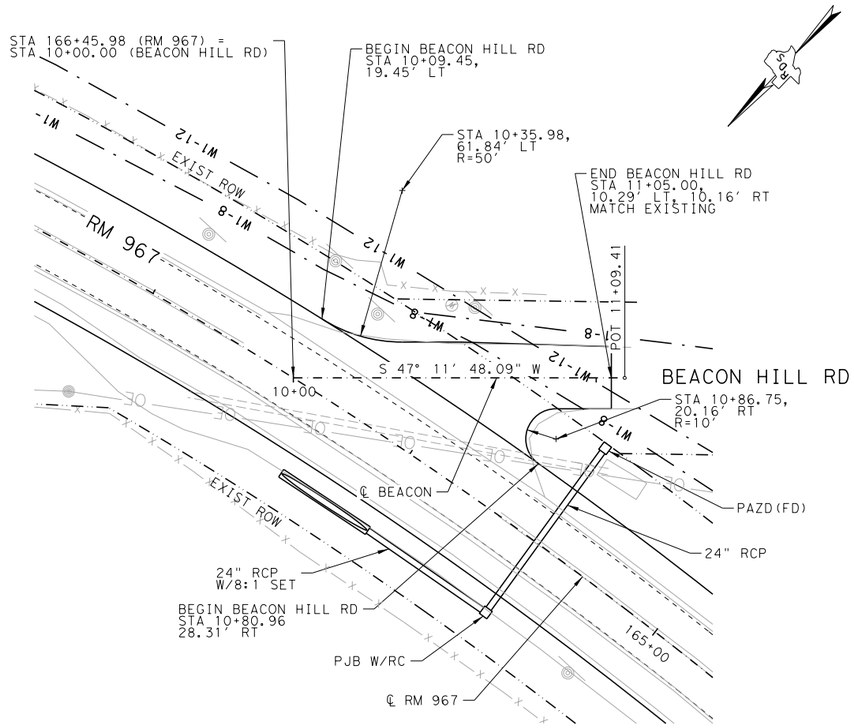
DATE: 5/17/2021 SHEET 22 OF 22

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	105

Filename: ...\Cad\Plan\015012-000xPP22.dgn
Date: 5/17/2021

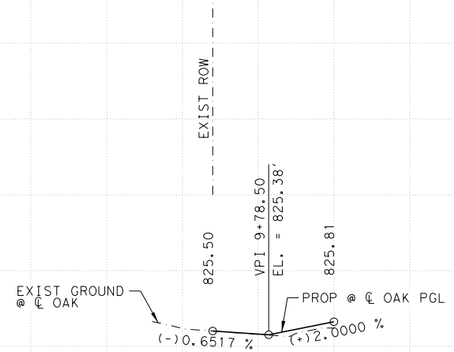


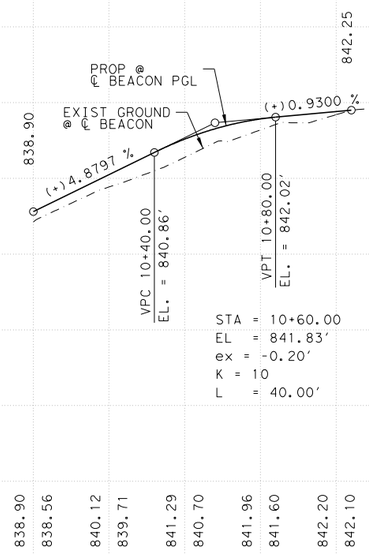


H: 0 25 50
V: 0 2.5 5

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE LIP OF GUTTER OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.





STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER
5/17/2021

Texas Department of Transportation

HAYS COUNTY

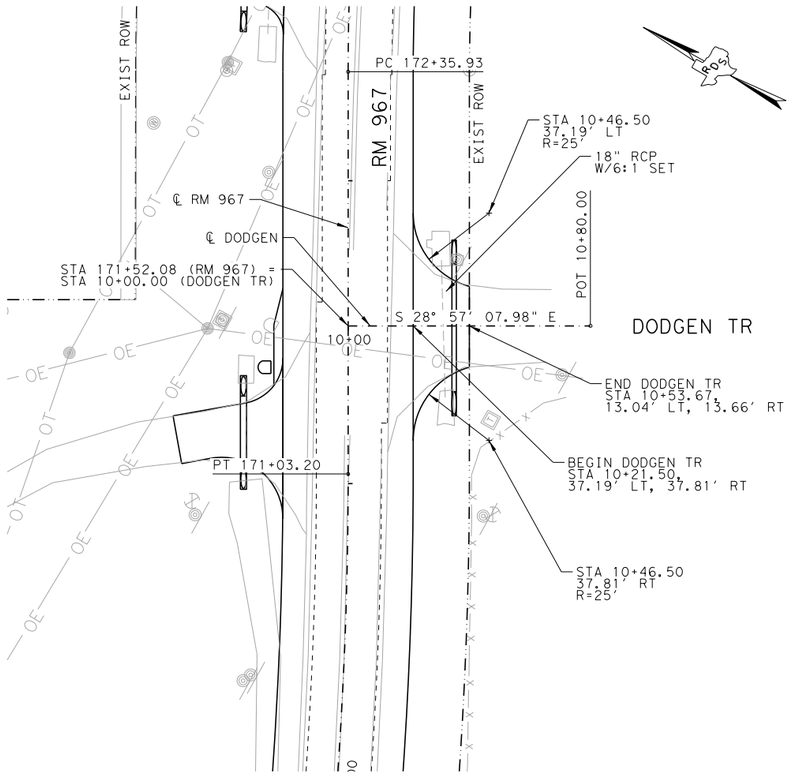
WSB & ASSOCIATES, INC.
FIRM # 16849

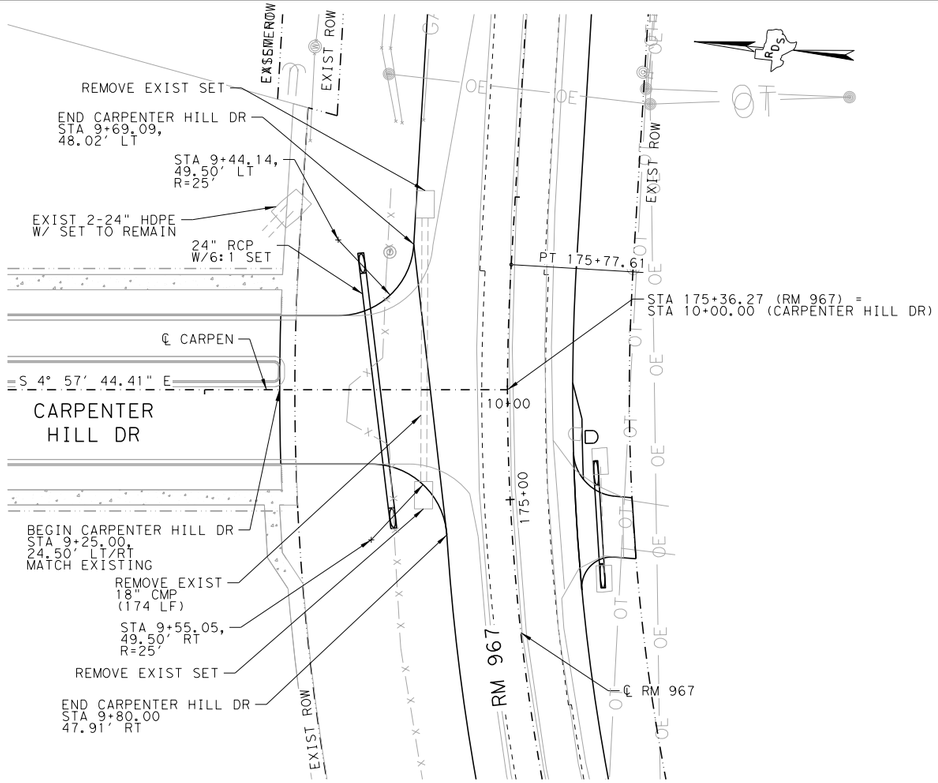
RM 967

INTERSECTION DETAILS
OAK FOREST DR
BEACON HILL RD

DATE: 5/17/2021			SHEET 1 OF 3
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	106

Filename: ...\Cad\Plan\015012-000*INT01.dgn
Date: 5/17/2021

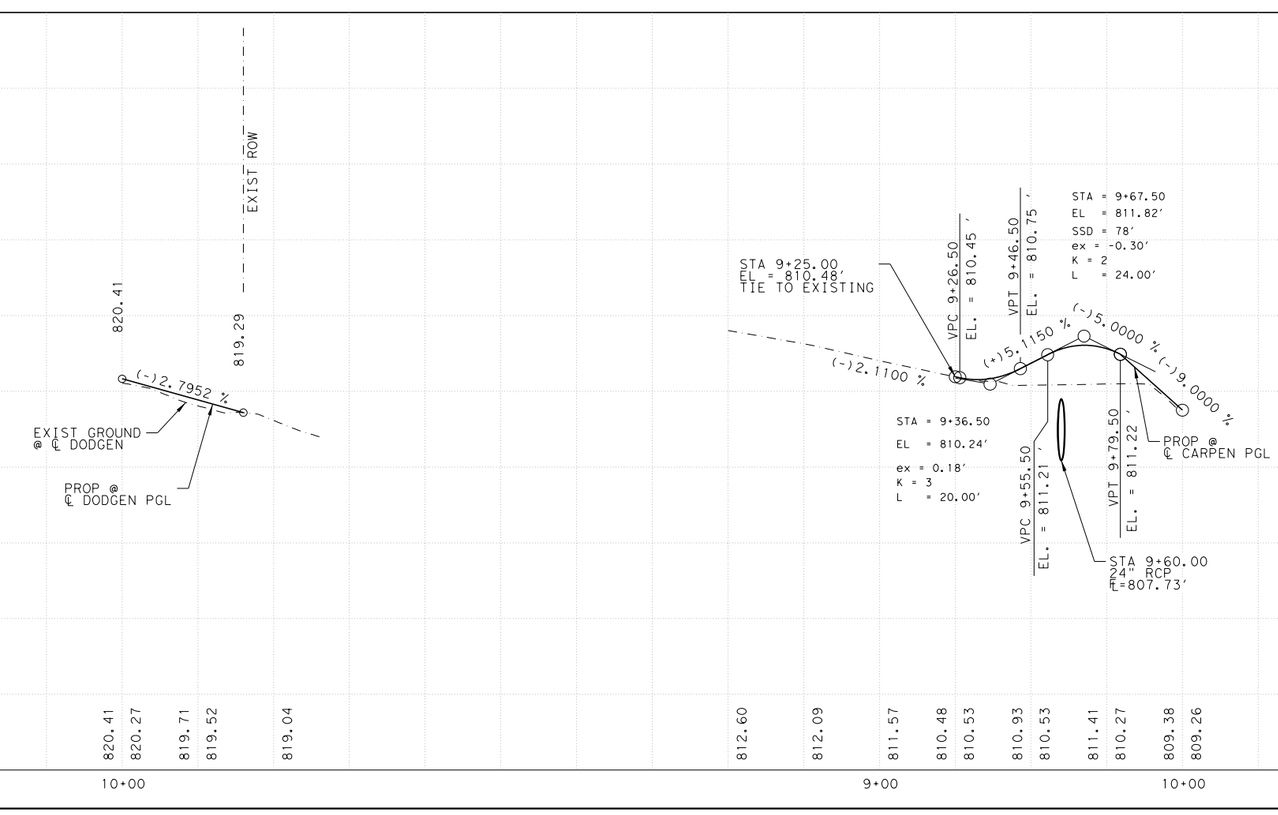




H: 0 25 50
V: 0 2.5 5

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE LIP OF GUTTER OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.



STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

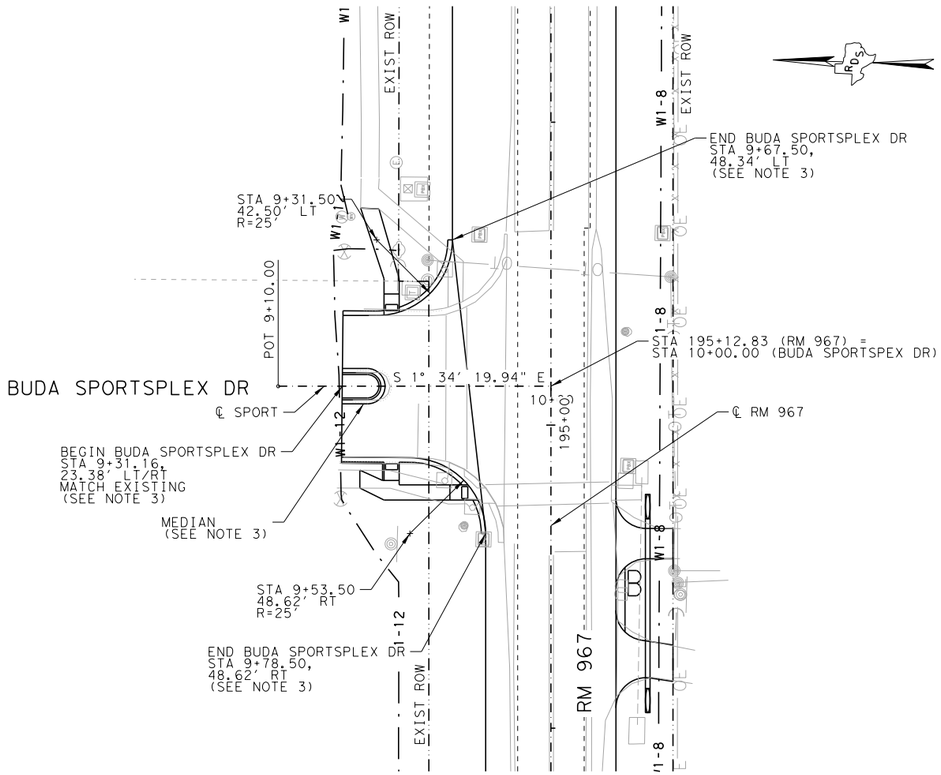
WSB & ASSOCIATES, INC.
FIRM # 16849

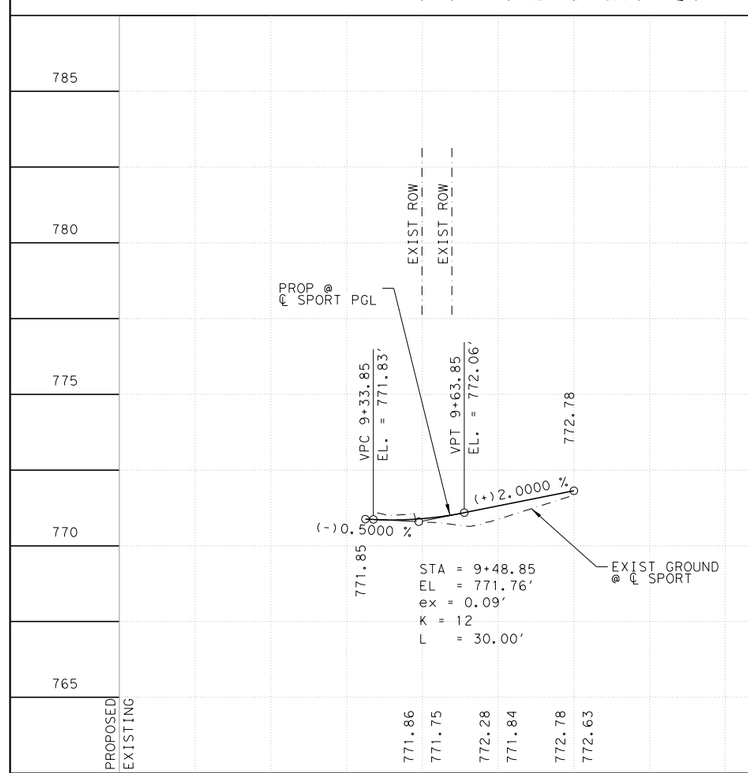
RM 967

INTERSECTION DETAILS
DODGEN TR
CARPENTER HILL DR

DATE: 5/17/2021				SHEET 2 OF 3
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	107

Filename: ...\Cad\Plan\015012-000*INT02.dgn
Date: 5/17/2021





H: 0 25 50
V: 0 2.5 5

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEETS FOR CURVE DATA.
2. ALL DIMENSIONS ARE TO THE LIP OF GUTTER OR EDGE OF PAVEMENT UNLESS OTHERWISE NOTED ON PLANS.
3. SEE BUDA SPORTSPLEX DETAILS SHEET FOR ADDITIONAL DETAIL.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

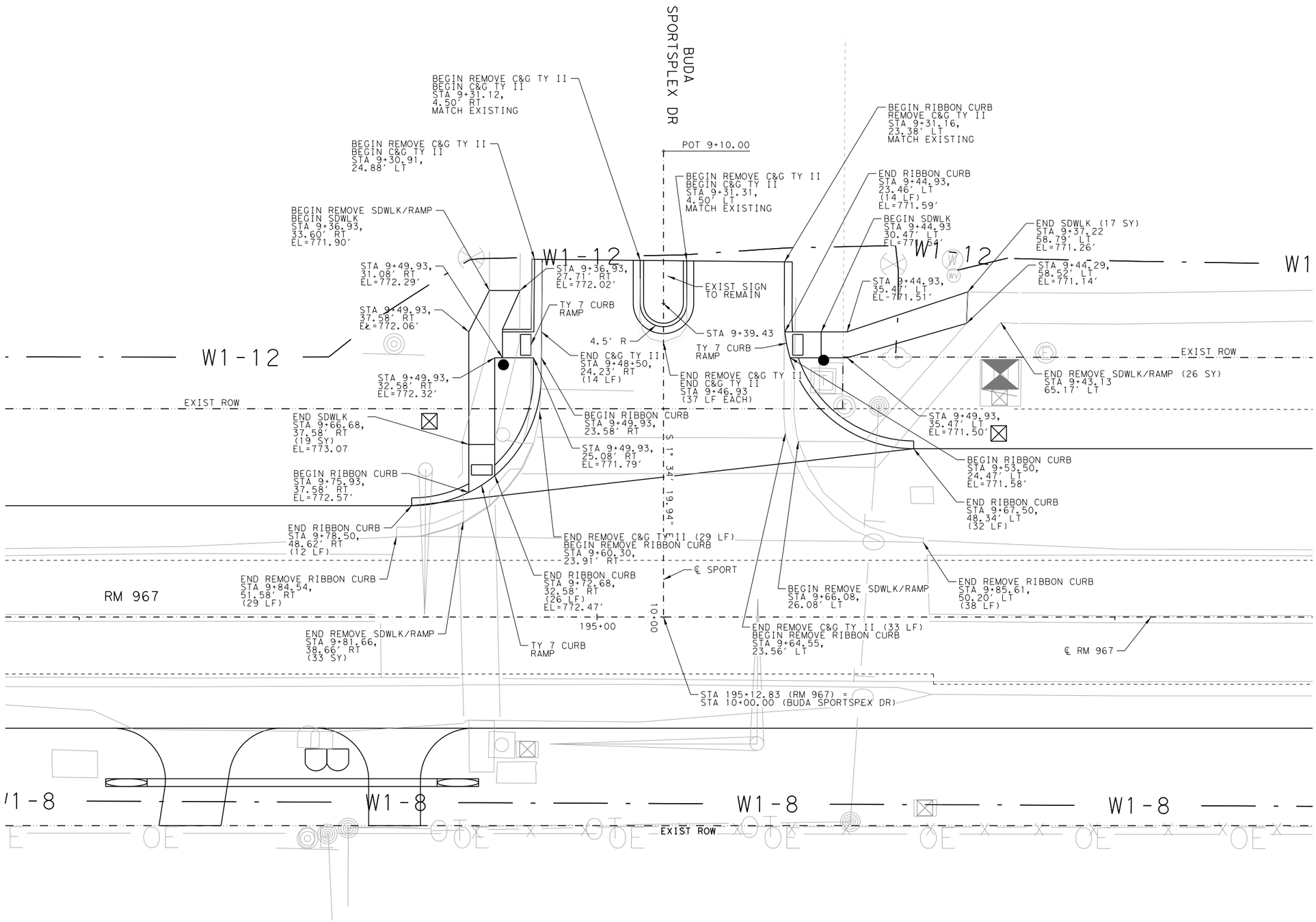
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

INTERSECTION DETAILS
BUDA SPORTSPLEX DR

DATE: 5/17/2021			SHEET 3 OF 3
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	108

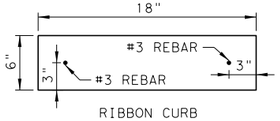
Filename: ...\Cad\Plan\015012-000*INT03.dgn
Date: 5/17/2021



0 5 10 20

NOTES:

1. CONTRACTOR TO FIELD VERIFY THAT PROPOSED RAMPS, SIDEWALK GRADES, AND CROSS SLOPES MEET ADA REQUIREMENTS.



RIBBON CURB
DETAIL
(ALL CCCG-12 NOTES
AND DETAILS APPLY)
(N.T.S.)

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

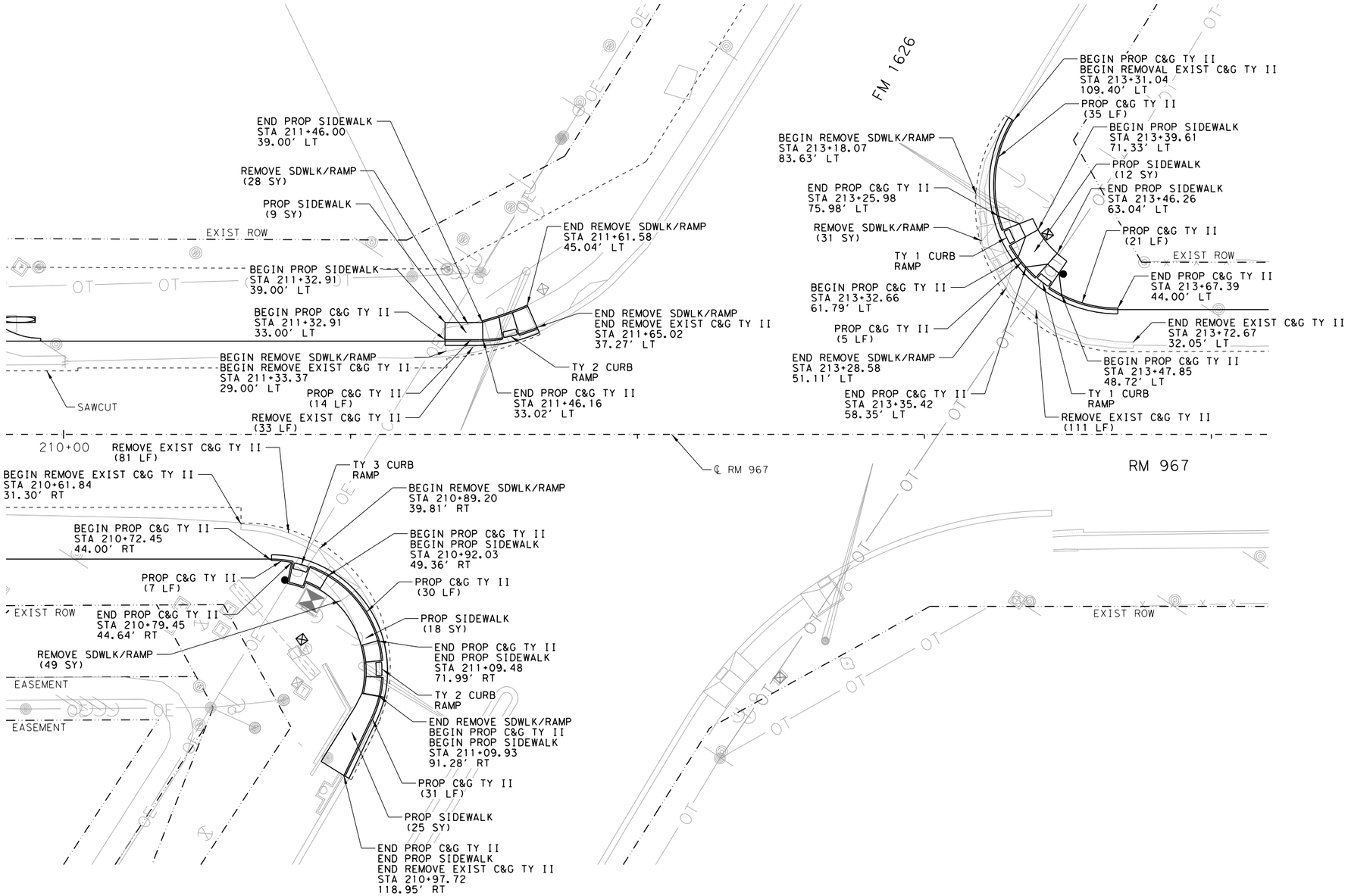
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

BUDA SPORTSPLEX DR DETAILS

DATE: 5/17/2021			SHEET 1 OF 1
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	109

Filename: ...\Cad\Plan\015012-000*INT04.dgn
Date: 5/17/2021



0 10 20 40

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

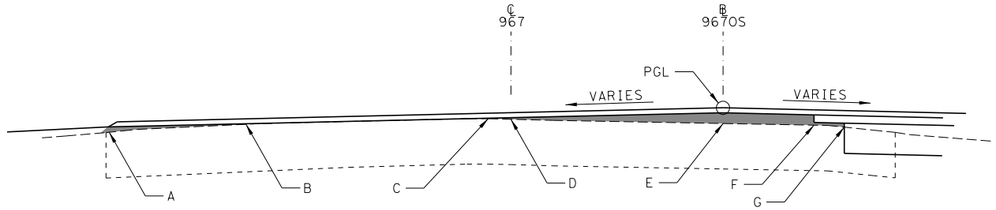
AT FM 1626
INTERSECTION DETAILS

DATE: 5/17/2021				
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	110

Filename: ...\Cad\Plan\015012-000*INT05.dgn
Date: 5/17/2021

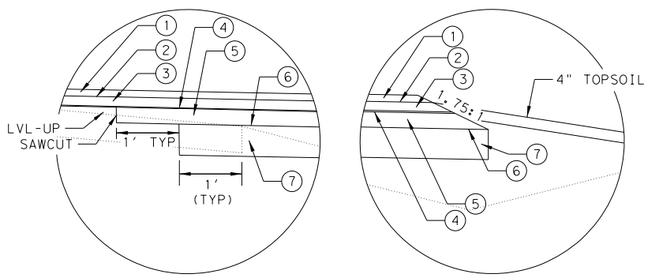
LEVEL-UP DETAILS

STATION "967OS"	(A)		(B)		(C)		(D) "967"		(E) "967OS"		(F)		(G)	
	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)	O/S (ft)	DEPTH (in.)
353+50.00														
354+00.00														
355+00.00	-15.8	1.5	-14.0	0			-2.5	0	0.0	1	6.5	1.25		
356+00.00	-17.5	1.25	-16.4	0	-9.2	0	-4.2	1	0.0	2.75	4.8	2.5		
357+00.00	-19.1	2.25	-17.3	0			-5.8	0	0.0	2.5	3.2	2.25		
358+00.00	-20.3	1.75	-19.0	0			-7.0	0	0.0	1.5	2.0	0.75		
359+00.00					-4.7	0			0.0	1	2.0	0.5		
360+00.00					-5.6	0			0.0	0.75	2.0	1		
361+00.00					-7.5	0	-7.0	0.25	0.0	1.5	2.0	2		
362+00.00							-7.0	0	0.0	1.75	2.0	2		
363+00.00					-9.2	0	-7.0	0.75	0.0	1.75	2.0	2		
364+00.00	-20.3	3	-7.8	0										
365+00.00	-20.3	2	-18.7	0	-3.4	0			0.0	1.25	2.0	2		
366+00.00	-20.3	1.75	-18.8	0	-5.8	0			0.0	2	2.0	1.75		
367+00.00	-20.3	1.75	-18.8	0	-5.8	0			0.0	2	2.0	1.75		
368+00.00	-20.3	1.5	-18.8	0	-5.4	0			0.0	2.25	2.0	2		
369+00.00					-8.0	0	-7.0	0.5	0.0	4.25	2.0	4	3.0	1
370+00.00					-5.8	0			0.0	3	2.0	3.25	3.0	0.25
371+00.00					-3.9	0			0.0	1.5	2.0	1.5		
372+00.00	-20.3	2.75	-11.5	0	-6.8	0			0.0	2.75	2.0	2.5		
373+00.00	-20.3	3	-9.3	0	-6.6	0			0.0	1.75	2.0	1.25		
374+00.00					-4.7	0			0.0	1.5	2.0	1.25		
375+00.00					-8.5	0	-7.0	3.5	0.0	2.25	2.0	1.75		
376+00.00					-8.5	0	-7.0	0.5	0.0	2.5	2.0	2.5		
377+00.00					-8.8	0	-7.0	0.75	0.0	3.25	2.0	3.25	3.0	0.25
378+00.00					-8.1	0	-7.0	0.25	0.0	3	2.0	2.75		
379+00.00					-8.5	0	-7.0	0.25	0.0	2	2.0	1.25		
380+00.00					-8.1	0	-7.0	0.25	0.0	1.5	2.0	0.75		
381+00.00					-8.1	0	-7.0	0.75	0.0	2.5	2.0	2		
382+00.00					-7.6	0	-7.0	0.25	0.0	3.5	2.0	3.25	3.0	0.25
383+00.00					-8.5	0	-7.0	0.5	0.0	3	2.0	2.75		
384+00.00					-7.8	0	-7.0	1	0.0	3.25	2.0	3		
385+00.00														
386+00.00														
387+00.00														
388+00.00														
389+00.00	-20.3	2	-10.1	0										
390+00.00	-20.3	4.25	-7.2	0										
391+00.00														
392+00.00					-8.4	0	-7.0	0.25	0.0	0.75	2.0	1		
393+00.00					-7.5	0	-7.0	0.25	0.0	1.25	2.0	1.75		
394+00.00					-8.3	0	-7.0	0.25	0.0	1.5	2.0	1.75		
395+00.00														
396+00.00					-10.6	0	-7.0	0.25	0.0	0.75	2.0	1		
397+00.00					-9.1	0	-7.0	0.5	0.0	1.5	2.0	1.75		
398+00.00					-8.6	0	-7.0	0.25	0.0	1	2.0	1.25		
399+00.00														
400+00.00														
401+00.00					-8.5	0	-7.0	0.25	0.0	1.25	2.0	1.75		
402+00.00							-7.0	0	0.0	2.25	3.0	2.75		
403+00.00	-20.3	2.75	-8.3	0			-7.0	0	0.0	1.5	3.0	0.5		
404+00.00														
405+00.00														
406+00.00					-5.1	0			0.0	2.75	3.0	2.75		
407+00.00	-20.3	2.25	-11.8	0	-5.0	0			0.0	2	3.0	1.75		
408+00.00					-5.6	0			0.0	2	2.0	1.5		
409+00.00	-20.3	2.75	-11.5	0	-5.7	0			0.0	2.5	2.0	2.25		
410+00.00	-20.3	3.25	-11.4	0	-5.3	0			0.0	2	2.0	2		
411+00.00	-20.3	2	-10.2	0			-7.0	0	0.0	3	2.0	3.25	3.0	0.25
412+00.00	-20.3	3	-10.2	0			-7.0	0	0.0	2.5	2.0	2.25		
413+00.00	-20.3	1.25	-14.4	0	-4.8	0			0.0	1.5	2.0	1.25		
414+00.00					-4.2	0			0.0	2.25	2.0	2.25		
415+00.00	-20.3	1.75	-11.8	0	-6.7	0			0.0	2.75	2.0	2.5		
416+00.00	-20.3	3	-9.9	0			-7.0	0	0.0	3	2.0	2.75		
417+00.00	-20.3	2	-10.4	0	-7.7	0	-7.0	0.25	0.0	3.25	2.0	3.25	3.0	0.25
418+00.00					-7.7	0	-7.0	0.5	0.0	1.25	2.0	0.5		
419+00.00					-8.6	0	-7.0	0.5	0.0	2.5	2.0	2.25		
420+00.00					-9.6	0	-7.0	0.75	0.0	3.25	2.0	3		
421+00.00					-8.2	0	-7.0	0.5	0.0	3.75	2.0	3.75	3.0	0.75
422+00.00					-9.1	0	-7.0	0.25	0.0	2	2.0	1.25		
423+00.00					-8.0	0	-7.0	0.25	0.0	2.75	2.0	2.75		
424+00.00					-9.2	0	-7.0	1	0.0	0	2.5	4.5	3.5	1.5
425+00.00					-6.8	0			0.0	3.5	4.1	3.5	5.1	0.75
426+00.00					-6.0	0			0.0	2	5.8	1.5		
427+00.00					-2.4	0			0.0	1.25	7.5	1.75		



LIMITS OF LEVEL-UP
STA 353+50 - STA 427+00

LEVEL-UP NOTES:



PAVEMENT DETAILS

1. 1" TOM
2. TACK COAT
3. 1.5" D-GR HMA (TY D)
4. UNDERSEAL COURSE
5. 4" D-GR HMA (TY B)
6. PRIME COAT
7. 12" FLEX BASE (2 EQUAL LIFTS)

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

LEVEL-UP AND SAWCUT DETAILS

DATE: 5/17/2021			SHEET 1 OF 2
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	111

Filename: ...\CadPlan\015012-000*LVL01.dgn
Date: 5/17/2021

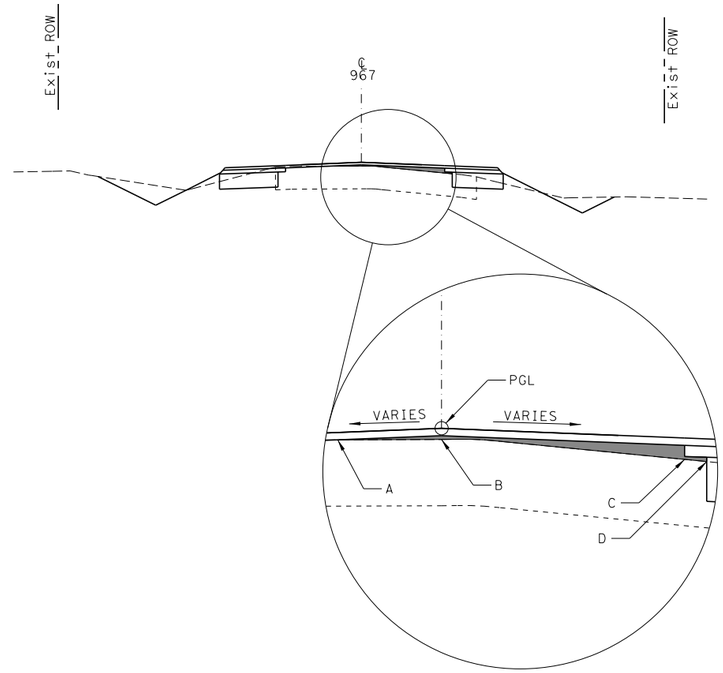
RM 967 TABLE OF SAWCUTS

STATION	O/S LEFT			O/S RIGHT	STATION
			BEGIN	10.0'	353+50
			PI	10.0'	401+77
			PI	11.0'	401+77
			PI	11.0'	407+00
424+44	12.5'	BEGIN	PI	10	407+00
427+85	12.5'	END	END	10.0'	427+85
444+50	10.0'	BEGIN	BEGIN	11.0'	444+50
453+00	10.0'	PI			
453+00	10.5'	PI			
133+75	10.5'	PI	PI	11.0'	133+35
133+75	15.5'	PI	PI	16.5'	133+35
135+00	15.5'	PI	END	16.5'	136+36
138+90	21.5'	PI			
139+21	26.8'	END			
164+00	10.5'	BEGIN	BEGIN	11.0'	164+00
			PI	11.0'	171+20
			PI	13.0'	171+20
171+60	10.5'	PI			
171+60	8.5'	PI			
			PI	13.0'	172+00
			PI	14.0'	172+00
172+35	8.5'	PI			
172+35	7.5'	PI			
			PI	14.0'	172+35
			PI	14.5'	172+35
			PI	14.5'	173+60
			PI	13.5'	173+60
174+00	7.5'	PI			
174+00	8.5'	PI			
			PI	13.5'	174+30
			PI	12.5'	174+30
175+75	8.5'	PI	PI	12.5'	175+75
175+75	10.3'	PI	PI	11.0'	175+75
185+20	10.3'	PI			
186+11	19.2'	PI			
186+66	19.2'	END			
190+84	19.5'	BEGIN			
191+82	11.0'	PI			
			PI	11.0'	195+65
			PI	13.0'	195+65
197+00	11.0'	PI	PI	13.0'	197+00
197+00	12.0'	PI	PI	14.0'	197+00
197+50	12.0'	PI	PI	14.0'	197+50
197+50	13.0'	PI	PI	15.5'	197+50
198+00	13.0'	PI			
198+00	15.0'	PI			
			PI	15.5'	198+25
			PI	17.0'	198+25
198+55	15.0'	PI			
198+55	18.0'	PI			
			PI	17.0'	199+00
			PI	18.0'	199+00
			END	18.0'	200+00
204+50	18.0'	PI			
204+50	21.5'	PI			
205+15	21.5'	PI			
205+15	20.5'	PI			
			BEGIN	25.5'	207+83
209+15	20.5'	PI			
209+15	22.0'	PI			
210+05	22.0'	PI			
210+05	23.0'	PI			
			END	25.5'	211+10
211+34	23.0'	PI			
211+34	26.5'	PI			
211+66	35.0'	END			
213+70	28.8'	BEGIN			
215+80	29.5'	END			

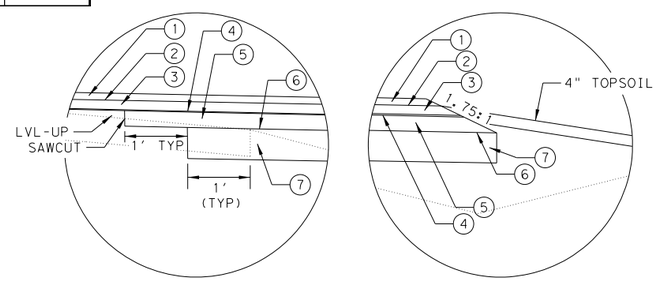
LEVEL-UP DETAILS

STATION "967OS"	(A) O/S (ft)	(A) DEPTH (in.)	(B) O/S (ft)	(B) DEPTH (in.)	(C) O/S (ft)	(C) DEPTH (in.)	(D) O/S (ft)	(D) DEPTH (in.)
445+00.00	-6.0	0	0.0	0.75	11.0	2.5		
446+00.00	-4.8	0	0.0	0.5	11.0	1.75		
447+00.00	-5.0	0	0.0	0.75	11.0	2.75		
448+00.00			3.4	0	11.0	3		
449+00.00	-2.5	0	0.0	1	11.0	3.25	12.0	0.75
450+00.00	-4.3	0	0.0	1.25	11.0	4	12.0	1.25
451+00.00	-3.9	0	0.0	1	11.0	3.5	12.0	1
452+00.00	-4.7	0	0.0	1	11.0	3.75	12.0	1.25
453+00.00			1.3	0	11.0	1.25		
454+00.00	-4.6	0	0.0	0.75	11.0	3.25	12.0	0.75
100+00.00			0.0	0	11.0	0.5		
101+00.00			0.0	0	11.0	1		
102+00.00			0.0	0	11.0	2.25		
103+00.00			3.6	0	11.0	1		
104+00.00								
105+00.00								
106+00.00								
107+00.00								
108+00.00								
109+00.00			0.4	0	11.0	2		
110+00.00								
111+00.00								
112+00.00								
113+00.00								
114+00.00			0.0	0	11.0	1.25		
115+00.00			1.0	0	11.0	1.25		
130+00.00	-2.5	0			10.0	0.75		
131+00.00	-3.3	0			10.0	1		
136+00.00	-5.2	0			15.5	4.75	16.5	2
167+00.00			0.3	0	10.0	3.75	11.0	1
168+00.00			0.6	0	10.0	2.5		
169+00.00			0.0	0	10.0	2.5		
170+00.00			0.0	0	10.0	3		
180+00.00			1.5	0	10.0	2.5		
181+00.00			0.7	0	10.0	2		
185+00.00			0.9	0	10.0	1.25		
189+00.00			1.1	0	10.0	1.75		
190+00.00			0.0	0	10.0	2		
191+00.00			1.7	0	10.0	2		
192+00.00			0.5	0	10.0	2		
193+00.00			0.7	0	10.0	1.5		
194+00.00			0.8	0	10.0	1.5		
196+00.00			0.0	0	12.0	3		
199+00.00			6.1	0	16.0	3		
200+00.00			2.7	0	17.0	2.75		

LEVEL-UP NOTES:



LIMITS OF LEVEL-UP
STA 445+00 R1 - STA 115+00 R2



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5. 4" D-GR HMA (TY B)
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7. 12" FLEX BASE (2 EQUAL LIFTS)

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LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

LEVEL-UP AND SAWCUT DETAILS

DATE: 5/17/2021			SHEET 2 OF 2
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT. / SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776 / 01	036,ETC	RM 967	112

Filename: ...\Cad\Plan\015012-000*LVL02.dgn
Date: 5/17/2021

SUMMARY OF DRIVEWAY DETAILS

P&P SHEET NO.	DRIVEWAY ID	CL STA	RT/LT	LT RADIUS	STA	OFFSET	RT RADIUS	STA	OFFSET	W (FT)	L (FT)	MAILBOX TURNOUT (SY)	PIPE LENGTH (FT)	NO. OF BARRELS	PIPE SIZE (IN)	DIST FROM EOP TO CULVERT CL	RDWY XSLOPE (%)	EOP ELEV (FT)	L1 (FT)	L1 ELEV (FT)	GRADE1 (%)	L2 (FT)	L2 ELEV (FT)	GRADE2 (%)	L3 (FT)	L3 ELEV (FT)	GRADE3 (%)	APSH DWY (SY)	CONC DWY (SY)
1	1	359+08.56 R1	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								17	
3	2	371+91.43 R1	RT	15	372+16.53 R1	23.00	10	371+75.34 R1	23.00	15.00	17.00	-	24	1	18" RCP	5.60	-1.26%	909.14	8.00	909.55	5.12%	15.43	908.83	-4.67%	-	-	-	38	
4	3	388+59.08 R1	RT	15	388+86.35 R1	23.00	10	388+41.78 R1	23.00	17.00	17.00	8	24	1	18" RCP	10.00	-2.00%	895.58	6.94	895.50	-1.15%	10.06	895.75	2.49%	-	-	-	44	
	4	389+50.91 R1	RT	15	389+71.64 R1	23.00	10	389+34.25 R1	23.00	10.00	17.00	8	18	1	18" RCP	9.70	-2.00%	895.96	22.00	895.56	-1.82%	-	-	-	-	-	-	31	
5	5	393+77.62 R1	RT	20	394+08.50 R1	23.00	15	393+52.71 R1	23.00	21.00	17.00	8	-	-	-	6.50	-2.00%	897.81	22.00	896.45	-6.18%	-	-	-	-	-	-	56	
6	6	402+69.72 R1	LT	2" OVERLAY FOR 5', TIE TO EXISTING								11	2" OVERLAY FOR 5', TIE TO EXISTING															31	
	7	406+10.16 R1	RT	-	-	-	-	-	-	46.33	17.00	-	92	1	18" RCP	6.03	-2.00%	892.69	17.00	893.39	4.12%	-	-	-	-	-	-		131
7	8	413+09.73 R1	RT	10	413+28.73 R1	23.00	10	412+90.73 R1	23.00	18.00	17.00	8	28	1	18" RCP	6.72	-2.00%	884.01	11.00	884.35	3.09%	6.00	884.69	5.67%	-	-	-	39	
9	9	431+72.06 R1	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								16	
	RUBY	431+85.70 R1	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								40	
	10	438+84.08 R1	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								22	
11	11	453+77.87 R1	RT	50	454+30.88 R1	18.00	50	453+25.91 R1	18.00	21.00	22.00	25	-	-	-	-	-2.00%	866.73	22.00	865.97	-3.45%	-	-	-	-	-	-	114	
12	OAK FORREST	115+71.07 R1	LT	25	115+28.32 R1	21.50	25	116+13.82 R1	21.50	37.22	18.50	-	58	1	30" RCP	7.50	SEE INTERSECTION DETAILS SHEET NO. 104											-	-
13	12	118+82.41 R2	LT	15	118+61.41 R2	21.50	15	119+03.41 R2	21.50	12.00	18.50	-	28	1	24" RCP	6.00	-2.00%	816.96	2.00	816.92	-2.00%	5.80	817.64	11.72%	10.76	816.84	-7.43%	36	
	13	118+84.70 R2	RT	5	118+97.20 R2	21.50	5	118+72.20 R2	21.50	15.00	18.50	-	20	1	18" RCP	8.80	-2.00%	816.96	5.00	816.86	-2.00%	3.82	817.11	3.93%	9.79	815.72	-14.20%	33	
	14	121+46.04 R2	LT	15	121+23.04 R2	21.50	15	121+69.04 R2	21.50	16.00	18.50	8	28	1	24" RCP	7.50	-2.00%	810.96	7.50	811.14	2.40%	11.00	811.06	0.91%	-	-	-		47
	15	123+36.43 R2	LT	10	123+20.29 R2	21.50	10	123.54.45 R2	21.50	14.00	18.50	8	20	1	24" RCP	6.00	-2.00%	807.40	11.00	808.48	9.82%	7.53	807.85	5.98%	-	-	-		36
14	16	129+39.49 R2	LT	10	129+22.19 R2	21.50	10	129+56.20 R2	21.50	14.00	18.50	8	21	1	18" RCP	5.50	-2.00%	812.26	6.90	812.96	10.14%	11.64	813.21	8.16%	-	-	-		36
	17	134+52.12 R2	LT	25	134+12.12 R2	21.50	25	134+92.12 R2	32.50	30.00	29.93	8	50	1	24" RCP	13.00	-2.00%	822.56	7.50	822.81	3.33%	14.60	822.42	-0.96%	-	-	-	132	
15	18	139+65.84 R2	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								37	
	19	144+45.49 R2	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								45	
16	20	148+89.85 R2	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								53	
	21	148+97.22 R2	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								17	
	22	155+04.14 R2	RT	20	155+36.93 R2	36.69	50	154+50.52 R2	69.56	26.35	18.5	-	-	-	-	-	-2.00%	871.62	21.50	871.72	0.47%	-	-	-	-	-	-	81	
17	23	156+54.03 R2	LT	15	156+25.20 R2	21.50	15	156.79.61 R2	21.50	22.00	18.50	-	30	1	18" RCP	9.50	-2.00%	877.80	12.50	878.03	1.84%	6.00	877.79	-0.17%	-	-	-	59	
	24	157+73.50 R2	RT	25	158+10.14 R2	21.50	15	157+46.00 R2	21.50	25.00	18.50	-	-	-	-	-	-2.00%	881.02	21.50	881.25	1.07%	-	-	-	-	-	-	70	
	BEACON HILL	166+45.98 R2	RT	50	166+48.29 R2	21.50	10	165+63.55 R2	21.50	20.50	65.30	-	-	-	-	-	SEE INTERSECTION DETAILS SHEET NO. 104											-	-
18	25	171+14.52 R2	LT	20	170+88.28 R2	21.50	15	171+41.42 R2	21.50	16.00	34.30	8	24	1	24" RCP	11.00	-3.76%	820.47	9.66	820.85	3.93%	25.36	820.85	1.50%	-	-	-	81	
	DODGEN	171+52.08 R2	RT	25	171+89.27 R2	21.50	25	171+14.27 R2	21.50	26.70	18.50	-	42	1	18" RCP	13.50	SEE INTERSECTION DETAILS SHEET NO. 105											-	-
	26	172+65.82 R2	LT	10	172+47.95 R2	21.50	10	172+79.54 R2	21.50	12.36	18.55	-	20	1	24" RCP	13.15	5.52%	818.91	7.78	819.11	2.57%	10.85	818.08	-7.65%	-	-	-	31	
	27	174+87.90 R2	RT	15	175+15.07 R2	21.50	10	174+68.08 R2	21.50	20.23	18.77	8	26	1	18" RCP	7.30	-6.00%	809.94	18.70	809.72	-1.18%	-	-	-	-	-	-	50	
	CARPENTER	175+36.27 R2	LT	25	174+89.70 R2	21.50	25	175+82.40 R2	32.50	49.00	49.70	-	78	1	24" RCP	17.25	SEE INTERSECTION DETAILS SHEET NO. 105											-	-
19	28	178+13.60 R2	RT	15	178+37.60 R2	21.50	15	177+89.60 R2	21.50	18.00	18.74	8	30	1	18" RCP	6.50	-2.00%	800.99	13.00	800.90	-0.69%	5.80	800.36	-10.86%	-	-	-	49	
	29	180+70.96 R2	RT	5	180+80.46 R2	21.50	5	180+61.45 R2	21.50	9.00	18.75	9	13	1	18" RCP	9.50	-2.00%	796.18	12.97	795.91	-2.08%	5.80	794.69	-25.69%	-	-	-	20	
	30	182+03.05 R2	LT	15	181+72.55 R2	21.50	15	182+33.55 R2	21.50	31.00	38.00	8	38	1	24" RCP	8.50	-2.00%	794.15	2.00	794.11	-2.00%	12.00	795.71	13.00%	10.30	794.56	-11.17%		79
	31	184+34.91 R2	LT	10	184+16.40 R2	21.50	10	184+53.40 R2	21.50	17.00	23.00	-	23	1	24" RCP	9.50	-2.00%	789.30	2.00	789.26	-2.00%	10.57	790.50	11.35%	6.25	790.00	-8.00%	41	
	32	185+56.96 R2	RT	15	185+77.97 R2	21.50	15	182+33.97 R2	21.50	12.00	18.77	8	19	1	18" RCP	8.50	-2.00%	785.87	18.77	785.18	-3.68%	-	-	-	-	-	-	36	
20	33	187+07.10 R2	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								20	
	34	188+82.11 R2	LT	2" OVERLAY FOR 5', TIE TO EXISTING																								27	
	35	190+28.14 R2	RT	10	190+44.14 R2	21.50	10	190+12.15 R2	21.50	12.00	18.78	8	18	1	18" RCP	12.50	-2.00%	775.52	18.78	774.82	-3.73%	-	-	-	-	-	-	30	
	36	194+21.41 R2	RT	10	194+38.88 R2	21.50	10	194+06.05 R2	21.50	12.00	18.79	6	-	-	-	-	-2.00%	777.75	7.75	777.96	2.71%	-	-	-	-	-	-	31	
	37	194+60.91 R2	RT	10	194+75.91 R2	21.50	10	194+45.91 R2	21.50	12.00	18.80	-	56	1	18" RCP	10.50	-2.00%	775.52	14.37	775.42	-0.70%	4.41	774.82	-15.87%	-	-	-	26	
	BUDA	195+12.83 R2	LT	25	194+64.21 R2	21.50	25	194+61.17 R2	32.50	46.76	41.80	-	-	-	-	-	SEE INTERSECTION DETAILS SHEET NO. 106											-	-
21	38	197+94.91 R2	LT	20	197+52.28 R2	32.50	20	198+38.53 R2	32.50	46.33	27.96	-	56	1	18" RCP	15.50	-2.00%	772.97	12.61	772.42	-4.36%	6.19	773.22	4.04%	-	-	-		170
	39	198+36.15 R2	RT	10	198+51.15 R2	21.50	10	198+21.15 R2	21.50	10.00	18.81	8	16	1	18" RCP	15.60	-2.00%	772.71	12.61	772.23	-3.81%	6.19	772.88	2.75%	-	-	-	26	
	WILEY WAY	200+47.02 R2	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								24	
	40	200+57.93 R2	LT	20	200+18.09 R2	32.50	20	200+97.47 R2	32.50	36.85	37.04	-	42	1	18" RCP	32.30	-2.00%	768.59	37.04	764.79	-10.26%	-	-	-	-	-	-		177
	41	202+64.58 R2	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								43	
	42	204+80.69 R2	LT	25	204+36.42 R2	57.50	25	205+24.67 R2	57.50	35.35	37	8	48	1	18" RCP	13.50	-2.00%	763.13	36.69	761.94	-3.24%	-	-	-	-	-	-	176	
22	43	206+78.11 R2	RT	2" OVERLAY FOR 5', TIE TO EXISTING																								122	
	44	209+44.28 R2	LT	25	208+96.27 R2	58.50	25	209+92.03 R2	58.50	45.23	35.88	-	68	1	24" RCP	7.5	-2.00%	754.21	35.88	758.07	10.75%	-	-	-	-	-	-		216

NOTE: REFER TO DITCH TABLES FOR CULVERT ℄ AND GRADE.

P&P SHEET NO.	DRIVEWAY ID	LOCATION (STATION)	NO. OF MAILBOXES (EA) *	REMOVE EXIST MAILBOX (EA)
4	3	388+91.35	1	1
	4	389+76.61	1	1
5	5	394+12.17	1	1
6	6	402+75.96	1	1
7	8	413+35.91	1	1
11	11	454+17.75	1	1
13	14	121+16.53	1	1
	15	123+12.29	1	1
14	16	129+56.20	1	1
	17	134+86.24	1	1
18	25	171+38.42	1	1
	27	175+20.15	1	1
19	28	178+42.60	1	1
	29	180+60.04	1	1
	30	181+66.03	1	1
	32	185+82.96	1	1
20	35	190+13.29	1	1
	36/37	194+47.84	2	2
21	39	198+22.29	1	1
	42	204+33.95	1	1

* FOR CONTRACTOR'S INFORMATION ONLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DRIVEWAY DETAILS

DATE: 5/17/2021			SHEET 1 OF 2
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	113

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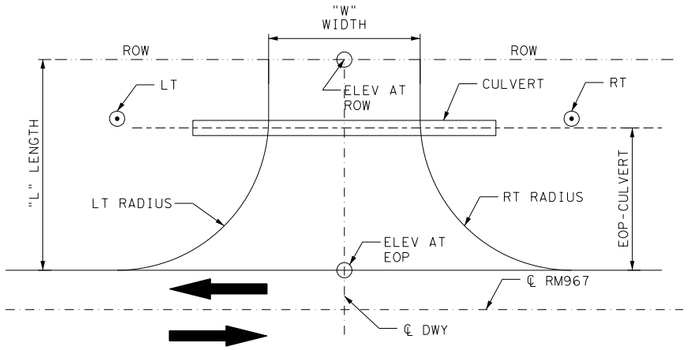
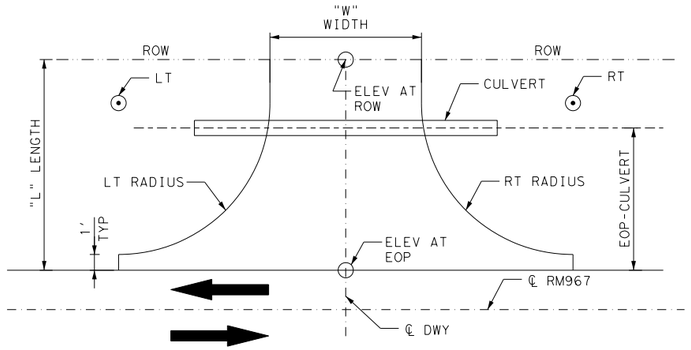
Date: 5/17/2021



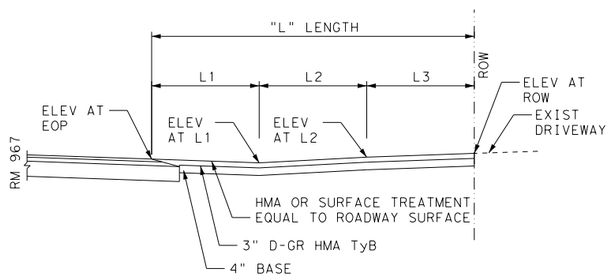
TYPICAL ASPHALT DRIVEWAY PLAN

NOT TO SCALE



TYPICAL CONCRETE DRIVEWAY PLAN

NOT TO SCALE



TYPICAL ASPHALT DRIVEWAY PROFILE

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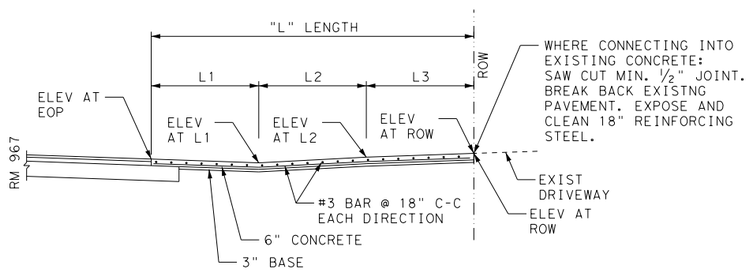

TYPICAL CONCRETE DRIVEWAY PROFILE

NOT TO SCALE

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DRIVEWAY DETAILS

DATE: 5/17/2021				SHEET 2 OF 2
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	114

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Date: 5/17/2021

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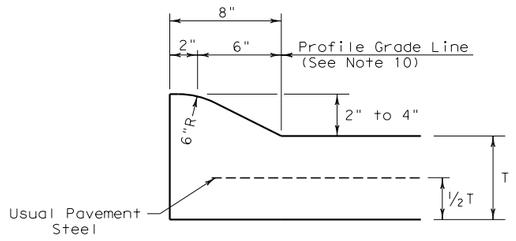
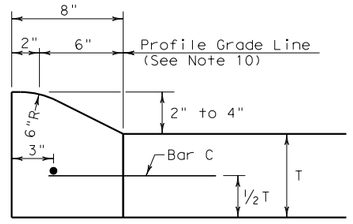
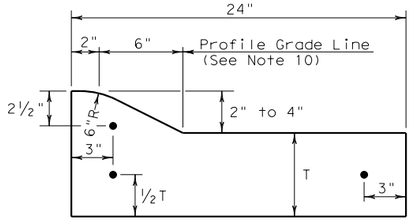


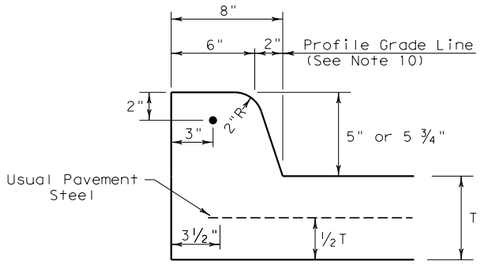
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



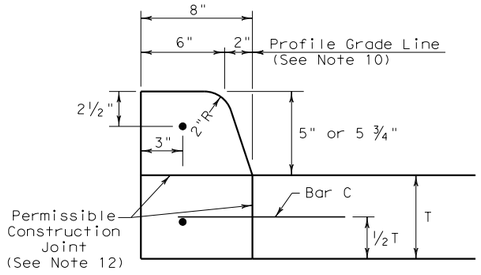
TYPE I CURB
2" - 4" HEIGHT



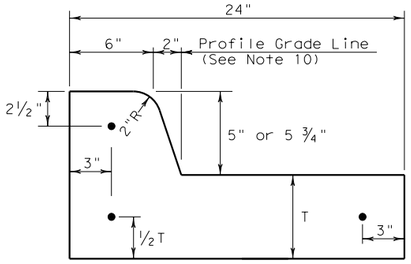
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



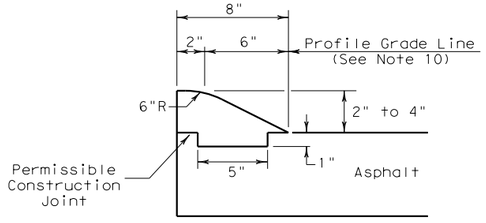
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



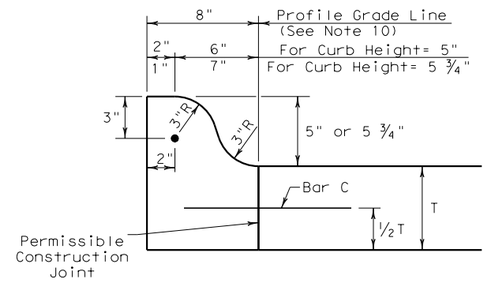
TYPE II CURB
5" - 5 ¾" HEIGHT



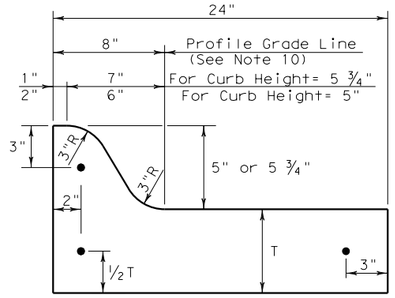
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



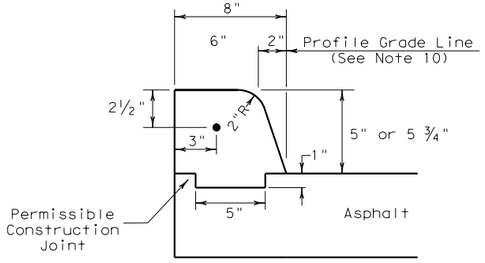
TYPE III CURB (KEYED)
2" - 4" HEIGHT



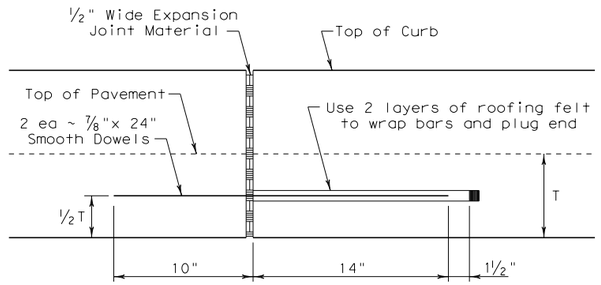
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

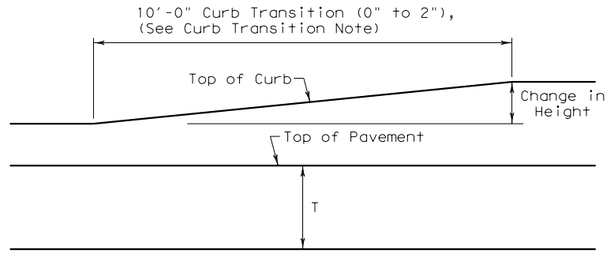


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

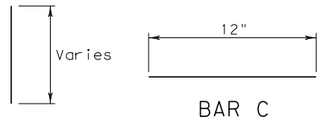
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

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 fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
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 horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B used as needed to support curb reinforcing steel during concrete placement.



BAR B

BAR C

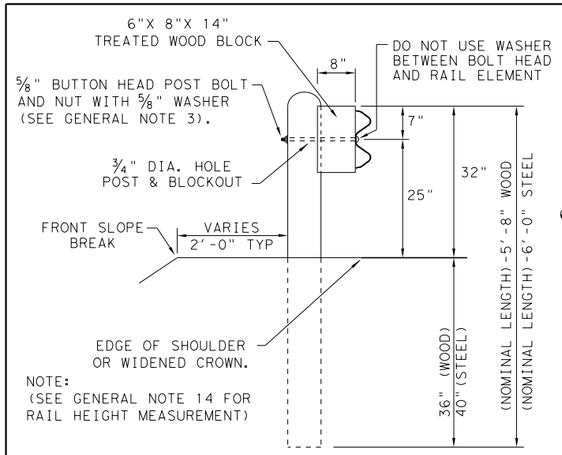
Texas Department of Transportation

Design Division Standard

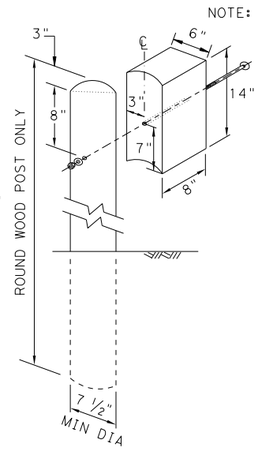
CONCRETE CURB AND CURB AND GUTTER

CCCG-21

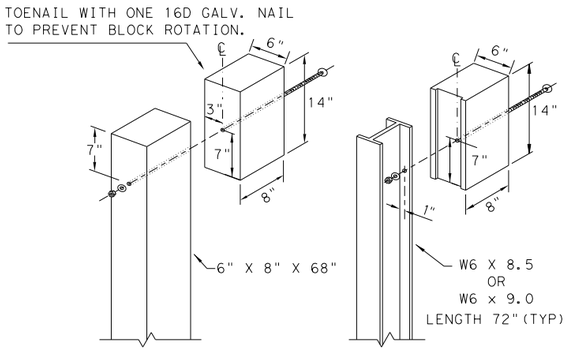
FILE: cccg12.dgn	DN: TxDOT	CK: AM	DW: VP	CK: VP
© TxDOT: 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
UPDATED 2012 - VP	DIST	COUNTY		SHEET NO.
	AUS	HAYS		115



TYPICAL POST PLACEMENT



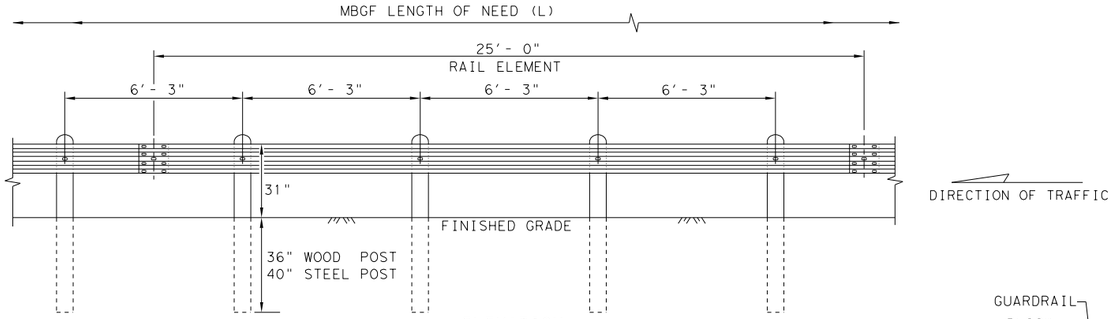
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

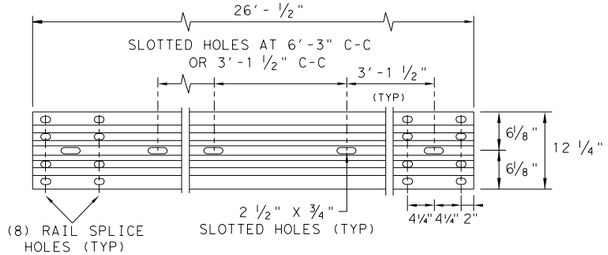
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



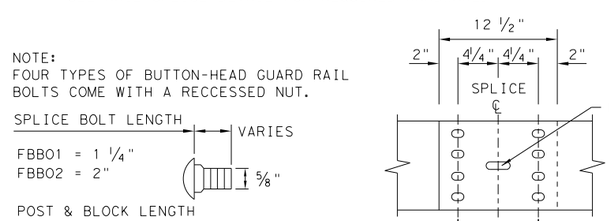
ELEVATION MID-SPAN RAIL SPLICE

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



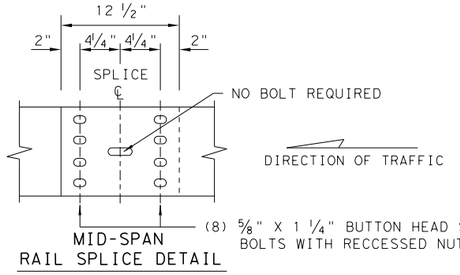
ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

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



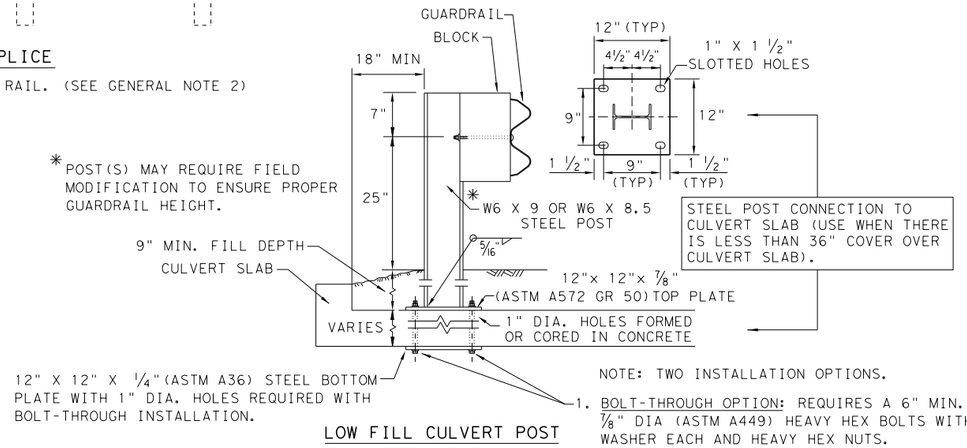
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

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

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

GENERAL NOTES

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

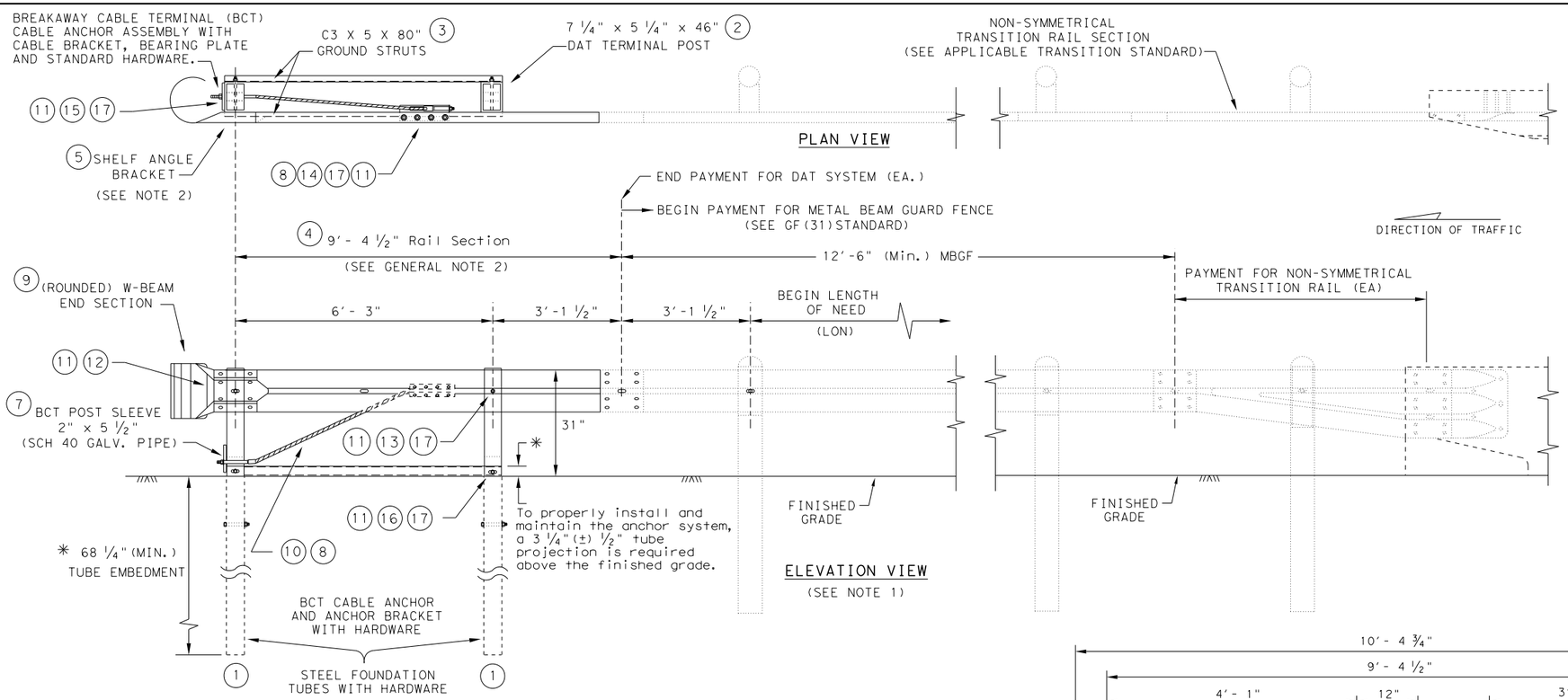
Texas Department of Transportation — Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		116

DATE: 5/17/2021
FILE: K:\0150I2-000\Cad\Plan\STND\gf3119.dgn

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\gf31dat19.dgn



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

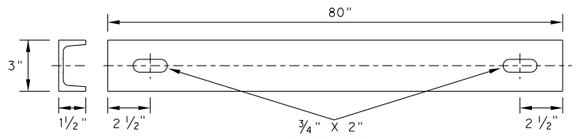
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

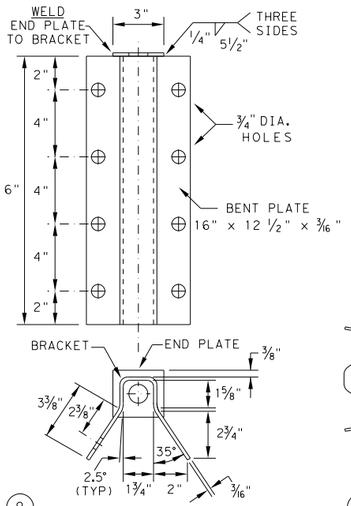
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

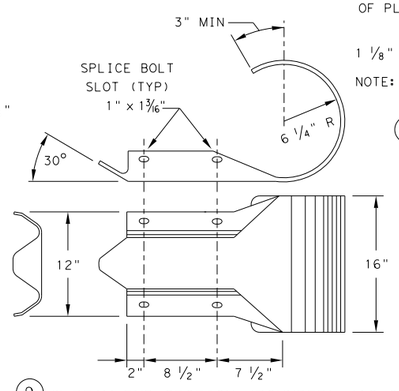
(4) TERMINAL RAIL ELEMENT FOR DAT



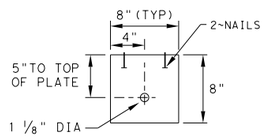
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

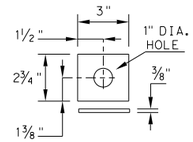


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

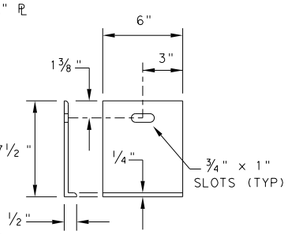


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

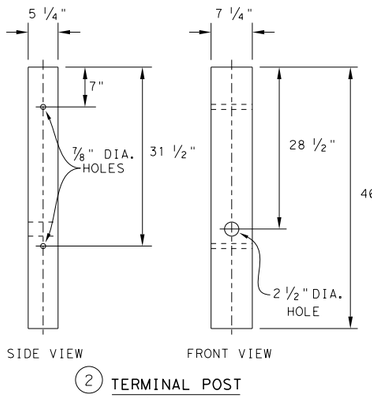
(6) BEARING PLATE
8"x 8"x 5/8" R



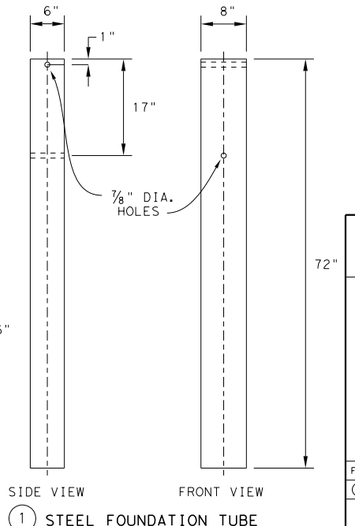
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation

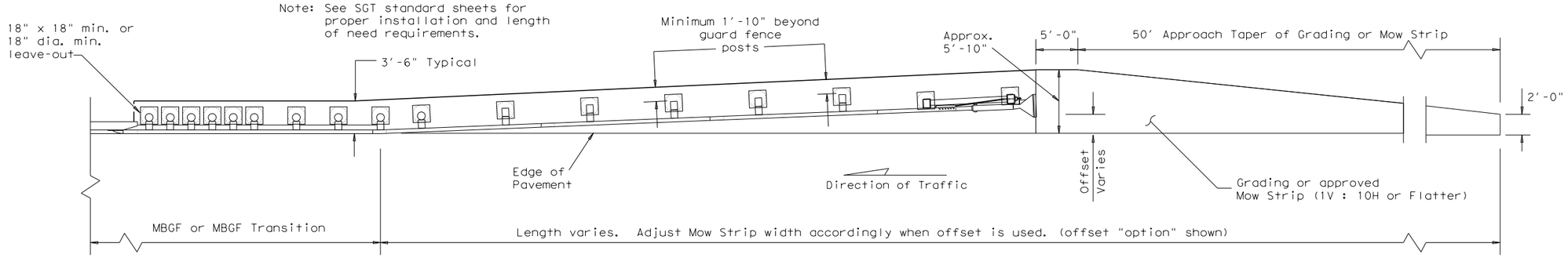
Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

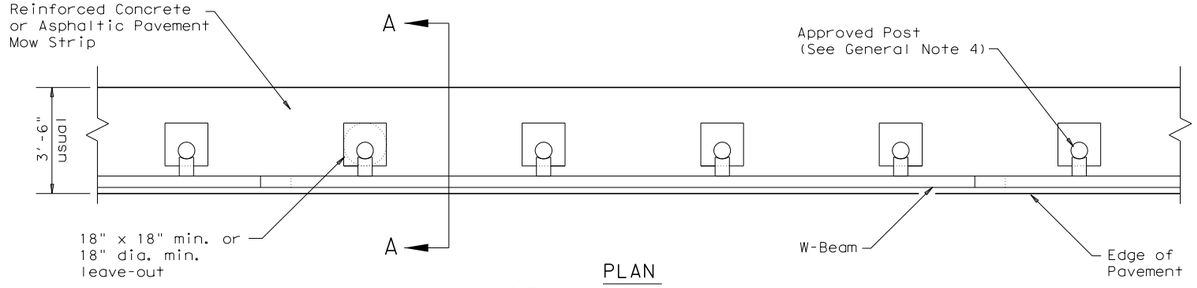
GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		117

DATE: 5/17/2021
FILE: K:\01502-000\Cad\Plan\STND\gf31ms19.dgn

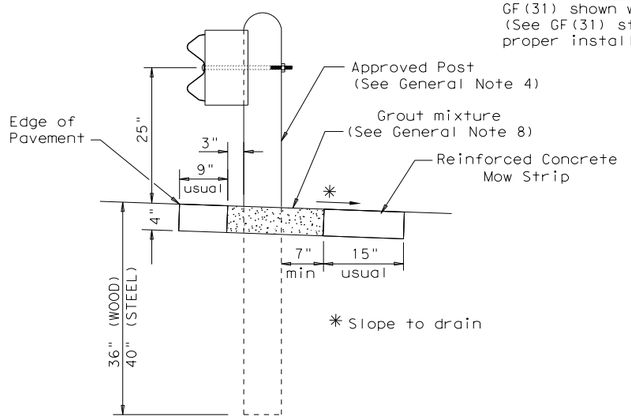


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



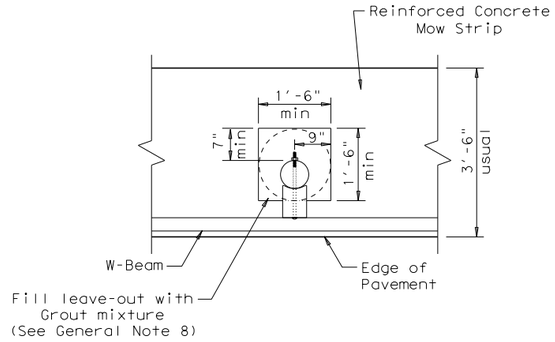
PLAN

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



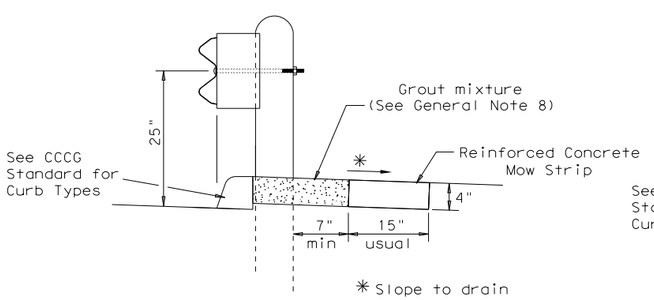
SECTION A-A

Typical



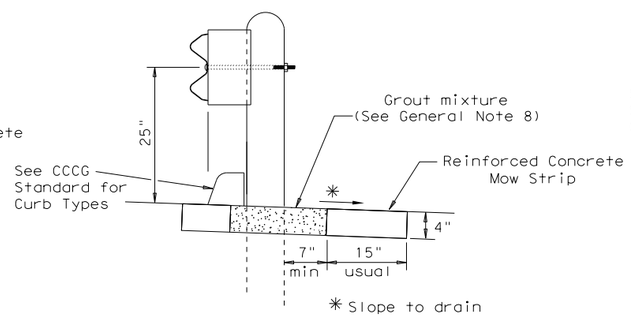
MOW STRIP DETAIL

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



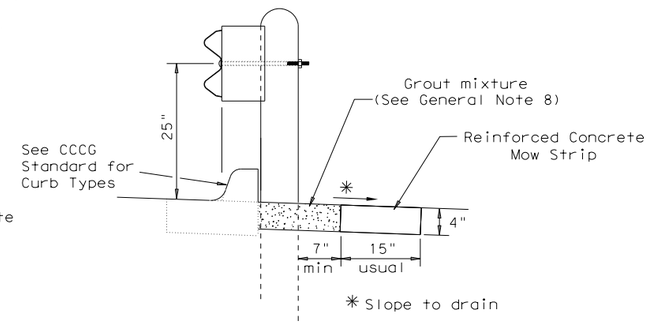
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

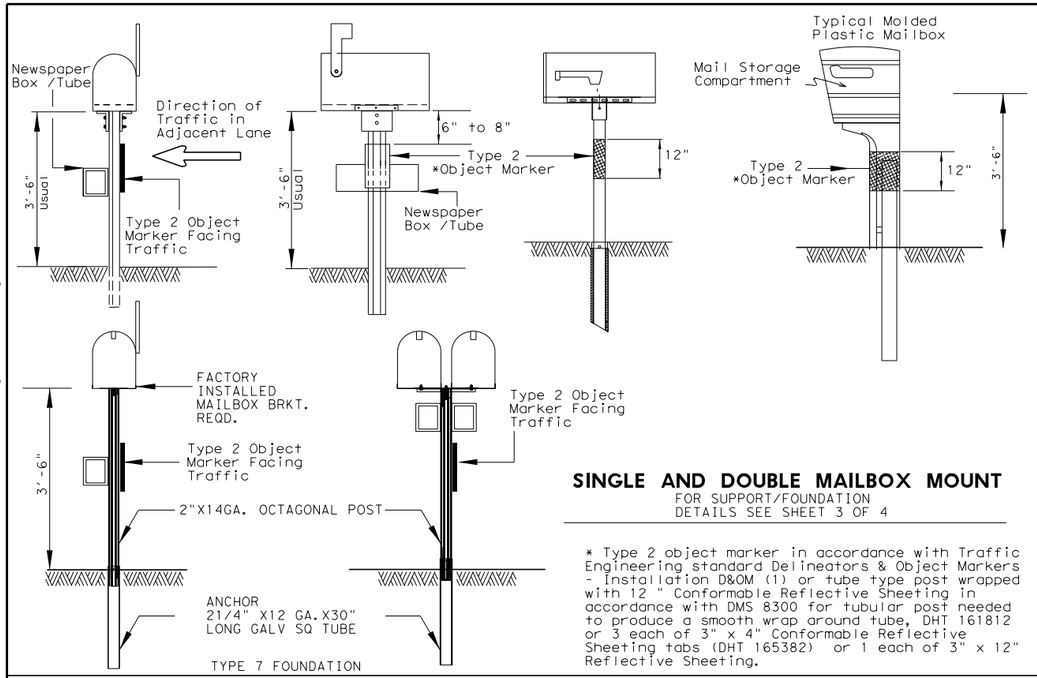
Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1776	01	036, ETC		RM967	
	DIST	COUNTY			SHEET NO.	
	AUS	HAYS			118	



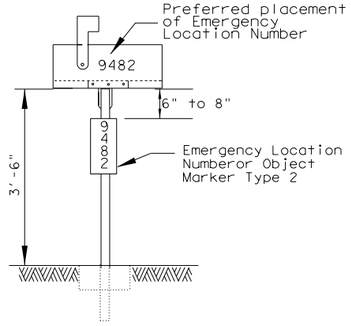
SINGLE AND DOUBLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12 " Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.

*PED-XX: XX is the standard year for example PED- 12 , PED-13,etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2: A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved , may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

MAILBOX SIZES

SIZE	TYPICAL MAILBOX SIZE LENGTH (INCHES)	WIDTH (INCHES)	HEIGHT (INCHES)	LIGHT WEIGHT MATERIAL SHEET METAL MAXIMUM WEIGHT (POUNDS)	LIGHT WEIGHT MATERIAL **PLASTIC MAXIMUM WEIGHT (POUNDS)
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

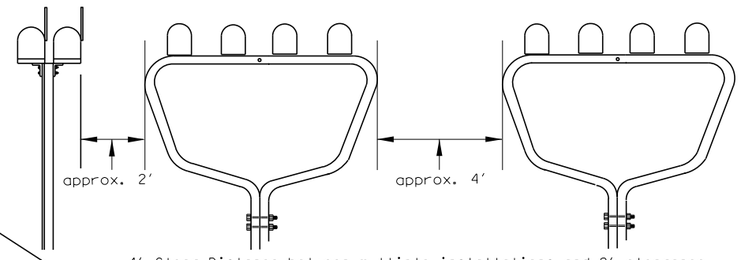
* Maximum allowed dimensions for mailbox
** Excluding Molded Plastic on 4 X 4 Post

LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)					
VIEW	TOP	BOTTOM	FRONT SIDE	BACK SIDE	WEIGHT (POUNDS)
SIDE	18	15	18.3	15	
BACK	11 1/2	11 1/2		15	22.4

SEE TOP RIGHT CORNER OF SHEET 2 OF 4

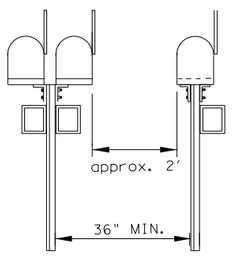
Mailboxes shall be made of light weight sheet metal or light weight plastic. Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



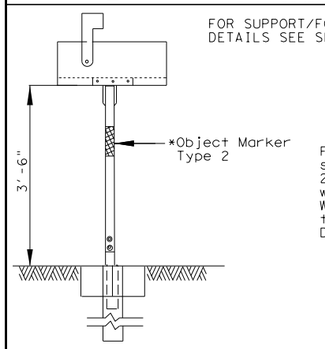
4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation. DHT #'s 164116 or 149339.

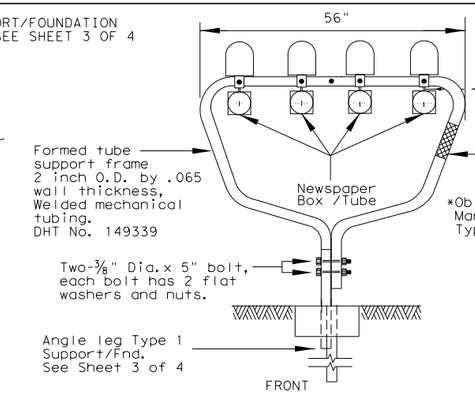
MULTIPLE MAILBOX PLACEMENT

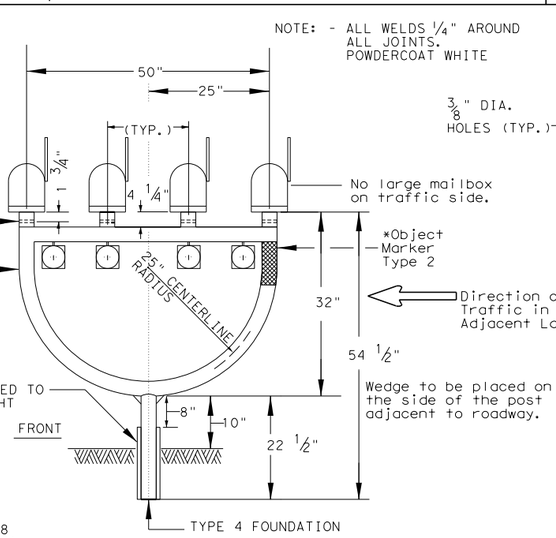


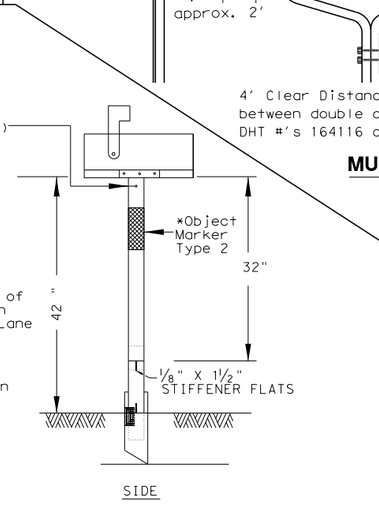
Clear Distance between single or double mounted posts. (Normally when 3 or more mailboxes are in one location, a multiple support is used).

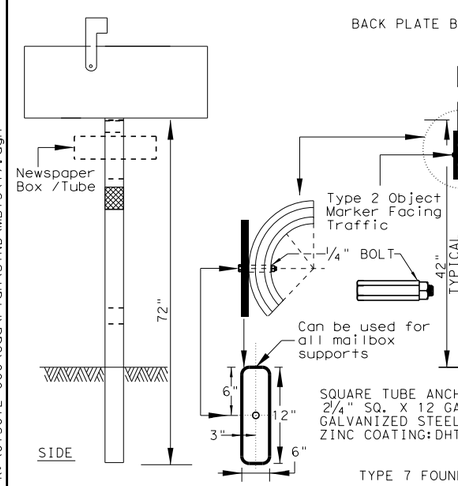
SINGLE & DOUBLE MAILBOX PLACEMENT











DOUBLE AND MULTIPLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4 FOR DHT NUMBERS SEE SHEET 4 OF 4

NEWSPAPER RECEPTACLE

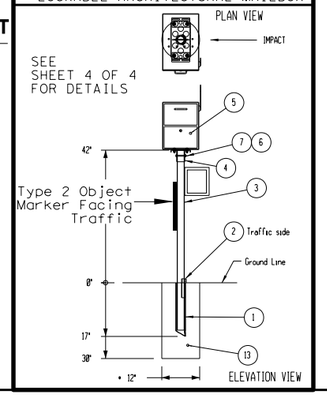
A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:

- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.

MULTIPLE MAILBOX MOUNT

INDEX OF MAILBOX DETAIL SHEETS

LOCKABLE ARCHITECTURAL MAILBOX



SHEET 1 OF 4

Texas Department of Transportation

Maintenance Division Standard

MAILBOX MOUNTING AND SPACING

MB-15(1)

FILE: MB14(1).DGN	DN: JEO		CK: JEO	DW:	CK:
© TxDOT APRIL 2015	CONT	SECT	JOB		HIGHWAY
REVISIONS: Added additional newspaper receptacle for double mailbox support	1776	01	036, ETC		RM967
	DIST	COUNTY			SHEET NO.
	AUS	HAYS			119

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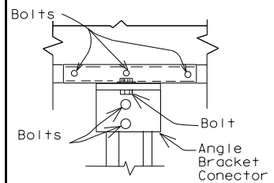
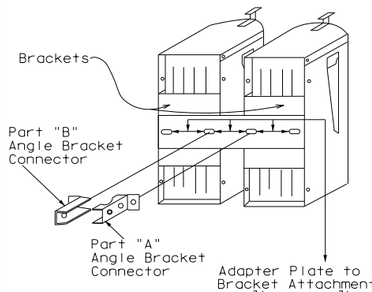


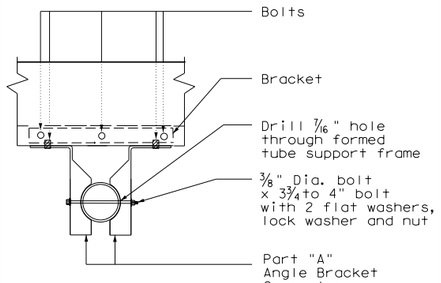
For bolt sizes see details below for "SMALL MAILBOX" and "MEDIUM AND LARGE MAILBOXES"

SINGLE MAILBOX

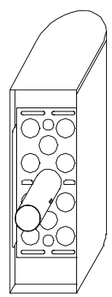


(Not permitted for Large Mailboxes)

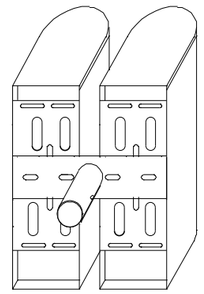
DOUBLE MAILBOX



MULTIPLE MAILBOX



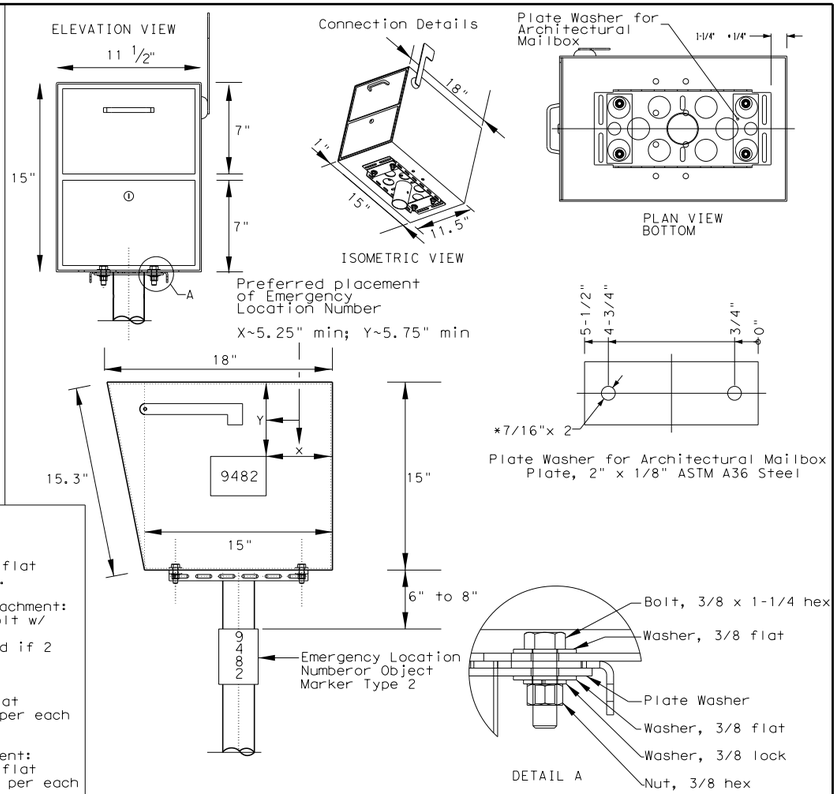
To be used with 2 3/8" OD RR or thinwall Steel posts.



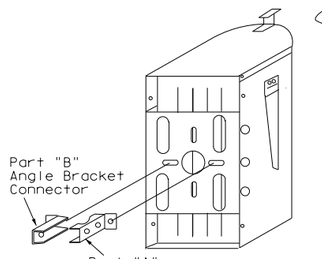
To be used with thinwall Steel posts. Not to be used with RR posts.

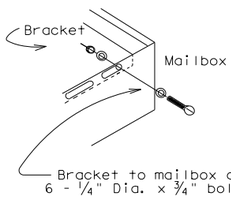
WELDED SINGLE MAILBOXBRACKET

WELDED DOUBLE MAILBOX BRACKET WITHADAPTER PLATE



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



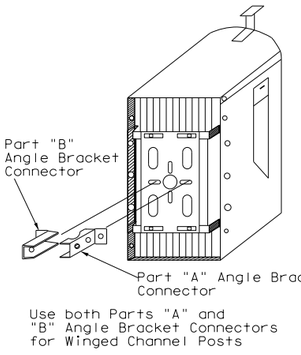


Bracket to mailbox attachment:
6 - 1/4" Dia. x 3/4" bolt w/ 2 flat washers and nut per each bolt.

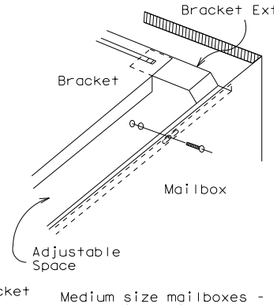
Angle to bracket attachment:
2 - 3/8" Dia. x 3/4" bolt with 2 flat washers, lock washer and nut per each bolt.

Angle to
2 - 3/8" Dia. x 2 1/2" bolt with 2 flat washers, lock washer and nut per each bolt.

SMALL MAILBOX



Use both Parts "A" and "B" Angle Bracket Connectors for Winged Channel Posts



Bracket to mailbox attachment:
6 - 1/4" Dia. x 3/4" bolt w/2 flat washers and nut per each bolt.

Bracket to bracket extension attachment:
2 - 1/4" Dia. x 3/4" carriage bolt w/ flat washer, lock washer and nut per bolt (4 bolts required if 2 bracket extensions are used).

Angle to bracket attachment:
2 - 3/8" Dia. x 3/4" bolt w/2 flat washers, lock washer and nut per each bolt.

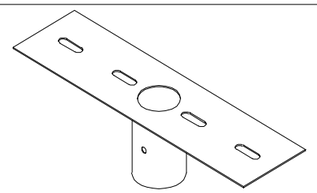
Angle to mailbox support attachment:
2 - 3/8" Dia. x 2 1/2" bolt w/2 flat washers, lock washer, and nut per each bolt.

Medium size mailboxes - one extension bracket
Large size mailboxes - two extension brackets

MEDIUM AND LARGE MAILBOXES

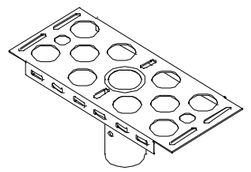
GENERAL NOTES

1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.



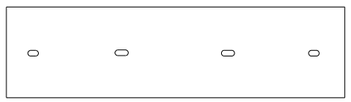
DHT 162323

For use with galvanized thinwall steel posts DHT # 143426 or powder-coated thinwall steel post DHT # 162911.



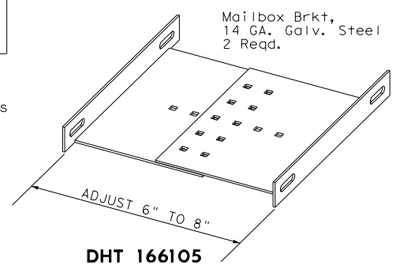
DHT 161443

For use with RCR post DHT # 161442 or galvanized thinwall steel post DHT # 143426 or powder-coated thinwall steel post. DHT # 162911.

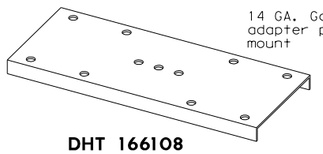


DHT #3789

Used for mounting two Mailboxes on the same post.

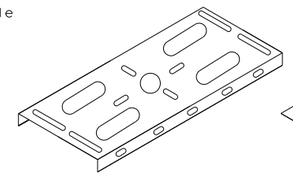


DHT 166105



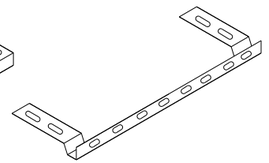
14 GA. Galv. Steel adapter plate for double mount

DHT 166108



DHT 148939

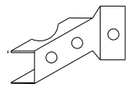
Mailbox Bracket



DHT 148938

Used for extending 6" wide bracket to attach larger mailboxes.

Bracket Extension

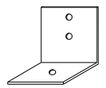


DHT 159489

Part "A" Angle Bracket Connector

DHT 159490

Part "B" Angle Bracket Connector



DHT 2917

Angle Bracket For Temporary Mailbox

HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

SHEET 2 OF 4

Texas Department of Transportation | Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS

MB-15(1)

FILE: MB14(1).DGN	DN: JEO		CK:	DW: JEO		CK:
©TxDOT APRIL 2015	CONT	SECT	JOB		HIGHWAY	
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	AUS	HAYS			120	

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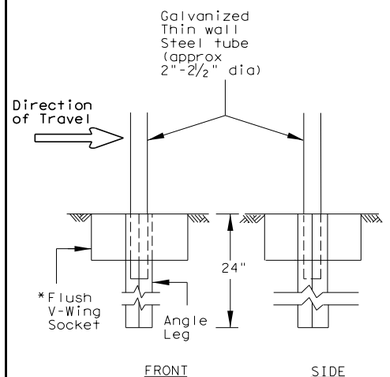
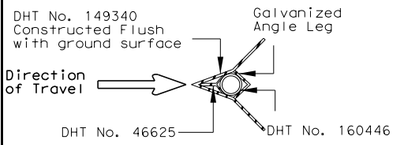
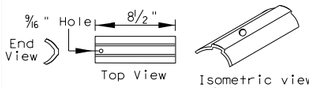




TYPE 1 SUPPORT/FOUNDATION

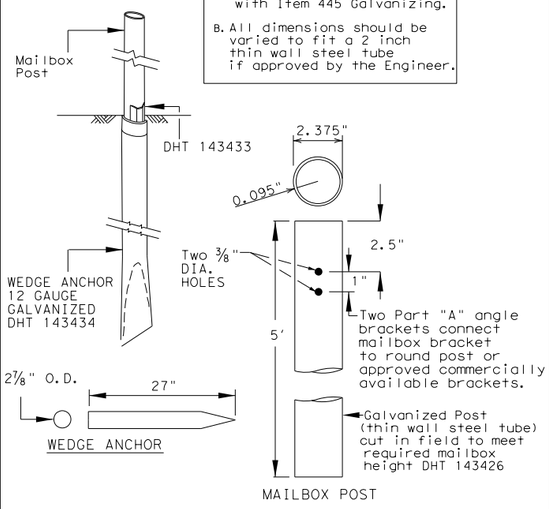
THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE



NOTES FOR TYPE 2 SUPPORT/FOUNDATION

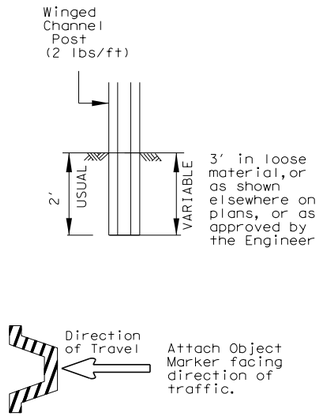
A. Galvanize steel support foundation in accordance with Item 445 Galvanizing.

B. All dimensions should be varied to fit a 2 inch thin wall steel tube if approved by the Engineer.



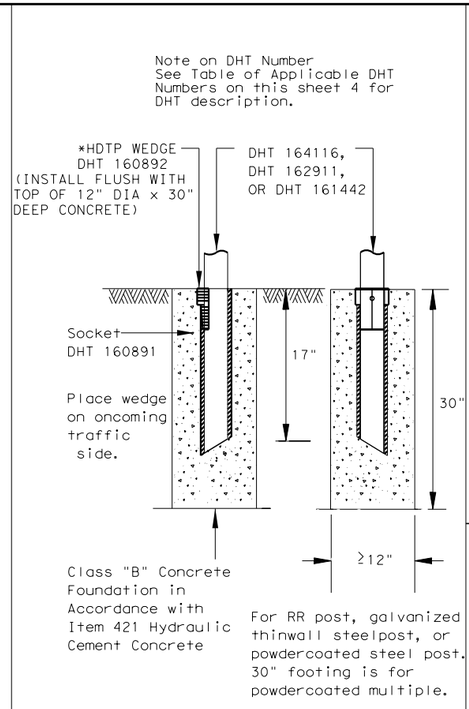
TYPE 2 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM



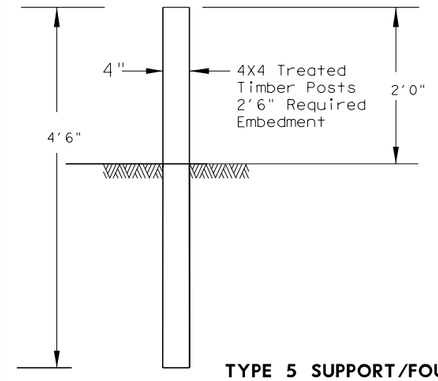
TYPE 3 SUPPORT/FOUNDATION

WINGED CHANNEL POST



TYPE 4 SUPPORT/FOUNDATION

FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.

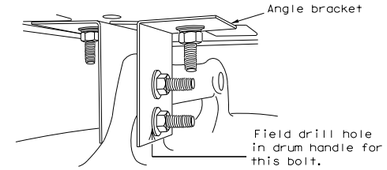


TYPE 5 SUPPORT/FOUNDATION

FOR ONE PIECE MOLDED PLASTIC MAILBOX

ONE PIECE MOLDED PLASTIC MAILBOXES

Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. The use of steel pipe or structural tubing in place of timber post is prohibited.

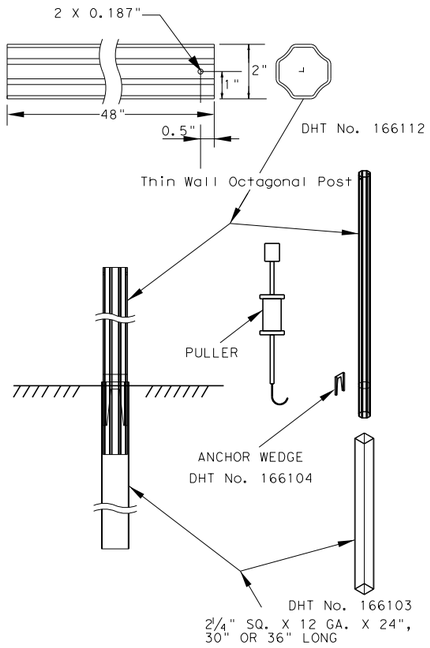


Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).

Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT

CONNECTION DETAIL



TYPE 7 MAILBOX SUPPORT/FOUNDATION

CONNECTION DETAIL

MB-(X) ASSM TY (XXX) (X) (XX) (OPTIONAL)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- SP = Single Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post
- Ty 7 = Wedge Anchor

Type of Bracket
- AB = Angle Bracket.
- TB = 2.375" Tube Bracket

GENERAL NOTES

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
4. The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
5. The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
6. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HDTP: High density thermoplastic polyesters

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MAILBOX SUPPORT AND FOUNDATION

MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		121

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LOCKABLE ARCHITECTURAL MAILBOX

SINGLE-MOUNT INSTALLATION PARTS			
#	PART NAME	PART/DHT #	QTY
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

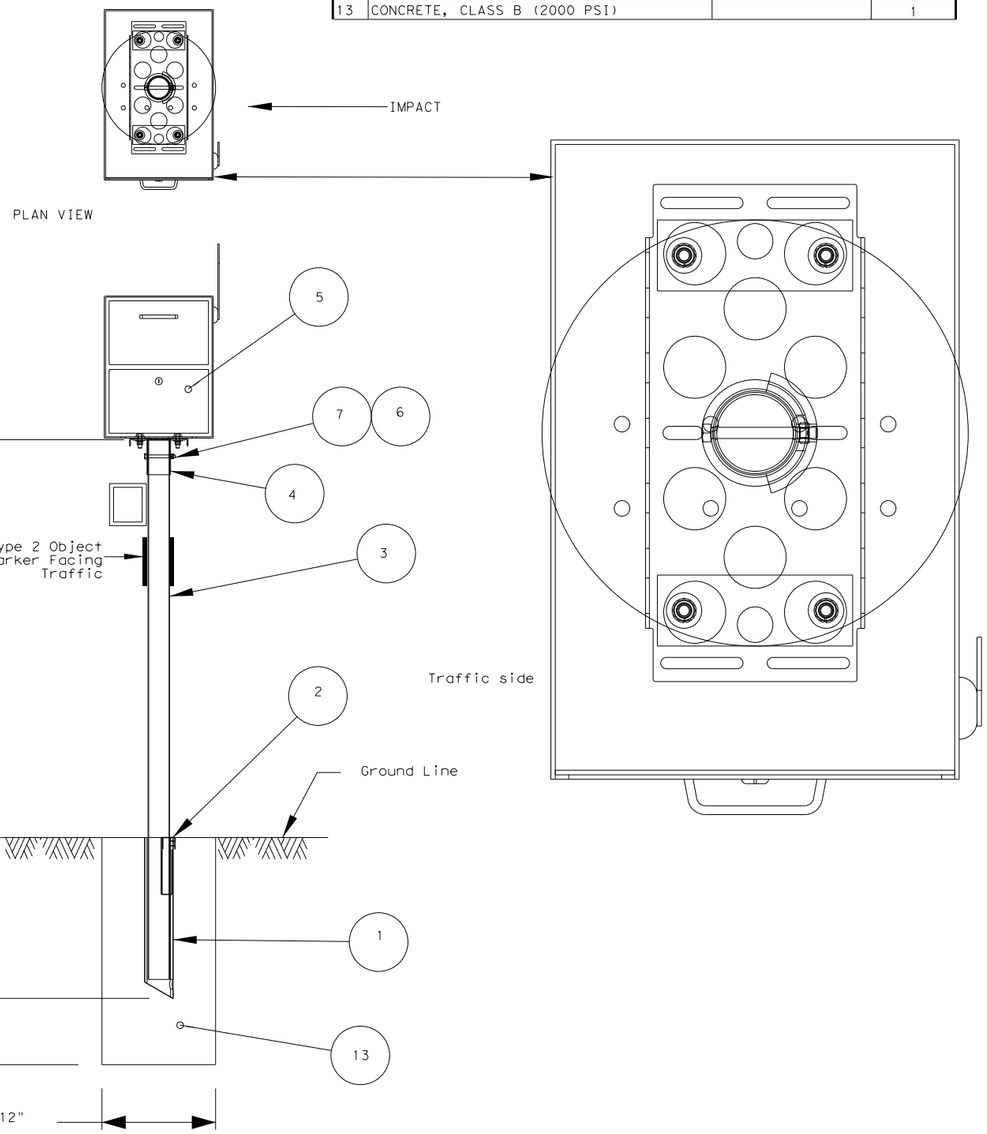

TABLE OF APPLICABLE DHT NUMBERS	
DHT NUMBER	DESCRIPTION
	FOUNDATIONS
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
	POSTS
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
166152	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED 2" OCTAGONAL
166112	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED 2" OCTAGONAL
	REFLECTIVE SHEETING
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
	CONNECTING HARDWARE
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
162323	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL STEEL POST, GALVANIZED OR POWDERCOATED.
161443	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT;HEX HEAD, GALV;3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT;HEX HEAD, GALV;3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT;HEX HEAD, GALV;3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT;HEX HEAD, GALV;3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT;HEX HEAD, GALV;3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT;HEX HEAD, GALV;3/8"DIA X 4"L HD, W/2-FLAT WASHERS

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SHEET 4 OF 4

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DHT NUMBERS TABLE

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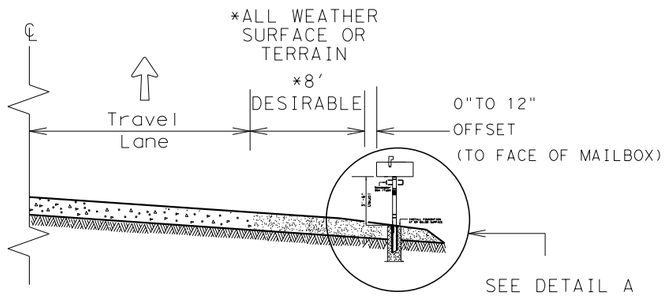
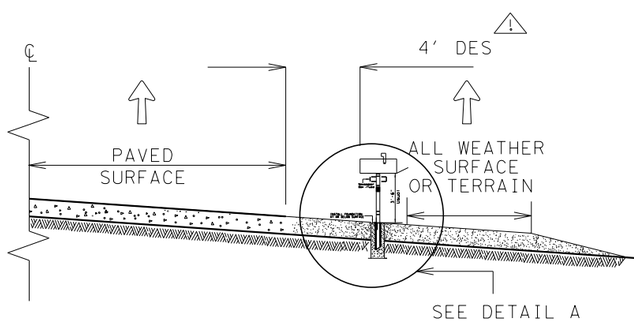
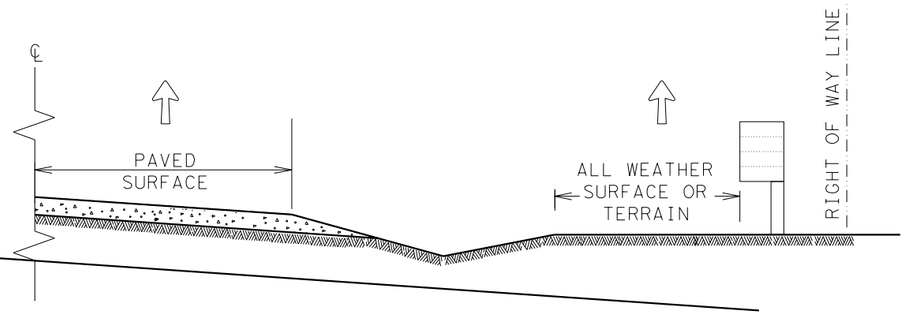
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		121a



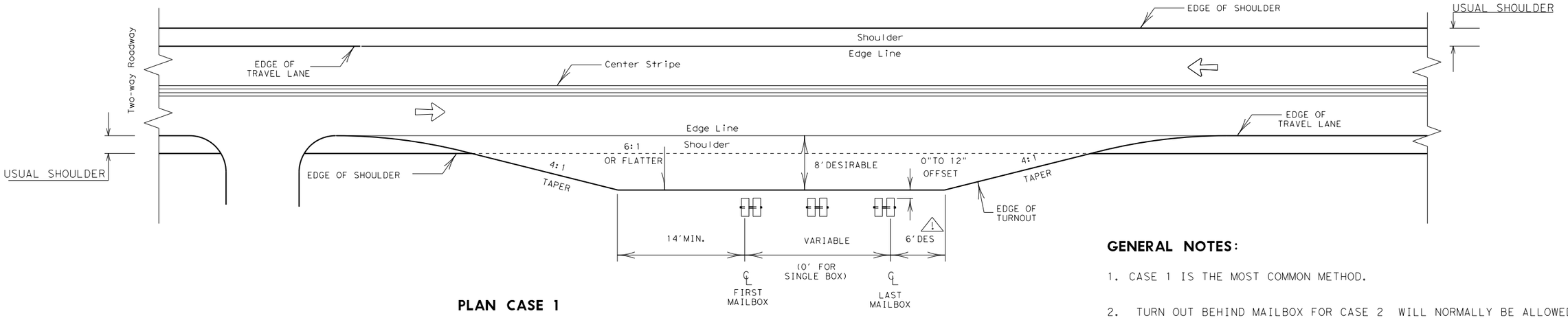
CASE 1. OFF TRAVEL WAY DELIVERY



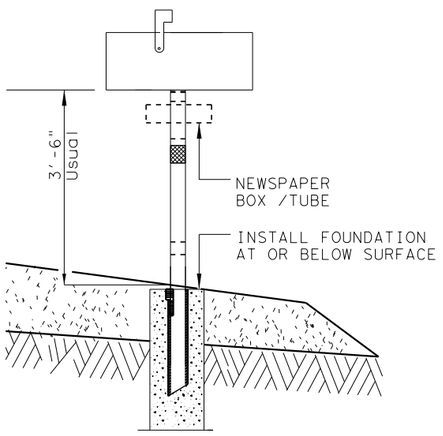
CASE 2. BACK SIDE DELIVERY



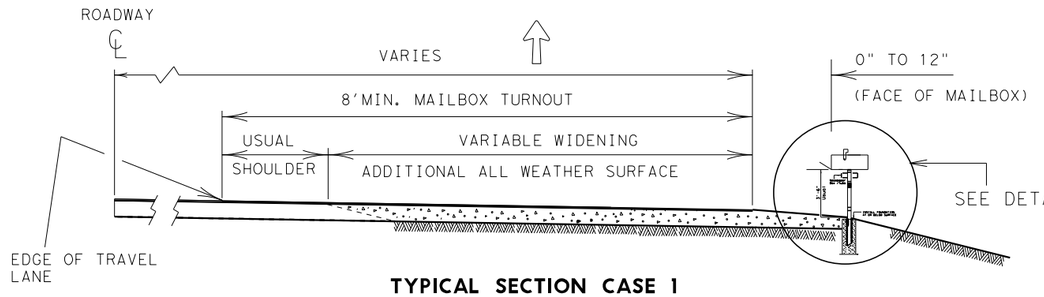
CASE 3. DELIVERY NEAR RIGHT OF WAY LINE



PLAN CASE 1



DETAIL A



TYPICAL SECTION CASE 1

MAIL DELIVERY VEHICLE TRAVEL DIRECTION

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.
2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.
3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. IF THE NUMBER OF MAILBOXES EXCEEDS FOUR, A COMMUNITY MAIL BOX SHOULD BE ENCOURAGED AT THESE LOCATIONS.

Texas Department of Transportation | Maintenance Division Standard

Guideline

MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS
MB-14(2)

FILE: MB14(2).DGN	DN: JEO		CK:	DW: JEO		CK:	
©TxDOT MAY 2014	CONT	SECT	JOB		HIGHWAY		
REVISIONS DECEMBER 2012-NEW TXDOT TITLE BLOCK	1776	01	036, ETC		RM967		
	DIST	COUNTY			SHEET NO.		
	AUS	HAYS			122		

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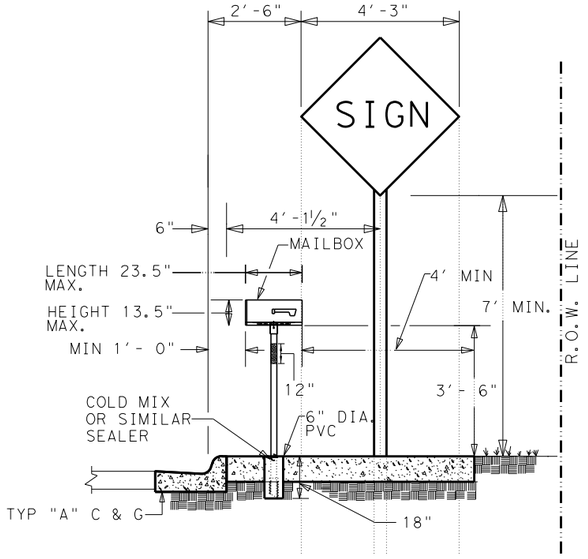
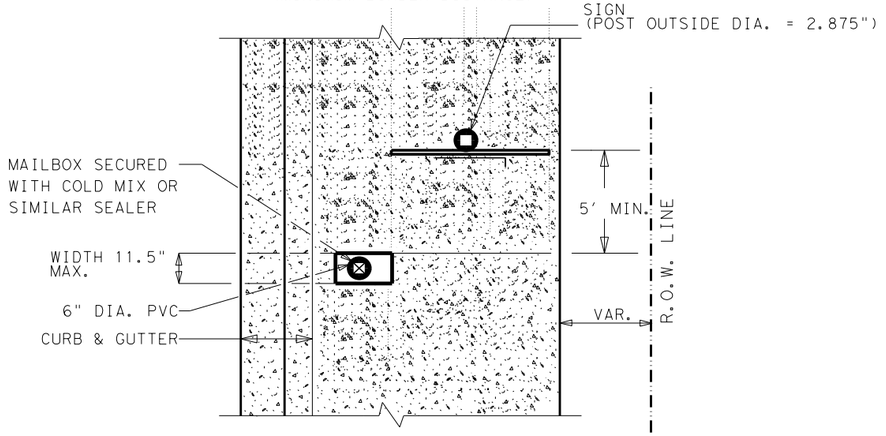
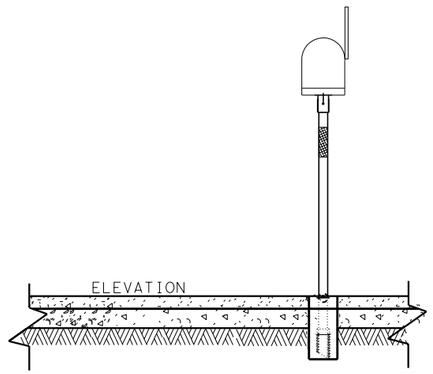
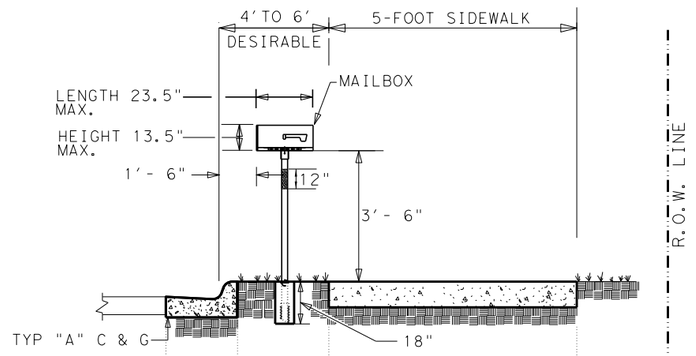


MAILBOX SIDEWALK INSTALLATION RELATIVE TO ANY OTHER OBSTRUCTION SUCH AS A SIGN
(MINIMUM BORDER DISTANCE)

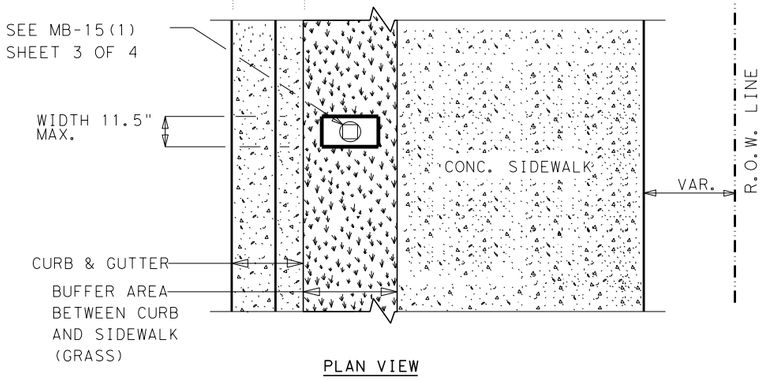


PLAN VIEW





MAILBOX SIDEWALK INSTALLATION
(DESIRABLE BORDER DISTANCE)



PLAN VIEW

Texas Department of Transportation | Maintenance Division Standard

SINGLE MAILBOX PLACEMENT BEHIND CURBS WITH OR WITHOUT SIDEWALKS

MB-14(2A)

FILE: MB-14(2A)	DN:	CK:	DW:	CK:
©TxDOT MAY 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		122a

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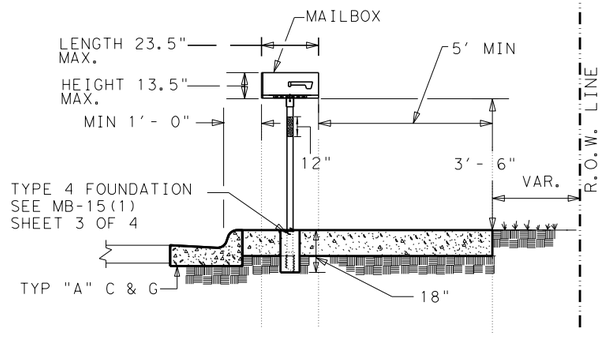
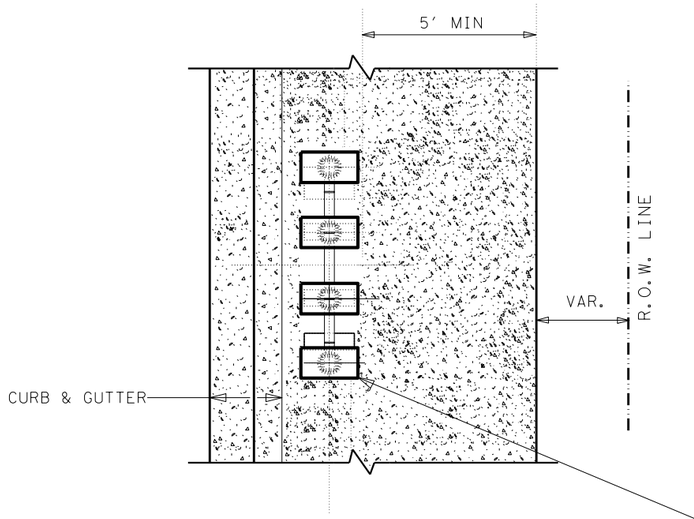
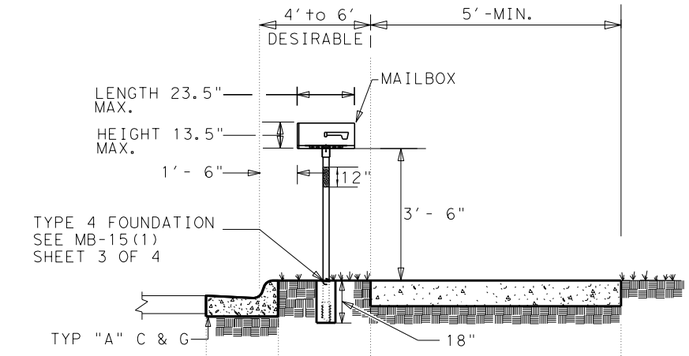


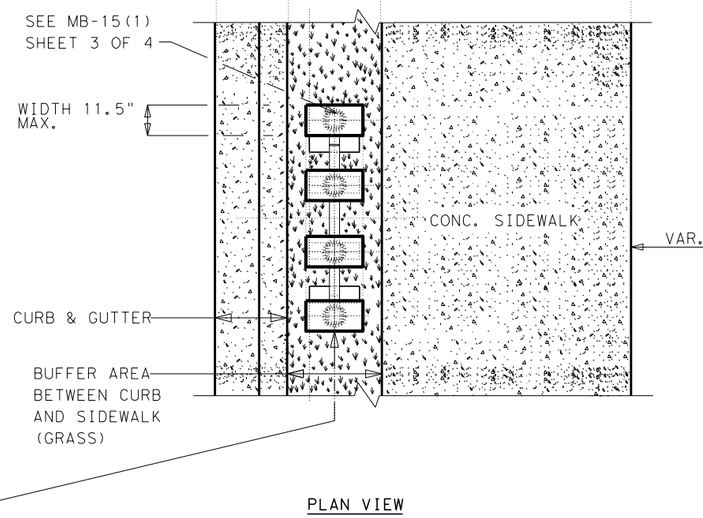
MAILBOX SIDEWALK INSTALLATION RELATIVE TO ANY OTHER OBSTRUCTION SUCH AS A SIGN
(MINIMUM BORDER DISTANCE)



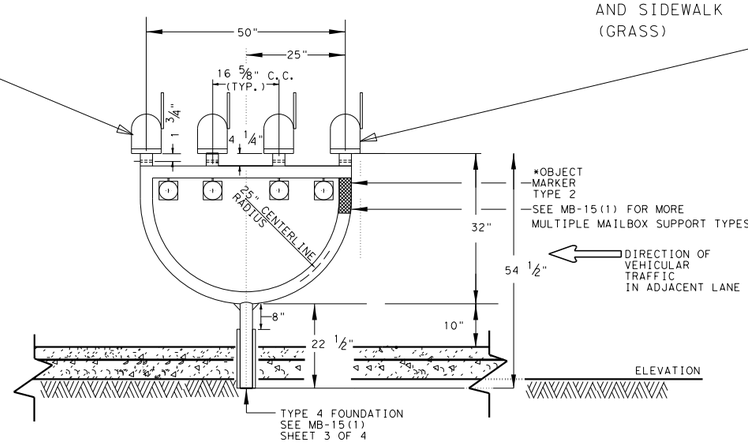
PLAN VIEW



MAILBOX SIDEWALK INSTALLATION
(DESIRABLE BORDER DISTANCE)



PLAN VIEW



SHEET 3 OF 3

Texas Department of Transportation

Maintenance Division Standard

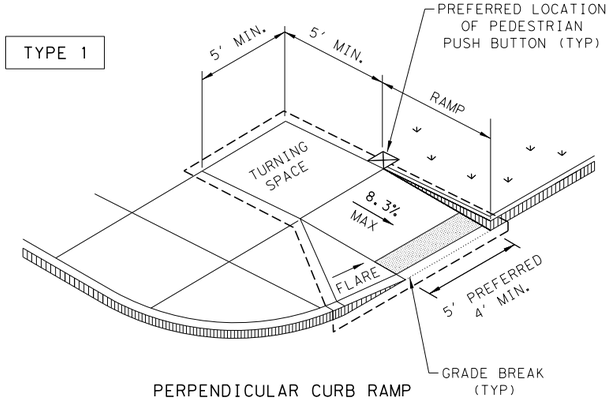
MULTIPLE MAILBOX PLACEMENT BEHIND CURBS WITH OR WITHOUT SIDEWALKS

MB-14(2B)

FILE: MB-14(2A)	DN:	CK:	DW:	CK:
© TxDOT MAY 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		122b

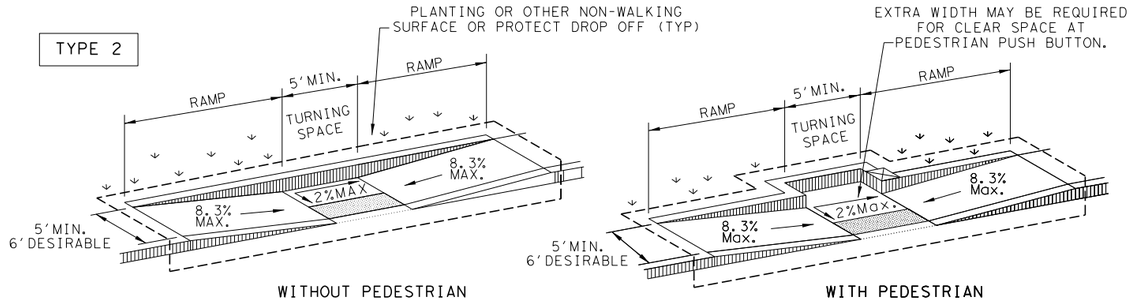
DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\PED18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

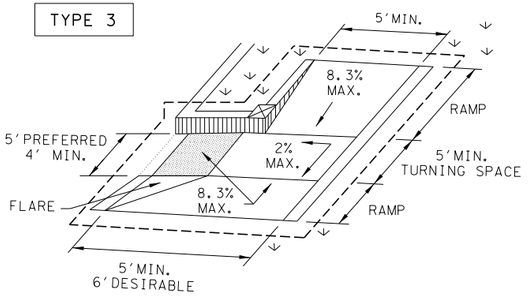


WITHOUT PEDESTRIAN PUSH BUTTON

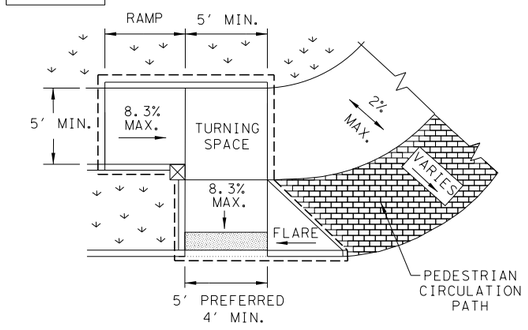
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

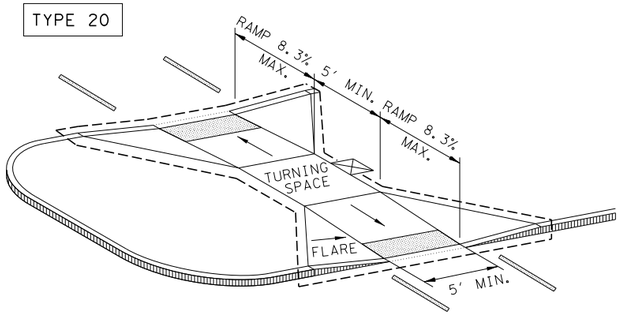


TYPE 6



COMBINATION CURB RAMPS

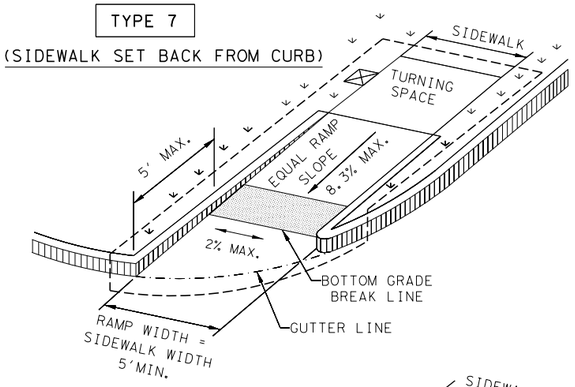
TYPE 20



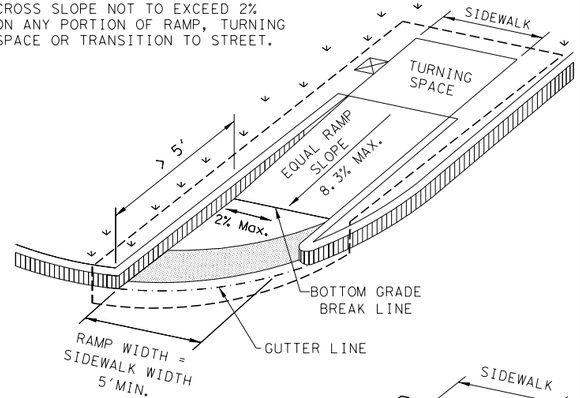
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

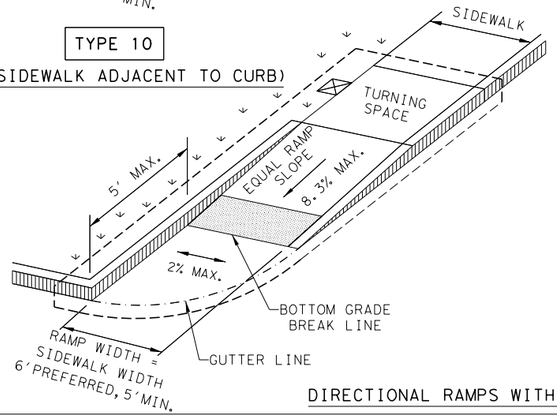


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

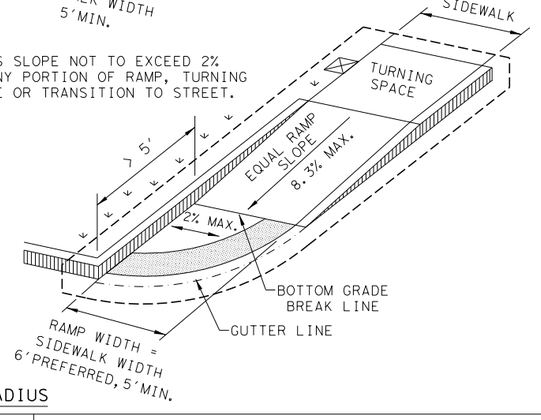


TYPE 10

(SIDEWALK ADJACENT TO CURB)

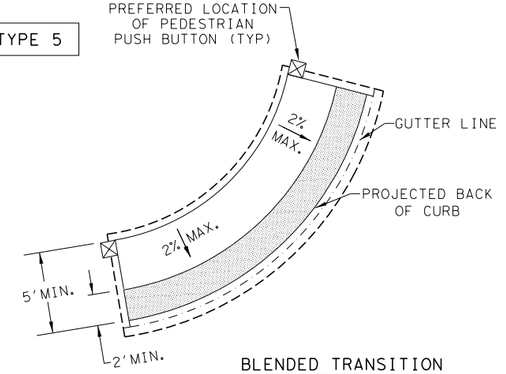


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

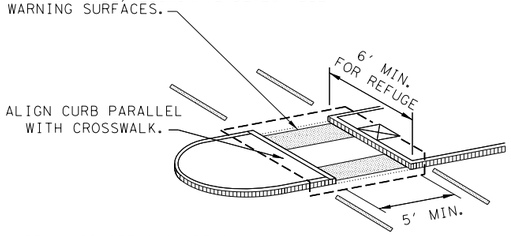
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

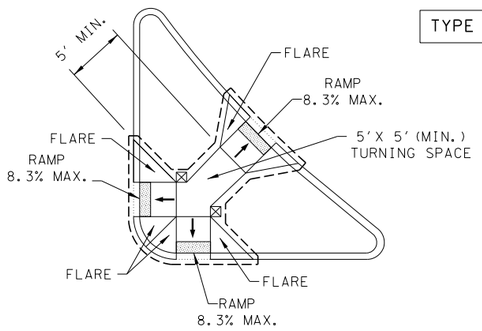
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21



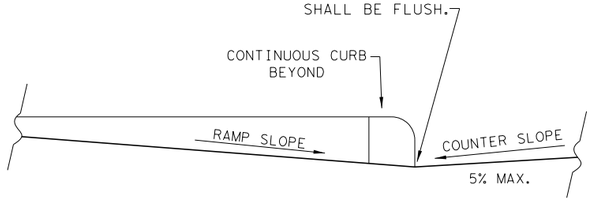
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	AUS	HAYS		123

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\PED18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5′. Where the sidewalk is adjacent to the back of curb, a 6′ sidewalk width is desirable. Where a 5′ sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4′ for short distances. 5′x 5′ passing areas at intervals not to exceed 200′ are required.
5. Turning Spaces shall be 5′x 5′ minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4′x 4′ wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6′ wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5′x 5′ landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

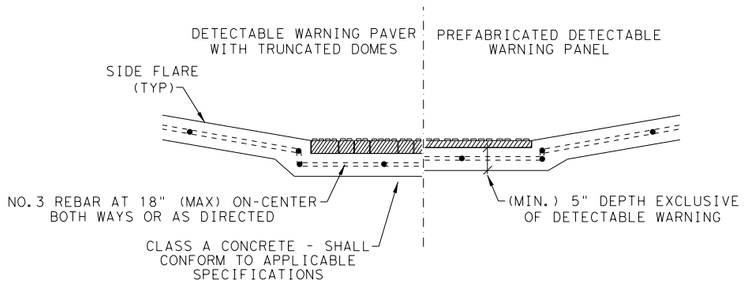
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

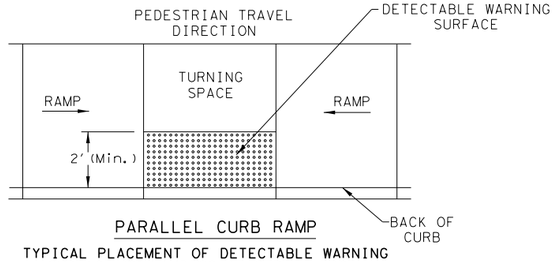
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

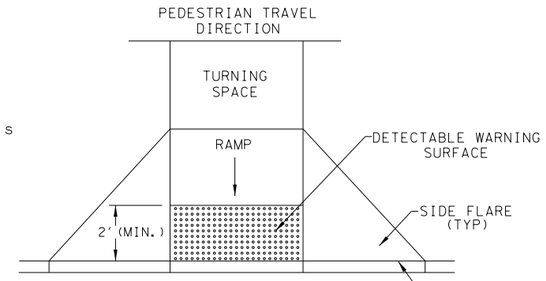


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

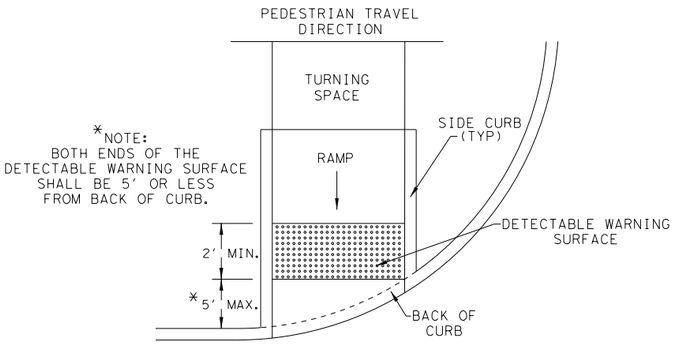
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation | Design Division Standard

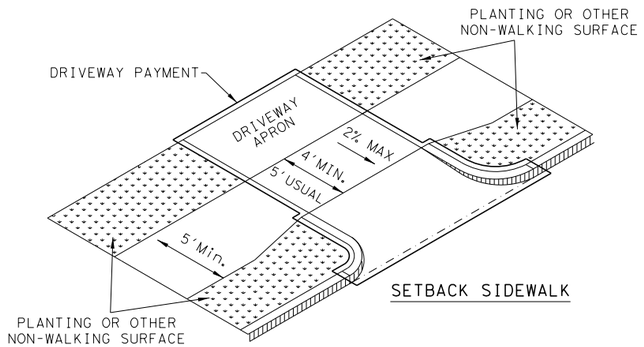
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

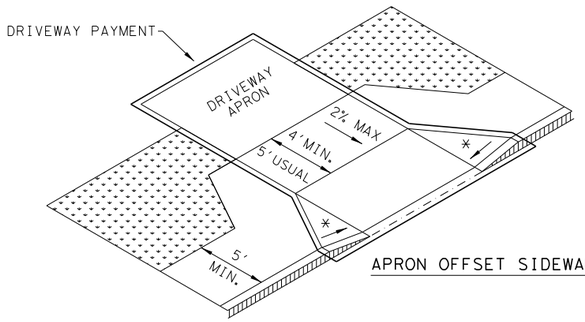
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	AUS	HAYS		124

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\PED18.dgn

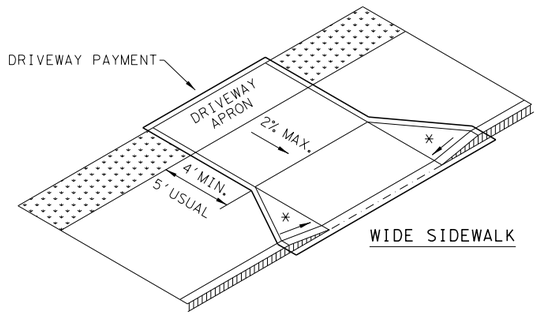
SIDEWALK TREATMENT AT DRIVEWAYS



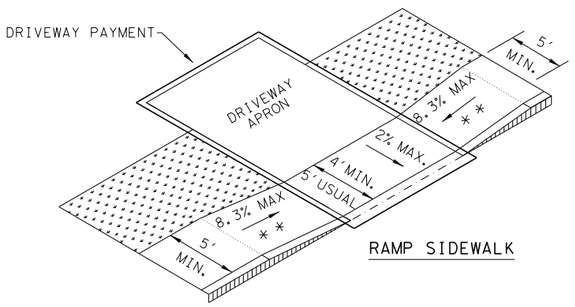
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

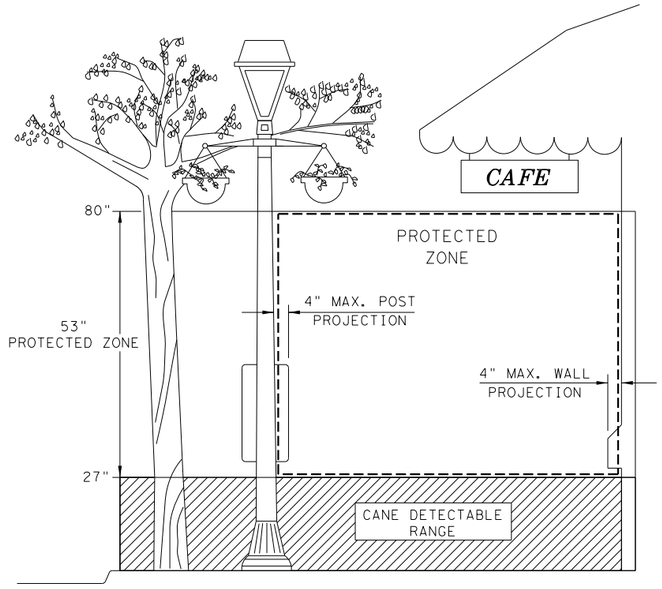


RAMP SIDEWALK

NOTES:

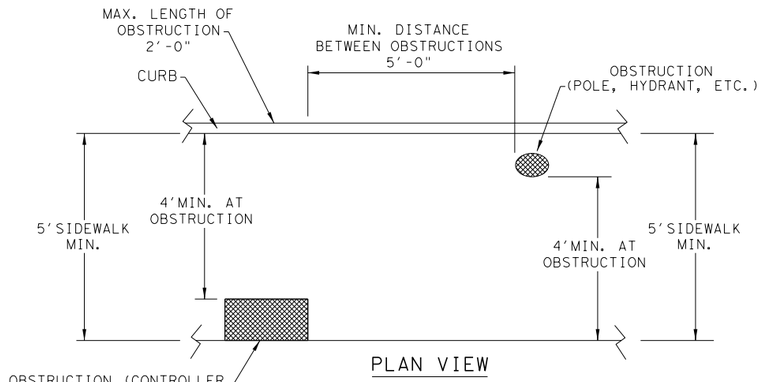
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

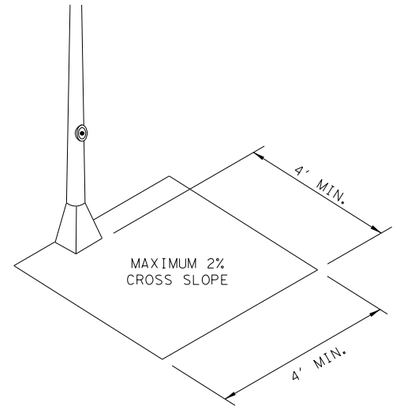
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



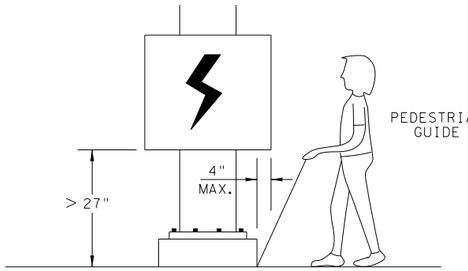
PLAN VIEW

PLACEMENT OF STREET FIXTURES

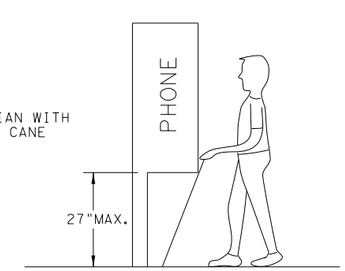
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

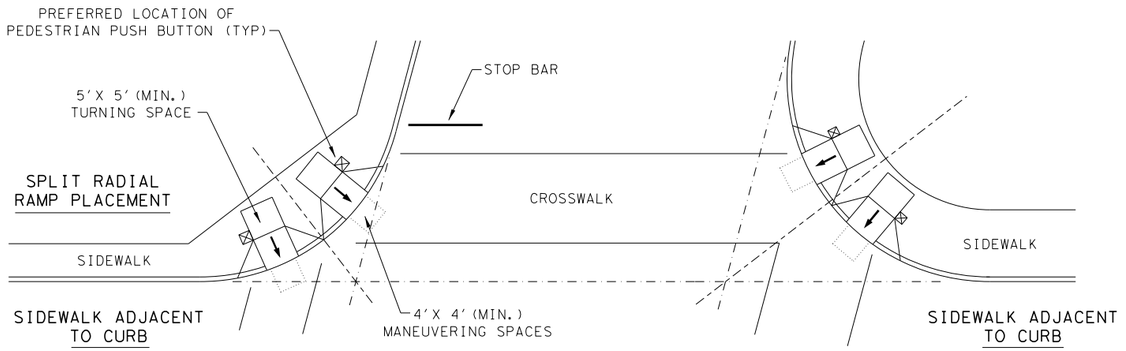
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG	
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY	
REVISIONS	1776	01	036, ETC		RM967	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.	
	AUS	HAYS			125	

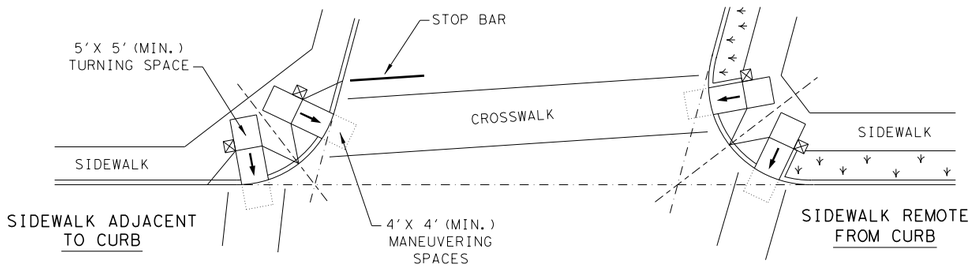
DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\PED18.dgn

TYPICAL CROSSING LAYOUTS

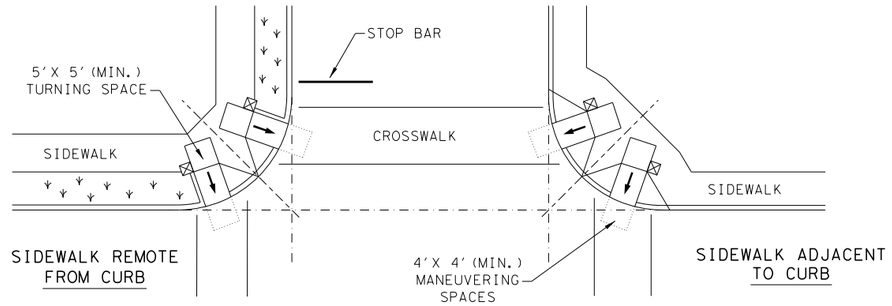
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



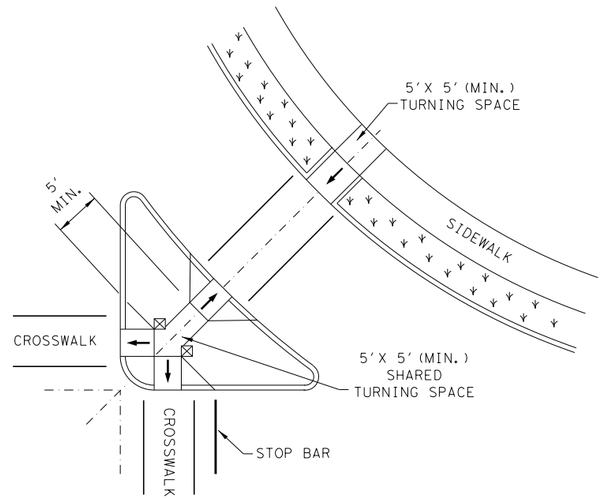
SKEWED INTERSECTION WITH "LARGE" RADIUS



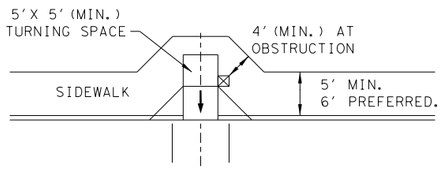
SKEWED INTERSECTION WITH "SMALL" RADIUS

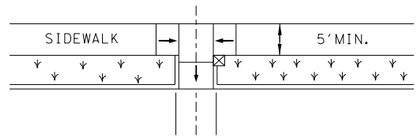


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	1776	01	036, ETC		RM967
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	AUS	HAYS			126

DATE: 5/17/2021
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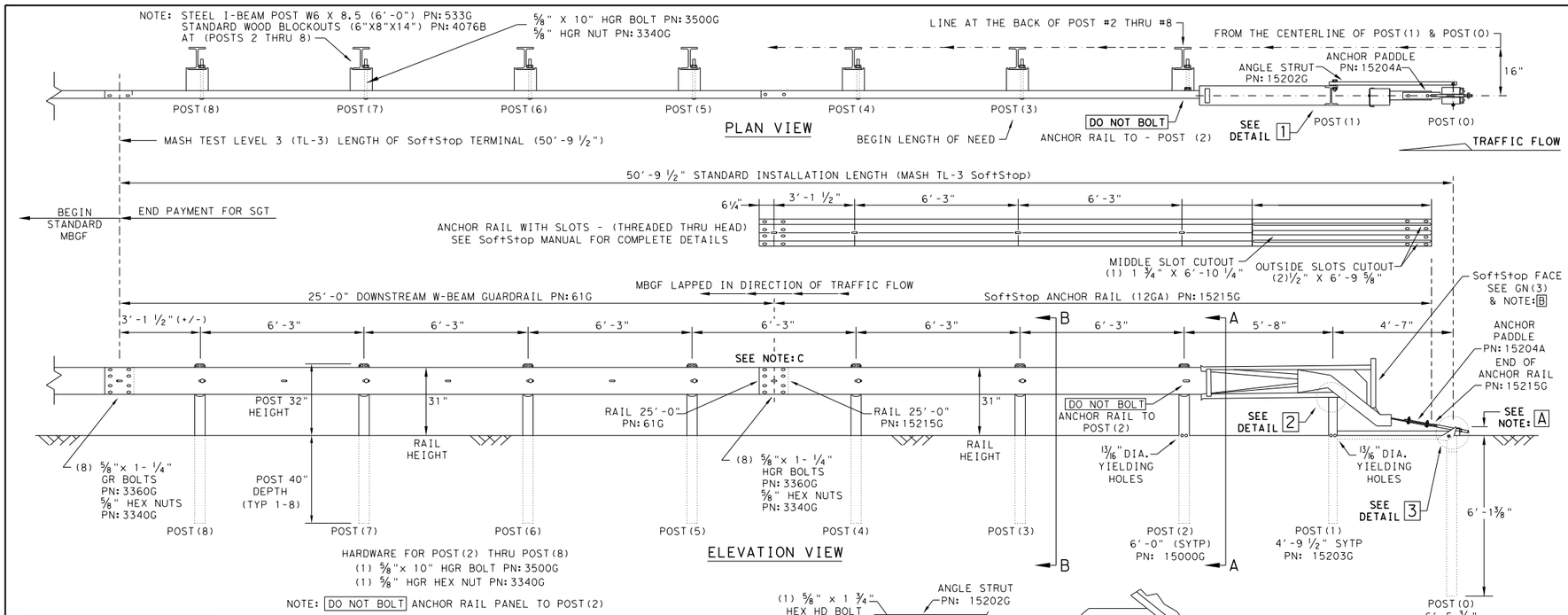

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Design Division Standard

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

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		127

DATE: 5/17/2021
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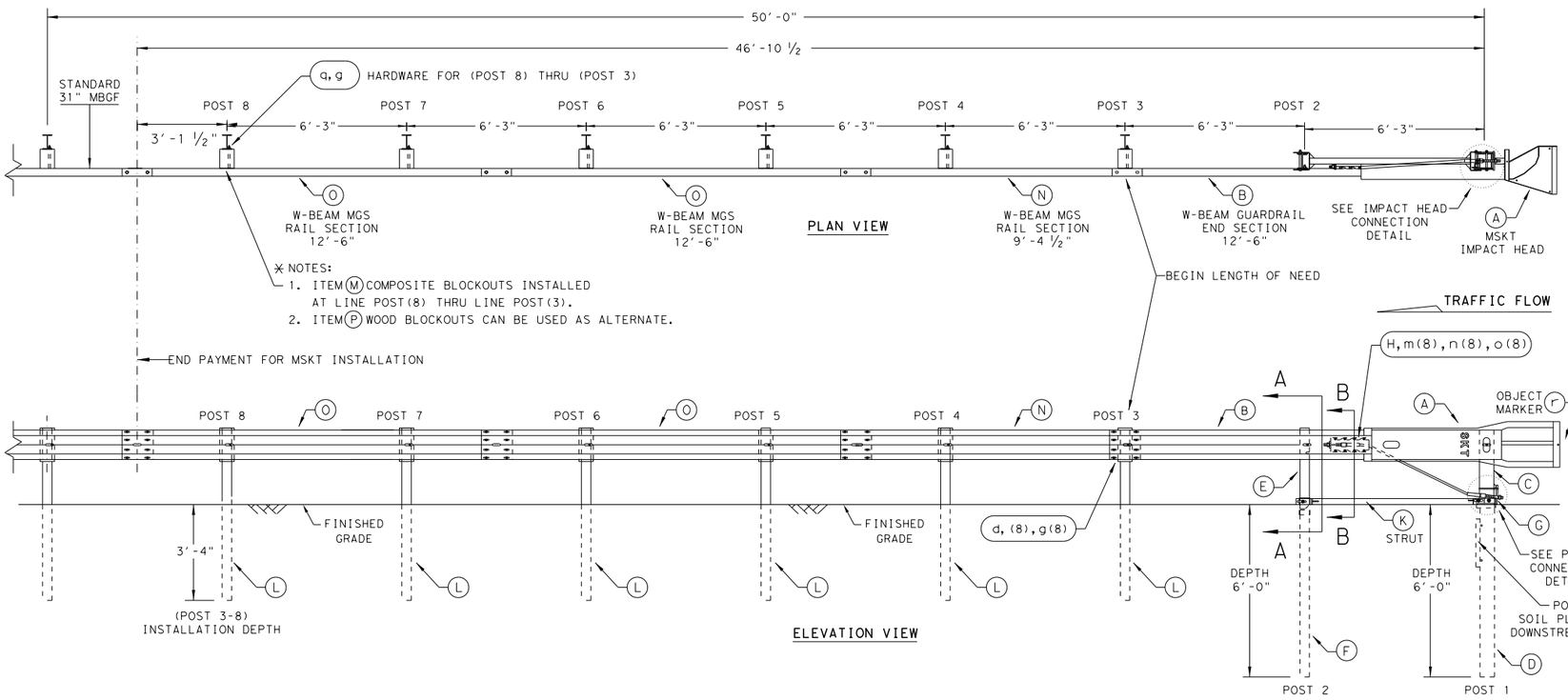


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

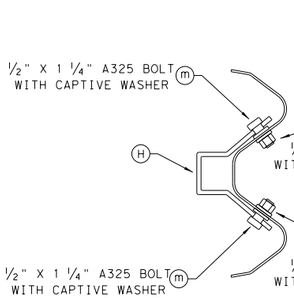
GENERAL NOTES

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

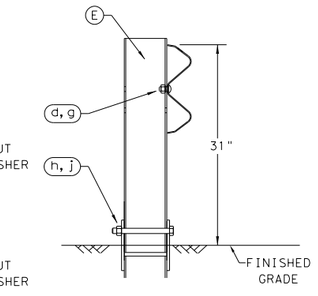
ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE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

SEE NOTES: ✳

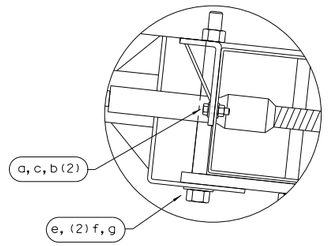
ALTERNATIVE ITEMS NOT SHOWN. ✳✳
✳ ITEM(P) 8" WOOD-BLOCKOUT
✳✳ ITEM(Q) 25'GUARD FENCE PANEL



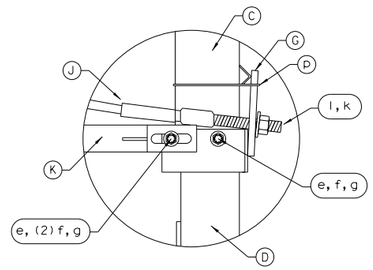
SECTION B-B
ANCHOR BRACKET



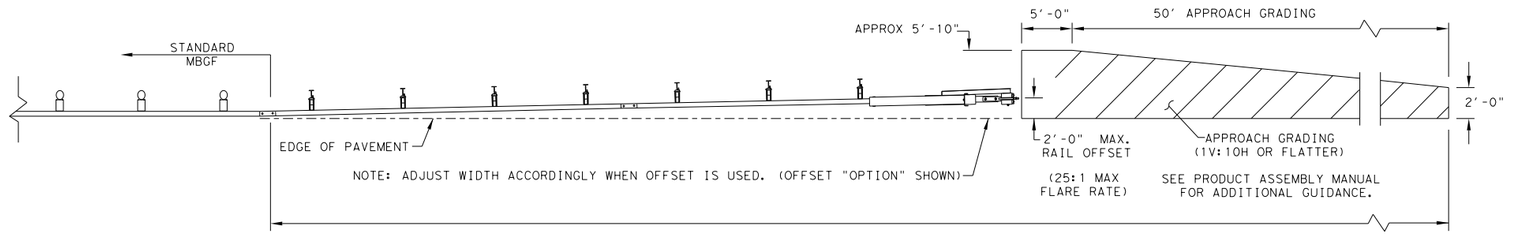
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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

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

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s3118.dgn	DN:TxDOT	CK:KM	DW:VP	CK:CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1776	01	036,ETC	RM967	
	DIST	COUNTY		SHEET NO.	
	AUS	HAYS		128	

DATE: 5/17/2021
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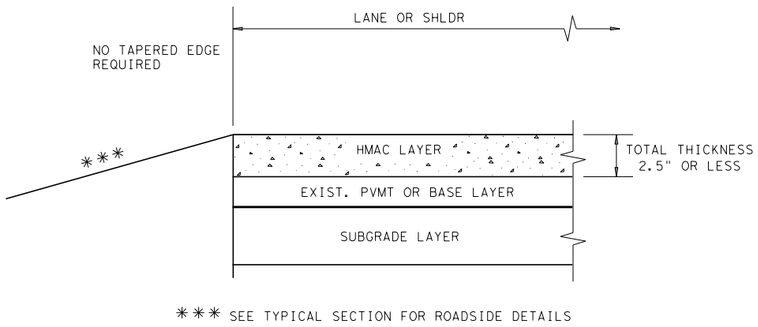
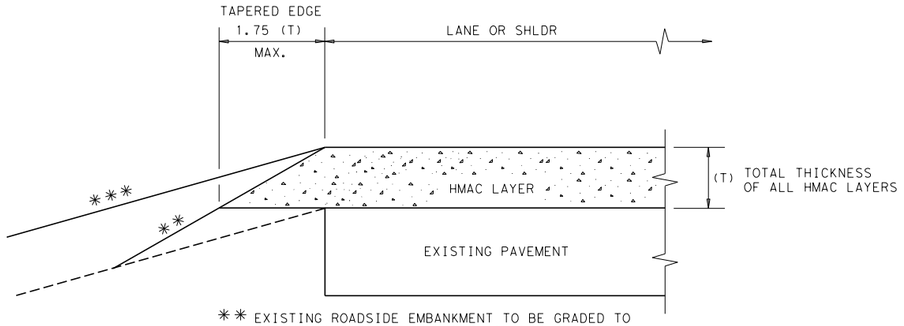


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 1

THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS

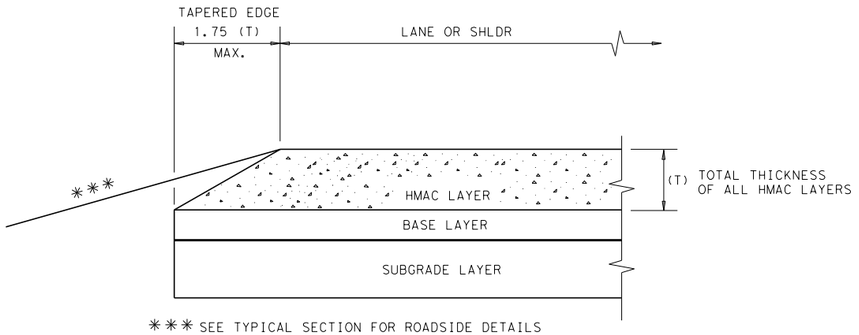


** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2

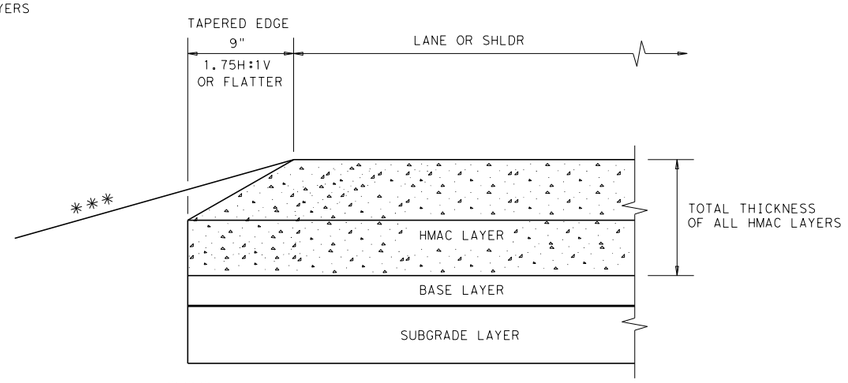
OVERLAY OF EXISTING PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4

NEW OR RECONSTRUCTED PAVEMENT
HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.
6. STANDARD ONLY APPLIES TO RM 2243.

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		129

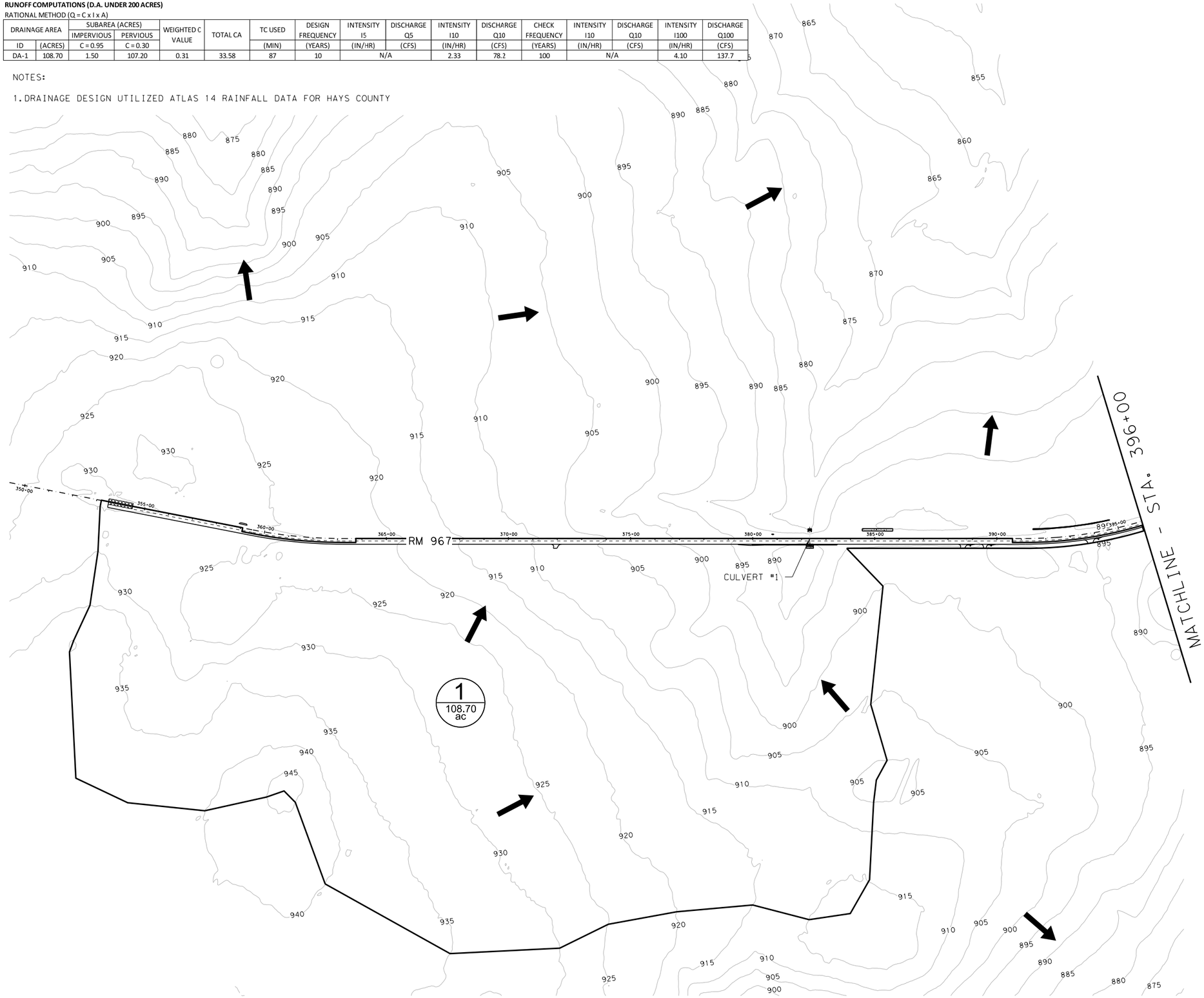
RUNOFF COMPUTATIONS (D.A. UNDER 200 ACRES)

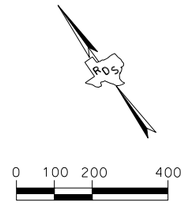
RATIONAL METHOD (Q = C x I x A)

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED C VALUE	TOTAL CA	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I10	DISCHARGE Q10	CHECK FREQUENCY	INTENSITY I10	DISCHARGE Q10	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS													
ID	(ACRES)	C = 0.95	C = 0.30			(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
DA-1	108.70	1.50	107.20	0.31	33.58	87	10	N/A		2.33	78.2	100	N/A		4.10	137.7

NOTES:

1. DRAINAGE DESIGN UTILIZED ATLAS 14 RAINFALL DATA FOR HAYS COUNTY





STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DRAINAGE AREA MAP

DATE: 5/17/2021				SHEET 1 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	130

Filename: ...\Cad\Plan\015012-000*DA01.dgn
Date: 5/17/2021

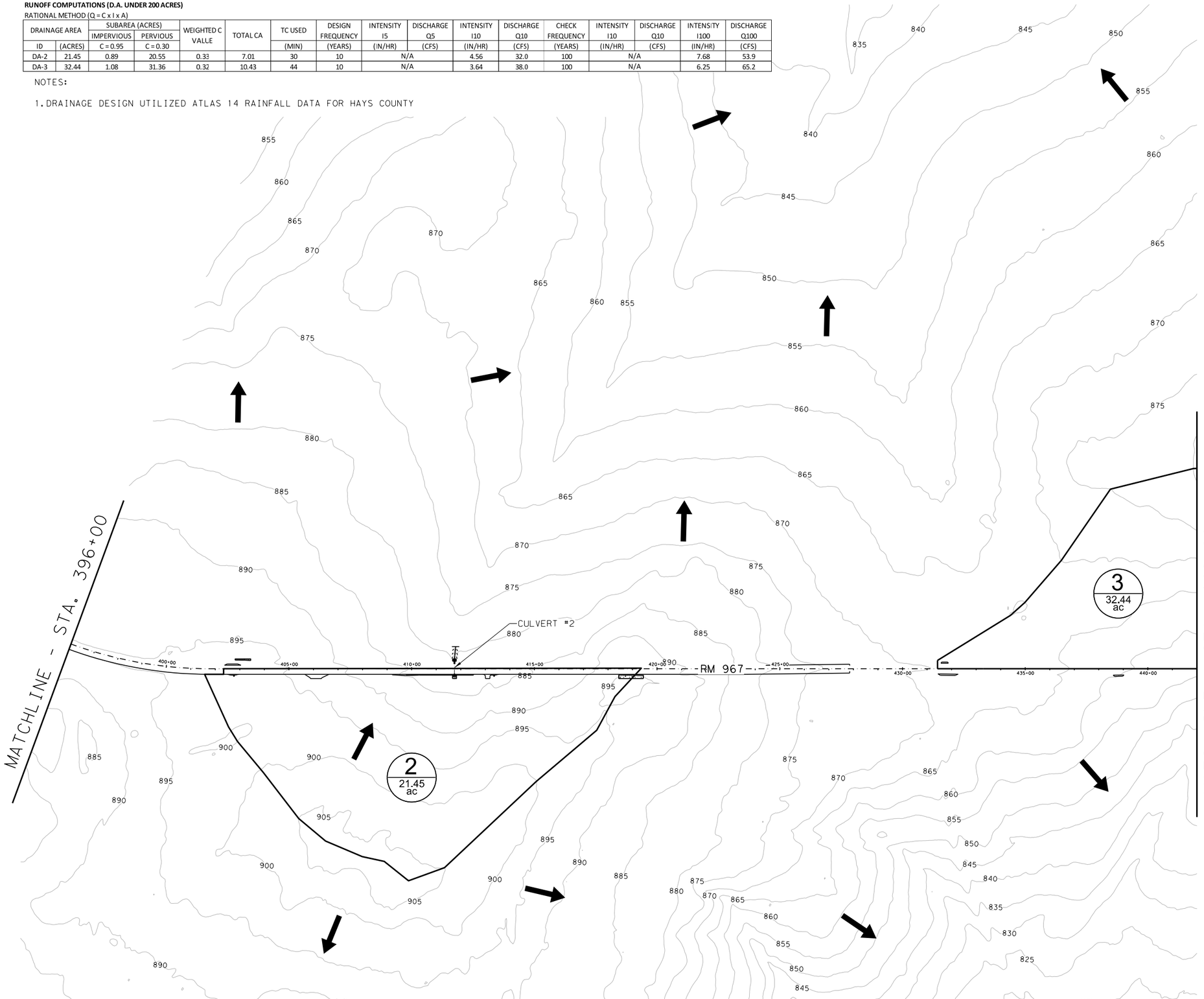
RUNOFF COMPUTATIONS (D.A. UNDER 200 ACRES)

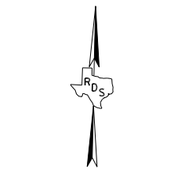
RATIONAL METHOD (Q = C x I x A)

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED C VALUE	TOTAL CA	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I10	DISCHARGE Q10	CHECK FREQUENCY	INTENSITY I10	DISCHARGE Q10	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS													
ID	(ACRES)	C = 0.95	C = 0.30			(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
DA-2	21.45	0.89	20.55	0.33	7.01	30	10	N/A		4.56	32.0	100	N/A		7.68	53.9
DA-3	32.44	1.08	31.36	0.32	10.43	44	10	N/A		3.64	38.0	100	N/A		6.25	65.2

NOTES:

1. DRAINAGE DESIGN UTILIZED ATLAS 14 RAINFALL DATA FOR HAYS COUNTY





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FIRM # 16849

RM 967

DRAINAGE AREA MAP

DATE: 5/17/2021				SHEET 2 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	131

Filename: ...\Cad\Plan\015012-000*DA02.dgn
Date: 5/17/2021

RUNOFF COMPUTATIONS (D.A. UNDER 200 ACRES)

RATIONAL METHOD (Q = C x I x A)

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED C VALUE	TOTAL CA	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I10	DISCHARGE Q10	CHECK FREQUENCY	INTENSITY I10	DISCHARGE Q10	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS													
ID	(ACRES)	C = 0.95	C = 0.30			(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
DA-3	32.44	1.08	31.36	0.32	10.43	44	10	N/A		3.64	38.0	100	N/A		6.25	65.2

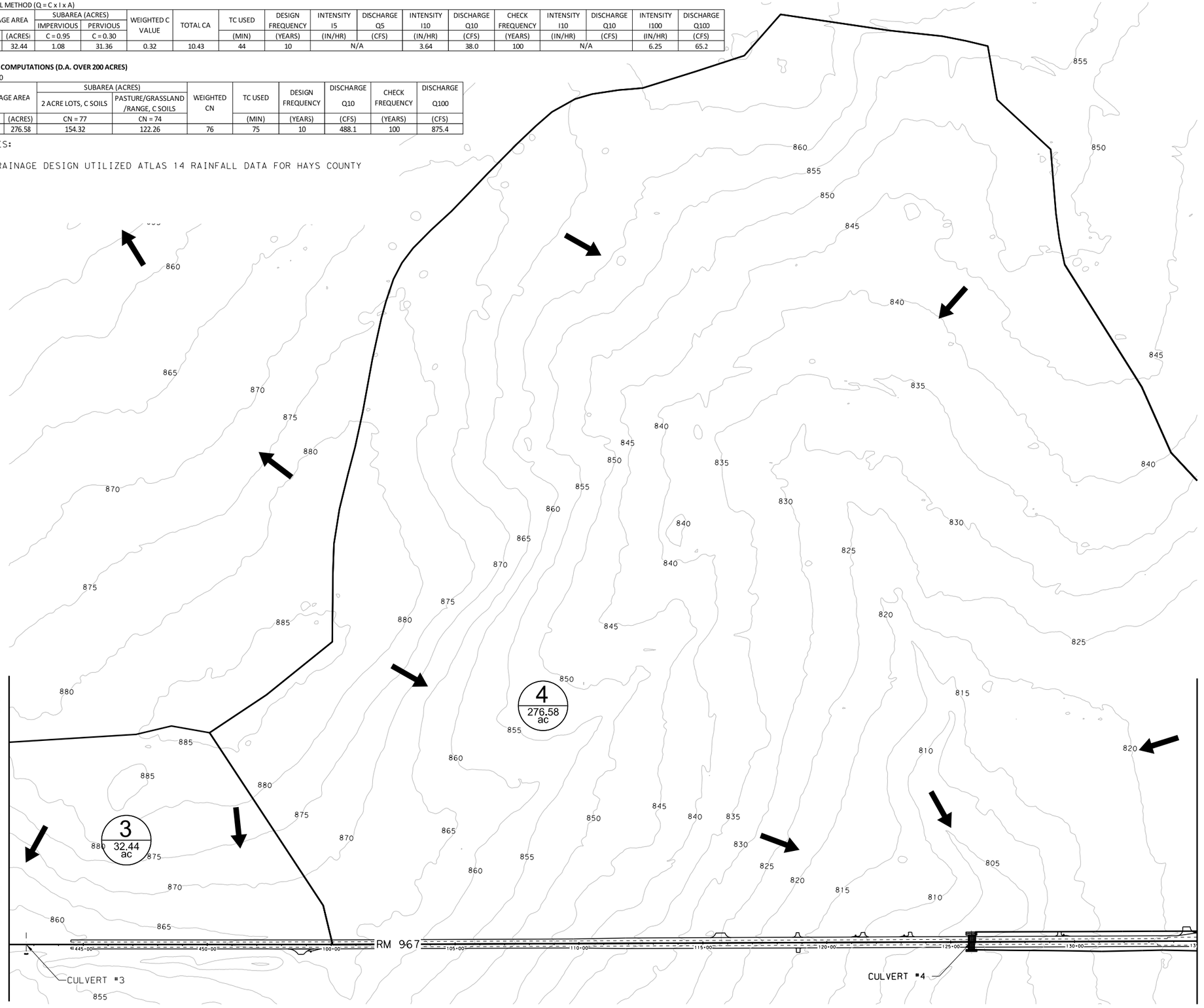
RUNOFF COMPUTATIONS (D.A. OVER 200 ACRES)

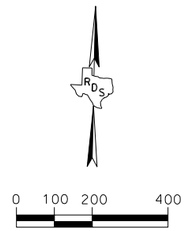
SCS TR-20

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED CN	TC USED	DESIGN FREQUENCY	DISCHARGE Q10	CHECK FREQUENCY	DISCHARGE Q100
		2 ACRE LOTS, C SOILS	PASTURE/GRASSLAND /RANGE, C SOILS						
ID	(ACRES)	CN = 77	CN = 74		(MIN)	(YEARS)	(CFS)	(YEARS)	(CFS)
DA-4	276.58	154.32	122.26	76	75	10	488.1	100	875.4

NOTES:

1. DRAINAGE DESIGN UTILIZED ATLAS 14 RAINFALL DATA FOR HAYS COUNTY





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HAYS COUNTY

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FIRM # 16849

RM 967

DRAINAGE AREA MAP

DATE: 5/17/2021				SHEET 3 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	132

Filename: ...\Cad\Plan\015012-000*DA03.dgn
Date: 5/17/2021

RUNOFF COMPUTATIONS (D.A. UNDER 200 ACRES)

RATIONAL METHOD (Q = C x I x A)

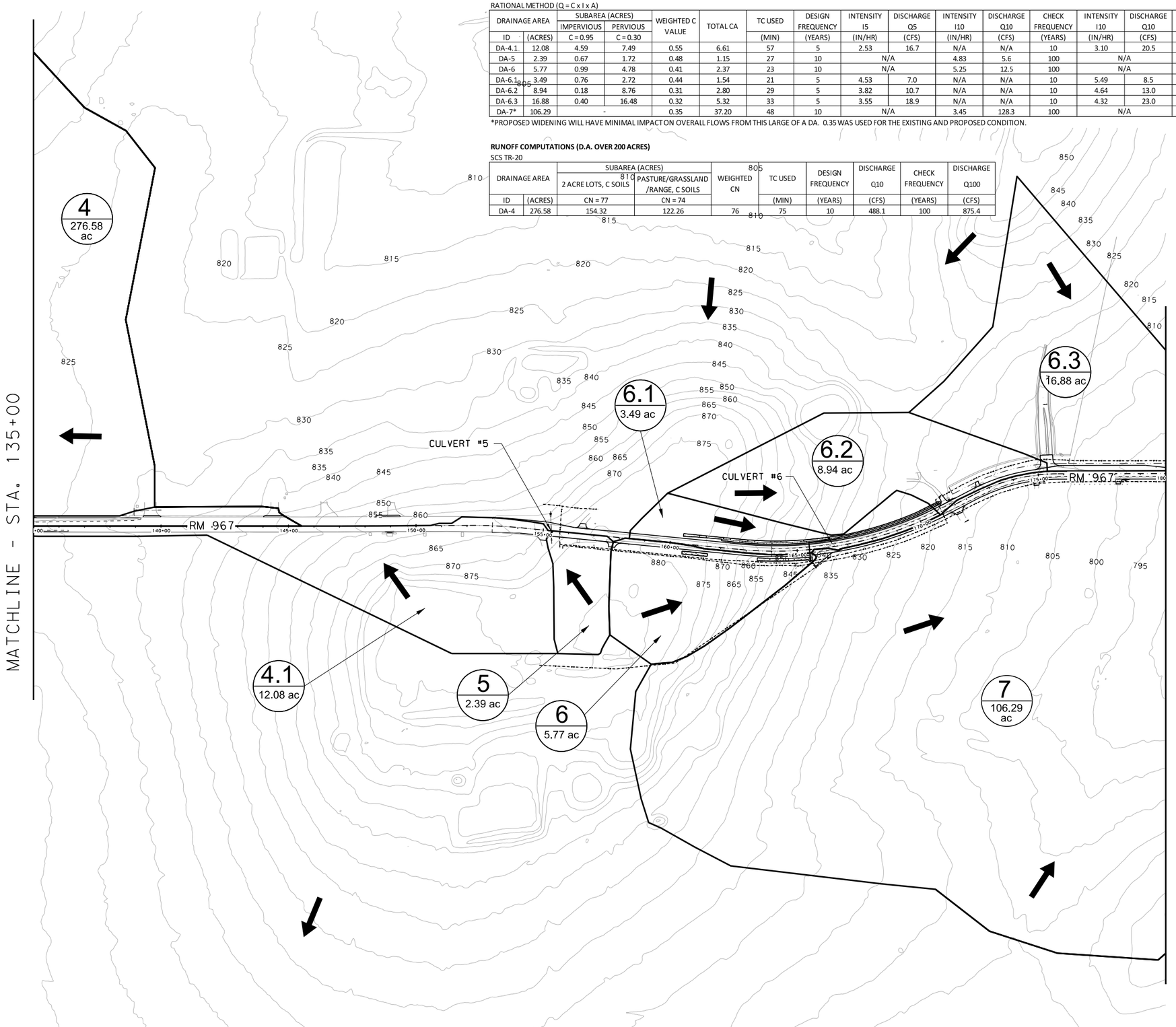
DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED C VALUE	TOTAL CA	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I10	DISCHARGE Q10	CHECK FREQUENCY	INTENSITY I10	DISCHARGE Q10	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS													
ID	(ACRES)	C = 0.95	C = 0.30			(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
DA-4.1	12.08	4.59	7.49	0.55	6.61	57	5	2.53	16.7	N/A	N/A	10	3.10	20.5	N/A	
DA-5	2.39	0.67	1.72	0.48	1.15	27	10	N/A		4.83	5.6	100	N/A		8.09	9.3
DA-6	5.77	0.99	4.78	0.41	2.37	23	10	N/A		5.25	12.5	100	N/A		8.73	20.7
DA-6.1	3.49	0.76	2.72	0.44	1.54	21	5	4.53	7.0	N/A	N/A	10	5.49	8.5	N/A	
DA-6.2	8.94	0.18	8.76	0.31	2.80	29	5	3.82	10.7	N/A	N/A	10	4.64	13.0	N/A	
DA-6.3	16.88	0.40	16.48	0.32	5.32	33	5	3.55	18.9	N/A	N/A	10	4.32	23.0	N/A	
DA-7*	106.29	-		0.35	37.20	48	10	N/A		3.45	128.3	100	N/A		5.94	221.0

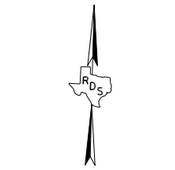
*PROPOSED WIDENING WILL HAVE MINIMAL IMPACT ON OVERALL FLOWS FROM THIS LARGE OF A DA. 0.35 WAS USED FOR THE EXISTING AND PROPOSED CONDITION.

RUNOFF COMPUTATIONS (D.A. OVER 200 ACRES)

SCS TR-20

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED CN	TC USED	DESIGN FREQUENCY	DISCHARGE Q10	CHECK FREQUENCY	DISCHARGE Q100
		2 ACRE LOTS, C SOILS	PASTURE/GRASSLAND /RANGE, C SOILS						
ID	(ACRES)	CN = 77	CN = 74		(MIN)	(YEARS)	(CFS)	(YEARS)	(CFS)
DA-4	276.58	154.32	122.26	76	75	10	488.1	100	875.4





NOTES:

1. DRAINAGE DESIGN UTILIZED ATLAS 14 RAINFALL DATA FOR HAYS COUNTY

STATE OF TEXAS
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Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DRAINAGE AREA MAP

DATE: 5/17/2021				SHEET 4 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	133

Filename: ...\Cad\Plan\015012-000*DA04.dgn
Date: 5/17/2021

RUNOFF COMPUTATIONS (D.A. UNDER 200 ACRES)

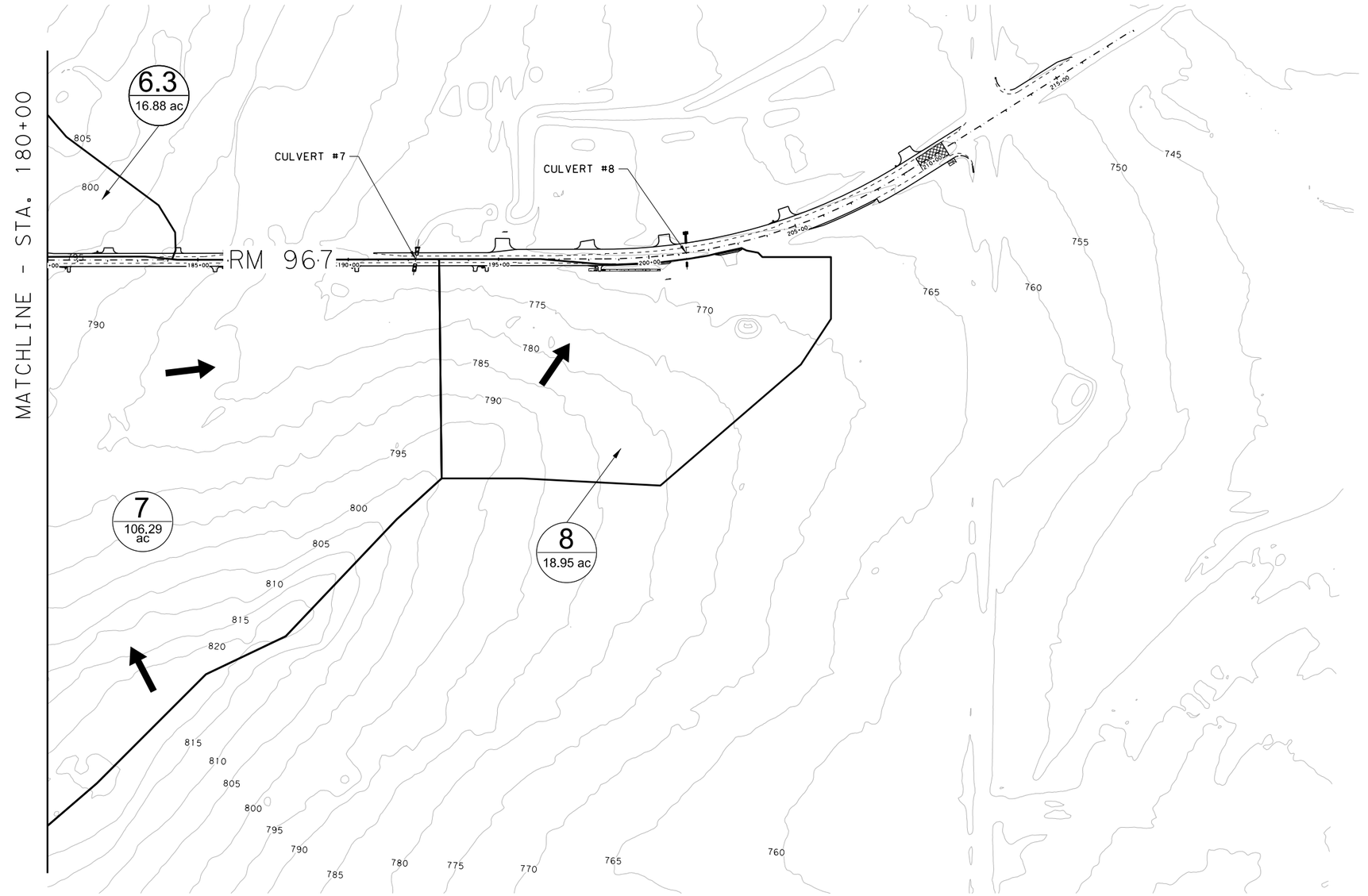
RATIONAL METHOD (Q = C x I x A)

DRAINAGE AREA		SUBAREA (ACRES)		WEIGHTED C VALUE	TOTAL CA	TC USED	DESIGN FREQUENCY	INTENSITY I5	DISCHARGE Q5	INTENSITY I10	DISCHARGE Q10	CHECK FREQUENCY	INTENSITY I10	DISCHARGE Q10	INTENSITY I100	DISCHARGE Q100
		IMPERVIOUS	PERVIOUS													
ID	(ACRES)	C = 0.95	C = 0.30			(MIN)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)	(YEARS)	(IN/HR)	(CFS)	(IN/HR)	(CFS)
DA-6.3	16.88	0.40	16.48	0.32	5.32	33	5	3.55	18.9	N/A	N/A	10	4.32	23.0	N/A	
DA-7*	106.29	-		0.35	37.20	48	10	N/A		3.45	128.3	100	N/A		5.94	221.0
DA-8	18.95	2.33	16.62	0.38	7.20	42	10	N/A		3.75	27.0	100	N/A		6.41	46.1

*PROPOSED WIDENING WILL HAVE MINIMAL IMPACT ON OVERALL FLOWS FROM THIS LARGE OF A DA. 0.35 WAS USED FOR THE EXISTING AND PROPOSED CONDITION.

NOTES:

1. DRAINAGE DESIGN UTILIZED ATLAS 14 RAINFALL DATA FOR HAYS COUNTY



0 100 200 400

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DRAINAGE AREA MAP

DATE: 5/17/2021				SHEET 5 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	134

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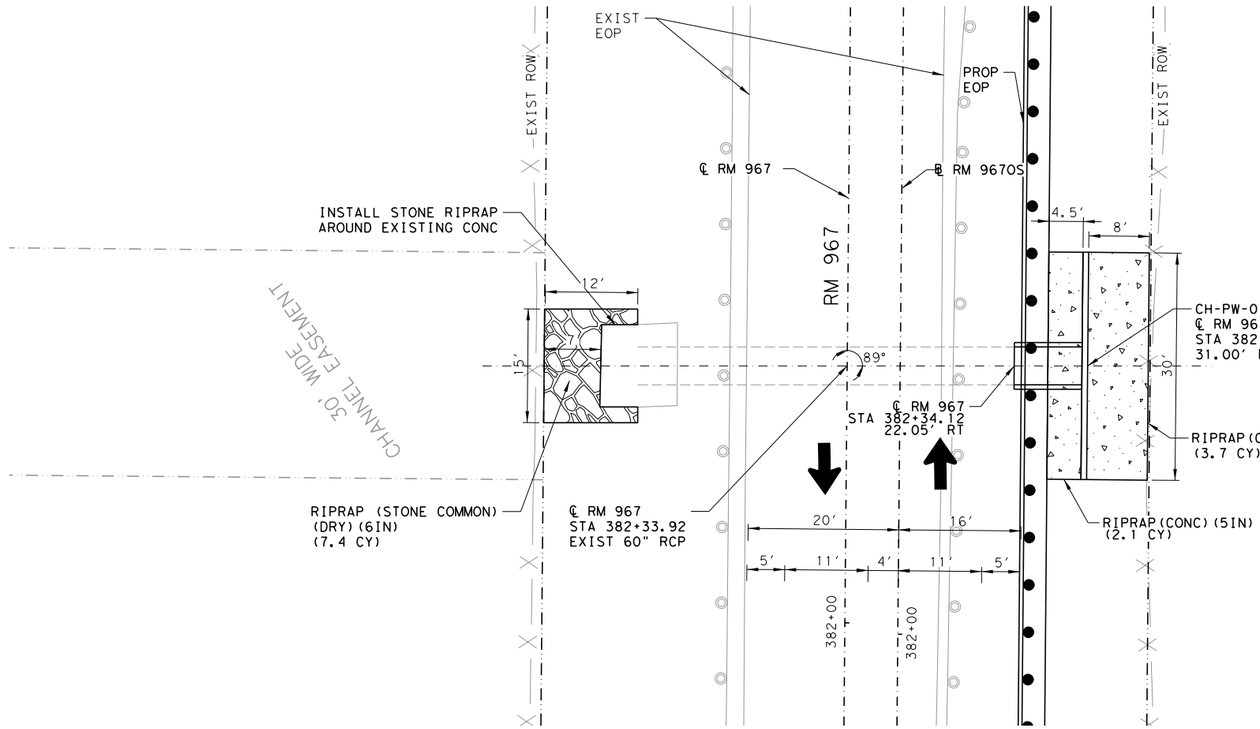
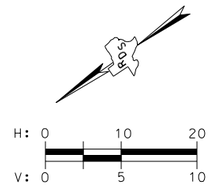
Date: 5/17/2021



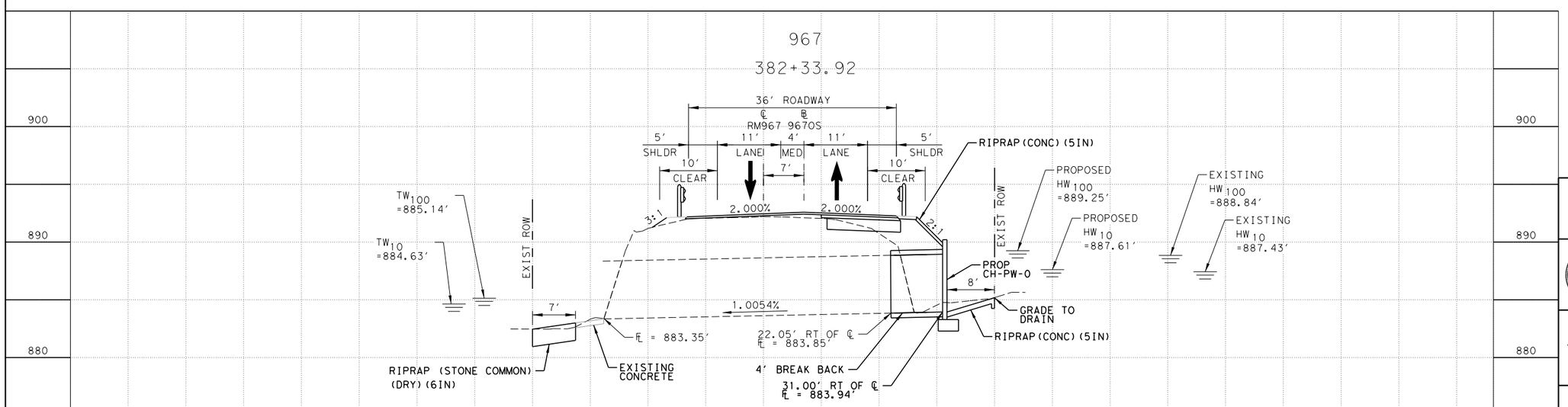


NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS

ROADWAY DATA FOR CROSSING: CULVERT 1
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 36

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	78.2	78.2	887.61	3.67	2.33	1-S2n	1.75	2.01	1.28	10.24	4.67
100-yr	137.7	137.7	889.25	5.31	4.05	5-S2n	2.4	2.79	1.79	11.84	5.64



CULVERT 1
STA 382+33.92

EXISTING: 60" RCP W/SET LT & RT
NO DEBRIS IDENTIFIED IN EXIST CULVERT
EXIST CULVERT GOOD CONDITION
PROPOSED: EXTEND 60" RCP 5' UPSTREAM
WITH CH-PW-0 RT

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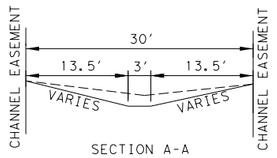
FIRM # 16849

RM 967

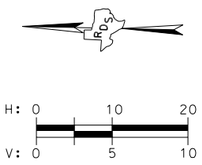
CULVERT LAYOUT
CULVERT #1
STA 382+33.92

DATE: 5/17/2021				SHEET 1 OF 8
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	135

Filename: ...\Cad\Plan\015012-000*CLV01.dgn
Date: 5/17/2021



SECTION A-A
NTS

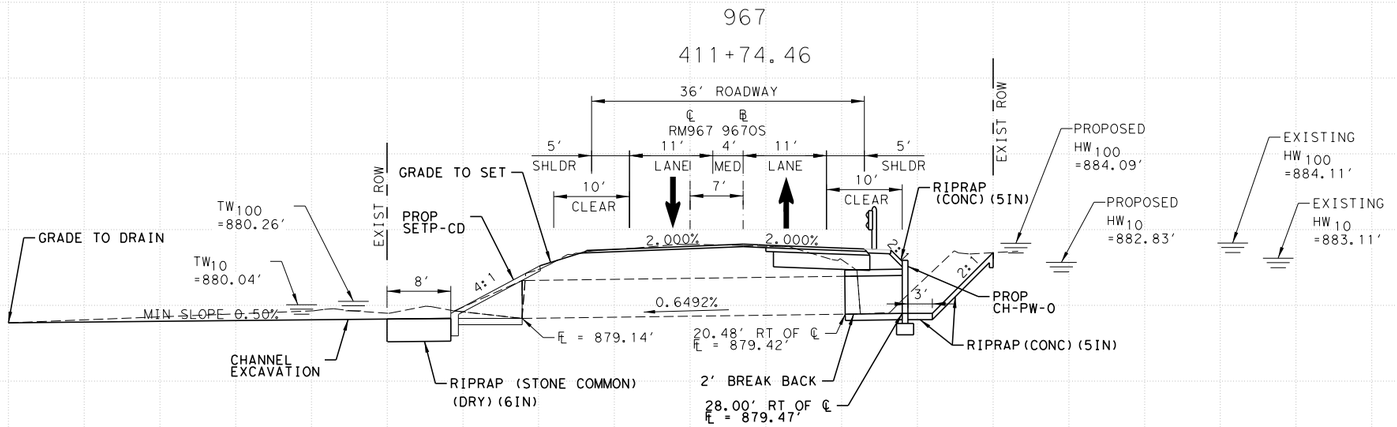


NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS
2. CULVERT DAMAGE OCCURING DURING EXISTING SET REMOVAL IS TO BE REPLACED AT THE COST TO THE CONTRACTOR.
3. THE REMOVAL AND REPLACEMENT OF FENCE TO BE SUBSIDIARY TO CHANNEL EXCAVATION.
4. 50 LF OF CHANNEL EXCAVATION WAS ASSUMED TO OBTAIN POSITIVE DRAINAGE. CONTRACTOR TO VERIFY IN THE FIELD THE LINEAR LIMITS OF CHANNEL EXCAVATION REQUIRED TO OBTAIN POSITIVE DRAINAGE.

ROADWAY DATA FOR CROSSING: CULVERT 2
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 36

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	32.0	32.0	882.83	3.36	1.06	5-S2n	1.8	1.85	0.57	8	9.41
100-yr	53.9	42.5	884.09	4.62	4.21	7-M2c	2.5	2.18	0.79	9.36	11.31



CULVERT 2
STA 411+74.46

EXISTING: 30" RCP W/SET LT & RT
WATER BACKED UP IN EXIST CULVERT
EXIST CULVERT GOOD CONDITION
PROPOSED: EXTEND 30" RCP 6' UPSTREAM
WITH CH-PW-O RT. REPLACE SET DOWNSTREAM
WITH SETP-CD 4:1.

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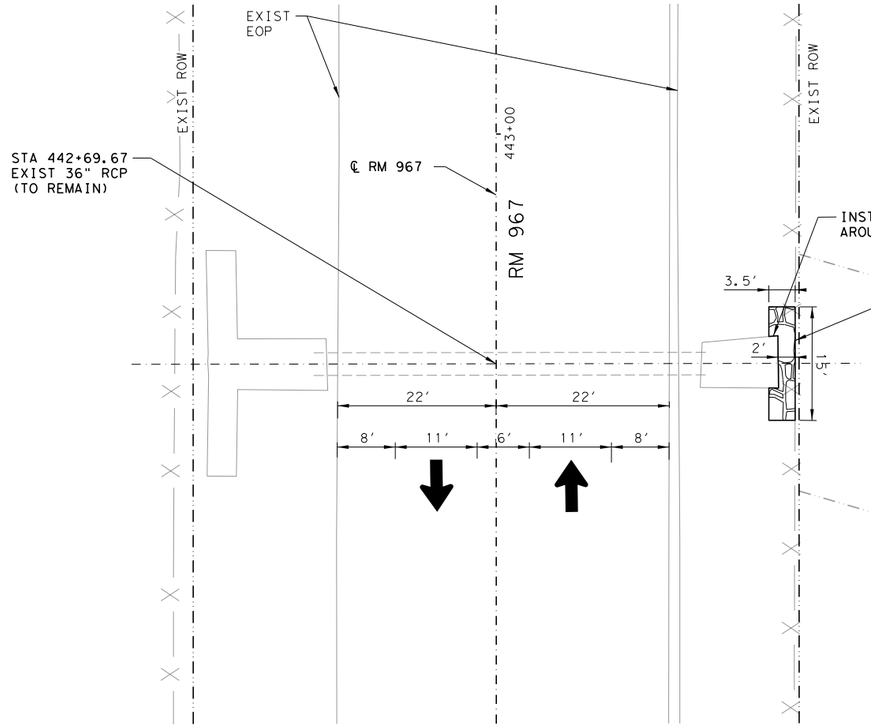
FIRM # 16849

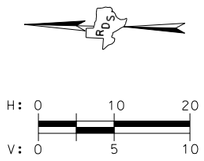
RM 967

CULVERT LAYOUT
CULVERT #2
STA 411+74.46

DATE: 5/17/2021				SHEET 2 OF 8
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	136

Filename: ...\Cad\Plan\015012-000*CLV02.dgn
Date: 5/17/2021



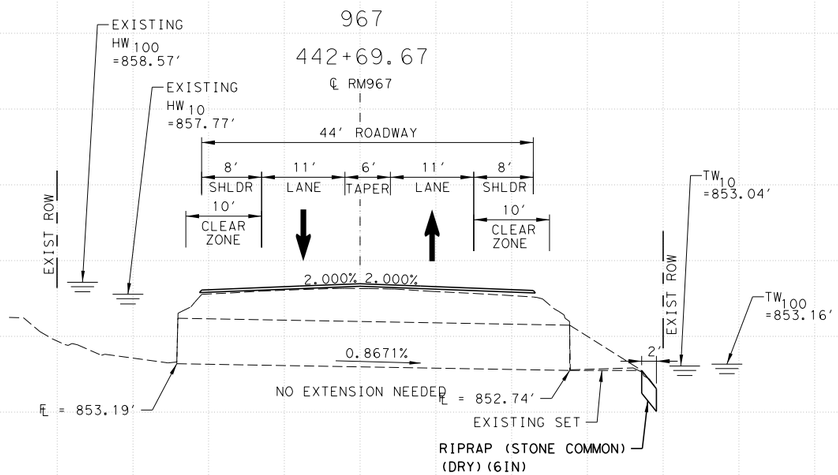


NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS

ROADWAY DATA FOR CROSSING: CULVERT 3
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 44

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	38.0	38.0	857.77	4.58	0	5-S2n	1.84	2.08	0.3	9.16	17.06
100-yr	65.2	42.7	858.57	5.38	4.5	7-M2c	2.50	2.18	0.42	9.39	20.93



CULVERT 3
STA 442+69.67

EXISTING: 36" RCP W/SET LT & RT
NO DEBRIS IDENTIFIED IN EXIST CULVERT
EXIST CULVERT IN GOOD CONDITION
PROPOSED: N/A

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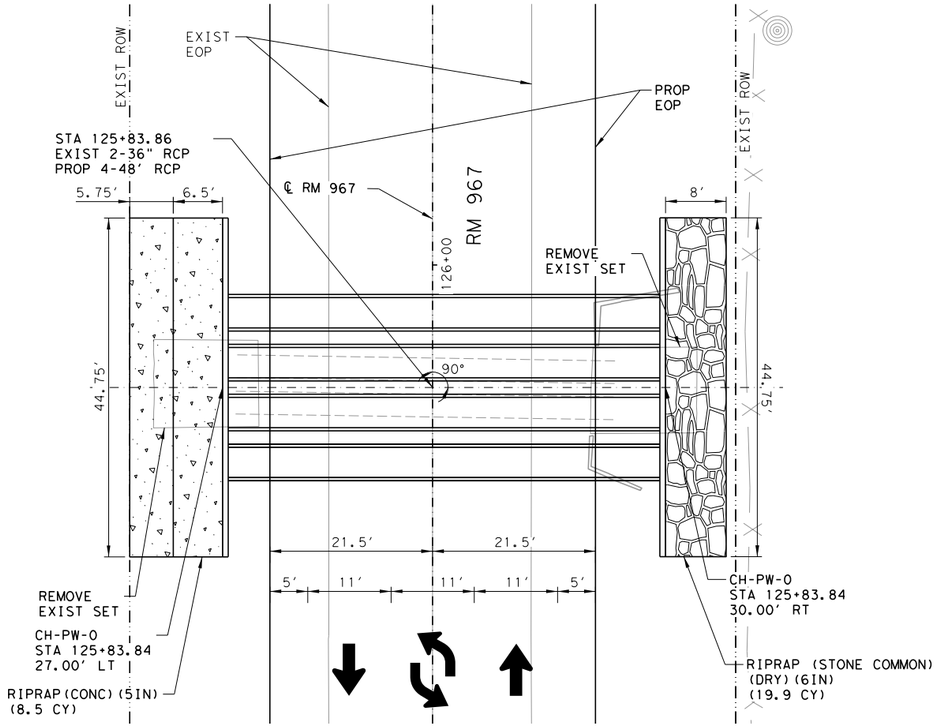
FIRM # 16849

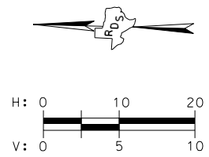
RM 967

CULVERT LAYOUT
CULVERT #3
STA 442+69.67

DATE: 5/17/2021			SHEET 3 OF 8
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	137

Filename: ...\Cad\Plan\015012-000*CLV03.dgn
Date: 5/17/2021



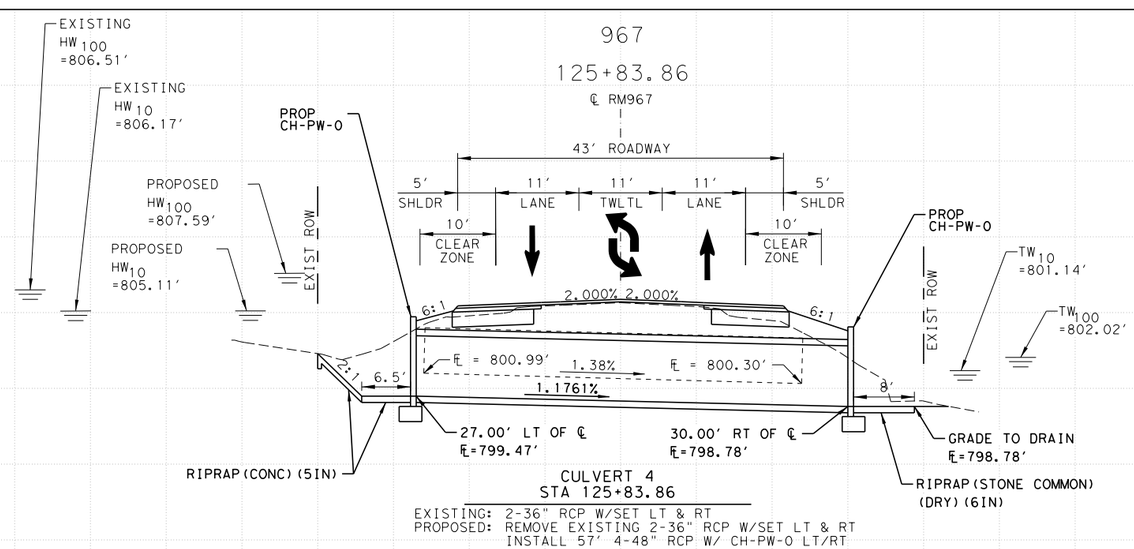


NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS

ROADWAY DATA FOR CROSSING: CULVERT 4
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 43

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	488.1	488.1	805.11	5.64	1.67	5-S2n	2.48	2.82	2.34	12.52	5.31
100-yr	875.4	670.35	807.59	8.12	7.31	7-M2c	4	3.71	3.22	13.77	6.35



CULVERT 4
STA 125+83.86

EXISTING: 2-36" RCP W/SET LT & RT
PROPOSED: REMOVE EXISTING 2-36" RCP W/SET LT & RT
INSTALL 57' 4-48" RCP W/ CH-PW-O LT/RT

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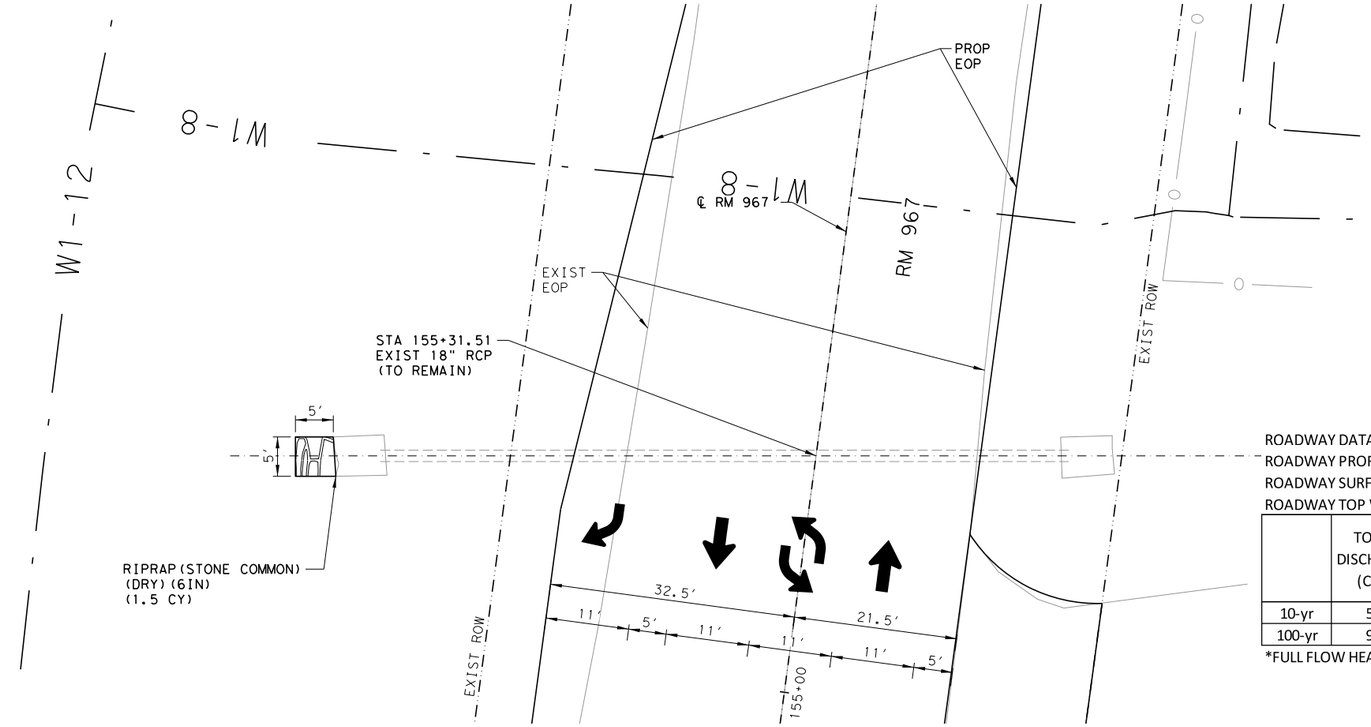
FIRM # 16849

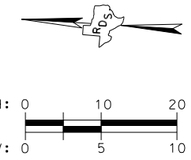
RM 967

CULVERT LAYOUT
CULVERT #4
STA 125+83.86

DATE: 5/17/2021			SHEET 4 OF 8
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	138

Filename: ...\Cad\Plan\015012-000*CLV04.dgn
Date: 5/17/2021





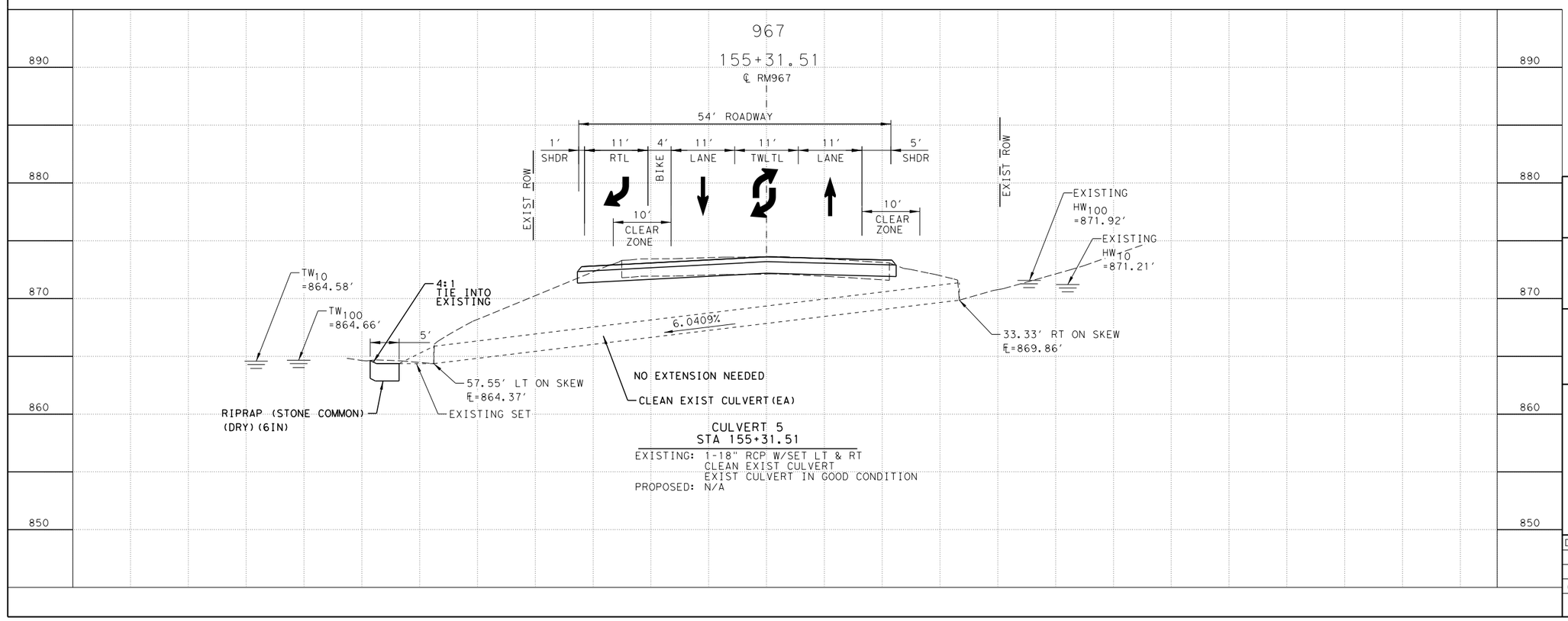
NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS

ROADWAY DATA FOR CROSSING: CULVERT 5
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 54

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	5.6	5.6	871.21	1.35	0.0*	1-S2n	0.44	0.44	0.21	12.4	4.27
100-yr	9.3	9.3	871.92	2.06	0.0*	5-S2n	0.58	0.62	0.29	12.94	5.06

*FULL FLOW HEADWATER ELEVATION IS BELOW INLET INVERT.



CULVERT 5
STA 155+31.51

EXISTING: 1-18" RCP W/SET LT & RT
CLEAN EXIST CULVERT
EXIST CULVERT IN GOOD CONDITION
PROPOSED: N/A

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

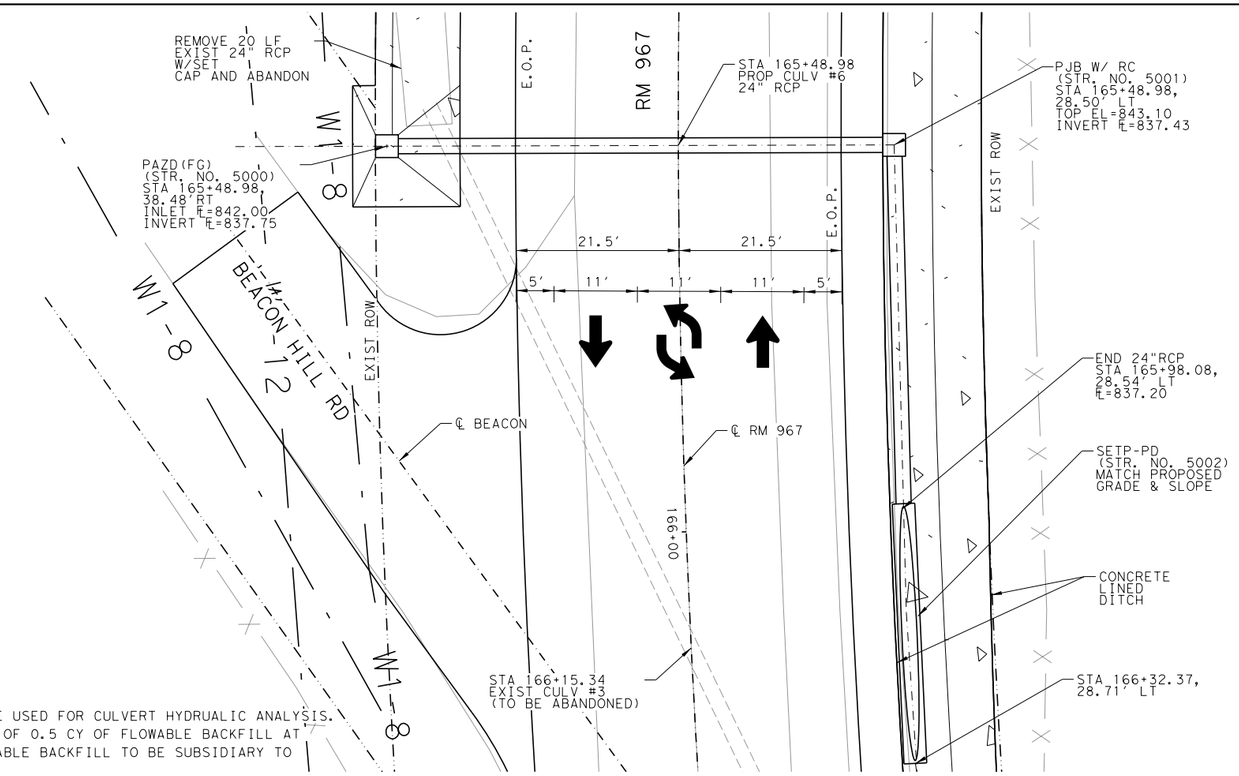
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

CULVERT LAYOUT
CULVERT #5
STA 155+31.51

DATE: 5/17/2021			SHEET 5 OF 8
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	139

Filename: ...\Cad\Plan\015012-000*CLV05.dgn
Date: 5/17/2021



NOTES:

1. GEOPAK DRAINAGE USED FOR CULVERT HYDRUALIC ANALYSIS.
2. CAP TO CONSIST OF 0.5 CY OF FLOWABLE BACKFILL AT EACH END. FLOWABLE BACKFILL TO BE SUBSIDIARY TO REMOVAL OF RCP.

Orifice Calculations

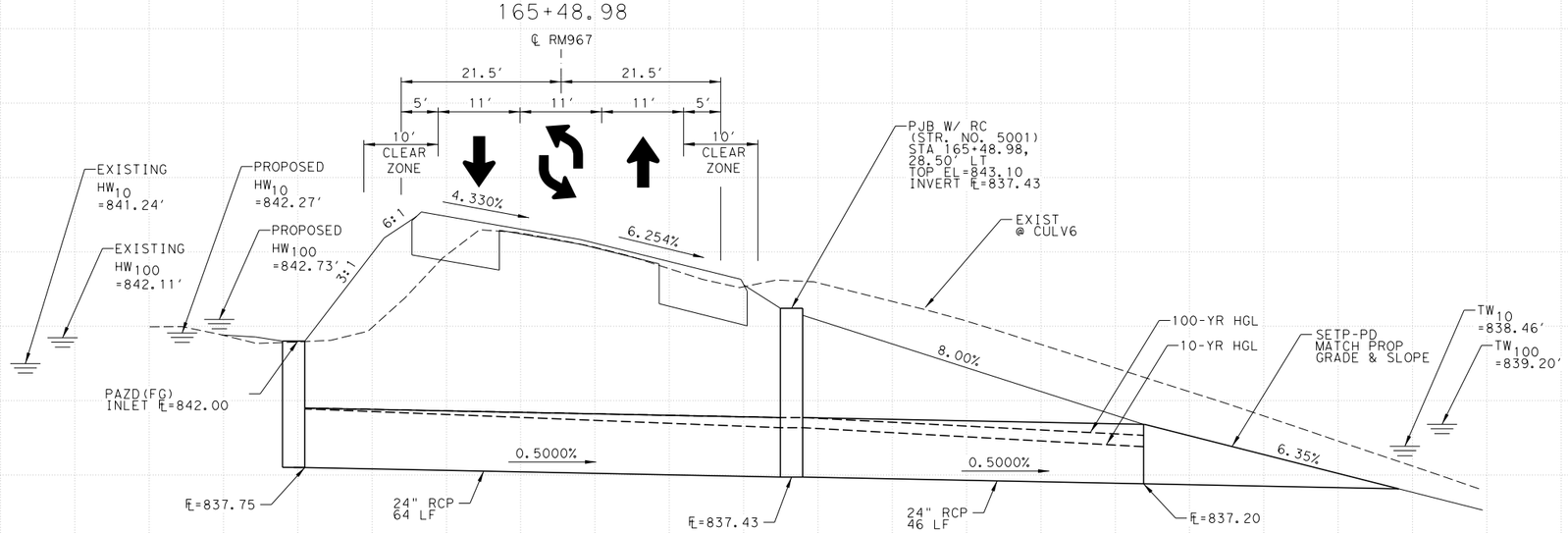
Storm Event	Q	h	A*
(yr)	(cfs)	(ft)	(sf)
10	12.5	0.27	4.52
100	20.7	0.73	

*3x3 Standard Grate, open area = 649 in^2 (4.52 ft^2)
Q = 0.67 A (2gh)^0.5
g = 32.2 ft/s^2

ROADWAY DATA FOR CROSSING: CULVERT 6
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 44

PIPE RUN (STRUCTURE TO STRUCTURE)	PIPE SIZE	APPROX PIPE LENGTH	PIPE INVERT ELEVATION		SLOPE	APPROX. RIM ELEVATION		FULL PIPE CAPACITY
	(IN)	(FT)	UPPER END	LOWER END	(%)	UPPER END	LOWER END	(CFS)
5000 5001	24	64	837.75	837.43	0.50	842.00	843.10	16.9
5001 5002	24	46	837.43	837.2	0.50	843.1	N/A	17.0

10-YR				100-YR			
TOTAL DISCHARGE	FLOW VEL.	HGL		TOTAL DISCHARGE	FLOW VEL.	HGL	
(CFS)	(FPS)	UPPER END	LOWER END	(CFS)	(FPS)	UPPER END	LOWER END
12.5	5.9	839.72	839.09	20.7	6.8	839.75	839.43
12.5	5.9	839.09	838.47	20.7	6.8	839.43	838.83



CULVERT 6
STA 165+48.98

EXISTING: 141 LF 24" RCP RCP W/ SET
EXIST CULVERT TO BE ABANDONED
PROPOSED: JACK & BORE, 60 LF
24" RCP, 4 LF + 46 LF
3'x3' PB W/ PAZD(FG)
3'x3' PJB W/ SL
SETP-PD

H: 0 10 20
V: 0 2.5 5

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

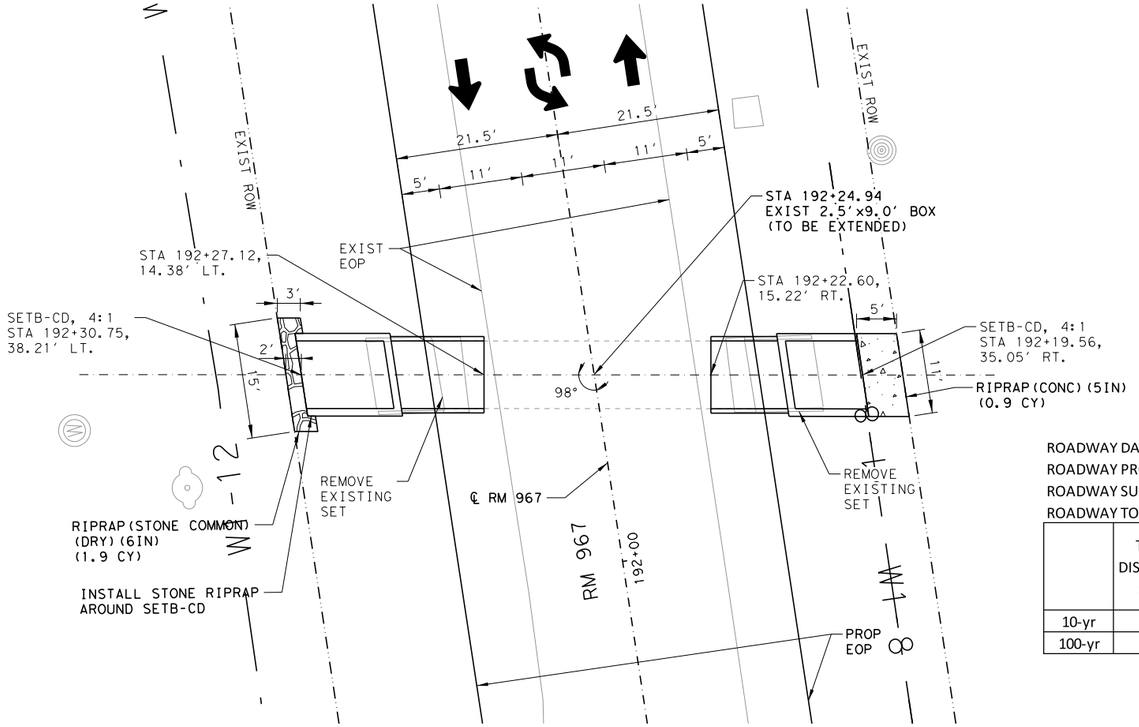
CULVERT LAYOUT
CULVERT #6
STA 165+48.98

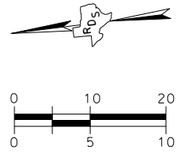
DATE: 5/17/2021 SHEET 6 OF 8

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	140

Filename: ...\Cad\Plan\015012-000*CLV06.dgn
Date: 5/17/2021





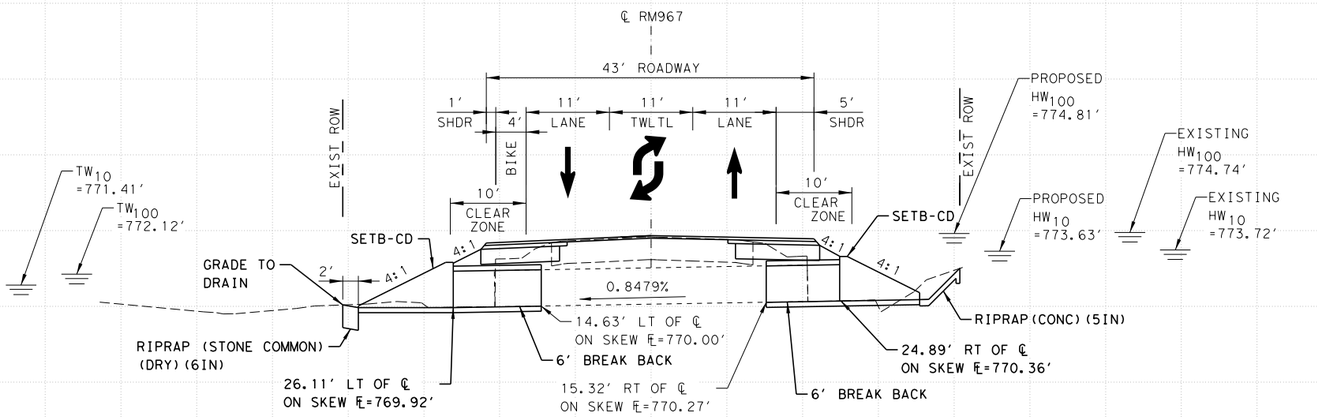
NOTES:

1 FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS.

2. FOR BID ITEM PURPOSES, BOTH THE CULVERT AND SET ARE PAID FOR AS A 9'X3' STRUCTURE.

ROADWAY DATA FOR CROSSING: CULVERT 7
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 43

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	128.3	128.3	773.63	3.27	2.55	5-S2n	1.22	1.4	1.61	10.16	7.25
100-yr	221.0	173.3	774.81	4.45	3.56	5-S2n	1.49	1.75	2.32	11.02	8.68



CULVERT 7
STA 192+24.94

EXISTING: 30" X 9' X 41 LF BOX W/ WING WALLS
NO DEBRIS IDENTIFIED IN EXIST CULVERT
EXIST CULVERT IN GOOD CONDITION
PROPOSED: EXTEND BOX 4' UPSTREAM & 6' DOWNSTREAM
WITH SETB-CD LT AND RT

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

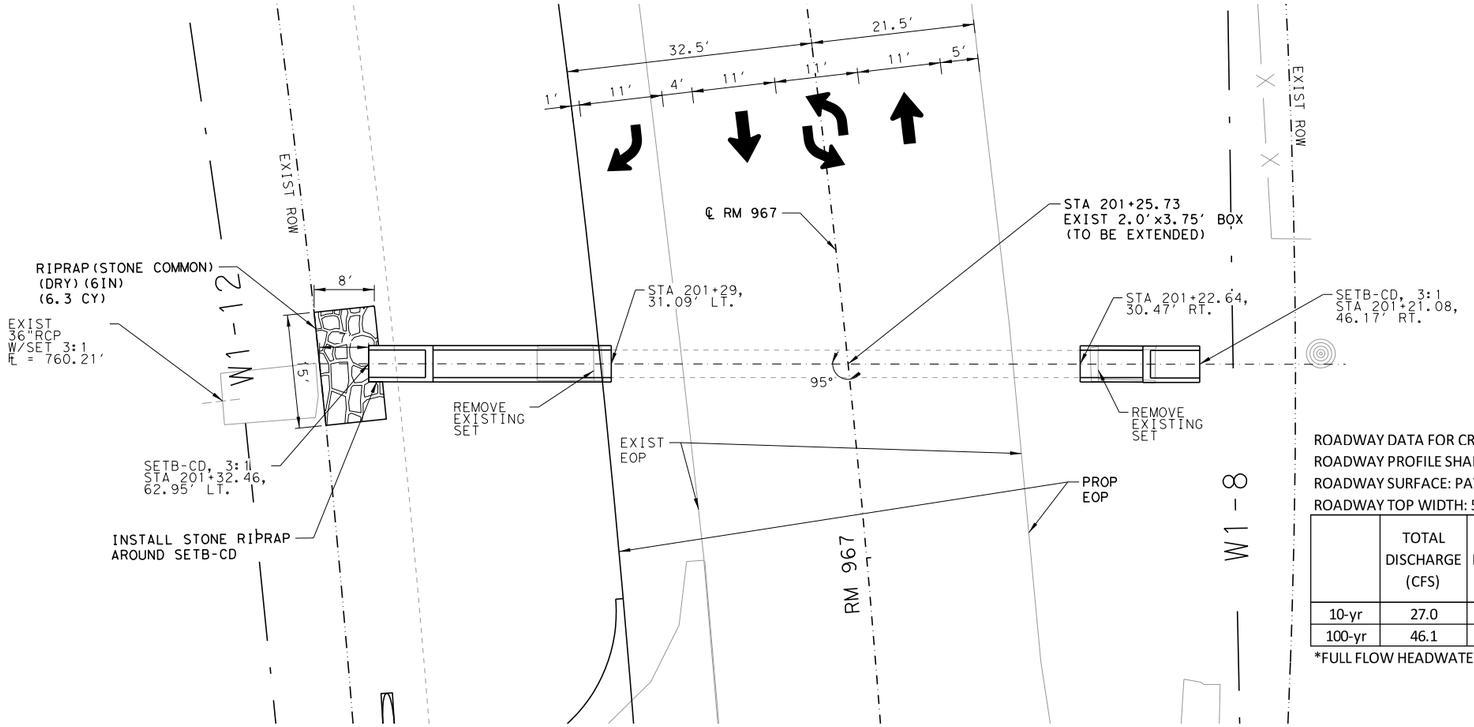
WSB & ASSOCIATES, INC.
FIRM # 16849

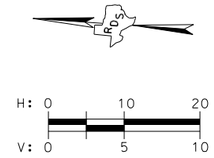
RM 967

CULVERT LAYOUT
CULVERT #7
STA 192+24.94

DATE: 5/17/2021			SHEET 7 OF 8
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	141

Filename: ...\Cad\Plan\015012-000*CLV07.dgn
Date: 5/17/2021





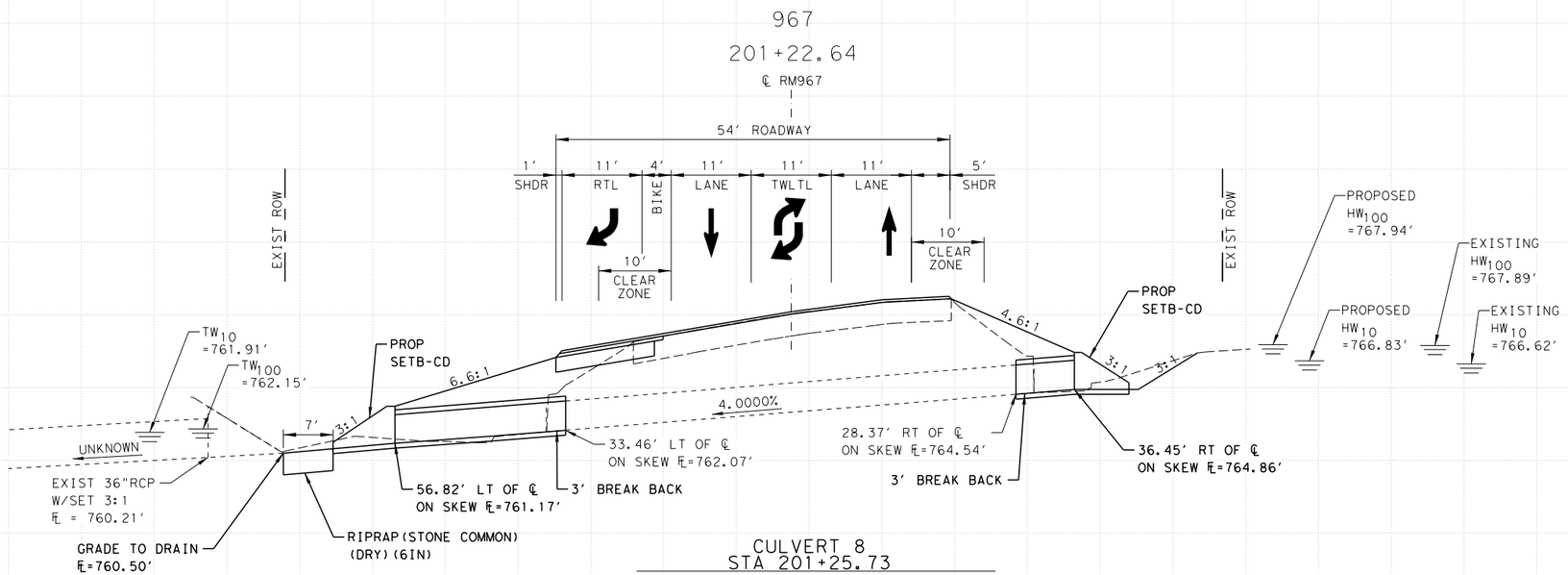
NOTES:

1. FHWA HY-8 USED FOR CULVERT HYDRAULIC ANALYSIS.
2. FOR BID ITEM PURPOSES, BOTH THE CULVERT AND SET ARE PAID FOR AS A 4'X2' STRUCTURE.

ROADWAY DATA FOR CROSSING: CULVERT 8
ROADWAY PROFILE SHAPE: CONSTANT
ROADWAY SURFACE: PAVED
ROADWAY TOP WIDTH: 54

	TOTAL DISCHARGE (CFS)	CULVERT DISCHARGE (CFS)	HEADWATER ELEVATION (FT)	INLET CONTROL DEPTH (FT)	OUTLET CONTROL DEPTH (FT)	FLOW TYPE	NORMAL DEPTH (FT)	OUTLET DEPTH (FT)	TAILWATER DEPTH (FT)	OUTLET VELOCITY (FT/S)	TAILWATER VELOCITY (FT/S)
10-yr	27.0	27.0	766.83	1.97	0.0*	1-S2n	0.52	0.57	0.74	12.88	4.29
100-yr	46.1	46.1	767.94	3.08	0.0*	5-S2n	0.74	0.84	0.98	14.91	4.99

*FULL FLOW HEADWATER ELEVATION IS BELOW INLET INVERT.



CULVERT 8
STA 201+25.73

EXISTING: 2' X 3.75' X 67 LF BOX W/ SETS
NO DEBRIS IDENTIFIED IN EXIST CULVERT
EXIST CULVERT IN GOOD CONDITION
PROPOSED: EXTEND BOX 5' UPSTREAM & 21' DOWNSTREAM
WITH SETB-CD LT AND RT

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER
Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

CULVERT LAYOUT
CULVERT #8
STA 201+25.69

DATE: 5/17/2021				SHEET 8 OF 8
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	142

Filename: ...\Cad\Plan\015012-000*CLV08.dgn
Date: 5/17/2021

STATION	LEFT SIDE													RIGHT SIDE											
	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)
354+00	929.02	4	4	0	0.94	929.96	0.03	-0.58%	7.9	0.1	0.18	0.75	0.03	929.15	4	4	0	0.95	930.1	0.03	-1.03%	10.8	0.5	0.3	1.39	0.09
355+00	928.44	4	4	0	0.93	929.37	0.03	0.03%	1.7	0.5	0.58	0.37	0.01	928.12	4	4	0	0.84	928.96	0.03	-0.43%	5.0	1.0	0.46	1.19	0.06
356+00	928.47	4	4	0	1.17	929.64	0.03	-1.10%	19.5	0.8	0.35	1.6	0.12	927.69	4	4	0	0.84	928.53	0.03	-0.70%	6.4	1.5	0.49	1.58	0.1
357+00	927.37	4	4	0	1.31	928.68	0.03	-1.26%	28.2	1.1	0.39	1.83	0.15	926.99	4	4	0	0.99	927.98	0.03	-0.70%	10.0	1.9	0.53	1.68	0.11
358+00	926.11	4	4	0	1.31	927.42	0.03	-0.41%	16.1	1.5	0.54	1.3	0.07	926.29	4	4	0	0.95	927.24	0.03	-0.89%	10.1	2.3	0.55	1.93	0.15
359+00	925.70	4	4	0	1.09	926.79	0.03	-1.41%	18.3	1.7	0.45	2.1	0.19	925.40	4	4	0	1.15	926.55	0.03	-0.26%	9.1	2.7	0.73	1.27	0.06
360+00	924.29	4	4	0	1.49	925.78	0.03	-0.74%	30.5	2.1	0.55	1.76	0.12	925.14	4	4	0	0.97	926.11	0.03	-1.17%	12.2	2.8	0.56	2.24	0.2
361+00	923.55	4	4	0	1.29	924.84	0.03	-0.75%	20.9	2.4	0.57	1.83	0.13	923.97	4	3	0	1.07	925.04	0.03	-0.50%	9.0	3.1	0.72	1.72	0.11
362+00	922.80	4	4	0	1.5	924.3	0.03	-0.68%	29.7	2.6	0.60	1.8	0.12	923.47	4	3	0	0.93	924.40	0.03	-1.03%	8.9	3.3	0.64	2.29	0.2
363+00	922.12	4	4	0	1.08	923.2	0.03	-0.78%	13.3	2.9	0.61	1.94	0.14	922.44	4	3	0	1.03	923.47	0.03	-0.79%	10.2	3.5	0.69	2.11	0.16
364+00	921.34	4	4	0	1.03	922.37	0.03	-1.57%	16.6	3.1	0.55	2.57	0.26	921.65	4	4	0	1.07	922.72	0.03	-1.42%	17.5	3.8	0.6	2.6	0.26
365+00	919.77	4	4	0	0.91	920.68	0.03	-2.31%	14.5	3.4	0.53	3.04	0.37	920.23	4	4	0	0.99	921.22	0.03	-2.00%	16.8	3.9	0.57	3	0.35
366+00	917.46	4	4	0	0.99	918.45	0.03	-1.81%	16.0	3.5	0.56	2.79	0.31	918.23	4	4	0	1.14	919.37	0.03	-1.95%	24.2	4.1	0.59	2.99	0.35
367+00	915.65	4	4	0	0.88	916.53	0.03	-2.10%	12.6	3.7	0.57	3	0.35	916.28	4	4	0	1.21	917.49	0.03	-2.16%	29.9	4.2	0.58	3.1	0.38
368+00	913.55	4	4	0	0.92	914.47	0.03	-1.74%	12.9	3.8	0.58	2.81	0.31	914.12	4	4	0	1.26	915.38	0.03	-1.89%	31.1	4.4	0.61	3.01	0.35
369+00	911.81	4	4	0	0.81	912.62	0.03	-1.33%	8.0	3.9	0.62	2.56	0.25	912.23	4	4	0	1.29	913.52	0.03	-1.38%	33.9	4.5	0.65	2.69	0.27
370+00	910.48	4	4	0	0.82	911.3	0.03	-1.69%	9.4	4.1	0.60	2.83	0.31	910.85	4	4	0	1.18	912.03	0.03	-1.71%	24.9	4.6	0.63	2.93	0.32
371+00	908.79	4	4	0	0.88	909.67	0.03	-2.23%	13.0	4.3	0.57	3.14	0.39	909.14	4	4	0	1.46	910.60	0.03	-1.40%	39.7	4.7	0.66	2.73	0.28
372+00	906.56	4	4	0	0.69	907.25	0.03	-3.06%	6.8	4.5	0.59	3.22	0.40	907.74	4	4	0	0.97	908.71	0.03	-2.54%	18.0	4.8	0.591	2.78	0.33
373+00														905.20	4	4	0	1.06	906.26	0.03	-1.90%	19.7	5.0	0.63	3.11	0.37
374+00														903.30	4	4	0	1.16	904.46	0.03	-1.17%	19.7	5.1	0.7	2.61	0.25
375+00	901.51	4	4	0	1.05	902.56	0.03	-1.79%	18.6	0.5	0.27	1.70	0.15	902.13	4	4	2	1.53	903.66	0.03	-2.13%	80.6	26.5	0.94	4.89	0.74
376+00	899.72	4	4	0	0.8	900.52	0.03	-1.29%	7.7	1.0	0.37	1.8	0.15	900.00	4	3	2	1.9	901.90	0.03	-1.75%	110.4	26.5	1	4.67	0.66
377+00	898.43	4	4	0	1.02	899.45	0.03	-2.29%	19.5	1.5	0.39	2.47	0.27	898.25	3	3	2	1.81	900.06	0.03	-1.67%	86.1	26.1	1.07	4.72	0.66
378+00	896.14	4	4	0	0.79	896.93	0.03	-2.87%	11.1	2.0	0.42	2.89	0.36	896.58	4	4	0	1.47	898.05	0.03	-2.08%	72.5	31.3	1.02	5.05	0.77
379+00	893.27	4	4	0	0.77	894.04	0.03	-2.77%	10.3	2.5	0.45	3.05	0.39	894.50	4	4	2	1.29	895.79	0.03	-2.50%	58.7	31.1	0.98	5.4	0.89
380+00														892.00	3	3	2	1.12	893.12	0.03	-1.60%	31.2	30.8	1.1	5.27	0.81
381+00																										
382+00																										
383+00	889.54	4	4	0	0.68	890.22	0.03	1.67%	8.7	1.7	0.43	2.26	0.22	889.32	3	3	0	1.52	890.84	0.03	2.09%	47.0	2.0	0.48	2.65	0.29
384+00	891.21	4	4	0	1.71	892.92	0.03	0.53%	45.9	1.6	0.53	1.45	0.08	891.41	3	3	0	1.51	892.92	0.03	0.97%	31.4	1.8	0.53	1.93	0.15
385+00	891.74	4	2	0	1.18	892.92	0.03	0.77%	16.8	1.5	0.49	1.64	0.11	892.38	3	3	0	0.77	893.15	0.03	0.53%	3.9	1.6	0.54	1.46	0.09
386+00	892.51	4	3	0	0.98	893.49	0.03	0.68%	7.5	1.4	0.53	1.63	0.11	892.91	3	3	0	0.87	893.78	0.03	0.30%	4.0	1.4	0.57	1.13	0.05
387+00	893.19	4	3	0	0.84	894.03	0.03	0.04%	1.8	1.4	0.78	0.44	0.01	893.21	3	3	0	0.91	894.12	0.03	0.11%	2.7	1.2	0.64	0.74	0.02
388+00	893.23	4	3	0	1.67	894.90	0.03	0.04%	11.5	1.4	0.76	0.51	0.01	893.32	4	3	0	1.24	894.56	0.03	-0.24%	9.2	0.9	0.45	0.87	0.03
389+00	893.27	4	3	0	1.95	895.22	0.03	0.04%	4.6	1.4	0.86	0.55	0.01	893.08	4	3	0	2.17	895.25	0.03	1.10%	88.0	0.6	0.26	1.29	0.09
390+00	893.31	4	3	0	1.3	894.61	0.03	0.04%	4.3	1.4	0.86	0.55	0.01	894.18	4	4	0	0.91	895.09	0.03	-0.24%	4.7	0.3	0.33	0.71	0.02
391+00	893.35	4	4	0	0.82	894.17	0.03	0.04%	1.4	1.4	0.81	0.53	0.01													
392+00	893.39	4	1.7	0	2.24	895.63	0.03	0.04%	14.6	1.3	0.90	0.56	0.01													
393+00	893.43	4	1	0	3.25	896.68	0.03	0.04%	33.8	1.3	0.96	0.57	0.01													
394+00	893.47	4	2.6	0	1.26	894.73	0.03	0.03%	1.9	1.3	0.90	0.49	0.01													
395+00	893.50	4	3	0	1.03	894.53	0.03	0.04%	2.3	1.3	0.83	0.54	0.01													
396+00	893.54	4	4	2	0.46	894	0.03	0.04%	1.3	1.3	0.46	0.72	0.02													
397+00	893.58	4	4	2	0.42	894	0.03	0.04%	1.2	1.2	0.42	0.68	0.02													
398+00	893.62	4	4	2	0.78	894.4	0.03	0.01%	3.8	1.6	0.52	0.76	0.02													
399+00	893.63	4	4	0	0.9	894.53	0.03	0.55%	6.8	1.3	0.44	1.31	0.07													
400+00	894.18	4	4	0	0.98	895.16	0.03	0.67%	9.5	1.0	0.42	1.41	0.09													
401+00	894.85	4	4	0	0.89	895.74	0.03	0.07%	2.4	0.5	0.50	0.51	0.01	895.90	4	3	0	1.52	897.42	0.03	0.02%	5.3	0.1	0.74	0.36	0.01
402+00	894.92	4	4	0	1.42	896.34	0.03	-0.10%	9.9	0.5	0.46	0.58	0.01	895.92	4	4	0	1.86	897.78	0.03	0.23%	30.7	0.1	0.33	0.7	0.02
403+00	894.82	4	2	0	1.94	896.76	0.03	0.01%	5.3	1.0	0.91	0.28	0.00	896.15	4	4	0	1.41	897.56	0.03	-0.70%	25.6	0.3	0.27	1.06	0.06
404+00	894.83	4	4	0	1.61	896.44	0.03	-1.66%	56.1	0.8	0.33	1.87	0.16	895.45	4	4	0	0.71	896.16	0.03	-1.60%	6.2	0.6	0.3	1.72	0.14
405+00	893.17	4	4	0	1.31	894.48	0.03	-2.09%	36.3	1.1	0.35	2.21	0.22	893.85	4	4	0	0.63	894.48	0.03	-2.09%	5.2	1.1	0.35	2.21	0.22
406+00	891.08	4	4	0	1.4	892.48	0.03	-2.16%	44.1	1.3	0.37	2.33	0.24	891.76	4	4	0	1.27	893.03	0.03	-2.18%	34.2	1.6	0.4	2.46	0.27
407+00	888.92	4	4	0	1.39	890.31	0.03	-2.44%	46.0	1.5	0.34	2.34	0.25	889.58	4	4	0	1.51	891.09	0.03	-2.12%	53.4	4.9	0.45	2.61	0.29
408+00	886.48	4	4	0	1.25	887.73	0.03	-2.23%	33.1	1.8	0.42	2.56	0.28	887.46	4	4	0	1.39	888.85	0.03	-1.98%	41.4	5.2	0.48	2.63	0.29
409+00	884.25	4	3	0	1.33	885.58	0.03	-2.12%	33.1	2.0	0.46	2.65	0.30	885.48	4	4	0	1.38	886.86	0.03	-1.83%	39.1	5.4	0.51	2.65	0.29
410+00	882.13	4	3	0	1.01	883.14	0.03	-0.43%	15.9	2.2	0.48	2.72	0.31	883.65	4	3	0	1.61	885.26	0.03	-1.61%	48.0	5.5	0.57	2.65	0.28
411+00														882.04	4	4	0	1.61	883.65	0.03	-0.48%	30.2	5.7	0.69	1.66	0.1
412+00														881.56	3	3	0	2.14	883.70	0.03	0.71%	57.9	5.8	0.74	2.08	0.16
413+00	880.98	4	4	0	0.83	881.81	0.03	1.11%	7.8	3.1	0.59	2.26	0.20	882.27	4	4	0	1.46	883.73	0.03	1.03%	34.1	5.8	0.59	2.18	0.18
414+00	882.09	4	4	0	0.79	882.88	0.03	1.08%	6.8	2.9	0.58	2.2	0.19	883.30	4	4	0	0.96	884.26	0.03	0.78%	9.7	5.7	0.61	1.94	0.14
415+00	883.17	4	4	0	0.76	883.93	0.03	1.41%	7.0	2.5	0.52	2.34	0.22	884.08	4	4	0	1.3	885.38	0.03	1.87%	33.7	2.5	0.49	2.6	0.28
416+00	884.58	4	4	0	0.71	885.29	0.03	2.28%	7.4	2.0	0.43	2.65	0.30	885.95	4	4	0	1.12	887.07	0.03	1.82%	22.3	2.0	0.45	2.43	0.25
417+00	886.86	4	4	0	0.63	887.49	0.03	2.86%	6.0	1.5	0.37	2.68	0.32	887.77	4	4	0	1.27	889.04	0.03	2.76%	38.4	1.5	0.38	2.65	0.31
418+00	889.72	4	4	0	1.32	891.04	0.03	2.00%	36.3	1.0	0.34	2.12	0.21	890.53	4	4	0	0.53	891.06	0.03	1.46%	2.7	1.0	0.36	1.88	0.16
419+00	891.72	4	4	0	0.88	892.6	0.03	-1.50%	10.7	0.5	0.28	1.6	0.13	891.99	4	2.5	0	0.42	892.41	0.03	-0.99%	1.0	0.5	0.33	1.43	0.1
420+00	890.22	4	4	0	0.92	891.14	0.03	-2.08%	14.1	0.5	0.26	1.81	0.17	891.00	4	4	0	1.1	892.10	0.03	-1.66%	20.3	0.5	0.27	1.66	0.14

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Date: 5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DITCH TABLES

DATE: 5/17/2021			SHEET 1 OF 3
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	143

STATION	LEFT SIDE													RIGHT SIDE											
	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)
421+00	888.14	4	4	0	0.93	889.07	0.03	-2.00%	14.3	1.0	0.34	2.12	0.21	889.34	4	4	0	0.85	890.19	0.03	-1.72%	10.4	1.0	0.35	2	0.18
422+00	886.14	4	4	0	0.84	886.98	0.03	-1.85%	10.5	1.5	0.41	2.28	0.23	887.62	4	4	0	1.33	888.95	0.03	-3.50%	49.0	1.5	0.36	2.9	0.38
423+00	884.29	4	4	0	1.5	885.79	0.03	-4.32%	75.0	2.0	0.39	3.37	0.50	884.12	4	4	0	1.23	885.35	0.03	-4.51%	45.1	2.0	0.38	3.15	0.52
424+00	879.97	4	3	0	1.03	881	0.03	-2.45%	18.0	2.5	0.49	2.96	0.36	879.61	4	4	0	0.86	880.47	0.03	-2.70%	13.4	2.5	0.46	3.77	0.37
425+00														876.91	4	4	0	0.92	877.83	0.03	-2.85%	16.5	3.0	0.49	3.19	0.42
426+00	874.28	4	4	0	0.58	874.86	0.03	-1.60%	3.6	3.1	0.55	2.59	0.27	874.06	4	4	0	1.07	875.13	0.03	-1.99%	20.7	3.3	0.54	4.44	0.32
427+00	872.68	4	4	0	0.62	873.3	0.03	-1.08%	3.6	3.6	0.62	2.32	0.20	872.07	4	4	0	1.04	873.11	0.03	-1.47%	19.2	3.6	0.56	2.92	0.34
445+00	859.25	4	4	0	0.9	860.15	0.03	0.69%	7.7	6.9	0.87	2.31	0.18	858.45	4	4	0	0.73	859.18	0.03	1.16%	5.7	2.9	0.57	2.26	0.2
446+00	859.94	4	4	0	1.89	861.83	0.03	1.45%	80.4	6.8	0.75	3.04	0.33	859.61	4	4	0	0.85	860.46	0.03	0.64%	6.3	2.8	0.63	1.79	0.12
447+00	861.39	4	4	0	1.79	863.18	0.03	0.43%	37.9	6.8	0.94	1.92	0.12	860.25	4	4	0	1.11	861.36	0.03	0.77%	14.2	2.6	0.59	1.88	0.14
448+00	861.82	4	4	0	2.05	863.87	0.03	0.40%	52.5	6.8	0.95	1.87	0.12	861.02	4	4	0	1.41	862.43	0.03	0.24%	15.0	2.6	0.73	1.22	0.05
449+00	862.22	4	4	0	2	864.22	0.03	0.37%	47.2	7.0	0.98	1.83	0.11	861.26	4	4	0	1.02	862.28	0.03	0.19%	5.6	2.6	0.76	1.11	0.04
450+00	862.59	4	4	0	1.9	864.49	0.03	0.47%	46.4	7.2	0.94	2.02	0.13	861.45	4	4	0	1.46	862.91	0.03	0.62%	26.4	2.4	0.59	1.7	0.11
451+00	863.06	4	4	0	1.82	864.88	0.03	0.39%	37.7	1.6	0.56	1.29	0.07	862.07	4	4	0	1.11	863.18	0.03	0.87%	15.1	2.1	0.53	1.87	0.14
452+00	863.45	4	4	0	2.06	865.51	0.03	0.69%	69.8	1.4	0.48	1.55	0.10	862.94	4	4	0	1.08	864.02	0.03	0.82%	13.6	1.8	0.51	1.76	0.13
453+00	864.14	4	4	0	1.84	865.98	0.03	0.93%	60.0	1.2	0.42	1.67	0.12	863.76	4	4	0	0.94	864.70	0.03	1.62%	13.2	1.5	0.42	2.17	0.2
454+00	865.07	4	4	0	1.59	866.66	0.03	0.05%	9.4	0.8	0.63	0.5	0.01	865.38	4	4	0	0.89	866.27	0.03	0.35%	5.3	1.0	0.48	1.1	0.05
455+00	865.12	4	4	0	1.71	866.83	0.03	-1.06%	65.3	0.4	0.25	1.56	0.13	865.73	4	4	0	1.53	867.26	0.03	-1.27%	22.5	0.5	0.37	0.93	0.04
101+00	864.06	4	4	0	1.36	865.42	0.03	-1.63%	35.5	0.5	0.36	1.96	0.18	864.46	4	4	0	1.13	865.59	0.03	-2.44%	26.5	0.5	0.26	1.92	0.19
102+00	862.43	4	4	0	1.92	864.35	0.03	-1.91%	96.3	1.0	0.40	2.31	0.23	862.02	4	4	0	1.12	863.14	0.03	-2.20%	24.5	1.0	0.34	2.2	0.23
103+00	860.52	4	4	0	1.71	862.23	0.03	-2.32%	77.9	1.5	0.42	2.6	0.29	859.82	4	4	0	0.95	860.77	0.03	-2.33%	16.3	1.5	0.39	2.49	0.27
104+00	858.20	4	4	0	1.49	859.69	0.03	-2.50%	56.0	1.8	0.44	2.81	0.34	857.49	4	4	0	1.02	858.51	0.03	-2.36%	19.8	2.0	0.43	2.68	0.31
105+00	855.70	4	4	0	1.78	857.48	0.03	-1.96%	79.7	2.2	0.49	2.65	0.29	855.13	4	4	0	0.88	856.01	0.03	-3.09%	15.3	2.5	0.45	3.14	0.42
106+00	853.74	4	4	0	0.99	854.73	0.03	-4.11%	24.1	2.5	0.45	3.63	0.56	852.04	4	4	0	1.01	853.05	0.03	-3.05%	21.9	3.0	0.48	3.27	0.44
107+00	849.63	4	4	0	1.59	851.22	0.03	-3.62%	80.2	2.9	0.47	3.52	0.52	848.99	4	4	0	1.03	850.02	0.03	-3.03%	23.0	3.3	0.5	3.34	0.46
108+00	846.01	4	4	0	2.15	848.16	0.03	-3.20%	168.5	3.1	0.50	3.43	0.48	845.96	4	4	0	1.16	847.12	0.03	-3.29%	33.0	3.7	0.51	3.55	0.51
109+00	842.81	4	4	0	2.55	845.36	0.03	-2.61%	239.8	3.4	0.53	3.23	0.42	842.67	4	4	0	1.34	844.01	0.03	-3.07%	46.8	3.9	0.53	3.5	0.49
110+00	840.20	4	4	0	1.98	842.18	0.03	-2.72%	124.7	3.6	0.54	3.34	0.45	839.60	4	4	0	1.13	840.73	0.03	-3.35%	31.0	4.2	0.53	3.68	0.54
111+00	837.48	4	4	0	1.47	838.95	0.03	-2.67%	55.8	3.9	0.55	3.36	0.45	836.25	4	4	0	0.82	837.07	0.03	-2.40%	11.2	4.5	0.58	3.31	0.42
112+00	834.81	4	4	0	1.4	836.21	0.03	-2.67%	49.0	4.1	0.56	3.40	0.45	833.85	4	4	0	0.77	834.62	0.03	-2.62%	9.9	4.6	0.58	3.44	0.46
113+00	832.14	4	4	0	1.53	833.67	0.03	-3.23%	68.3	4.3	0.55	3.70	0.54	831.23	4	4	0	0.83	832.06	0.03	-2.91%	12.7	4.9	0.58	3.63	0.51
114+00	828.91	4	4	0	2.07	830.98	0.03	-4.78%	186.1	4.5	0.52	4.33	0.75	828.32	4	4	0	1.84	830.16	0.03	-3.35%	113.8	5.0	0.57	3.85	0.58
115+00														824.97	4	4	0	1.39	826.36	0.03	-3.58%	53.9	5.3	0.58	3.90	0.59
116+00	822.87	4	4	2	0.83	823.7	0.03	-3.57%	24.1	19.4	0.72	5.47	1.00	821.39	4	4	0	1.26	822.65	0.03	-2.86%	38.3	5.5	0.61	3.71	0.53
117+00	819.30	4	4	0	1.5	820.8	0.03	-2.80%	60.3	19.4	0.98	5.05	0.83	818.53	4	4	0	1.31	819.84	0.03	-2.43%	39.2	5.7	0.64	3.53	0.47
118+00	816.50	4	4	0	2.16	818.66	0.03	-1.62%	121.4	19.3	1.08	4.11	0.53	816.10	4	4	0	1.15	817.25	0.03	-1.83%	24.0	5.8	0.68	3.18	0.37
119+00	814.88	4	4	0	1.69	816.57	0.03	-2.57%	79.5	19.4	1.00	4.89	0.78	814.27	4	4	0	1.04	815.31	0.03	-2.76%	22.6	6.1	0.64	3.76	0.53
120+00	812.31	4	4	0	1.52	813.83	0.03	-2.68%	61.2	19.4	0.99	5.00	0.80	811.51	4	4	0	1.27	812.78	0.03	-2.59%	37.2	6.2	0.65	3.69	0.51
121+00	809.63	4	4	0	1.97	811.6	0.03	-1.68%	96.7	19.4	1.08	4.17	0.55	808.92	4	4	0	1	809.92	0.03	-2.31%	18.6	6.4	0.67	3.56	0.47
122+00	807.95	4	4	0	1.08	809.03	0.03	-1.89%	20.6	19.3	1.05	4.35	0.60	806.61	4	4	0	0.75	807.36	0.03	-1.67%	7.3	6.5	0.72	3.17	0.36
123+00	806.06	4	4	0	1.7	807.76	0.03	-1.32%	57.9	19.4	1.13	3.81	0.45	804.94	4	4	0	0.91	805.85	0.03	-1.28%	10.8	6.6	0.76	2.88	0.29
124+00	804.74	4	4	0	1.57	806.31	0.03	-1.08%	42.3	19.4	1.20	4.29	0.51	803.66	4	4	0	0.93	804.59	0.03	-0.78%	8.9	6.9	0.85	2.41	0.20
125+00	803.66	4	4	2	1.11	804.77	0.03	-1.34%	30.0	19.4	0.91	3.75	0.44	802.88	4	4	0	0.82	803.70	0.03	-1.52%	8.9	6.9	0.75	3.10	0.34
126+00	802.32	4	4	0	0.79	803.11	0.03	1.87%	8.9	3.6	0.56	2.85	0.32													
127+00	804.19	4	4	0	0.72	804.91	0.03	2.41%	7.9	3.4	0.53	3.09	0.38	804.85	4	4	0	1.73	806.58	0.03	1.97%	74.0	16.8	0.99	4.27	0.59
128+00	806.60	4	4	0	1.16	807.76	0.03	3.00%	31.5	3.2	0.49	3.30	0.45	806.82	4	4	0	1.67	808.49	0.03	2.83%	80.8	17.0	0.93	4.90	0.80
129+00	809.60	4	4	0	1.59	811.19	0.03	2.68%	69.0	3.0	0.49	3.12	0.40	809.65	4	4	0	1.54	811.19	0.03	2.26%	58.2	17.1	0.97	4.51	0.67
130+00	812.28	4	4	0	1.5	813.78	0.03	1.79%	48.3	2.7	0.51	2.61	0.28	811.91	4	4	0	1.87	813.78	0.03	2.36%	99.7	17.4	0.97	4.61	0.69
131+00	814.07	4	4	0	2.05	816.12	0.03	1.88%	113.7	2.4	0.48	2.58	0.27	814.27	4	4	0	1.85	816.12	0.03	1.77%	83.9	17.6	1.03	4.15	0.55
132+00	815.95	4	4	0	2.07	818.02	0.03	1.35%	98.9	2.2	0.50	2.23	0.20	816.04	4	4	0	1.98	818.02	0.03	1.92%	104.8	17.7	1.02	4.28	0.59
133+00	817.30	4	4	0	2.5	819.8	0.03	1.12%	149.0	1.8	0.48	1.98	0.16	817.96	4	4	0	1.09	819.05	0.03	1.83%	20.8	18.0	1.03	4.23	0.57
134+00	818.42	4	4	0	2.8	821.22	0.03	4.23%	391.8	1.4	0.34	3.06	0.43	819.79	4	4	0	1.17	820.96	0.03	2.02%	26.4	18.1	1.02	4.39	0.62
135+00	822.65	4	20	0	0.38	823.03	0.03	2.51%	4.5	1.0	0.22	1.78	0.17	821.81	4	4	0	1.19	823.00	0.03	2.09%	28.1	18.4	1.02	4.47	0.64
136+00	825.16	4	20	0	0.28	825.44	0.03	1.14%	1.3	0.5	0.19	1.11	0.07	823.90	4	4	2	0.81	824.71	0.03	2.39%	20.2	18.5	0.78	4.65	0.71
153+00														862.07	4	4	0	1.75	863.82	0.03	2.37%	68.7	13.0	0.86	4.42	0.67
154+00														864.44	4	4	0	2.11	866.55	0.03	5.28%	163.6	12.3	0.74	5.63	1.14
155+00														869.72	4	4	0	1.67	871.39	0.03	4.77%	82.6	11.5	0.73	5.39	1.04
156+00	874.17	4	4	0	1.31	875.48	0.03	2.12%	26.3	1.5	0.40	2.39	0.25	874.49	4	3	0	1.62	876.11	0.03	2.94%	47.6	0.5	0.27	2.02	0.21
157+00	876.29	2	4	0	2.95	879.24	0.03	2.12%	202.8	1.0	0.38	2.29	0.24	877.43	4	3	0	1.81	879.24	0.03	0.96%	70.1	4.6	0.60	3.68	0.52
158+00	878.41	4	4	0	1.31	879.72	0.03	-0.37%	10.1	0.5	0.36	0.97	0.04	878.39	4	4	0	2.37	880.76	0.03	0.45%	67.3	4.6	0.81	1.75	0.11
159+00	878.04	4	4	0	1.13	879.17	0.03	-0.70%	8.9	3.3	0.65	1.96	0.14	878.84	4	4	0	1.26	880.1	0.03	-2.11%	19.3	0.4	0.24	1.73	0.16
160+00	877.34	4	4	0	0.93	878.27	0.03	-4.53%	11.5	3.6	0.47	4.02	0.67	876.73	4	4	0	2.23	878.96	0.03	-3.06%	174.4	0.7	0.26	2.54	0.33
161+00	872.81	4	2	0	2.84	875.65	0.03	-4.88%	321.8	4.1	0.55	4.47	0.80	873.67	4	2.7	0	1.98	875.65	0.03	-4.78%	137.2	1.1	0.32	3.13	0.46
162+00	867.93	4	2	0	2.65	870.58	0.015	-6.44%	614.7	2.6	0.34	7.44	0.65	868.89	4	4	0	2.1	870.99	0.03	-7.52%	242.6	1.3	0.30	3.72	0.67
163+00	861.49	4	4	0	1.8	863.29	0.015	-8.24%	247.9	3.2	0.35	8.6	0.85													
164+00	853.25	4	4	0	2.15	855.4	0.015	-7.79%	525.8	3.9	0.34	8.35	0.81													
165+00	845.46	4	3	0	2.28	847.74	0.015	-7.27%	516.4	4.5	0.39	8.67	0.84													

Filename: ...\Cad\Plan\015012-000*TBL02.dgn
Date: 5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DITCH TABLES

DATE: 5/17/2021			SHEET 2 OF 3
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	144

STATION	LEFT SIDE													RIGHT SIDE											
	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)	FLOW LINE ELEV.	FRONT SLOPE (X:1)	BACK SLOPE (X:1)	BOTTOM WIDTH	DITCH DEPTH (ft)	TOP OF BANK ELEV.	MANNING'S n	CHANNEL SLOPE	DITCH CAPACITY (CFS)	DESIGN FLOW (5yr)(CFS)	NORMAL DEPTH (ft)	VELOCITY (ft/s)	SHEAR STRESS (LB/SF)
166+00	838.19	4	3	0	2.28	840.47	0.015	-6.48%	487.6	4.9	0.41	8.48	0.79												
167+00	831.71	3	4	1.56	2.33	834.04	0.015	-4.68%	554.3	16.3	0.50	9.94	0.92												
168+00	827.03	3	4	1.56	2.28	829.31	0.015	-3.43%	449.9	16.7	0.54	8.93	0.73												
169+00	823.60	3	4	1.56	2.28	825.88	0.015	-3.05%	424.3	16.8	0.56	8.57	0.66												
170+00	820.55	3	4	1.5	2.28	822.83	0.015	-1.85%	327.7	17.4	0.64	7.2	0.45												
171+00	818.70	3	4	1.66	2.28	820.98	0.015	-1.19%	268.7	15.6	0.66	5.92	0.30	817.94	4	3	0	1.02	818.96	0.03	-2.86%	19.0	1.2	0.36	2.61	0.31
172+00	817.51	3	4	1.47	2.28	819.79	0.015	-2.39%	370.9	24.3	0.71	8.63	0.63	815.08	4	3	0	1.87	816.95	0.03	-2.27%	85.0	1.6	0.42	2.57	0.29
173+00	815.12	4	4	0	1.26	816.38	0.03	-2.84%	38.2	24.3	1.06	5.37	0.91	812.81	4	4	0	2.40	815.21	0.03	-3.06%	220.9	2.1	0.42	2.99	0.39
174+00	812.28	4	4	0	1.27	813.55	0.03	-3.38%	42.5	24.4	1.03	5.74	1.06	809.75	4	4	0	2.11	811.86	0.03	-3.14%	158.8	2.6	0.45	3.19	0.43
175+00	808.90	4	4	0	1.59	810.49	0.03	-3.26%	76.1	24.3	1.04	5.66	1.02	806.61	4	3	0	1.98	808.59	0.03	-2.73%	108.6	3.2	0.53	3.28	0.43
176+00	805.64	4	4	2	0.89	806.53	0.03	-3.11%	28.3	23.6	0.82	5.46	0.96	803.88	4	4	0	1.47	805.35	0.03	-2.46%	53.6	3.4	0.52	3.11	0.39
177+00	802.53	5	4	0	1.2	803.73	0.03	-2.37%	34.6	23.5	1.04	4.85	0.75	801.42	4	4	0	1.94	803.36	0.03	-1.67%	92.5	3.9	0.59	2.79	0.30
178+00	800.16	5	4	4	1.46	801.62	0.03	-1.93%	97.8	33.2	0.88	4.77	0.69	799.75	4	4	0	1.59	801.34	0.03	-3.14%	74.6	4.4	0.55	3.64	0.52
179+00	798.23	2	3	2	1.17	799.4	0.03	-2.77%	37.4	33.9	1.12	6.33	1.17	796.61	4	4	0	2.00	798.61	0.03	-1.78%	103.6	4.8	0.63	3.01	0.34
180+00	795.46	4	4	0	2.44	797.9	0.03	-1.65%	169.5	34.8	1.35	4.79	0.67	794.83	4	4	0	1.39	796.22	0.03	-1.93%	40.9	5.3	0.65	3.18	0.38
181+00	793.81	4	4	0	2.22	796.03	0.03	-0.92%	98.4	35.5	1.52	3.87	0.42	792.90	4	4	0	1.14	794.04	0.03	-1.47%	21.0	5.7	0.70	2.92	0.31
182+00	792.89	4	4	0	1.64	794.53	0.03	-2.53%	72.8	35.4	1.25	5.65	0.96	791.43	4	4	0	1.09	792.52	0.03	-1.90%	21.2	6.0	0.68	3.26	0.39
183+00	790.36	4	4	0	2	792.36	0.03	-2.64%	126.2	35.7	1.25	5.75	1.00	789.53	4	4	0	1.40	790.93	0.03	-2.01%	42.5	6.4	0.69	3.38	0.42
184+00	787.72	3	4	0	2.58	790.3	0.03	-1.84%	180.6	35.9	1.41	5.18	0.78	787.52	4	4	0	1.52	789.04	0.03	-1.91%	51.6	6.6	0.70	3.34	0.41
185+00																										
186+00	783.58	4	4	0	1.68	785.26	0.03	-4.79%	106.8	32.9	1.31	4.80	0.68												
189+00														774.92	4	4	0	1.02	775.94	0.03	-1.71%	16.9	7.6	0.76	3.32	0.39
190+00														773.21	4	4	0	0.94	774.15	0.03	-1.26%	11.6	7.7	0.81	2.97	0.31
191+00	773.02	4	4	0	0.57	773.59	0.03	-1.62%	3.5	0.3	0.23	1.45	0.11	771.95	4	4	0	1.26	773.21	0.03	-7.76%	63.1	8.0	0.58	5.93	1.36
192+00	771.40	4	4	0	0.55	771.95	0.03	-1.71%	3.2	0.7	0.31	1.83	0.16												
193+00	769.69	4	4	0	0.97	770.66	0.03	0.21%	5.2	1.0	0.52	0.91	0.03	771.32	4	3	0	2.27	773.59	0.03	-0.80%	84.7	0.4	0.31	1.23	0.07
194+00	769.90	4	4	0	0.94	770.84	0.03	0.78%	9.2	0.5	0.32	1.25	0.08	770.52	4	3	0	2.48	773.00	0.03	-0.23%	57.5	2.2	0.73	1.18	0.05
195+00														770.29	4	4	0	1.57	771.86	0.03	-1.06%	41.9	2.3	0.53	2.09	0.18
196+00	768.76	4	4	0	1.51	770.27	0.03	-1.67%	50.9	0.5	0.27	1.76	0.16	769.23	4	4	0	1.00	770.23	0.03	-0.99%	12.2	2.4	0.54	2.00	0.16
197+00	767.09	2	4	0	1.65	768.74	0.03	0.88%	32.1	1.0	0.45	1.65	0.12	768.24	4	3	0	2.13	770.37	0.03	-0.14%	29.9	2.3	0.81	0.99	0.03
198+00	767.97	4	4	0	1.03	769	0.03	-3.95%	26.3	1.9	0.38	3.21	0.46	768.10	4	3	1.5	1.62	769.72	0.015	-0.24%	51.5	4.3	0.54	2.35	0.05
199+00	764.02	4	4	0	1.45	765.47	0.03	-1.26%	37.0	2.8	0.55	2.31	0.21	767.86	3.4	3	1.5	1.12	768.98	0.015	-0.17%	17.1	4.4	0.6	2.12	0.04
200+00	762.76	4	4	0	1.33	764.09	0.03	1.46%	31.6	3.7	0.60	2.61	0.26	767.69	4.7	3	1.5	0.75	768.44	0.015	-1.86%	25.7	4.4	0.33	4.92	0.25
201+00	764.22	4	4	0	0.84	765.06	0.03	-3.03%	13.4	4.5	0.56	3.61	0.51												
202+00	761.19	4	4	0	2.02	763.21	0.03	-0.59%	61.3	0.8	0.40	1.27	0.07												
203+00	760.60	4	4	0	2.29	762.89	0.03	-0.25%	31.5	1.6	0.75	0.71	0.02												
204+00	760.35	4	4	0	2.28	762.63	0.03	-0.25%	55.1	2.4	0.70	1.21	0.05												
205+00	760.10	4	4	0	2.01	762.11	0.03	-1.76%	104.4	3.2	0.54	2.70	0.29												

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

DITCH TABLES

DATE: 5/17/2021 SHEET 3 OF 3

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	145

Filename: ...\Cad\Plan\015012-000*TBL03.dgn
Date: 5/17/2021

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (2) (CY)	Class "C" Conc (Wingwall) (3) (CY)	Total Wingwall Area (SF)
STA 192+24.94 (Both)	1 ~ 9'x 2.5'	4'	SCC-9	SETB-CD	0°	4:1	8"	7"	0.000'	2.917'	N/A	N/A	10.333'	N/A	10.167'	0.0	0.0	6.5	N/A
STA 201+25.73 (Both)	1 ~ 3.75'x 2'	6'	SCC-3&4	SETB-CD	0°	3:1	8"	7"	0.000'	2.417'	N/A	N/A	6.250'	N/A	4.917'	0.0	0.0	2.3	N/A

NOTES:
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
Side slope at culvert for flared or straight wingwalls.
Channel slope for parallel wingwalls.
Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)
Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

(1) Round the wall heights shown to the nearest foot for bidding purposes.

(2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.

(3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.

(4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

Bridge Division Standard

BOX CULVERT SUPPLEMENT
WINGS AND END TREATMENTS

BCS

FILE: bcsstde1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		146

DATE: 5/17/2021 3:41:14 PM
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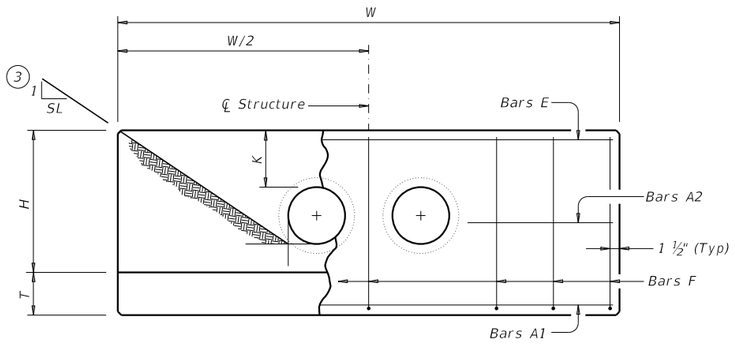
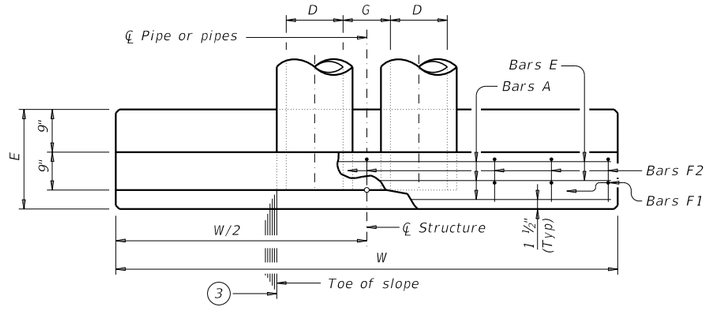
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

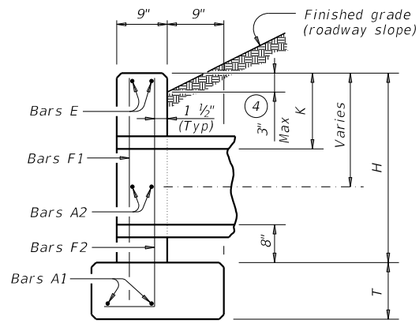
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	24"	14' – 0"	217	2.1	3' – 7"	34	0.4
	27"	15' – 3"	254	2.4	3' – 11"	37	0.5
	30"	16' – 6"	272	2.7	4' – 4"	40	0.6
	33"	17' – 9"	314	3.1	4' – 8"	43	0.6
	36"	19' – 0"	371	3.9	5' – 1"	46	0.8
	42"	21' – 6"	442	4.9	5' – 10"	52	1.0
	48"	25' – 0"	569	6.4	6' – 7"	59	1.3
	54"	27' – 6"	701	7.5	7' – 6"	82	1.6
	60"	30' – 0"	794	8.8	8' – 3"	90	1.8
	66"	32' – 6"	894	10.2	8' – 9"	96	2.0
	72"	35' – 0"	1,055	11.7	9' – 4"	103	2.3
3:1	12"	13' – 0"	175	1.6	1' – 9"	14	0.2
	15"	14' – 9"	193	1.9	2' – 2"	17	0.2
	18"	16' – 6"	228	2.2	2' – 8"	19	0.3
	21"	18' – 3"	299	2.6	3' – 1"	31	0.4
	24"	20' – 0"	323	3.0	3' – 7"	33	0.4
	27"	21' – 9"	371	3.5	3' – 11"	37	0.5
	30"	23' – 6"	415	4.0	4' – 4"	40	0.5
	33"	25' – 3"	469	4.6	4' – 8"	43	0.6
	36"	27' – 0"	556	5.7	5' – 1"	46	0.8
	42"	30' – 6"	675	7.1	5' – 10"	52	1.0
	48"	35' – 6"	837	9.2	6' – 7"	59	1.3
	54"	39' – 0"	1,015	11.0	7' – 6"	84	1.6
	60"	42' – 6"	1,171	12.9	8' – 3"	91	1.8
	66"	46' – 0"	1,298	14.9	8' – 9"	98	2.0
	72"	49' – 6"	1,561	17.1	9' – 4"	103	2.3
4:1	12"	17' – 0"	229	2.0	1' – 9"	15	0.2
	15"	19' – 3"	266	2.4	2' – 2"	17	0.2
	18"	21' – 6"	308	2.9	2' – 8"	19	0.3
	21"	23' – 9"	382	3.5	3' – 1"	31	0.3
	24"	26' – 0"	430	3.9	3' – 7"	34	0.4
	27"	28' – 3"	486	4.7	3' – 11"	37	0.5
	30"	30' – 6"	539	5.2	4' – 4"	40	0.6
	33"	32' – 9"	603	6.0	4' – 8"	42	0.6
	36"	35' – 0"	738	7.5	5' – 1"	47	0.8
	42"	39' – 6"	881	9.3	5' – 10"	52	1.0
	48"	46' – 0"	1,102	12.1	6' – 7"	61	1.3
	54"	50' – 6"	1,364	14.4	7' – 6"	84	1.6
	60"	55' – 0"	1,547	16.9	8' – 3"	91	1.8
	66"	59' – 6"	1,741	19.5	8' – 9"	98	2.0
	72"	64' – 0"	2,077	22.4	9' – 4"	102	2.3
6:1	12"	25' – 0"	336	3.0	1' – 9"	14	0.2
	15"	28' – 3"	384	3.6	2' – 2"	17	0.2
	18"	31' – 6"	452	4.2	2' – 8"	19	0.3
	21"	34' – 9"	581	5.1	3' – 1"	31	0.4
	24"	38' – 0"	644	5.8	3' – 7"	34	0.4
	27"	41' – 3"	737	6.9	3' – 11"	37	0.5
	30"	44' – 6"	807	7.7	4' – 4"	39	0.6
	33"	47' – 9"	912	8.9	4' – 8"	44	0.6
	36"	51' – 0"	1,108	11.0	5' – 1"	48	0.8
	42"	57' – 6"	1,318	13.7	5' – 10"	54	1.0
	48"	67' – 0"	1,682	17.9	6' – 7"	59	1.3
	54"	73' – 6"	2,072	21.3	7' – 6"	83	1.6
	60"	80' – 0"	2,351	24.9	8' – 3"	89	1.8
	66"	86' – 6"	2,643	28.9	8' – 9"	96	2.0
	72"	93' – 0"	3,121	33.1	9' – 4"	101	2.3



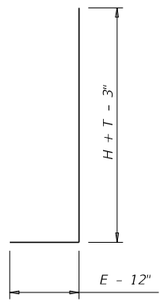
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

(1) Total quantities include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' – 9"	1' – 0"	2' – 8"	0' – 9"	1' – 9"
15"	0' – 11"	1' – 0"	2' – 11"	0' – 9"	1' – 9"
18"	1' – 2"	1' – 0"	3' – 2"	0' – 9"	1' – 9"
21"	1' – 4"	1' – 0"	3' – 5"	0' – 9"	2' – 0"
24"	1' – 7"	1' – 0"	3' – 8"	0' – 9"	2' – 0"
27"	1' – 8"	1' – 0"	3' – 11"	0' – 9"	2' – 3"
30"	1' – 10"	1' – 0"	4' – 2"	0' – 9"	2' – 3"
33"	1' – 11"	1' – 0"	4' – 5"	0' – 9"	2' – 6"
36"	2' – 1"	1' – 0"	4' – 8"	1' – 0"	2' – 6"
42"	2' – 4"	1' – 0"	5' – 2"	1' – 0"	2' – 9"
48"	2' – 7"	1' – 3"	5' – 11"	1' – 0"	3' – 0"
54"	3' – 0"	1' – 3"	6' – 5"	1' – 0"	3' – 3"
60"	3' – 3"	1' – 3"	6' – 11"	1' – 0"	3' – 6"
66"	3' – 3"	1' – 3"	7' – 5"	1' – 0"	3' – 9"
72"	3' – 4"	1' – 3"	7' – 11"	1' – 0"	4' – 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' – 6"	~
E	#5	~	2
F	#5	1' – 0"	~

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

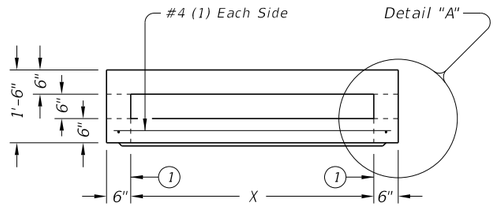
Texas Department of Transportation

Bridge Division Standard

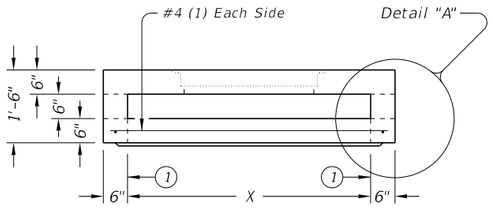
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

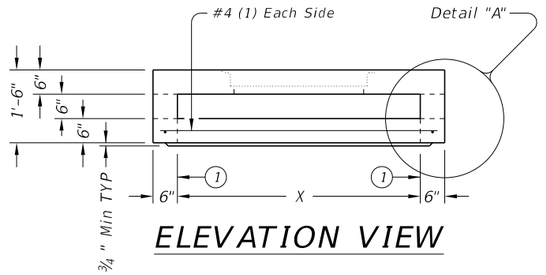
FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		147



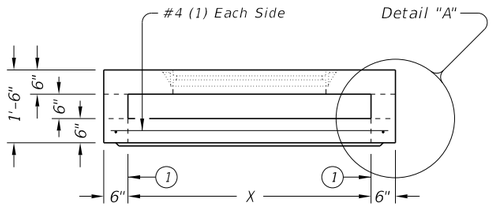
ELEVATION VIEW



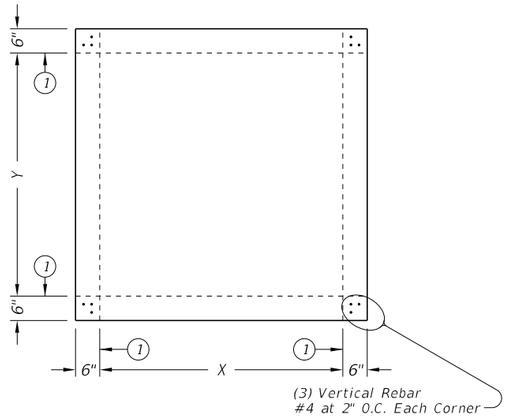
ELEVATION VIEW



ELEVATION VIEW

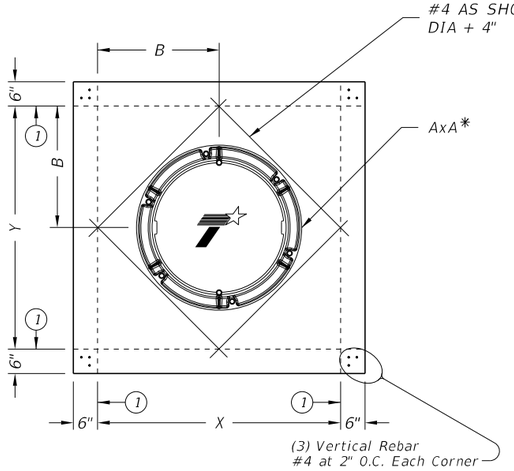


ELEVATION VIEW



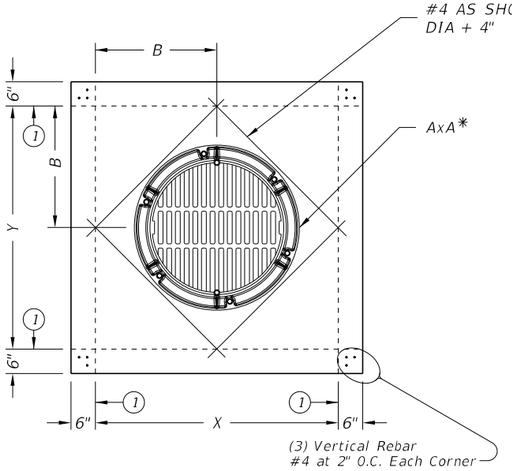
PLAN VIEW
NO OPENINGS

STYLE 'SL'



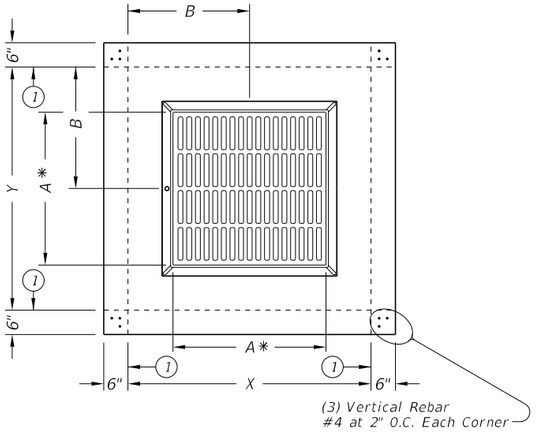
PLAN VIEW
32" DIA CAST-IN RING & COVER

STYLE 'RC'



PLAN VIEW
32" DIA CAST-IN RING & GRATE

STYLE 'RG'



PLAN VIEW
CAST-IN FRAME & GRATE

STYLE 'FG'

Style	Size (X x Y)	A x A *	B x B	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	n/a	n/a	0.37 in²/ft	0.37 in²/ft
RC,RG	3'x3'	32" Dia	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
FG	3'x3'	3'x3'	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
SL	4'x4'	n/a	n/a	0.34 in²/ft	0.34 in²/ft
RC,RG	4'x4'	32" Dia	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	3'x3'	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	4'x4'	2'x2'	0.34 in²/ft	0.34 in²/ft
SL	5'x5'	n/a	n/a	0.43 in²/ft	0.43 in²/ft
RC,RG	5'x5'	32" Dia	2.5'x2.5'	0.68 in²/ft	0.68 in²/ft
FG	5'x5'	3'x3'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft
FG	5'x5'	4'x4'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft

* Nominal frame/grate or ring/cover size.

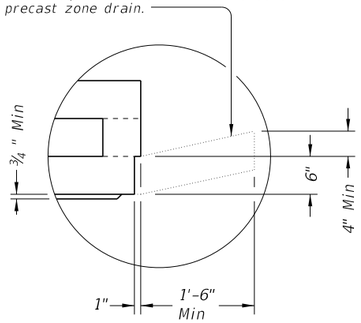
(1) Matches inside face of wall of precast base or riser below inlet.

FABRICATION NOTES:
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of ¾" to reinforcing from bottom of slab for structural reinforcement. Place short span reinforcing closest to surface.
4. No substitution is allowed for diagonal #4 bars around openings.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:
1. PAZD is for use in ditches and medians outside of the horizontal clearance (clear zone). Precast Area Zone Drain is not intended for direct traffic and may not be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:
1. Designed according to ASTM C913.
2. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Construct cast-in-place reinforced concrete apron when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PAZD. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PAZD, use detail above to create an apron ledge on all 4 sides.

Texas Department of Transportation

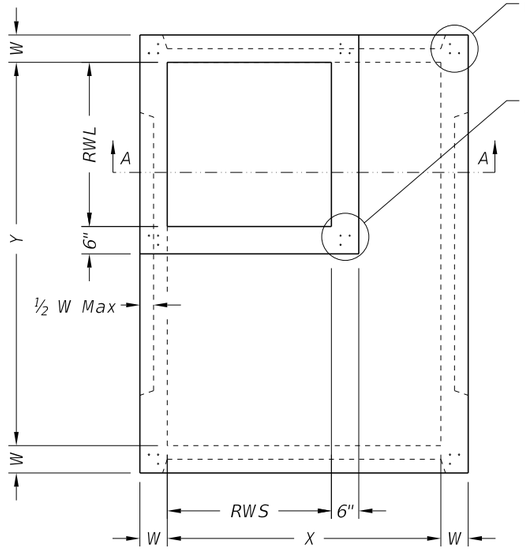
Bridge Division Standard

PRECAST AREA ZONE DRAIN

PAZD

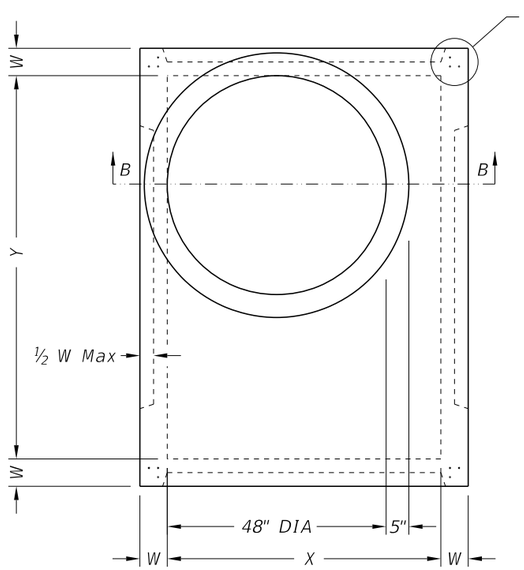
FILE: prestd08-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		148

DATE: 5/17/2021 3:41:16 PM
FILE: K:\015012-000\Cad\Plan\STND\PAZD-20.dgn



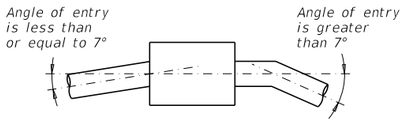
PLAN VIEW "A"

SQUARE REDUCED RISER OPTION



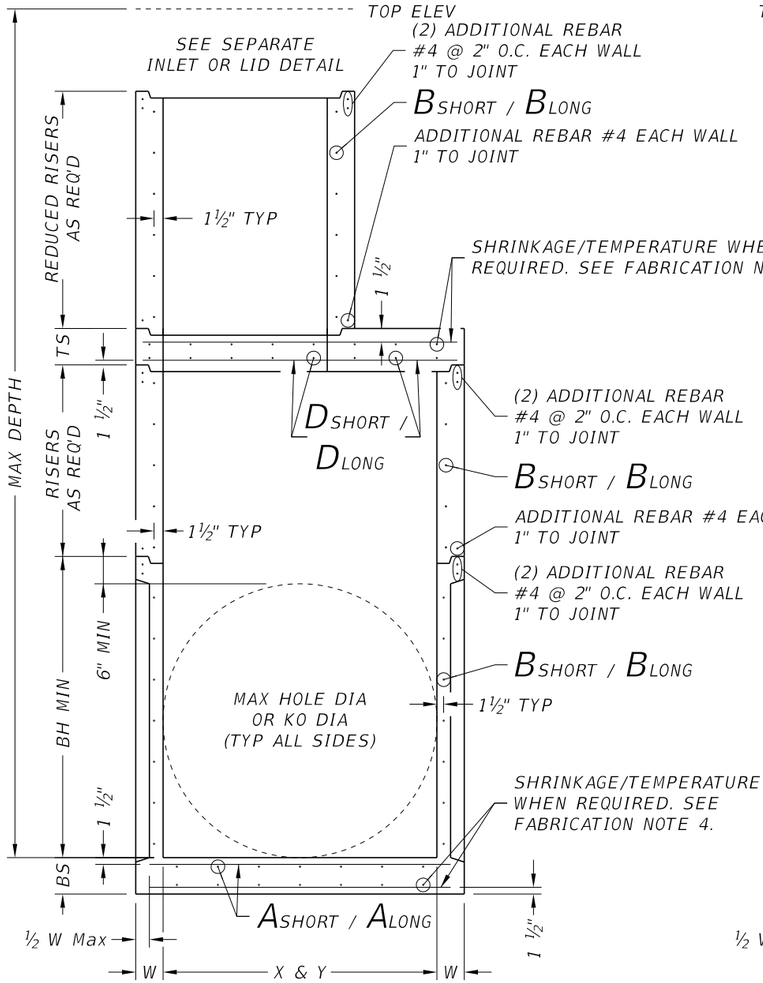
PLAN VIEW "B"

ROUND REDUCED RISER OPTION



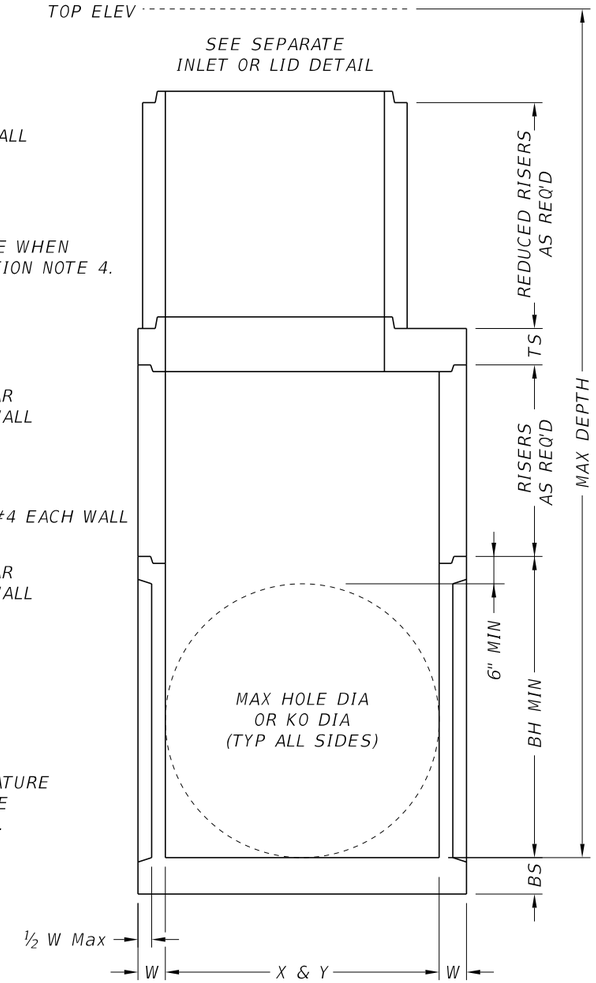
PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PB wall.
If necessary, use pipe elbow or curved
approach alignment to stay within this limit.



SECTION A-A

SQUARE REDUCED RISER OPTION



SECTION B-B

ROUND REDUCED RISER OPTION

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in^2/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST BASE

PB

FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		149

DATE: 5/17/2021 3:41:17 PM
FILE: K:\015012-000\Cad\Plan\STND\PB-20.dgn

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB										Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

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Bridge Division Standard

DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

FILE: prestd10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		150

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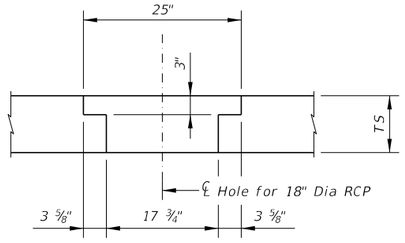
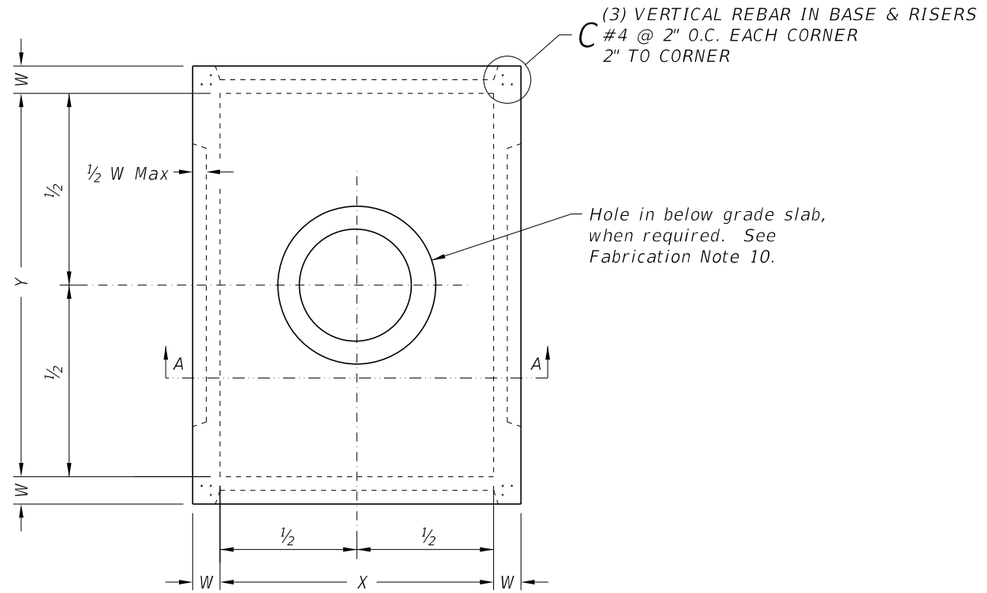
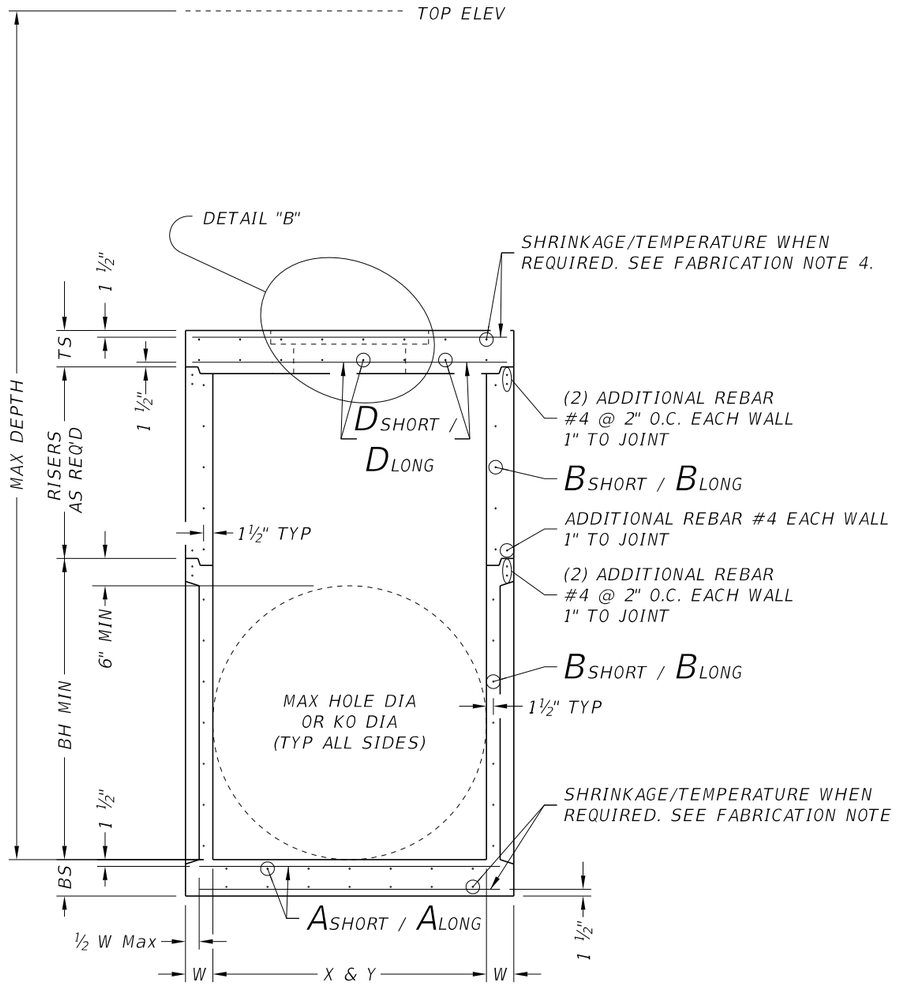


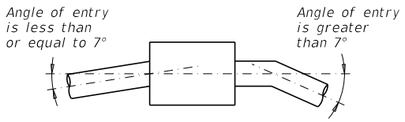
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in^2/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

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PRECAST JUNCTION BOX

PJB

FILE: prestd09-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		151

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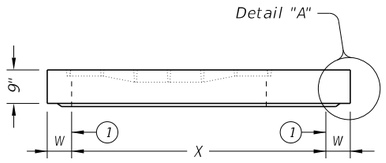
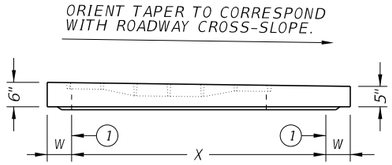
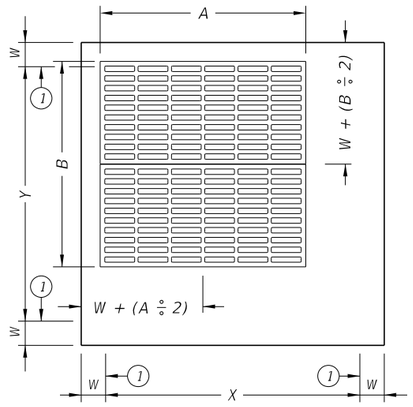


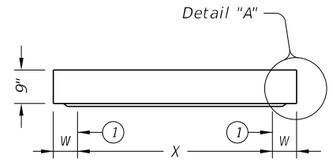
STYLE 'FG'



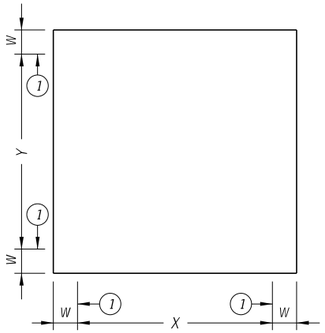
STYLE 'SFG'
ELEVATION VIEW



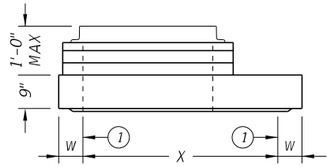
PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



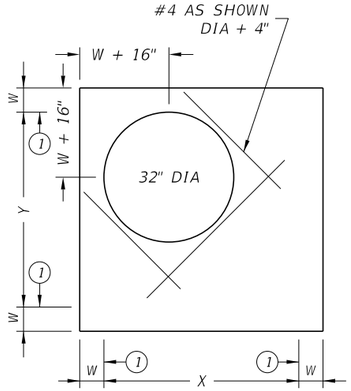
ELEVATION VIEW



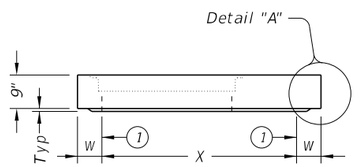
PLAN VIEW
NO OPENINGS
STYLE 'SL'



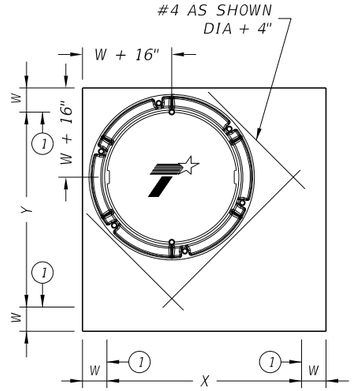
ELEVATION VIEW



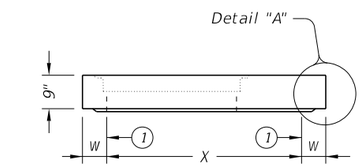
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



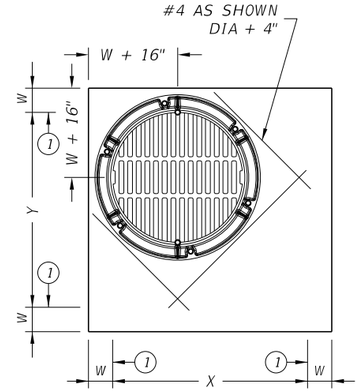
ELEVATION VIEW



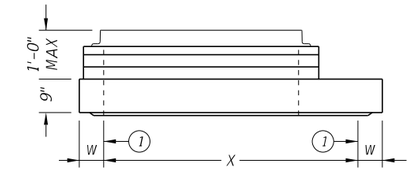
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



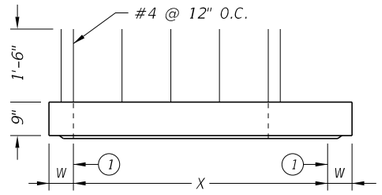
ELEVATION VIEW



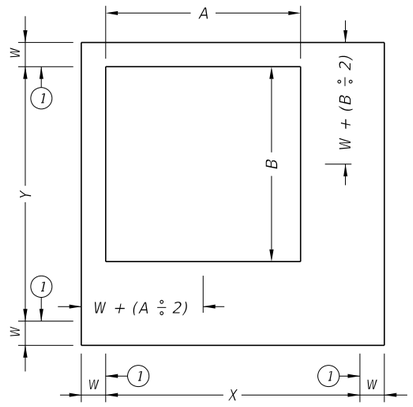
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



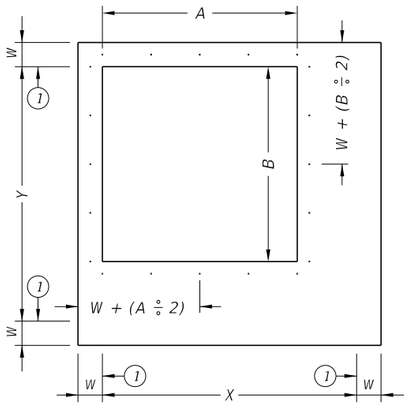
ELEVATION VIEW



ELEVATION VIEW



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

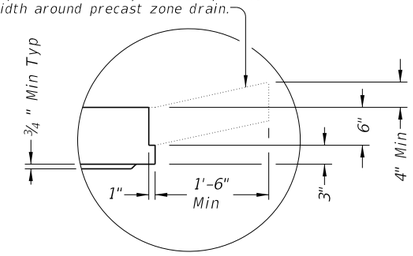
PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		152

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		153

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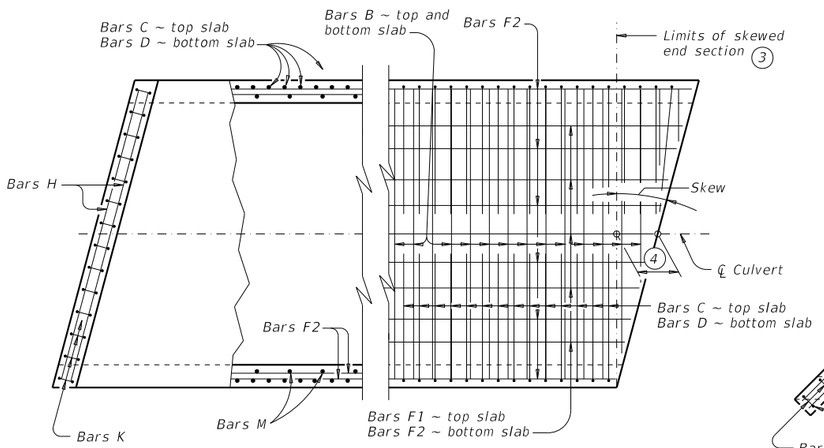
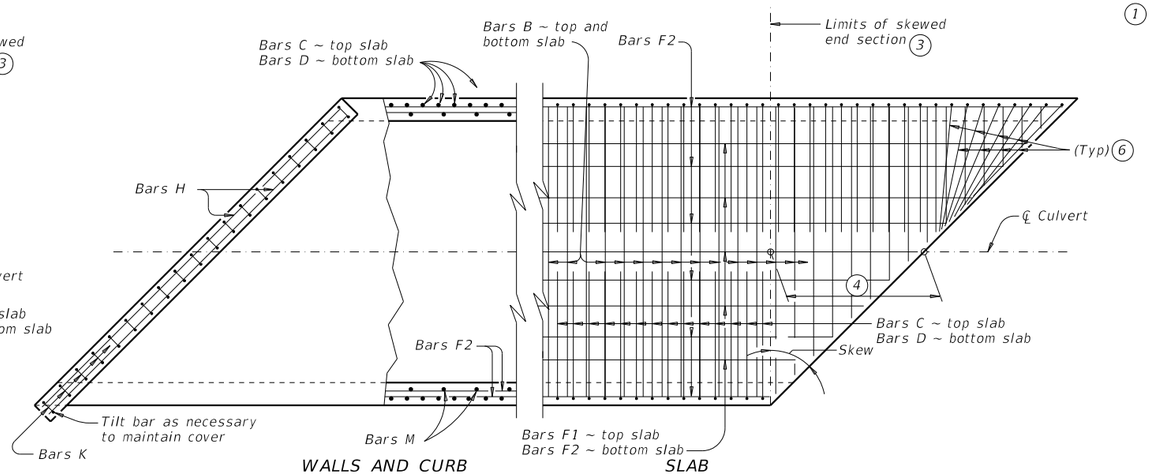
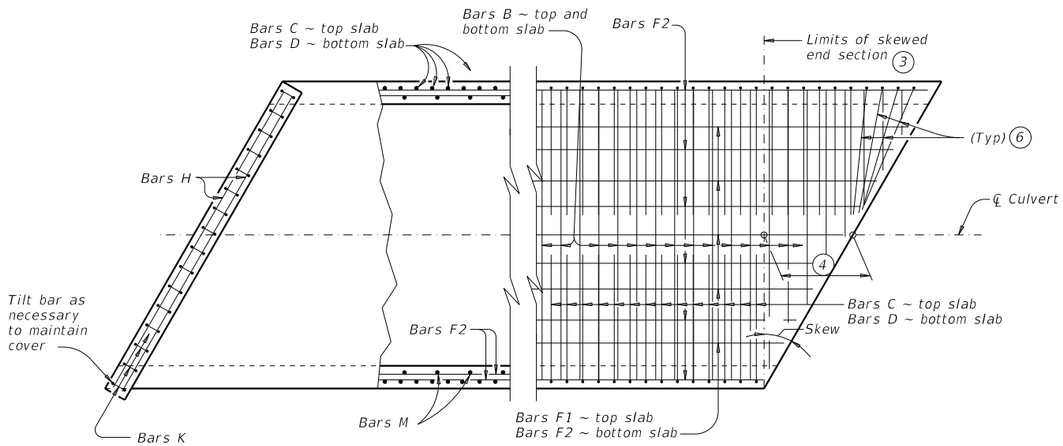


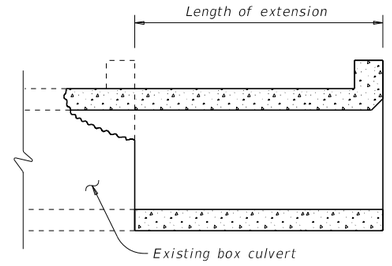
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° (7)



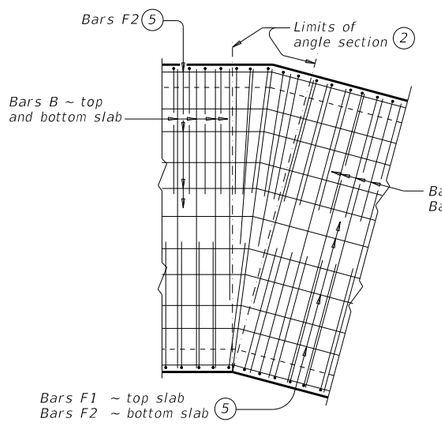
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



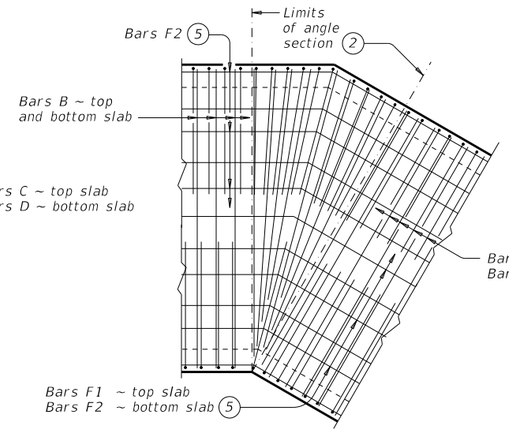
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



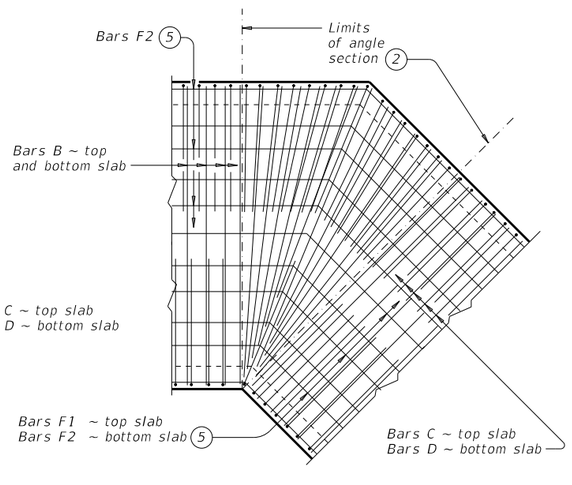
LENGTHENING DETAIL (1)



PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

(1) For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.

For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D , E, or F ancher adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.

Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

(2) When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.

(3) The length of Bars B vary in the skewed end sections.

(4) [One half of overall width] x [tangent of the skew angle]

(5) Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.

(6) When necessary to avoid conflictin acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.

(7) At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

CONSTRUCTION NOTES:

Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) with these exceptions:
provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.

For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.

For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

SCC-MD

FILE: sccmdste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AUS	HAYS		154

DATE: 5/17/2021 3:41:25 PM
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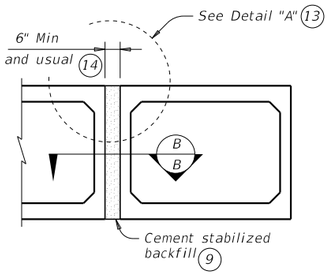
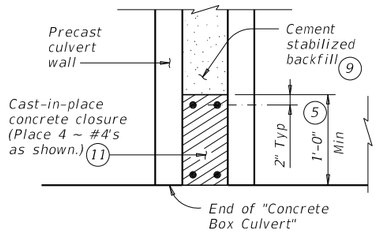
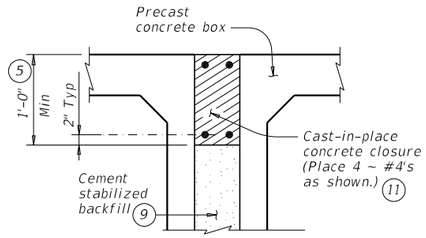


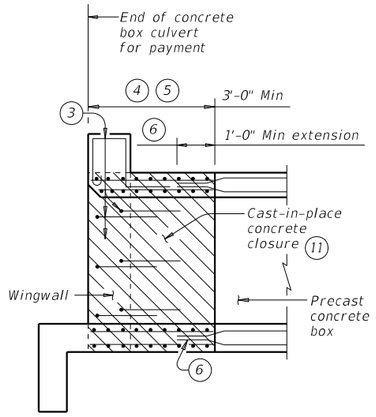
MULTIPLE UNIT PLACEMENT



SECTION B-B

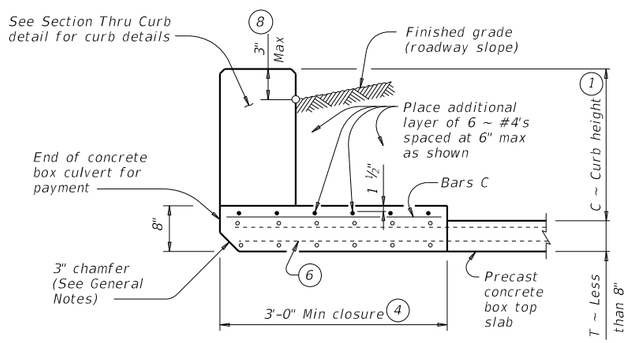


DETAIL "A" (13)

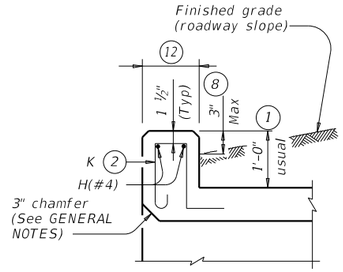


WINGWALL CONNECTION

(Also applies to safety end treatment.)

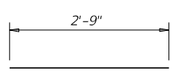


SECTION THRU TOP SLABS LESS THAN 8"

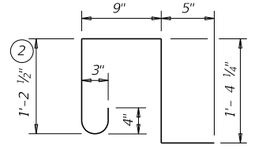


SECTION THRU CURB

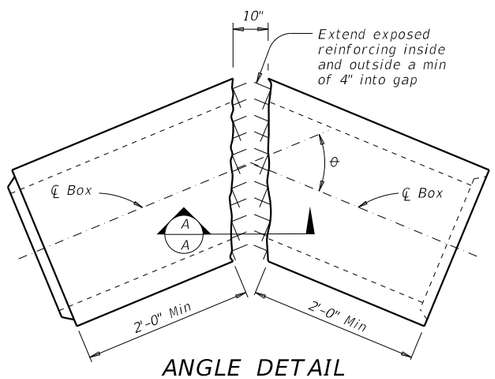
QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



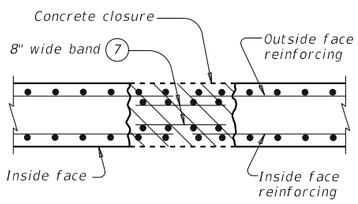
BARS C (#4)
(Spa = 1'–0" Max)



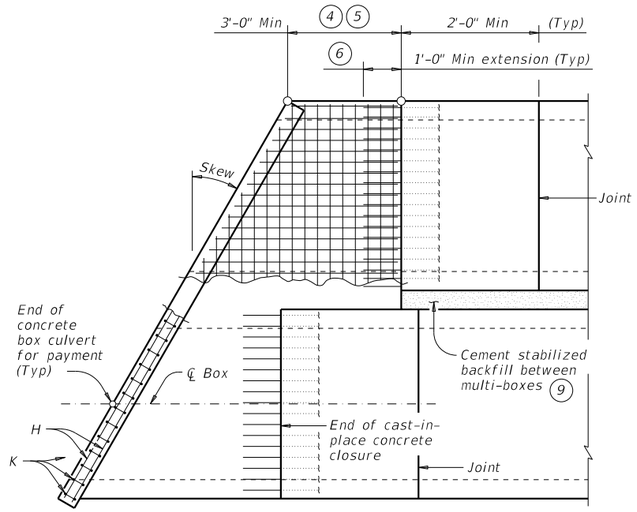
BARS K (#4)
(Spa = 1'–0" Max)
(Length = 4'–2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

1. 0" Min to 5'–0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'–0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631–CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. For curbs less than 1'–0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
3. Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
4. Provide a 3'–0" Min cast–in–place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast–in–place closure flush with the inside and outside faces of the precast box section.
5. For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'–0" Min cast–in–place closure in the top slab, bottom slab, and exterior wall. See Section B–B detail when interior walls are cast full length.
6. Extend precast box reinforcing a minimum of 1'–0" into concrete closure (Typ).
7. Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
9. Cement stabilized backfill between boxes is considered part of the box culvert for payment.
10. All curb concrete and reinforcing is considered part of the box culvert for payment.
11. Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
12. 1'–0" typical. 2'–3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
13. For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
14. This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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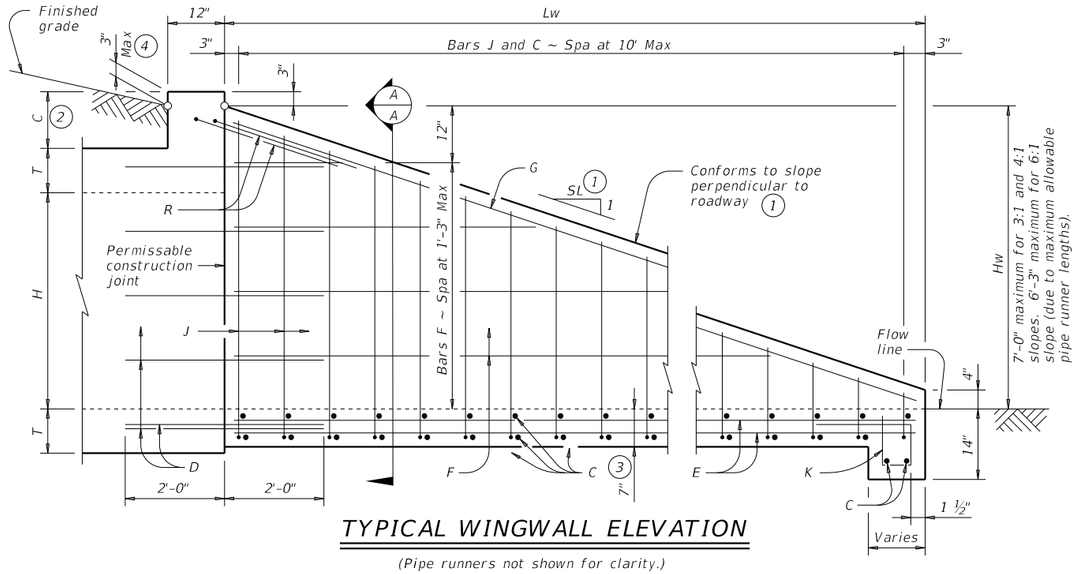
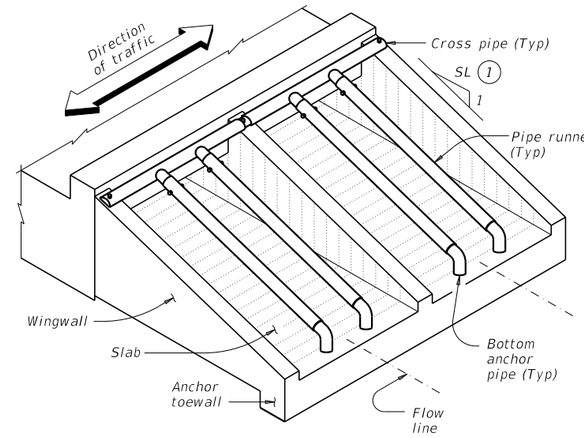


TYPICAL WINGWALL ELEVATION

(Pipe runners not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

WING DIMENSION CALCULATIONS:

$Hw = H + T + C - 0.250'$

$Lw = (Hw - 0.333') (SL)$

For cast-in-place culverts:

$Atw = (N) (S) + (N + 1) (U)$

For precast culverts:

$Atw = (N) (2U + S) + (N - 1) (0.500')$

Total Wingwall Area (SF)
$= (0.5) (Hw + 0.333') (Lw) (N + 1)$

Total Concrete Volume (CY)
$= [(\text{Wingwall Area}) (0.583') +$
$(Lw) (Atw) (0.583') +$
$(Atw) (1.167') (1.167' - 0.583')] \div (27)$

PIPE RUNNER DIMENSION CALCULATIONS:

Pipe Runner Length
$= (Lw) (K1) - (1.917')$

Total Reinforcing (Lb)
$= (1.55) (Lw) (Atw) +$
$(4.43) (Atw) +$
$(K2) (Hw) (N + 1) (\sqrt{Lw})$

C = Height of curb above top of top slab (feet)
Hw = Height of wingwall (feet)
K = Constant value for use in formulas

Slope SL:1	K1	K2
3:1	~ 1.054 ~	7.45
4:1	~ 1.031 ~	8.49
6:1	~ 1.014 ~	10.30

Atw = Anchor toewall length (feet)
Lw = Length of wingwall (feet)
N = Number of culvert barrels
SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for H, S, T, and U values.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

Adjust reinforcing as necessary to provide a minimum clear cover of 1 ½".

Provide Class "C" concrete (f`c = 3,600 psi).

Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts.

Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing".

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

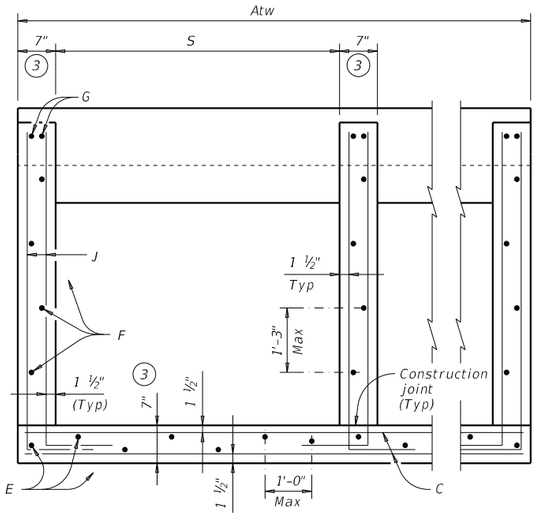
Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

The quantities for pipe runners, reinforcing steel, and concrete resulting from the formulas given herein are for Contractor's information only.

See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.

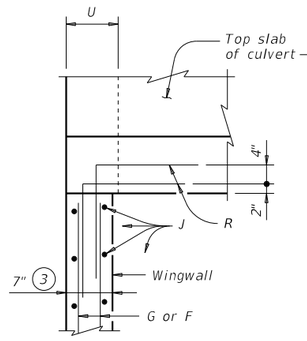
Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.



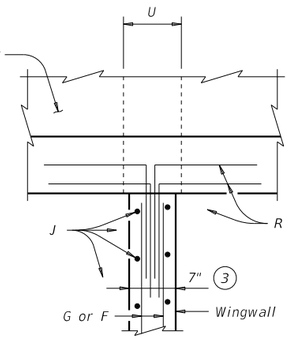
SECTION A-A

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)



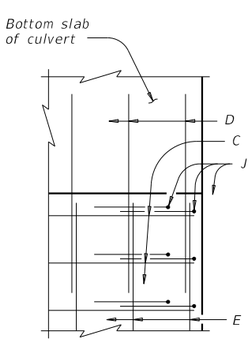
AT TOP OF EXTERIOR WINGWALL

(Cast-in-place culvert)



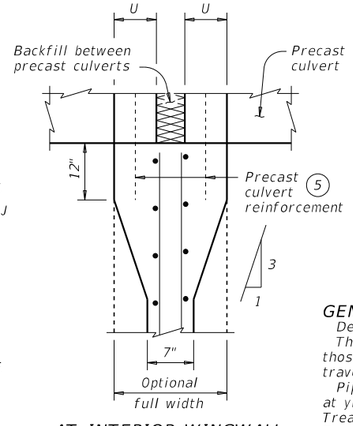
AT TOP OF INTERIOR WINGWALL

(Cast-in-place culvert)



AT OUTSIDE OF BOTTOM SLAB

(Cast-in-place culvert)



AT INTERIOR WINGWALL

(Precast culvert)

PLAN VIEWS OF CORNER DETAILS

(1) Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.

(2) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet.

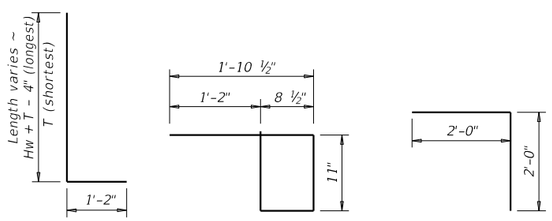
(3) Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.

(4) For vehicle safety, reduce curb height, if necessary, to provide a maximum 3" projection. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

TABLE OF REINFORCING BAR SIZES AND SPACING

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'-0" Max
F	#4	1'-3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'-0" Max
R	#4	As shown



SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 0° SKEW BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ CROSS DRAINAGE

SETB-CD

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
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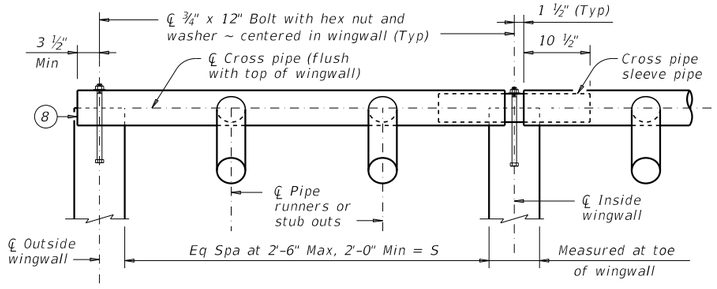
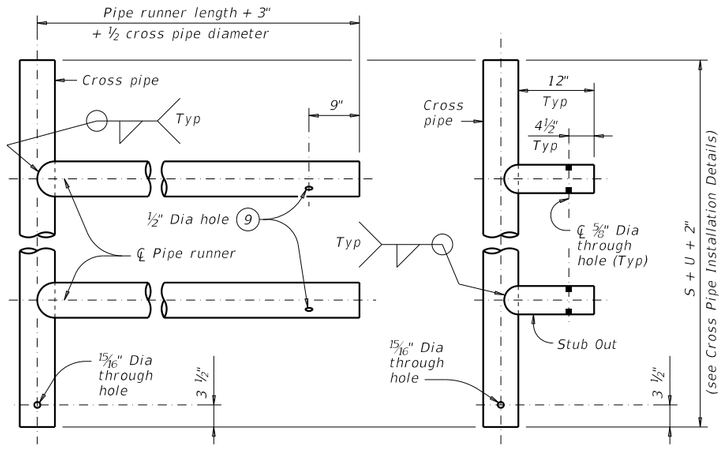
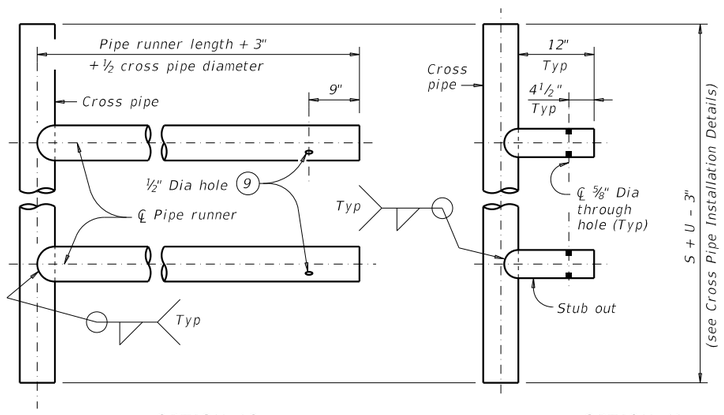


NOTE: At Contractor's option, make the cross pipe continuous across the inside wingwalls. If option is selected, omit the sleeve pipe and make a $^{15}/_{16}$" diameter through hole in the cross pipe to accept the anchor bolt at the centerline of each inside wingwall.

CROSS PIPE INSTALLATION DETAILS

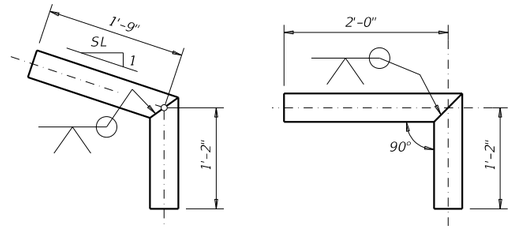


FOR USE IN OUTSIDE CULVERT BAY

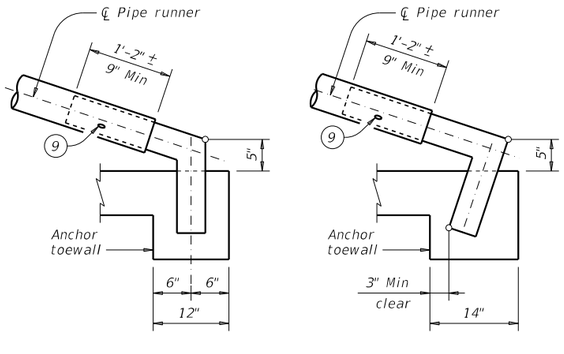


FOR USE IN INSIDE CULVERT BAY

CROSS PIPE AND CONNECTIONS DETAILS

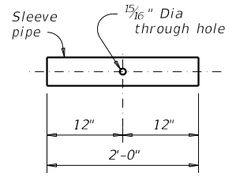


BOTTOM ANCHOR PIPE DETAILS (10)

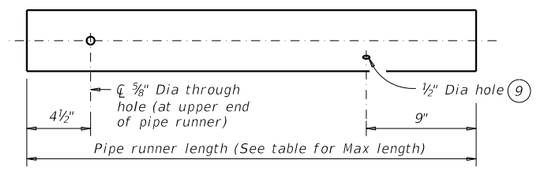


BOTTOM ANCHOR TOEWALL DETAILS

(Wingwall not shown for clarity.)

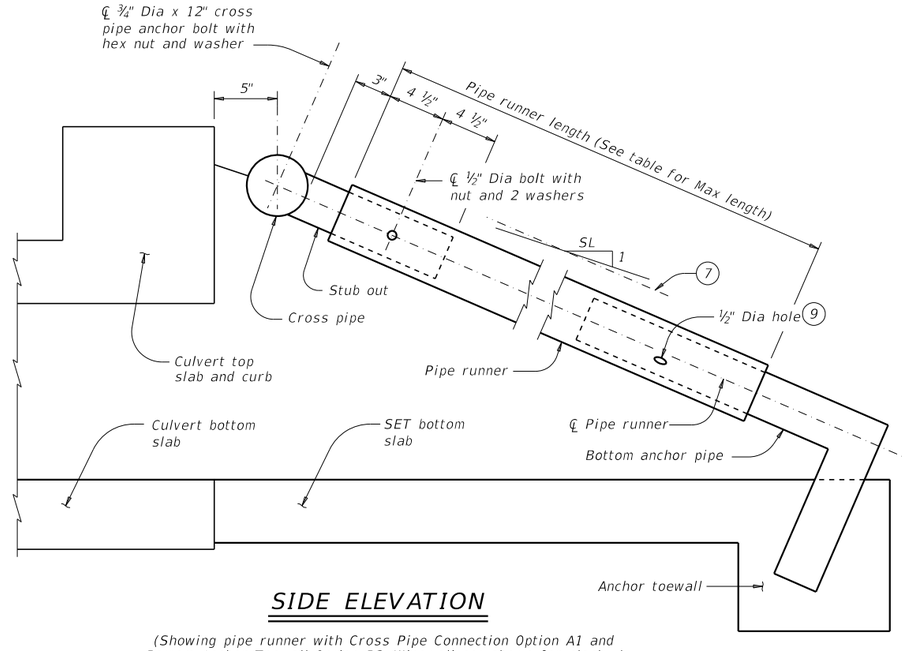


CROSS PIPE SLEEVE PIPE DETAILS



NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS



SIDE ELEVATION

(Showing pipe runner with Cross Pipe Connection Option A1 and Bottom Anchor Toewall Option B2. Wingwall not shown for clarity.)

(6) Cross pipe is the same size as the pipe runner. Cross pipe stub out is the same size as the anchor pipe.

(7) Note that actual slope of safety pipe runner may vary slightly from side slope.

(8) Take care to ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, inspect the 1#2" hole to ensure that the lap of the safety pipe runner with the bottom anchor pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MAXIMUM PIPE RUNNER LENGTHS AND (6) REQUIRED PIPE RUNNER AND ANCHOR PIPE SIZES

Maximum Pipe Runner Length	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
10'- 0"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'- 8"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
34'- 2"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"

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SHEET 2 OF 2

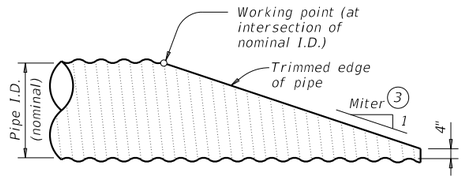
Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT

FOR 0° SKEW BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ CROSS DRAINAGE

SETB-CD

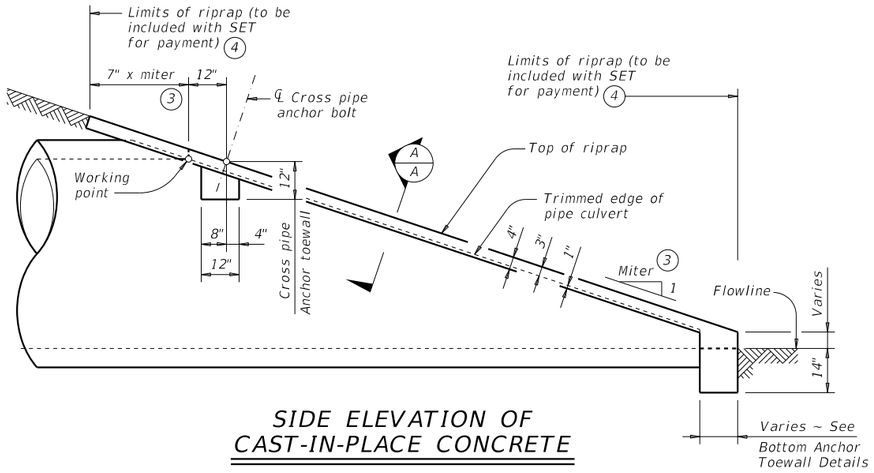
FILE: setbcdse-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		157



NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

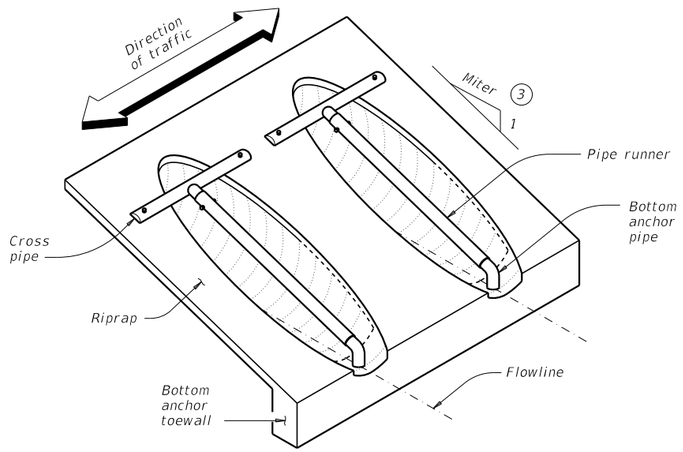
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert.
Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert.
Details of corrugated metal pipe (CMP) culvert
are similar. Pipe runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS (1) (2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1' – 7"	3' – 5"	N/A	N/A	N/A	5' – 10"	N/A	N/A	N/A	8' – 1"	N/A	N/A	N/A	12' – 9"
27"	1' – 8"	3' – 8"	N/A	N/A	5' – 5"	6' – 11"	N/A	N/A	7' – 7"	9' – 7"	N/A	N/A	11' – 11"	14' – 11"
30"	1' – 10"	3' – 11"	N/A	N/A	6' – 4"	8' – 0"	N/A	N/A	8' – 9"	11' – 0"	N/A	N/A	13' – 8"	17' – 0"
33"	1' – 11"	4' – 2"	6' – 2"	6' – 5"	7' – 3"	9' – 1"	8' – 6"	8' – 10"	10' – 0"	12' – 5"	13' – 3"	13' – 9"	15' – 5"	19' – 2"
36"	2' – 1"	4' – 5"	6' – 11"	7' – 3"	8' – 2"	10' – 2"	9' – 6"	9' – 11"	11' – 2"	13' – 10"	14' – 9"	15' – 3"	17' – 2"	21' – 3"
42"	2' – 4"	4' – 11"	8' – 6"	8' – 10"	9' – 11"	12' – 4"	11' – 7"	12' – 0"	13' – 6"	16' – 8"	17' – 9"	18' – 5"	20' – 8"	25' – 7"
48"	2' – 7"	5' – 5"	10' – 1"	10' – 5"	11' – 9"	N/A	13' – 7"	14' – 2"	15' – 10"	N/A	20' – 9"	21' – 6"	24' – 2"	N/A
54"	3' – 0"	5' – 11"	11' – 8"	12' – 1"	N/A	N/A	15' – 8"	16' – 3"	N/A	N/A	23' – 10"	24' – 8"	N/A	N/A
60"	3' – 3"	6' – 5"	13' – 3"	N/A	N/A	N/A	17' – 9"	N/A	N/A	N/A	26' – 10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (no skew)	Always required
42" thru 60"	Always required	Always required

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10' – 0"
4" STD	4.500"	4.026"	19' – 8"
5" STD	5.563"	5.047"	34' – 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT Roadway Design Manual.

(3) Miter = slope of mitered end of pipe culvert.

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

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SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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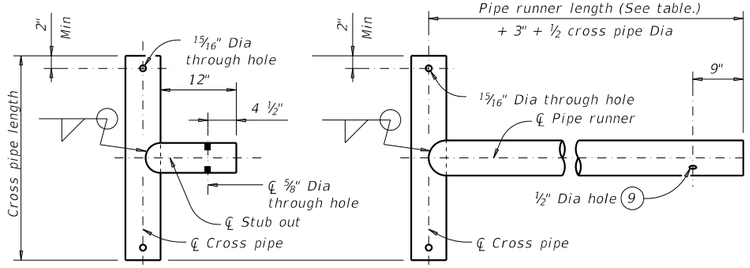
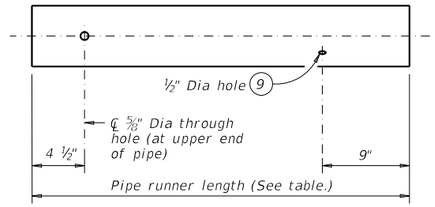
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		158



OPTION A1 OPTION A2

CROSS PIPE AND CONNECTIONS DETAILS

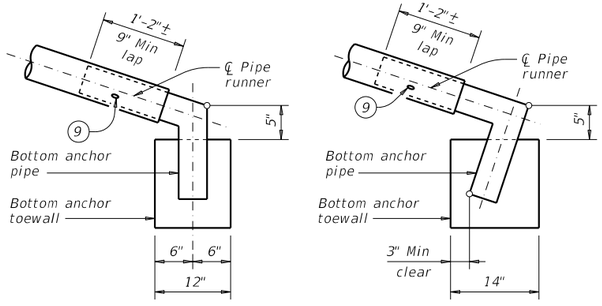


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

OPTION B1 OPTION B2

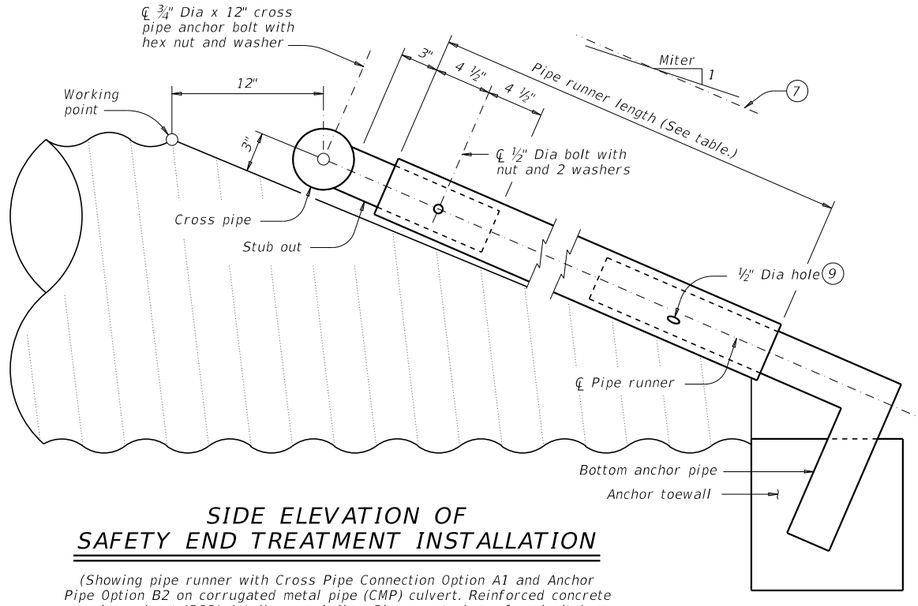
BOTTOM ANCHOR PIPE DETAILS (10)



OPTION B1 OPTION B2

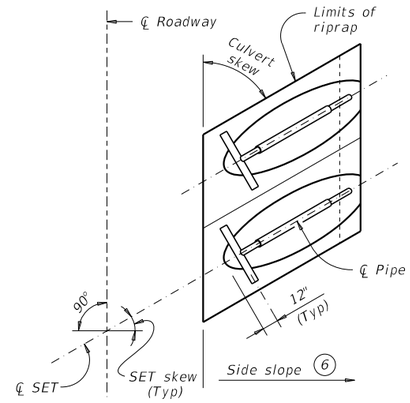
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)

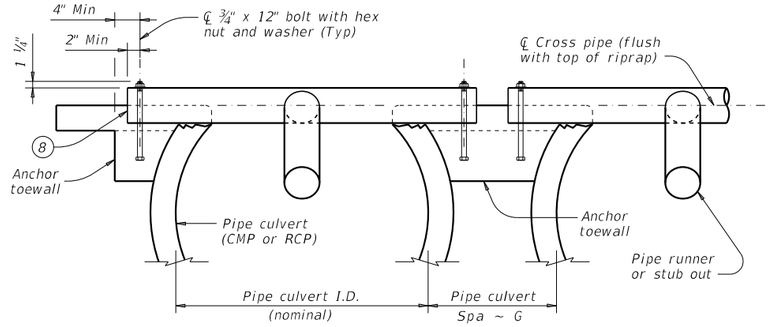


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

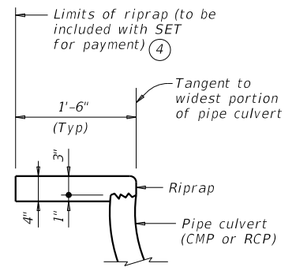
(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)



PLAN OF SKEWED INSTALLATION



SHOWING CROSS PIPE AND ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SECTION A-A

(4) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

(7) Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.

(8) Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(9) After installation, inspect the ½" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.

(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

Payment for riprap and toewall is included in the price bid for each safety end treatment.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

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SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 60" DIA PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD

FILE: setpcdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
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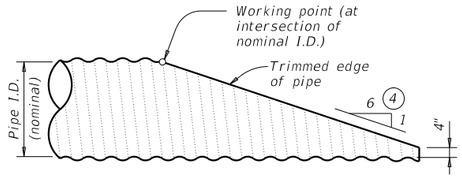
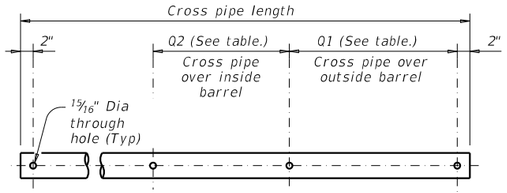


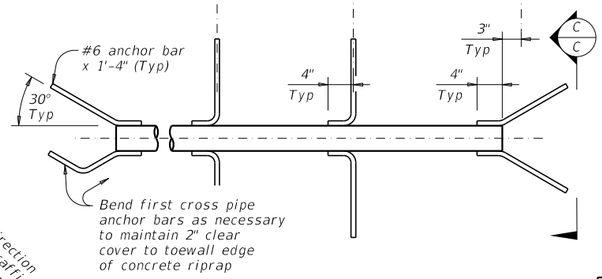
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

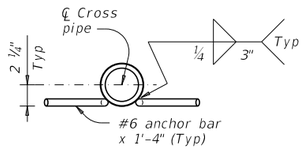
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

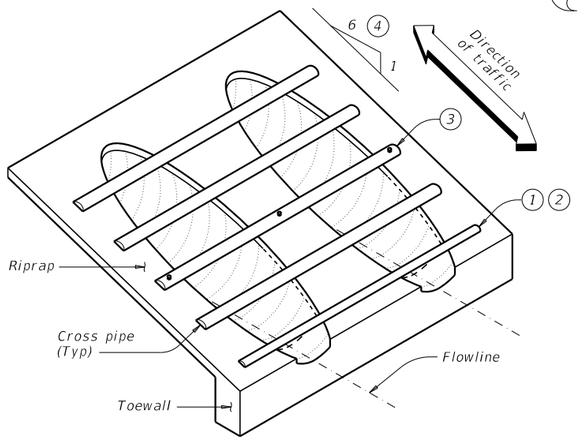


PIPE WITH ANCHOR BARS

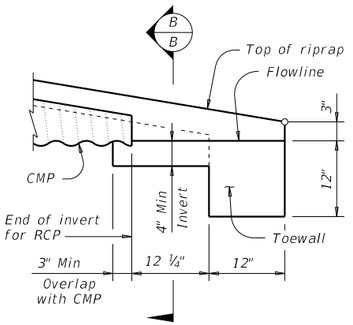


SECTION C-C

CROSS PIPE DETAILS

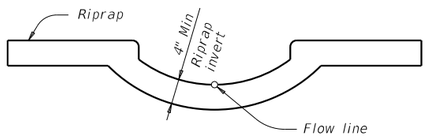


ISOMETRIC VIEW OF TYPICAL INSTALLATION



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

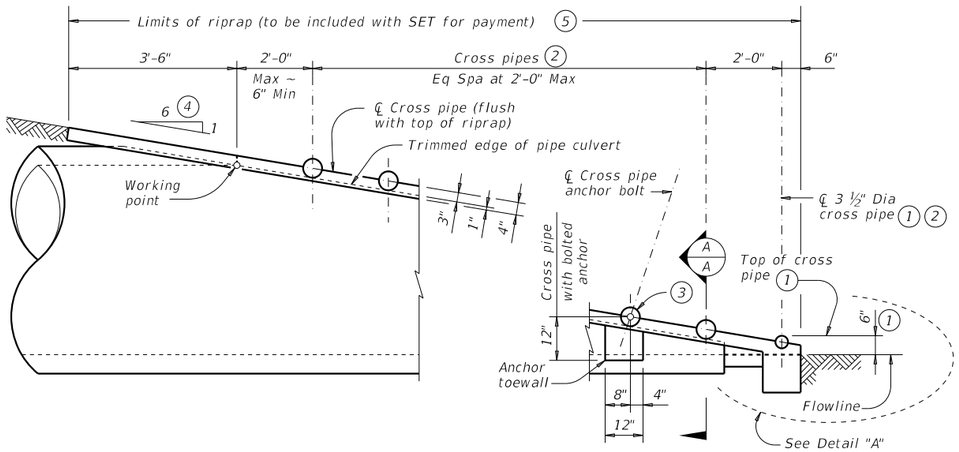
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

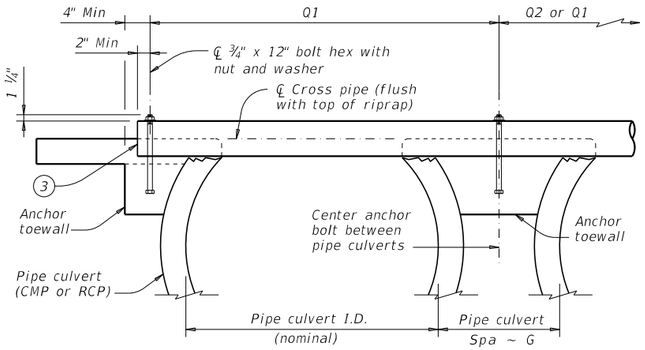
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



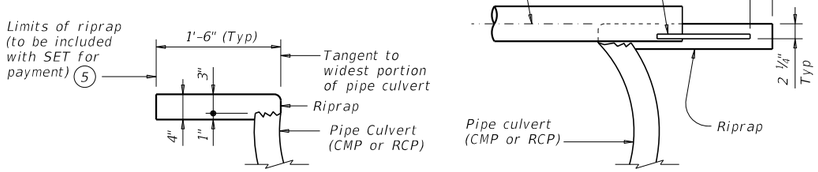
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



SHOWING CROSS PIPE WITH ANCHOR BAR

SHOWING TYPICAL PIPE CULVERT AND RIPRAP

Texas Department of Transportation

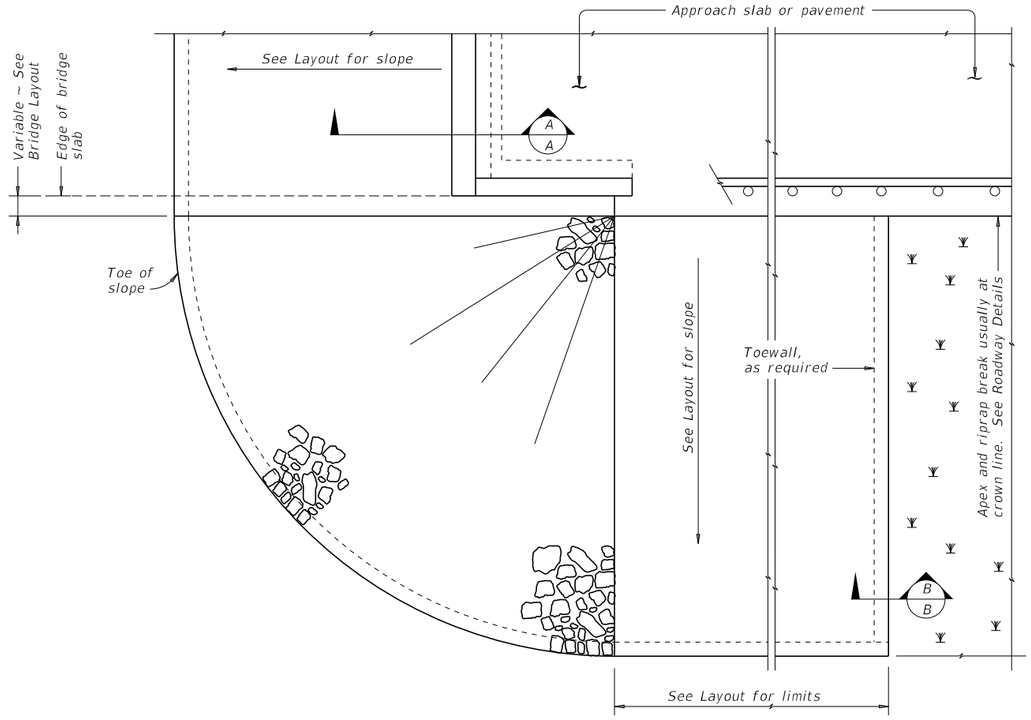
Bridge Division Standard

SAFETY END TREATMENT

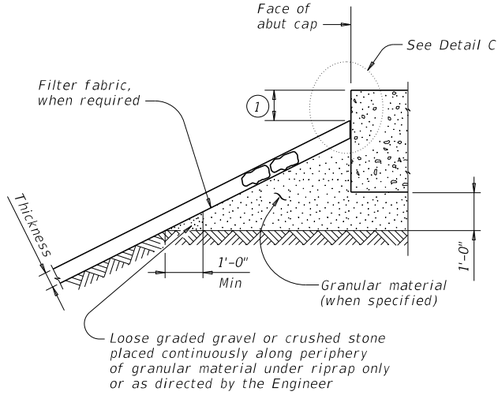
FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

SETP-PD

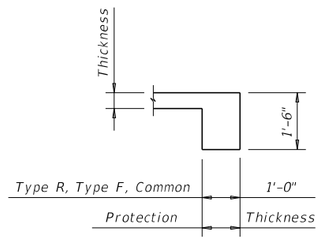
FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		160



PLAN

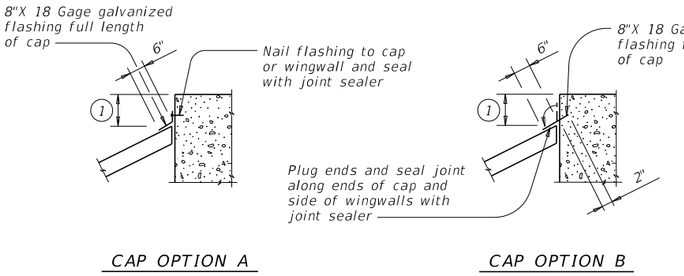


SECTION A-A AT CAP



SECTION B-B

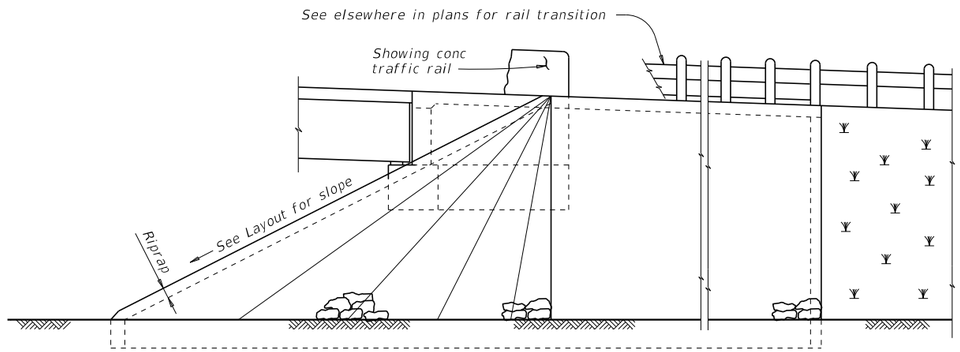
Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C



ELEVATION

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:

Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.

See elsewhere in plans for locations and details of shoulder drains.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES		CK: JGD	DW: BWH		CK: AES	
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REVISIONS	1776	01	036, ETC		RM967		
	DIST	COUNTY				SHEET NO.	
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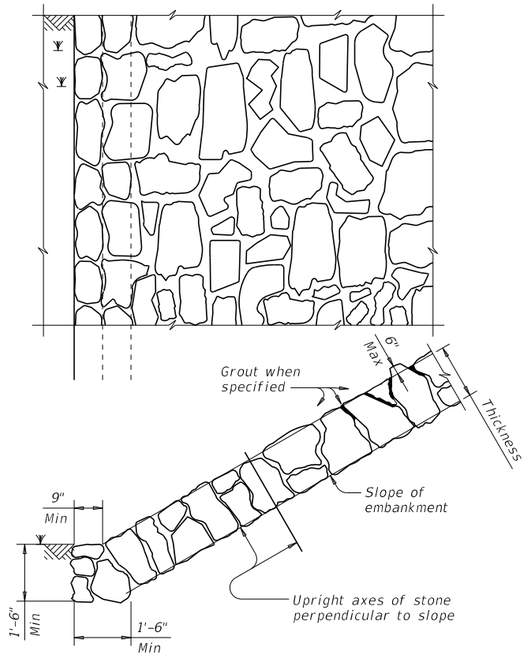


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

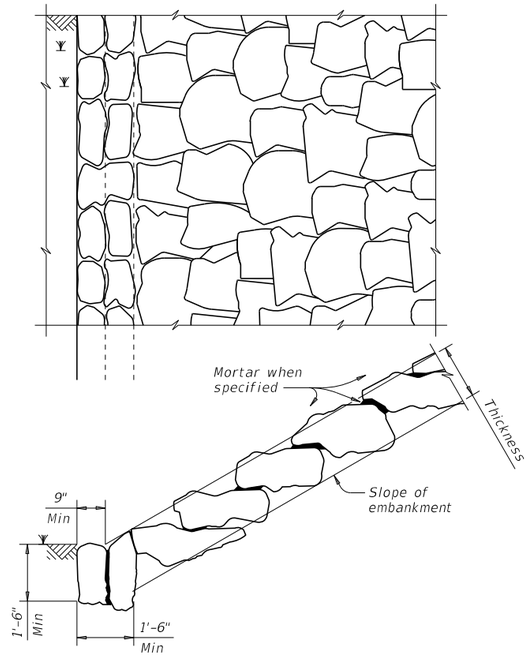


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

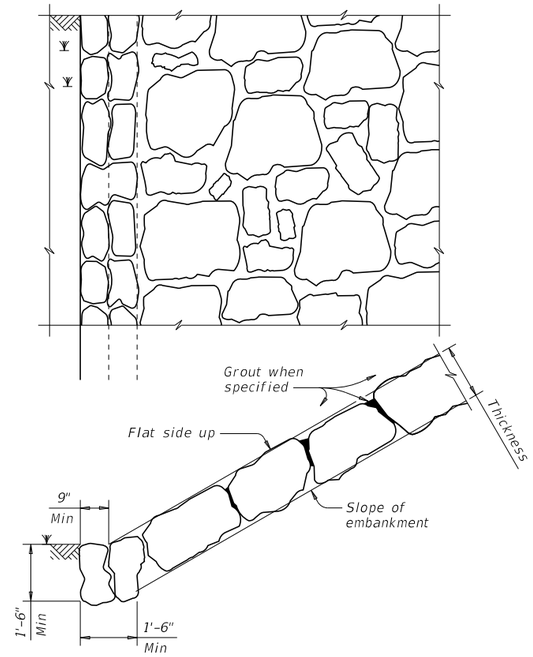


FIGURE 3 ~ TYPE F STONE RIPRAP

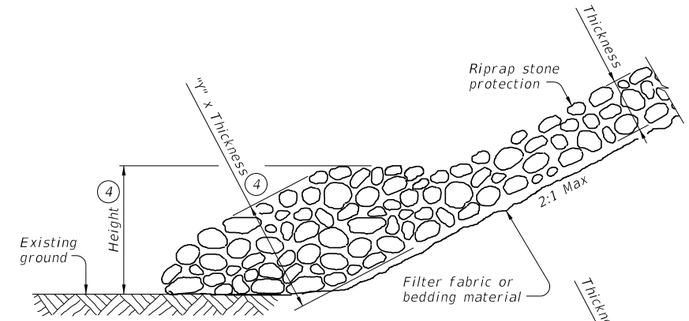
grouted

2 *Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.*

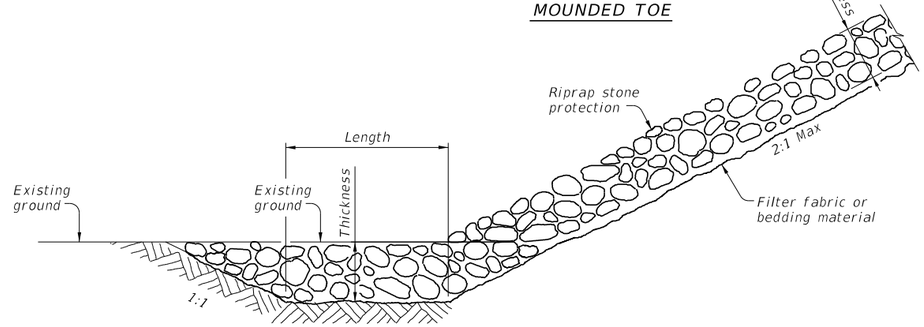
3 *Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.*

4 *"Y" and Height need to be defined. See layout or detail sheet for values if this option is used.*

5 *List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.*
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.

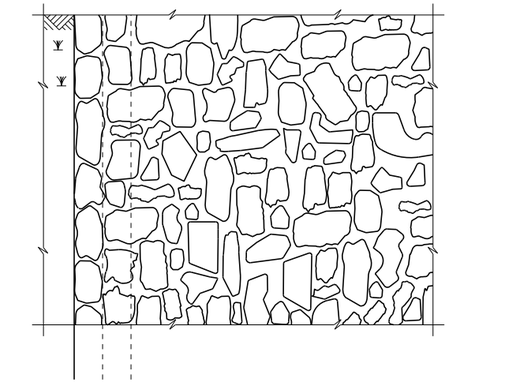


MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS 5



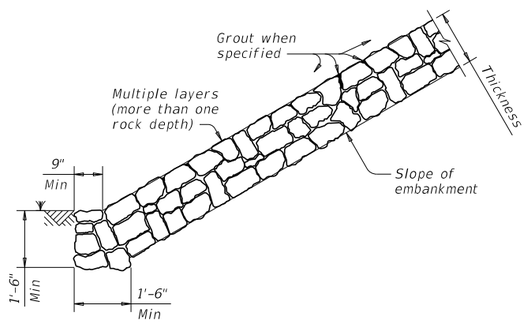
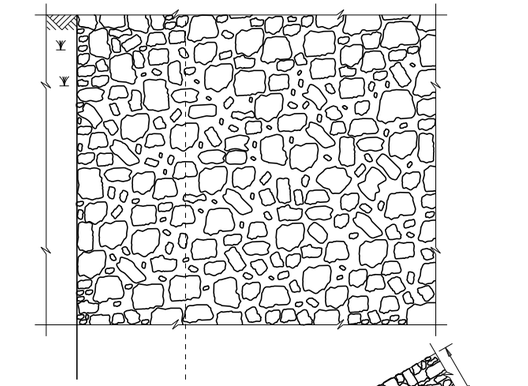


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted



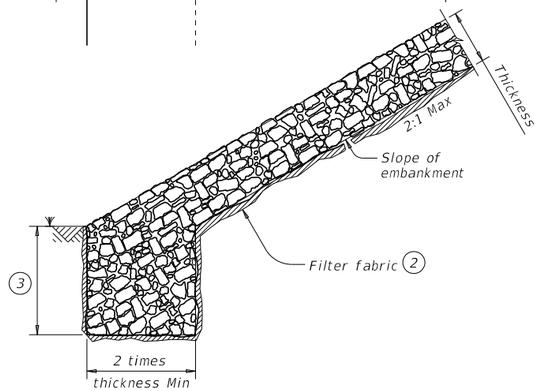


FIGURE 5 ~ PROTECTION STONE RIPRAP 5

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		162

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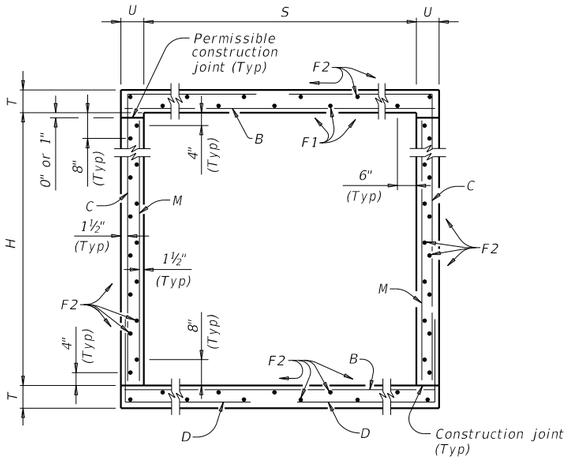
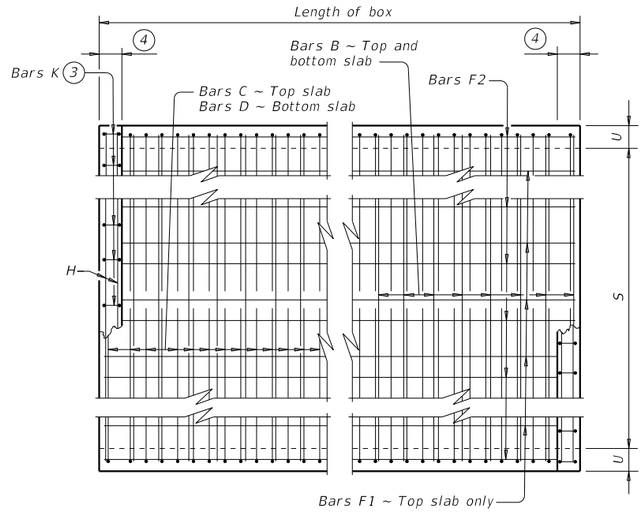
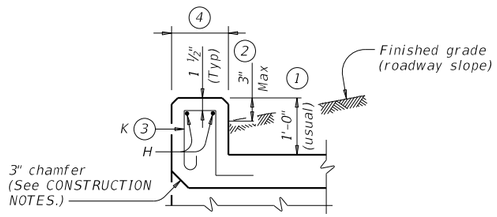


TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB

1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

3. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.

Chamfer the bottom edge of the top slab 3" at the entrance.

Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

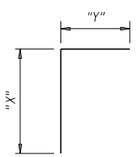
Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:

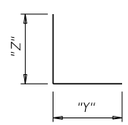
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.

See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

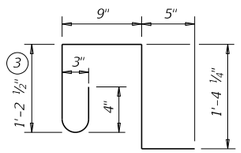
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

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5/17/2021

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL
(MOD)

SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
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	AUS	HAYS		163

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SECTION DIMENSIONS				(5) FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																												QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
3' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	5' - 5"	391	2' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	19	39' - 9"	505	3' - 11"	10	10	28	0.292	48.2	0.3	38	12.0	1,966
3' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	6' - 5"	463	3' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	23	39' - 9"	611	3' - 11"	10	10	28	0.335	54.5	0.3	38	13.7	2,216
4' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	5' - 9"	622	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	558	4' - 11"	13	12	33	0.342	63.6	0.4	46	14.1	2,590
4' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	6' - 9"	730	3' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.385	70.8	0.4	46	15.8	2,876
4' - 0"	4' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	7' - 9"	839	4' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	4' - 0"	289	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.428	75.3	0.4	46	17.5	3,058
3' - 9"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 8"	526	162	#4	6"	5' - 9"	622	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	558	4' - 11"	13	12	33	0.329	62.9	0.4	46	13.6	2,562

(5) For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

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HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL
(MOD)

SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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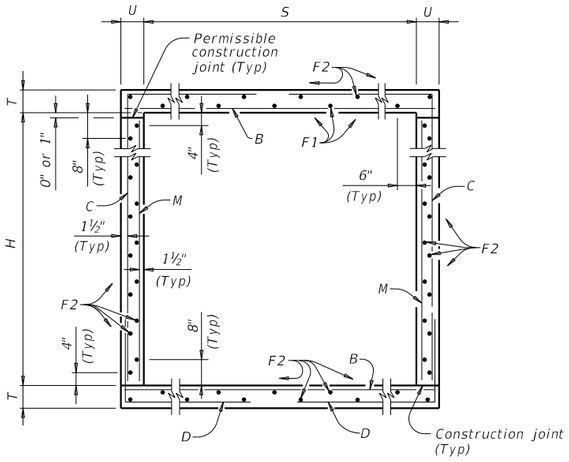

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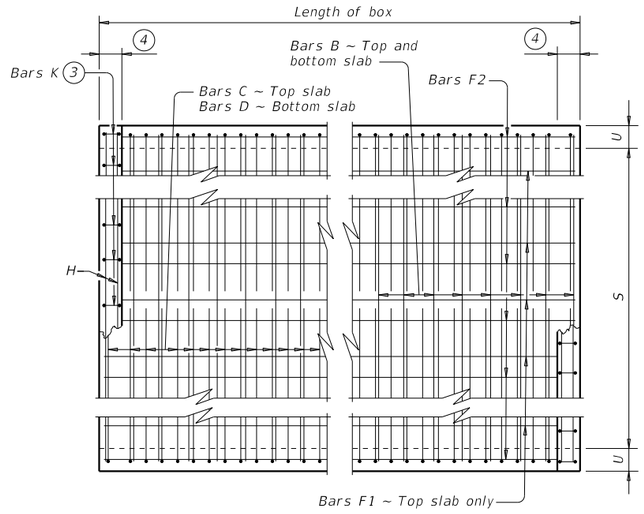
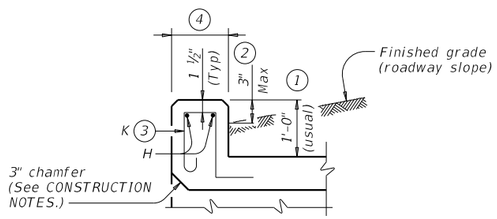


PLAN OF REINF STEEL



SECTION THRU CURB

1 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

2 For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

3 For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

4 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

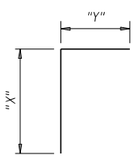
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min
- Uncoated or galvanized ~ #6 = 2'-6" Min

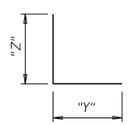
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

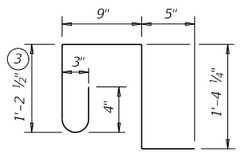
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

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HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL
(MOD)

SCC-9

FILE: scc09ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	AUS	HAYS		165

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SECTION DIMENSIONS				FILL HEIGHT (5)	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																														QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
9' – 0"	4' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	10' – 1"	1,636	4' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	4' – 0"	289	7	39' – 9"	186	35	39' – 9"	929	9' – 11"	26	22	61	0.675	171.1	0.8	87	27.8	6,932
9' – 0"	4' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	10' – 1"	2,454	4' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	108	9"	4' – 0"	289	7	39' – 9"	186	35	39' – 9"	929	9' – 11"	26	22	61	0.675	209.0	0.8	87	27.8	8,447
9' – 0"	4' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	10' – 3"	2,494	4' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	82	12"	4' – 0"	219	7	39' – 9"	186	35	39' – 9"	929	10' – 1"	27	24	67	0.772	210.3	0.8	94	31.6	8,505
9' – 0"	4' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	10' – 5"	2,535	4' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	82	12"	4' – 0"	219	7	39' – 9"	186	35	39' – 9"	929	10' – 1"	27	24	67	0.899	212.3	0.8	94	36.7	8,587
9' – 0"	4' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	11' – 6"	2,798	4' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	108	9"	4' – 0"	289	7	39' – 9"	186	35	39' – 9"	929	10' – 3"	27	24	67	1.000	222.2	0.8	94	40.8	8,980
9' – 0"	4' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	10' – 8"	2,595	4' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	108	9"	4' – 0"	289	7	39' – 9"	186	35	39' – 9"	929	10' – 5"	28	24	67	1.103	219.1	0.8	95	44.9	8,859
9' – 0"	4' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	10' – 10"	2,636	5' – 0"	5' – 9"	162	#6	6"	9' – 4"	2,271	5' – 9"	3' – 7"	108	9"	4' – 0"	289	7	39' – 9"	186	35	39' – 9"	929	10' – 7"	28	24	67	1.208	222.2	0.8	95	49.1	8,981
9' – 0"	5' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	11' – 1"	1,798	5' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	5' – 0"	361	7	39' – 9"	186	39	39' – 9"	1,036	9' – 11"	26	22	61	0.718	179.7	0.8	87	29.5	7,273
9' – 0"	5' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	11' – 1"	2,697	5' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	108	9"	5' – 0"	361	7	39' – 9"	186	39	39' – 9"	1,036	9' – 11"	26	22	61	0.718	219.6	0.8	87	29.5	8,869
9' – 0"	5' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	11' – 3"	2,737	5' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	82	12"	5' – 0"	274	7	39' – 9"	186	39	39' – 9"	1,036	10' – 1"	27	24	67	0.821	220.4	0.8	94	33.6	8,910
9' – 0"	5' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	11' – 5"	2,778	5' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	82	12"	5' – 0"	274	7	39' – 9"	186	39	39' – 9"	1,036	10' – 1"	27	24	67	0.949	222.5	0.8	94	38.7	8,992
9' – 0"	5' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	12' – 6"	3,042	5' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	108	9"	5' – 0"	361	7	39' – 9"	186	39	39' – 9"	1,036	10' – 3"	27	24	67	1.056	232.7	0.8	94	43.0	9,403
9' – 0"	5' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	11' – 8"	2,839	5' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	108	9"	5' – 0"	361	7	39' – 9"	186	39	39' – 9"	1,036	10' – 5"	28	24	67	1.165	229.7	0.8	95	47.4	9,282
9' – 0"	5' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	13' – 1"	3,183	6' – 0"	7' – 0"	162	#6	6"	10' – 7"	2,575	7' – 0"	3' – 7"	108	9"	5' – 0"	361	7	39' – 9"	186	39	39' – 9"	1,036	10' – 7"	28	24	67	1.276	247.9	0.8	95	51.8	10,011
9' – 0"	6' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	12' – 1"	1,960	6' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	6' – 0"	433	7	39' – 9"	186	43	39' – 9"	1,142	9' – 11"	26	22	61	0.761	188.2	0.8	87	31.2	7,613
9' – 0"	6' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	12' – 1"	2,940	6' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	108	9"	6' – 0"	433	7	39' – 9"	186	43	39' – 9"	1,142	9' – 11"	26	22	61	0.761	230.1	0.8	87	31.2	9,290
9' – 0"	6' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	12' – 3"	2,981	6' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	82	12"	6' – 0"	329	7	39' – 9"	186	43	39' – 9"	1,142	10' – 1"	27	24	67	0.870	230.5	0.8	94	35.6	9,315
9' – 0"	6' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	12' – 5"	3,021	6' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	82	12"	6' – 0"	329	7	39' – 9"	186	43	39' – 9"	1,142	10' – 1"	27	24	67	0.998	232.6	0.8	94	40.7	9,396
9' – 0"	6' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	13' – 6"	3,285	6' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	108	9"	6' – 0"	433	7	39' – 9"	186	43	39' – 9"	1,142	10' – 3"	27	24	67	1.111	243.3	0.8	94	45.2	9,824
9' – 0"	6' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	12' – 8"	3,082	6' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	108	9"	6' – 0"	433	7	39' – 9"	186	43	39' – 9"	1,142	10' – 5"	28	24	67	1.226	240.2	0.8	95	49.8	9,703
9' – 0"	6' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	14' – 1"	3,427	7' – 0"	7' – 0"	162	#6	6"	10' – 7"	2,575	7' – 0"	3' – 7"	108	9"	6' – 0"	433	7	39' – 9"	186	43	39' – 9"	1,142	10' – 7"	28	24	67	1.344	258.5	0.8	95	54.6	10,433
9' – 0"	7' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	13' – 1"	2,122	7' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	7' – 0"	505	7	39' – 9"	186	43	39' – 9"	1,142	9' – 11"	26	22	61	0.805	194.0	0.8	87	33.0	7,847
9' – 0"	7' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	13' – 1"	3,183	7' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	108	9"	7' – 0"	505	7	39' – 9"	186	43	39' – 9"	1,142	9' – 11"	26	22	61	0.805	238.0	0.8	87	33.0	9,605
9' – 0"	7' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	13' – 3"	3,224	7' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	82	12"	7' – 0"	383	7	39' – 9"	186	43	39' – 9"	1,142	10' – 1"	27	24	67	0.920	238.0	0.8	94	37.6	9,612
9' – 0"	7' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	13' – 5"	3,265	7' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	82	12"	7' – 0"	383	7	39' – 9"	186	43	39' – 9"	1,142	10' – 1"	27	24	67	1.047	240.0	0.8	94	42.6	9,694
9' – 0"	7' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	14' – 6"	3,528	7' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	108	9"	7' – 0"	505	7	39' – 9"	186	43	39' – 9"	1,142	10' – 3"	27	24	67	1.167	251.1	0.8	94	47.5	10,139
9' – 0"	7' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	13' – 8"	3,325	7' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	108	9"	7' – 0"	505	7	39' – 9"	186	43	39' – 9"	1,142	10' – 5"	28	24	67	1.288	248.1	0.8	95	52.3	10,018
9' – 0"	7' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	15' – 1"	3,670	8' – 0"	7' – 0"	162	#6	6"	10' – 7"	2,575	7' – 0"	3' – 7"	108	9"	7' – 0"	505	7	39' – 9"	186	43	39' – 9"	1,142	10' – 7"	28	24	67	1.412	266.3	0.8	95	57.3	10,748
9' – 0"	8' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	14' – 1"	2,285	8' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	9' – 11"	26	22	61	0.848	202.5	0.8	87	34.7	8,188
9' – 0"	8' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	14' – 1"	3,427	8' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	9' – 11"	26	22	61	0.848	248.5	0.8	87	34.7	10,027
9' – 0"	8' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	14' – 3"	3,467	8' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	10' – 1"	27	24	67	0.969	251.5	0.8	94	39.5	10,155
9' – 0"	8' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	14' – 5"	3,508	8' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	10' – 1"	27	24	67	1.097	253.6	0.8	94	44.6	10,237
9' – 0"	8' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	15' – 6"	3,772	8' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	10' – 3"	27	24	67	1.222	261.7	0.8	94	49.7	10,561
9' – 0"	8' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	14' – 8"	3,569	8' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	10' – 5"	28	24	67	1.350	258.6	0.8	95	54.8	10,440
9' – 0"	8' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	14' – 10"	3,609	9' – 0"	5' – 9"	162	#6	6"	9' – 4"	2,271	5' – 9"	3' – 7"	108	9"	8' – 0"	577	7	39' – 9"	186	47	39' – 9"	1,248	10' – 7"	28	24	67	1.479	261.7	0.8	95	60.0	10,561
9' – 0"	9' – 0"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	15' – 1"	2,447	9' – 6"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	9' – 11"	26	22	61	0.891	219.2	0.8	87	36.4	8,853
9' – 0"	9' – 0"	8"	7"	13'	162	#6	6"	9' – 11"	2,413	162	#6	6"	15' – 1"	3,670	9' – 6"	5' – 6"	162	#6	6"	8' – 7"	2,089	5' – 6"	3' – 1"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	9' – 11"	26	22	61	0.891	267.2	0.8	87	36.4	10,773
9' – 0"	9' – 0"	9"	8"	16'	162	#6	6"	10' – 1"	2,454	162	#6	6"	15' – 3"	3,711	9' – 7"	5' – 7"	162	#6	6"	8' – 9"	2,129	5' – 7"	3' – 2"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	10' – 1"	27	24	67	1.019	270.2	0.8	94	41.5	10,902
9' – 0"	9' – 0"	11"	8"	20'	162	#6	6"	10' – 1"	2,454	162	#6	6"	15' – 5"	3,751	9' – 9"	5' – 7"	162	#6	6"	8' – 11"	2,170	5' – 7"	3' – 4"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	10' – 1"	27	24	67	1.146	272.2	0.8	94	46.6	10,983
9' – 0"	9' – 0"	12"	9"	23'	162	#6	6"	10' – 3"	2,494	162	#6	6"	16' – 6"	4,015	9' – 10"	5' – 7"	162	#6	6"	9' – 0"	2,190	5' – 7"	3' – 5"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	10' – 3"	27	24	67	1.278	280.3	0.8	94	51.9	11,307
9' – 0"	9' – 0"	13"	10"	26'	162	#6	6"	10' – 5"	2,535	162	#6	6"	15' – 8"	3,812	9' – 11"	5' – 8"	162	#6	6"	9' – 2"	2,230	5' – 8"	3' – 6"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	10' – 5"	28	24	67	1.412	277.3	0.8	95	57.3	11,186
9' – 0"	9' – 0"	14"	11"	30'	162	#6	6"	10' – 7"	2,575	162	#6	6"	17' – 1"	4,157	10' – 0"	7' – 0"	162	#6	6"	10' – 7"	2,575	7' – 0"	3' – 7"	162	6"	9' – 0"	974	7	39' – 9"	186	51	39' – 9"	1,354	10' – 7"	28	24	67	1.547	295.5	0.8	95	62.7	11,916
9' – 0"	2' – 6"	8"	7"	10'	162	#6	6"	9' – 11"	2,413	108	#6	9"	8' – 7"	1392	3' – 1"	5' – 6"	108	#6	9"	8' – 7"	1,392	5' – 6"	3' – 1"	108	9"	2' – 6"	180	7	39' – 9"	186	35	39' – 9"	929	9' – 11"	26	22	61	0.610	162.3	0.8	87	25.2	6,579

(5) For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

HL93 LOADING

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL (MOD)

SCC-9

FILE: scc09ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
04/2021 Updated X values.	DIST	COUNTY		SHEET NO.
	AUS	HAYS		166

DATE: 5/17/2021 3:41:35 PM
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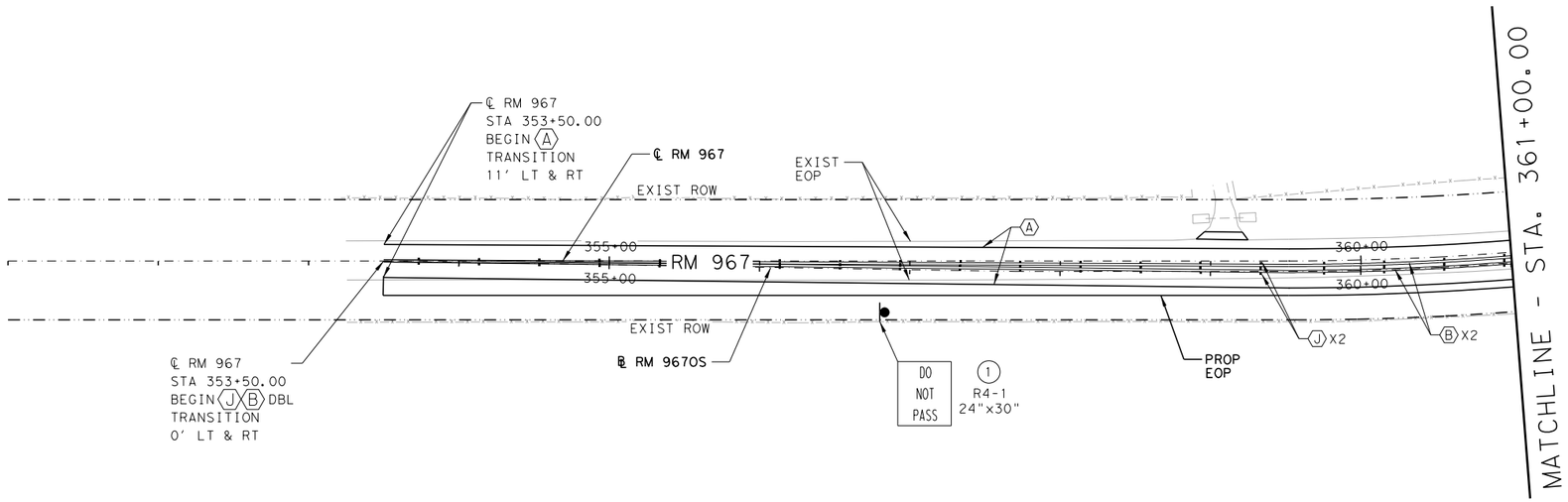
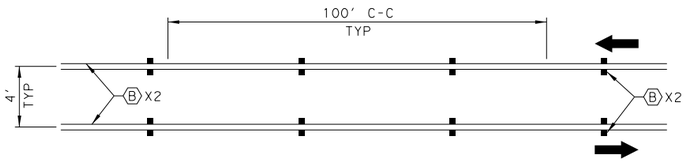
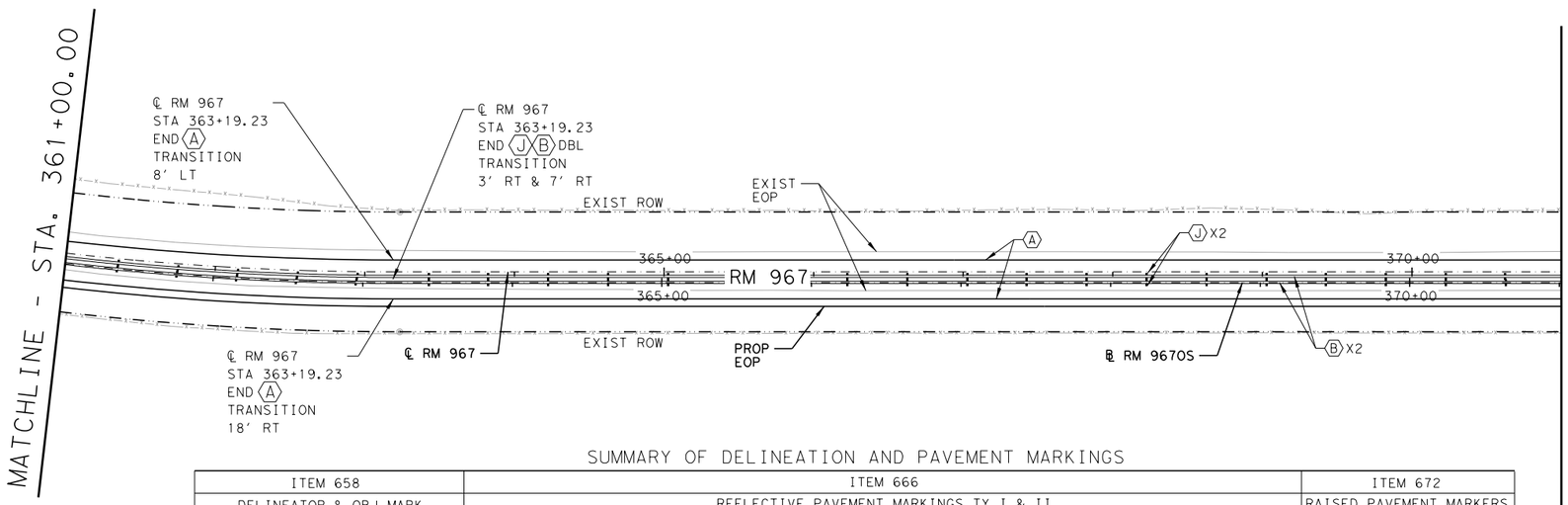


DETAIL A
NTS





SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	3504	7003	0	0	0	0	0	0	0	0	0	0	0	0	0	176

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

0 50 100

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

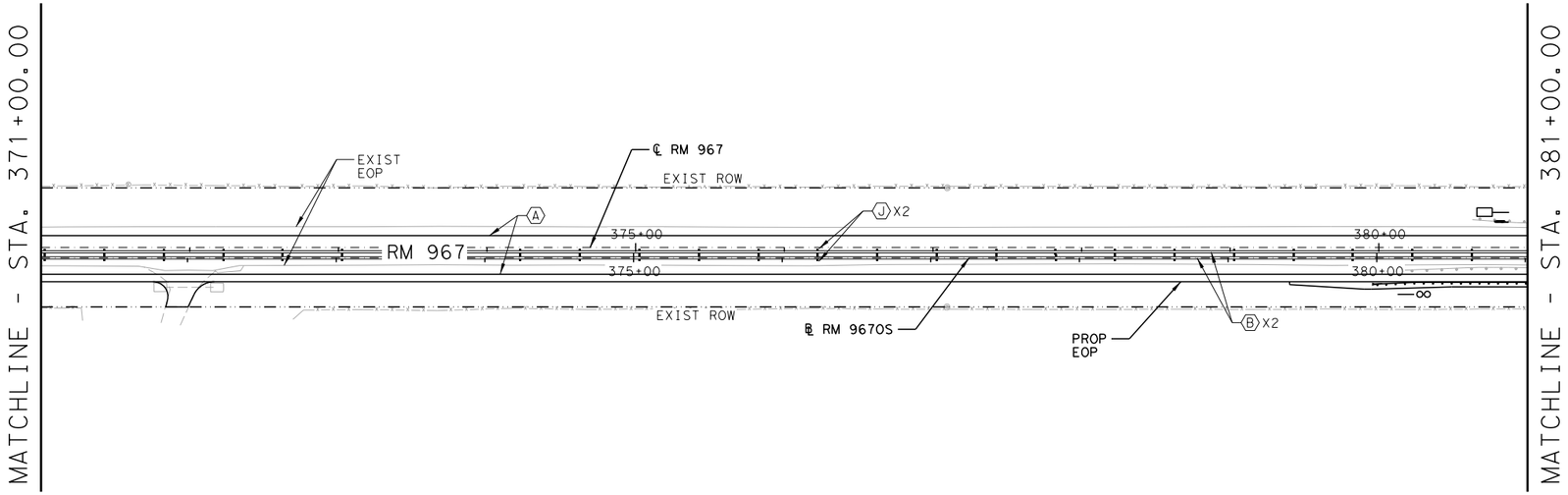
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

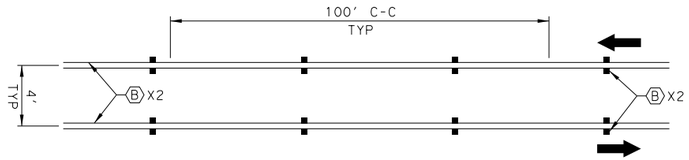
SIGNING AND PAVEMENT MARKINGS PLAN
BEGIN PROJECT TO
STA 371+00.00

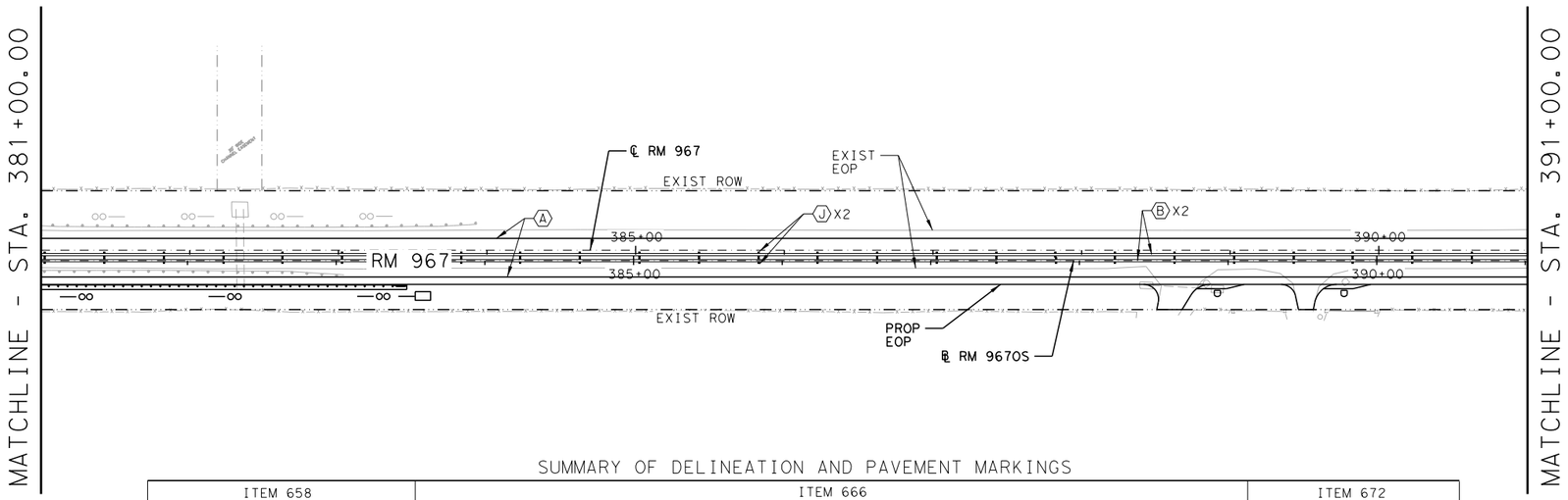
DATE: 5/17/2021			SHEET 1 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	167

Filename: ...\Cad\Plan\015012-000*SS01.dgn
Date: 5/17/2021



DETAIL A
NTS





SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓚ	Ⓛ	Ⓜ	Ⓝ	Ⓞ	Ⓟ	Ⓘ	Ⓙ
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
4	2	0	4000	8000	0	0	0	0	0	0	0	0	0	0	0	0	0	200

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

POS

0 50 100

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

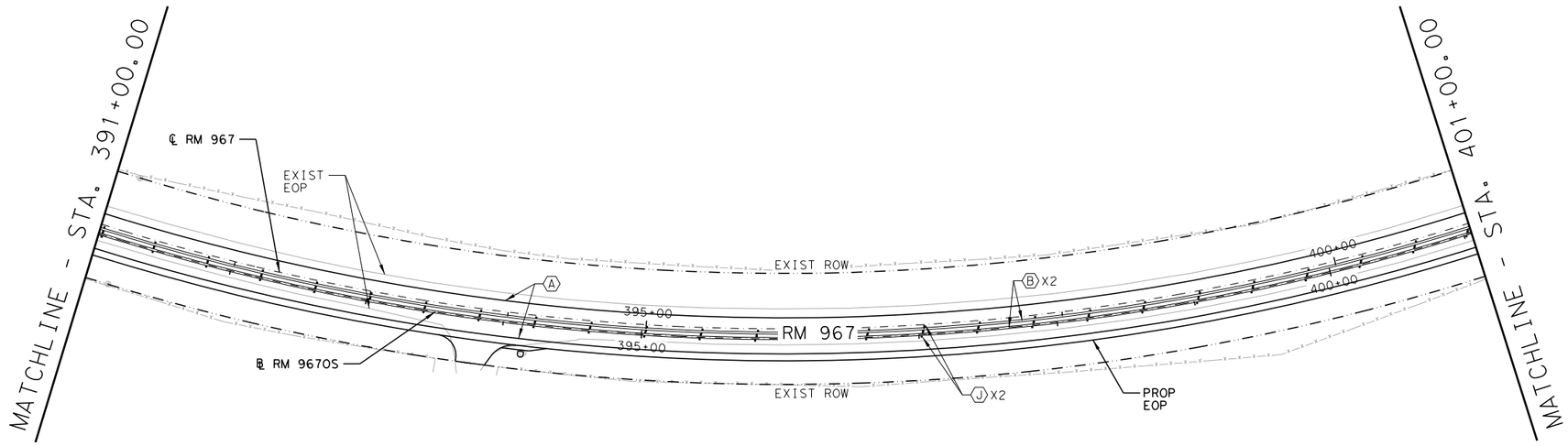
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

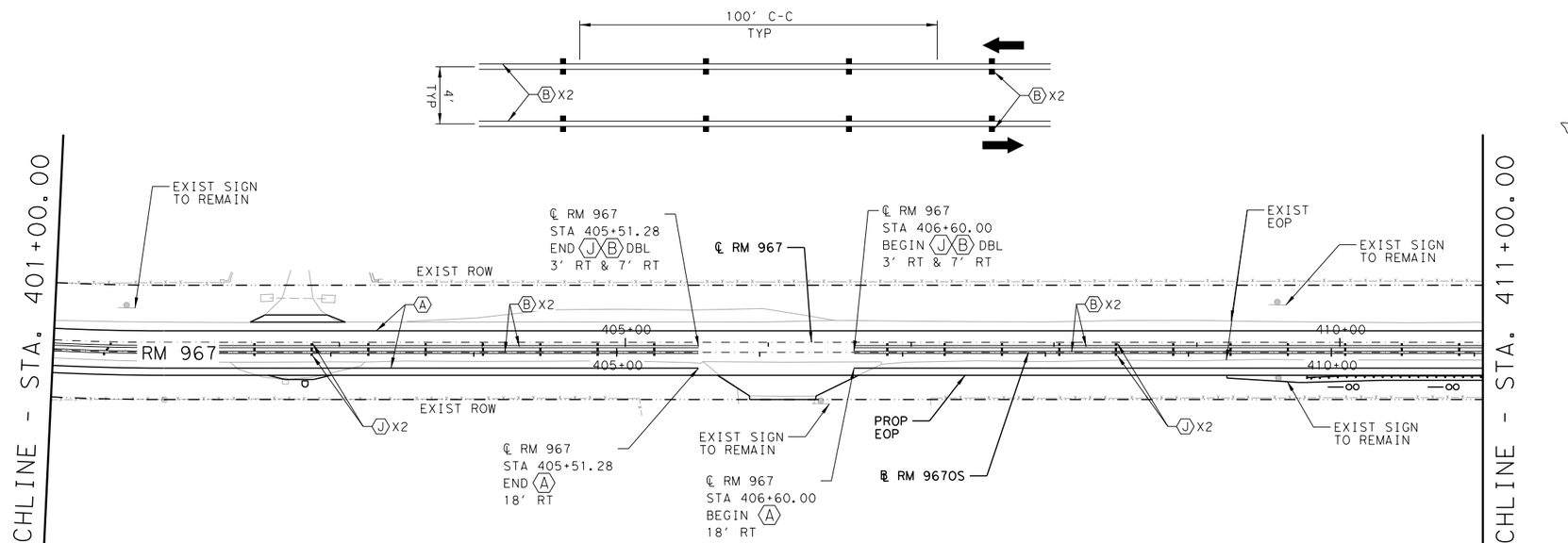
SIGNING AND PAVEMENT MARKINGS PLAN
STA 371+00.00 TO
STA 391+00.00

DATE: 5/17/2021			SHEET 2 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	168

Filename: ...\Cad\Plan\015012-000*SS02.dgn
Date: 5/17/2021



DETAIL A
NTS



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓚ	Ⓛ	Ⓜ	Ⓝ	Ⓞ	Ⓟ	Ⓘ	Ⓙ
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
2	0	0	3898	7578	0	0	0	0	0	0	0	0	0	0	0	0	0	190

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

0 50 100

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

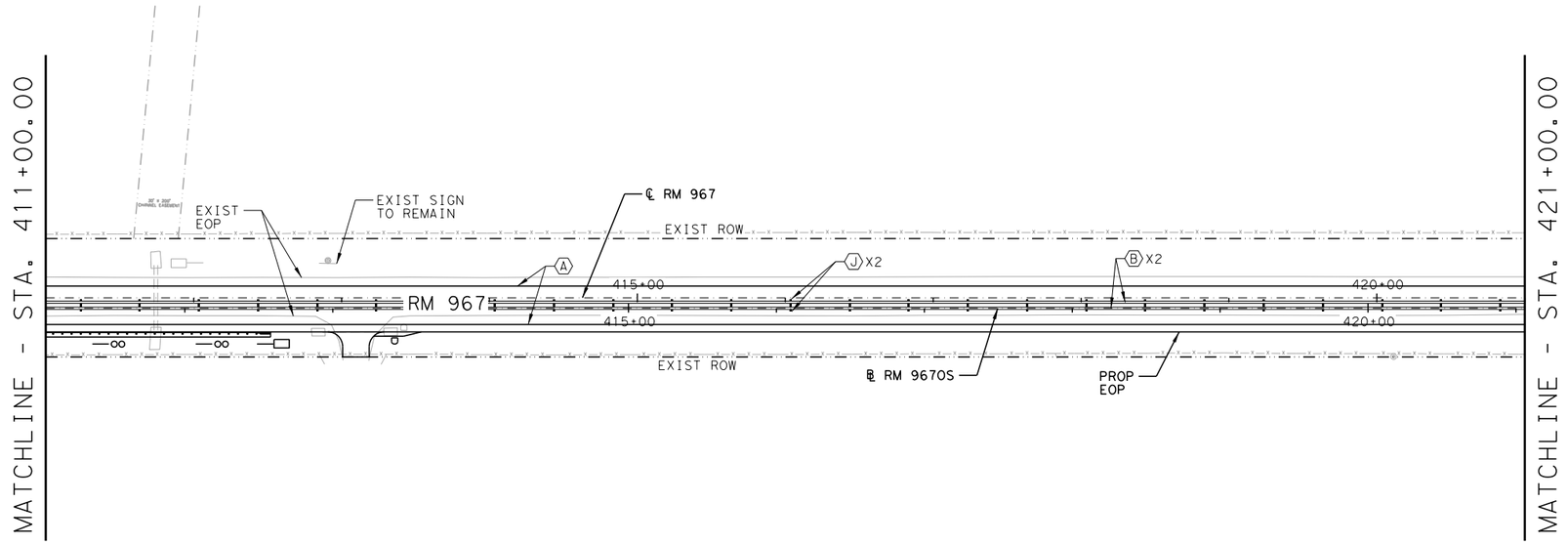
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

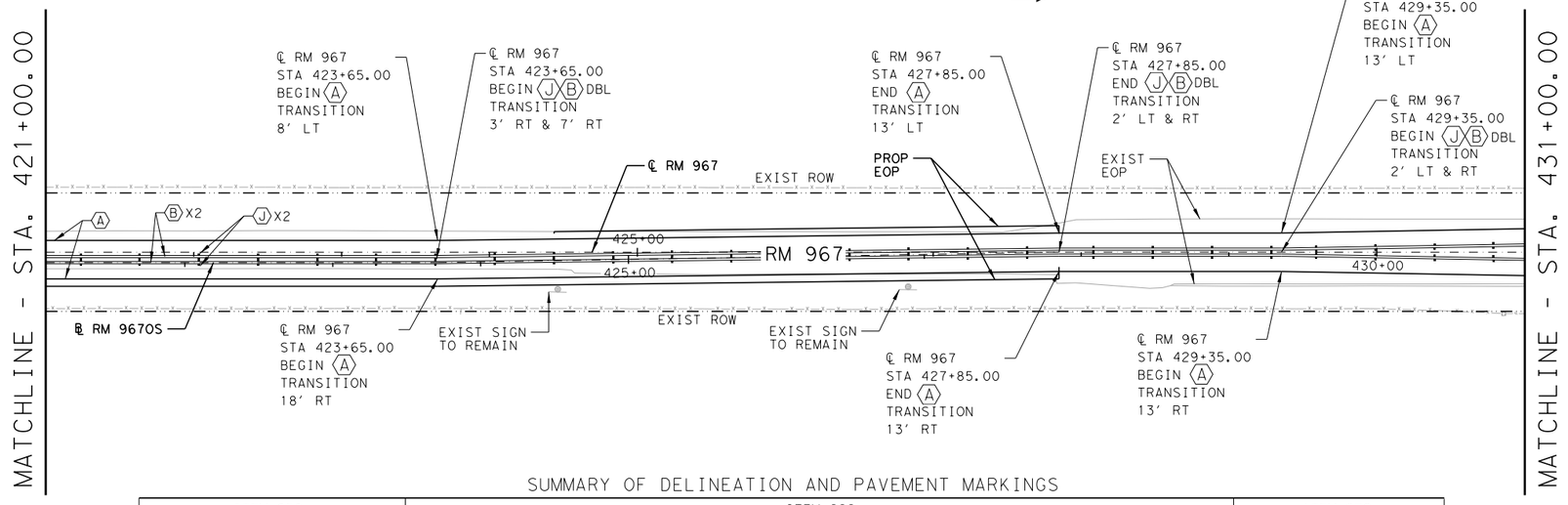
SIGNING AND PAVEMENT MARKINGS PLAN
STA 391+00.00 TO
STA 411+00.00

DATE: 5/17/2021			SHEET 3 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	169

Filename: ...\Cad\Plan\015012-000*SS03.dgn
Date: 5/17/2021



DETAIL A
NTS



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
2	1	0	4000	7999	0	0	0	0	0	0	0	0	0	0	0	0	0	200

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

0 50 100

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

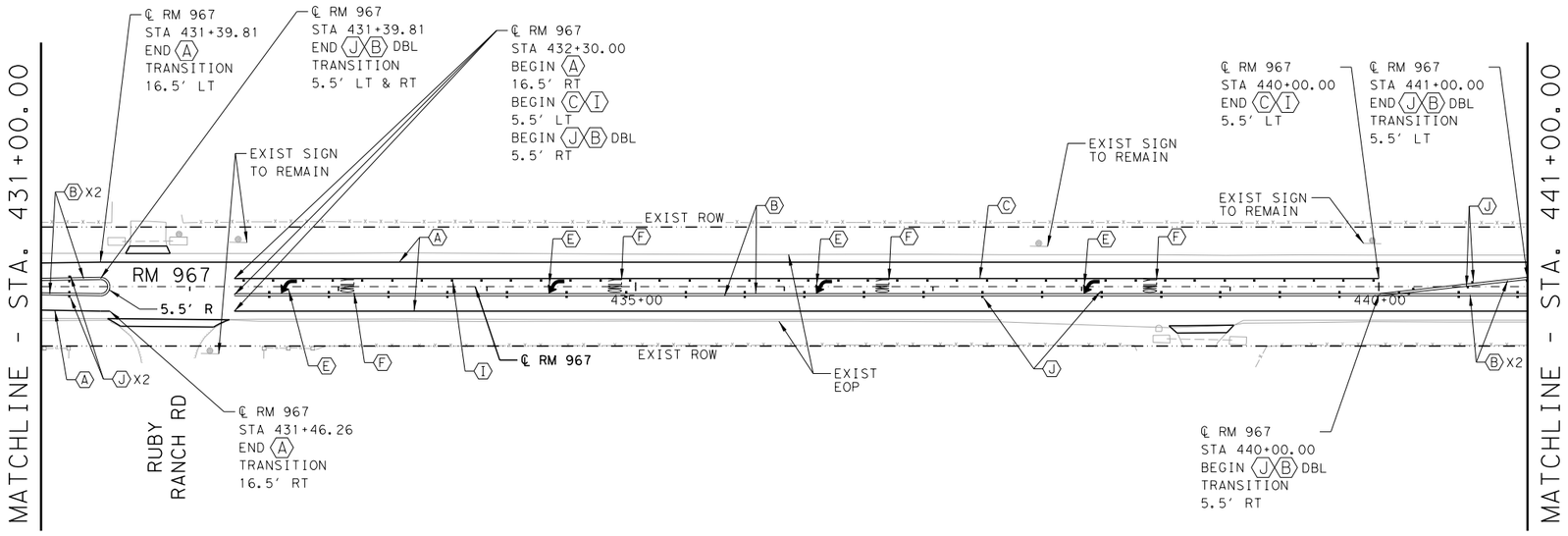
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

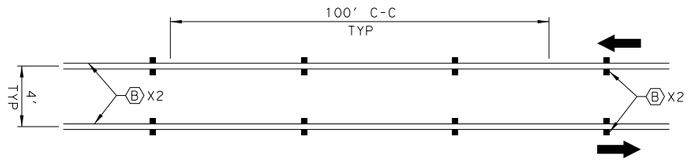
SIGNING AND PAVEMENT MARKINGS PLAN
STA 411+00.00 TO
STA 431+00.00

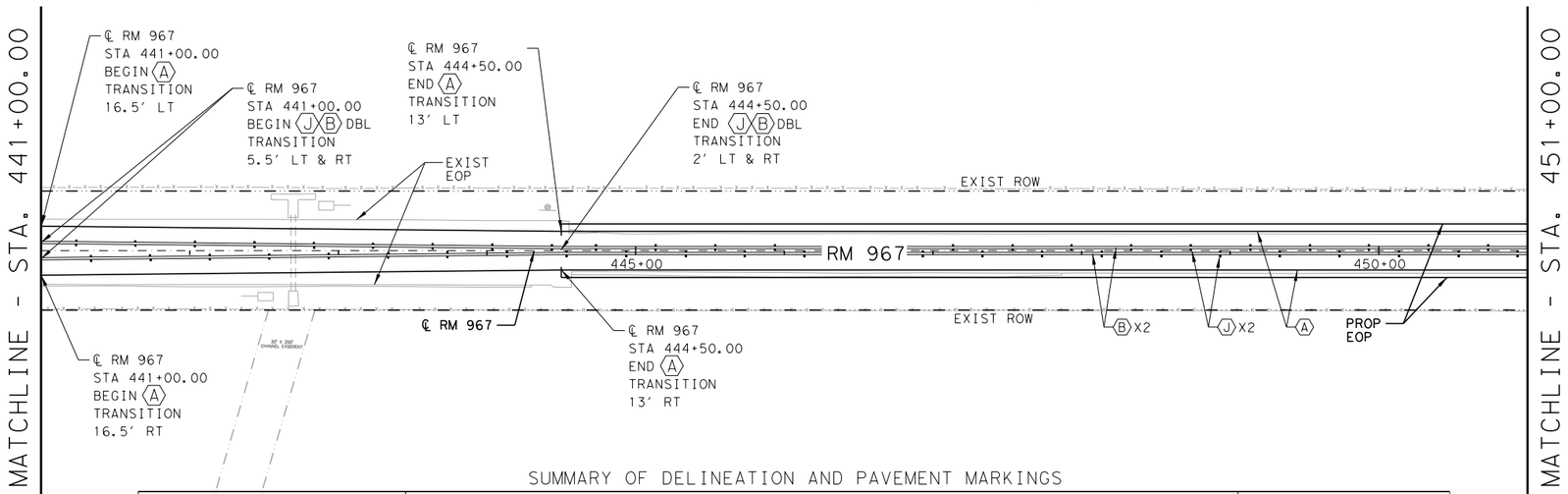
DATE: 5/17/2021			SHEET 4 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	170

Filename: ...\Cad\Plan\015012-000*SS04.dgn
Date: 5/17/2021



DETAIL A
NTS





SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC) (GND)	OM ASSM OM-2Y (WC) (GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	3917	6135	770	0	4	4	0	0	0	0	0	0	0	0	39	154

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

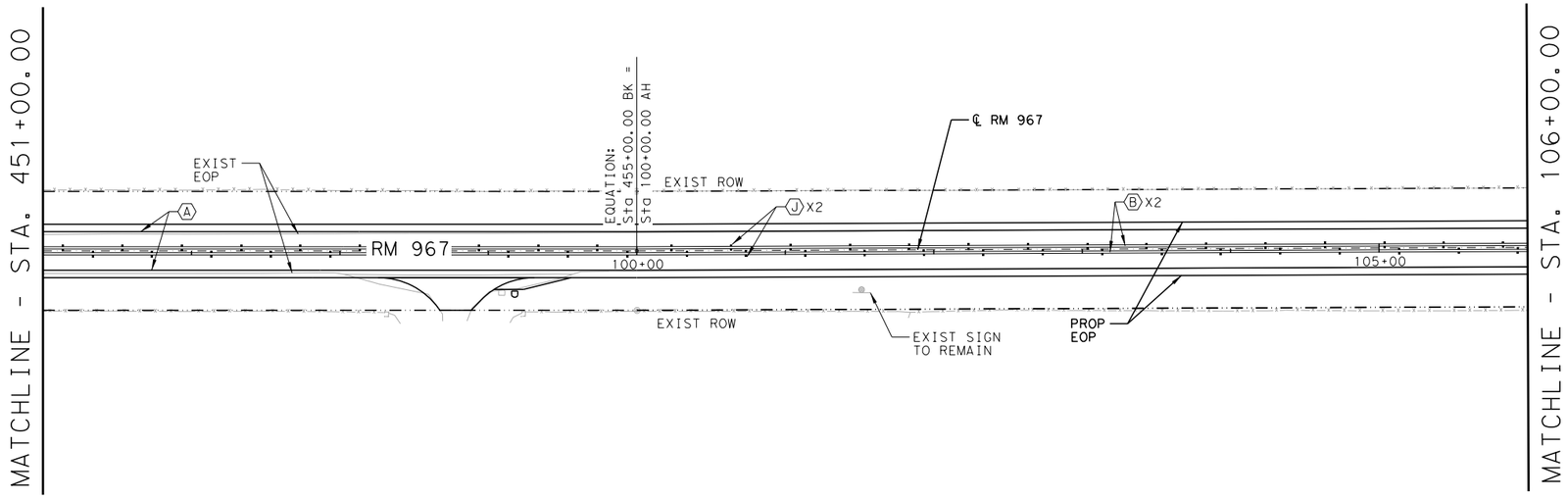
WSB & ASSOCIATES, INC.
FIRM # 16849

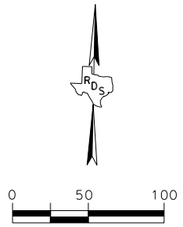
RM 967

SIGNING AND PAVEMENT MARKINGS PLAN
STA 431+00.00 TO
STA 451+00.00

DATE: 5/17/2021			SHEET 5 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	171

Filename: ...\Cad\Plan\015012-000*SS05.dgn
Date: 5/17/2021





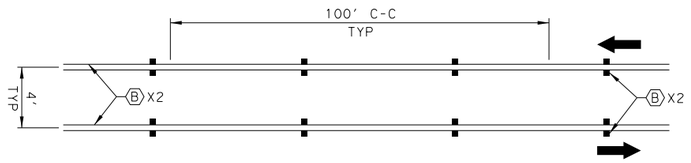
NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

DETAIL A
NTS



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	Ⓖ	Ⓗ	Ⓚ	Ⓛ	Ⓜ	Ⓝ	Ⓞ	Ⓟ	Ⓘ	Ⓙ
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	2000	4000	0	0	0	0	0	0	0	0	0	0	0	0	0	100

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

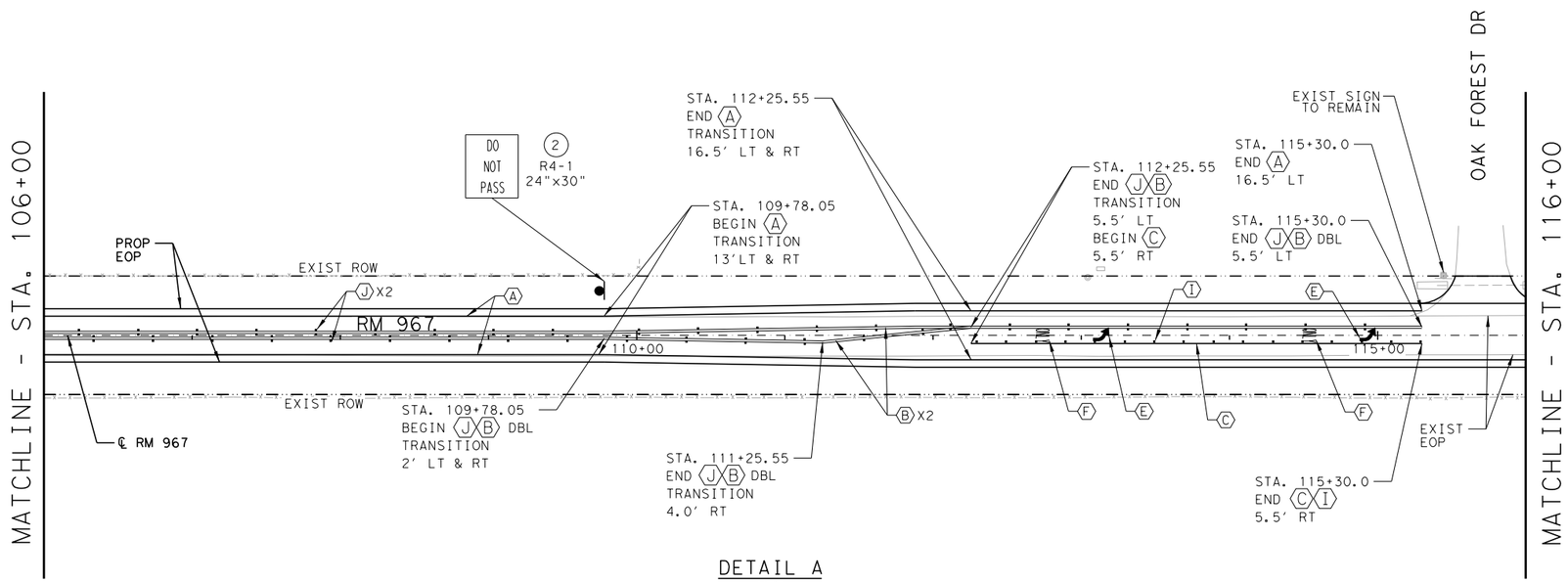
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

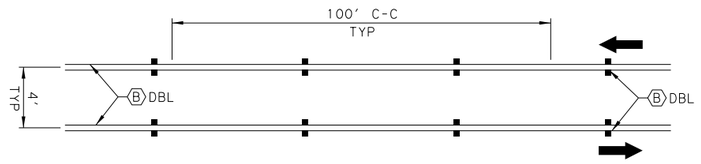
SIGNING AND PAVEMENT MARKINGS PLAN
STA 451+00.00 TO
STA 106+00.00

DATE: 5/17/2021			SHEET 6 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	172

Filename: ...\Cad\Plan\015012-000*SS06.dgn
Date: 5/17/2021

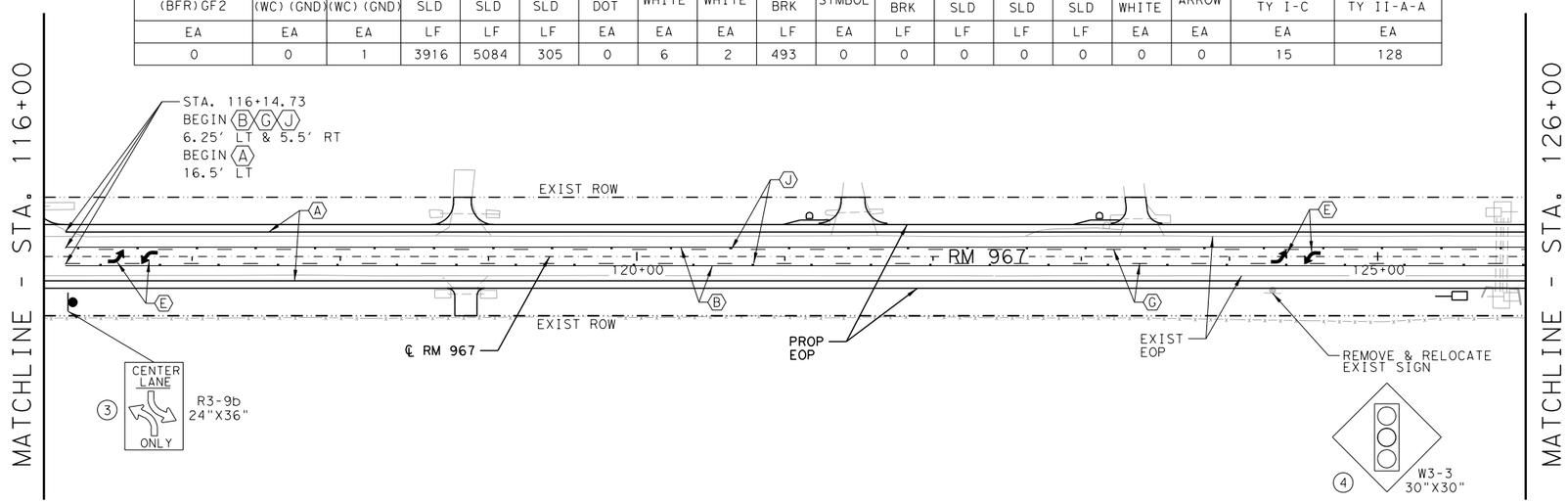


DETAIL A
NTS



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	1	3916	5084	305	0	6	2	493	0	0	0	0	0	0	0	15	128



0 50 100

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

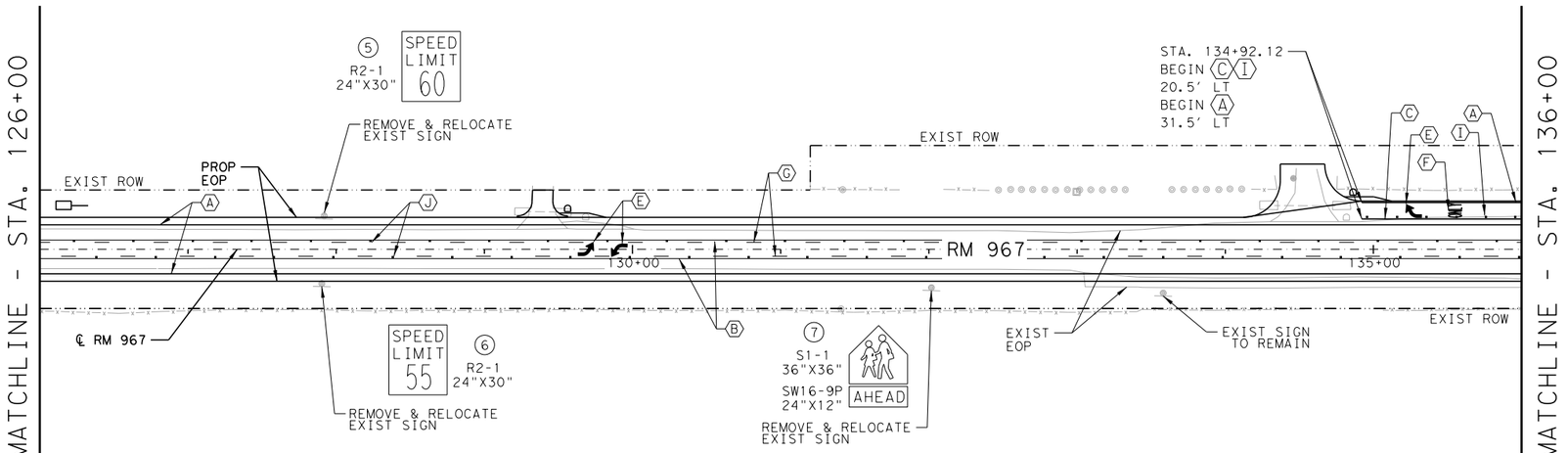
SIGNING AND PAVEMENT MARKINGS PLAN
STA 106+00.00
TO STA 126+00.00

DATE: 5/17/2021 SHEET 7 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

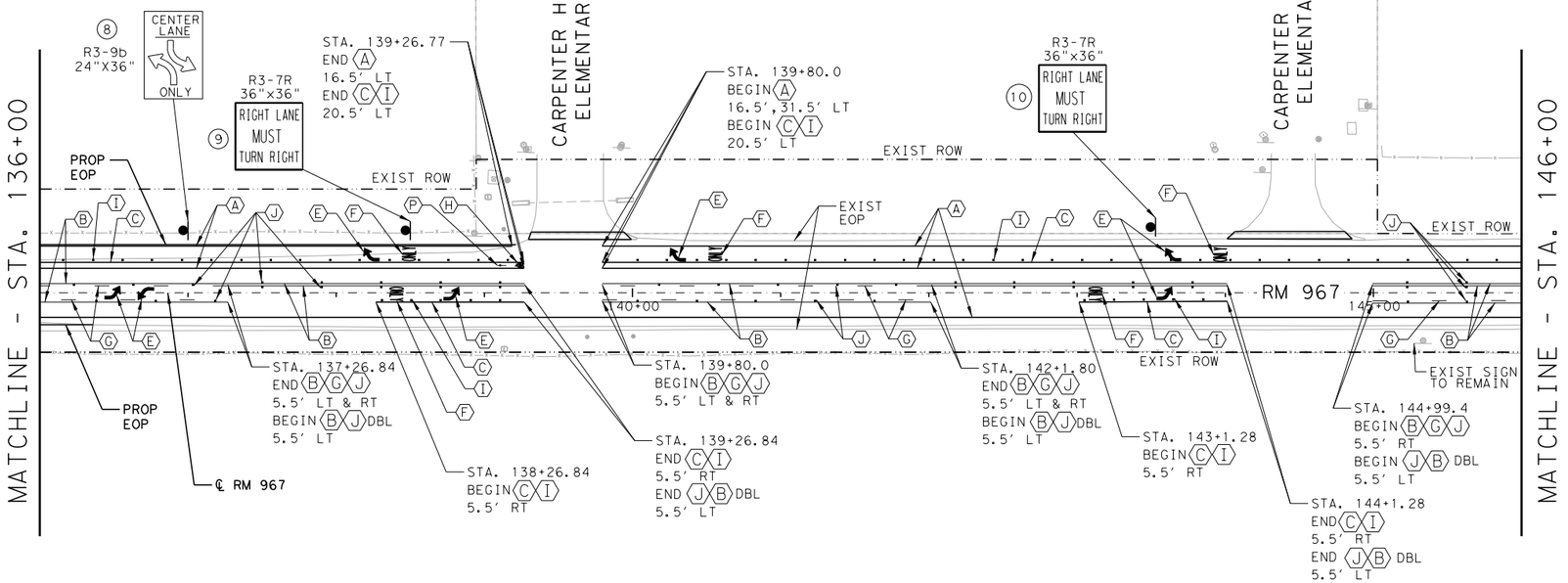
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	173

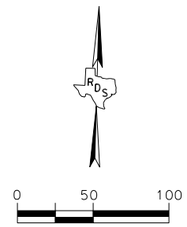
Filename: ...\Cad\Plan\015012-000*SS07.dgn
Date: 5/17/2021



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
⟨A⟩	⟨B⟩	⟨C⟩	⟨D⟩	⟨E⟩	⟨F⟩	⟨G⟩	⟨H⟩	⟨K⟩	⟨L⟩	⟨M⟩	⟨N⟩	⟨O⟩	⟨P⟩	⟨I⟩	⟨J⟩			
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	1	4996	3800	1156	0	10	6	700	1	0	0	0	0	0	1	57	95





NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

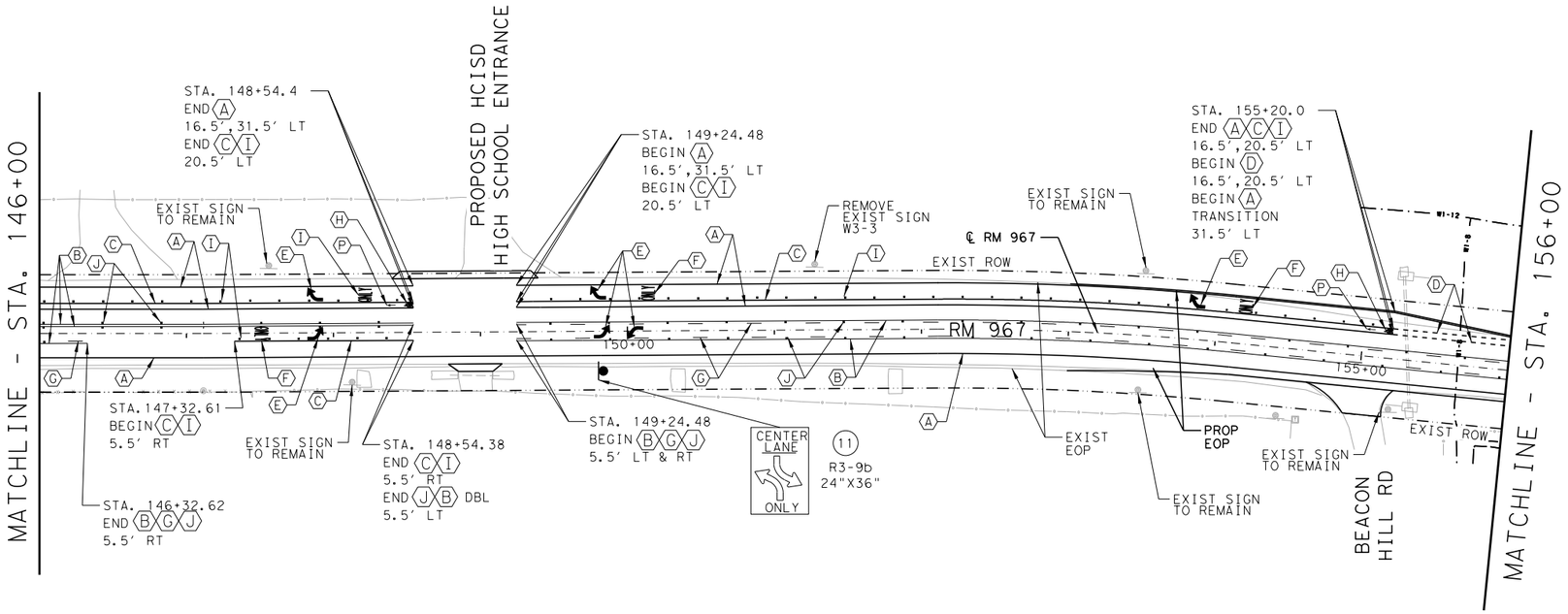
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SIGNING AND PAVEMENT MARKINGS PLAN
STA 126+00.00 TO
STA 146+00.00

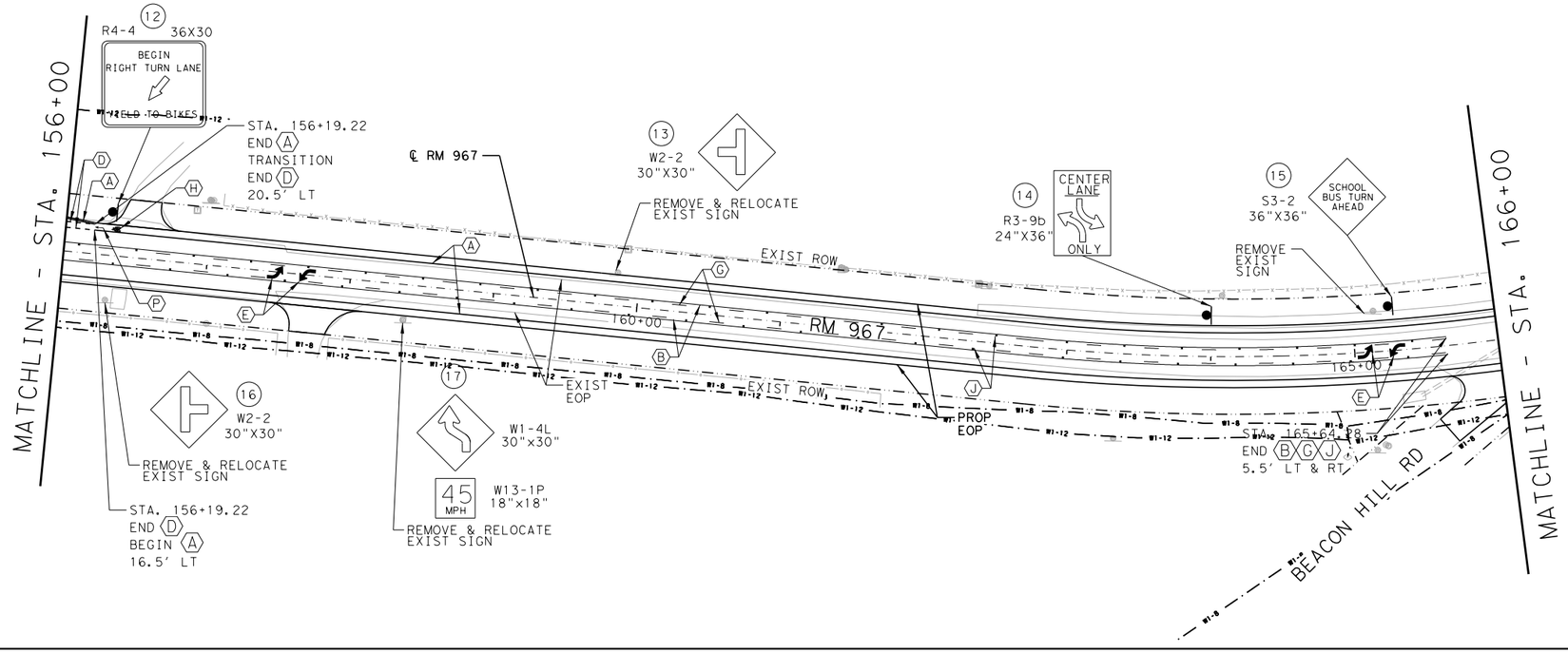
DATE: 5/17/2021			SHEET 8 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	174

Filename: ...\Cad\Plan\015012-000+SS08.dgn
Date: 5/17/2021



SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	A	B	C	D	E	F	G	H	K	L	M	N	O	P	I	J
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	LF	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	4786	3821	852	50	10	4	828	3	0	0	0	0	0	3	42	96



0 50 100

NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

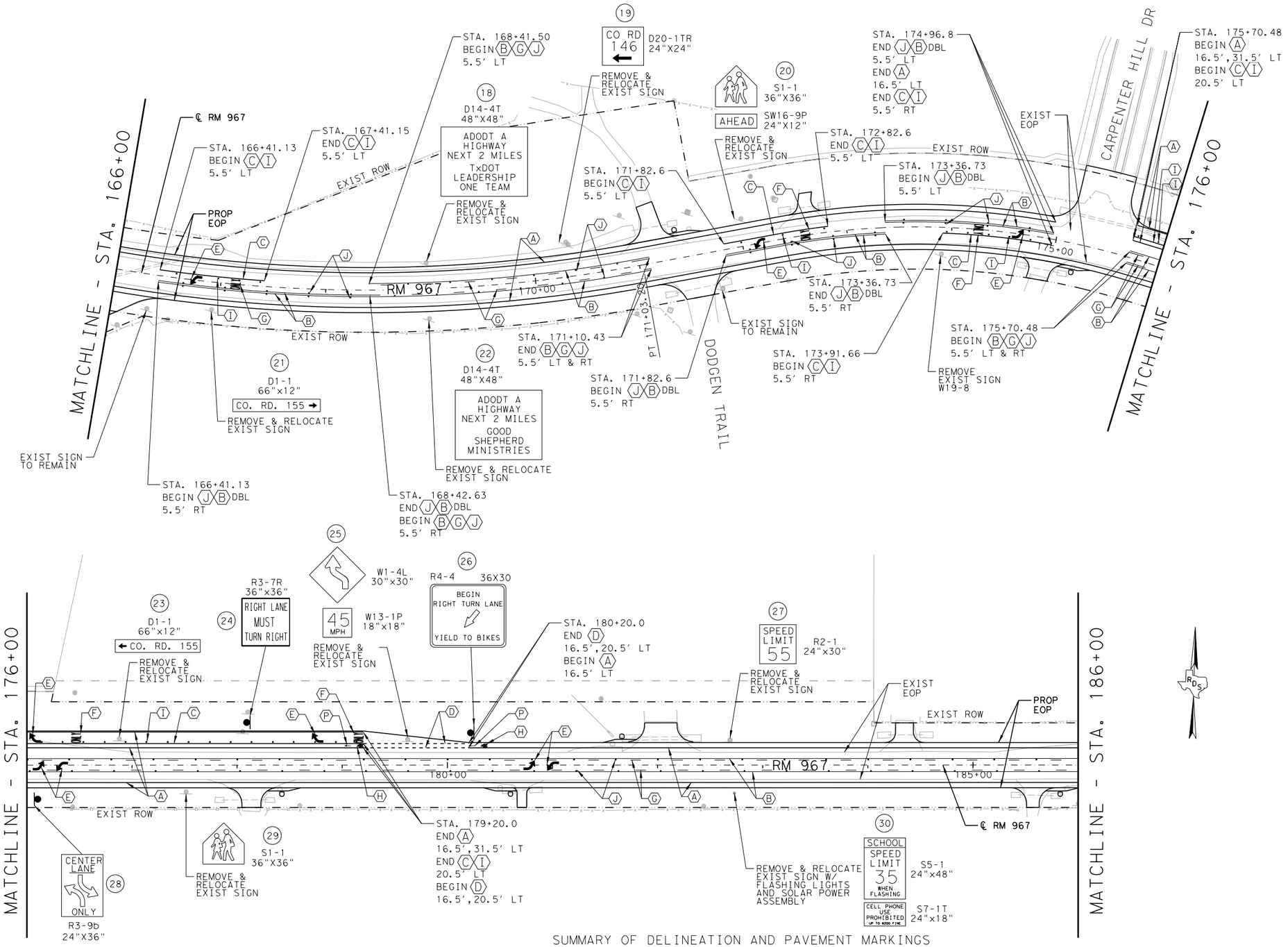
RM 967

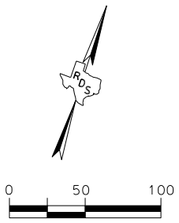
SIGNING AND PAVEMENT MARKINGS PLAN
STA 146+00.00 TO
STA 166+00.00

DATE: 5/17/2021 SHEET 9 OF 12

STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	175

Filename: ...\Cad\Plan\015012-000*SS09.dgn
Date: 5/17/2021





NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC) (GND)	OM ASSM OM-2Y (WC) (GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	4175	3631	550	50	9	5	650	2	0	0	0	0	0	2	27	91

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

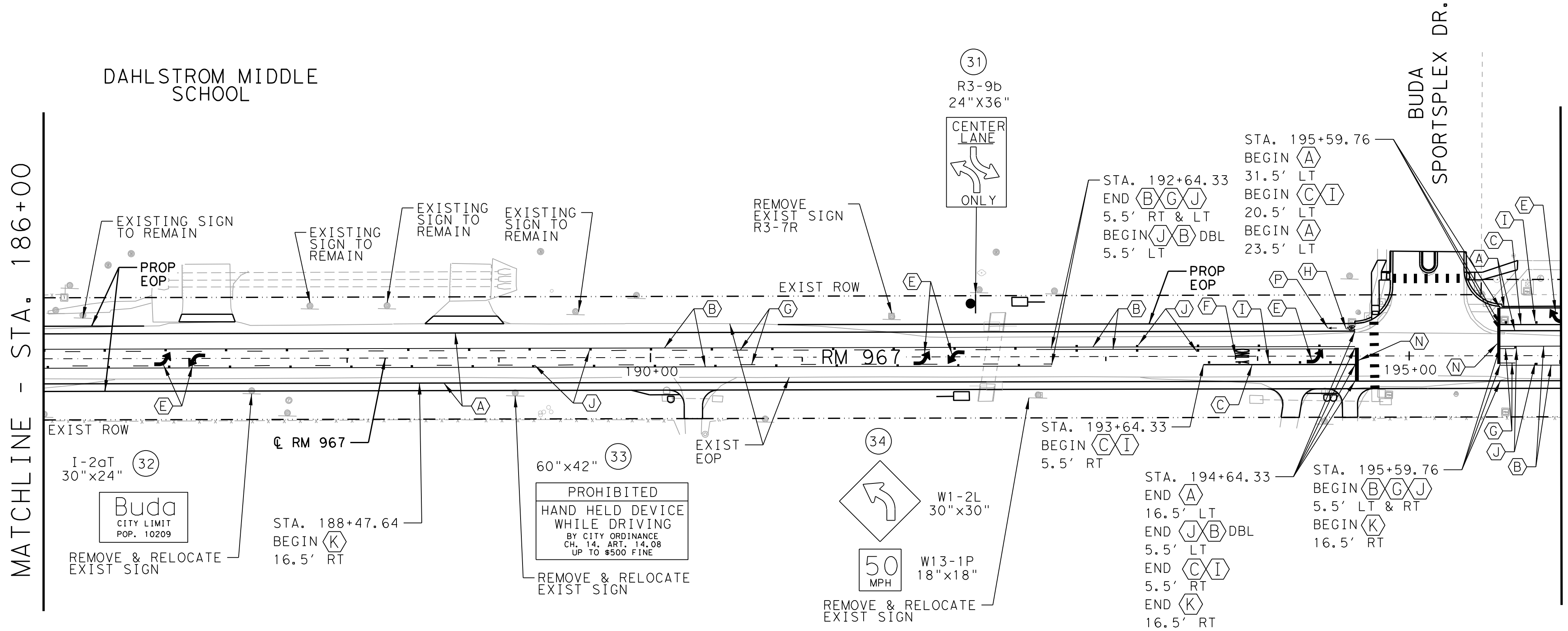
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

SIGNING AND PAVEMENT MARKINGS PLAN
STA 166+00.00 TO
STA 186+00.00

DATE: 5/17/2021			SHEET 10 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	176

Filename: ...\Cad\Plan\015012-000*SS10.dgn
Date: 5/17/2021



0 50 100

NOTES:

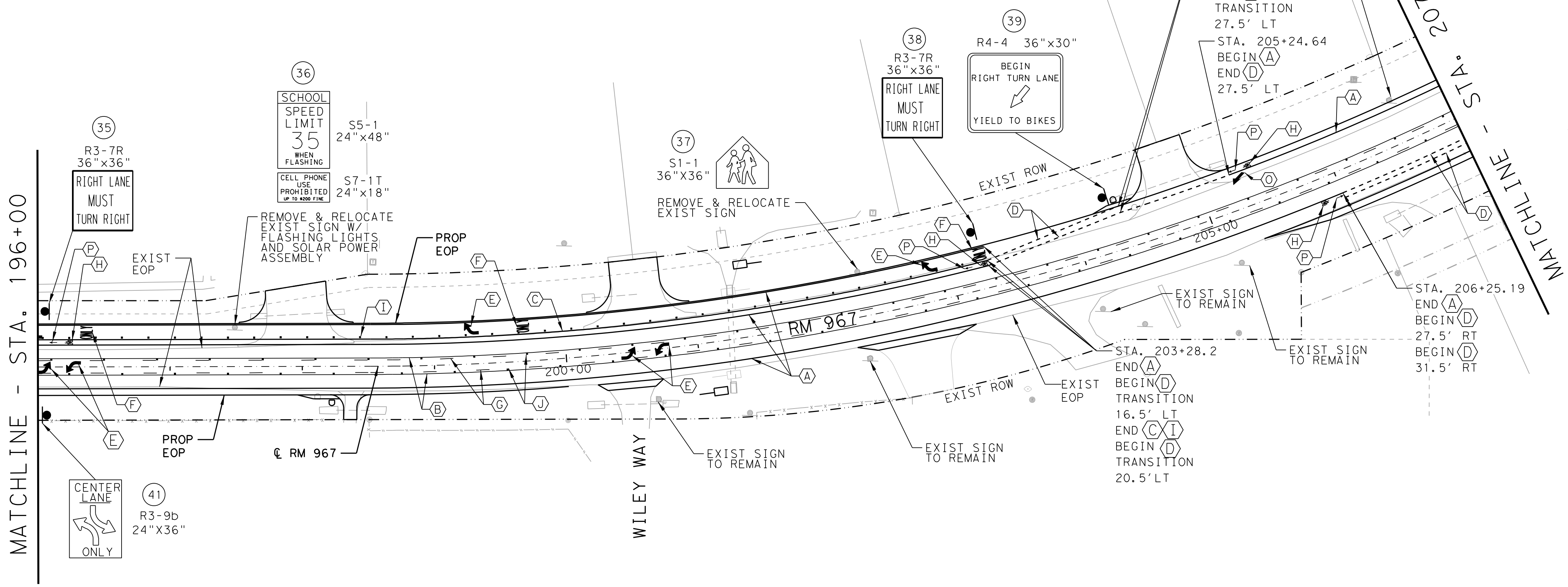
1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- ● PROPOSED SIGN ASSEMBLY
- ◎ EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
			A	B	C	D	E	F	G	H	K	L	M	N	O	P	I	J
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC)(GND)	OM ASSM OM-2Y (WC)(GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	2	4569	4009	864	126	12	4	903	5	0	0	0	211	1	5	44	101



STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers
5/17/2021

Texas Department of Transportation

HAYS COUNTY

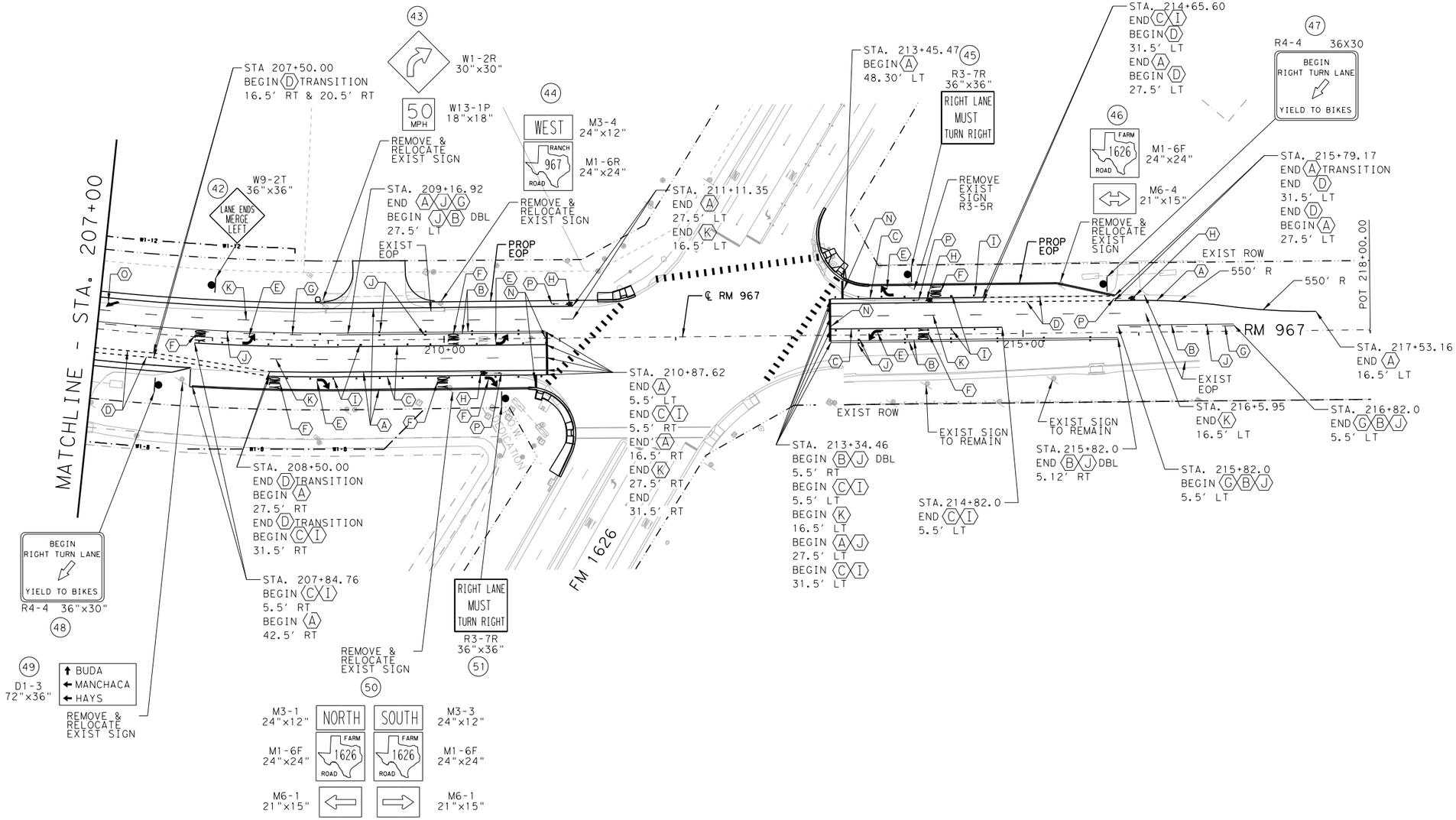
wsb
WSB & ASSOCIATES, INC.
FIRM # 16849

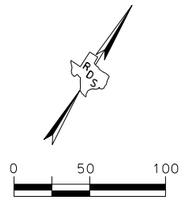
RM 967

SIGNING AND PAVEMENT MARKINGS PLAN
STA 186+00.00 TO
STA 207+00.00

DATE: 5/17/2021			SHEET 11 OF 12	
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	177

Filename: ...\Cad\Plan\015012-000*SS11.dgn
Date: 5/17/2021





NOTES:

1. THE LOCATION OF PROPOSED SIGNS, RELOCATED SIGNS, PAVEMENT MARKINGS, DELINEATORS, AND OBJECT MARKERS SHALL BE IN ACCORDANCE WITH THE STANDARD DETAILS INCLUDED IN THESE PLANS AND THE TMUTCD.

LEGEND

- PROPOSED SIGN ASSEMBLY
- EXISTING SIGN ASSEMBLY
- DELINEATOR ASSEMBLY
- OBJECT MARKER ASSEMBLY

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

SUMMARY OF DELINEATION AND PAVEMENT MARKINGS

ITEM 658			ITEM 666														ITEM 672	
DELINEATOR & OBJ MARK			REFLECTIVE PAVEMENT MARKINGS TY I & II														RAISED PAVEMENT MARKERS	
∞—	□—	□—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(K)	(L)	(M)	(N)	(O)	(P)	(I)	(J)
DEL ASSM (D-SW)SZ 1 (BFR)GF2	OM ASSM OM-2X (WC) (GND)	OM ASSM OM-2Y (WC) (GND)	4" WHITE SLD	4" YELLOW SLD	8" WHITE SLD	4" BIKE DOT	ARROW WHITE	WORD WHITE	4" YELLOW BRK	BIKE SYMBOL	4" WHITE BRK	12" YELLOW SLD	12" WHITE SLD	24" WHITE SLD	LNDP ARROW WHITE	BIKE ARROW	CL B REFL TY I-C	CL B REFL TY II-A-A
EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	EA	LF	LF	LF	LF	EA	EA	EA	EA
0	0	0	1310	1152	821	133	6	6	80	4	230	0	0	407	1	4	41	29

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

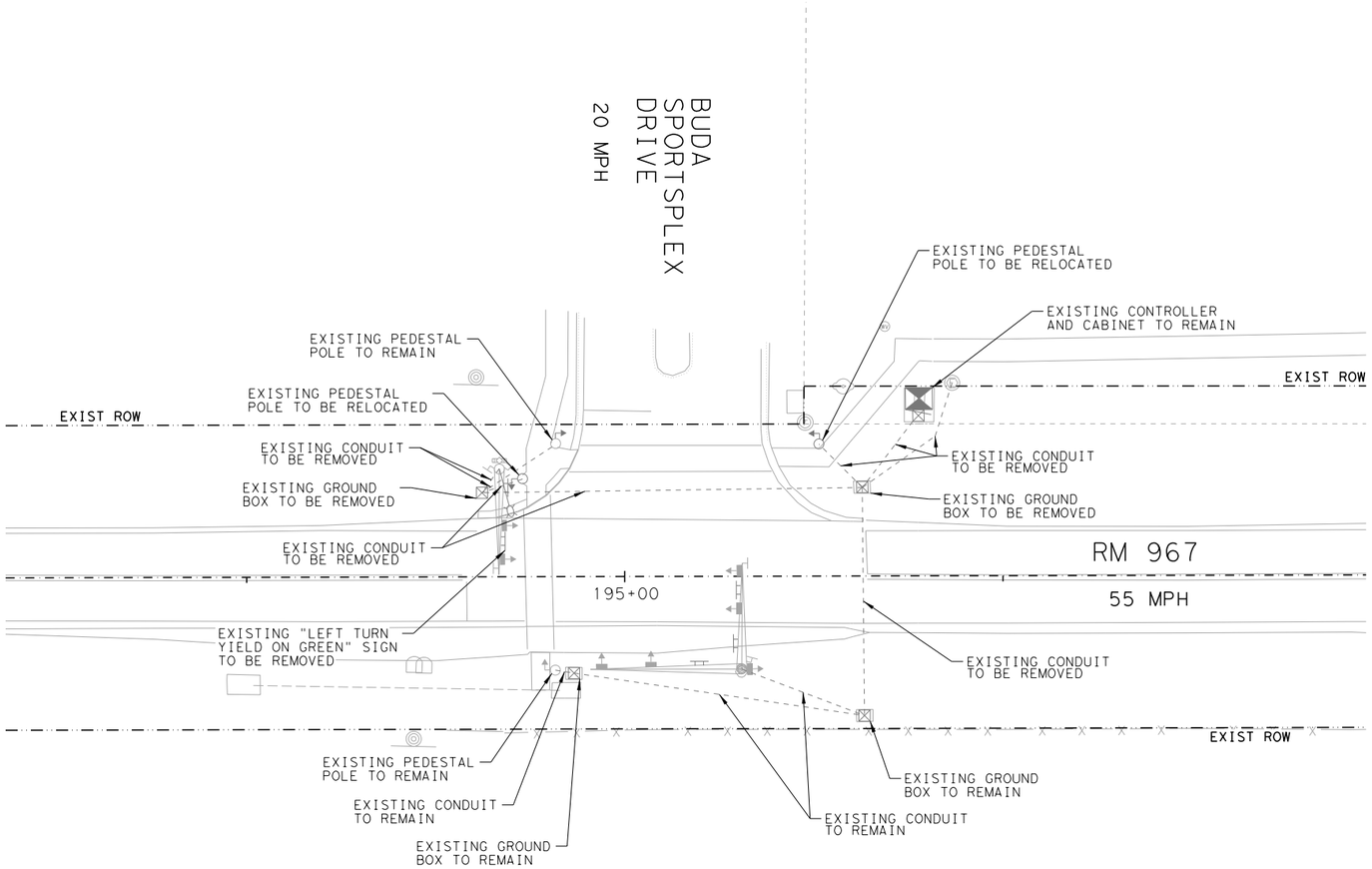
SIGNING AND PAVEMENT MARKING PLAN
STA 207+00.00 TO
END OF PROJECT

DATE: 5/17/2021 SHEET 12 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	178

Filename: ...\Cad\Plan\015012-000*SS12.dgn
Date: 5/17/2021



0 10 20 40

LEGEND

- EXIST SIGNAL HEAD
- EXIST PEDESTRIAN SIGNAL HEAD
- EXIST MAST ARM
- EXIST PEDESTAL POLE
- EXIST CONDUIT
- EXIST MAST ARM MOUNTED SIGN
- EXIST RADAR DETECTION (PRESENCE)
- EXIST RADAR DETECTION (ADVANCED)
- EXIST CONTROLLER
- EXIST GROUND BOX
- EXIST LUMINAIRE

NOTES:

1. EXISTING TRAFFIC SIGNAL TO REMAIN OPERATIONAL UNTIL PROPOSED SIGNAL ELEMENTS ARE IN PLACE.

SIGNAL REMOVAL				
ITEM NO	DESC	DESCRIPTION	UNIT	QUANTITY
687	6003	RELOCATE PED POLE ASSEMBLY	EA	2
690	6001	REMOVAL OF CONDUIT	LF	260
690	6006	REMOVAL OF GROUND BOXES	EA	2
690	6009	REMOVAL OF CABLES	LF	260
690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	1

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

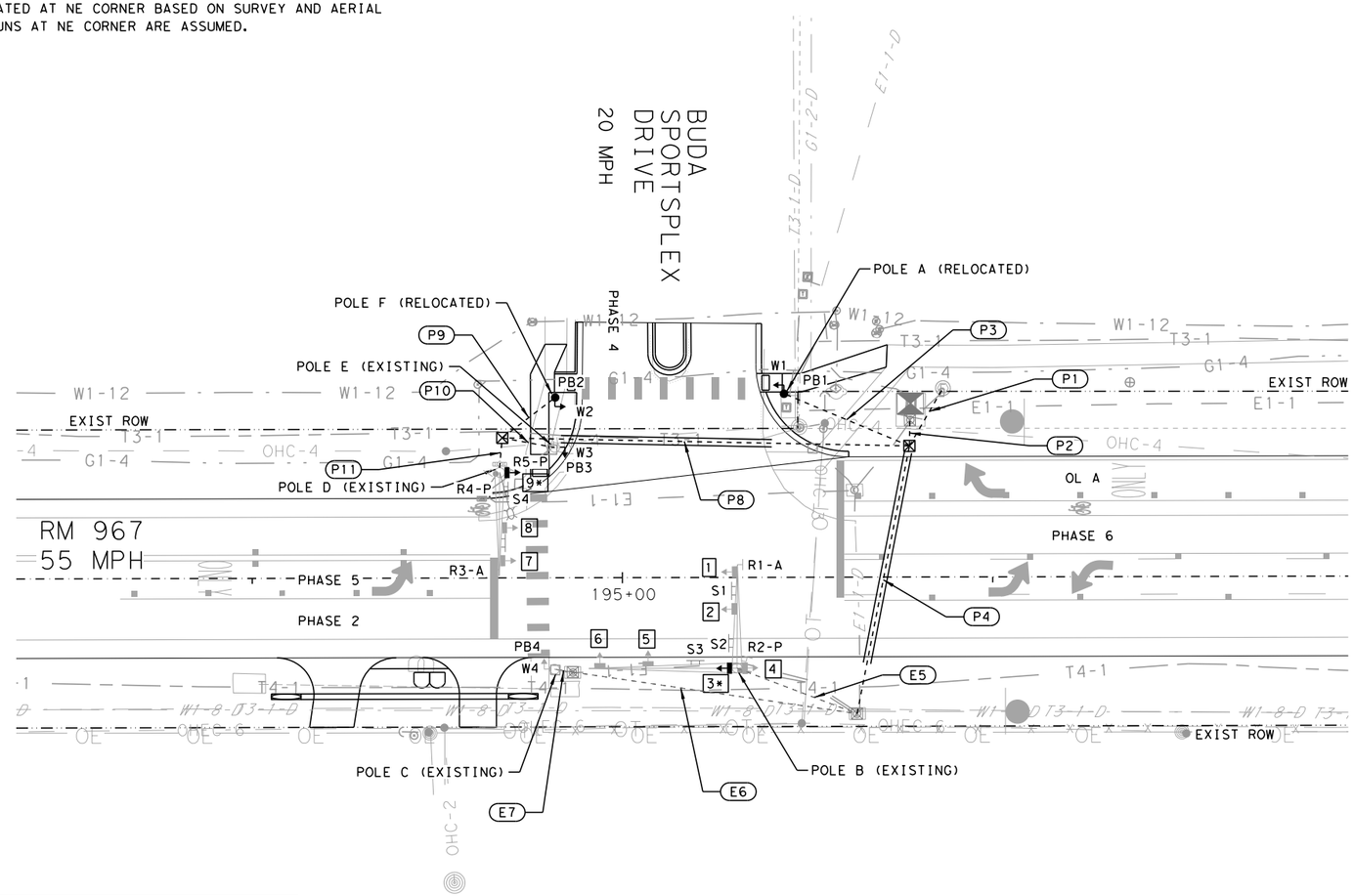
RM 967

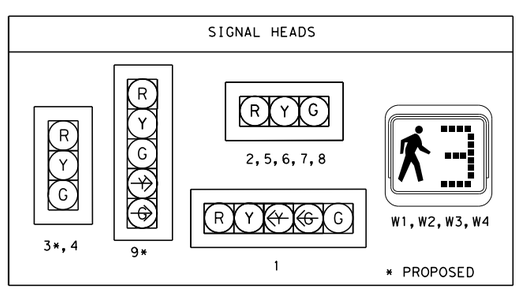
AT BUDA SPORTSPLEX DRIVE
EXISTING SIGNAL LAYOUT
AND REMOVALS

DATE: 5/17/2021			SHEET 1 OF 5
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	179

Filename: ...\Cad\Plan\015012-000*SIG01.dgn
Date: 5/17/2021

NOTES:
1. THIS SIGNAL IS TO BE CONSTRUCTED PER TXDOT STANDARDS AND SPECIFICATIONS.
2. POLE LOCATIONS PROVIDED ARE APPROXIMATE AND MAY NEED TO BE ADJUSTED IN THE FIELD TO AVOID CONFLICTS. STAKE PROPOSED POLE LOCATIONS AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO CONSTRUCTION.
3. ALL SIGNAL HEADS WILL HAVE BACKPLATES.
4. SIGNAL OPERATIONS WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.
5. AS BUILT PLANS SHOW SIGNAL CONTROLLER AT NW CORNER AND ELECTRICAL SERVICE AT SE CORNER OF THE INTERSECTION. EXISTING CONTROLLER AND ELECTRICAL SERVICE ARE LOCATED AT NE CORNER BASED ON SURVEY AND AERIAL IMAGES. EXISTING CONDUIT RUNS AT NE CORNER ARE ASSUMED.





SIGNAL POLES AND FOUNDATION DESCRIPTIONS		
POLE	BID CODE	LOCATION
POLE A	0687 6003	PED POLE ASSEMBLY STA 195+44 50' LT
POLE B		EXISTING TO REMAIN
POLE C		EXISTING TO REMAIN
POLE D		EXISTING TO REMAIN
POLE E		EXISTING TO REMAIN
POLE F	0687 6003	PED POLE ASSEMBLY STA 194+84 48' LT

0 10 20 40

LEGEND

- PROP SIGNAL HEAD
- PROP PEDESTAL POLE & SIGNAL HEAD
- PROP CONDUIT (TRENCHED)
- PROP CONDUIT (BORED)
- PROP GROUND BOX
- EXIST SIGNAL HEAD
- EXIST PEDESTRIAN SIGNAL HEAD
- EXIST MAST ARM
- EXIST PEDESTAL POLE
- EXIST CONDUIT
- EXIST MAST ARM MOUNTED SIGN
- EXIST RADAR DETECTION (PRESENCE)
- EXIST RADAR DETECTION (ADVANCED)
- EXIST CONTROLLER
- EXIST GROUND BOX
- EXIST LUMINAIRE

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

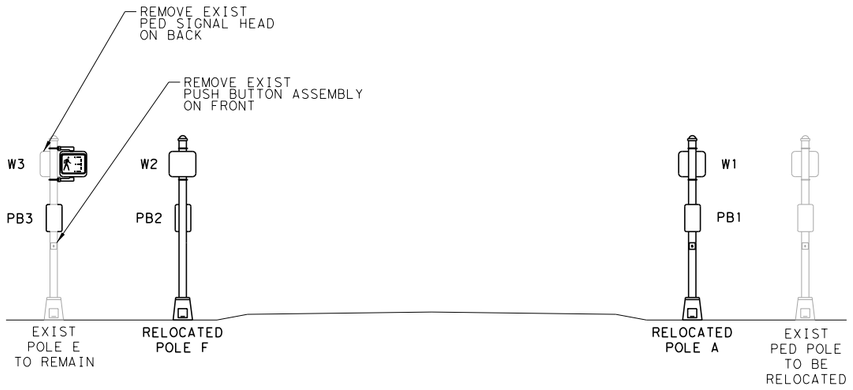
AT BUDA SPORTSPLEX DRIVE
PROPOSED SIGNAL LAYOUT

DATE: 5/17/2021 SHEET 2 OF 5

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

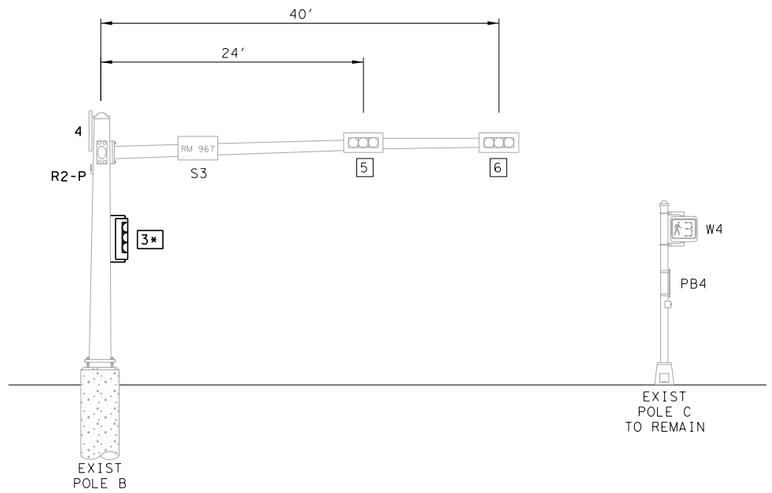
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	180

Filename: ...\Cad\Plan\015012-000*SIG02.dgn
Date: 5/17/2021



LOOKING NORTH ON BUDA SPORTSPLEX DRIVE

N. T. S.



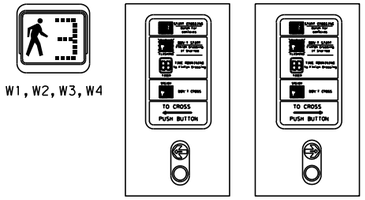
LOOKING SOUTH ON BUDA SPORTSPLEX DRIVE

N. T. S.

NOTE:
HEADS WILL BE INSTALLED PER TxMUTCD (LATEST)
FOUNDATIONS WILL BE ADJUSTED IN THE FIELD IN ORDER TO MEET CLEARANCE.
LOCATION OF MAST ARMS IS APPROXIMATE, ANY CHANGES WILL BE APPROVED BY THE ENGINEER.
MAST ARM ATTACHMENT HEIGHT WILL BE CLACULATED BY THE CONTRACTIOR IN THE FIELD AND APPROVED BY THE ENGINEER.

PROPOSED PEDESTRIAN SIGNAL HEADS
APS/COUNTDOWN

Push Button Station
Front View

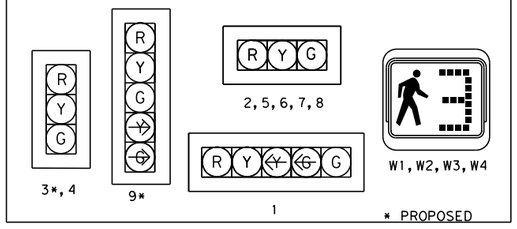


W1, W2, W3, W4

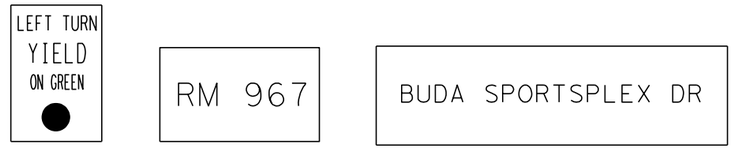
PB1, PB2, PB4 PB3

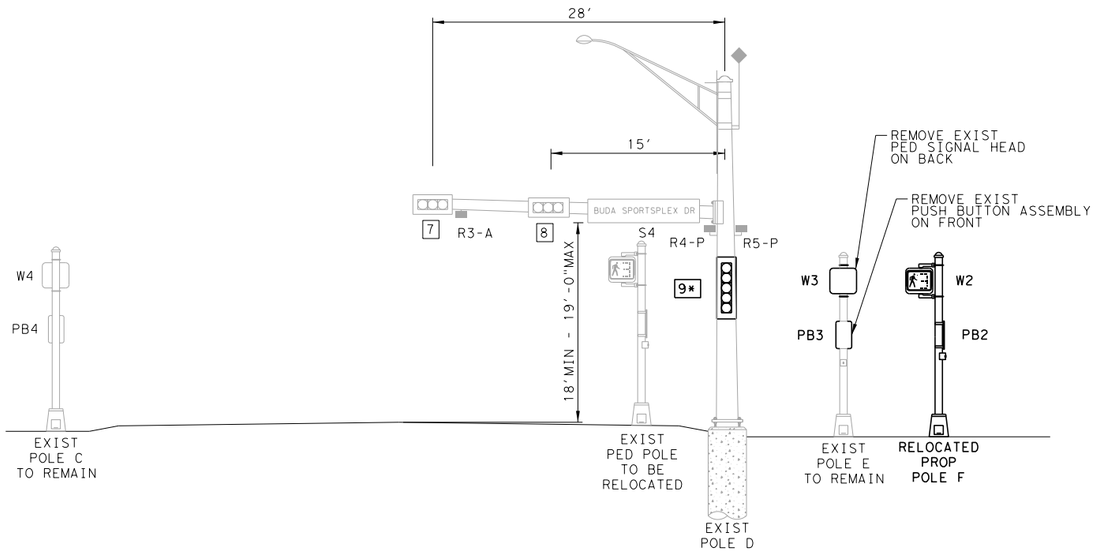
5" x 7" adhesive sign for pedestal pole and for standard signal pole
Adjustable Arrow - Inner arrow is embossed with small indicator light. Push Button can be part of sign assembly or separate.
Only install Double Arrow when called for in plans.

SIGNAL HEADS



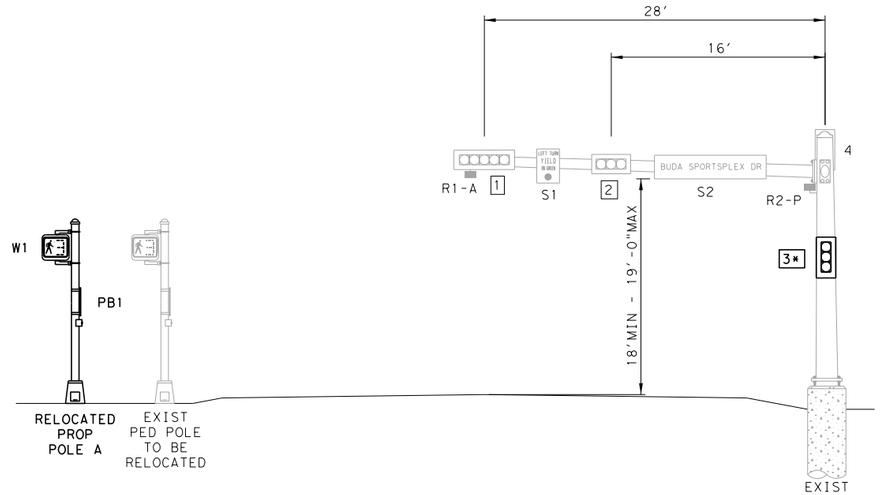
MAST ARM SIGNS





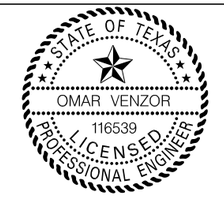
LOOKING WEST ON RM 967

N. T. S.



LOOKING EAST ON RM 967

N. T. S.



5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

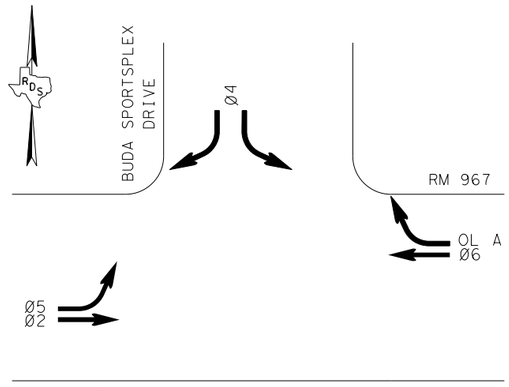
AT BUDA SPORTSPLEX DRIVE
SIGNAL ELEVATION
& PEDESTRIAN DETAILS

DATE: 5/17/2021			SHEET 3 OF 5
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	181

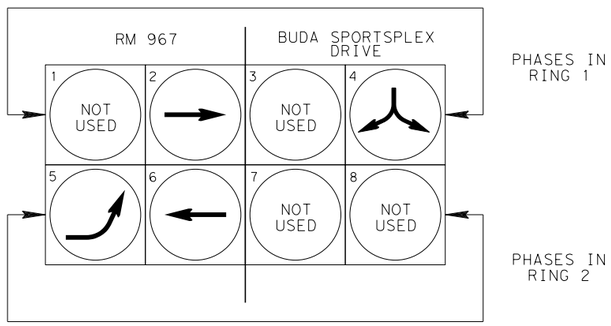
Filename: ...\Cad\Plan\015012-000*SIG03.dgn
Date: 5/17/2021

IN POLE WIRING			
POLE	14 AWG		
	2/C (FT)	5/C (FT)	7/C (FT)
POLE A	5	10	
POLE B*		20	
POLE C*			
POLE D*			20
POLE E	5	10	
POLE F	5	10	
TOTAL	15	50	20

*EXISITING CABLES TO REMAIN.



ORIENTATION VIEW



PHASING DIAGRAM

OL A = 04

CABLE TERMINATION CHART														
CNDR. NO.	CNDR. COLOR	PROPOSED CABLE 1 PED 1 TO CNTRL 5 CNDR.	EXIST CABLE 2 SH 1 TO CNTRL 7 CNDR.	EXIST CABLE 3 SH 2 TO CNTRL 5 CNDR.	PROPOSED CABLE 4 SH 3 TO CNTRL 5 CNDR.	EXIST CABLE 5 SH 4 TO CNTRL 5 CNDR.	EXIST CABLE 6 SH 5 TO CNTRL 5 CNDR.	EXIST CABLE 7 SH 6 TO CNTRL 5 CNDR.	EXIST CABLE 8 PED 4 TO CNTRL 5 CNDR.	EXIST CABLE 9 SH 7 TO CNTRL 5 CNDR.	EXIST CABLE 10 SH 8 TO CNTRL 5 CNDR.	PROPOSED CABLE 11 SH 9 TO CNTRL 7 CNDR.	PROPOSED CABLE 12 PED 3 TO CNTRL 5 CNDR.	PROPOSED CABLE 13 PED 2 TO CNTRL 5 CNDR.
1	BLACK	PED 1 DW PED PHS 6	SH 1 Y PHASE 2	SH 2 Y PHASE 2	SH 3 Y PHASE 2	SH 4 Y PHASE OLC	SH 5 Y PHASE 4	SH 6 Y PHASE 4	SPARE	SH 7 Y PHASE 6	SH 8 Y PHASE 6	SH 9 Y PHASE 6	SPARE	PED 2 DW PHASE 6
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SPARE	SH 1 R PHASE 2	SH 2 R PHASE 2	SH 3 R PHASE 2	SH 4 R PHASE OLC	SH 5 R PHASE 4	SH 6 R PHASE 4	PED 4 DW PHASE 4	SH 7 R PHASE 6	SH 8 R PHASE 6	SH 9 R PHASE 6	PED 3 DW PHASE 4	SPARE
4	GREEN	SPARE	SH 1 G PHASE 2	SH 2 G PHASE 2	SH 3 G PHASE 2	SH 4 G PHASE OLC	SH 5 G PHASE 4	SH 6 G PHASE 4	PED 4 W PHASE 4	SH 7 G PHASE 6	SH 8 G PHASE 6	SH 9 G PHASE 6	PED 3 W PHASE 4	SPARE
5	ORANGE	PED 1 W PED PHS 6	SH 1 Y ARROW PHASE 5	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 9 Y ARROW OL A	SPARE	PED 2 W PHASE 6
6	BLUE		SH 1 G ARROW PHASE 5									SH 9 G ARROW OL A		
7	WHITE/ BLACK		SPARE									SPARE		

SUMMARY OF CONDUITS AND CABLES RM 967 & BUDA SPORTSPLEX DRIVE														
	CONDUIT					SIGNAL					LUMINAIRE	GROUND	POWER	GROUND
RUN	PVC/ TRENCH		PVC/ BORE		LENGTH (FT)	2/C #14 AWG	5/C #14 AWG	7/C #14 AWG	6/C RADAR	ETHR CAT 5	#8 AWG (INS)	#8 AWG (BARE)	#6 AWG (INS)	#6 AWG (BARE)
	2"	3"	2"	3"										
P1	2				20						2	1	2	1
P2	1	3			15	4	11	2	5	1		3	2	1
P3	1				40	1	1					1		
P4				3	75	1	6	1	2			3		
E5					35		1							
E6														
E7														
P8				3	110	2	4	1	3	1	2	3		
P9	1				20	1	1					1		
P10	1				15	1	1					1		
P11	1	2			10		2	1	3	1	2	3		
TOTAL	140	65	0	555		430	1185	225	585	135	280	725	70	35

E = EXISTING CONDUIT, EXISTING CONDUCTORS TO REMAIN

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER
5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

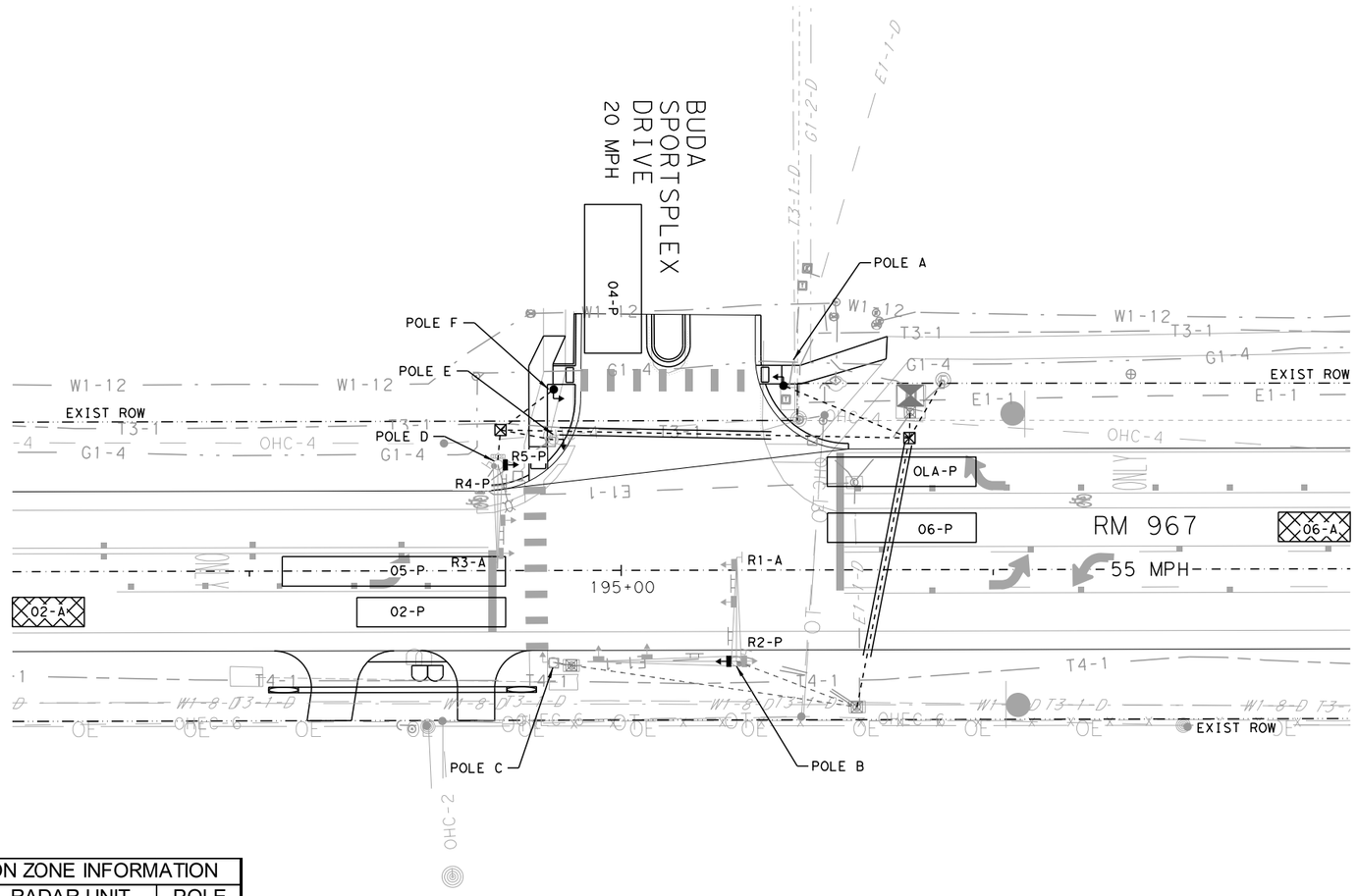
RM 967

AT BUDA SPORTSPLEX DRIVE
ELECTRICAL WIRING
AND PHASING

DATE: 5/17/2021			SHEET 4 OF 5
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	182

Filename: ...\Cad\Plan\015012-000*SIG04.dgn
Date: 5/17/2021

NOTES:
1. CONTRACTOR TO CONFIGURE RADAR DETECTION ZONES TO COMPLY WITH PROPOSED ROADWAY LAYOUT.



DETECTION ZONE INFORMATION		
ZONE	RADAR UNIT	POLE
06-A	R1-A	B
06-P	R2-P	
OLA-P		
02-A	R3-A	D
02-P	R4-P	
05-P		
04-P	R5-P	

0 10 20 40

LEGEND

- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- MAST ARM
- CONDUIT
- MAST ARM MOUNTED SIGN
- RADAR DETECTION (PRESENCE)
- RADAR DETECTION (ADVANCED)
- CONTROLLER
- GROUND BOX
- LUMINAIRE
- ETHERNET ANTENNA

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

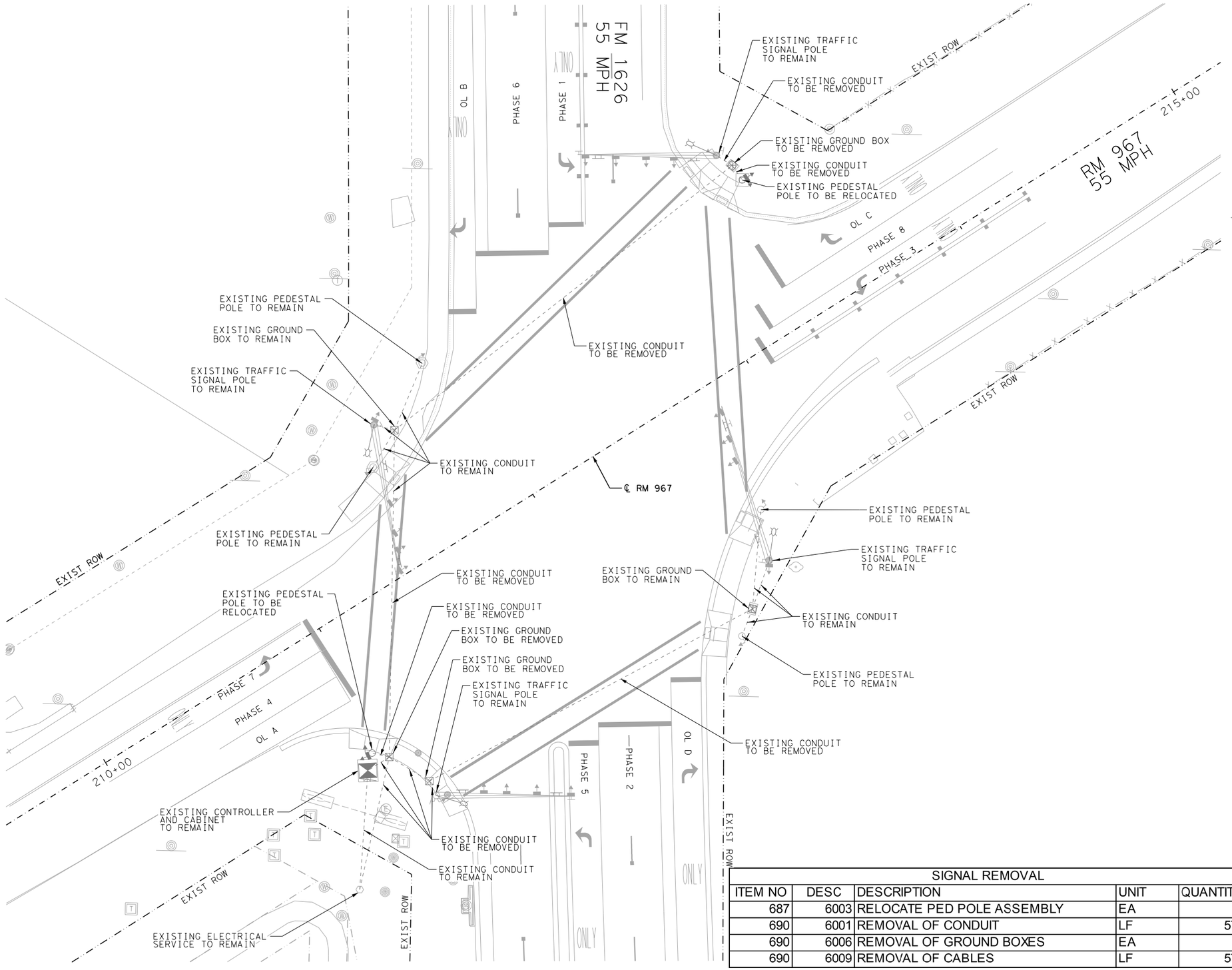
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

AT BUDA SPORTSPLEX DRIVE
RADAR PLAN

DATE: 5/17/2021				SHEET 5 OF 5
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	183

Filename: ...\Cad\Plan\015012-000*SIG05.dgn
Date: 5/17/2021



0 10 20 40

LEGEND

- EXIST SIGNAL HEAD
- EXIST PEDESTRIAN SIGNAL HEAD
- EXIST MAST ARM
- EXIST PEDESTAL POLE
- EXIST CONDUIT
- EXIST MAST ARM MOUNTED SIGN
- EXIST RADAR DETECTION (PRESENCE)
- EXIST RADAR DETECTION (ADVANCED)
- EXIST CONTROLLER
- EXIST GROUND BOX
- EXIST LUMINAIRE

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

RM 967 AT FM 1626
EXISTING SIGNAL LAYOUT
AND REMOVALS

SIGNAL REMOVAL

ITEM NO	DESC	DESCRIPTION	UNIT	QUANTITY
687	6003	RELOCATE PED POLE ASSEMBLY	EA	2
690	6001	REMOVAL OF CONDUIT	LF	570
690	6006	REMOVAL OF GROUND BOXES	EA	3
690	6009	REMOVAL OF CABLES	LF	570

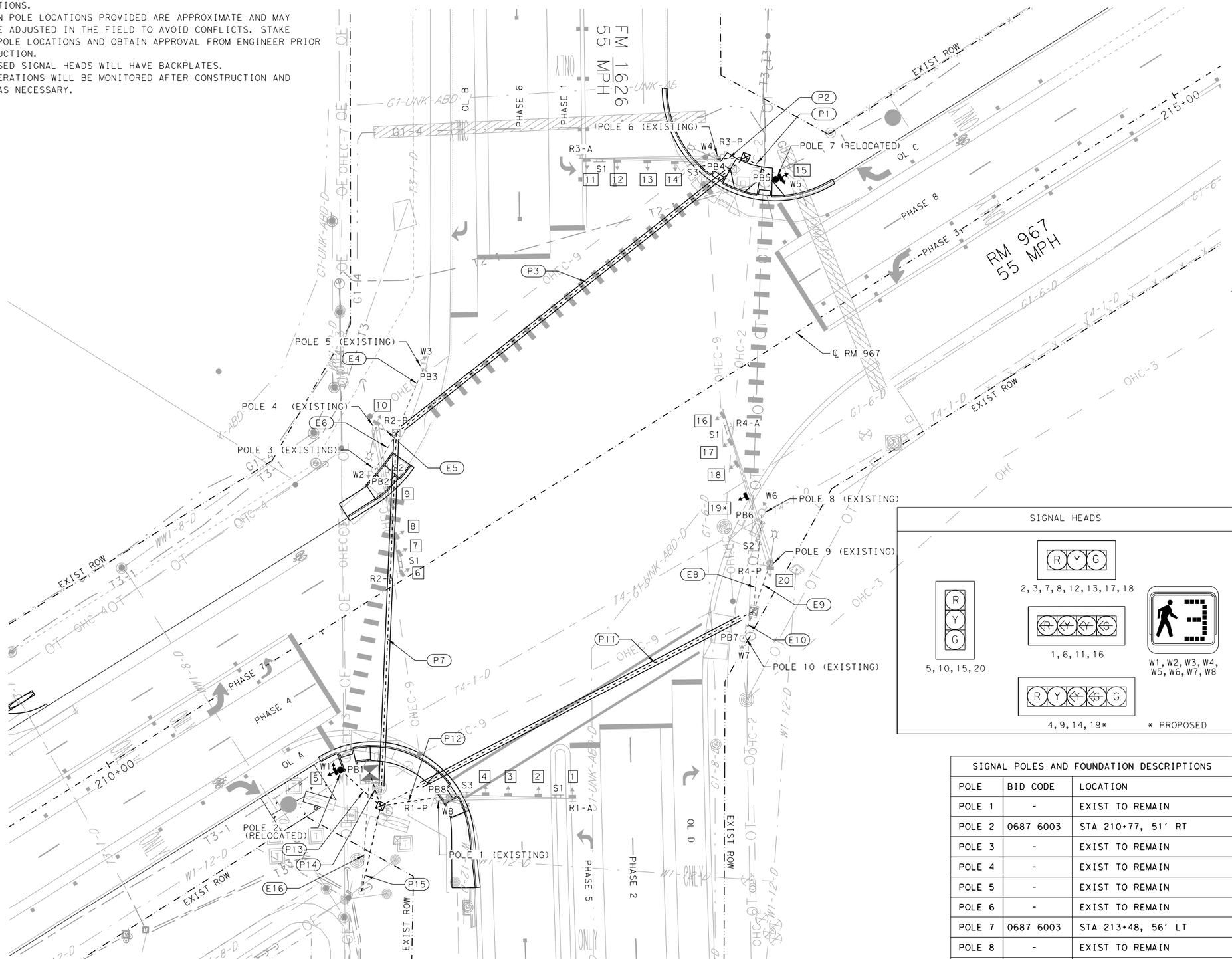
DATE: 5/17/2021 SHEET 1 OF 6

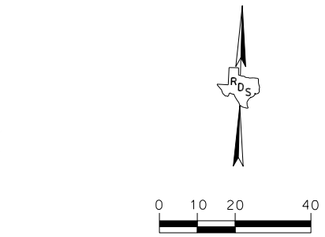
STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	184

Filename: ...\Cad\Plan\015012-000*SIG11.dgn
Date: 5/17/2021

NOTES:
1. THIS SIGNAL IS TO BE CONSTRUCTED PER TXDOT STANDARDS AND SPECIFICATIONS.
2. PEDESTRIAN POLE LOCATIONS PROVIDED ARE APPROXIMATE AND MAY NEED TO BE ADJUSTED IN THE FIELD TO AVOID CONFLICTS. STAKE PROPOSED POLE LOCATIONS AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO CONSTRUCTION.
3. ALL PROPOSED SIGNAL HEADS WILL HAVE BACKPLATES.
4. SIGNAL OPERATIONS WILL BE MONITORED AFTER CONSTRUCTION AND MODIFIED AS NECESSARY.





LEGEND

- PROP SIGNAL HEAD
- PROP PEDESTAL POLE & SIGNAL HEAD
- PROP CONDUIT (TRENCHED)
- PROP CONDUIT (BORED)
- PROP GROUND BOX
- EXIST SIGNAL HEAD
- EXIST PEDESTRIAN SIGNAL HEAD
- EXIST MAST ARM
- EXIST PEDESTAL POLE
- EXIST CONDUIT
- EXIST MAST ARM MOUNTED SIGN
- EXIST RADAR DETECTION (PRESENCE)
- EXIST RADAR DETECTION (ADVANCED)
- EXIST CONTROLLER
- EXIST GROUND BOX
- EXIST LUMINAIRE

SIGNAL HEADS

SIGNAL POLES AND FOUNDATION DESCRIPTIONS

POLE	BID CODE	LOCATION
POLE 1	-	EXIST TO REMAIN
POLE 2	0687 6003	STA 210+77, 51' RT
POLE 3	-	EXIST TO REMAIN
POLE 4	-	EXIST TO REMAIN
POLE 5	-	EXIST TO REMAIN
POLE 6	-	EXIST TO REMAIN
POLE 7	0687 6003	STA 213+48, 56' LT
POLE 8	-	EXIST TO REMAIN
POLE 9	-	EXIST TO REMAIN
POLE 10	-	EXIST TO REMAIN

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

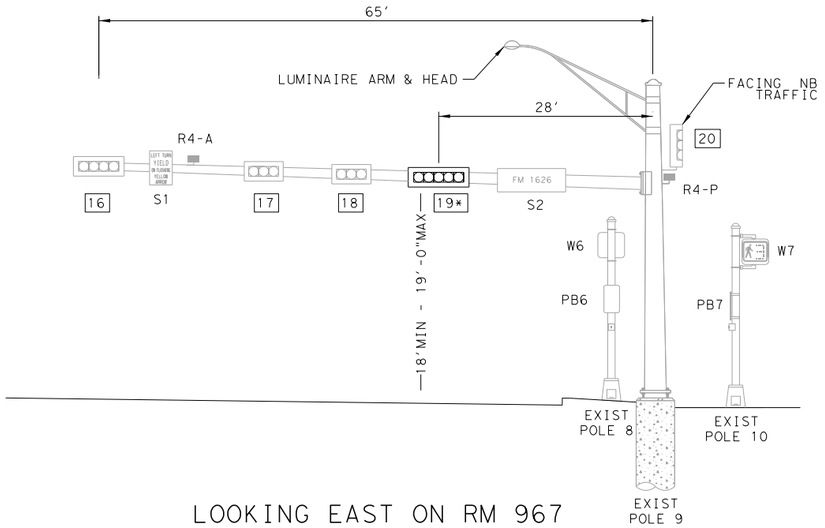
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

RM 967 AT FM 1626
PROPOSED SIGNAL LAYOUT

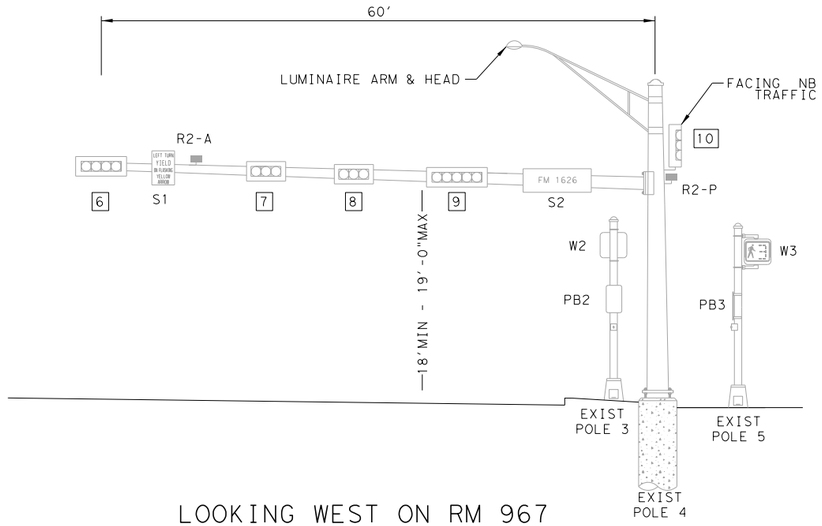
DATE: 5/17/2021			SHEET 2 OF 6
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	185

Filename: ...\Cad\Plan\015012-000*SIG12.dgn
Date: 5/17/2021



LOOKING EAST ON RM 967

N.T.S.

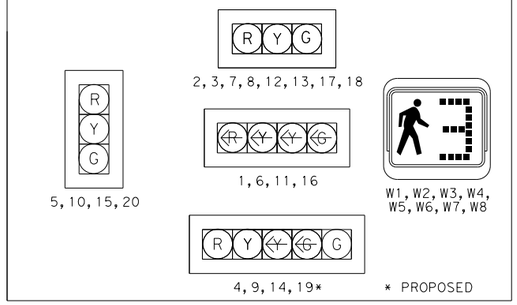


LOOKING WEST ON RM 967

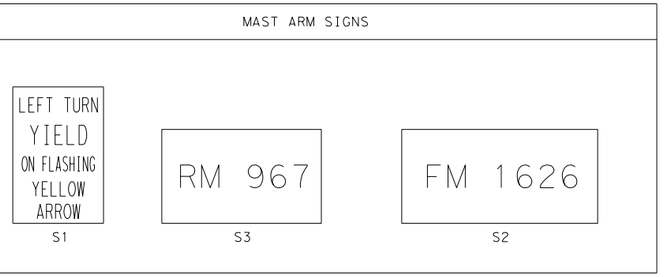
N.T.S.

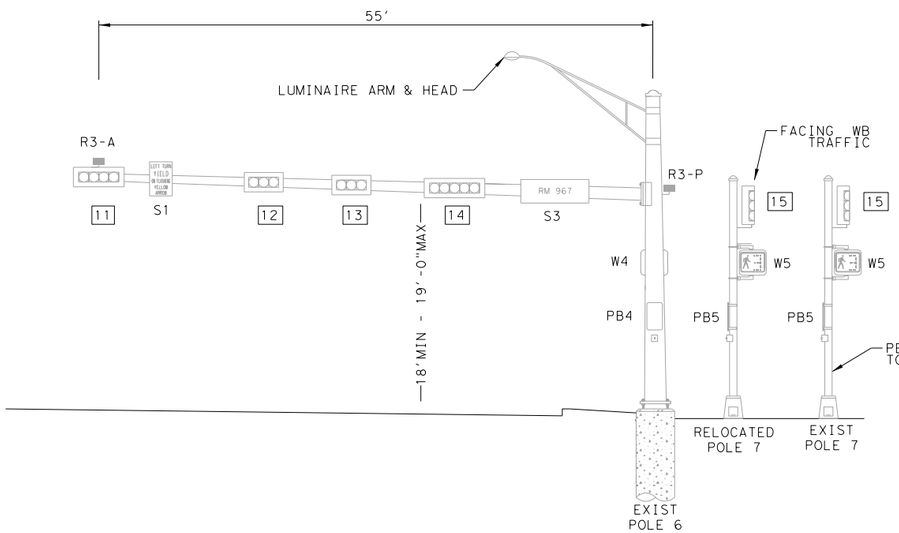
NOTE:
HEADS WILL BE INSTALLED PER TxMUTCD (LATEST) FOUNDATIONS WILL BE ADJUSTED IN THE FIELD IN ORDER TO MEET CLEARANCE. LOCATION OF MAST ARMS IS APPROXIMATE, ANY CHANGES WILL BE APPROVED BY THE ENGINEER. MAST ARM ATTACHMENT HEIGHT WILL BE CALCULATED BY THE CONTRACTOR IN THE FIELD AND APPROVED BY THE ENGINEER.

SIGNAL HEADS



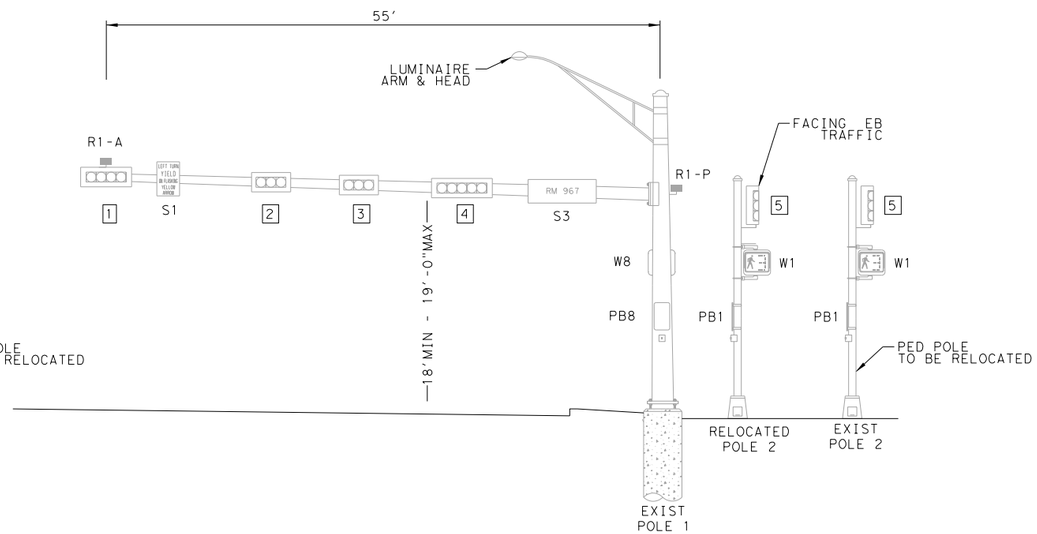
MAST ARM SIGNS





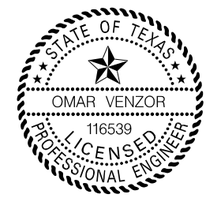
LOOKING NORTH ON FM 1626

N.T.S.



LOOKING SOUTH ON FM 1626

N.T.S.



5/17/2021

Texas Department of Transportation

HAYS COUNTY

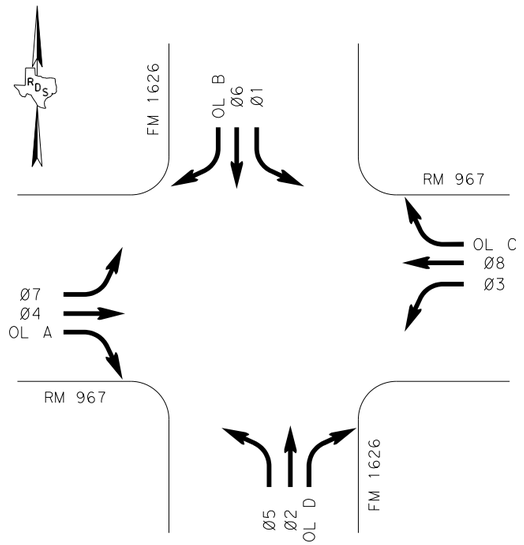
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

RM 967 AT FM 1626
SIGNAL ELEVATION &
PEDESTRIAN DETAILS

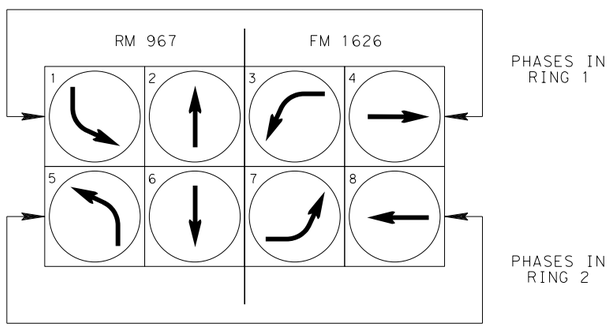
DATE: 5/17/2021				SHEET 3 OF 6
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	186

Filename: ...\Cad\Plan\015012-000*SIG13.dgn
Date: 5/17/2021



ORIENTATION VIEW

SUMMARY OF CONDUITS AND CABLES RM 967 & FM 1626													
	CONDUIT					SIGNAL				LUMINAIRE	GROUND	POWER	GROUND
RUN	PVC/ TRENCH		PVC/ BORE		LENGTH (FT)	2/C #14 AWG	5/C #14 AWG	7/C #14 AWG	6/C RADAR	#8 AWG (INS)	#8 AWG (BARE)	#6 AWG (INS)	#6 AWG (BARE)
	2"	3"	2"	3"									
P1	1				15	1	2				1		
P2	1	2			15	1	2	2	2	2	3		
P3			1	2	180	2	4	2	2	2	3		
E4													
E5													
E6													
P7			1	2	150	4	8	4	4	4	3		
E8													
E9					25			1					
E10													
P11			1	2	170	2	4	2	2	2	3		
P12	1	2			25	1	2	2	2	2	3		
P13	1	2			25	1	1				1		
P14	1	2			15	8	16	8	8		3		
P15		1			35					8	1		
E16													
TOTAL	95	160	500	1000	655	1520	3014	1546	1520	1392	1725	0	0



PHASING DIAGRAM

OL A = Ø5 OL M = Ø2
OL B = Ø7 OL N = Ø4
OL C = Ø1 OL O = Ø6
OL D = Ø3 OL P = Ø8

IN POLE WIRING			
POLE	14 AWG		
	2/C (FT)	5/C (FT)	7/C (FT)
POLE 1*			
POLE 2*	5	30	
POLE 3*			
POLE 4*			
POLE 5*			
POLE 6*			
POLE 7*	5	30	
POLE 8*			
POLE 9*			50
POLE 10*			
TOTAL	10	60	50

*EXISITING CABLES TO REMAIN.

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED
PROFESSIONAL ENGINEER
5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

AT FM 1626
ELECTRICAL WIRING
AND PHASING

DATE: 5/17/2021			SHEET 4 OF 6
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	187

Filename: ...\Cad\Plan\015012-000*SIG14.dgn
Date: 5/17/2021

CABLE TERMINATION CHART

CNDR. NO.	CNDR. COLOR	EXIST CABLE 1 POLE #1 TO CNTRL 5 CNDR.	EXIST CABLE 2 POLE #1 TO CNTRL 7 CNDR.	EXIST CABLE 3 POLE #1 TO CNTRL 7 CNDR.	EXIST CABLE 4 POLE #1 TO CNTRL 5 CNDR.	PROPOSED CABLE 5 POLE 2 TO CNTRL 5 CNDR.	PROPOSED CABLE 6 POLE 2 TO CNTRL 5 CNDR.	EXIST CABLE 7 POLE 3 TO CNTRL 5 CNDR.	EXIST CABLE 8 POLE #4 TO CNTRL 5 CNDR.	EXIST CABLE 9 POLE #4 TO CNTRL 5 CNDR.	EXIST CABLE 10 POLE #4 TO CNTRL 7 CNDR.	EXIST CABLE 11 POLE #4 TO CNTRL 7 CNDR.	EXIST CABLE 12 POLE #5 TO CNTRL 5 CNDR.	EXIST CABLE 13 POLE #6 TO CNTRL 5 CNDR.	EXIST CABLE 14 POLE #6 TO CNTRL 7 CNDR.	EXIST CABLE 15 POLE #6 TO CNTRL 7 CNDR.	EXIST CABLE 16 POLE #6 TO CNTRL 5 CNDR.	PROPOSED CABLE 17 POLE 7 TO CNTRL 5 CNDR.	PROPOSED CABLE 18 POLE #6 TO CNTRL 5 CNDR.	EXIST CABLE 19 POLE 8 TO CNTRL 5 CNDR.
1	BLACK	SH 2, 3 Y PHASE 6	SH 4 Y PHASE 6	SH 1 Y PHASE 1	SPARE	PED 1 DW PED PHS 6	SH 5 Y OL N	PED 2 DW PED PHS 6	SH 7, 8 Y PHASE 8	SH 10 Y OL O	SH 9 Y PHASE 8	SH 6 Y ARW PHASE 3	SPARE	SH 12, 13 Y PHASE 2	SH 14 Y PHASE 2	SH 11 Y ARW PHASE 5	SPARE	PED 5 DW PED PHS 2	SH 15 Y OL P	PED 6 DW PED PHS 2
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 2, 3 R PHASE 6	SH 4 R PHASE 6	SH 1 R PHASE 1	PED 8 DW PED PHS 4	SPARE	SH 5 R OL N	SPARE	SH 7, 8 R PHASE 8	SH 10 R OL O	SH 9 R PHASE 8	SH 6 R ARW PHASE 3	PED 3 DW PED PHS 8	SH 12, 13 R PHASE 2	SH 14 R PHASE 2	SH 11 R ARW PHASE 5	PED 4 DW PED PHS 8	SPARE	SH 15 R OL P	SPARE
4	GREEN	SH 2, 3 G PHASE 6	SH 4 G PHASE 6	SH 1 G PHASE 1	PED 8 W PED PHS 4	SPARE	SH 5 G OL N	SPARE	SH 7, 8 G PHASE 8	SH 10 G OL O	SH 9 G PHASE 8	SH 6 G ARW PHASE 3	PED 3 W PED PHS 8	SH 12, 13 G PHASE 2	SH 14 G PHASE 2	SH 11 G ARW PHASE 5	PED 4 W PED PHS 8	SPARE	SH 15 G OL P	SPARE
5	ORANGE	SPARE	SH 4 Y ARW OL B	SH 1 FY ARW OL M	SPARE	PED 1 W PED PHS 6	SPARE	PED 2 W PED PHS 6	SPARE	SPARE	SH 9 Y ARW OL C	SH 6 FY ARW OL N	SPARE	SPARE	SH 14 Y ARW OL D	SH 11 FY ARW OL O	SPARE	PED 5 W PED PHS 2	SPARE	PED 6 W PED PHS 2
6	BLUE		SH 4 G ARW OL B	SPARE							SH 9 G ARW OL C	SPARE			SH 14 G ARW OL D	SPARE				
7	WHITE/ BLACK		SPARE	SPARE							SPARE	SPARE			SPARE	SPARE				

CABLE TERMINATION CHART

CNDR. NO.	CNDR. COLOR	EXIST CABLE 20 POLE #9 TO CNTRL 5 CNDR.	EXIST CABLE 21 POLE #9 TO CNTRL 5 CNDR.	EXIST CABLE 22 POLE #9 TO CNTRL 7 CNDR.	EXIST CABLE 23 POLE #9 TO CNTRL 5 CNDR.	PROPOSED CABLE 24 POLE #9 TO CNTRL 7 CNDR.
1	BLACK	SH 16, 17 Y PHASE 4	SH 20 Y OL M	SH 16 Y ARW PHASE 7	SPARE	SH 19 Y PHASE 4
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 16, 17 R PHASE 4	SH 20 R OL M	SH 16 R ARW PHASE 7	PED 7 DW PED PHS 4	SH 19 R PHASE 4
4	GREEN	SH 16, 17 G PHASE 4	SH 20 G OL M	SH 16 G ARW PHASE 7	PED 7 W PED PHS 4	SH 19 G PHASE 4
5	ORANGE	SPARE	SPARE	SH 11 FY ARW OL P	SPARE	SH 19 Y ARW OL C
6	BLUE			SPARE		SH 19 G ARW OL A
7	WHITE/ BLACK			SPARE		SPARE

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

AT FM 1626
CABLE TERMINATION

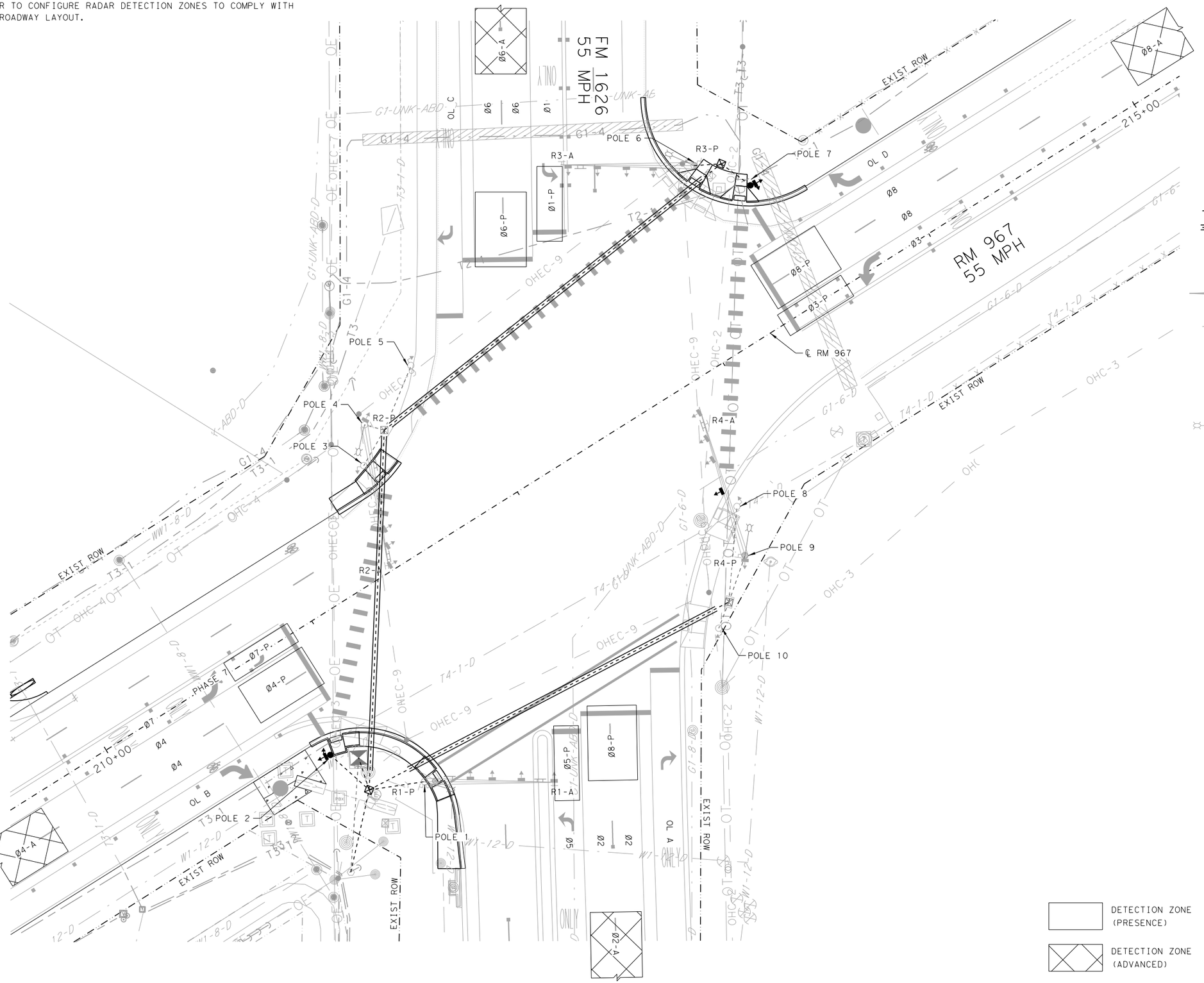
DATE: 5/17/2021 SHEET 5 OF 6

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	188

Filename: ...\Cad\Plan\015012-000*SIG15.dgn
Date: 5/17/2021

NOTES:
1. CONTRACTOR TO CONFIGURE RADAR DETECTION ZONES TO COMPLY WITH PROPOSED ROADWAY LAYOUT.



0 10 20 40

LEGEND

- PROP SIGNAL HEAD
- PROP PEDESTAL POLE & SIGNAL HEAD
- PROP CONDUIT (TRENCHED)
- PROP CONDUIT (BORED)
- PROP GROUND BOX
- EXIST SIGNAL HEAD
- EXIST PEDESTRIAN SIGNAL HEAD
- EXIST MAST ARM
- EXIST PEDESTAL POLE
- EXIST CONDUIT
- EXIST MAST ARM MOUNTED SIGN
- EXIST RADAR DETECTION (PRESENCE)
- EXIST RADAR DETECTION (ADVANCED)
- EXIST CONTROLLER
- EXIST GROUND BOX
- EXIST LUMINAIRE

DETECTION ZONE (PRESENCE)

DETECTION ZONE (ADVANCED)

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

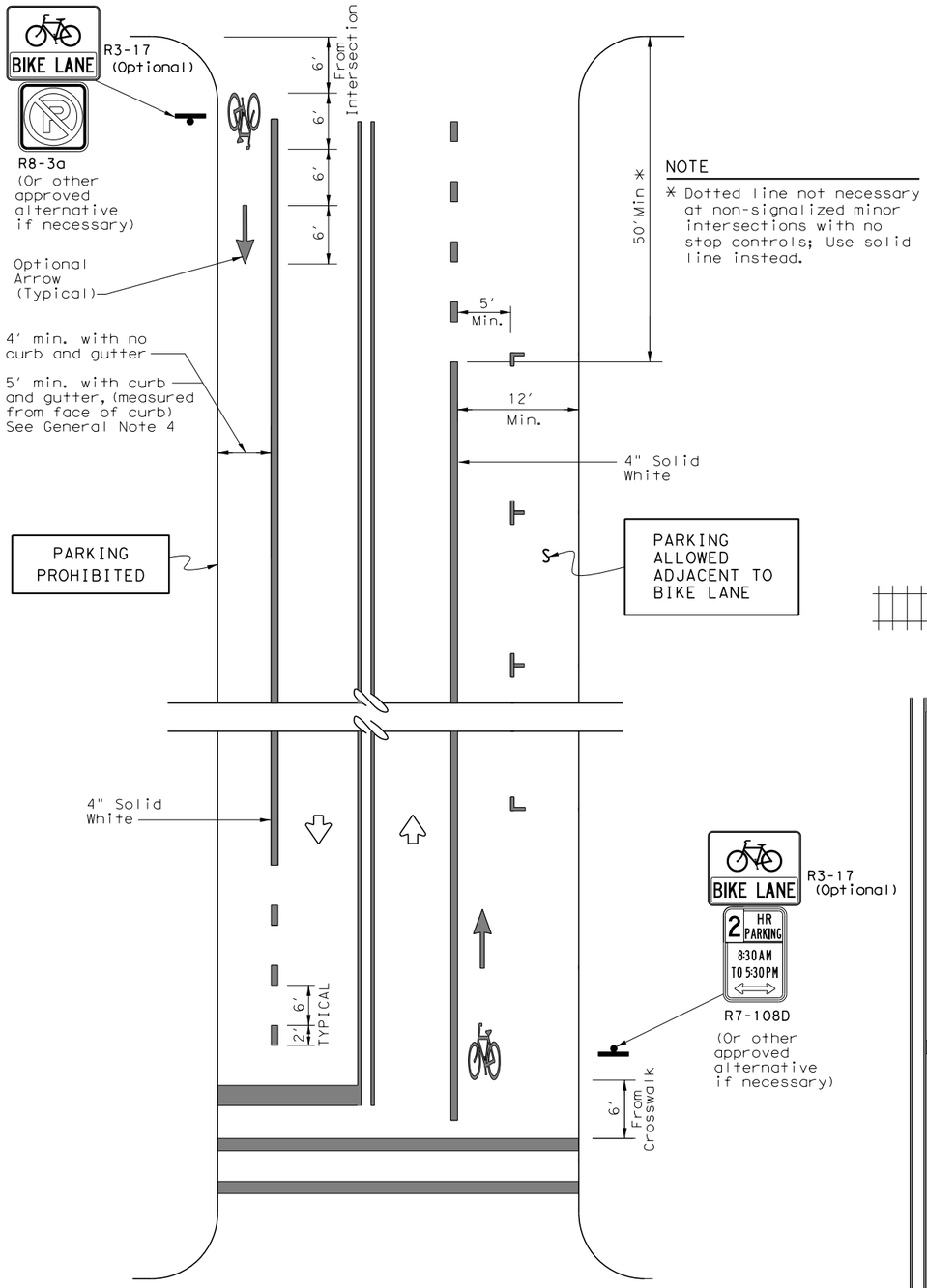
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

RM 967 AT FM 1626
RADAR PLAN

DATE: 5/17/2021				SHEET 6 OF 6
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	189

Filename: ...\Cad\Plan\015012-000*SIG16.dgn
Date: 5/17/2021



NOTES

1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:

   -1200' for 45 MPH or less roads
   -2500' for 50 MPH and greater roads.

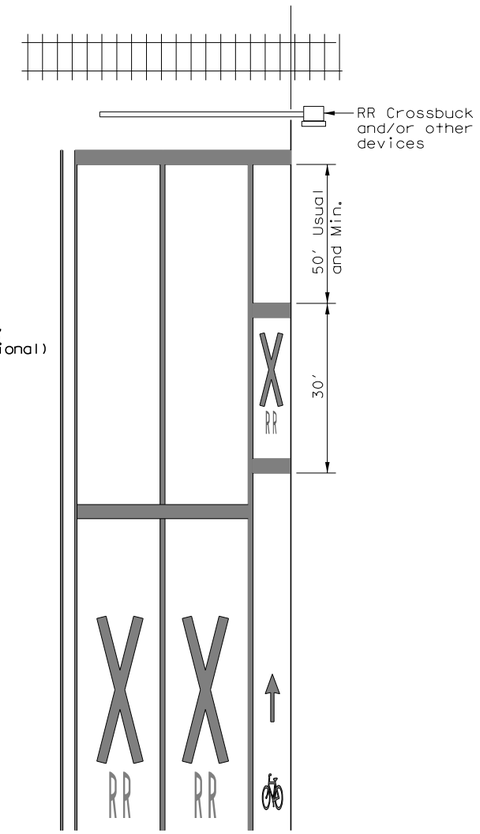
TWO-WAY STREET

NOTE

* Dotted line not necessary at non-signalized minor intersections with no stop controls; Use solid line instead.

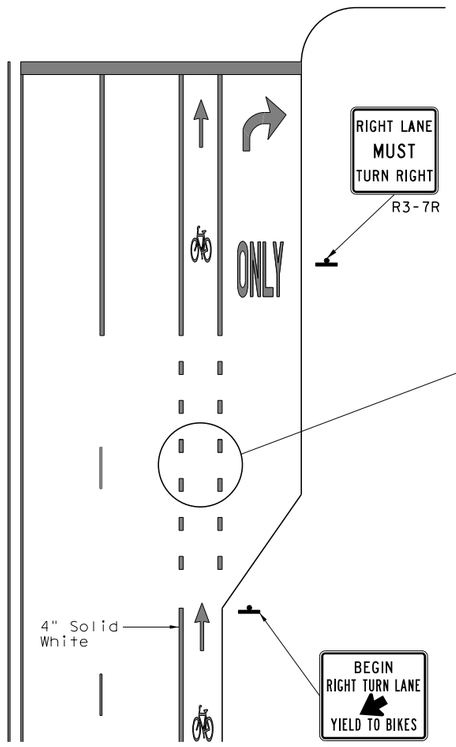
GENERAL NOTES

1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a) sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b) sign mounted directly below should be installed at the end of marked bicycle lane.

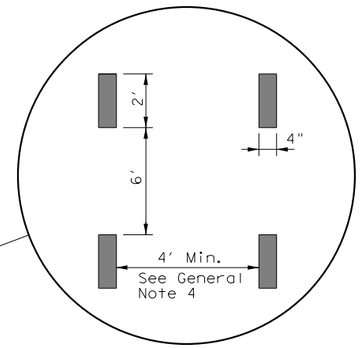


(See RCPM Standard for travel lane details)

RAILROAD CROSSING APPROACH



RIGHT TURN ONLY LANE



DETAIL "A"

LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290

Texas Department of Transportation
Traffic Operations Division

BICYCLE LANE PAVEMENT MARKINGS

BLPM-10

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
1776	01	036, ETC	RM967

DIST	COUNTY	SHEET NO.
AUS	HAYS	190

DATE: 5/17/2021 3:43:00 PM
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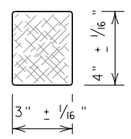
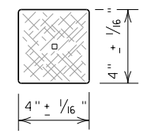
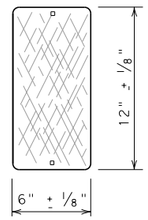
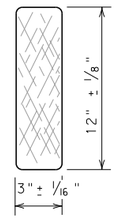
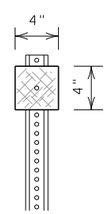
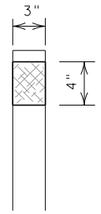
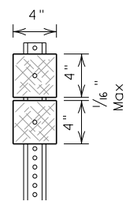
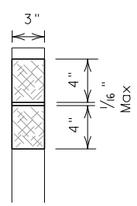
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
- S = Single
- D = Double

COLOR OF REFLECTORS
- W = White
- Y = Yellow
- R = Red

REFLECTOR UNIT SIZE
- 1 or 2

TYPE OF POST OR DELINEATOR
- WC = Wing Channel Post
- YFLX = Yellow Flexible Post
- WFLX = White Flexible Post
- BRF = Barrier Reflector

TYPE OF MOUNT
- GND = Embedded (drivable or set in concrete)
- CTB = Concrete Barrier Mount
- GF1 or GF2 = Guard Fence Attachment
- SRF = Surface Mount

DIRECTION
If Required
- BI = Bi-Directional
- BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
- 1, 2, 3, or 4

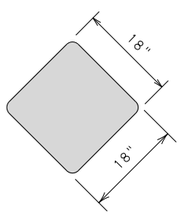
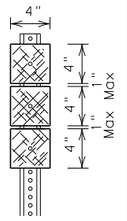
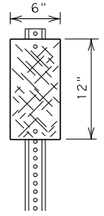
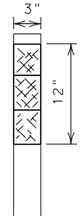
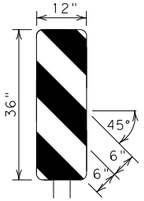
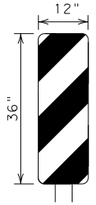
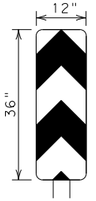
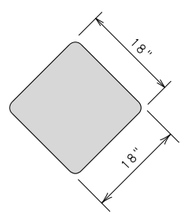
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker only)

TYPE OF POST
- WC = Wing Channel Post
- WFLX = White Flexible Post
- TWT = Thin Walled Tubing

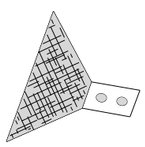
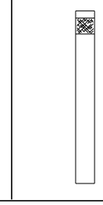
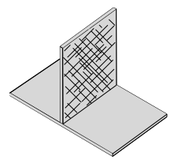
TYPE OF MOUNT
- GND = Embedded (drivable)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

DIRECTION
If Required
- BI = Bi-Directional

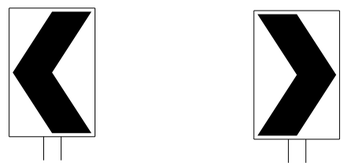
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

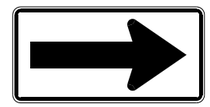
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE	 W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).			

ONE DIRECTION LARGE ARROW

DEVICE	 W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	AUS	HAYS		191

20A

DATE: 5/17/2021 3:43:00 PM
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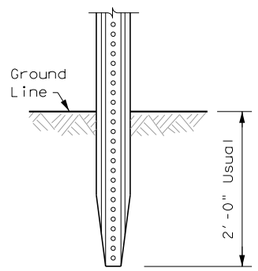
POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

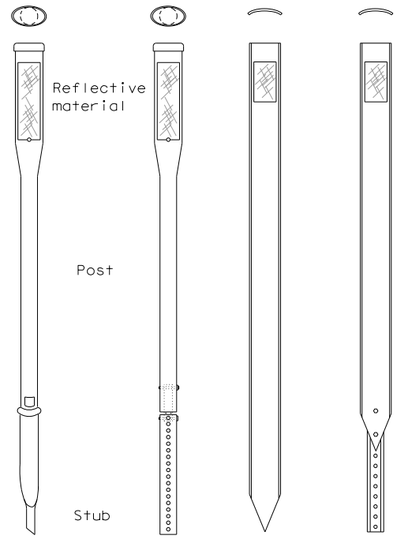


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

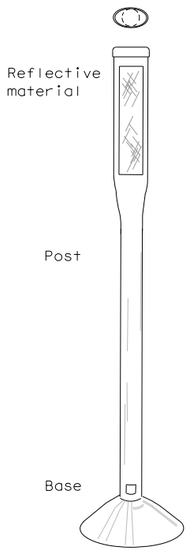
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



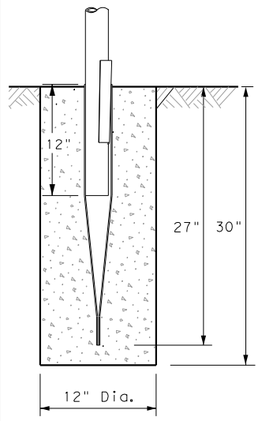
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

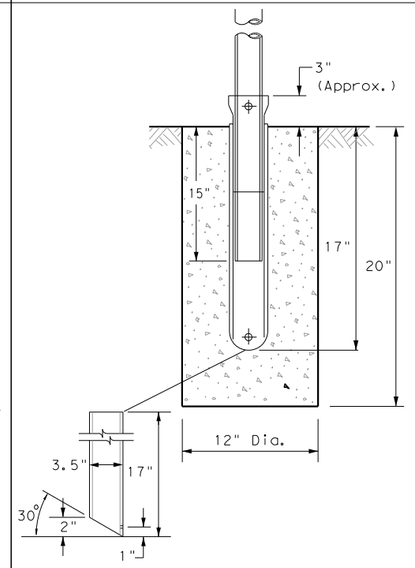
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

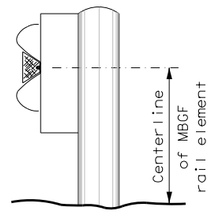
NOTE

1. Install per manufacturer's recommendations.

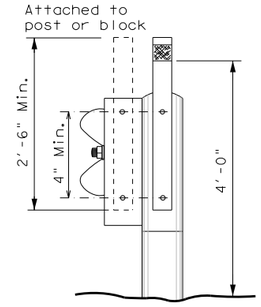
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

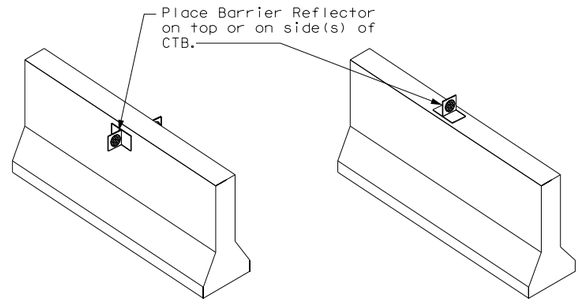
GF1



GF2



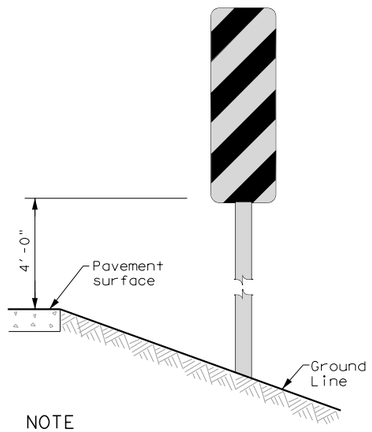
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

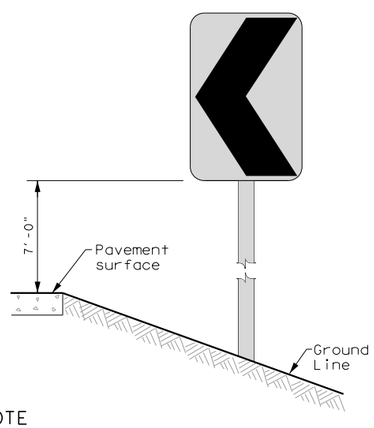
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

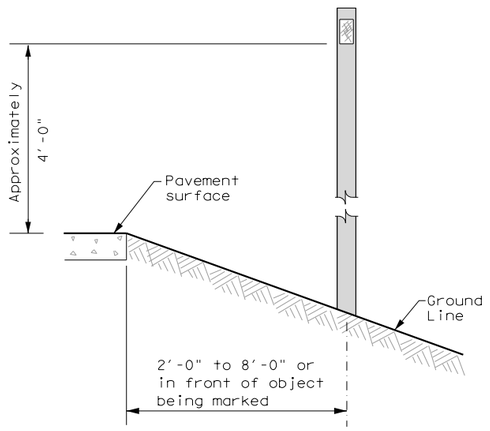
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

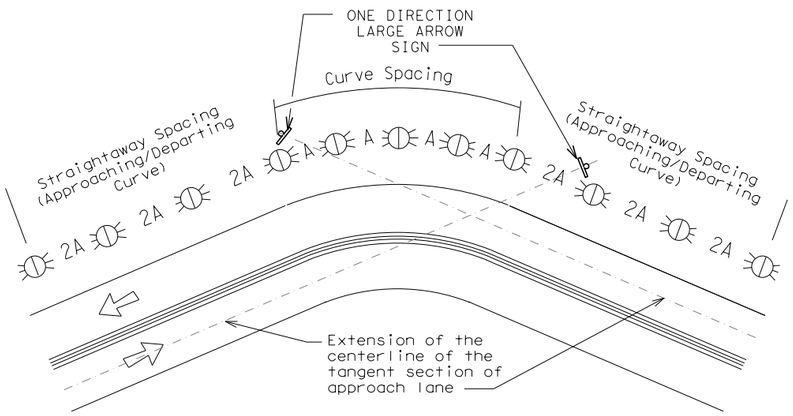
FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	AUS	HAYS		192
20B				

DATE: 5/17/2021 3:43:01 PM
FILE: K:\015012-000\cad\Plan\STND\dom2-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

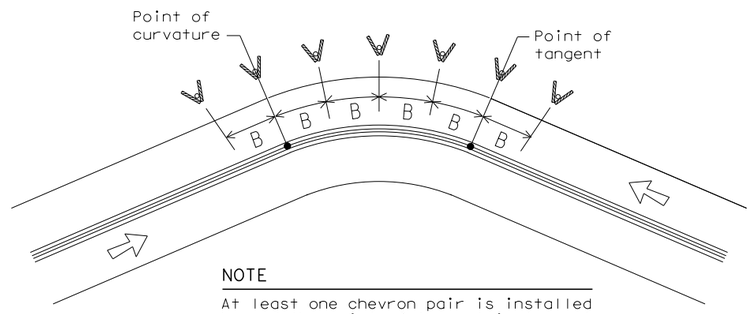
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

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REVISIONS	1776	01	036,ETC	RM967
3-15 8-15 8-15 7-20	DIST	COUNTY		SHEET NO.
	AUS	HAYS		193

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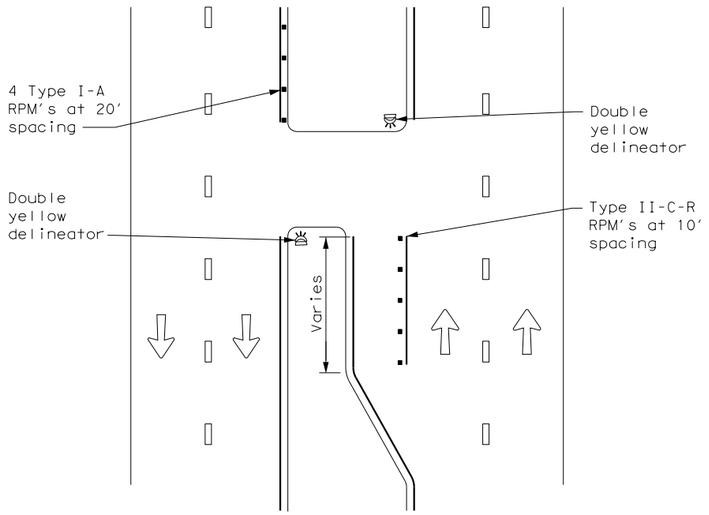
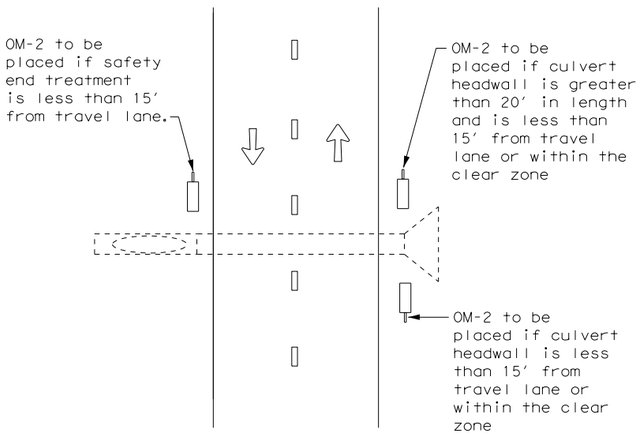
CROSSOVERS



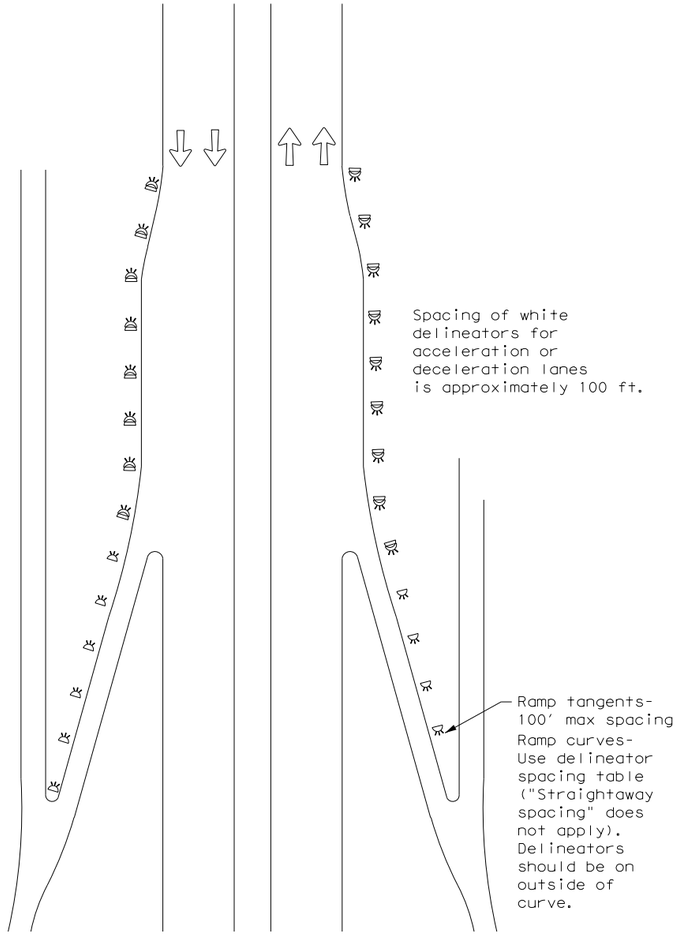
DETAIL 1

FOR CULVERTS WITH MBGF



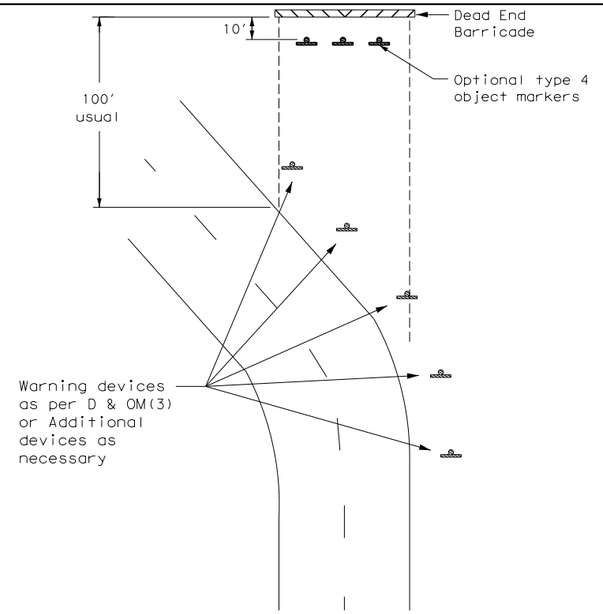
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



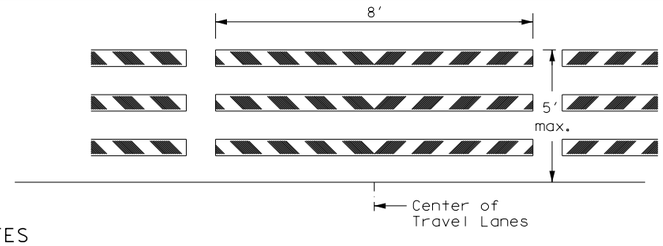
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

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GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

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ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		AUS	HAYS			195

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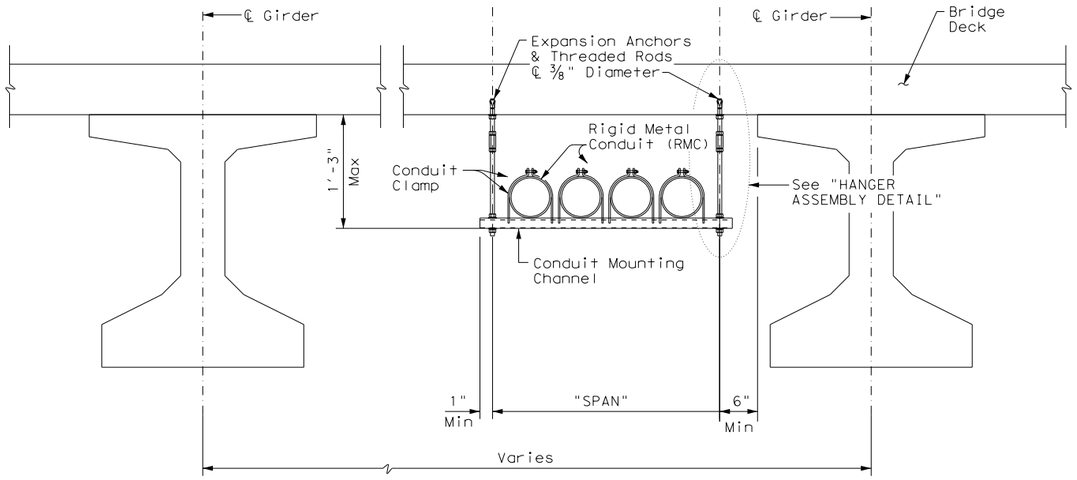
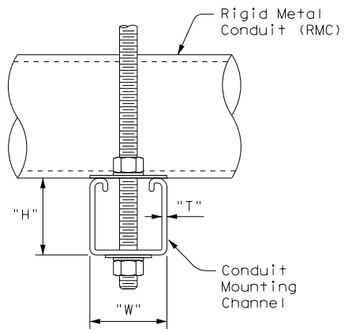
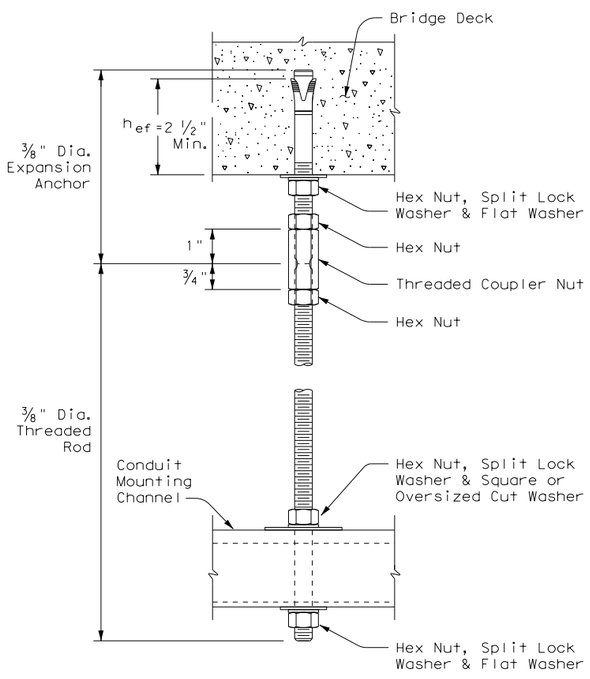


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

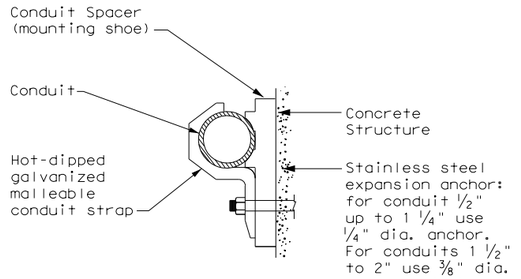
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

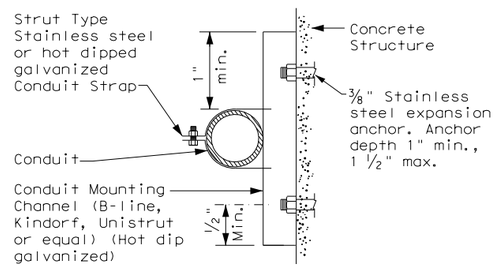




HANGER ASSEMBLY DETAIL

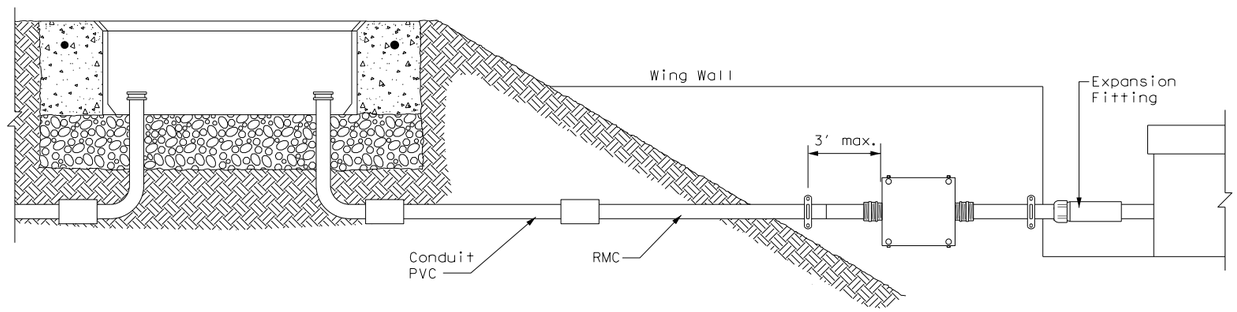
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.

4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.

5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.

6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

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ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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	AUS	HAYS		196

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

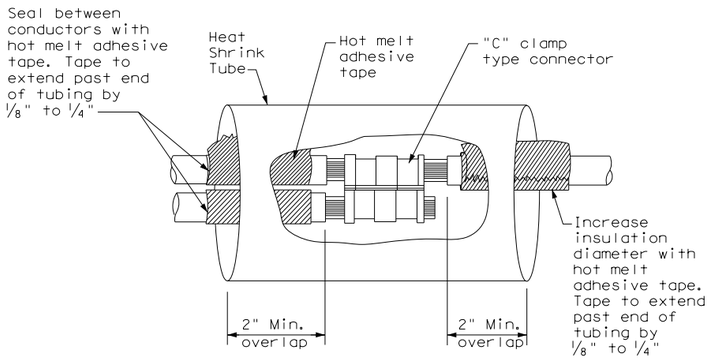
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

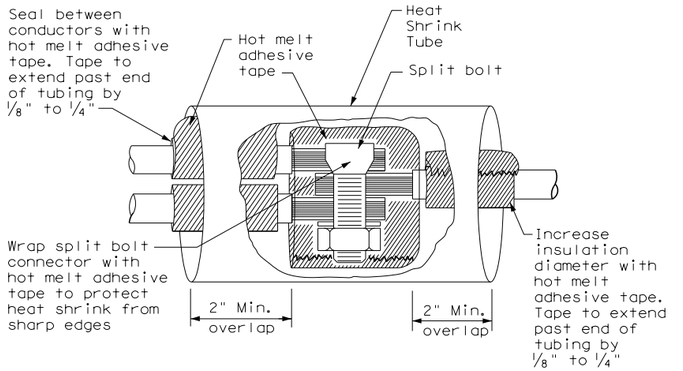
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

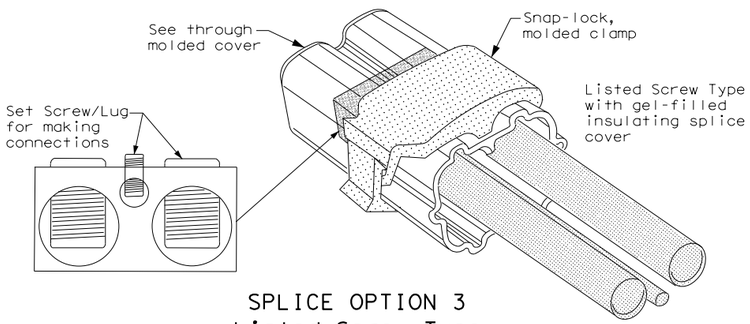
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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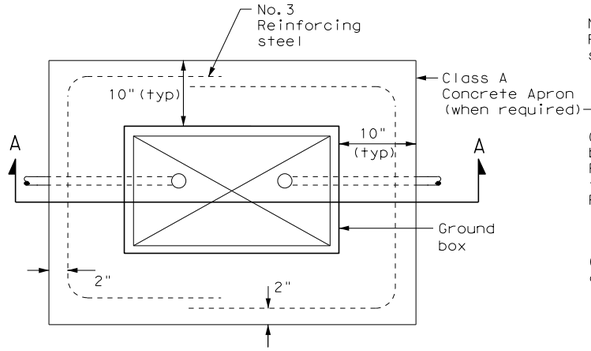
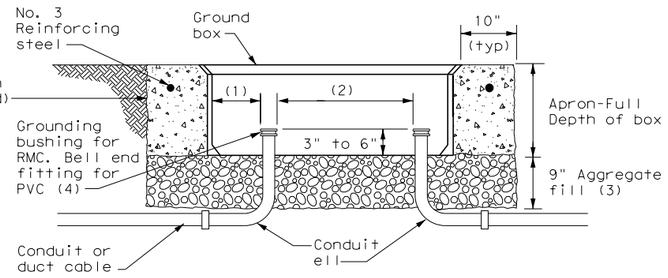


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

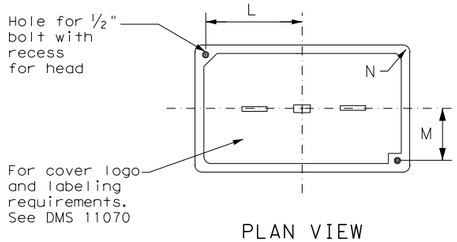
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

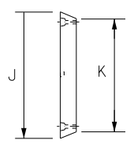
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



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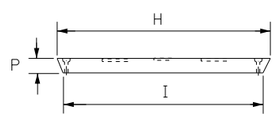

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

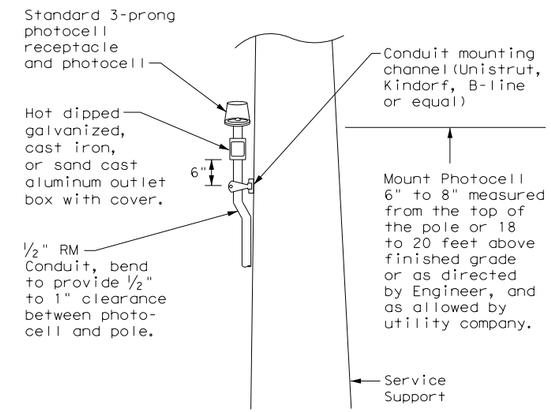
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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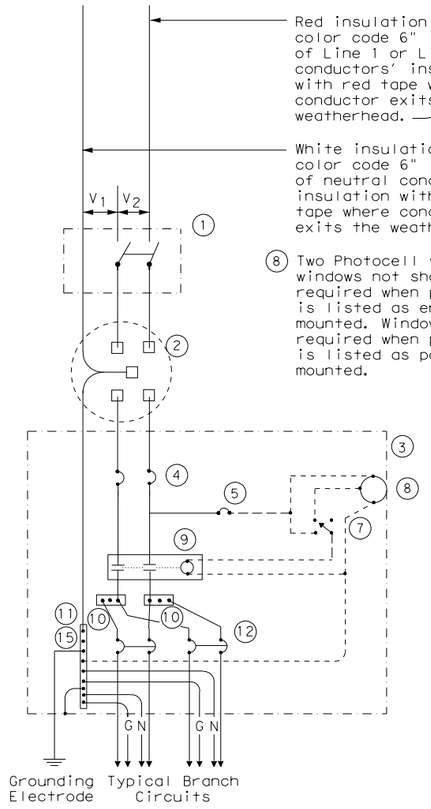
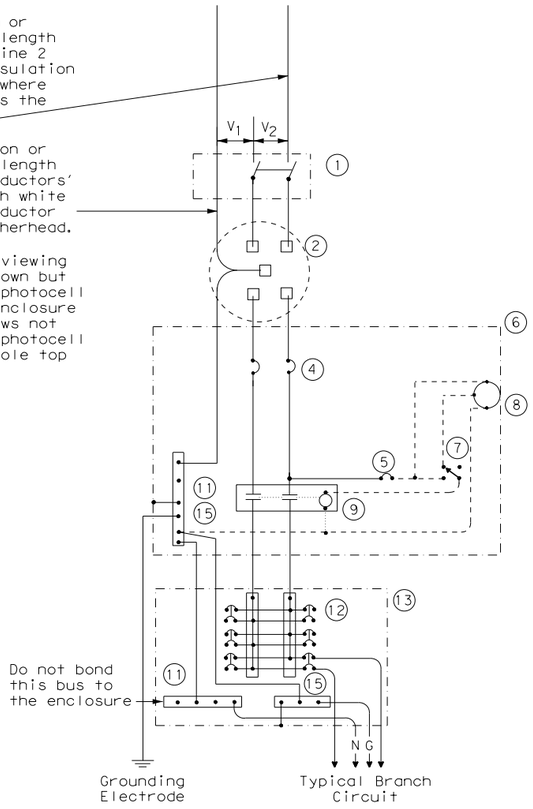
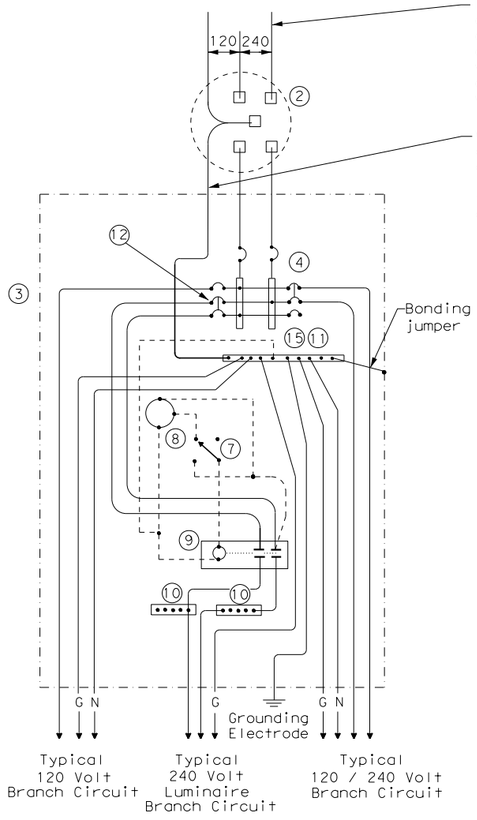


SCHEMATIC TYPE A
THREE WIRE

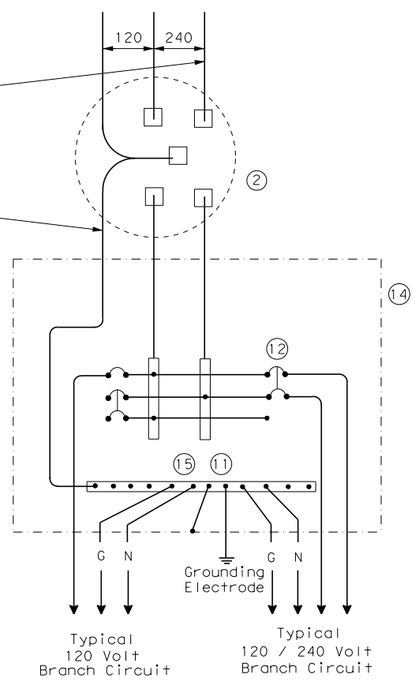
8 Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - - - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

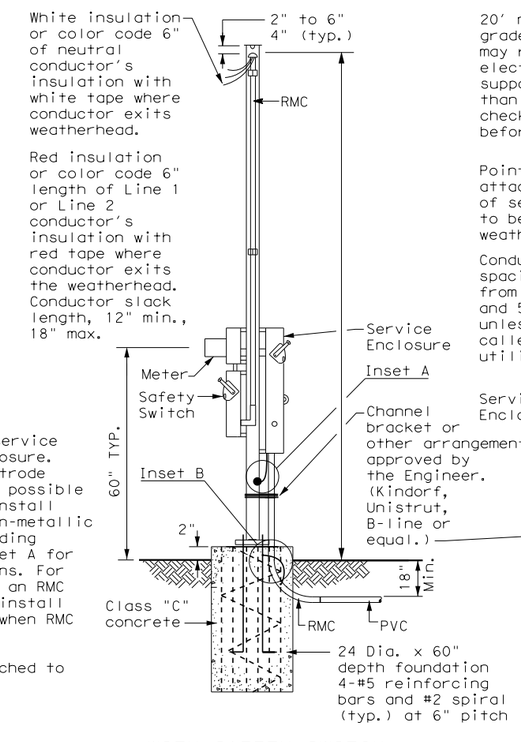
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

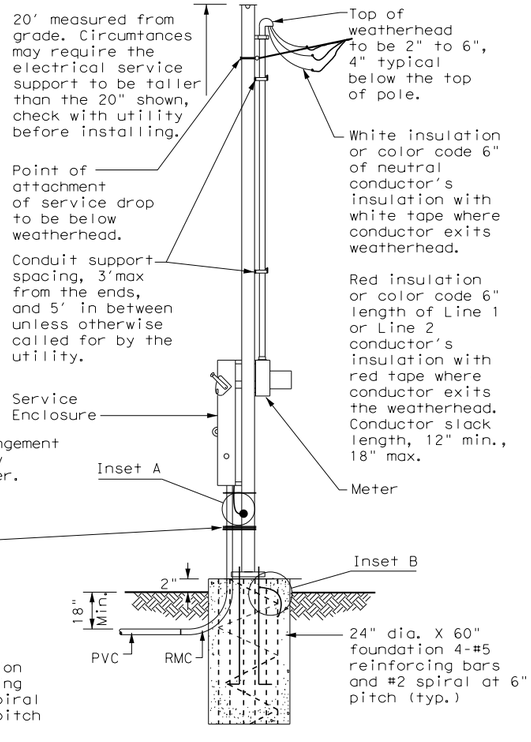
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

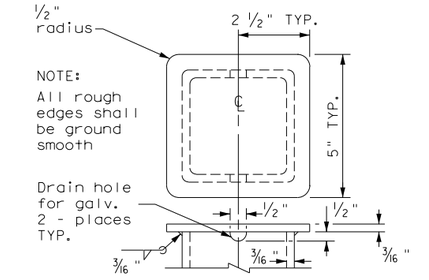


WITH SAFETY SWITCH

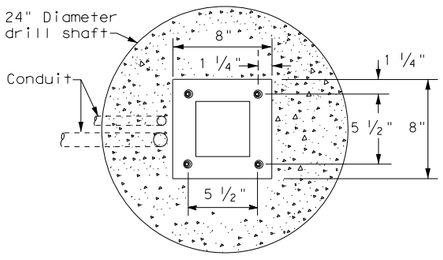


WITHOUT SAFETY SWITCH

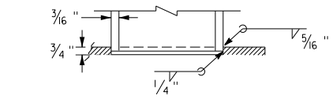
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

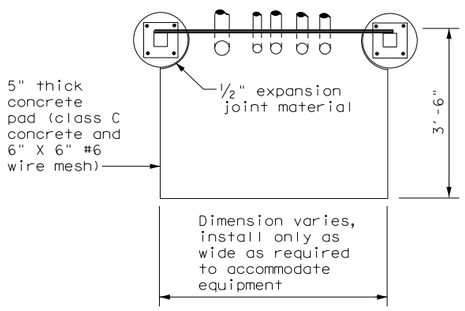


BASE PLATE DETAIL



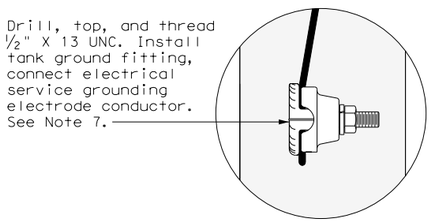
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



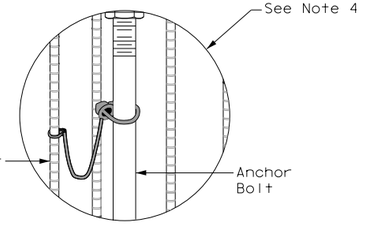
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

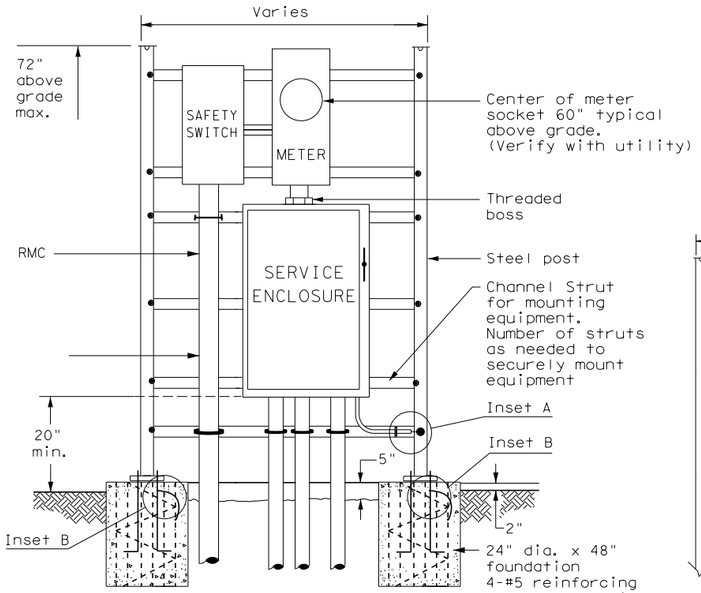


FRONT VIEW

INSET A

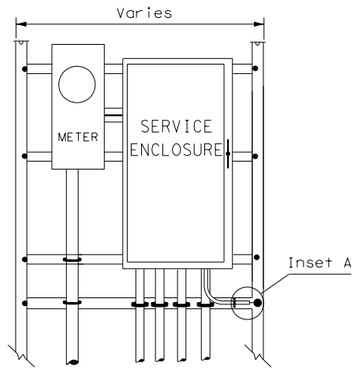


INSET B



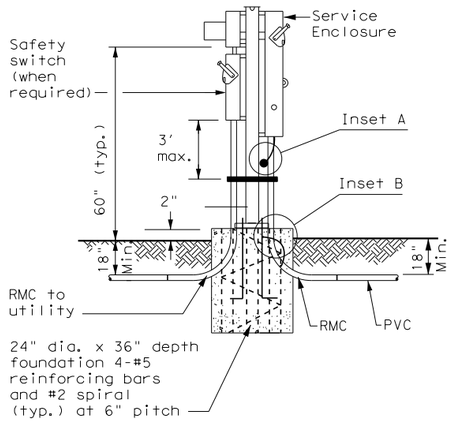
WITH SAFETY SWITCH

FRONT VIEW

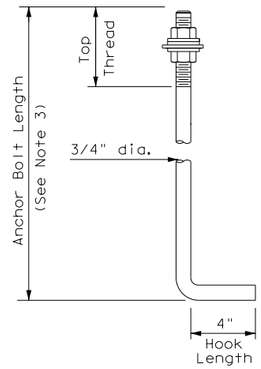


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		201

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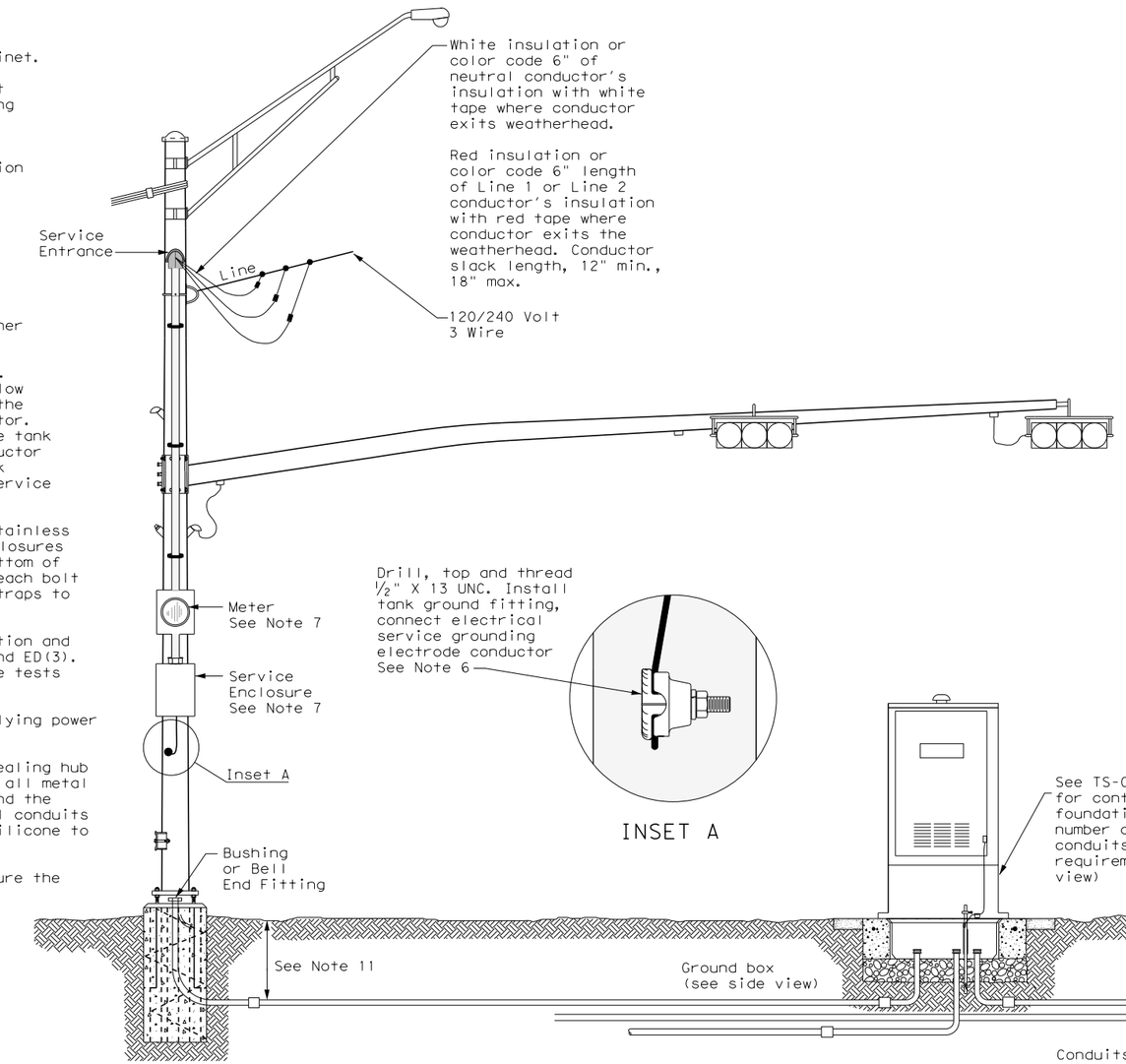
TRAFFIC SIGNAL NOTES

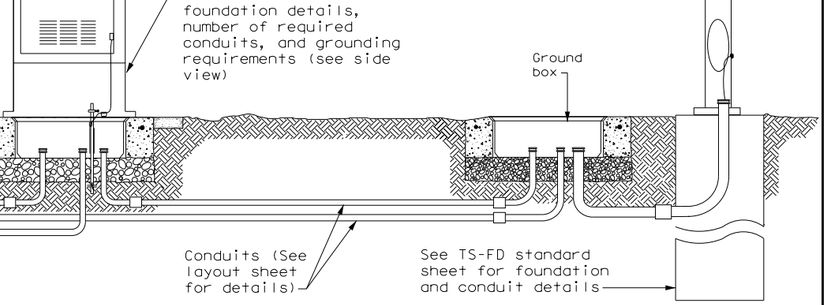
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

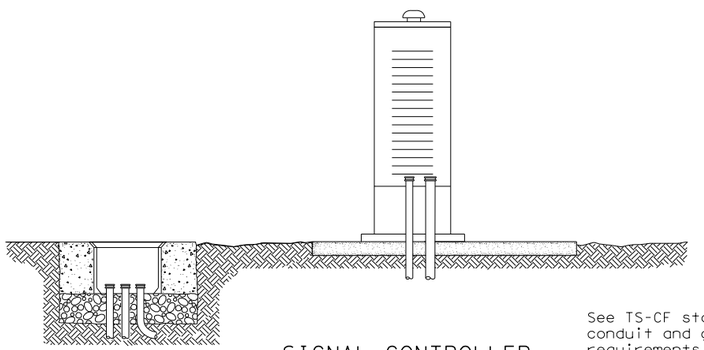
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	1776	01	036, ETC	RM967
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	AUS	HAYS		202

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

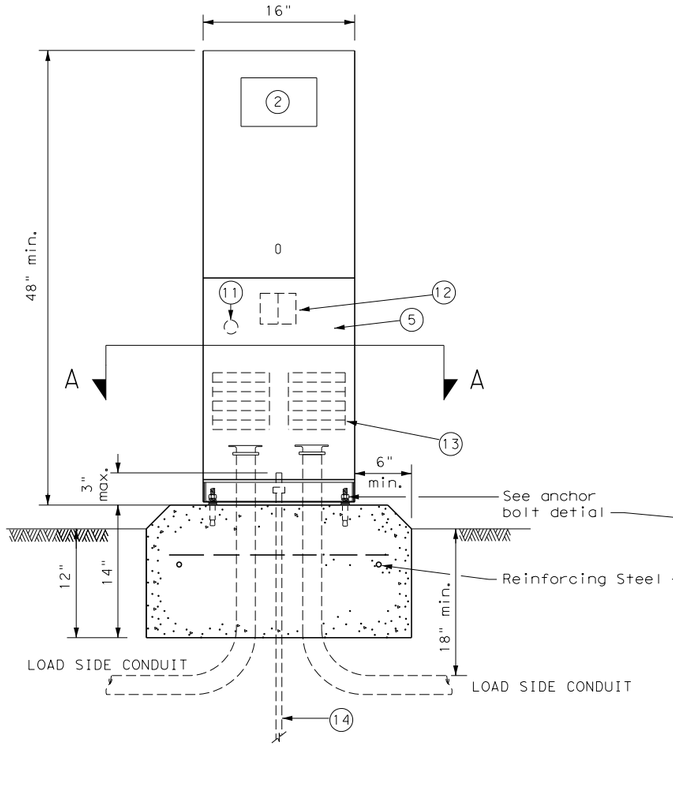
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

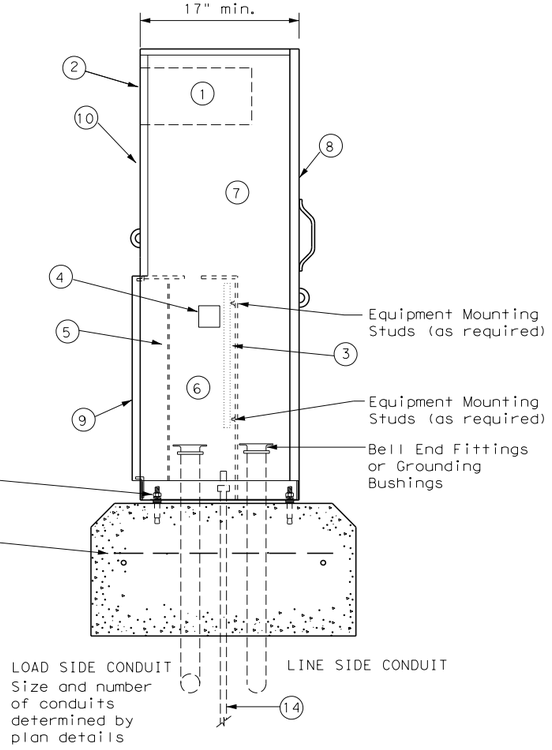
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

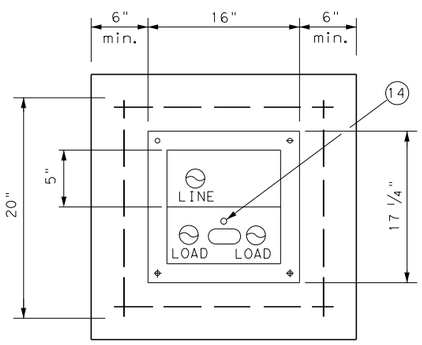


FRONT VIEW

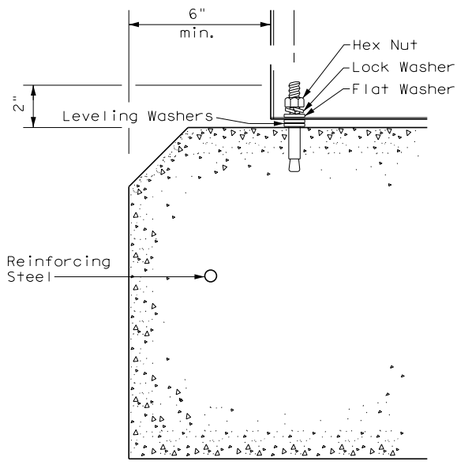


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
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TIMBER POLE(TP)SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1½ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC)and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

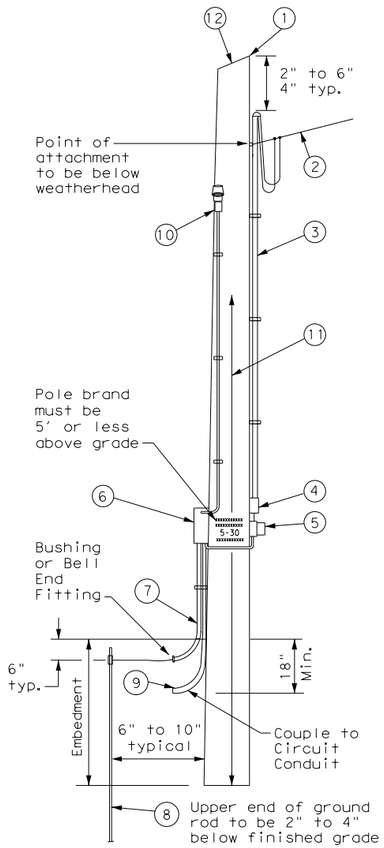
(8) ⅝ in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

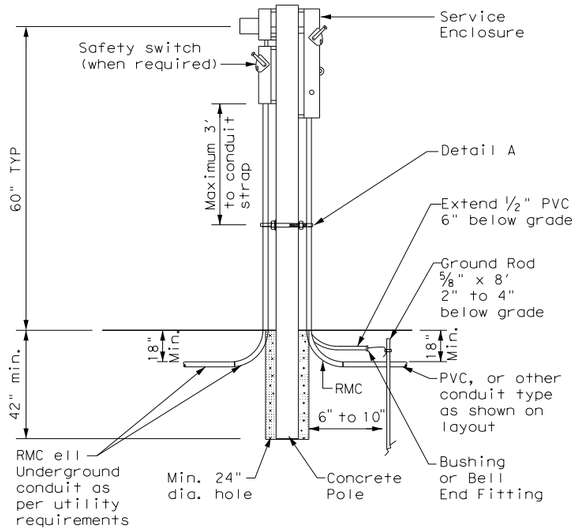


SERVICE SUPPORT TYPE TP (O)

GRANITE CONCRETE(GC)& OTHER CONCRETE(OC)NOTES

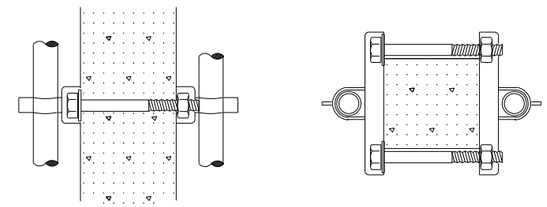
Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



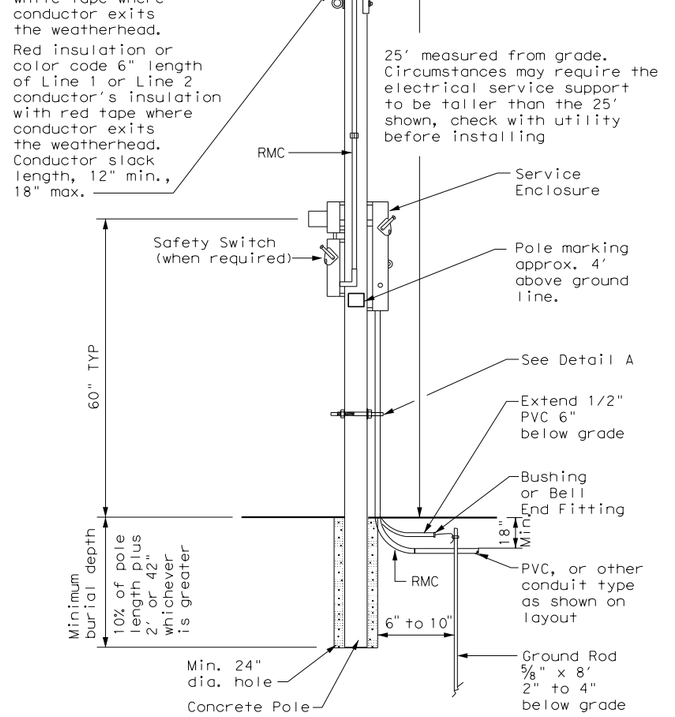
CONCRETE SERVICE SUPPORT

Underground(U)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.



CONCRETE SERVICE SUPPORT

Overhead(O)

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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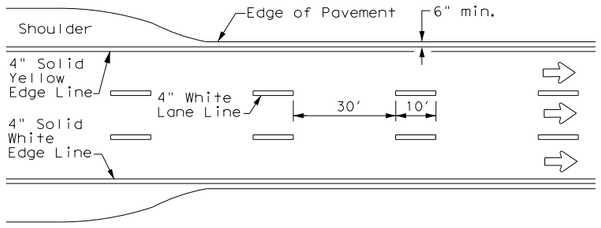
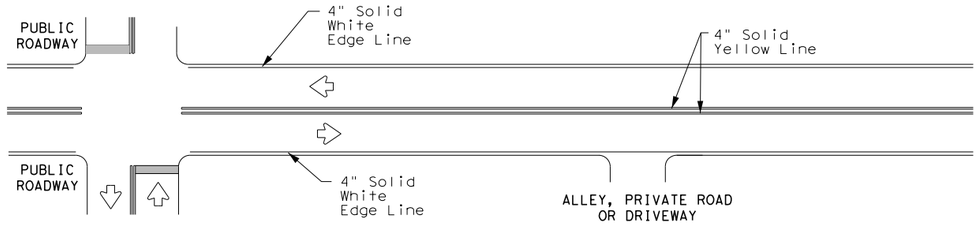
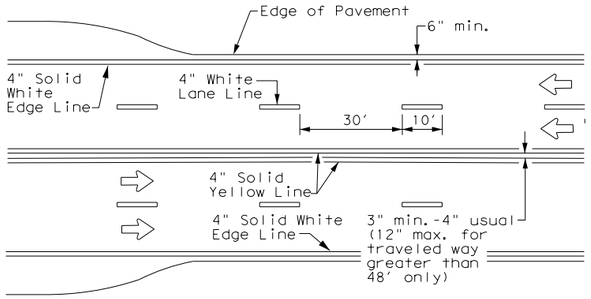


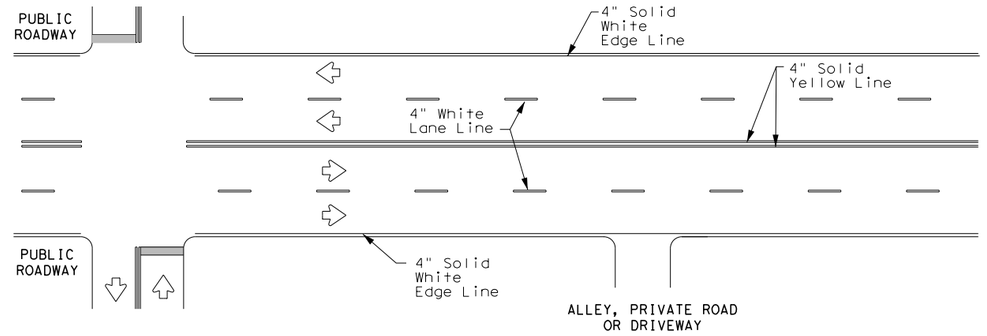
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



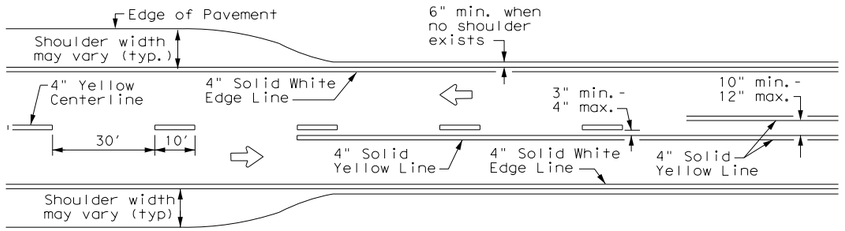
TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



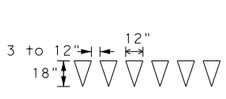
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



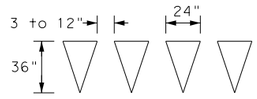
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

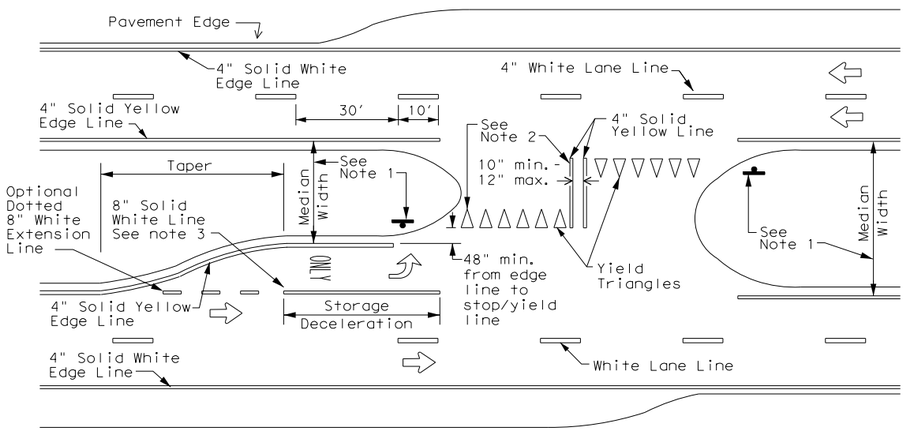


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

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

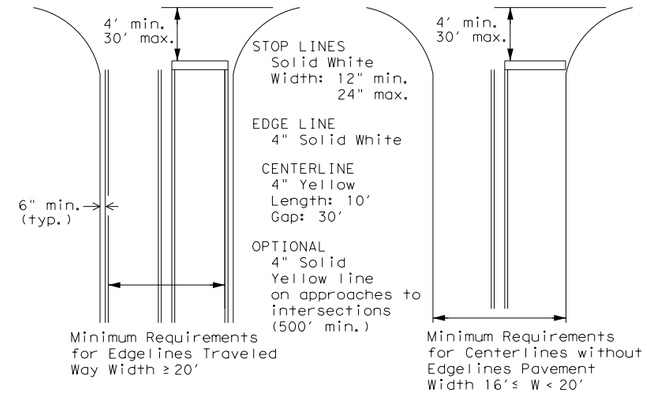
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths
for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

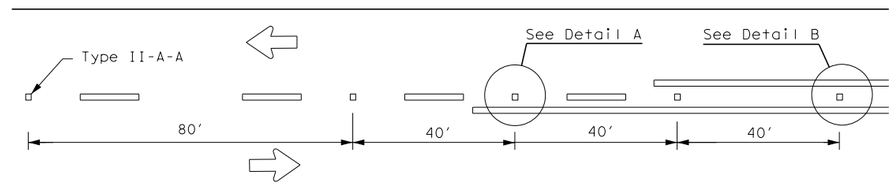
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	1776	01	036,ETC	RM967
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	AUS	HAYS		205

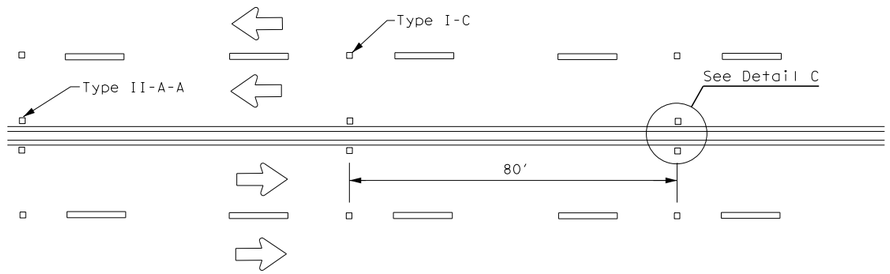
22B

DATE: 5/17/2021 3:43:10 PM
FILE: K:\015012-000\CadPlan\STND\pm1-20.dgn

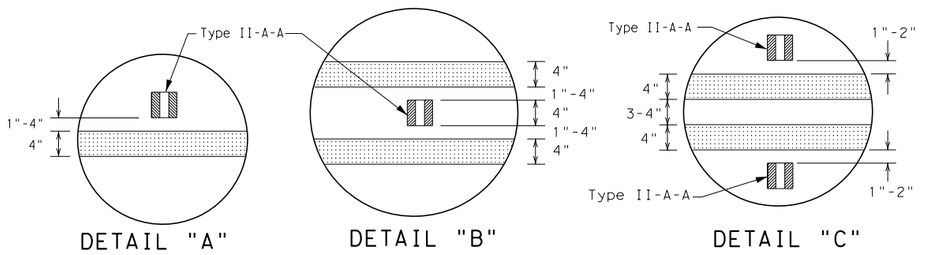
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



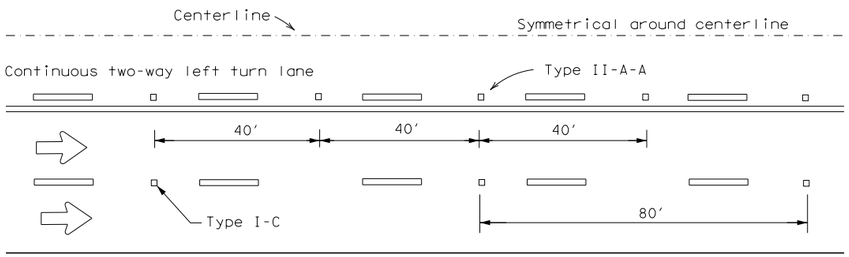
CENTERLINE FOR ALL TWO LANE ROADWAYS



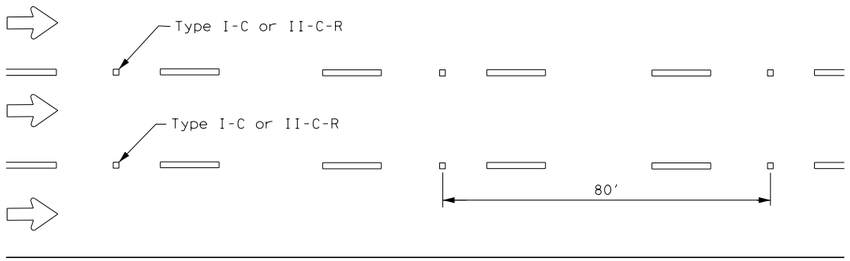
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

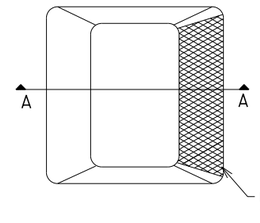


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

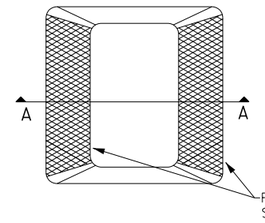
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

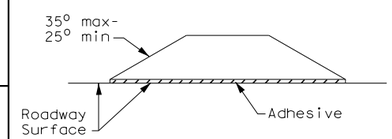
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

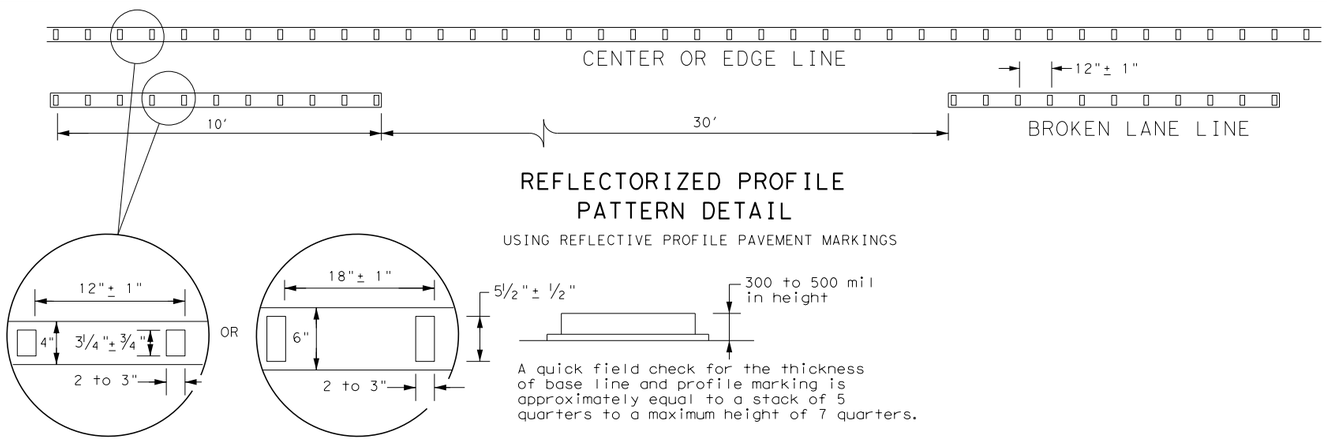


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

NOTE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	1776	01	036,ETC	RM967
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	AUS	HAYS		206

22B

DATE: 5/17/2021 3:43:11 PM
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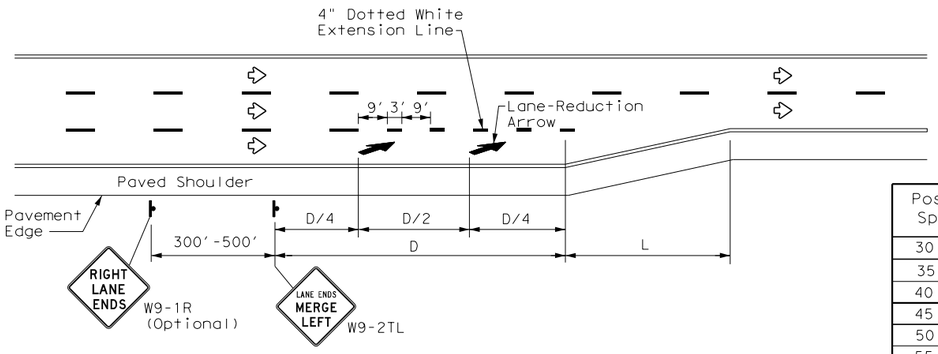
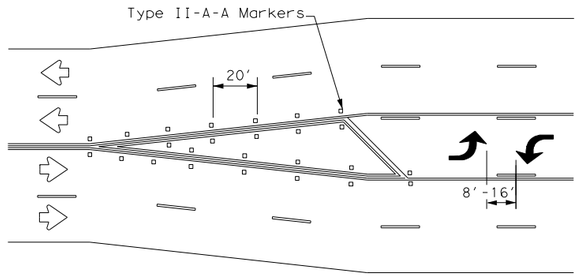


LANE REDUCTION

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

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



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

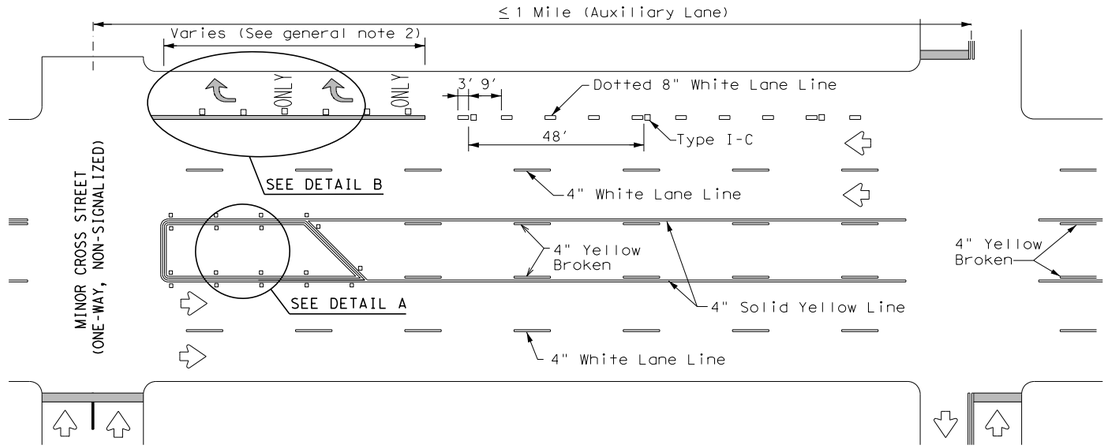
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

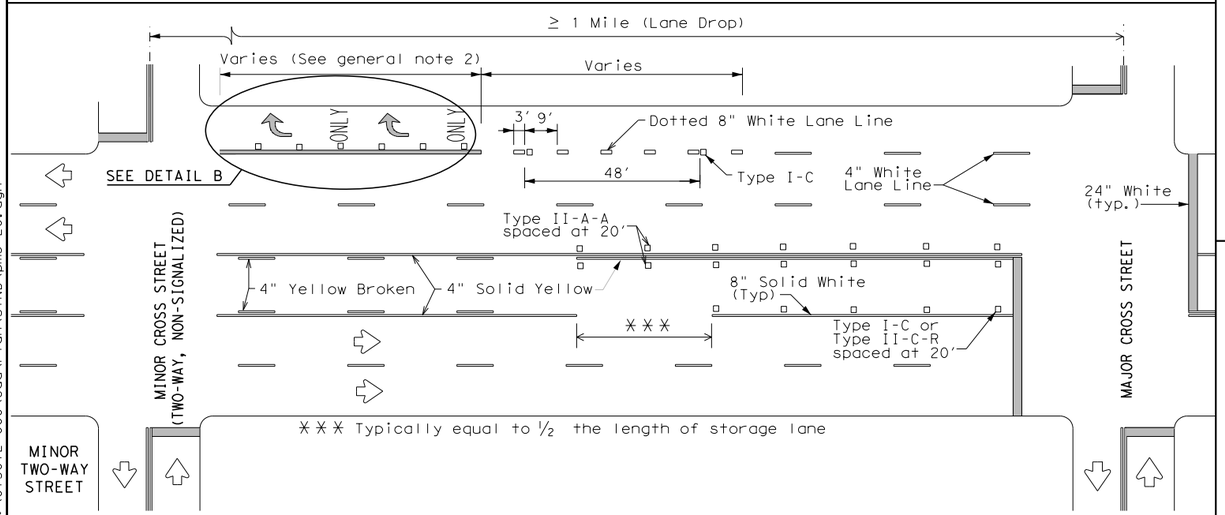
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

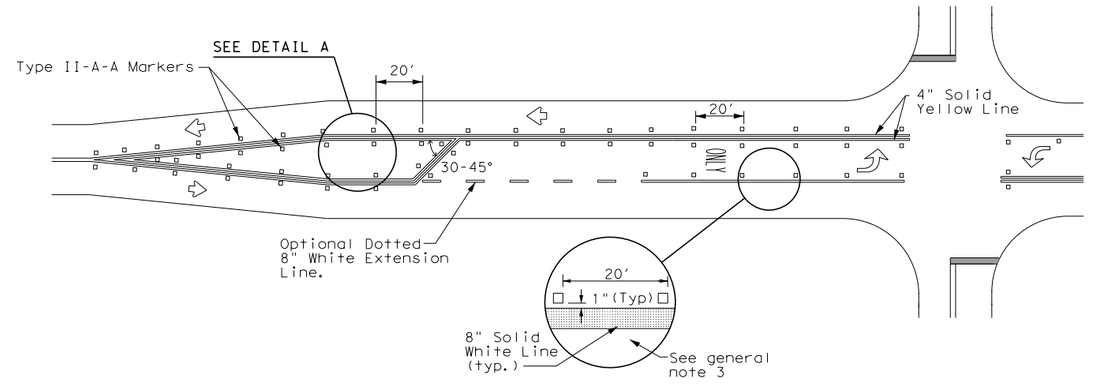
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



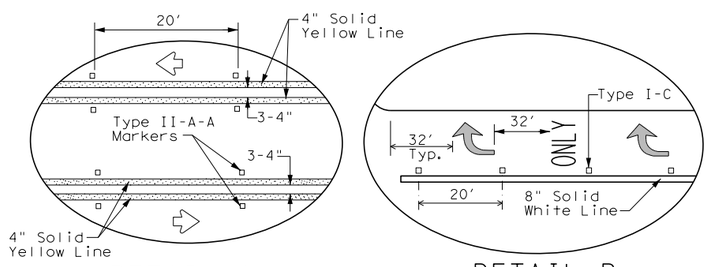
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	AUS	HAYS		207
3-03 6-20				

22D

DATE: 5/17/2021 3:43:12 PM
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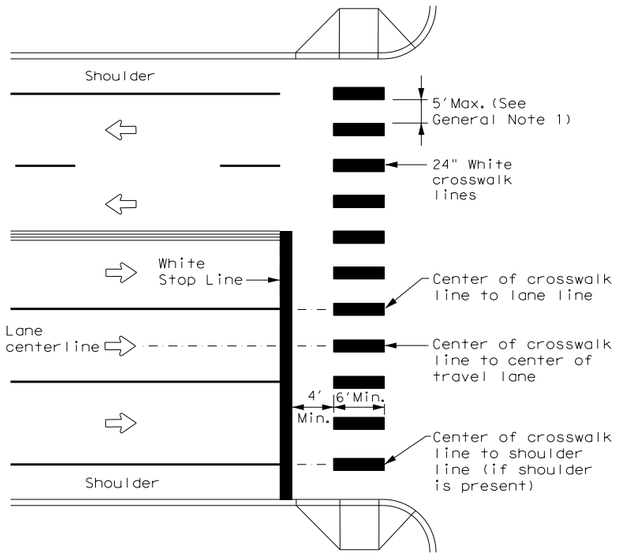


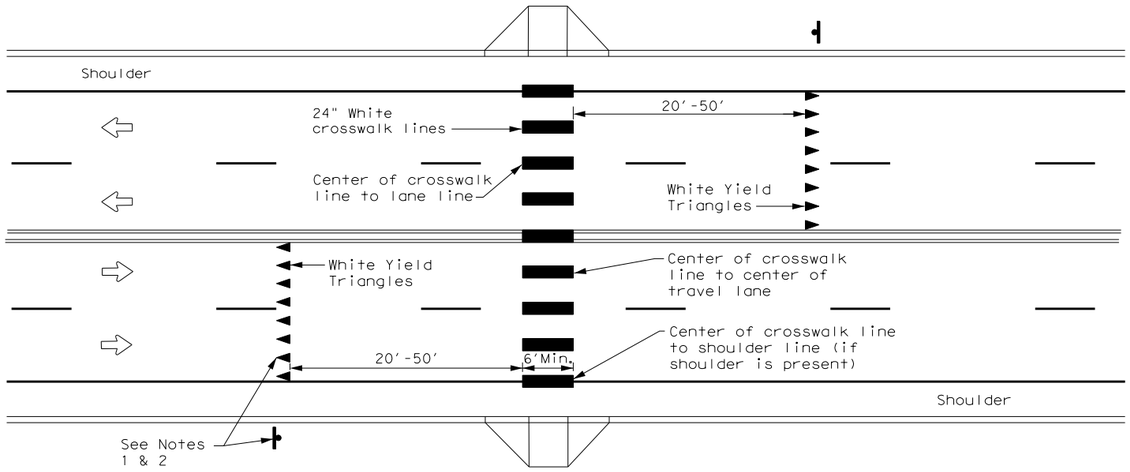
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		208

22D

DATE: 5/17/2021 3:43:12 PM
FILE: K:\015012-000\CadVPlan\STND\pm4-20.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

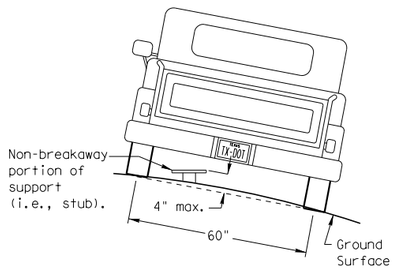
Anchor Type

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

Sign Mounting Designation

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

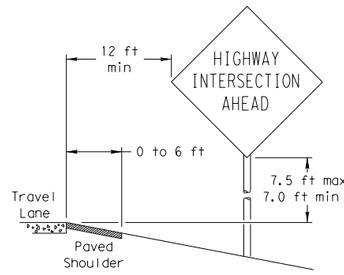
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

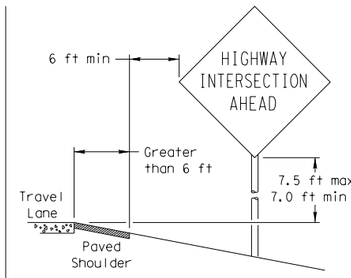
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

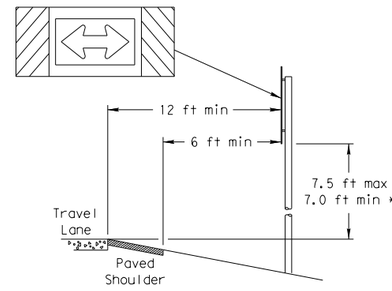
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



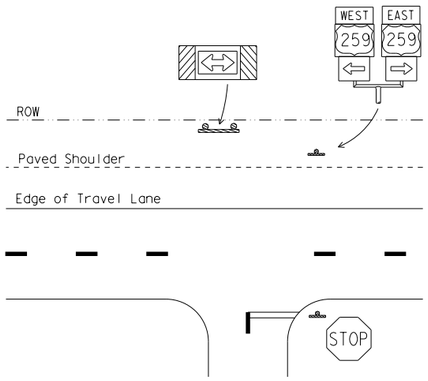
GREATER THAN 6 FT. WIDE

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.

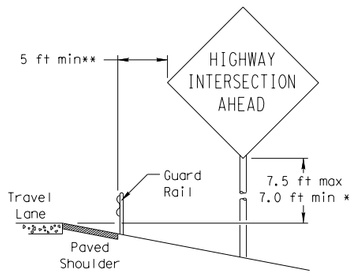
T-INTERSECTION



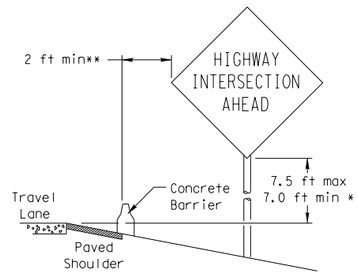
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

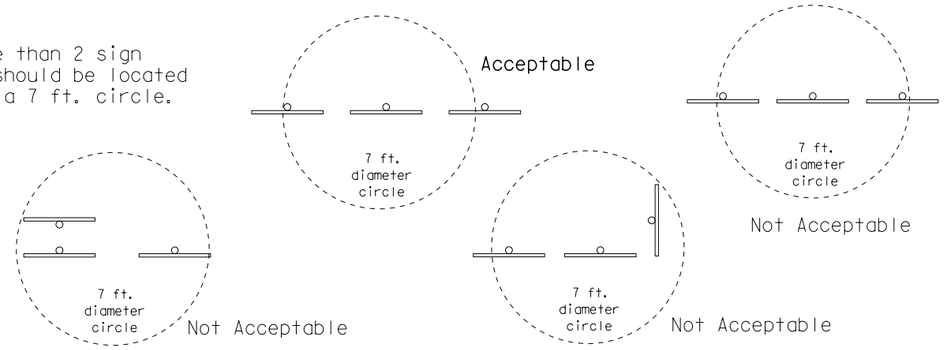
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

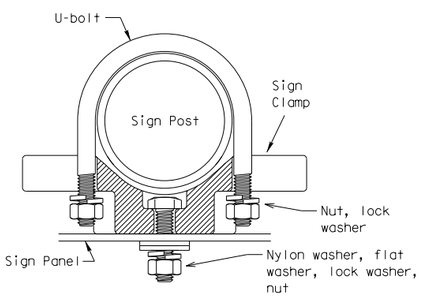
The website address is:
http://www.txdot.gov/publications/traffic.htm

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

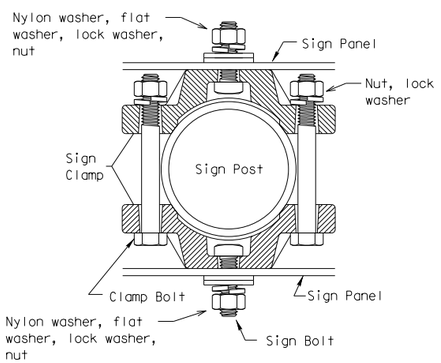


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

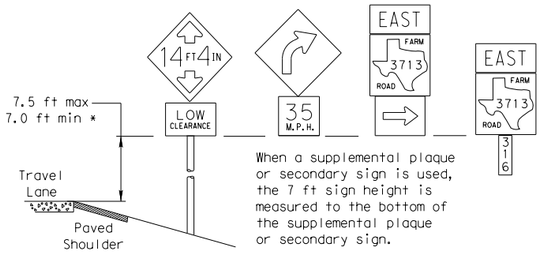
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



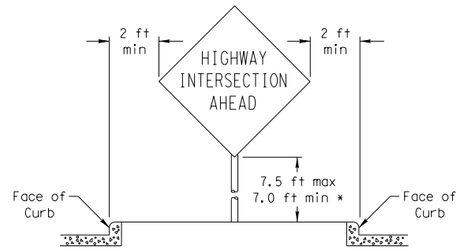
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



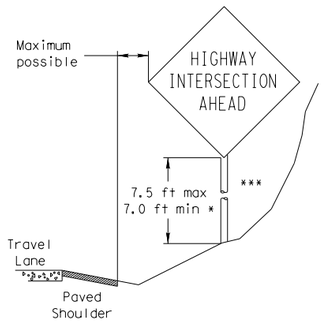
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
1776	01	036, ETC	RM967
DIST	COUNTY		SHEET NO.
AUS	HAYS		209

26A

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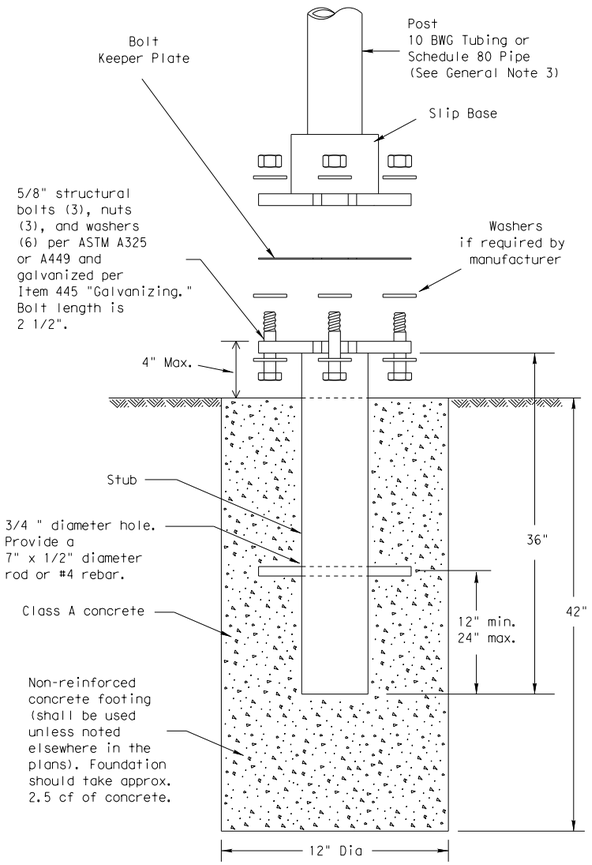
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

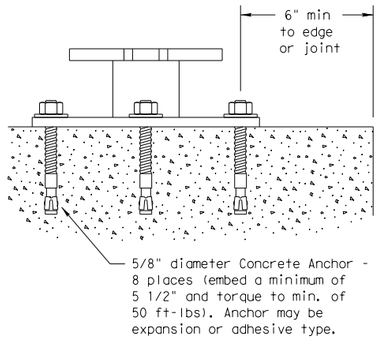
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)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

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS 9-08

CONT	SECT	JOB	HIGHWAY
1776	01	036,ETC	RM967

DIST	COUNTY	SHEET NO.
AUS	HAYS	210

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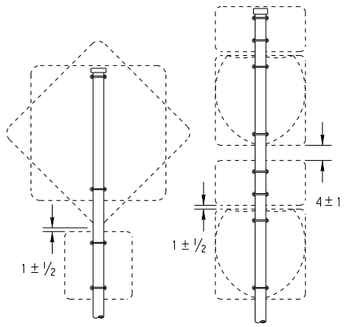
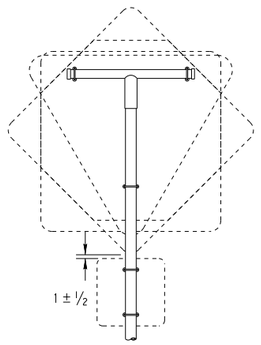


SM RD SGN ASSM TY XXXXX(1)XX(P)



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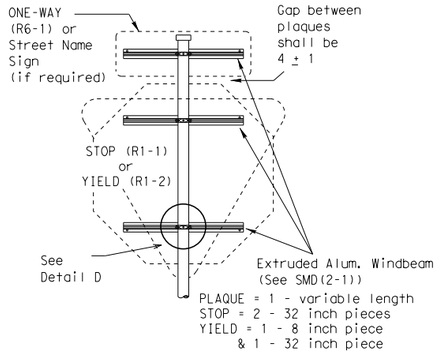

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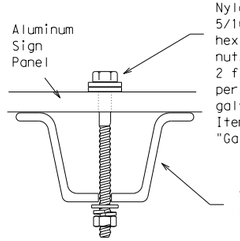
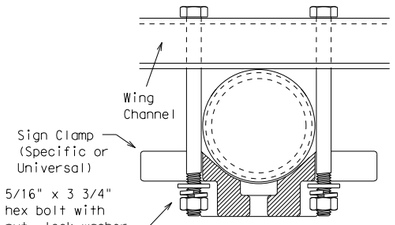


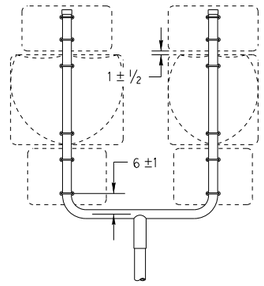
Top View

Detail A



Top View

Detail B



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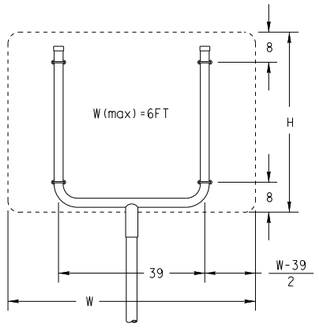

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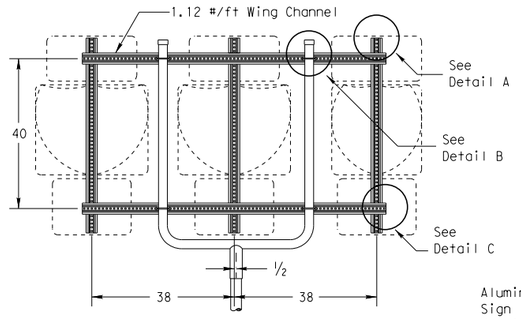
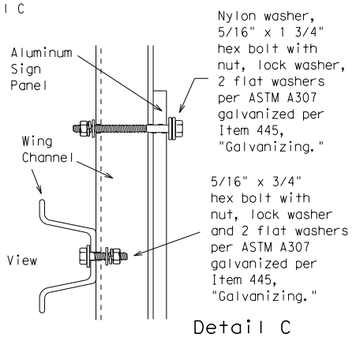
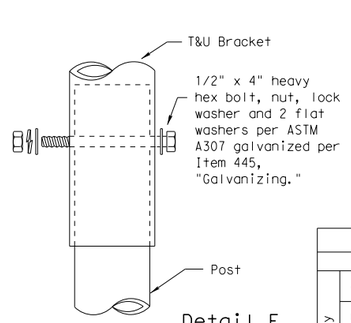


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

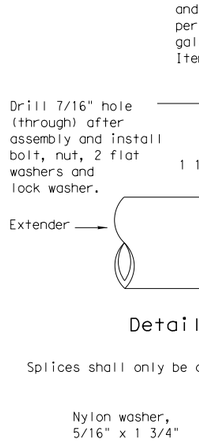


SIDE VIEW

Detail C

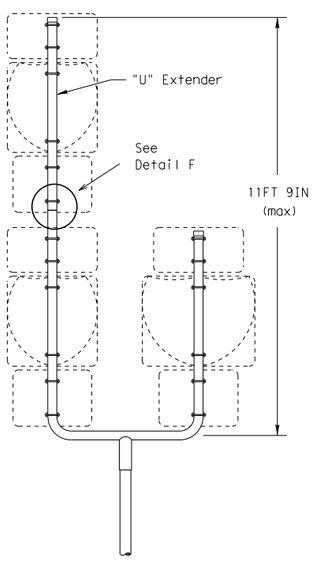


Detail E



Detail F

Splices shall only be allowed behind the sign substrate.



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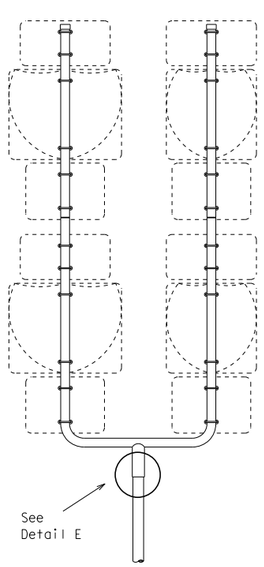

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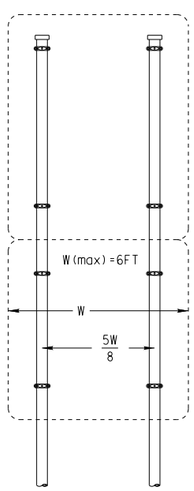
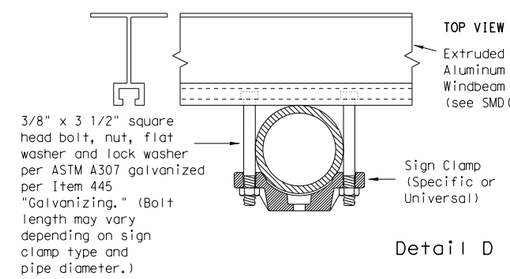
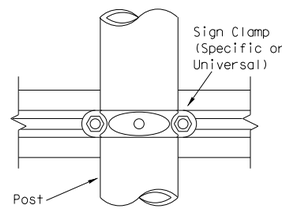
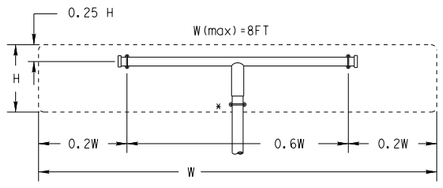


SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D

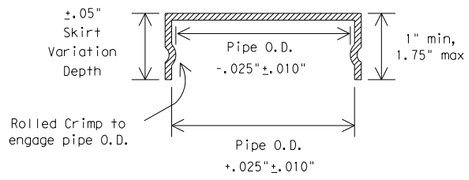




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		211

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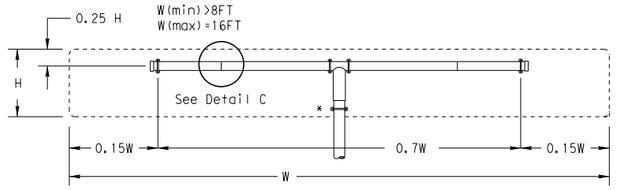
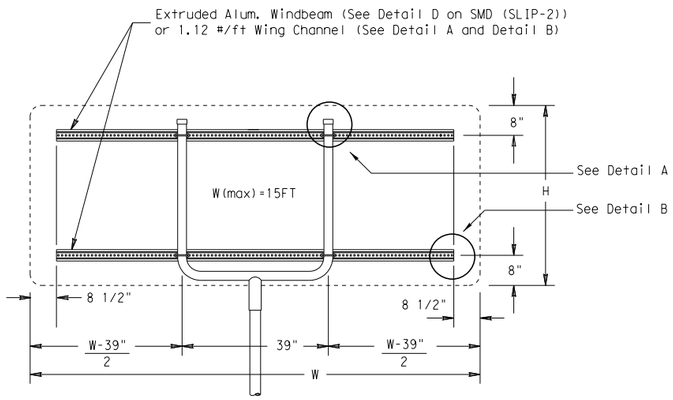
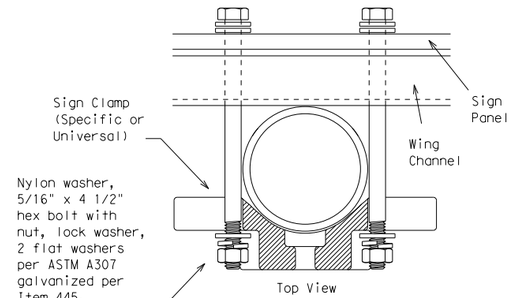


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

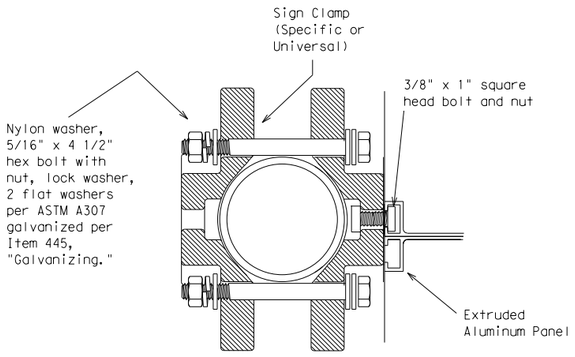
(* - See Note 12)



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

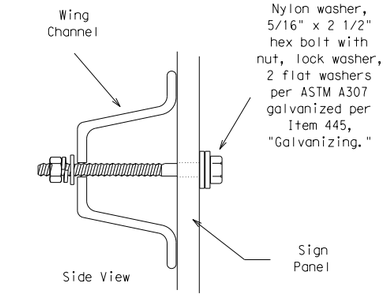


Detail A

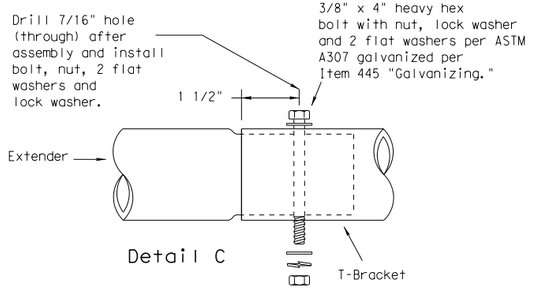


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

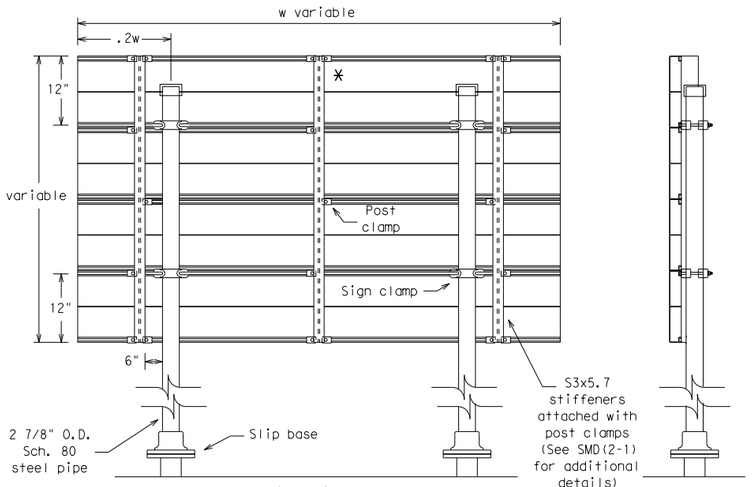


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

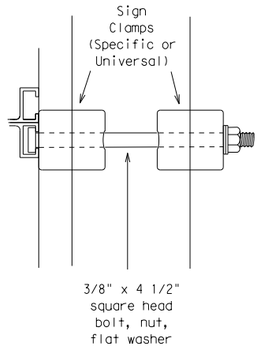


Typical Sign Mount

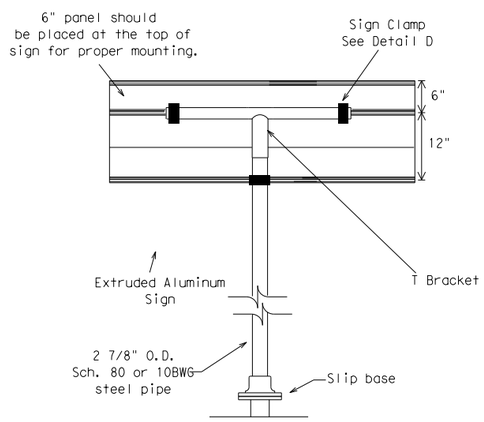
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

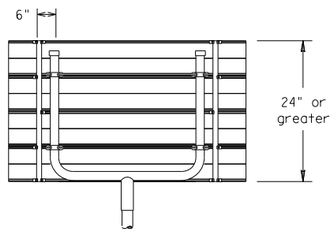
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

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

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

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)
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	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
1776	01	036, ETC	RM967

DIST	COUNTY	SHEET NO.
AUS	HAYS	212

26D

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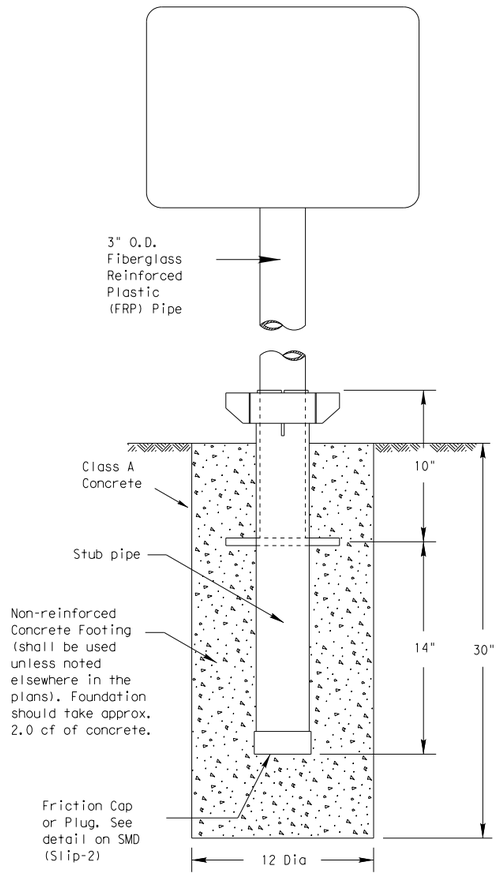
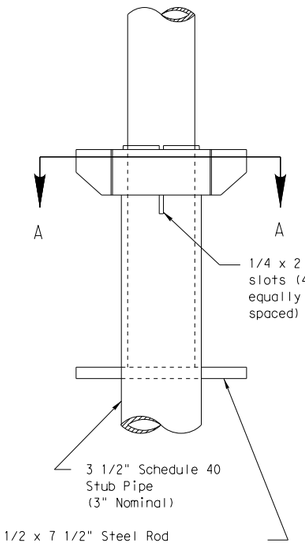
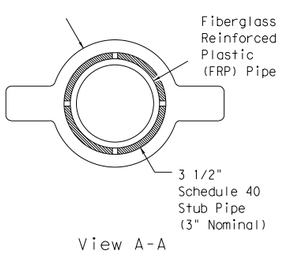
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



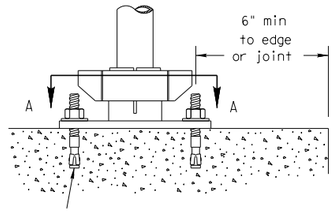


1/2 x 7 1/2" Steel Rod
Acts as a "stop" for the sign post and prevents stub from turning in the foundation.



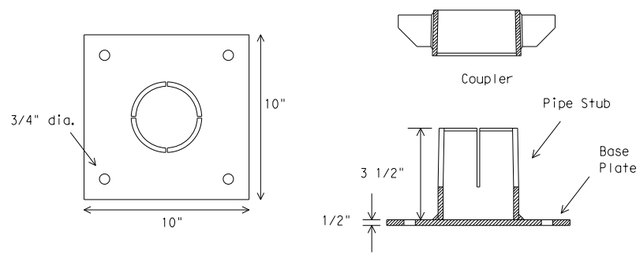
View A-A

SM RD SGN ASSM TY FRP(X)UA(P)



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

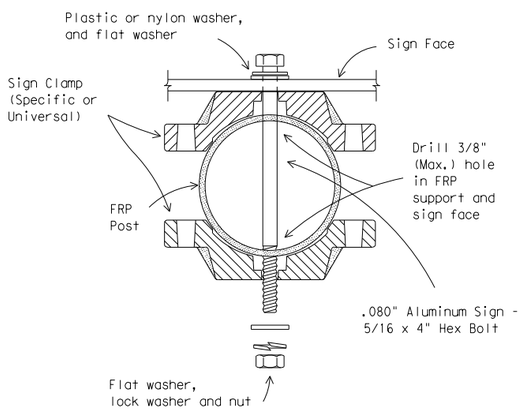
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

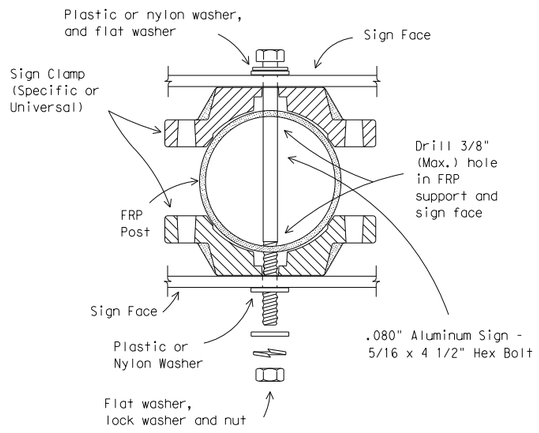
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

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9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
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	AUS	HAYS		213

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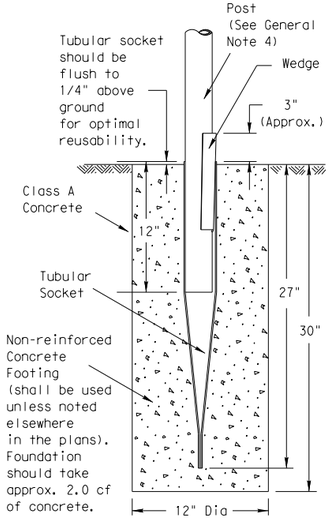
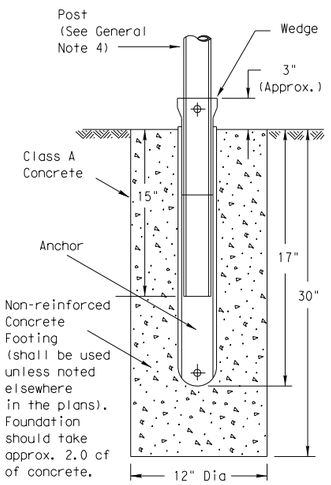
Wedge Anchor Steel System



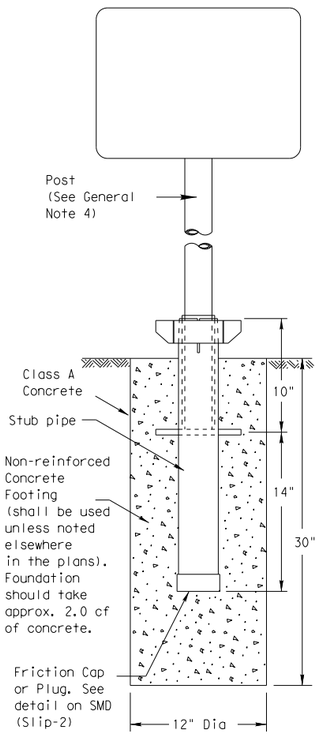
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System



SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



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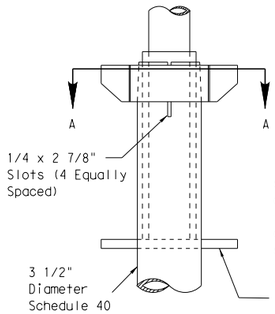
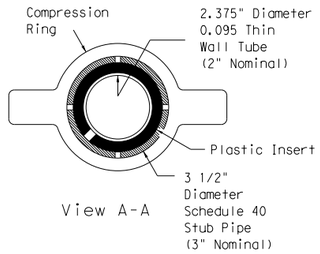
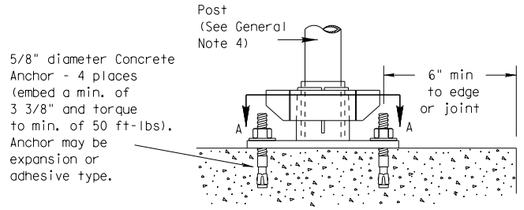


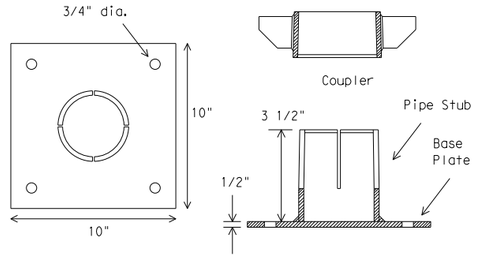


View A-A

Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

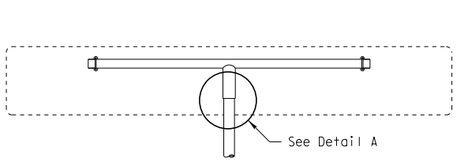


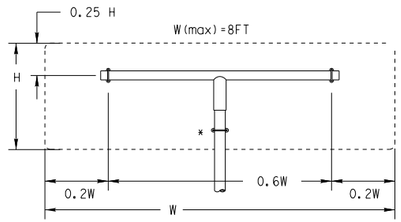
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. 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.



SM RD SGN ASSM TY TWT(X)UB(P)

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





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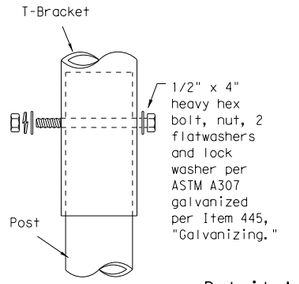
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations.
Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   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
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

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9-08 REVISIONS

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1776	01	036,ETC	RM967
DIST	COUNTY		SHEET NO.
AUS	HAYS		214

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FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

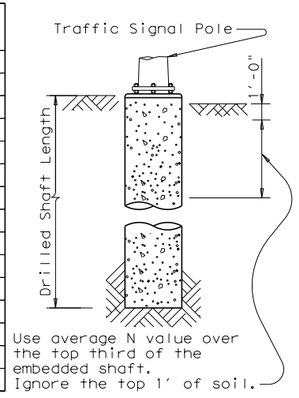
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET)				
				24-A	30-A	36-A	36-B	42-A
AT BUDA								
POLE A	10	24A	1	6				
POLE F	10	24A	1	6				
AT 1626								
POLE 2	10	30A	1		12			
POLE 7	10	30A	1		12			
TOTAL DRILLED SHAFT LENGTHS				12	24			

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

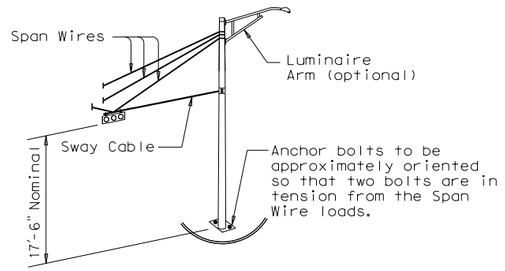


ANCHOR BOLT & TEMPLATE SIZES

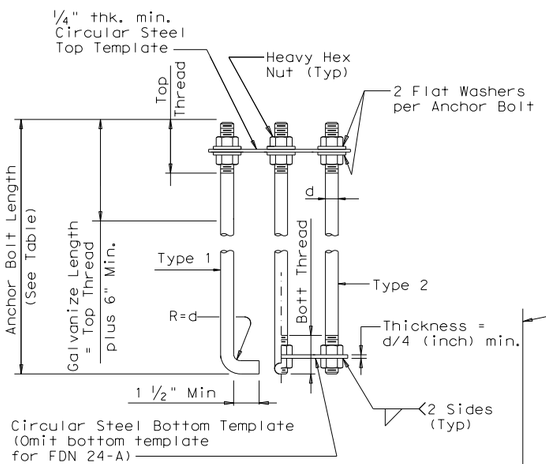
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.

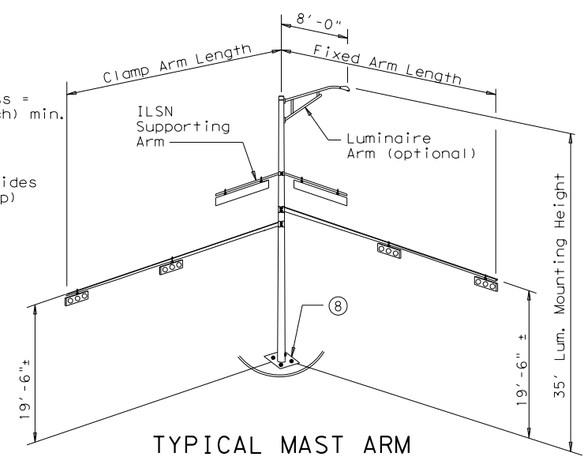


TYPICAL STRAIN POLE ASSEMBLY



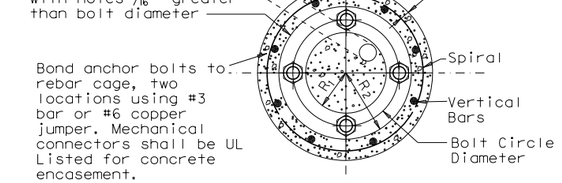
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

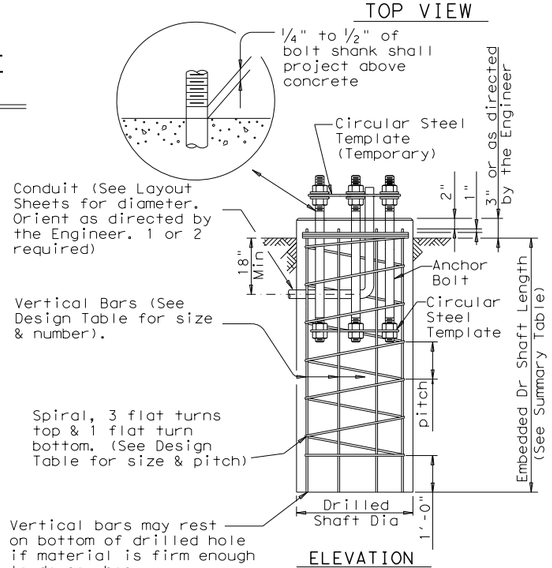


⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

STATE OF TEXAS
OMAR VENZOR
116539
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB

REVISIONS
5-96
11-99
1-12

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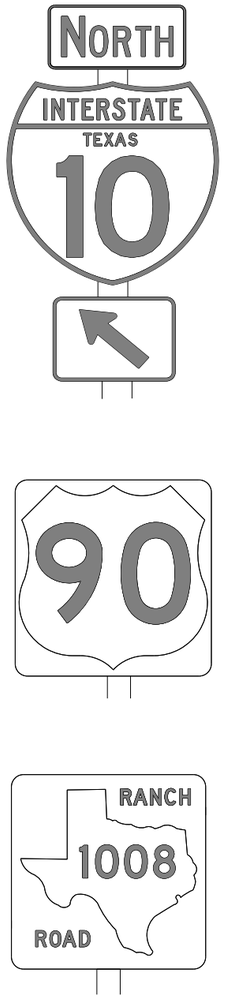
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

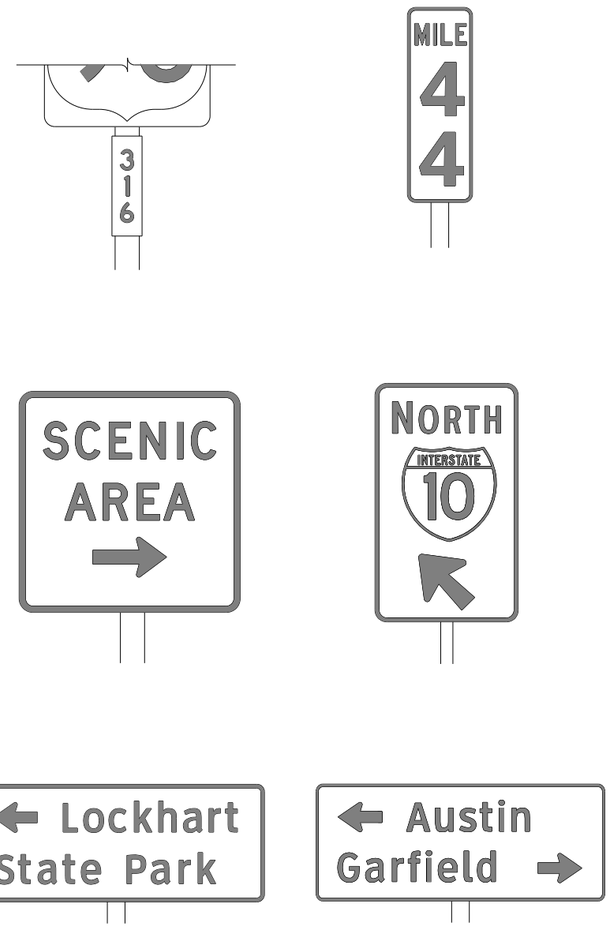
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

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

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

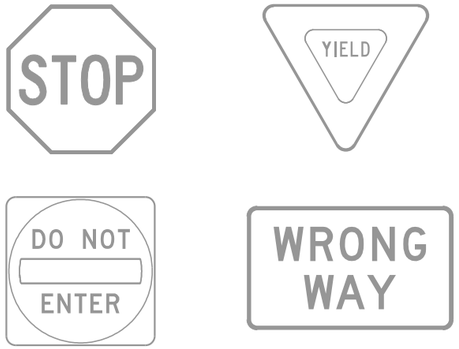
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	AUS	HAYS		216

3

DATE: 5/17/2021 3:43:19 PM
FILE: K:\015012-000\CadPlan\STND\tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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

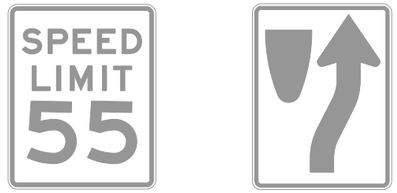


REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

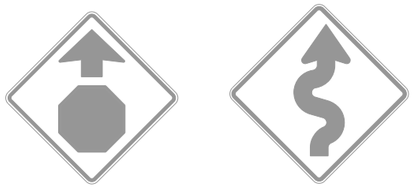
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	AUS	HAYS		217

A. GENERAL SITE DATA

1. PROJECT LIMITS: **FROM 1.5 MI WEST OF RUBY RANCH ROAD TO FM 1626**

Project Coordinates: **30°06'10.24" N , 97°56'21.65"W**

2. PROJECT SITE MAPS:
* Project Location Map: The Title Sheet
* Drainage Patterns: Drainage Area Maps
* Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: Typical Sections
* Location of Erosion and Sediment Controls: Erosion Control Sheet
* Surface Waters and Discharge Locations: Drainage and Culvert Layouts
* Project Specific Locations: To be specified by the Project Field Office during construction and located in the Project SW3P File. Reference Item #10 below

3. PROJECT DESCRIPTION: CONSTRUCTION OF WIDENING AN EXISTING NON-FREEEWAY FACILITY

4. MAJOR SOIL DISTURBING ACTIVITIES:
Preparing right of way, grading, excavation and embankment, flex base, installing drainage improvements, erosion and sediment controls, and seeding and topsoil.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

6. TOTAL PROJECT AREA: **43.5 AC.**

7. TOTAL AREA TO BE DISTURBED: **21.3 AC.**

8. WEIGHTED RUNOFF COEFFICIENT
BEFORE CONSTRUCTION: **0.56**
AFTER CONSTRUCTION: **0.64**

9. NAME OF RECEIVING WATERS: (Segment Number of Receiving waters)

ONION CREEK - SEGMENT 1427 AND LITTLE BEAR CREEK WHICH DRAINS TO BEAR CREEK - SEGMENT 1427-C

10. PROJECT SW3P FILE: For projects disturbing one acre or more, TxDOT will maintain an SW3P file with all pertinent environmental documents, correspondence, etc. at the project field office. If no field office is available then the SW3P file shall be kept in the Inspector's truck.

B. EROSION AND SEDIMENT CONTROLS

1.SOIL STABILIZATION PRACTICES:

- [X] TEMPORARY SEEDING
- [X] PERMANENT PLANTING, SODDING, OR SEEDING
- [ ] MULCHING
- [ ] SOIL RETENTION BLANKET
- [ ] BUFFER ZONES
- [X] PRESERVATION OF NATURAL RESOURCES

OTHER:
Disturbed areas on which construction activity has ceased (temporarily or permanently) shall be stabilized within 14 days unless activities are scheduled to resume within 21 days.

2.STRUCURAL PRACTICES:

- [X] SILT FENCES
- [X] ROCK FILTER DAMS
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- [ ] DIVERSION DIKE AND SWALE COMBINATIONS
- [ ] PIPE SLOPE DRAINS
- [ ] PAVED FLUMES
- [X] ROCK BEDDING AT CONSTRUCTION EXIT
- [ ] TIMBER MATTING AT CONSTRUCTION EXIT
- [ ] CHANNEL LINERS
- [ ] SEDIMENT TRAPS
- [ ] SEDIMENT BASINS
- [ ] STORM INLET SEDIMENT TRAP
- [X] STONE OUTLET STRUCTURES
- [ ] CURBS AND GUTTERS
- [ ] STORM SEWERS
- [ ] VELOCITY CONTROL DEVICES

OTHER: VEGETATIVE FILTER STRIPS

3. STORM WATER MANAGEMENT:

Storm water generated by offsite areas upgradient of the project will be routed through culverts to cross the project area. The upgradient runoff will either be intercepted by drainage ditches or flow within existing natural channels to reach the culvert entrances. Onsite runoff will flow through grass-lined channels along the roadway. Erosion control logs or silt fences will direct overland (sheet) flow to rock filter dams prior to exiting the project.

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

1. Install temporary erosion control measures and BMP's.
2. Prep ROW.
3. Construct Phase 1 roadway, making minor adjustments to rock filter dams as needed. Apply temporary seeding as needed.
4. Place topsoil and permanent seeding.
5. Repeat steps 1-4 for Phase 2 & 3 work area.
6. After the establishment of vegetation, remove all temporary erosion control measures and reseed any areas disturbed by their removal.

5. NON-STORM WATER DISCHARGES:

Filter non-storm water discharges, or hold retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water; and water used for dust control, pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
Maintenance will be performed as indicated on Field Inspection and Maintenance Report Form 2118.

2. INSPECTION:
Inspection will be performed as indicated on Field Inspection and Maintenance Report Form 2118.

3. WASTE MATERIALS:
All waste materials will be collected, stored and disposed of in a legal and proper manner. No construction waste material will be buried on site.

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
At a minimum, any products in the following categories are considered to be hazardous. Paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization, or concretecuring compounds and additives. In the event a spill which may be hazardous, the spill coordinator must be contacted immediately.

5. SANITARY WASTE:
All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management contractor.

OFFSITE VEHICLE TRACKING:

- [X] HAUL ROADS DAMPENED FOR DUST CONTROL
- [X] LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- [X] EXCESS DIRT ON ROAD REMOVED DAILY
- [X] STABILIZED CONSTRUCTION ENTRANCE

OTHER:
Excess dirt on road shall be broomed as needed or as directed by the engineer.

REMARKS: Disposal areas, stockpiles and haul roads shall be constructed in a manner that will minimize and control sediment from entering receiving waters. Disposal areas shall not be located in any waterbody or streambed.

Construction staging areas and vehicle maintenance areas shall be constructed to minimize the runoff of pollutants.

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

DATE: 5/17/2021				SHEET 1 OF 1
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	218

Filename: ...\015012-000*Austin Dist*SW3P.dgn
Date: 5/17/2021

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\051012-000_EPIC.DGN

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☒ No Action Required ☐ Required Action

Action No.

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

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

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

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

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

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1.

2.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):
Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☐ Required Action

Action No.

1. The project is located on the Edwards Aquifer Recharge Zone and Contributig Zone with the Transition Zone.
2. If any sensitive feature is encountered during construction, implement the Void Discovery Protocol on the Void Mitigation Notes plan sheet.
3. A Water Pollution Abatement plan (WPAP) and WPAP Approval Letter were obtained for the project. Comply with the WPAP and WPAP Approval Letter.
4. Maintain a copy of the WPAP and the WPAP Approval Letter onsite or immediately available until project completion

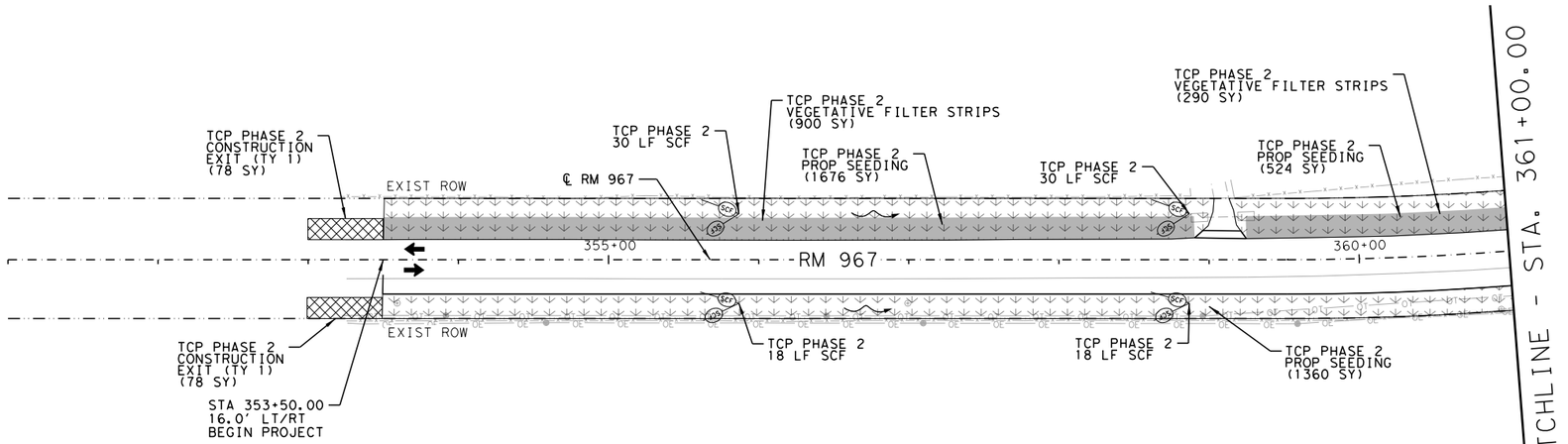
Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

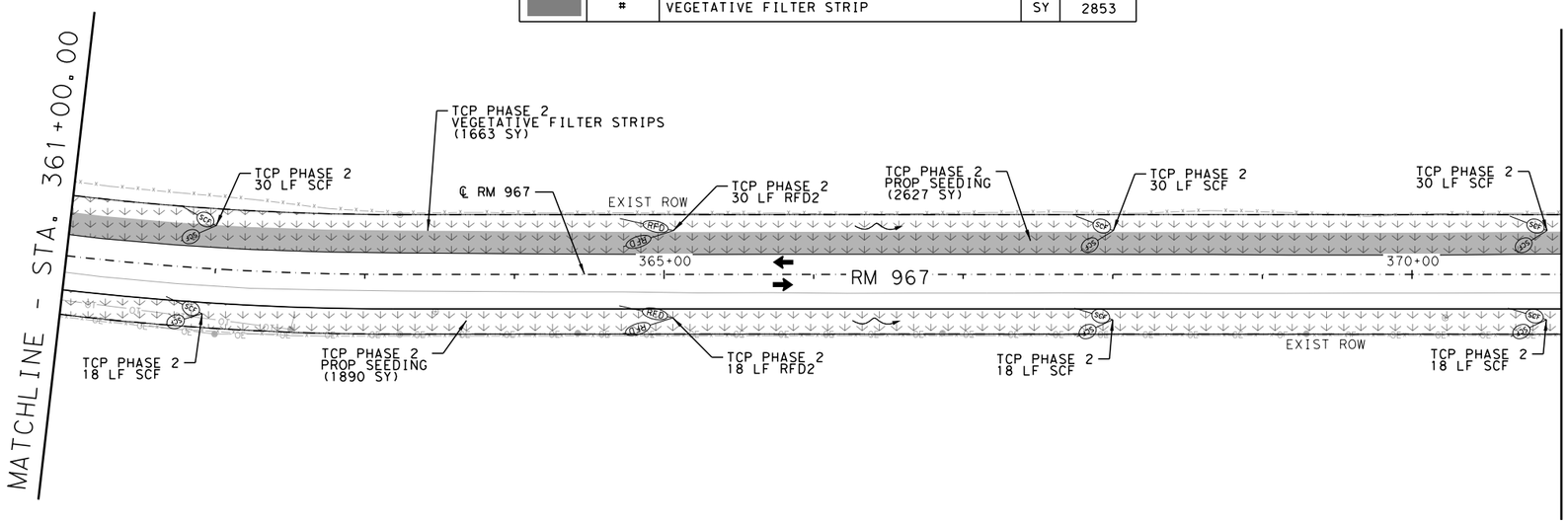
EPIC

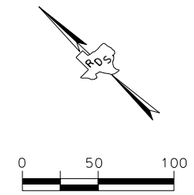
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	776	01	036, ETC	RM967
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	AUS	HAYS		219
01-23-2015 SECTION I CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8077
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4039
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	8077
	168	VEGETATIVE WATERING	MG	202
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	8077
RFD	506	ROCK FILTER DAM (TY 2)	LF	48
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	240
	506	CONSTRUCTION EXIT (TY 1)	SY	156
	#	VEGETATIVE FILTER STRIP	SY	2853





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

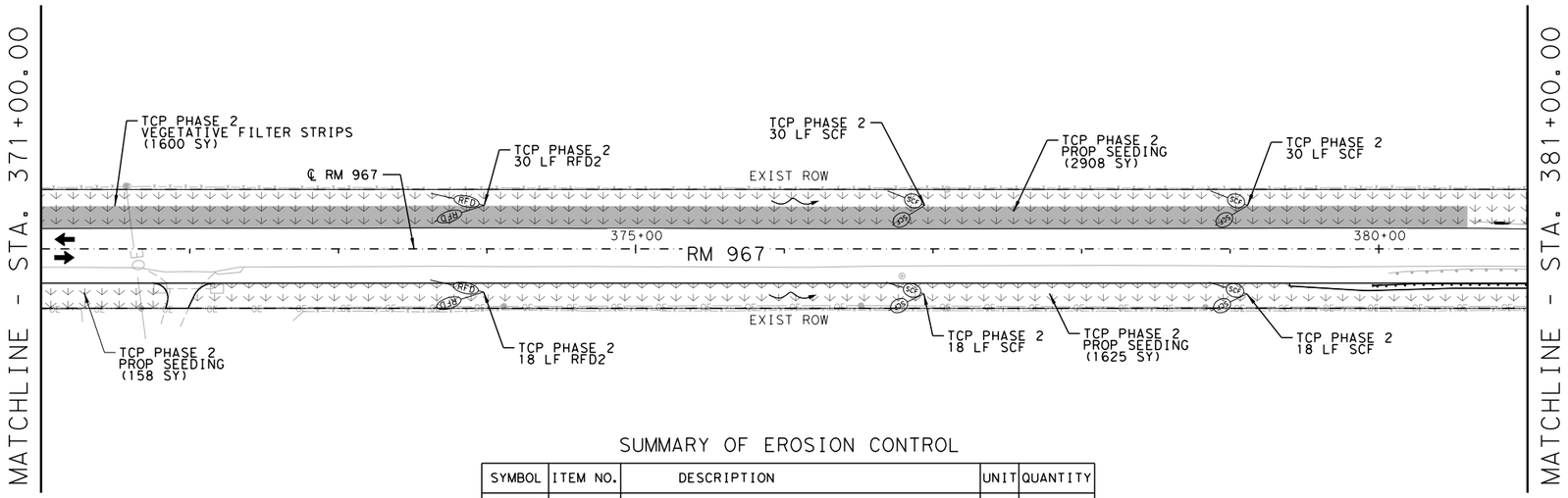
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
BEGIN PROJECT
TO STA 371+00.00

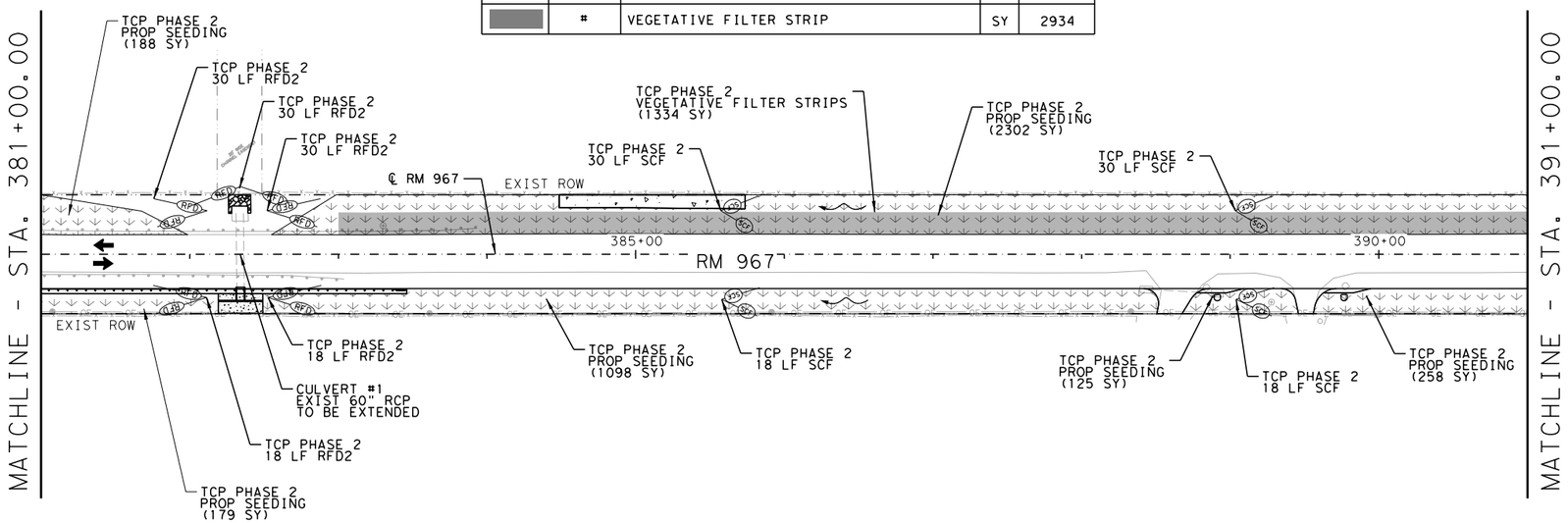
DATE: 5/17/2021			SHEET 1 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	220

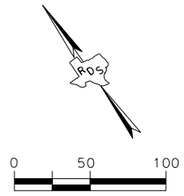
Filename: ...\Cad\Plan\015012-000*EC01.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8841
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4421
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	8841
	168	VEGETATIVE WATERING	MG	222
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	8841
RFD	506	ROCK FILTER DAM (TY 2)	LF	174
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	192
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	2934





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

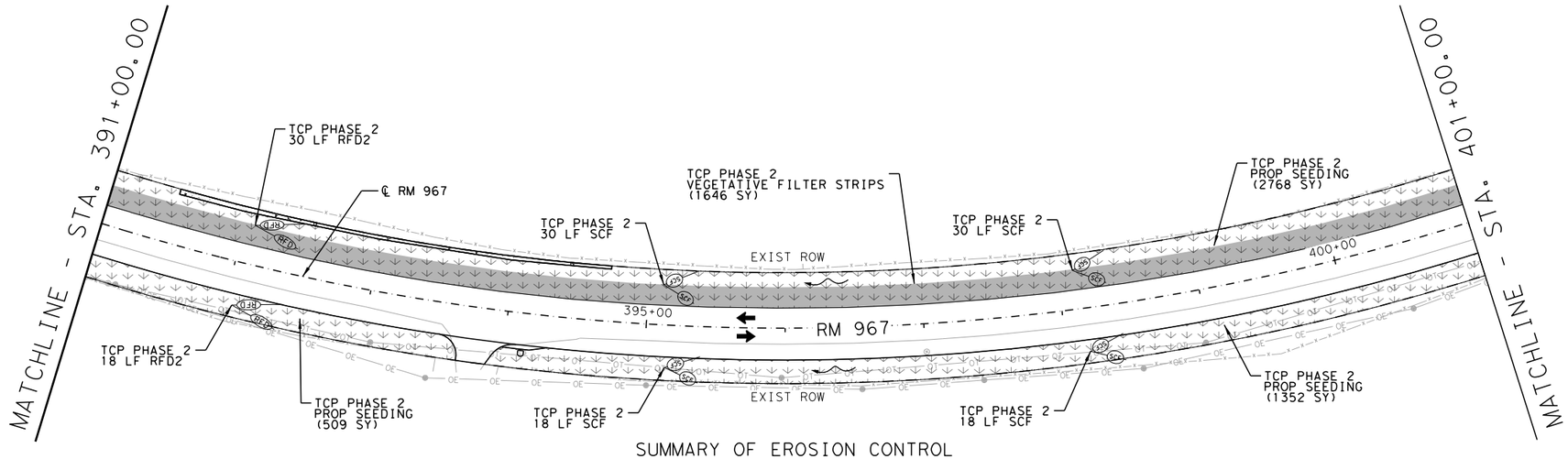
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 371+00.00 TO
STA 391+00.00

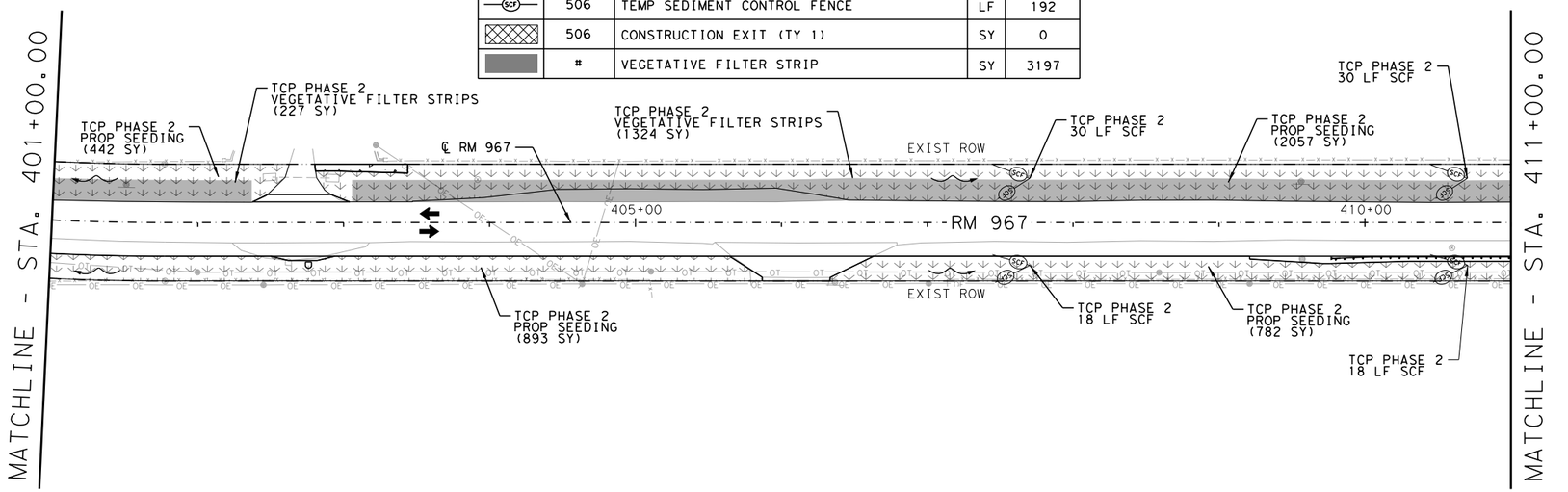
DATE: 5/17/2021			SHEET 2 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	221

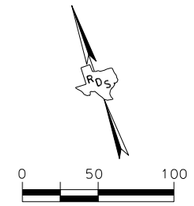
Filename: ...\Cad\Plan\015012-000*EC02.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8803
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4402
	164	BORADCAST SEED (PERM) (URBAN) (CLAY)	SY	8803
	168	VEGETATIVE WATERING	MG	221
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	8803
RFD	506	ROCK FILTER DAM (TY 2)	LF	48
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	192
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	3197





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

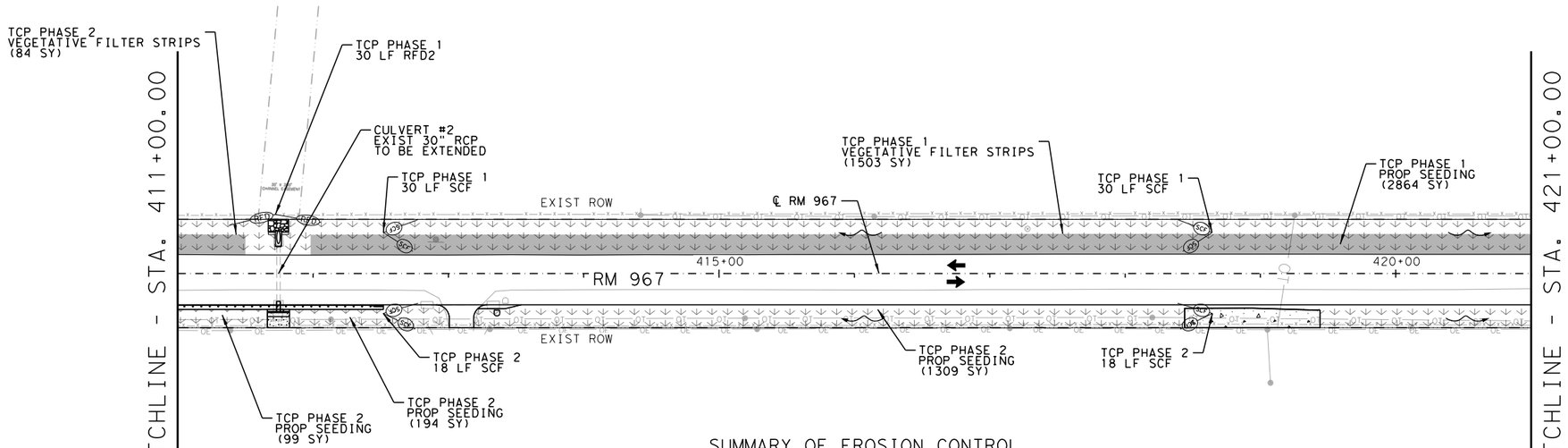
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 391+00.00 TO
STA 411+00.00

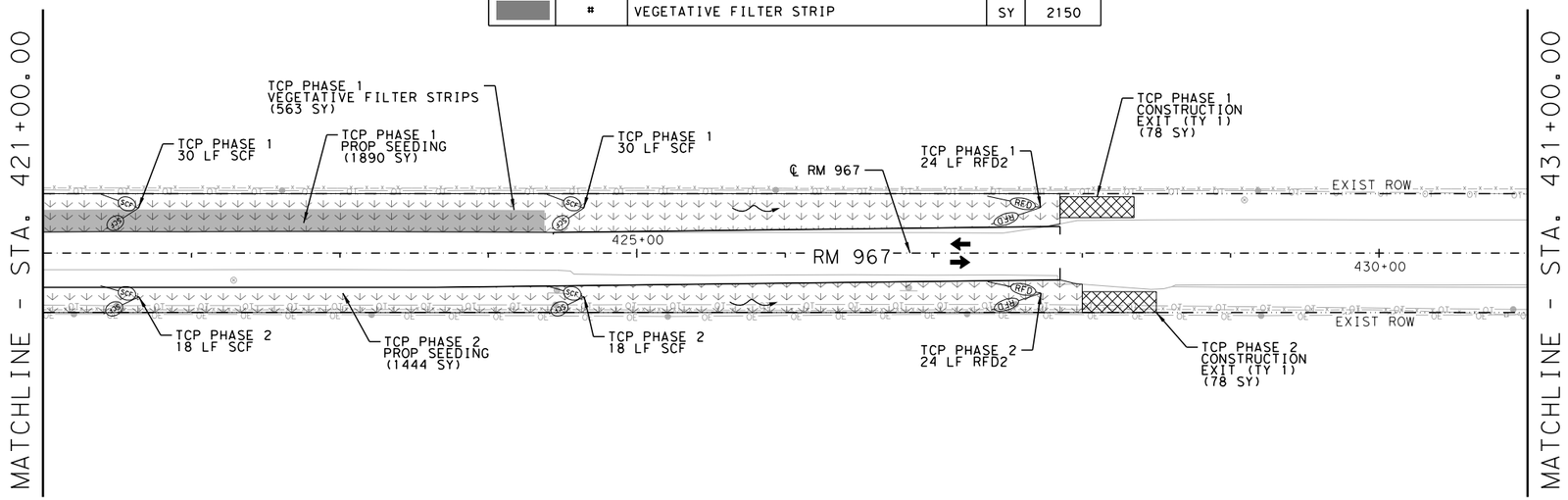
DATE: 5/17/2021				SHEET 3 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	222

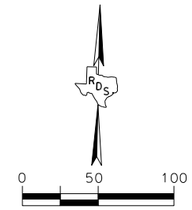
Filename: ...\Cad\Plan\015012-000*EC03.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	7800
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	3900
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	7800
	168	VEGETATIVE WATERING	MG	195
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	7800
RFD	506	ROCK FILTER DAM (TY 2)	LF	78
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	192
	506	CONSTRUCTION EXIT (TY 1)	SY	156
	#	VEGETATIVE FILTER STRIP	SY	2150





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

5/17/2021

Texas Department of Transportation

HAYS COUNTY

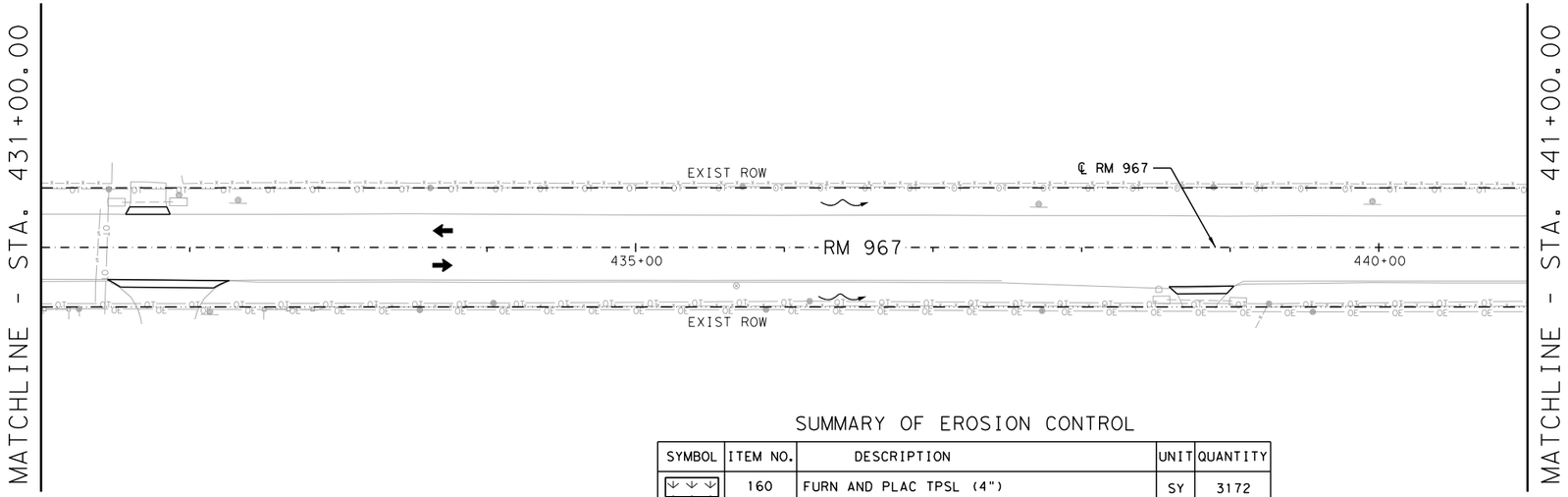
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 411+00.00 TO
STA 431+00.00

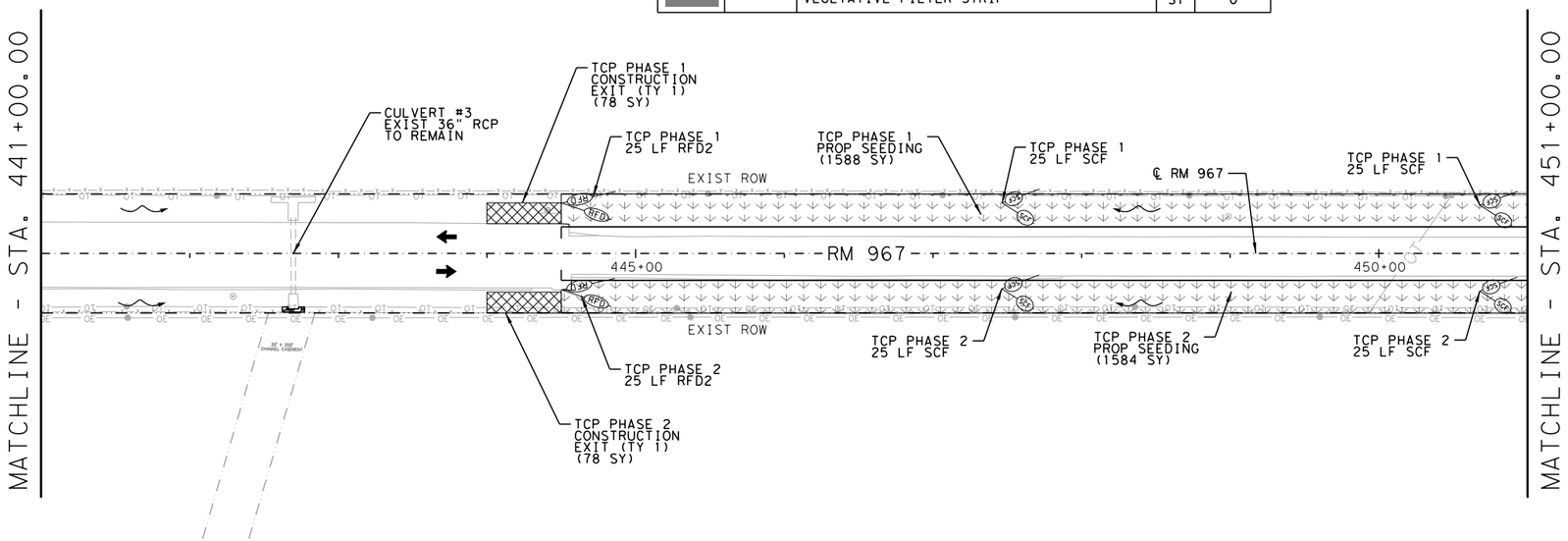
DATE: 5/17/2021			SHEET 4 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	223

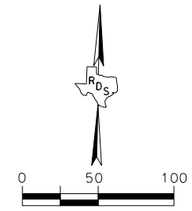
Filename: ...\Cad\Plan\015012-000*EC04.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	3172
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	1586
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	3172
	168	VEGETATIVE WATERING	MG	80
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	3172
RFD	506	ROCK FILTER DAM (TY 2)	LF	50
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	100
	506	CONSTRUCTION EXIT (TY 1)	SY	156
	#	VEGETATIVE FILTER STRIP	SY	0





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

5/17/2021

Texas Department of Transportation

HAYS COUNTY

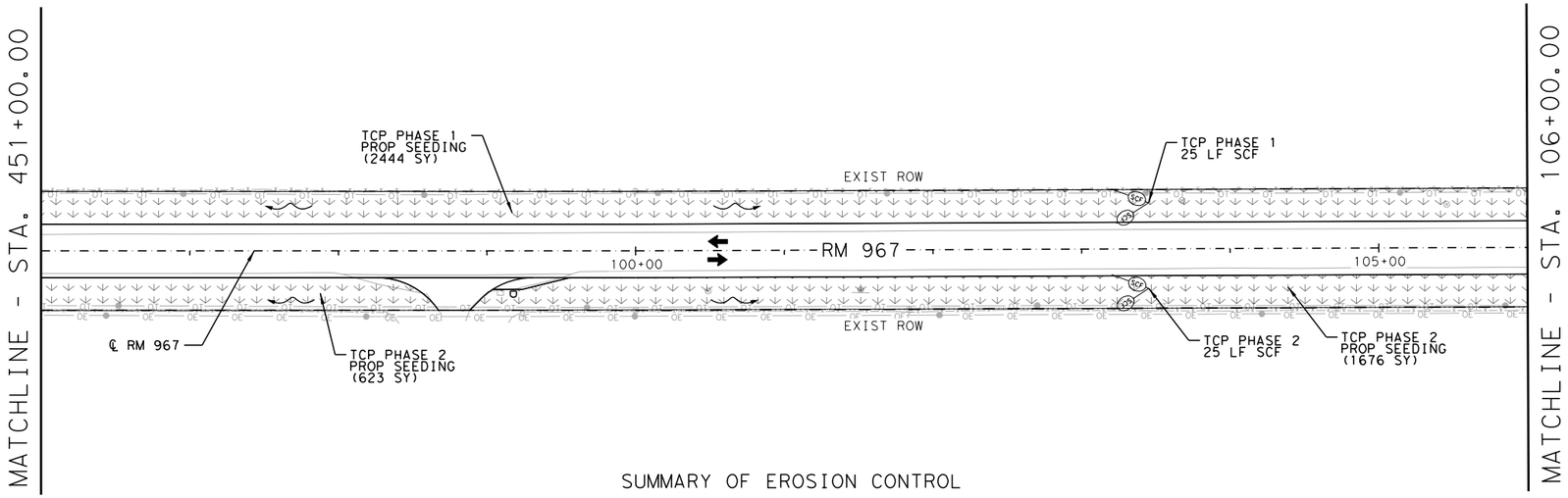
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 431+00.00 TO
STA 451+00.00

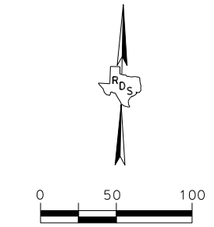
DATE: 5/17/2021			SHEET 5 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	224

Filename: ...\Cad\Plan\015012-000*EC05.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	4743
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	2372
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	4743
	168	VEGETATIVE WATERING	MG	119
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	4743
RFD	506	ROCK FILTER DAM (TY 2)	LF	0
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	50
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	0



LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

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3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

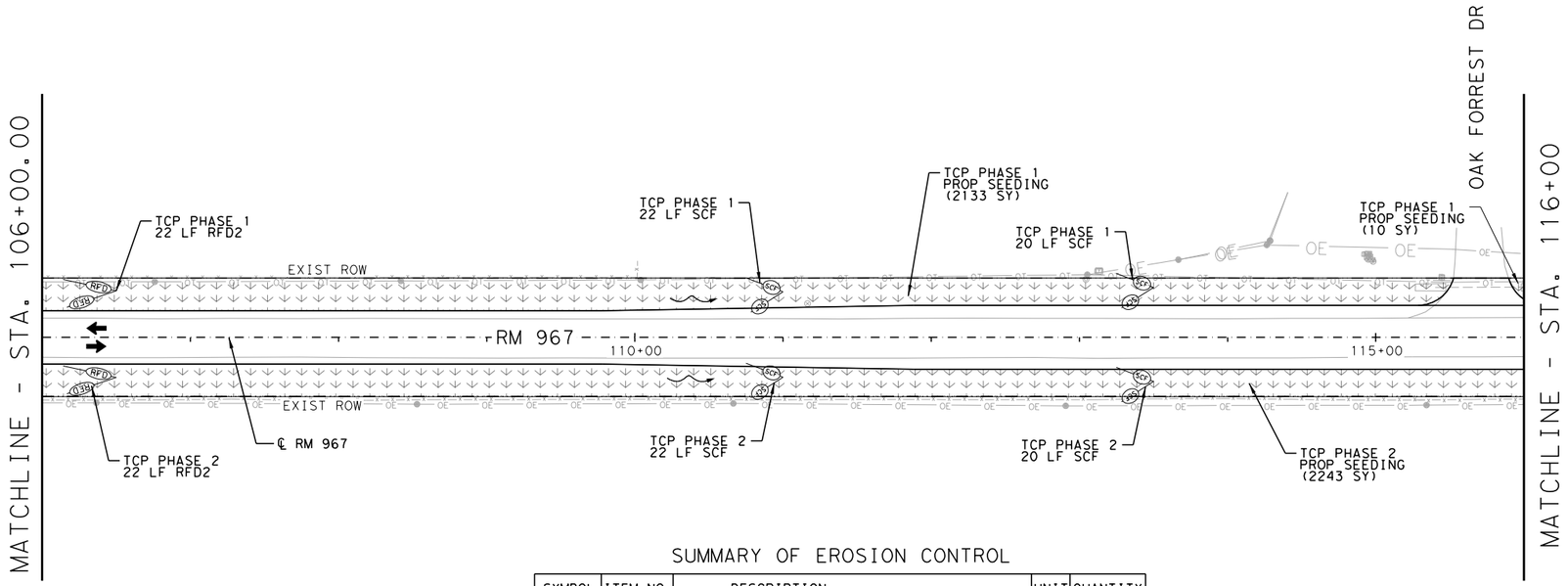
EROSION CONTROL
STA 451+00.00 TO
STA 106+00.00

DATE: 5/17/2021 SHEET 6 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

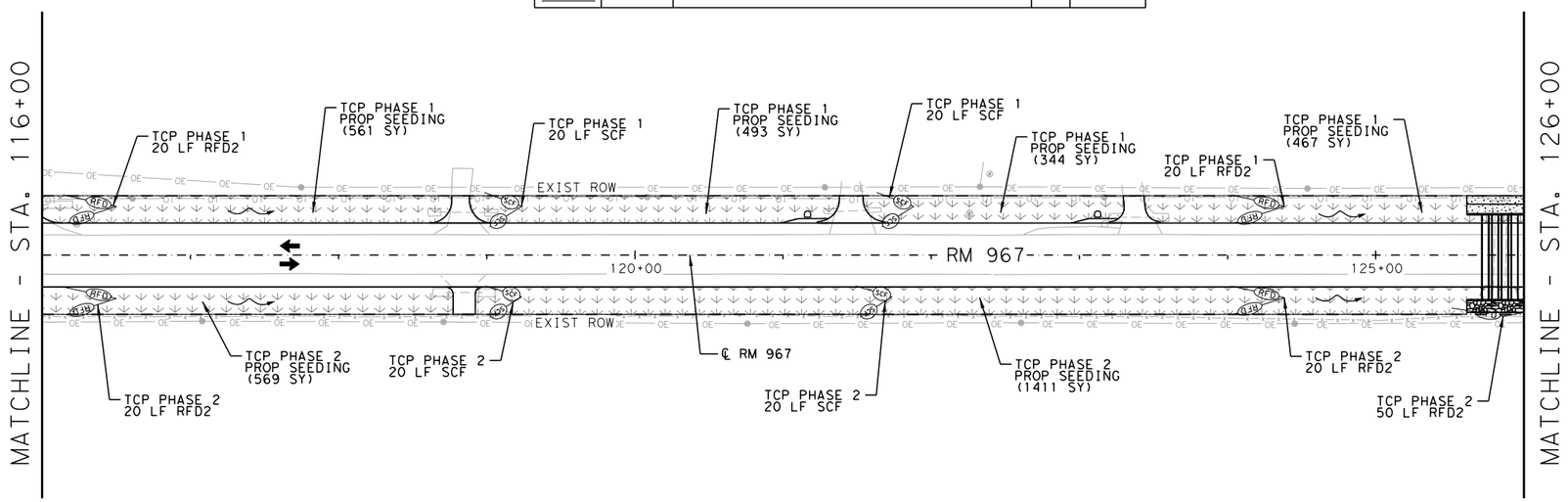
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	225

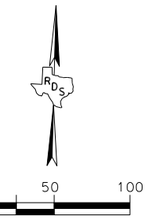
Filename: ...\Cad\Plan\015012-000*EC06.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8231
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4116
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	8231
	168	VEGETATIVE WATERING	MG	206
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	8231
RFD	506	ROCK FILTER DAM (TY 2)	LF	174
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	164
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	0





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

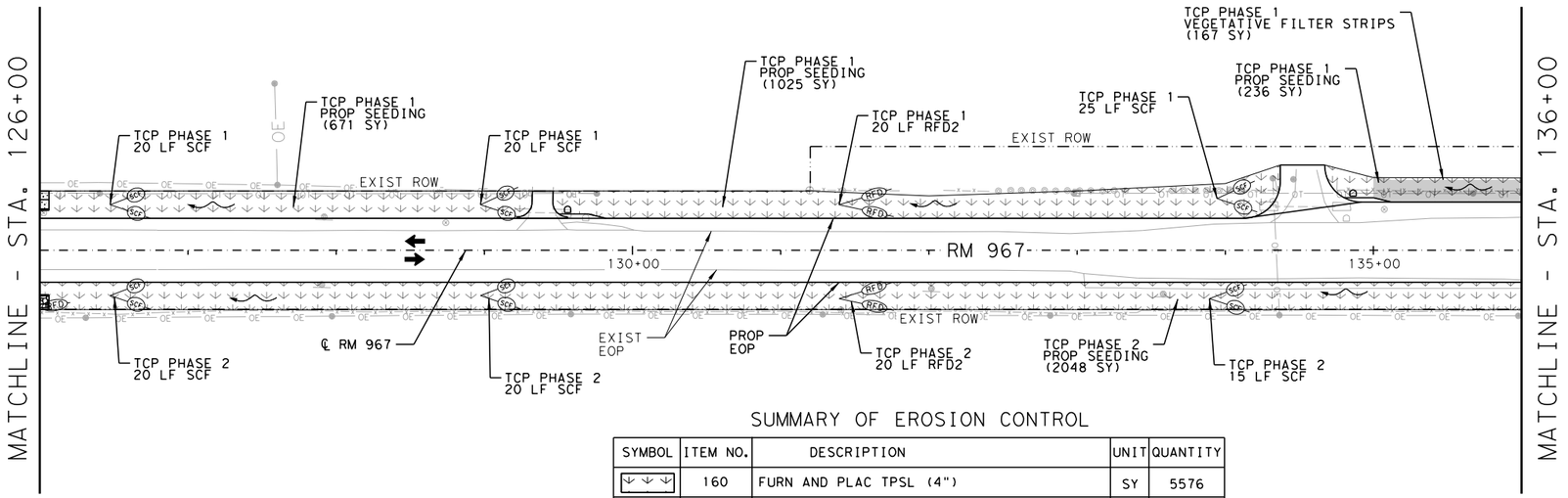
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 106+00.00
TO STA 126+00.00

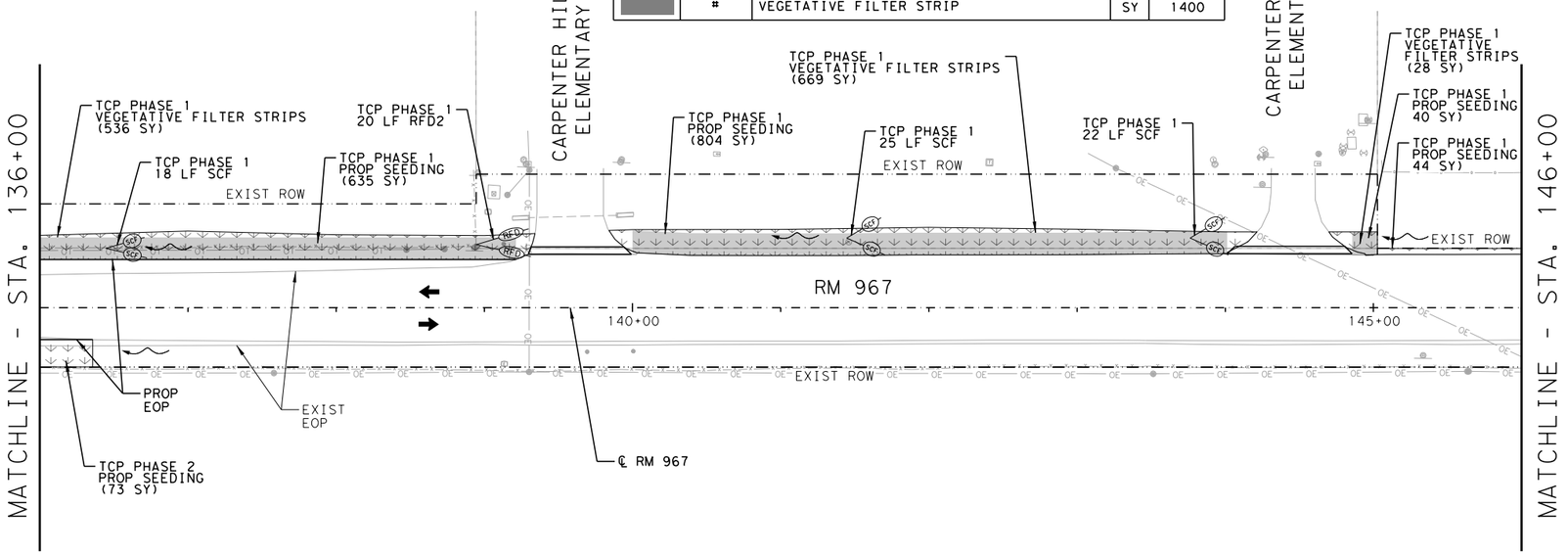
DATE: 5/17/2021			SHEET 7 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	226

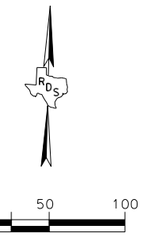
Filename: ...\Cad\Plan\015012-000*EC07.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	5576
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	2788
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	5576
	168	VEGETATIVE WATERING	MG	140
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	5576
RFD	506	ROCK FILTER DAM (TY 2)	LF	60
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	185
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	1400





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

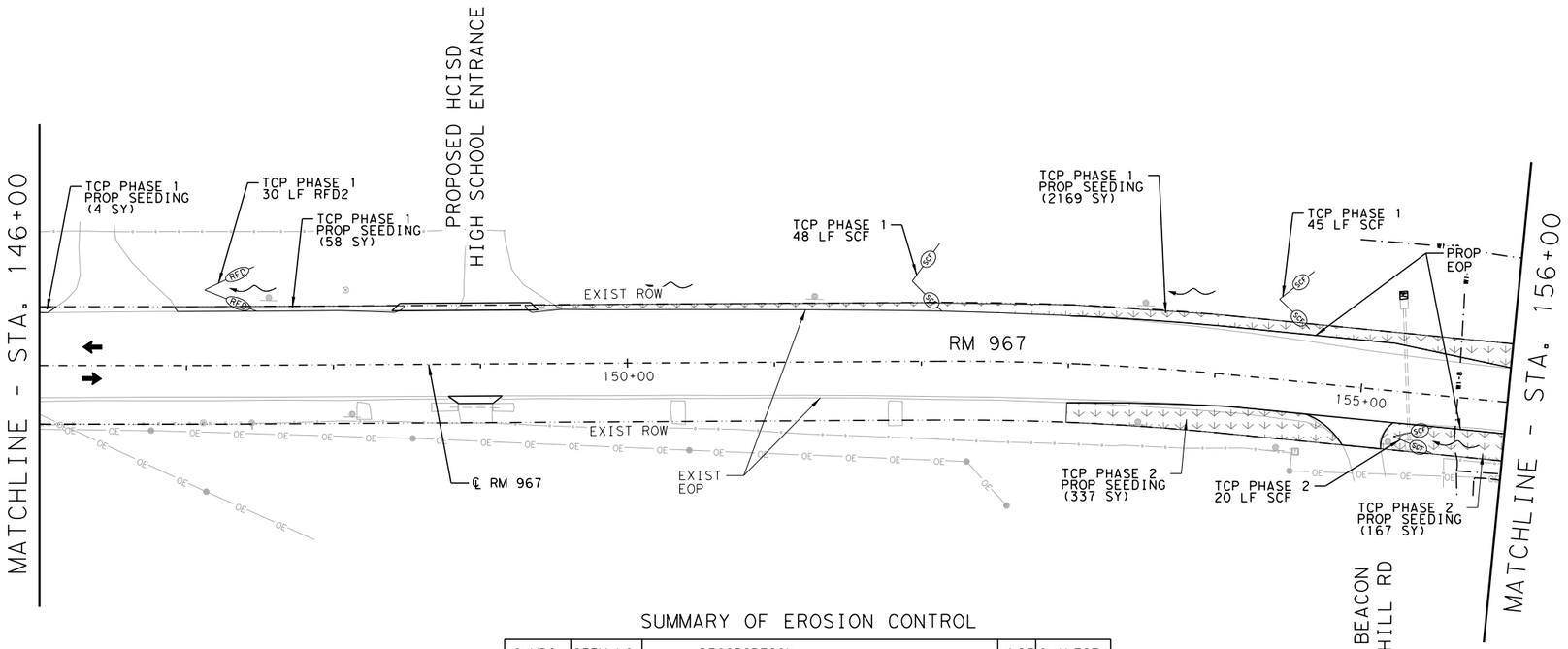
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 126+00.00 TO
STA 146+00.00

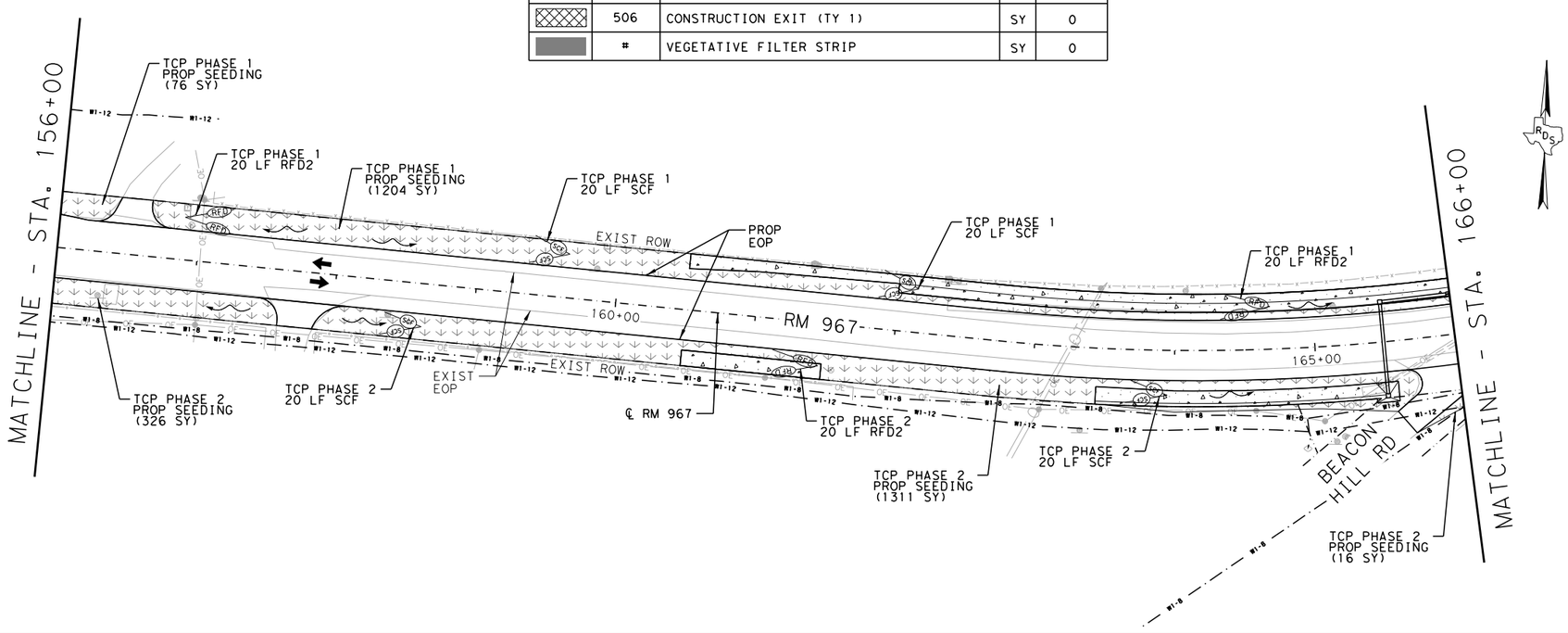
DATE: 5/17/2021			SHEET 8 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	227

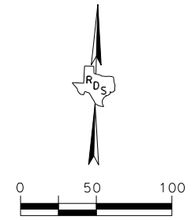
Filename: ...\Cad\Plan\015012-000*EC08.dgn
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	5668
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	2834
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	5668
	168	VEGETATIVE WATERING	MG	142
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	5668
RFD	506	ROCK FILTER DAM (TY 2)	LF	90
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	193
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	0





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

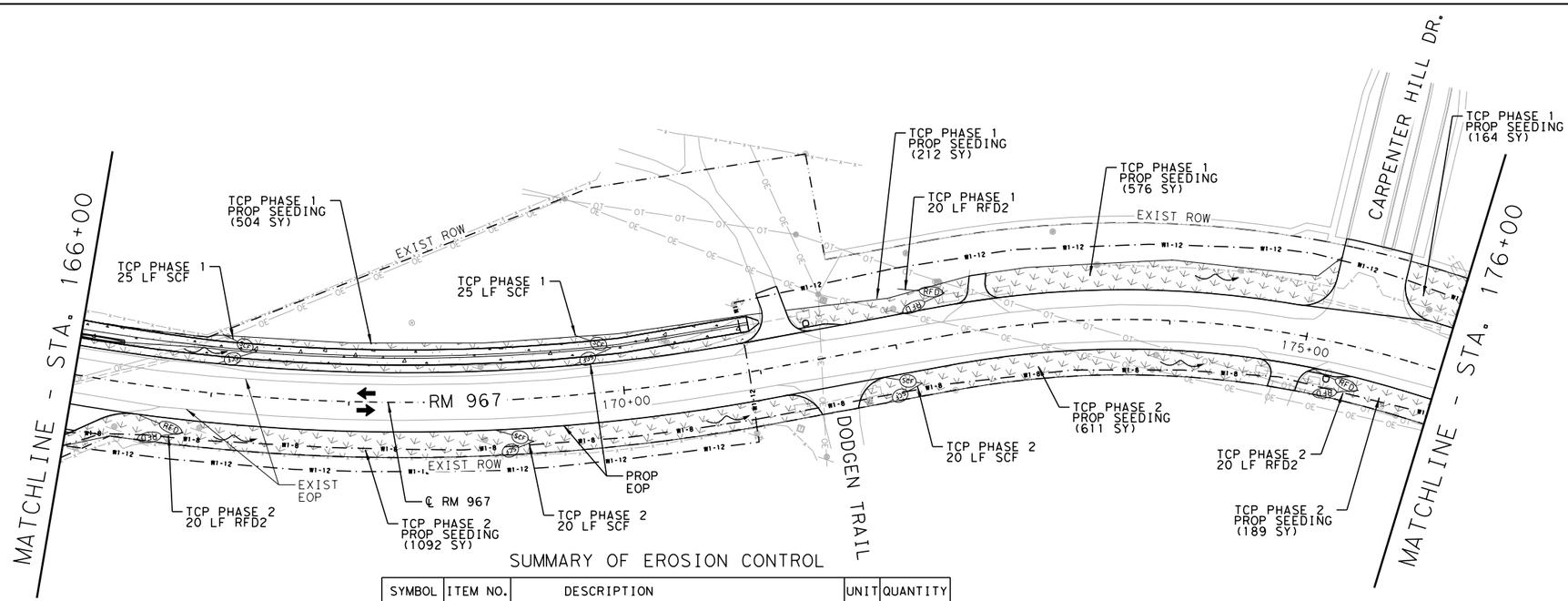
WSB & ASSOCIATES, INC.
FIRM # 16849

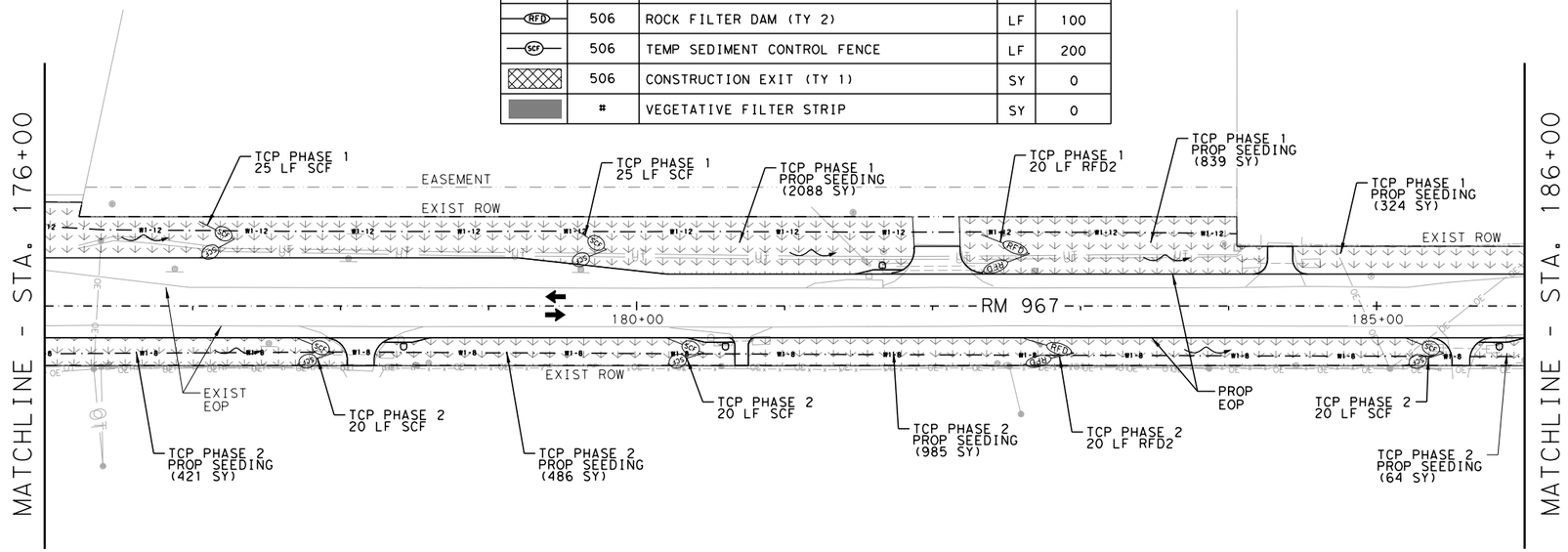
RM 967

EROSION CONTROL
STA 146+00.00 TO
STA 166+00.00

DATE: 5/17/2021			SHEET 9 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	228

Filename: ...\Cad\Plan\015012-000*EC09.dgn
Date: 5/17/2021





SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8555
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4278
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	8555
	168	VEGETATIVE WATERING	MG	214
	169	SOIL RETENTION BLANKETS (CL1) (TYA)	SY	8555
RFD	506	ROCK FILTER DAM (TY 2)	LF	100
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	200
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	0

0 50 100

LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

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STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 166+00.00 TO
STA 186+00.00

DATE: 5/17/2021			SHEET 10 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	229

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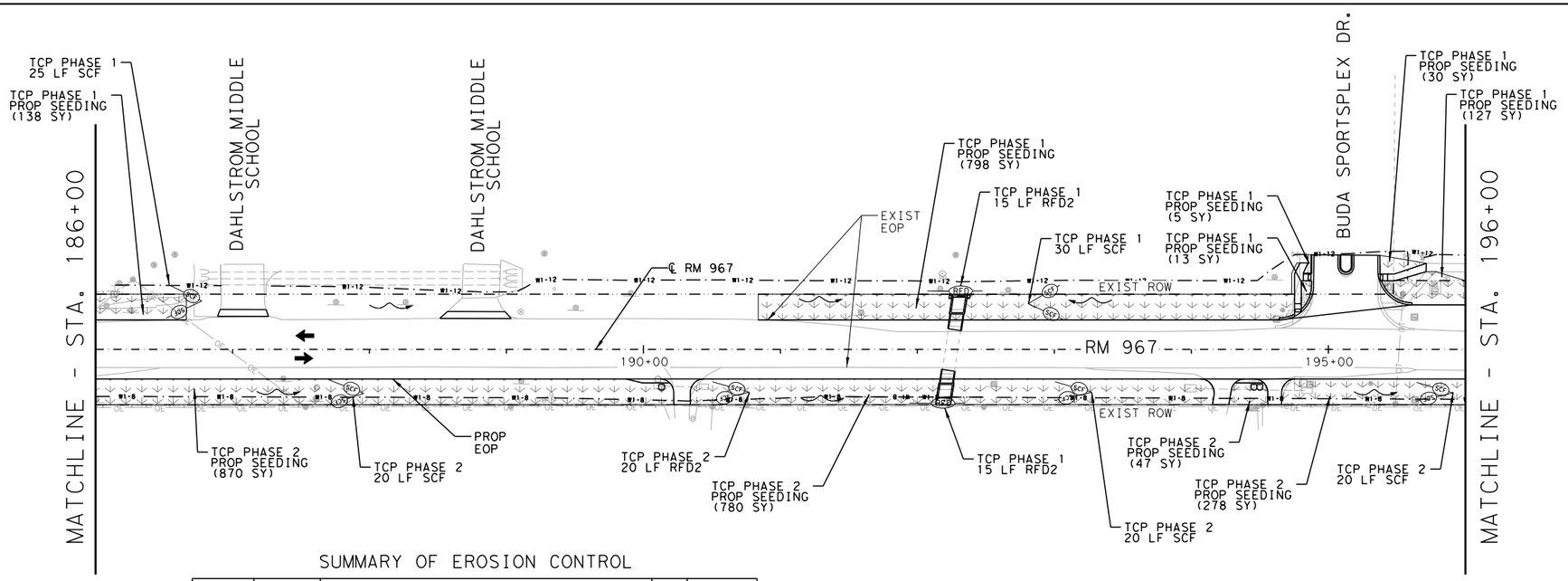
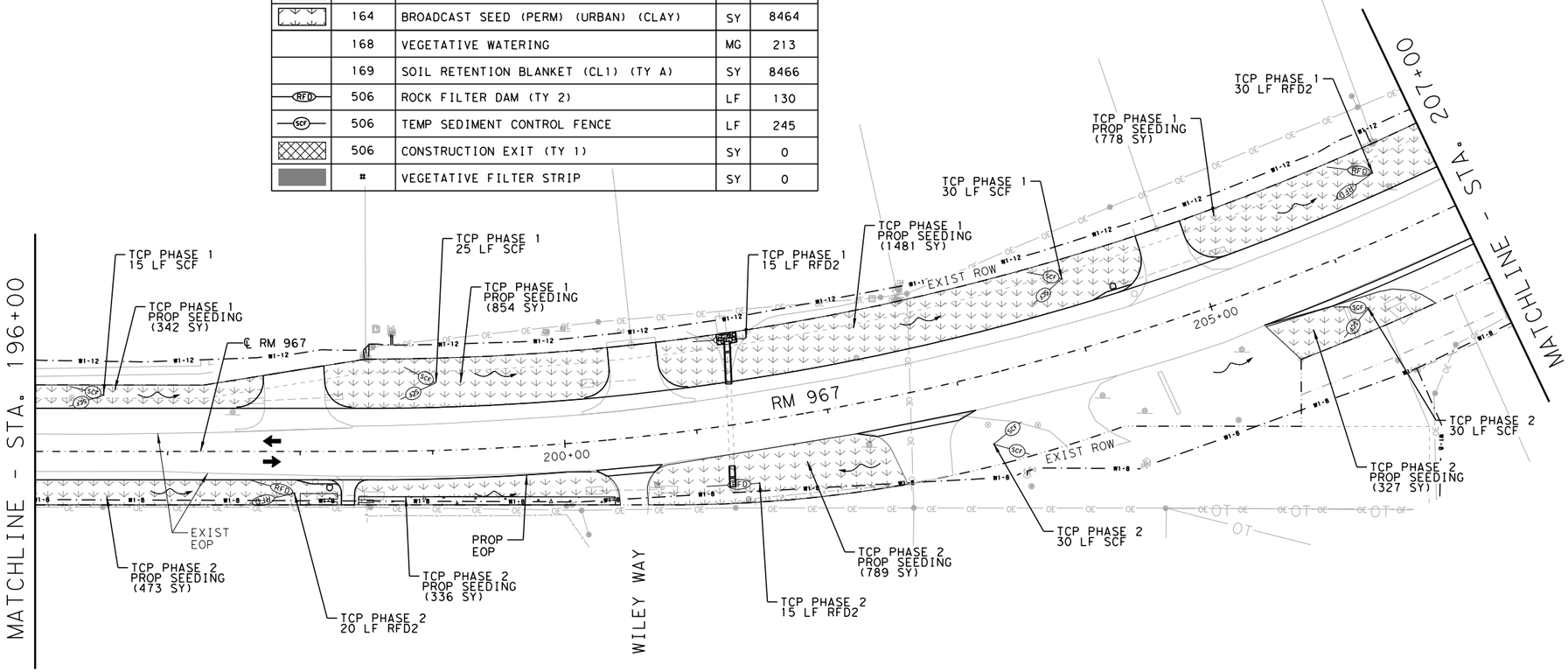
Date: 5/17/2021



SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	8466
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	4233
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	8464
	168	VEGETATIVE WATERING	MG	213
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	8466
RFD	506	ROCK FILTER DAM (TY 2)	LF	130
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	245
	506	CONSTRUCTION EXIT (TY 1)	SY	0
	#	VEGETATIVE FILTER STRIP	SY	0



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LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

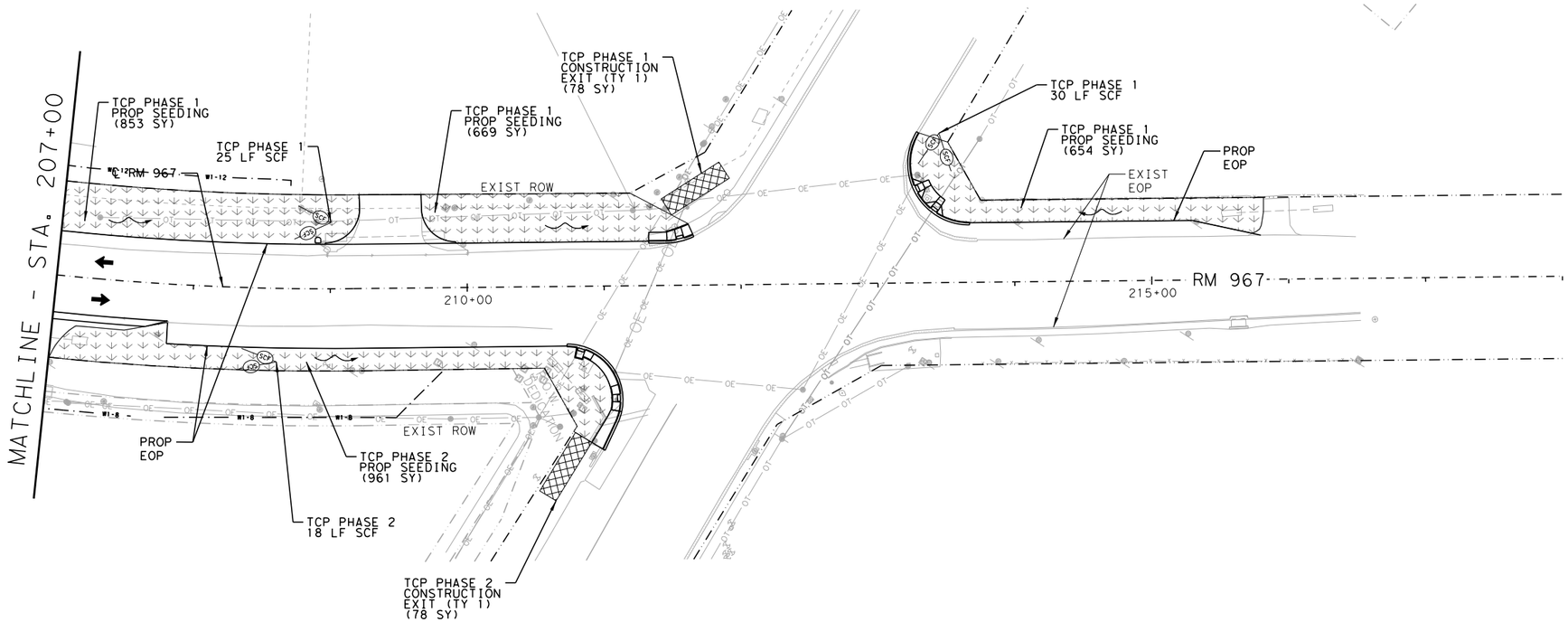
WSB & ASSOCIATES, INC.
FIRM # 16849

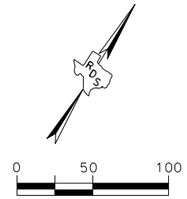
RM 967

EROSION CONTROL
STA 186+00.00 TO
STA 207+00.00

DATE: 5/17/2021			SHEET 11 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	230

Filename: ...\Cad\Plan\015012-000*EC11.dgn
Date: 5/17/2021





LEGEND

- TOPSOIL AND SEEDING
- VEGETATIVE FILTER STRIPS
- CONSTRUCTION EXIT (TY 1)
- FLOW DIRECTION

NOTES:

1. LOCATION OF TEMPORARY SEEDING WILL BE DETERMINED AS DIRECTED BY THE ENGINEER.
2. LOCATION OF CONSTRUCTION EXITS TO BE VERIFIED BY ENGINEER IN THE FIELD.
3. CONTRACTOR TO UTILIZE SOIL RETENTION BLANKETS FOR ALL DISTURBED AREA FROM STA 155+00 R2 TO STA 174+00 R2

SUMMARY OF EROSION CONTROL

SYMBOL	ITEM NO.	DESCRIPTION	UNIT	QUANTITY
	160	FURN AND PLAC TPSL (4")	SY	3137
	164	BROADCAST SEED (TEMP) (WARM OR COOL)	SY	1569
	164	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	3137
	168	VEGETATIVE WATERING	MG	79
	169	SOIL RETENTION BLANKET (CL1) (TY A)	SY	3137
RFD	506	ROCK FILTER DAM (TY 2)	LF	0
SCF	506	TEMP SEDIMENT CONTROL FENCE	LF	73
	506	CONSTRUCTION EXIT (TY 1)	SY	156
	#	VEGETATIVE FILTER STRIP	SY	0

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EROSION CONTROL
STA 207+00.00 TO
END OF PROJECT

DATE: 5/17/2021 SHEET 12 OF 12

STATE	STATE DIST. NO.			COUNTY
TEXAS	AUS			HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	231

Filename: ...\Cad\Plan\015012-000*EC12.dgn
Date: 5/17/2021

The following TCEQ requirements (Form TCEQ-0592, Rev. 7/15/15) are applicable to all work in the recharge zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later thanwhen it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

11. The following records shall be maintained and made available to the TCEQ upon request:
   - the dates when major grading activities occur;
   - the dates when construction activities temporarily or permanently cease on a portion of the site; and
   - the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

   A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
   B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
   C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

Texas Department of Transportation

Austin District Standard

TCEQ REQUIREMENTS FOR THE RECHARGE ZONE OF THE EDWARDS AQUIFER

TCEQ-RZ-19(AUS)

REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
1776	01	036,ETC	RM967
DIST	COUNTY		SHEET NO.
AUS	HAYS		232

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The following TCEQ requirements (Form TCEQ-0592A, Rev. 7/15/15) are applicable to all work that disturbs 5 or more acres in the contributing zone of the Edwards Aquifer in Hays, Travis and/or Williamson Counties and must be adhered to by the Contractor and all Subcontractors:

1. A written notice of construction must be submitted to the TCEQ regional office at least 48 hours prior to the start of any ground disturbance or construction activities. This notice must include:
   - the name of the approved project;
   - the activity start date; and
   - the contact information of the prime contractor.

2. All contractors conducting regulated activities associated with this project should be provided with complete copies of the approved Contributing Zone Plan (CZP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractor(s) should keep copies of the approved plan and approval letter on-site.

3. No hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

4. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

5. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

6. Sediment must be removed from the sediment traps or sedimentation basins when it occupies 50% of the basin's design capacity.

7. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

8. All excavated material that will be stored on-site must have proper E&S controls.

9. If portions of the site will have a cease in construction activity lasting longer than 14 days, soilstabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

10. The following records should be maintained and made available to the TCEQ upon request:
    - the dates when major grading activities occur;
    - the dates when construction activities temporarily or permanently cease on a portion of the site; and
    - the dates when stabilization measures are initiated.

11. The holder of any approved CZP must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

    A. any physical or operational modification of any best management practices (BMPs) or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
    B. any change in the nature or character of the regulated activity from that which was originally approved;
    C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer; or
    D. any development of land previously identified as undeveloped in the approved contributing zone plan.

TCEQ REGIONAL OFFICE

Austin Regional Office
12100 Park 35 Circle
Bldg A, Room 179
Austin, Texas 78753
Phone: (512) 339-2929
Fax: (512) 339-3795

Texas Department of Transportation

Austin District Standard

TCEQ REQUIREMENTS FOR THE CONTRIBUTING ZONE OF THE EDWARDS AQUIFER

(DISTURBING 5 OR MORE ACRES)

TCEQ-CZ-19(AUS)

REVISIONS
01/10/14: REQUIREMENTS AND ADDRESS UPDATED
01/21/16: REQUIREMENTS UPDATED
09/24/19: UPDATED RELEASE YEAR

CONT	SECT	JOB	HIGHWAY
1776	01	036,ETC	RM967
DIST	COUNTY		SHEET NO.
AUS	HAYS		232a

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VOIDS DEFINITION

- VOID GREATER THAN SIX INCHES ACROSS IN ANY DIRECTION AND/OR
- VOID IS GREATER THAN ONE SQUARE FOOT ALONG ANY PLANE AND/OR
- VOID BLOWS AIR AND/OR
- VOID CONTINUALLY RECEIVES WATER DURING A RAIN EVENT AND/OR
- VOID HAS WATER FLOWING THROUGH OR OUT OF IT AND/OR

GENERAL NOTES

1. USING EXPLOSIVES IS NOT ALLOWED.
2. THE PROJECT AREA IS A KNOWN KARST AREA. FRACTURED MATERIAL, BOULDERS,UNDERGROUND VOIDS, GROUNDWATER, UNSTABLE MATERIAL, AND DRASTICALLY VARYING STRATA CAN BE EXPECTED. THE CONTRACTOR SHALL WORK WITH TXDOT AND TXDOT'S PARTNERS TO ALLOW ACCESS AND ON-SITE MONITORING OF EXCAVATION.
3. THE VOID MITIGATION DETAILS ARE EXAMPLES. IMPLEMENTATION OF THE APPROVED MITIGATION PLAN SHOULD USE THE REFERENCED BID ITEMS.
4. CONCRETE USED FOR VOID MITIGATION SHALL BE 3,000 PSI IN ACCORDANCE WITH ITEM 420 CLASS A CONC (MISC). QUANTITIES UNDER 4 CY MAY BE HAND MIXED ON SITE USING 5,000 PSI RATED BAG MIX CONCRETE.
5. 3 IN. x 5 IN. ROCK SHALL BE IN ACCORDANCE WITH ITEM 506. LARGE ROCK > 1 FT. SHALL BE IN ACCORDANCE WITH 12 IN. ROCK PER ITEM 432.
6. FILTER FABRIC AND EROSION LOGS WILL BE IN ACCORDANCE WITH ITEM 506.
7. IMPERMEABLE LINER WILL BE IN ACCORDANCE WITH ITEM 5056. THE EDGE OF THE LINER SHALL BE ANCHORED IN A 6 IN. WIDE BY 18 IN. DEEP TRENCH.
8. STEEL CASING, USED FOR DRILL SHAFT CONSTRUCTION, SHALL BE IN ACCORDANCE WITH ITEM 416.
9. AGGREGATE OR OTHER BACKFILL WILL BE PAID FOR BY OVERRUN OF EXISTING EMBANKMENT ITEM. FILTER FABRIC OVER THE AGGREGATE IS SUBSIDIARY. SANDBAGS SHALL BE PAID USING SANDBAGS FOR EROSION CONTROL. THE SANDBAGS SHALL BE POLYPROPYLENE AND FILLED WITH PEA GRAVEL. CONNECTOR PIPE SHALL BE PAID USING PIPE(PVC)(SCH 80)(6 IN).
10. IF A SINGLE VOID IMPACT CAUSES DELAYS BY MORE THAN 20 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE INITIAL 20 DAYS. IF THE ACCUMULATION OF VOID IMPACTS CAUSE DELAYS BY MORE 40 WORKING DAYS, DELAY WILL BE CONSIDERED FOR THE IMPACT BEYOND THE 40 DAYS . OVERHEAD, BARRICADES AND DELAYS WILL BE EVALUATED AND PAID IN ACCORDANCE WITH THE CONTRACT. IMPACTS WILL NOT BE CONSIDERED IMPACT AFTER A RESPONSE PROCEDURE IS PROVIDED. ALL DELAYS CAUSED BY A VOID AND THE DURATION FOR IMPLEMENTATION OF A RESPONSE ARE NON-COMPENSABLE FOR LABOR, EQUIPMENT, STANDBY, MOBILIZATIONS, AND COST ESCALATIONS.

VOID MITIGATION AND PROTECTION MEASURES

REFER TO VOID MITIGATION DETAILS FOR ADDITIONAL INFORMATION. VOID MITIGATION DETAILS ARE TO BE APPROVED BY GEOSCIENTIST AND THE TCEQ (IF APPLICABLE) PRIOR TO IMPLEMENTATION.

1. IN THE EVENT THAT UNKNOWN KARST VOIDS ARE ENCOUNTERED, WORK AT THAT LOCATION WILL BE HALTED IMMEDIATELY AND THE FEATURE WILL BE INSPECTED PROMPTLY BY TXDOT.
2. WHEN REQUIRED, TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE POTENTIAL OF THE FEATURES TO PROVIDE SUITABLE HABITAT FOR ENDANGERED KARST INVERTEBRATES. WORK AT THAT LOCATION WILL NOT RESUME UNTIL AUTHORIZATION TO DISTURB THE FEATURE HAS BEEN OBTAINED. REFER TO THE EPIC SHEET FOR ADDITIONAL INFORMATION FOR THREATENED OR ENDANGERED SPECIES.

   TXDOT WILL INSPECT ALL VOIDS TO DETERMINE THE APPROPRIATE VOID MITIGATION PLAN.
3. ADDITIONAL EXCAVATION OF THE VOID MAY BE REQUIRED BY TXDOT OR THE GEOSCIENTIST TO FULLY EVALUATE THE VOID AND/OR MITIGATION PLAN PREPERATION. TXDOT APPROVAL IS REQUIRED PRIOR THE EXCAVATION. THIS WORK IS SUBSIDIARY.

VOID DISCOVERY PROTOCOL

IF A VOID IS DISCOVERED, THE FOLLOWING PROTOCOL WILL BE FOLLOWED:

1. ALL VOIDS REQUIRE AN EMAIL NOTIFICATION TO TXDOT DESIGNATED REPRESENTATIVE WITHIN 2 HOURS OF DISCOVERY. THE EMAIL WILL REQUIRE LOCATION INFORMATION (STATION, LATITUDE & LONGITUDE), DATES OF DISCOVERY, VIDEO/PICTURE DOCUMENTATION, SIZE, ETC. CONTRACTOR SHALL SUPPLY A CAMERA AND DIGITAL PICTURE/VIDEO DOCUMENTATION OF ALL VOIDS AND PROVIDE A MEASUREMENT OF THE SIZE OF THE VOID. FOR VOIDS THAT CANNOT BE SAFELY EXPLORED, ANOTHER DEVICE SHALL BE PROVIDED TO DOCUMENT THE VOID. CONTACT THE DISTRICT CONSTRUCTION OFFICE FOR AN EXAMPLE EMAIL THAT SHALL BE FOLLOWED. THIS WORK IS SUBSIDIARY.
2. ALL ACTIVITY WITHIN A 50-FOOT RADIUS OF THE VOID SHALL STOP. BLOCK TRAFFIC FROM DRIVING NEAR THE VOID AND PREVENT CONSTRUCTION EQUIPMENT FROM OPERATING IN THE VICINITY OF THE VOID USING BARRELS, ORANGE CONSTRUCTION FENCE OR OTHER APPROVED HIGHLY VISIBLE BARRIER.
3. A DRY VOID THAT IS LESS THAN 1 CF IN VOLUME OR LESS THAN 6 IN. IN ALL DIRECTIONS WILL NOT REQUIRE ACTION BEYOND NOTIFICATION. TXDOT SHALL BE NOTIFIED IMMEDIATELY VIA EMAIL AND PHONE WHEN A VOID IS FOUND THAT REQUIRES ACTION. TXDOT WILL RESPOND WITHIN 6 BUSINESS DAYS FROM TIME OF EMAIL NOTIFICATION TO PROVIDE GUIDANCE TO THE CONTRACTOR.
4. COVER THE VOID TO PREVENT CONTAMINATION AND CHANGES IN AMBIENT CONDITIONS (TARPS AND PLYWOOD, OR SIMILAR MATERIALS ARE APPROPRIATE AS AVAILABLE). WHERE COVERING THE VOID IS NOT FEASIBLE, CONTRACTOR SHALL OBTAIN APPROVAL FROM TXDOT OF ALTERNATE TEMPORARY PROTECTION MEASURES. BIODEGRADABLE EROSION CONTROL LOG (BECL) SHOULD WRAP THE SURFACE PERIMETER OF THE VOID. TEMPORARY PROTECTIONS SHOULD REMAIN IN PLACE UNTIL FINAL MITIGATION AND PROTECTION MEASURES ARE APPROVED AND IN PLACE. AN EARTHEN BERM WILL BE MAINTAINED ON THE UP-GRADIENT SIDE OF VOID TO PREVENT ANY CONSTRUCTION RUNOFF FROM ENTERING ANY PART OF THE FEATURE WHICH MAY REMAIN. THIS WORK IS SUBSIDIARY.
5. WHEN REQUIRED TXDOT SHALL IMMEDIATELY NOTIFY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AUSTIN REGIONAL OFFICE.
6. TXDOT WILL PROVIDE FOR THE EVALUATION OF THE VOID A QUALIFIED GEOSCIENTIST LICENSED BY THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS OR BY A PROFESSIONAL ENGINEER WHO QUALIFIES TO PRACTICE GEOSCIENCE ACCORDING TO THE TEXAS BOARD OF PROFESSIONAL GEOSCIENTISTS.
7. WHEN REQUIRED TXDOT WILL SUBMIT AND OBTAIN APPROVAL OF AN ENCOUNTERED FEATURE MITIGATION PLAN TO THE TCEQ AUSTIN REGION OFFICE.
8. WORK SHOULD CEASE IN THE AREA UNTIL ASSESSMENT OF THE VOID CAN BE COMPLETED. TCEQ APPROVES THE ENCOUNTERED FEATURE MITIGATION PLAN AND MITIGATION IS COMPLETED. WHEN THE VOID IS OUTSIDE TCEQ JURISDICTION, TXDOT WILL APPROVE THE ENCOUNTERED FEATURE MITIGATION PLAN.

VOIDS RELATED TO DRILLED SHAFTS, SOIL NAILS, ROCK NAILS AND OTHER SIMILAR FUNCTIONS

1. SUBMIT INSTALLATION PLAN FOR REVIEW NO LATER THAN 2 MONTHS BEFORE CONSTRUCTION.
2. THE USE OF DRILLING FLUIDS, UNDERWATER PLACEMENT, OR SLURRY METHOD WILL NOT BE ALLOWED IF A VOID IS EXPOSED DURING DRILLING OF SHAFTS OR NAILS. THE CONTRACTOR SHALL USE APPROPRIATE INDUSTRY APPROVED METHODS TO PROVIDE A PRODUCT IN COMPLIANCE WITH THE SPECIFICATIONS. ADDITIONAL TIME OR COMPENSATION WILL NOT BE ALLOWED FOR USE OF ALTERNATE METHODS OR CASING INSTALLATION.
3. DURING NON-WORK HOURS OPEN HOLES SHALL BE PROTECTED FOR SAFETY AND COVERED. SHAFTS SHALL BE SURROUNDED BY EROSION CONTROL LOGS AT AN OFFSET OF 10' FROM THE EDGE OF THE OPENING. THIS WORK IS SUBSIDIARY
4. VIDEO DOCUMENTATION SHALL BE CONDUCTED OF A DRILL SHAFT ONCE EXCAVATION IS COMPLETE AND PRIOR TO PLACING REINFORCEMENT. SUFFICIENT LIGHTING SHALL ACCOMPANY THE VIDEO CAMERA TO ENSURE THE SHAFT AND VOIDS ARE VISIBLE. THIS WORK IS SUBSIDIARY.
5. CONCRETE USED TO FILL THE VOIDS WILL BE PAID USING CLASS A CONC (MISC) ITEM BUT WILL USE THE CLASS OF CONCRETE AS REQUIRED BY THE SPECIFICATION. QUANTITY OF CONCRETE WILL BE BASED ON VISUAL INSPECTION PROVIDED BY THE CONTRACTOR. IF VISUAL INSPECTION IS UNABLE TO DETERMINE THE SIZE OF THE VOID THE CONCRETE FOR PAYMENT WILL BE MEASURED AS THE ADDITIONAL CONCRETE BEYOND THE AMOUNT REQUIRED TO PLACE A CLEAN SHAFT PLUS 10 PERCENT WASTE.
6. THE USE OF PERMANENT CASING SHALL BE IN ACCORDANCE WITH ITEM 416. MATERIAL COST FOR CASING THAT REMAINS WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. ADDITIONAL LABOR, EQUIPMENT, TIME, ETC. FOR INSTALLATION OF THE CASING WILL NOT BE COMPENSABLE.
7. ADDITIONAL NAIL LENGTH WILL BE PAID BY OVERRUN OF EXISTING BID ITEM. ALTERNATE NAIL TYPE COST WILL BE PAID BY INVOICE FROM SUPPLIER WITH MARK UP IN ACCORDANCE WITH MATERIAL FOR ITEM 9.7. LABOR, EQUIPMENT, ADDITIONAL TIME, ETC. WILL NOT BE COMPENSABLE.
8. CORE HOLES ARE REQUIRED FOR ALL DRILLED SHAFTS.

Texas Department of Transportation

HAYS COUNTY

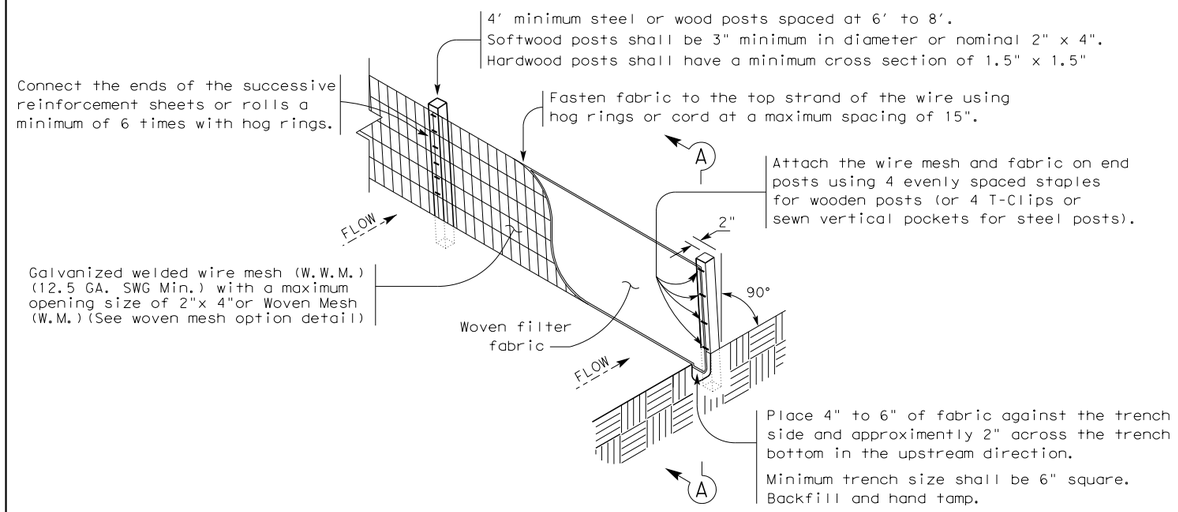
WSB & ASSOCIATES,INC.
FIRM • 16849

RM 967

VOID MITIGATION NOTES
VMD-18(AUS)

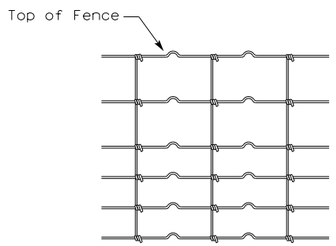
DATE: 5/17/2021				SHEET 1 OF 7
STATE		STATE DIST.NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	233

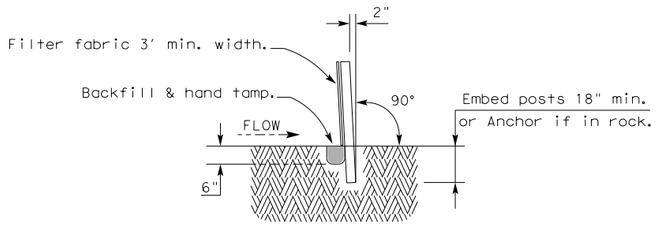
Filename: ...\Cad\Plan\VMD-18(AUS)A.dgn
Date: 5/17/2021



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

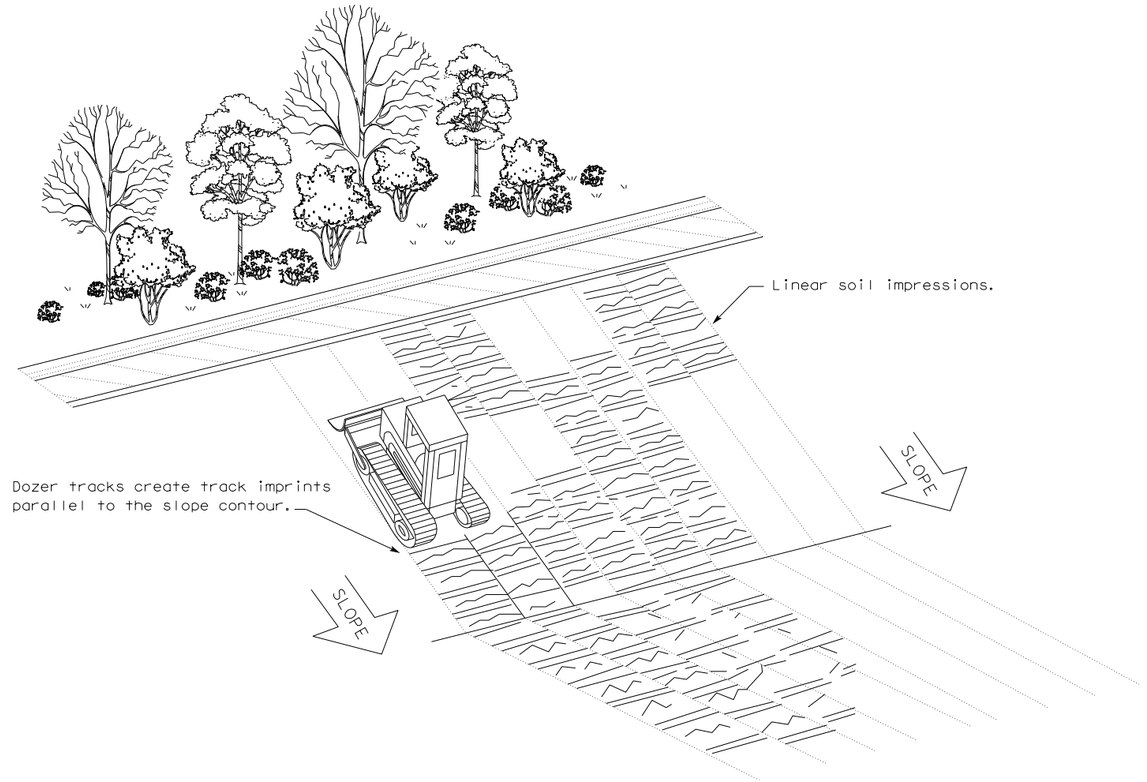
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		234

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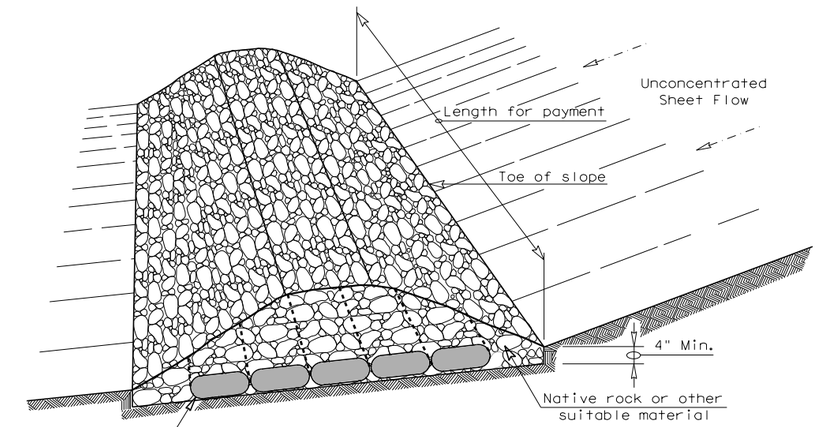
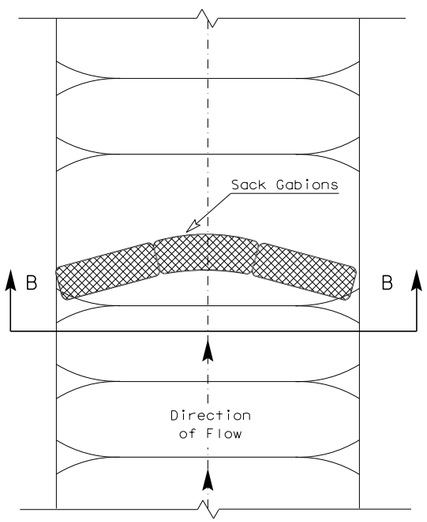
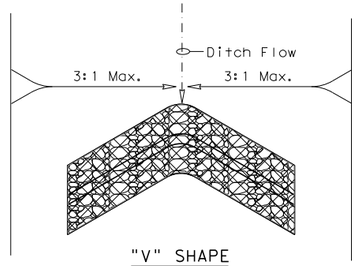


FILTER DAM AT TOE OF SLOPE

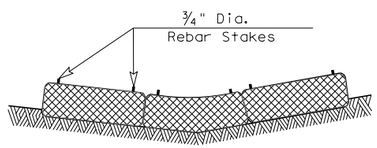
RFD1



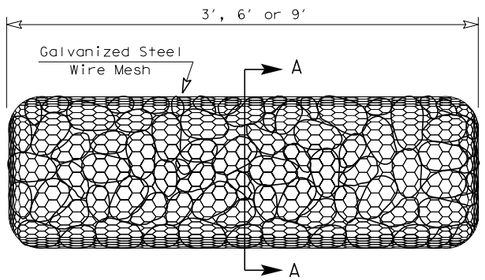
PLAN VIEW



"V" SHAPE
PLAN VIEW

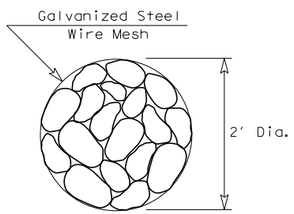


SECTION B-B

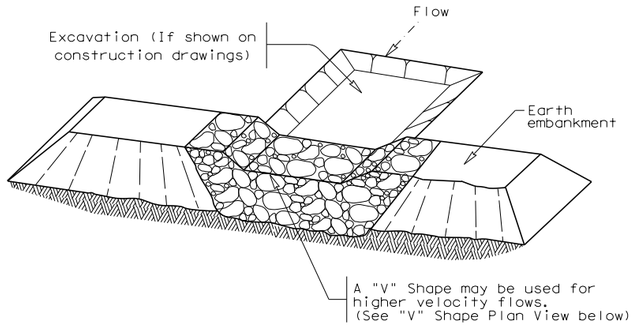


TYPE 4 (SACK GABIONS)

RFD4

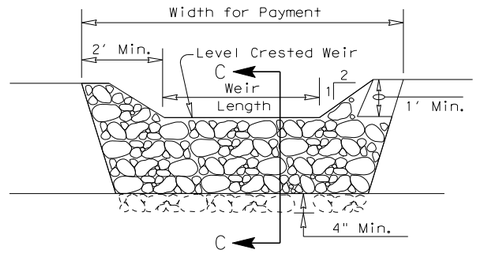


SECTION A-A

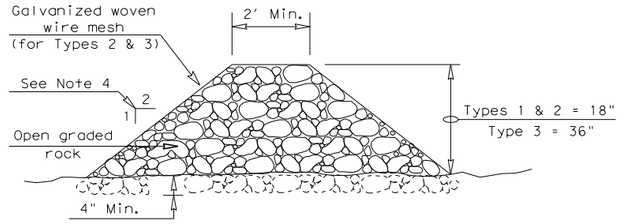


FILTER DAM AT SEDIMENT TRAP

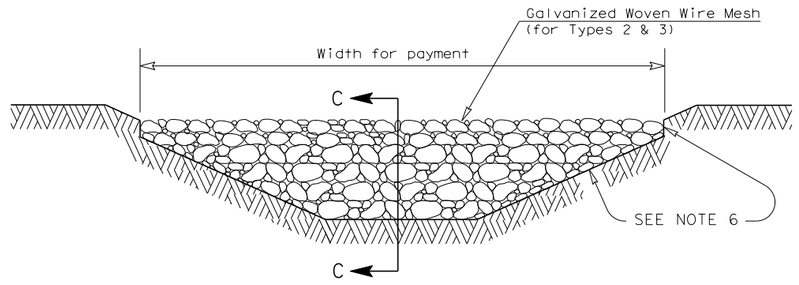
RFD1 OR RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam	RFD1
Type 2 Rock Filter Dam	RFD2
Type 3 Rock Filter Dam	RFD3
Type 4 Rock Filter Dam	RFD4

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		235

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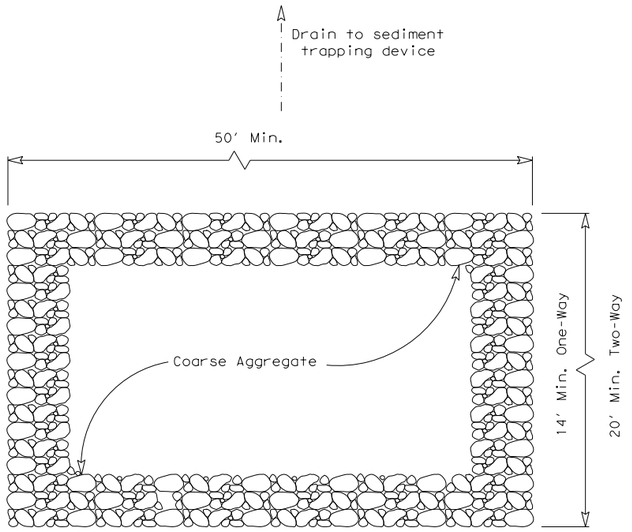
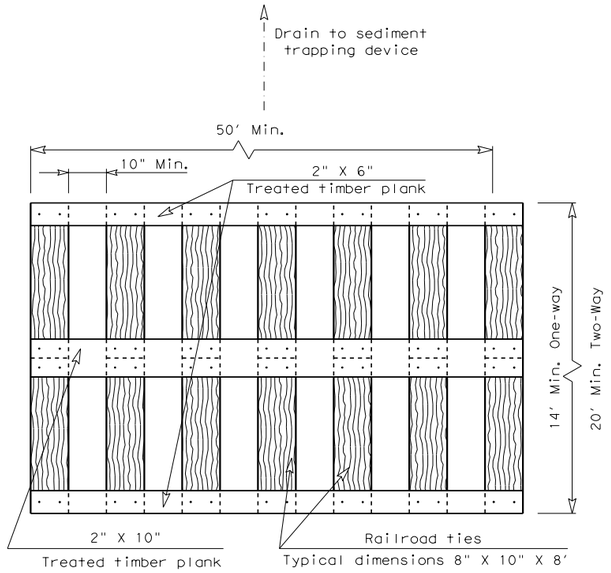
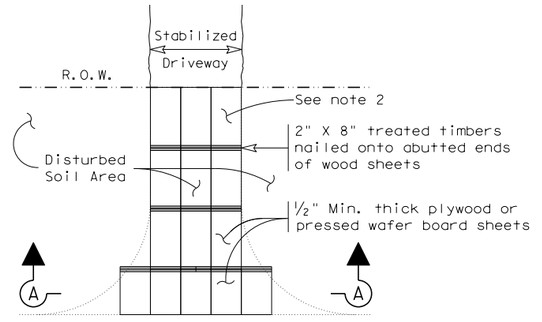


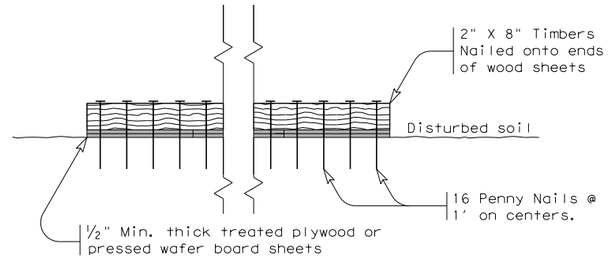
PLAN VIEW



PLAN VIEW



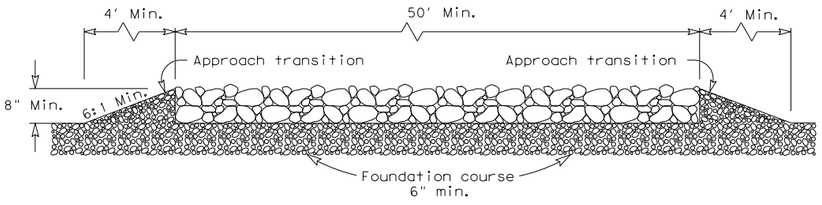
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

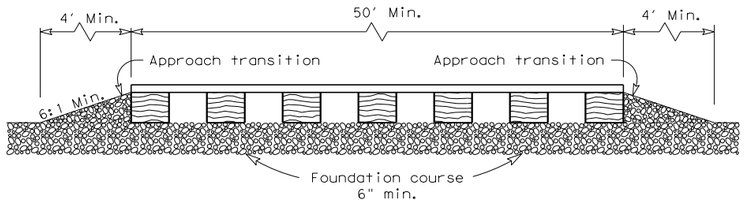
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER 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 materialas 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.

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 ½"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.

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

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036,ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		236

DATE: 5/17/2021 3:44:00 PM
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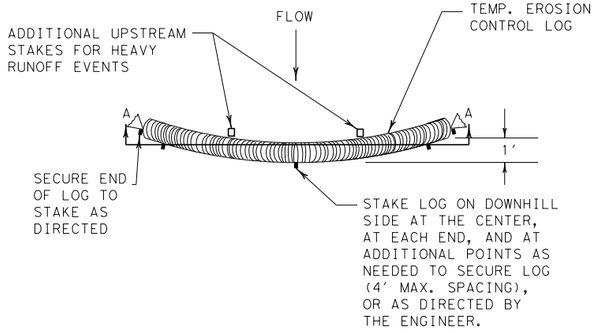
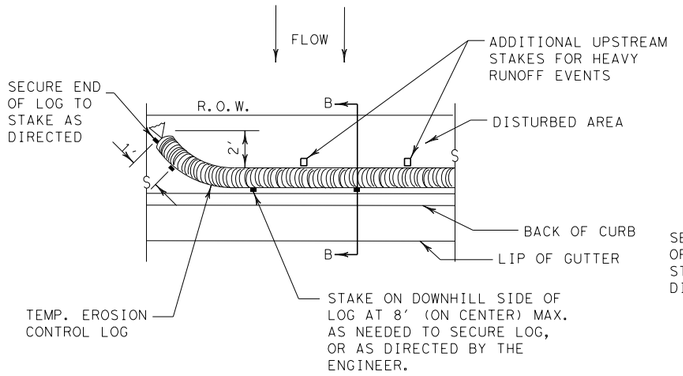
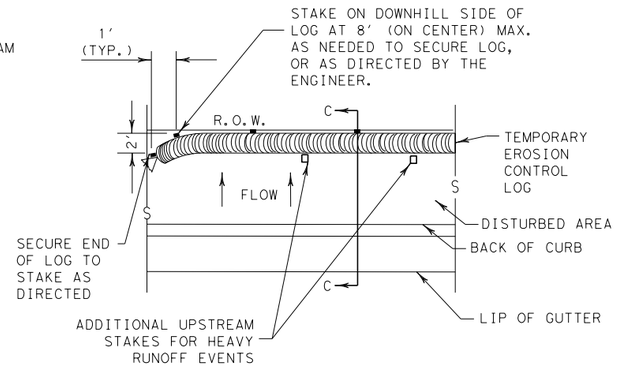


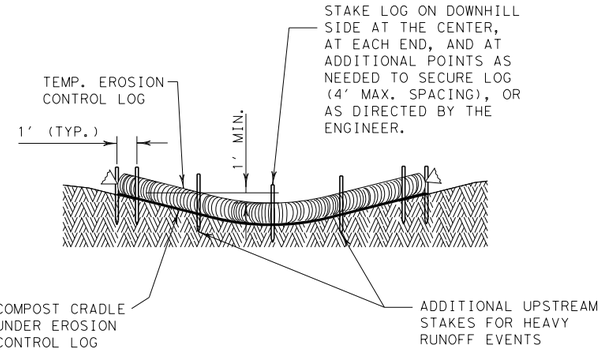
PLAN VIEW



PLAN VIEW



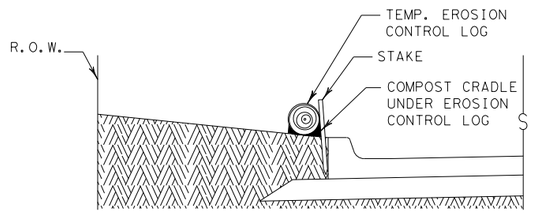
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

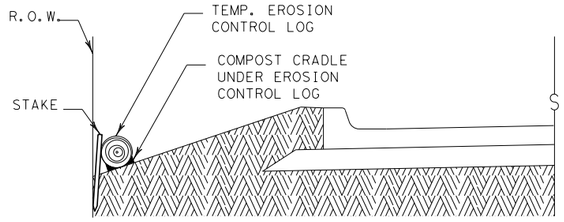
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

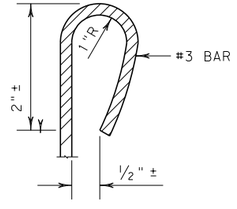
CL-BOC



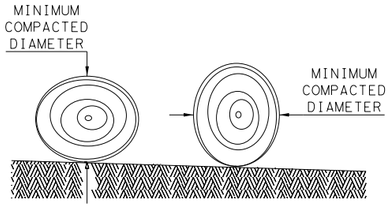
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

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

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

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.

SHEET 1 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916		DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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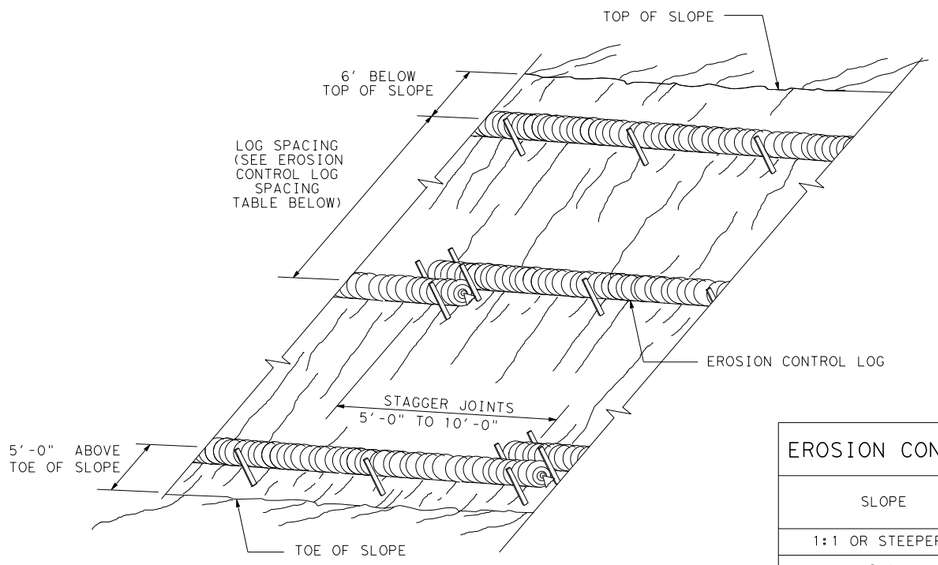
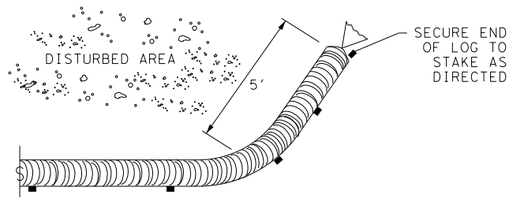


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

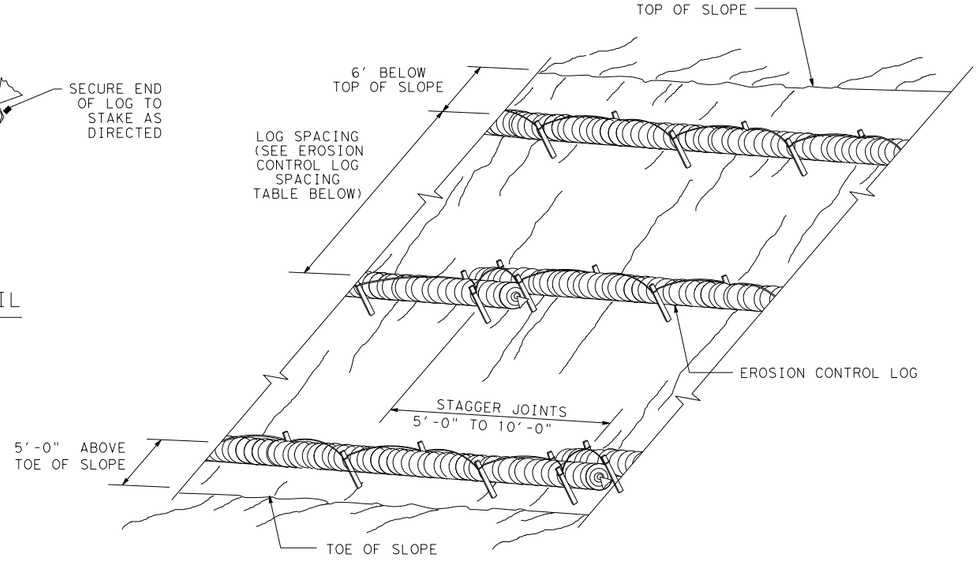
CL-SST



END SECTION RAP DETAIL

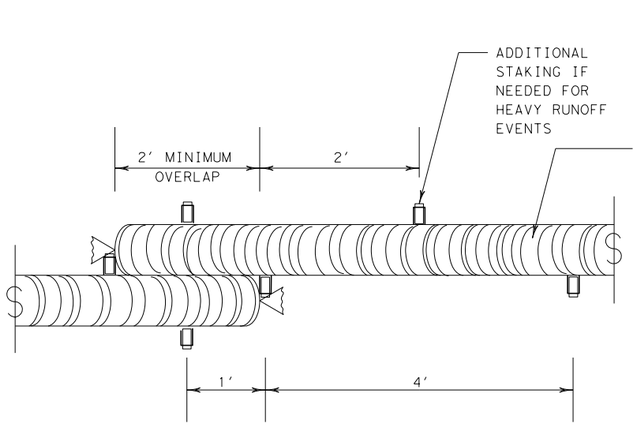
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

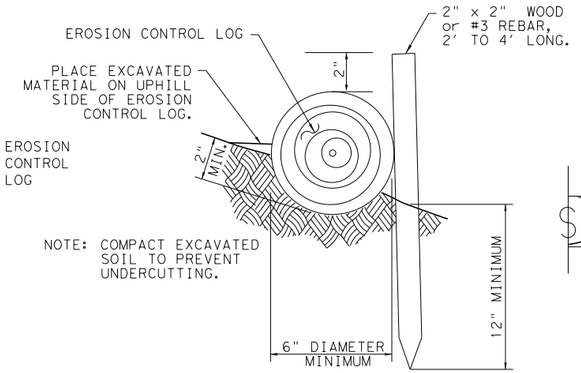
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

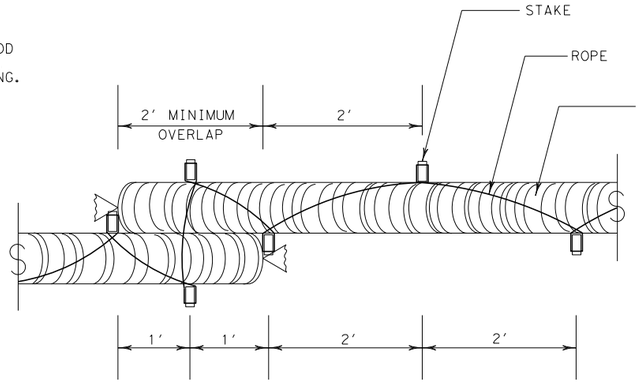




STAKE AND TRENCHING ANCHORING DETAIL

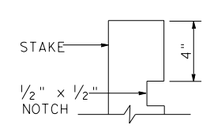
CL-SST

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

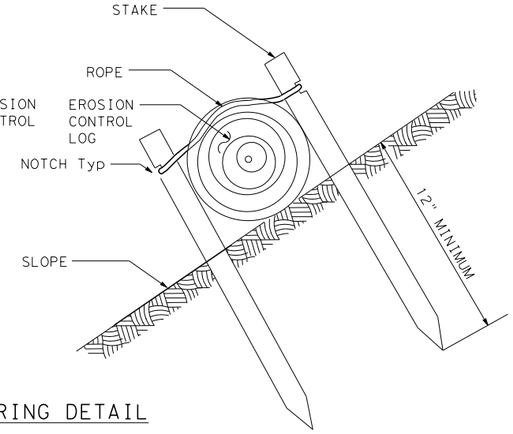


STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL



SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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	DIST	COUNTY			SHEET NO.	
	AUS	HAYS			238	

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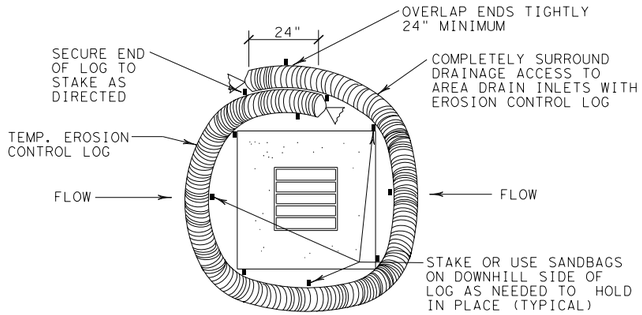
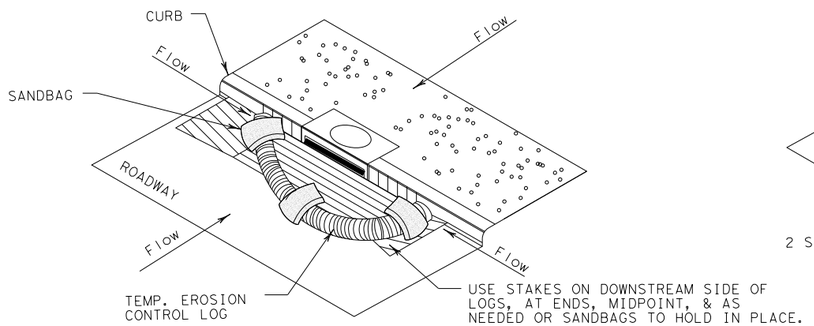


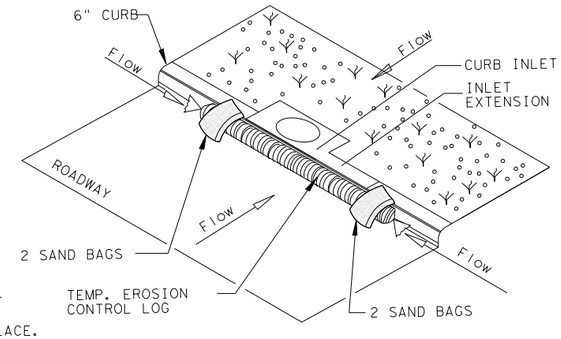
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

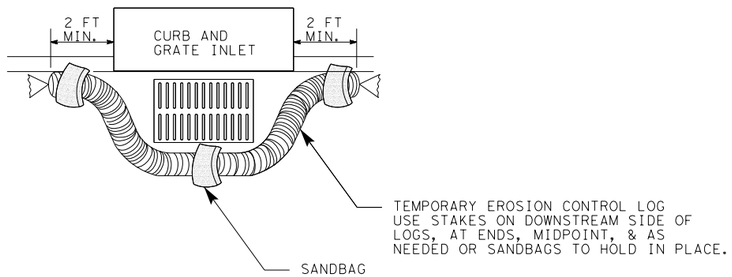
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

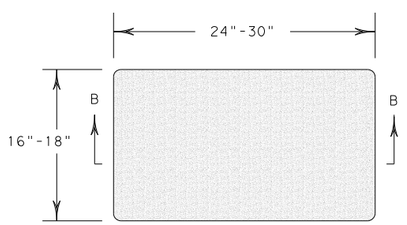
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

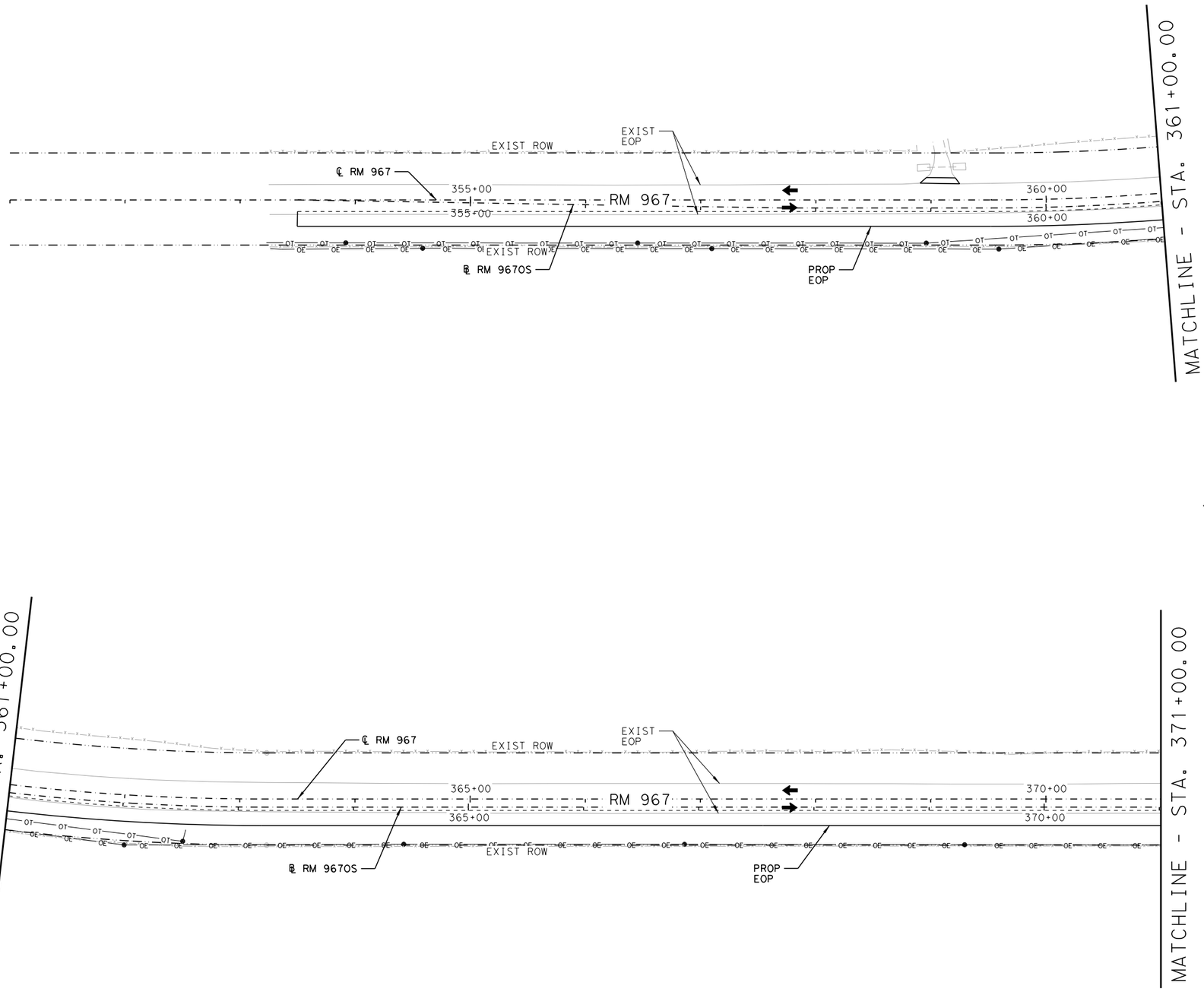
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	1776	01	036, ETC	RM967
	DIST	COUNTY		SHEET NO.
	AUS	HAYS		239

DATE: 5/17/2021
FILE: K:\015012-000\Cad\Plan\STND\ec916.dgn



0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
- UT — UNDERGROUND TELEPHONE
- FIRE HYDRANT
- WATER METER
- IRRIGATION CONTROL VALVE
- WATER VALVE
- SIGNAL PULL BOX
- SANITARY MANHOLE
- ELECTRIC TRANSFORMER
- ELECTRIC JUNCTION BOX
- TELEPHONE MANHOLE

STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

5/17/2021

Texas Department of Transportation

HAYS COUNTY

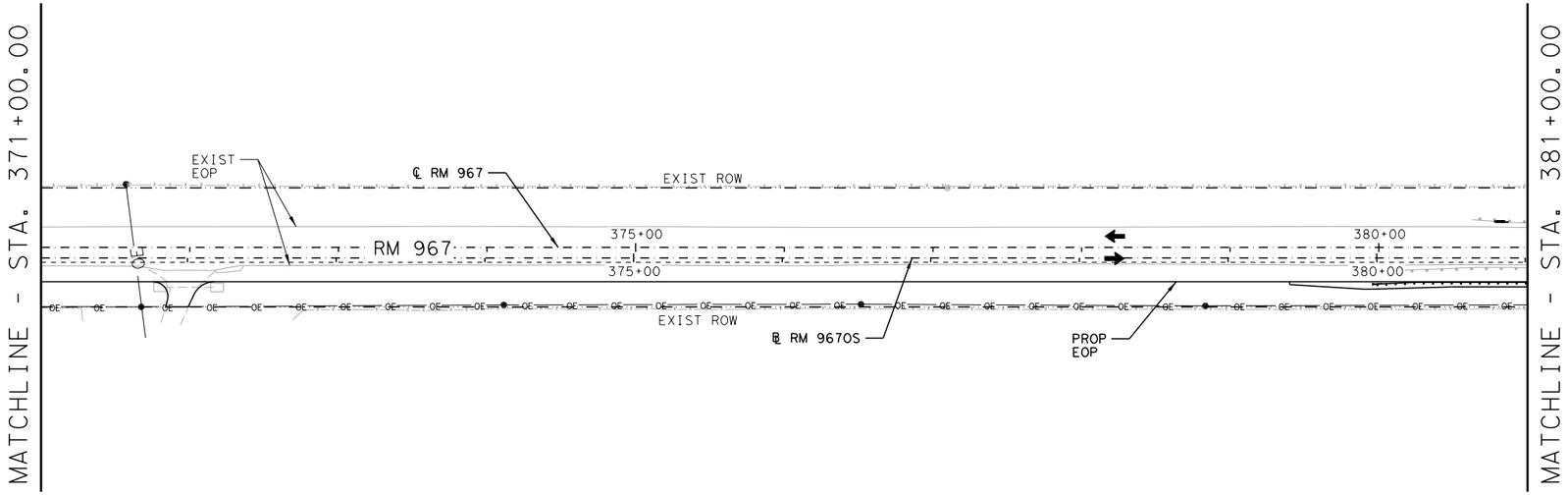
WSB & ASSOCIATES, INC.
FIRM # 16849

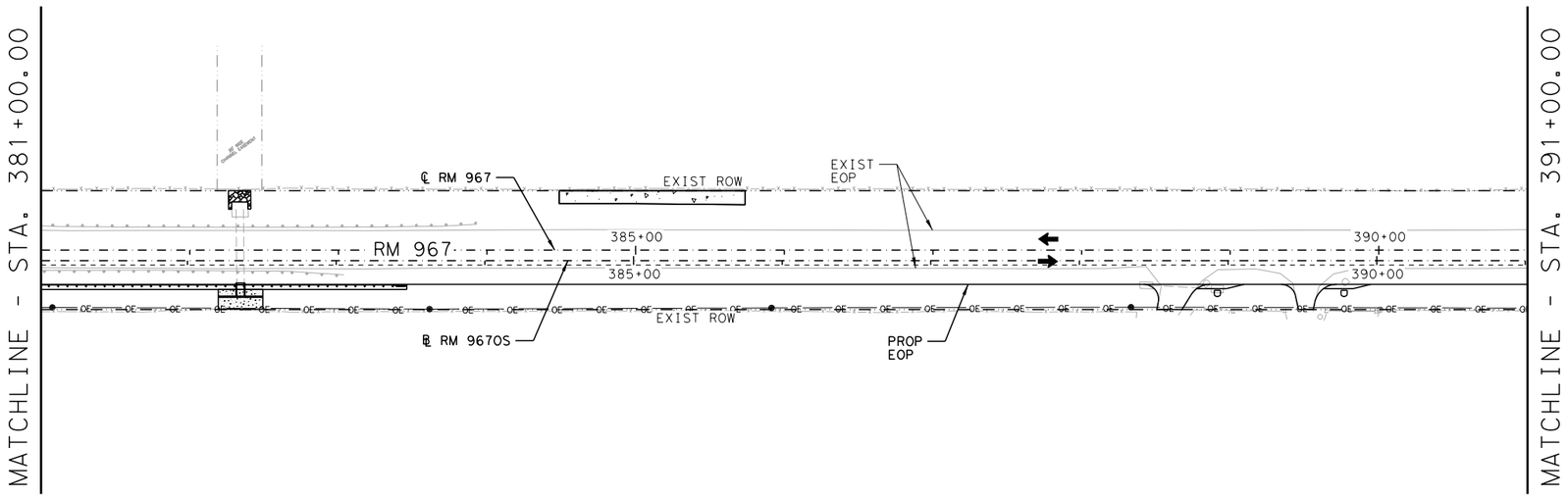
RM 967

EXISTING UTILITIES
BEGIN PROJECT TO
STA 371+00.00

DATE: 5/17/2021				SHEET 1 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	240

Filename: ...\Cad\Plan\015012-000*UTL01.dgn
Date: 5/17/2021





0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
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- WATER VALVE
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- ELECTRIC TRANSFORMER
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- TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

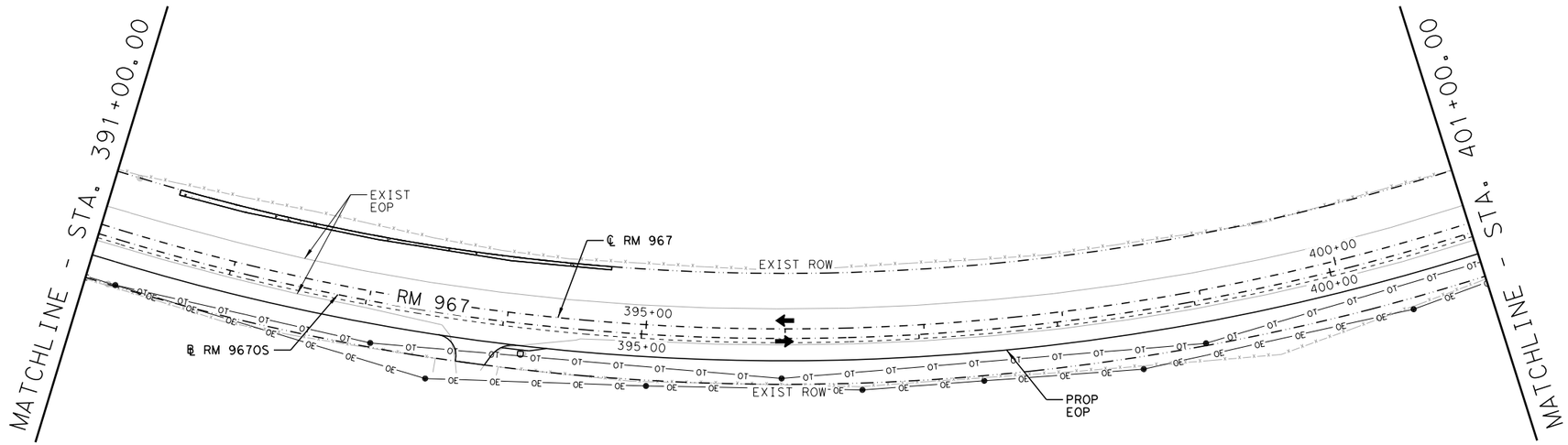
WSB & ASSOCIATES, INC.
FIRM # 16849

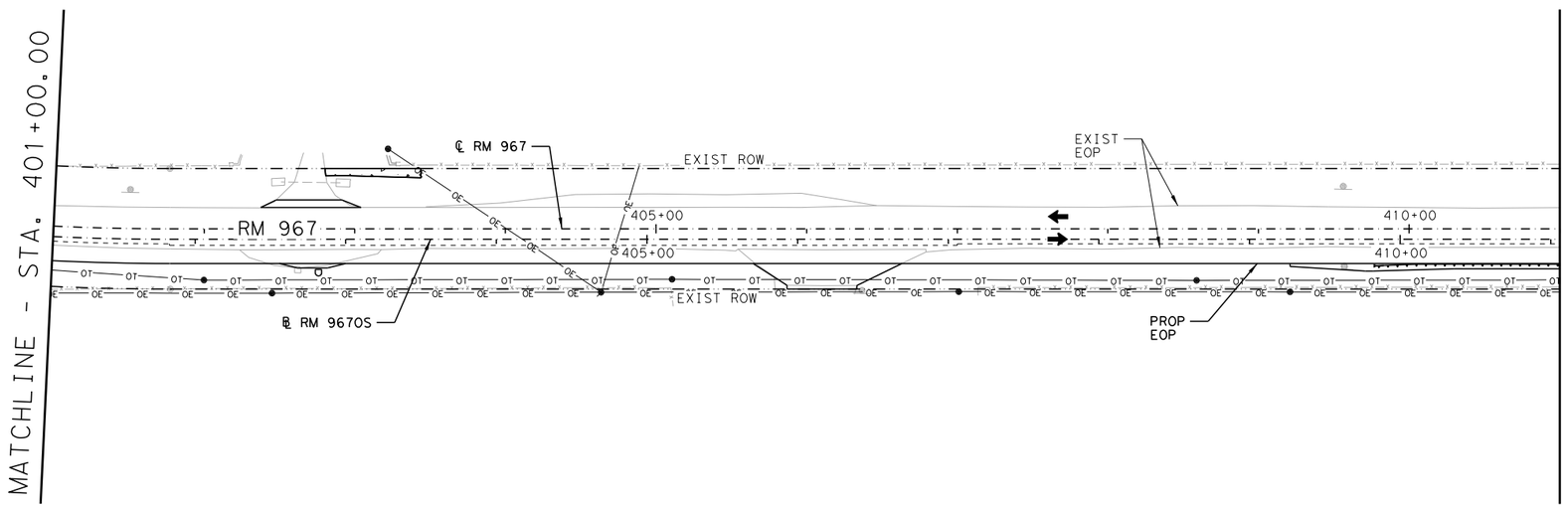
RM 967

EXISTING UTILITIES
STA 371+00.00 TO
STA 391+00.00

DATE: 5/17/2021				SHEET 2 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	241

Filename: ...\Cad\Plan\015012-000*UTL02.dgn
Date: 5/17/2021





LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
- UT — UNDERGROUND TELEPHONE
- FIRE HYDRANT
- WATER METER
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- WATER VALVE
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5/17/2021

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HAYS COUNTY

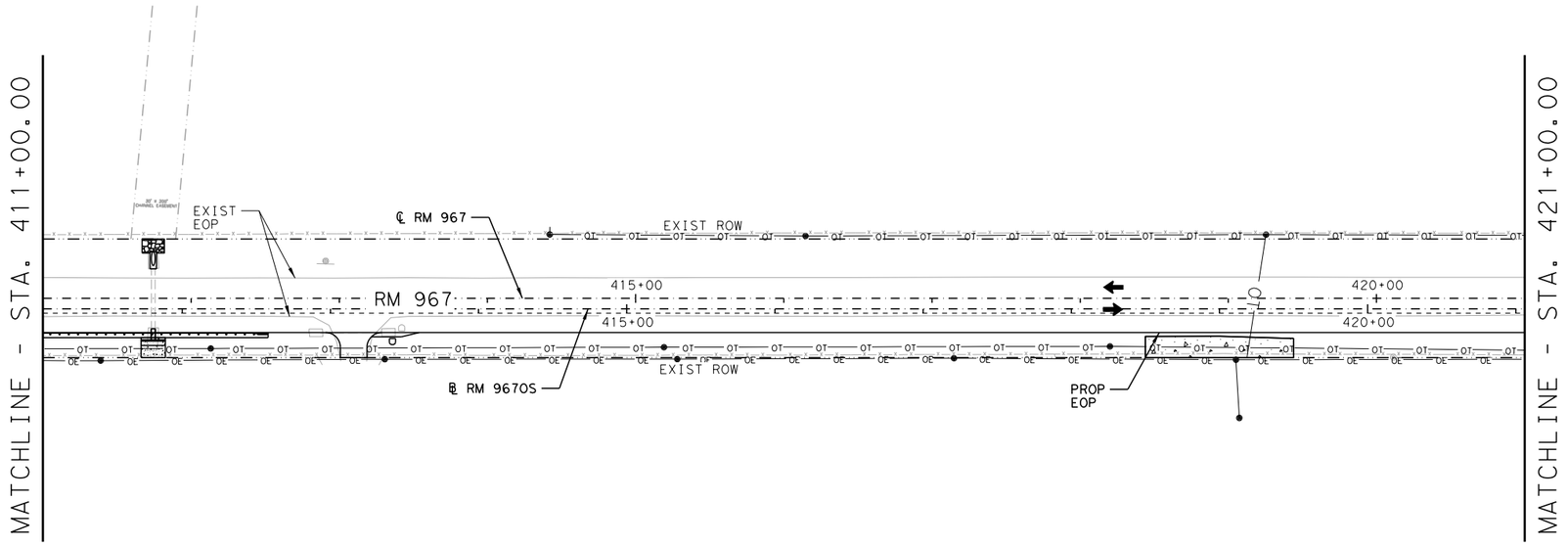
WSB & ASSOCIATES, INC.
FIRM # 16849

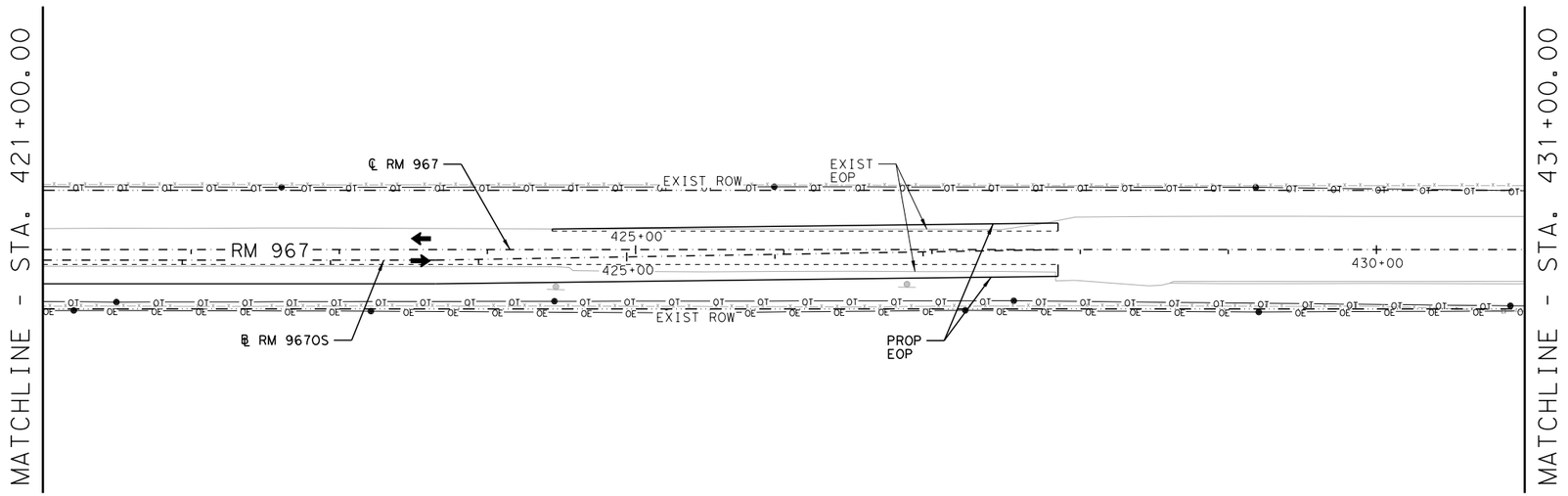
RM 967

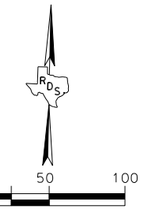
EXISTING UTILITIES
STA 391+00.00 TO
STA 411+00.00

DATE: 5/17/2021				SHEET 3 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	242

Filename: ...\Cad\Plan\015012-000*UTL03.dgn
Date: 5/17/2021







LEGEND

W1-8	WATER LINE-SIZE
OE	OVERHEAD ELECTRICAL
OT	OVERHEAD TELEPHONE
GAS	BURIED GAS LINE
WW	SANITARY SEWER
UT	UNDERGROUND TELEPHONE
	FIRE HYDRANT
	WATER METER
	IRRIGATION CONTROL VALVE
	WATER VALVE
	SIGNAL PULL BOX
	SANITARY MANHOLE
	ELECTRIC TRANSFORMER
	ELECTRIC JUNCTION BOX
	TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

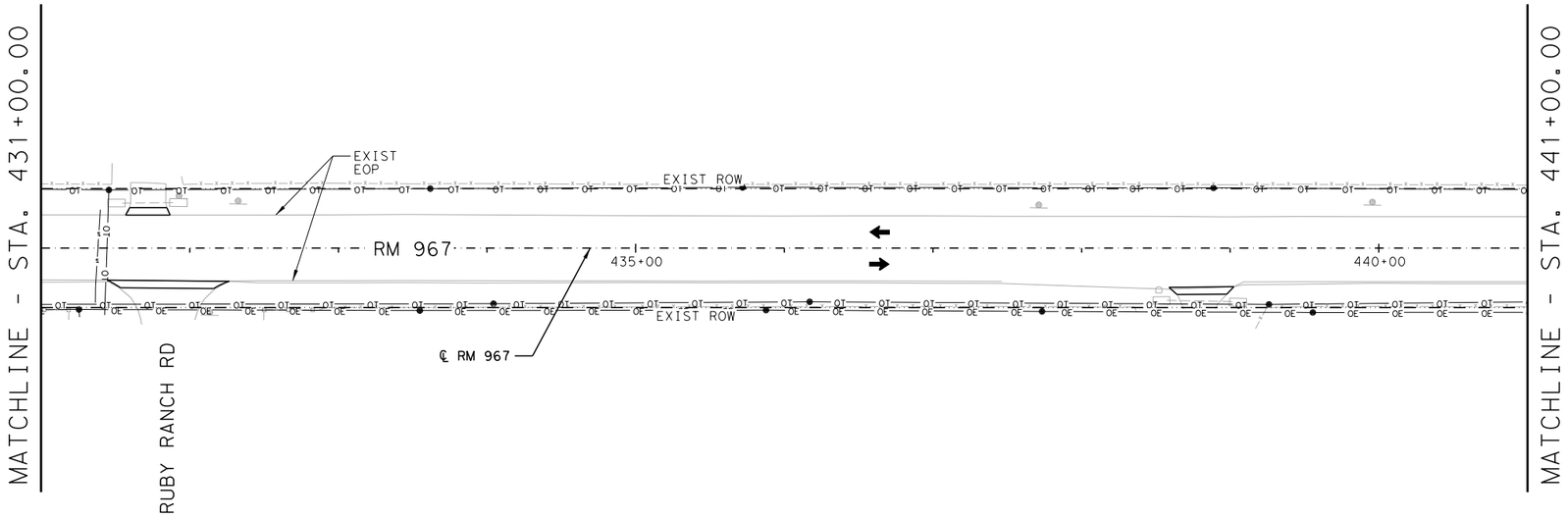
WSB & ASSOCIATES, INC.
FIRM # 16849

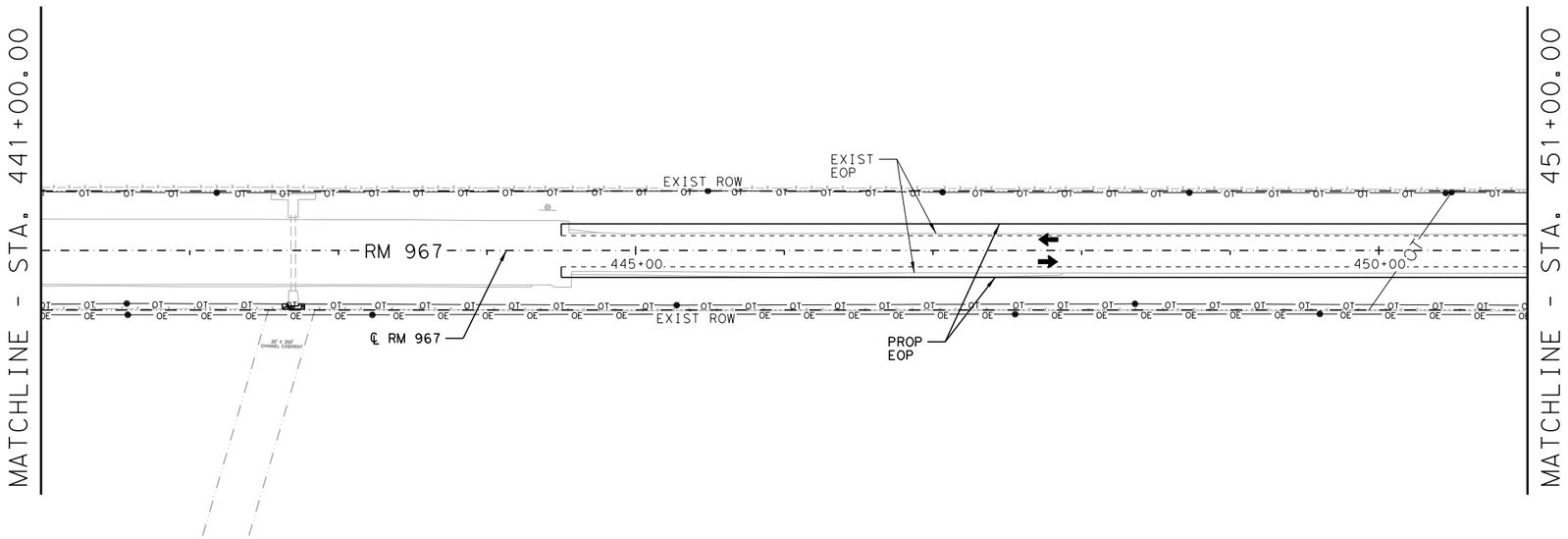
RM 967

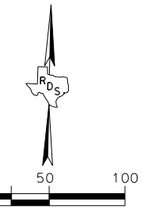
EXISTING UTILITIES
STA 411+00.00 TO
STA 431+00.00

DATE: 5/17/2021				SHEET 4 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	243

Filename: ...\Cad\Plan\015012-000*UTL04.dgn
Date: 5/17/2021







LEGEND

W1-8	WATER LINE-SIZE
OE	OVERHEAD ELECTRICAL
OT	OVERHEAD TELEPHONE
GAS	BURIED GAS LINE
WW	SANITARY SEWER
UT	UNDERGROUND TELEPHONE
	FIRE HYDRANT
	WATER METER
	IRRIGATION CONTROL VALVE
	WATER VALVE
	SIGNAL PULL BOX
	SANITARY MANHOLE
	ELECTRIC TRANSFORMER
	ELECTRIC JUNCTION BOX
	TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 431+00.00 TO
STA 451+00.00

DATE: 5/17/2021 SHEET 5 OF 12

STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	244

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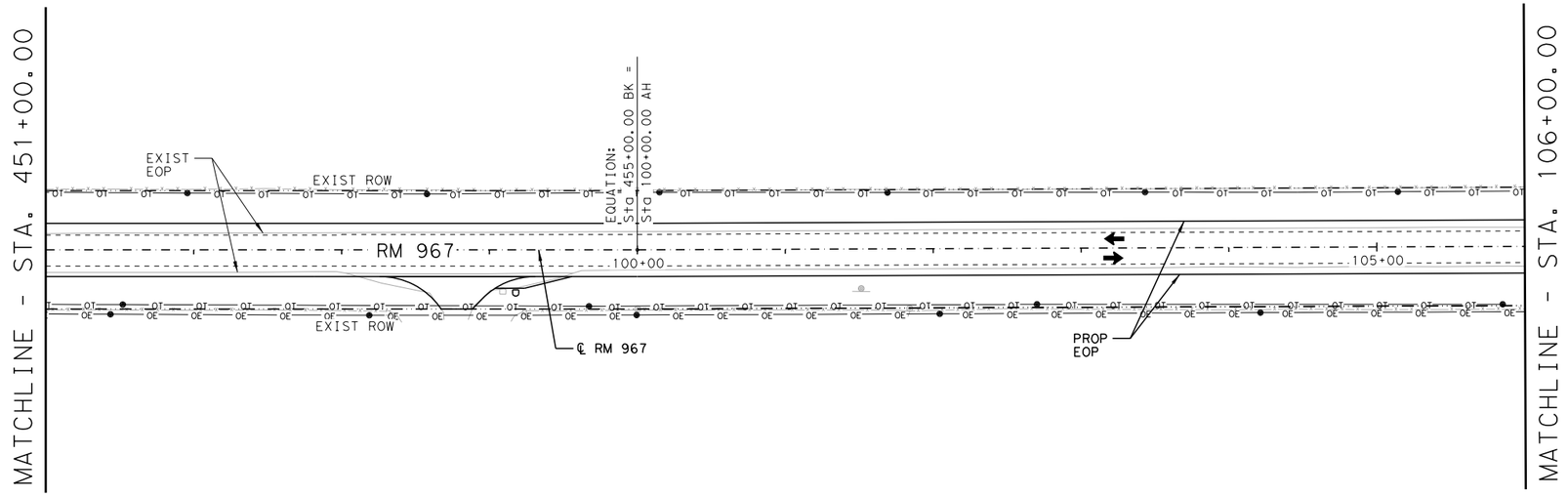
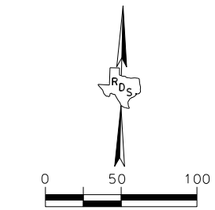
Date: 5/17/2021





LEGEND

W1-8	WATER LINE-SIZE
OE	OVERHEAD ELECTRICAL
OT	OVERHEAD TELEPHONE
GAS	BURIED GAS LINE
WW	SANITARY SEWER
UT	UNDERGROUND TELEPHONE
	FIRE HYDRANT
	WATER METER
	IRRIGATION CONTROL VALVE
	WATER VALVE
	SIGNAL PULL BOX
	SANITARY MANHOLE
	ELECTRIC TRANSFORMER
	ELECTRIC JUNCTION BOX
	TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 451+00.00 TO
STA 106+00.00

DATE: 5/17/2021 SHEET 6 OF 12

STATE	STATE DIST. NO.	COUNTY
TEXAS	AUS	HAYS

CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	245

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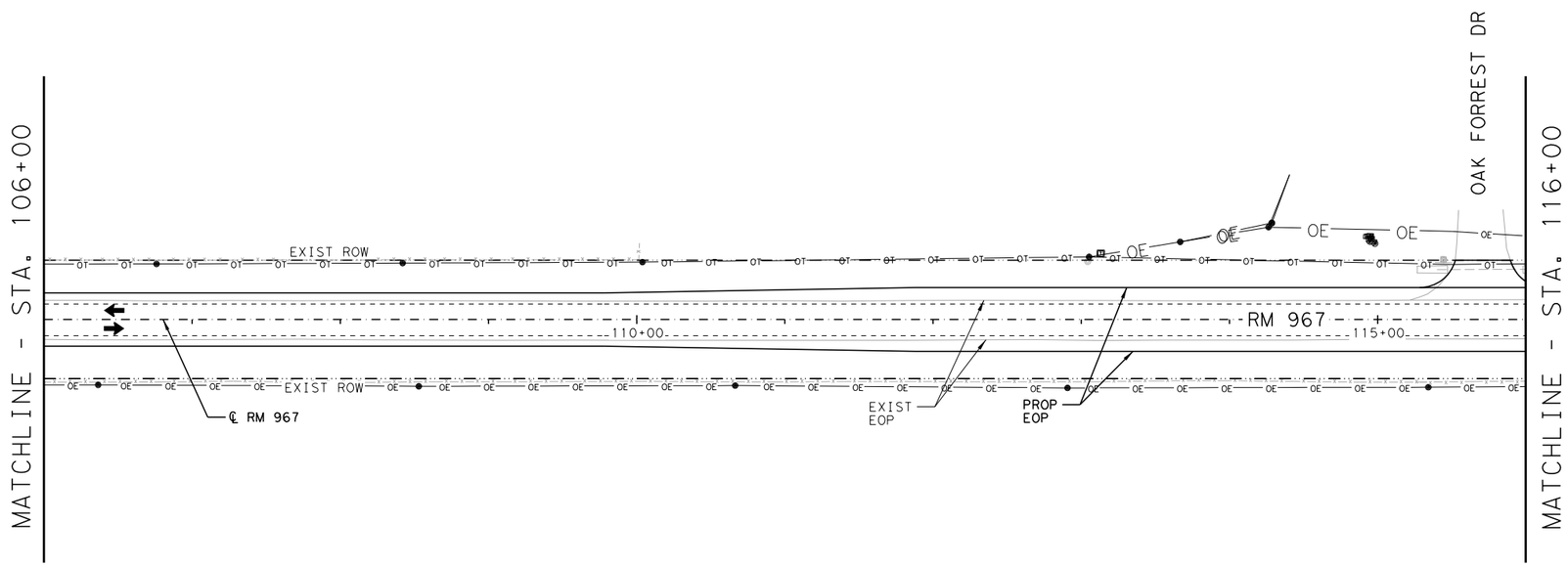
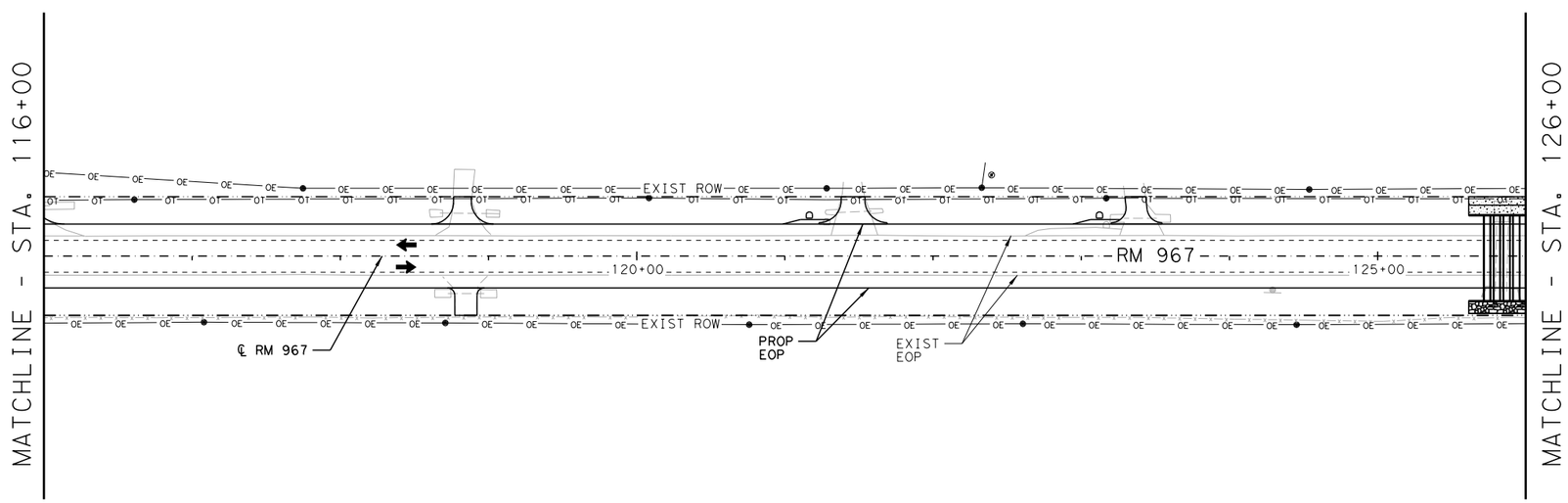
Date: 5/17/2021





0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
- UT — UNDERGROUND TELEPHONE
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STATE OF TEXAS
DANIEL A. ROGERS
88794
LICENSED
PROFESSIONAL ENGINEER

Daniel A. Rogers

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 106+00.00
TO STA 126+00.00

DATE: 5/17/2021				SHEET 7 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	246

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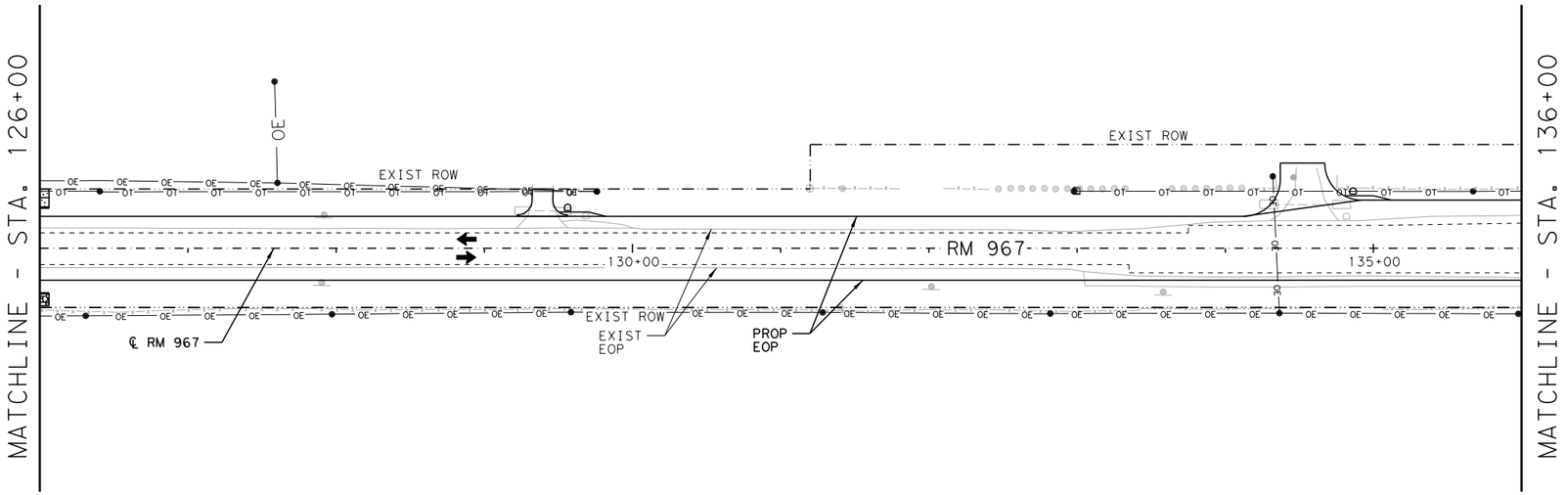
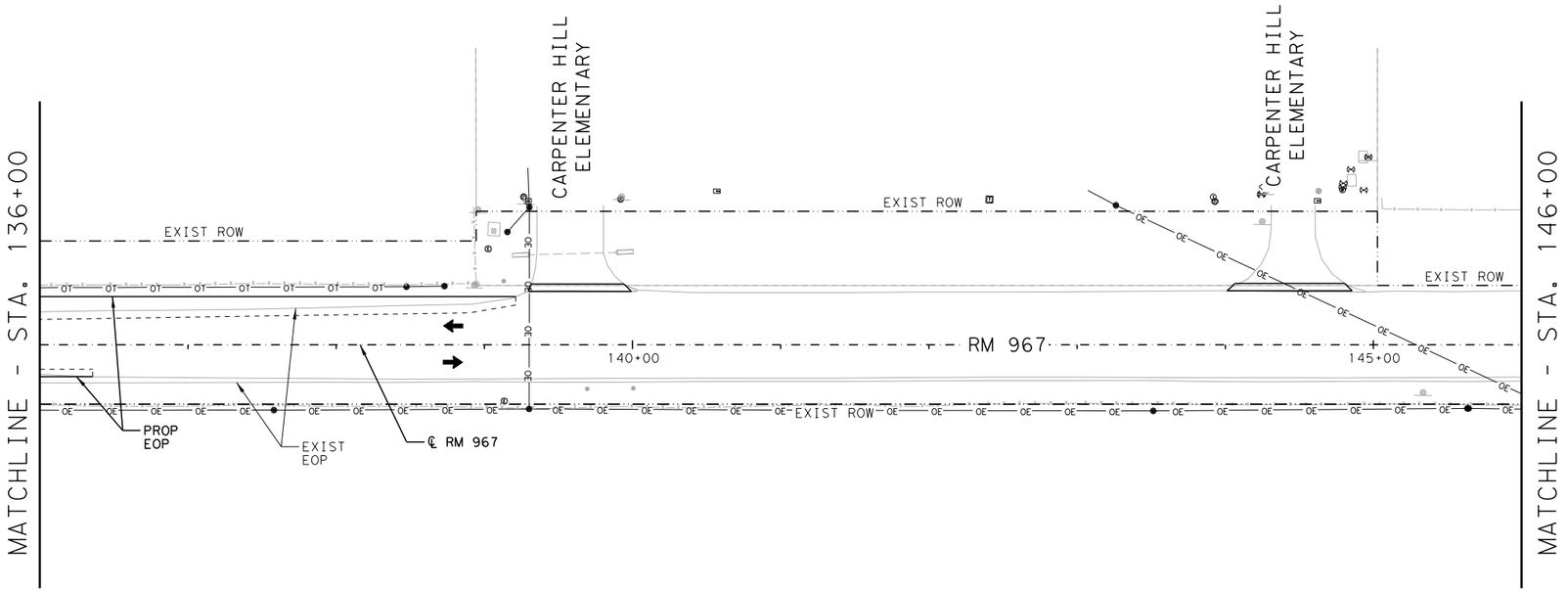
Date: 5/17/2021





0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
- UT — UNDERGROUND TELEPHONE
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- WATER METER
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- WATER VALVE
- SIGNAL PULL BOX
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- ELECTRIC TRANSFORMER
- ELECTRIC JUNCTION BOX
- TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 126+00.00 TO
STA 146+00.00

DATE: 5/17/2021			SHEET 8 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	247

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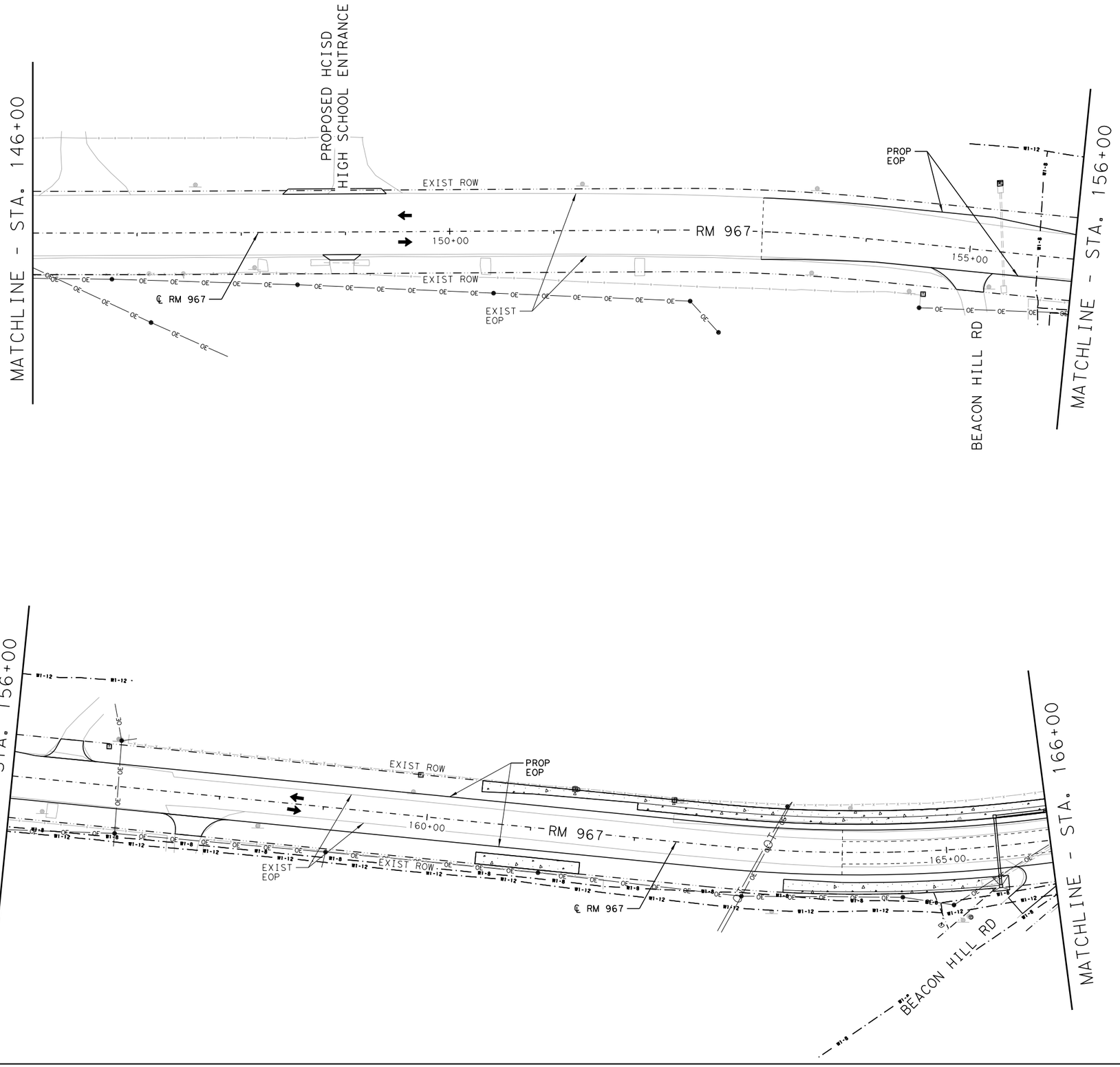
Date: 5/17/2021



0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
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5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 146+00.00 TO
STA 166+00.00

DATE: 5/17/2021				SHEET 9 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	248

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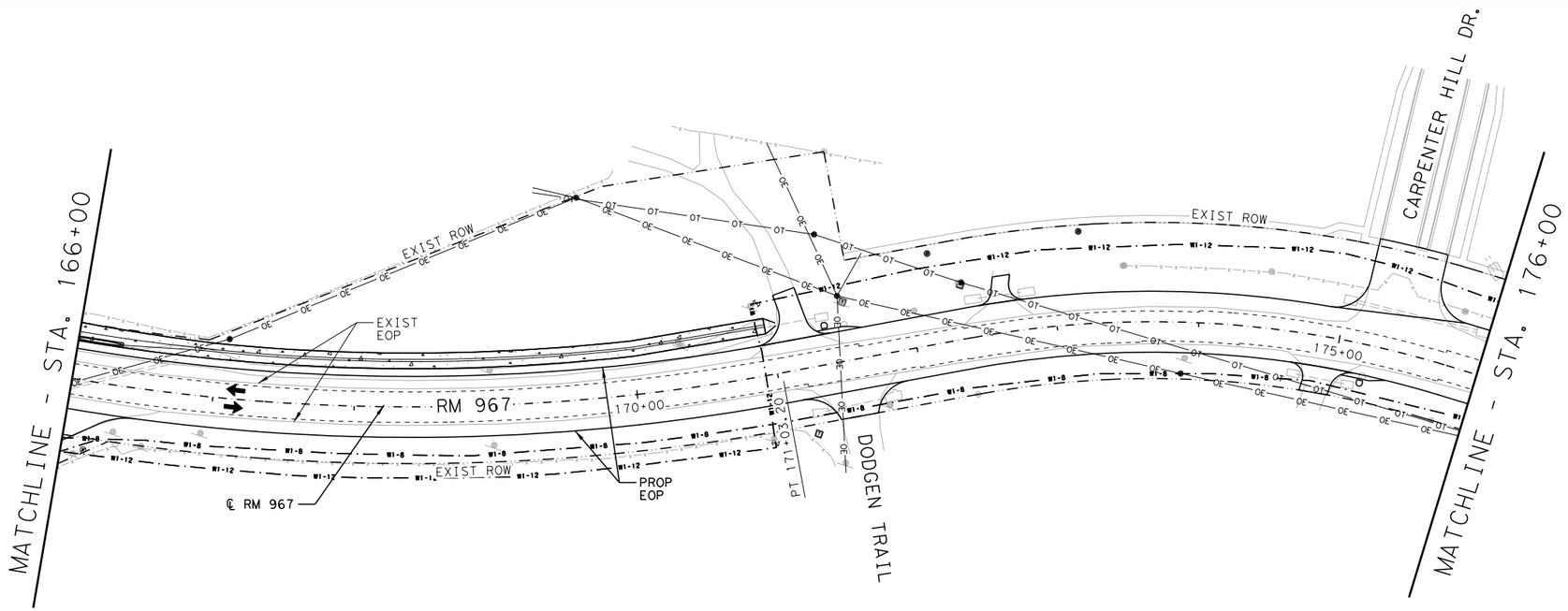
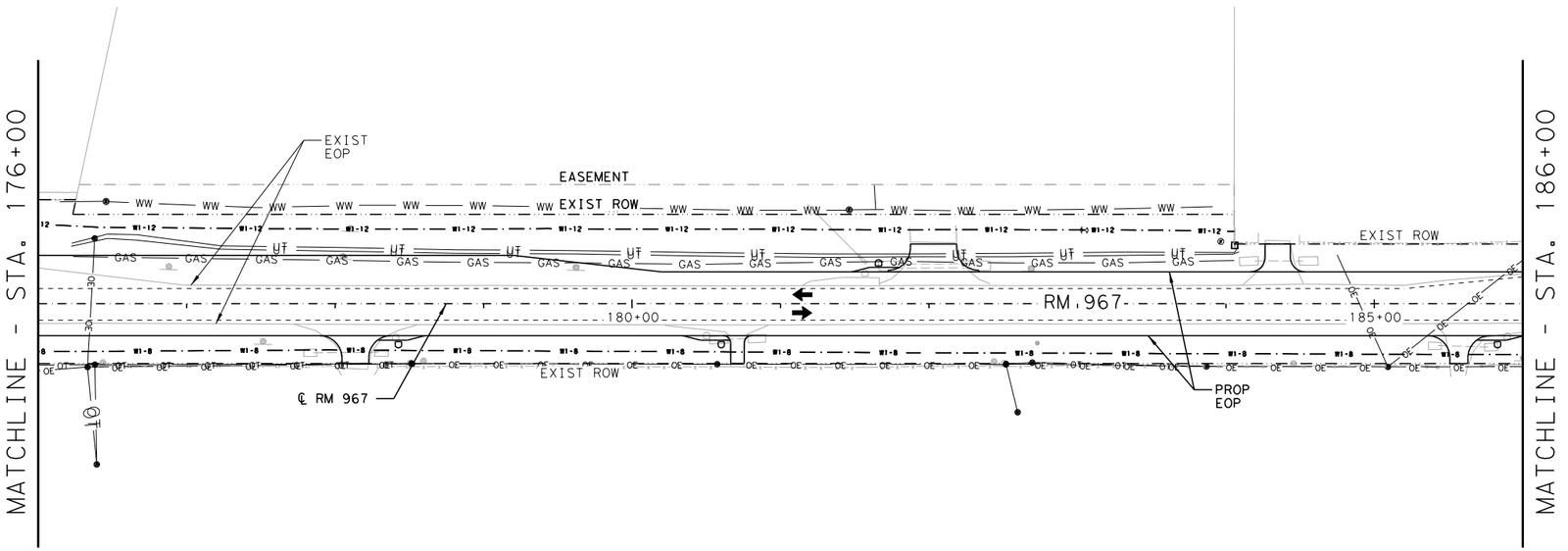
Date: 5/17/2021





LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
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5/17/2021

Texas Department of Transportation

HAYS COUNTY

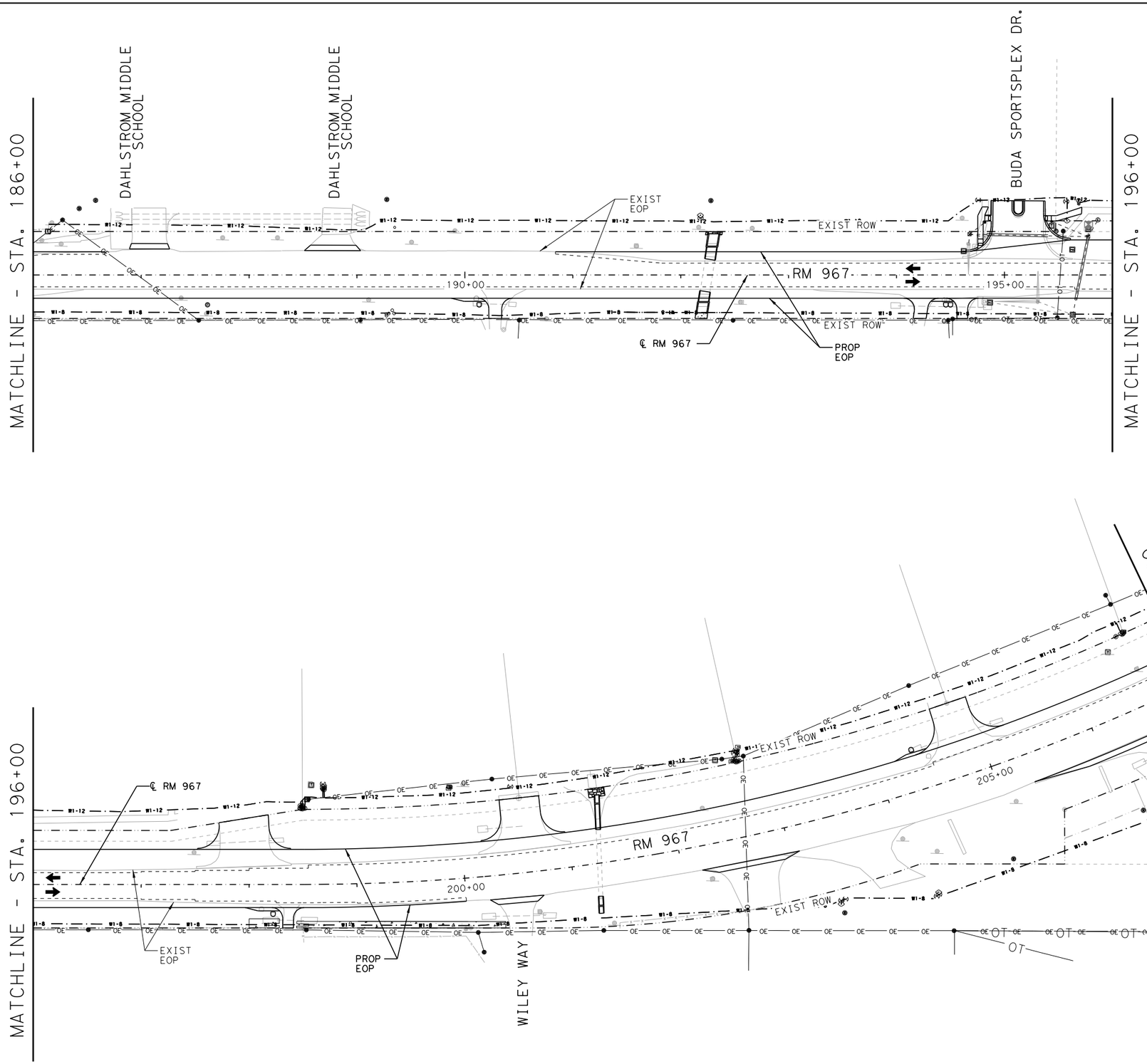
WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 166+00.00 TO
STA 186+00.00

DATE: 5/17/2021			SHEET 10 OF 12
STATE	STATE DIST. NO.		COUNTY
TEXAS	AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036,ETC	RM 967	249

Filename: ...\Cad\Plan\015012-000*UTL10.dgn
Date: 5/17/2021



0 50 100

LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
- UT — UNDERGROUND TELEPHONE
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- WATER VALVE
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5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITIES
STA 186+00.00 TO
STA 207+00.00

DATE: 5/17/2021				SHEET 11 OF 12
STATE		STATE DIST. NO.		COUNTY
TEXAS		AUS		HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	250

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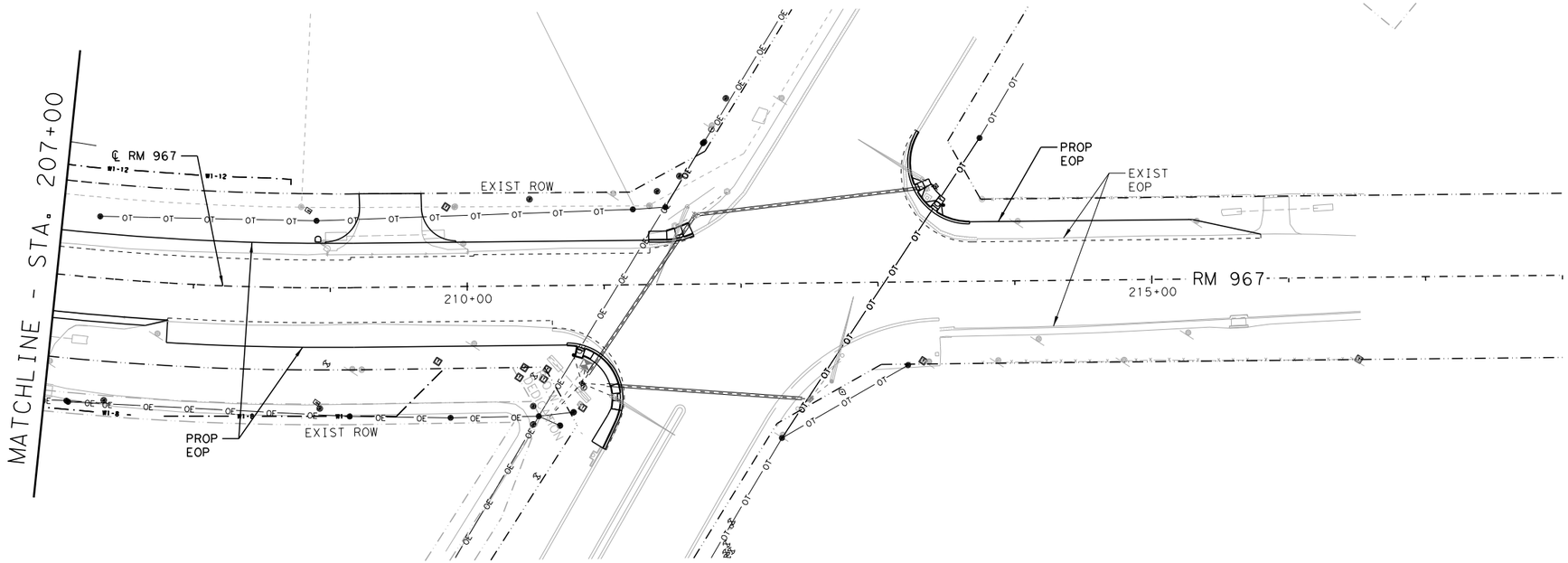
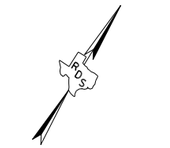
Date: 5/17/2021





LEGEND

- W1-8 — WATER LINE-SIZE
- OE — OVERHEAD ELECTRICAL
- OT — OVERHEAD TELEPHONE
- GAS — BURIED GAS LINE
- WW — SANITARY SEWER
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- WATER METER
- IRRIGATION CONTROL VALVE
- WATER VALVE
- SIGNAL PULL BOX
- SANITARY MANHOLE
- ELECTRIC TRANSFORMER
- ELECTRIC JUNCTION BOX
- TELEPHONE MANHOLE

5/17/2021

Texas Department of Transportation

HAYS COUNTY

WSB & ASSOCIATES, INC.
FIRM # 16849

RM 967

EXISTING UTILITES
STA 207+00.00 TO
END OF PROJECT

DATE: 5/17/2021 SHEET 12 OF 12

STATE	STATE DIST. NO.			COUNTY
TEXAS	AUS			HAYS
CONT.	SECT.	JOB	HIGHWAY NO.	SHEET NO.
1776	01	036, ETC	RM 967	251

Filename: ...\Cad\Plan\015012-000*UTL12.dgn
Date: 5/17/2021