

FED. RD. DIST. NO.	PROJECT NO.		SHEET NO.
6	F 2021(675)		1
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725

STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS
SEE SHEET 2 FOR INDEX OF SHEETS

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
PROJECT NO. F 2021(675)
CSJ: 0215-09-035

GUADALUPE FM 725

LIMITS FROM: FM 78
TO: W. ZIPP RD

NET LENGTH OF ROADWAY = 31082.04 FT = 5.887 MI
NET LENGTH OF BRIDGE = 142.140 FT = 0.027 MI
NET LENGTH OF PROJECT = 31224.18 FT = 5.914 MI

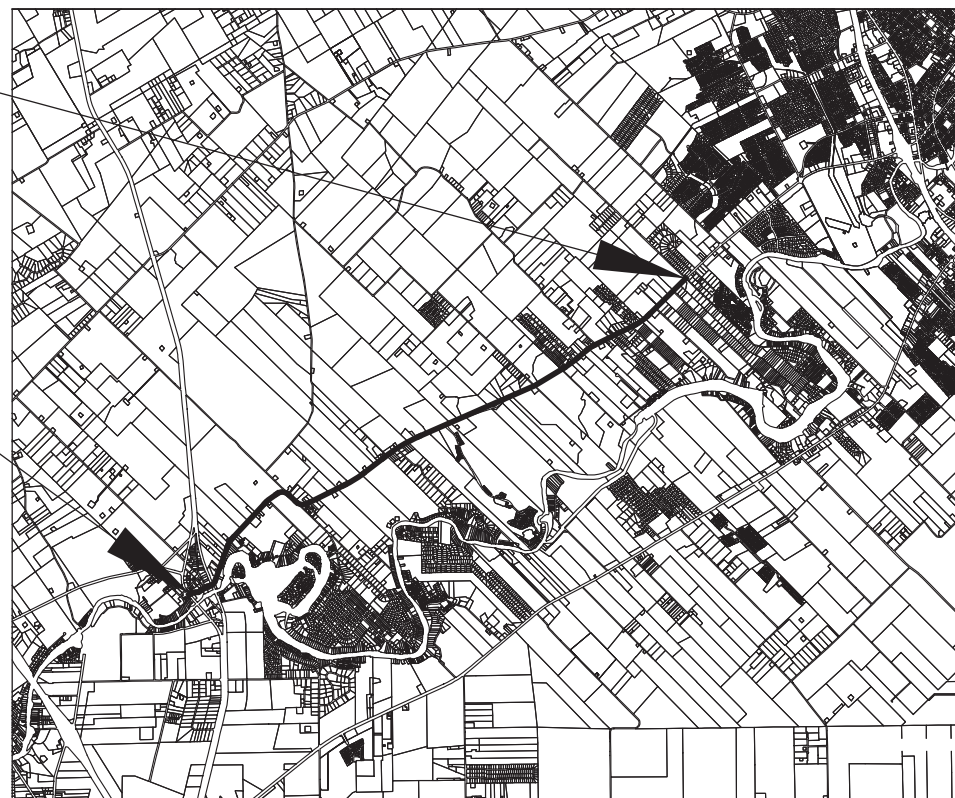
DESIGN SPEED = 40 MPH
AREA OF DISTURBED SOIL = 48.09 ACRES
ADT: 9619

ACCESSIBILITY STANDARDS = PROWAG

FOR WORK CONSISTING OF REHAB AND WIDEN NARROW ROADWAY

END PROJECT
END CSJ: 0215-09-035
STA 322+63.84

BEGIN PROJECT
BEGIN CSJ: 0215-09-035
STA 10+39.66



N.T.S

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

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED
IN ACCORDANCE WITH THE PLANS.

P.E. _____ DATE _____

AREA ENGINEER _____

TEXAS DEPARTMENT OF TRANSPORTATION

EXCEPTIONS: NONE
EQUATIONS: NONE
R.R. CROSSINGS: STA 23+11.16



100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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

RECOMMENDED FOR LETTING
DocuSigned by:
Alyssa G. Colburn, P.E.
4/30/2021

RECOMMENDED FOR LETTING
DocuSigned by:
Clayton Ripps, P.E.
5/3/2021

APPROVED FOR LETTING
DocuSigned by:
Gina E. Gallegos, P.E.
4/30/2021

FILE LOCATION
<https://www.txdot.gov/inside-txdot/district/san-antonio/specinfo.html>

LEVELS DISPLAYED	

COUNTY: GUADALUPE PROJ. NO. _____
HWY. NO. 725 LETTING DATE _____
DATE ACCEPTED _____

SHEET NO.	DESCRIPTION			
	GENERAL			
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237	HYDRAULIC CALCULATION DATA SHEET STRUCTURE E1 EXISTING CONDITIONS			
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	HYDRAULIC CALCULATION DATA SHEET STRUCTURE F1 EXISTING CONDITIONS			

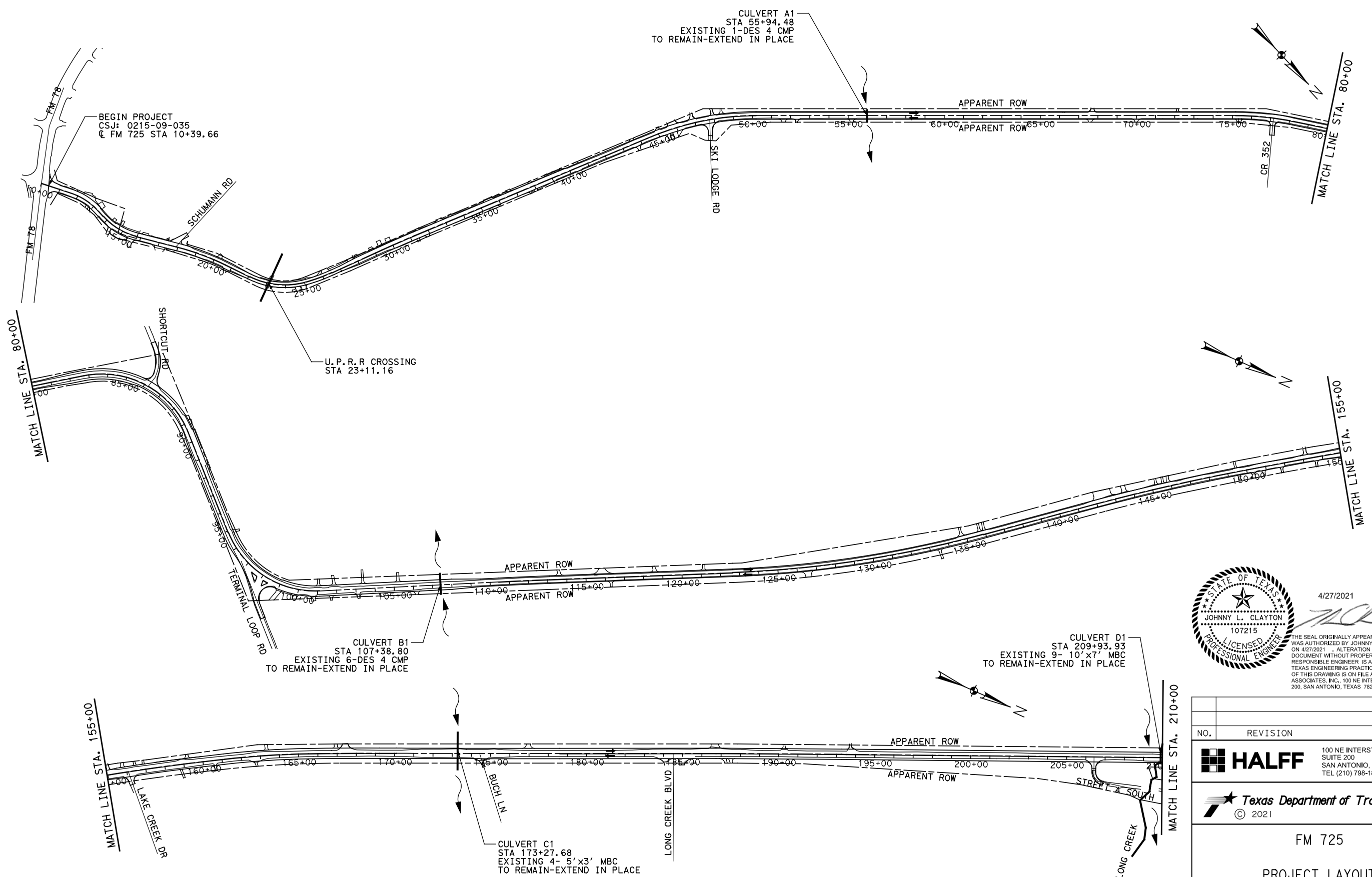


[Signature] P.E. 4/28/2021
 JOHNNY L. CLAYTON DATE

THE STANDARD SHEETS IDENTIFIED HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
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FM 725 INDEX OF SHEETS			
SCALE: NTS		SHEET 1 OF 1	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6		2	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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4/27/2021

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 SUITE 200
 SAN ANTONIO, TEXAS 78216
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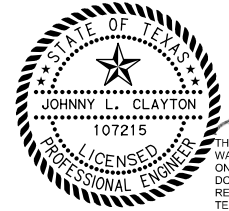
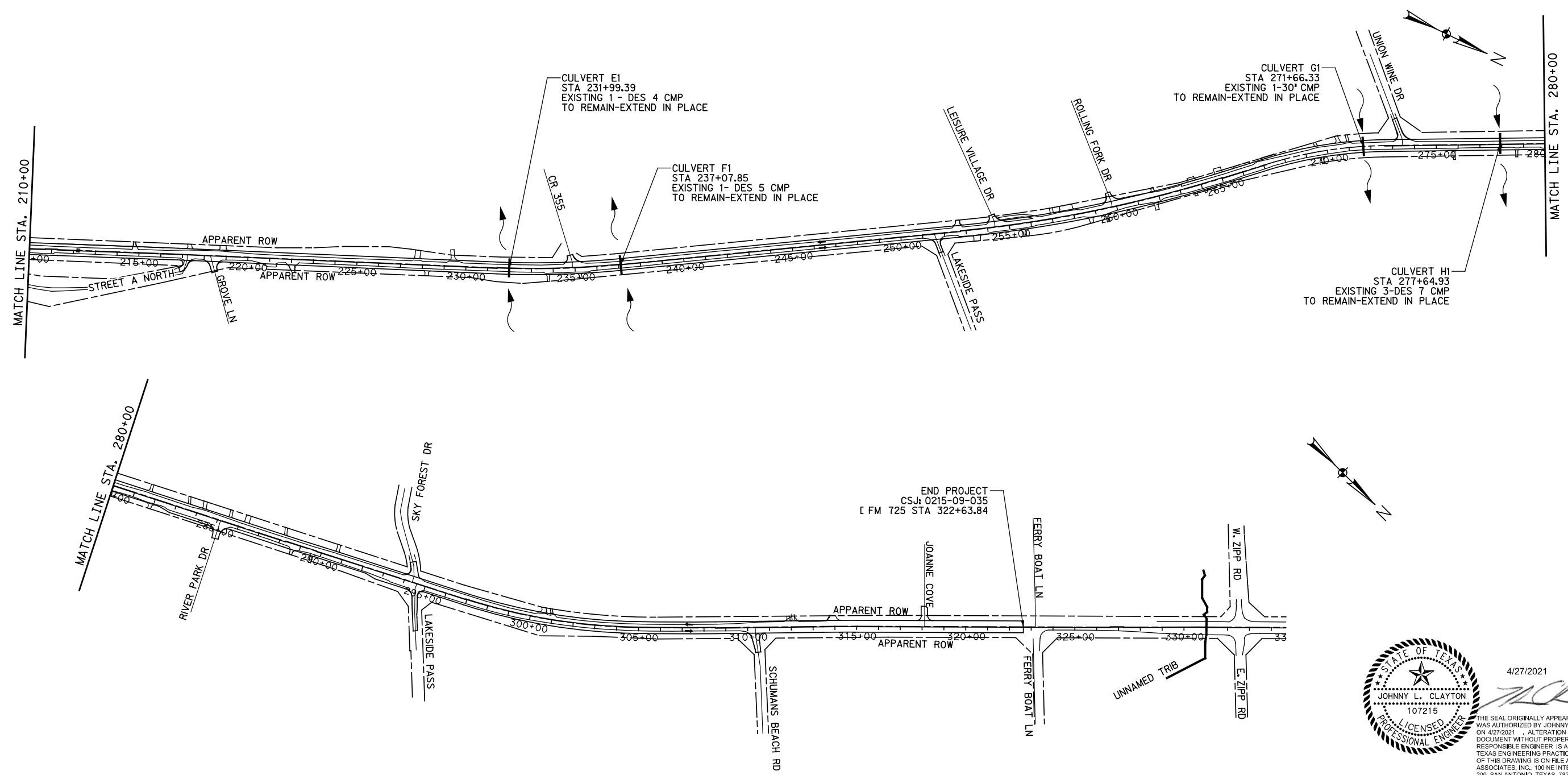


FM 725
PROJECT LAYOUT

SCALE: H: 500 SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 3
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

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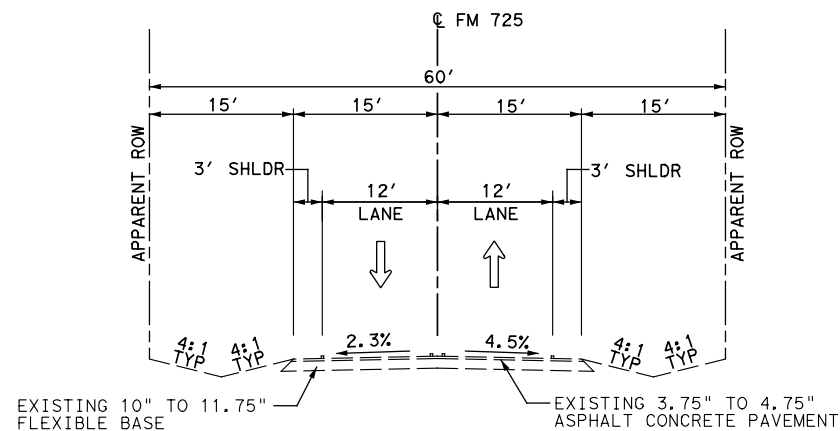
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 SAN ANTONIO, TEXAS 78216
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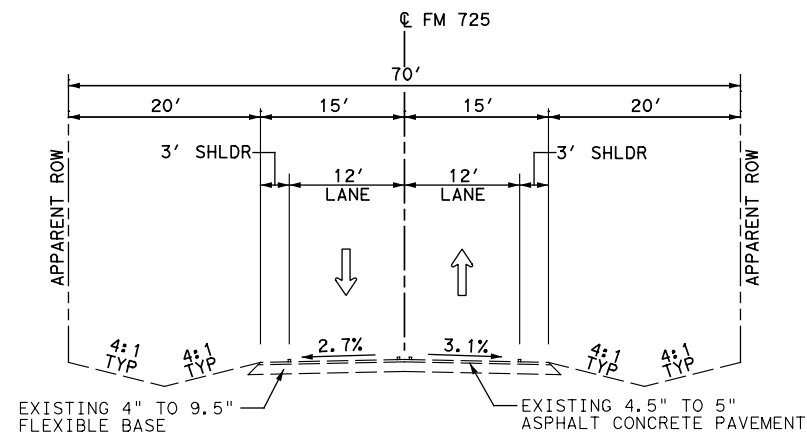
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PROJECT LAYOUT

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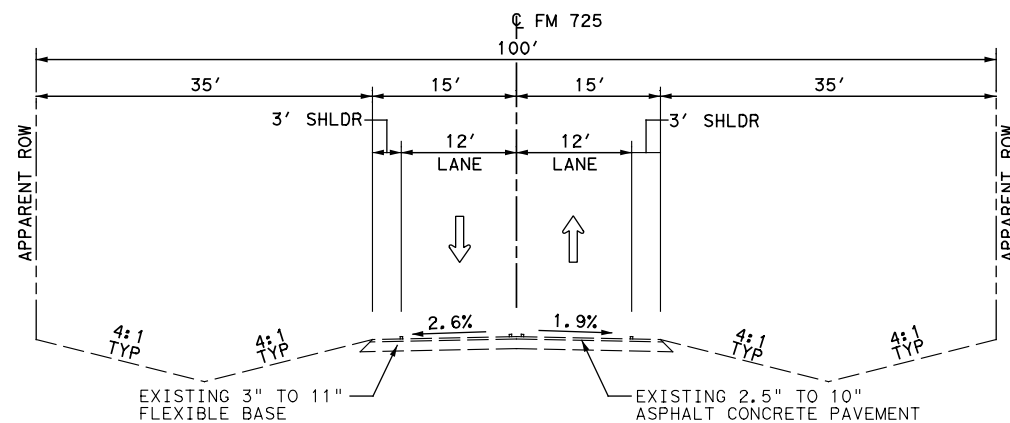
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6	SEE TITLE SHEET		4
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



EXISTING TYPICAL SECTION
STA 10+40.00 TO STA 50+94.00



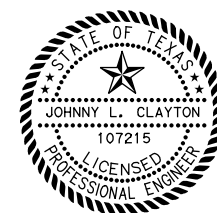
EXISTING TYPICAL SECTION
STA 50+94.00 TO STA 100+00.00



EXISTING TYPICAL SECTION
STA 100+00.00 TO STA 322+63.84

NOTES:

1. EXISTING TYPICAL SECTIONS WERE DEVELOPED USING RECORD PLANS AND SURVEY DATA
2. CROSS SLOPE SHOWN ON TYPICAL SECTIONS IS USUAL, ACTUAL SLOPE VARIES AT LOCATIONS
3. GEOMETRY OF ROADWAY SECTIONS AND DITCHES IS APPROXIMATE AND IS SHOWN FOR INFORMATION ONLY
4. THE EXISTING PAVEMENT THICKNESS SHOWN ON THE PLANS ARE AVERAGE THICKNESS FOR THE CONTRACTORS INFORMATION ONLY. THE ACTUAL PAVEMENT THICKNESSES MAY VARY AT SECTIONS

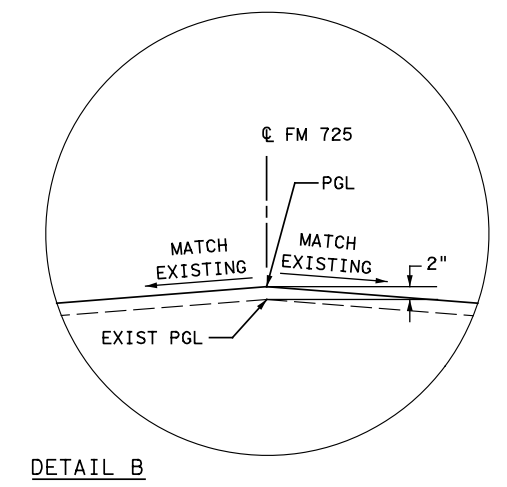
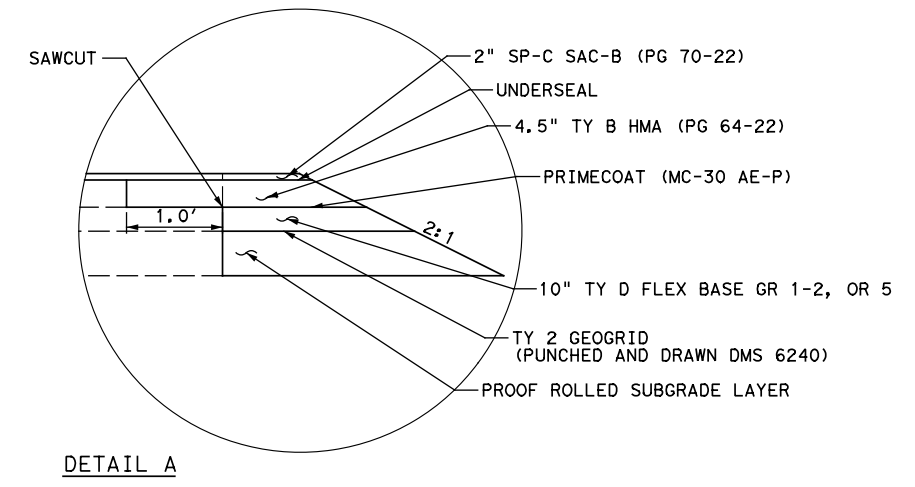
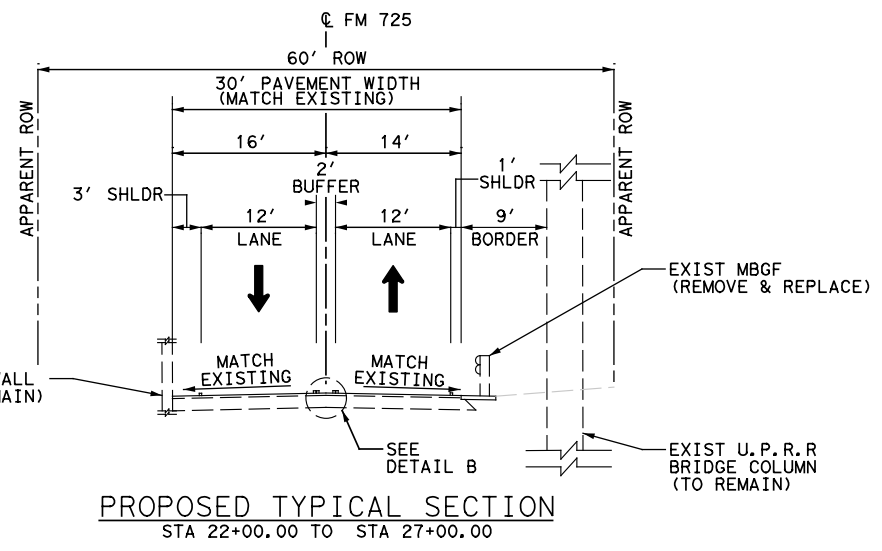
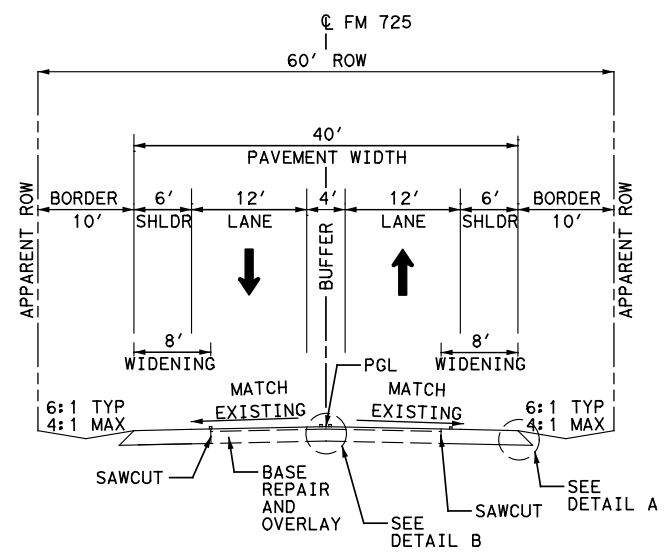


2/28/2021

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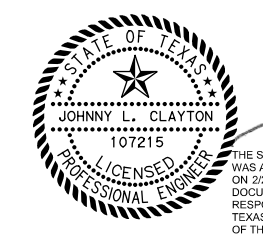
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		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 EXISTING TYPICAL SECTIONS			
SCALE: NTS		SHEET 1 OF 1	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	5	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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 OFFICE:SAN



NOTES:

1. CROSS SLOPES & PGL SHOWN IN PLANS FOR DESIGN PURPOSES ONLY, CONTRACTOR TO SET PGL AT 2" OR 3" ABOVE EXIST CENTERLINE GRADE AND MATCH EXIST CROSS SLOPES.
2. PROPOSED TYPICALS MAY VARY WHEN TRANSITIONING TO/FROM EXISTING SECTIONS OF PAVEMENT TO PROPOSED SECTIONS OF PAVEMENT. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL DETAILS.
3. CROSS SLOPES SHOWN ARE USUAL. REFER TO THE ROADWAY P&P SHEETS FOR ADDITIONAL DETAILS ON CROSS SLOPES.
4. REFER TO THE PAVEMENT MARKING LAYOUT SHEETS FOR LANE TRANSITIONS AT INTERSECTIONS.
5. SAWCUT SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT BID ITEMS.
6. SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE.



2/28/2021

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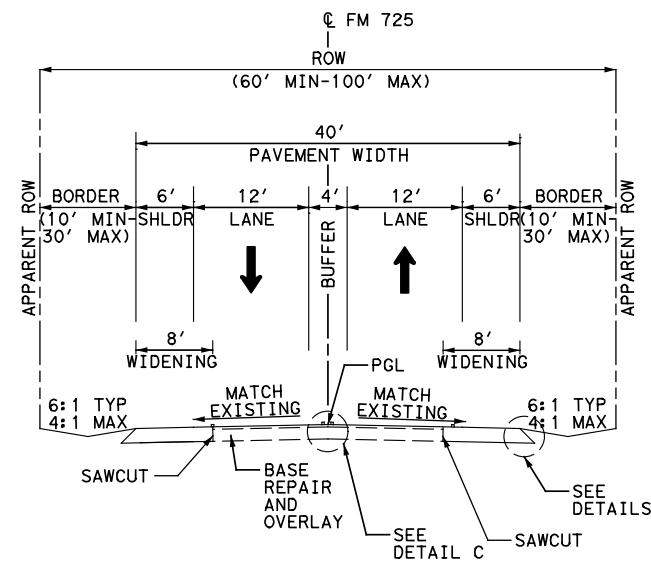
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 TEXAS
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FM 725
PROPOSED TYPICAL SECTIONS

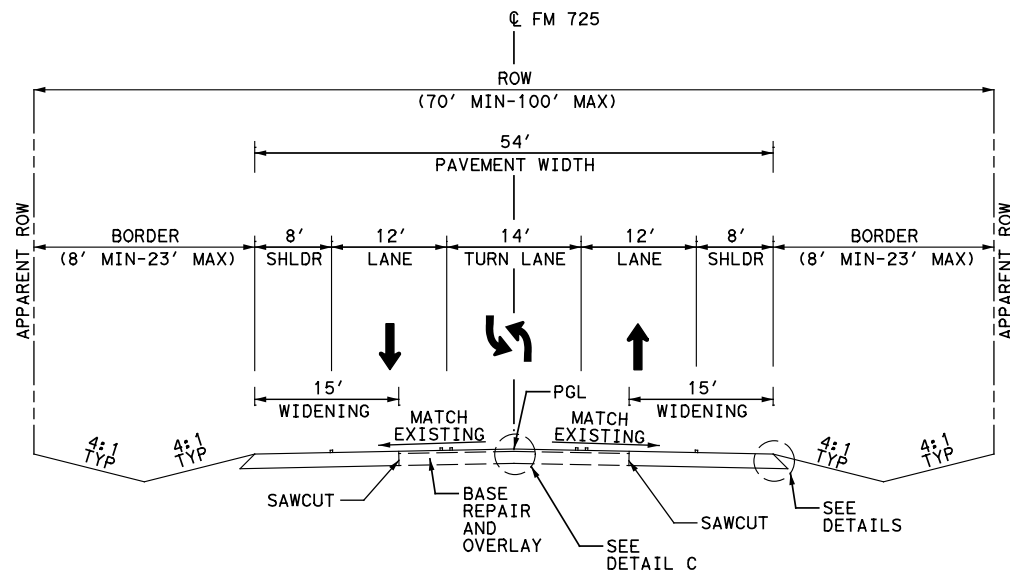
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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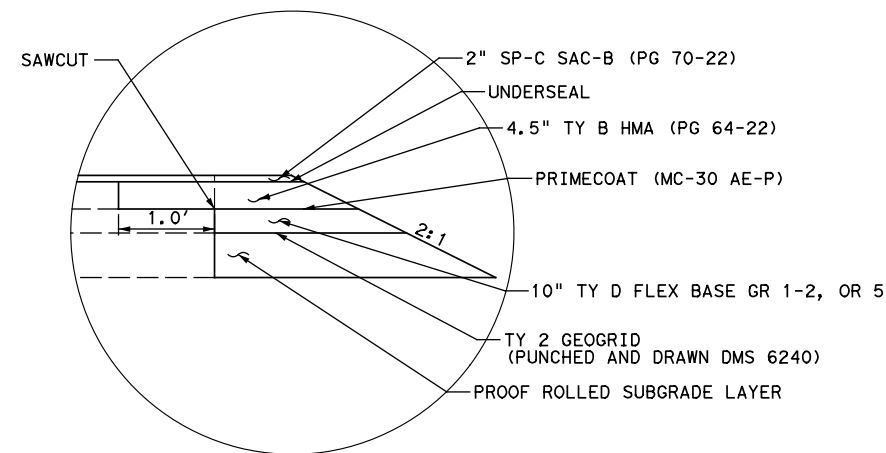
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**STA 109+50.00 TO STA 155+50.00

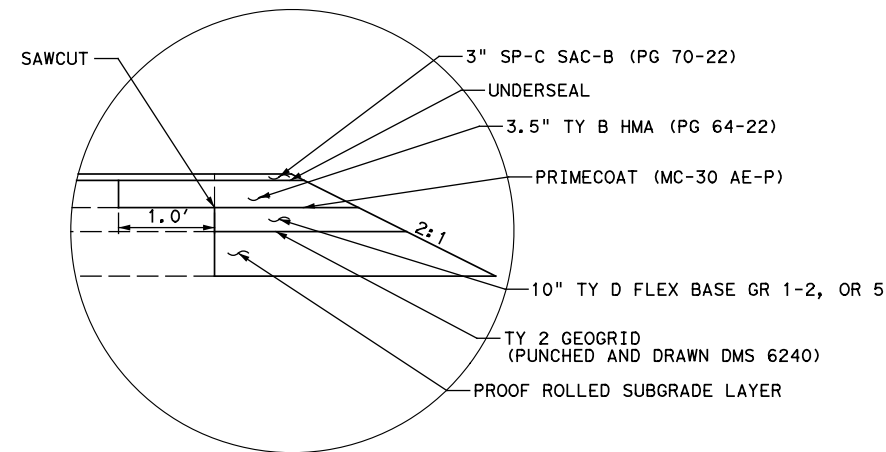


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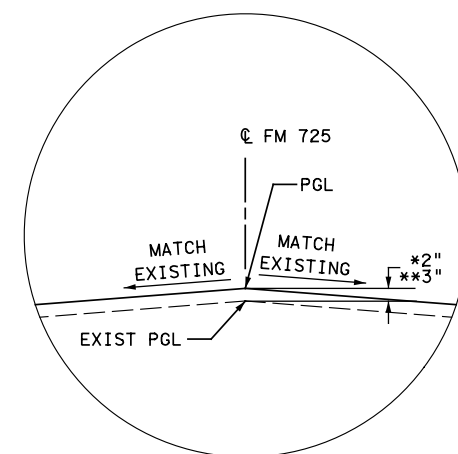
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**STA 158+00.00 TO STA 291+00.00
**STA 297+50.00 TO STA 316+00.00



DETAIL A
STA 10+00.00 TO STA 97+35.00
STA 252+35.00 TO STA 322+63.84



DETAIL B
STA 97+35.00 TO STA 252+35.00



DETAIL C

NOTES:

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STATE OF TEXAS
JOHNNY L. CLAYTON
PROFESSIONAL ENGINEER
107215
2/28/2021
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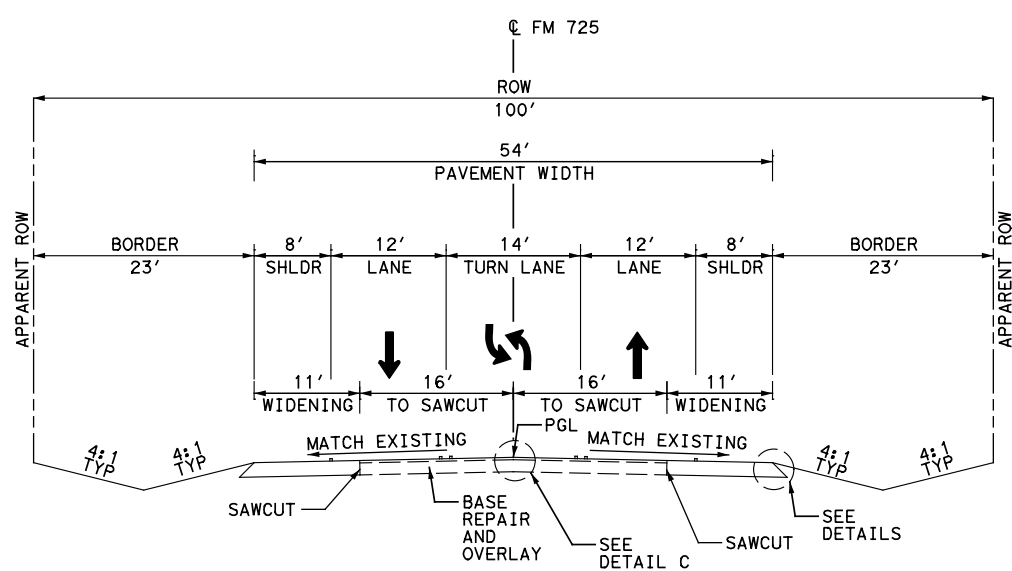
NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

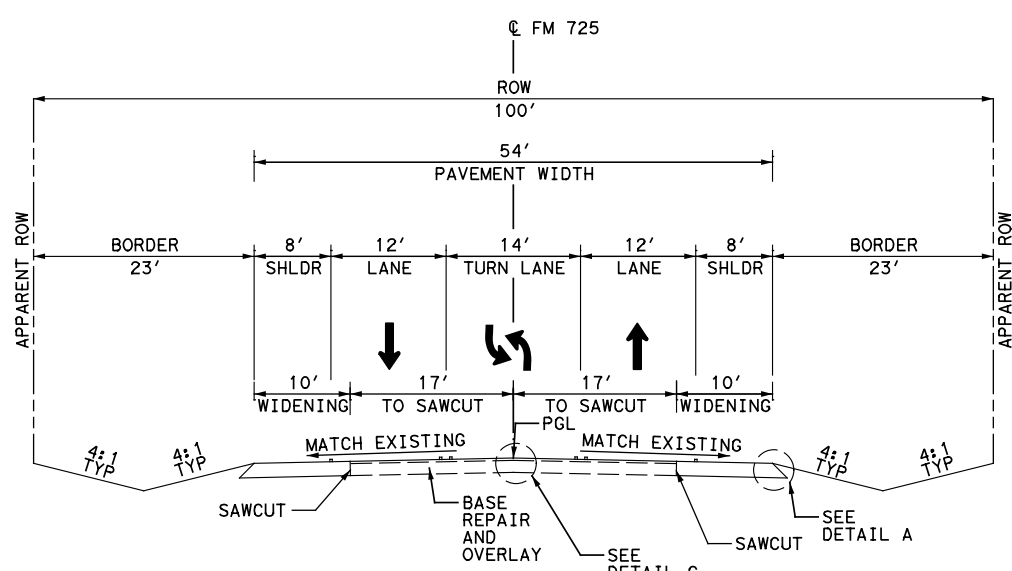
Texas Department of Transportation
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FM 725
PROPOSED TYPICAL SECTIONS

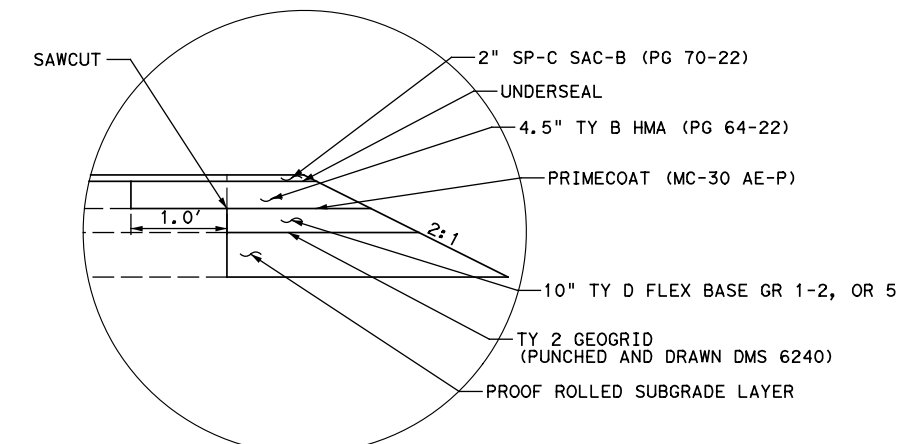
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FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 7
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



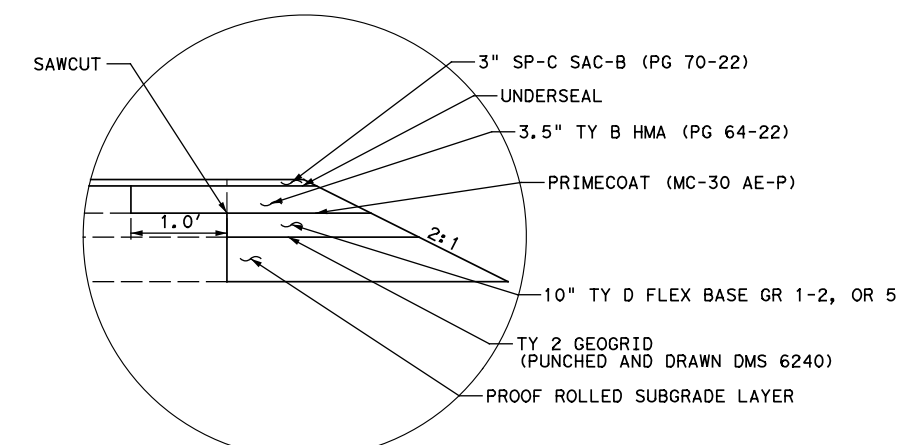
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 STA 155+50.00 TO 158+00.00



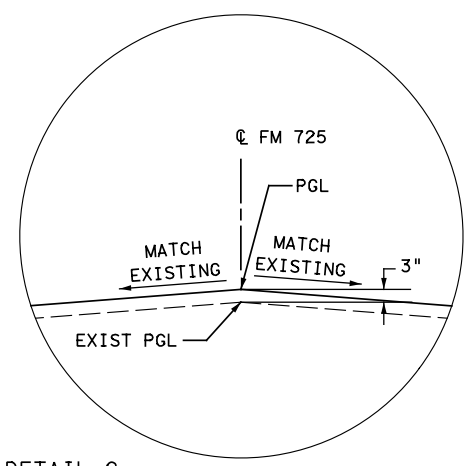
PROPOSED TYPICAL SECTION
 STA 291+00.00 TO 297+50.00
 STA 316+00.00 TO 322+63.84



DETAIL A
 STA 10+00.00 TO 97+35.00
 STA 252+35.00 TO 322+63.84



DETAIL B
 STA 97+35.00 TO 252+35.00



DETAIL C

NOTES:

1. CROSS SLOPES & PGL SHOWN IN PLANS FOR DESIGN PURPOSES ONLY, CONTRACTOR TO SET PGL AT 2" OR 3" ABOVE EXIST CENTERLINE GRADE AND MATCH EXIST CROSS SLOPES.
2. PROPOSED TYPICALS MAY VARY WHEN TRANSITIONING TO/FROM EXISTING SECTIONS OF PAVEMENT TO PROPOSED SECTIONS OF PAVEMENT. REFER TO ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL DETAILS.
3. CROSS SLOPES SHOWN ARE USUAL. REFER TO THE ROADWAY P&P SHEETS FOR ADDITIONAL DETAILS ON CROSS SLOPES.
4. REFER TO THE PAVEMENT MARKING LAYOUT SHEETS FOR LANE TRANSITIONS AT INTERSECTIONS.
5. SAWCUT SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT BID ITEMS.
6. SUBSTITUTE PG BINDER IS NOT ALLOWED FOR SURFACE MIXTURE.

STATE OF TEXAS
 JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER
 2/28/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
Texas Department of Transportation © 2021			
FM 725 PROPOSED TYPICAL SECTIONS			
SCALE: NTS SHEET 3 OF 3			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

*****GENERAL NOTES*****
 2014 Specification Book (Revised March 5, 2021)

===== Basis of Estimate =====				
Item	Description	Area	Rate/Area	Quant-Unit
0168-6001	Vegetative Watering	73,263 SY	15.6 GAL/SY	1,145 MG
0310-6027	Prime Coat (MC-30 OR AE-P))	90,124 SY	0.25 GAL/SY	22,531 GAL
730-6107	Full Width Mowing	26 MO	1 CY/3 MO	9 MO
734-6002	Litter Removal	26 MO	1 CY/1 MO	26 MO
738-6003	Cleaning & Sweeping Hwys	26 MO	1 CY/1 MO	26 MO

Item	Description	Depth	Area	Quant-Unit
0247-6475	FL BS (TY D GR 1-2 OR 5)	10"	90,076 SY	25,021 CY

===== Asphalt Concrete Pavement =====				
Type	Location	Depth	Rate/Area	Quant-Unit
SP C (SAC-B PG70-22)	Main Rdwy	2"	115 LB/83,896 SY-IN	9,648 TONS
SP C (SAC-B PG70-22)	Main Rdwy	3"	115 LB/86,684 SY-IN	14,953 TONS
TY B (PG64-22)	Main Rdwy	3.5"	110 LB/50,037 SY-IN	9,632 TONS
TY B (PG64-22)	Main Rdwy	4.5"	110 LB/44,578 SY-IN	11,033 TONS
TY D (Level-Up)	Main Rdwy	1"	110 LB/600 SY-IN	33 TONS

===== Surface Treatment Data =====				
Item	Description	Area	Rate	Quant-Unit
3085-6001	Membrane Underseal	171,980 SY	0.20 GAL/SY	34,396 GAL

--General--

The following State, District, Local and/or Utility Standards have been modified:
 HEADWALL (CH-PW-0) (DIA=30 IN) (MOD) ITEM No. 466-6233
 HEADWALL (CH-PW-A-0) (DES 4) (MOD) ITEM No. 466-6260.

Contact the Engineer or the City when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

City of New Braunfels: (830) 221-4049

Remove existing raised pavement markings as the work progresses or as approved. This work is subsidiary to the various bid items. Properly dispose materials removed.

To better fit field conditions, the cross sections may be varied when approved. If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Locate and reference all manholes and valves within the construction area with station and offset. Each manhole and valve shall be identified by its owner (SAWS, CPS, etc.). No roadwork will begin until this list has been submitted. All valves and manhole covers have to be accessible at all times, therefore; temp. CTB, material stock piles, etc. cannot be placed over these valves or covers.

Adjust or construct all manholes and valves to final pavement elevations prior to the final mat of ACP. If, between the final elevation adjustment and the final mat of ACP, the manholes and valves are going to be exposed to traffic, place temporary asphalt around the manhole and valve to provide a +/- 50:1 taper. The cost of elevation adjustment and the concrete apron around the manhole and valve will be part of the manhole and valve work. The asphalt tapers are part of the ACP work.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

The Contractor should be aware that the "City Public Service" (CPS) will be consulted by the Engineer in matters concerning the execution of the work, materials and testing related to the CPS work. As such; a CPS employee may be observing the construction and related operations as they progress.

If a sanitary sewer overflow (SSO) occurs:

1. Attempt to eliminate the source of the SSO.
2. Contain sewage from the SSO to the extent possible to prevent contamination of waterways.

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

Will Lockett, Will.Lockett@txdot.gov

Carlos Arcila, carlos.arcila@txdot.gov

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

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

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

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

The Contractor must measure the vertical clearance at each structure after the final surface of the roadway is completed and provide the vertical clearance measurement to the Engineer.

--Item 5--

Reference all existing striping and other pavement markings to allow these markings to be re-established. Ensure the markings (lane lines, edge lines, ramp gores, etc.) are in line with signs, TMS arrows, etc. located on overhead sign supports.

Taper ACP placed at curb inlets, traffic inlets and slotted drains.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion

joints and rails on bridges and all railroad tracks encountered as approved. Clean all of these features if they weren't properly protected. This work is subsidiary work to applicable bid items.

Prior to letting, bidders may obtain a free computer diskette or a computerized transfer of files (from the Engineer's office) that contains the earthwork information. If copies of the cross-sections in addition to, or instead of, the CD are requested, they will be available at the Engineer's office for borrowing by copying companies at the bidder's expense.

When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. A horizontal boom or equivalent equipment is required for construction in the vicinity of the electric lines in order to provide vertical clearance of equipment during construction. Contact the utility owner sixteen (16) week in anticipation of pole bracing. The estimated duration for pole bracing is 6 to 10 weeks (or longer if temporary construction easements are required) after invoice is paid. For de-energizing or sleeving of the overhead electrical lines depicted on the plans, please contact the utility owner sixteen (16) week in anticipation of needed de-energization. The estimated duration for de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and backfeed requirements. De-energizing may not be possible in all instances or may be restricted during specific periods of time due to load demand. Contractor will be reimbursed for the invoice cost for pole bracing and/or de-energizing or sleeving through force account.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

Structures

Bridge and culvert construction operations cannot begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer

will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at <https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design>. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

--Item 6--

Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.), comply with Item 6.

If removal of AC water lines is included in the construction contract, then notify the Engineer of proposed dates of removal of the AC water lines in accordance to Item 6. Excavate to the top of the AC water line to allow a separate contractor hired by the State to remove the AC water line. The excavation for the AC water line removal is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.).

--Item 7--

The project's total disturbed area is 74.18 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI

for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

Roadway closures during the following key dates and/or special event are prohibited. See the TCP Narrative for these dates.

--Item 8--

Working days will be computed and charged in accordance with Article 8.3.1.4: Standard work week.

A Special Provision to Item 8 for a delayed authorized date to begin work has been included in the contract. The reason for including the Special Provision is for material processing or contractor mobilization.

Create and maintain a Critical Path Method (CPM) schedule.

The CPM schedule shall be created and maintained using software fully compatible with version 6.1 of Primavera Project Planner.

--Item 9--

When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case by case basis.

--Item 100--

Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P.

Trim and remove brush and trees within the stations noted in the plans and as needed for construction operations. Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas to the ROW limits. 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 12 ft. vertical clearance under all trees. This work is subsidiary.

Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

--Item 110--

Where excavation extends beyond a right of way fence, remove and replace the fence to a comparable condition. This work shall be considered subsidiary to the bid item.

--Item 132--

At no time shall the retaining wall backfill material exceed the adjacent embankment operation by more than one embankment lift. At no time will the embankment adjacent to the retaining wall backfill exceed the wall backfill by any elevation.

--Item 161--

Approximately 0 CY of existing topsoil may be salvaged and windrowed or stockpiled (as approved) for later use as Compost Manufactured Topsoil (CMT). Place erosion control measures for the stockpile and/or windrow.

--Item 164--

Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

If performing a permanent seeding in an area with established temporary grass cover and mowing is performed instead of tilling, seed and fertilizer may be distributed simultaneously during "Broadcast Seeding" operations, provided each component is applied at the specified rate.

--Item 166--

Use a fertilizer with an analysis of 13-13-13 (50% of the total N must be sulfur coated urea) to apply 60 lbs of actual N per acre. This requires 460 lbs of 13-13-13 per acre or .095 lbs per SY of area.

--Item 168--

Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 247--

There is no minimum PI requirement for this project.

--Item 302--

Previously tested aggregates found to contain excessive quantities of dust (more than 0.5 percent passing the No. 40 sieve) during precoating, stockpiling or hauling operations, may be rejected. Use Test Method Tex-200-F, Part I for testing.

Precoated Aggregate Type PE shall consist of crushed slag, crushed stone or natural limestone rock asphalt.

The Engineer will utilize the Ignition Oven Method (Tex 236-F) for aggregate gradation, with the option of utilizing belt or vacuum extraction gradation in the event the ignition oven malfunctions.

--Item 305--

All reclaimable asphalt pavement (RAP) material will be retained by the Contractor.

--Item 310--

Refinish material that does not receive prime coat within one working day following acceptance of flexible base.

Control: 0215-09-035

County: GUADALUPE

Highway: FM 725

--Item 316--

When using latex asphalt, avoid drifting of asphalt onto traffic and adjacent properties.

Asphalt season will be year around, but meet sections 316.4.4.1 through 4.4.3.

Ensure that the asphalt for precoating the aggregate and the asphalt used for the surface treatment will not result in a reaction that may adversely affect the bonding of the aggregate and asphalt during the surface treatment operation.

Do not add bag house fines in the production of precoated material.

Clean all concrete curbs, islands, medians, etc. that get coated with asphalt.

--Item 320--

Construct all longitudinal ACP joints adjacent to a travel lane with a joint maker device that will create a 3:1 to 6:1 taper. For placement of 2 inches or more, the device shall provide a maximum ½ inch vertical edge. Taper outside edges (next to the grass) or backfill (shoulder-up) the same day.

Provide a material transfer device capable of providing a continuous flow of material to the paver. The material transfer device will consist of a windrow elevator or better.

When placing Item 346 mixtures, use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV's remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

--Item 3076, & 3077--

Table 10 in Item 3076 and Table 11 in Item 3077, Hamburg Wheel Test Requirements tested in accordance with Tex-242-F are changed for PG 64-22 or lower and PG 70-22. Minimum number of passes at 12.55 mm Rut Depth, tested at 50 degrees C will be 5,000 and 10,000 respectively.

The asphalt plant shall have truck scales as defined in Item 520. Give three weight tickets bearing the date, ticket number, the truck number, the gross, net & tare weights to the truck driver for the State inspector at the spreading and finishing operation. Trucks may be required to weigh on public scales or portable platform scales to verify the weight of the ticket.

Submit a copy of the Tex 233-F production charts on a weekly basis. At the end of the ACP work, provide all originals.

Control: 0215-09-035

County: GUADALUPE

Highway: FM 725

Crushing of aggregate for hot mix and immediate use for production of the mix is not allowed. Stockpile the aggregate until enough material is available for five days of production unless prior approval is provided

Hold a pre-placement meeting one month prior to the placement of the hot mix. Do not use diesel or solvents as asphalt release agents in production, transportation, or construction. A list of approved asphalt release agents is available from the District Laboratory.

No more than one hot mix lot will be open for any specific type of hot mix, unless authorized. After a lot is open and the Contractor gets approval to change plants, the previous lot will be closed and a new lot will be opened. The numbering for the lots produced at the new plant will start with No. 1. If allowed to switch back to the original or previous plant, the next lot from that plant will resume numbering sequentially from the last lot produced by that plant.

--Item 354--

Retain planed material.

Take precaution to avoid damage to existing bridge decks and armor joints. Repair any damage to the bridge decks and/or armor joints as approved. This work will not be paid directly, but will be performed at the Contractor's expense.

--Item 401--

A shrinkage compensator is not required for when used for backfilling pipes. Strength of the Flowable Backfill will be verified by the District Laboratory. Field testing is not required, unless deemed necessary.

--Item 403--

The Contractor and/or Contractor's Engineer who selects and designs the temporary shoring is responsible for the overall (global) stability calculations as well as internal stability and sliding calculations (including mat and soil nail pullout) as per the TxDOT Bridge Division Geotechnical Manual. If the Contractor chooses a Temporary Earth Retaining Wall for Temporary Shoring, then the Contractor and/or Contractor's Engineer is required also to provide wire struts as shown on these plans. Designs for any type of Retaining Wall used for Temporary Special Shoring shall conform to the TXDOT Geotechnical Manual Chapter 6: Retaining Walls.

The Contractor is responsible for maintaining positive drainage during construction of temp shoring operations and permanent wall structures.

--Item 420--

Mass concrete will be measured in place.

Restrict large aggregate size to ¾" maximum for class "C" concrete used in aesthetic details requiring form liners.

Control: 0215-09-035

County: GUADALUPE

Highway: FM 725

Pier and Bent Concrete will be paid for as "Plans Quantity".

--Item 432--

In all riprap slopes, provide 3-inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

In areas where guard fence posts are to be placed in riprap, the riprap shall have an 18 inch +/- blocked out area (round or square). After the posts are installed, the blocked-out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

Match the slope of the Riprap (Mow Strip) to the slope of the adjacent roadway.

--Item 462--

Use lean concrete or 2 sack flowable backfill for fill between pre-cast boxes. Lean concrete and 2 sack flowable backfill shall be considered subsidiary to this bid item.

The following structures shall be cast-in-place:
C1, D1.

The following structures shall be pre-cast:
A1, B1, E1, F1, G1, H1.

--Item 465--

Concrete Class B invert shaping is required at all inlets, manholes and junction boxes in order to insure positive flow. The material and work performed for the placement of the inverts shall be considered subsidiary to this item.

--Item 496--

The Contractor will submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496.

--Item 500--

"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--

Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

Control: 0215-09-035

Sheet 9E

County: GUADALUPE

Highway: FM 725

Treat the pavement drop-offs as shown in the TCP.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance. Failure to make corrections as noted may result in payment for this item being withheld.

There are traffic signals at the intersection of FM 78 and Terminal Loop Rd. Keep the signals in operation at all times except when necessary for specific installation operations, including any modifications to existing signal heads to maintain clear visibility at all times. Adjustment of any signal head will be subsidiary to Item 502. When it is necessary for a signal to be turned off, hire off duty police officers to control the traffic until the signals are back in satisfactory condition.

Moving an existing sign to a temporary location is subsidiary to this Item. Installations with permanent supports at permanent locations will be paid for under the applicable bid item (s).

Mount temporary mailboxes on plastic drum in accordance with Compliant Work Zone Traffic Control Devices, Section K. Mounting and moving the mailbox as needed for the various construction phases is subsidiary to this Item.

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. Unless shown in the TCP, no lane, ramp, connector, etc. closures are allowed during special events. At least one lane has to remain open at all times. Lane closures will not be allowed if this reporting requirement is not met.

For closures not listed in the TCP; the lane closures are limited to between the hours of 9:00 pm and 5:00 am Sunday through Thursday, and at least one lane has to remain open at all times.

Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

Temporary Rumble Strips are to be used according to WZ (RS)-16.

Use 2 number of rumble strip arrays.

If Nighttime work is required and work is not behind positive barrier then full TY 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

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.

Moving or adjustment of traffic signal heads, VIVDS, and radar detection for the purpose of alignment with the shifting of lanes in conjunction with the traffic control plan will be subsidiary to various bid items.

--Item 506--

An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

Failure to correctly maintain daily monitoring reports and submitting to TxDOT on a daily/weekly basis may result in the monthly estimate being withheld.

--Item 510--

The length of the one-way traffic control section is limited to 1 mile.

Payment for Pilot Car Method includes all necessary flaggers to safely conduct operations. This may involve stationing additional flaggers at public streets and driveways.

--Item 512--

Portable traffic barrier manufactured after December 31, 2019 must have been successfully tested to the 2016 edition of MASH and will be manufactured in accordance with the Standard Sheets in the plans. Portable traffic barrier manufactured on or before this date, and successfully tested to NCHRP Report 350 or the 2009 edition of MASH may continue to be used throughout their normal service lives, but must be the same shape type as shown in the plans.

Only Single Slope shape CTB may be furnished on the inside shoulder/inside median of the Interstate or Freeway Main Lanes.

More than one shape type of CTB may be furnished on a project, although no mixing of CTB shape types will be permitted along a continuous segment of CTB.

--Item 540--

MBGF posts shall be round with domed tops, and not painted. If 10 or less timber posts are needed, they may be purchased locally and will be accepted by visual inspection.

Guard fence posts placed in proposed and/or existing areas of riprap, sidewalks or other concrete shall have an 18 inch +/- (square or round) block out in the concrete. After the posts are installed, the blocked-out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding 1/2" from the edge of the hole.

--Item 542--

Salvage all undamaged/acceptable radius guardrail and deliver to the TxDOT maintenance section yard.

--Item 556--

Coarse Aggregate Grade 3 meeting requirements of Item 421, Table 4, is acceptable for Filter Material.

--Item 585--

Use Surface Test Type B, pay adjustment schedule 2 to evaluate ride quality of travel lanes.

--Item 644--

The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

The set screw type for Triangular Slipbase Systems is not allowed. Use the following products for the Triangular Slipbase System.

Triangular Slip Base Systems
(For use with 10 BWG and Schedule 80 Round Posts)

Southern Plains Fabrication	SPF Triangular Slipbase Housing	Info@SouthernPlainsFabrication.com http://SouthernPlainsFabrication.com (806) 241-0060
Structural and Steel Products	Triangular Slipbase Breakaway Support	CustServ@s-steel.com http://s-steel.com (800) 782-5804

--Item 658--

CTB reflectors will not be paid for directly but will be considered subsidiary to the barrier.

--Item 662--

Raised reflective pavement markings are required when using work zone reflective pavement markings for lane lines as shown in the standards. The raised reflective pavement markings must be placed during the same operation for installation of the work zone reflective pavement markings and placed before the roadway is open to traffic. These raised reflective pavement markings will be subsidiary to work zone pavement markings.

--Item 666--

Use TY II material (vs. an acrylic or epoxy) as the sealer for the TY I markings, place the TY II a minimum of 14 calendar days (to provide adequate curing) before placing the TY I markings.

Failure to provide the retroreflectometer testing data within the time specified in the specifications will result in non-payment of the bid item.

--Item 672--

Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 677--

Obtain approval before using the mechanical method for the elimination of existing thermoplastic pavement markings.

--Item 730--

Mow full-width and hand trim the right of way, including newly seeded or sodded areas, when vegetation reaches a height of 16" or when directed. Removal of brush sprouts growing within guardrail, concrete barriers or at other locations where mowing or hand trimming is done within the limits of construction is required and subsidiary to this item. Mowing may be required more

often in newly sodded or seeded areas than in other parts of the project because of the supplemental irrigation these areas receive and the resulting weed growth. Coordinate mowing to avoid rutting or compaction of the soil when mowing where supplemental irrigation is being used. Use mowing equipment that will not adversely affect soil retention blankets or mulches that have been applied. Work performed under this item does not replace the mowing required when placing permanent seeding in an area that has established temporary seeding as described in Article 164.3, Construction.

--Item 734 & 738--

Perform Litter Removal and Cleaning and Sweeping Highways once a month or as directed.

--Item 3085--

The minimum application rates are listed in Table UC. The Engineer may adjust the application rates taking into consideration the existing pavement surface conditions.

Table UC

Material	Minimum Application Rate (gal. per square yard)
TRAIL – Hot Asphalt	0.15
Spray Applied Underseal Membrane	0.20
Seal Coat – Emulsion (CHFRS-2P, CRS-2P)	0.25
Seal Coat – Asphalt (AC-15P, AC-20-5TR, AC-20XP, AC10-2TR)	0.23
Aggregate for Seal Coat Options TY PB GR 4(AC) or TY B GR 4(Emulsion)	1 CY:120 SY

--Item 6185--

2 shadow vehicles with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.



CONTROLLING PROJECT ID 0215-09-035

DISTRICT San Antonio
HIGHWAY FM 725

COUNTY Guadalupe

QUANTITY SHEET

CONTROL SECTION JOB				0215-09-035		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00133787			
COUNTY				Guadalupe			
HIGHWAY				FM 725			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	313.000		313.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	837.000		837.000	
	110-6001	EXCAVATION (ROADWAY)	CY	30,749.000		30,749.000	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	14,406.000		14,406.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	73,263.000		73,263.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	73,263.000		73,263.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	73,263.000		73,263.000	
	168-6001	VEGETATIVE WATERING	MG	1,145.000		1,145.000	
	169-6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	73,263.000		73,263.000	
	216-6001	PROOF ROLLING	HR	54.000		54.000	
	247-6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	25,021.000		25,021.000	
	310-6027	PRIME COAT(MC-30 OR AE-P)	GAL	22,531.000		22,531.000	
	351-6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	SY	30,561.000		30,561.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	18,439.000		18,439.000	
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY	768.000		768.000	
	351-6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR(3")	SY	18,423.000		18,423.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY	17,500.000		17,500.000	
	400-6005	CEM STABIL BKFL	CY	245.000		245.000	
	400-6006	CUT & RESTORING PAV	SY	135.000		135.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	312.000		312.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	152.000		152.000	
	450-6006	RAIL (TY T223)	LF	192.000		192.000	
	459-6007	GABION MATTRESSES (GALV)(12 IN)	SY	333.000		333.000	
	459-6009	GABIONS (3' X 3')(GALV)	CY	47.000		47.000	
	460-6004	CMP (GAL STL 30 IN)	LF	13.000		13.000	
	460-6011	CMP AR (GAL STL DES 4)	LF	29.000		29.000	
	460-6024	CMP AR (GAL STL DES 7)	LF	93.000		93.000	
	462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF	80.000		80.000	
	462-6075	CONC BOX CULV (10 FT X 7 FT)(EXTEND)	LF	180.000		180.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	934.000		934.000	
	464-6030	RC PIPE (ARCH)(CL III)(DES 1)	LF	813.000		813.000	
	464-6033	RC PIPE (ARCH)(CL III)(DES 4)	LF	184.000		184.000	
	464-6034	RC PIPE (ARCH)(CL III)(DES 5)	LF	22.000		22.000	
	465-6128	INLET (COMPL)(PSL)(FG)(4FTX4FT-4FTX4FT)	EA	1.000		1.000	
	466-6111	HEADWALL (CH - PW - A - 0) (DES= 4)	EA	4.000		4.000	
	466-6114	HEADWALL (CH - PW - A - 0) (DES= 7)	EA	2.000		2.000	
	466-6156	WINGWALL (FW - 0) (HW=9 FT)	EA	2.000		2.000	



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HIGHWAY FM 725

COUNTY Guadalupe

QUANTITY SHEET

CONTROL SECTION JOB				0215-09-035		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00133787			
COUNTY				Guadalupe			
HIGHWAY				FM 725			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	466-6180	WINGWALL (PW - 1) (HW=5 FT)	EA	1.000		1.000	
	466-6181	WINGWALL (PW - 1) (HW=6 FT)	EA	1.000		1.000	
	466-6233	HEADWALL (CH-PW-0)(DIA = 30 IN)(MOD)	EA	1.000		1.000	
	466-6260	HEADWALL (CH-PW-A-0)(DES 4) (MOD)	EA	1.000		1.000	
	467-6359	SET (TY II) (18 IN) (RCP) (4: 1) (P)	EA	62.000		62.000	
	467-6517	SET (TY II) (DES 1) (RCP) (4: 1) (P)	EA	54.000		54.000	
	467-6553	SET (TY II) (DES 4) (RCP) (4: 1) (C)	EA	1.000		1.000	
	467-6561	SET (TY II) (DES 5) (RCP) (4: 1) (C)	EA	2.000		2.000	
	480-6001	CLEAN EXIST CULVERTS	EA	8.000		8.000	
	496-6002	REMOV STR (INLET)	EA	1.000		1.000	
	496-6005	REMOV STR (WINGWALL)	EA	4.000		4.000	
	496-6006	REMOV STR (HEADWALL)	EA	11.000		11.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	25.000		25.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	345.000		345.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	345.000		345.000	
	506-6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	3,828.000		3,828.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	3,828.000		3,828.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	35,783.000		35,783.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	35,783.000		35,783.000	
	506-6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	1,455.000		1,455.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1,455.000		1,455.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	420.000		420.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	1,000.000		1,000.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	280.000		280.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	420.000		420.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	530-6004	DRIVEWAYS (CONC)	SY	855.000		855.000	
	530-6019	DRIVEWAYS (ACP)(TYPE 1)	SY	6,227.000		6,227.000	
	530-6021	DRIVEWAYS (ACP) (TYPE 2)	SY	8,170.000		8,170.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	2,214.000		2,214.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	50.000		50.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000		4.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	11.000		11.000	
	540-6033	MTL BM GD FEN (LONG SPAN SYSTEM)	EA	2.000		2.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	1,930.000		1,930.000	



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COUNTY Guadalupe

QUANTITY SHEET

CONTROL SECTION JOB				0215-09-035		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00133787			
COUNTY				Guadalupe			
HIGHWAY				FM 725			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	13.000		13.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	12.000		12.000	
	560-6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	57.000		57.000	
	560-6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	18.000		18.000	
	560-6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	14.000		14.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	111.000		111.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	38.000		38.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	4.000		4.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	4.000		4.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	4.000		4.000	
	644-6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	2.000		2.000	
	644-6064	IN BRIDGE MNT CLEARANCE SGN ASSM(TY N)	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	106.000		106.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	55.000		55.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	46.000		46.000	
	658-6099	INSTL OM ASSM (OM-2Z)(WFLX)GND	EA	152.000		152.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	155,246.000		155,246.000	
	662-6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF	16,428.000		16,428.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	107,219.000		107,219.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	3,052.000		3,052.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	1,526.000		1,526.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	770.000		770.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	10.000		10.000	
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA	2.000		2.000	
	666-6224	PAVEMENT SEALER 4"	LF	71,955.000		71,955.000	
	666-6225	PAVEMENT SEALER 6"	LF	60,275.000		60,275.000	
	666-6230	PAVEMENT SEALER 24"	LF	770.000		770.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	10.000		10.000	
	666-6233	PAVEMENT SEALER (MED NOSE)	EA	2.000		2.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	8,750.000		8,750.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	61,081.000		61,081.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	60,275.000		60,275.000	
	666-6345	REF PROF PAV MRK TY I(Y)4"(SLD)(100MIL)	LF	2,118.000		2,118.000	
	672-6007	REFL PAV MRKR TY I-C	EA	117.000		117.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	975.000		975.000	
	730-6107	FULL - WIDTH MOWING	CYC	9.000		9.000	



CONTROLLING PROJECT ID 0215-09-035



DISTRICT San Antonio
HIGHWAY FM 725

COUNTY Guadalupe

QUANTITY SHEET

CONTROL SECTION JOB				0215-09-035		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00133787			
COUNTY				Guadalupe			
HIGHWAY				FM 725			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	734-6002	LITTER REMOVAL	CYC	25.000		25.000	
	738-6003	CLEANING / SWEEPING (OUTSIDE MAIN LANE)	CYC	25.000		25.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	20,665.000		20,665.000	
	3076-6043	D-GR HMA TY-D PG70-22 (LEVEL-UP)	TON	33.000		33.000	
	3077-6023	SP MIXESSP-CSAC-B PG70-22	TON	24,601.000		24,601.000	
	3085-6001	UNDERSEAL COURSE	GAL	34,396.000		34,396.000	
	5001-6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	90,033.000		90,033.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000		3.000	
	6185-6002	TMA (STATIONARY)	DAY	459.000		459.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	63.000		63.000	
	18	RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SHEET	LOCATION	502 6001	512 6009	512 6010	512 6033	512 6034	512 6057	512 6058	662 6063	662 6093	662 6095	662 6109	662 6111	6185 6002	6185 6005
		BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	PORT CTB (MOVE) (LOW PROF) (TY 1)	PORT CTB (MOVE) (LOW PROF) (TY 2)	PORT CTB (REMOVE) (LOW PROF) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 2)	WK ZN PAV MRK REMOV (W) 4" (SLD)	WK ZN PAV MRK REMOV (Y) 4" (BRK)	WK ZN PAV MRK REMOV (Y) 4" (SLD)	WK ZN PAV MRK SHT TERM (TAB) TY W	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	TMA (STATIONAR Y)	TMA (MOBILE OPERATION)
		MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	DAY OTU	DAY
PHASE I SHEETS															
1 OF 1	PHASE I								61,397	16,428	44,653			50	
PHASE II SHEETS															
1 OF 8	PHASE II - CULVERT A1														
2 OF 8	PHASE II - CULVERT B1		80	40	80	40									
3 OF 8	PHASE II - CULVERT C1		100		260	80									
4 OF 8	PHASE II - CULVERT D1		100		460	80	220								
5 OF 8	PHASE II - CULVERT E1				60	40	60	40							
6 OF 8	PHASE II - CULVERT F1														
7 OF 8	PHASE II - CULVERT G1														
8 OF 8	PHASE II - CULVERT H1		140	40	140	40	140	40							
	PHASE II SUBTOTAL		420	80	1,000	280	420	80						153	
PHASE III SHEETS															
1 OF 1	PHASE III								31,283		62,566			111	
PHASE IV SHEETS															
1 OF 1	PHASE IV								62,566					145	
PHASE V SHEETS															
1 OF 1	PHASE V											3,052	1,526		63
	PROJECT TOTALS	26	420	80	1,000	280	420	80	155246	16428	107219	3052	1526	459	63



NO.		REVISION		BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
					
FM 725 SUMMARY OF TCP					
SHEET 1 OF 1					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				11
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

FM 725 STATION	STATION QUANTITIES			
	EXCAVATION		EMBANKMENT	
	AREA	VOLUME (CY)	AREA	VOLUME (CY)
241+00.0000 R1	27.4	102.2	10.1	44.8
242+00.0000 R1	26.8	100.4	8.4	34.3
243+00.0000 R1	24.9	95.7	9.9	33.9
244+00.0000 R1	23.1	88.9	14	44.3
245+00.0000 R1	24.6	88.3	11.8	47.8
246+00.0000 R1	24.3	90.6	12.9	45.7
247+00.0000 R1	23.5	88.5	13.1	48.1
248+00.0000 R1	22.6	85.4	10.4	43.5
249+00.0000 R1	23.6	85.6	14.3	45.7
250+00.0000 R1	25.6	91.1	11.2	47.2
251+00.0000 R1	26	95.6	12.6	44.1
252+00.0000 R1	33.7	110.6	9.8	41.5
253+00.0000 R1	46.2	148.0	8.8	34.4
254+00.0000 R1	46.6	171.9	7	29.3
255+00.0000 R1	51.1	180.9	5.6	23.3
256+00.0000 R1	50.7	188.5	5.8	21.1
257+00.0000 R1	45.1	177.4	5.7	21.3
258+00.0000 R1	38.2	154.3	6.3	22.2
259+00.0000 R1	37.1	139.4	5.4	21.7
260+00.0000 R1	25.9	116.7	12.1	32.4
261+00.0000 R1	27.2	98.3	11.9	44.4
262+00.0000 R1	24.9	96.5	6.2	33.5
263+00.0000 R1	28.8	99.4	5	20.7
264+00.0000 R1	31.1	110.9	0.7	10.6
265+00.0000 R1	32.3	117.4	1.4	3.9
266+00.0000 R1	29.8	115.0	1.9	6.1
267+00.0000 R1	29.1	109.1	11	23.9
268+00.0000 R1	19.9	90.7	29.6	75.2
269+00.0000 R1	29.1	90.7	15.7	83.9
270+00.0000 R1	32.1	113.3	15.2	57.2
271+00.0000 R1	49.9	151.9	28.7	81.3
272+00.0000 R1	66.8	216.1	7.1	66.3
273+00.0000 R1	92.3	294.6	1.8	16.5
274+00.0000 R1	31.5	229.3	5.8	14.1
275+00.0000 R1	21.9	98.9	13.8	36.3
276+00.0000 R1	19.6	76.9	34	88.5
277+00.0000 R1	15.6	65.2	60.3	174.6
278+00.0000 R1	20.5	66.9	88.9	276.3
279+00.0000 R1	26.7	87.4	16.7	195.6
280+00.0000 R1	37.1	118.1	8.8	47.2
281+00.0000 R1	33.2	130.2	6.3	28.0
282+00.0000 R1	32.4	121.5	10.7	31.5
283+00.0000 R1	32.9	120.9	9.8	38.0
284+00.0000 R1	37.5	130.4	9.5	35.7
285+00.0000 R1	50.7	163.3	1.4	20.2
286+00.0000 R1	50.5	187.4	6.6	14.8
287+00.0000 R1	32.6	153.9	16.9	43.5
288+00.0000 R1	44	141.9	13.4	56.1
289+00.0000 R1	27.1	131.7	19.3	60.6
290+00.0000 R1	28.8	103.5	18.6	70.2
291+00.0000 R1	15	81.1	29.9	89.8
292+00.0000 R1	16.4	58.1	23.5	98.9
293+00.0000 R1	20.5	68.3	48.8	133.9
294+00.0000 R1	33.8	100.6	30.7	147.2
295+00.0000 R1	21.9	103.1	21.7	97.0
296+00.0000 R1	13.2	65.0	39.8	113.9
297+00.0000 R1	12.8	48.1	34.9	138.3
298+00.0000 R1	24.9	69.8	36.6	132.4
299+00.0000 R1	21.2	85.4	39.3	140.6
300+00.0000 R1	23.3	82.4	26.9	122.6
301+00.0000 R1	26.1	91.5	44.6	132.4
302+00.0000 R1	20.9	87.0	31.8	141.5
303+00.0000 R1	20.4	76.5	39.6	132.2
304+00.0000 R1	20.1	75.0	46.2	158.9
305+00.0000 R1	20.9	75.9	37.8	155.6
306+00.0000 R1	20.7	77.0	25.6	117.4
307+00.0000 R1	19.2	73.9	27.6	98.5
308+00.0000 R1	20	72.6	22	91.9
309+00.0000 R1	19.8	73.7	25.6	88.1
310+00.0000 R1	32	95.9	6.7	59.8
311+00.0000 R1	29.7	114.3	10.6	32.0
312+00.0000 R1	23.7	98.9	20.4	57.4
313+00.0000 R1	26.7	93.3	24.8	83.7
314+00.0000 R1	26.3	98.1	21	84.8
315+00.0000 R1	20.7	87.0	36.5	106.5
316+00.0000 R1	12.6	61.7	20.7	105.9
317+00.0000 R1	12.5	46.5	20.9	77.0

FM 725 STATION	STATION QUANTITIES			
	EXCAVATION		EMBANKMENT	
	AREA	VOLUME (CY)	AREA	VOLUME (CY)
318+00.0000 R1	22.7	65.2	13.3	63.3
319+00.0000 R1	14.4	68.7	12	46.9
320+00.0000 R1	14.2	53.0	7	35.2
321+00.0000 R1	16.2	56.3	5.1	22.4
322+00.0000 R1	16	59.6	5.5	19.6
322+63.8400 R1	0	29.6	0	10.2

GRAND TOTAL	
110 6001	132 6005*
EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (ORD COMP) (TY C)
CY	CY
30,749	14,406



* EMBANKMENT SHALL MEET PI REQUIREMENTS NO LESS THAN 6 AND NO GREATER THAN 25.

NO.		REVISION		BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
					
FM 725 SUMMARY OF EARTHWORK					
SHEET 2 OF 2					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				13
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

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SHEET	LOCATION	100 6002	216 6001	247 6475	310 6027	351 6001	351 6002	351 6013	351 6019	354 6021	432 6001	432 6045	450 6006	540 6001	540 6002	540 6006	540 6016	540 6033	542 6001	542 6002	544 6001	544 6003
		PREPARING ROW	PROOF ROLLING	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	PRIME COAT (MC-30 OR AE-P)	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	FLEXIBLE PAVEMENT STRUCTURE REPAIR (4")	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	PLANE ASPH CONC PAV (0" TO 2")	RIPRAP (CONC) (4 IN)	RIPRAP (MOW STRIP) (4 IN)	RAIL (TY T223)	W-BEAM GD FEN (TIM POST)	W-BEAM GD FEN (STEEL POST)	MTL BEAM GD FEN TRANS (THRIE-B EAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	MTL BM GD FEN (LONG SPAN SYSTEM)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)
PLAN AND PROFILE SHEETS		STA	HR	CY	GAL	SY	SY	SY	SY	SY	CY	CY	LF	LF	LF	EA	EA	EA	LF	EA	EA	EA
107	PLAN AND PROFILE	12	2	599	539		1,743			1,194		5		35							1	
108	PLAN AND PROFILE	12	2	374	337		2,216		187	1,017		33		603			1		613	2	2	2
109	PLAN AND PROFILE	12	2	673	606				1,600	1,601	10											
110	PLAN AND PROFILE	12	2	673	606		574		453	2,176		8		100			1				1	
111	PLAN AND PROFILE	12	2	673	606			454	2,308	440												
112	PLAN AND PROFILE	12	2	706	635			314	2,069	819												
113	PLAN AND PROFILE	12	2	1,142	1,030				299	2,903												
114	PLAN AND PROFILE	12	2	1,054	955				2,055	1,547												
115	PLAN AND PROFILE	12	2	792	713				421	2,781							2	2			2	
116	PLAN AND PROFILE	12	2	673	606	601			2,167	434												
117	PLAN AND PROFILE	12	2	673	606	2,888			314													
118	PLAN AND PROFILE	12	2	673	606	3,201																
119	PLAN AND PROFILE	12	2	1,098	988	3,423																
120	PLAN AND PROFILE	12	2	1,180	1,062	1,834				1,367												
121	PLAN AND PROFILE	12	2	1,192	1,073	3,201													433		2	4
122	PLAN AND PROFILE	12	2	1,192	1,073	3,201																
123	PLAN AND PROFILE	12	2	1,192	1,073	3,201																
124	PLAN AND PROFILE	12	2	1,192	1,073	3,201																
125	PLAN AND PROFILE	12	2	1,192	1,072	3,201																
126	PLAN AND PROFILE	12	2	1,192	1,073	2,295				907												
127	PLAN AND PROFILE	12	2	1,193	1,072	314	67		2,508	314												
128	PLAN AND PROFILE	12	2	1,192	1,073		2,634		569		105	15		263					113	2	1	
129	PLAN AND PROFILE	12	2	1,198	1,083		3,021		421		10	11		163			1				1	
130	PLAN AND PROFILE	12	2	1,056	950				3,563	360												
131	PLAN AND PROFILE	12	2	1,192	1,072				2,929	274												
132	PLAN AND PROFILE	12	2	1,007	906				1,571	2,297												
133	PLAN AND PROFILE	1	2	48	43			121														
PROJECT TOTALS		313	54	25,021	22,531	30,561	18,439	768	18,423	17,500	312	152	192	2,214	50	4	11	2	1,930	4	13	12

SHEET	LOCATION	560 6001	560 6002	560 6003	3076 6001	3076 6043	3077 6023	3085 6001	5001 6002
		MAILBOX INSTALL-S (TWG-POST) TY 1	MAILBOX INSTALL-D (TWG-POST) TY 1	MAILBOX INSTALL-M (TWG-POST) TY 1	D-GR HMA TY-B PG64-22	D-GR HMA TY-D PG70-22 (LEVEL-UP)	SP MIXES SP-C SAC-B PG70-22	UNDERSEAL COURSE	GEOGRID BASE REINFORCEMENT (TY II)
PLAN AND PROFILE SHEETS		EA	EA	EA	TON	TON	TON	GAL	SY
107	PLAN AND PROFILE	4		1	571		602	1,055	2,154
108	PLAN AND PROFILE	2		1	358		534	938	1,347
109	PLAN AND PROFILE	7	4	1	641		619	1,085	2,423
110	PLAN AND PROFILE	2	3		641		619	1,085	2,423
111	PLAN AND PROFILE			1	641		619	1,085	2,423
112	PLAN AND PROFILE	1			670		632	1,108	2,539
113	PLAN AND PROFILE	1	1		1,059		813	1,422	4,110
114	PLAN AND PROFILE	4	1	2	831	16	1,125	1,450	3,791
115	PLAN AND PROFILE	2		1	585		1,006	1,179	2,850
116	PLAN AND PROFILE	1			503		932	1,094	2,423
117	PLAN AND PROFILE	1			503		932	1,094	2,423
118	PLAN AND PROFILE	2	3	1	503		932	1,094	2,423
119	PLAN AND PROFILE	1	1	2	797		1,234	1,444	3,951
120	PLAN AND PROFILE	1		1	854		1,254	1,467	4,245
121	PLAN AND PROFILE			1	862		1,254	1,467	4,289
122	PLAN AND PROFILE	3			862		1,254	1,467	4,289
123	PLAN AND PROFILE				862		1,254	1,467	4,289
124	PLAN AND PROFILE	5			862		1,254	1,467	4,289
125	PLAN AND PROFILE	1		1	862		1,254	1,467	4,289
126	PLAN AND PROFILE				862		1,254	1,467	4,289
127	PLAN AND PROFILE	4	1		1,056	17	916	1,461	4,289
128	PLAN AND PROFILE	3	1		1,103		834	1,458	4,289
129	PLAN AND PROFILE	6	1		1,110		866	1,514	4,313
130	PLAN AND PROFILE	4	1		982		860	1,505	3,800
131	PLAN AND PROFILE		1		1,103		834	1,458	4,289
132	PLAN AND PROFILE	2		1	938		834	1,458	3,623
133	PLAN AND PROFILE				44		80	140	171
PROJECT TOTALS		57	18	14	20,665	33	24,601	34,396	90,033

NO.	REVISION	BY	DATE
 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
 © 2021			
FM 725 SUMMARY OF ROADWAY			
SCALE: NTS		SHEET 1 OF 1	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		14
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



LOCATION	104 6017	105 6046	464 6003	464 6030	467 6359	467 6517	530 6004	530 6019	530 6021
	REMOVING CONC (DRIVEWAYS)	*REMOVING STAB BASE & ASPH PAV (0"-10")	RC PIPE (CL III) (18 IN)	RC PIPE (ARCH) (CL III) (DES 1)	SET (TY II) (DES 1) (18 IN) (RCP) (4:1) (P)	SET (TY II) (DES 1) (RCP) (4:1) (P)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (TYPE I)	DRIVEWAYS (ACP) (TYPE II)
	SY	SY	LF	LF	EA	EA	SY	SY	SY
1	25						25		
2		78							78
3		61							61
4		133							144
5		64							64
6		9							45
7		24							25
8		67							67
9	61						61		
10		26							26
11		27							27
12	32						32		
13	22						22		
14		6							18
15		6							16
16		17							19
17		23							23
18	19						19		
19									22
20									43
21				20		2			47
22		54			2				56
23		84	63						84
24		40							42
25		24							25
26	34						35		
27				27		2			38
28				26		2			35
29		24							44
30		26							167
31		22							79
32		11							64
33									39
34		24							42
35									44
36									41
37		27							44
38			46		2				128
39									68
40									40
41		17							52
42									46
43		38							39
44		40							41
45	52						53		
46		32							38
47		15							46
48									45
49									44
50		62	28		2				65
51									44
52				17		2			40
53									31
54			36		2				91
55			19		2				63
56			22		2				50
57									51
58									62
59									28
60									20
61									163
62									36
63									49
64		18							37
65									47
66									46

NOTES:
 * FOR CONTRACTOR'S INFORMATION ONLY. WILL BE PAID FOR UNDER ITEM 100-6002 PREP ROW.
 1. REFER TO DITCH PROFILE SHEETS FOR ADDITIONAL DRIVEWAY CULVERT INFORMATION.

NO.		REVISION		BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
					
FM 725 SUMMARY OF DRIVEWAY SHEET 1 OF 3					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				15
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

LOCATION	104 6017	105 6046	464 6003	464 6030	467 6359	467 6517	530 6004	530 6019	530 6021
	REMOVING CONC (DRIVEWAYS)	*REMOVING STAB BASE & ASPH PAV (0"-10")	RC PIPE (CL III) (18 IN)	RC PIPE (ARCH) (CL III) (DES 1)	SET (TY II) (DES 1) (18 IN) (RCP) (4:1) (P)	SET (TY II) (DES 1) (RCP) (4:1) (P)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (TYPE I)	DRIVEWAYS (ACP) (TYPE II)
	SY	SY	LF	LF	EA	EA	SY	SY	SY
67		35							37
68		37							37
69	30						30		
70		6							88
71									30
72		14							45
73		39							39
74		10							11
75									42
76		82							82
77		40							40
78		28							28
79		40							40
80		13							77
81		10							70
82		16							16
83		43							44
84		22							22
85		69							70
86		15							33
87		13							33
88		7							27
89		9							22
90		12							19
91		10							20
92									25
93				29		2			25
94		27		24		2			27
95		83		51		2			84
96		54	19		2				56
97		47	19		2				51
98				16		2			41
99		34		25		2			35
100	19						19		
101									31
102									32
103		248							248
104		26							30
105									44
106									51
107									80
108									91
109				19		2			75
110			23		2				60
111	163			58		2	173		
112			24		2				60
113			20		2				47
114		8	18		2				83
115		5							59
116		3	43		2				56
117		24	100		2				435
118		14	32		2				104
119		10							48
120		4	86		2				43
121		3							56
122			21		2				41
123		65							65
124		46		21		2			47
125				23		2			48
126				18		2			31
127				16		2			25
128				21		2			41
129				23		2			50
130									45
131		91		85		2			92
132	77		36		2		77		



NOTES:
 * FOR CONTRACTOR'S INFORMATION ONLY. WILL BE PAID FOR UNDER ITEM 100-6002 PREP ROW.
 1. REFER TO DITCH PROFILE SHEETS FOR ADDITIONAL DRIVEWAY CULVERT INFORMATION.

NO.		REVISION		BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
					
FM 725 SUMMARY OF DRIVEWAY					
SHEET 2 OF 3					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				16
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

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 DATE:2/28/2021
 TXDOT*MON*PENTABLE.tb1
 TIME:7:23:28 PM OFFICE:SAN
 DATE:2/28/2021
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LOCATION	104 6017	105 6046	464 6003	464 6030	467 6359	467 6517	530 6004	530 6019	530 6021
	REMOVING CONC (DRIVEWAYS)	*REMOVING STAB BASE & ASPH PAV (0"-10")	RC PIPE (CL III) (18 IN)	RC PIPE (ARCH) (CL III) (DES 1)	SET (TY II) (DES 1) (18 IN) (RCP) (4:1) (P)	SET (TY II) (DES 1) (RCP) (4:1) (P)	DRIVEWAYS (CONC)	DRIVEWAYS (ACP) (TYPE I)	DRIVEWAYS (ACP) (TYPE II)
	SY	SY	LF	LF	EA	EA	SY	SY	SY
133		27			2				110
134			16		2				32
135		35	18		2				35
136		28	16		2				30
137									48
138									71
139	101						105		
140		0							96
141		62		27		2			66
142									37
143									161
144									30
145	70						70		
146	96						96		
147		67							67
148									56
149				19		2			26
150				22		2			62
151	36			17		2	38		
152			18		2				49
153			16		2				40
154			22		2				62
155			24		2				49
156			28		2				84
157			17		2				43
158			20		2				53
159									59
160		6							29
161		22							38
162		33							33
163		90							91
SCHUMANN RD								243	
SKI LODGE RD								217	
LAKEVIEW TRAIL (CR 352)								207	
SHORT CUT RD								666	
TERMINAL LOOP RD								1,192	
LAKE CREEK DR								160	
BUCH LN				34		2		107	
LONG CREEK BLVD 1								79	
LONG CREEK BLVD 2								144	
STREET A (SOUTH)								339	
STREET A (NORTH)				38		2		154	
GROVE LN			47		2			183	
ALTWEIN LN								133	
LAKESIDE PASS (SOUTH)			37		2			165	
LEISURE VILLAGE				42		2		131	
ROLLING FORK DR								170	
UNION WINE RD				46		2		294	
RIVER PARK DR								304	
LAKESIDE PASS								541	
SKYFOREST DR				49		2		247	
SCUMANS BEACH RD								315	
JOANNE COVE								236	
PROJECT TOTALS	837	2,831	934	813	62	54	855	6,227	8,170

NOTES:
 * FOR CONTRACTOR'S INFORMATION ONLY. WILL BE PAID FOR UNDER ITEM 100-6002 PREP ROW.
 1. REFER TO DITCH PROFILE SHEETS FOR ADDITIONAL DRIVEWAY CULVERT INFORMATION.

NO.		REVISION		BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
					
FM 725 SUMMARY OF DRIVEWAY SHEET 3 OF 3					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				17
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

SHEET	LOCATION	400 6005	400 6006	403 6001	459 6007	459 6009	460 6004	460 6011	460 6024	462 6051	462 6075	464 6033	464 6034	465 6128	466 6111
		CEM STABIL BKFL CY	CUT & RESTORING PAV SY	TEMPORARY SPL SHORING SF	GABION MATTRESSES (GALV)(12' IN) SY	GABIONS (3' X 3')(GALV) CY	CMP (GAL STL 30 IN) LF	CMP AR (GAL STL DES 4) LF	CMP AR (GAL STL DES 7) LF	CONC BOX CULV (5 FT X 3 FT)(EXTEND) LF	CONC BOX CULV (10 FT X 7 FT)(EXTEND) LF	RC PIPE (ARCH)(CL III)(DES 4) LF	RC PIPE (ARCH)(CL III)(DES 5) LF	INLET (COMPL)(PSL)(FG)(4FTX4FT-4FTX4FT) EA	HEADWALL (CH - PW - A - O)(DES= 4) EA
CULVERT LAYOUT SHEETS															
244	CULVERT LAYOUT A1	9											16		1
245	CULVERT LAYOUT B1	42		91								168			2
246	CULVERT LAYOUT C1	33		211	38					80					
247	CULVERT LAYOUT D1	43	135	601	263						180				
248	CULVERT LAYOUT E1	24		88	13		29								1
249	CULVERT LAYOUT F1	16			9							22			
250	CULVERT LAYOUT G1	6		118	10		13							1	
251	CULVERT LAYOUT H1	72		199		47			93						
PROJECT TOTALS		245	135	1,308	333	47	13	29	93	80	180	184	22	1	4

SHEET	LOCATION	466 6114	466 6156	466 6180	466 6181	466 6233	466 6260	467 6553	467 6561	480 6001	496 6002	496 6005	496 6006
		HEADWALL (CH - PW - A - O)(DES= 7) EA	WINGWALL (FW - O)(HW=9 FT) EA	WINGWALL (PW - 1)(HW=5 FT) EA	WINGWALL (PW - 1)(HW=6 FT) EA	HEADWALL (CH - PW - O)(DIA= 30 IN)(MOD) EA	HEADWALL (CH - PW - A - O)(DES= 4)(MOD) EA	SET (TY II)(DES 4)(RCP)(4: 1)(C) EA	SET (TY II)(DES 5)(RCP)(4: 1)(C) EA	CLEAN EXIST CULVERTS EA	REMOV STR (INLET) EA	REMOV STR (WINGWALL) EA	REMOV STR (HEADWALL) EA
CULVERT LAYOUT SHEETS													
244	CULVERT LAYOUT A1							1		1			2
245	CULVERT LAYOUT B1									1			2
246	CULVERT LAYOUT C1			1	1					1		2	
247	CULVERT LAYOUT D1		2							1		2	
248	CULVERT LAYOUT E1						1			1			2
249	CULVERT LAYOUT F1							2		1			2
250	CULVERT LAYOUT G1					1				1	1		1
251	CULVERT LAYOUT H1	2								1			2
PROJECT TOTALS		2	2	1	1	1	1	1	2	8	1	4	11

NO.	REVISION	BY	DATE
 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312 			
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FM 725 SUMMARY OF CULVERT			
SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6			18
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

PAVEMENT MARKINGS AND DELINEATION SUMMARY

Sheet	0666 6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL) (LF)	0666 6078 REFL PAV MRK TY I (W) (WORD) (100MIL) (LF)	0666 6156 REFL PAV MRK TY I (Y) (MED NOSE) (100MIL) (LF)	0666 6312 RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL) (LF)	0666 6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL) (LF)	0666 6343 REF PROF PAV MRK TY I (W) 6" (SLD) (100MIL) (LF)	0666 6345 REF PROF PAV MRK TY I (Y) 4" (SLD) (100MIL) (LF)
294	175	10			4,188	4,548	804
295	71				4,762	4,706	
296	22				4,785	4,737	
297	88			1,000	4,741	4,343	
298				100	4,800	4,800	
299					4,800	4,800	
300	52		1	1,040	4,308	4,653	600
301	59			1,140	4,554	4,653	
302	68			1,080	4,874	4,536	
303	27			1,160	4,730	4,717	
304	99			1,050	4,649	4,481	
305	109			1,100	5,472	4,491	
306			1	1,080	4,418	4,638	462
307						172	252
TOTAL	770	10	2	8,750	61,081	60,275	2,118

Sheet	0666 6224 PAVEMENT SEALER 4" (LF)	0666 6225 PAVEMENT SEALER 6" (LF)	0666 6230 PAVEMENT SEALER 24" (LF)	0666 6232 PAVEMENT SEALER (WORD) (EA)	0666 6233 PAVEMENT SEALER (MED NOSE) (EA)	0672 6007 REFL PAV MRKR TY I-C (EA)	0672 6009 REFL PAV MRKR TY II-A-A (EA)
294	4,992	4,548	175	10			54
295	4,762	4,706	71				30
296	4,785	4,737	22				30
297	5,741	4,343	88			99	100
298	4,900	4,800					37
299	4,800	4,800					30
300	5,948	4,653	52		1	18	55
301	5,694	4,653	59				56
302	5,954	4,536	68				108
303	5,890	4,717	27				116
304	5,699	4,481	99				106
305	6,572	4,491	109				109
306	5,960	4,638			1		138
307	252	172					6
TOTAL	71,955	60,275	770	10	2	117	975

Sheet	0658 6062 INSTL DEL ASSM (D-SW) SZ1 (BRF) GF2 (BI) (EA)	0658 6099 INSTL OM ASSM (OM-2Z) (WFLX) GND (EA)	0658 6060 REMOVE DEL IN & OBJECT MARKER ASSMS (EA)
294	9		12
295		18	1
296		8	2
297		13	
298	6	13	8
299		14	
300	6	19	7
301		6	
302	8	12	3
303	8	4	4
304	3	27	6
305	6	18	12
306			
307			
TOTAL	46	152	55

NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
TEDSI INFRASTRUCTURE GROUP Consulting Engineers 1201 Interstate Highway 2 Mission, Texas 78572 (936) 424-7898			
Texas Department of Transportation © 2020			
FM 725 PAVEMENT MARKINGS AND DELINEATION SUMMARY			
SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		19
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DATE: 5/26/2021 TIME: 8:38:22 AM
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SMALL SIGNS SUMMARY

Sheet	0644 6001 IN SM RD SN SUP&AM TY10BWC (1) SA (P) (EA)	0644 6004 IN SM RD SN SUP&AM TY10BWG (1) SA (T) (EA)	0644 6007 IN SM RD SN SUP&AM TY10BWG (1) SA (U) (EA)	0644 6030 IN SM RD SN SUP&AM TYS80 (1) SA (T) (EA)	0644 6033 IN SM RD SN SUP&AM TYS80(1)SA(U) (EA)	0644 6036 IN SM RD SN SUP&AM TYS80(1)SA(U-BM) (EA)	0644 6064 IN BRIDGE MNT CLEARANCE SIGN ASSM (TY N) (EA)	0644 6076 REMOVE SM RD SN SUP&AM (EA)
294	22	4			1	2	2	29
295	8	2						10
296	3	2						3
297	14	3	1					18
298	1			1	1			3
299	1	1						2
300	6	2	1					3
301	7	4		1				4
302	6	3			1			6
303	5	3						3
304	11	6	1					8
305	9	4	1		1			6
306	16	4		2				11
307	2							
Total	111	38	4	4	4	2	2	106

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NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
TEDSI INFRASTRUCTURE GROUP Consulting Engineers 1201 Interstate Highway 2 Mission, Texas 78572 (936) 424-7898			
Texas Department of Transportation © 2020			
FM 725 SMALL SIGNS SUMMARY			
SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	20	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

SUMMARY OF SMALL SIGNS

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DATE: 4/27/2021
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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
294	1	W11-8L		36"x36"	✓			10BWG	1	SA	P	
	2	R2-1		30"x36"	✓			10BWG	1	SA	P	
	3	D1-2		90"x24"	✓			10BWG	1	SA	T	
	4	D21-1TL		84"x12"	✓			10BWG	1	SA	T	
	5	W3-3		30"x30"	✓			10BWG	1	SA	P	
	6	M3-1		24"x12"	✓			10BWG	1	SA	P	
		M1-6F		24"x24"	✓							
	7	M2-1		21"x15"	✓			10BWG	1	SA	P	
		M1-6F		24"x24"	✓							
	8	D14-4T		48"x48"	✓			S80	1	SA	U	
		CW21-1aT (FOLDED)		36"x36"								
	9	D2-1		84"x18"	✓			10BWG	1	SA	T	
	10	R7-1R		12"x18"	✓			10BWG	1	SA	P	

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/>

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



FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	21	

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext
FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80							UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic		BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels		TY = TYPE TY N TY S	
294 CONT.	11	R7-1L		12"x18"	✓		10BWG	1	SA	P		
	12	R1-1		36"x36"	✓		10BWG	1	SA	P		
	13	W1-1L		36"x36"	✓		10BWG	1	SA	P		
		W13-1P		18"x18"	✓							
	14	W12-2		36"x36"	✓		10BWG	1	SA	P		
		W12-2TP		24"x18"	✓							
	15	W11-8L		36"x36"	✓		10BWG	1	SA	P		
	16	D21-1TR		84"x12"	✓		10BWG	1	SA	T		
	17	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	18	W12-2a		84"x24"	✓						BRIDGE MOUNTED	
	19	W12-2a		84"x24"	✓						BRIDGE MOUNTED	
	20	W1-9TL		96"x36"	✓		S80	1	SA	U	BM	

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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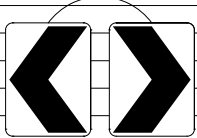
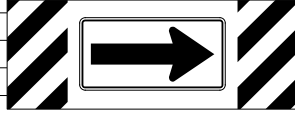
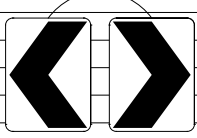
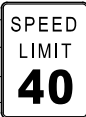
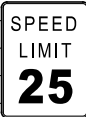
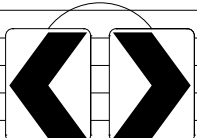


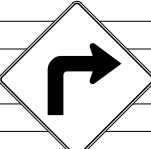



FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 2 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	22	

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
294 CONT.												
	21	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	22	W1-9TR		96"x36"	✓		S80	1	SA	U	BM	
	23	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	24	R2-1		30"x36"	✓		10BWG	1	SA	P		
	25	R2-1		30"x36"	✓		10BWG	1	SA	P		
	26	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	27	W12-2		36"x36"	✓		10BWG	1	SA	P		
		W12-2TP		24"x18"	✓							
	28	W1-1R		36"x36"	✓		10BWG	1	SA	P		
		W13-1P		18"x18"	✓							
	29	S1-1		36"x36"	✓		10BWG	1	SA	P		
		SW16-9P		24"x12"	✓							

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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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FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 3 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	23	

SUMMARY OF SMALL SIGNS

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	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
294 CONT.												
	30	S5-1		24"x48"	✓		10BWG	1	SA	P		
		S7-1T		24"x18"	✓							
	31	S5-2		24"x30"	✓		10BWG	1	SA	P		
295	1	S5-2		24"x30"	✓		10BWG	1	SA	P		
	2	S5-1		24"x48"	✓		10BWG	1	SA	P		
		S7-1T		24"x18"	✓							
	3	D21-1TR		84"x12"	✓		10BWG	1	SA	T		
	4	S1-1		36"x36"	✓		10BWG	1	SA	P		
		SW16-9P		24"x12"	✓							
	5	R1-1		36"x36"	✓		10BWG	1	SA	P		
	6	R2-1		30"x36"	✓		10BWG	1	SA	P		
	7	R2-1		30"x36"	✓		10BWG	1	SA	P		
	8	D21-1TL		84"x12"	✓		10BWG	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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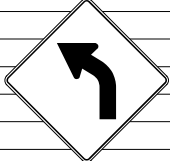






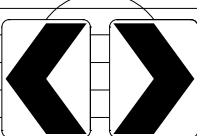

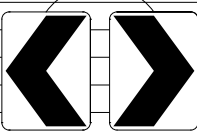
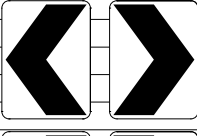
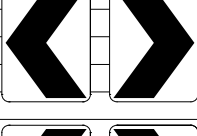
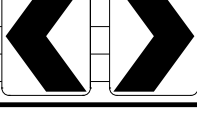
FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 4 OF 15

FILE: slums16.dgn	ON: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	24	

SUMMARY OF SMALL SIGNS

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
295												
CONT.												
	9	W1-2L		36"x36"	✓		10BWG	1	SA	P		
	10	W3-5		36"x36"	✓		10BWG	1	SA	P		
296	1	D21-1TR		90"x12"	✓		10BWG	1	SA	T		
	2	R1-1		36"x36"	✓		10BWG	1	SA	P		
	3	W1-3R W13-1P	 	36"x36" 18"x18"	✓ ✓		10BWG	1	SA	P		
	4	D21-1TL		90"x12"	✓		10BWG	1	SA	T		
	5	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
297	1	D21-1TL		84"x12"	✓		10BWG	1	SA	T		
	2	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	3	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	4	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	5	W1-8L W1-8R		18"x24" 18"x24"	✓		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.
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FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 5 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	25	

DATE: 4/27/2021

FILE: \\halff-pw.bentley.com:halff-pw-01\Documents\34832_000-TXD01*FM-725\CADD\Sheet\S\EDS1\Summary\FM 725-SIGNS_SUMS.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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
297 CONT.	6	R1-1		36"x36"	✓		10BWG	1	SA	P		
	7	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	8	W3-3		30"x30"	✓		MOUNTED ON A SOLAR POWERED FLASHING BEACON (SPFBA) TO BE PAID AS SPFBA RELOCATE					
	9	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	10	D21-1aTR		60"x24"	✓		10BWG	1	SA	T		
	11	D21-1TR		84"x12"	✓		10BWG	1	SA	T		
	12	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	13	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	14	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	15	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	16	R1-2 R5-1		48"x48"x48" 36"x36"	✓		10BWG	1	SA	U		
	17	M1-6F		24"x24"	✓		10BWG	1	SA	P		
		D10-7aT		3"x10"	✓							

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

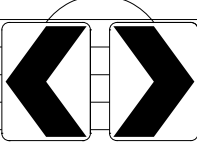
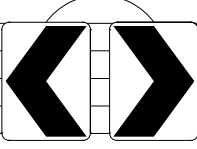

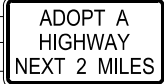


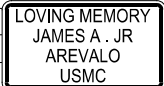

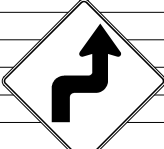





FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 6 OF 15

FILE: slums16.dgn	ON: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
297 CONT.	18	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	19	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	20	D21-1aTL		60"x24"	✓		10BWG	1	SA	T		
298	1	D14-4T CW21-1aT (FOLDED)	 	48"x24" 36"x36"	✓		S80	1	SA	T		
	2	D14-4T CW21-1aT (FOLDED)	  	48"x48" 36"x36"	✓		S80	1	SA	U		
	3	W1-3R W13-1P	 	36"x36" 18"x18"	✓		10BWG	1	SA	P		
299	1	D21-1aTR		60"x24"	✓		10BWG	1	SA	T		
	2	R1-1		36"x36"	✓		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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FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 7 OF 15







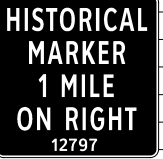




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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	27	

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SUMMARY OF SMALL SIGNS

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
300	1	R1-1		36"x36"	✓		10BWG	1	SA	P	
	2	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	3	D21-1aTL		48"x24"	✓		10BWG	1	SA	T	
	4	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	5	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	6	S3-1		36"x36"	✓		10BWG	1	SA	P	
	7	D7-6aTR		48"x48"	✓		10BWG	1	SA	U	
	8	D21-1TR		60"x12"	✓		10BWG	1	SA	T	
	9	R1-1		36"x36"	✓		10BWG	1	SA	P	
301	1	D21-1TL		60"x12"	✓		10BWG	1	SA	T	
	2	R3-9b		24"x36"	✓		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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

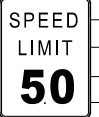
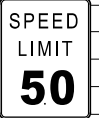







FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 8 OF 15

FILE: slums16.dgn	ON: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	28	

SUMMARY OF SMALL SIGNS

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 DATE: 4/27/2021
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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
301 CONT.	3	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	4	D21-1aTR		66"x24"	✓		10BWG	1	SA	T	
	5	R1-1		36"x36"	✓		10BWG	1	SA	P	
	6	D21-1TaL		60"x24"	✓		10BWG	1	SA	T	
	7	R2-1		30"x36"	✓		10BWG	1	SA	P	
	8	R2-1		30"x36"	✓		10BWG	1	SA	P	
	9	D14-4T CW21-1aT (FOLDED)	 	48"x24" 36"x36"	✓		S80	1	SA	T	
	10	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	11	R3-9b		24"x36"	✓		10BWG	1	SA	P	
	12	D21-1aTR		60"x24"	✓		10BWG	1	SA	T	
302	1	I-3		30"x18"	✓		10BWG	1	SA	P	
	2	I-3		30"x18"	✓		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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FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 9 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	29	

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	TY = TYPE TY N TY S	
302 CONT.	3	D21-1aTL		48"x24"	✓			10BWG	1	SA	T	
	4	D21-1TR		66"x12"	✓			10BWG	1	SA	T	
	5	R3-9b		24"x36"	✓			10BWG	1	SA	P	
	6	R3-9b		24"x36"	✓			10BWG	1	SA	P	
	7	R1-1		36"x36"	✓			10BWG	1	SA	P	
	8	R1-1		36"x36"	✓			10BWG	1	SA	P	
	9	D7-7aTL (R)		48"x48" 48"x48"	✓			S80	1	SA	U	
	10	D21-1TL		66"x12"	✓			10BWG	1	SA	T	
303	1	D21-1TL		72"x12"	✓			10BWG	1	SA	T	
	2	R3-9b		24"x36"	✓			10BWG	1	SA	P	
	3	R3-9b		24"x36"	✓			10BWG	1	SA	P	
	4	R1-1		36"x36"	✓			10BWG	1	SA	P	
	5	R3-9b		24"x36"	✓			10BWG	1	SA	P	

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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7.5 to 15	0.100"
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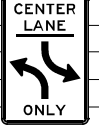



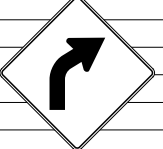

FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 10 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	30	

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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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	TY = TYPE TY N TY S	
303 CONT.	6	R3-9b		24"x36"	✓			1	SA	P		
	7	D21-1TR		72"x12"	✓			1	SA	T		
	8	D21-1TR		84"x12"	✓			1	SA	T		
304	1	R1-1		36"x36"	✓			1	SA	P		
	2	D21-1aTL		54"x24"	✓			1	SA	T		
	3	D21-1TL		84"x12"	✓			1	SA	T		
	4	R1-1		36"x36"	✓			1	SA	P		
	5	D21-1aTL		54"x24"	✓			1	SA	T		
	6	R3-9b		24"x36"	✓			1	SA	P		
	7	R3-9b		24"x36"	✓			1	SA	P		
	8	D21-1aTR		66"x24"	✓			1	SA	T		
	9	R1-1		36"x36"	✓			1	SA	P		
	10	W1-2R		36"x36"	✓			1	SA	P		
	11	D21-1aTR		54"x24"	✓			1	SA	T		

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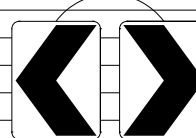
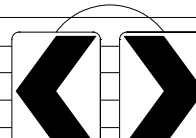



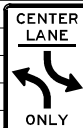





FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 11 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	31	

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
304 CONT.	12	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	13	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	14	D21-1aTL		48"x24"	✓		10BWG	1	SA	T		
	15	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	16	W1-8L W1-8R		18"x24" 18"x24"	✓		10BWG	1	SA	P		
	17	D7-6aTL		48"x48"	✓		10BWG	1	SA	U		
	18	R1-1		36"x36"	✓		10BWG	1	SA	P		
305	1	D21-1aTR		60"x24"	✓		10BWG	1	SA	T		
	2	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	3	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	4	D21-1aTR		54"x24"	✓		10BWG	1	SA	T		
	5	R1-1		36"x36"	✓		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:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD (GEN).

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Traffic Operations Division Standard

FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 12 OF 15

FILE: slums16.dgn	ON: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	32	

SUMMARY OF SMALL SIGNS

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 FILE: \\halff-pw-bent\ey.com\halff-pw-01\Documents\34832_000-TXD01*FM-725-SIGNS-SUMS.dgn

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
305 CONT.	6	D1-2		114"x30"	✓		S80	1	SA	U		
	7	D21-1aTL		48"x24"	✓		10BWG	1	SA	T		
	8	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	9	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	10	W1-2L		36"x36"	✓		10BWG	1	SA	P		
	11	R1-1		36"x36"	✓		10BWG	1	SA	P		
	12	R1-1		36"x36"	✓		10BWG	1	SA	P		
	13	D7-7aTR		48"x48"	✓		10BWG	1	SA	U		
	14	M2-1		21"x15"	✓		10BWG	1	SA	P		
		M1-6F		24"x24"	✓							
	15	D21-1aTR		60"x24"	✓		10BWG	1	SA	T		
306	1	R3-9b		24"x36"	✓		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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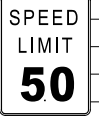

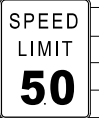
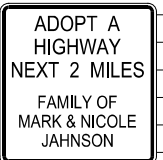









FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 13 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	33	

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
306 CONT.	2	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	3	D1-2		108"x30"	✓		S80	1	SA	T		
	4	R2-1		30"x36"	✓		10BWG	1	SA	P		
	5	I-2aT		84"x24"	✓		10BWG	1	SA	T		
	6	R2-1		30"x36"	✓		10BWG	1	SA	P		
	7	D14-4T		48"x48"	✓		S80	1	SA	T		
		CW21-1aT (FOLDED)		36"x36"								
	8	M3-1		24"x12"	✓							
		M1-6F		24"x24"	✓		10BWG	1	SA	P		
		D10-7aT		3"x10"	✓							
	9	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	10	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	11	W1-2R		36"x36"	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
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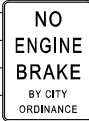















Traffic Operations Division Standard

FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 14 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	34	

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)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
306 CONT.	12	R1-1		36"x36"	✓		10BWG	1	SA	P		
	13	R5-4aT		36"x48"	✓		10BWG	1	SA	P		
	14	D21-1TL		84"x12"	✓		10BWG	1	SA	T		
	15	D21-1aTL		66"x24"	✓		10BWG	1	SA	T		
	16	M2-1		21"x15"	✓		10BWG	1	SA	P		
		M1-6F		24"x24"	✓							
	17	R1-1		36"x36"	✓		10BWG	1	SA	P		
	18	W14-2		30"x30"	✓		10BWG	1	SA	P		
	19	M2-1		21"x15"	✓		10BWG	1	SA	P		
		M1-6F		24"x24"	✓							
	20	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	21	R3-9b		24"x36"	✓		10BWG	1	SA	P		
	22	D21-1TR		84"x12"	✓		10BWG	1	SA	T		
307	1	M2-1		21"x15"	✓		10BWG	1	SA	P		
		M1-6F		24"x24"	✓							
	2	M2-1		21"x15"	✓		10BWG	1	SA	P		
		M1-6F		24"x24"	✓							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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FM 725 SUMMARY OF SMALL SIGNS

SOSS SHEET 15 OF 15

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0215	09	035	FM 725
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	GUADALUPE	35	

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SW3P SUMMARY

SHEET NO.	0161 6017	0164 6035	0164 6051	0168 6001	0166 6002	0169 6002	0506 6002	0506 6011	0506 6021	0506 6024	0506 6038	0506 6039	0506 6041	0506 6043
	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEED (TEMP) (WARM OR COOL)	VEGETATIVE WATERING	* FERTILIZER	SOIL RETENTION BLANKETS (CL 1) (TY B)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 2)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	SY	MG	TON	SY	LF	LF	SY	SY	LF	LF	LF	LF
335	3629	3629	3629	56.70	0.04	3629			312	312	1118	1118	150	150
336	3459	3459	3459	54.05	0.04	3459	45	45	156	156	2206	2206	120	120
337	3976	3976	3976	62.13	0.04	3976			312	312	3808	3808	120	120
338	5360	5360	5360	83.75	0.06	5360			84	84	3737	3737	90	90
339	9762	9762	9762	152.53	0.10	9762	45	45	312	312	4565	4565	120	120
340	10173	10173	10173	158.95	0.11	10173			312	312	2854	2854	90	90
341	6067	6067	6067	94.80	0.06	6067	45	45	312	312	2757	2757	150	150
342	7753	7753	7753	121.14	0.08	7753			312	312	966	966	120	120
343	6067	6067	6067	94.80	0.06	6067	75	75	312	312	3937	3937	75	75
344	5166	5166	5166	80.72	0.05	5166	45	45	312	312	2012	2012	75	75
345	5096	5096	5096	79.63	0.05	5096	45	45	312	312	2838	2838	90	90
346	4198	4198	4198	65.59	0.04	4198	45	45	312	312	2517	2517	150	150
347	2314	2314	2314	36.16	0.02	2314			312	312	2424	2424	75	75
348	243	243	243	3.80	0.00	243			156	156	44	44	30	30
TOTAL	73263	73263	73263	1144.73	0.8	73263	345	345	3828	3828	35783	35783	1455	1455

NOTE:

* ITEM 166 shall not be paid for directly but will be subsidiary to ITEM 164.

NO.	REVISION	BY	DATE
<div style="display: inline-block; vertical-align: middle; font-size: 8px; margin-left: 5px;"> 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312 </div>			
<div style="display: inline-block; vertical-align: middle; font-size: 8px; margin-left: 5px;"> TEDSI INFRASTRUCTURE GROUP Consulting Engineers 1201 Interstate Highway 2 Mission, Texas 78572 (936) 424-7898 </div>			
<div style="display: inline-block; vertical-align: middle; font-size: 8px; margin-left: 5px;"> Texas Department of Transportation © 2021 </div>			
<h3 style="margin: 0;">FM 725 SW3P SUMMARY</h3>			
SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		36
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TXDOT*MON*PENTABLE.tb1 TIME:11:53:09 PM OFFICE:SAN
 DATE:4/27/2021
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DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

1. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.
2. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.
3. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.
4. THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING/UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND/OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.

5. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.
6. TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. AT NO TIME SHALL TWO CONSECUTIVE INTERSECTING ROADWAYS BE CLOSED AT ONE TIME DURING CONSTRUCTION.
8. AT NO TIME SHALL TWO CONSECUTIVE RAMPS BE CLOSED AT ONE TIME DURING CONSTRUCTION OR OVERLAY OPERATIONS.
9. UNLESS OTHERWISE NOTED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER, DAILY LANE CLOSURES SHALL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:

 DAYLIGHT HOURS (DAWN TO DUSK), MONDAY THROUGH FRIDAY OR AS DIRECTED AND APPROVED BY THE ENGINEER.

 NIGHTTIME: ASK AREA ENGINEER AND CONSTRUCTION ENGINEER. (WITH UNIFORMED OFF DUTY LAW ENFORCEMENT OFFICERS).

 WEEKEND CLOSURES WHEN APPROVED BY THE ENGINEER. ASK AREA ENGINEER AND CONSTRUCTION ENGINEER.

 NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES AND/OR SPECIAL EVENTS:
 - o BETWEEN DECEMBER 15 AND JANUARY 1.
 - o WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING
 - o SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.
 - o SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.
 - o FRIDAY, APRIL 2 FOR EASTER WEEKEND.
10. REMOVAL AND DISPOSAL OF EXISTING ABANDONED UTILITIES (EITHER PREVIOUSLY ABANDONED OR ABANDONED DURING THIS PROJECT) REQUIRED TO SUPPORT THIS PROJECT'S CONSTRUCTION SHALL BE PERFORMED UNDER THE OVERALL PREPARE RIGHT-OF-WAY ITEM (ITEM 100).
11. COORDINATE WITH ADJACENT PROJECTS
12. COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.
13. EXCAVATION WITHIN 5 FEET OF AN EXISTING ENERGY POLE WILL REQUIRE POLE BRACING.
14. COORDINATE WITH THE CITY OF SAN ANTONIO OR TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

15. CONTRACTOR SHALL NOT WORK IN AREAS WITH UTILITY CONFLICTS UNTIL THEY ARE CLEARED.
- 2. SEQUENCE OF WORK:**
1. THIS PROJECT WILL BE CONSTRUCTED IN FIVE (5) PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES MUST BE ALLOWED TO DRIVEWAYS AND SIDE STREETS.
 2. PREPARING ROW/REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURRING, AS PER THE PHASES NOTED BELOW.
 3. PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC. BEGIN SURFACE CONSTRUCTION ON HIGH SIDE OF ROAD TO AVOID WATER PONDING ISSUES.
 4. ONCE WORK HAS BEGUN AT A REFERENCE LOCATION, THE ENTIRE SEQUENCE MUST BE WORKED ON CONTINUOUSLY TO COMPLETION.
 5. PROVIDE A SMOOTH TRANSITION AT WORK LIMIT ENDS BEFORE OPENING TO TRAFFIC. MAINTAIN A MINIMUM TAPER RATE OF 50:1 TO TRANSITION FROM CONSTRUCTION TO EXISTING PAVEMENT. INSTALL WORK ZONE TABS AND/OR PAVEMENT MARKINGS TO GUIDE TRAFFIC.
 6. A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

4/27/2021

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NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 TRAFFIC CONTROL PLAN NARRATIVE			
SCALE: NTS		SHEET 1 OF 2	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		37
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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PHASE I (BASE REPAIR):

THE INTENT OF THIS PHASE IS TO PERFORM BASE REPAIR ON THE NORTHBOUND AND SOUTHBOUND LANES.

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL WARNING DEVICES AND/OR SIGNS.
2. THE FOLLOWING OPERATIONS MUST BE LIMITED TO ONLY WHAT CAN BE DONE WITHIN ONE WORKDAY. THE LIMITS OF THE OPERATION MUST BE COMPLETED BY THE TIME SPECIFIED AND BOTH LANES OF TRAFFIC MUST BE REOPENED AT THE CONCLUSION OF EACH WORKDAY.
 - A. UTILIZE TCP (1-2)-18 WITH PILOT CAR TO MAINTAIN ONE-LANE TWO-WAY TRAFFIC CONTROL.
 - B. PERFORM BASE REPAIR.
 - C. INSTALL TEMPORARY PAVEMENT MARKINGS.
 - D. OPEN ALL LANES TO TRAFFIC.

PHASE II (CULVERT EXTENSIONS):

THE INTENT OF THIS PHASE IS EXTEND CULVERTS A1 THROUGH H1 ON THE LT AND RT SIDES.

PHASE IIA

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL WARNING DEVICES, TEMPORARY PAVEMENT MARKINGS, AND/OR SIGNS.
2. CONSTRUCT RIGHT SIDE OF CULVERTS A1, E1 AND F1 UNDER ONE LANE TWO WAY TRAFFIC CONTROL PER THE TCP LAYOUTS AND TCP (1-2)-18.
3. INSTALL LPCB AT CULVERTS B1, C1, D1 AND H1 AS SHOWN ON THE TCP LAYOUTS
4. CONSTRUCT RIGHT SIDE OF CULVERTS B1, C1, D1, E1, AND G1. G1 WILL BE RECONSTRUCTED BEHIND EXIST MBGF.

PHASE IIB (SOUTHBOUND LANES)

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL WARNING DEVICES, TEMPORARY PAVEMENT MARKINGS, AND/OR SIGNS.
2. CONSTRUCT LEFT SIDE OF CULVERTS A1, F1 AND G1 UNDER ONE LANE TWO WAY TRAFFIC CONTROL PER THE TCP LAYOUTS AND TCP (1-2)-18.
3. INSTALL LPCB AT CULVERTS B1, C1, D1, E1, AND H1 AS SHOWN ON THE TCP LAYOUTS.
4. CONSTRUCT LEFT SIDE OF CULVERTS B1, C1, D1, E1, AND H1.

PHASE III (NORTHBOUND WIDENING)

THE INTENT OF THIS PHASE IS TO WIDEN THE RT SIDE OF THE ROADWAY.

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL WARNING DEVICES, TEMPORARY PAVEMENT MARKINGS AND/OR SIGNS.
2. SHIFT TRAFFIC AND PLACE PLASTIC DRUMS AS SHOWN ON TCP LAYOUTS UTILIZING TCP (2-1b)-18 AND TCP (2-3)-18.
3. SAWCUT EXISTING PAVEMENT AND EXCAVATE ROADWAY.
4. PREPARE SUBGRADE.
5. CONSTRUCT FLEX BASE, PLACE PRIME COAT, AND HMA TY B.

PHASE IV (SOUTHBOUND WIDENING)

THE INTENT OF THIS PHASE IS TO WIDEN THE LT SIDE OF THE ROADWAY.

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL WARNING DEVICES, TEMPORARY PAVEMENT MARKINGS AND/OR SIGNS.
2. SHIFT TRAFFIC AND PLACE PLASTIC DRUMS AS SHOWN ON TCP LAYOUTS UTILIZING TCP (2-1b)-18 AND TCP (2-3)-18.
3. SAWCUT EXISTING PAVEMENT AND EXCAVATE ROADWAY.
4. PREPARE SUBGRADE.
5. CONSTRUCT FLEX BASE, PLACE PRIME COAT, AND HMA TY B.

PHASE V (FINAL SURFACE AND CLEAN-UP)

THE INTENT OF THIS PHASE IS TO INSTALL THE FINAL SURFACE ON THE ROADWAY. AND INSTALL ALL PERMANENT SIGNING AND PAVEMENT MARKINGS.

1. INSTALL SW3P ITEMS, TRAFFIC CONTROL DEFIVES AND/OR SIGNS.
2. THE FOLLOWING OPERATIONS MUST BE LIMITED TO ONLY WHAT CAN BE DONE WITHIN ONE WORKDAY. THE LIMITS OF THE OPERATION MUST BE COMPLETED BY THE TIME SPECIFIED AND BOTH LANES OF TRAFFIC MUST BE REOPENED AT THE CONCLUSION OF EACH WORKDAY.
 - A. UTILIZE TCP (1-2)-18 WITH PILOT CAR TO MAINTAIN ONE-LANE TWO-WAY TRAFFIC CONTROL.
 - B. PLACE UNDERSEAL.
 - C. PLACE SP-C.
 - D. UTILIZE TCP (3-3)-14 TO MAINTAIN ONE-LANE TWO-WAY TRAFFIC CONTROL.
 - E. PLACE FINAL PAVEMENT MARKINGS.
 - F. INSTALL SIGNS AND DELINEATION.
 - G. PLACE TOPSOIL AND DRILL SEED.
 - H. FINAL CLEAN-UP.
 - I. REMOVE BARRICADES AND ADVANCE WANRING SIGNS ONLY AFTER PROJECT HAS BEEN ACCEPTED AS COMPLETE BY THE ENGINEER.

3. SAFETY:

1. THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."
2. BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

3. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FLAGGERS AS DIRECTED/APPROVED BY THE ENGINEER, AT SUCH POINTS, AND FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL.

4. THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

1. THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED / APPROVED BY THE ENGINEER.

2. THROUGHOUT CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

5. FINAL CLEAN UP

UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

6. PAYMENT

ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID FOR UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS. ALL WORK ZONE PAVEMENT MARKINGS WILL BE PAID FOR UNDER ITEM 662 WORK ZONE PAVEMENT MARKINGS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS OTHERWISE INDICATED IN THE PLANS.

7. UTILITY RESTRICTIONS

THE CONTRACTOR SHALL ENSURE ALL UTILITIES ARE RELOCATED PRIOR TO CONSTRUCTION OF WORK IN PHASE II. WORK IN THESE PHASES MAY START FOR LOCATIONS WHERE CONSTRUCTION ACTIVITIES ARE NOT IN CONFLICT WITH EXISTING UTILITIES AS APPROVED BY THE ENGINEER.

4/29/2021

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FM 725

**TRAFFIC CONTROL PLAN
NARRATIVE**

SCALE: NTS		SHEET 2 OF 2	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	38	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

LOCATION	ROAD WORK ← NEXT XX MILES NEXT XX MILES →	ROAD WORK ← NEXT XX MILES	ROAD WORK NEXT XX MILES →	END ROAD WORK	WORK ZONE	BEGIN ROAD WORK NEXT XX MILES	NAME ADDRESS CITY STATE CONTRACTOR	STAY ALERT TALK OR TEXT LATER	DO NOT PASS	OBEY WARNING SIGNS STATE LAW	WHEN WORKERS ARE PRESENT	TRAFFIC FINES DOUBLE	BE PREPARED TO STOP	ROUGH ROAD	SHOULDER DROP OFF
	G20-1aT	G20-1bTL	G20-1bTR	G20-2	G20-5aP	G20-5T	G20-6T	G20-10T	R4-1	R20-3T	R20-5aTP	R20-5T	CW3-4	CW8-8	CW8-9aT
①					X	X	X	X	X	X	X	X			
②				X											
③	X	X	X												
④				X											
⑤								X	X	X	X	X	X	X	X

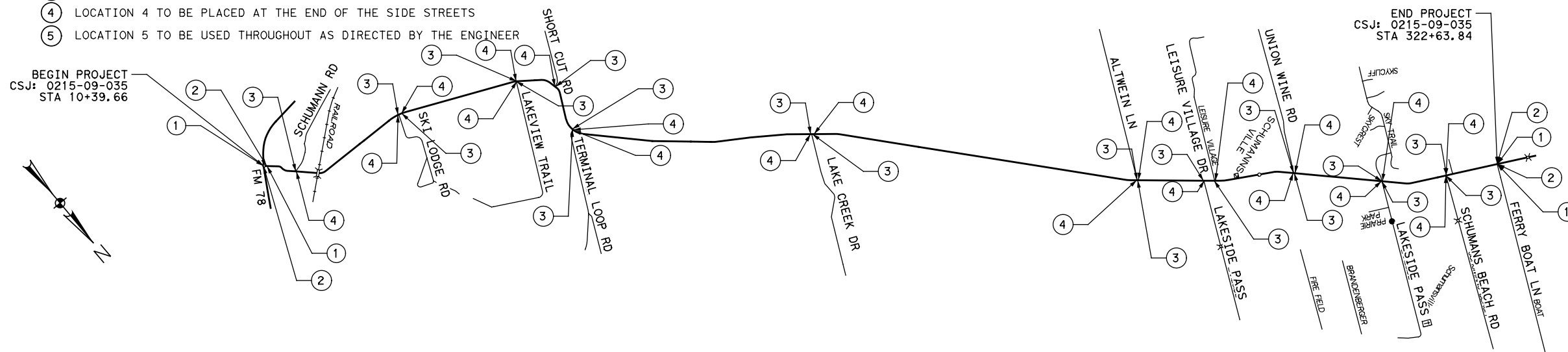
LOCATION	UNEVEN LANES	NO CENTER LINE	XX MPH	XXX FEET	ROAD WORK AHEAD	PEDESTRIAN CROSSING	NARROW LANES AHEAD	FRESH OIL	ROAD MACHINERY AHEAD	SHOULDER WORK	WORK CONVOY	42" TWO-PIECE CONE	OPPOSING TRAFFIC LANE DIVIDER	VERTICAL PANEL	PLASTIC DRUM
	CW8-11	CW8-12	CW13-1P	CW16-2P	CW20-1D	CW20-7	CW20-8T	CW21-2	CW21-3D	CW21-5	CW21-10aT				
①			X	X	X					X	X				
②															
③					X										
④															
⑤	X	X	X	X	X	X	X	X	X	X		X	X	X	X

LOCATION	TY III BARRICADE	PORTABLE CHANGEABLE MESSAGE SIGN	TRAILER MOUNTED FLASHING ARROW PANEL	TRUCK MOUNTED ATTENUATOR
①				
②				
③				
④				
⑤	X	X	X	X

NOTES:

- REFER TO STANDARDS "BC", "TCP", AND "WZ" STANDARDS FOR PLACEMENT OF ADVANCE WARNING SIGNS, BARRICADES, AND OTHER TRAFFIC CONTROL DEVICES.
- BARRICADES ARE NOT TO BE USED AS A SIGN SUPPORT. SUPPORTS FOR SIGNS SHALL BE TEMPORARY, FIXED OR PORTABLE SIGN SUPPORTS, AS DIRECTED BY THE ENGINEER OR IN ACCORDANCE WITH THE "BC" STANDARD SHEETS AND THE TEXAS MUTCD.
- THE DISTANCE PLAQUE IN FEET OR MILES, MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
- ALL CONSTRUCTION TRAFFIC IS TO BE REGULATED SO AS TO CAUSE A MINIMUM OF INCONVENIENCE TO THE TRAVELLING PUBLIC. AT TIMES WHEN IT IS NECESSARY FOR CONSTRUCTION EQUIPMENT OR TRUCKS TO STOP, UNLOAD, OR CROSS ROADWAYS UNDER TRAFFIC, WARNING SIGNS AND FLAGGER SHALL BE PROVIDED AS NECESSARY TO ADEQUATELY PROTECT TRAVELING PUBLIC.
- BARRICADES AND WARNING SIGNS SHOWN ON THIS SHEET ARE MINIMAL WORK ZONE SIGNING. ADDITIONAL BARRICADES, WARNING SIGNS, ARROW PANELS, CONES, ETC. MAY BE REQUIRED IN ACCORDANCE WITH "TCP" SHEETS, TXDOT STANDARDS, AND TEXAS MUTCD.
- CERTAIN SIGNS MUST BE USED IN CONJUNCTION WITH OTHER SIGNS. EXAMPLE: "FLAGGER AHEAD" SIGN MUST BE USED WITH THE "BE PREPARED TO STOP" SIGN.

- LOCATION 1 TO BE PLACED AT BEGINNING OF PROJECT
- LOCATION 2 TO BE PLACED AT THE END OF THE PROJECT
- LOCATION 3 TO BE PLACED AT THE BEGINNING OF THE SIDE STREETS
- LOCATION 4 TO BE PLACED AT THE END OF THE SIDE STREETS
- LOCATION 5 TO BE USED THROUGHOUT AS DIRECTED BY THE ENGINEER



STATE OF TEXAS

★

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

4/27/2021

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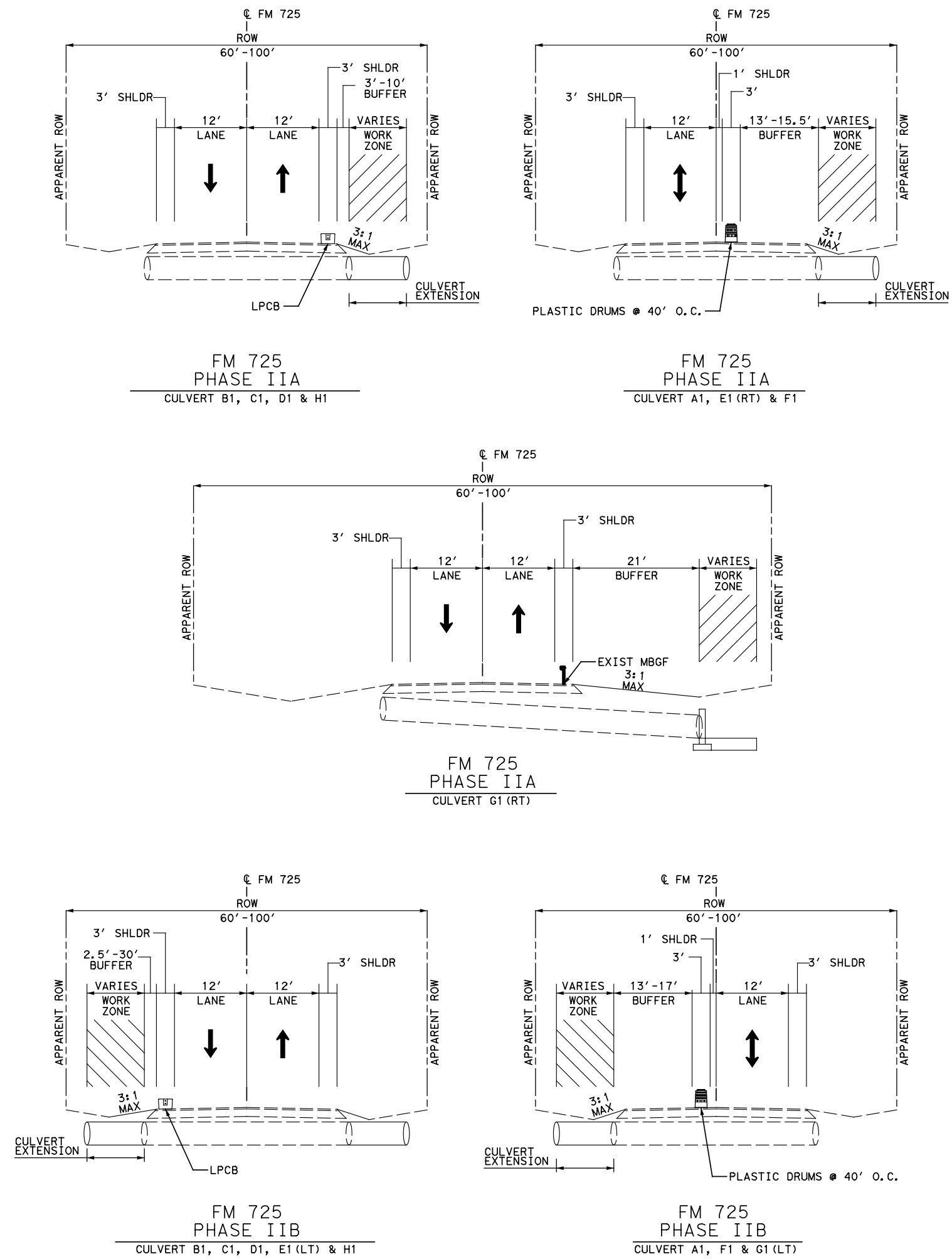
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**FM 725
SCHEDULE OF
BARRICADES &
ADVANCED WARNING
DEVICES**

SCALE: NTS		SHEET 1 OF 1	
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 39
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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LEGEND:

- PROP DIRECTION OF TRAFFIC
- CONSTRUCTION THIS PHASE
- PERMANENT CONSTRUCTION PREVIOUS PHASE
- TEMP PAVEMENT CONSTRUCTION THIS PHASE
- TEMP PAVEMENT CONSTRUCTION PREVIOUS PHASE
- OPPOSING TRAFFIC LANE DIVIDERS
- PLASTIC DRUM
- WK ZN PAV MRK (Y) 4" (SLD) DBL
- WK ZN PAV MRK (W) 4" (SLD)
- LOW PROFILE CONCRETE BARRIER

NOTE(S):

- ONE-LANE TWO-WAY TRAFFIC CONTROL (WITH FLAGGERS, PILOT CAR AND PORTABLE TRAFFIC SIGNALS) WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.

STATE OF TEXAS

JOHNNY L. CLAYTON

107215

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4/14/2021

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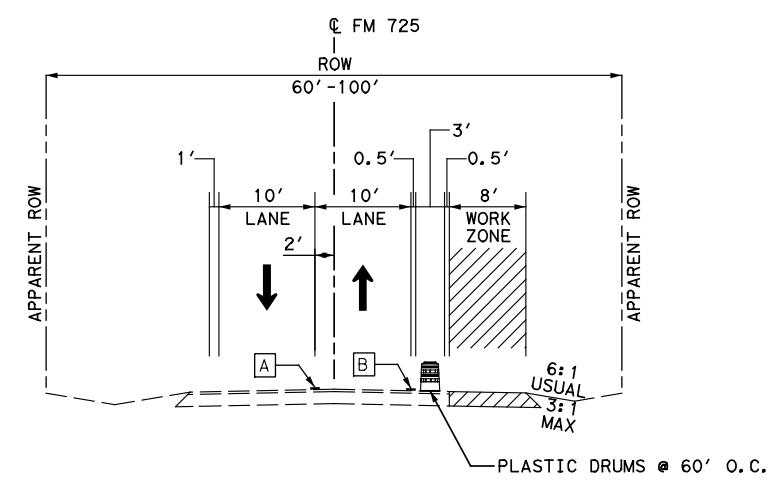
FM 725

TRAFFIC CONTROL PLAN

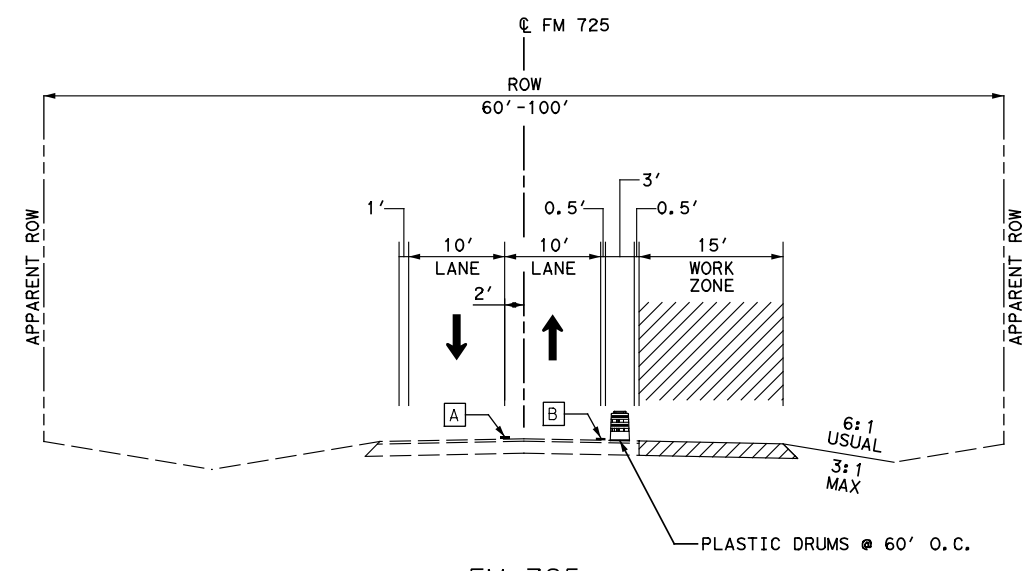
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SCALE: NTS		SHEET 1 OF 2	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	40	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
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0215	09	035	FM 725

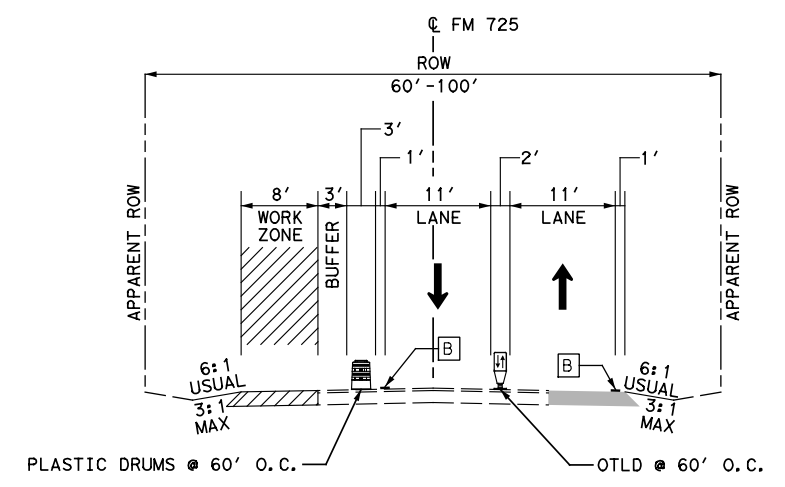
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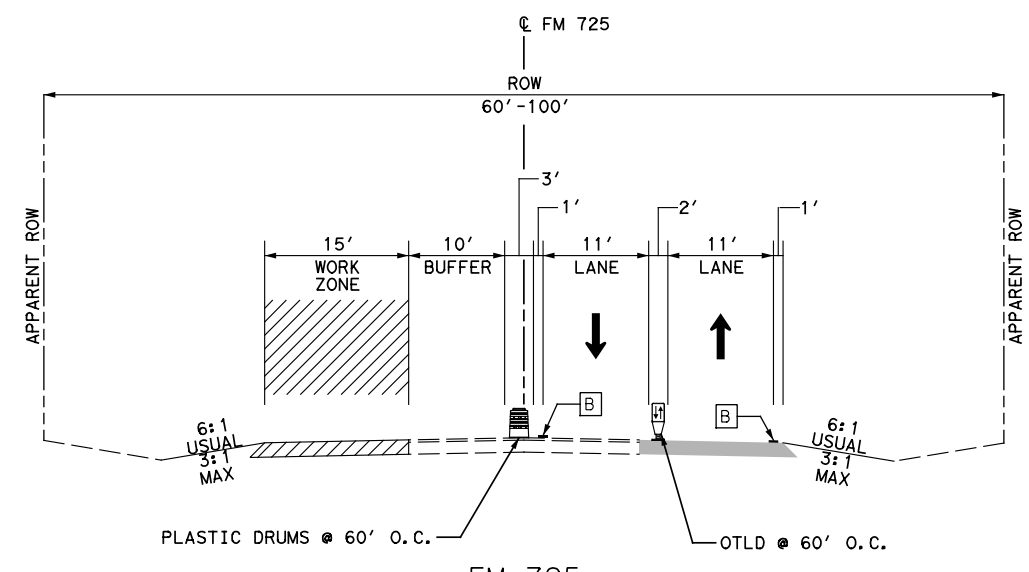
FM 725
 PHASE III
 STA 10+37.83 TO STA 80+50.00
 STA 109+50.00 TO STA 155+50.00



FM 725
 PHASE III
 STA 80+50.00 TO STA 109+50.00
 STA 155+50.00 TO STA 323+20.00



FM 725
 PHASE IV
 STA 10+37.83 TO STA 80+50.00
 STA 109+50.00 TO STA 155+50.00



FM 725
 PHASE IV
 STA 80+50.00 TO STA 109+50.00
 STA 155+50.00 TO STA 323+20.00

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - TEMP PAVEMENT CONSTRUCTION THIS PHASE
 - TEMP PAVEMENT CONSTRUCTION PREVIOUS PHASE

- OPPOSING TRAFFIC LANE DIVIDERS
- PLASTIC DRUM
- WK ZN PAV MRK (Y) 4" (SLD) DBL
- WK ZN PAV MRK (W) 4" (SLD)

NOTE(S):

- ONE-LANE TWO-WAY TRAFFIC CONTROL (WITH FLAGGERS, PILOT CAR AND PORTABLE TRAFFIC SIGNALS) WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.

STATE OF TEXAS

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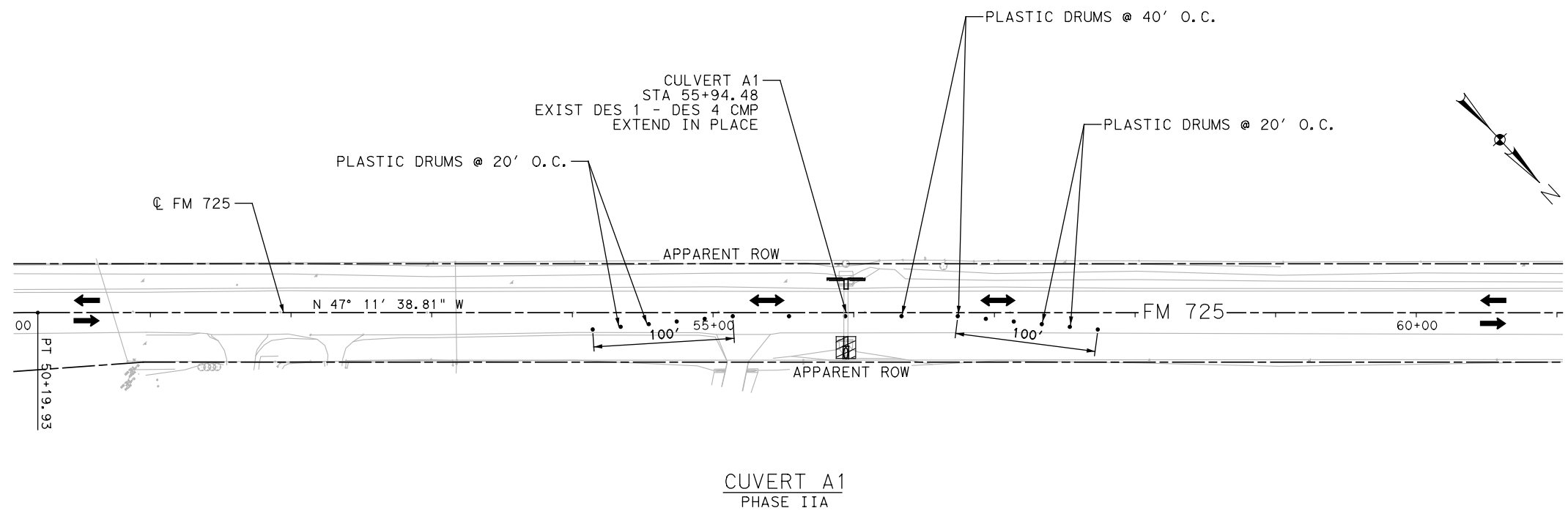
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 TRAFFIC CONTROL PLAN
 TYPICAL SECTIONS

SCALE: NTS		SHEET 2 OF 2	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	41	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

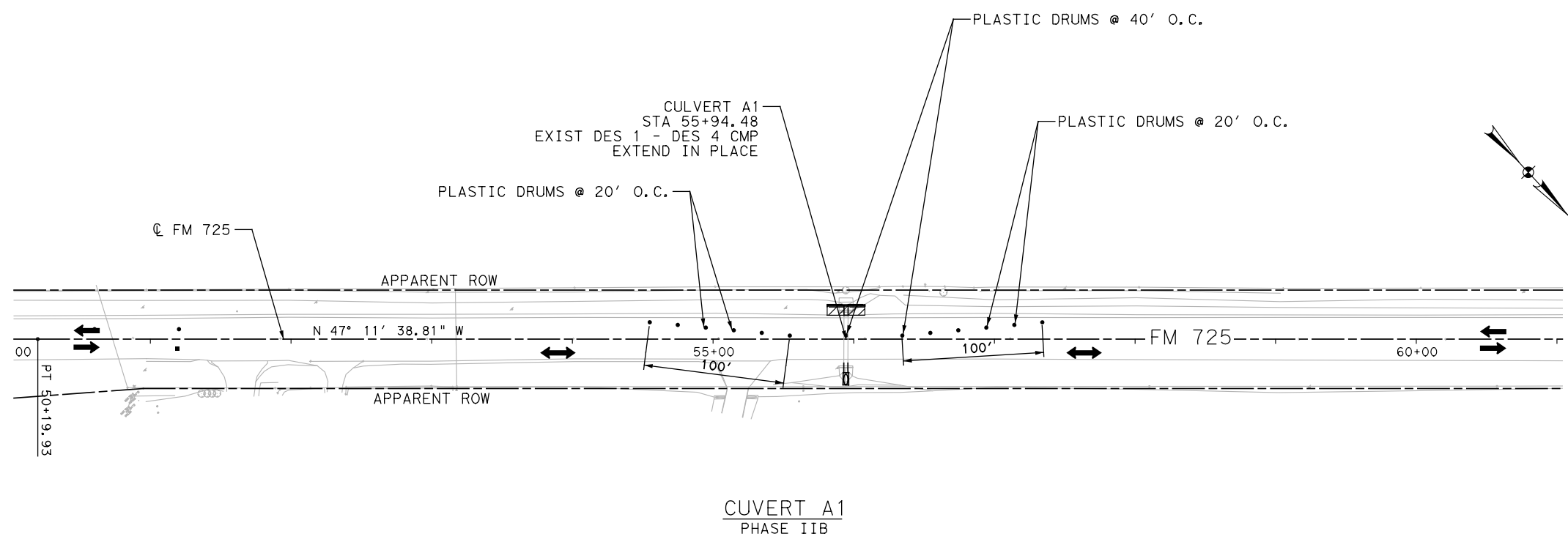
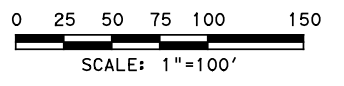
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CUVERT A1
PHASE IIA

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST

- NOTES:**
- REFERENCE TCP (2-2)-18 FOR ADDITIONAL DETAILS



CUVERT A1
PHASE IIB

STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

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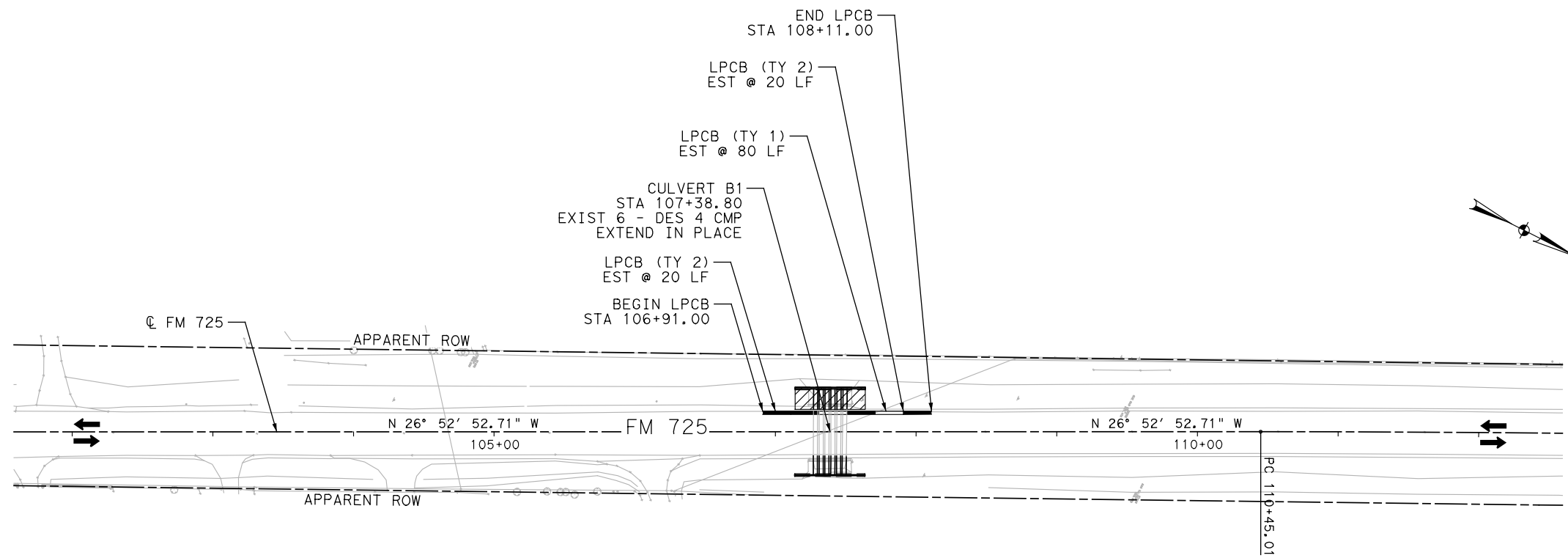
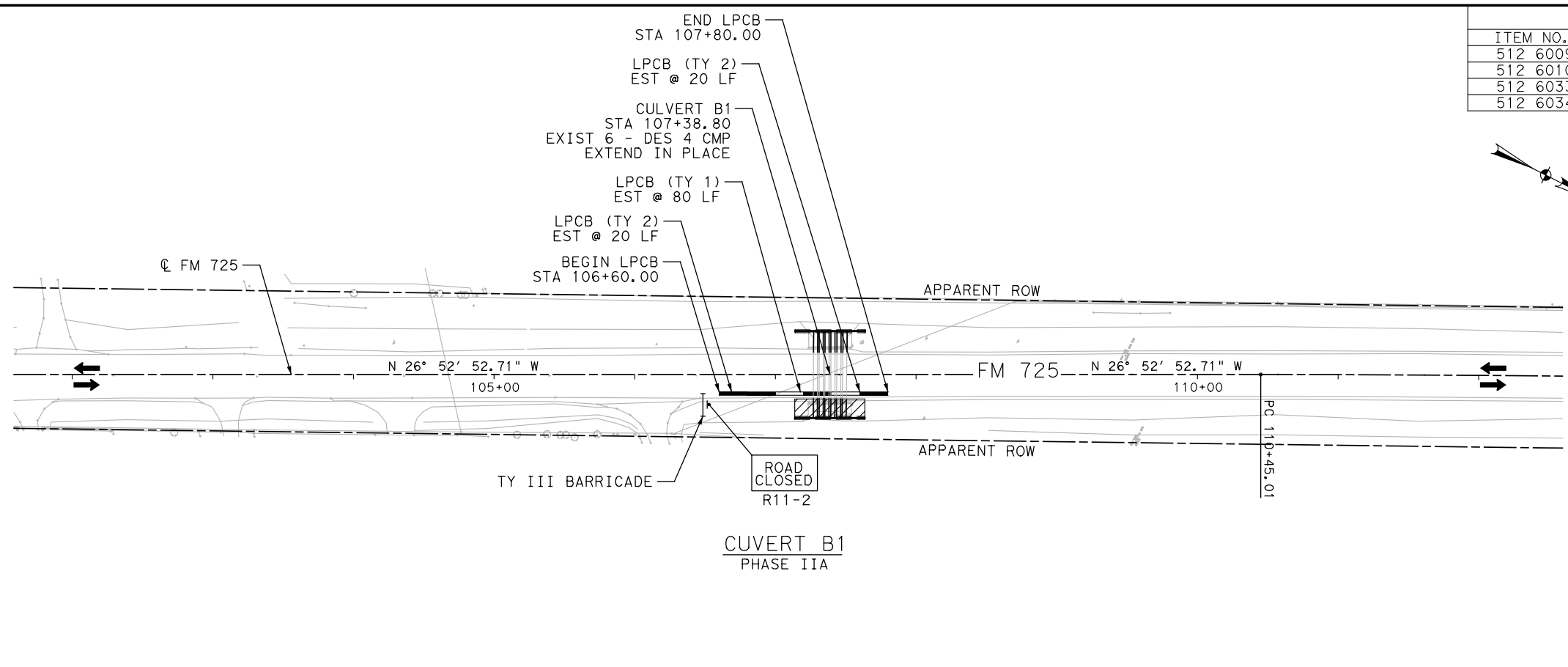
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FM 725
TRAFFIC CONTROL PLAN
AT
CULVERT
PHASE II

SCALE: 1"=100' SHEET 1 OF 8

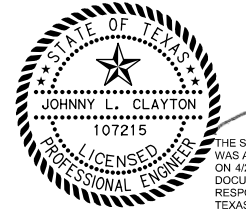
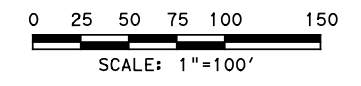
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STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
HIGHWAY NO.		
FM 725		

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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	LF	80
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	LF	40
512 6033	PORT CTB (MOVE) (LOW PROF) (TY 1)	LF	80
512 6034	PORT CTB (MOVE) (LOW PROF) (TY 2)	LF	40

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST



4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
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 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



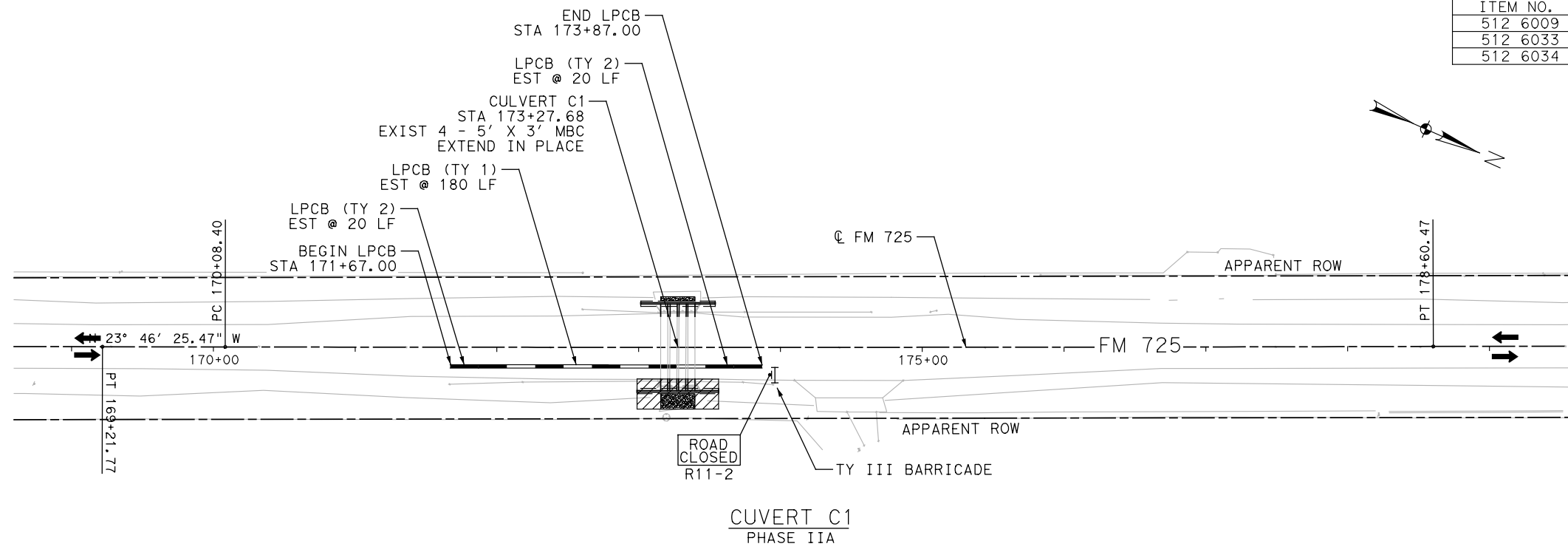
**FM 725
TRAFFIC CONTROL PLAN
AT
CULVERT
PHASE II**

SCALE: 1"=100' SHEET 2 OF 8

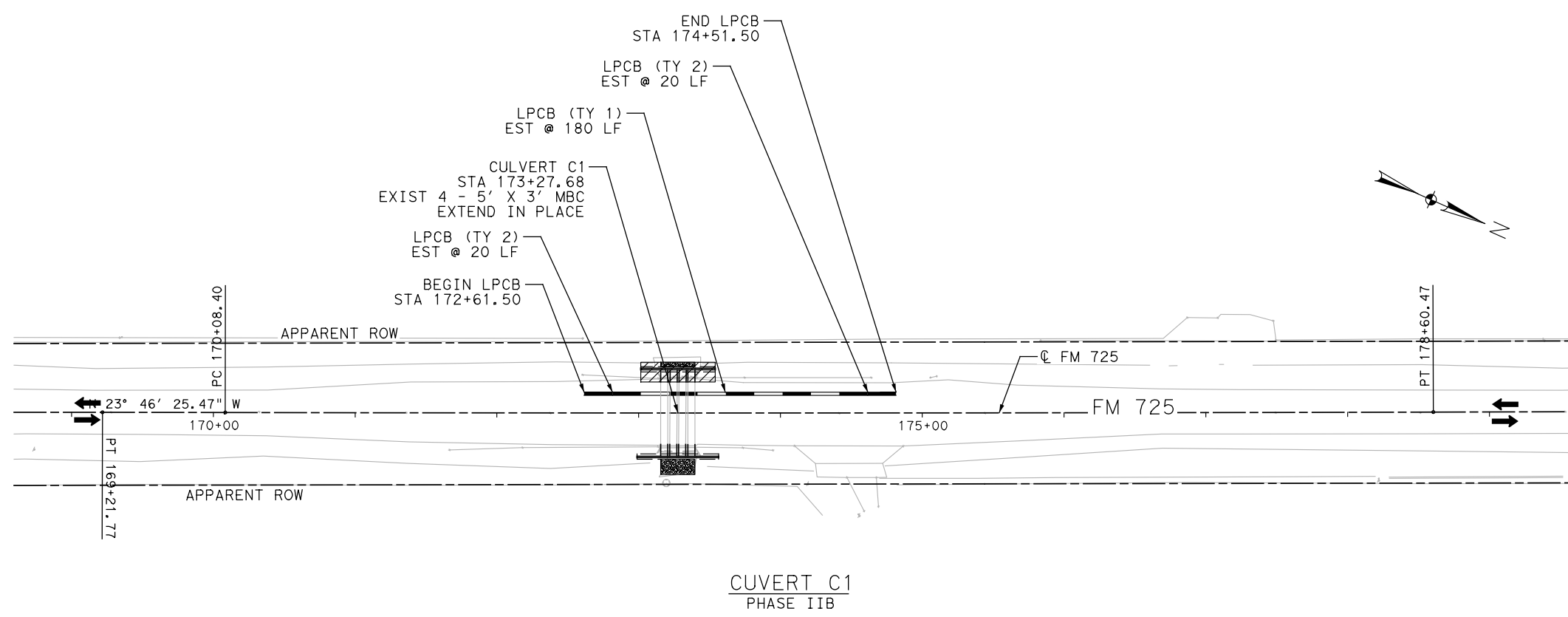
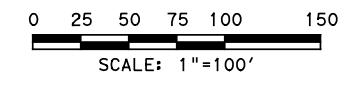
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	LF	100
512 6033	PORT CTB (MOVE) (LOW PROF) (TY 1)	LF	260
512 6034	PORT CTB (MOVE) (LOW PROF) (TY 2)	LF	80



- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

4/27/2021

[Signature]

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NO.	REVISION	BY	DATE

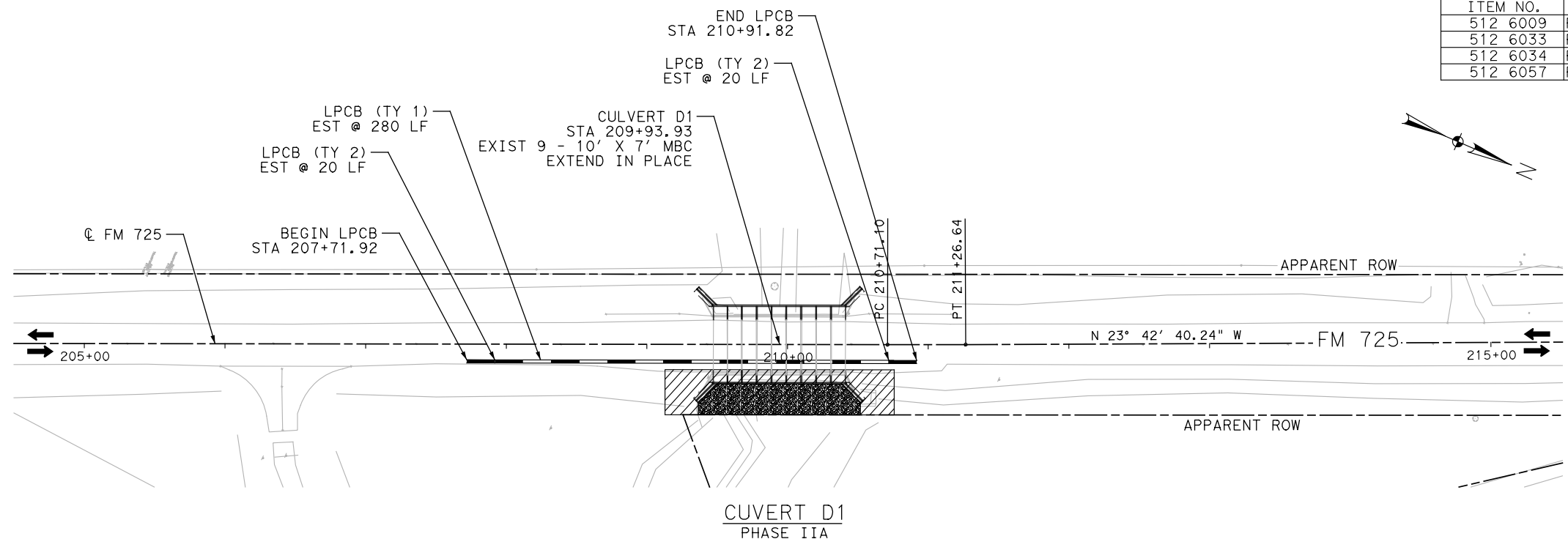
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SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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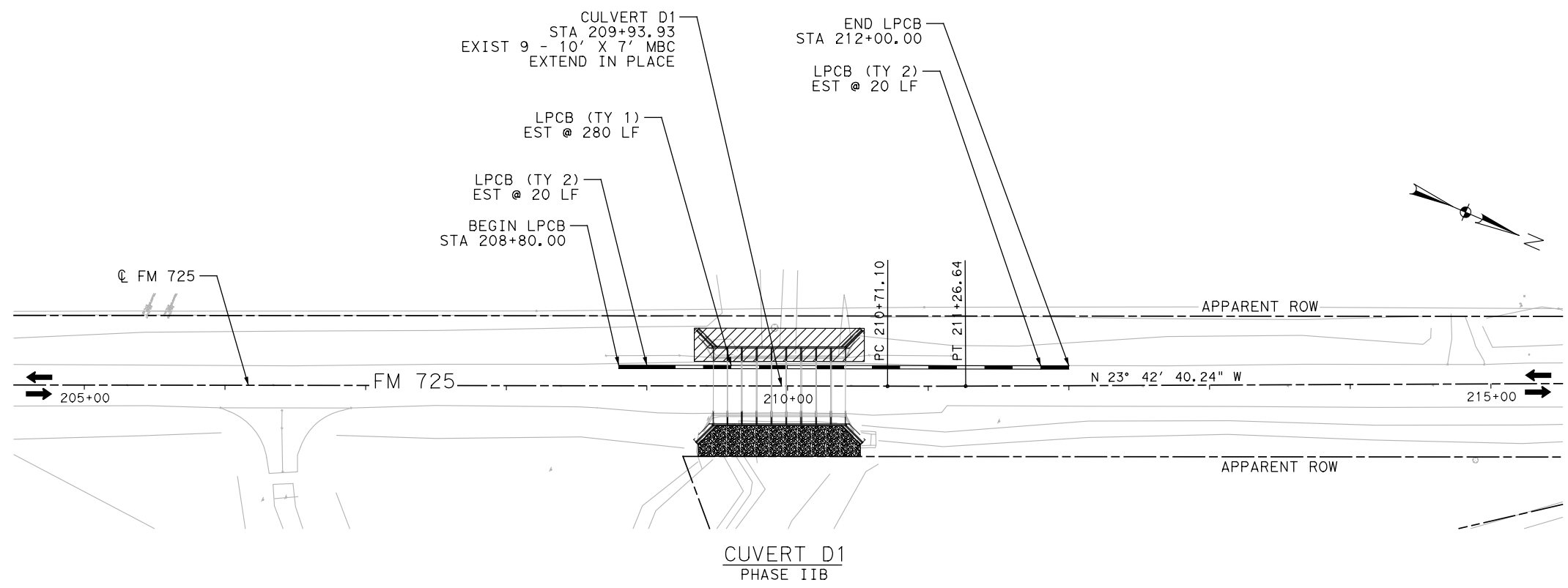
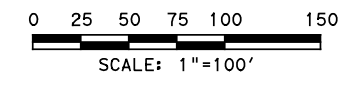
FM 725 TRAFFIC CONTROL PLAN AT CULVERT PHASE II			
SCALE: 1"=100'		SHEET 3 OF 8	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		44
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	LF	100
512 6033	PORT CTB (MOVE) (LOW PROF) (TY 1)	LF	460
512 6034	PORT CTB (MOVE) (LOW PROF) (TY 2)	LF	80
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY 1)	LF	220



- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

4/27/2021

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NO.	REVISION	BY	DATE

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TEL (210) 798-1895 FIRM #F-312

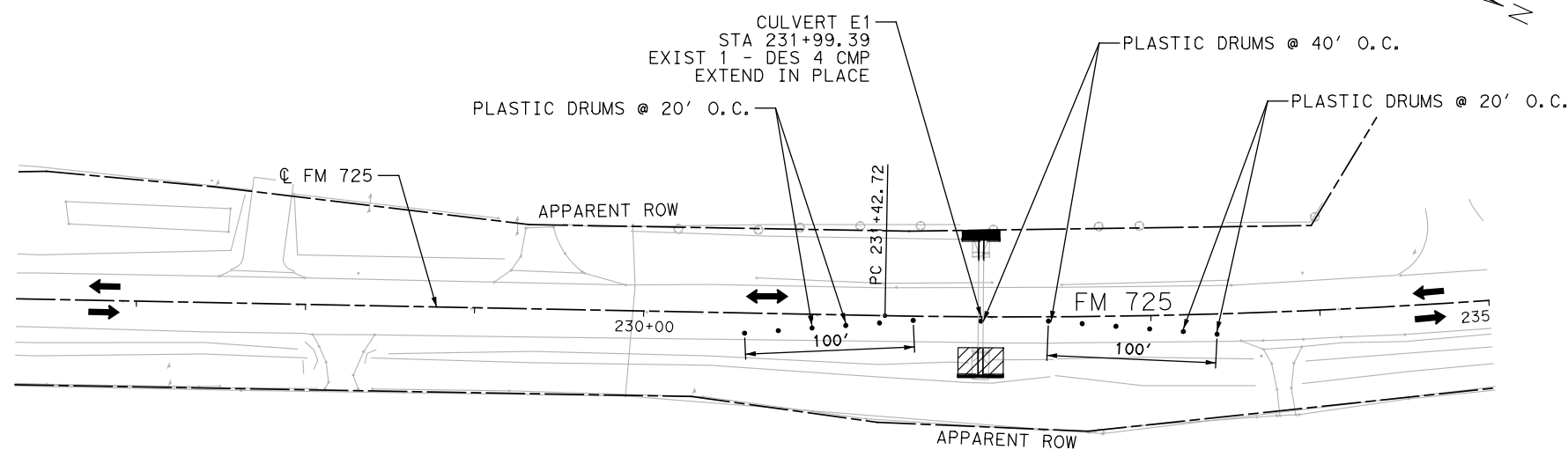
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FM 725
TRAFFIC CONTROL PLAN
AT
CUVERT
PHASE II

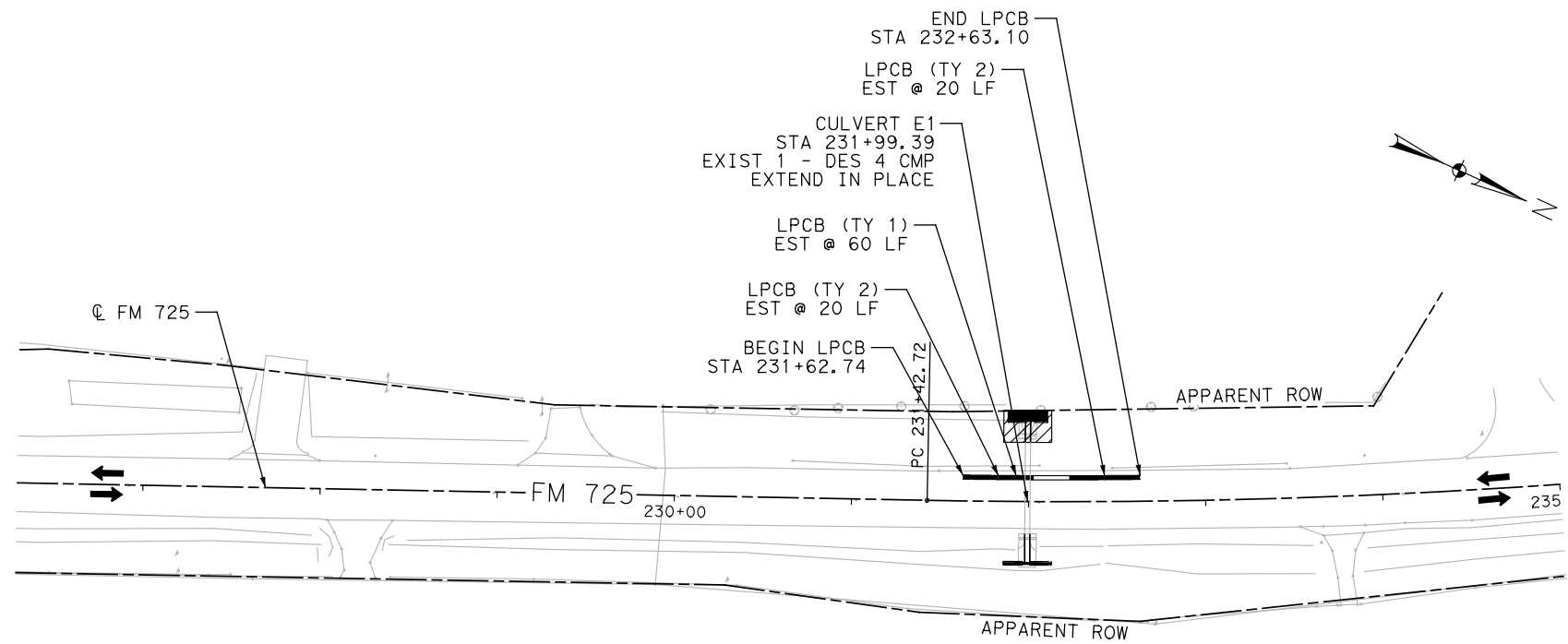
SCALE: 1" = 100' SHEET 4 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	45	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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 4/27/2021



CUVERT E1
PHASE IIA

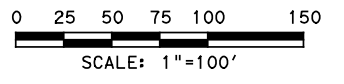


CUVERT E1
PHASE IIB

ESTIMATED QUANTITIES		UNIT	QTY
ITEM NO.	DESCRIPTION		
512 6033	PORT CTB (MOVE) (LOW PROF) (TY 1)	LF	60
512 6034	PORT CTB (MOVE) (LOW PROF) (TY 2)	LF	40
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY 1)	LF	60
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY 2)	LF	40

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST

- NOTE(S):**
- IF CULVERT EXTENSION CANNOT BE COMPLETED WITHIN ONE WORKDAY, SAFETY SLOPES MUST BE INSTALLED UPON THE COMPLETION OF THE WORK DAY.
 - REFERENCE TCP(2-2)-18 FOR ADDITIONAL DETAILS



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

4/27/2021

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NO.	REVISION	BY	DATE

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SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

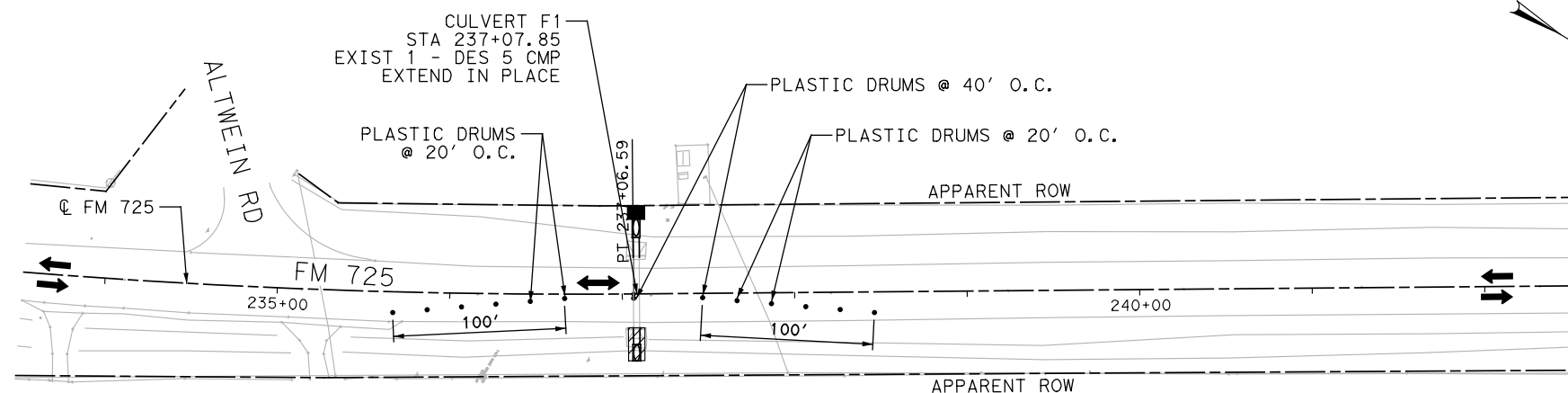
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FM 725
TRAFFIC CONTROL PLAN
AT
CULVERT
PHASE II

SCALE: 1"=100' SHEET 5 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	46	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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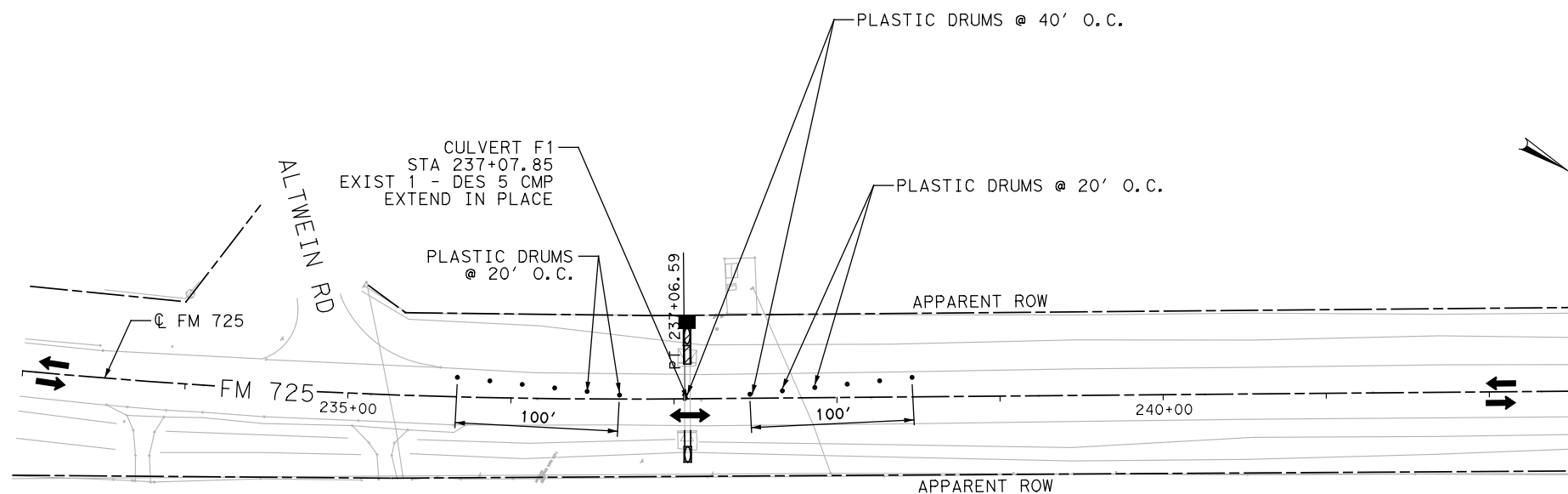
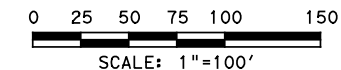
CUVERT F1
PHASE IIA

LEGEND:

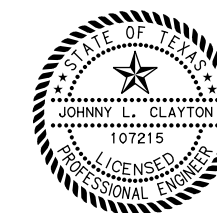
- PROP DIRECTION OF TRAFFIC
- CONSTRUCTION THIS PHASE
- PERMANENT CONSTRUCTION PREVIOUS PHASE
- PORT CTB (LPCB)
- PLASTIC DRUM
- OPPOSING TRF LN DIVIDER (OTLD)
- SIGN POST

NOTE(S):

1. IF CULVERT EXTENSION CANNOT BE COMPLETED WITHIN ONE WORKDAY, SAFETY SLOPES MUST BE INSTALLED UPON THE COMPLETION OF THE WORK DAY.
2. REFERENCE TCP(2-2)-18 FOR ADDITIONAL DETAILS



CUVERT F1
PHASE IIB



4/27/2021

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HALFF 100 NE INTERSTATE 410 LOOP
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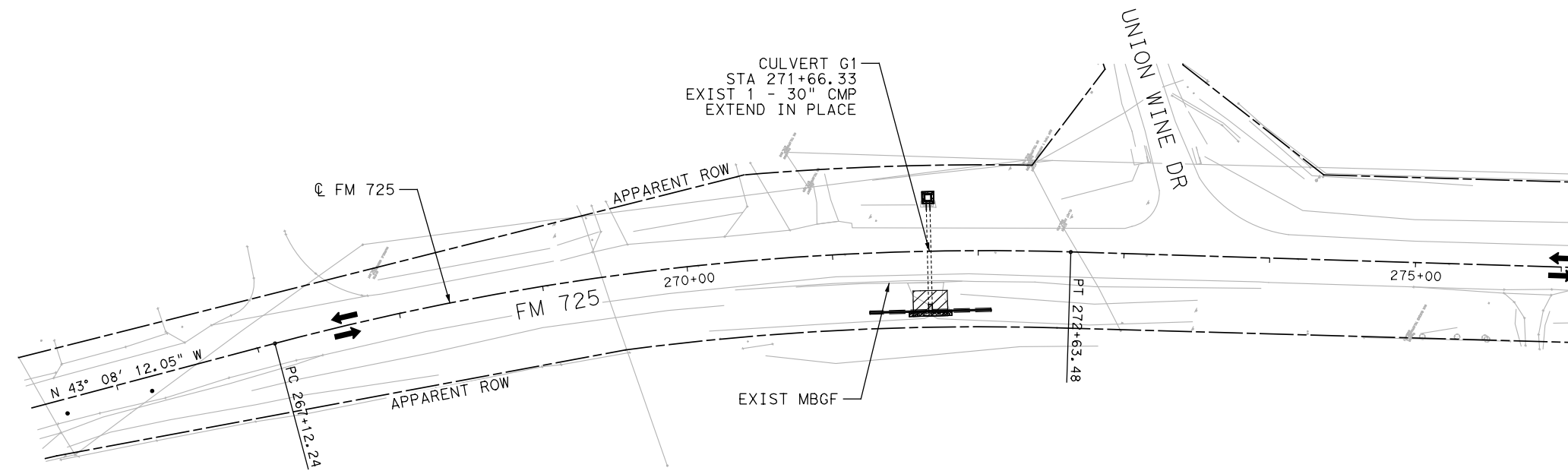


**FM 725
TRAFFIC CONTROL PLAN
AT
CULVERT
PHASE II**

SCALE: 1" = 100' SHEET 6 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	47
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
HIGHWAY NO.		
FM 725		

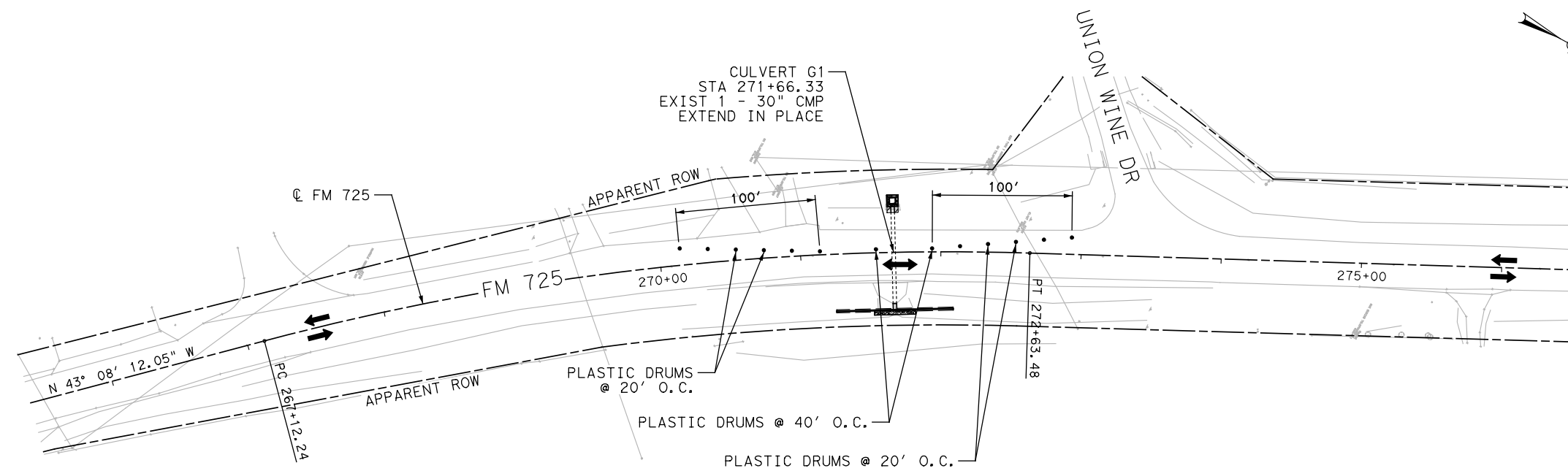
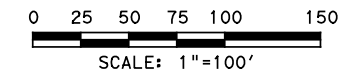
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CUVERT G1
PHASE IIA

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST

- NOTE(S):**
- IF CULVERT EXTENSION CANNOT BE COMPLETED WITHIN ONE WORKDAY, SAFETY SLOPES MUST BE INSTALLED UPON THE COMPLETION OF THE WORK DAY.
 - REFERENCE TCP(2-2)-18 FOR ADDITIONAL DETAILS



CUVERT G1
PHASE IIB

4/27/2021

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NO.	REVISION	BY	DATE

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 TEL (210) 798-1895 FIRM #F-312

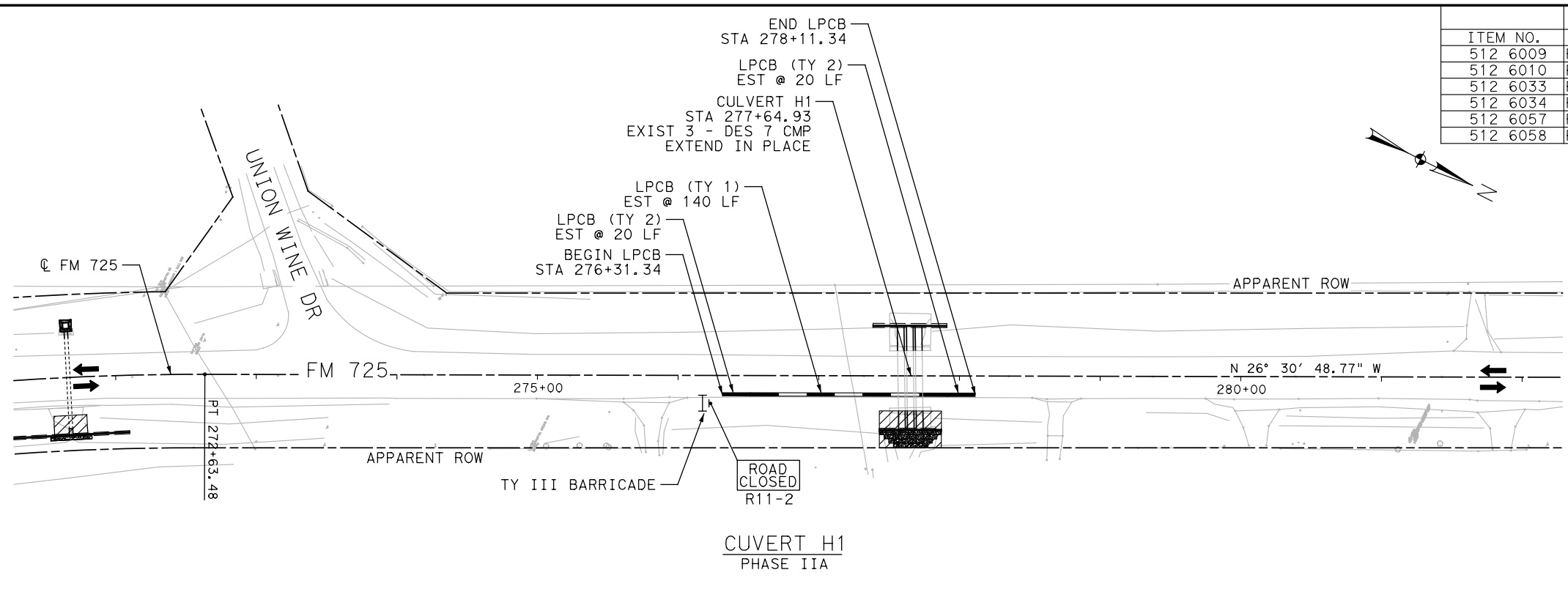
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FM 725
 TRAFFIC CONTROL PLAN
 AT
 CULVERT
 PHASE II

SCALE: 1"=100' SHEET 7 OF 8

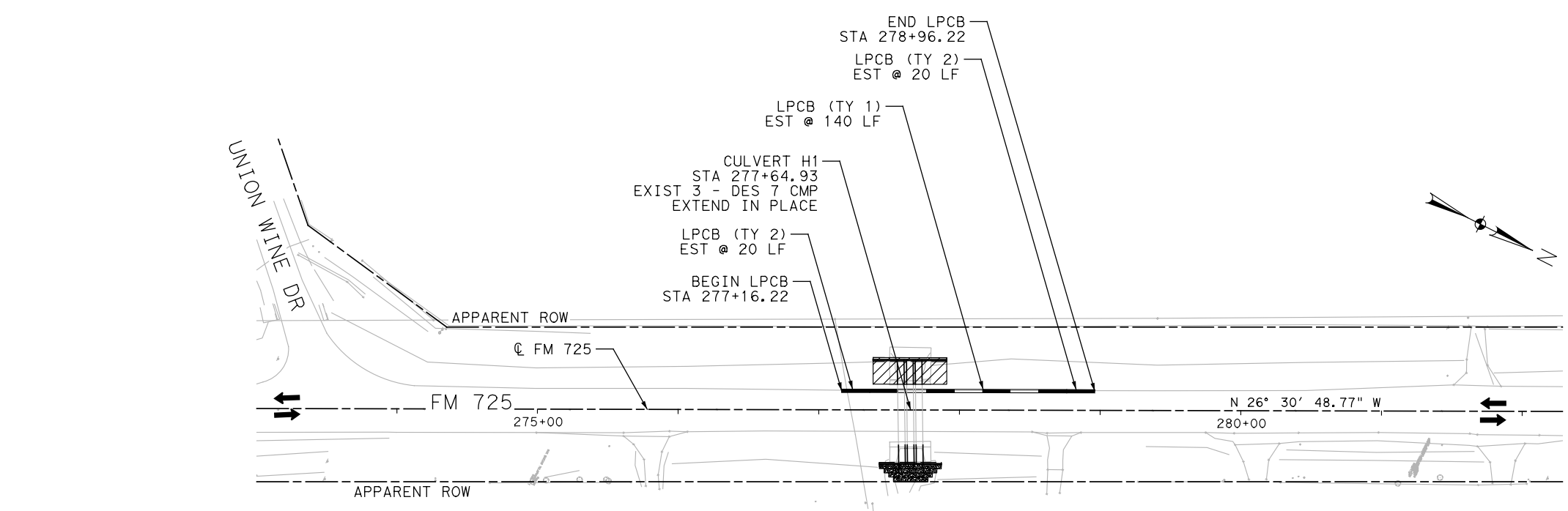
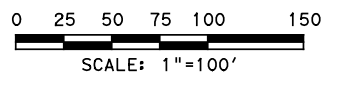
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		48
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
512 6009	PORT CTB (FUR & INST) (LOW PROF) (TY 1)	LF	140
512 6010	PORT CTB (FUR & INST) (LOW PROF) (TY 2)	LF	40
512 6033	PORT CTB (MOVE) (LOW PROF) (TY 1)	LF	140
512 6034	PORT CTB (MOVE) (LOW PROF) (TY 2)	LF	40
512 6057	PORT CTB (REMOVE) (LOW PROF) (TY 1)	LF	140
512 6058	PORT CTB (REMOVE) (LOW PROF) (TY 2)	LF	40

- LEGEND:**
- PROP DIRECTION OF TRAFFIC
 - CONSTRUCTION THIS PHASE
 - PERMANENT CONSTRUCTION PREVIOUS PHASE
 - PORT CTB (LPCB)
 - PLASTIC DRUM
 - OPPOSING TRF LN DIVIDER (OTLD)
 - SIGN POST



4/27/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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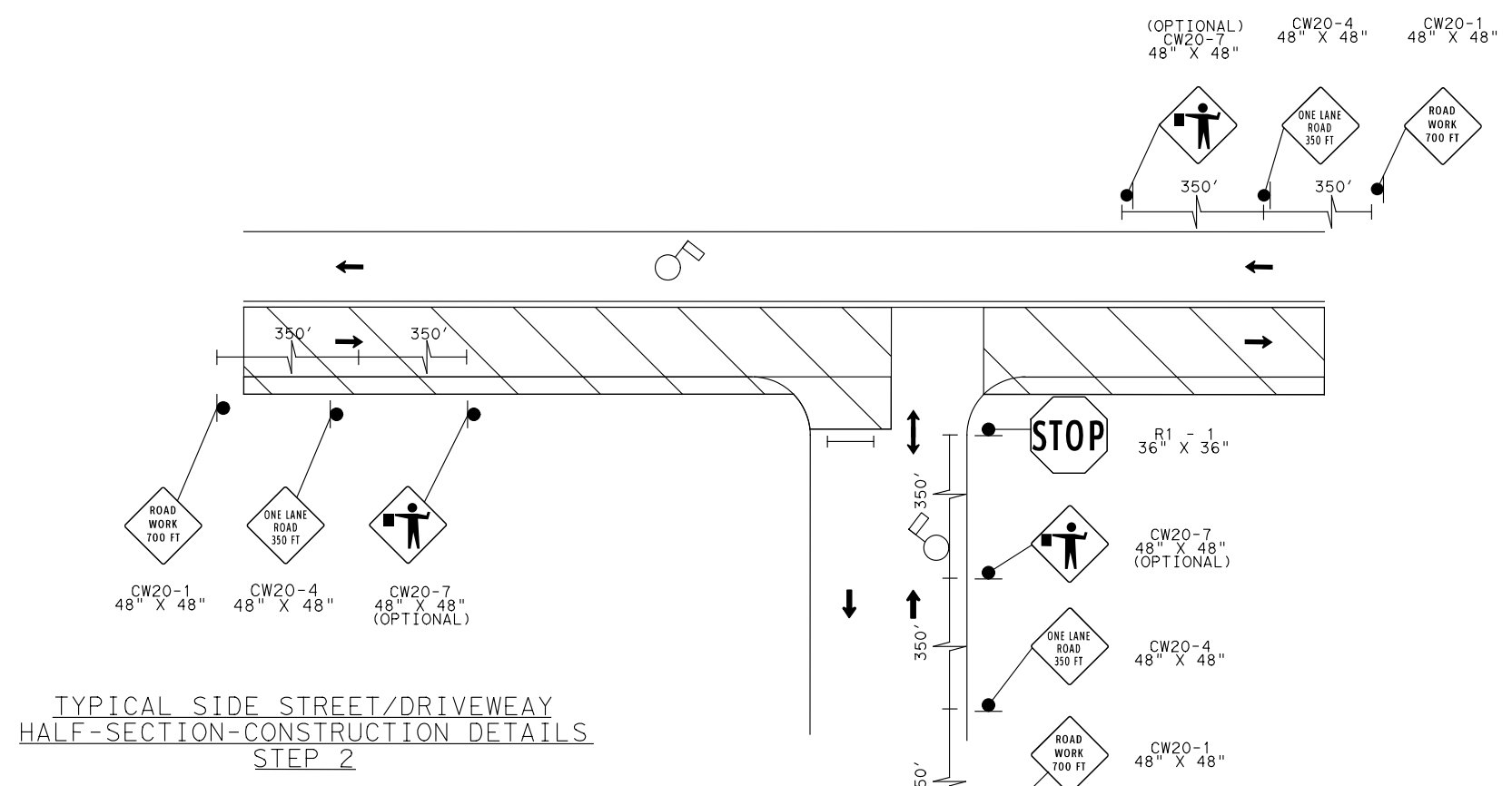
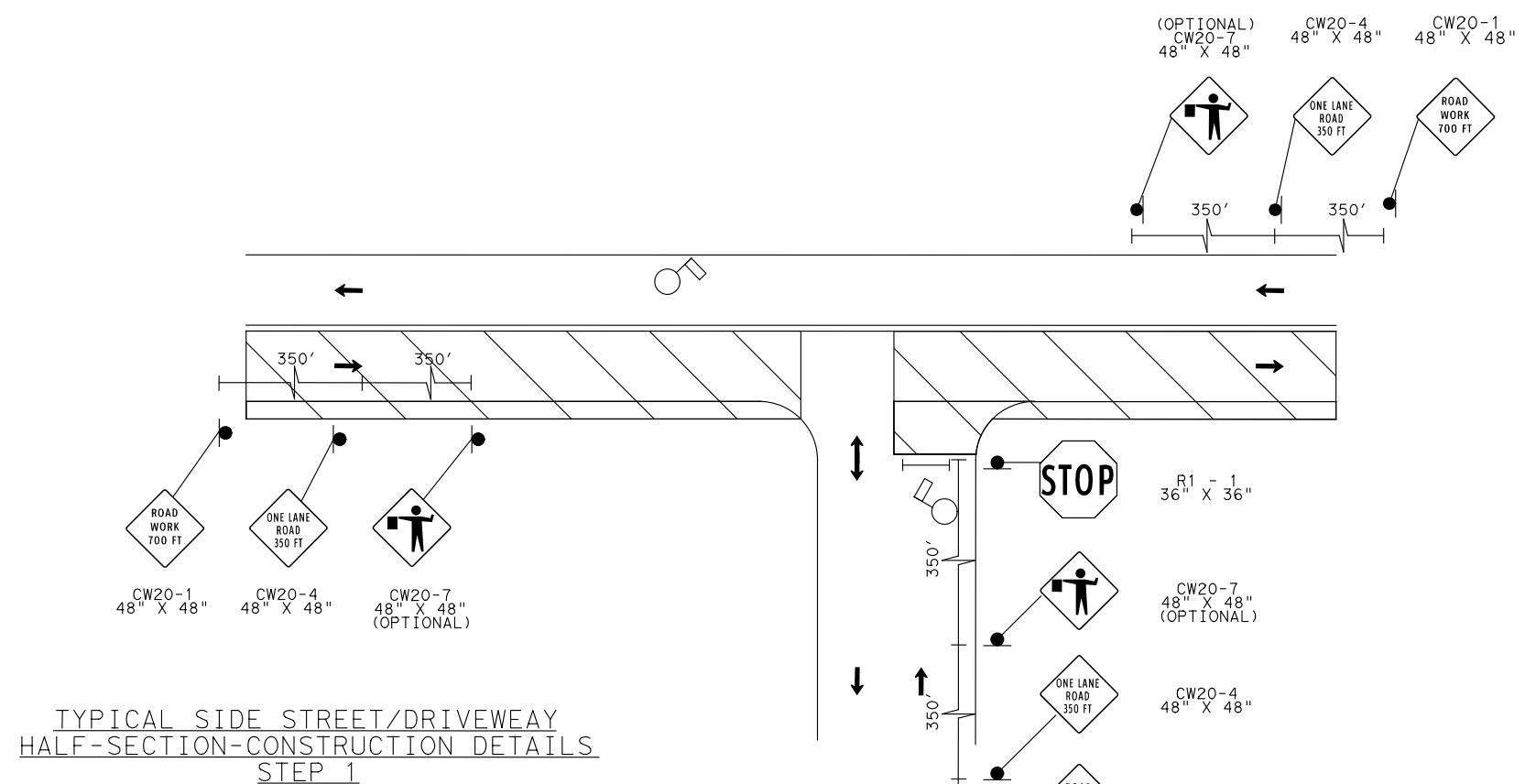
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**FM 725
TRAFFIC CONTROL PLAN
AT
CULVERT
PHASE II**

SCALE: 1" = 100' SHEET 8 OF 8

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 49
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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 DATE: 02/23/2021
 TIME: 7:44:47 PM OFFICE: SAN
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 DATE: 02/23/2021
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- LEGEND:**
- CONSTRUCTION THIS PHASE
 - FLAGMAN LOCATION
 - SIGN POST
 - TYPE 3 BARRICADE
 - TRAFFIC FLOW ARROW OR DETOUR ROUTE

- NOTES:**
1. THE CONTRACTOR SHALL COORDINATE ALL STREET AND DRIVEWAY CLOSURES PRIOR TO COMMENCEMENT OF CONSTRUCTION. PROPERTIES WITH MORE THAN ONE DRIVEWAY SHALL BE RECONSTRUCTED ONE DRIVEWAY AT A TIME BEFORE PROCEEDING TO THE SECOND DRIVEWAY. CROSS STREETS OR DRIVEWAYS WITH ONE DRIVEWAY ACCESS SHALL BE RECONSTRUCTED IN HALF WIDTHS UNLESS ARRANGEMENTS HAVE BEEN MADE WITH THE OWNER. SIDE STREET/DRIVEWAY HALF WIDTH CONSTRUCTION SHALL BE CONDUCTED DURING OFFPEAK, WEEKEND, NIGHT CLOSURES, OR AS APPROVED BY THE ENGINEER.
 2. ANY PAVEMENT REQUIRED TO TRANSITION FROM THE PROPOSED CONSTRUCTION TO THE EXISTING INTERSECTION PAVEMENT WILL BE PAID FOR UNDER ITEM 508 "CONSTRUCTING DETOURS".
 3. EXPERIENCED FLAGGERS TO BE USED TO DIRECT TRAFFIC DURING INTERSECTION CONSTRUCTION.
 4. CHANNELIZING DEVICES SHALL BE SPACED PER BARRICADE CONSTRUCTION STANDARDS, UNLESS OTHERWISE SHOWN ON PLANS.
 5. SEE ADVANCED WARNING SIGNS LAYOUT FOR ADDITIONAL INFORMATION.
 6. REFER TO BARRICADE CONSTRUCTION STANDARDS FOR MINIMUM SPACING OF CONSTRUCTION WARNING AND CROSS STREET SIGNS.

STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

2/28/2021

[Signature]

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Texas Department of Transportation

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FM 725

TRAFFIC CONTROL PLAN

MISCELLANEOUS DETAILS

(SIDE STREET/DRIVEWAY

HALF-SECTION WITH FLAGGERS)

SCALE: NTS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	50
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
		HIGHWAY NO.
		FM 725

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET					6185 6002	6185 6005
			FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	TMA (STATIONARY)	TMA (MOBILE OPERATION)
SHEET NUMBER			EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
ALL	I	TCP (1-2) - 18	1		1	50	50	
ALL	II	TCP (2-1) - 18		1	1	153	153	
ALL	III	TCP (2-1) - 18		1	1	111	111	
ALL	IV	TCP (2-1) - 18		1	1	145	145	
FINAL OVERLAY AND STRIPING								
ALL	V	TCP (3-1) - 13 & TCP (3-3)-14	1	1	1	63		63
TOTALS			2				459	63

NOTE.
 FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
 RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
 TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
 DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENUATORS WILL BE USED FOR THE SPECIFIC TCP.
 TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
 TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

FILE: tma.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB
REVISIONS 3/2018	0215	09	035
	DIST	COUNTY	
	SAN	GUADALUPE	
	FEDERAL AID PROJECT	SHEET NO.	
			51

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

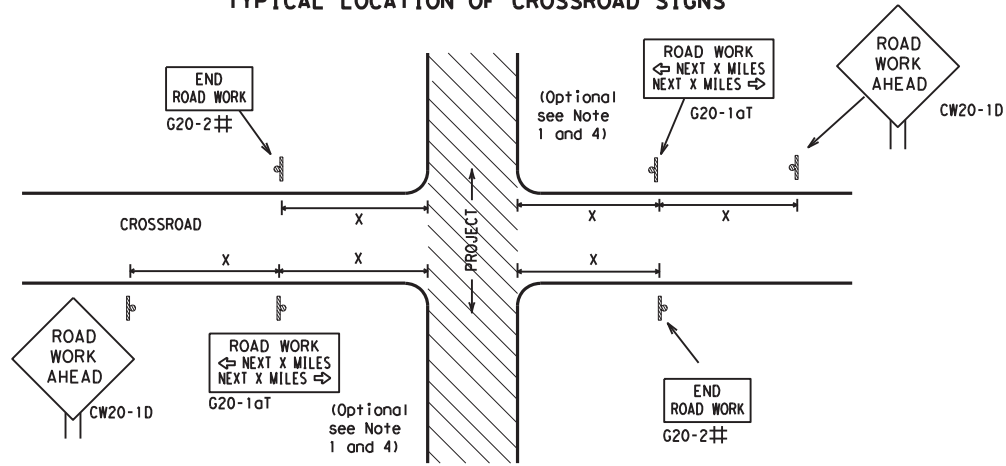
<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard															
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) - 21</p>																	
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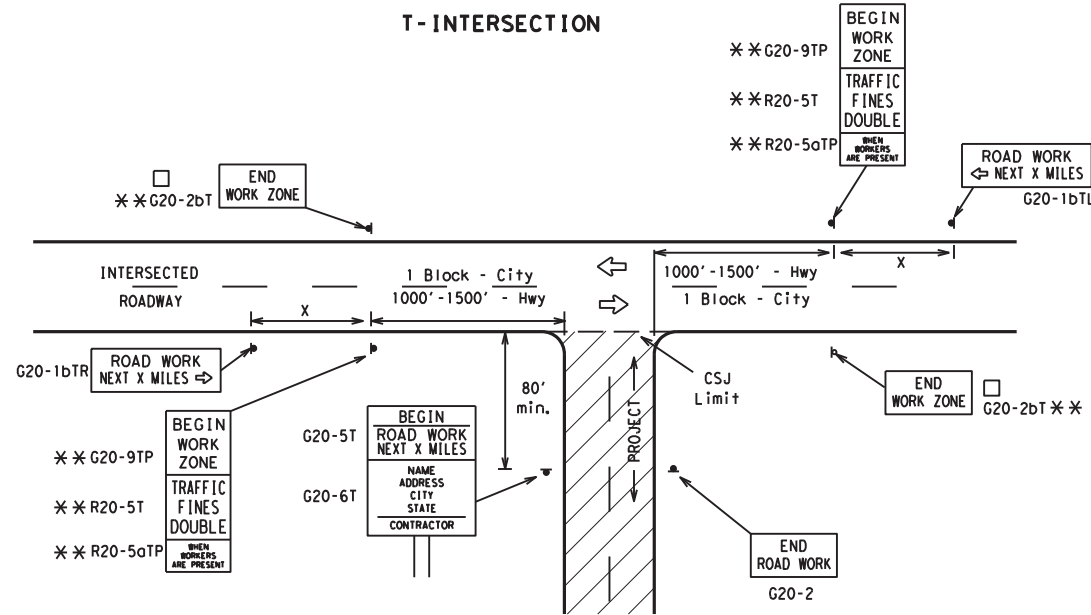
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

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

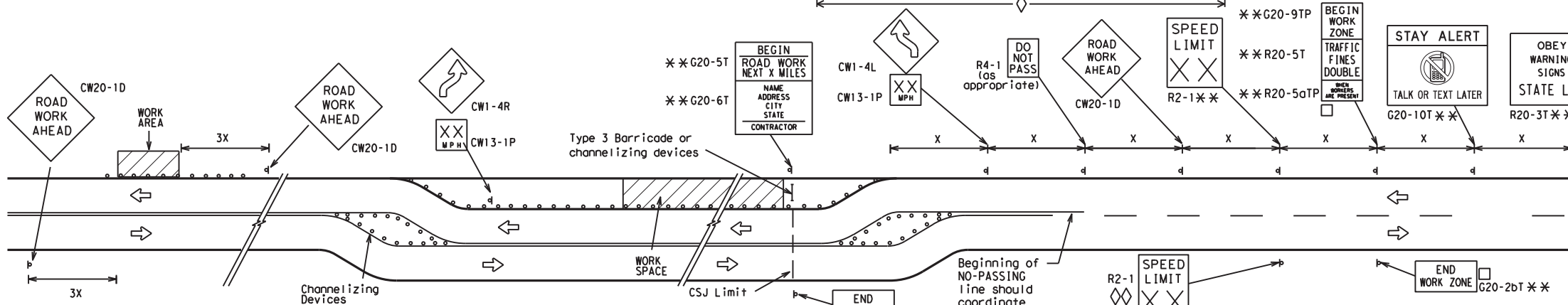
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

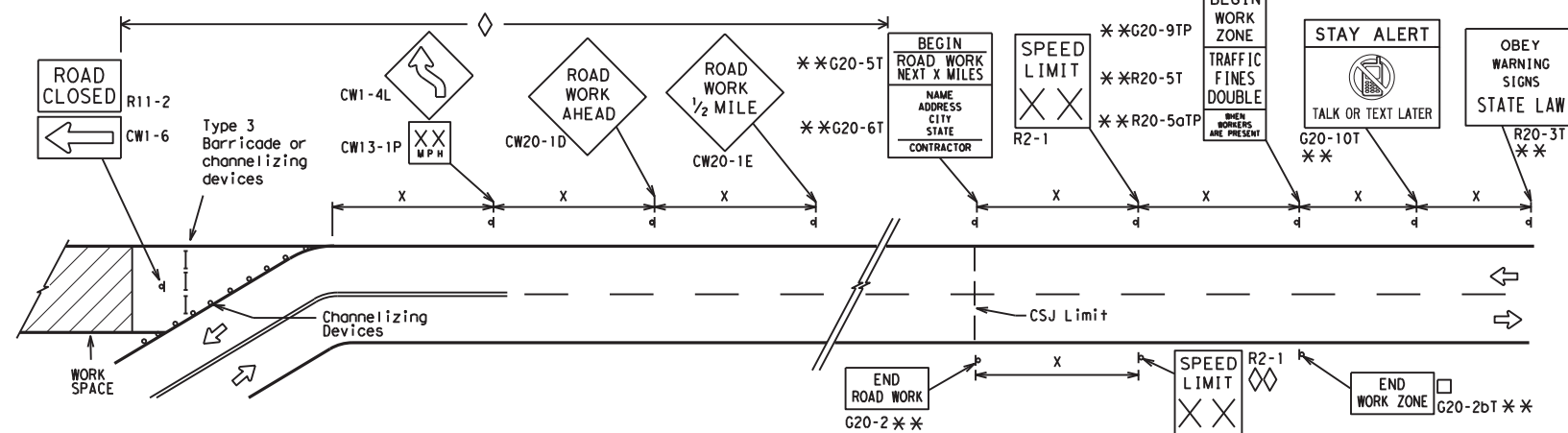
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - ** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - ◇ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - ◇◇ Contractor will install a regulatory speed limit sign at the end of the work zone.

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

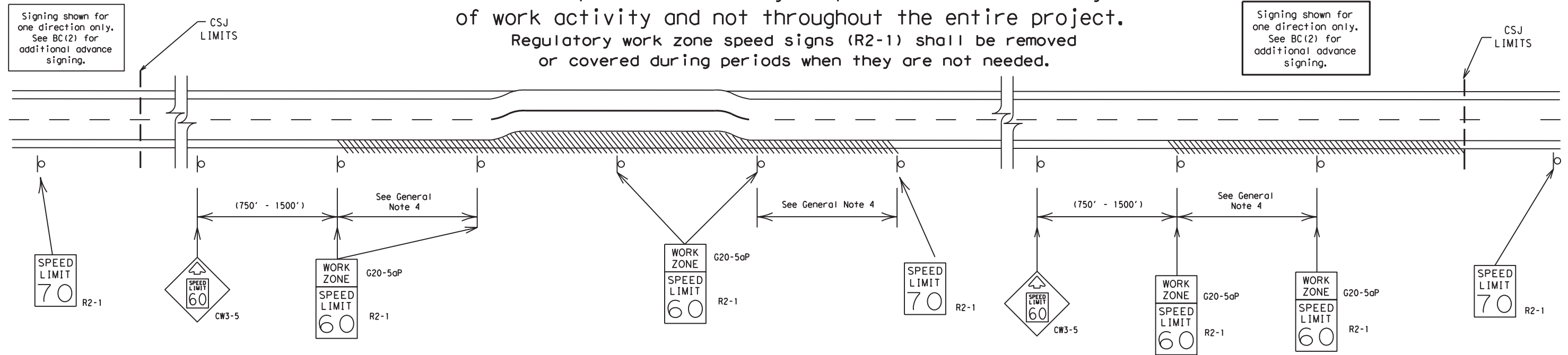
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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

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SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

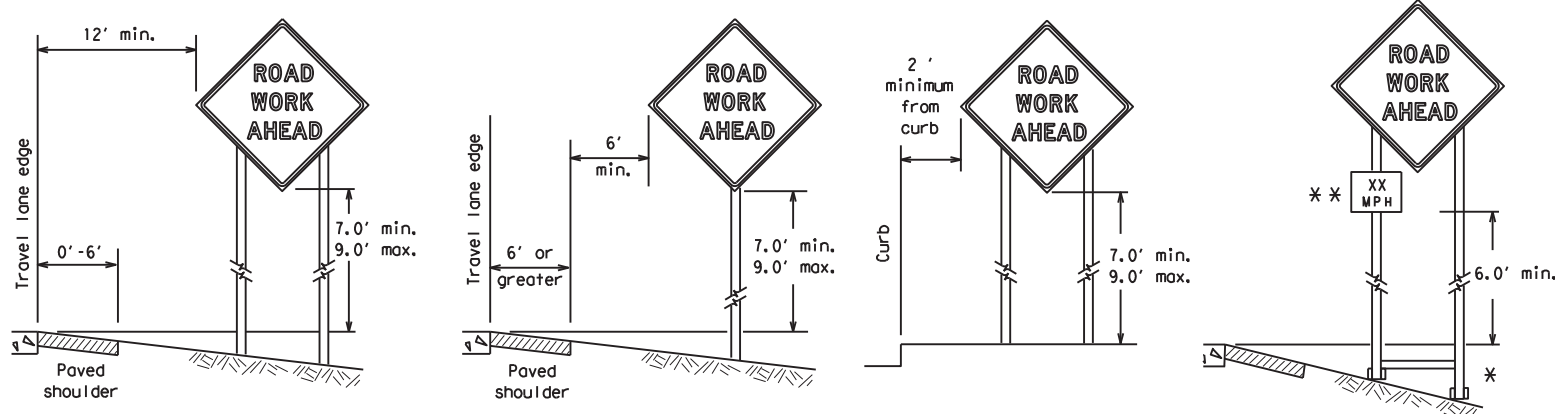
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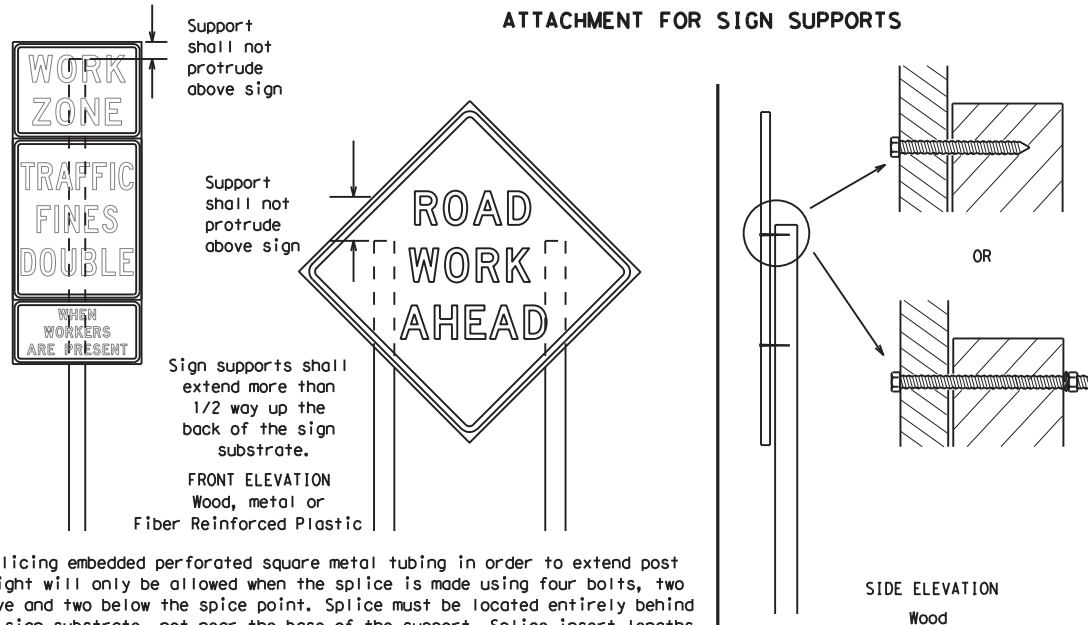
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

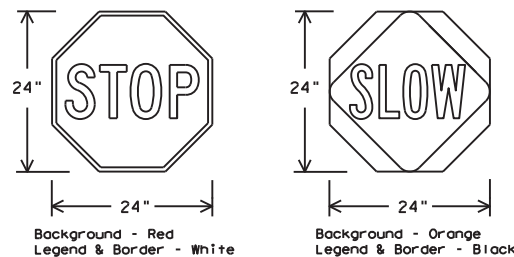
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

FLAGS ON SIGNS

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

SHEET 4 OF 12



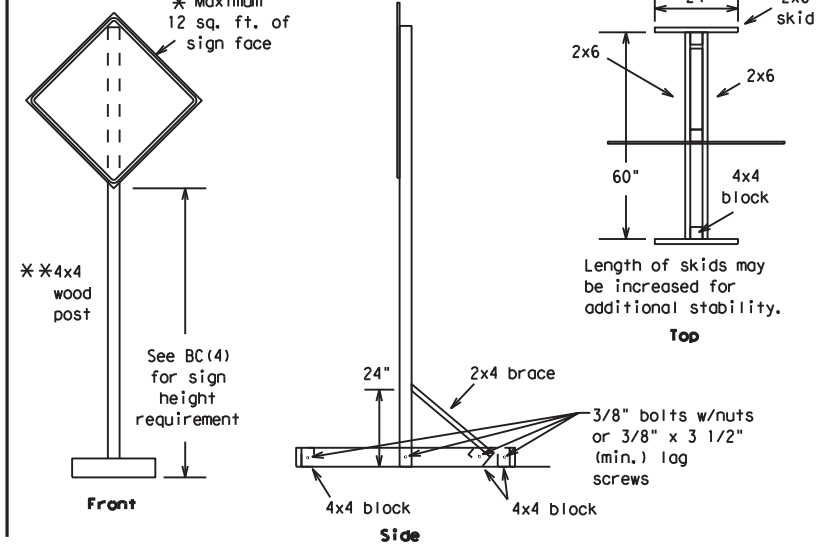
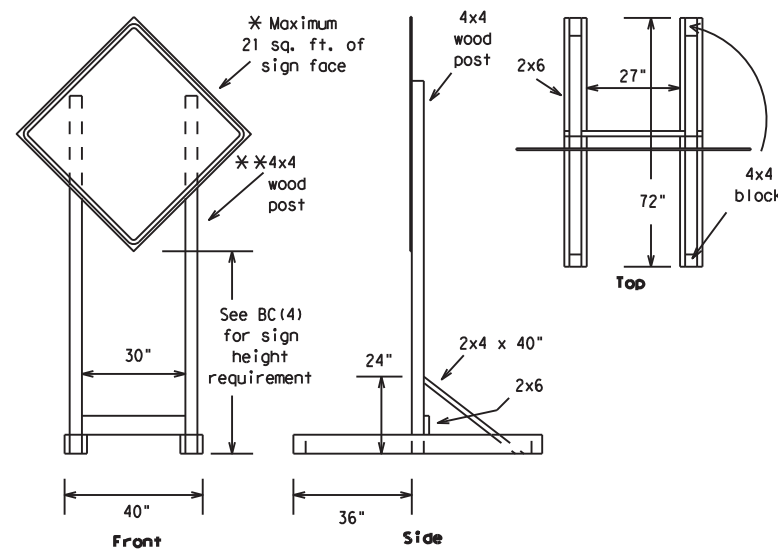
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	SAN	GUADALUPE	55	

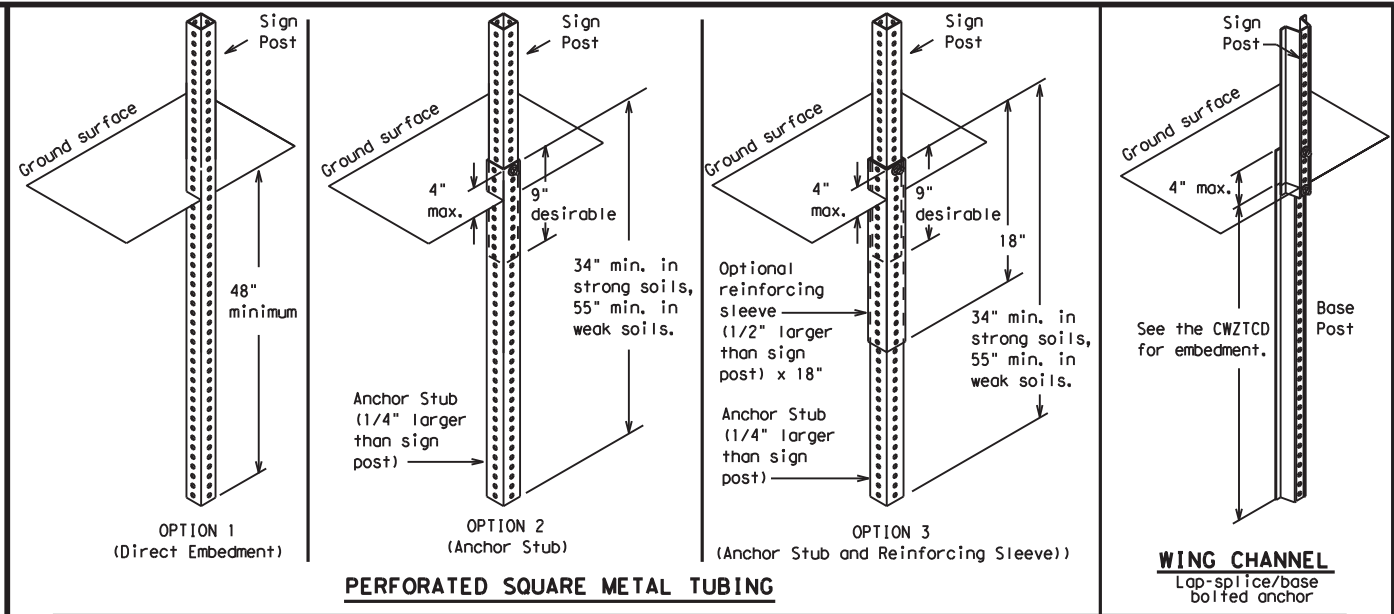
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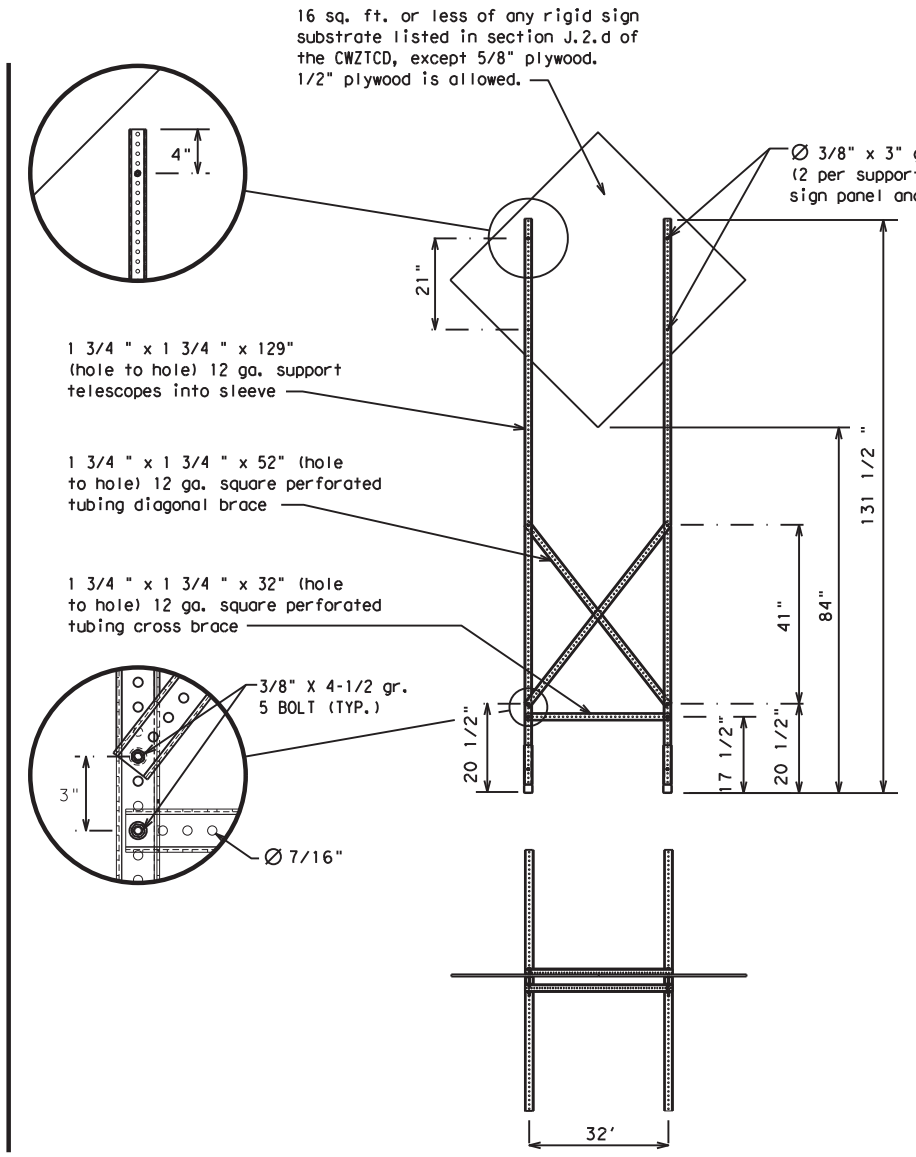
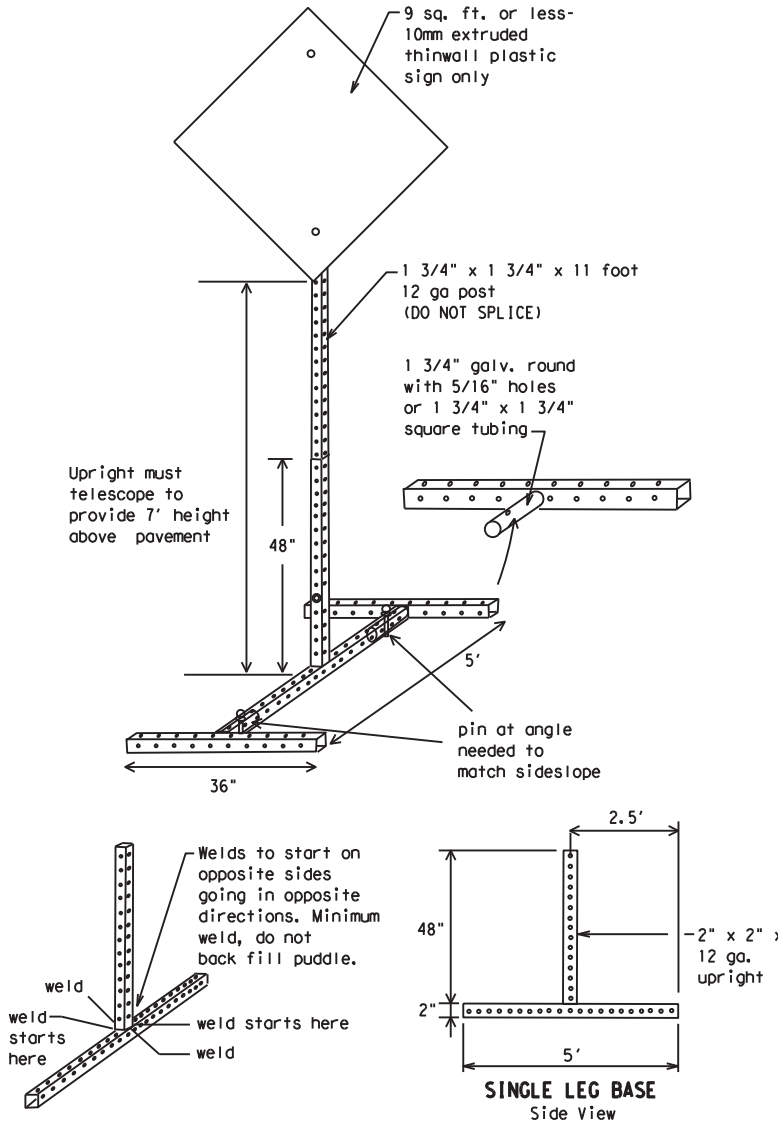
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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REVISIONS		0215	09	035	FM 725				
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7-13	5-21	SAN	GUADALUPE	56					

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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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

FORM X LINES RIGHT

USE XXXXX RD EXIT

USE EXIT I-XX NORTH

USE I-XX E TO I-XX N

WATCH FOR TRUCKS

EXPECT DELAYS

END SHOULDER USE

WATCH FOR WORKERS

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

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

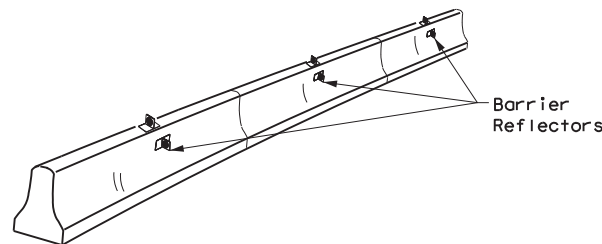
Roadway designation # IH-number, US-number, SH-number, FM-number

DATE: FILE:

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 21</h2>			
FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT: 0215	SECT: 09	JOB: 035
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9-07 8-14	SAN: GUADALUPE		SHEET NO.: 57
7-13 5-21			

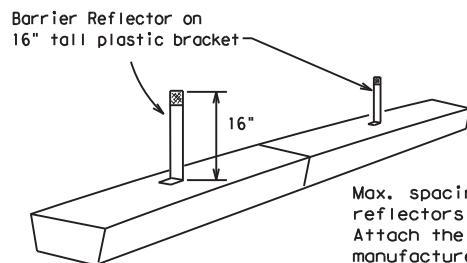
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

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

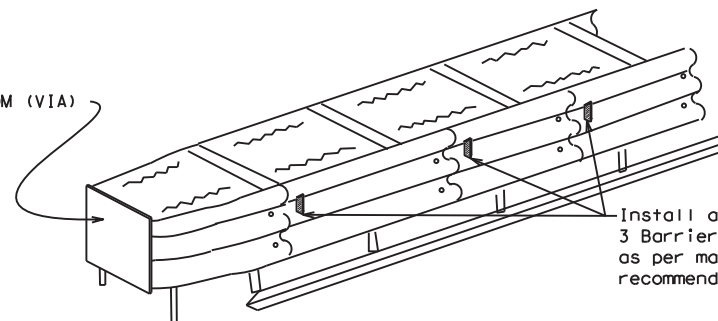


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

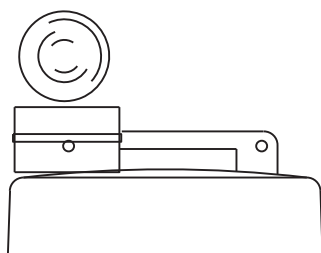
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

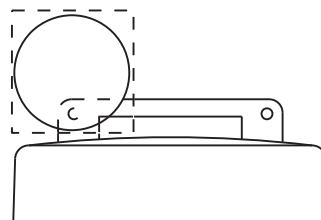
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



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

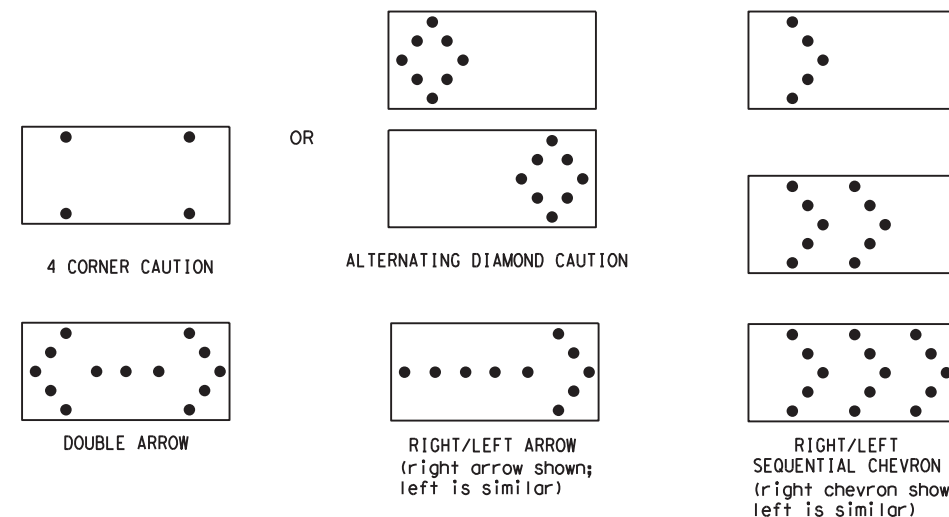


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) -21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
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REVISIONS		0215	09	035	FM 725				
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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

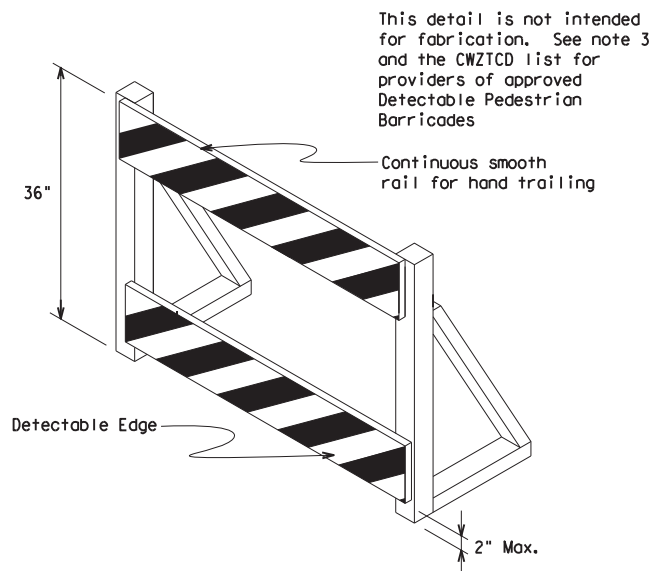
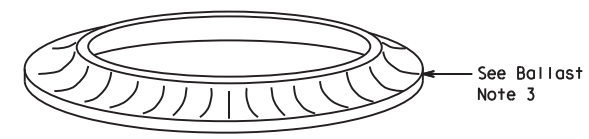
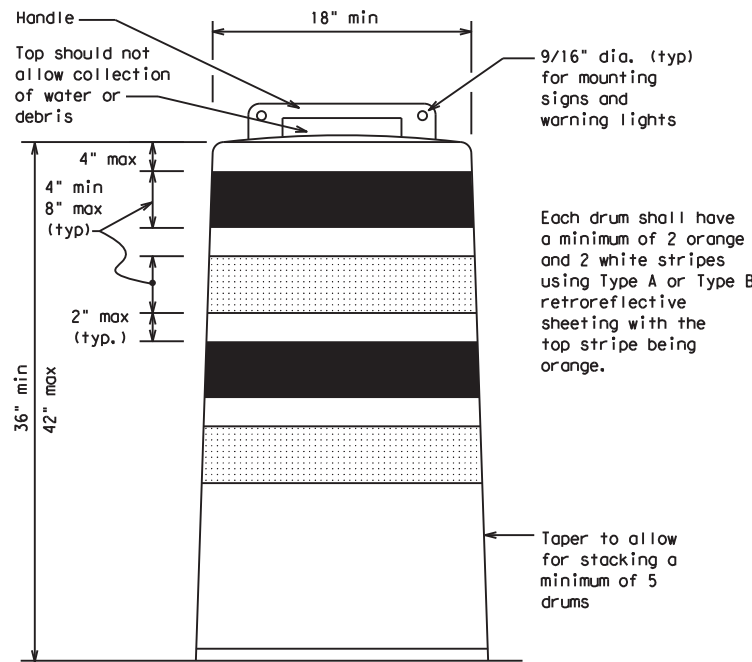
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
- 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.

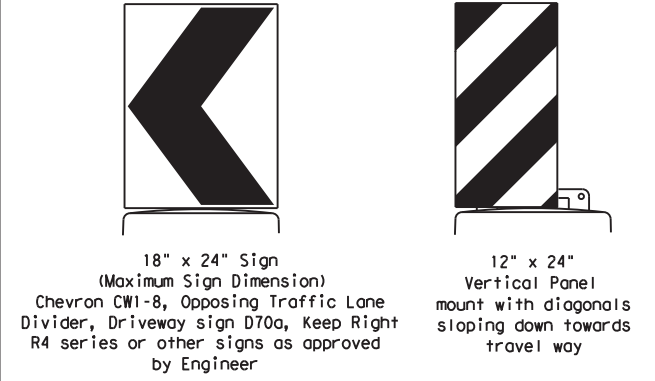
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

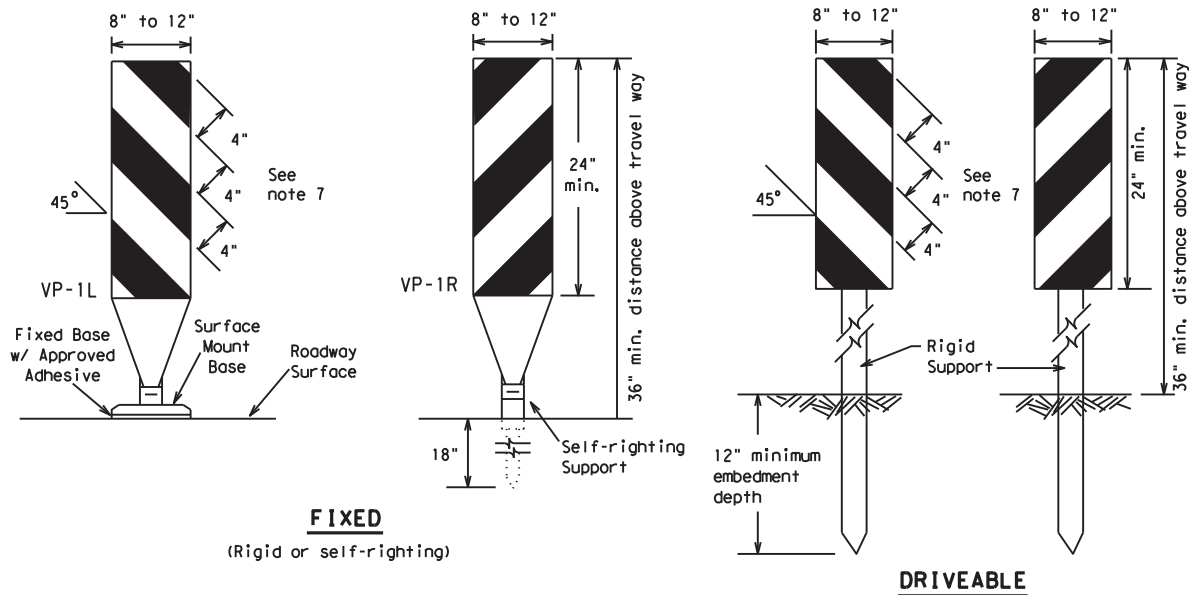
SHEET 8 OF 12

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

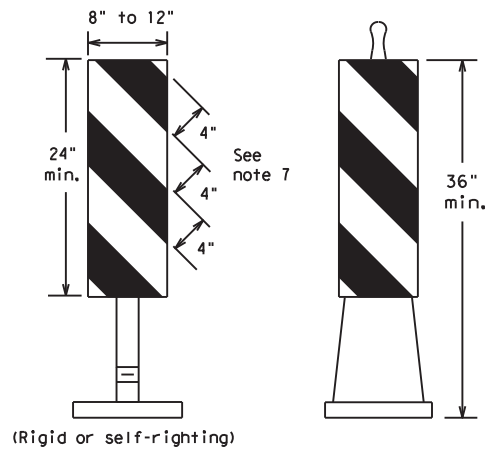
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FIXED
(Rigid or self-righting)

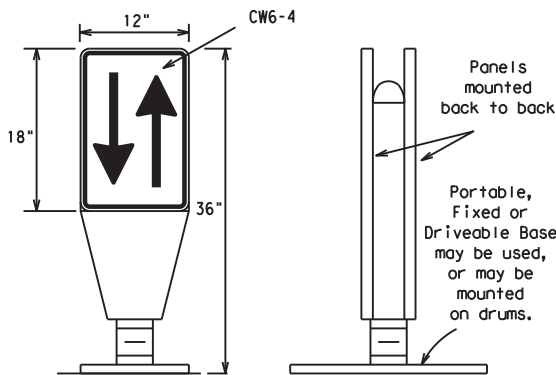
DRIVEABLE



PORTABLE

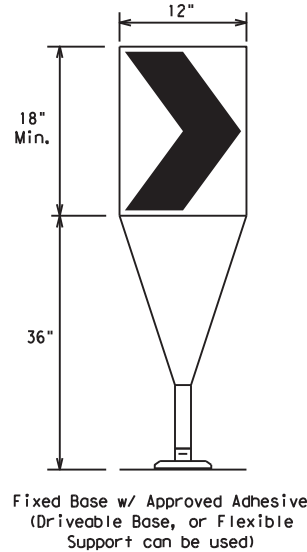
VERTICAL PANELS (VPs)

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



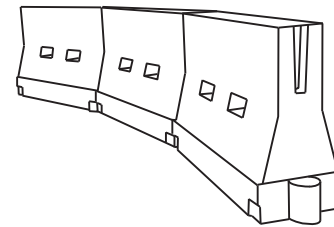
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 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.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

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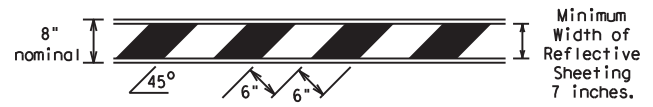
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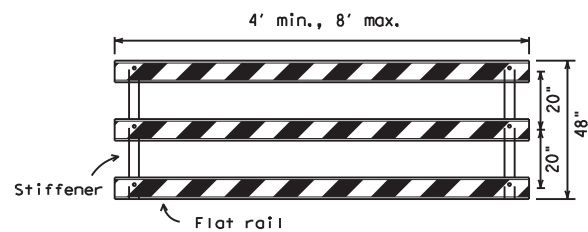
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

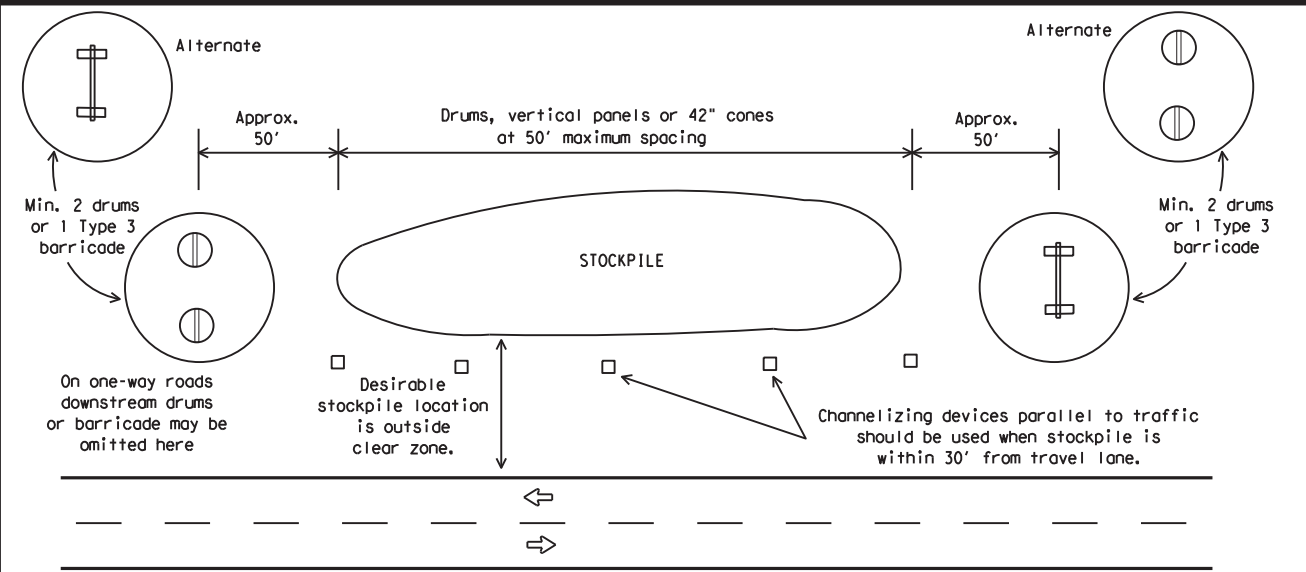


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



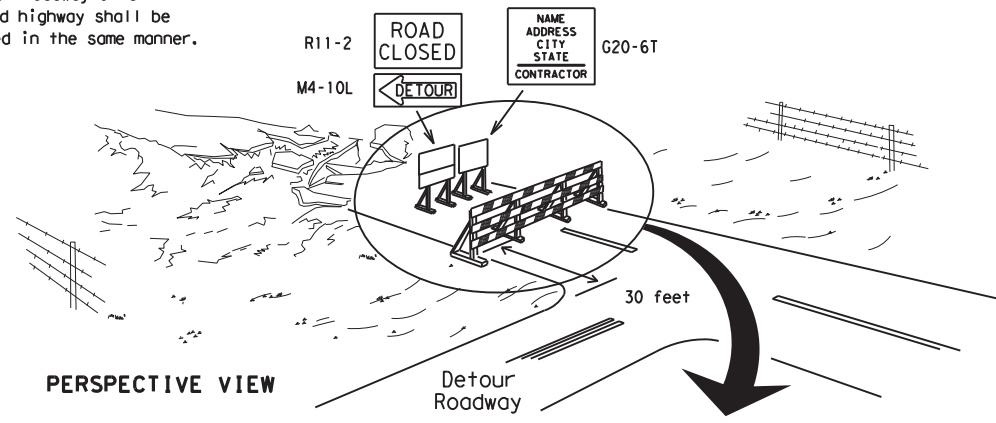
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



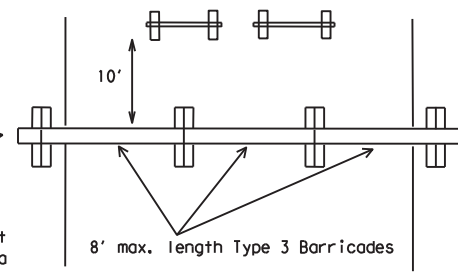
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

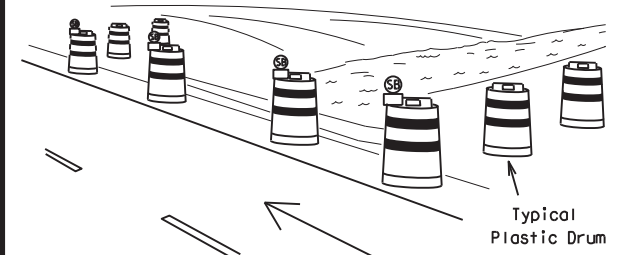
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



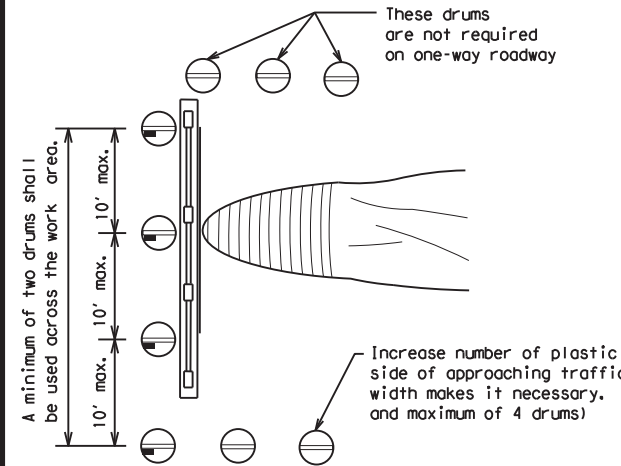
PLAN VIEW

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

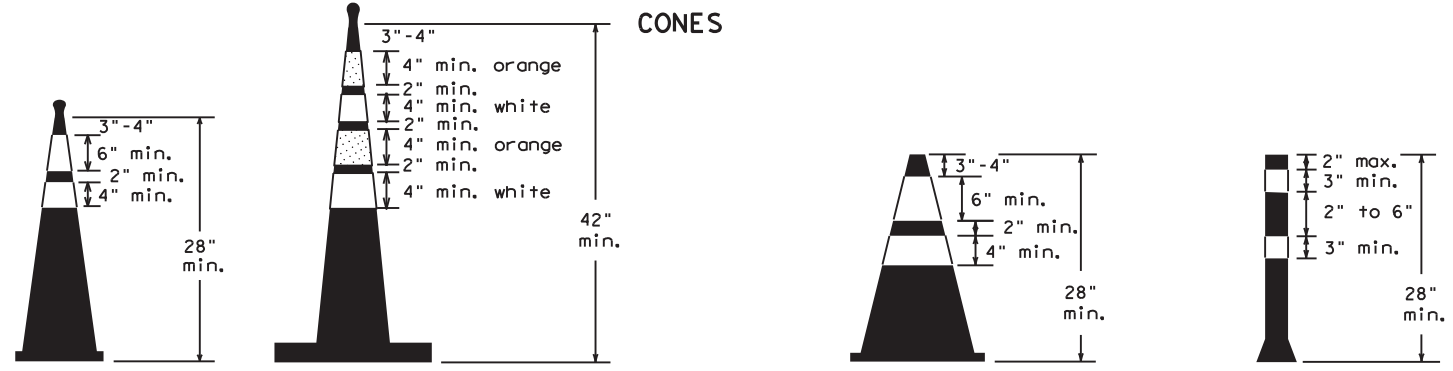


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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



Two-Piece cones

One-Piece cones

Tubular Marker

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

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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

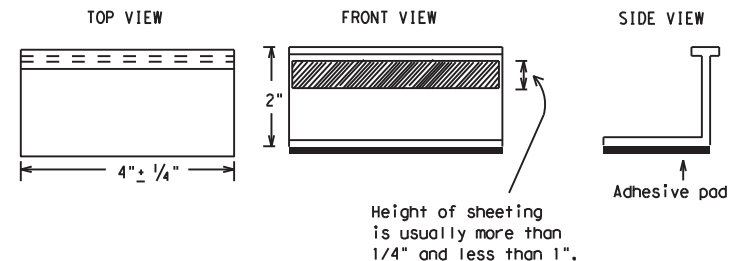
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

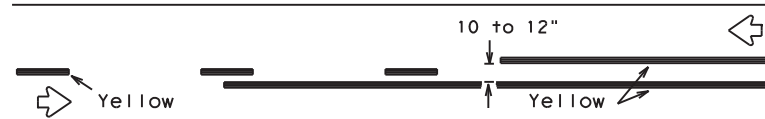
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
	0215	09	035	FM 725
REVISIONS	DIST	COUNTY	SHEET NO.	
2-98 9-07 5-21				
1-02 7-13				
11-02 8-14	SAN	GUADALUPE	62	

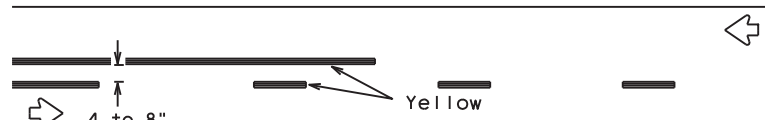
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DATE:
FILE:

PAVEMENT MARKING PATTERNS

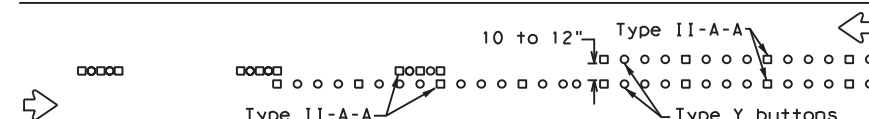


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

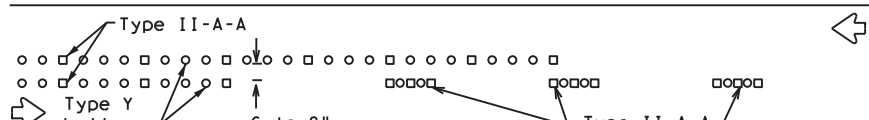


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

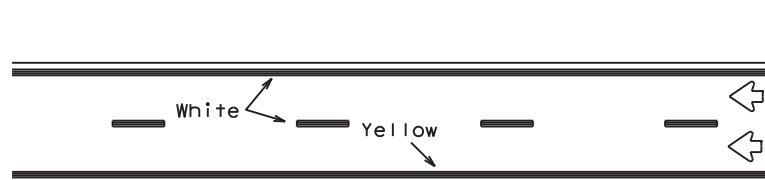


RAISED PAVEMENT MARKERS - PATTERN A



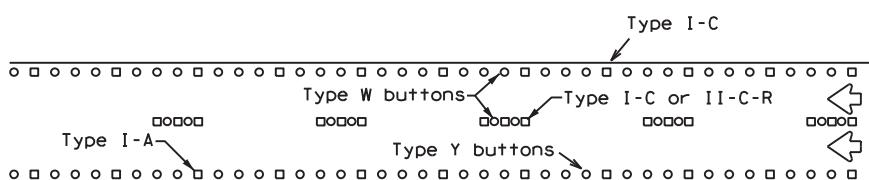
RAISED PAVEMENT MARKERS - PATTERN B

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



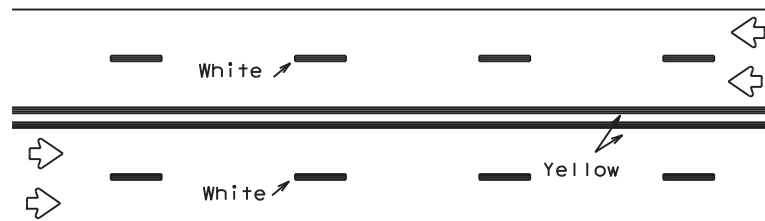
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



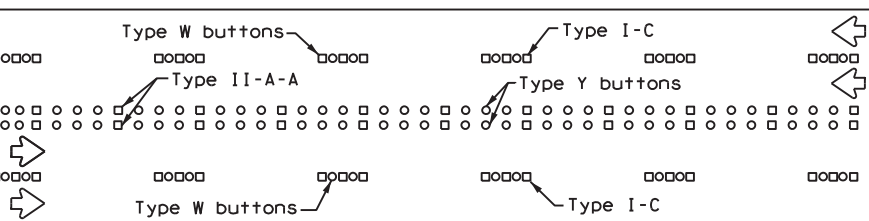
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



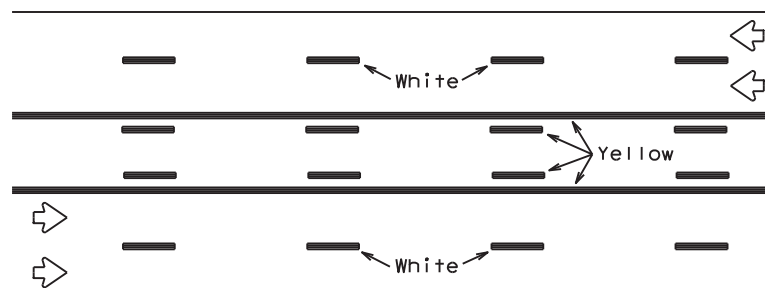
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



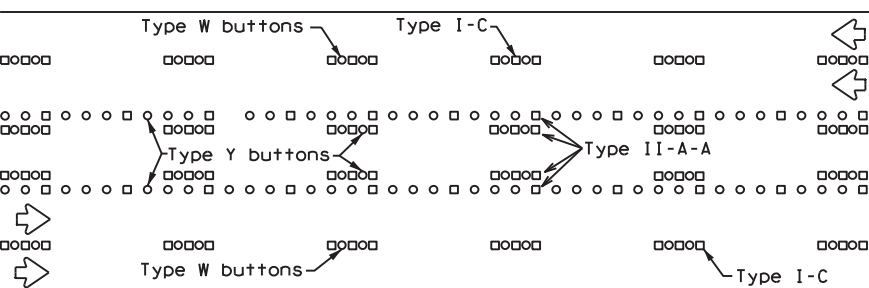
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

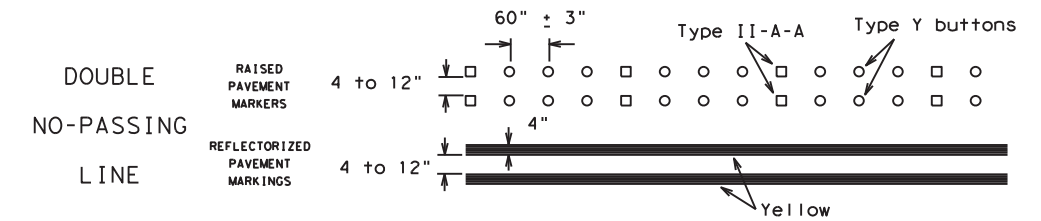
Prefabricated markings may be substituted for reflectORIZED pavement markings.



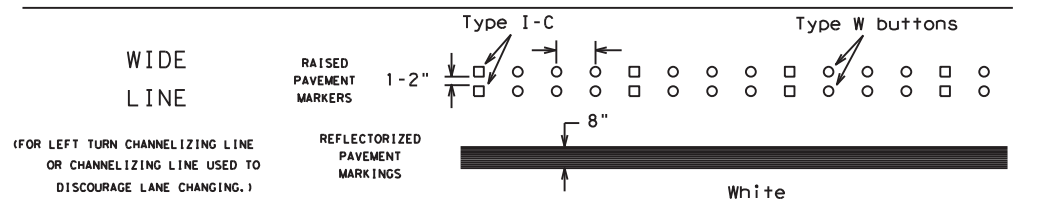
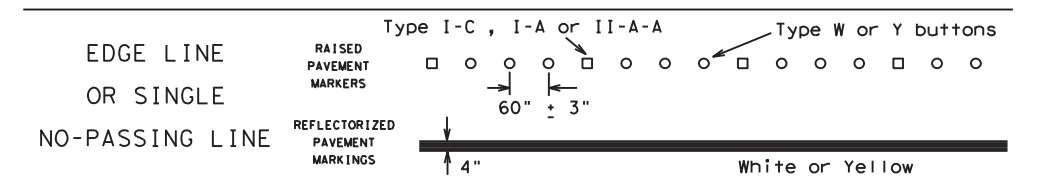
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

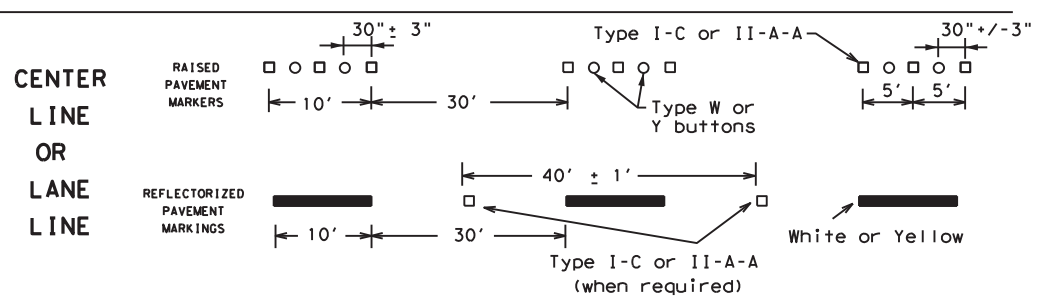
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



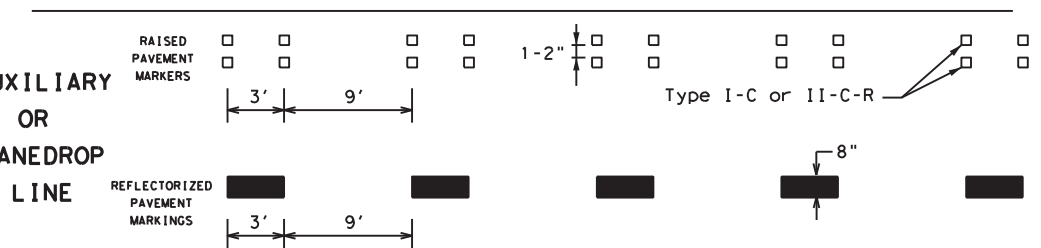
SOLID LINES



BROKEN LINES

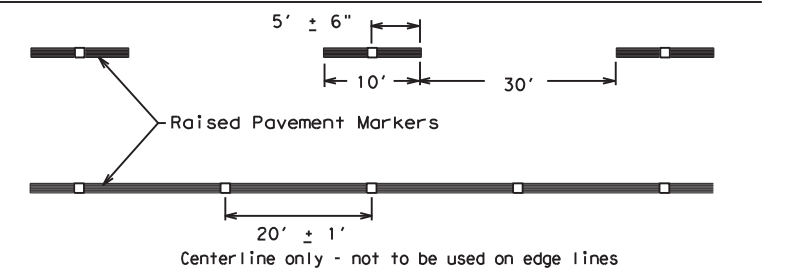


AUXILIARY OR LANEDROP LINE



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

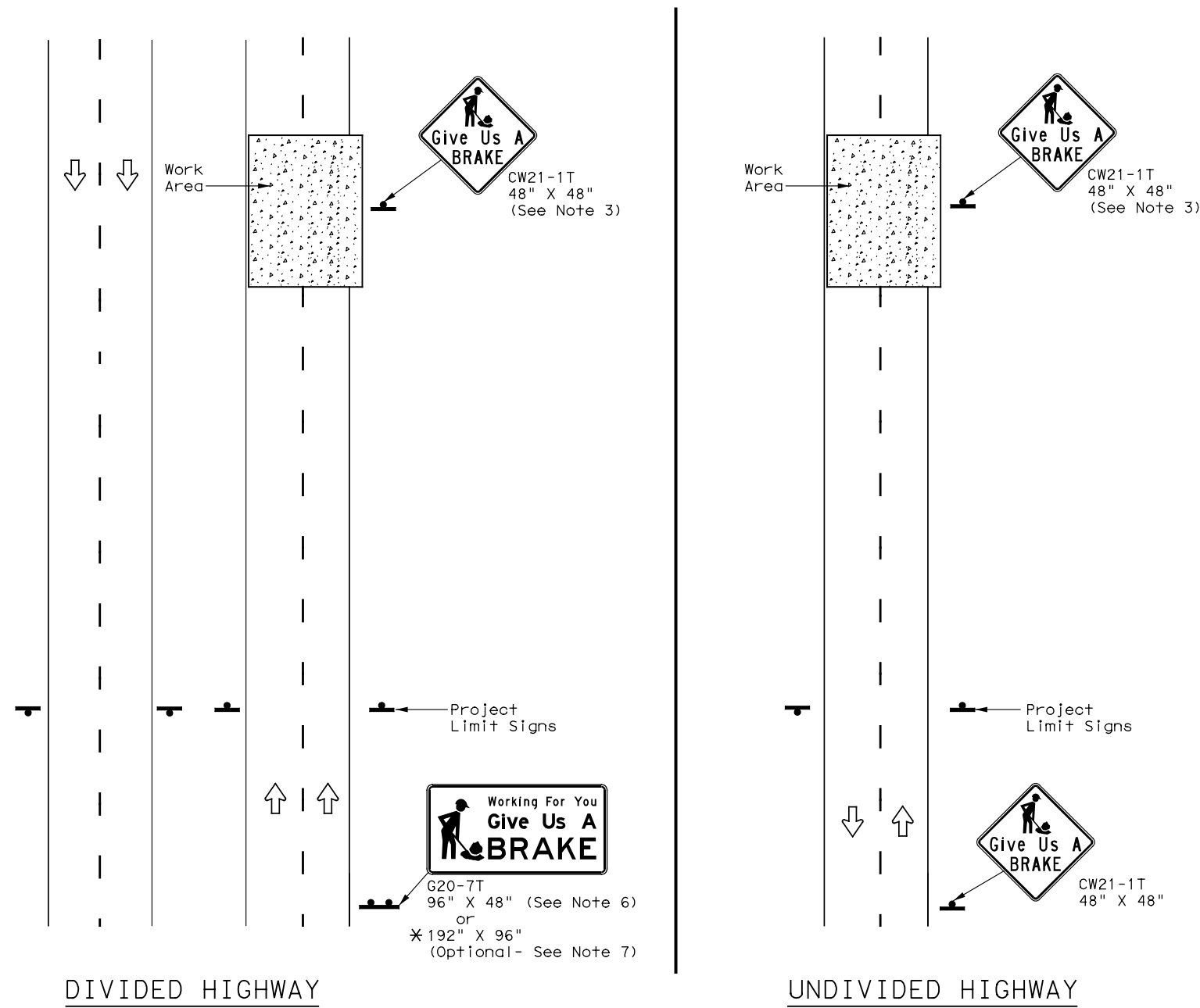
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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	SAN	GUADALUPE	63	
11-02 8-14				

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DATE: 2/28/2021 6:32:32 PM
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SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND

	Sign
	Large Sign
	Traffic Flow

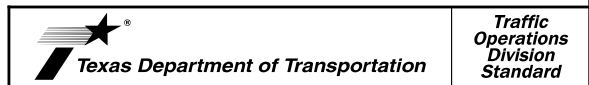
DEPARTMENTAL MATERIAL SPECIFICATIONS

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

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

GENERAL NOTES

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



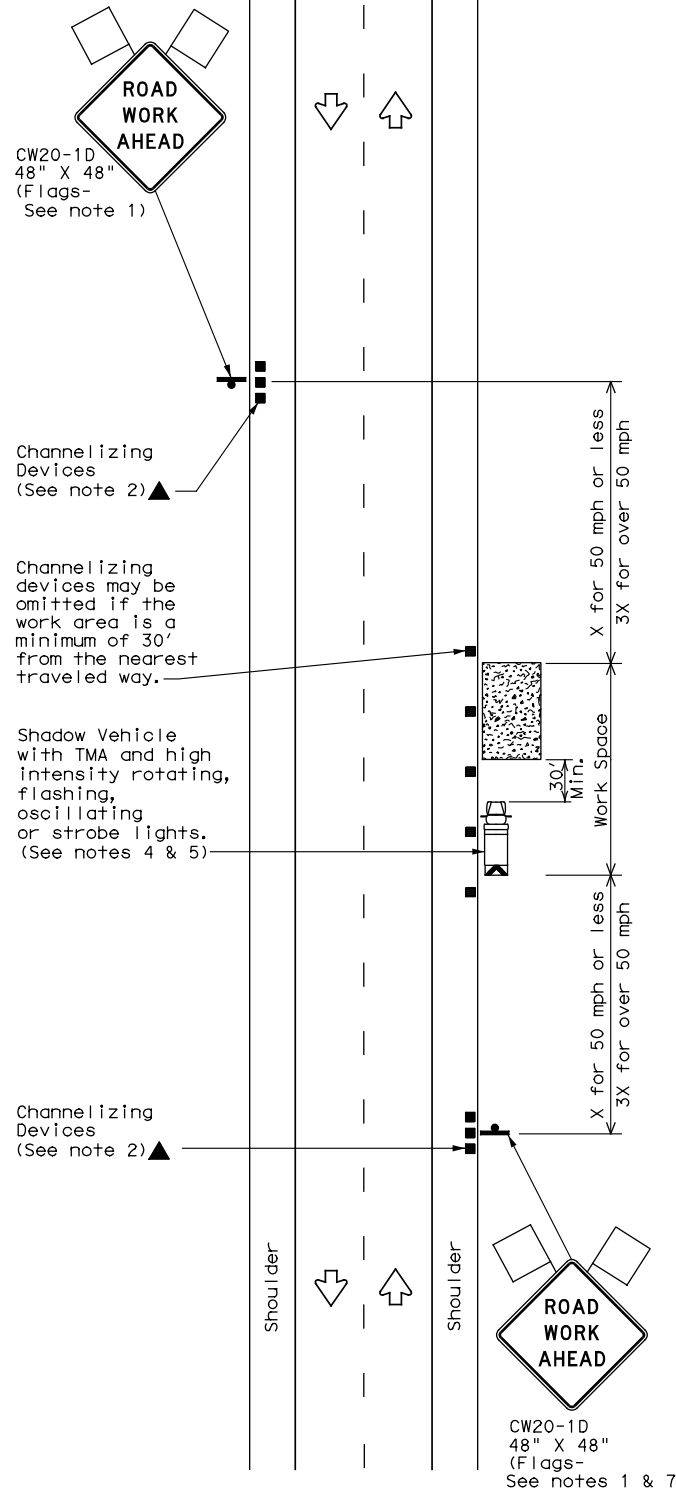
WORK ZONE
 "GIVE US A BRAKE"
 SIGNS

WZ (BRK) - 13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
6-96 5-98 7-13	DIST	COUNTY	SHEET NO.	
8-96 3-03	SAN	GUADALUPE	66	

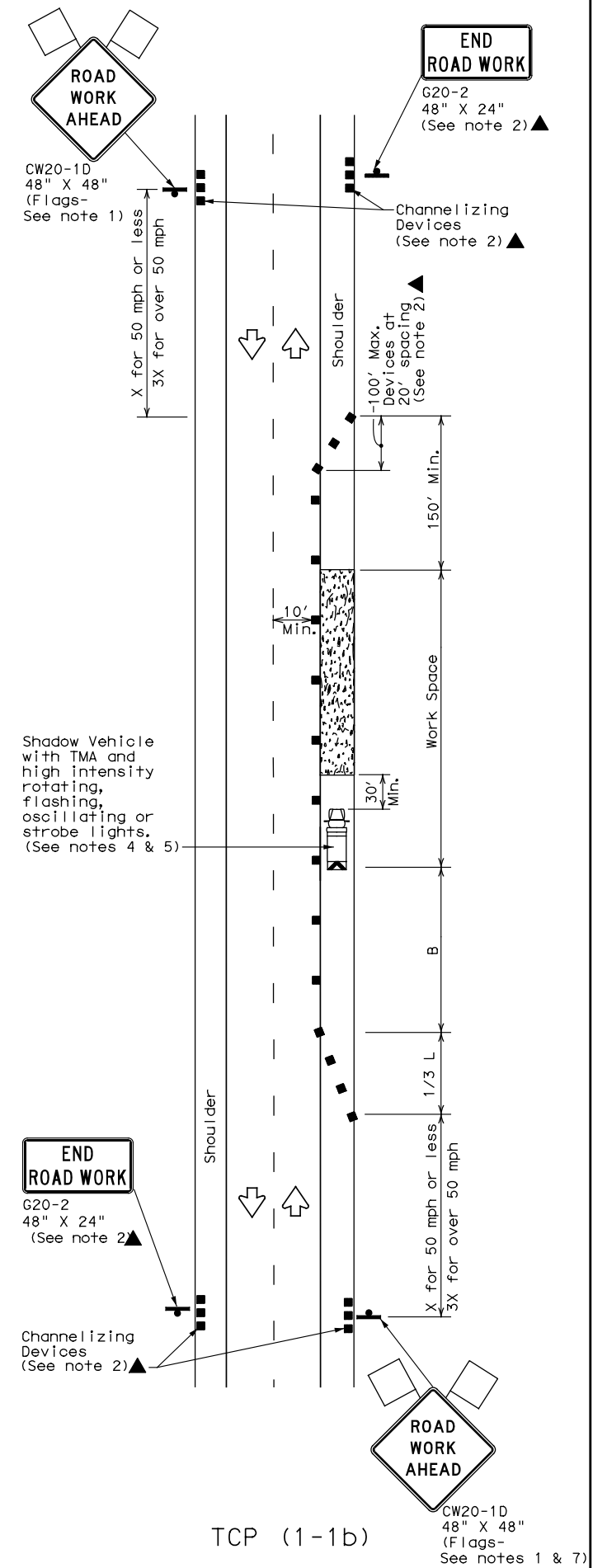
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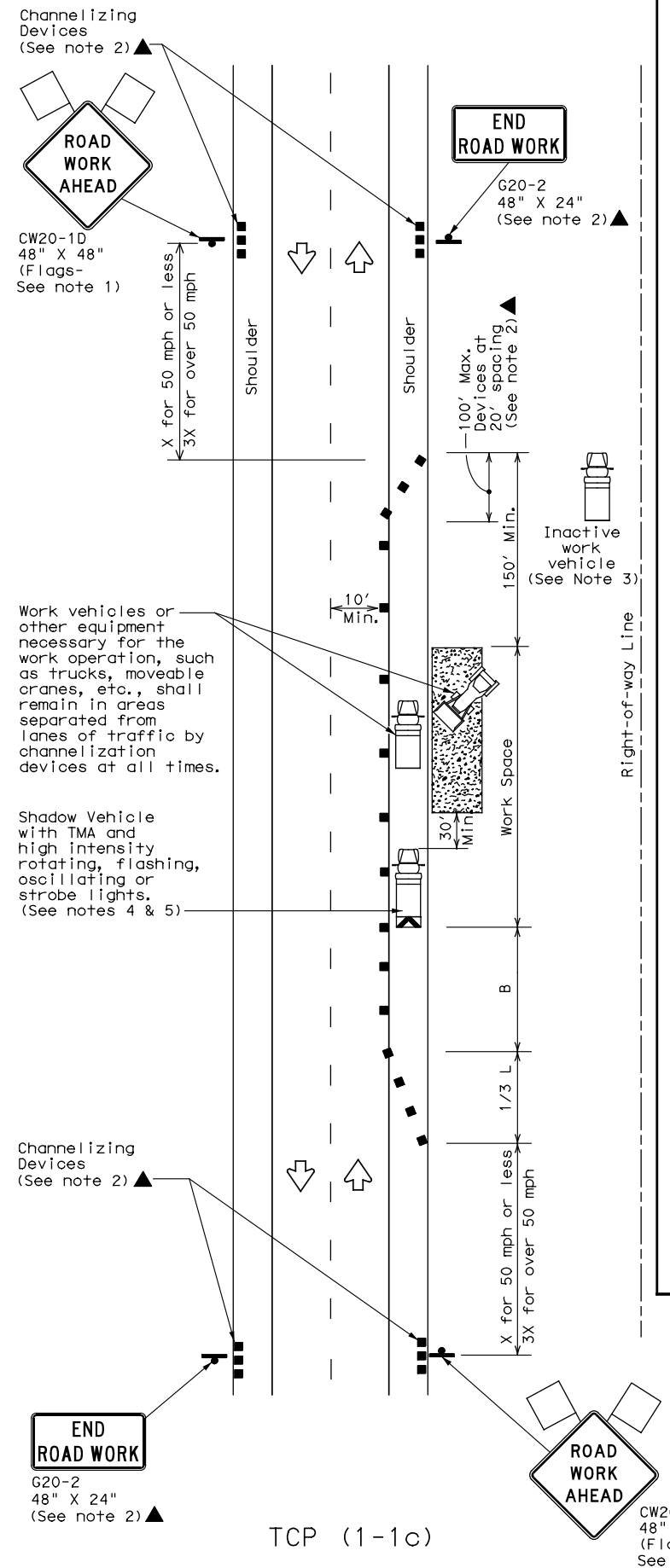
TCP (1-1a)

WORK SPACE NEAR SHOULDER
 Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
 Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
 Conventional Roads

LEGEND

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

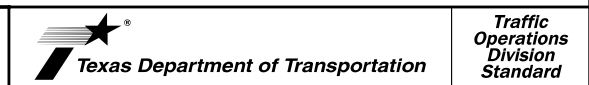
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'
35		205'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

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

TYPICAL USAGE

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

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



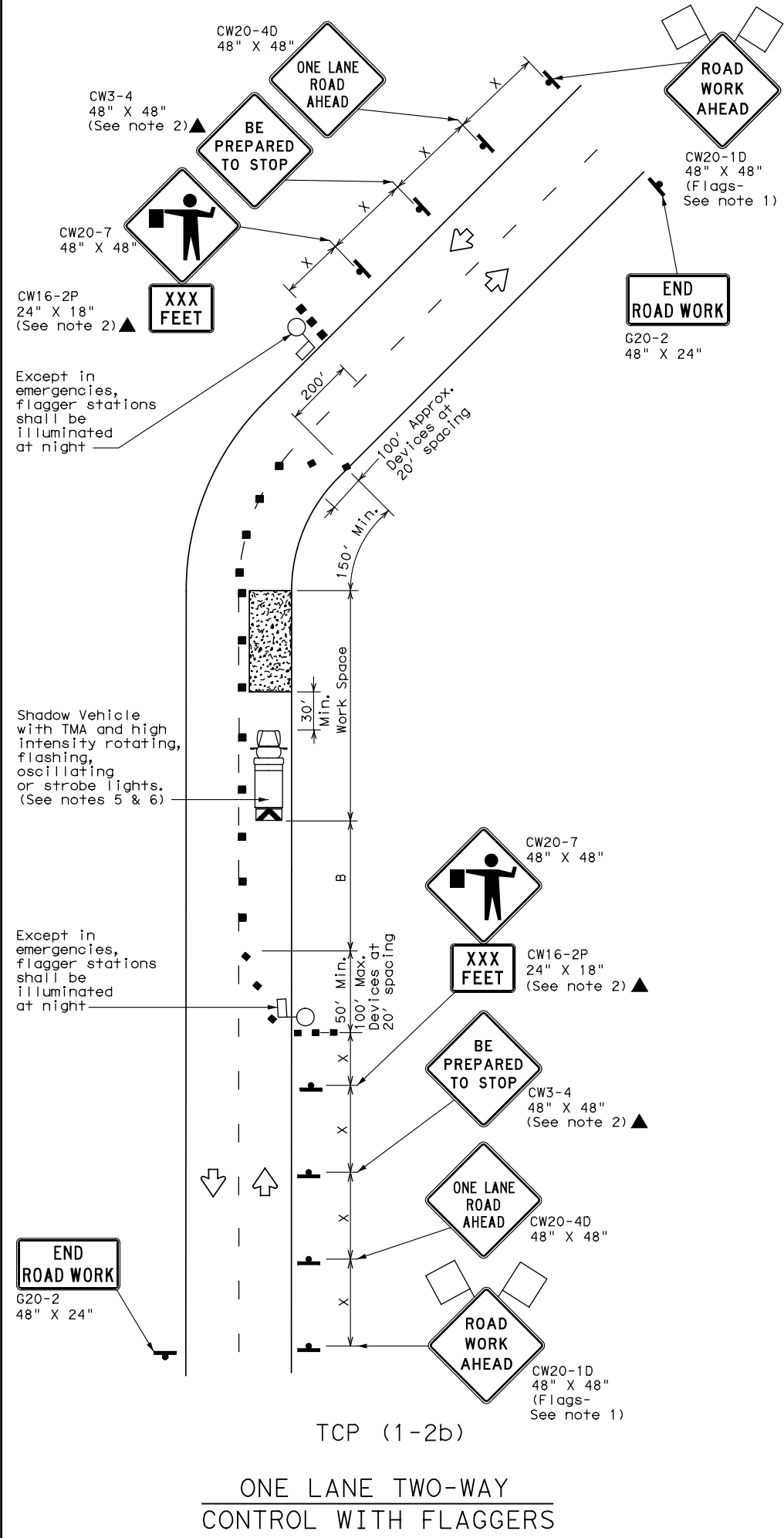
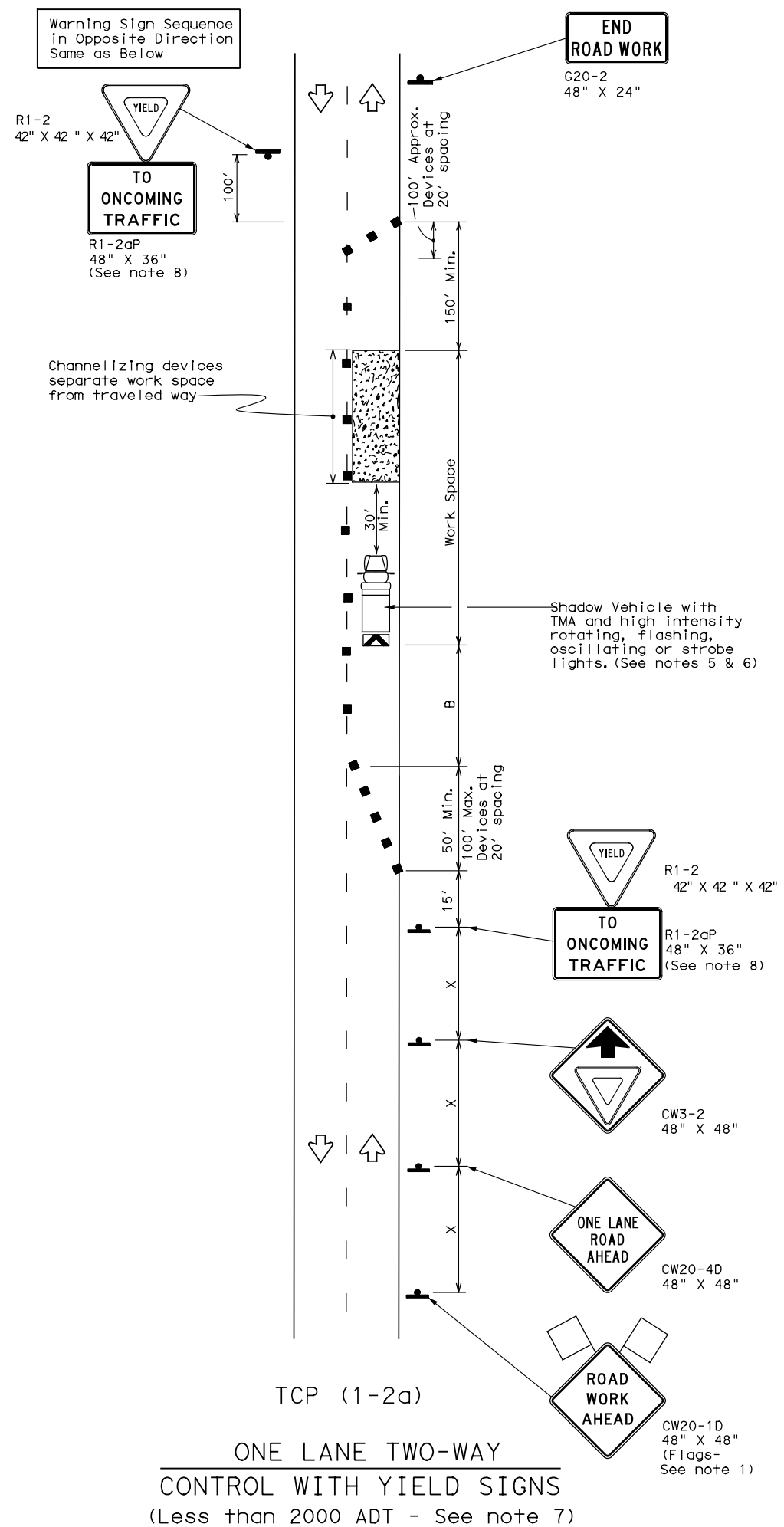
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (1-1) - 18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	SAN	GUADALUPE	67	
1-97 2-18				

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

Posted Speed * X	Formula L = WS ² / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = 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		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
	✓	✓		

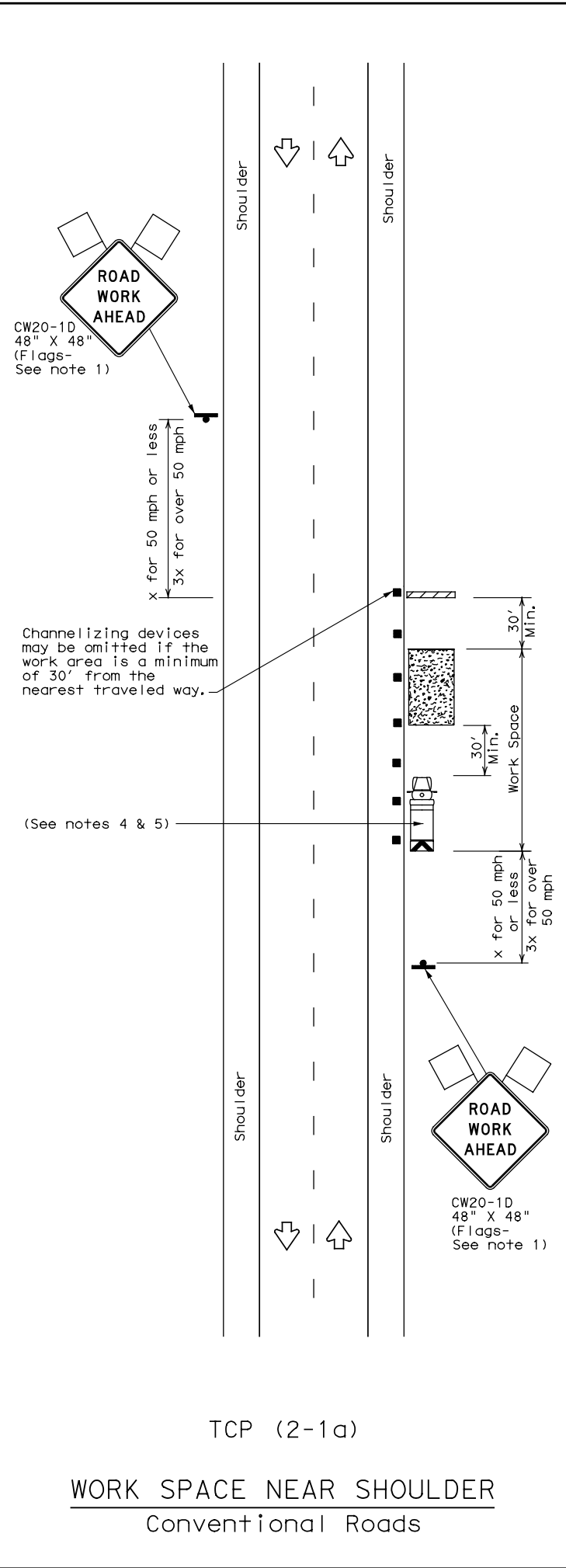
GENERAL NOTES

- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
 - Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-2a)**
- R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
 - R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.
- TCP (1-2b)**
- Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
 - Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL			
TCP (1-2) - 18			
FILE: tcp1-2-18.dgn	DN:	CK:	DW:
© TxDOT December 1985	CON: 0215	SECT: 09	JOB: 035
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2-94 2-12		SAN:	GUADALUPE
1-97 2-18			SHEET NO. 68

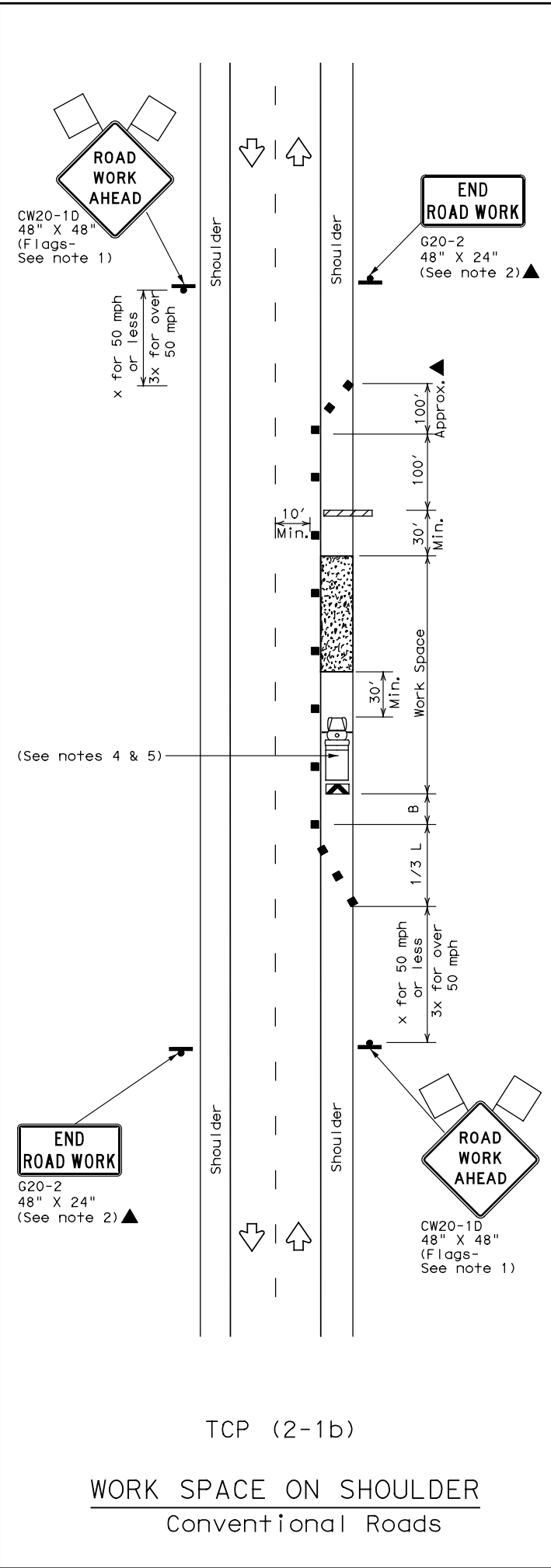
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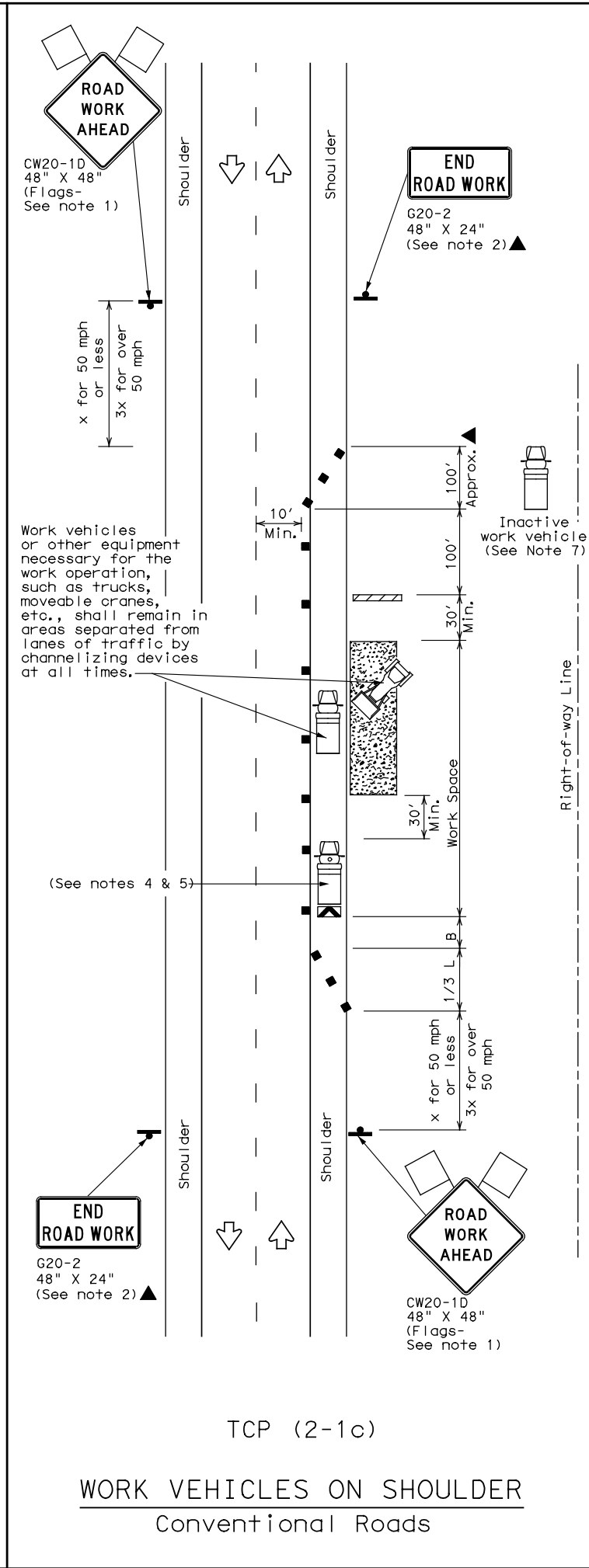
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

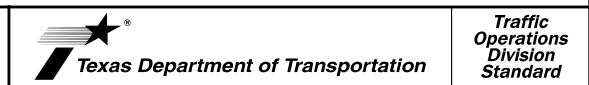
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

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

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



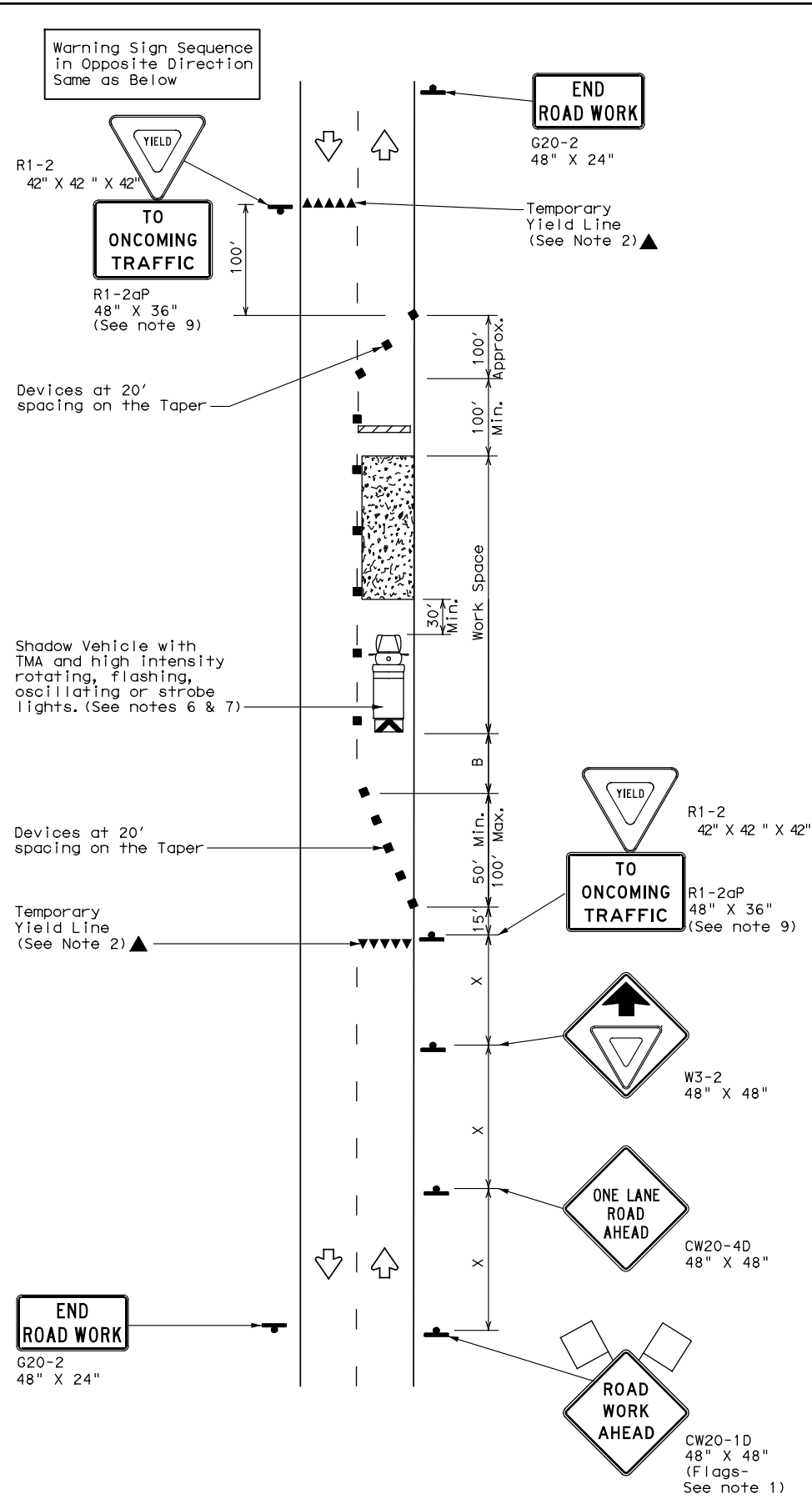
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (2-1) - 18

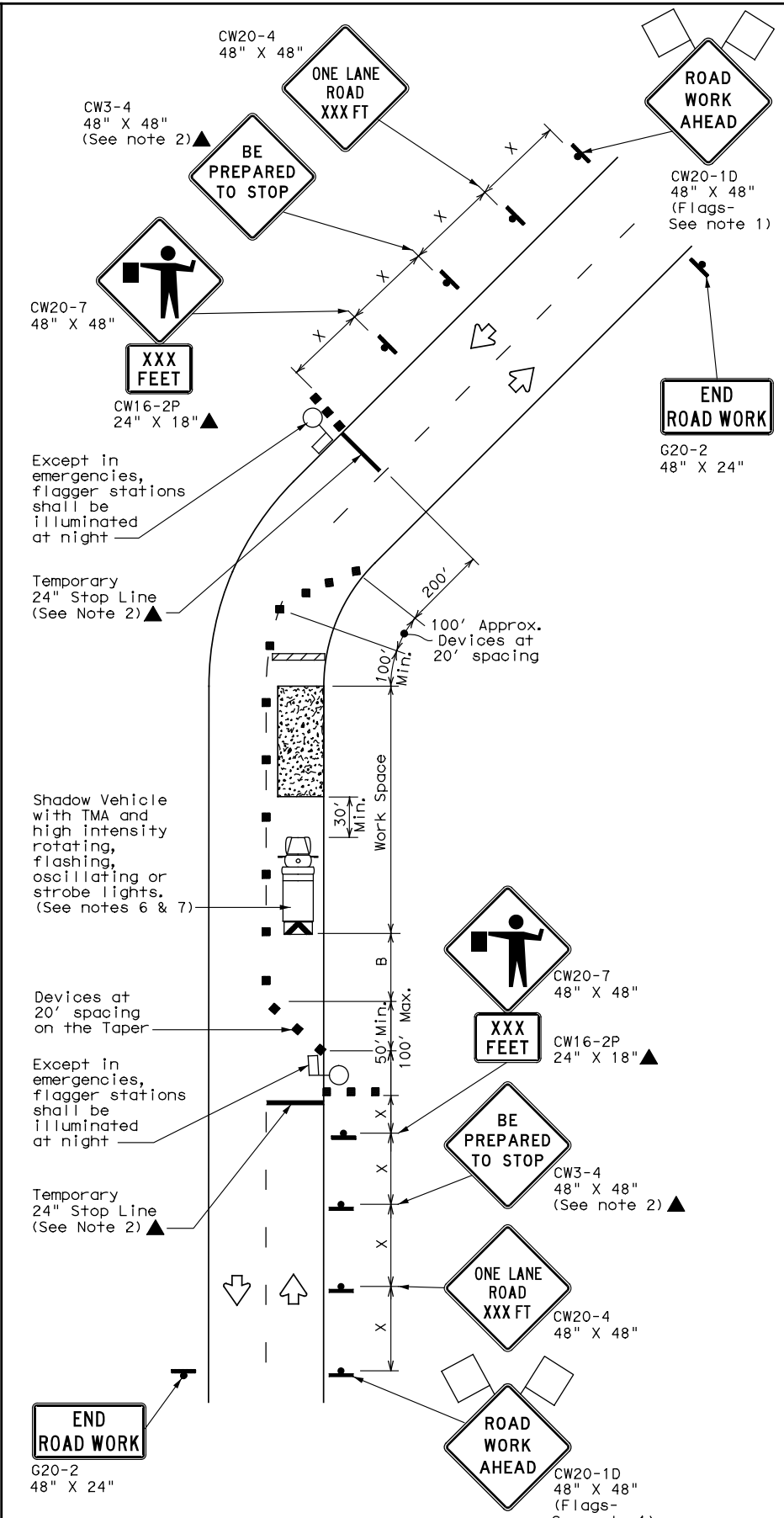
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8-95 2-12	SAN	GUADALUPE	69	
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TCP (2-2a)
 2-LANE ROADWAY WITHOUT PAVED SHOULDERS
 ONE LANE TWO-WAY
 CONTROL WITH YIELD SIGNS
 (Less than 2000 ADT - See Note 9)



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

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = 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'

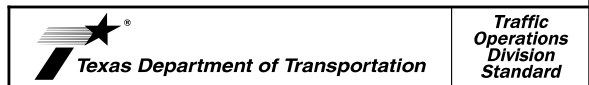
* Conventional Roads Only
 ** Taper lengths have been rounded off.
 L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

TYPICAL USAGE

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
 - Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-2a)
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
 - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.



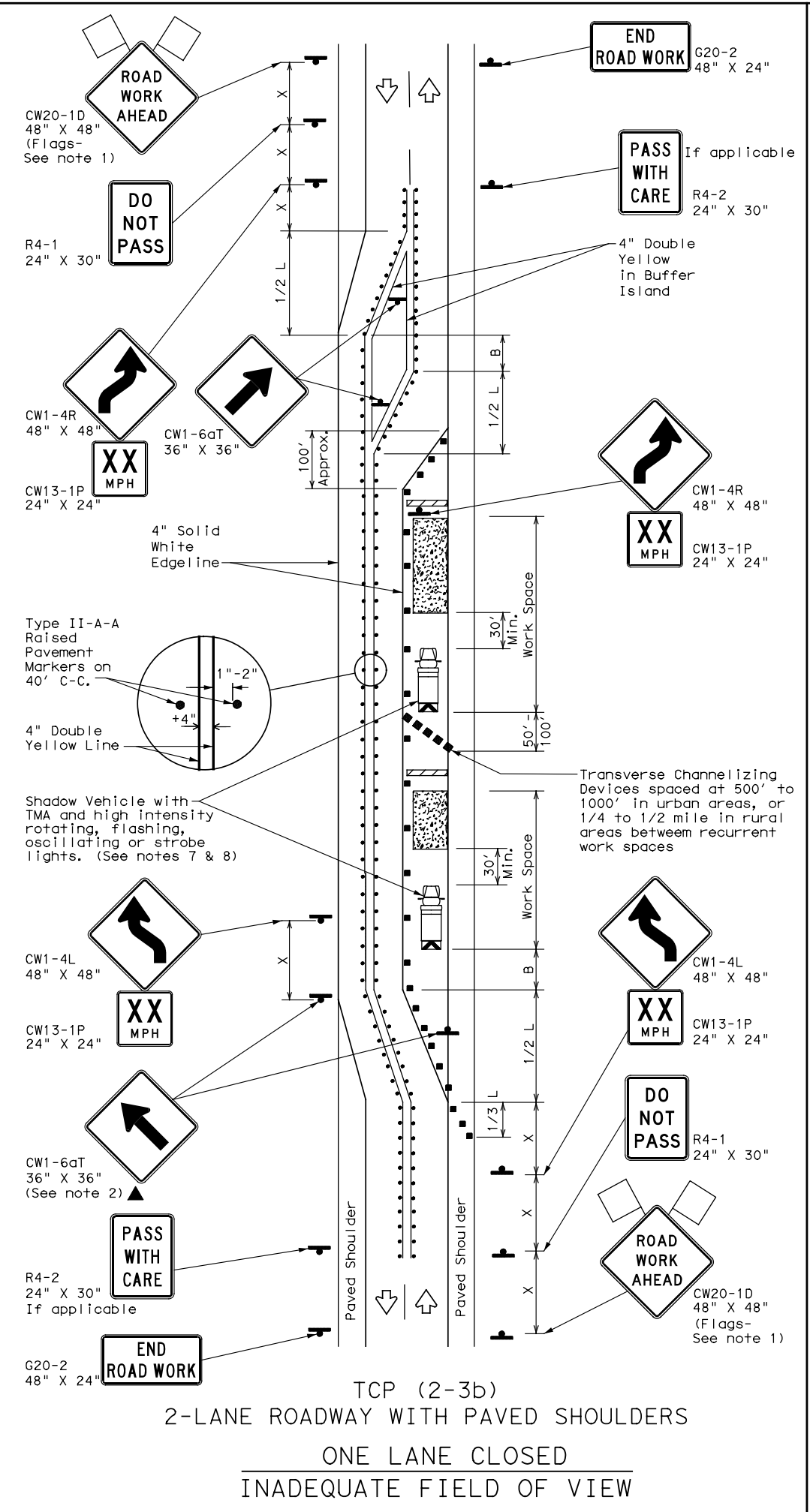
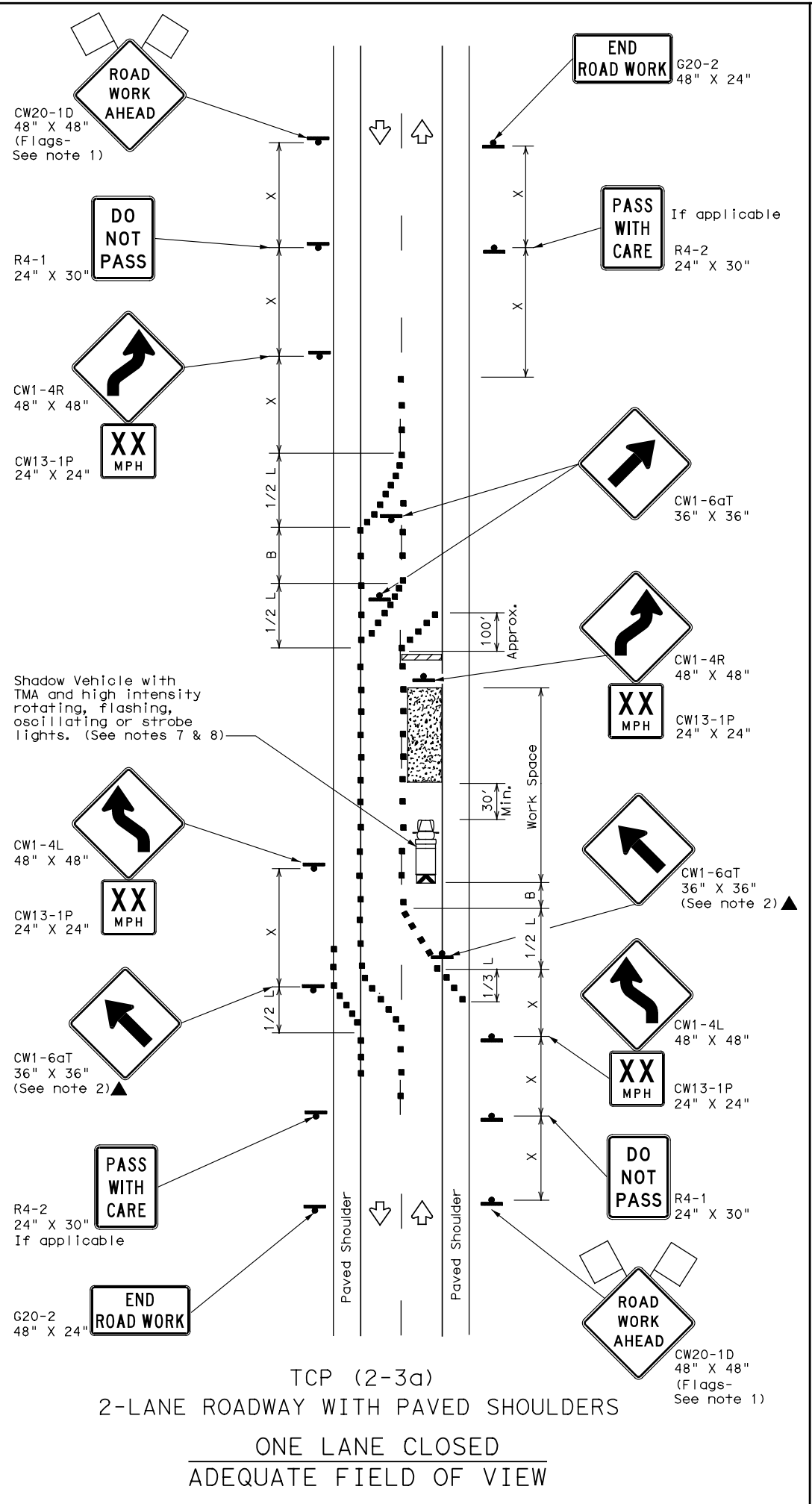
TRAFFIC CONTROL PLAN
 ONE-LANE TWO-WAY
 TRAFFIC CONTROL

TCP (2-2) - 18

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1-97	2-12	SAN	GUADALUPE	70	
4-98	2-18				

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LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed X	Formula	Minimum Desirable Taper Lengths XX			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = 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'	

X Conventional Roads Only
 XX 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
			✓	✓

TCP (2-3b) ONLY

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
 - Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
 - The R4-1 "DO NOT PASS," R4-2 "PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
 - Conflicting pavement marking shall be removed for long term projects.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-3a)**
- Conflicting pavement markings shall be removed for long-term projects. 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 device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
TRAFFIC SHIFTS ON
TWO-LANE ROADS

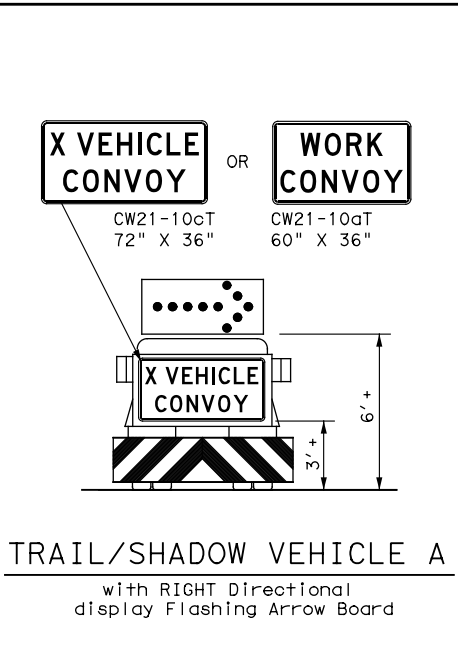
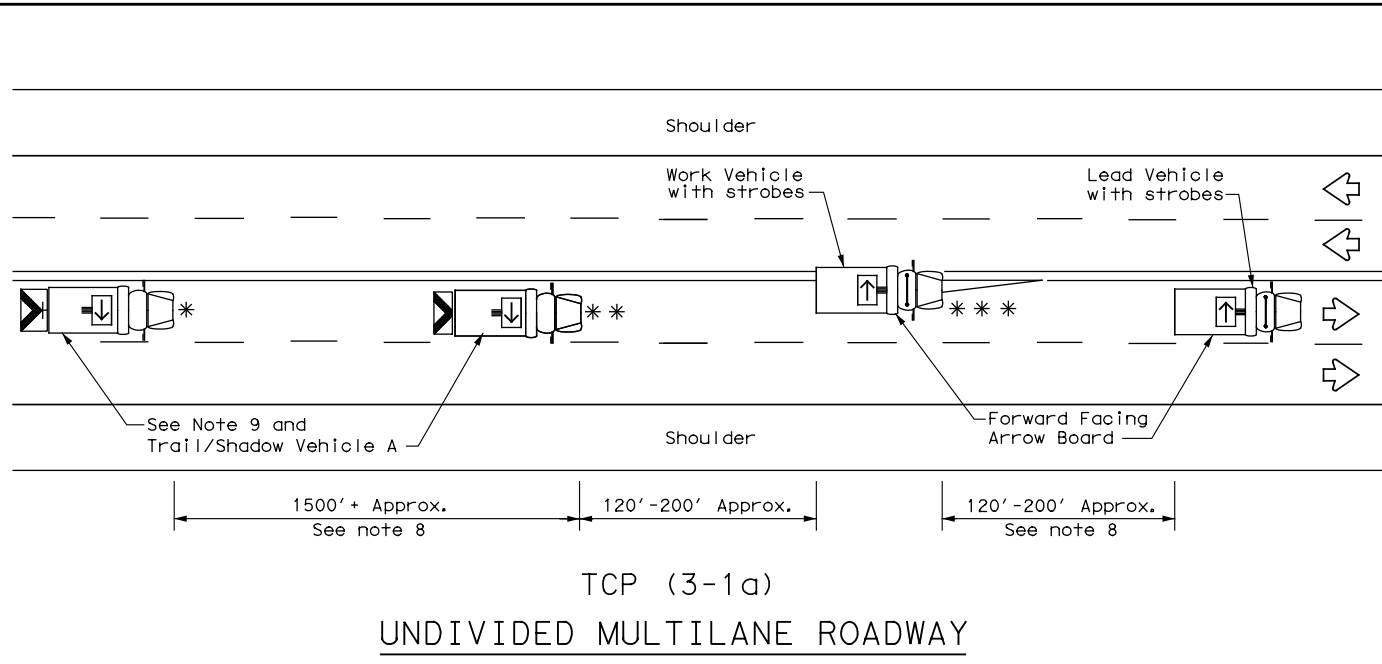
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8-95 3-03	DIST	COUNTY	SHEET NO.	
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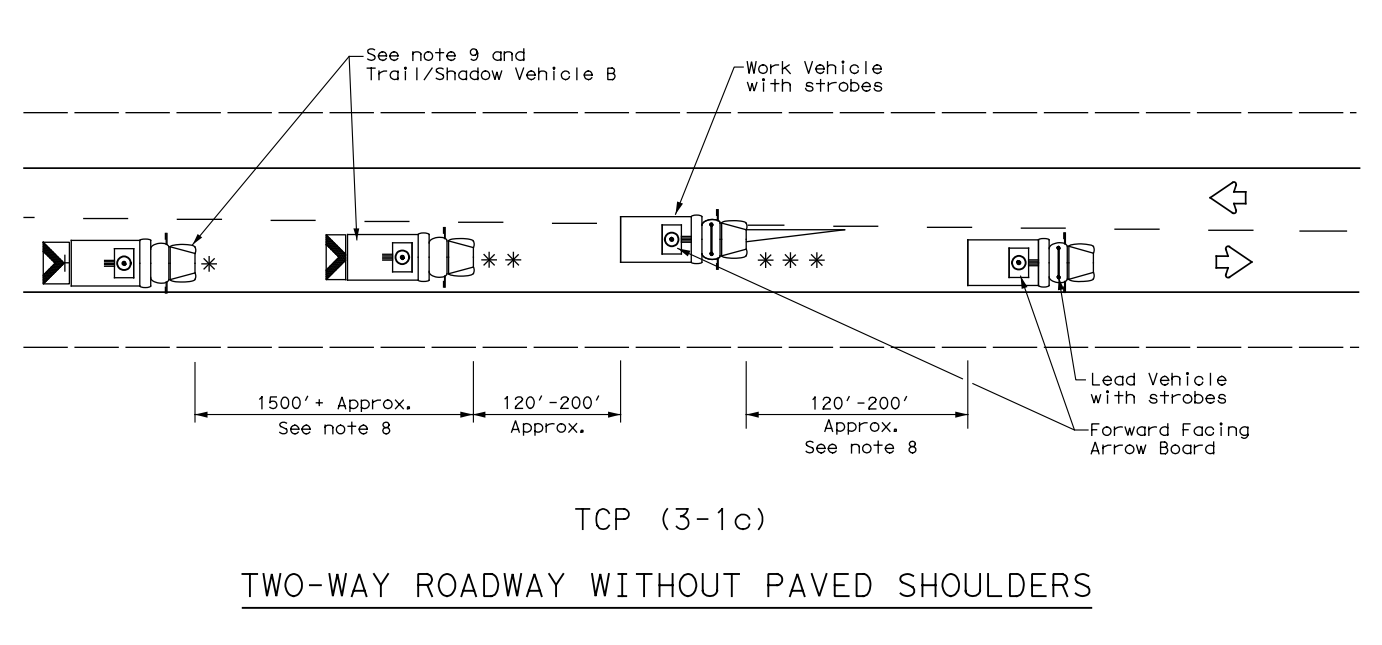
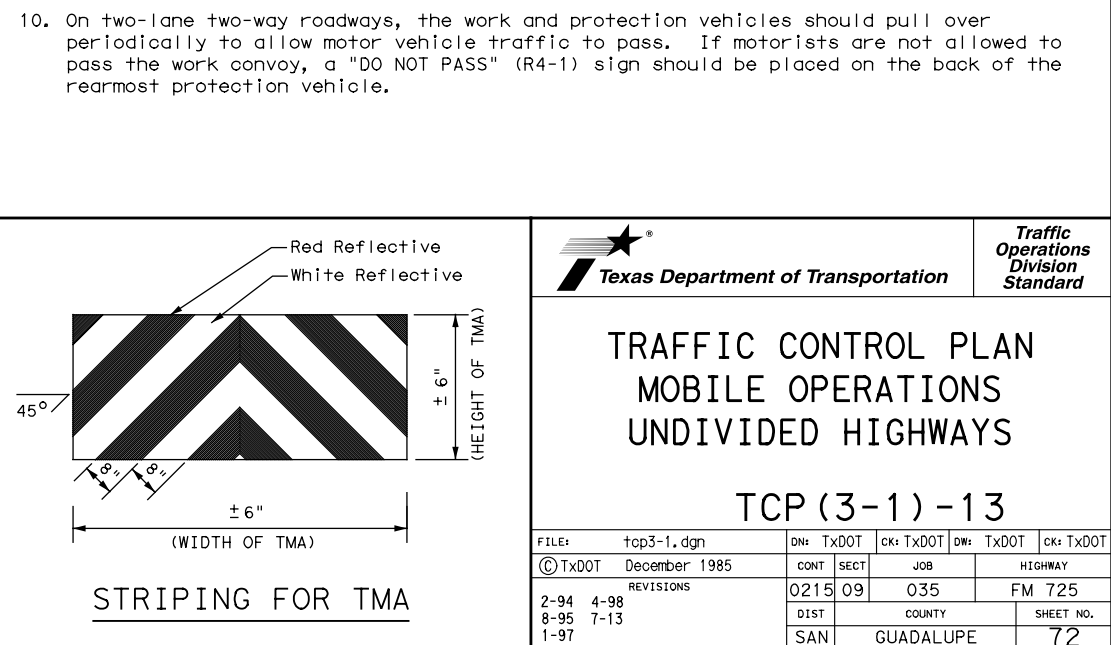
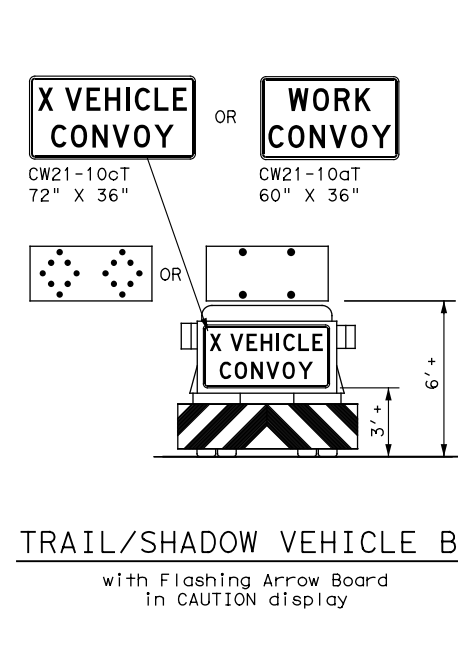
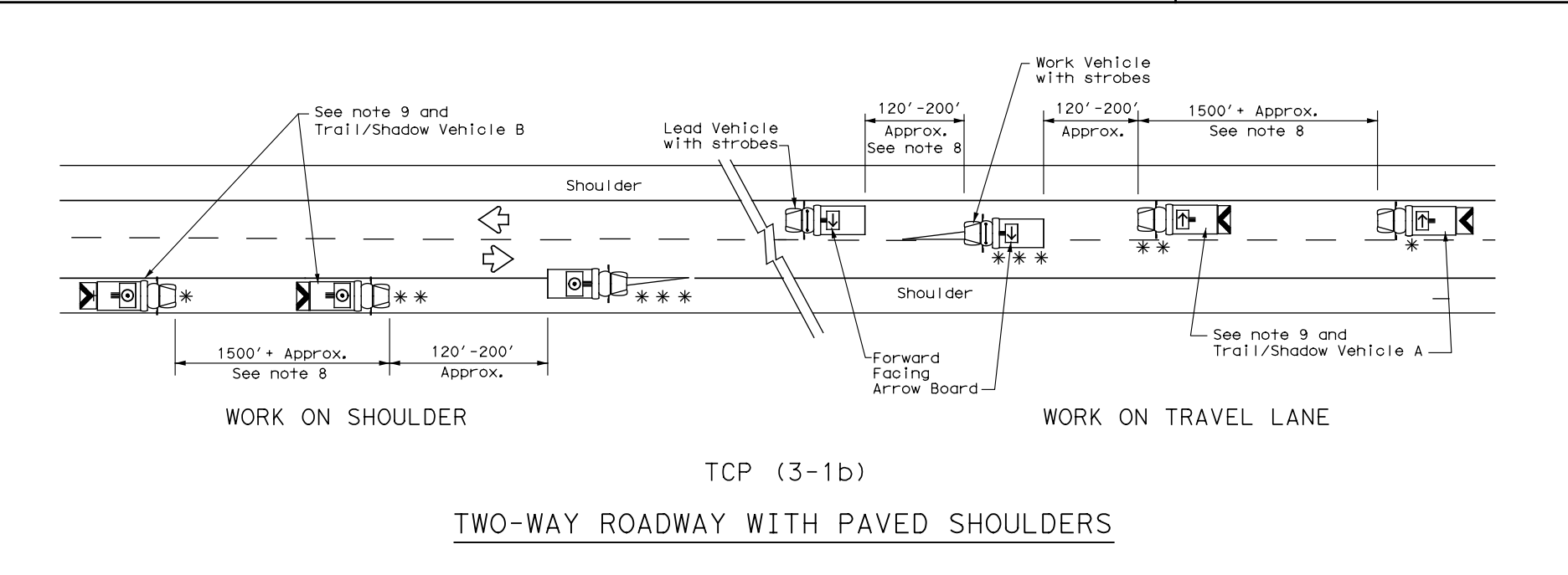


LEGEND				
*	Trail Vehicle	ARROW BOARD DISPLAY		
**	Shadow Vehicle			
***	Work Vehicle		RIGHT Directional	
	Heavy Work Vehicle		LEFT Directional	
	Truck Mounted Attenuator (TMA)		Double Arrow	
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)	

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY" (CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



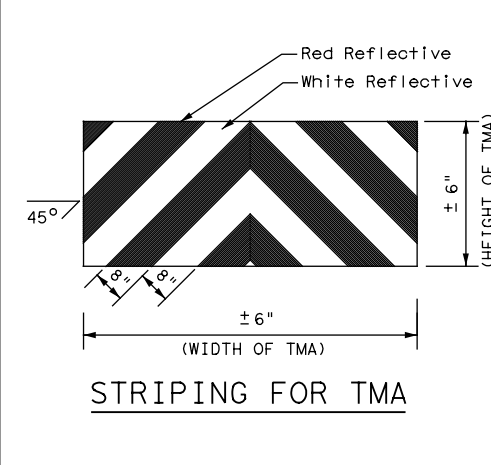
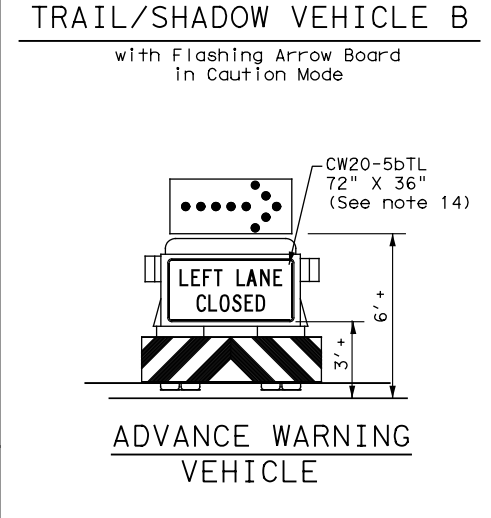
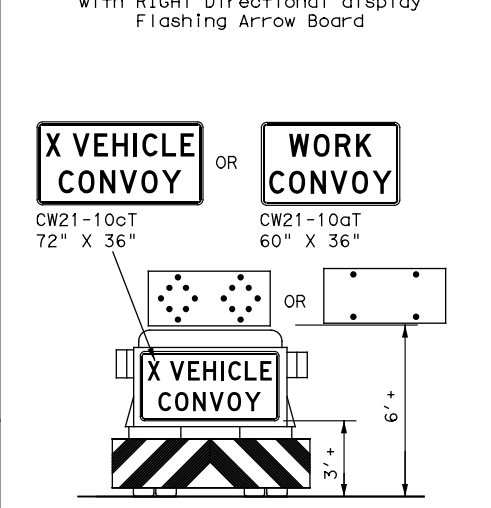
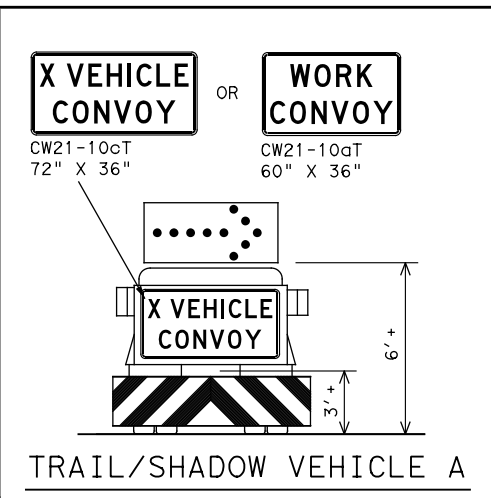
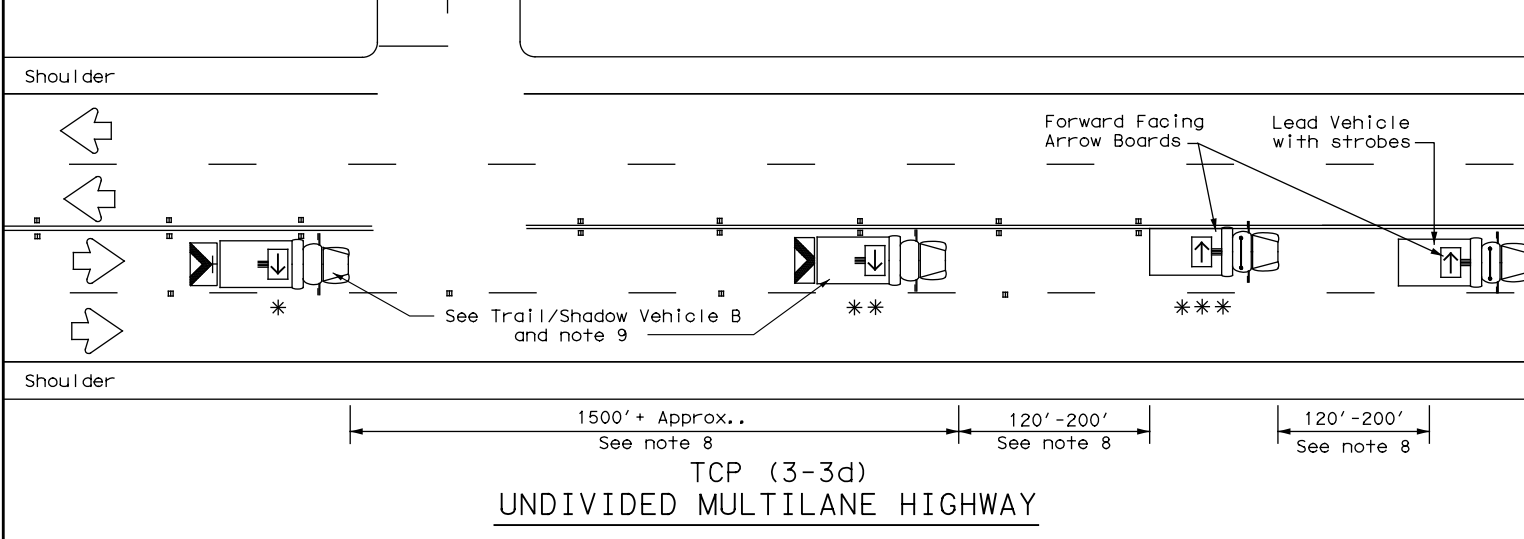
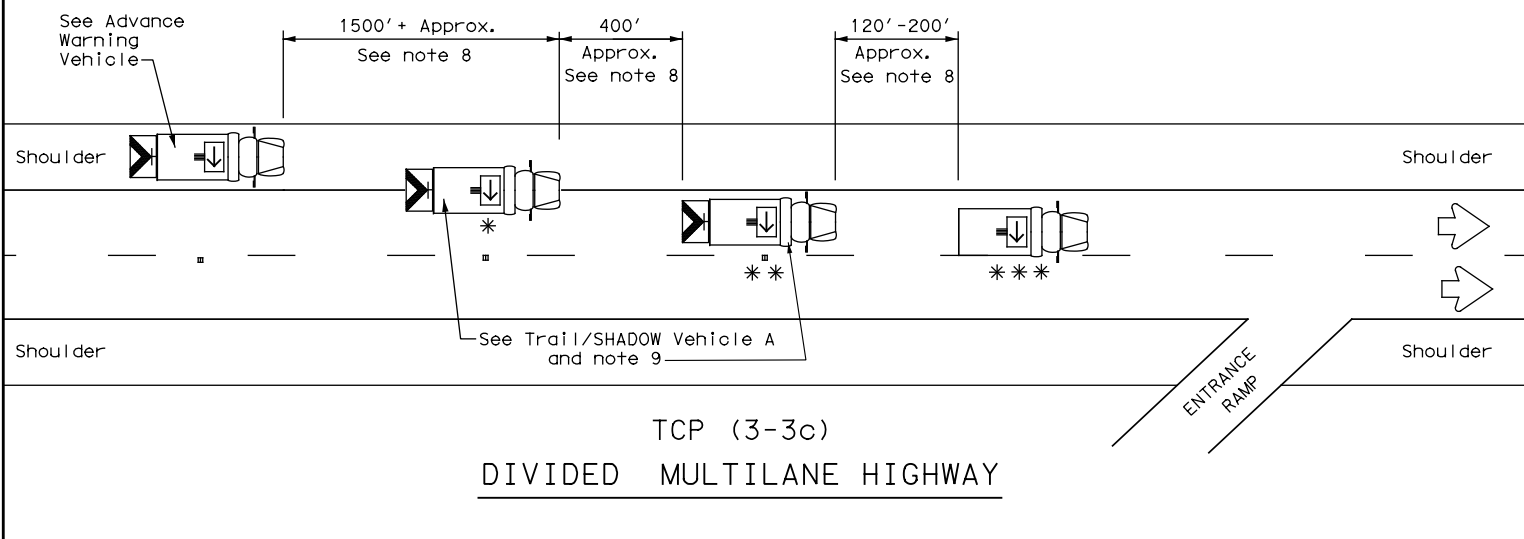
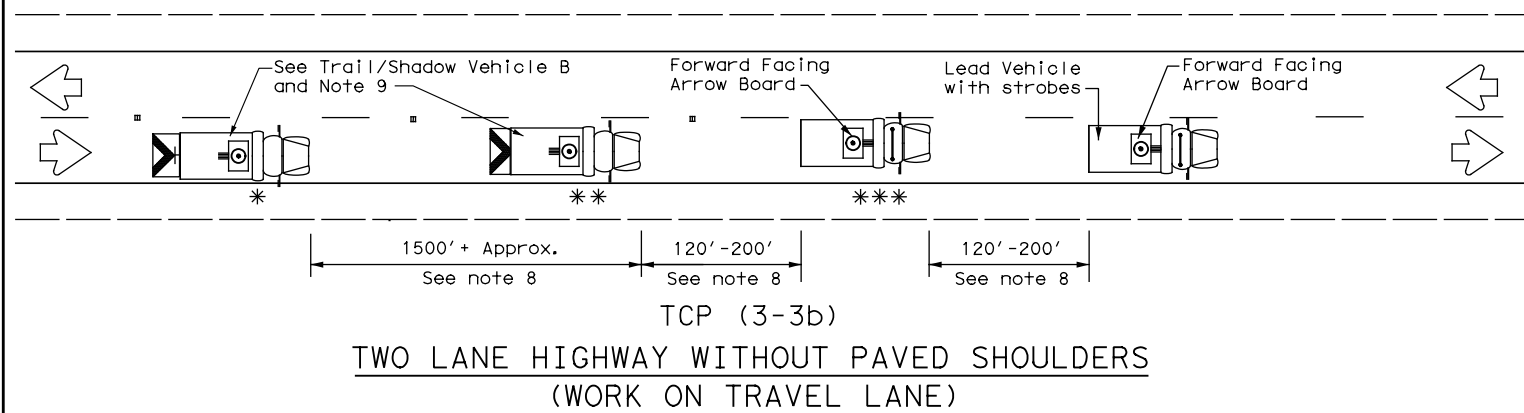
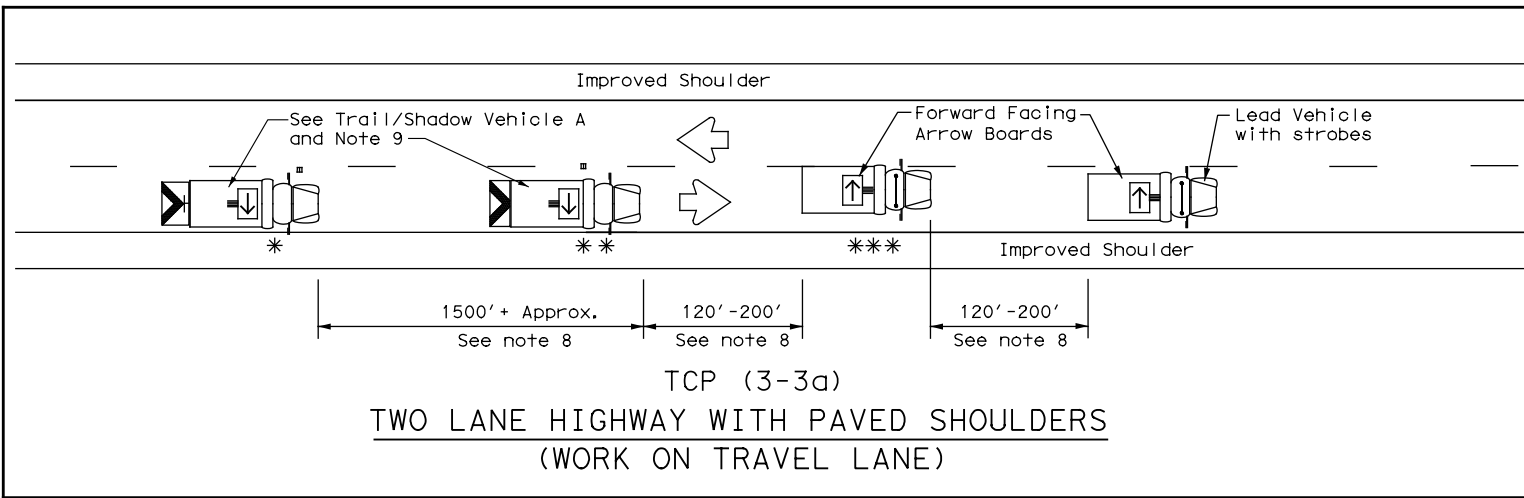
Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
 MOBILE OPERATIONS
 UNDIVIDED HIGHWAYS

TCP (3-1) - 13

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

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

GENERAL NOTES

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

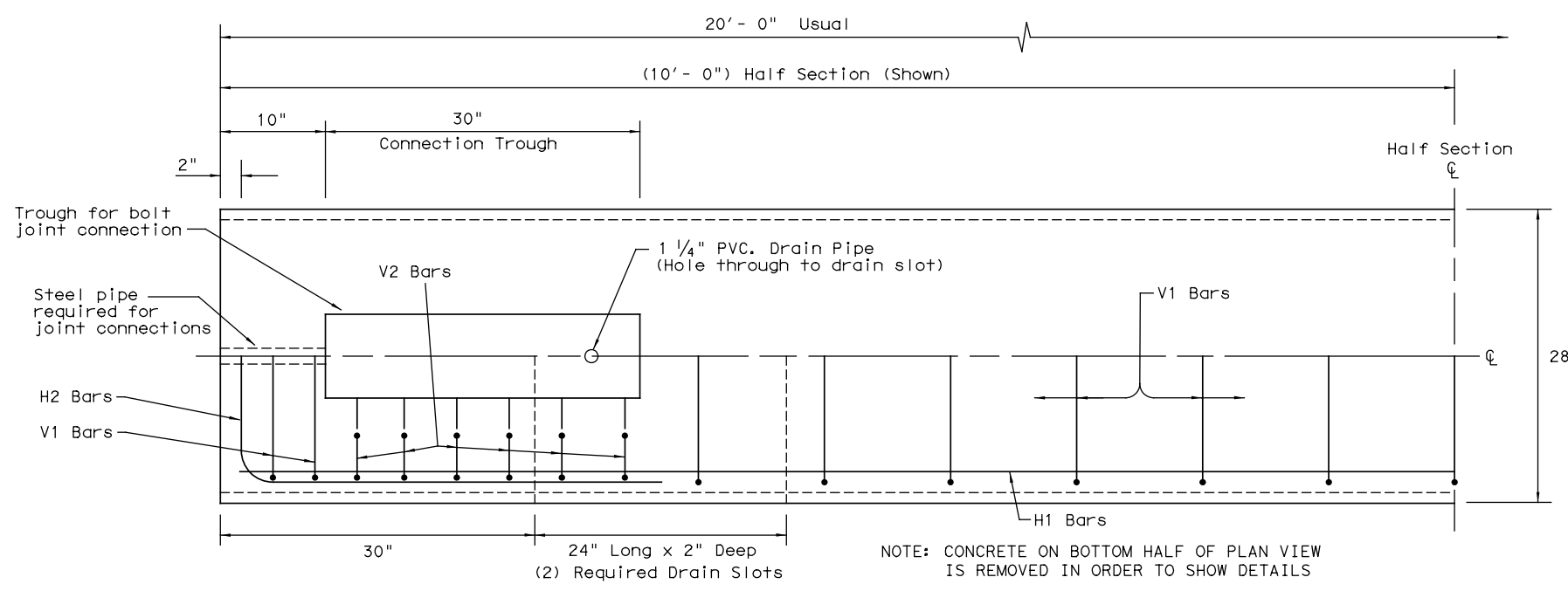
Texas Department of Transportation
Traffic Operations Division Standard

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

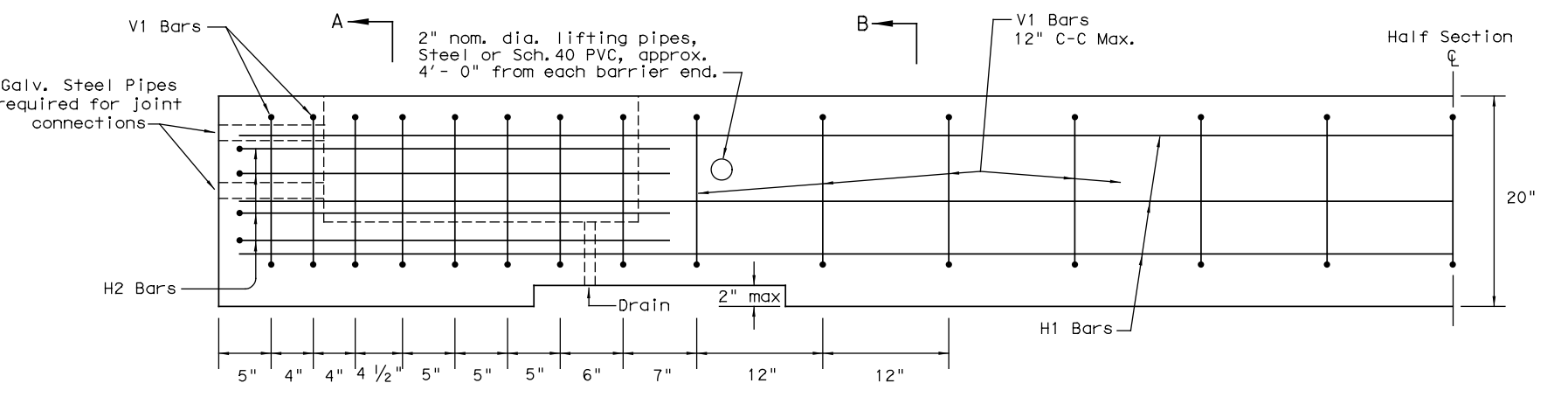
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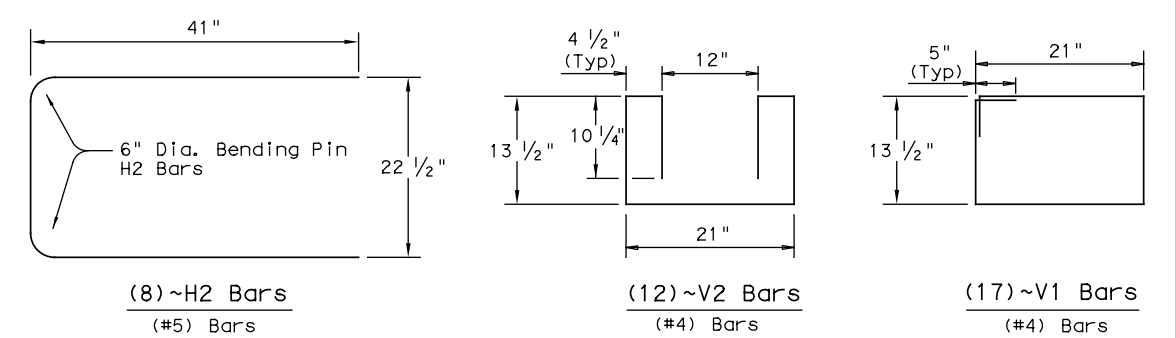
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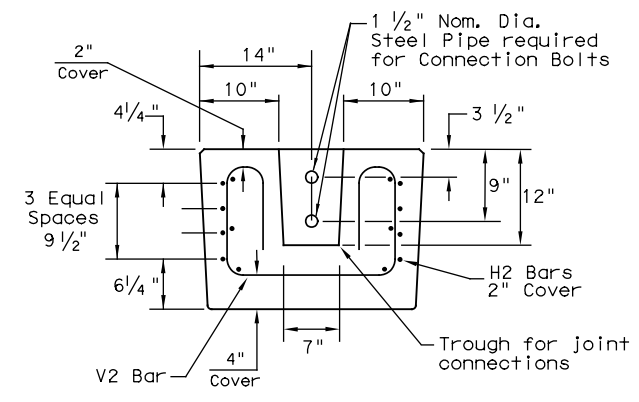
PLAN
 (TYPE 1) BARRIER SEGMENT
 (SYMMETRICAL ABOUT CENTER LINES)



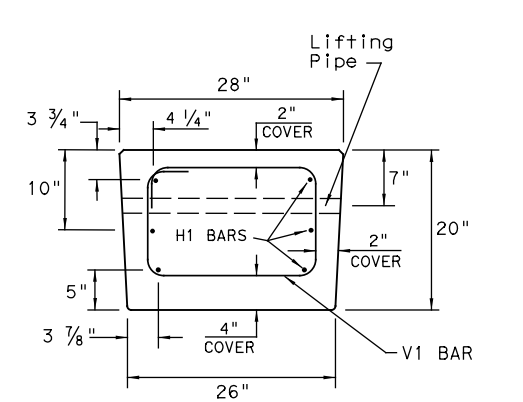
ELEVATION
 (TYPE 1) BARRIER SEGMENT
 (SYMMETRICAL ABOUT CENTER LINES)



REINFORCING STEEL DETAILS
 TYPE 1 - BARRIER SEGMENT
 Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have 3/4" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

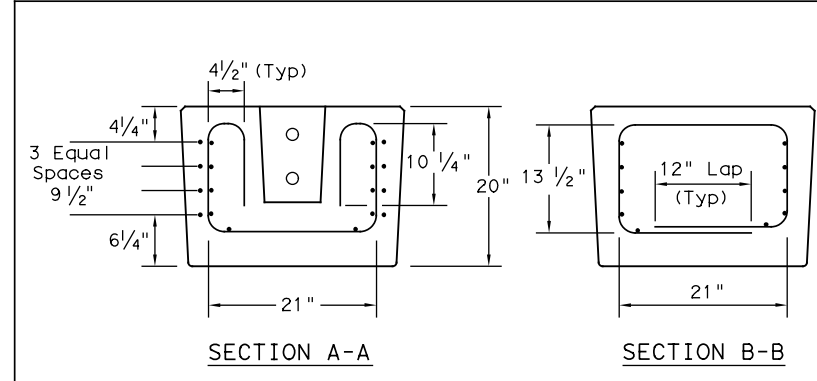
(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000

(WWR) GENERAL NOTES

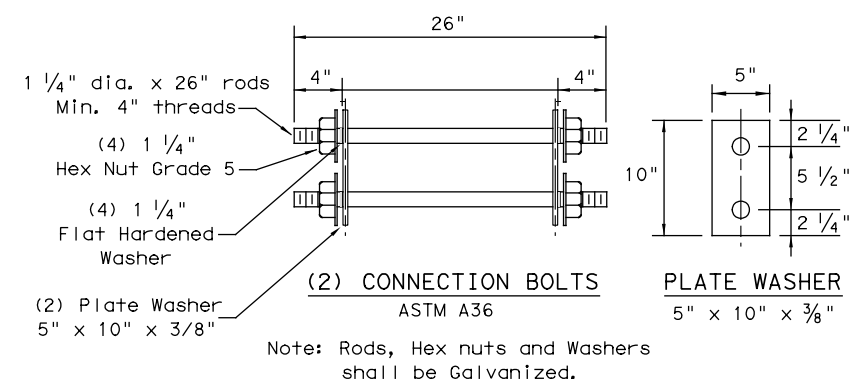
1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

- 8 ~ (D31) Horizontal Wires (Equally spaced)
- 10 ~ (D20) Horizontal Wires (Equally spaced)
- 29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)



WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING



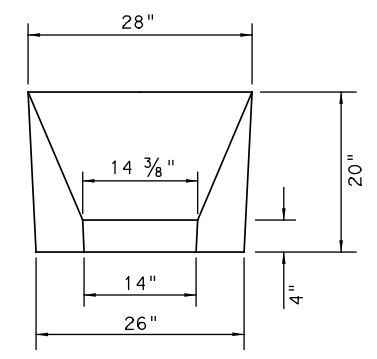
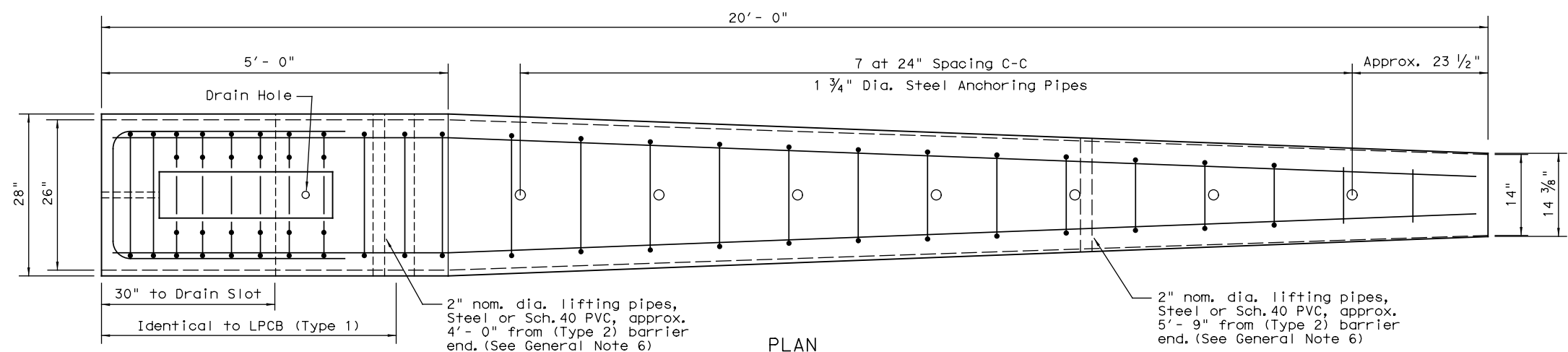
Note: Rods, Hex nuts and Washers shall be Galvanized.

Texas Department of Transportation
 Design Division Standard

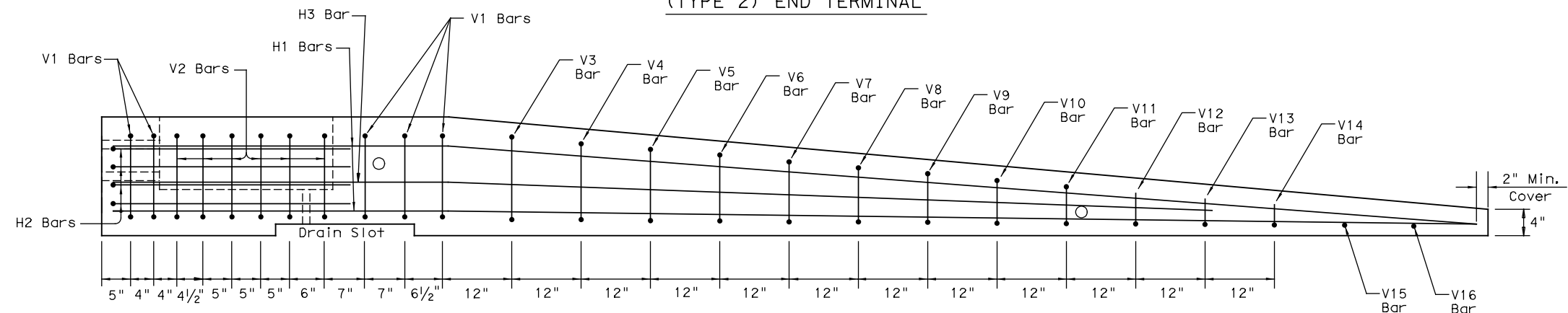
LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 1) LPCB-13

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©TxDOT December 2010	CONT SECT	JOB	HIGHWAY	
REVISIONS	0215 09	035	FM 725	
	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	74	

DATE: 2/28/2021
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 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



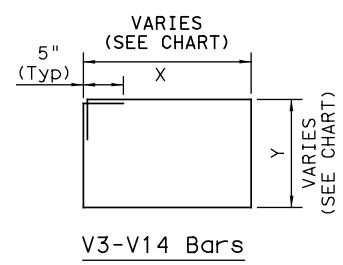
APPROACH VIEW



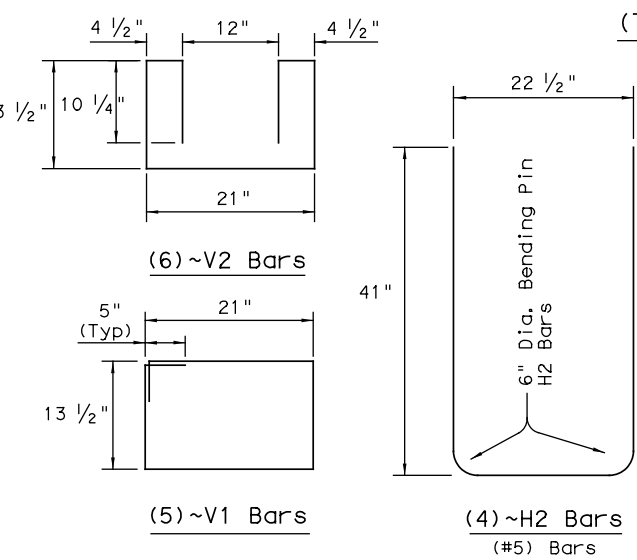
PLAN (TYPE 2) END TERMINAL

ELEVATION (TYPE 2) END TERMINAL

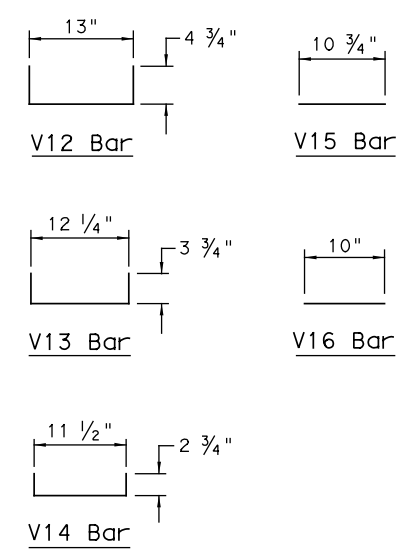
- TYPE 2 - NOTES**
1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
 2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
 3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
 4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
 5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
 6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
 7. See LPCB sheet 1 for additional information.



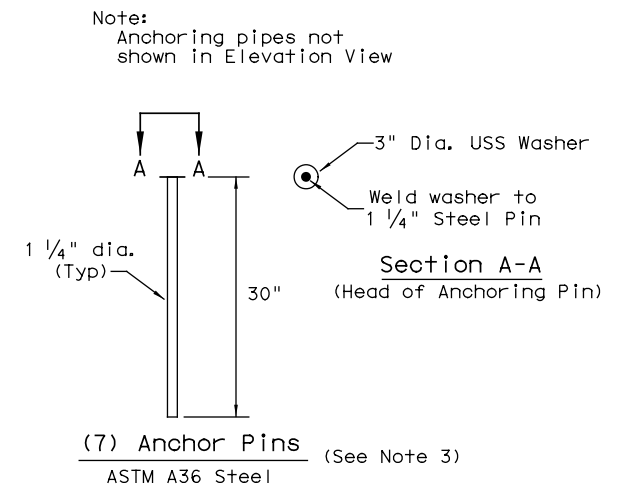
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



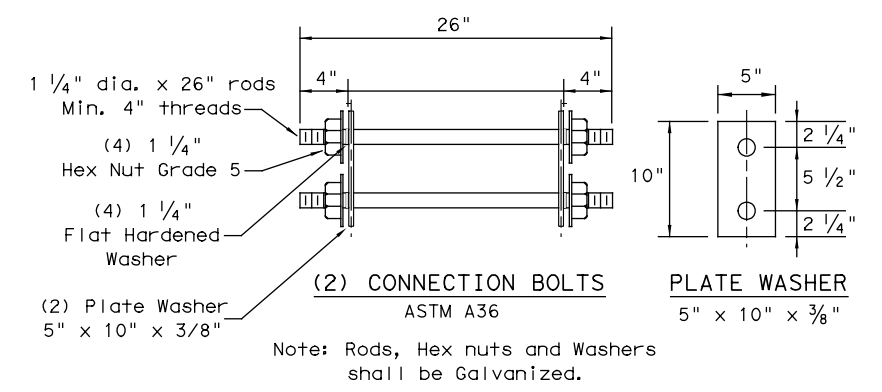
REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL



Note: All V Bars are (#4)



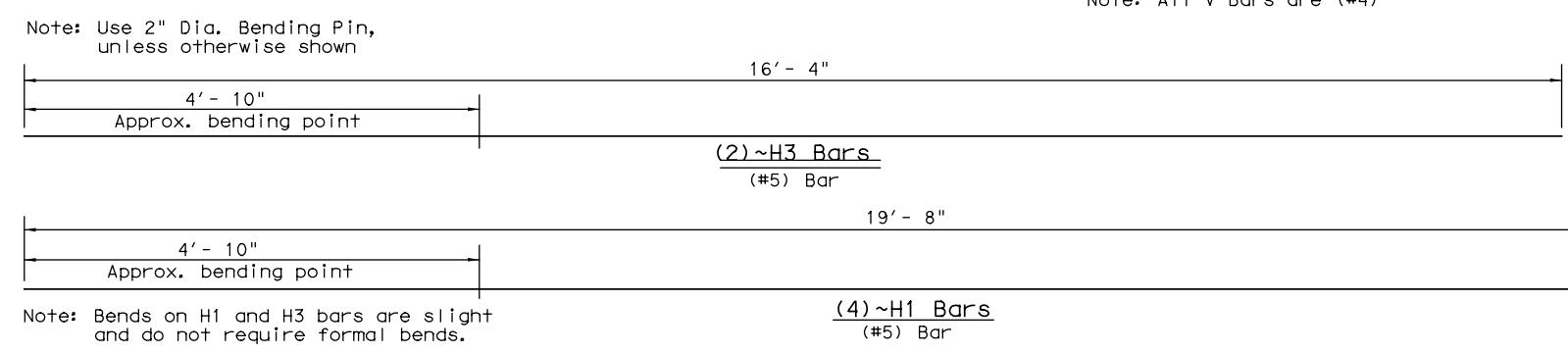
(7) Anchor Pins
ASTM A36 Steel (See Note 3)



Note: Rods, Hex nuts and Washers shall be Galvanized.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2)		APPROX. QUANTITIES 20 FT. SECTION	
CONCRETE	CY	1.65	
REINFORCING STEEL	LBS	240	
TOTAL BARRIER WT.	LBS	7000	

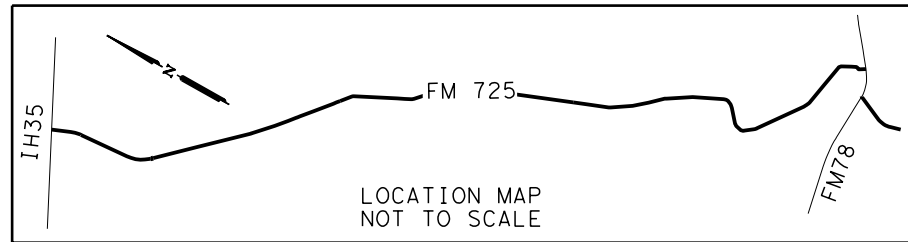


Note: Bends on H1 and H3 bars are slight and do not require formal bends.

Texas Department of Transportation
 Design Division Standard

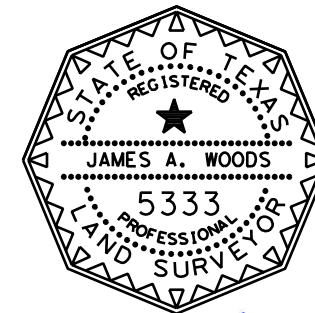
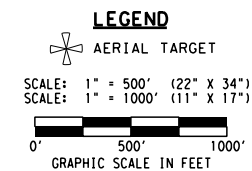
LOW PROFILE CONCRETE BARRIER PRECAST BARRIER (TYPE 2) LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
DIST	COUNTY		SHEET NO.	
SAN	GUADALUPE		75	



NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD83 (2011 ADJ.; EPOCH 2010.00)
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6. FIELD SURVEYS PERFORMED JANUARY 2018.



James A. Woods, P.L.S.

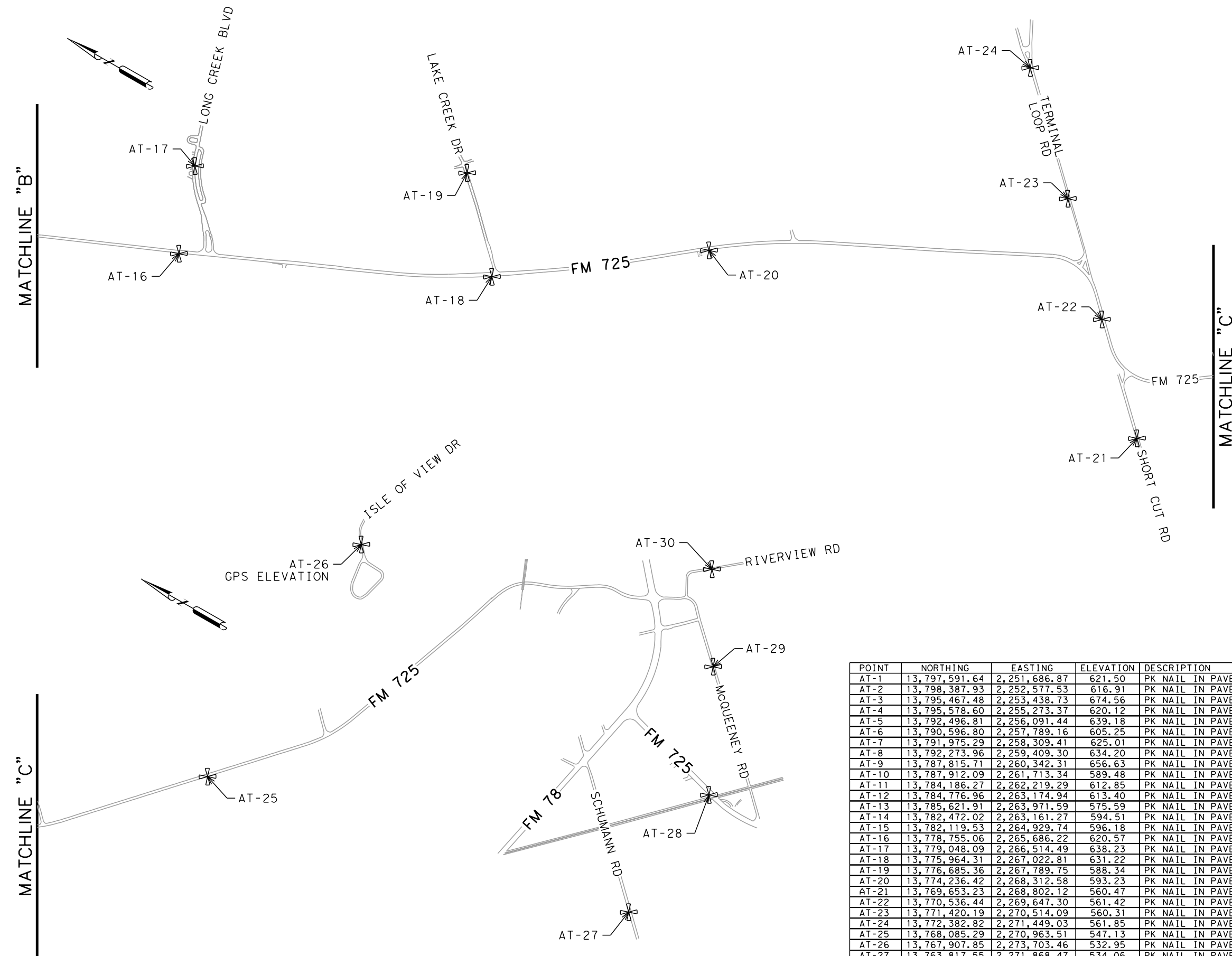
I HEREBY CERTIFY THAT THIS CONTROL MAP WAS PREPARED UNDER MY SUPERVISION IN JULY 2018.



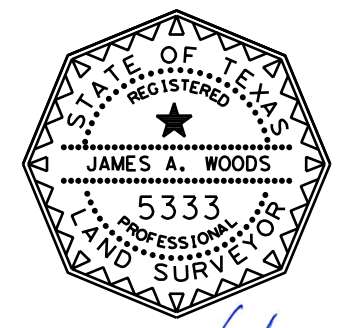
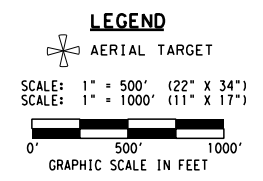
FM 725
CONTROL INDEX

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
			76
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725



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 6. FIELD SURVEYS PERFORMED JANUARY 2018.



James A. Woods, P.P.S.

I HEREBY CERTIFY THAT THIS CONTROL MAP WAS PREPARED UNDER MY SUPERVISION IN JULY 2018.

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
AT-1	13,797,591.64	2,251,686.87	621.50	PK NAIL IN PAVEMENT
AT-2	13,798,387.93	2,252,577.53	616.91	PK NAIL IN PAVEMENT
AT-3	13,795,467.48	2,253,438.73	674.56	PK NAIL IN PAVEMENT
AT-4	13,795,578.60	2,255,273.37	620.12	PK NAIL IN PAVEMENT
AT-5	13,792,496.81	2,256,091.44	639.18	PK NAIL IN PAVEMENT
AT-6	13,790,596.80	2,257,789.16	605.25	PK NAIL IN PAVEMENT
AT-7	13,791,975.29	2,258,309.41	625.01	PK NAIL IN PAVEMENT
AT-8	13,792,273.96	2,259,409.30	634.20	PK NAIL IN PAVEMENT
AT-9	13,787,815.71	2,260,342.31	656.63	PK NAIL IN PAVEMENT
AT-10	13,787,912.09	2,261,713.34	589.48	PK NAIL IN PAVEMENT
AT-11	13,784,186.27	2,262,219.29	612.85	PK NAIL IN PAVEMENT
AT-12	13,784,776.96	2,263,174.94	613.40	PK NAIL IN PAVEMENT
AT-13	13,785,621.91	2,263,971.59	575.59	PK NAIL IN PAVEMENT
AT-14	13,782,472.02	2,263,161.27	594.51	PK NAIL IN PAVEMENT
AT-15	13,782,119.53	2,264,929.74	596.18	PK NAIL IN PAVEMENT
AT-16	13,778,755.06	2,265,686.22	620.57	PK NAIL IN PAVEMENT
AT-17	13,779,048.09	2,266,514.49	638.23	PK NAIL IN PAVEMENT
AT-18	13,775,964.31	2,267,022.81	631.22	PK NAIL IN PAVEMENT
AT-19	13,776,685.36	2,267,789.75	588.34	PK NAIL IN PAVEMENT
AT-20	13,774,236.42	2,268,312.58	593.23	PK NAIL IN PAVEMENT
AT-21	13,769,653.23	2,268,802.12	560.47	PK NAIL IN PAVEMENT
AT-22	13,770,536.44	2,269,647.30	561.42	PK NAIL IN PAVEMENT
AT-23	13,771,420.19	2,270,514.09	560.31	PK NAIL IN PAVEMENT
AT-24	13,772,382.82	2,271,449.03	561.85	PK NAIL IN PAVEMENT
AT-25	13,768,085.29	2,270,963.51	547.13	PK NAIL IN PAVEMENT
AT-26	13,767,907.85	2,273,703.46	532.95	PK NAIL IN PAVEMENT
AT-27	13,763,817.55	2,271,868.47	534.06	PK NAIL IN PAVEMENT
AT-28	13,763,706.13	2,273,264.97	535.66	PK NAIL IN PAVEMENT
AT-29	13,764,299.03	2,274,382.99	537.64	PK NAIL IN PAVEMENT
AT-30	13,764,787.24	2,275,210.77	533.57	PK NAIL IN PAVEMENT

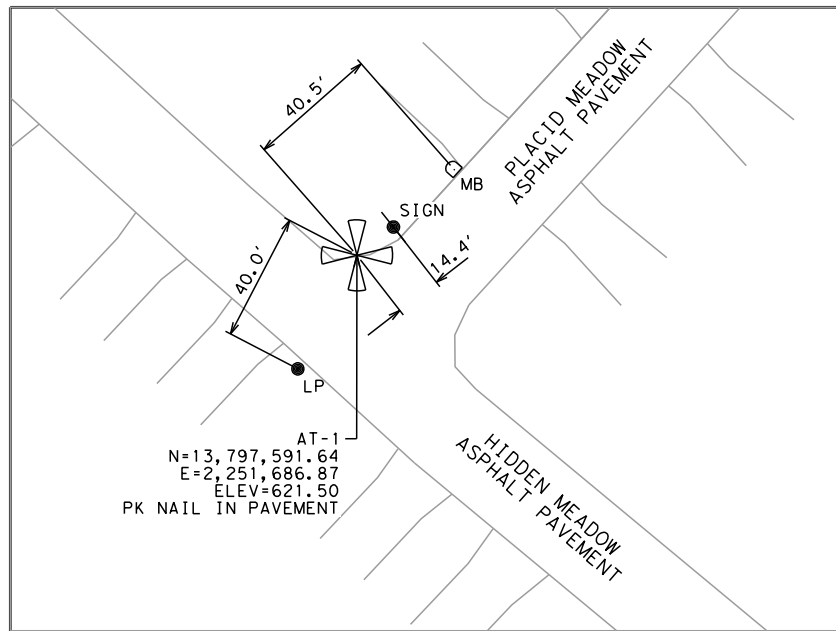
Civil Corp
ENGINEERS • SURVEYORS
4611 AIRLINE ROAD, SUITE 300, VICTORIA, TEXAS 77904
TBPE REGISTRATION #F-10283 TBPLS REGISTRATION #100576-00



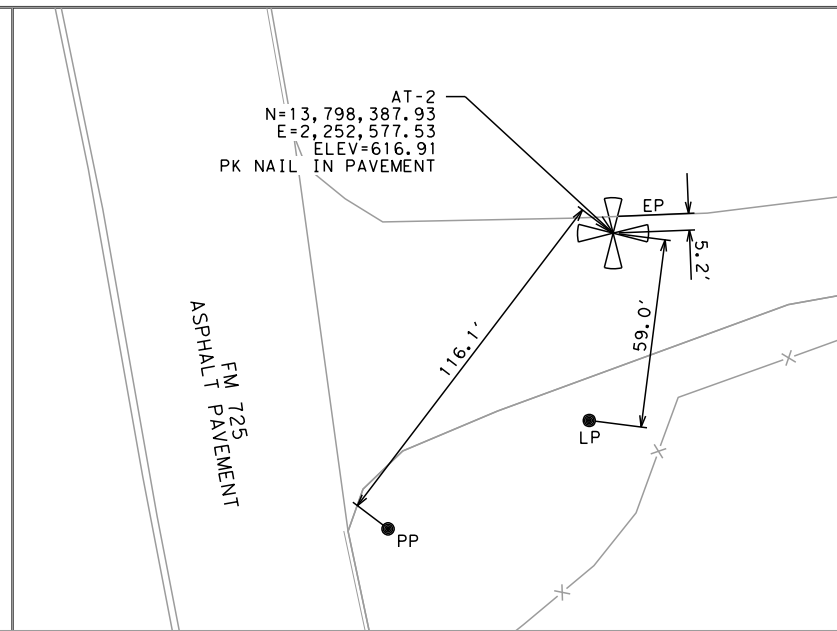
FM 725 CONTROL INDEX

SHEET 2 OF 2

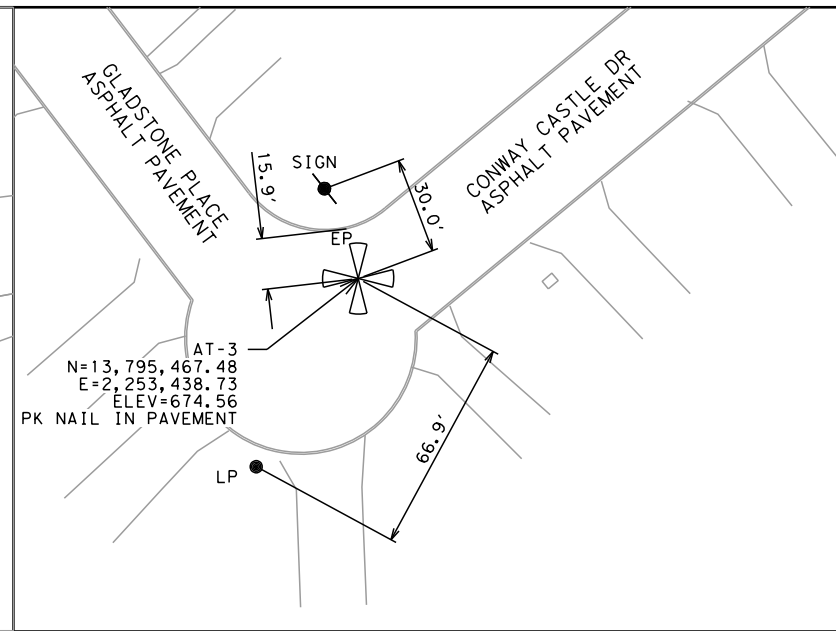
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TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725



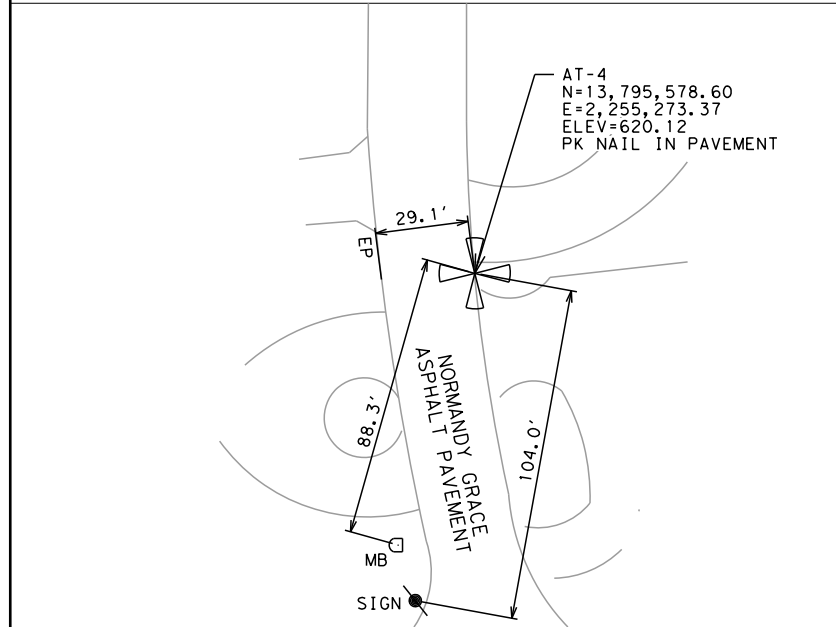
BEING ON THE EAST SIDE OF HIDDEN MEADOW,
APPROXIMATELY 630 FEET NORTHWEST OF SERENE MEADOW.



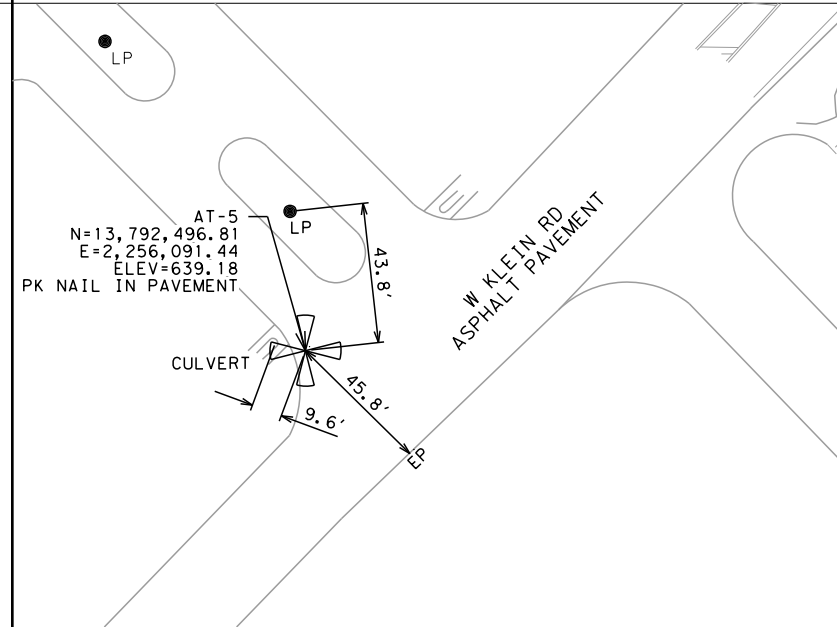
BEING ON THE EAST SIDE OF FM 725,
APPROXIMATELY 1,440 FEET NORTHWEST OF E COUNTY LINE ROAD.



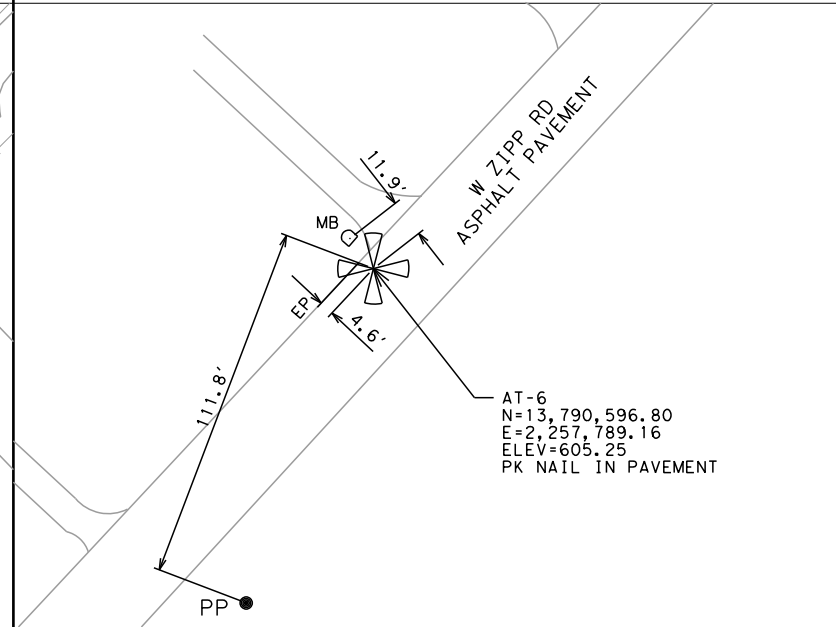
BEING ON THE CENTER OF CONWAY CASTLE DRIVE,
APPROXIMATELY 660 FEET SOUTHWEST OF FM 725.



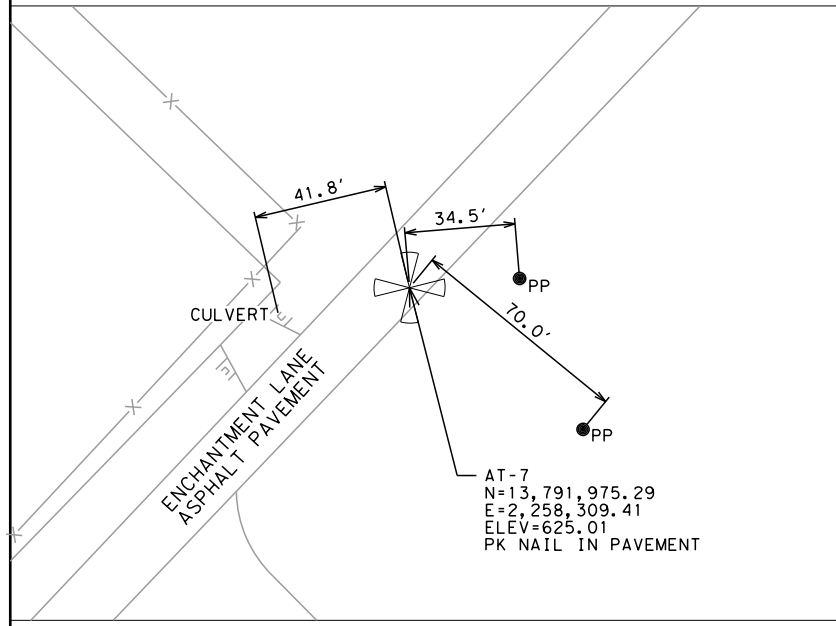
BEING ON THE EAST SIDE OF NORMANDY GRACE,
APPROXIMATELY 150 FEET NORTH OF SOUTHBANK BOULEVARD.



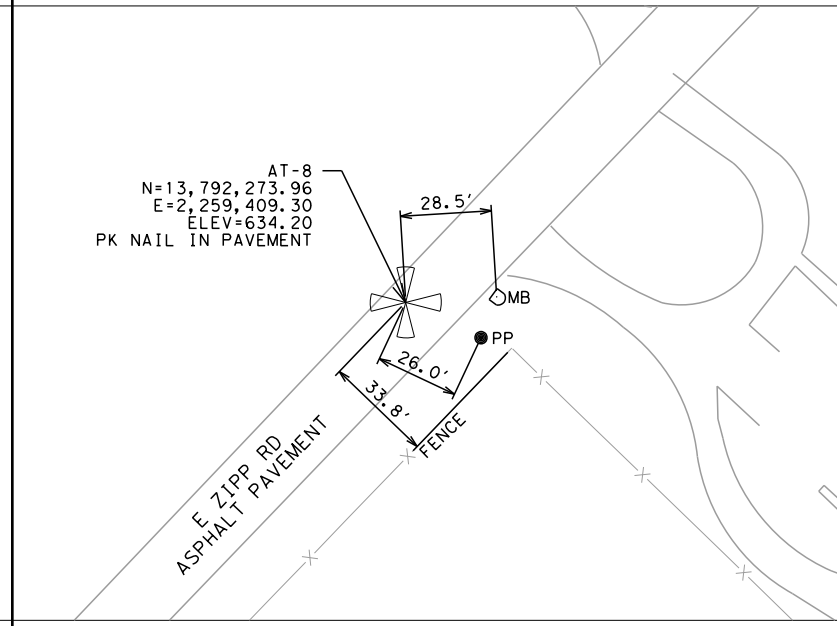
BEING ON THE NORTH SIDE OF WEST KLEIN ROAD,
APPROXIMATELY 500 FEET SOUTHWEST OF FM 725.



BEING ON THE NORTH SIDE OF WEST ZIPP ROAD,
APPROXIMATELY 580 FEET SOUTHWEST OF FM 725.

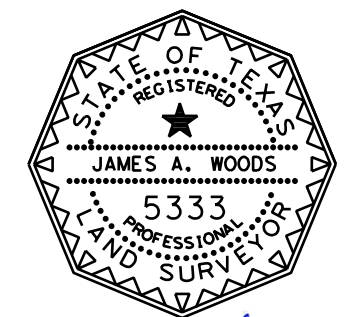


BEING ON THE SOUTH SIDE OF ENCHANTMENT LANE,
APPROXIMATELY 760 FEET NORTHEAST OF FM 725.



BEING ON THE SOUTH SIDE OF EAST ZIPP ROAD,
APPROXIMATELY 1,760 FEET NORTHEAST OF FM 725.

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James A. Woods, RPS

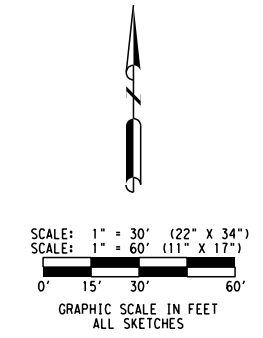
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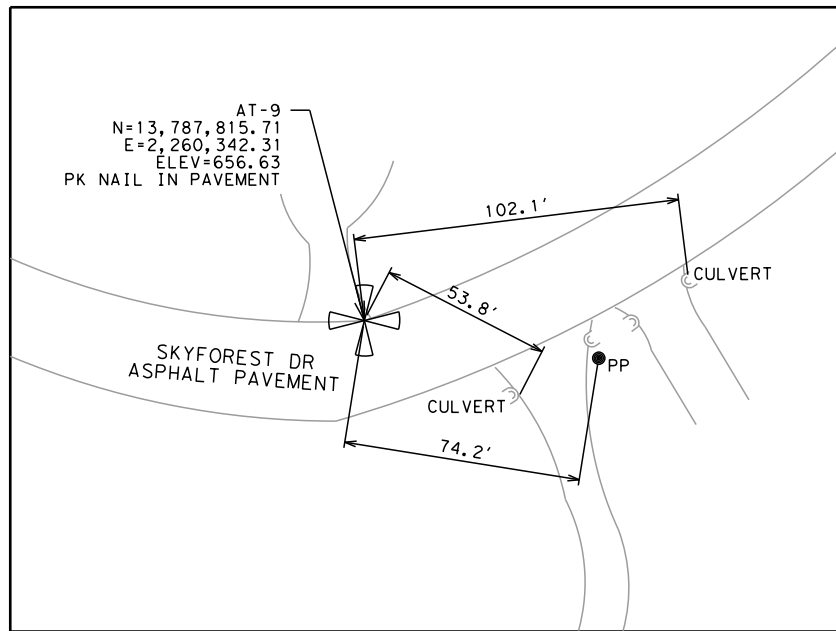


**FM 725
HORIZONTAL AND
VERTICAL CONTROL**

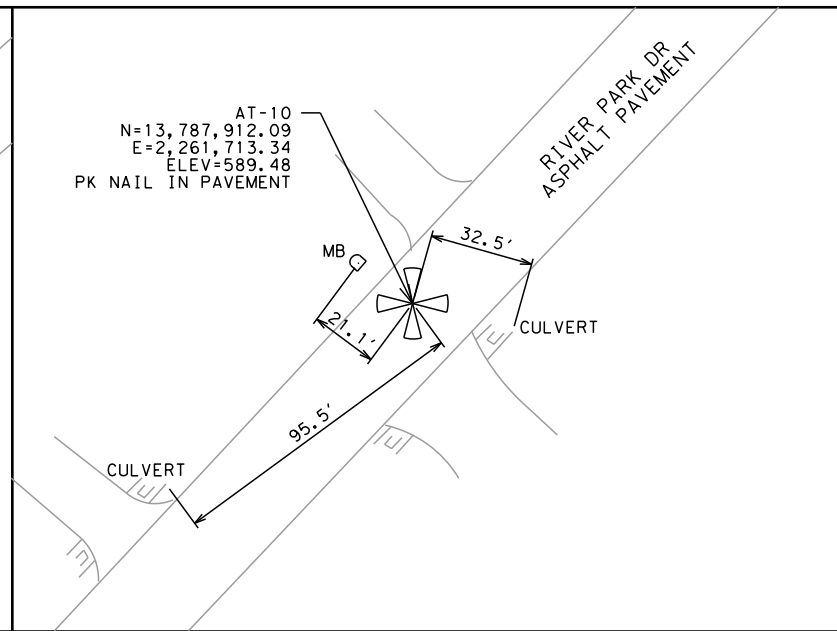
SHEET 1 OF 4

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TEXAS	SAT	GUADALUPE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0215	09	035	FM 725	

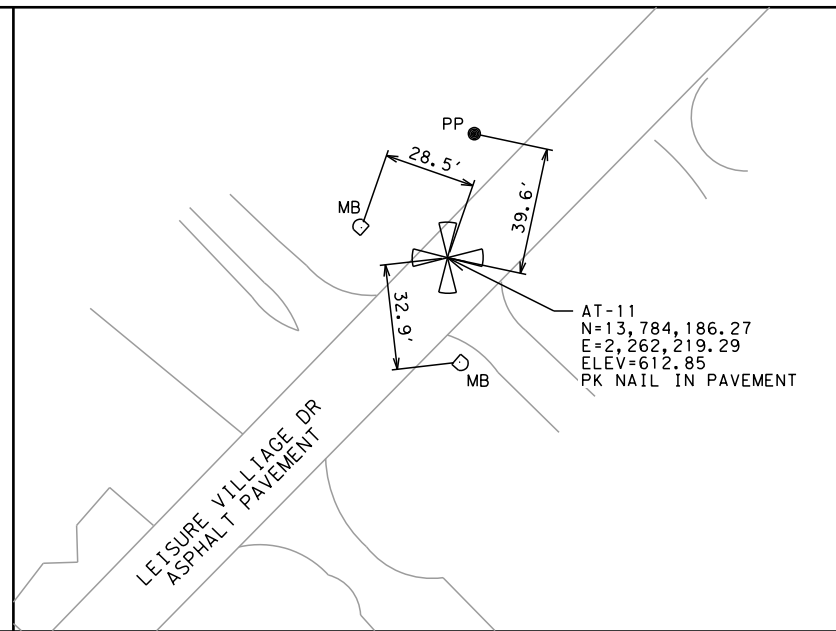




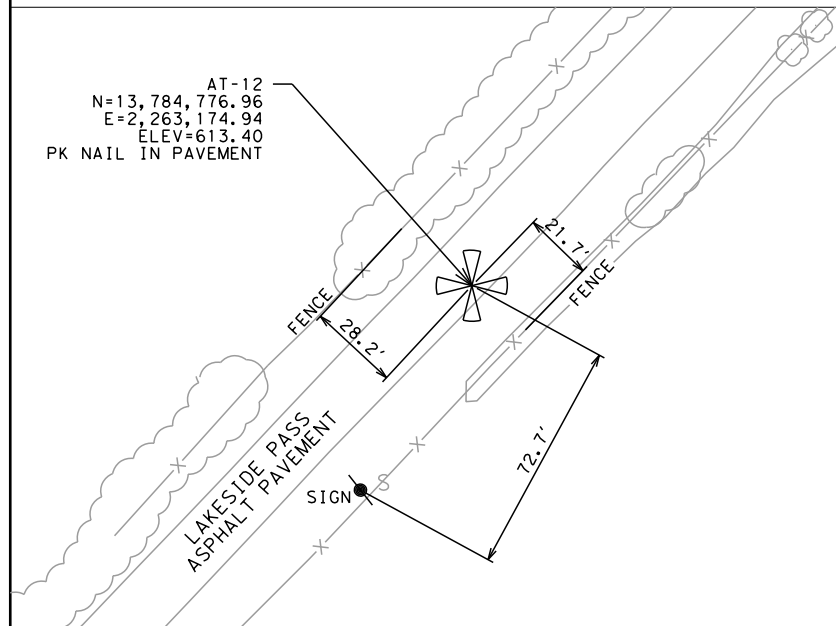
BEING ON THE NORTH SIDE OF SKYFOREST DRIVE, APPROXIMATELY 500 FEET WEST OF FM 725.



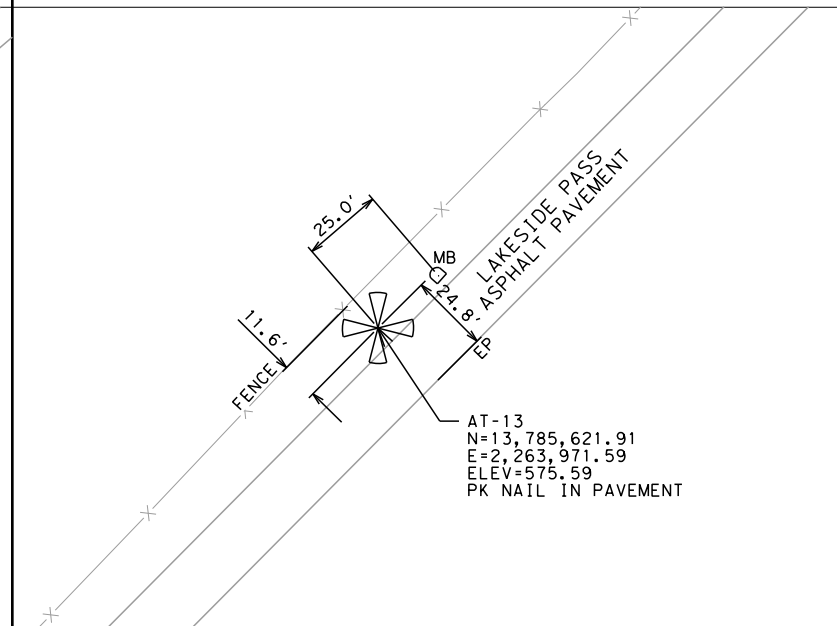
BEING ON THE SOUTH SIDE OF RIVER PARK DRIVE, APPROXIMATELY 830 FEET EAST OF FM 725.



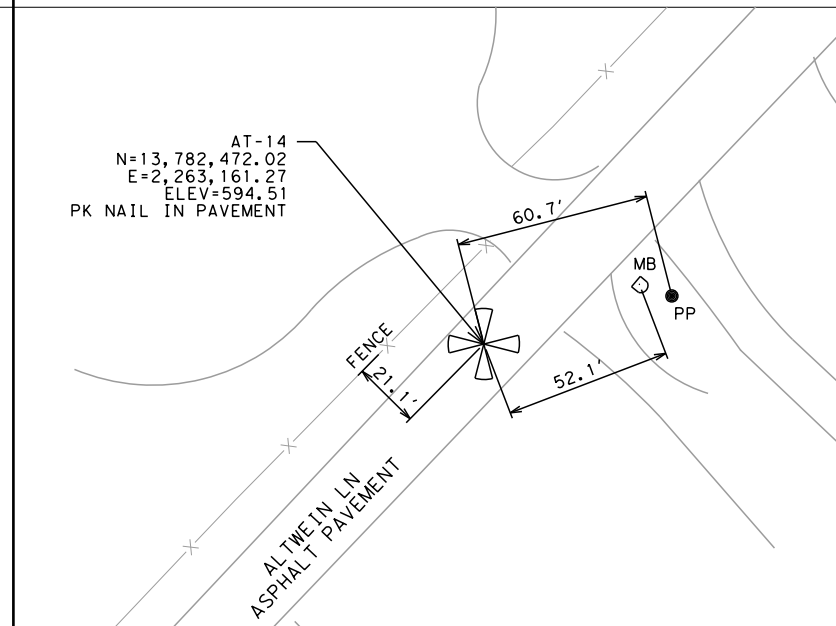
BEING ON THE SOUTH SIDE OF LEISURE VILLAGE DRIVE, APPROXIMATELY 800 FEET WEST OF FM 725.



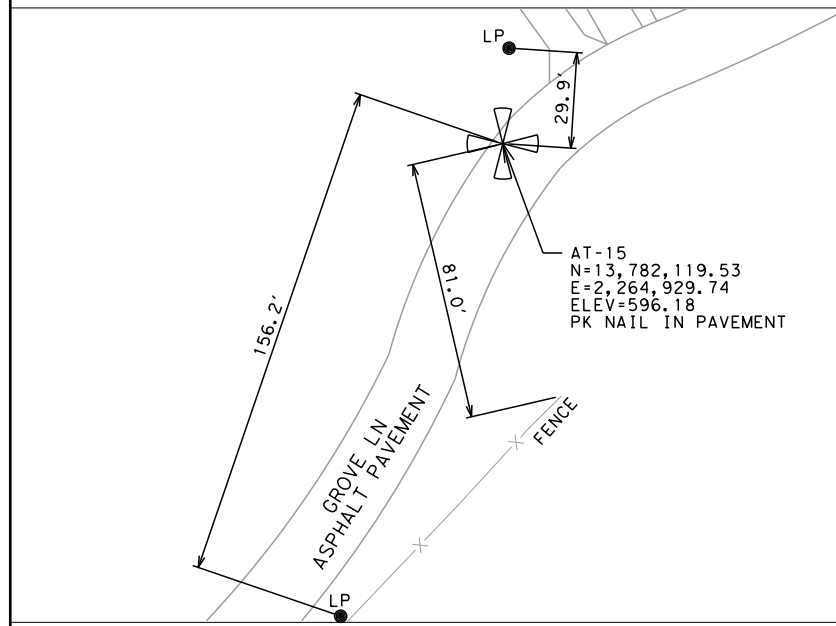
BEING ON THE SOUTH SIDE OF LAKESIDE PASS, APPROXIMATELY 340 FEET EAST OF FM 725.



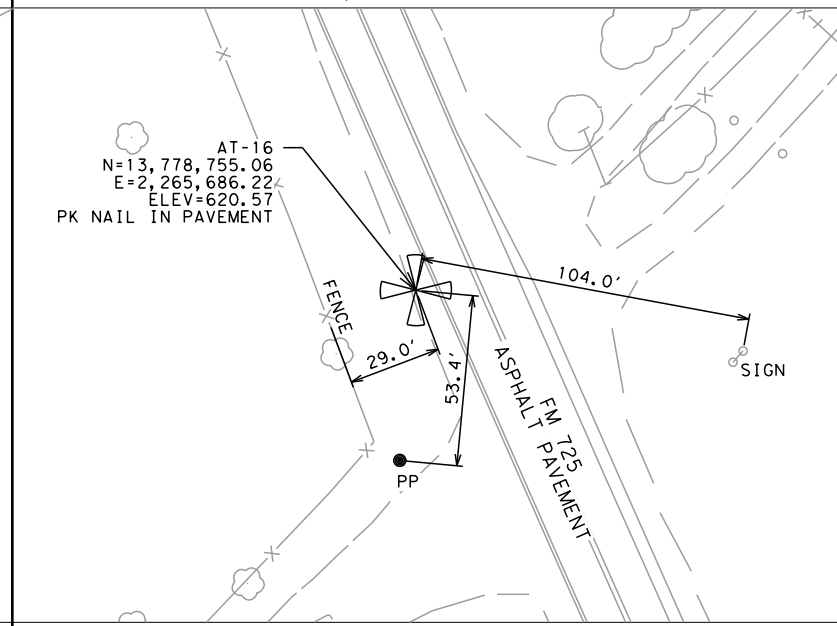
BEING ON THE NORTH SIDE OF LAKESIDE PASS, APPROXIMATELY 1,500 FEET EAST OF FM 725.



BEING ON THE SOUTH SIDE OF ALTWEIN LANE, APPROXIMATELY 900 FEET WEST OF FM 725.

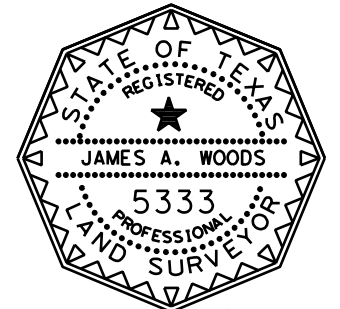


BEING ON THE SOUTH SIDE OF GROVE LANE, APPROXIMATELY 700 FEET EAST OF FM 725.



BEING ON THE WEST SIDE OF FM 725, APPROXIMATELY 230 FEET WEST OF LONG CREEK BOULEVARD.

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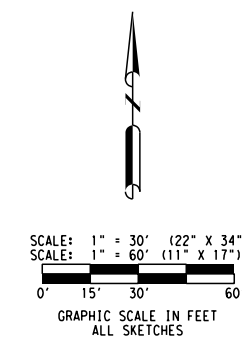
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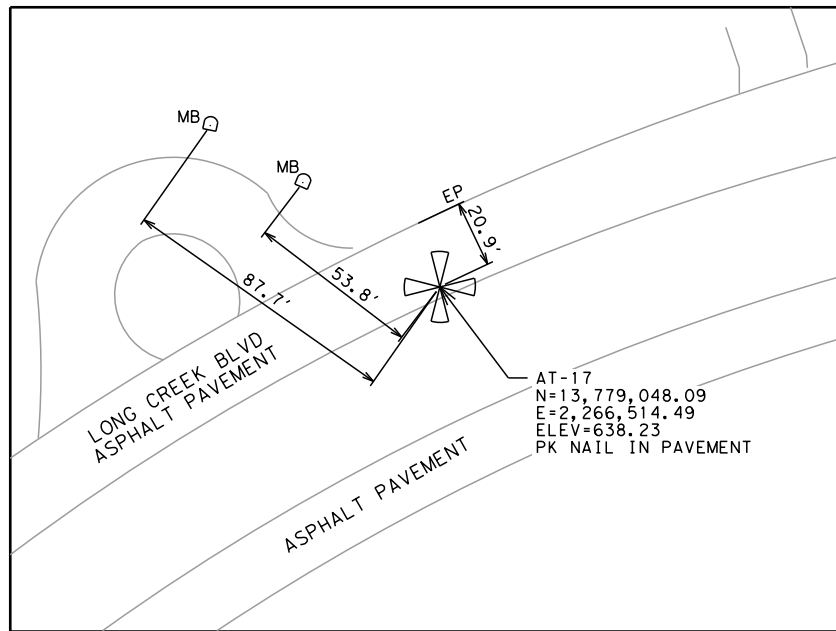


**FM 725
HORIZONTAL AND
VERTICAL CONTROL**

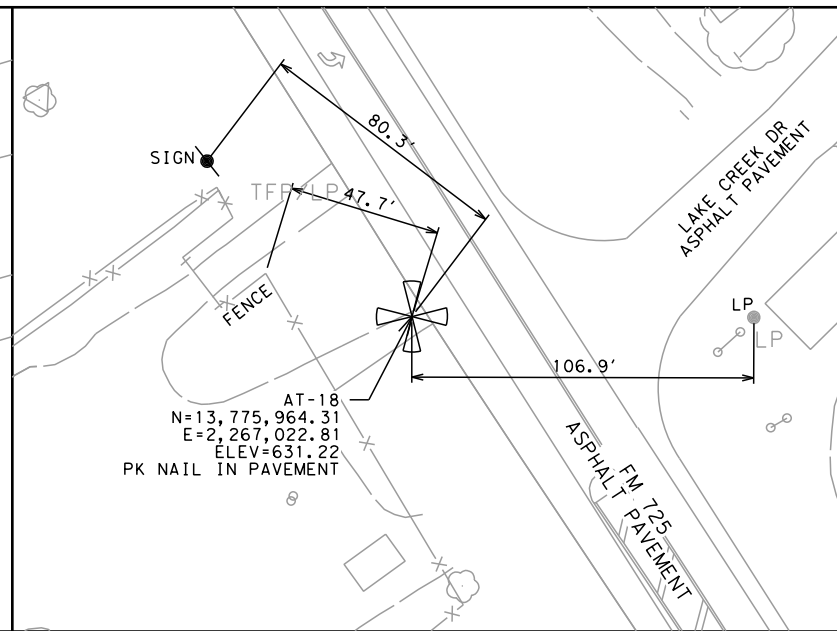
SHEET 2 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
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TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725

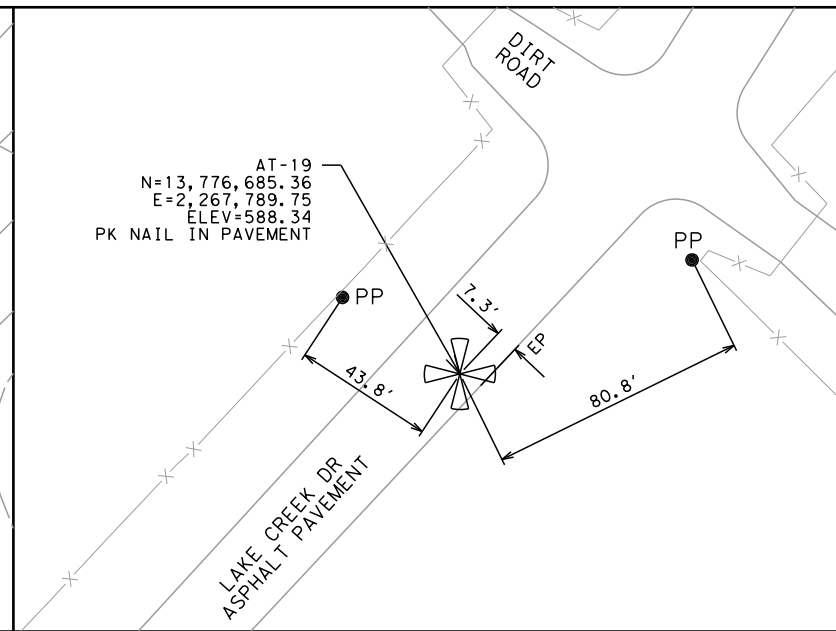




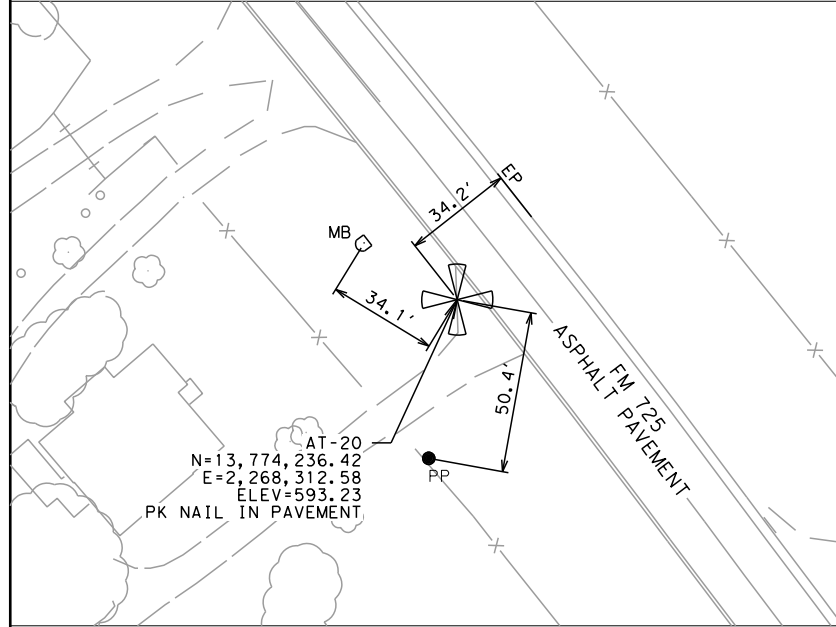
BEING ON THE SOUTH SIDE OF LONG CREEK BOULEVARD, APPROXIMATELY 900 FEET NORTHEAST OF FM 725.



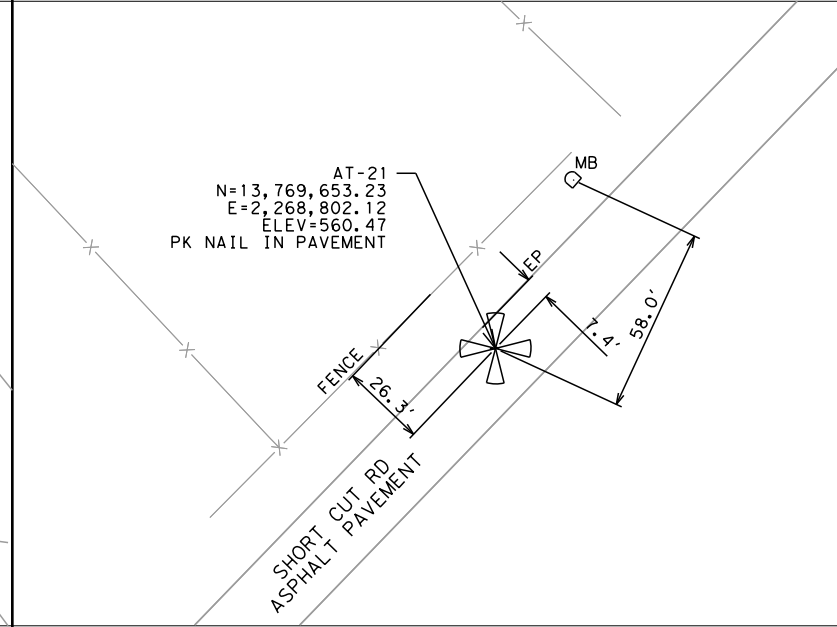
BEING ON THE WEST SIDE OF FM 725, APPROXIMATELY 50 FEET NORTHWEST OF LAKE CREEK DRIVE.



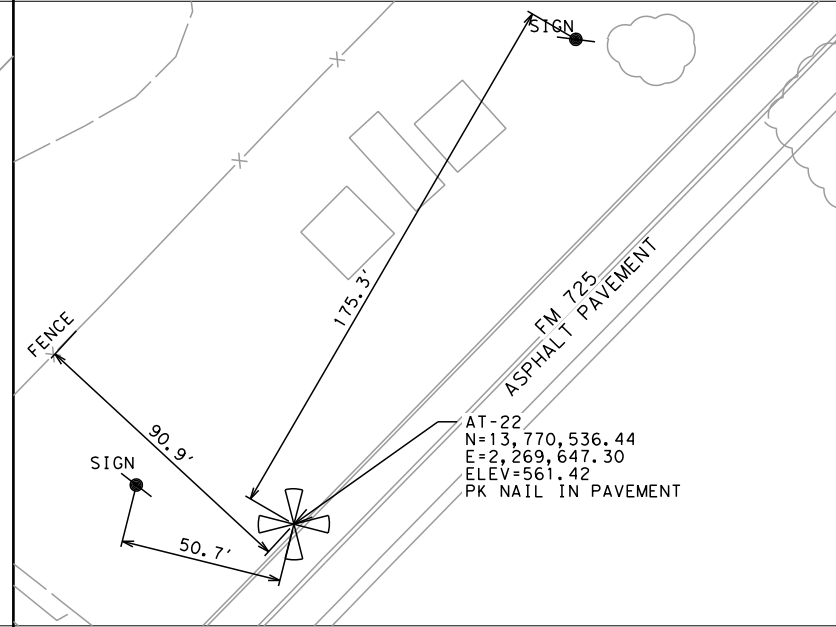
BEING ON THE SOUTH SIDE OF LAKE CREEK DRIVE, APPROXIMATELY 1,040 FEET NORTHEAST OF FM 725.



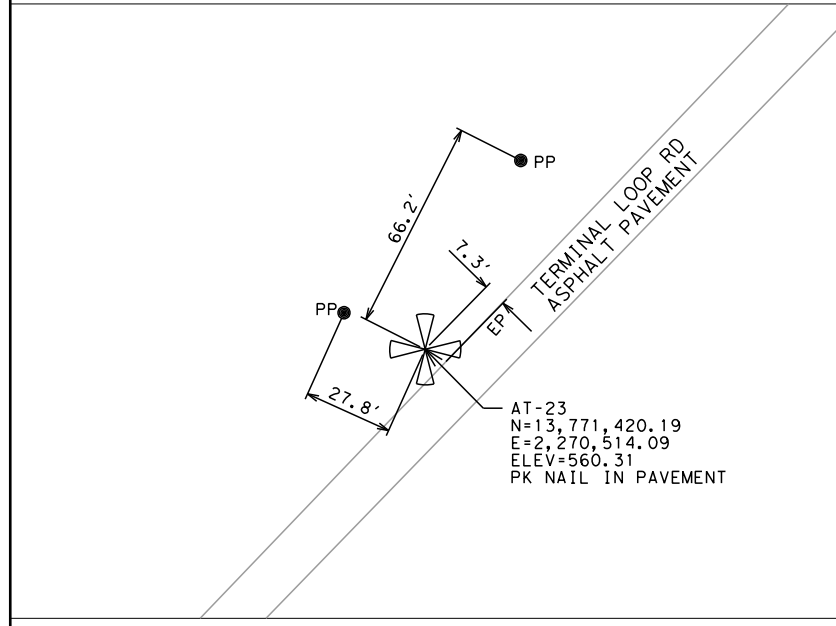
BEING ON THE WEST SIDE OF FM 725, APPROXIMATELY 2,120 FEET SOUTHEAST OF LAKE CREEK DRIVE.



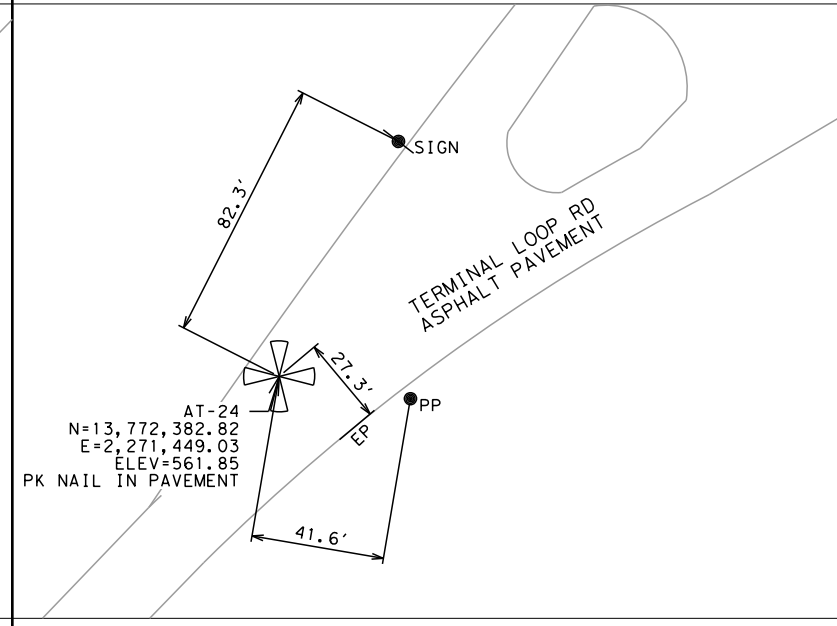
BEING ON THE SOUTH SIDE OF SHORT CUT ROAD, APPROXIMATELY 680 FEET SOUTHWEST OF FM 725.



BEING ON THE NORTH SIDE OF FM 725, APPROXIMATELY 600 FEET NORTHEAST OF SHORT CUT ROAD.



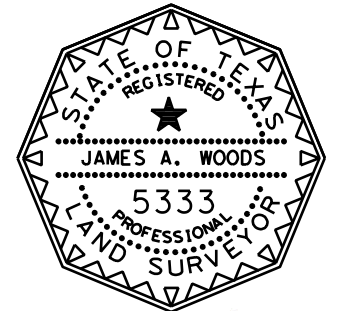
BEING ON THE NORTH SIDE OF TERMINAL LOOP ROAD, APPROXIMATELY 710 FEET NORTHEAST OF FM 725.



BEING ON THE NORTH SIDE OF TERMINAL LOOP ROAD, APPROXIMATELY 150 FEET WEST OF DANIELL ALLEY.

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011 ADJ.; EPOCH 2010.00)
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO NAVD88 (GEOID 12A).
3. ALL DISTANCES AND COORDINATES SHOWN ARE IN U.S. SURVEY FEET, DISPLAYED IN SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A TXDOT SURFACE ADJUSTMENT FACTOR OF 1.00016.
4. HORIZONTAL COORDINATE SOLUTIONS ARE BASED ON GPS OBSERVATION MEANS UTILIZING THE TXDOT VRS SYSTEM.
5. ELEVATIONS HAVE BEEN ESTABLISHED VIA DIGITAL LEVEL LOOPS, HOLDING THE PUBLISHED ELEVATION OF 539.108 FT. ON BL180, WITH THE EXCEPTION OF AT-26. THE ELEVATION OF AT-26 WAS ESTABLISHED VIA GPS OBSERVATION MEANS UTILIZING THE TXDOT VRS SYSTEM.
6. FIELD SURVEYS PERFORMED JANUARY 2018.



James A. Woods, P.E., S.P.

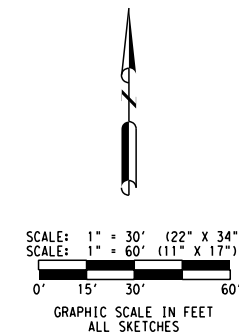
I HEREBY CERTIFY THAT THIS CONTROL MAP WAS PREPARED UNDER MY SUPERVISION IN JULY 2018.

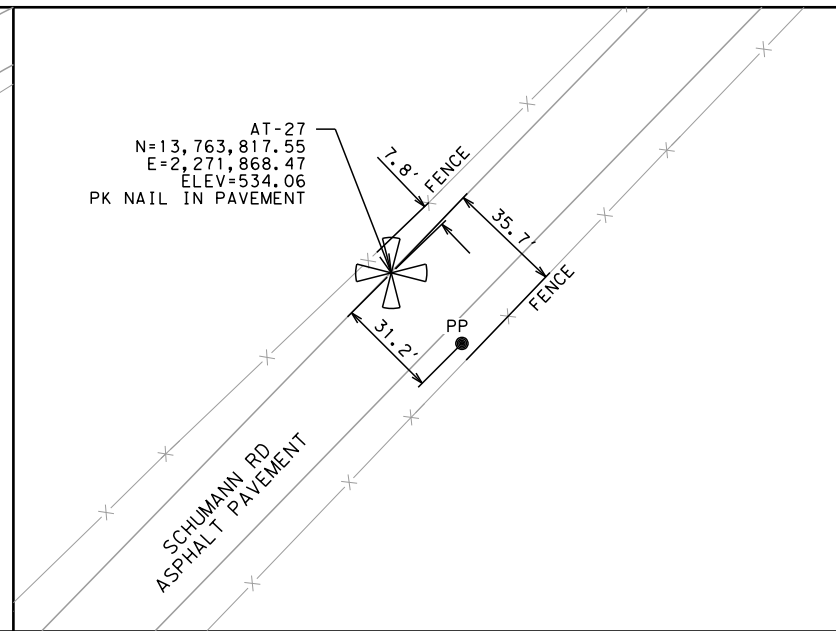
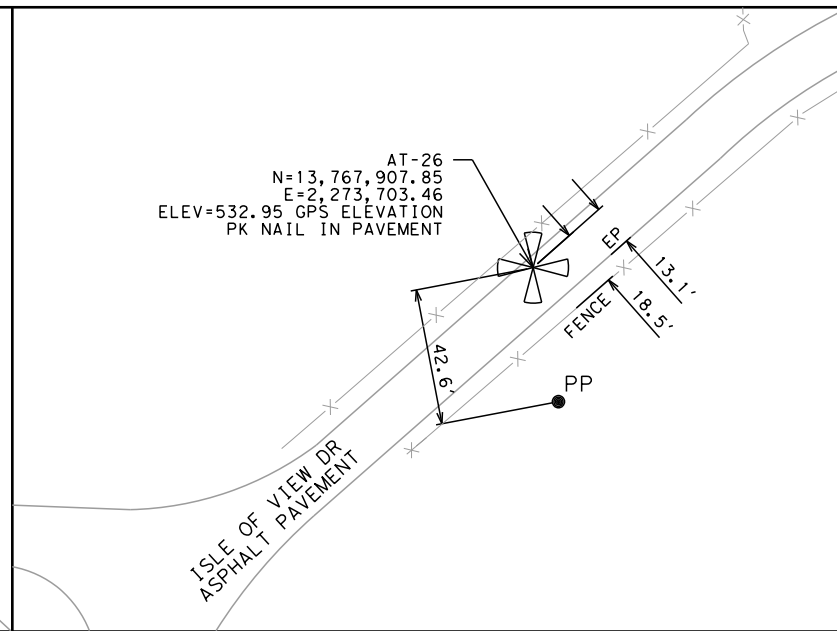
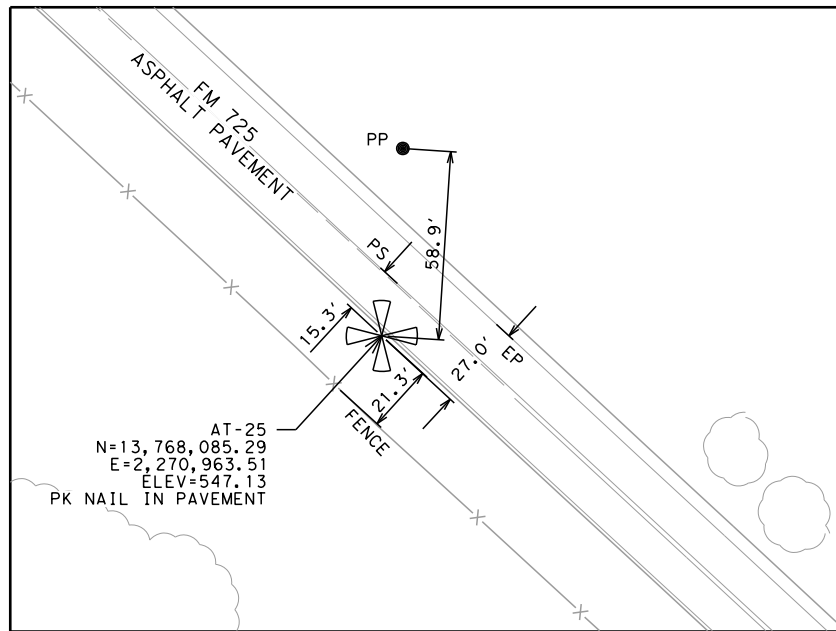


**FM 725
HORIZONTAL AND
VERTICAL CONTROL**

SHEET 3 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT			SHEET NO.
				80
STATE	DIST.	COUNTY		
TEXAS	SAT	GUADALUPE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0215	09	035	FM 725	





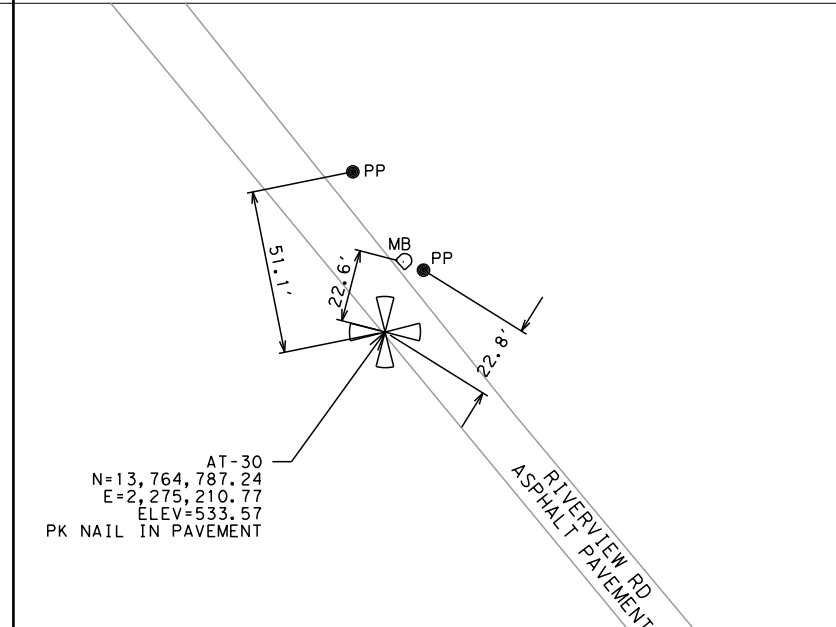
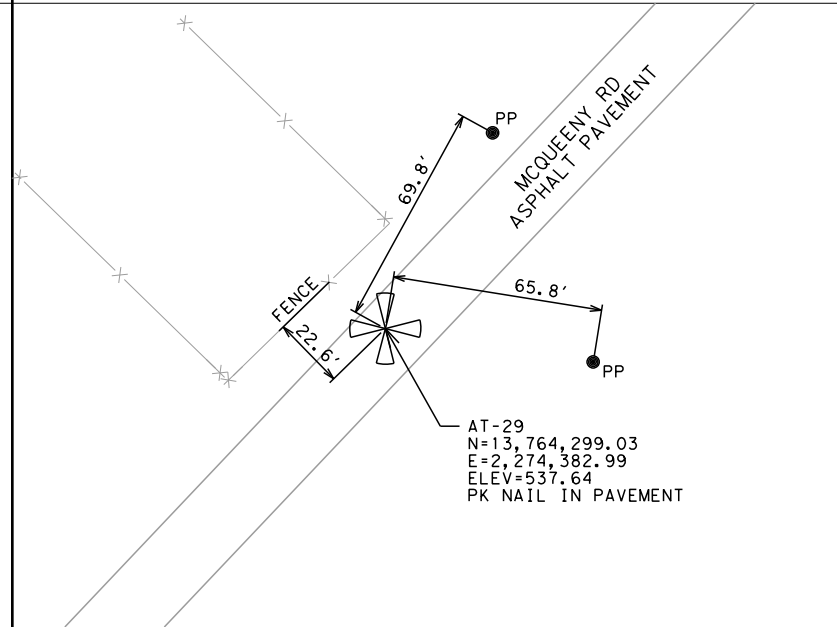
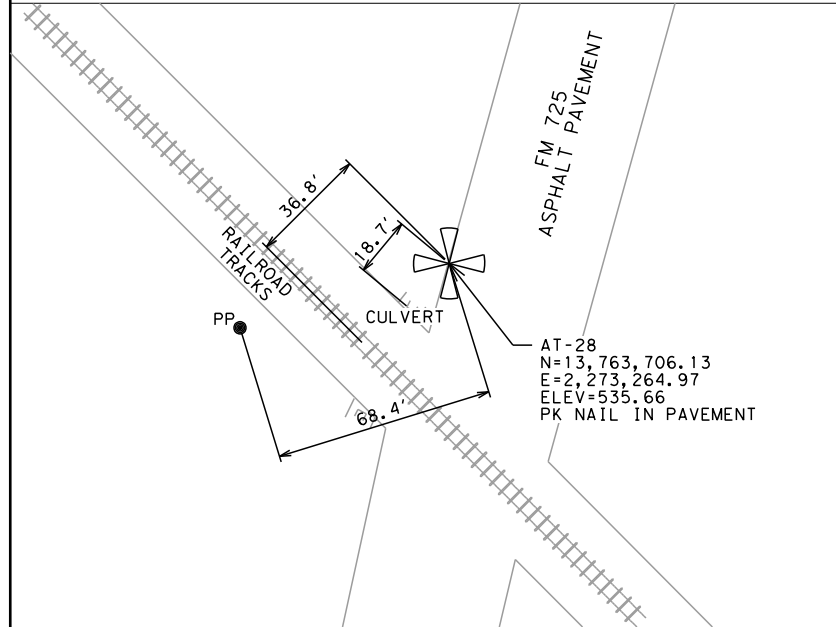
NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204) NAD 83 (2011 ADJ.; EPOCH 2010.00)
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO NAVD88 (GEOID 12A).
3. ALL DISTANCES AND COORDINATES SHOWN ARE IN U.S. SURVEY FEET, DISPLAYED IN SURFACE AND MAY BE CONVERTED TO GRID BY DIVIDING BY A TXDOT SURFACE ADJUSTMENT FACTOR OF 1.00016.
4. HORIZONTAL COORDINATE SOLUTIONS ARE BASED ON GPS OBSERVATION MEANS UTILIZING THE TXDOT VRS SYSTEM.
5. ELEVATIONS HAVE BEEN ESTABLISHED VIA DIGITAL LEVEL LOOPS, HOLDING THE PUBLISHED ELEVATION OF 539.108 FT. ON BL180, WITH THE EXCEPTION OF AT-26. THE ELEVATION OF AT-26 WAS ESTABLISHED VIA GPS OBSERVATION MEANS UTILIZING THE TXDOT VRS SYSTEM.
6. FIELD SURVEYS PERFORMED JANUARY 2018.

BEING ON THE WEST SIDE OF FM 725, APPROXIMATELY 1,240 FEET NORTHEAST OF SKI LODGE ROAD.

BEING ON THE EAST SIDE OF ISLE OF VIEW DRIVE, APPROXIMATELY 1,220 FEET WEST OF HOT SHOT LANE.

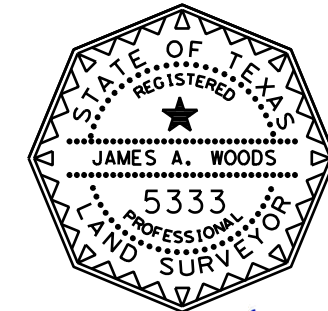
BEING ON THE NORTH SIDE OF SCHUMANN ROAD, APPROXIMATELY 1,560 FEET SOUTHWEST OF FM 78.



BEING ON THE WEST SIDE OF FM 725, APPROXIMATELY 1,120 FEET SOUTHEAST OF FM 78.

BEING ON THE SOUTH SIDE OF MCQUEENEY ROAD, APPROXIMATELY 160 FEET NORTHEAST OF TOVAR LN.

BEING ON THE WEST SIDE OF RIVERVIEW ROAD, APPROXIMATELY 500 FEET SOUTHEAST OF MCQUEENEY ROAD.



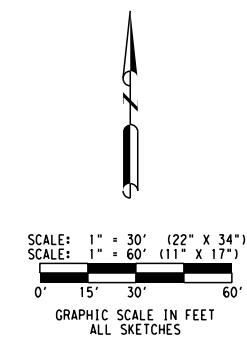
James A. Woods, PLS

I HEREBY CERTIFY THAT THIS CONTROL MAP WAS PREPARED UNDER MY SUPERVISION IN JULY 2018.



**FM 725
HORIZONTAL AND
VERTICAL CONTROL**

SHEET 4 OF 4



FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
			81
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:33:20 PM OFFICE:SAN
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FM725

Beginning chain FM725 description

Point 100 N 13,765,145.5230 E 2,274,679.3210 Sta 10+00.00

Course from 100 to PC FM7251 N 29° 02' 33.91" W Dist 161.4740

Curve Data

Curve FM7251
 P.I. Station 12+50.78 N 13,765,364.7722 E 2,274,557.5753
 Delta = 30° 17' 12.72" (RT)
 Degree = 17° 21' 44.49"
 Tangent = 89.3093
 Length = 174.4398
 Radius = 330.0000
 External = 11.8715
 Long Chord = 172.4160
 Mid. Ord. = 11.4593
 P.C. Station 11+61.47 N 13,765,286.6929 E 2,274,600.9315
 P.T. Station 13+35.91 N 13,765,454.0604 E 2,274,559.5144
 C.C. N 13,765,446.8954 E 2,274,889.4366
 Back = N 29° 02' 33.91" W
 Ahead = N 1° 14' 38.81" E
 Chord Bear = N 13° 53' 57.55" W

Course from PT FM7251 to PC FM7252 N 1° 14' 38.81" E Dist 37.4926

Curve Data

Curve FM7252
 P.I. Station 14+77.42 N 13,765,595.5323 E 2,274,562.5867
 Delta = 34° 01' 11.24" (LT)
 Degree = 16° 51' 06.12"
 Tangent = 104.0126
 Length = 201.8775
 Radius = 340.0000
 External = 15.5540
 Long Chord = 198.9251
 Mid. Ord. = 14.8736
 P.C. Station 13+73.41 N 13,765,491.5442 E 2,274,560.3284
 P.T. Station 15+75.28 N 13,765,682.9858 E 2,274,506.2794
 C.C. N 13,765,498.9263 E 2,274,220.4085
 Back = N 1° 14' 38.81" E
 Ahead = N 32° 46' 32.43" W
 Chord Bear = N 15° 45' 56.81" W

Course from PT FM7252 to PC FM7253 N 32° 46' 32.43" W Dist 225.9522

Curve Data

Curve FM7253
 P.I. Station 19+33.50 N 13,765,984.1766 E 2,274,312.3560
 Delta = 11° 53' 30.04" (RT)
 Degree = 4° 30' 41.32"
 Tangent = 132.2687
 Length = 263.5871
 Radius = 1,270.0000
 External = 6.8692
 Long Chord = 263.1143
 Mid. Ord. = 6.8323
 P.C. Station 18+01.24 N 13,765,872.9656 E 2,274,383.9599
 P.T. Station 20+64.82 N 13,766,107.7558 E 2,274,265.2053
 C.C. N 13,766,560.4817 E 2,275,451.7715
 Back = N 32° 46' 32.43" W
 Ahead = N 20° 53' 02.39" W
 Chord Bear = N 26° 49' 47.41" W

Course from PT FM7253 to PC FM7254 N 20° 53' 02.39" W Dist 143.1379

Curve Data

Curve FM7254
 P.I. Station 23+64.38 N 13,766,387.6323 E 2,274,158.4204
 Delta = 41° 45' 52.19" (LT)
 Degree = 13° 58' 28.49"
 Tangent = 156.4182
 Length = 298.8605
 Radius = 410.0000
 External = 28.8242
 Long Chord = 292.2878
 Mid. Ord. = 26.9309
 P.C. Station 22+07.96 N 13,766,241.4901 E 2,274,214.1799
 P.T. Station 25+06.82 N 13,766,459.4984 E 2,274,019.4890

FM725

C.C. N 13,766,095.3345 E 2,273,831.1152

Back = N 20° 53' 02.39" W
 Ahead = N 62° 38' 54.58" W
 Chord Bear = N 41° 45' 58.48" W

Curve Data

Curve FM7255
 P.I. Station 25+78.75 N 13,766,492.5442 E 2,273,955.6050
 Delta = 9° 08' 18.03" (LT)
 Degree = 6° 21' 58.31"
 Tangent = 71.9249
 Length = 143.5447
 Radius = 900.0000
 External = 2.8694
 Long Chord = 143.3926
 Mid. Ord. = 2.8603
 P.C. Station 25+06.82 N 13,766,459.4984 E 2,274,019.4890
 P.T. Station 26+50.37 N 13,766,515.0245 E 2,273,887.2835
 C.C. N 13,765,660.1143 E 2,273,605.9856
 Back = N 62° 38' 54.58" W
 Ahead = N 71° 47' 12.61" W
 Chord Bear = N 67° 13' 03.59" W

Course from PT FM7255 to PC FM7256 N 71° 47' 12.61" W Dist 285.0068

Curve Data

Curve FM7256
 P.I. Station 30+30.32 N 13,766,633.7817 E 2,273,526.3612
 Delta = 1° 52' 32.89" (RT)
 Degree = 0° 59' 16.29"
 Tangent = 94.9513
 Length = 189.8857
 Radius = 5,800.0000
 External = 0.7772
 Long Chord = 189.8772
 Mid. Ord. = 0.7771
 P.C. Station 29+35.37 N 13,766,604.1043 E 2,273,616.5555
 P.T. Station 31+25.26 N 13,766,666.3954 E 2,273,437.1866
 C.C. N 13,772,113.5259 E 2,275,429.3639
 Back = N 71° 47' 12.61" W
 Ahead = N 69° 54' 39.72" W
 Chord Bear = N 70° 50' 56.17" W

Course from PT FM7256 to PC FM7257 N 69° 54' 39.72" W Dist 1,335.6257

Curve Data

Curve FM7257
 P.I. Station 47+44.13 N 13,767,222.4423 E 2,271,916.8100
 Delta = 22° 43' 00.91" (RT)
 Degree = 4° 03' 48.71"
 Tangent = 283.2422
 Length = 559.0439
 Radius = 1,410.0000
 External = 28.1676
 Long Chord = 555.3893
 Mid. Ord. = 27.6159
 P.C. Station 44+60.88 N 13,767,125.1546 E 2,272,182.8198
 P.T. Station 50+19.93 N 13,767,414.9101 E 2,271,709.0065
 C.C. N 13,768,449.3708 E 2,272,667.1250
 Back = N 69° 54' 39.72" W
 Ahead = N 47° 11' 38.81" W
 Chord Bear = N 58° 33' 09.27" W

Course from PT FM7257 to PC FM7258 N 47° 11' 38.81" W Dist 2,497.5512

Curve Data

Curve FM7258
 P.I. Station 76+69.05 N 13,769,215.0296 E 2,269,765.4547
 Delta = 11° 32' 22.74" (RT)
 Degree = 3° 49' 10.99"
 Tangent = 151.5663
 Length = 302.1073
 Radius = 1,500.0000
 External = 7.6380
 Long Chord = 301.5970
 Mid. Ord. = 7.5993
 P.C. Station 75+17.48 N 13,769,112.0377 E 2,269,876.6529
 P.T. Station 78+19.59 N 13,769,338.1844 E 2,269,677.1073
 C.C. N 13,770,212.5278 E 2,270,895.9279

2/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 1 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 82
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE*.tbl TIME:16:33:25.25 PM OFFICE:SAN DATE:2/28/2021
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FM725

Back = N 47° 11' 38.81" W
 Ahead = N 35° 39' 16.08" W
 Chord Bear = N 41° 25' 27.45" W

Course from PT FM7258 to PC FM7259 N 35° 39' 16.08" W Dist 197.6693

Curve Data

Curve FM7259
 P.I. Station = 81+46.02 N 13,769,603.4273 E 2,269,486.8304
 Delta = 0° 32' 47.36" (RT)
 Degree = 0° 12' 43.94"
 Tangent = 128.7647
 Length = 257.5274
 Radius = 27,000.0000
 External = 0.3070
 Long Chord = 257.5264
 Mid. Ord. = 0.3070
 P.C. Station = 80+17.26 N 13,769,498.8000 E 2,269,561.8868
 P.T. Station = 82+74.78 N 13,769,708.7658 E 2,269,412.7754
 C.C. = N 13,785,236.9825 E 2,291,500.6564
 Back = N 35° 39' 16.08" W
 Ahead = N 35° 06' 28.71" W
 Chord Bear = N 35° 22' 52.39" W

Curve Data

Curve FM72510
 P.I. Station = 86+77.65 N 13,770,038.3346 E 2,269,181.0820
 Delta = 79° 25' 44.10" (RT)
 Degree = 11° 48' 48.83"
 Tangent = 402.8615
 Length = 672.3536
 Radius = 485.0000
 External = 145.4938
 Long Chord = 619.7931
 Mid. Ord. = 111.9194
 P.C. Station = 82+74.78 N 13,769,708.7658 E 2,269,412.7754
 P.T. Station = 89+47.14 N 13,770,326.5568 E 2,269,462.5520
 C.C. = N 13,769,987.6986 E 2,269,809.5392
 Back = N 35° 06' 28.71" W
 Ahead = N 44° 19' 15.38" E
 Chord Bear = N 4° 36' 23.34" E

Course from PT FM72510 to PC FM72511 N 44° 19' 15.38" E Dist 560.6199

Curve Data

Curve FM72511
 P.I. Station = 98+55.00 N 13,770,976.0740 E 2,270,096.8529
 Delta = 71° 12' 08.09" (LT)
 Degree = 11° 48' 48.83"
 Tangent = 347.2403
 Length = 602.7161
 Radius = 485.0000
 External = 111.4904
 Long Chord = 564.6747
 Mid. Ord. = 90.6517
 P.C. Station = 95+07.76 N 13,770,727.6453 E 2,269,854.2441
 P.T. Station = 101+10.47 N 13,771,285.7933 E 2,269,939.8504
 C.C. = N 13,771,066.5035 E 2,269,507.2570
 Back = N 44° 19' 15.38" E
 Ahead = N 26° 52' 52.71" W
 Chord Bear = N 8° 43' 11.34" E

Course from PT FM72511 to PC FM72512 N 26° 52' 52.71" W Dist 934.5346

Curve Data

Curve FM72512
 P.I. Station = 111+78.25 N 13,772,238.1938 E 2,269,457.0606
 Delta = 0° 45' 48.33" (RT)
 Degree = 0° 17' 11.32"
 Tangent = 133.2447
 Length = 266.4854
 Radius = 20,000.0000
 External = 0.4438
 Long Chord = 266.4834
 Mid. Ord. = 0.4438
 P.C. Station = 110+45.01 N 13,772,119.3468 E 2,269,517.3064
 P.T. Station = 113+11.49 N 13,772,357.8328 E 2,269,398.4038
 C.C. = N 13,781,162.2215 E 2,287,356.2082
 Back = N 26° 52' 52.71" W

FM725

Ahead = N 26° 07' 04.38" W
 Chord Bear = N 26° 29' 58.54" W

Course from PT FM72512 to PC FM72513 N 26° 07' 04.38" W Dist 952.2525

Curve Data

Curve FM72513
 P.I. Station = 129+28.39 N 13,773,809.6308 E 2,268,686.6133
 Delta = 13° 04' 28.21" (LT)
 Degree = 0° 59' 16.29"
 Tangent = 664.6467
 Length = 1,323.5202
 Radius = 5,800.0000
 External = 37.9581
 Long Chord = 1,320.6505
 Mid. Ord. = 37.7113
 P.C. Station = 122+63.75 N 13,773,212.8510 E 2,268,979.2037
 P.T. Station = 135+87.27 N 13,774,324.7510 E 2,268,266.6055
 C.C. = N 13,770,659.5783 E 2,263,771.4404
 Back = N 26° 07' 04.38" W
 Ahead = N 39° 11' 32.59" W
 Chord Bear = N 32° 39' 18.48" W

Course from PT FM72513 to PC FM72514 N 39° 11' 32.59" W Dist 538.2046

Curve Data

Curve FM72514
 P.I. Station = 145+66.99 N 13,775,084.0622 E 2,267,647.4944
 Delta = 4° 35' 49.15" (RT)
 Degree = 0° 31' 15.13"
 Tangent = 441.5158
 Length = 882.5579
 Radius = 11,000.0000
 External = 8.8572
 Long Chord = 882.3212
 Mid. Ord. = 8.8500
 P.C. Station = 141+25.47 N 13,774,741.8749 E 2,267,926.4999
 P.T. Station = 150+08.03 N 13,775,447.5100 E 2,267,396.8116
 C.C. = N 13,781,693.0644 E 2,276,451.8130
 Back = N 39° 11' 32.59" W
 Ahead = N 34° 35' 43.44" W
 Chord Bear = N 36° 53' 38.02" W

Course from PT FM72514 to PC FM72515 N 34° 35' 43.44" W Dist 280.5177

Curve Data

Curve FM72515
 P.I. Station = 156+40.88 N 13,775,968.4613 E 2,267,037.4931
 Delta = 4° 02' 08.77" (RT)
 Degree = 0° 34' 22.65"
 Tangent = 352.3330
 Length = 704.3746
 Radius = 10,000.0000
 External = 6.2050
 Long Chord = 704.2290
 Mid. Ord. = 6.2012
 P.C. Station = 152+88.55 N 13,775,678.4271 E 2,267,237.5399
 P.T. Station = 159+92.92 N 13,776,271.8554 E 2,266,858.3547
 C.C. = N 13,781,356.2039 E 2,275,469.3593
 Back = N 34° 35' 43.44" W
 Ahead = N 30° 33' 34.67" W
 Chord Bear = N 32° 34' 39.06" W

Course from PT FM72515 to PC FM72516 N 30° 33' 34.67" W Dist 118.1961

Curve Data

Curve FM72516
 P.I. Station = 163+31.03 N 13,776,562.9990 E 2,266,686.4496
 Delta = 5° 43' 20.92" (RT)
 Degree = 1° 18' 07.84"
 Tangent = 219.9102
 Length = 439.4548
 Radius = 4,400.0000
 External = 5.4921
 Long Chord = 439.2721
 Mid. Ord. = 5.4852
 P.C. Station = 161+11.12 N 13,776,373.6342 E 2,266,798.2597
 P.T. Station = 165+50.57 N 13,776,762.5687 E 2,266,594.0784
 C.C. = N 13,778,610.7475 E 2,270,587.1017



NO.				REVISION				BY		DATE	



FM 725											
HORIZONTAL ALIGNMENT DATA											
SHEET 2 OF 22											
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.						SHEET			
6		SEE TITLE SHEET						83			
STATE		DISTRICT		COUNTY							
TEXAS		SAT		GUADALUPE							
CONTROL		SECTION		JOB		HIGHWAY NO.					
0215		09		035		FM 725					

TXDOT*MON*PENTABLE.tb1 TIME:16:33:29 PM OFFICE:SAN
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 ah3070

FM725

Back = N 30° 33' 34.67" W
 Ahead = N 24° 50' 13.75" W
 Chord Bear = N 27° 41' 54.21" W

Curve Data

Curve FM72517
 P.I. Station = 167+36.18 N 13,776,931.0066 E 2,266,516.1166
 Delta = 1° 03' 48.28" (RT)
 Degree = 0° 17' 11.32"
 Tangent = 185.6055
 Length = 371.2003
 Radius = 20,000.0001
 External = 0.8612
 Long Chord = 371.1950
 Mid. Ord. = 0.8612
 P.C. Station = 165+50.57 N 13,776,762.5687 E 2,266,594.0784
 P.T. Station = 169+21.77 N 13,777,100.8625 E 2,266,441.2942
 C.C. = N 13,785,163.3816 E 2,284,744.1843
 Back = N 24° 50' 13.75" W
 Ahead = N 23° 46' 25.48" W
 Chord Bear = N 24° 18' 19.61" W

Course from PT FM72517 to PC FM72518 N 23° 46' 25.47" W Dist 86.6266

Curve Data

Curve FM72518
 P.I. Station = 174+34.44 N 13,777,570.0244 E 2,266,234.6259
 Delta = 0° 14' 38.76" (LT)
 Degree = 0° 01' 43.13"
 Tangent = 426.0378
 Length = 852.0742
 Radius = 200,000.0000
 External = 0.4538
 Long Chord = 852.0736
 Mid. Ord. = 0.4538
 P.C. Station = 170+08.40 N 13,777,180.1383 E 2,266,406.3727
 P.T. Station = 178+60.47 N 13,777,959.1753 E 2,266,061.2195
 C.C. = N 13,696,554.9468 E 2,083,377.4720
 Back = N 23° 46' 25.48" W
 Ahead = N 24° 01' 04.24" W
 Chord Bear = N 23° 53' 44.86" W

Course from PT FM72518 to PC FM72519 N 24° 01' 04.24" W Dist 813.1463

Curve Data

Curve FM72519
 P.I. Station = 186+94.12 N 13,778,720.6417 E 2,265,721.9086
 Delta = 0° 28' 11.20" (RT)
 Degree = 1° 08' 45.30"
 Tangent = 20.4981
 Length = 40.9959
 Radius = 5,000.0000
 External = 0.0420
 Long Chord = 40.9958
 Mid. Ord. = 0.0420
 P.C. Station = 186+73.62 N 13,778,701.9183 E 2,265,730.2518
 P.T. Station = 187+14.62 N 13,778,739.4327 E 2,265,713.7193
 C.C. = N 13,780,737.0240 E 2,270,297.3455
 Back = N 24° 01' 04.24" W
 Ahead = N 23° 32' 53.04" W
 Chord Bear = N 23° 46' 58.64" W

Course from PT FM72519 to PC FM72520 N 23° 32' 53.04" W Dist 613.4471

Curve Data

Curve FM72520
 P.I. Station = 193+41.60 N 13,779,314.2053 E 2,265,463.2275
 Delta = 0° 09' 18.46" (RT)
 Degree = 0° 34' 22.65"
 Tangent = 13.5374
 Length = 27.0748
 Radius = 10,000.0000
 External = 0.0092
 Long Chord = 27.0748
 Mid. Ord. = 0.0092
 P.C. Station = 193+28.06 N 13,779,301.7952 E 2,265,468.6360
 P.T. Station = 193+55.14 N 13,779,326.6300 E 2,265,457.8527
 C.C. = N 13,783,296.9778 E 2,274,635.8883
 Back = N 23° 32' 53.04" W

FM725

Ahead = N 23° 23' 34.58" W
 Chord Bear = N 23° 28' 13.81" W

Course from PT FM72520 to PC FM72521 N 23° 23' 34.58" W Dist 1,715.9611

Curve Data

Curve FM72521
 P.I. Station = 210+98.87 N 13,780,927.0342 E 2,264,765.5301
 Delta = 0° 19' 05.66" (LT)
 Degree = 0° 34' 22.65"
 Tangent = 27.7717
 Length = 55.5433
 Radius = 10,000.0000
 External = 0.0386
 Long Chord = 55.5433
 Mid. Ord. = 0.0386
 P.C. Station = 210+71.10 N 13,780,901.5452 E 2,264,776.5564
 P.T. Station = 211+26.64 N 13,780,952.4615 E 2,264,754.3623
 C.C. = N 13,776,931.1974 E 2,255,598.5208
 Back = N 23° 23' 34.58" W
 Ahead = N 23° 42' 40.24" W
 Chord Bear = N 23° 33' 07.41" W

Course from PT FM72521 to PC FM72522 N 23° 42' 40.24" W Dist 484.3558

Curve Data

Curve FM72522
 P.I. Station = 216+44.66 N 13,781,426.7500 E 2,264,546.0539
 Delta = 0° 23' 08.63" (RT)
 Degree = 0° 34' 22.65"
 Tangent = 33.6614
 Length = 67.3226
 Radius = 10,000.0000
 External = 0.0567
 Long Chord = 67.3225
 Mid. Ord. = 0.0567
 P.C. Station = 216+11.00 N 13,781,395.9301 E 2,264,559.5901
 P.T. Station = 216+78.32 N 13,781,457.6603 E 2,264,532.7255
 C.C. = N 13,785,417.1942 E 2,273,715.4316
 Back = N 23° 42' 40.24" W
 Ahead = N 23° 19' 31.61" W
 Chord Bear = N 23° 31' 05.93" W

Course from PT FM72522 to PC FM72523 N 23° 19' 31.61" W Dist 1,464.3959

Curve Data

Curve FM72523
 P.I. Station = 234+25.12 N 13,783,061.6971 E 2,263,841.0734
 Delta = 8° 04' 36.96" (LT)
 Degree = 1° 25' 56.62"
 Tangent = 282.4060
 Length = 563.8764
 Radius = 4,000.0000
 External = 9.9568
 Long Chord = 563.4096
 Mid. Ord. = 9.9320
 P.C. Station = 231+42.72 N 13,782,802.3720 E 2,263,952.8930
 P.T. Station = 237+06.59 N 13,783,302.7389 E 2,263,693.9271
 C.C. = N 13,781,218.5584 E 2,260,279.8106
 Back = N 23° 19' 31.61" W
 Ahead = N 31° 24' 08.58" W
 Chord Bear = N 27° 21' 50.10" W

Course from PT FM72523 to PC FM72524 N 31° 24' 08.58" W Dist 1,568.3930

Curve Data

Curve FM72524
 P.I. Station = 258+91.55 N 13,785,167.6625 E 2,262,555.4664
 Delta = 11° 44' 03.47" (LT)
 Degree = 0° 57' 17.75"
 Tangent = 616.5630
 Length = 1,228.8128
 Radius = 6,000.0000
 External = 31.5960
 Long Chord = 1,226.6664
 Mid. Ord. = 31.4305
 P.C. Station = 252+74.99 N 13,784,641.4080 E 2,262,876.7236
 P.T. Station = 265+03.80 N 13,785,617.5838 E 2,262,133.8969
 C.C. = N 13,781,515.1373 E 2,257,755.5488



HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 3 OF 22			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		84
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:33:32 PM OFFICE:SAN ah3070
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FM725

C.C. = N 13,781,515.1373 E 2,257,755.5488
 Back = N 31° 24' 08.58" W
 Ahead = N 43° 08' 12.05" W
 Chord Bear = N 37° 16' 10.32" W

Course from PT FM72524 to PC FM72525 N 43° 08' 12.05" W Dist 208.4425

Curve Data

Curve FM72525
 P.I. Station = 269+89.81 N 13,785,972.2404 E 2,261,801.5890
 Delta = 16° 37' 23.28" (RT)
 Degree = 3° 00' 56.04"
 Tangent = 277.5718
 Length = 551.2440
 Radius = 1,900.0000
 External = 20.1682
 Long Chord = 549.3127
 Mid. Ord. = 19.9564
 P.C. Station = 267+12.24 N 13,785,769.6894 E 2,261,991.3762
 P.T. Station = 272+63.48 N 13,786,220.6196 E 2,261,677.6784
 C.C. = N 13,787,068.7975 E 2,263,377.8532
 Back = N 43° 08' 12.05" W
 Ahead = N 26° 30' 48.77" W
 Chord Bear = N 34° 49' 30.41" W

Course from PT FM72525 to PC FM72526 N 26° 30' 48.77" W Dist 1,564.3790

Curve Data

Curve FM72526
 P.I. Station = 289+01.81 N 13,787,686.6405 E 2,260,946.3145
 Delta = 0° 50' 50.45" (LT)
 Degree = 0° 34' 22.65"
 Tangent = 73.9464
 Length = 147.8901
 Radius = 10,000.0000
 External = 0.2734
 Long Chord = 147.8888
 Mid. Ord. = 0.2734
 P.C. Station = 288+27.86 N 13,787,620.4711 E 2,260,979.3249
 P.T. Station = 289+75.75 N 13,787,752.3145 E 2,260,912.3292
 C.C. = N 13,783,156.3771 E 2,252,031.0365
 Back = N 26° 30' 48.77" W
 Ahead = N 27° 21' 39.22" W
 Chord Bear = N 26° 56' 14.00" W

Curve Data

Curve FM72527
 P.I. Station = 290+33.81 N 13,787,803.8738 E 2,260,885.6480
 Delta = 0° 40' 30.68" (RT)
 Degree = 0° 34' 53.50"
 Tangent = 58.0539
 Length = 116.1065
 Radius = 9,852.6522
 External = 0.1710
 Long Chord = 116.1058
 Mid. Ord. = 0.1710
 P.C. Station = 289+75.75 N 13,787,752.3145 E 2,260,912.3292
 P.T. Station = 290+91.86 N 13,787,855.7440 E 2,260,859.5762
 C.C. = N 13,792,280.5317 E 2,269,662.7580
 Back = N 27° 21' 39.22" W
 Ahead = N 26° 41' 08.54" W
 Chord Bear = N 27° 01' 23.88" W

Course from PT FM72527 to PC FM72528 N 26° 41' 08.54" W Dist 602.0544

Curve Data

Curve FM72528
 P.I. Station = 300+93.33 N 13,788,750.5375 E 2,260,409.8216
 Delta = 16° 49' 46.23" (LT)
 Degree = 2° 07' 19.44"
 Tangent = 399.4118
 Length = 793.0719
 Radius = 2,700.0000
 External = 29.3827
 Long Chord = 790.2240
 Mid. Ord. = 29.0664
 P.C. Station = 296+93.91 N 13,788,393.6697 E 2,260,589.1959
 P.T. Station = 304+86.99 N 13,789,040.1876 E 2,260,134.8078

FM725

C.C. = N 13,787,181.1102 E 2,258,176.7906
 Back = N 26° 41' 08.54" W
 Ahead = N 43° 30' 54.77" W
 Chord Bear = N 35° 06' 01.65" W

Course from PT FM72529 to PC FM72530 N 45° 15' 42.56" W Dist 492.7106

Curve Data

Curve FM72529
 P.I. Station = 306+69.91 N 13,789,172.8386 E 2,260,008.8597
 Delta = 1° 44' 47.79" (LT)
 Degree = 0° 28' 38.87"
 Tangent = 182.9187
 Length = 365.8090
 Radius = 12,000.0000
 External = 1.3941
 Long Chord = 365.7948
 Mid. Ord. = 1.3939
 P.C. Station = 304+86.99 N 13,789,040.1876 E 2,260,134.8078
 P.T. Station = 308+52.80 N 13,789,301.5893 E 2,259,878.9269
 C.C. = N 13,780,777.6216 E 2,251,432.5090
 Back = N 43° 30' 54.77" W
 Ahead = N 45° 15' 42.56" W
 Chord Bear = N 44° 23' 18.67" W

Course from PT FM72529 to PC FM72530 N 45° 15' 42.56" W Dist 492.7106

Curve Data

Curve FM72530
 P.I. Station = 314+25.43 N 13,789,704.6466 E 2,259,472.1690
 Delta = 0° 54' 56.91" (RT)
 Degree = 0° 34' 22.65"
 Tangent = 79.9212
 Length = 159.8389
 Radius = 10,000.0000
 External = 0.3194
 Long Chord = 159.8372
 Mid. Ord. = 0.3194
 P.C. Station = 313+45.51 N 13,789,648.3926 E 2,259,528.9395
 P.T. Station = 315+05.35 N 13,789,761.8007 E 2,259,416.3049
 C.C. = N 13,796,751.6989 E 2,266,567.6211
 Back = N 45° 15' 42.56" W
 Ahead = N 44° 20' 45.65" W
 Chord Bear = N 44° 48' 14.11" W

Course from PT FM72530 to PC FM72531 N 44° 20' 45.65" W Dist 1,156.6623

Curve Data

Curve FM72531
 P.I. Station = 326+92.66 N 13,790,610.8861 E 2,258,586.3849
 Delta = 0° 21' 04.45" (LT)
 Degree = 0° 34' 22.65"
 Tangent = 30.6511
 Length = 61.3021
 Radius = 10,000.0000
 External = 0.0470
 Long Chord = 61.3020
 Mid. Ord. = 0.0470
 P.C. Station = 326+62.01 N 13,790,588.9665 E 2,258,607.8097
 P.T. Station = 327+23.31 N 13,790,632.6740 E 2,258,564.8261
 C.C. = N 13,783,599.0683 E 2,251,456.4935
 Back = N 44° 20' 45.65" W
 Ahead = N 44° 41' 50.09" W
 Chord Bear = N 44° 31' 17.87" W

Course from PT FM72531 to PC FM72532 N 44° 41' 50.09" W Dist 290.2247

Curve Data

Curve FM72532
 P.I. Station = 330+60.02 N 13,790,872.0218 E 2,258,327.9944
 Delta = 0° 31' 57.83" (RT)
 Degree = 0° 34' 22.65"
 Tangent = 46.4897
 Length = 92.9788
 Radius = 10,000.0000
 External = 0.1081
 Long Chord = 92.9784
 Mid. Ord. = 0.1081
 P.C. Station = 330+13.53 N 13,790,838.9753 E 2,258,360.6935
 P.T. Station = 331+06.51 N 13,790,905.3708 E 2,258,295.6041

2/28/2021

JOHNNY L. CLAYTON
107215

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 4 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 85
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:33:39 PM OFFICE:SAN
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FM725

C.C. N 13,797,872.5810 E 2,265,469.0260
 Back = N 44° 41' 50.09" W
 Ahead = N 44° 09' 52.27" W
 Chord Bear = N 44° 25' 51.18" W

Course from PT FM72532 to 101 N 44° 09' 52.27" W Dist 915.8602

Point 101 N 13,791,562.3560 E 2,257,657.5050 Sta 340+22.37

Ending chain FM725 description

SCHUMANN RD

Beginning chain SCHUMANN description

Point 11004 N 13,765,827.1659 E 2,274,413.4482 Sta 10+00.00

Course from 11004 to PC SCHUMANN1 N 74° 12' 33.97" W Dist 139.6104

Curve Data

Curve SCHUMANN1
 P.I. Station 11+91.75 N 13,765,879.3464 E 2,274,228.9300
 Delta = 8° 31' 13.34" (LT)
 Degree = 8° 11' 06.40"
 Tangent = 52.1441
 Length = 104.0960
 Radius = 700.0000
 External = 1.9395
 Long Chord = 104.0001
 Mid. Ord. = 1.9341
 P.C. Station 11+39.61 N 13,765,865.1569 E 2,274,279.1064
 P.T. Station 12+43.71 N 13,765,885.9452 E 2,274,177.2051
 C.C. N 13,765,191.5729 E 2,274,088.6211
 Back = N 74° 12' 33.97" W
 Ahead = N 82° 43' 47.31" W
 Chord Bear = N 78° 28' 10.64" W

Course from PT SCHUMANN1 to 11005 N 82° 43' 47.30" W Dist 4.3473

Point 11005 N 13,765,886.4953 E 2,274,172.8928 Sta 12+48.05

Ending chain SCHUMANN description

SKI LODGE RD

Beginning chain SKI_LODGE description

Point 11006 N 13,767,267.4957 E 2,271,898.1833 Sta 10+00.00

Course from 11006 to PC SKI_LODGE1 N 41° 51' 53.77" E Dist 85.3728

Curve Data

Curve SKI_LODGE1
 P.I. Station 11+05.57 N 13,767,346.1184 E 2,271,968.6407
 Delta = 4° 37' 37.78" (RT)
 Degree = 11° 27' 32.96"
 Tangent = 20.2008
 Length = 40.3796
 Radius = 500.0000
 External = 0.4079
 Long Chord = 40.3686
 Mid. Ord. = 0.4076
 P.C. Station 10+85.37 N 13,767,331.0745 E 2,271,955.1592
 P.T. Station 11+25.75 N 13,767,360.0258 E 2,271,983.2919
 C.C. N 13,766,997.3860 E 2,272,327.5192
 Back = N 41° 51' 53.77" E
 Ahead = N 46° 29' 31.55" E
 Chord Bear = N 44° 10' 42.66" E

Course from PT SKI_LODGE1 to 11007 N 46° 29' 31.55" E Dist 174.2476

Point 11007 N 13,767,479.9873 E 2,272,109.6701 Sta 13+00.00

Ending chain SKI_LODGE description

LAKEVIEW TRAIL

Beginning chain LAKEVIEW_TRAIL description

Point 11008 N 13,769,253.8078 E 2,269,742.3006 Sta 10+00.00

Course from 11008 to 11009 N 46° 19' 12.79" E Dist 150.0000

Point 11009 N 13,769,357.4018 E 2,269,850.7823 Sta 11+50.00

Ending chain LAKEVIEW_TRAIL description

SHORTCUT RD

Beginning chain SHORT_CUT description

Point 400 N 13,770,047.3936 E 2,269,328.2269 Sta 10+00.00

Course from 400 to PC SHORT_CUT1 N 82° 55' 47.86" W Dist 17.4391

Curve Data

Curve SHORT_CUT1
 P.I. Station 11+29.72 N 13,770,063.3597 E 2,269,199.4941
 Delta = 53° 02' 25.48" (LT)
 Degree = 25° 27' 53.25"
 Tangent = 112.2800
 Length = 208.2892
 Radius = 225.0000
 External = 26.4593
 Long Chord = 200.9310
 Mid. Ord. = 23.6752
 P.C. Station 10+17.44 N 13,770,049.5400 E 2,269,310.9203
 P.T. Station 12+25.73 N 13,769,982.6326 E 2,269,121.4562
 C.C. N 13,769,826.2508 E 2,269,283.2268
 Back = N 82° 55' 47.86" W
 Ahead = S 44° 01' 46.65" W
 Chord Bear = S 70° 32' 59.39" W

Course from PT SHORT_CUT1 to 401 S 44° 01' 46.65" W Dist 24.2717

Point 401 N 13,769,965.1818 E 2,269,104.5866 Sta 12+50.00

Ending chain SHORT_CUT description

TERMINAL LOOP

Beginning chain TERMINAL_LOOP description

Point 500 N 13,770,974.1293 E 2,269,983.3788 Sta 10+00.00

Course from 500 to PC TERMINAL_LOOP1 N 85° 09' 21.61" E Dist 79.6145

Curve Data

Curve TERMINAL_LOOP1
 P.I. Station 11+16.60 N 13,770,983.9757 E 2,270,099.5672
 Delta = 40° 35' 56.93" (LT)
 Degree = 57° 17' 44.81"
 Tangent = 36.9903
 Length = 70.8589
 Radius = 100.0000
 External = 6.6221
 Long Chord = 69.3857
 Mid. Ord. = 6.2108
 P.C. Station 10+79.61 N 13,770,980.8522 E 2,270,062.7090
 P.T. Station 11+50.47 N 13,771,010.3333 E 2,270,125.5202
 C.C. N 13,771,080.4950 E 2,270,054.2647
 Back = N 85° 09' 21.61" E
 Ahead = N 44° 33' 24.69" E
 Chord Bear = N 64° 51' 23.15" E

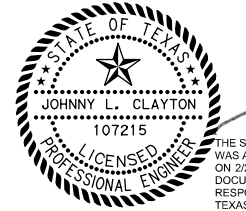
Course from PT TERMINAL_LOOP1 to 501 N 44° 33' 24.69" E Dist 119.5266

Point 501 N 13,771,095.5025 E 2,270,209.3820 Sta 12+70.00

Ending chain TERMINAL_LOOP description

LAKE CREEK DR

Beginning chain LAKE_CREEK description



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 5 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 86
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:33:44 PM OFFICE:SAN
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 ah3070

Curve Data

Curve LAKE_CREEK1 (Chord Definition)
 P.I. Station 10+30.43 N 13,775,964.0959 E 2,267,083.8095
 Delta = 10° 13' 48.45" (LT)
 Degree = 16° 54' 46.94"
 Tangent = 30.4343
 Length = 60.4866
 Radius = 340.0000
 External = 1.3594
 Long Chord = 60.6262
 Mid. Ord. = 1.3540
 P.C. Station 10+00.00 N 13,775,947.3641 E 2,267,058.3872
 P.T. Station 10+60.49 N 13,775,985.0768 E 2,267,105.8560
 C.C. N 13,776,231.3722 E 2,266,871.4662
 Back = N 56° 38' 56.16" E
 Ahead = N 46° 25' 07.71" E
 Chord Bear = N 51° 32' 01.94" E

Course from PT LAKE_CREEK1 to 601 N 44° 44' 49.88" E Dist 50.8409
 Point 601 N 13,776,021.1850 E 2,267,141.6470 Sta 11+11.33

=====
 Ending chain LAKE_CREEK description
 =====

C BUCH LN

Beginning chain BUCH description
 =====

Point 11010 N 13,777,570.4533 E 2,266,233.9395 Sta 10+00.00

Course from 11010 to 11011 N 43° 00' 34.64" E Dist 150.0000

Point 11011 N 13,777,680.1392 E 2,266,336.2577 Sta 11+50.00

=====
 Ending chain BUCH description
 =====

C LONG CREEK BLVD (1)

Beginning chain LONG_CREEK1 description
 =====

Point 11012 N 13,778,454.4250 E 2,265,840.4472 Sta 10+00.00

Course from 11012 to PC LONG_CREEK11 N 56° 43' 31.74" E Dist 101.6561

Curve Data

Curve LONG_CREEK11
 P.I. Station 11+32.45 N 13,778,527.0919 E 2,265,951.1793
 Delta = 11° 43' 12.10" (LT)
 Degree = 19° 05' 54.94"
 Tangent = 30.7904
 Length = 61.3659
 Radius = 300.0000
 External = 1.5759
 Long Chord = 61.2590
 Mid. Ord. = 1.5677
 P.C. Station 11+01.66 N 13,778,510.1987 E 2,265,925.4370
 P.T. Station 11+63.02 N 13,778,548.8619 E 2,265,972.9535
 C.C. N 13,778,761.0142 E 2,265,760.8417
 Back = N 56° 43' 31.74" E
 Ahead = N 45° 00' 19.64" E
 Chord Bear = N 50° 51' 55.69" E

Course from PT LONG_CREEK11 to 11013 N 45° 00' 19.64" E Dist 47.3533
 Point 11013 N 13,778,582.3426 E 2,266,006.4405 Sta 12+10.38

=====
 Ending chain LONG_CREEK1 description
 =====

C LONG CREEK BLVD (2)

Beginning chain LONG_CREEK2 description
 =====

Point 11014 N 13,778,535.4973 E 2,265,804.4093 Sta 10+00.00

Course from 11014 to PC LONG_CREEK21 N 64° 33' 33.75" E Dist 86.9890

Curve Data

Curve Data

Curve LONG_CREEK21
 P.I. Station 10+99.76 N 13,778,578.3518 E 2,265,894.4958
 Delta = 4° 10' 46.15" (LT)
 Degree = 16° 22' 12.80"
 Tangent = 12.7712
 Length = 25.5310
 Radius = 350.0000
 External = 0.2329
 Long Chord = 25.5254
 Mid. Ord. = 0.2328
 P.C. Station 10+86.99 N 13,778,572.8657 E 2,265,882.9631
 P.T. Station 11+12.52 N 13,778,584.6640 E 2,265,905.5981
 C.C. N 13,778,888.9265 E 2,265,732.6116
 Back = N 64° 33' 33.75" E
 Ahead = N 60° 22' 47.60" E
 Chord Bear = N 62° 28' 10.67" E

Course from PT LONG_CREEK21 to 11015 N 60° 22' 47.60" E Dist 37.4322
 Point 11015 N 13,778,603.1647 E 2,265,938.1387 Sta 11+49.95

=====
 Ending chain LONG_CREEK2 description
 =====

C STREET A (S)

Beginning chain STREET_A_S description
 =====

Point 1000 N 13,780,506.1184 E 2,264,947.6150 Sta 10+00.00

Course from 1000 to PC STREET_A1 N 65° 27' 28.66" E Dist 79.4832

Curve Data

Curve STREET_A1
 P.I. Station 11+30.66 N 13,780,560.3880 E 2,265,066.4677
 Delta = 80° 55' 16.05" (LT)
 Degree = 95° 29' 34.68"
 Tangent = 51.1735
 Length = 84.7404
 Radius = 60.0000
 External = 18.8589
 Long Chord = 77.8709
 Mid. Ord. = 14.3488
 P.C. Station 10+79.48 N 13,780,539.1326 E 2,265,019.9175
 P.T. Station 11+64.22 N 13,780,609.7091 E 2,265,052.8239
 C.C. N 13,780,593.7120 E 2,264,994.9958
 Back = N 65° 27' 28.66" E
 Ahead = N 15° 27' 47.39" W
 Chord Bear = N 24° 59' 50.63" E

Course from PT STREET_A1 to 1001 N 15° 27' 47.39" W Dist 35.7764
 Point 1001 N 13,780,644.1905 E 2,265,043.2853 Sta 12+00.00

=====
 Ending chain STREET_A_S description
 =====

C STREET A (N)

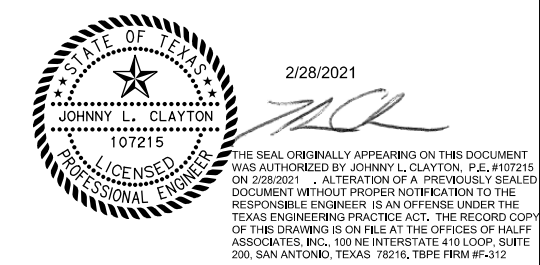
Beginning chain STREET_A_N description
 =====

Point 2500 N 13,781,500.4839 E 2,264,514.2602 Sta 10+00.00

Course from 2500 to PC STREET_A_N1 N 77° 25' 11.90" E Dist 35.7088

Curve Data

Curve STREET_A_N1
 P.I. Station 10+66.37 N 13,781,514.9389 E 2,264,579.0345
 Delta = 63° 01' 52.10" (RT)
 Degree = 114° 35' 29.61"
 Tangent = 30.6587
 Length = 55.0050
 Radius = 50.0000
 External = 8.6512
 Long Chord = 52.2730
 Mid. Ord. = 7.3751
 P.C. Station 10+35.71 N 13,781,508.2614 E 2,264,549.1118
 P.T. Station 10+90.71 N 13,781,491.2986 E 2,264,598.5560
 C.C. N 13,781,459.4617 E 2,264,560.0019



NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			



FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 6 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 87
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

Back = N 77° 25' 11.90" E
 Ahead = S 39° 32' 56.00" E
 Chord Bear = S 71° 03' 52.05" E

Course from PT STREET_A_N1 to 2501 S 39° 32' 56.00" E Dist 59.2861

Point 2501 N 13,781,445.5841 E 2,264,636.3057 Sta 11+50.00

Ending chain STREET_A_N description

☺ GROVE LN

Beginning chain GROVE description

Point 2400 N 13,781,607.8725 E 2,264,467.9548 Sta 10+00.00

Course from 2400 to PC GROVE1 N 66° 40' 28.38" E Dist 26.3547

Curve Data

Curve GROVE1
 P.I. Station 10+51.35 N 13,781,628.2028 E 2,264,515.1035
 Delta = 18° 55' 02.87" (LT)
 Degree = 38° 11' 49.87"
 Tangent = 24.9903
 Length = 49.5258
 Radius = 150.0000
 External = 2.0675
 Long Chord = 49.3012
 Mid. Ord. = 2.0394
 P.C. Station 10+26.35 N 13,781,618.3078 E 2,264,492.1556
 P.T. Station 10+75.88 N 13,781,645.0032 E 2,264,533.6038
 C.C. N 13,781,756.0484 E 2,264,432.7626
 Back = N 66° 40' 28.39" E
 Ahead = N 47° 45' 25.51" E
 Chord Bear = N 57° 12' 56.95" E

Course from PT GROVE1 to 2401 N 47° 45' 25.51" E Dist 74.1195

Point 2401 N 13,781,694.8319 E 2,264,588.4746 Sta 11+50.00

Ending chain GROVE description

☺ ALTWEIN LN

Beginning chain ALTWEIN description

Point 1200 N 13,783,117.0157 E 2,263,800.5861 Sta 10+00.00

Course from 1200 to 1201 S 49° 26' 05.87" W Dist 100.0000

Point 1201 N 13,783,051.9847 E 2,263,724.6192 Sta 11+00.00

Ending chain ALTWEIN description

☺ LAKESIDE PASS (S)

Beginning chain LAKESIDE_P_S description

Point 11016 N 13,784,541.2125 E 2,262,937.8889 Sta 10+00.00

Course from 11016 to PC LAKESIDE_P_S1 N 49° 53' 49.26" E Dist 18.6173

Curve Data

Curve LAKESIDE_P_S1
 P.I. Station 10+39.44 N 13,784,566.6180 E 2,262,968.0556
 Delta = 6° 48' 33.24" (LT)
 Degree = 16° 22' 12.80"
 Tangent = 20.8221
 Length = 41.5952
 Radius = 350.0000
 External = 0.6188
 Long Chord = 41.5708
 Mid. Ord. = 0.6177
 P.C. Station 10+18.62 N 13,784,553.2051 E 2,262,952.1290
 P.T. Station 10+60.21 N 13,784,581.8245 E 2,262,982.2796
 C.C. N 13,784,820.9158 E 2,262,726.6718
 Back = N 49° 53' 49.26" E
 Ahead = N 43° 05' 16.02" E
 Chord Bear = N 46° 29' 32.64" E

Course from PT LAKESIDE_P_S1 to 11017 N 43° 05' 16.02" E Dist 90.9911

Point 11017 N 13,784,648.2760 E 2,263,044.4372 Sta 11+51.20

Ending chain LAKESIDE_P_S description

☺ LEISURE VILLAGE DR

Beginning chain LEISURE_VILL description

Point 1400 N 13,784,779.4359 E 2,262,789.8664 Sta 10+00.00

Course from 1400 to 1401 S 43° 56' 54.04" W Dist 200.0000

Point 1401 N 13,784,635.4428 E 2,262,651.0645 Sta 12+00.00

Ending chain LEISURE_VILL description

☺ ROLLING FORK DR

Beginning chain ROLLING_FORK description

Point 11018 N 13,785,221.0014 E 2,262,474.2955 Sta 10+00.00

Course from 11018 to 11019 S 44° 39' 06.32" W Dist 150.0000

Point 11019 N 13,785,114.2927 E 2,262,368.8761 Sta 11+50.00

Ending chain ROLLING_FORK description

☺ UNION WINE RD

Beginning chain UNION_WINE description

Point 1600 N 13,786,302.3507 E 2,261,636.9046 Sta 10+00.00

Course from 1600 to 1601 S 43° 24' 50.70" W Dist 200.0000

Point 1601 N 13,786,157.0695 E 2,261,499.4514 Sta 12+00.00

Ending chain UNION_WINE description

☺ RIVER PARK DR

Beginning chain RIVER_PARK description

Point 11020 N 13,787,340.3116 E 2,261,119.0900 Sta 10+00.00

Course from 11020 to PC RIVER_PARK1 N 64° 09' 59.42" E Dist 50.0124

Curve Data

Curve RIVER_PARK1
 P.I. Station 11+12.89 N 13,787,389.5021 E 2,261,220.6940
 Delta = 19° 17' 16.58" (LT)
 Degree = 15° 29' 07.24"
 Tangent = 62.8729
 Length = 124.5561
 Radius = 370.0000
 External = 5.3039
 Long Chord = 123.9688
 Mid. Ord. = 5.2289
 P.C. Station 10+50.01 N 13,787,362.1048 E 2,261,164.1043
 P.T. Station 11+74.57 N 13,787,434.0541 E 2,261,265.0575
 C.C. N 13,787,695.1286 E 2,261,002.8741
 Back = N 64° 09' 59.42" E
 Ahead = N 44° 52' 42.84" E
 Chord Bear = N 54° 31' 21.13" E

Course from PT RIVER_PARK1 to 11021 N 44° 52' 42.84" E Dist 49.8893

Point 11021 N 13,787,469.4059 E 2,261,300.2597 Sta 12+24.46

Ending chain RIVER_PARK description

☺ SKYFOREST DR

Beginning chain SKYFOREST description



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NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 7 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 88
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:33:59 PM OFFICE:SAN
 DATE:2/28/2021
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Point 11026 N 13,788,183.0488 E 2,260,695.0613 Sta 10+00.00

Course from 11026 to PC SKYFOREST1 S 36° 20' 57.96" W Dist 94.1438

Curve Data

Curve SKYFOREST1

P.I. Station 11+21.91 N 13,788,084.8588 E 2,260,622.8031
 Delta = 9° 04' 20.76" (LT)
 Degree = 16° 22' 12.80"
 Tangent = 27.7682
 Length = 55.4203
 Radius = 350.0000
 External = 1.0998
 Long Chord = 55.3625
 Mid. Ord. = 1.0964
 P.C. Station 10+94.14 N 13,788,107.2238 E 2,260,639.2615
 P.T. Station 11+49.56 N 13,788,060.1783 E 2,260,610.0771
 C.C. = N 13,787,899.7759 E 2,260,921.1575
 Back = S 36° 20' 57.96" W
 Ahead = S 27° 16' 37.21" W
 Chord Bear = S 31° 48' 47.59" W

Course from PT SKYFOREST1 to 11027 S 27° 16' 37.21" W Dist 70.7914

Point 11027 N 13,787,997.2588 E 2,260,577.6339 Sta 12+20.36

Ending chain SKYFOREST description

Ⓞ LAKESIDE PASS

Beginning chain LAKESIDE_PASS description

Point 11024 N 13,788,174.7705 E 2,260,699.2223 Sta 10+00.00

Course from 11024 to PC LAKESIDE_PASS1 N 45° 31' 04.84" E Dist 144.5547

Curve Data

Curve LAKESIDE_PASS1

P.I. Station 11+51.96 N 13,788,281.2448 E 2,260,807.6396
 Delta = 2° 25' 24.07" (LT)
 Degree = 16° 22' 12.80"
 Tangent = 7.4028
 Length = 14.8034
 Radius = 350.0000
 External = 0.0783
 Long Chord = 14.8023
 Mid. Ord. = 0.0783
 P.C. Station 11+44.55 N 13,788,276.0578 E 2,260,802.3579
 P.T. Station 11+59.36 N 13,788,286.6506 E 2,260,812.6972
 C.C. = N 13,788,525.7726 E 2,260,557.1181
 Back = N 45° 31' 04.84" E
 Ahead = N 43° 05' 40.77" E
 Chord Bear = N 44° 18' 22.80" E

Course from PT LAKESIDE_PASS1 to 11025 N 43° 05' 40.77" E Dist 91.1378

Point 11025 N 13,788,353.2018 E 2,260,874.9631 Sta 12+50.50

Ending chain LAKESIDE_PASS description

Ⓞ SCHUMANS BEACH RD

Beginning chain SCHUMANS_B description

Point 2100 N 13,789,434.0167 E 2,259,745.2836 Sta 10+00.00

Course from 2100 to PC SCHUMANS_B1 N 44° 44' 17.44" E Dist 37.0877

Curve Data

Curve SCHUMANS_B1

P.I. Station 10+54.88 N 13,789,473.0011 E 2,259,783.9134
 Delta = 5° 59' 30.75" (LT)
 Degree = 16° 51' 06.12"
 Tangent = 17.7945
 Length = 35.5565
 Radius = 340.0000
 External = 0.4653
 Long Chord = 35.5403
 Mid. Ord. = 0.4647

P.C. Station 10+37.09 N 13,789,460.3612 E 2,259,771.3884
 P.T. Station 10+72.64 N 13,789,486.8795 E 2,259,795.0505
 C.C. = N 13,789,699.6764 E 2,259,529.8760
 Back = N 44° 44' 17.44" E
 Ahead = N 38° 44' 46.69" E
 Chord Bear = N 41° 44' 32.06" E

Course from PT SCHUMANS_B1 to 2101 N 38° 44' 46.69" E Dist 77.3558

Point 2101 N 13,789,547.2112 E 2,259,843.4654 Sta 11+50.00

Ending chain SCHUMANS_B description

Ⓞ JOANNE COVE

Beginning chain JOANNE_CO description

Point 11002 N 13,789,979.3593 E 2,259,203.6570 Sta 10+00.00

Course from 11002 to 11003 S 45° 47' 55.55" W Dist 150.0000

Point 11003 N 13,789,874.7822 E 2,259,096.1227 Sta 11+50.00

Ending chain JOANNE_CO description

Ⓞ FERRYBOAT LN

Beginning chain FERRY_BOAT description

Point 2100 N 13,789,434.0167 E 2,259,745.2836 Sta 10+00.00

Course from 2100 to 2101 N 40° 56' 14.85" E Dist 149.8422

Equation: Sta 11+49.84 (BK) = Sta 11+50.00 (AH)
 End Region 1
 Begin Region 2

Point 2101 N 13,789,547.2112 E 2,259,843.4654 Sta 11+50.00

Ending chain FERRY_BOAT description

Ⓞ DRW 01

Beginning chain DRW01 description

Point DRW0101 N 13,765,390.7714 E 2,274,564.2441 Sta 10+00.00

Course from DRW0101 to DRW0102 N 75° 43' 33.50" E Dist 100.0000

Point DRW0102 N 13,765,415.4274 E 2,274,661.1569 Sta 11+00.00

Ending chain DRW01 description

Ⓞ DRW 02

Beginning chain DRW02 description

Point DRW0201 N 13,765,410.1467 E 2,274,561.4891 Sta 10+00.00

Course from DRW0201 to DRW0202 N 40° 21' 11.69" E Dist 100.0000

Point DRW0202 N 13,765,486.3534 E 2,274,626.2389 Sta 11+00.00

Ending chain DRW02 description

Ⓞ DRW 03

Beginning chain DRW03 description

Point 105 N 13,765,548.0681 E 2,274,556.8385 Sta 10+00.00

Course from 105 to 106 N 64° 56' 02.11" E Dist 100.0000

Point 106 N 13,765,590.4344 E 2,274,647.4204 Sta 11+00.00

Ending chain DRW03 description



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725			
HORIZONTAL ALIGNMENT DATA			
SHEET 8 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 89
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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Q DRW 04

Beginning chain DRW04 description

Point 107 N 13,765,671.9397 E 2,274,513.0967 Sta 10+00.00

Course from 107 to PC DRW041 N 81° 37' 47.84" E Dist 17.9619

Curve Data

Curve DRW041 (Chord Definition)
 P.I. Station 10+36.55 N 13,765,677.2598 E 2,274,549.2552
 Delta = 40° 46' 54.57" (LT)
 Degree = 180° 00' 00.00"
 Tangent = 18.5858
 Length = 22.6566
 Radius = 50.0000
 External = 3.3426
 Long Chord = 34.8423
 Mid. Ord. = 3.1331
 P.C. Station 10+17.96 N 13,765,674.5543 E 2,274,530.8674
 P.T. Station 10+40.62 N 13,765,691.3189 E 2,274,561.4114
 C.C. N 13,765,724.0218 E 2,274,523.5891
 Back = N 81° 37' 47.85" E
 Ahead = N 40° 50' 53.28" E
 Chord Bear = N 61° 14' 20.56" E

Course from PT DRW041 to 108 N 40° 50' 53.28" E Dist 40.4048

Point 108 N 13,765,721.8830 E 2,274,587.8384 Sta 10+81.02

Ending chain DRW04 description

Q DRW 05

Beginning chain DRW05 description

Point 109 N 13,765,794.3475 E 2,274,434.5785 Sta 10+00.00

Course from 109 to 110 N 54° 37' 43.93" E Dist 100.0000

Point 110 N 13,765,852.2345 E 2,274,516.1205 Sta 11+00.00

Ending chain DRW05 description

Q DRW 06

Beginning chain DRW06 description

Point 111 N 13,765,841.9743 E 2,274,403.9138 Sta 10+00.00

Course from 111 to 112 N 57° 13' 27.57" E Dist 100.0000

Point 112 N 13,765,896.1094 E 2,274,487.9934 Sta 11+00.00

Ending chain DRW06 description

Q DRW 07

Beginning chain DRW07 description

Point 113 N 13,766,126.6655 E 2,274,257.9904 Sta 10+00.00

Course from 113 to 114 N 83° 55' 58.17" E Dist 100.0000

Point 114 N 13,766,137.2349 E 2,274,357.4303 Sta 11+00.00

Ending chain DRW07 description

Q DRW 08

Beginning chain DRW08 description

Point 115 N 13,766,437.7212 E 2,274,056.6621 Sta 10+00.00

Course from 115 to 116 N 33° 22' 29.46" E Dist 100.0000

Point 116 N 13,766,521.2301 E 2,274,111.6735 Sta 11+00.00

Ending chain DRW08 description

Q DRW 09

Beginning chain DRW09 description

Point 117 N 13,766,452.3775 E 2,274,032.6601 Sta 10+00.00

Course from 117 to PC DRW091 N 35° 15' 06.63" E Dist 16.1442

Curve Data

Curve DRW091 (Chord Definition)
 P.I. Station 10+34.40 N 13,766,480.4715 E 2,274,052.5163
 Delta = 40° 07' 16.12" (LT)
 Degree = 180° 00' 00.00"
 Tangent = 18.2584
 Length = 22.2895
 Radius = 50.0000
 External = 3.2294
 Long Chord = 34.3013
 Mid. Ord. = 3.0335
 P.C. Station 10+16.14 N 13,766,465.5612 E 2,274,041.9780
 P.T. Station 10+38.43 N 13,766,498.6640 E 2,274,050.9664
 C.C. N 13,766,494.4198 E 2,274,001.1469
 Back = N 35° 15' 06.63" E
 Ahead = N 4° 52' 09.49" W
 Chord Bear = N 15° 11' 28.57" E

Course from PT DRW091 to 118 N 4° 52' 09.49" W Dist 47.9408

Point 118 N 13,766,546.4317 E 2,274,046.8971 Sta 10+86.37

Ending chain DRW09 description

Q DRW 10

Beginning chain DRW10 description

Point 119 N 13,766,669.3587 E 2,273,429.0841 Sta 10+00.00

Course from 119 to 120 N 20° 05' 20.28" E Dist 100.0000

Point 120 N 13,766,763.2748 E 2,273,463.4320 Sta 11+00.00

Ending chain DRW10 description

Q DRW 11

Beginning chain DRW11 description

Point 121 N 13,766,687.3840 E 2,273,379.7983 Sta 10+00.00

Course from 121 to 122 N 20° 05' 20.28" E Dist 100.0000

Point 122 N 13,766,781.3001 E 2,273,414.1462 Sta 11+00.00

Ending chain DRW11 description

Q DRW 12

Beginning chain DRW12 description

Point 123 N 13,766,779.3332 E 2,273,128.3853 Sta 10+00.00

Course from 123 to 124 N 27° 35' 17.80" E Dist 100.0000

Point 124 N 13,766,867.9631 E 2,273,174.6968 Sta 11+00.00

Ending chain DRW12 description

Q DRW 13

Beginning chain DRW13 description

Point 125 N 13,766,794.2350 E 2,273,087.6396 Sta 10+00.00

Course from 125 to 126 N 42° 32' 16.14" E Dist 100.0000

Point 126 N 13,766,867.9182 E 2,273,155.2473 Sta 11+00.00

Ending chain DRW13 description



2/28/2021

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NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
Texas Department of Transportation © 2021			
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 9 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 90
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

📍 DRW 14

Beginning chain DRW14 description
 =====
 Point 127 N 13,766,809.1562 E 2,273,046.8416 Sta 10+00.00
 Course from 127 to 128 N 14° 16' 00.31" E Dist 100.0000
 Point 128 N 13,766,906.0721 E 2,273,071.4853 Sta 11+00.00
 =====
 Ending chain DRW14 description

📍 DRW 15

Beginning chain DRW15 description
 =====
 Point 129 N 13,766,825.5130 E 2,273,002.1177 Sta 10+00.00
 Course from 129 to 130 N 8° 53' 33.34" E Dist 100.0000
 Point 130 N 13,766,924.3110 E 2,273,017.5760 Sta 11+00.00
 =====
 Ending chain DRW15 description

📍 DRW 16

Beginning chain DRW16 description
 =====
 Point 131 N 13,766,887.5888 E 2,272,832.3864 Sta 10+00.00
 Course from 131 to 132 N 20° 59' 48.03" E Dist 100.0000
 Point 132 N 13,766,980.9489 E 2,272,868.2178 Sta 11+00.00
 =====
 Ending chain DRW16 description

📍 DRW 17

Beginning chain DRW17 description
 =====
 Point 133 N 13,766,897.9868 E 2,272,803.9556 Sta 10+00.00
 Course from 133 to 134 N 22° 34' 38.66" E Dist 100.0000
 Point 134 N 13,766,990.3230 E 2,272,842.3487 Sta 11+00.00
 =====
 Ending chain DRW17 description

📍 DRW 18

Beginning chain DRW18 description
 =====
 Point 135 N 13,766,935.8937 E 2,272,700.3083 Sta 10+00.00
 Course from 135 to 136 N 20° 05' 20.28" E Dist 100.0000
 Point 136 N 13,767,029.8098 E 2,272,734.6562 Sta 11+00.00
 =====
 Ending chain DRW18 description

📍 DRW 19

Beginning chain DRW19 description
 =====
 Point 137 N 13,766,966.4923 E 2,272,616.6437 Sta 10+00.00
 Course from 137 to 138 N 20° 05' 20.28" E Dist 100.0000
 Point 138 N 13,767,060.4084 E 2,272,650.9916 Sta 11+00.00
 =====
 Ending chain DRW19 description

📍 DRW 20

Beginning chain DRW20 description
 =====
 Point 139 N 13,766,982.0346 E 2,272,574.1472 Sta 10+00.00
 Course from 139 to 140 N 15° 02' 08.41" E Dist 100.0000

Point 140 N 13,767,078.6110 E 2,272,600.0892 Sta 11+00.00

Ending chain DRW20 description

📍 DRW 21

Beginning chain DRW21 description
 =====
 Point 141 N 13,767,096.6377 E 2,272,260.7924 Sta 10+00.00
 Course from 141 to 142 N 20° 05' 20.28" E Dist 100.0000
 Point 142 N 13,767,190.5537 E 2,272,295.1403 Sta 11+00.00
 =====
 Ending chain DRW21 description

📍 DRW 22

Beginning chain DRW22 description
 =====
 Point 143 N 13,767,157.8530 E 2,272,101.3673 Sta 10+00.00
 Course from 143 to 144 N 23° 39' 22.07" E Dist 100.0000
 Point 144 N 13,767,249.4500 E 2,272,141.4920 Sta 11+00.00
 =====
 Ending chain DRW22 description

📍 DRW 23

Beginning chain DRW23 description
 =====
 Point 145 N 13,767,173.2603 E 2,272,067.4234 Sta 10+00.00
 Course from 145 to 146 N 26° 51' 02.78" E Dist 100.0000
 Point 146 N 13,767,262.4789 E 2,272,112.5903 Sta 11+00.00
 =====
 Ending chain DRW23 description

📍 DRW 24

Beginning chain DRW24 description
 =====
 Point 147 N 13,767,513.0185 E 2,271,603.0809 Sta 10+00.00
 Course from 147 to 148 N 42° 48' 21.18" E Dist 100.0000
 Point 148 N 13,767,586.3845 E 2,271,671.0325 Sta 11+00.00
 =====
 Ending chain DRW24 description

📍 DRW 25

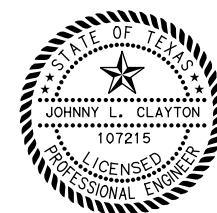
Beginning chain DRW25 description
 =====
 Point 149 N 13,767,560.3917 E 2,271,551.9330 Sta 10+00.00
 Course from 149 to 150 N 47° 30' 23.37" E Dist 100.0000
 Point 150 N 13,767,627.9424 E 2,271,625.6683 Sta 11+00.00
 =====
 Ending chain DRW25 description

📍 DRW 26

Beginning chain DRW26 description
 =====
 Point 151 N 13,767,756.1985 E 2,271,340.5245 Sta 10+00.00
 Course from 151 to 152 N 50° 18' 01.61" E Dist 100.0000
 Point 152 N 13,767,820.0746 E 2,271,417.4649 Sta 11+00.00
 =====
 Ending chain DRW26 description

📍 DRW 27

Beginning chain DRW27 description



2/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation
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FM 725
HORIZONTAL ALIGNMENT DATA

SHEET 10 OF 22			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		91
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Point 153 N 13,768,597.6559 E 2,270,432.0203 Sta 10+00.00
 Course from 153 to 154 N 43° 10' 53.97" E Dist 100.0000
 Point 154 N 13,768,670.5746 E 2,270,500.4517 Sta 11+00.00
 =====
 Ending chain DRW27 description
Q DRW 28
 Beginning chain DRW28 description
 =====
 Point 155 N 13,768,763.7183 E 2,270,252.7261 Sta 10+00.00
 Course from 155 to 156 N 50° 52' 30.89" E Dist 100.0000
 Point 156 N 13,768,826.8194 E 2,270,330.3035 Sta 11+00.00
 =====
 Ending chain DRW28 description
Q DRW 29
 Beginning chain DRW29 description
 =====
 Point 157 N 13,769,125.7094 E 2,269,862.0877 Sta 10+00.00
 Course from 157 to 158 N 47° 56' 50.20" E Dist 100.0000
 Point 158 N 13,769,192.6908 E 2,269,936.3405 Sta 11+00.00
 =====
 Ending chain DRW29 description
Q DRW 30
 Beginning chain DRW30 description
 =====
 Point 159 N 13,771,103.4745 E 2,269,990.8458 Sta 10+00.00
 Course from 159 to 160 S 73° 32' 30.88" E Dist 100.0000
 Point 160 N 13,771,075.1431 E 2,270,086.7485 Sta 11+00.00
 =====
 Ending chain DRW30 description
Q DRW 31
 Beginning chain DRW31 description
 =====
 Point 163 N 13,771,163.7240 E 2,269,982.4129 Sta 10+00.00
 Course from 163 to 164 N 67° 48' 18.06" E Dist 100.0000
 Point 164 N 13,771,201.5000 E 2,270,075.0033 Sta 11+00.00
 =====
 Ending chain DRW31 description
Q DRW 32
 Beginning chain DRW32 description
 =====
 Point DRW3201 N 13,771,252.0511 E 2,269,955.3609 Sta 10+00.00
 Course from DRW3201 to DRW3202 N 57° 37' 50.95" E Dist 100.0000
 Point DRW3202 N 13,771,305.5883 E 2,270,039.8225 Sta 11+00.00
 =====
 Ending chain DRW32 description
Q DRW 33
 Beginning chain DRW33 description
 =====
 Point 167 N 13,771,338.5408 E 2,269,913.1116 Sta 10+00.00
 Course from 167 to 168 N 61° 34' 06.53" E Dist 100.0000
 Point 168 N 13,771,386.1516 E 2,270,001.0503 Sta 11+00.00
 =====
 Ending chain DRW33 description

Q DRW 34
 Beginning chain DRW34 description
 =====
 Point 169 N 13,771,460.0038 E 2,269,851.5398 Sta 10+00.00
 Course from 169 to 170 N 53° 03' 01.68" E Dist 100.0000
 Point 170 N 13,771,520.1149 E 2,269,931.4563 Sta 11+00.00
 =====
 Ending chain DRW34 description
Q DRW 35
 Beginning chain DRW35 description
 =====
 Point DRW3501 N 13,771,574.1214 E 2,269,793.6914 Sta 10+00.00
 Course from DRW3501 to DRW3502 N 63° 07' 07.29" E Dist 100.0000
 Point DRW3502 N 13,771,619.3357 E 2,269,882.8859 Sta 11+00.00
 =====
 Ending chain DRW35 description
Q DRW 36
 Beginning chain DRW36 description
 =====
 Point 173 N 13,771,724.5119 E 2,269,717.4556 Sta 10+00.00
 Course from 173 to 174 N 45° 37' 11.84" E Dist 100.0000
 Point 174 N 13,771,794.4533 E 2,269,788.9273 Sta 11+00.00
 =====
 Ending chain DRW36 description
Q DRW 37
 Beginning chain DRW37 description
 =====
 Point 175 N 13,772,643.6568 E 2,269,258.2694 Sta 10+00.00
 Course from 175 to 176 N 63° 51' 07.10" E Dist 100.0000
 Point 176 N 13,772,687.7260 E 2,269,348.0352 Sta 11+00.00
 =====
 Ending chain DRW37 description
Q DRW 38
 Beginning chain DRW38 description
 =====
 Point 177 N 13,773,559.7550 E 2,268,794.2858 Sta 10+00.00
 Course from 177 to 178 N 59° 59' 52.75" E Dist 100.0000
 Point 178 N 13,773,609.7580 E 2,268,880.8865 Sta 11+00.00
 =====
 Ending chain DRW38 description
Q DRW 39
 Beginning chain DRW39 description
 =====
 Point 179 N 13,774,133.9990 E 2,268,415.6196 Sta 10+00.00
 Course from 179 to 180 N 46° 30' 04.98" E Dist 100.0000
 Point 180 N 13,774,202.8327 E 2,268,488.1587 Sta 11+00.00
 =====
 Ending chain DRW39 description
Q DRW 40
 Beginning chain DRW40 description
 =====
 Point 181 N 13,775,403.8235 E 2,267,427.0998 Sta 10+00.00
 Course from 181 to 182 N 53° 01' 58.15" E Dist 100.0000



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NO.	REVISION	BY	DATE



FM 725

HORIZONTAL ALIGNMENT DATA

SHEET 11 OF 22

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		92
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Point 182 N 13,775,463.9592 E 2,267,506.9978 Sta 11+00.00
 =====
 Ending chain DRW40 description
DRW 41
 Beginning chain DRW41 description
 =====
 Point 183 N 13,775,466.6254 E 2,267,383.6270 Sta 10+00.00
 Course from 183 to 184 N 55° 49' 45.44" E Dist 100.0000
 Point 184 N 13,775,522.7914 E 2,267,466.3638 Sta 11+00.00
 =====
 Ending chain DRW41 description
DRW 42
 Beginning chain DRW42 description
 =====
 Point 185 N 13,775,509.5063 E 2,267,354.0505 Sta 10+00.00
 Course from 185 to 186 N 51° 04' 07.96" E Dist 100.0000
 Point 186 N 13,775,572.3449 E 2,267,431.8407 Sta 11+00.00
 =====
 Ending chain DRW42 description
DRW 43
 Beginning chain DRW43 description
 =====
 Point 187 N 13,775,588.3473 E 2,267,299.6712 Sta 10+00.00
 Course from 187 to 188 N 52° 33' 31.46" E Dist 100.0000
 Point 188 N 13,775,649.1420 E 2,267,379.0689 Sta 11+00.00
 =====
 Ending chain DRW43 description
DRW 44
 Beginning chain DRW44 description
 =====
 Point 189 N 13,775,741.2682 E 2,267,194.5483 Sta 10+00.00
 Course from 189 to 190 N 56° 29' 24.87" E Dist 100.0000
 Point 190 N 13,775,796.4761 E 2,267,277.9275 Sta 11+00.00
 =====
 Ending chain DRW44 description
DRW 45
 Beginning chain DRW45 description
 =====
 Point DRW45 N 13,776,170.2424 E 2,266,919.1662 Sta 10+00.00
 Course from DRW45 to DRW46 N 43° 55' 30.90" E Dist 100.0000
 Point DRW46 N 13,776,242.2669 E 2,266,988.5381 Sta 11+00.00
 =====
 Ending chain DRW45 description
DRW 46
 Beginning chain DRW46 description
 =====
 Point 193 N 13,776,327.5554 E 2,266,825.4668 Sta 10+00.00
 Course from 193 to 194 N 52° 40' 18.41" E Dist 100.0000
 Point 194 N 13,776,388.1934 E 2,266,904.9842 Sta 11+00.00
 =====
 Ending chain DRW46 description

DRW 47
 Beginning chain DRW47 description
 =====
 Point 195 N 13,776,507.3023 E 2,266,722.4519 Sta 10+00.00
 Course from 195 to 196 N 45° 45' 53.38" E Dist 100.0000
 Point 196 N 13,776,577.0628 E 2,266,794.1001 Sta 11+00.00
 =====
 Ending chain DRW47 description
DRW 48
 Beginning chain DRW48 description
 =====
 Point 197 N 13,778,735.4223 E 2,265,715.4692 Sta 10+00.00
 Course from 197 to 198 N 48° 45' 58.68" E Dist 100.0000
 Point 198 N 13,778,801.3354 E 2,265,790.6719 Sta 11+00.00
 =====
 Ending chain DRW48 description
DRW 49
 Beginning chain DRW49 description
 =====
 Point 199 N 13,778,758.8594 E 2,265,705.2529 Sta 10+00.00
 Course from 199 to 200 N 45° 48' 11.33" E Dist 100.0000
 Point 200 N 13,778,828.5719 E 2,265,776.9478 Sta 11+00.00
 =====
 Ending chain DRW49 description
DRW 50
 Beginning chain DRW50 description
 =====
 Point DRW5001 N 13,781,925.8910 E 2,264,330.8270 Sta 10+00.00
 Course from DRW5001 to DRW5002 N 45° 28' 53.43" E Dist 100.0000
 Point DRW5002 N 13,781,996.0049 E 2,264,402.1294 Sta 11+00.00
 =====
 Ending chain DRW50 description
DRW 51
 Beginning chain DRW51 description
 =====
 Point 203 N 13,782,507.4233 E 2,264,080.0733 Sta 10+00.00
 Course from 203 to 204 N 66° 40' 28.39" E Dist 100.0000
 Point 204 N 13,782,547.0187 E 2,264,171.9004 Sta 11+00.00
 =====
 Ending chain DRW51 description
DRW 52
 Beginning chain DRW52 description
 =====
 Point 205 N 13,783,011.4102 E 2,263,855.5179 Sta 10+00.00
 Course from 205 to 206 N 58° 27' 38.37" E Dist 100.0000
 Point 206 N 13,783,063.7186 E 2,263,940.7460 Sta 11+00.00
 =====
 Ending chain DRW52 description
DRW 53
 Beginning chain DRW53 description
 =====
 Point 207 N 13,783,138.6233 E 2,263,788.8490 Sta 10+00.00
 Course from 207 to 208 N 50° 54' 39.37" E Dist 100.0000



NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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HORIZONTAL ALIGNMENT DATA

SHEET 12 OF 22

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	93	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

Point 208 N 13,783,201.6761 E 2,263,866.4657 Sta 11+00.00

Ending chain DRW53 description

DRW 54

Beginning chain DRW54 description

Point 209 N 13,784,705.3159 E 2,262,837.1588 Sta 10+00.00

Course from 209 to 210 N 62° 15' 23.35" E Dist 100.0000

Point 210 N 13,784,751.8674 E 2,262,925.6628 Sta 11+00.00

Ending chain DRW54 description

DRW 55

Beginning chain DRW55 description

Point 211 N 13,784,888.9184 E 2,262,717.1615 Sta 10+00.00

Course from 211 to 212 N 59° 24' 10.38" E Dist 100.0000

Point 212 N 13,784,939.8182 E 2,262,803.2383 Sta 11+00.00

Ending chain DRW55 description

DRW 56

Beginning chain DRW56 description

Point 213 N 13,785,134.1566 E 2,262,541.2252 Sta 10+00.00

Course from 213 to 214 N 48° 47' 05.15" E Dist 100.0000

Point 214 N 13,785,200.0456 E 2,262,616.4492 Sta 11+00.00

Ending chain DRW56 description

DRW 57

Beginning chain DRW57 description

Point 215 N 13,785,193.9155 E 2,262,495.4423 Sta 10+00.00

Course from 215 to 216 N 48° 47' 01.18" E Dist 100.0000

Point 216 N 13,785,259.8059 E 2,262,570.6650 Sta 11+00.00

Ending chain DRW57 description

DRW 58

Beginning chain DRW58 description

Point 217 N 13,785,373.7720 E 2,262,350.2129 Sta 10+00.00

Course from 217 to 218 N 49° 58' 34.31" E Dist 100.0000

Point 218 N 13,785,438.0825 E 2,262,426.7906 Sta 11+00.00

Ending chain DRW58 description

DRW 59

Beginning chain DRW59 description

Point 219 N 13,785,515.9976 E 2,262,226.9151 Sta 10+00.00

Course from 219 to 220 N 48° 10' 43.18" E Dist 100.0000

Point 220 N 13,785,582.6786 E 2,262,301.4379 Sta 11+00.00

Ending chain DRW59 description

DRW 60

Beginning chain DRW60 description

Point 223 N 13,785,551.7578 E 2,262,194.6584 Sta 10+00.00

Course from 223 to 224 N 47° 43' 07.60" E Dist 100.0000

Point 224 N 13,785,619.0348 E 2,262,268.6436 Sta 11+00.00

Ending chain DRW60 description

DRW 61

Beginning chain DRW61 description

Point 225 N 13,785,603.1643 E 2,262,147.3634 Sta 10+00.00

Course from 225 to 226 N 47° 03' 06.21" E Dist 100.0000

Point 226 N 13,785,671.2980 E 2,262,220.5603 Sta 11+00.00

Ending chain DRW61 description

DRW 62

Beginning chain DRW62 description

Point 227 N 13,785,967.3116 E 2,261,829.7159 Sta 10+00.00

Course from 227 to 228 N 50° 13' 14.91" E Dist 100.0000

Point 228 N 13,786,031.2947 E 2,261,906.5675 Sta 11+00.00

Ending chain DRW62 description

DRW 63

Beginning chain DRW63 description

Point 229 N 13,786,502.0327 E 2,261,537.2879 Sta 10+00.00

Course from 229 to 230 N 59° 29' 46.23" E Dist 100.0000

Point 230 N 13,786,552.7923 E 2,261,623.4474 Sta 11+00.00

Ending chain DRW63 description

DRW 64

Beginning chain DRW64 description

Point 231 N 13,786,761.7144 E 2,261,407.7387 Sta 10+00.00

Course from 231 to 232 N 63° 29' 11.23" E Dist 100.0000

Point 232 N 13,786,806.3554 E 2,261,497.2216 Sta 11+00.00

Ending chain DRW64 description

DRW 65

Beginning chain DRW65 description

Point 233 N 13,786,886.5153 E 2,261,345.4784 Sta 10+00.00

Course from 233 to 234 N 58° 15' 37.98" E Dist 100.0000

Point 234 N 13,786,939.1210 E 2,261,430.5233 Sta 11+00.00

Ending chain DRW65 description

DRW 66

Beginning chain DRW66 description

Point 235 N 13,787,045.8474 E 2,261,265.9913 Sta 10+00.00

Course from 235 to 236 N 63° 29' 11.23" E Dist 100.0000



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312



FM 725

HORIZONTAL ALIGNMENT DATA

SHEET 13 OF 22

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		94
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Point 262      N  13,766,494.1496 E  2,273,630.7802 Sta  11+00.00
=====
Ending chain DRW79 description
Q DRW 80
Beginning chain DRW80 description
=====
Point 263      N  13,766,605.0636 E  2,273,613.6427 Sta  10+00.00
Course from 263 to 264 S 18° 56' 37.46" W Dist 100.0000
Point 264      N  13,766,510.4798 E  2,273,581.1787 Sta  11+00.00
=====
Ending chain DRW80 description
Q DRW 81
Beginning chain DRW81 description
=====
Point 265      N  13,766,620.4140 E  2,273,567.7188 Sta  10+00.00
Course from 265 to 266 S 18° 43' 18.46" W Dist 100.0000
Point 266      N  13,766,525.7052 E  2,273,535.6214 Sta  11+00.00
=====
Ending chain DRW81 description
Q DRW 82
Beginning chain DRW82 description
=====
Point 267      N  13,766,669.0551 E  2,273,429.9145 Sta  10+00.00
Course from 267 to 268 S 51° 23' 18.18" W Dist 100.0000
Point 268      N  13,766,606.6513 E  2,273,351.7751 Sta  11+00.00
=====
Ending chain DRW82 description
Q DRW 83
Beginning chain DRW83 description
=====
Point 269      N  13,766,712.6206 E  2,273,310.7951 Sta  10+00.00
Course from 269 to 270 S 41° 59' 55.22" W Dist 100.0000
Point 270      N  13,766,638.3045 E  2,273,243.8838 Sta  11+00.00
=====
Ending chain DRW83 description
Q DRW 84
Beginning chain DRW84 description
=====
Point 271      N  13,766,733.5873 E  2,273,253.4666 Sta  10+00.00
Course from 271 to 272 S 42° 15' 27.19" W Dist 100.0000
Point 272      N  13,766,659.5743 E  2,273,186.2202 Sta  11+00.00
=====
Ending chain DRW84 description
Q DRW 85
Beginning chain DRW85 description
=====
Point 273      N  13,766,809.8357 E  2,273,044.9836 Sta  10+00.00
Course from 273 to 274 S 32° 51' 02.18" W Dist 100.0000
Point 274      N  13,766,725.8269 E  2,272,990.7386 Sta  11+00.00
=====
Ending chain DRW85 description
    
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Q DRW 86
Beginning chain DRW86 description
=====
Point 275      N  13,766,825.9827 E  2,273,000.8335 Sta  10+00.00
Course from 275 to 276 S 38° 54' 34.05" W Dist 100.0000
Point 276      N  13,766,748.1688 E  2,272,938.0244 Sta  11+00.00
=====
Ending chain DRW86 description

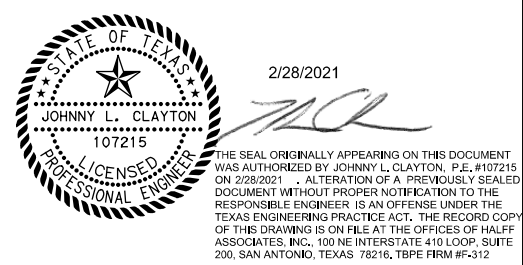
Q DRW 87
Beginning chain DRW87 description
=====
Point 277      N  13,766,850.8360 E  2,272,932.8781 Sta  10+00.00
Course from 277 to 278 S 20° 05' 20.28" W Dist 100.0000
Point 278      N  13,766,756.9200 E  2,272,898.5302 Sta  11+00.00
=====
Ending chain DRW87 description

Q DRW 88
Beginning chain DRW88 description
=====
Point 279      N  13,766,893.0197 E  2,272,817.5371 Sta  10+00.00
Course from 279 to 280 S 20° 05' 20.28" W Dist 100.0000
Point 280      N  13,766,799.1036 E  2,272,783.1892 Sta  11+00.00
=====
Ending chain DRW88 description

Q DRW 89
Beginning chain DRW89 description
=====
Point 281      N  13,766,924.8476 E  2,272,730.5111 Sta  10+00.00
Course from 281 to 282 S 14° 33' 33.11" W Dist 100.0000
Point 282      N  13,766,828.0588 E  2,272,705.3731 Sta  11+00.00
=====
Ending chain DRW89 description

Q DRW 90
Beginning chain DRW90 description
=====
Point 283      N  13,766,936.9595 E  2,272,697.3941 Sta  10+00.00
Course from 283 to 284 S 19° 38' 11.52" W Dist 100.0000
Point 284      N  13,766,842.7752 E  2,272,663.7889 Sta  11+00.00
=====
Ending chain DRW90 description

Q DRW 91
Beginning chain DRW91 description
=====
Point 285      N  13,766,952.3187 E  2,272,655.3982 Sta  10+00.00
Course from 285 to 286 S 21° 17' 44.94" W Dist 100.0000
Point 286      N  13,766,859.1469 E  2,272,619.0798 Sta  11+00.00
=====
Ending chain DRW91 description
    
```



NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
TEXAS DEPARTMENT OF TRANSPORTATION © 2021			
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 15 OF 22			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 96	
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:34:38 PM OFFICE:SAN
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 ah3070

Q DRW 92

Beginning chain DRW92 description
 =====
 Point 287 N 13,766,980.4687 E 2,272,578.4287 Sta 10+00.00
 Course from 287 to 288 S 21° 40' 59.04" W Dist 100.0000
 Point 288 N 13,766,887.5445 E 2,272,541.4815 Sta 11+00.00
 =====
 Ending chain DRW92 description

Q DRW 93

Beginning chain DRW93 description
 =====
 Point 289 N 13,767,087.9860 E 2,272,284.4484 Sta 10+00.00
 Course from 289 to 290 S 30° 42' 38.86" W Dist 100.0000
 Point 290 N 13,767,002.0104 E 2,272,233.3779 Sta 11+00.00
 =====
 Ending chain DRW93 description

Q DRW 94

Beginning chain DRW94 description
 =====
 Point 291 N 13,767,139.2895 E 2,272,145.7929 Sta 10+00.00
 Course from 291 to 292 S 31° 26' 25.64" W Dist 100.0000
 Point 292 N 13,767,053.9713 E 2,272,093.6317 Sta 11+00.00
 =====
 Ending chain DRW94 description

Q DRW 95

Beginning chain DRW95 description
 =====
 Point 293 N 13,767,177.4504 E 2,272,058.5870 Sta 10+00.00
 Course from 293 to 294 S 2° 04' 39.12" W Dist 100.0000
 Point 294 N 13,767,077.5161 E 2,272,054.9618 Sta 11+00.00
 =====
 Ending chain DRW95 description

Q DRW 96

Beginning chain DRW96 description
 =====
 Point 295 N 13,767,216.5166 E 2,271,982.8950 Sta 10+00.00
 Course from 295 to 296 S 38° 59' 32.49" W Dist 100.0000
 Point 296 N 13,767,138.7937 E 2,271,919.9733 Sta 11+00.00
 =====
 Ending chain DRW96 description

Q DRW 97

Beginning chain DRW97 description
 =====
 Point DRW9701 N 13,767,278.8250 E 2,271,881.0444 Sta 10+00.00
 Course from DRW9701 to DRW9702 S 24° 27' 37.71" W Dist 100.0000
 Point DRW9702 N 13,767,187.8003 E 2,271,839.6379 Sta 11+00.00
 =====
 Ending chain DRW97 description

Q DRW 98

Beginning chain DRW98 description
 =====
 Point 299 N 13,767,299.5370 E 2,271,851.0476 Sta 10+00.00
 Course from 299 to 300 S 42° 26' 19.49" W Dist 100.0000
 Point 300 N 13,767,225.7371 E 2,271,783.5674 Sta 11+00.00
 =====
 Ending chain DRW98 description

Q DRW 99

Beginning chain DRW99 description
 =====
 Point 301 N 13,768,601.5825 E 2,270,427.7808 Sta 10+00.00
 Course from 301 to 302 S 51° 26' 09.64" W Dist 100.0000
 Point 302 N 13,768,539.2437 E 2,270,349.5896 Sta 11+00.00
 =====
 Ending chain DRW99 description

Q DRW 100

Beginning chain DRW100 description
 =====
 Point DRW10001 N 13,768,906.5640 E 2,270,098.4986 Sta 10+00.00
 Course from DRW10001 to DRW10002 S 42° 48' 21.18" W Dist 100.0000
 Point DRW10002 N 13,768,833.1980 E 2,270,030.5469 Sta 11+00.00
 =====
 Ending chain DRW100 description

Q DRW 101

Beginning chain DRW101 description
 =====
 Point 305 N 13,770,273.3276 E 2,269,417.5684 Sta 10+00.00
 Course from 305 to 306 N 53° 55' 16.69" W Dist 100.0000
 Point 306 N 13,770,332.2172 E 2,269,336.7475 Sta 11+00.00
 =====
 Ending chain DRW101 description

Q DRW 102

Beginning chain DRW102 description
 =====
 Point 307 N 13,770,292.5387 E 2,269,432.3158 Sta 10+00.00
 Course from 307 to 308 N 52° 55' 03.56" W Dist 100.0000
 Point 308 N 13,770,352.8349 E 2,269,352.5388 Sta 11+00.00
 =====
 Ending chain DRW102 description

Q DRW 103

Beginning chain DRW103 description
 =====
 Point 309 N 13,770,391.3751 E 2,269,525.8518 Sta 10+00.00
 Course from 309 to 310 N 45° 40' 44.62" W Dist 100.0000
 Point 310 N 13,770,461.2428 E 2,269,454.3081 Sta 11+00.00
 =====
 Ending chain DRW103 description



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NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 16 OF 22			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		97
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:34:42 PM OFFICE:SAN ah3070
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Q DRW 104

Beginning chain DRW104 description
 =====
 Point 311 N 13,770,472.5910 E 2,269,605.1650 Sta 10+00.00
 Course from 311 to 312 N 45° 40' 44.62" W Dist 100.0000
 Point 312 N 13,770,542.4587 E 2,269,533.6213 Sta 11+00.00
 =====
 Ending chain DRW104 description

Q DRW 105

Beginning chain DRW105 description
 =====
 Point 313 N 13,770,726.4949 E 2,269,853.1207 Sta 10+00.00
 Course from 313 to 314 N 35° 57' 29.96" W Dist 100.0000
 Point 314 N 13,770,807.4393 E 2,269,794.4010 Sta 11+00.00
 =====
 Ending chain DRW105 description

Q DRW 106

Beginning chain DRW106 description
 =====
 Point 315 N 13,771,280.0383 E 2,269,942.7199 Sta 10+00.00
 Course from 315 to 316 S 67° 06' 17.70" W Dist 100.0000
 Point 316 N 13,771,241.1338 E 2,269,850.5980 Sta 11+00.00
 =====
 Ending chain DRW106 description

Q DRW 107

Beginning chain DRW107 description
 =====
 Point 317 N 13,771,359.2549 E 2,269,902.6113 Sta 10+00.00
 Course from 317 to 318 S 55° 37' 55.78" W Dist 100.0000
 Point 318 N 13,771,302.8045 E 2,269,820.0682 Sta 11+00.00
 =====
 Ending chain DRW107 description

Q DRW 108

Beginning chain DRW108 description
 =====
 Point 319 N 13,771,490.0984 E 2,269,836.2842 Sta 10+00.00
 Course from 319 to 320 S 61° 23' 26.99" W Dist 100.0000
 Point 320 N 13,771,442.2152 E 2,269,748.4936 Sta 11+00.00
 =====
 Ending chain DRW108 description

Q DRW 109

Beginning chain DRW109 description
 =====
 Point 321 N 13,771,652.3850 E 2,269,754.0181 Sta 10+00.00
 Course from 321 to 322 S 63° 07' 07.29" W Dist 120.0000
 Point 322 N 13,771,598.1277 E 2,269,646.9847 Sta 11+20.00
 =====
 Ending chain DRW109 description

Q DRW 110

Beginning chain DRW110 description
 =====
 Point 323 N 13,772,411.2598 E 2,269,372.2095 Sta 10+00.00
 Course from 323 to 324 S 46° 53' 18.35" W Dist 100.0000
 Point 324 N 13,772,342.9177 E 2,269,299.2070 Sta 11+00.00
 =====
 Ending chain DRW110 description

Q DRW 111

Beginning chain DRW111 description
 =====
 Point 325 N 13,772,602.1821 E 2,269,278.6037 Sta 10+00.00
 Course from 325 to 326 S 63° 51' 07.10" W Dist 100.0000
 Point 326 N 13,772,558.1130 E 2,269,188.8378 Sta 11+00.00
 =====
 Ending chain DRW111 description

Q DRW 112

Beginning chain DRW112 description
 =====
 Point 327 N 13,772,860.3844 E 2,269,152.0118 Sta 10+00.00
 Course from 327 to 328 S 42° 48' 17.08" W Dist 100.0000
 Point 328 N 13,772,787.0170 E 2,269,084.0616 Sta 11+00.00
 =====
 Ending chain DRW112 description

Q DRW 113

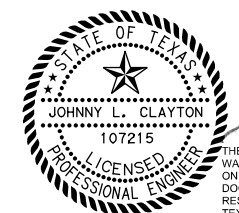
Beginning chain DRW113 description
 =====
 Point 329 N 13,773,078.5774 E 2,269,045.0357 Sta 10+00.00
 Course from 329 to 330 S 64° 50' 13.67" W Dist 100.0000
 Point 330 N 13,773,036.0581 E 2,268,954.5254 Sta 11+00.00
 =====
 Ending chain DRW113 description

Q DRW 114

Beginning chain DRW114 description
 =====
 Point 331 N 13,774,237.4318 E 2,268,336.4118 Sta 10+00.00
 Course from 331 to 332 S 50° 56' 09.32" W Dist 100.0000
 Point 332 N 13,774,174.4129 E 2,268,258.7677 Sta 11+00.00
 =====
 Ending chain DRW114 description

Q DRW 115

Beginning chain DRW115 description
 =====
 Point 333 N 13,774,313.3581 E 2,268,275.8708 Sta 10+00.00
 Course from 333 to 334 S 50° 56' 09.32" W Dist 100.0000
 Point 334 N 13,774,250.3392 E 2,268,198.2266 Sta 11+00.00
 =====
 Ending chain DRW115 description



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725

HORIZONTAL ALIGNMENT DATA

SHEET 17 OF 22

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 98
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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Q DRW 116

Beginning chain DRW116 description
 =====
 Point 335 N 13,774,329.1984 E 2,268,262.9792 Sta 10+00.00
 Course from 335 to 336 S 56° 59' 46.84" W Dist 100.0000
 Point 336 N 13,774,274.7292 E 2,268,179.1157 Sta 11+00.00
 =====
 Ending chain DRW116 description

Q DRW 117

Beginning chain DRW117 description
 =====
 Point 337 N 13,774,830.0323 E 2,267,855.3724 Sta 10+00.00
 Course from 337 to 338 S 51° 23' 51.44" W Dist 100.0000
 Point 338 N 13,774,767.6411 E 2,267,777.2230 Sta 11+00.00
 =====
 Ending chain DRW117 description

Q DRW 118

Beginning chain DRW118 description
 =====
 Point 339 N 13,774,922.5576 E 2,267,782.3126 Sta 10+00.00
 Course from 339 to 340 S 47° 08' 48.42" W Dist 100.0000
 Point 340 N 13,774,854.5454 E 2,267,709.0027 Sta 11+00.00
 =====
 Ending chain DRW118 description

Q DRW 119

Beginning chain DRW119 description
 =====
 Point 341 N 13,775,055.0476 E 2,267,680.4543 Sta 10+00.00
 Course from 341 to 342 S 52° 04' 30.09" W Dist 100.0000
 Point 342 N 13,774,993.5847 E 2,267,601.5727 Sta 11+00.00
 =====
 Ending chain DRW119 description

Q DRW 120

Beginning chain DRW120 description
 =====
 Point 343 N 13,775,081.9133 E 2,267,660.1874 Sta 10+00.00
 Course from 343 to 344 S 56° 10' 36.64" W Dist 100.0000
 Point 344 N 13,775,026.2501 E 2,267,577.1114 Sta 11+00.00
 =====
 Ending chain DRW120 description

Q DRW 121

Beginning chain DRW121 description
 =====
 Point 345 N 13,775,100.3730 E 2,267,646.3363 Sta 10+00.00
 Course from 345 to 346 S 63° 04' 38.64" W Dist 100.0000
 Point 346 N 13,775,055.0944 E 2,267,557.1744 Sta 11+00.00
 =====
 Ending chain DRW121 description

Q DRW 122

Beginning chain DRW122 description
 =====
 Point 347 N 13,775,396.7524 E 2,267,432.0317 Sta 10+00.00
 Course from 347 to 348 S 52° 25' 32.90" W Dist 100.0000
 Point 348 N 13,775,335.7735 E 2,267,352.7753 Sta 11+00.00
 =====
 Ending chain DRW122 description

Q DRW 123

Beginning chain DRW123 description
 =====
 Point 349 N 13,775,699.6948 E 2,267,222.9113 Sta 10+00.00
 Course from 349 to 350 S 55° 55' 11.49" W Dist 100.0000
 Point 350 N 13,775,643.6596 E 2,267,140.0859 Sta 11+00.00
 =====
 Ending chain DRW123 description

Q DRW 124

Beginning chain DRW124 description
 =====
 Point 351 N 13,775,861.1499 E 2,267,114.4576 Sta 10+00.00
 Course from 351 to 352 S 50° 54' 53.08" W Dist 100.0000
 Point 352 N 13,775,798.1023 E 2,267,036.8368 Sta 11+00.00
 =====
 Ending chain DRW124 description

Q DRW 125

Beginning chain DRW125 description
 =====
 Point 353 N 13,775,920.8023 E 2,267,075.5277 Sta 10+00.00
 Course from 353 to 354 S 59° 07' 01.37" W Dist 100.0000
 Point 354 N 13,775,869.4738 E 2,266,989.7059 Sta 11+00.00
 =====
 Ending chain DRW125 description

Q DRW 126

Beginning chain DRW126 description
 =====
 Point 355 N 13,775,978.1575 E 2,267,038.6644 Sta 10+00.00
 Course from 355 to 356 S 53° 07' 04.30" W Dist 100.0000
 Point 356 N 13,775,918.1404 E 2,266,958.6772 Sta 11+00.00
 =====
 Ending chain DRW126 description

Q DRW 127

Beginning chain DRW127 description
 =====
 Point 357 N 13,776,013.8862 E 2,267,015.9788 Sta 10+00.00
 Course from 357 to 358 S 57° 42' 29.43" W Dist 100.0000
 Point 358 N 13,775,960.4630 E 2,266,931.4450 Sta 11+00.00
 =====
 Ending chain DRW127 description



2/28/2021
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NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 18 OF 22			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		99
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:34:55 PM OFFICE:SAN ah3070
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Q DRW 128

Beginning chain DRW128 description
 =====
 Point 359 N 13,776,209.2172 E 2,266,895.6479 Sta 10+00.00
 Course from 359 to 360 S 59° 01' 21.67" W Dist 100.0000
 Point 360 N 13,776,157.7473 E 2,266,809.9108 Sta 11+00.00
 =====
 Ending chain DRW128 description

Q DRW 129

Beginning chain DRW129 description
 =====
 Point 361 N 13,776,572.3337 E 2,266,687.7596 Sta 10+00.00
 Course from 361 to 362 S 56° 44' 30.98" W Dist 100.0000
 Point 362 N 13,776,517.4926 E 2,266,604.1387 Sta 11+00.00
 =====
 Ending chain DRW129 description

Q DRW 130

Beginning chain DRW130 description
 =====
 Point 363 N 13,776,897.3985 E 2,266,532.2782 Sta 10+00.00
 Course from 363 to 364 S 58° 29' 33.71" W Dist 100.0000
 Point 364 N 13,776,845.1377 E 2,266,447.0208 Sta 11+00.00
 =====
 Ending chain DRW130 description

Q DRW 131

Beginning chain DRW131 description
 =====
 Point 365 N 13,776,939.1599 E 2,266,513.3813 Sta 10+00.00
 Course from 365 to 366 S 63° 32' 29.76" W Dist 100.0000
 Point 366 N 13,776,894.6051 E 2,266,423.8555 Sta 11+00.00
 =====
 Ending chain DRW131 description

Q DRW 132

Beginning chain DRW132 description
 =====
 Point 367 N 13,777,806.0625 E 2,266,129.3700 Sta 10+00.00
 Course from 367 to 368 S 70° 22' 00.92" W Dist 100.0000
 Point 368 N 13,777,772.4630 E 2,266,035.1836 Sta 11+00.00
 =====
 Ending chain DRW132 description

Q DRW 133

Beginning chain DRW133 description
 =====
 Point 369 N 13,778,703.3638 E 2,265,729.6080 Sta 10+00.00
 Course from 369 to 370 S 55° 44' 10.26" W Dist 100.0000
 Point 370 N 13,778,647.0633 E 2,265,646.9626 Sta 11+00.00
 =====
 Ending chain DRW133 description

Q DRW 134

Beginning chain DRW134 description
 =====
 Point 371 N 13,779,029.8929 E 2,265,587.1338 Sta 10+00.00
 Course from 371 to 372 S 61° 14' 24.63" W Dist 100.0000
 Point 372 N 13,778,981.7790 E 2,265,499.4693 Sta 11+00.00
 =====
 Ending chain DRW134 description

Q DRW 135

Beginning chain DRW135 description
 =====
 Point 373 N 13,779,341.3803 E 2,265,451.4718 Sta 10+00.00
 Course from 373 to 374 S 68° 26' 54.11" W Dist 100.0000
 Point 374 N 13,779,304.6463 E 2,265,358.4631 Sta 11+00.00
 =====
 Ending chain DRW135 description

Q DRW 136

Beginning chain DRW136 description
 =====
 Point 375 N 13,781,281.0147 E 2,264,610.0612 Sta 10+00.00
 Course from 375 to 376 S 56° 26' 42.79" W Dist 100.0000
 Point 376 N 13,781,225.7413 E 2,264,526.7254 Sta 11+00.00
 =====
 Ending chain DRW136 description

Q DRW 137

Beginning chain DRW137 description
 =====
 Point 377 N 13,781,514.2503 E 2,264,508.3242 Sta 10+00.00
 Course from 377 to 378 S 55° 11' 48.21" W Dist 100.0000
 Point 378 N 13,781,457.1743 E 2,264,426.2126 Sta 11+00.00
 =====
 Ending chain DRW137 description

Q DRW 138

Beginning chain DRW138 description
 =====
 Point 379 N 13,781,651.4905 E 2,264,449.1470 Sta 10+00.00
 Course from 379 to 380 S 59° 35' 51.69" W Dist 100.0000
 Point 380 N 13,781,600.8837 E 2,264,362.8976 Sta 11+00.00
 =====
 Ending chain DRW138 description

Q DRW 139

Beginning chain DRW139 description
 =====
 Point 381 N 13,782,461.5260 E 2,264,099.8640 Sta 10+00.00
 Course from 381 to 382 S 73° 03' 16.86" W Dist 100.0000
 Point 382 N 13,782,432.3801 E 2,264,004.2057 Sta 11+00.00
 =====
 Ending chain DRW139 description



2/28/2021
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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725

HORIZONTAL ALIGNMENT DATA

SHEET 19 OF 22

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 100
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

TXDOT*MON*PENTABLE.tb1 TIME:16:34:59 PM OFFICE:SAN ah3070
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Q DRW 140

Beginning chain DRW140 description
 =====
 Point 383 N 13,782,619.6092 E 2,264,031.6993 Sta 10+00.00
 Course from 383 to 384 S 59° 30' 12.49" W Dist 100.0000
 Point 384 N 13,782,568.8606 E 2,263,945.5334 Sta 11+00.00
 =====
 Ending chain DRW140 description

Q DRW 141

Beginning chain DRW141 description
 =====
 Point 385 N 13,784,626.5666 E 2,262,885.7837 Sta 10+00.00
 Course from 385 to 386 S 68° 27' 35.09" W Dist 100.0000
 Point 386 N 13,784,589.8511 E 2,262,792.7677 Sta 11+00.00
 =====
 Ending chain DRW141 description

Q DRW 142

Beginning chain DRW142 description
 =====
 Point 387 N 13,784,998.9861 E 2,262,640.5050 Sta 10+00.00
 Course from 387 to 388 S 50° 56' 58.20" W Dist 100.0000
 Point 388 N 13,784,935.9856 E 2,262,562.8459 Sta 11+00.00
 =====
 Ending chain DRW142 description

Q DRW 143

Beginning chain DRW143 description
 =====
 Point 389 N 13,785,052.1269 E 2,262,602.1666 Sta 10+00.00
 Course from 389 to 390 S 55° 04' 04.93" W Dist 100.0000
 Point 390 N 13,784,994.8666 E 2,262,520.1834 Sta 11+00.00
 =====
 Ending chain DRW143 description

Q DRW 144

Beginning chain DRW144 description
 =====
 Point 391 N 13,785,374.5823 E 2,262,349.5322 Sta 10+00.00
 Course from 391 to 392 S 47° 24' 45.33" W Dist 100.0000
 Point 392 N 13,785,306.9109 E 2,262,275.9076 Sta 11+00.00
 =====
 Ending chain DRW144 description

Q DRW 145

Beginning chain DRW145 description
 =====
 Point 393 N 13,785,512.2562 E 2,262,230.2599 Sta 10+00.00
 Course from 393 to 394 S 48° 13' 35.71" W Dist 100.0000
 Point 394 N 13,785,445.6376 E 2,262,155.6814 Sta 11+00.00
 =====
 Ending chain DRW145 description

Q DRW 146

Beginning chain DRW146 description
 =====
 Point 395 N 13,785,607.7213 E 2,262,143.1171 Sta 10+00.00
 Course from 395 to 396 S 46° 59' 32.08" W Dist 100.0000
 Point 396 N 13,785,539.5116 E 2,262,069.9910 Sta 11+00.00
 =====
 Ending chain DRW146 description

Q DRW 147

Beginning chain DRW147 description
 =====
 Point 397 N 13,785,690.5111 E 2,262,065.5652 Sta 10+00.00
 Course from 397 to 398 S 46° 51' 47.95" W Dist 100.0000
 Point 398 N 13,785,622.1370 E 2,261,992.5927 Sta 11+00.00
 =====
 Ending chain DRW147 description

Q DRW 148

Beginning chain DRW148 description
 =====
 Point 399 N 13,785,782.0933 E 2,261,979.8573 Sta 10+00.00
 Course from 399 to 400 S 47° 22' 25.62" W Dist 100.0000
 Point 400 N 13,785,714.3721 E 2,261,906.2786 Sta 11+00.00
 =====
 Ending chain DRW148 description

Q DRW 149

Beginning chain DRW149 description
 =====
 Point 401 N 13,785,960.7322 E 2,261,834.4183 Sta 10+00.00
 Course from 401 to 402 S 38° 36' 25.75" W Dist 100.0000
 Point 402 N 13,785,882.5879 E 2,261,772.0205 Sta 11+00.00
 =====
 Ending chain DRW149 description

Q DRW 150

Beginning chain DRW150 description
 =====
 Point 403 N 13,786,049.8207 E 2,261,774.2054 Sta 10+00.00
 Course from 403 to 404 S 37° 31' 19.88" W Dist 100.0000
 Point 404 N 13,785,970.5089 E 2,261,713.2985 Sta 11+00.00
 =====
 Ending chain DRW150 description

Q DRW 151

Beginning chain DRW151 description
 =====
 Point 405 N 13,786,079.0997 E 2,261,755.9721 Sta 10+00.00
 Course from 405 to 406 S 49° 55' 33.53" W Dist 100.0000
 Point 406 N 13,786,014.7220 E 2,261,679.4507 Sta 11+00.00
 =====
 Ending chain DRW151 description



NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725
 HORIZONTAL ALIGNMENT DATA

SHEET 20 OF 22

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 101
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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Q DRW 152

Beginning chain DRW152 description
 =====
 Point 407 N 13,787,030.1602 E 2,261,273.8173 Sta 10+00.00
 Course from 407 to PC DRW1521 S 63° 29' 11.23" W Dist 48.8256
 Curve Data

 Curve DRW1521 (Chord Definition)
 P.I. Station 10+59.76 N 13,787,003.4827 E 2,261,220.3423
 Delta = 24° 40' 17.58" (RT)
 Degree = 180° 00' 00.00"
 Tangent = 10.9345
 Length = 13.7064
 Radius = 50.0000
 External = 1.1817
 Long Chord = 21.3640
 Mid. Ord. = 1.1544
 P.C. Station 10+48.83 N 13,787,008.3640 E 2,261,230.1268
 P.T. Station 10+62.53 N 13,787,003.1313 E 2,261,209.4135
 C.C. N 13,787,053.1054 E 2,261,207.8063
 Back = S 63° 29' 11.23" W
 Ahead = S 88° 09' 28.82" W
 Chord Bear = S 75° 49' 20.02" W

Course from PT DRW1521 to 408 S 88° 09' 28.82" W Dist 24.9079
 Point 408 N 13,787,002.3307 E 2,261,184.5185 Sta 10+87.44
 =====
 Ending chain DRW152 description

Q DRW 153

Beginning chain DRW153 description
 =====
 Point 409 N 13,787,204.6458 E 2,261,186.7705 Sta 10+00.00
 Course from 409 to 410 S 48° 17' 11.09" W Dist 100.0000
 Point 410 N 13,787,138.1051 E 2,261,112.1224 Sta 11+00.00
 =====
 Ending chain DRW153 description

Q DRW 154

Beginning chain DRW154 description
 =====
 Point 411 N 13,787,266.7145 E 2,261,155.8059 Sta 10+00.00
 Course from 411 to 412 S 54° 20' 31.34" W Dist 100.0000
 Point 412 N 13,787,208.4199 E 2,261,074.5547 Sta 11+00.00
 =====
 Ending chain DRW154 description

Q DRW 155

Beginning chain DRW155 description
 =====
 Point 413 N 13,787,376.9590 E 2,261,100.8074 Sta 10+00.00
 Course from 413 to 414 S 57° 47' 46.77" W Dist 100.0000
 Point 414 N 13,787,323.6660 E 2,261,016.1915 Sta 11+00.00
 =====
 Ending chain DRW155 description

Q DRW 156

Beginning chain DRW156 description
 =====
 Point 415 N 13,787,444.1658 E 2,261,067.2795 Sta 10+00.00

Course from 415 to 416 S 64° 19' 03.48" W Dist 100.0000
 Point 416 N 13,787,400.8276 E 2,260,977.1585 Sta 11+00.00
 =====
 Ending chain DRW156 description

Q DRW 157

Beginning chain DRW157 description
 =====
 Point 417 N 13,787,619.0190 E 2,260,980.0493 Sta 10+00.00
 Course from 417 to 418 S 50° 14' 08.67" W Dist 100.0000
 Point 418 N 13,787,555.0559 E 2,260,903.1810 Sta 11+00.00
 =====
 Ending chain DRW157 description

Q DRW 158

Beginning chain DRW158 description
 =====
 Point 419 N 13,787,837.5017 E 2,260,868.7691 Sta 10+00.00
 Course from 419 to 420 S 59° 03' 56.16" W Dist 100.0000
 Point 420 N 13,787,786.0961 E 2,260,782.9935 Sta 11+00.00
 =====
 Ending chain DRW158 description

Q DRW 159

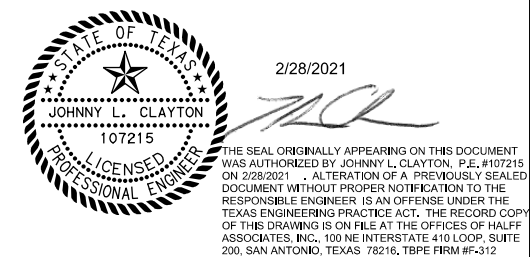
Beginning chain DRW159 description
 =====
 Point DRW15901 N 13,788,714.2502 E 2,260,399.2850 Sta 10+00.00
 Course from DRW15901 to DRW15902 S 42° 56' 57.73" W Dist 100.0000
 Point DRW15902 N 13,788,641.0546 E 2,260,331.1498 Sta 11+00.00
 =====
 Ending chain DRW159 description

Q DRW 160

Beginning chain DRW160 description
 =====
 Point 423 N 13,788,745.3072 E 2,260,377.5377 Sta 10+00.00
 Course from 423 to 424 S 39° 05' 35.41" W Dist 100.0000
 Point 424 N 13,788,667.6950 E 2,260,314.4794 Sta 11+00.00
 =====
 Ending chain DRW160 description

Q DRW 161

Beginning chain DRW161 description
 =====
 Point 425 N 13,789,539.0311 E 2,259,639.3050 Sta 10+00.00
 Course from 425 to 426 S 40° 48' 16.74" W Dist 100.0000
 Point 426 N 13,789,463.3369 E 2,259,573.9568 Sta 11+00.00
 =====
 Ending chain DRW161 description



NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 HORIZONTAL ALIGNMENT DATA			
SHEET 21 OF 22			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		102
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

C DRW 162

Beginning chain DRW162 description

Point 427 N 13,789,554.2089 E 2,259,623.9879 Sta 10+00.00

Course from 427 to 428 S 41° 30' 27.39" W Dist 100.0000

Point 428 N 13,789,479.3221 E 2,259,557.7159 Sta 11+00.00

Ending chain DRW162 description

C DRW 163

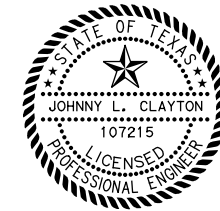
Beginning chain DRW163 description

Point 429 N 13,789,680.5291 E 2,259,496.6553 Sta 10+00.00

Course from 429 to 430 S 44° 59' 57.02" W Dist 100.0000

Point 430 N 13,789,609.8174 E 2,259,425.9456 Sta 11+00.00

Ending chain DRW163 description



2/28/2021

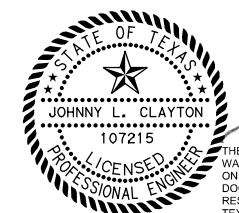
Handwritten signature of Johnny L. Clayton

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NO.		REVISION		BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312					
© 2021					
FM 725 HORIZONTAL ALIGNMENT DATA					
SHEET 22 OF 22					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				103
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

NORTHBOUND				
	STA	STA	REPAIR (IN)	MATERIAL
SHEET 1 OF 27	11+00.00	11+90.00	6	TY B HMA PG 64-22
	11+90.00	15+80.00	0	MILL SURFACE
	15+80.00	22+00.00	6	TY B HMA PG 64-22
SHEET 2 OF 27	22+00.00	32+60.00	6	TY B HMA PG 64-22
	32+60.00	34+00.00	3	TY B HMA PG 64-22
SHEET 3 OF 27	34+00.00	46+00.00	3	TY B HMA PG 64-22
SHEET 4 OF 27	46+00.00	48+15.00	3	TY B HMA PG 64-22
	48+15.00	52+45.00	0	MILL SURFACE
	52+45.00	56+75.00	6	TY B HMA PG 64-22
	56+75.00	58+00.00	3	TY B HMA PG 64-22
SHEET 5 OF 27	58+00.00	66+60.00	3	TY B HMA PG 64-22
	66+60.00	70+00.00	4	TY B HMA PG 64-22
SHEET 6 OF 27	70+00.00	72+35.00	4	TY B HMA PG 64-22
	72+35.00	78+50.00	0	MILL SURFACE
SHEET 7 OF 27	78+50.00	82+00.00	3	TY B HMA PG 64-22
	82+00.00	83+75.00	3	TY B HMA PG 64-22
SHEET 8 OF 27	83+75.00	94+00.00	0	MILL SURFACE
	94+00.00	94+20.00	0	MILL SURFACE
	94+20.00	97+35.00	3	TY B HMA PG 64-22
SHEET 9 OF 27	97+35.00	103+25.00	0	MILL SURFACE
	103+25.00	106+00.00	3	TY B HMA PG 64-22
SHEET 10 OF 27	106+00.00	107+90.00	3	TY B HMA PG 64-22
	107+90.00	118+00.00	0	MILL SURFACE
SHEET 11 OF 27	118+00.00	121+25.00	0	MILL SURFACE
	121+25.00	125+50.00	3	TY B HMA PG 64-22
SHEET 12 OF 27	125+50.00	130+00.00	5	TY B HMA PG 64-22
	130+00.00	142+00.00	5	TY B HMA PG 64-22
SHEET 13 OF 27	142+00.00	154+00.00	5	TY B HMA PG 64-22
SHEET 14 OF 27	154+00.00	166+00.00	5	TY B HMA PG 64-22
SHEET 15 OF 27	166+00.00	178+00.00	5	TY B HMA PG 64-22
SHEET 16 OF 27	178+00.00	190+00.00	5	TY B HMA PG 64-22
SHEET 17 OF 27	190+00.00	202+00.00	5	TY B HMA PG 64-22
SHEET 18 OF 27	202+00.00	214+00.00	5	TY B HMA PG 64-22
SHEET 19 OF 27	214+00.00	226+00.00	5	TY B HMA PG 64-22
SHEET 20 OF 27	226+00.00	238+00.00	5	TY B HMA PG 64-22
	238+00.00	243+20.00	5	TY B HMA PG 64-22
SHEET 21 OF 27	243+20.00	250+00.00	0	MILL SURFACE
	250+00.00	252+35.00	0	MILL SURFACE
SHEET 22 OF 27	252+35.00	261+50.00	3	TY B HMA PG 64-22
	261+50.00	262+00.00	6	TY B HMA PG 64-22
SHEET 23 OF 27	262+00.00	274+00.00	6	TY B HMA PG 64-22
SHEET 24 OF 27	274+00.00	286+00.00	6	TY B HMA PG 64-22
SHEET 25 OF 27	286+00.00	298+00.00	6	TY B HMA PG 64-22
SHEET 26 OF 27	298+00.00	310+00.00	6	TY B HMA PG 64-22
	310+00.00	315+55.00	6	TY B HMA PG 64-22
SHEET 27 OF 27	315+55.00	321+70.00	3	TY B HMA PG 64-22
	321+70.00	322+63.84	6	TY B HMA PG 64-22

SOUTHBOUND				
	STA	STA	REPAIR (IN)	MATERIAL
SHEET 1 OF 27	11+00.00	14+30.00	6	TY B HMA PG 64-22
	14+30.00	16+50.00	0	MILL SURFACE
	16+50.00	18+85.00	6	TY B HMA PG 64-22
	18+85.00	21+70.00	0	MILL SURFACE
	21+70.00	22+00.00	6	TY B HMA PG 64-22
SHEET 2 OF 27	22+00.00	26+50.00	6	TY B HMA PG 64-22
	26+50.00	34+00.00	0	MILL SURFACE
SHEET 3 OF 27	34+00.00	46+00.00	0	MILL SURFACE
SHEET 4 OF 27	46+00.00	58+00.00	0	MILL SURFACE
SHEET 5 OF 27	58+00.00	61+30.00	0	MILL SURFACE
	61+30.00	70+00.00	3	TY B HMA PG 64-22
SHEET 6 OF 27	70+00.00	82+00.00	3	TY B HMA PG 64-22
SHEET 7 OF 27	82+00.00	82+50.00	3	TY B HMA PG 64-22
	82+50.00	94+00.00	0	MILL SURFACE
SHEET 8 OF 27	94+00.00	97+35.00	0	MILL SURFACE
	97+35.00	105+40.00	3	TY B HMA PG 64-22
SHEET 9 OF 27	105+40.00	106+00.00	0	MILL SURFACE
	106+00.00	116+75.00	0	MILL SURFACE
SHEET 10 OF 27	116+75.00	118+00.00	3	TY B HMA PG 64-22
	118+00.00	130+00.00	3	TY B HMA PG 64-22
SHEET 11 OF 27	130+00.00	132+35.00	3	TY B HMA PG 64-22
	132+35.00	142+00.00	5	TY B HMA PG 64-22
SHEET 12 OF 27	142+00.00	154+00.00	5	TY B HMA PG 64-22
SHEET 13 OF 27	154+00.00	166+00.00	5	TY B HMA PG 64-22
	166+00.00	166+10.00	5	TY B HMA PG 64-22
SHEET 14 OF 27	166+10.00	176+35.00	0	MILL SURFACE
	176+35.00	178+00.00	5	TY B HMA PG 64-22
SHEET 15 OF 27	178+00.00	190+00.00	5	TY B HMA PG 64-22
SHEET 16 OF 27	190+00.00	202+00.00	5	TY B HMA PG 64-22
SHEET 17 OF 27	202+00.00	214+00.00	5	TY B HMA PG 64-22
SHEET 18 OF 27	214+00.00	226+00.00	5	TY B HMA PG 64-22
SHEET 19 OF 27	226+00.00	238+00.00	5	TY B HMA PG 64-22
SHEET 20 OF 27	238+00.00	250+00.00	5	TY B HMA PG 64-22
SHEET 21 OF 27	250+00.00	252+35.00	5	TY B HMA PG 64-22
	252+35.00	262+00.00	3	TY B HMA PG 64-22
SHEET 22 OF 27	262+00.00	262+35.00	3	TY B HMA PG 64-22
	262+35.00	270+10.00	6	TY B HMA PG 64-22
SHEET 23 OF 27	270+10.00	274+00.00	3	TY B HMA PG 64-22
	274+00.00	275+80.00	3	TY B HMA PG 64-22
SHEET 24 OF 27	275+80.00	284+65.00	6	TY B HMA PG 64-22
	284+65.00	286+00.00	3	TY B HMA PG 64-22
SHEET 25 OF 27	286+00.00	288+70.00	3	TY B HMA PG 64-22
	288+70.00	298+00.00	6	TY B HMA PG 64-22
SHEET 26 OF 27	298+00.00	305+60.00	6	TY B HMA PG 64-22
	305+60.00	307+65.00	3	TY B HMA PG 64-22
SHEET 27 OF 27	307+65.00	310+00.00	6	TY B HMA PG 64-22
	310+00.00	315+80.00	6	TY B HMA PG 64-22
SHEET 27 OF 27	315+80.00	322+00.00	3	TY B HMA PG 64-22
	322+00.00	322+63.84	3	TY B HMA PG 64-22



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

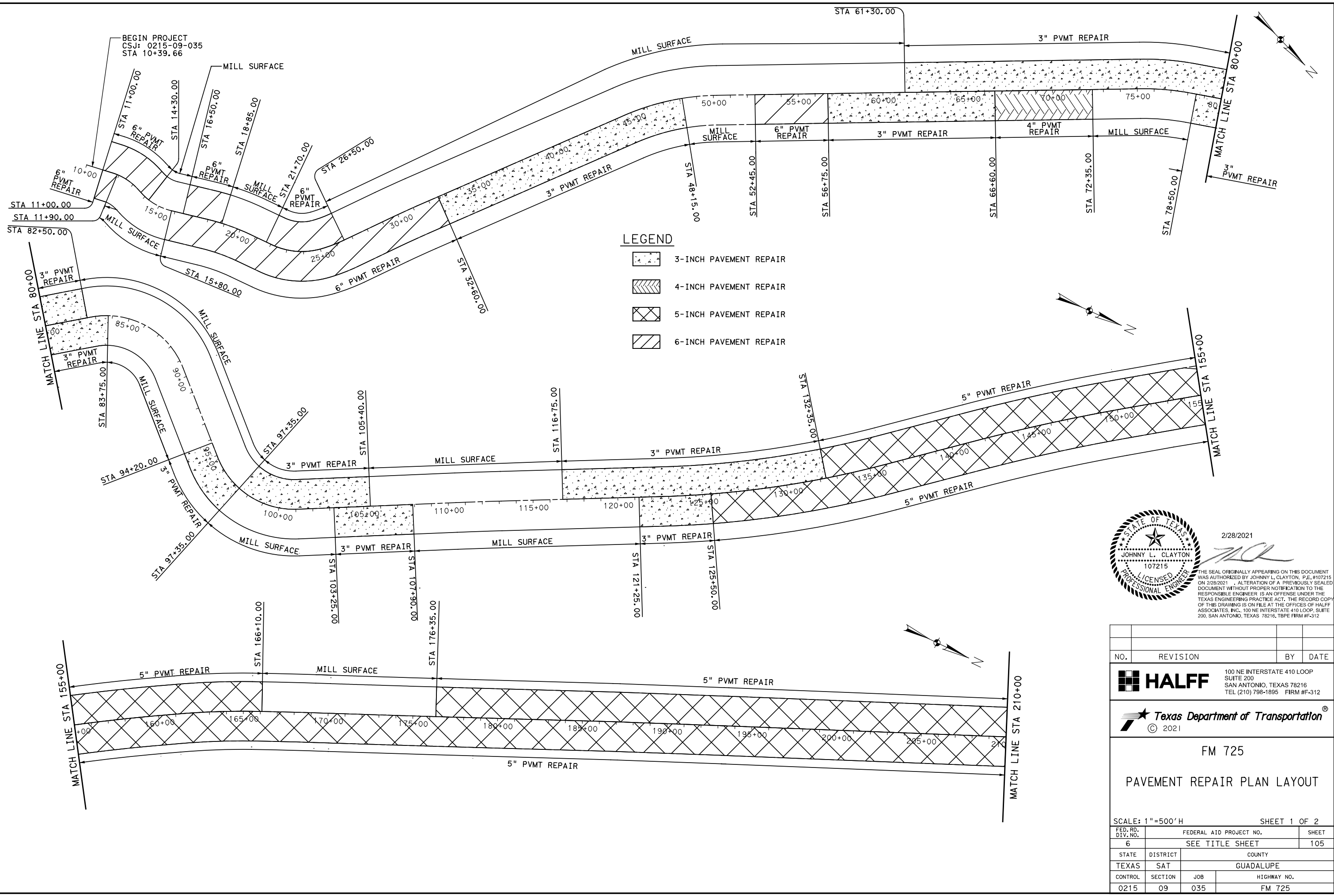


FM 725

PAVEMENT REPAIR LIMITS

SHEET 1 OF 1			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		104
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND

- 3-INCH PAVEMENT REPAIR
- 4-INCH PAVEMENT REPAIR
- 5-INCH PAVEMENT REPAIR
- 6-INCH PAVEMENT REPAIR

2/28/2021

JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

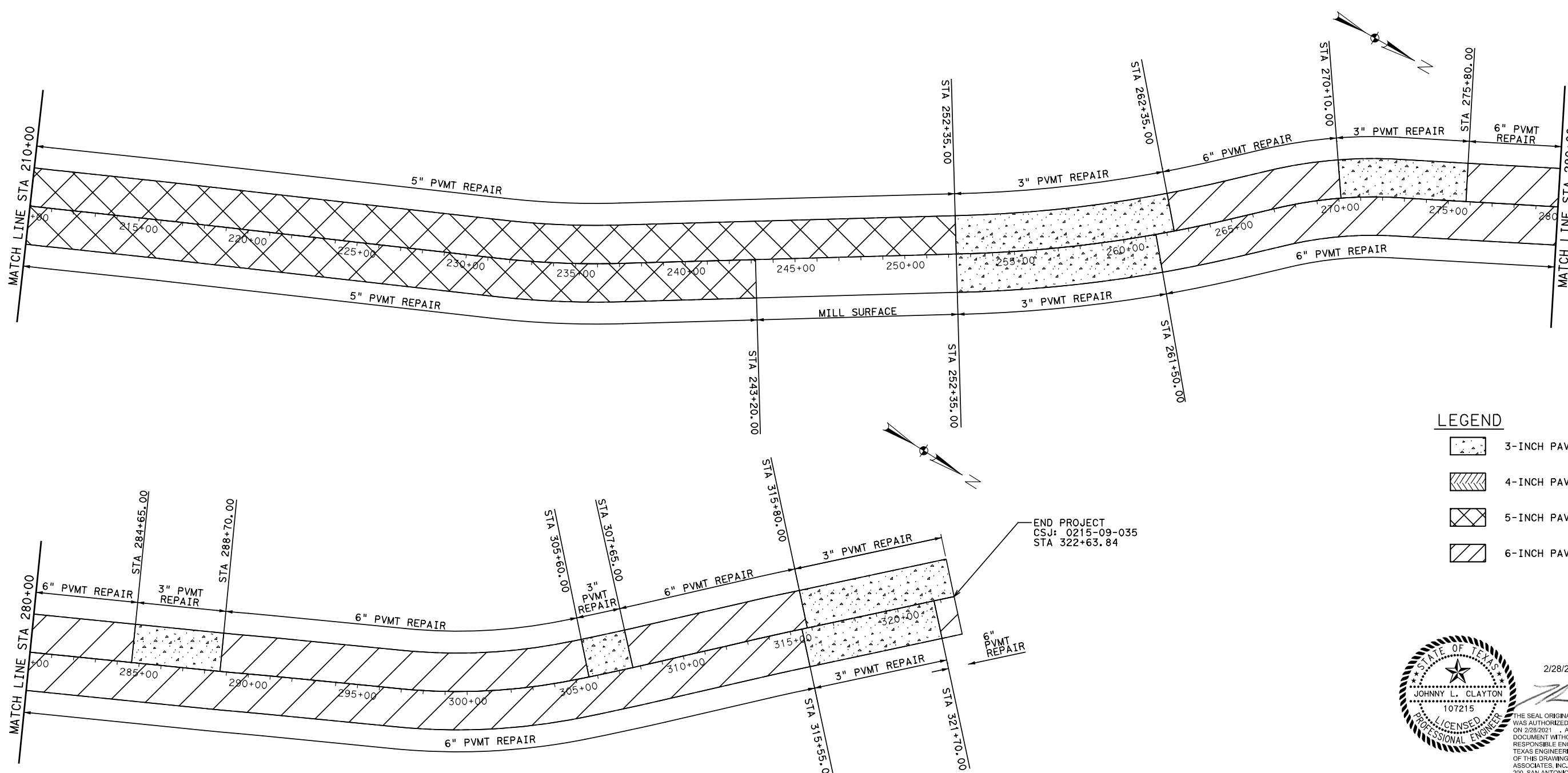
Texas Department of Transportation
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FM 725
 PAVEMENT REPAIR PLAN LAYOUT

SCALE: 1"=500'H SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 105
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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- LEGEND**
- 3-INCH PAVEMENT REPAIR
 - 4-INCH PAVEMENT REPAIR
 - 5-INCH PAVEMENT REPAIR
 - 6-INCH PAVEMENT REPAIR

END PROJECT
 CSJ: 0215-09-035
 STA 322+63.84

STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

2/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
 SUITE 200
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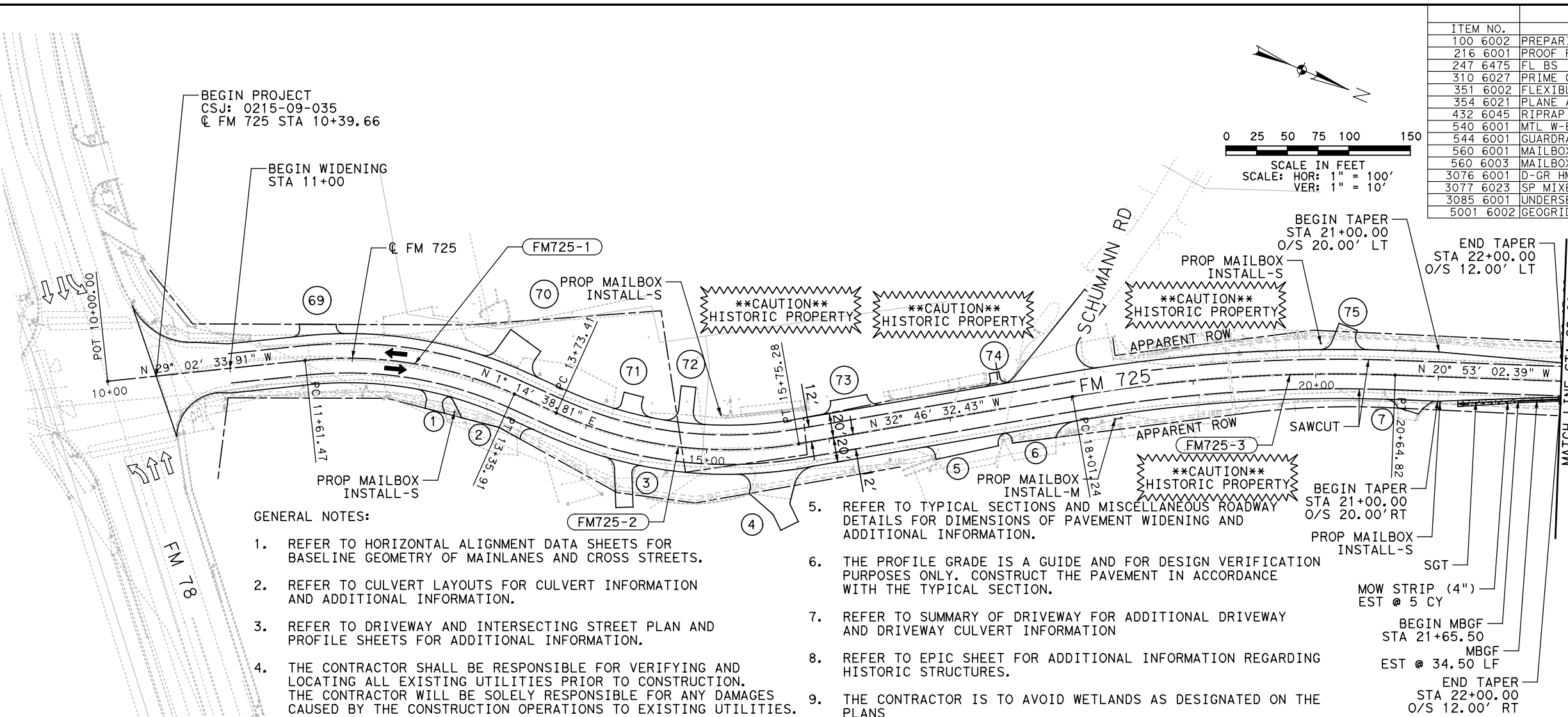
FM 725
 PAVEMENT REPAIR PLAN LAYOUT

SCALE: 1"=500'H SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	106	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

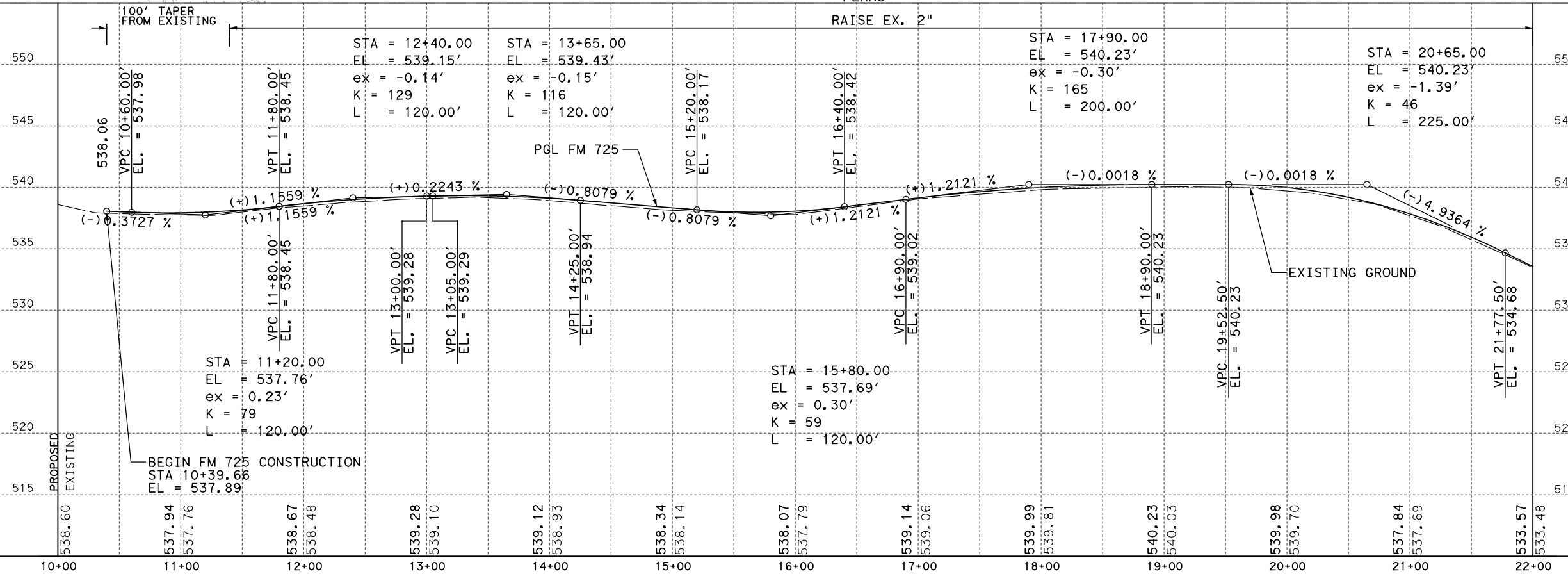
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	599
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	539
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	1743
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	1194
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	5
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	35
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	4
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	571
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	602
3085 6001	UNDERSEAL COURSE	GAL	1055
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2154



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ⇨ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- ⊙ XX DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
- - - FOC - - - EXIST FIBER OPTIC LINE
- - - C - - - EXIST CABLE TV LINE
- - - W - - - EXIST WATER LINE
- - - WW - - - EXIST WASTEWATER LINE
- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- WETLANDS
- DITCH LINE



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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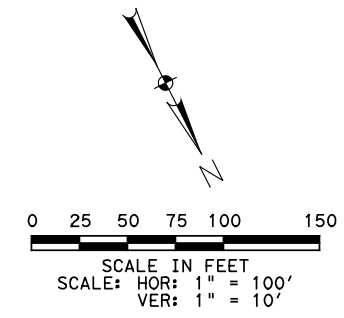
FM 725

PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 1 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	107	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

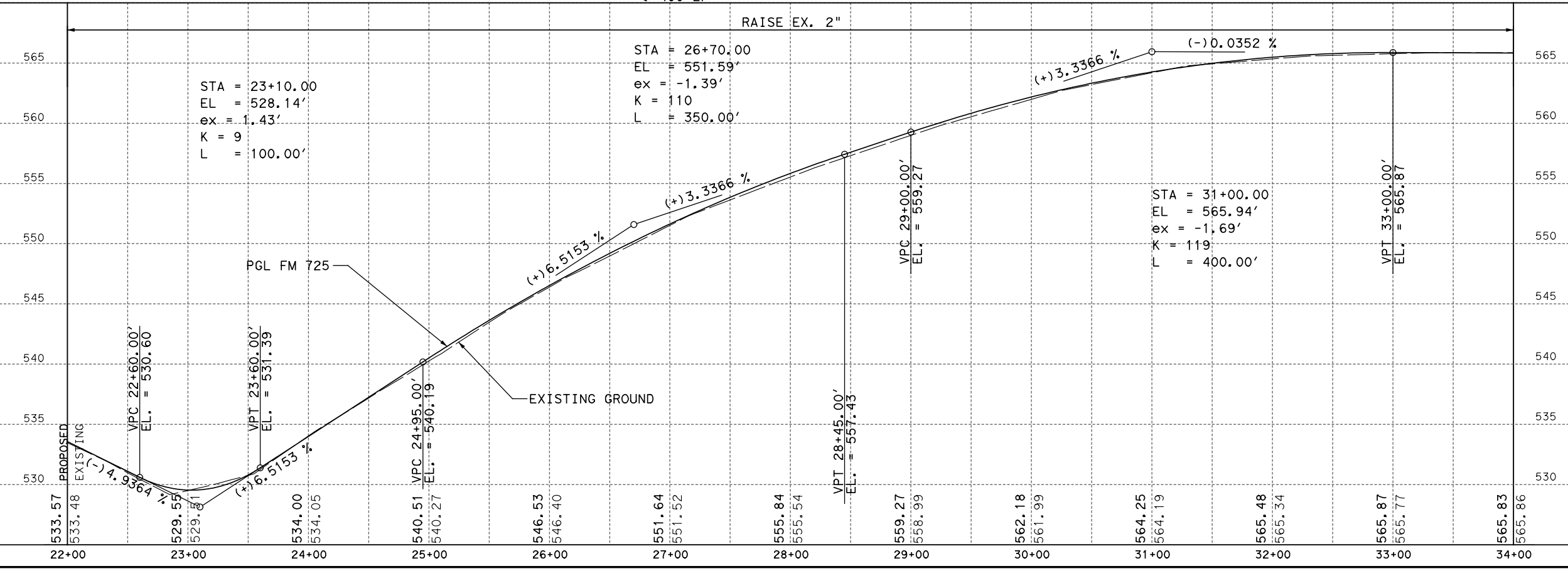
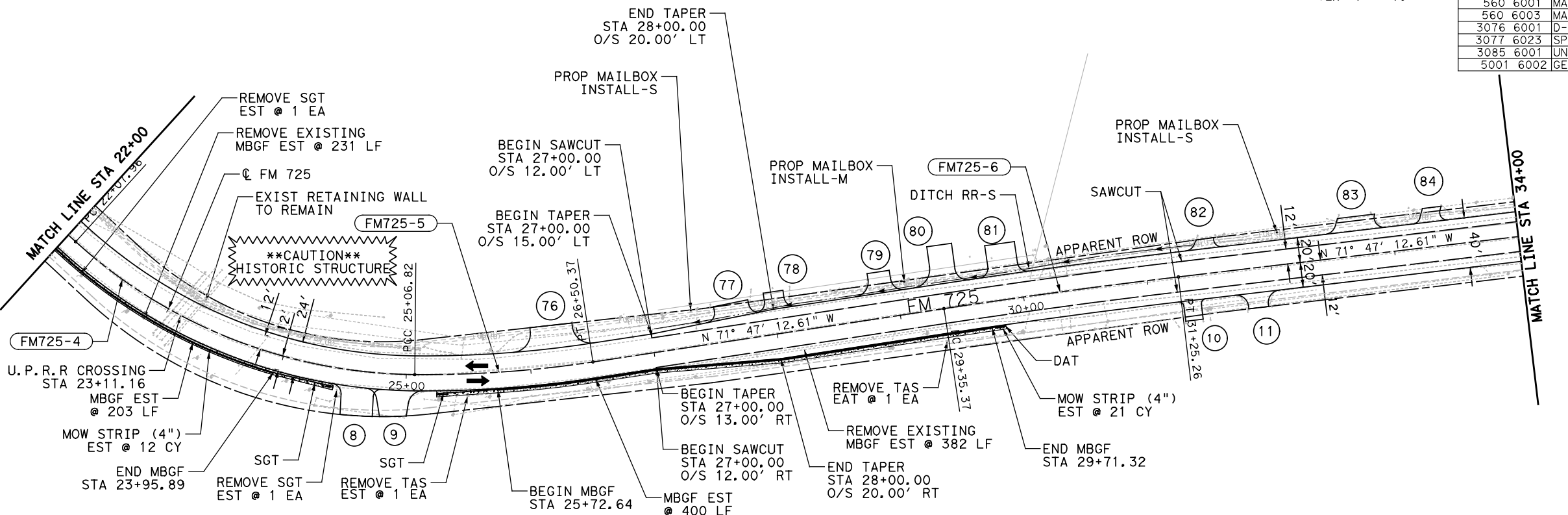
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	374
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	337
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	2216
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	187
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	1017
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	33
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	603
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
542 6001	REMOVE METAL BEAM GUARD FENCE	LF	613
542 6002	REMOVE TERMINAL ANCHOR SECTION	EA	2
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	2
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	358
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	534
3085 6001	UNDERSEAL COURSE	GAL	938
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	1347

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ⇨ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- ⊙ XX DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- ➔ DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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FM 725

PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 2 OF 27

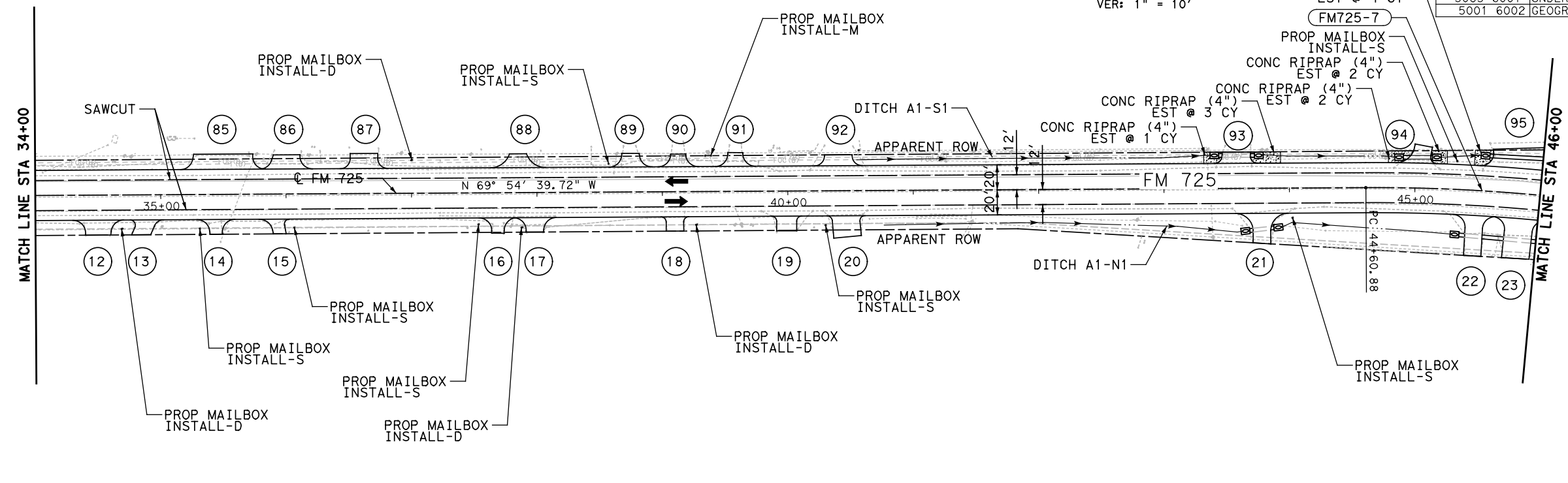
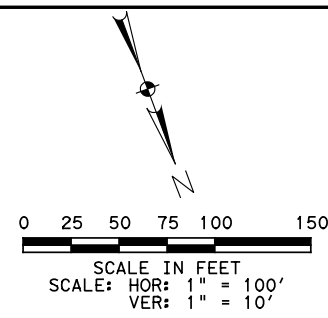
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	108

STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE

CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

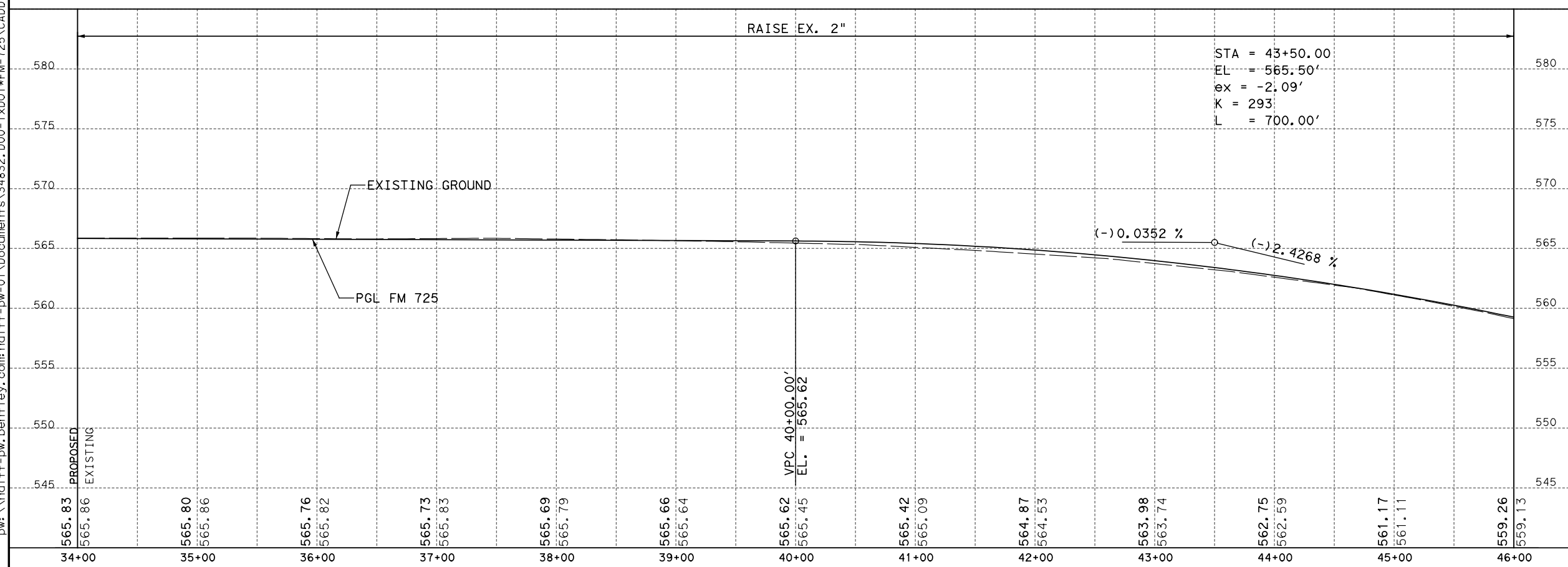
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	1600
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	1601
432 6001	RIPRAP (CONC) (4 IN)	CY	10
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	7
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	4
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	641
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	619
3085 6001	UNDERSEAL COURSE	GAL	1085
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➞ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- ⊙ XX DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
- - - FOC - - - EXIST FIBER OPTIC LINE
- - - C - - - EXIST CABLE TV LINE
- - - W - - - EXIST WATER LINE
- - - WW - - - EXIST WASTEWATER LINE
- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- - - WETLANDS
- ➔ DITCH LINE



JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
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TEL (210) 798-1895 FIRM #F-312

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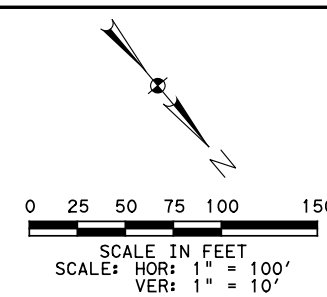
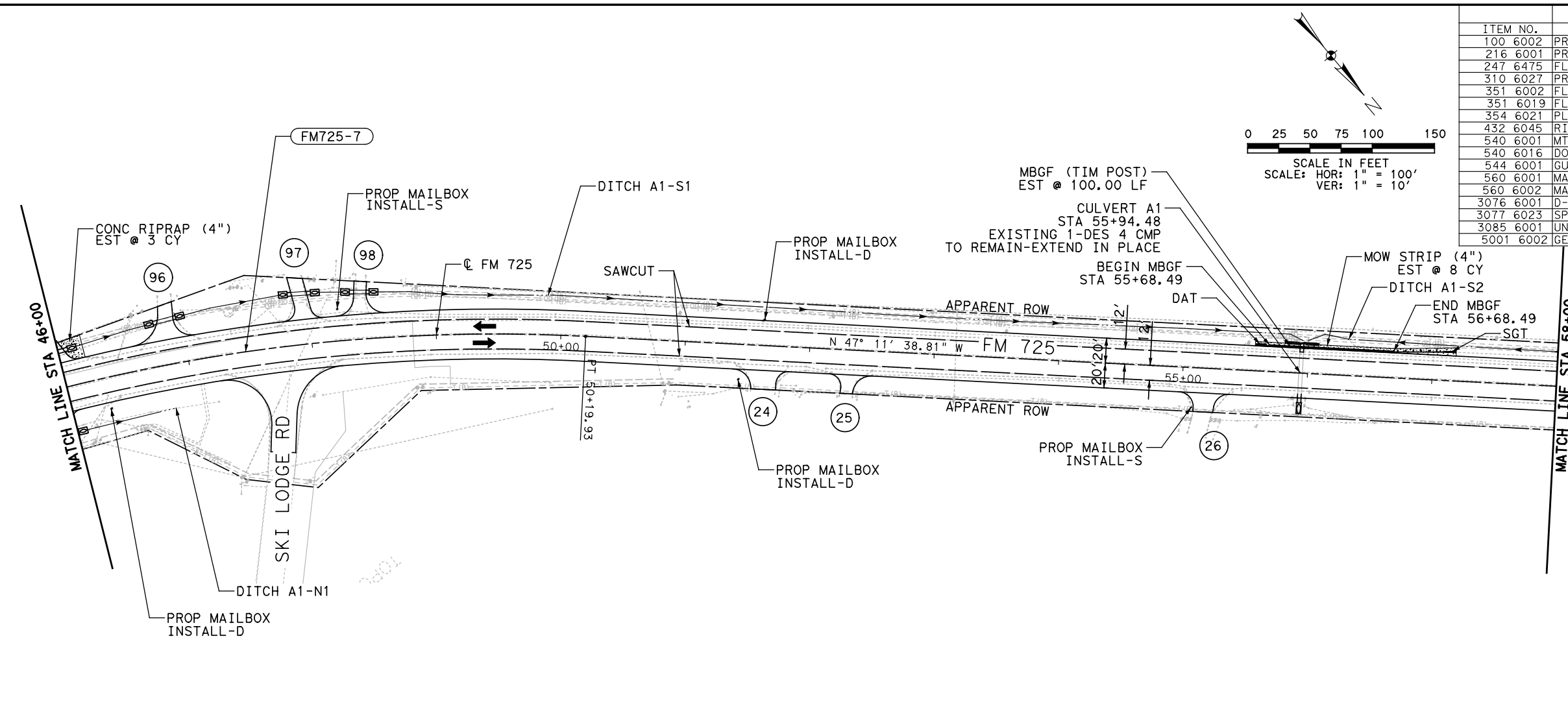
FM 725

PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 3 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 109
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

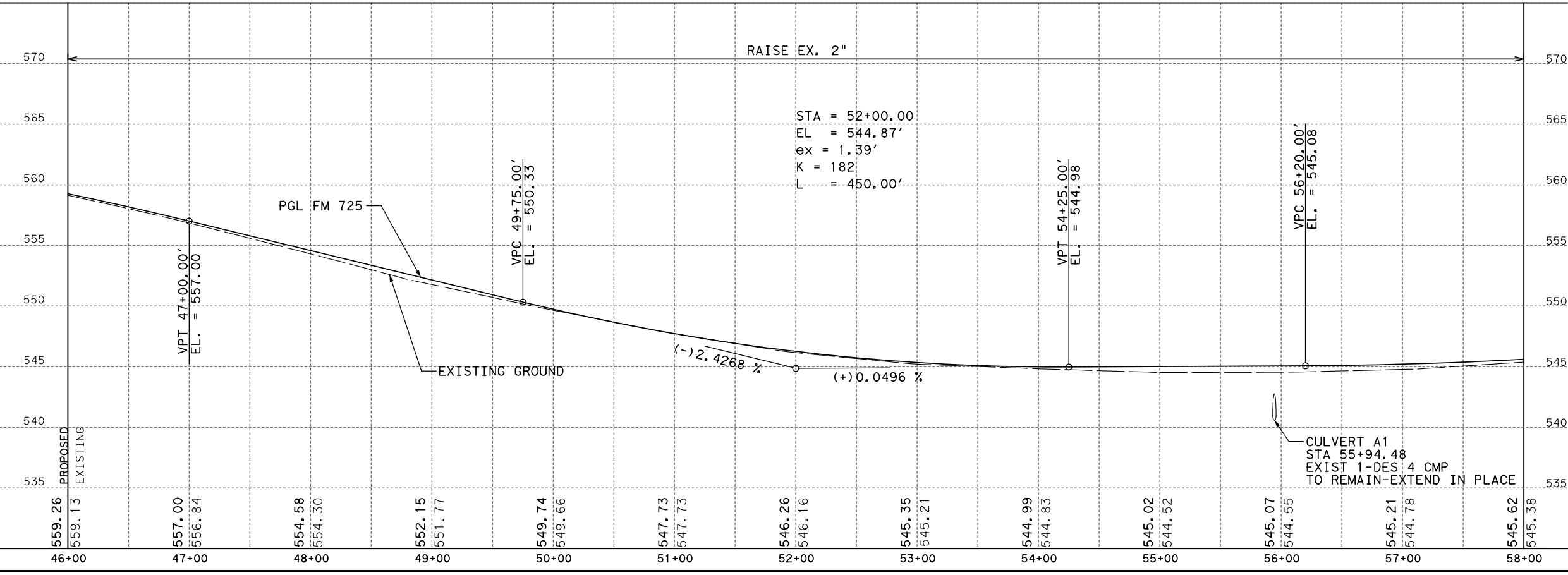
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	574
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	453
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	2176
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	8
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	100
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	2
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	3
3076 6001	D-GR HMA TY-B PG64-22	TON	641
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	619
3085 6001	UNDERSEAL COURSE	GAL	1085
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

4/28/2021

[Signature]

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NO.	REVISION	BY	DATE

HALFF

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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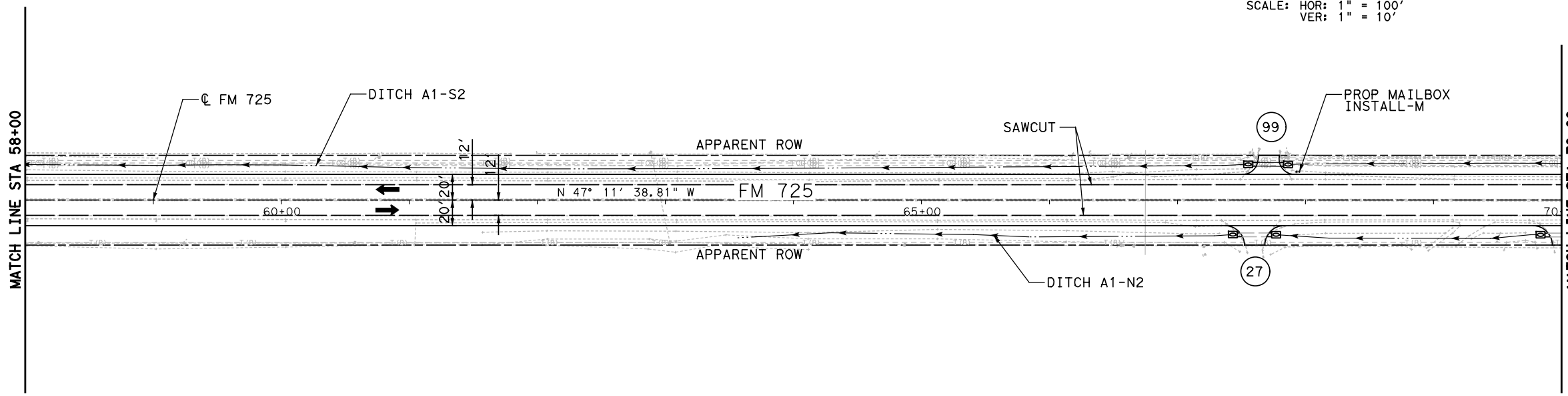
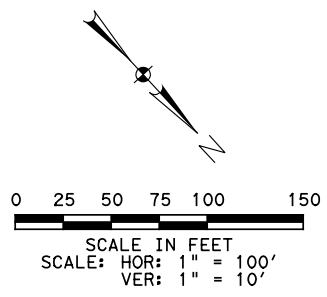
PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 4 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

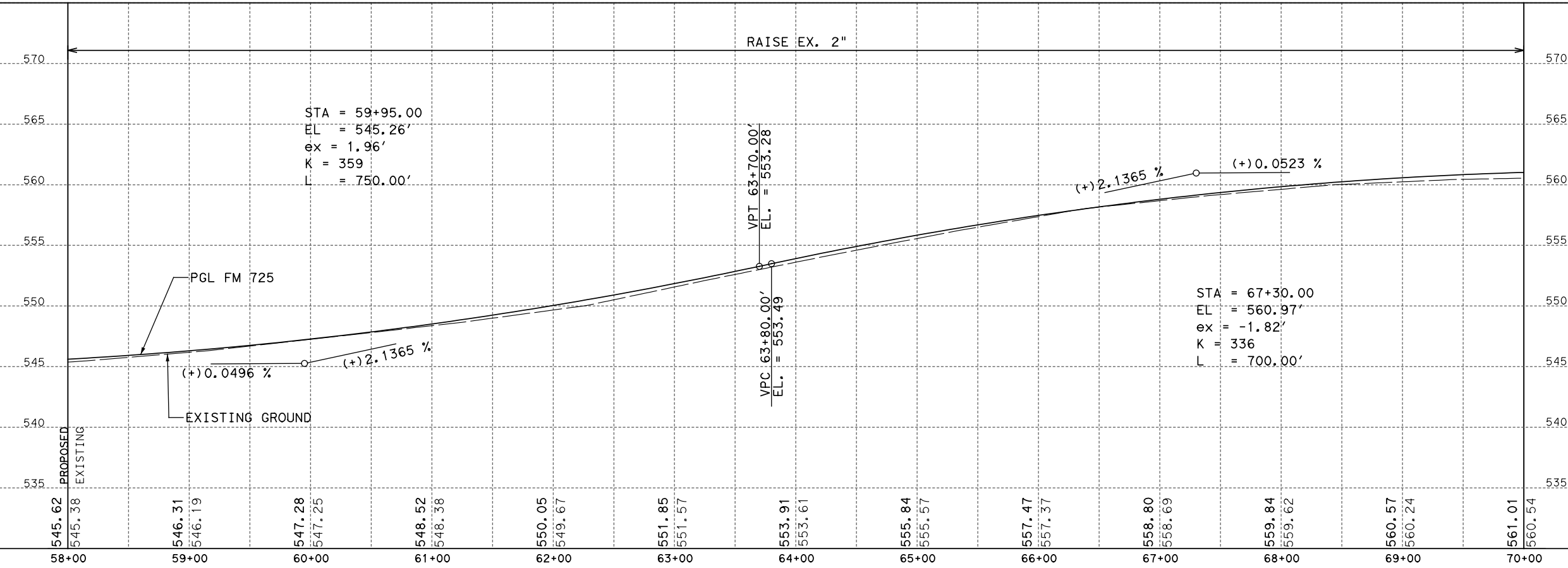
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR (4")	SY	454
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2308
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	440
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	641
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	619
3085 6001	UNDERSEAL COURSE	GAL	1085
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➞ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
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- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

4/28/2021

[Signature]

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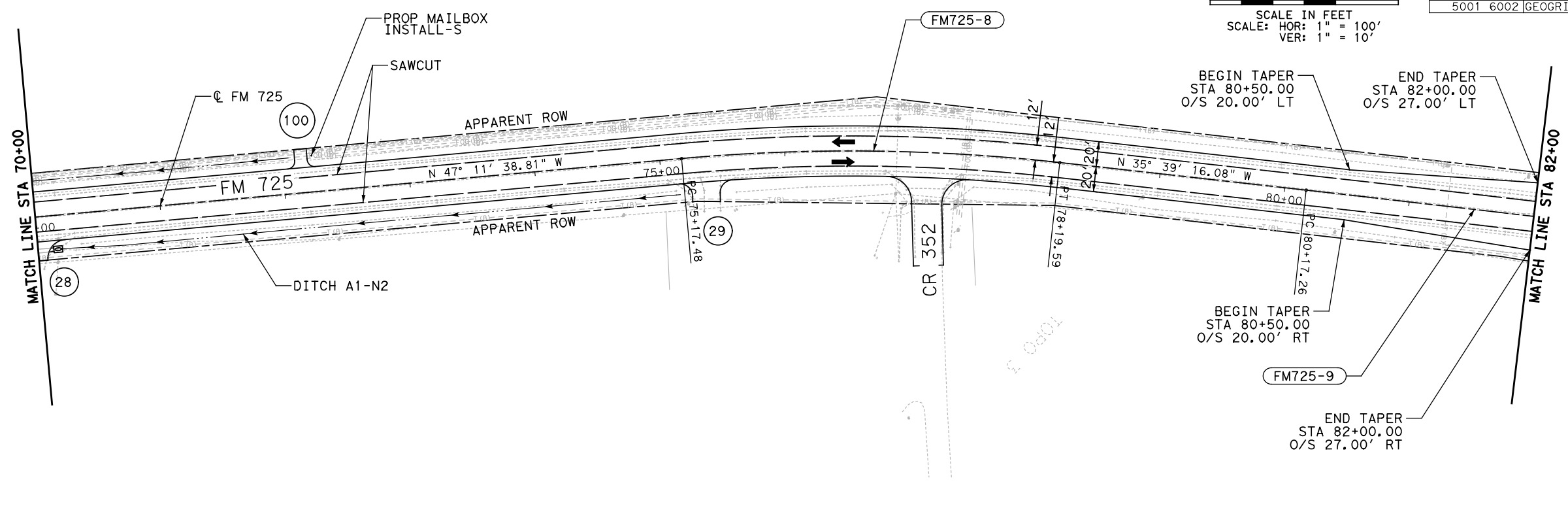
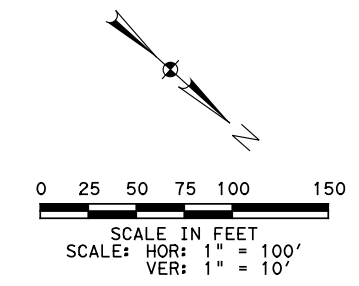
PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 5 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 111
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

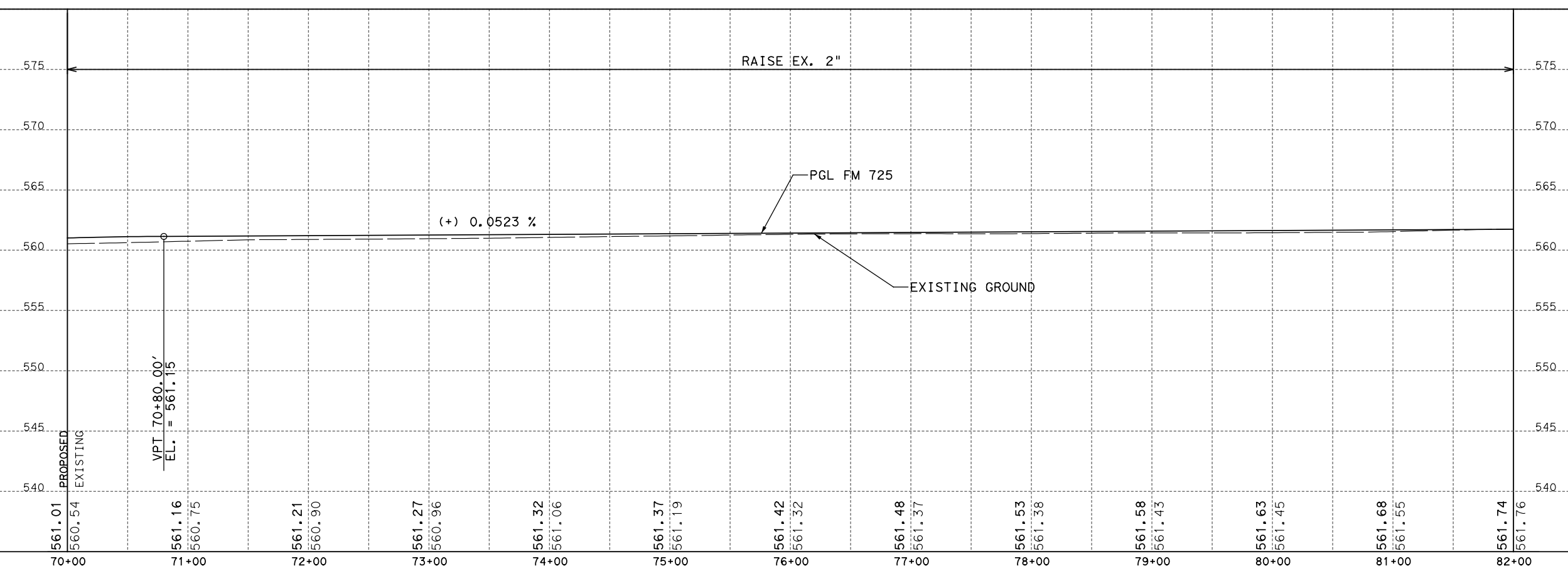
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	706
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	635
351 6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR (4")	SY	314
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2069
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	819
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	670
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	632
3085 6001	UNDERSEAL COURSE	GAL	1108
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2539



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➞ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
- - - FOC - - - EXIST FIBER OPTIC LINE
- - - C - - - EXIST CABLE TV LINE
- - - W - - - EXIST WATER LINE
- - - WW - - - EXIST WASTEWATER LINE
- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - WETLANDS
- - - DITCH LINE



STATE OF TEXAS
 JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



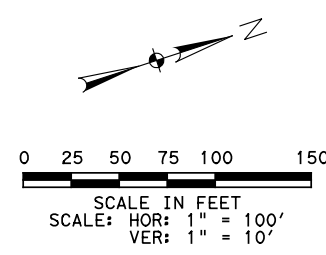
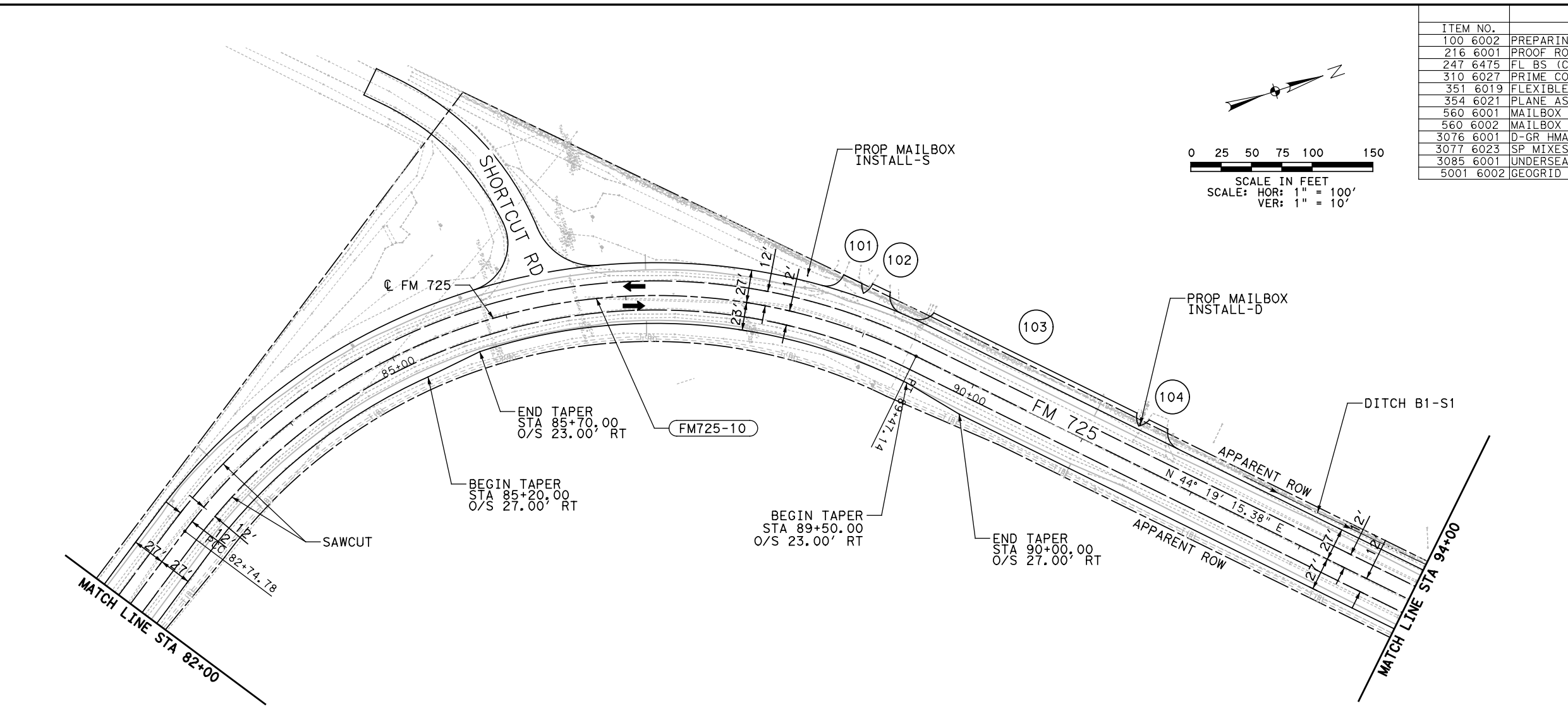
FM 725

PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 6 OF 27

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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

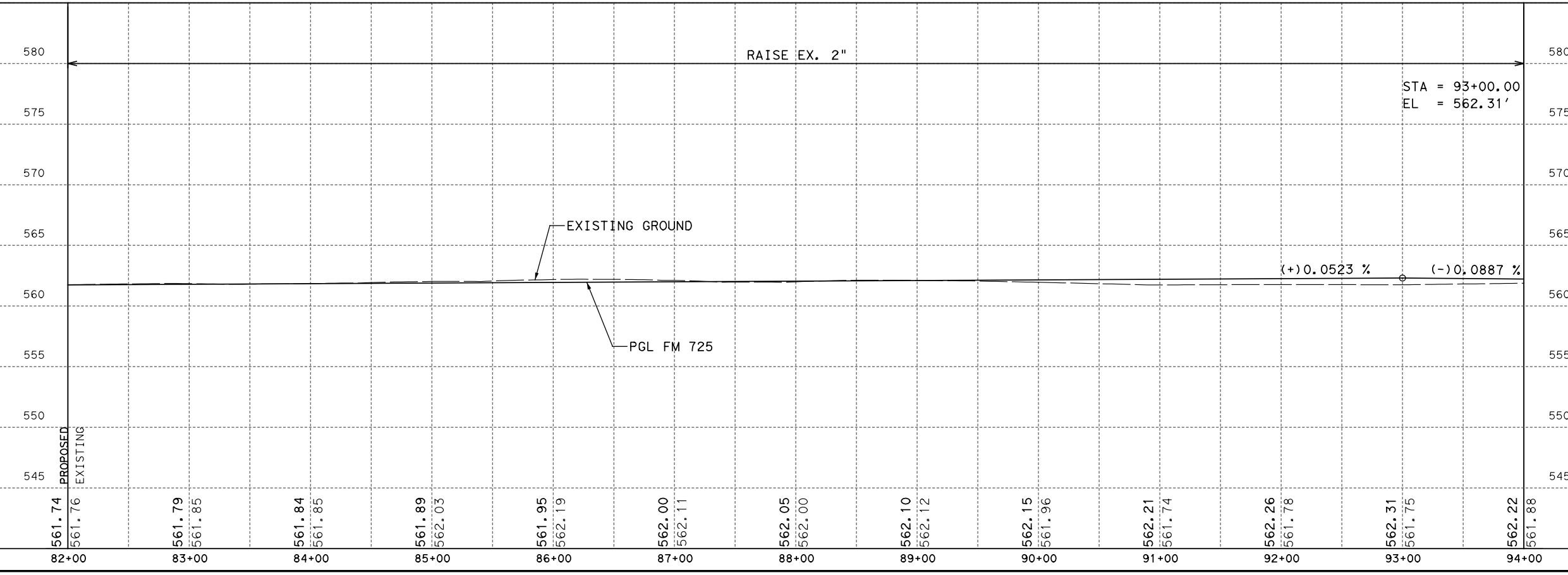
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1142
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1030
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	299
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	2903
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	1059
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	813
3085 6001	UNDERSEAL COURSE	GAL	1422
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4110

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- ➔ DITCH LINE



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

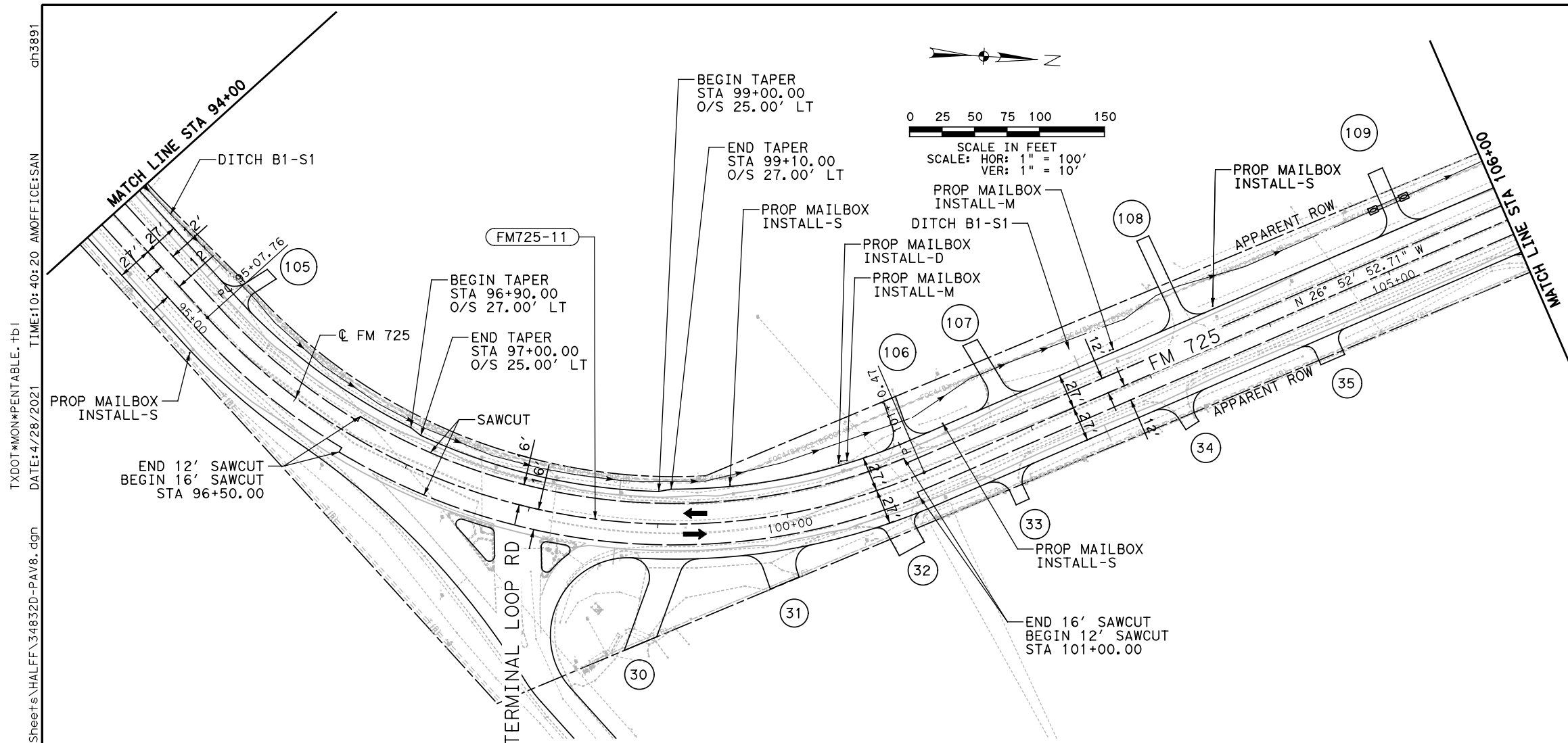
Texas Department of Transportation © 2021

FM 725

PLAN AND PROFILE

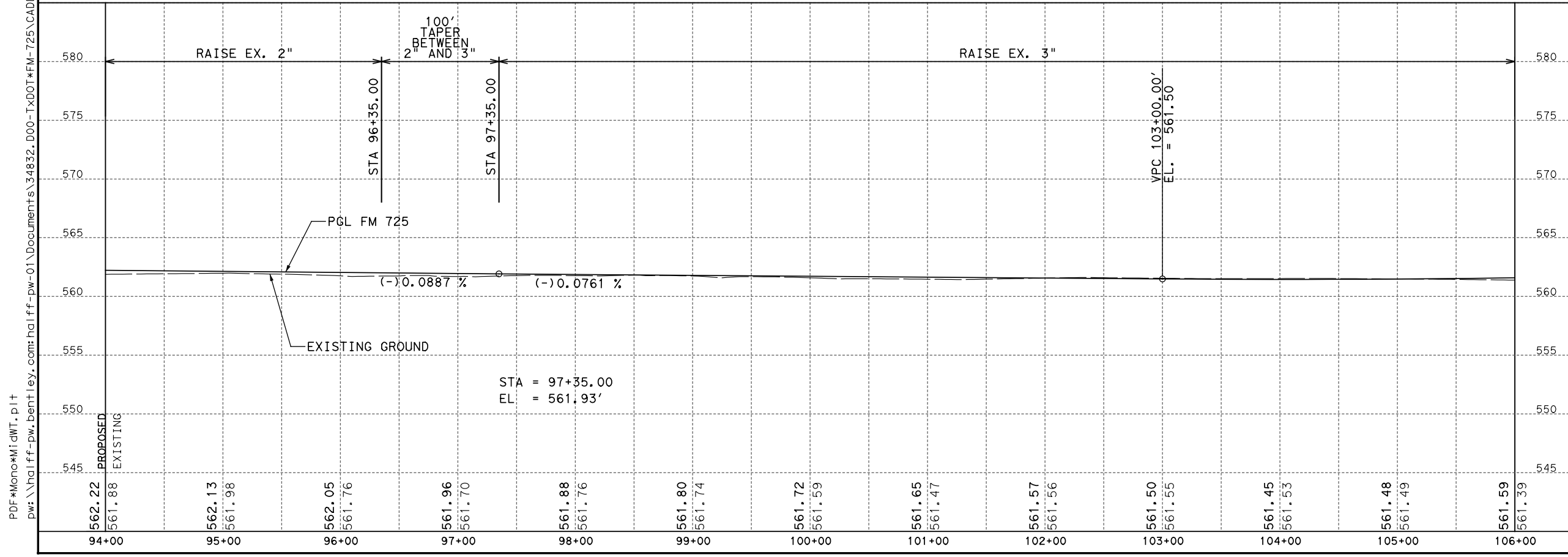
SCALE: 1"=100'H, 1"=10'V SHEET 7 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 113
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1054
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	955
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2055
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	1547
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	4
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	2
3076 6001	D-GR HMA TY-B PG64-22	TON	831
3076 6043	D-GR HMA TY-D PG70-22 (LEVEL-UP)	TON	16
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1125
3085 6001	UNDERSEAL COURSE	GAL	1450
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	3791

- LEGEND:**
- EXIST ROW
 - ➔ PROP DIRECTION OF TRAFFIC
 - ➡ EXIST DIRECTION OF TRAFFIC
 - - - SAWCUT LINE
 - ▬ CONCRETE RIPRAP
 - ▬ METAL BEAM GUARD FENCE
 - (XX) DRIVEWAY NUMBER
 - - - T - - - EXIST TELEPHONE LINE
 - - - FOC - - - EXIST FIBER OPTIC LINE
 - - - C - - - EXIST CABLE TV LINE
 - - - W - - - EXIST WATER LINE
 - - - WW - - - EXIST WASTEWATER LINE
 - - - G - - - EXIST GAS LINE
 - - - E - - - EXIST UNDERGROUND ELECTRIC LINE
 - - - OH - - - EXIST OVERHEAD UTILITY LINE
 - - - EXIST WATER US
 - - - WETLANDS
 - ➔ DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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FM 725

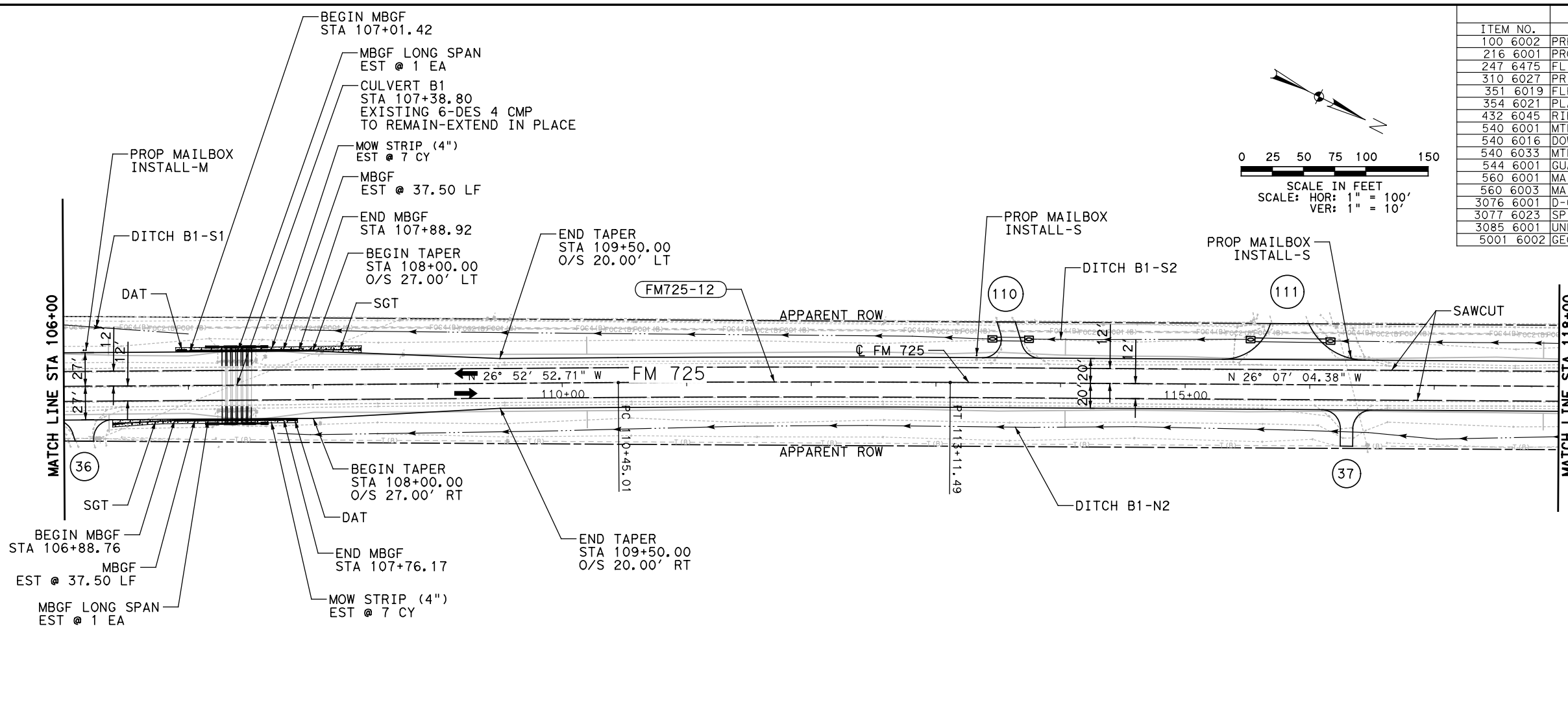
PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 8 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 114
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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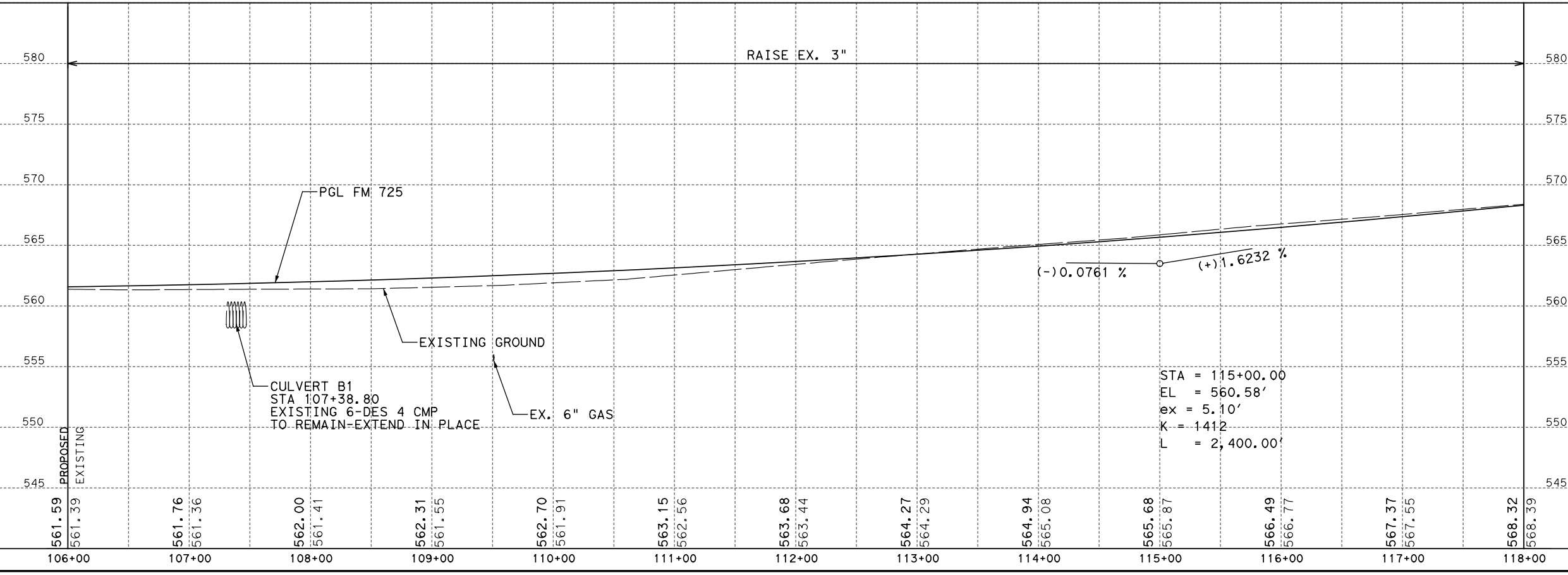
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 DATE: 4/28/2021
 TIME: 10:40:36 AM
 OFFICE: SAN



		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	792
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	713
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	421
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	2781
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	14
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	75
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	2
540 6033	MTL BM GD FEN (LONG SPAN SYSTEM)	EA	2
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	2
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	585
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1006
3085 6001	UNDERSEAL COURSE	GAL	1179
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2850

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➔ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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FM 725

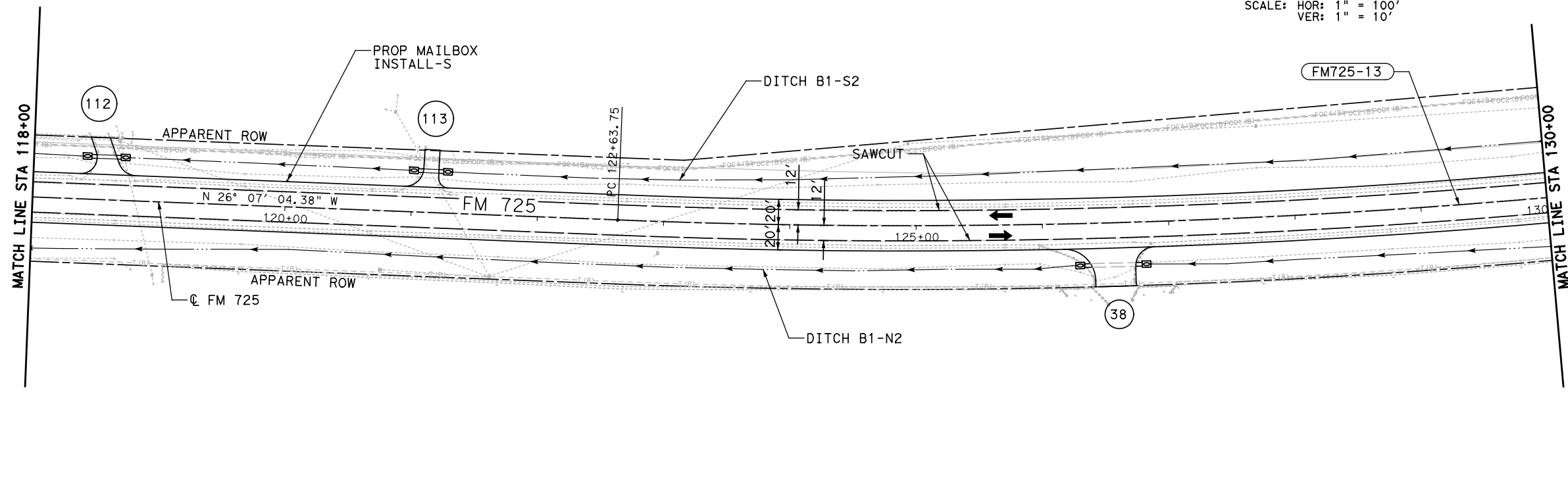
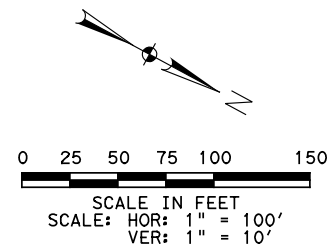
PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 9 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 115
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

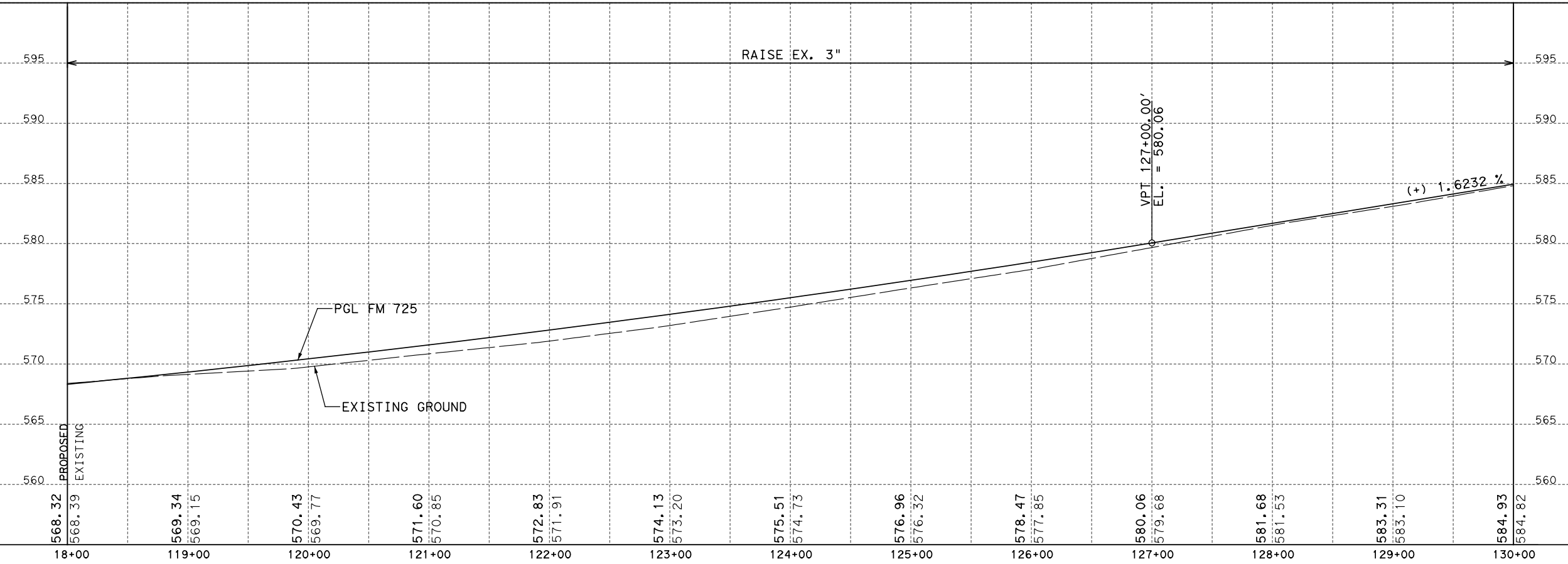
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	601
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2167
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	434
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	503
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	932
3085 6001	UNDERSEAL COURSE	GAL	1094
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ⇨ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- ⊙ XX DRIVeway NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
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- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
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- OH --- EXIST OVERHEAD UTILITY LINE
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- WETLANDS
- DITCH LINE



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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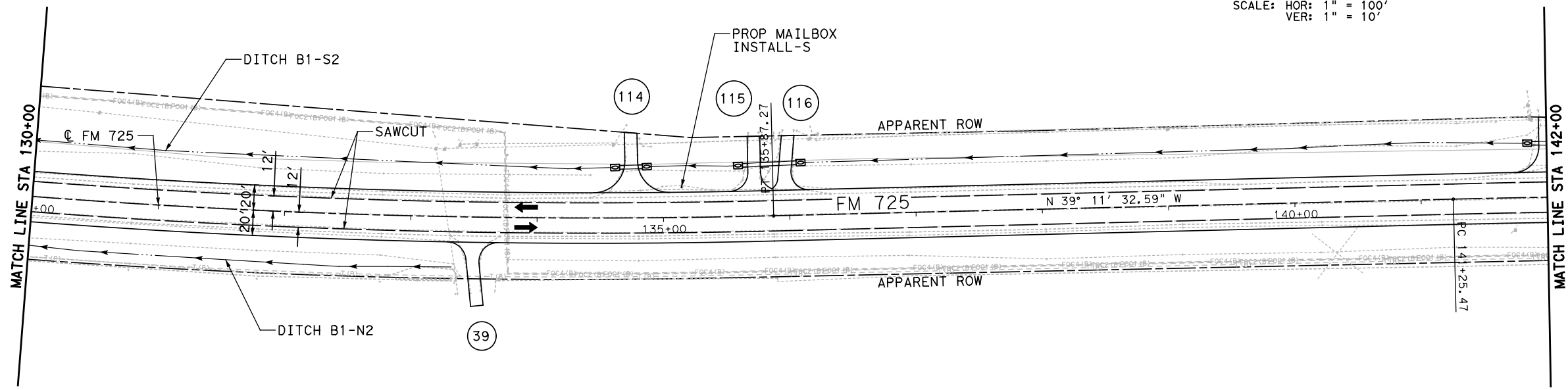
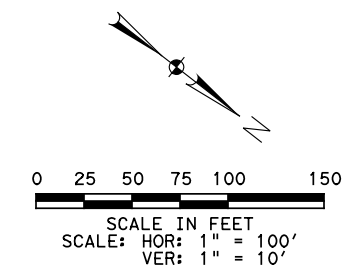
FM 725
PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 10 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 116
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

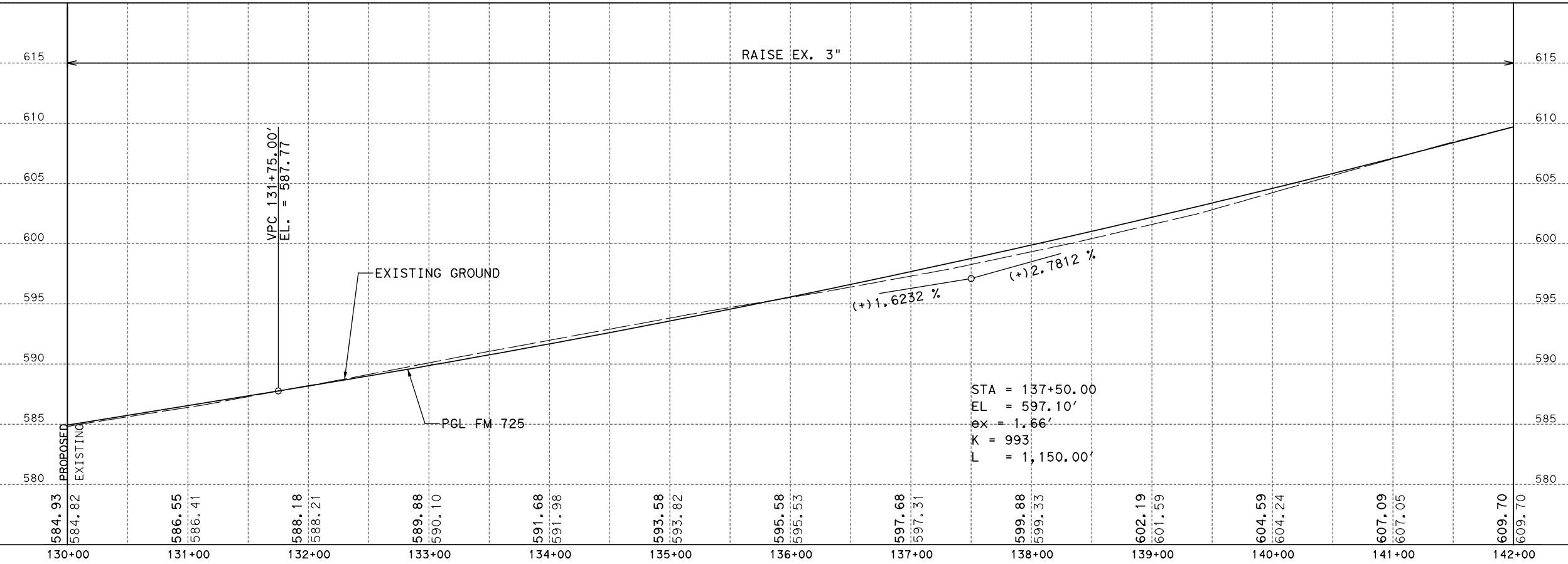
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	2888
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	314
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	503
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	932
3085 6001	UNDERSEAL COURSE	GAL	1094
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
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- - - C - - - EXIST CABLE TV LINE
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- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
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- - - EXIST WATER US
- - - WETLANDS
- - - DITCH LINE



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

4/28/2021

[Signature]

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NO.	REVISION	BY	DATE

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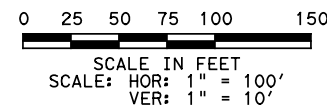
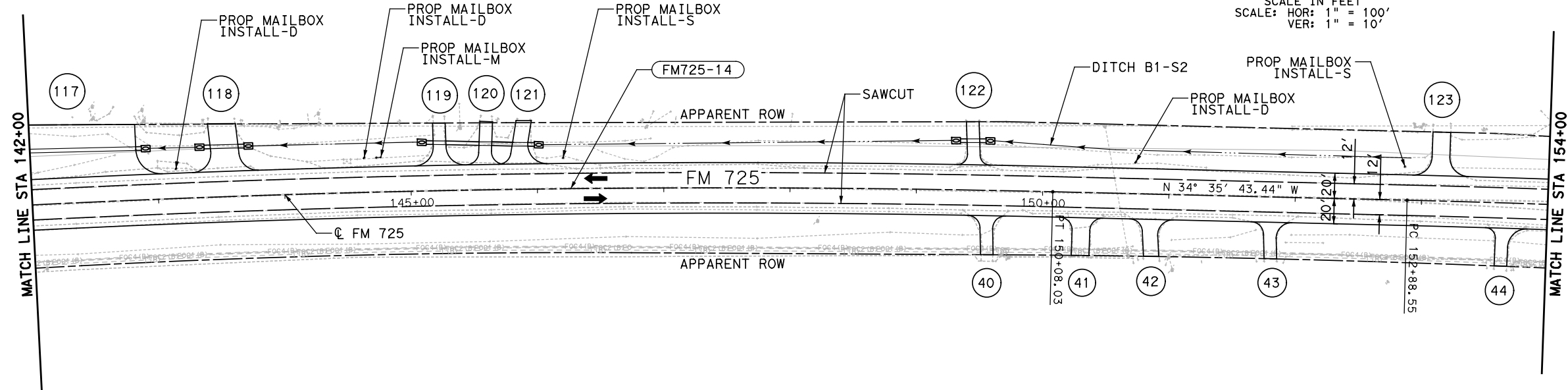
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PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 11 OF 27

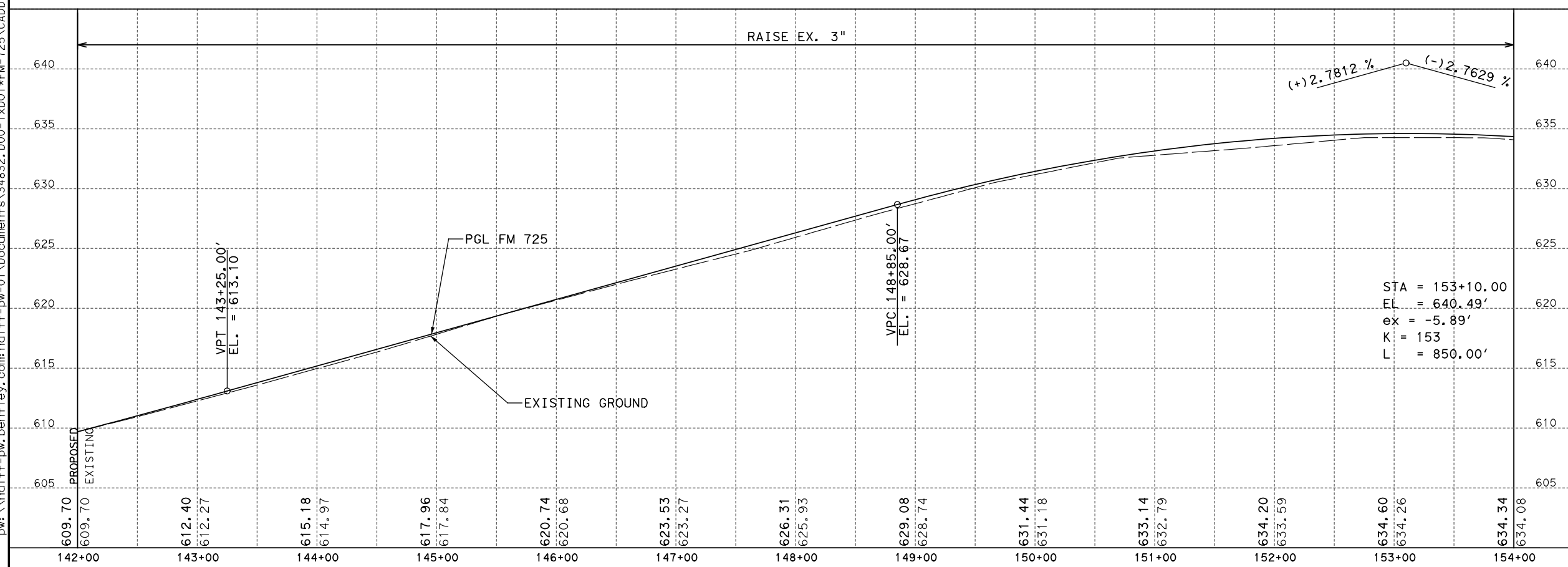
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6	SEE TITLE SHEET		117
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	673
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	606
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3201
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	2
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	3
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	503
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	932
3085 6001	UNDERSEAL COURSE	GAL	1094
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	2423



LEGEND:

- EXIST ROW
- ➡ PROP DIRECTION OF TRAFFIC
- ⬅ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
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- G --- EXIST GAS LINE
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- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

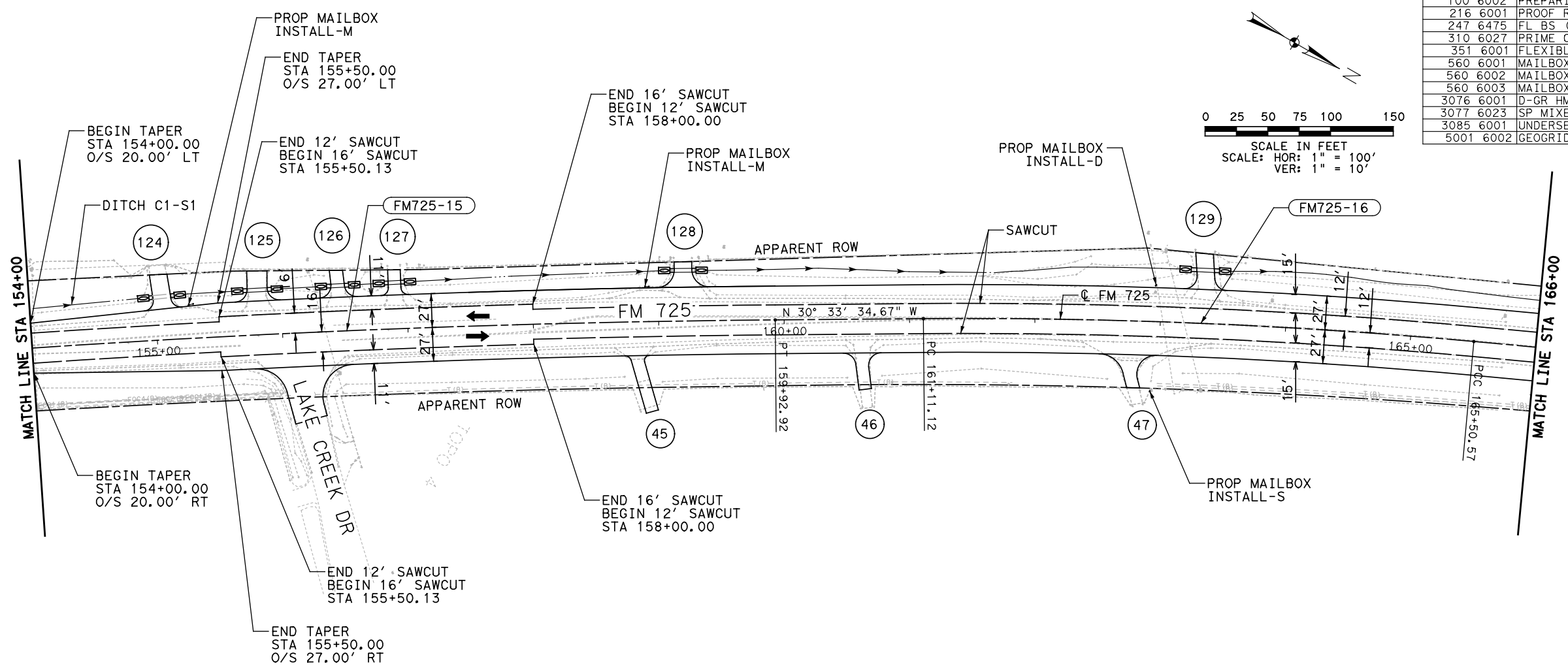
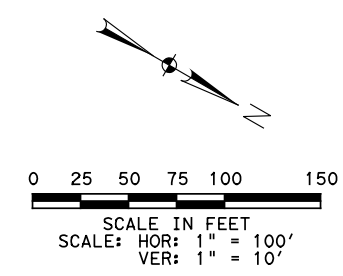
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NO.		REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312		
		FM 725		
PLAN AND PROFILE				
SCALE: 1" = 100'H, 1" = 10'V			SHEET 12 OF 27	
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 118	
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE		
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725	

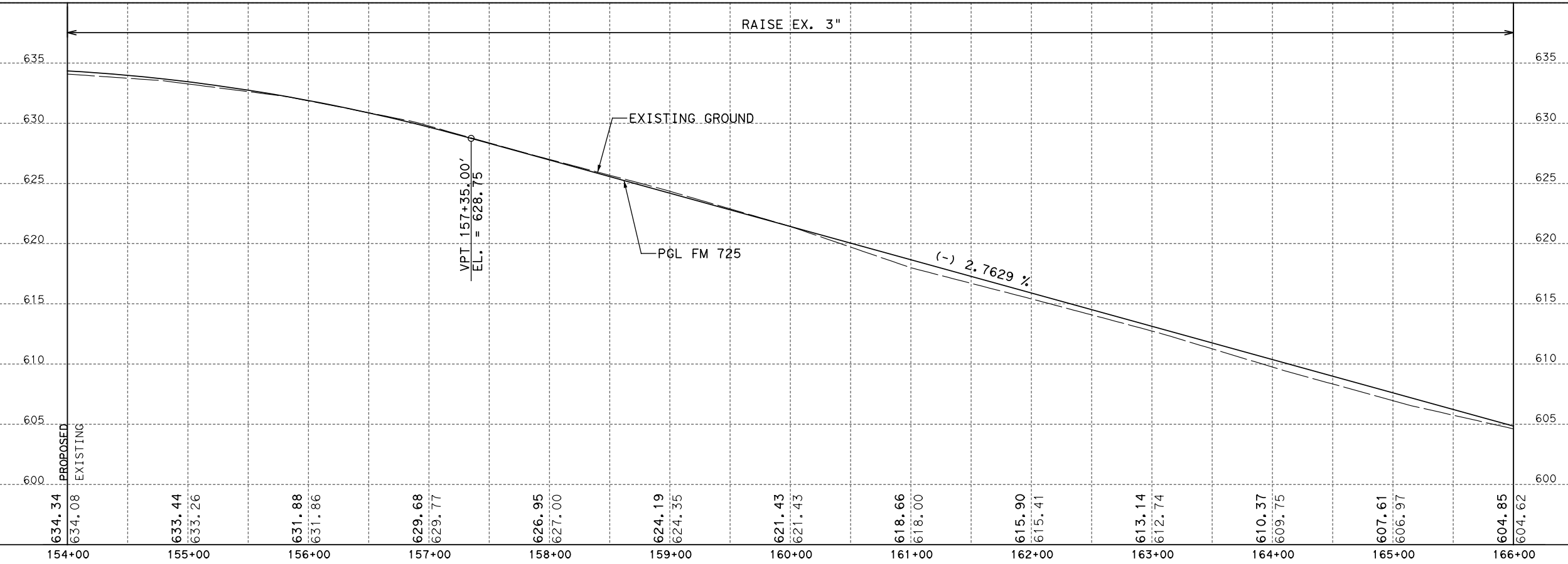
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1098
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	988
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3423
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	2
3076 6001	D-GR HMA TY-B PG64-22	TON	797
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1234
3085 6001	UNDERSEAL COURSE	GAL	1444
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	3951



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- ⊙ XX DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
- - - FOC - - - EXIST FIBER OPTIC LINE
- - - C - - - EXIST CABLE TV LINE
- - - W - - - EXIST WATER LINE
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- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- - - WETLANDS
- ➔ DITCH LINE



4/28/2021
 JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

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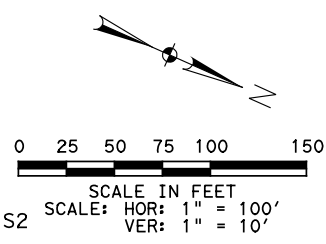
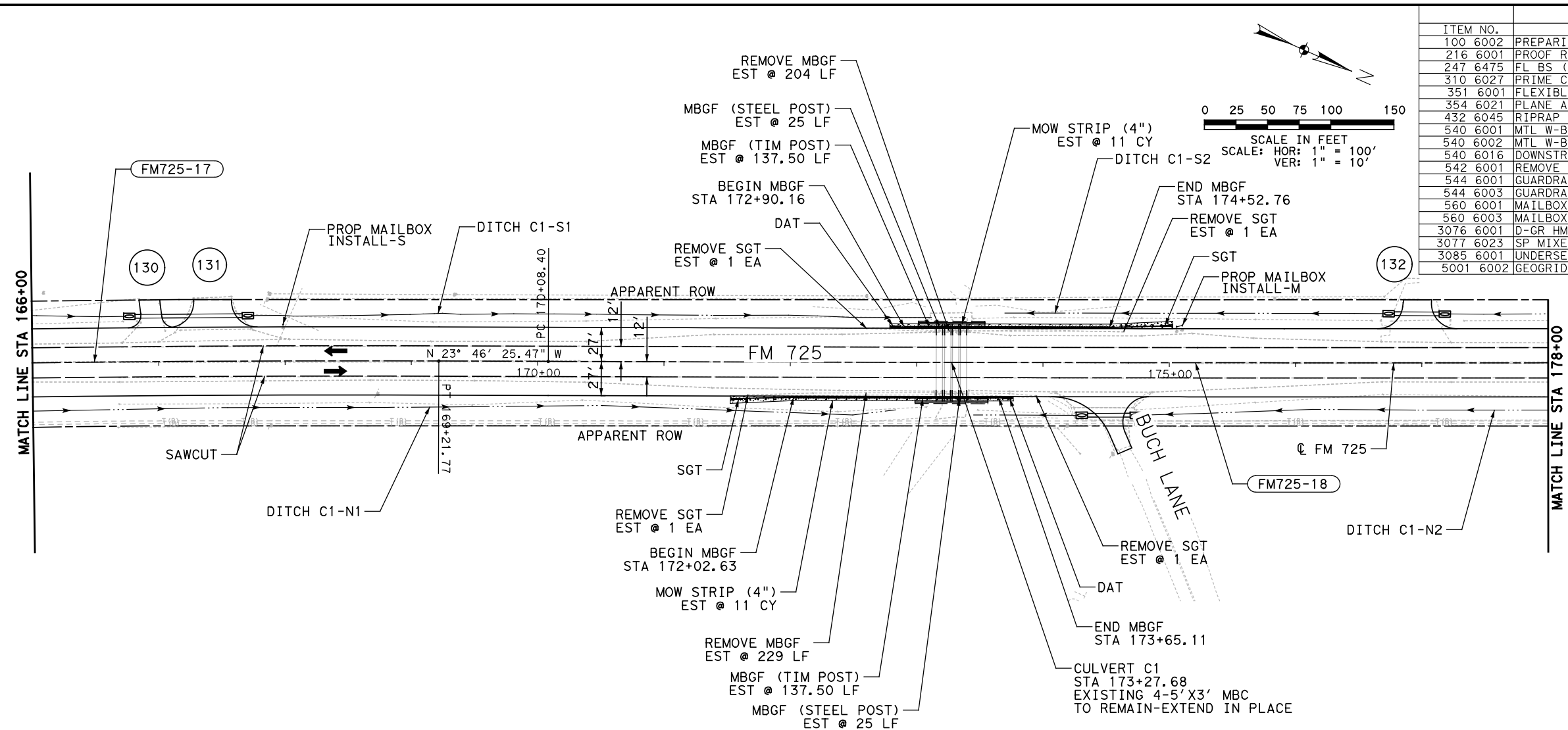
FM 725

PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 13 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	119	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

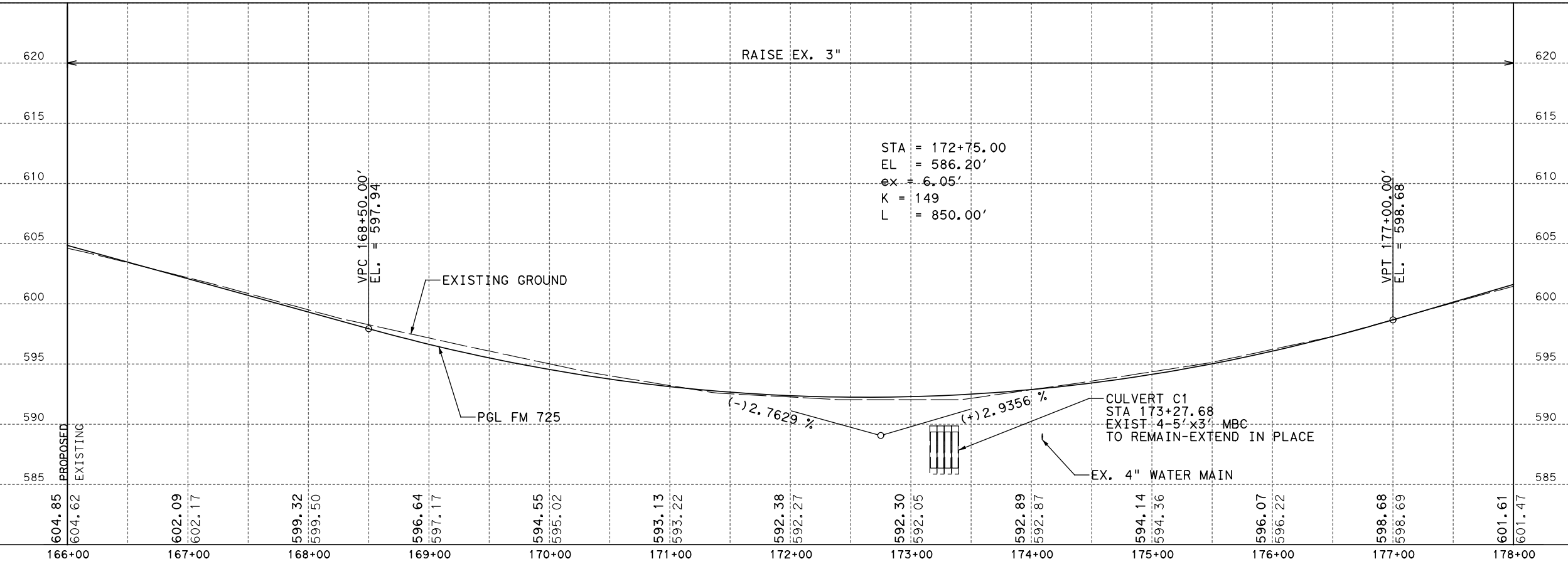
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ITEM NO.	ESTIMATED QUANTITIES		
	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1180
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1062
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	1834
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	1367
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	22
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	275
540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	50
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	2
542 6001	REMOVE METAL BEAM GUARD FENCE	LF	433
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	854
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEGRID BASE REINFORCEMENT (TY II)	SY	4245

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➔ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- WETLANDS
- DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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FM 725

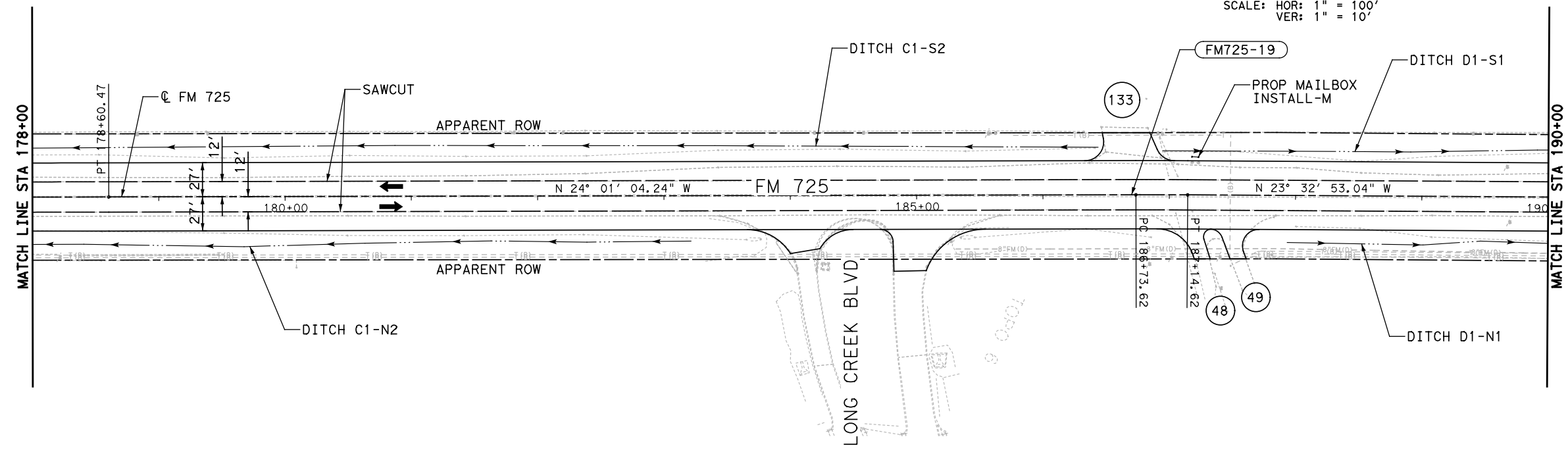
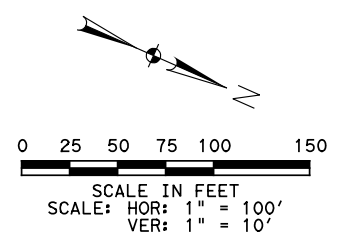
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 14 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

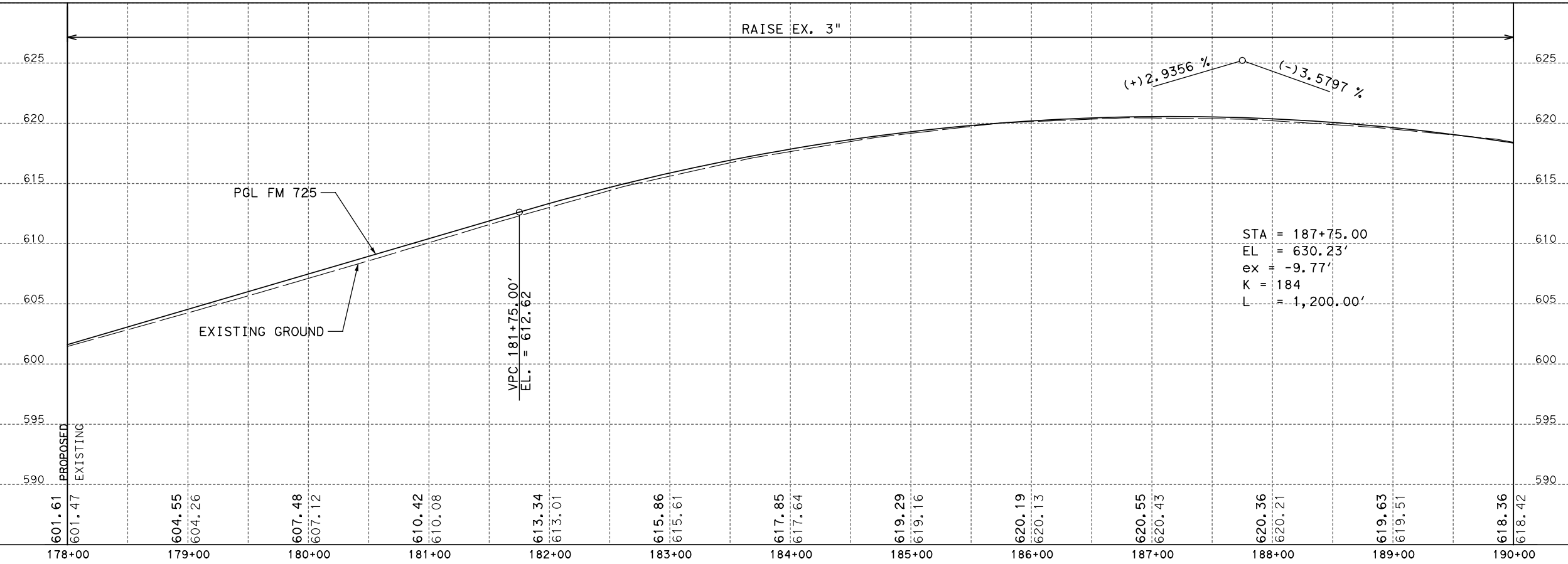
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1073
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3201
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- ➔ DITCH LINE



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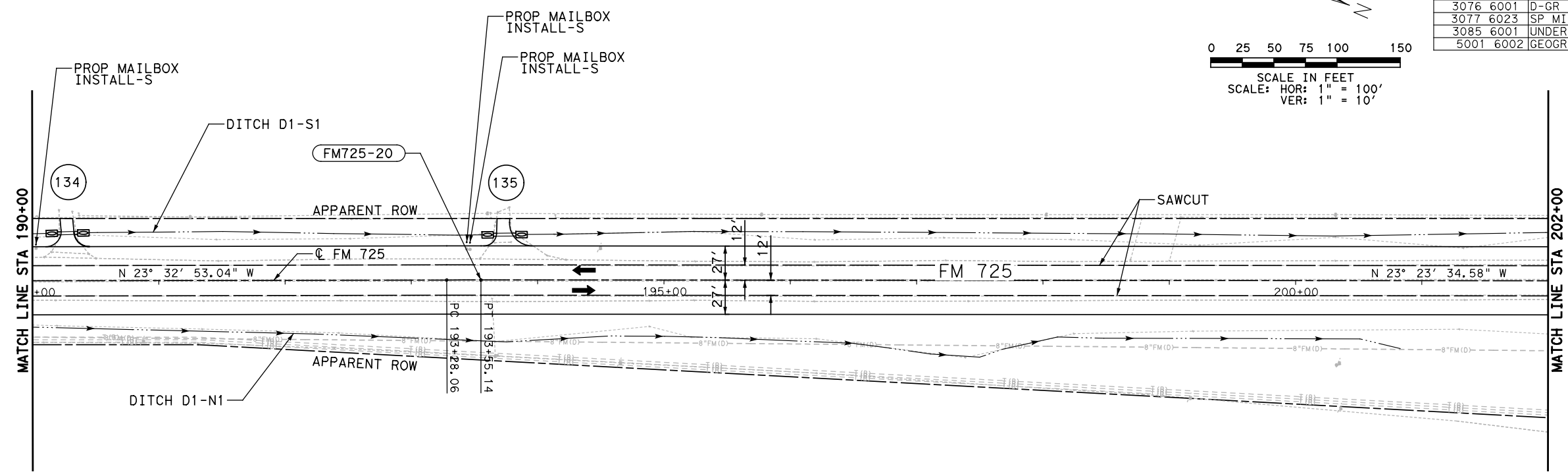
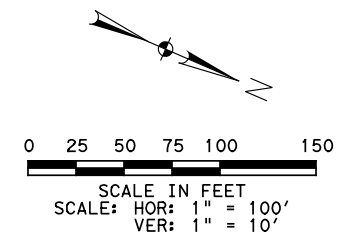
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 15 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 121
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

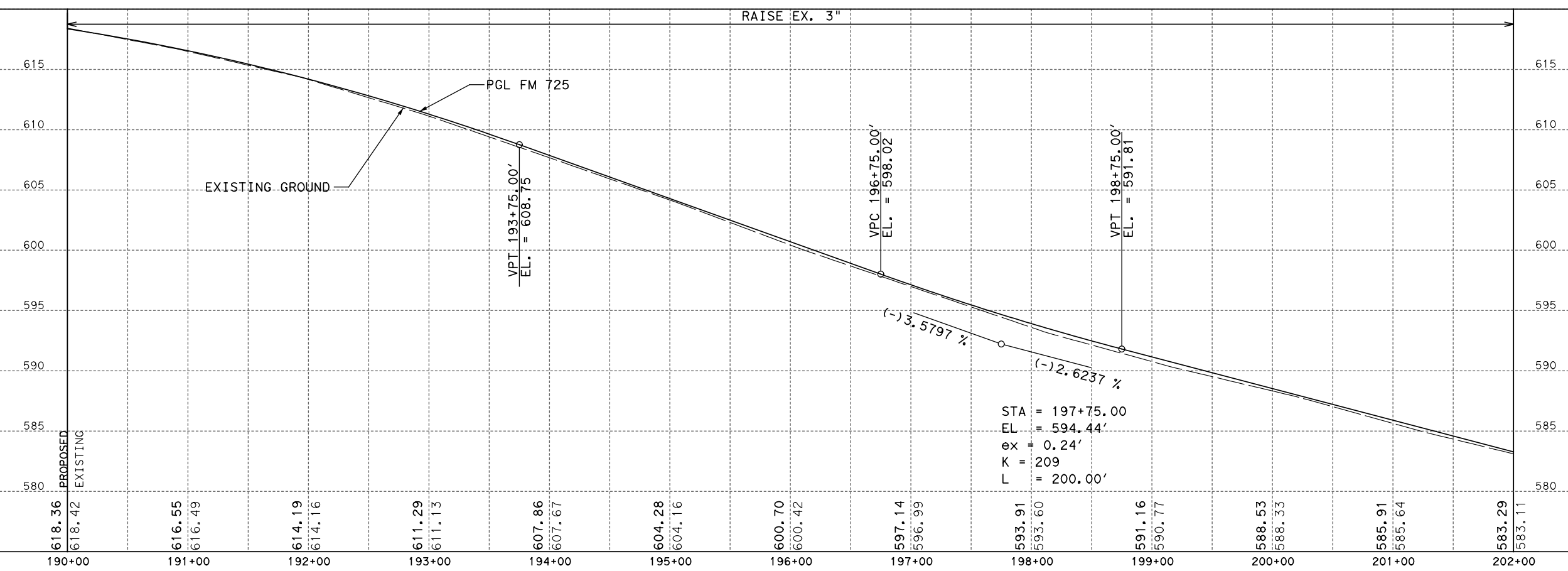
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ESTIMATED QUANTITIES		UNIT	QTY
ITEM NO.	DESCRIPTION		
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1073
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3201
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	3
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➞ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



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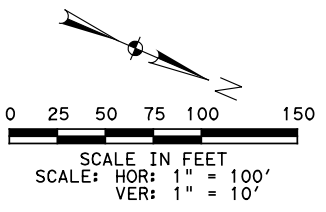
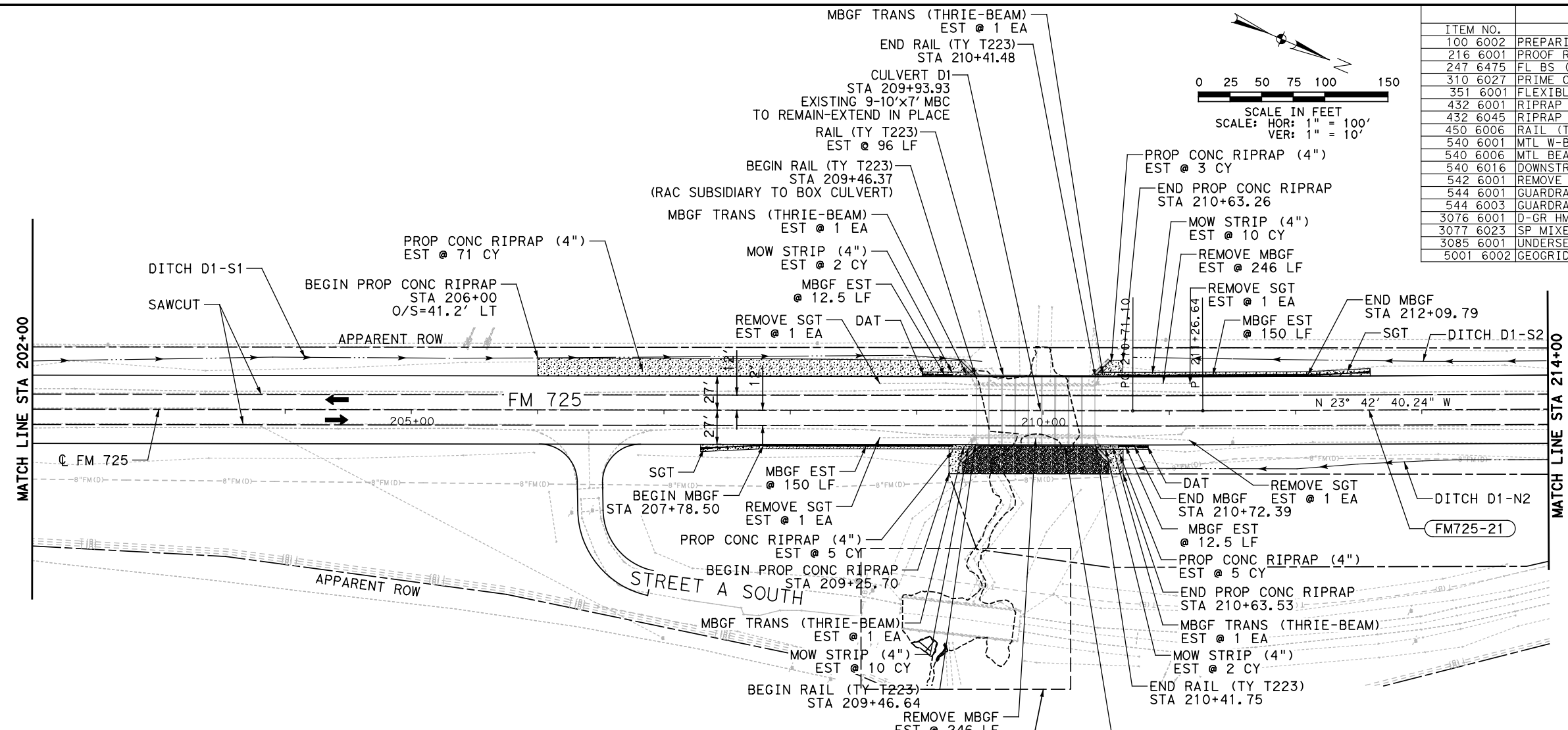
FM 725

PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 16 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	122	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

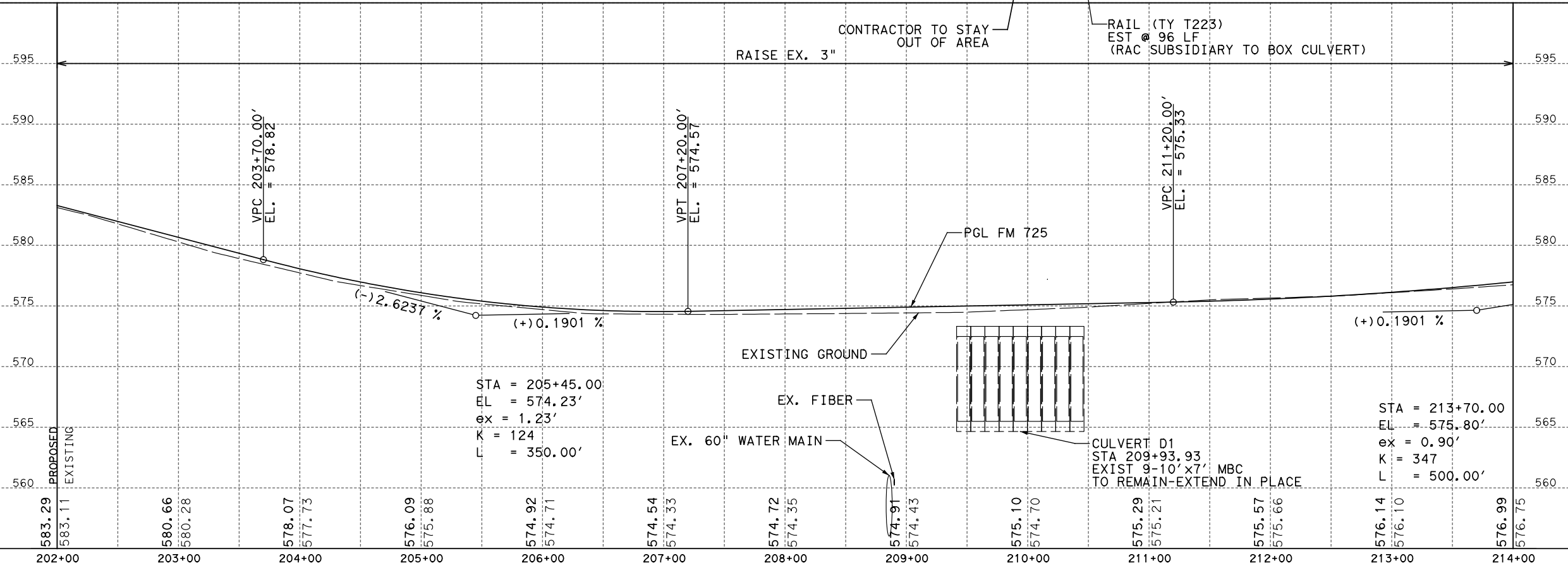
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ESTIMATED QUANTITIES		UNIT	QTY
ITEM NO.	DESCRIPTION		
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1073
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3201
432 6001	RIPRAP (CONC) (4 IN)	CY	84
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	24
450 6006	RAIL (TY T223)	LF	192
540 6001	MTL W-BEAM GD FEN (TIM POST)	EA	4
540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	2
542 6001	REMOVE METAL BEAM GUARD FENCE	LF	492
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➔ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▨ CONCRETE RIPRAP
- ▨ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- - - T EXIST TELEPHONE LINE
- - - FOC EXIST FIBER OPTIC LINE
- - - C EXIST CABLE TV LINE
- - - W EXIST WATER LINE
- - - WW EXIST WASTEWATER LINE
- - - G EXIST GAS LINE
- - - E EXIST UNDERGROUND ELECTRIC LINE
- - - OH EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- ▨ WETLANDS
- ➔ DITCH LINE



4/29/2021

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NO.	REVISION	BY	DATE

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TEL (210) 798-1895 FIRM #F-312

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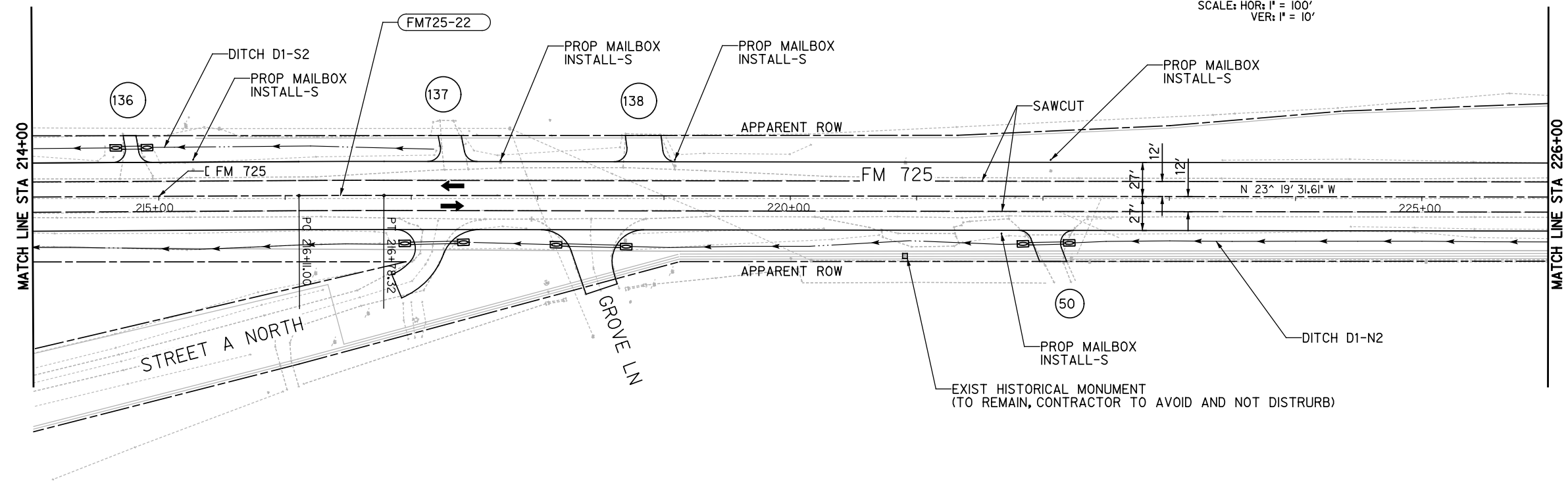
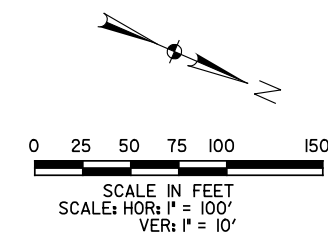
PLAN AND PROFILE

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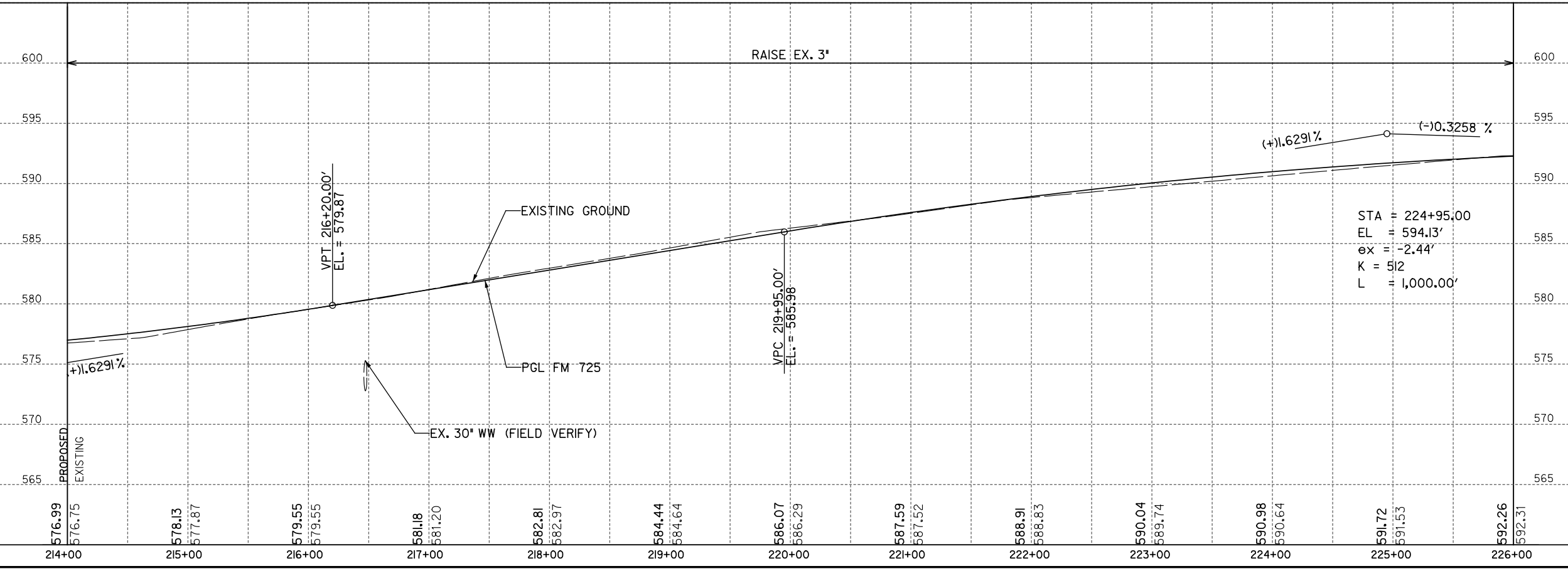
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP)(TY D GR 1-2, OR 5)FINAL POS	CY	1192
310 6027	PRIME COAT(MC-30 OR AE-P)	GAL	1073
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR(5")	SY	3201
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	5
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



- LEGEND:**
- EXIST ROW
 - ➔ PROP DIRECTION OF TRAFFIC
 - ➡ EXIST DIRECTION OF TRAFFIC
 - - - SAWCUT LINE
 - ▬ CONCRETE RIPRAP
 - ▬ METAL BEAM GUARD FENCE
 - (XX) DRIVEWAY NUMBER
 - ▬ EXIST TELEPHONE LINE
 - ▬ EXIST FIBER OPTIC LINE
 - ▬ EXIST CABLE TV LINE
 - ▬ EXIST WATER LINE
 - ▬ EXIST WASTEWATER LINE
 - ▬ EXIST GAS LINE
 - ▬ EXIST UNDERGROUND ELECTRIC LINE
 - ▬ EXIST OVERHEAD UTILITY LINE
 - - - EXIST WATER US
 - ▬ WETLANDS
 - ▬ DITCH LINE



4/30/2021

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NO.	REVISION	BY	DATE

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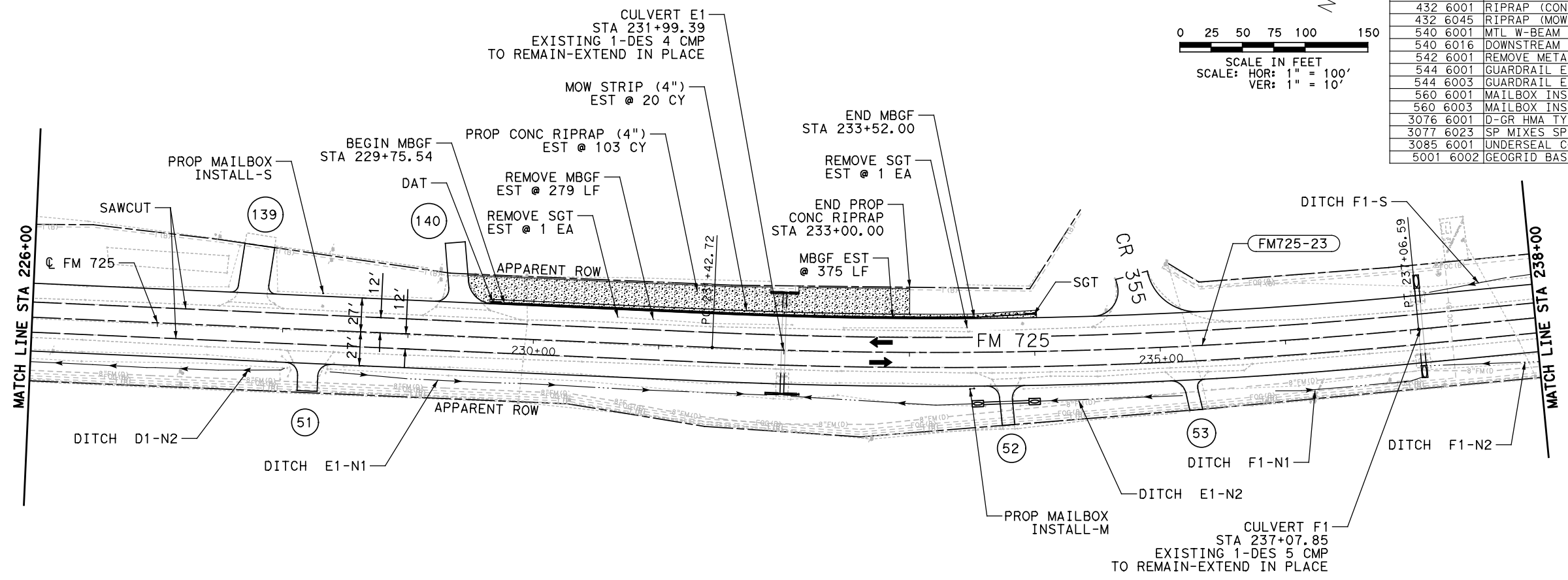
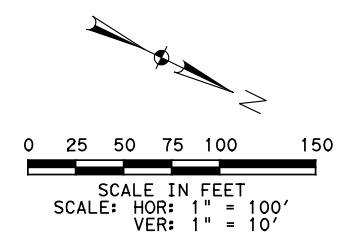
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 18 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 124
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

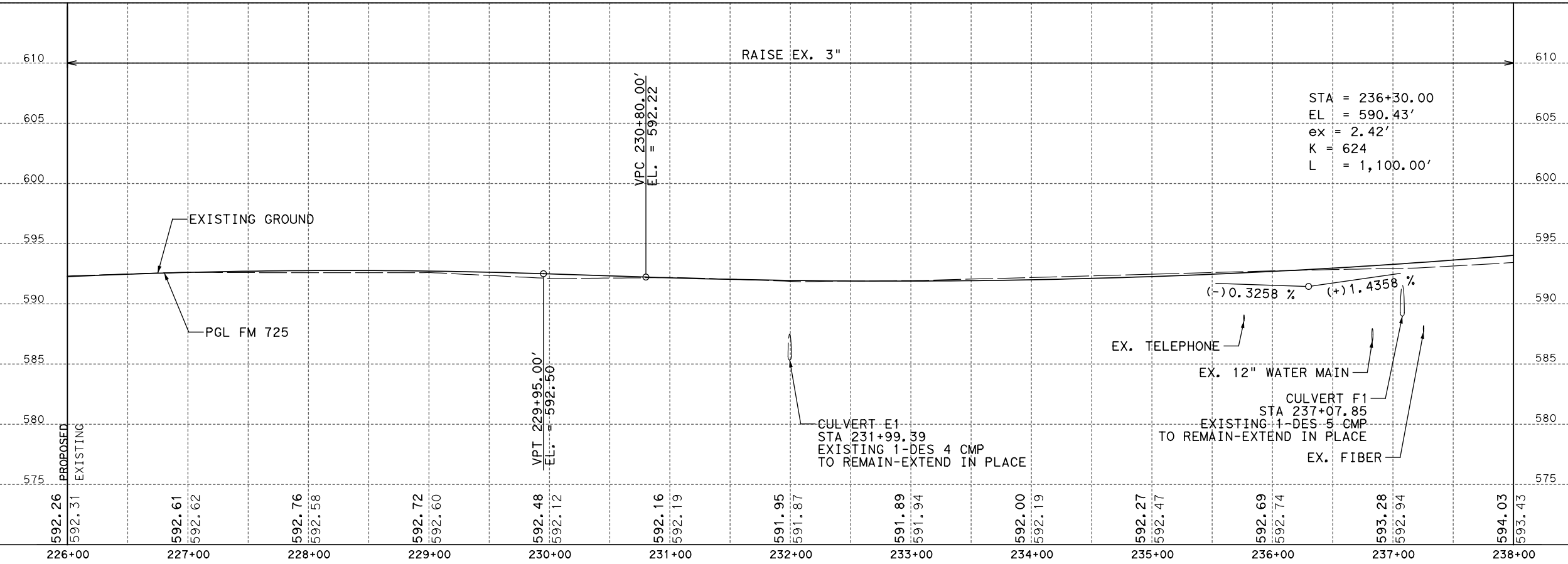
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1072
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	3201
432 6001	RIPRAP (CONC) (4 IN)	CY	103
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	20
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	375
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
542 6001	REMOVE METAL BEAM GUARD FENCE	LF	279
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	1
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
- - - FOC - - - EXIST FIBER OPTIC LINE
- - - C - - - EXIST CABLE TV LINE
- - - W - - - EXIST WATER LINE
- - - WW - - - EXIST WASTEWATER LINE
- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- - - WETLANDS
- ➔ DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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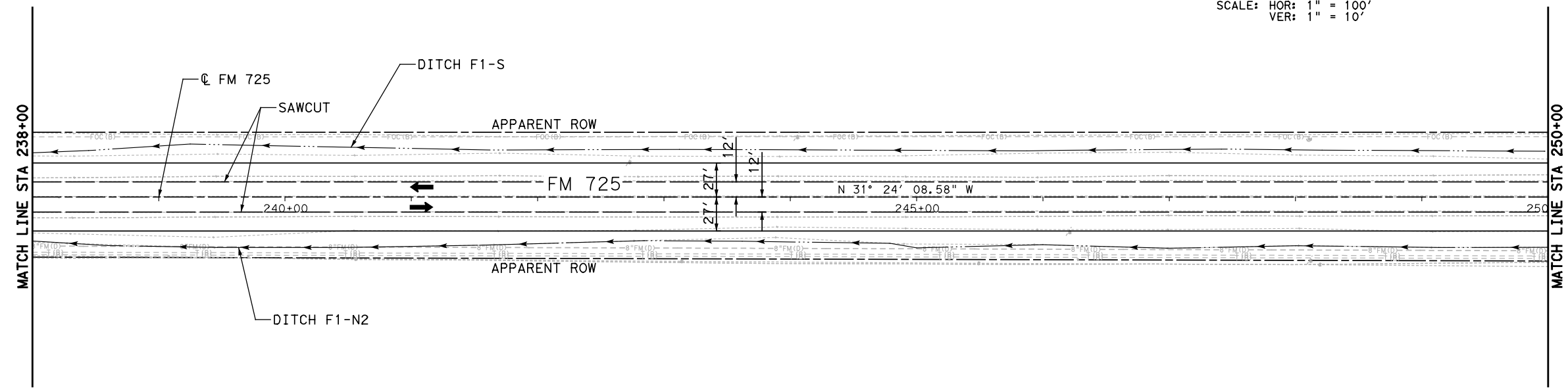
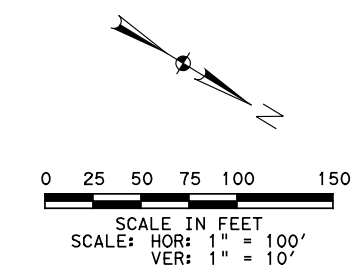
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 19 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		125
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

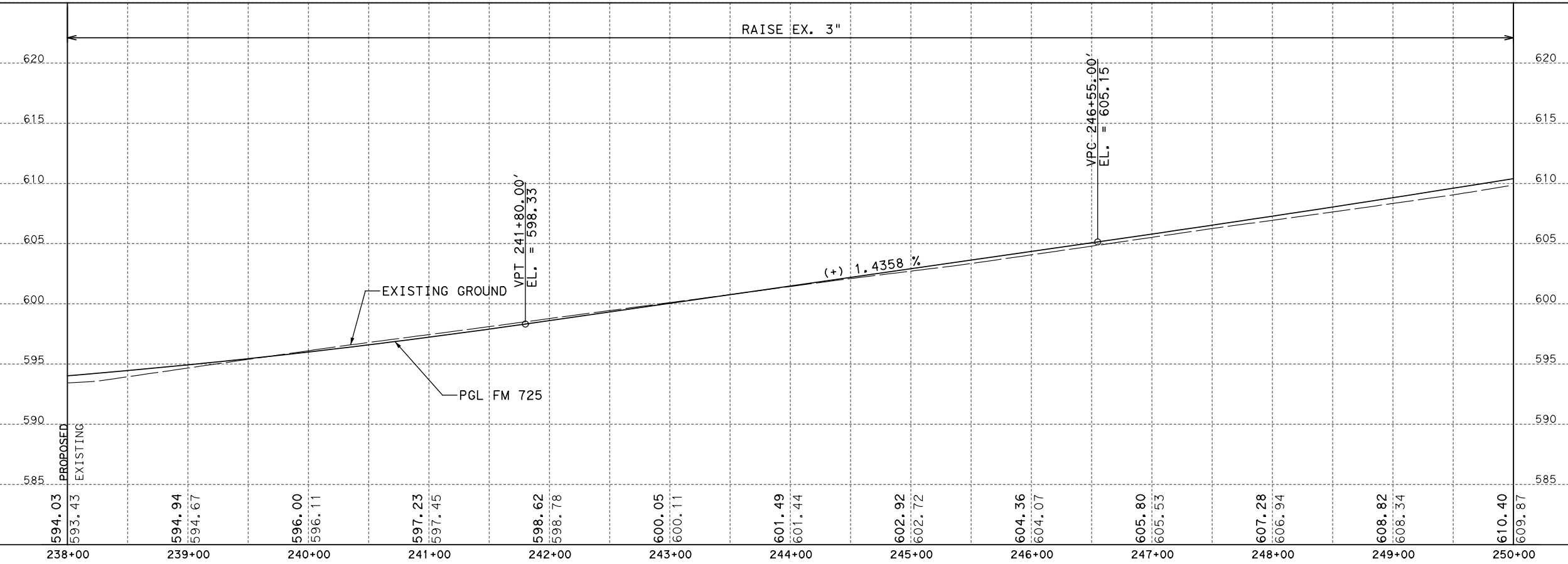
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1073
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	2295
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	907
3076 6001	D-GR HMA TY-B PG64-22	TON	862
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	1254
3085 6001	UNDERSEAL COURSE	GAL	1467
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➞ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

4/28/2021

[Signature]

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

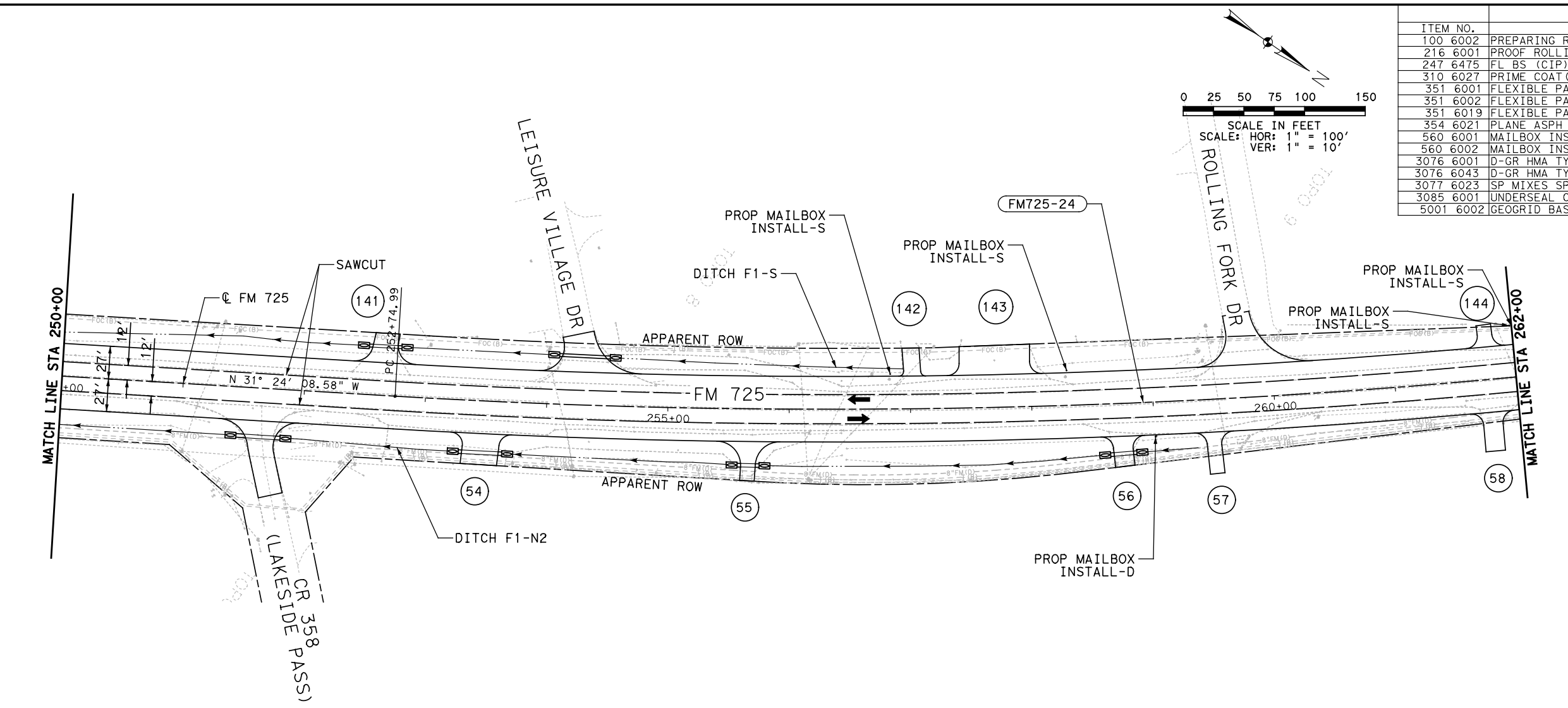
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FM 725

PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 20 OF 27

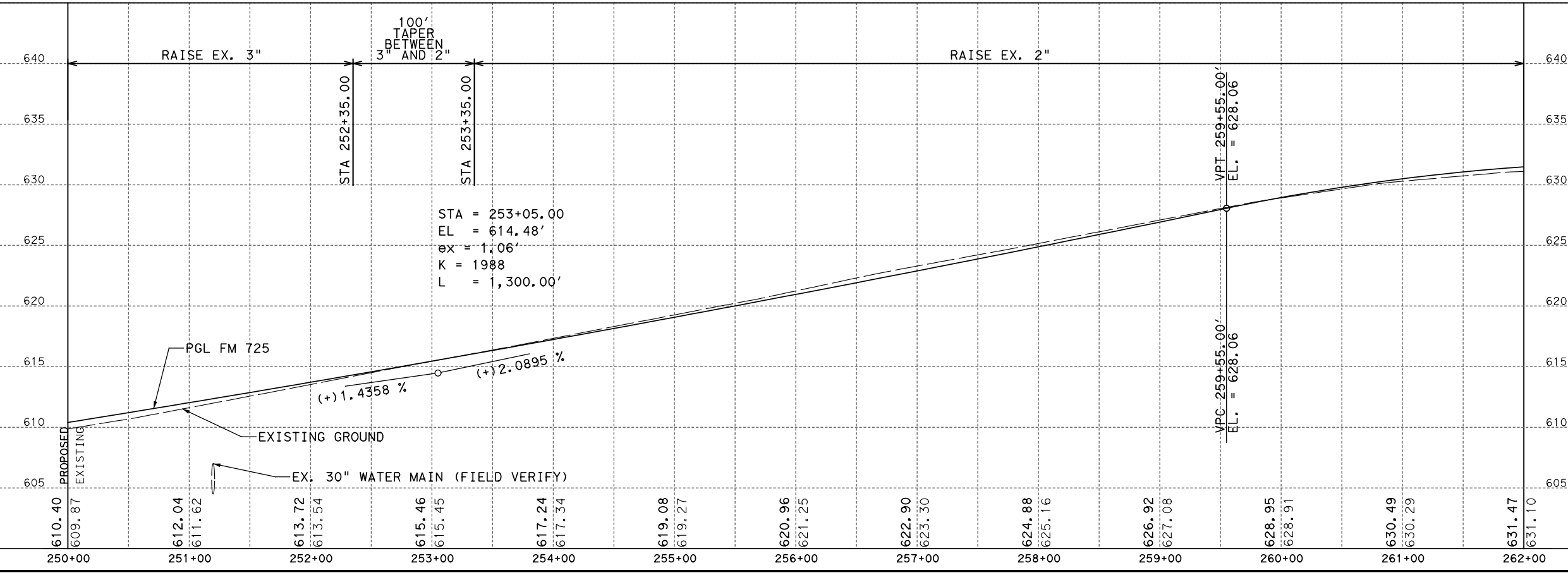
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	126	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



ESTIMATED QUANTITIES				
ITEM NO.	DESCRIPTION	UNIT	QTY	
100 6002	PREPARING ROW	STA	12	
216 6001	PROOF ROLLING	HR	2	
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1193	
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1072	
351 6001	FLEXIBLE PAVEMENT STRUCTURE REPAIR (5")	SY	314	
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	67	
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2508	
354 6021	PLANE ASPH CONC PAV (0" TO 2")	SY	314	
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	4	
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1	
3076 6001	D-GR HMA TY-B PG64-22	TON	1056	
3076 6043	D-GR HMA TY-D PG70-22 (LEVEL-UP)	TON	17	
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	916	
3085 6001	UNDERSEAL COURSE	GAL	1461	
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289	

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- · - · - CONCRETE RIPRAP
- - - - METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- · - · - FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- WETLANDS
- DITCH LINE



4/28/2021

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SAN ANTONIO, TEXAS 78216
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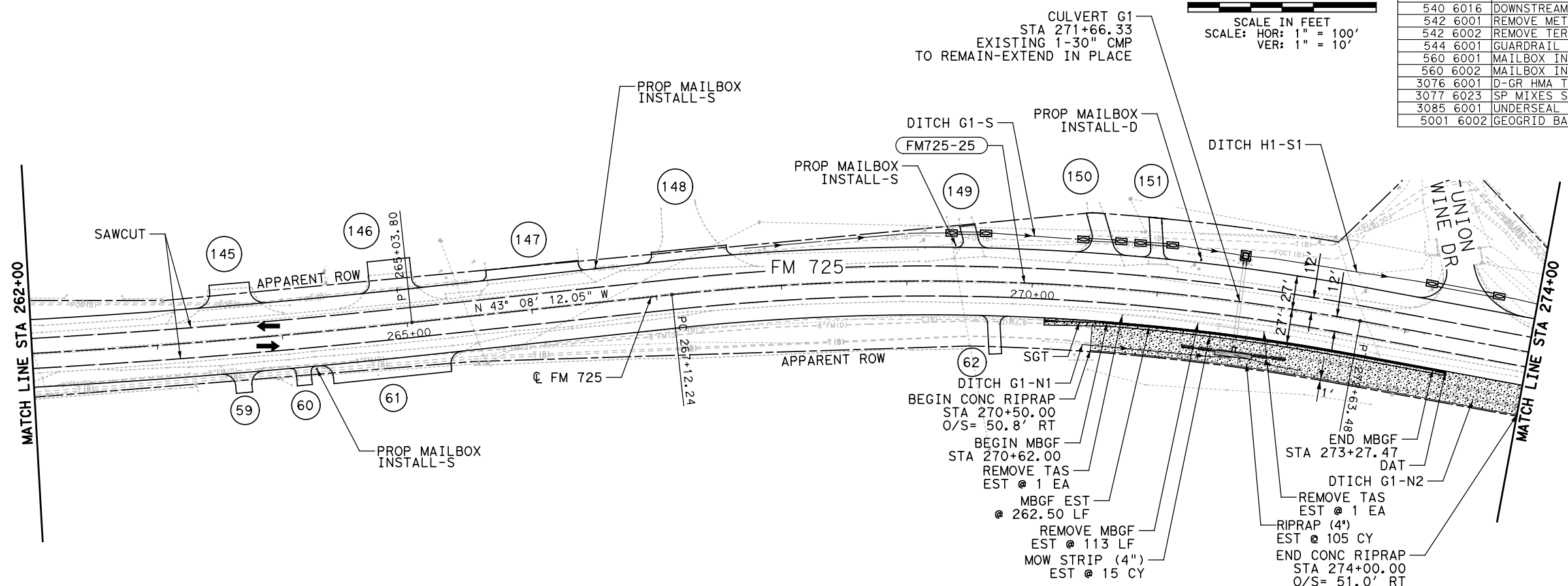
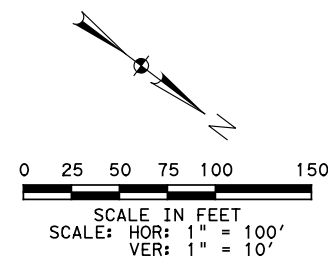
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 21 OF 27

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 127
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035 HIGHWAY NO. FM 725

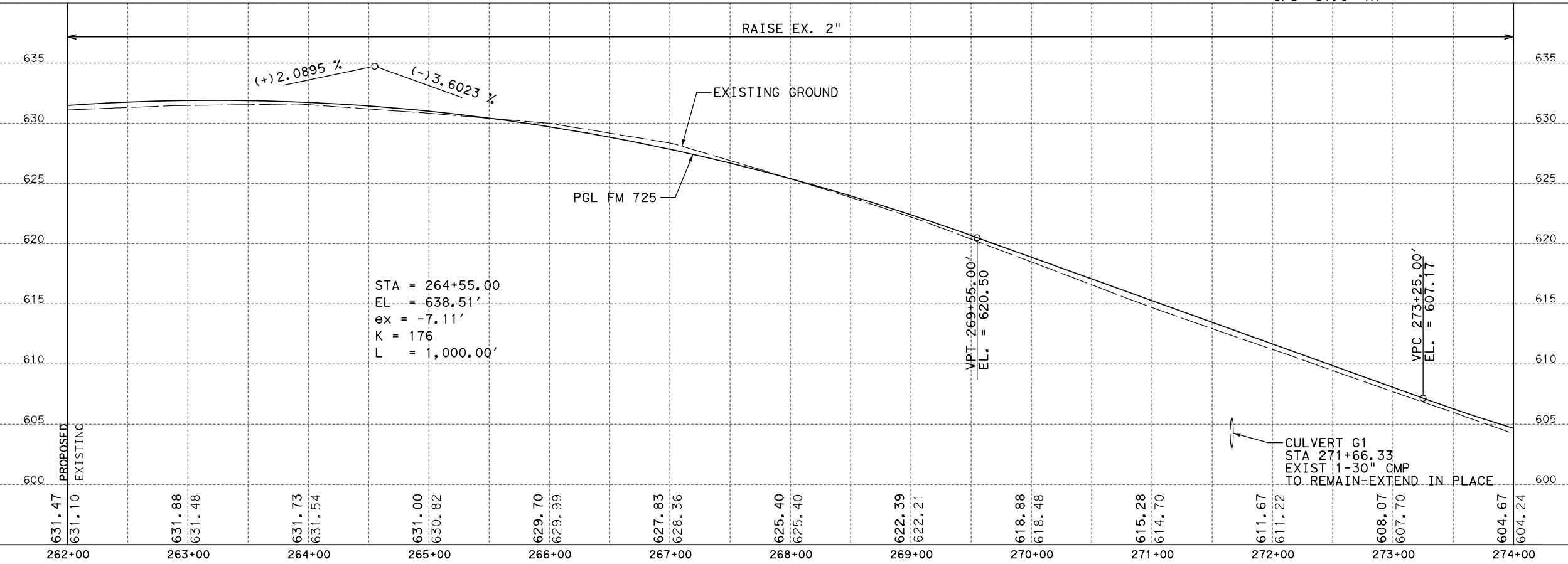
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 DATE: 4/28/2021
 TIME: 10:44:07 AM
 OFFICE: SAN

ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1073
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	2634
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	569
432 6001	RIPRAP (CONC) (4 IN)	CY	105
432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	15
540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	263
540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
542 6001	REMOVE METAL BEAM GUARD FENCE	LF	113
542 6002	REMOVE TERMINAL ANCHOR SECTION	EA	2
544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	3
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	1103
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	834
3085 6001	UNDERSEAL COURSE	GAL	1458
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▨ CONCRETE RIPRAP
- ▨ METAL BEAM GUARD FENCE
- ⊙ XX DRIVEWAY NUMBER
- - - T EXIST TELEPHONE LINE
- - - FOC EXIST FIBER OPTIC LINE
- - - C EXIST CABLE TV LINE
- - - W EXIST WATER LINE
- - - WW EXIST WASTEWATER LINE
- - - G EXIST GAS LINE
- - - E EXIST UNDERGROUND ELECTRIC LINE
- - - OH EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- - - WETLANDS
- ➡ DITCH LINE



4/28/2021

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NO.	REVISION	BY	DATE

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SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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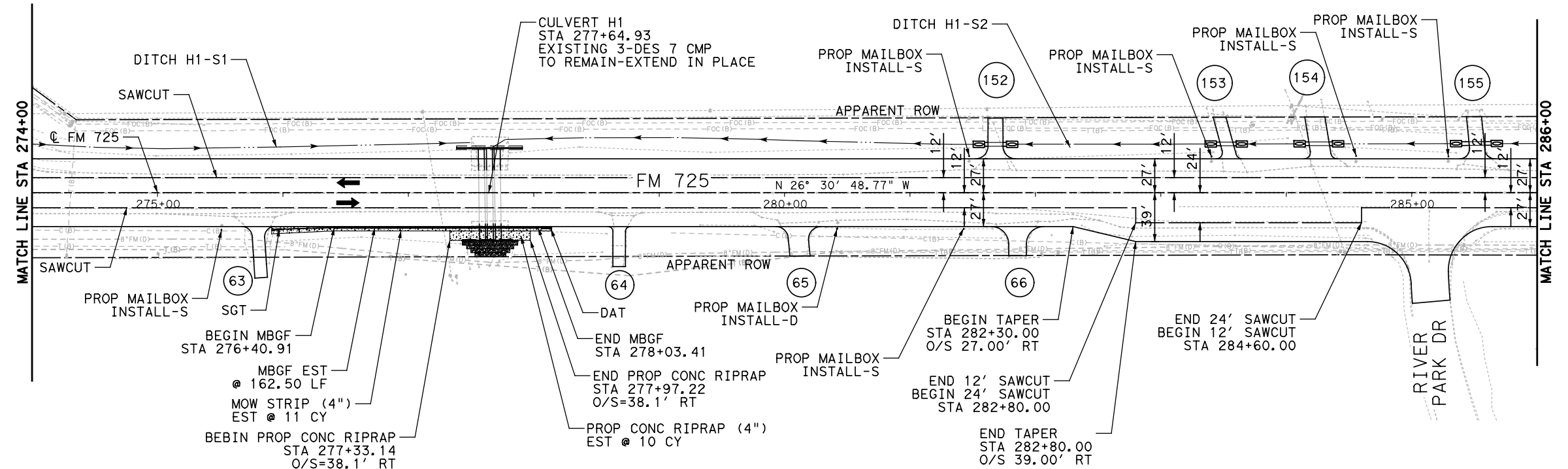
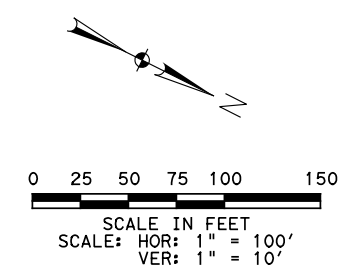
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 22 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	128	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

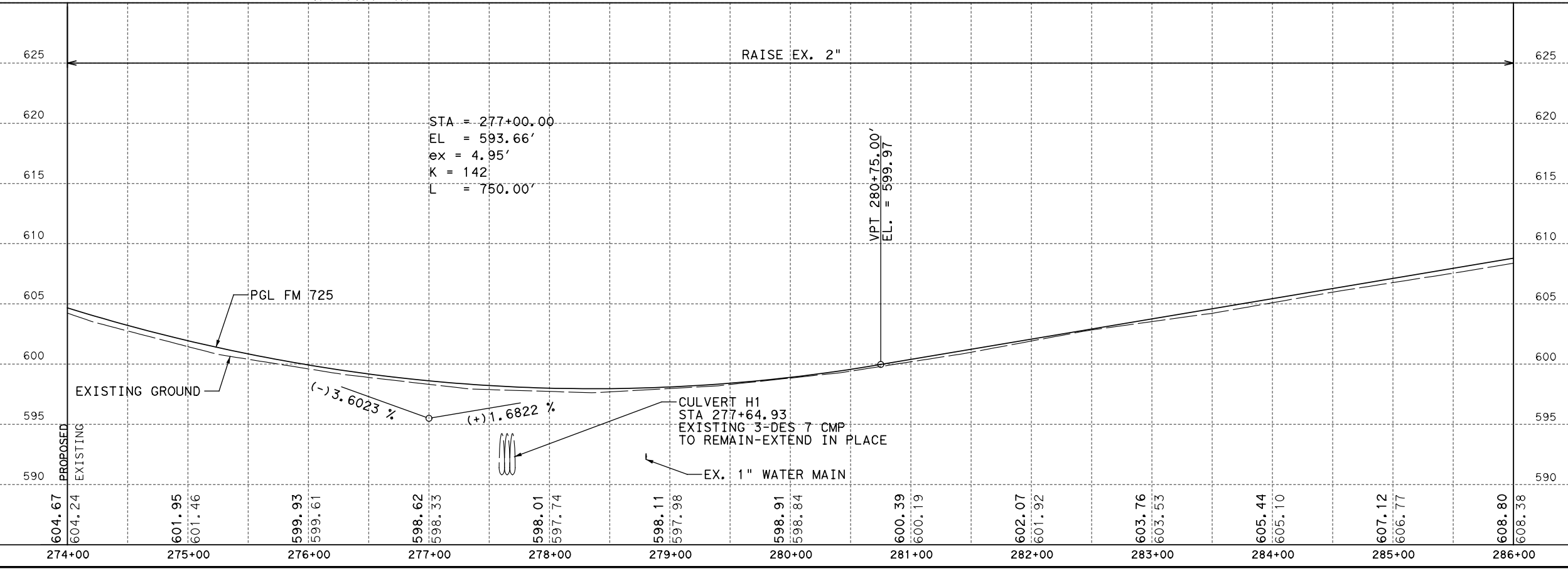
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 TIME: 10:44:25 AM
 OFFICE: SAN
 TXDOT*MON*PENTABLE.tb1
 DATE: 4/28/2021
 TIME: 10:44:25 AM
 OFFICE: SAN

ESTIMATED QUANTITIES		UNIT	QTY	
100	6002	PREPARING ROW	STA	12
216	6001	PROOF ROLLING	HR	2
247	6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1198
310	6027	PRIME COAT (MC-30 OR AE-P)	GAL	1083
351	6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	3021
351	6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	421
432	6001	RIPRAP (CONC) (4 IN)	CY	10
432	6045	RIPRAP (MOW STRIP) (4 IN)	CY	11
540	6001	MTL W-BEAM GD FEN (TIM POST)	LF	163
540	6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
544	6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
560	6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	6
560	6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
3076	6001	D-GR HMA TY-B PG64-22	TON	1110
3077	6023	SP MIXES SP-C SAC-B PG70-22	TON	866
3085	6001	UNDERSEAL COURSE	GAL	1514
5001	6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4313



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➔ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- DITCH LINE



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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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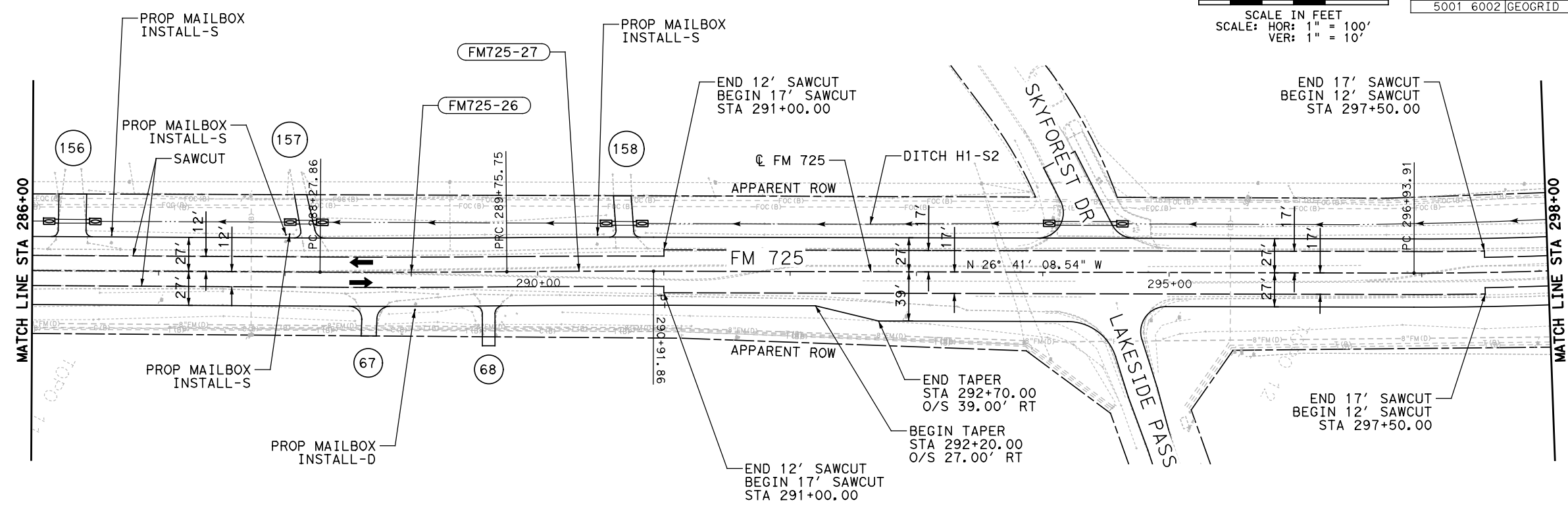
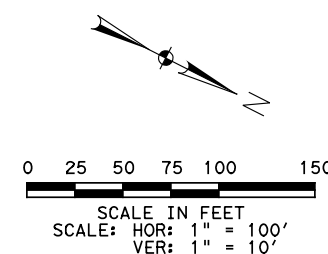
PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 23 OF 27

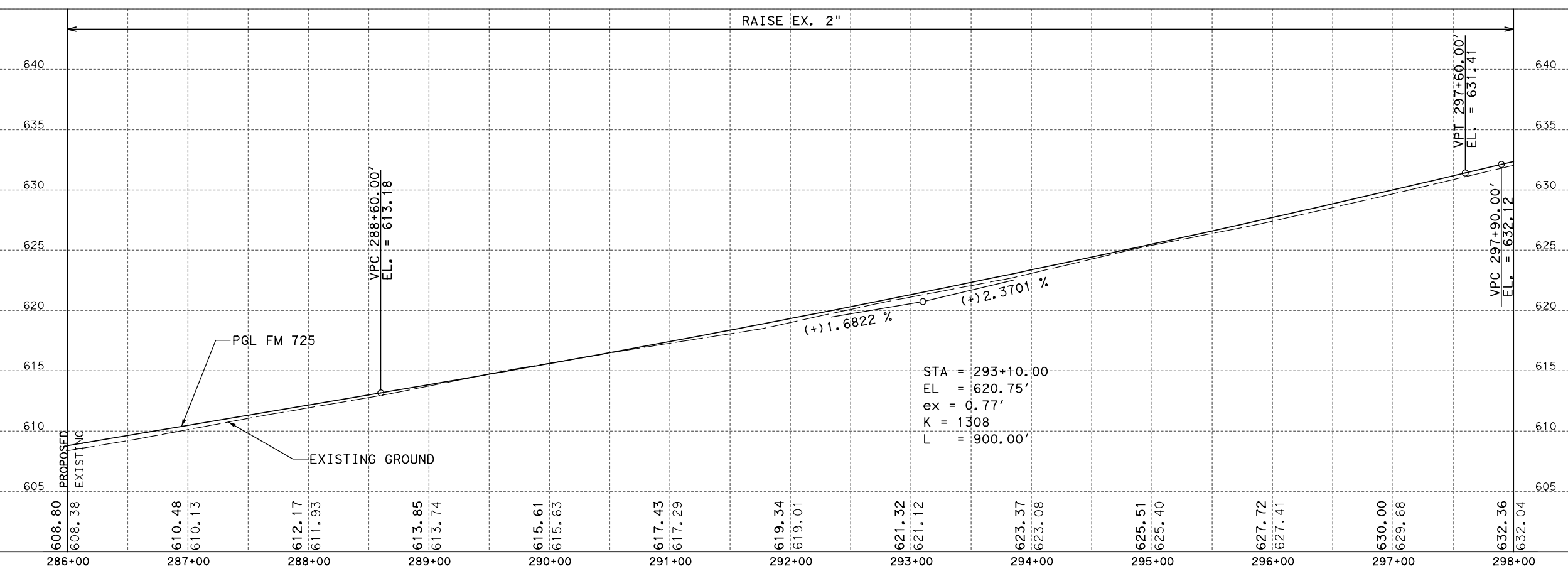
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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ESTIMATED QUANTITIES		UNIT	QTY
ITEM NO.	DESCRIPTION		
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1056
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	950
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	3563
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	360
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	4
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	982
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	860
3085 6001	UNDERSEAL COURSE	GAL	1505
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	3800



- LEGEND:**
- EXIST ROW
 - ➔ PROP DIRECTION OF TRAFFIC
 - ➡ EXIST DIRECTION OF TRAFFIC
 - - - SAWCUT LINE
 - ▬ CONCRETE RIPRAP
 - ▬ METAL BEAM GUARD FENCE
 - (XX) DRIVEWAY NUMBER
 - - - T - - - EXIST TELEPHONE LINE
 - - - FOC - - - EXIST FIBER OPTIC LINE
 - - - C - - - EXIST CABLE TV LINE
 - - - W - - - EXIST WATER LINE
 - - - WW - - - EXIST WASTEWATER LINE
 - - - G - - - EXIST GAS LINE
 - - - E - - - EXIST UNDERGROUND ELECTRIC LINE
 - - - OH - - - EXIST OVERHEAD UTILITY LINE
 - - - EXIST WATER US
 - - - WETLANDS
 - ➔ DITCH LINE



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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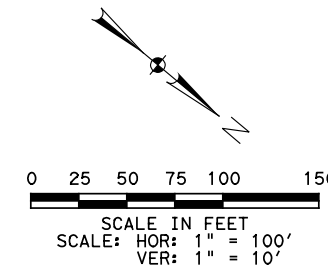
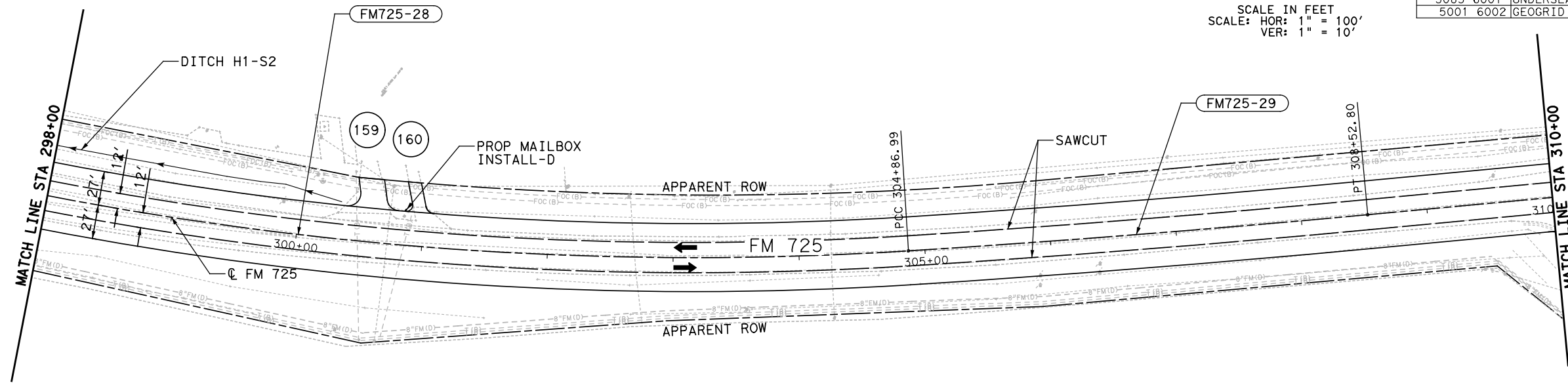
FM 725

PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 24 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		130
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

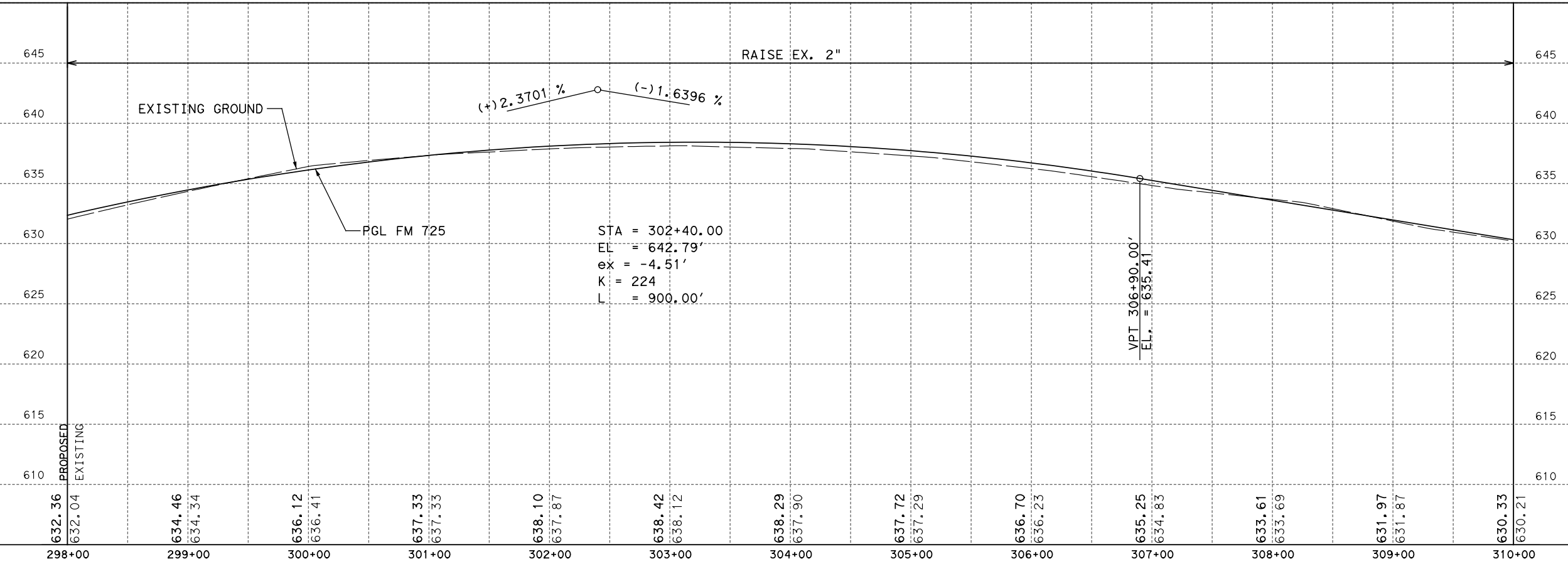
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1192
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	1072
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	2929
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	274
560 6002	MAILBOX INSTALL-D (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	1103
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	834
3085 6001	UNDERSEAL COURSE	GAL	1458
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	4289

LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ⇨ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ⋯ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
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- OH --- EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- ▬ WETLANDS
- ➔ DITCH LINE



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NO.	REVISION	BY	DATE

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 SAN ANTONIO, TEXAS 78216
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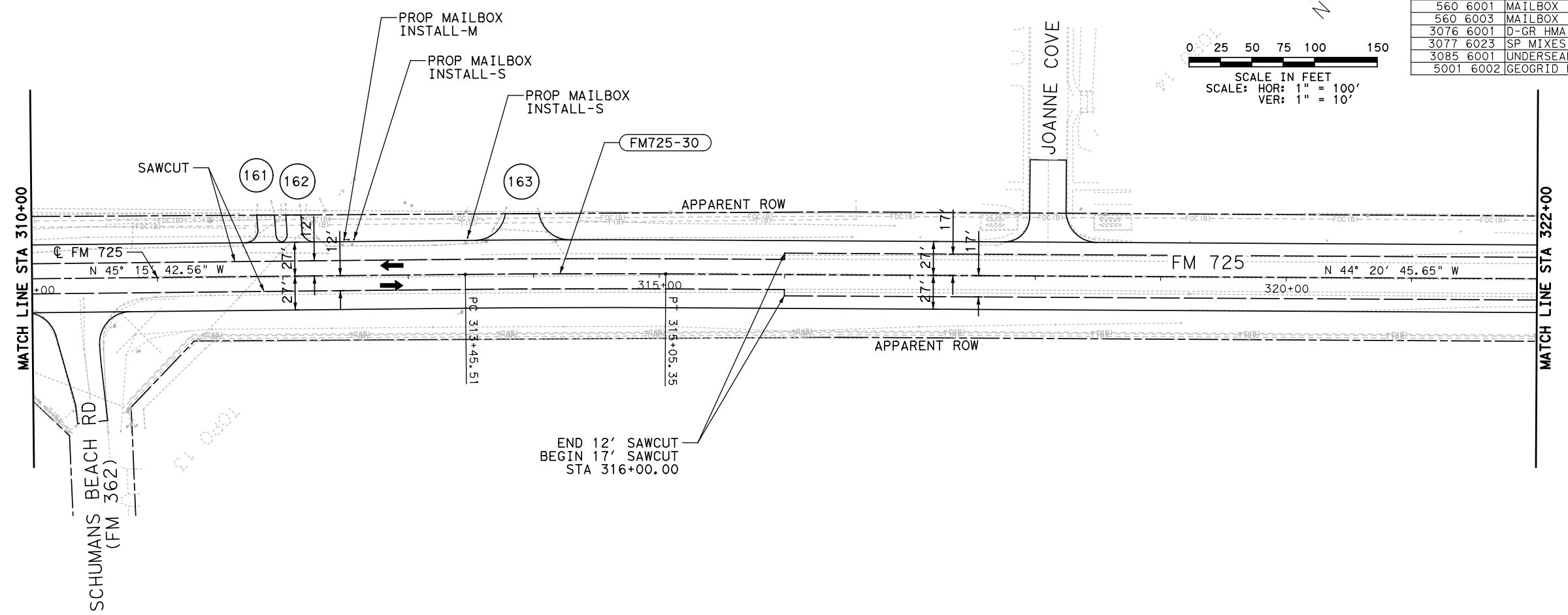
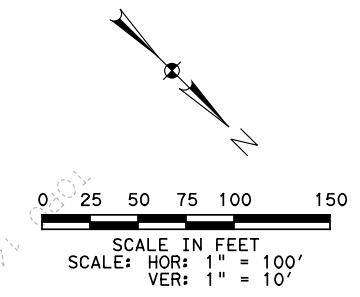
PLAN AND PROFILE

SCALE: 1"=100'H, 1"=10'V SHEET 25 OF 27

FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.		SHEET
6		SEE TITLE SHEET		131
STATE	DISTRICT	COUNTY		
TEXAS	SAT	GUADALUPE		
CONTROL	SECTION	JOB	HIGHWAY NO.	
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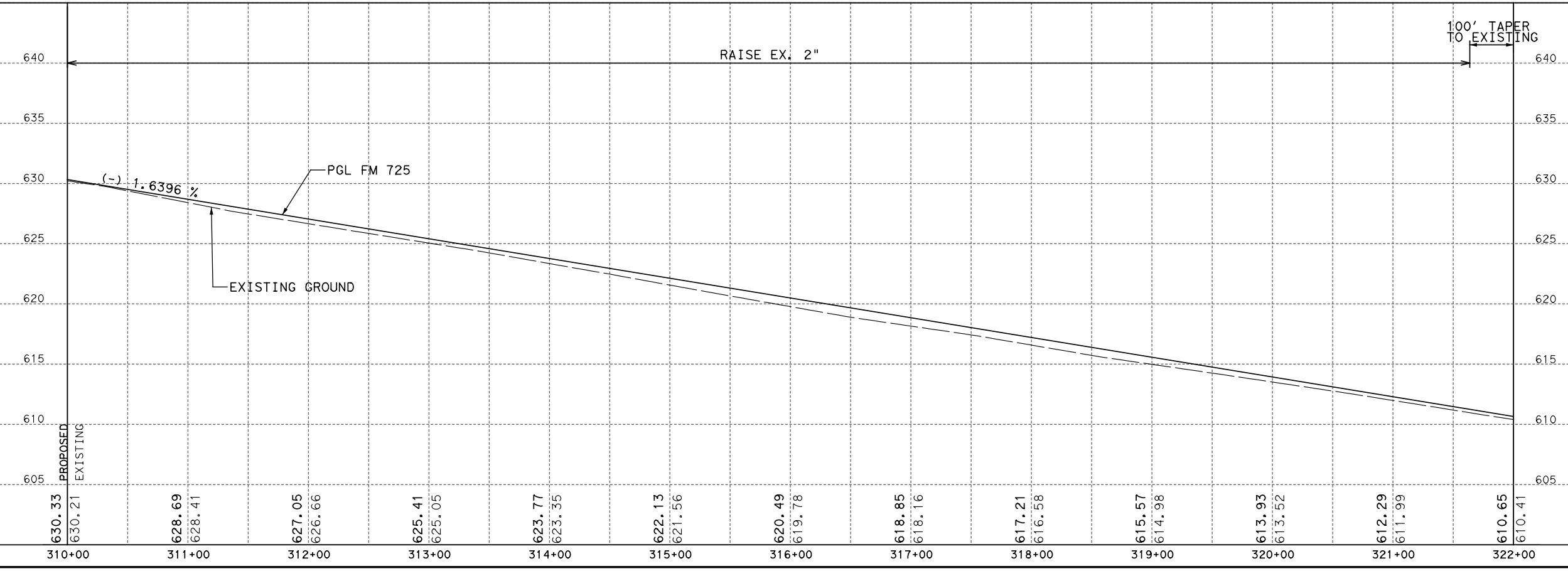
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ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	12
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1007
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	906
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	1571
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	2297
560 6001	MAILBOX INSTALL-S (TWG-POST) TY 1	EA	2
560 6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA	1
3076 6001	D-GR HMA TY-B PG64-22	TON	938
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	834
3085 6001	UNDERSEAL COURSE	GAL	1458
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	3623



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- SAWCUT LINE
- CONCRETE RIPRAP
- METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- T --- EXIST TELEPHONE LINE
- FOC --- EXIST FIBER OPTIC LINE
- C --- EXIST CABLE TV LINE
- W --- EXIST WATER LINE
- WW --- EXIST WASTEWATER LINE
- G --- EXIST GAS LINE
- E --- EXIST UNDERGROUND ELECTRIC LINE
- OH --- EXIST OVERHEAD UTILITY LINE
- EXIST WATER US
- WETLANDS
- ➔ DITCH LINE



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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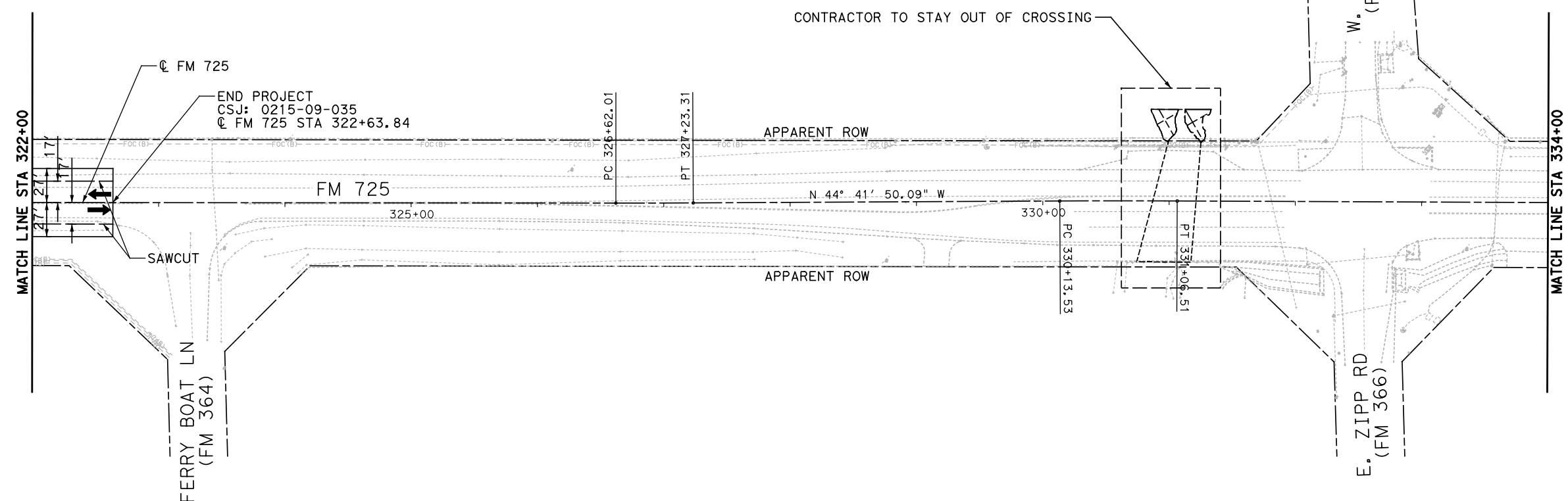
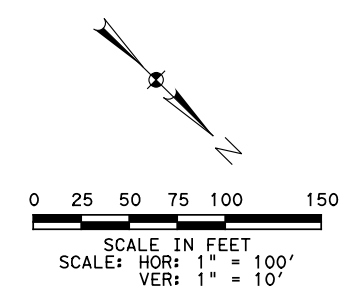
 PLAN AND PROFILE

SCALE: 1" = 100'H, 1" = 10'V SHEET 26 OF 27

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		132
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

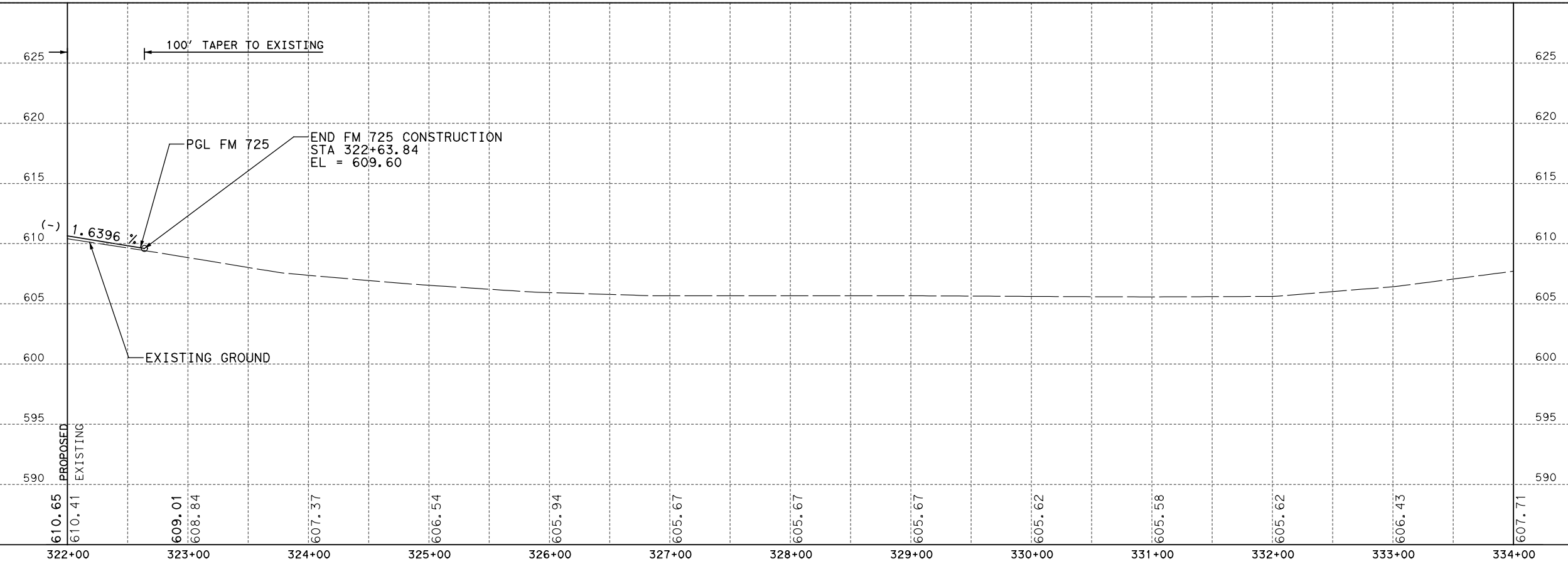
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	1
216 6001	PROOF ROLLING	HR	2
247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	48
310 6027	PRIME COAT (MC-30 OR AE-P)	GAL	43
351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	121
351 6019	FLEXIBLE PAVEMENT STRUCTURE REPAIR (3")	SY	121
3076 6001	D-GR HMA TY-B PG64-22	TON	44
3077 6023	SP MIXES SP-C SAC-B PG70-22	TON	80
3085 6001	UNDERSEAL COURSE	GAL	140
5001 6002	GEOGRID BASE REINFORCEMENT (TY II)	SY	171



LEGEND:

- EXIST ROW
- ➔ PROP DIRECTION OF TRAFFIC
- ➡ EXIST DIRECTION OF TRAFFIC
- - - SAWCUT LINE
- ▬ CONCRETE RIPRAP
- ▬ METAL BEAM GUARD FENCE
- (XX) DRIVEWAY NUMBER
- - - T - - - EXIST TELEPHONE LINE
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- - - G - - - EXIST GAS LINE
- - - E - - - EXIST UNDERGROUND ELECTRIC LINE
- - - OH - - - EXIST OVERHEAD UTILITY LINE
- - - EXIST WATER US
- ▬ WETLANDS
- ➔ DITCH LINE



4/29/2021

JOHNNY L. CLAYTON
107215

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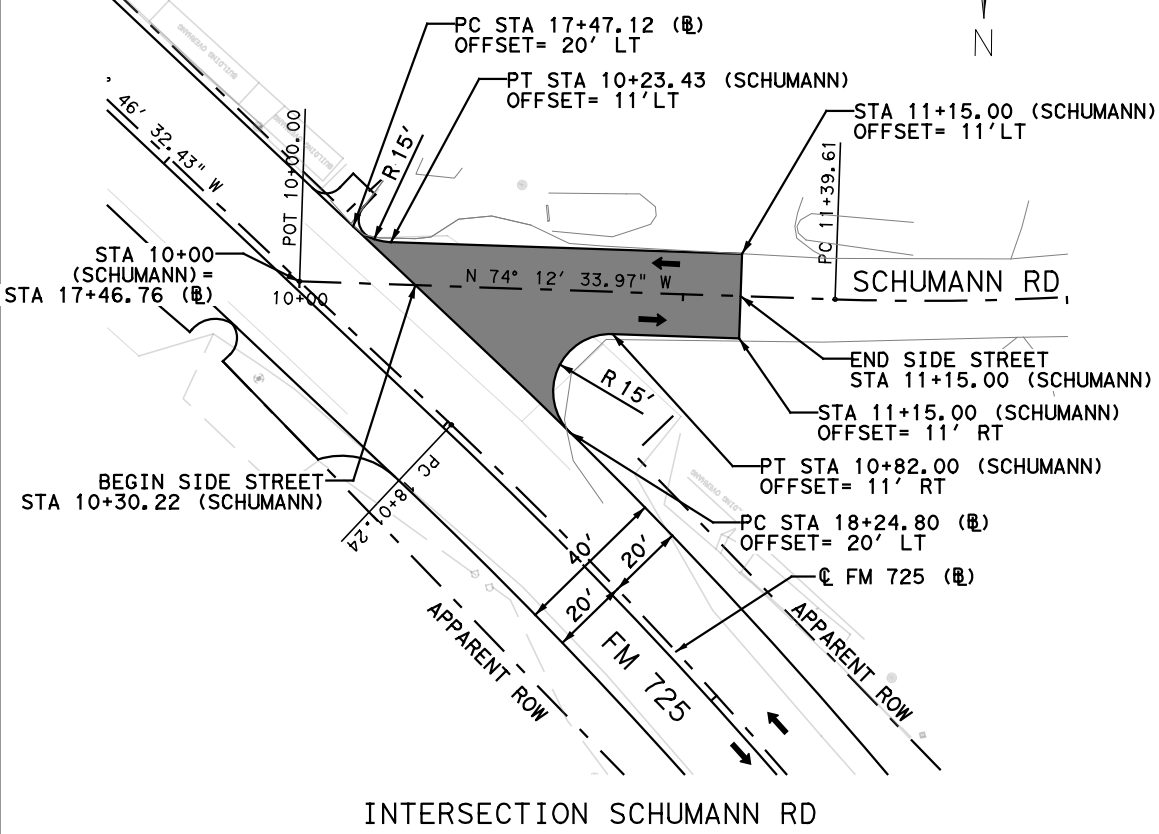
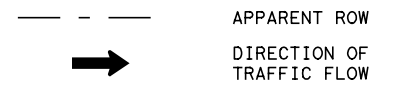
PLAN AND PROFILE

SCALE: 1" = 100' H, 1" = 10' V SHEET 27 OF 27

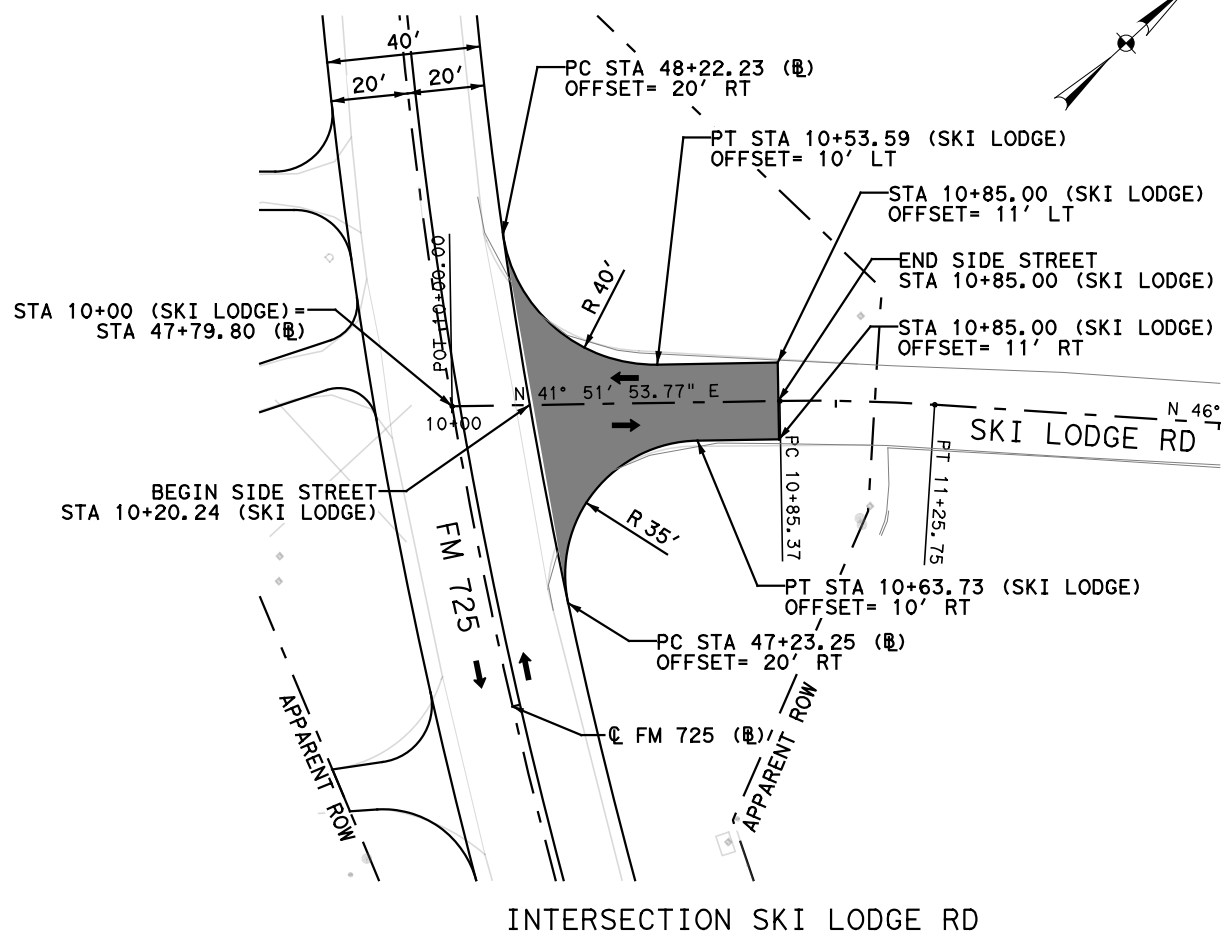
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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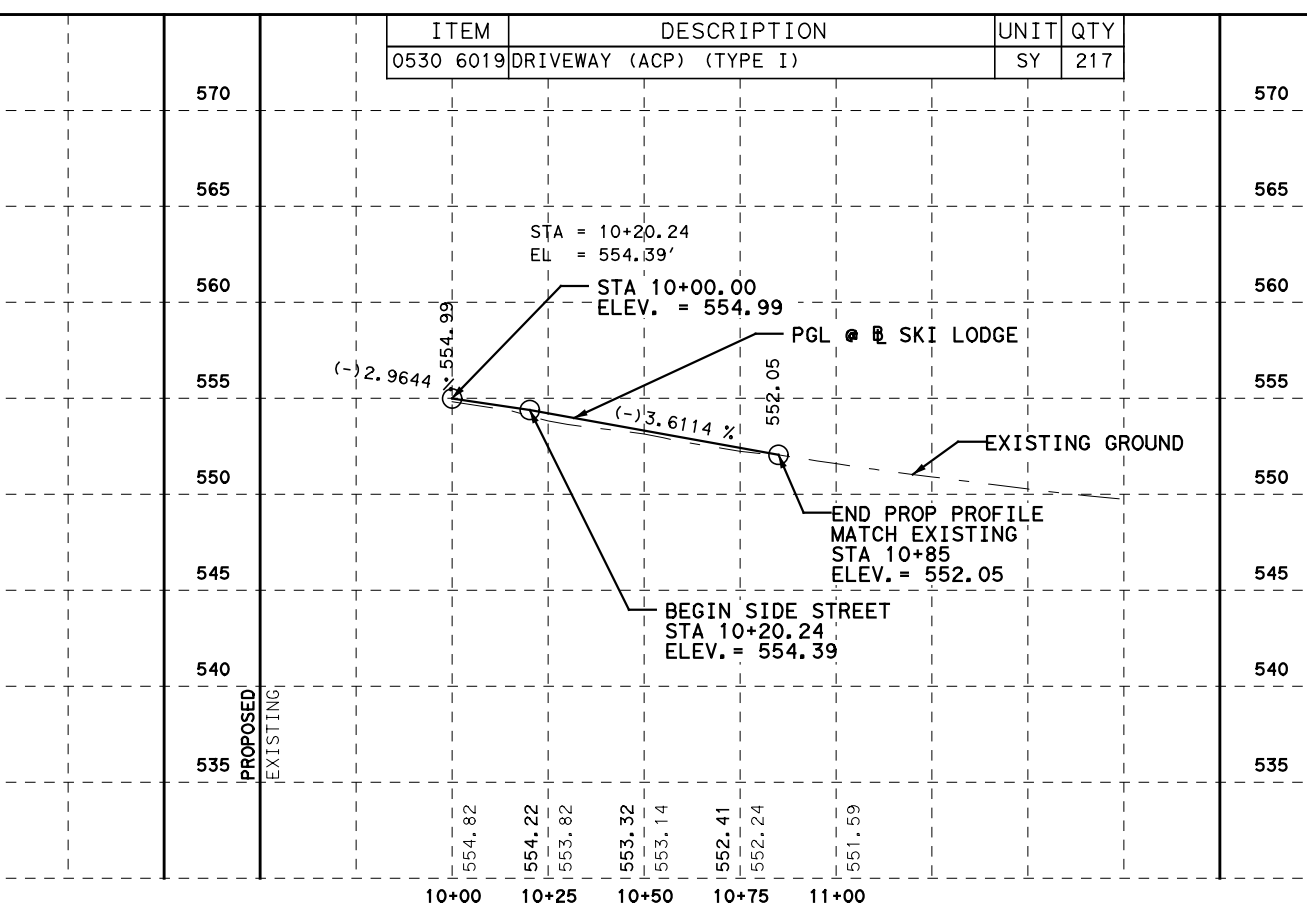
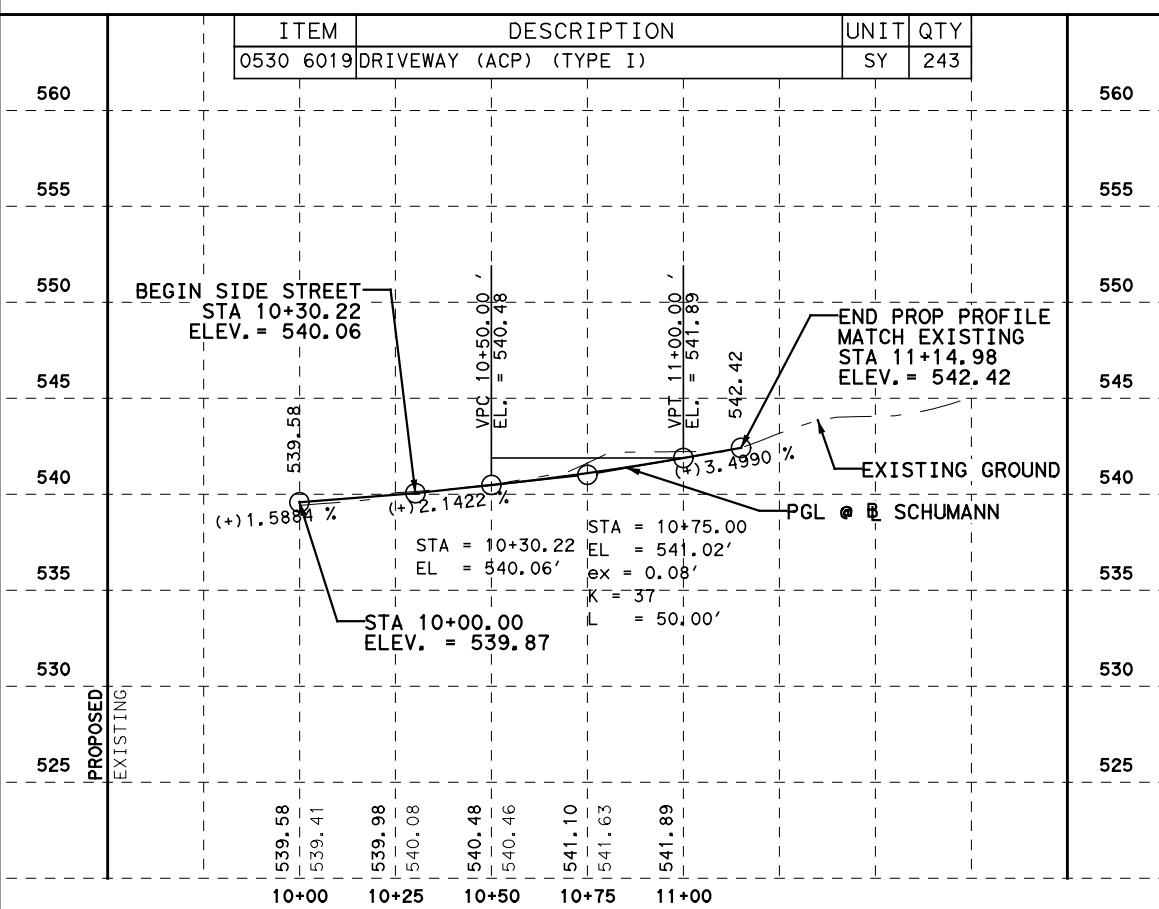
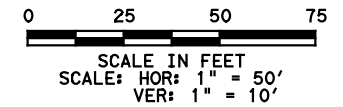
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INTERSECTION SCHUMANN RD



INTERSECTION SKI LODGE RD



4/28/2021

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 SAN ANTONIO, TEXAS 78216
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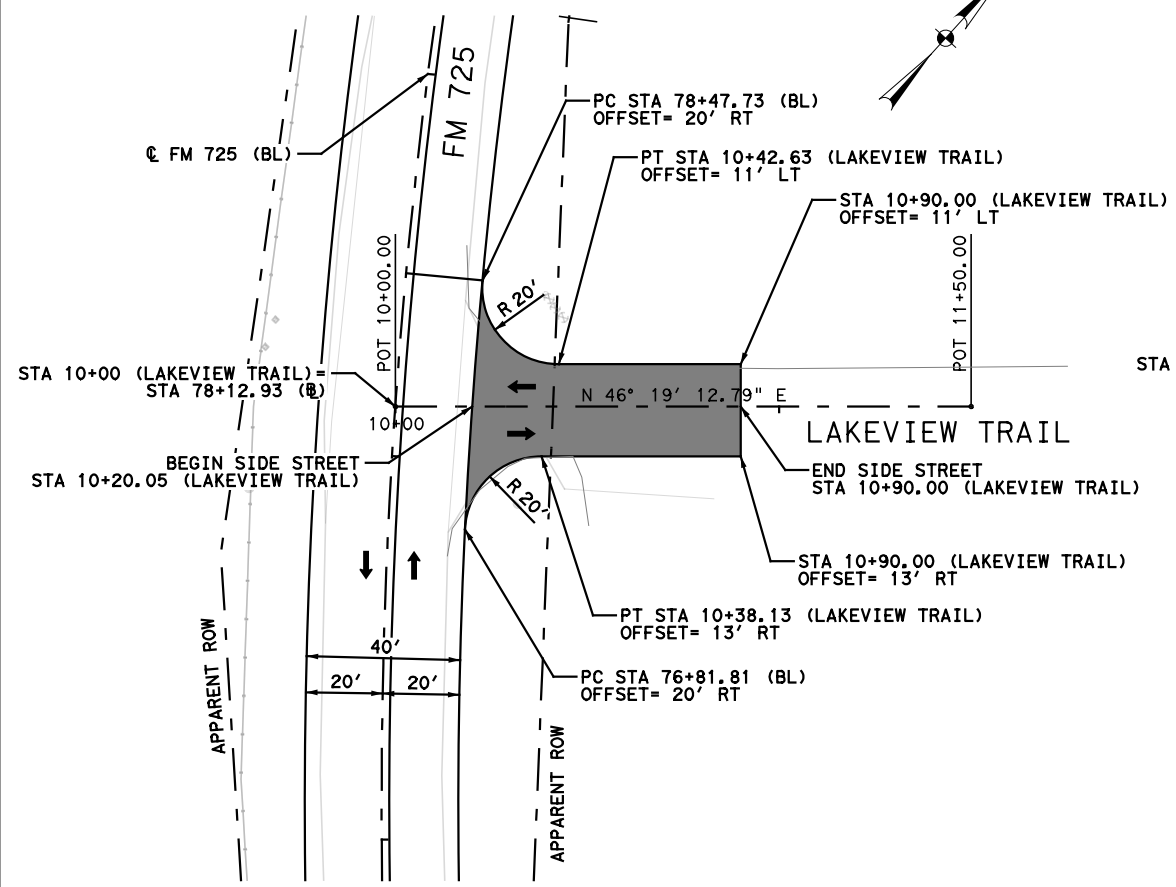
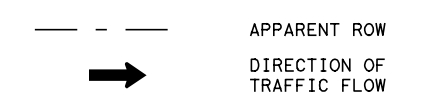
FM 725
 INTERSECTING STREET
 PLAN & PROFILE

SHEET 1 OF 11

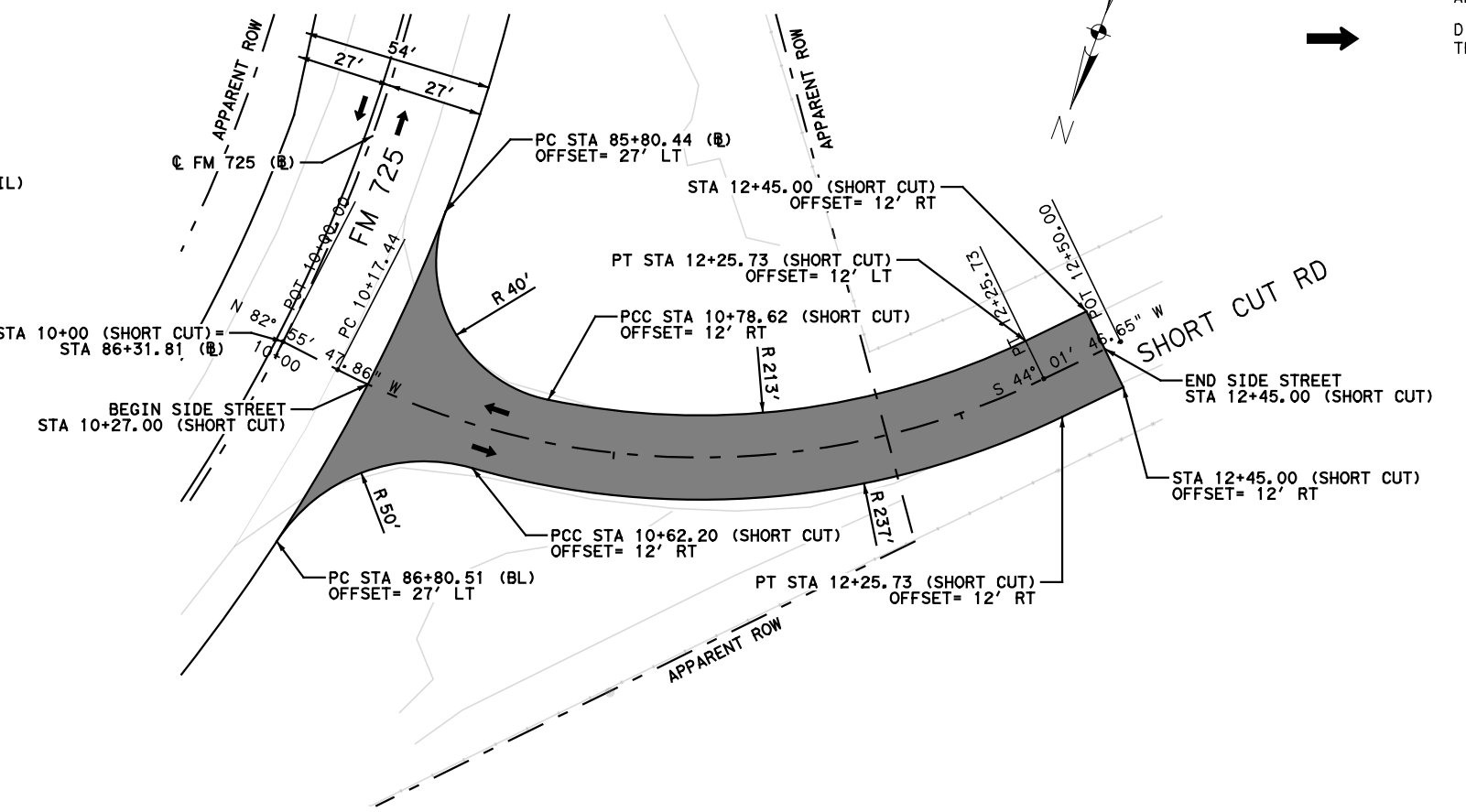
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6	See Title Sheet	134	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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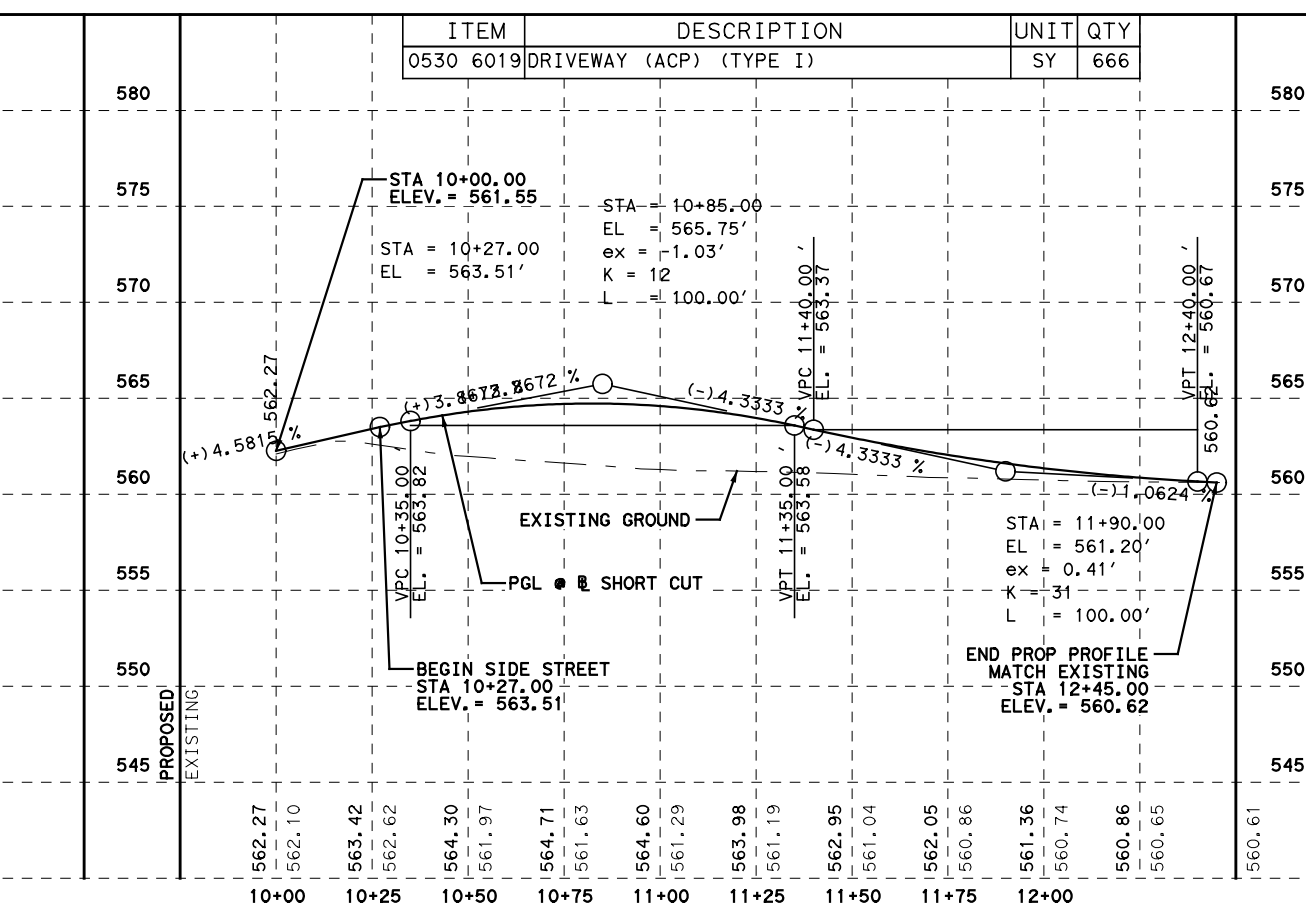
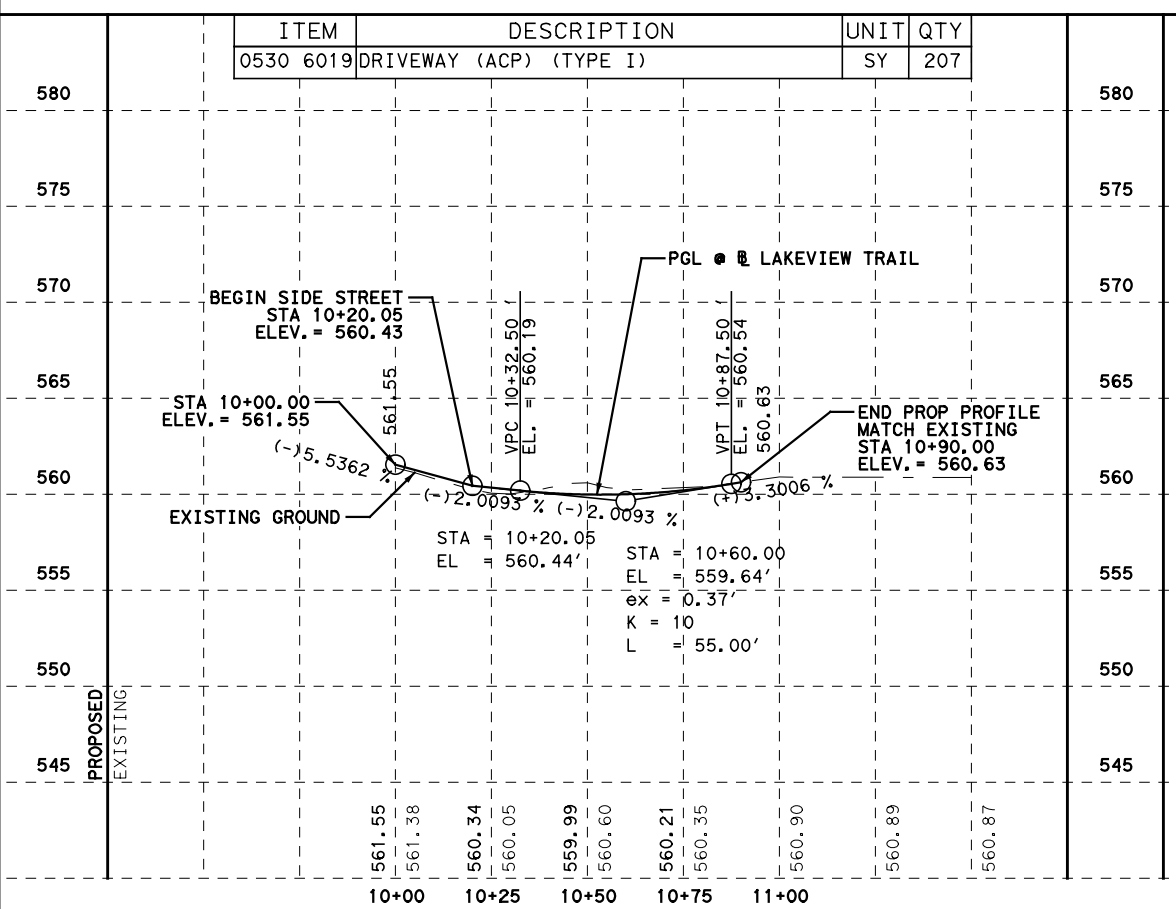
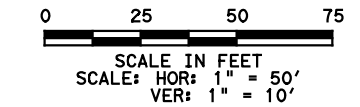
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INTERSECTION LAKEVIEW TRAIL (CR 352)



INTERSECTION SHORT CUT RD



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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SAN ANTONIO, TEXAS 78216
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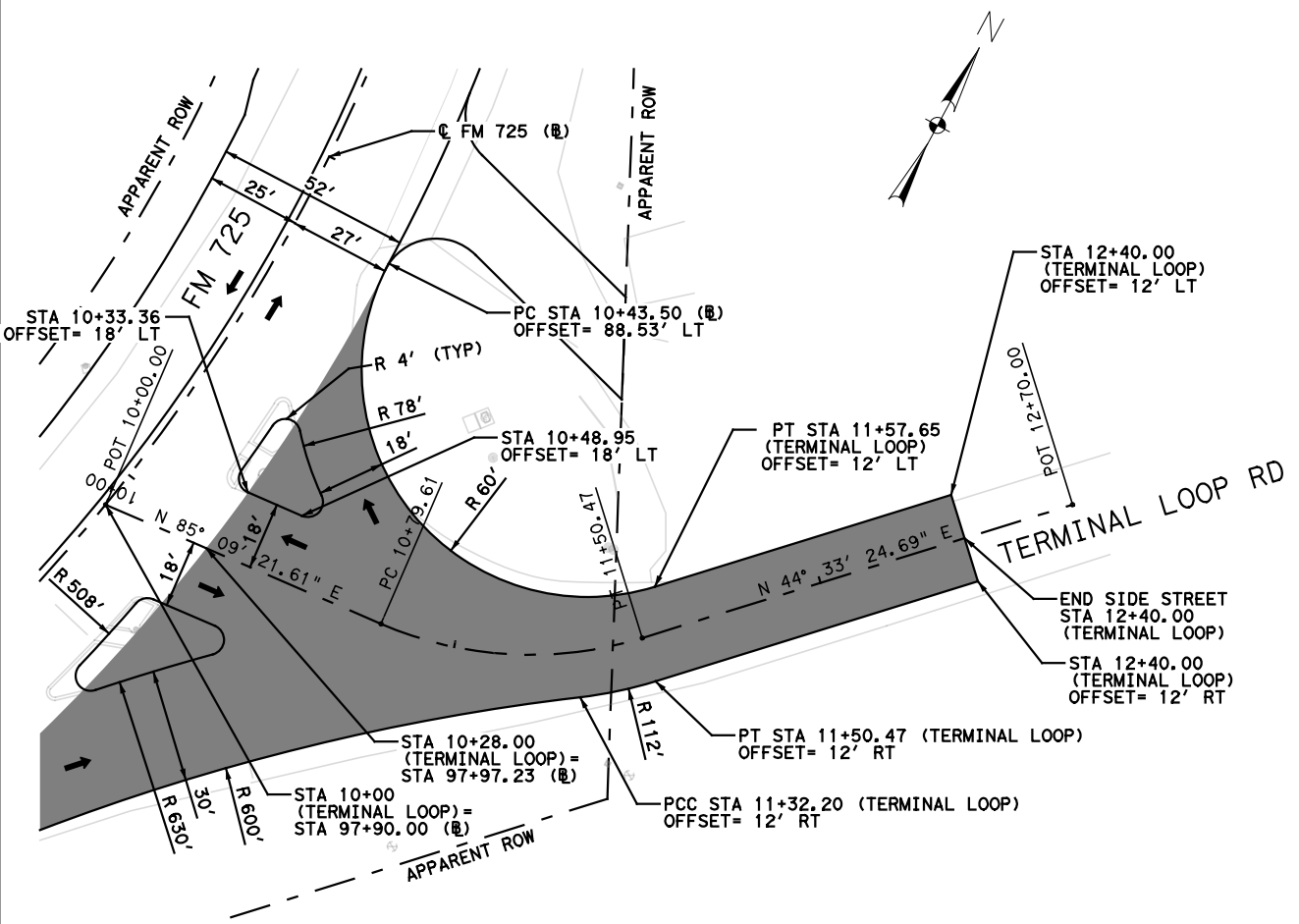
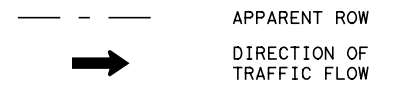
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INTERSECTING STREETS
PLAN AND PROFILE**

SHEET 2 OF 11

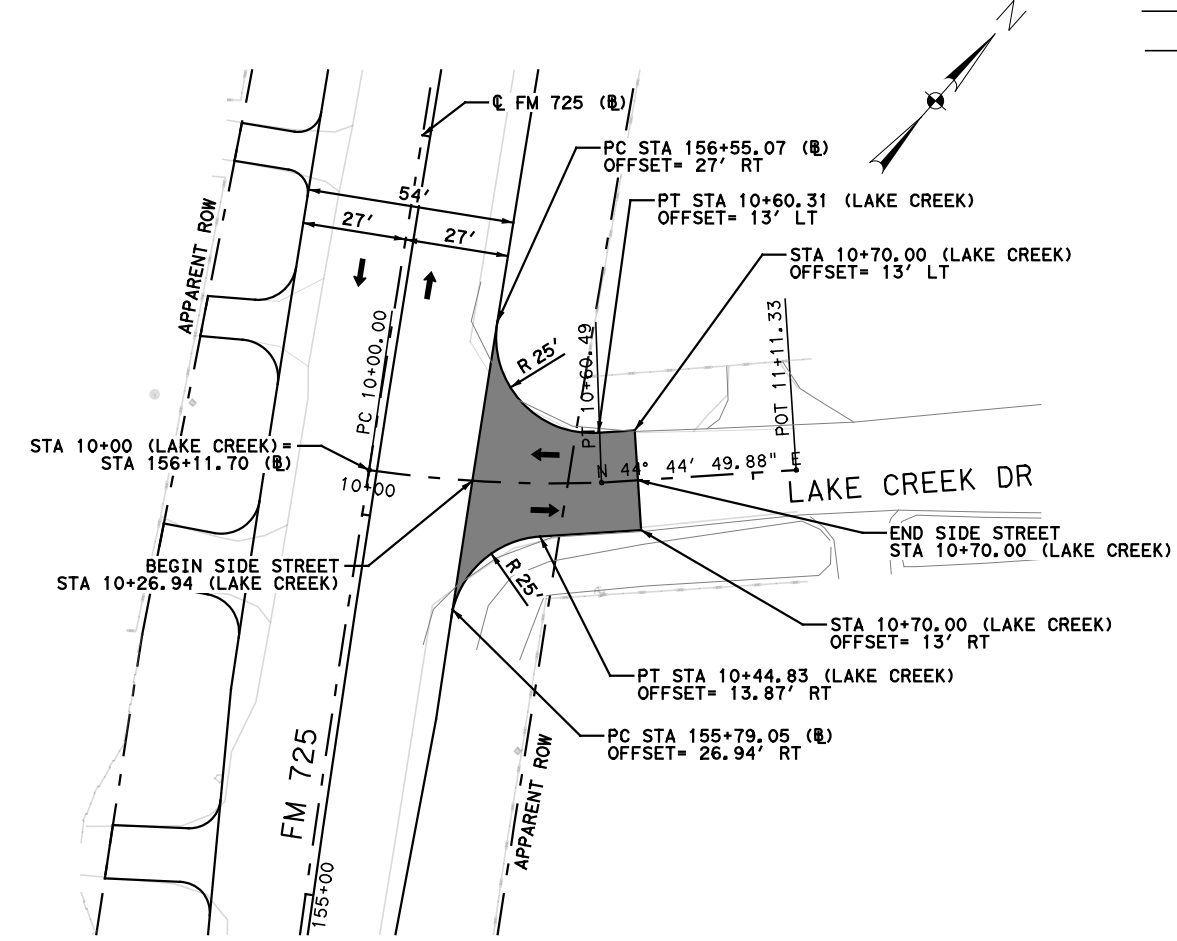
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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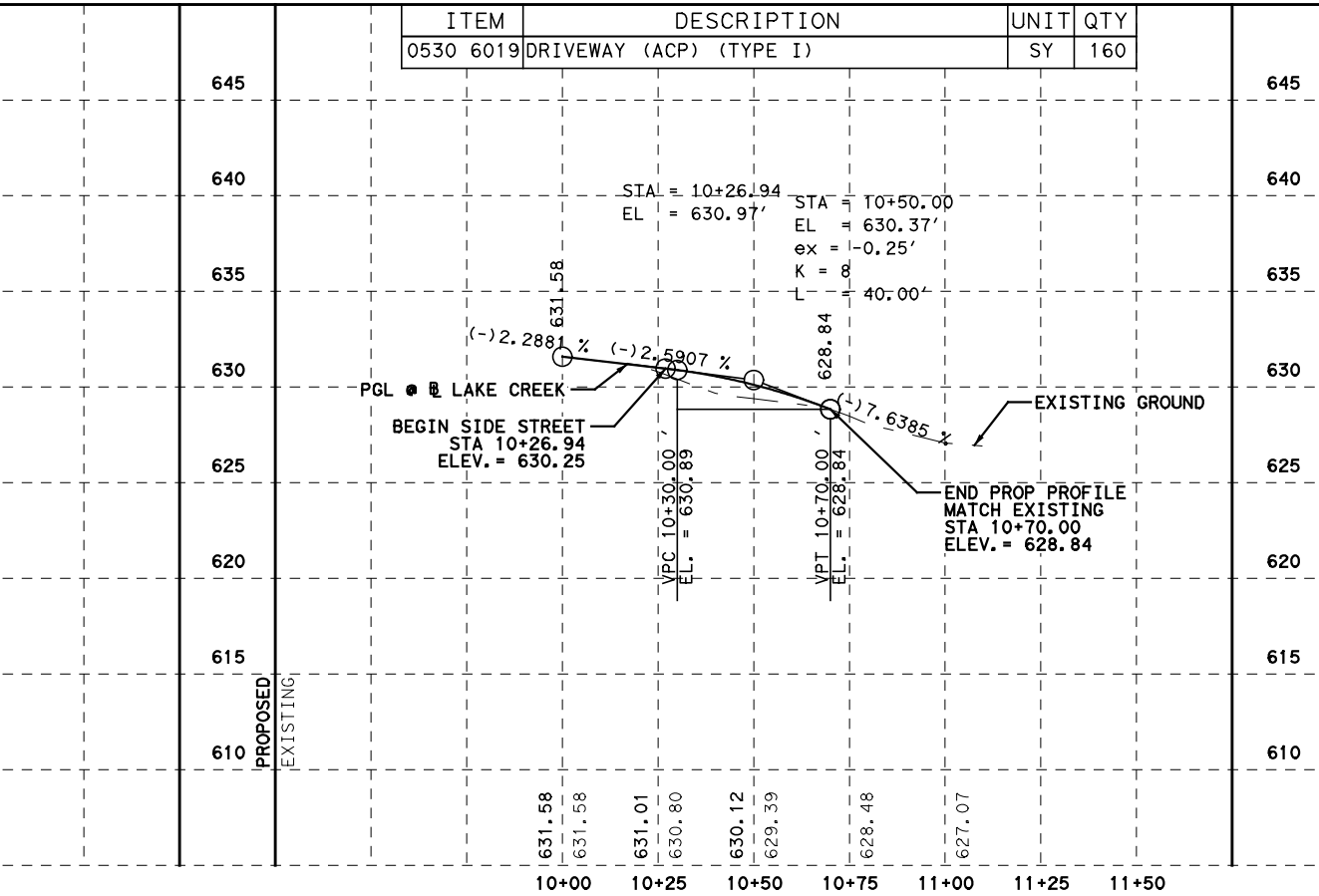
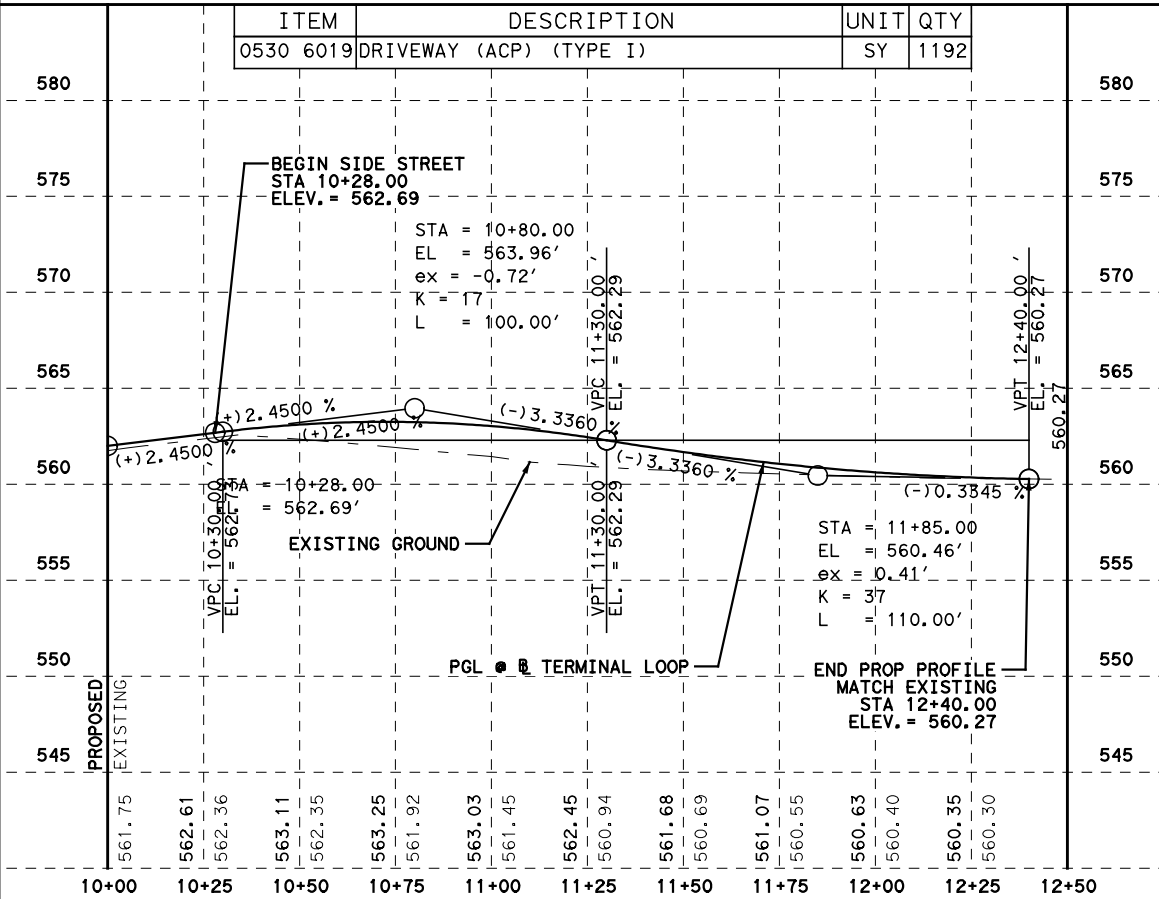
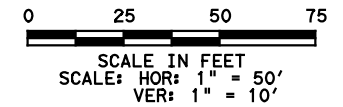
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INTERSECTION TERMINAL LOOP RD



INTERSECTION LAKE CREEK DR



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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HALFF 100 NE INTERSTATE 410 LOOP
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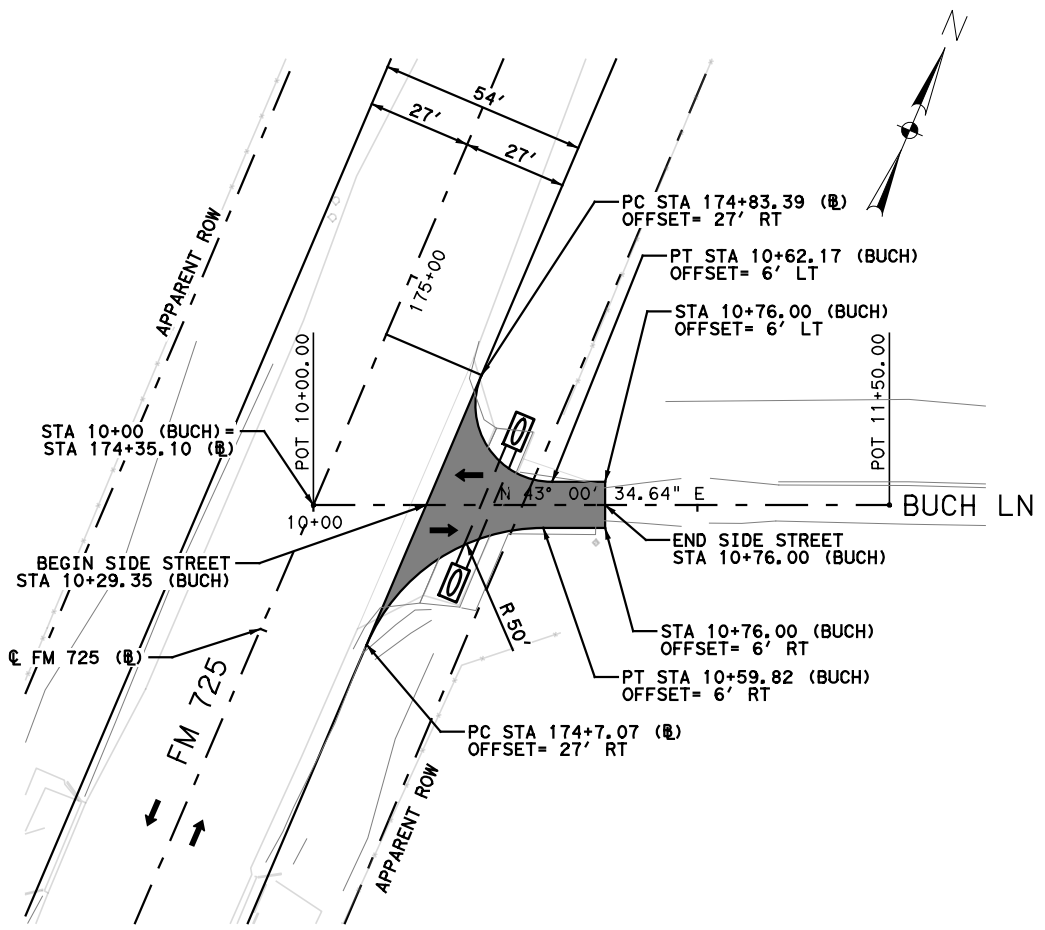
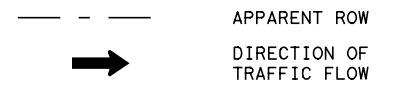
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INTERSECTING STREET
PLAN & PROFILE**

SHEET 3 OF 11

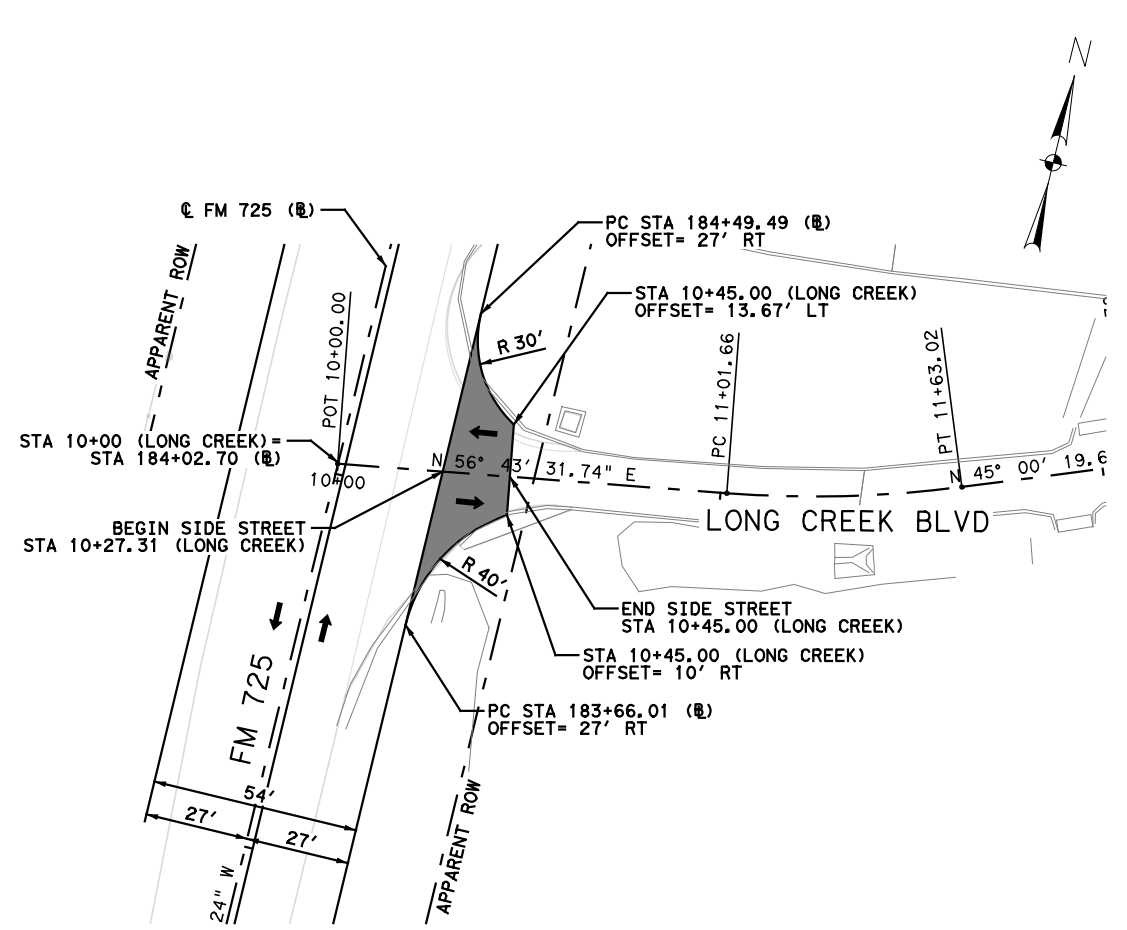
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TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
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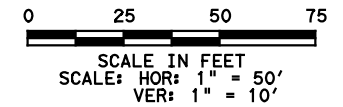
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INTERSECTION BUCH LN

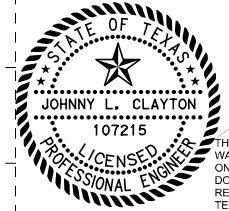
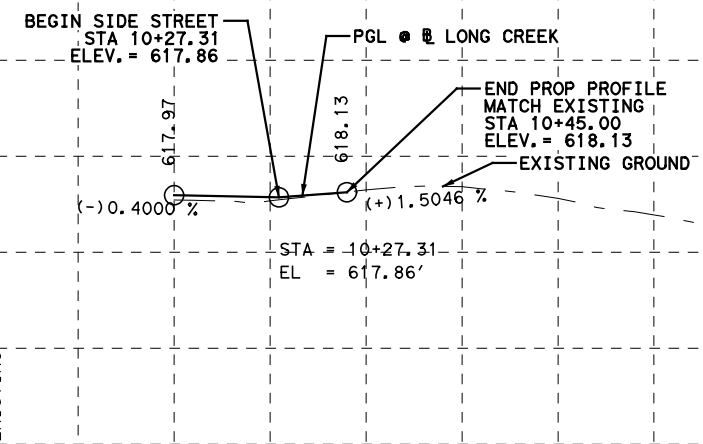
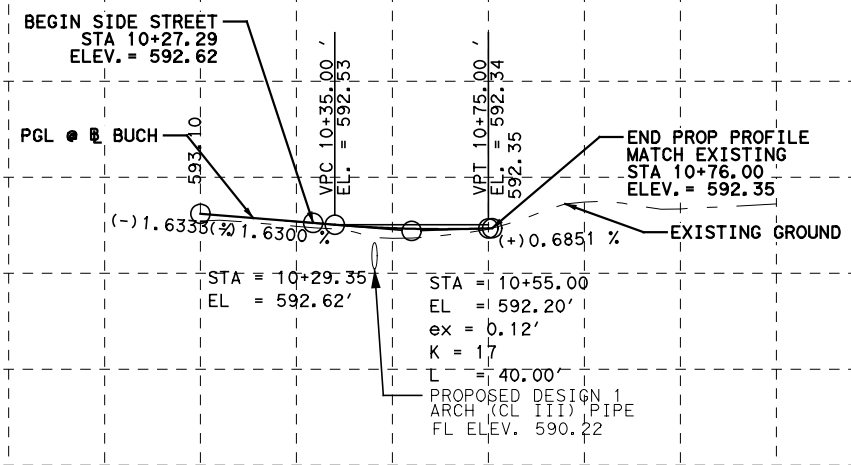


INTERSECTION LONG CREEK BLVD(1)



ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	107

ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	79



4/28/2021
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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

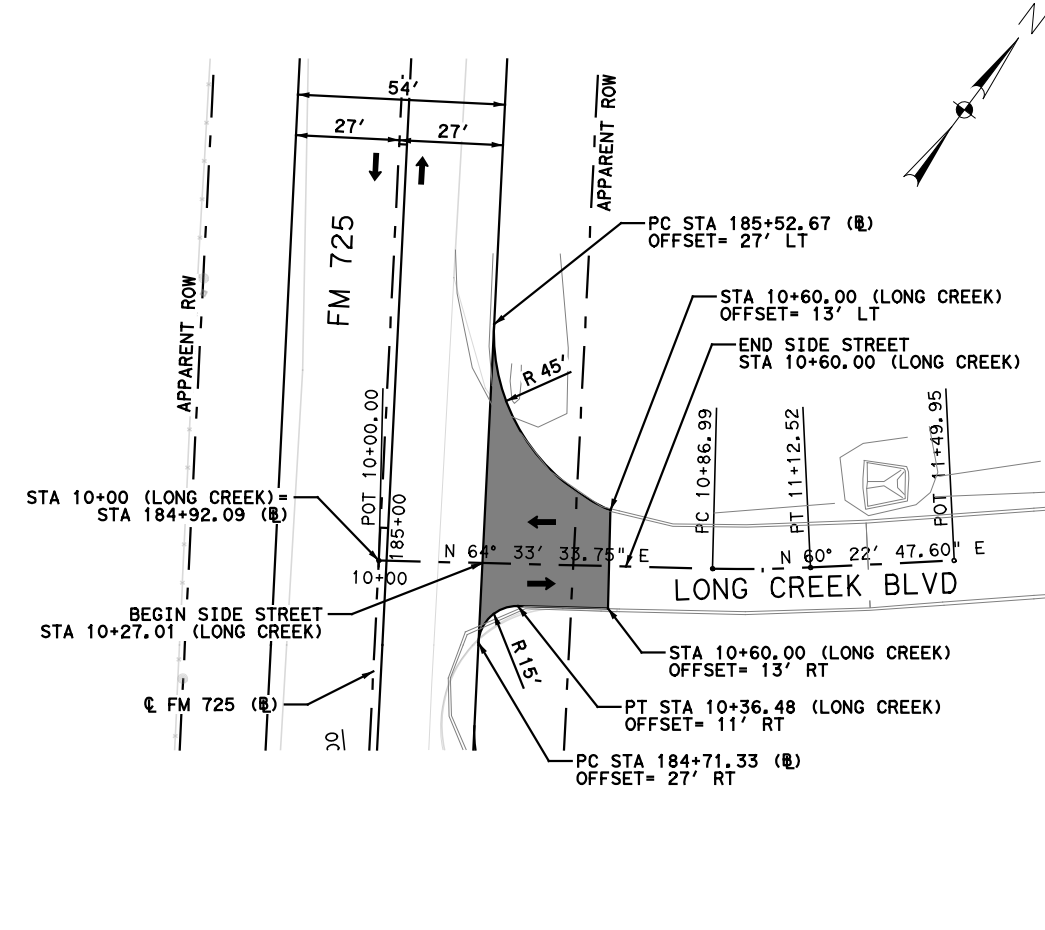
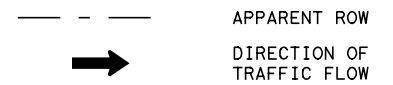


**FM 725
 INTERSECTING STREET
 PLAN & PROFILE**

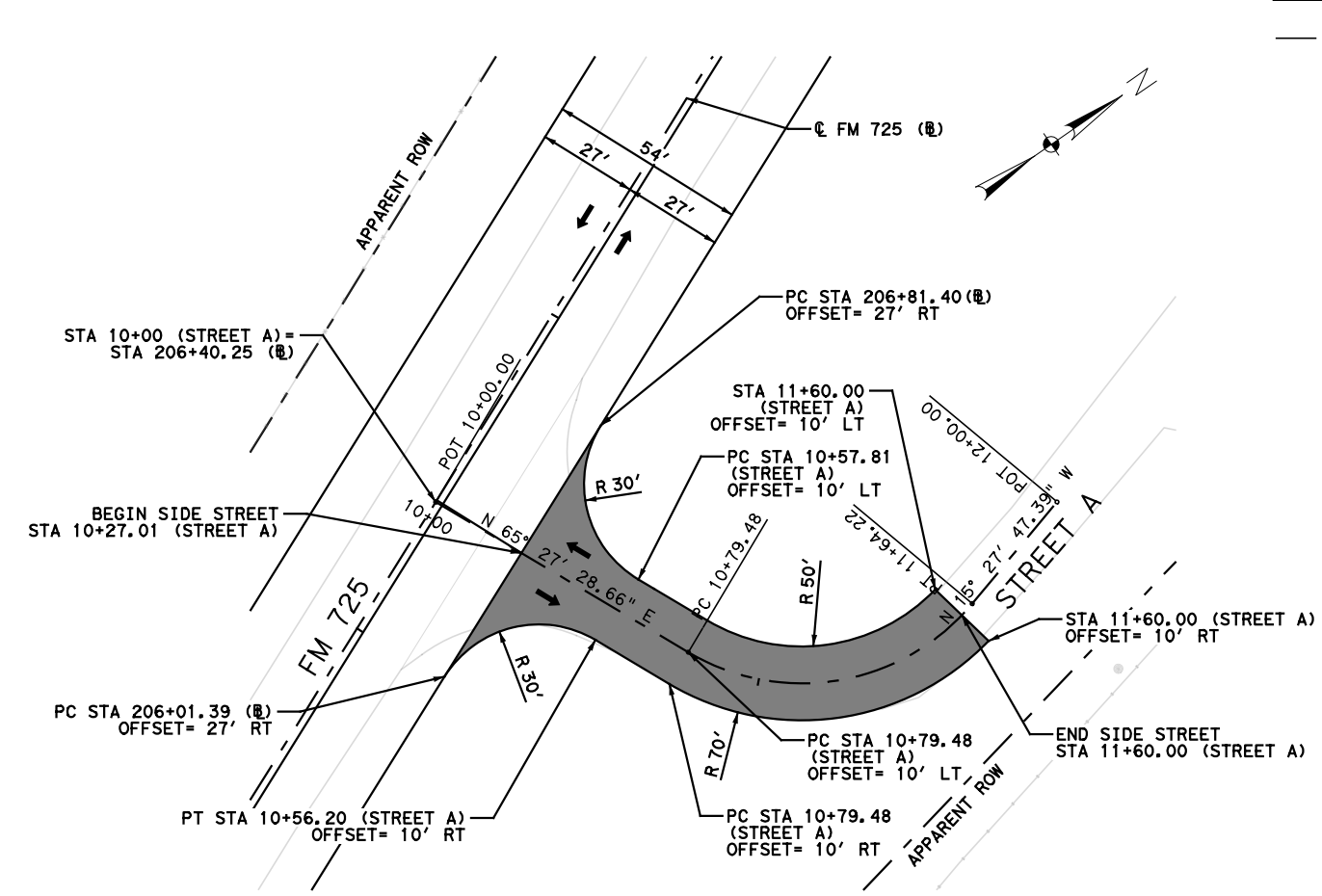
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FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 137
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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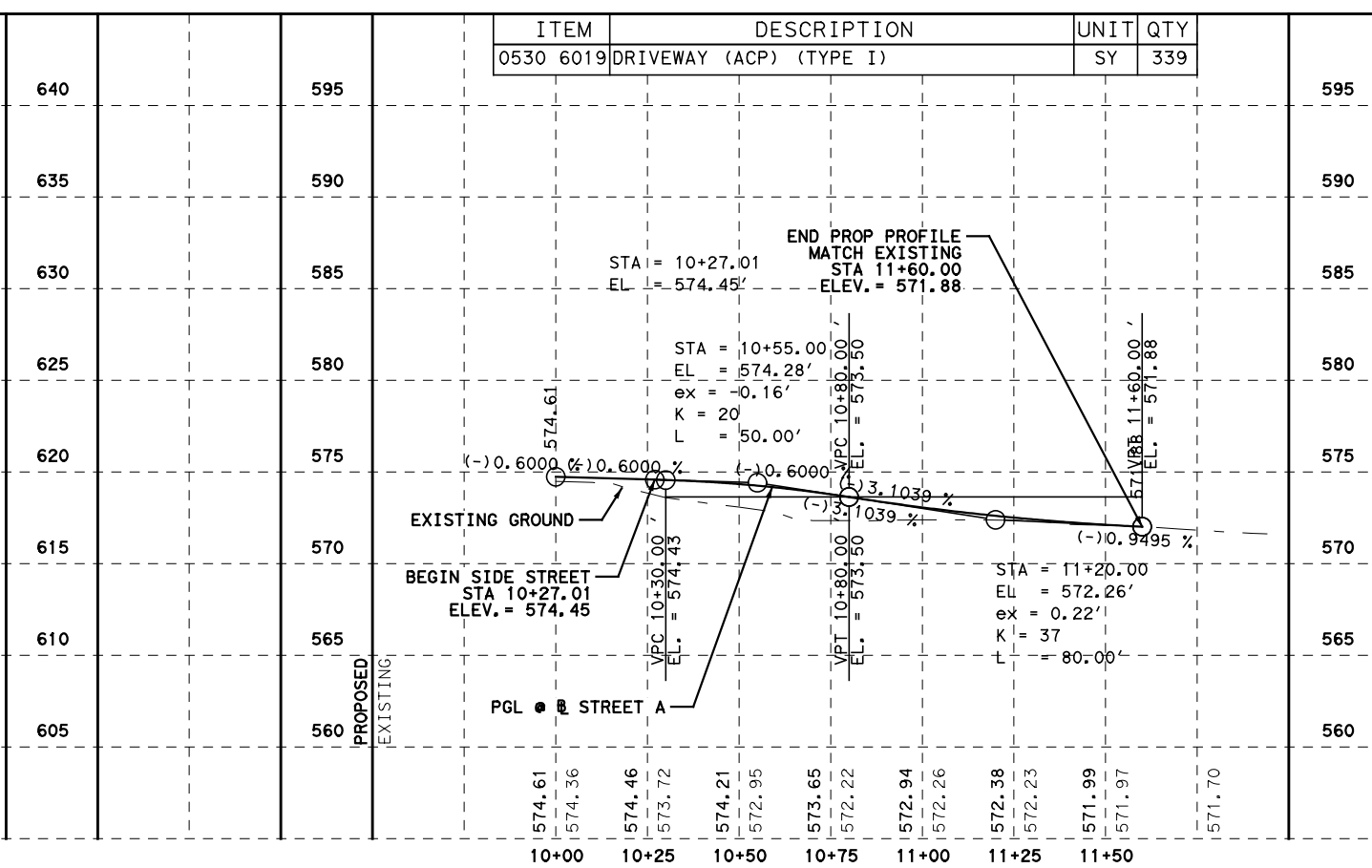
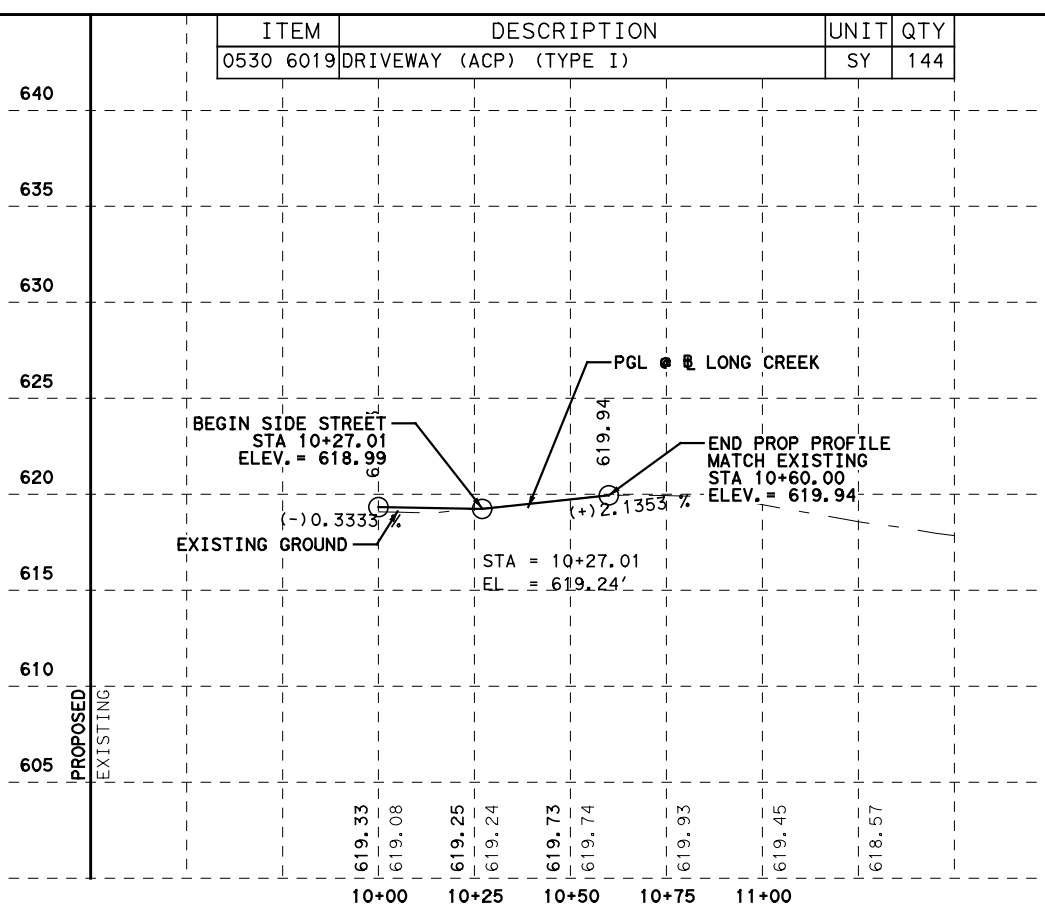
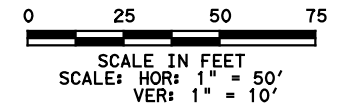
LEGEND



INTERSECTION LONG CREEK BLVD(2)



INTERSECTION STREET A SOUTH



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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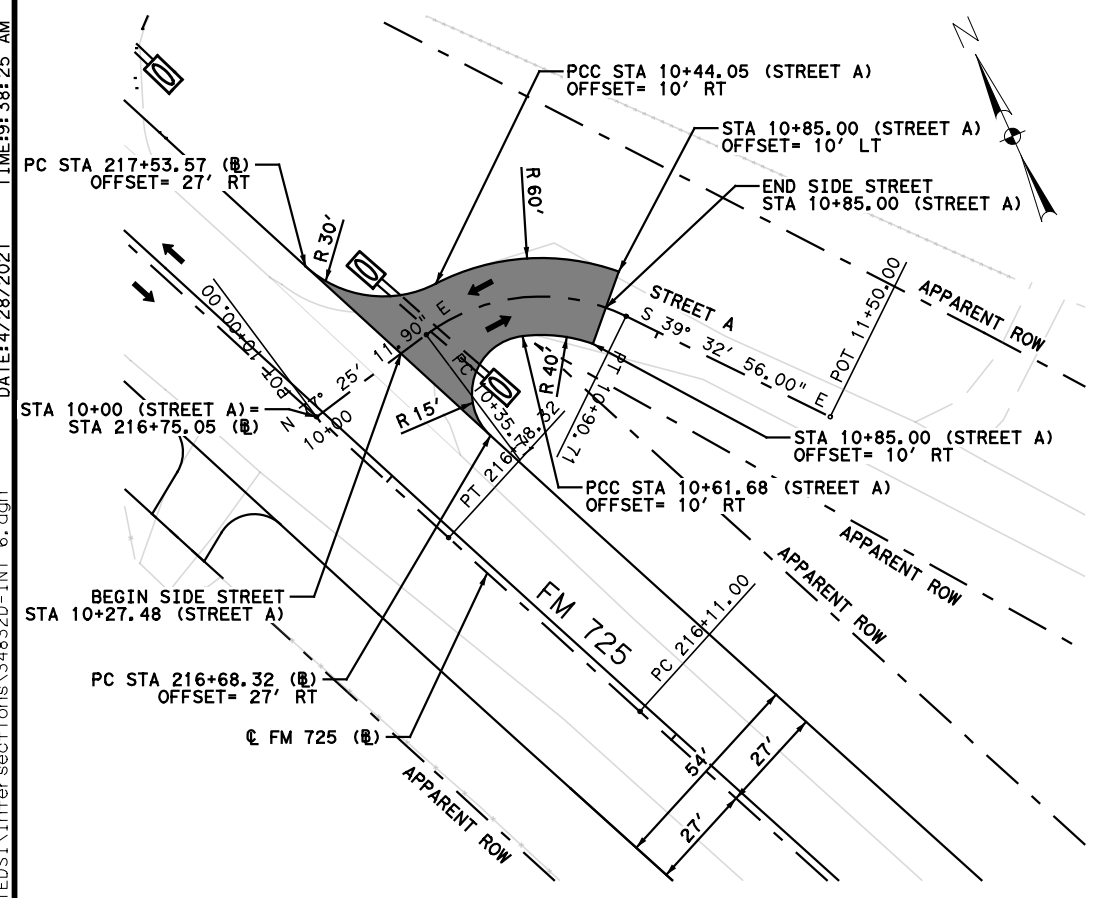
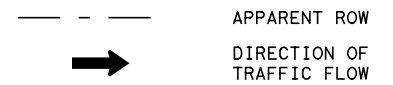
**FM 725
INTERSECTING STREET
PLAN & PROFILE**

SHEET 5 OF 11

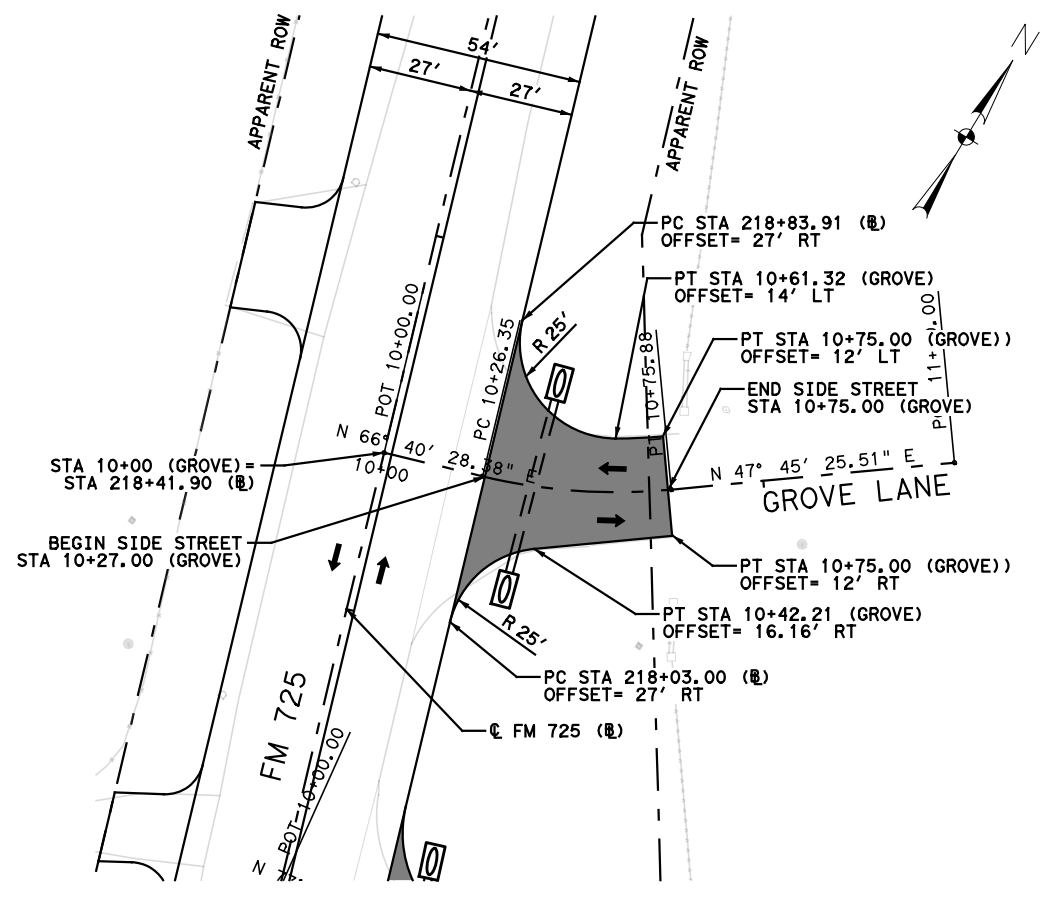
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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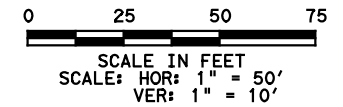
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INTERSECTION STREET A NORTH

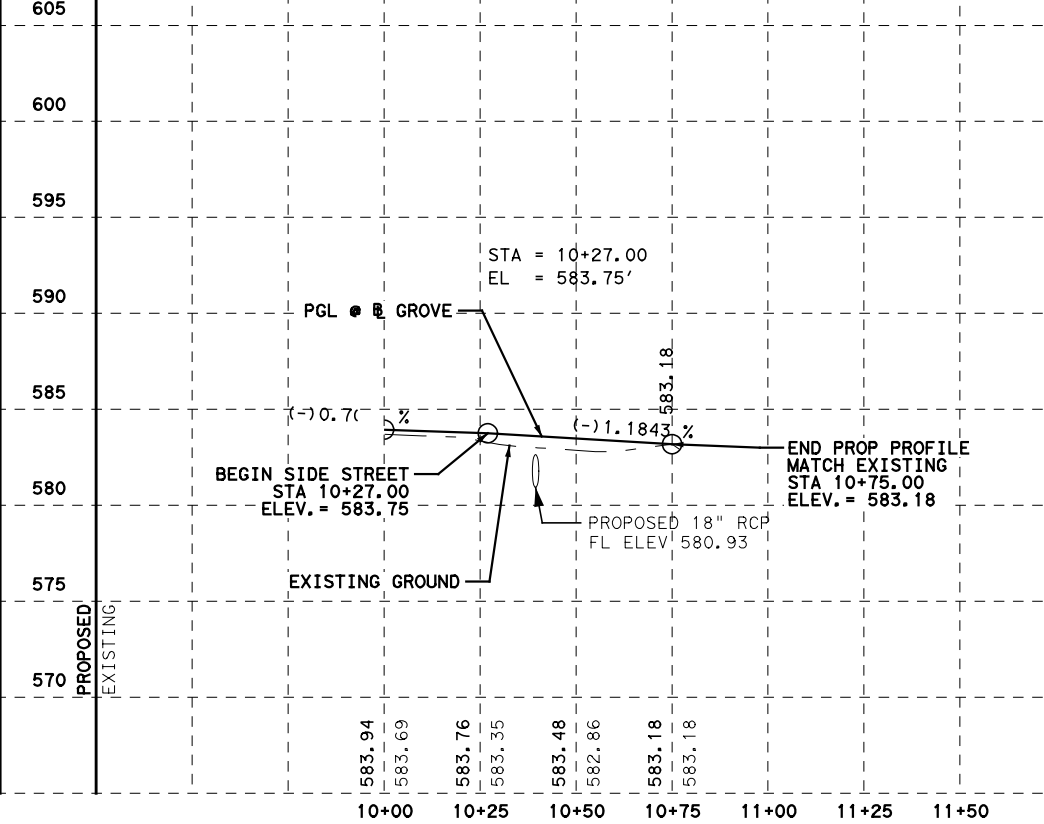
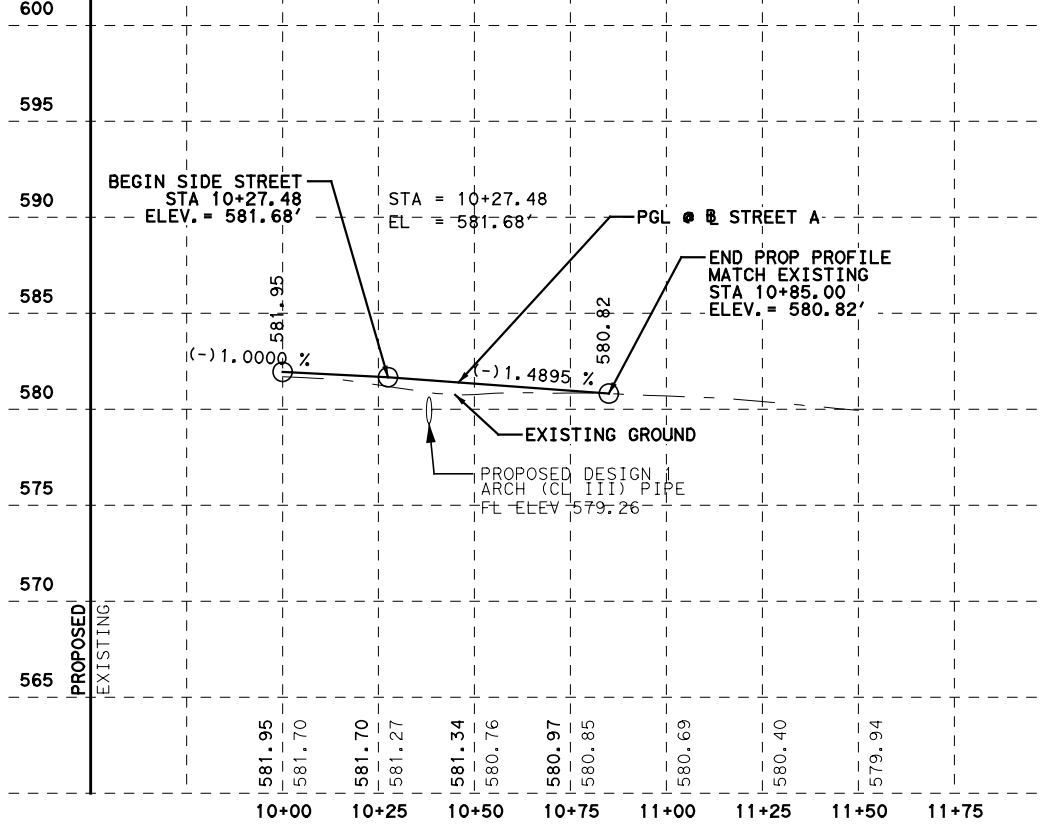


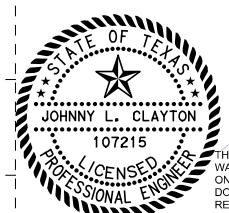
INTERSECTION GROVE LN



ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	154

ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	183





4/28/2021

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NO.	REVISION	BY	DATE

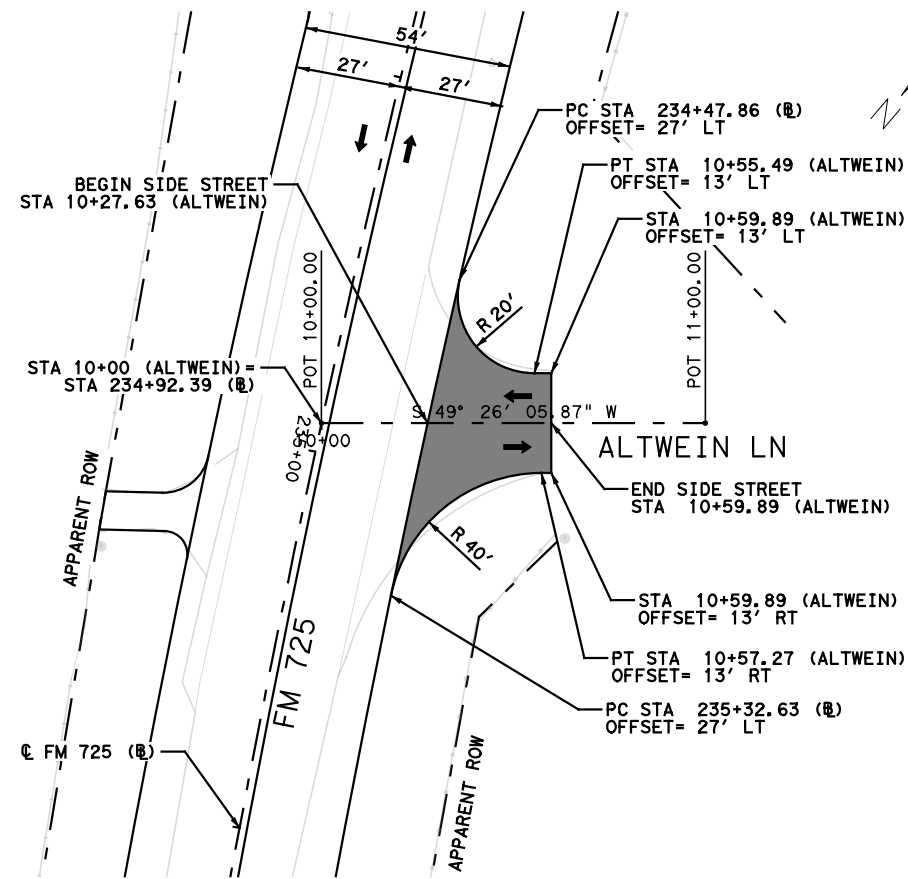
HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
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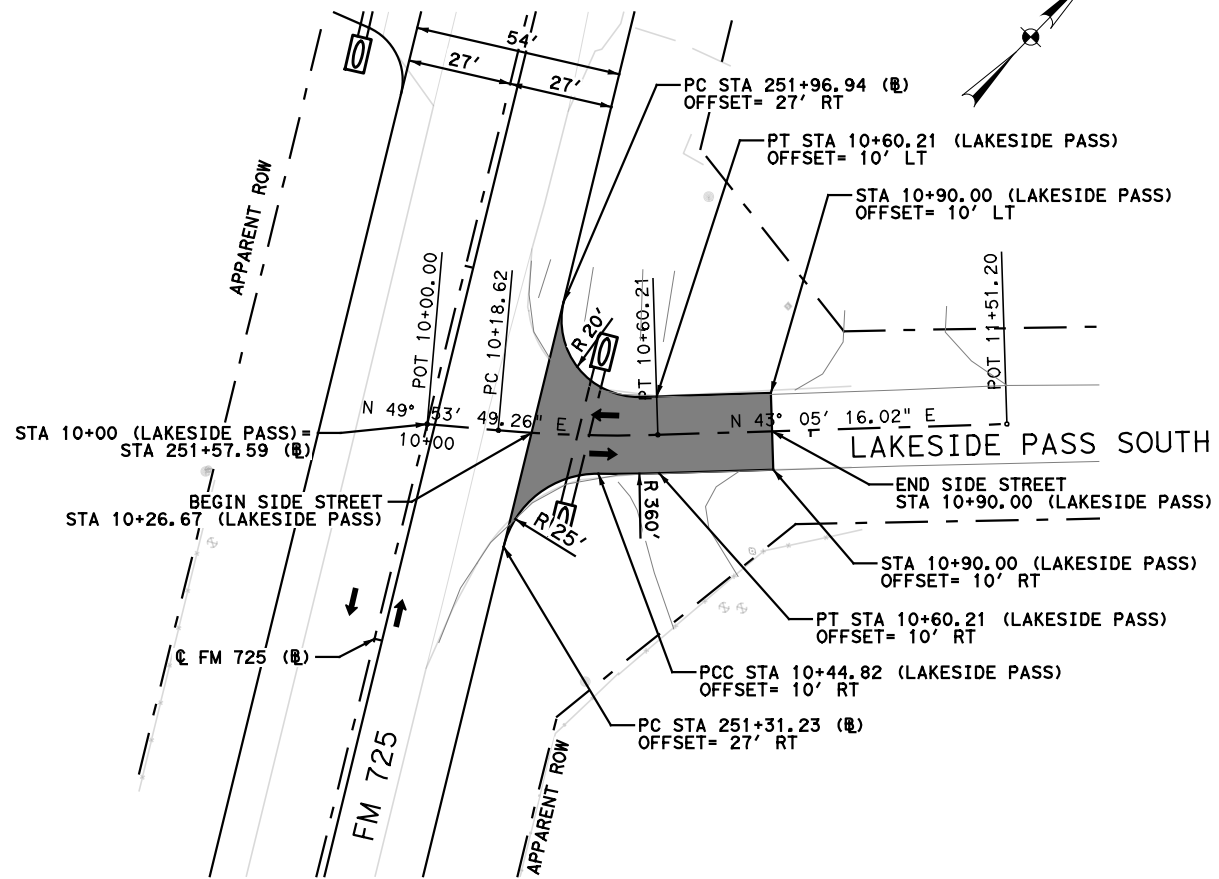
**FM 725
INTERSECTING STREET
PLAN & PROFILE**

SHEET 6 OF 11		
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 139
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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INTERSECTION ALTWEIN LN

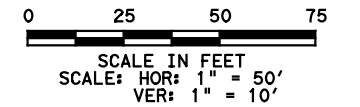


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LEGEND

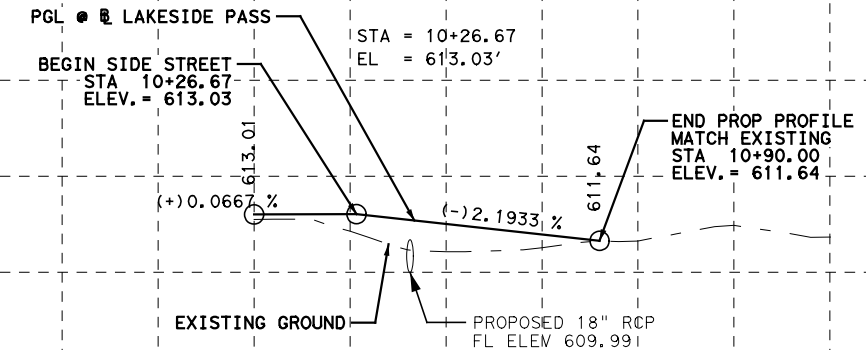
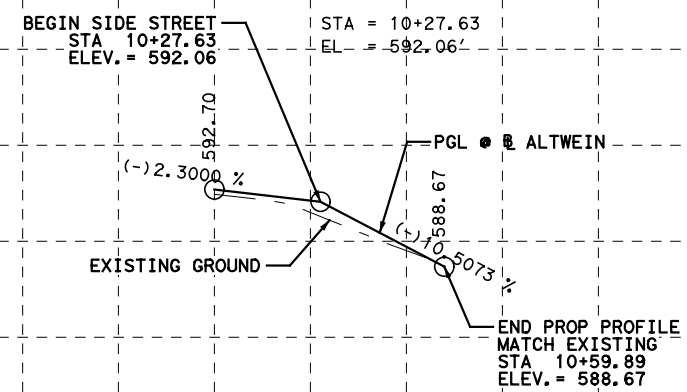
--- APPARENT ROW

→ DIRECTION OF TRAFFIC FLOW



ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	133

ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	165



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
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SAN ANTONIO, TEXAS 78216
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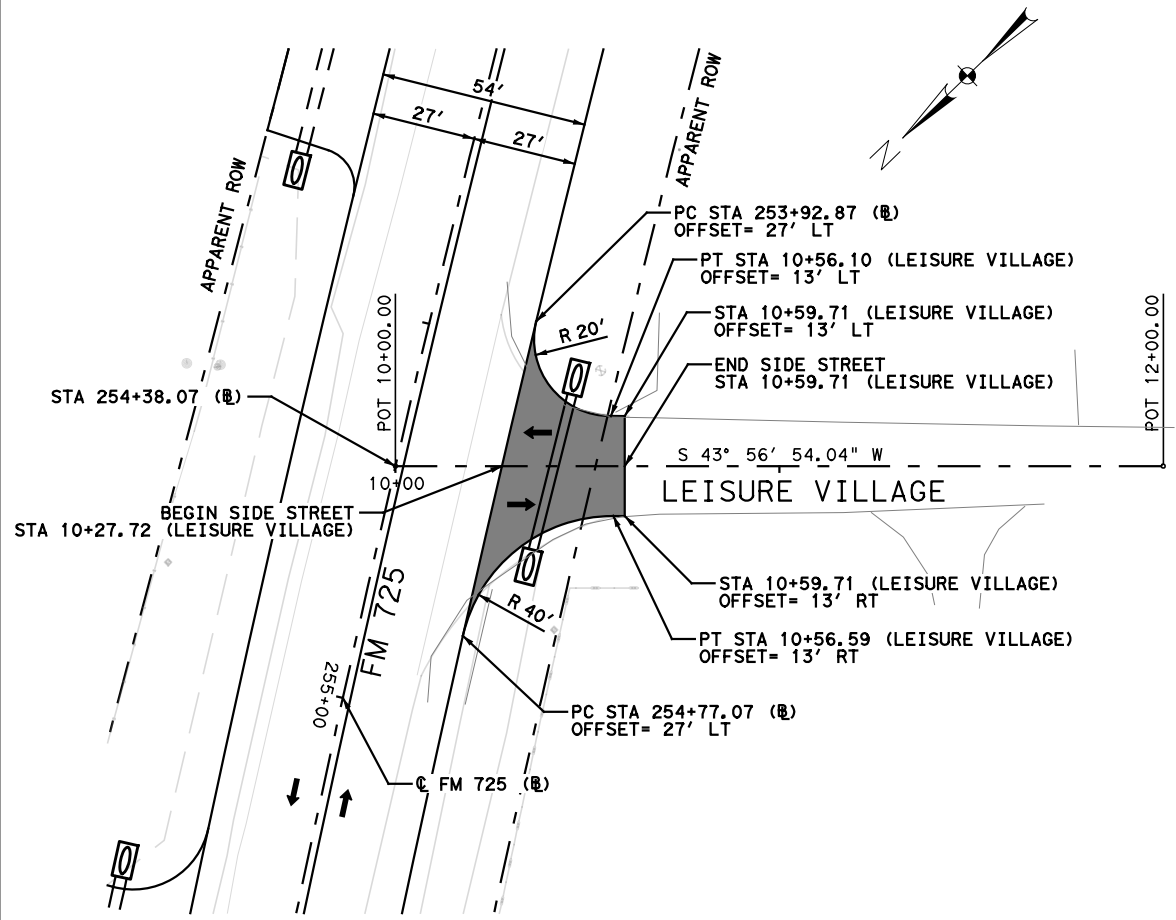
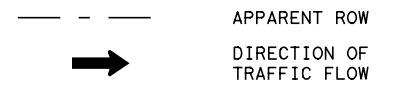
**FM 725
INTERSECTING STREET
PLAN & PROFILE**

SHEET 7 OF 11

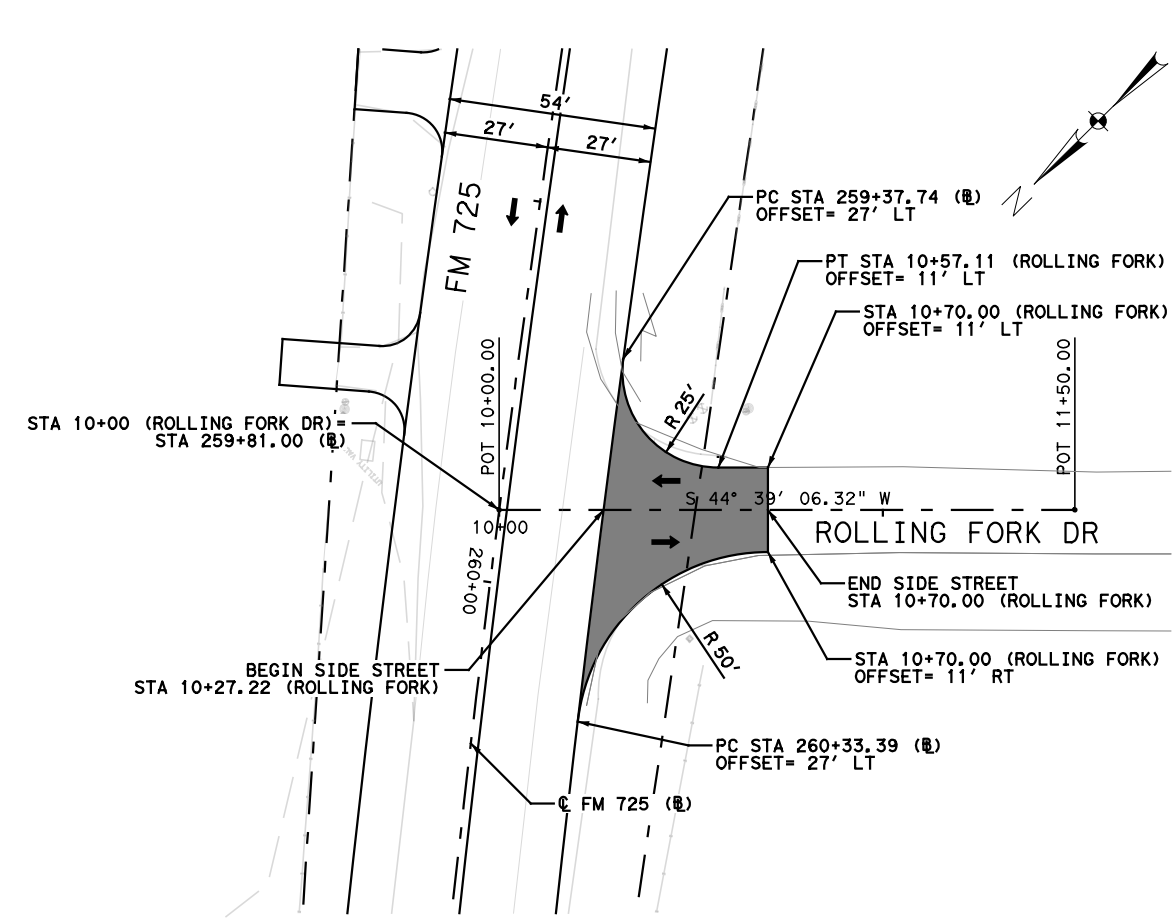
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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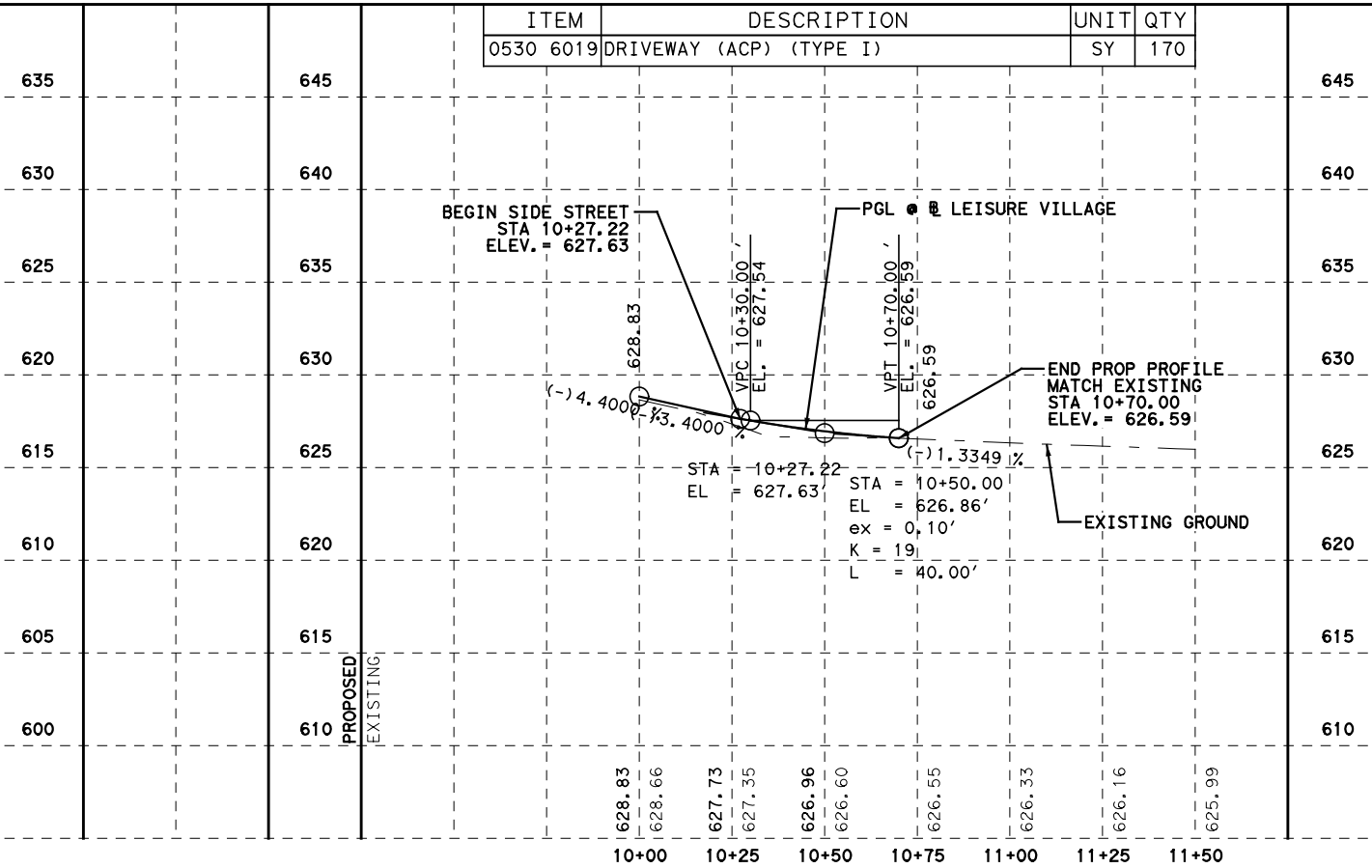
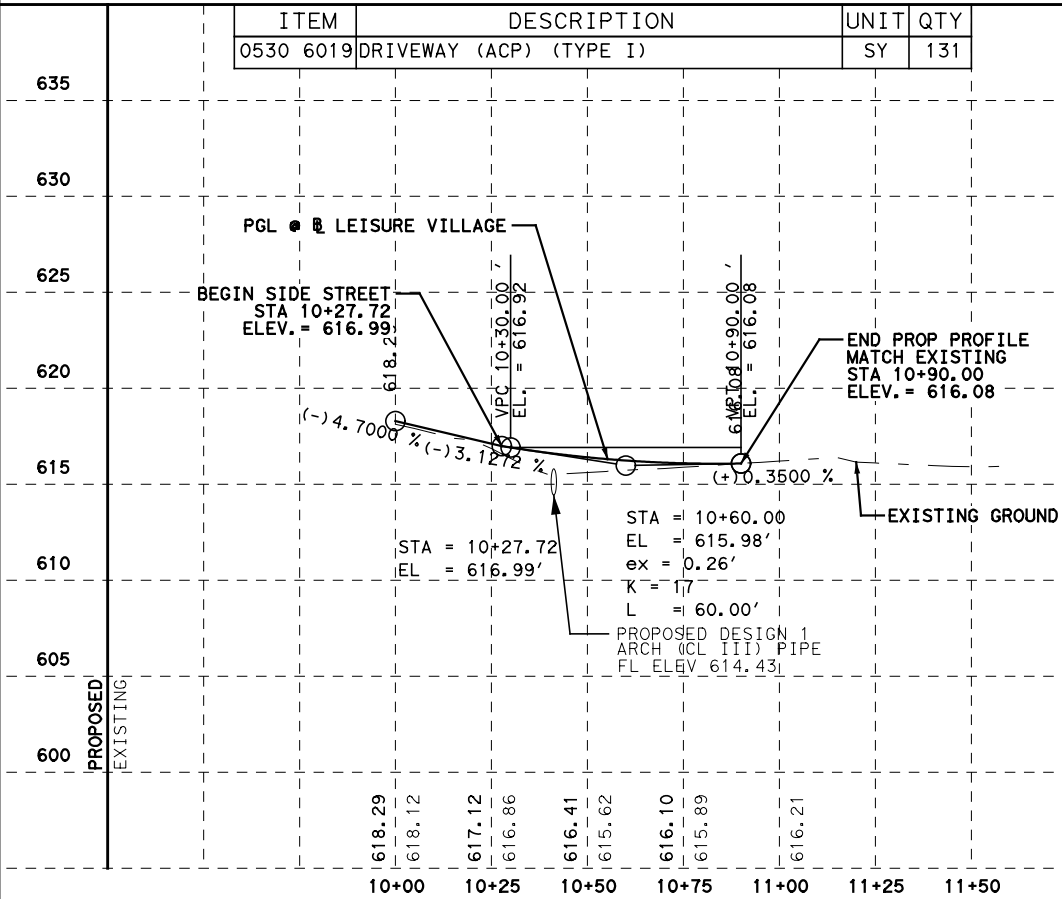
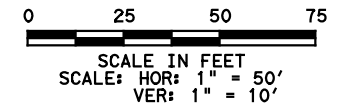
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INTERSECTION LEISURE VILLAGE



INTERSECTION ROLLING FORK DR



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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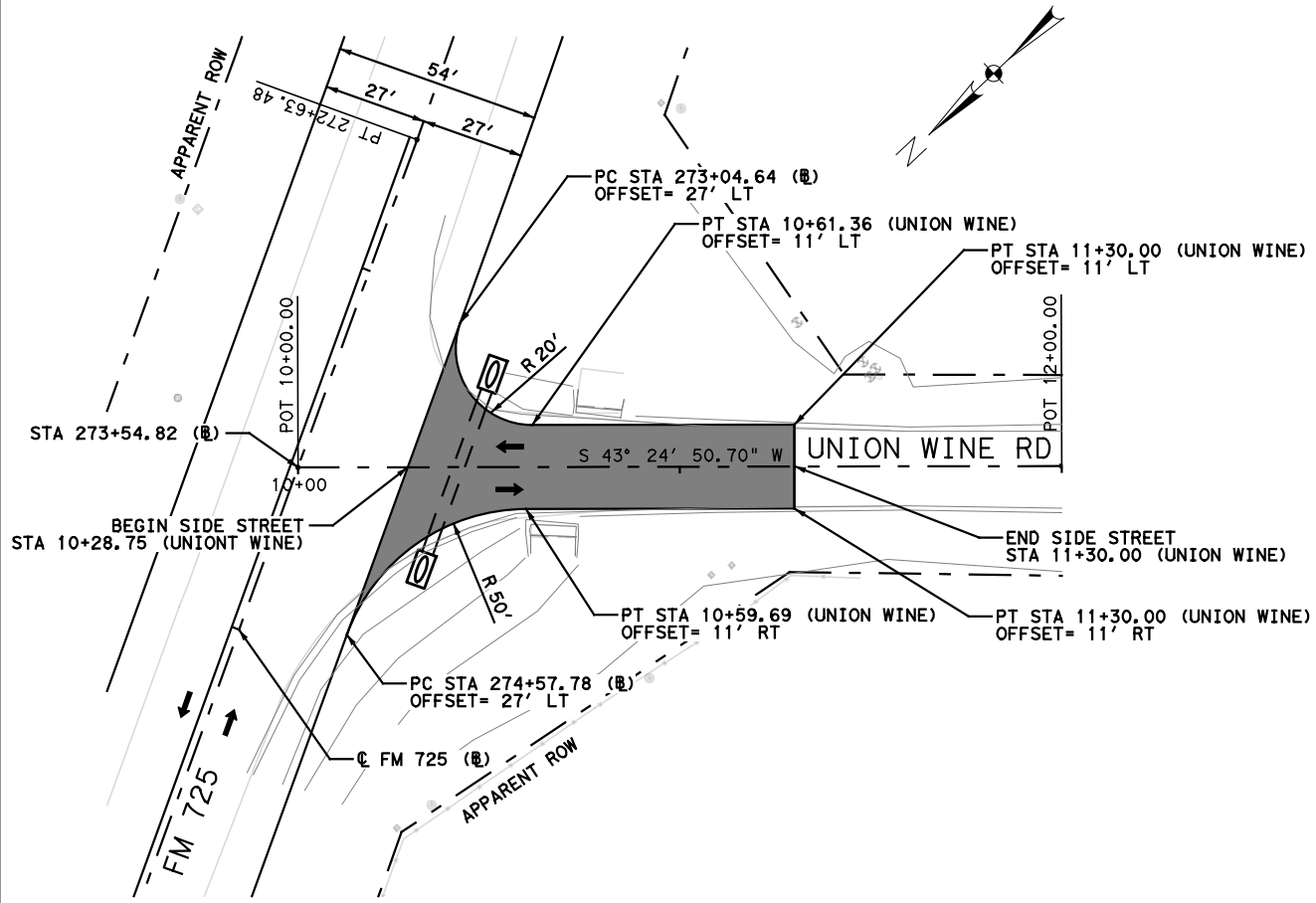
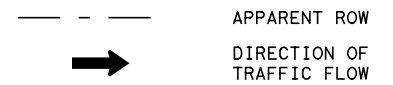
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INTERSECTING STREET
PLAN & PROFILE

SHEET 8 OF 11

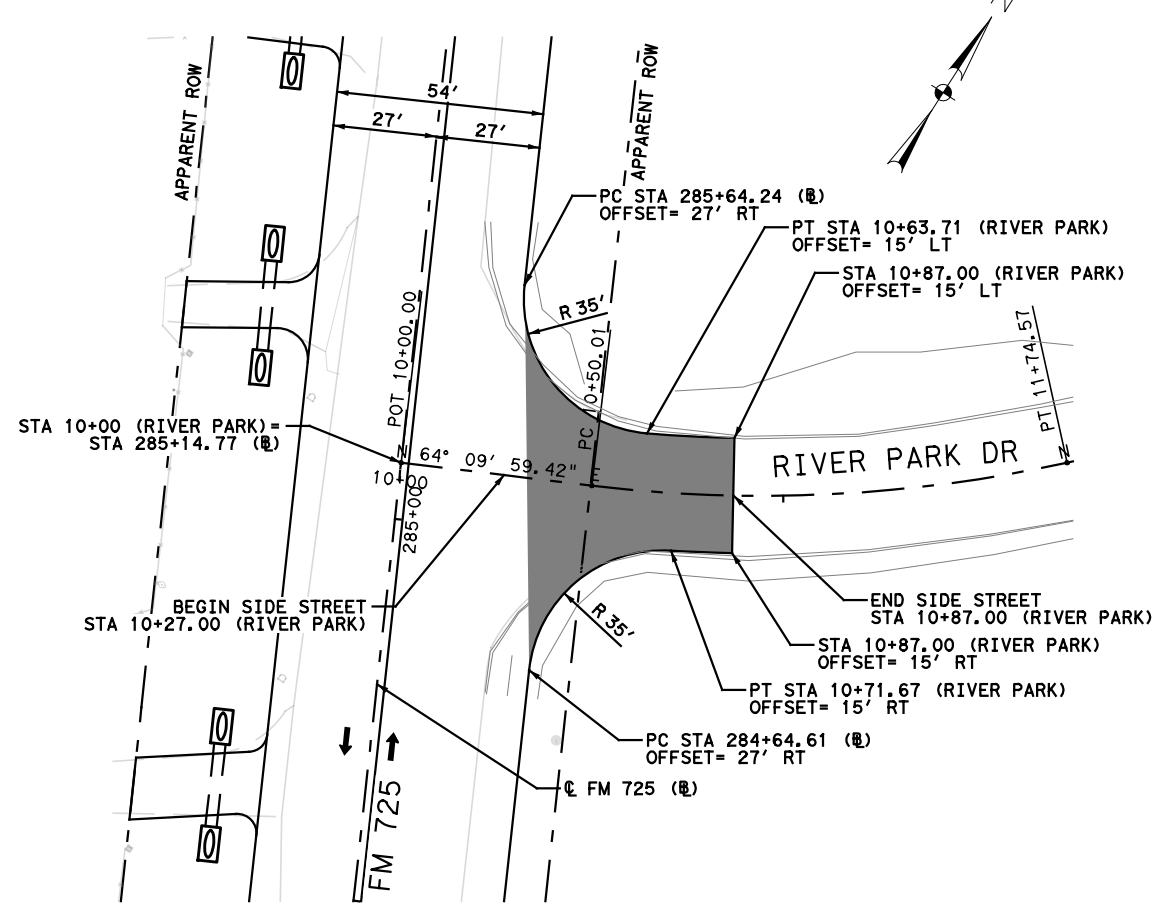
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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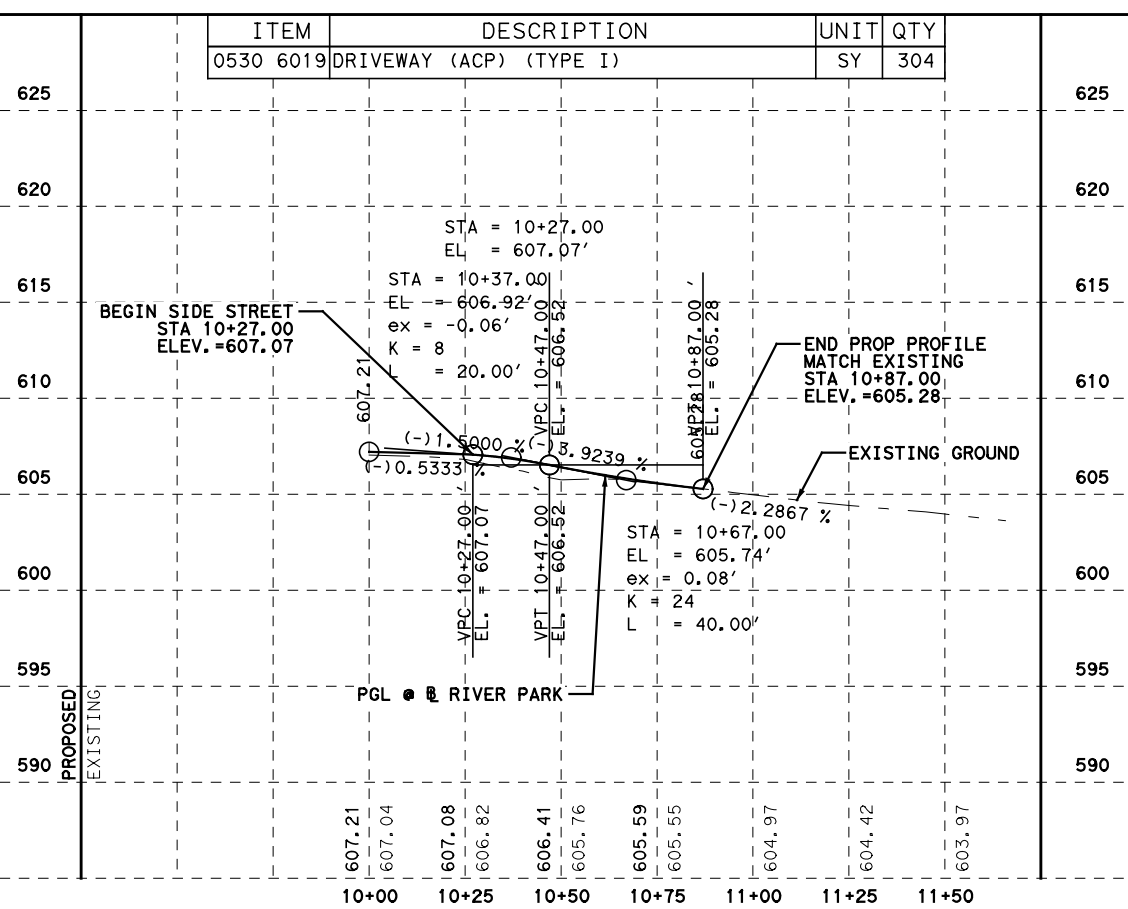
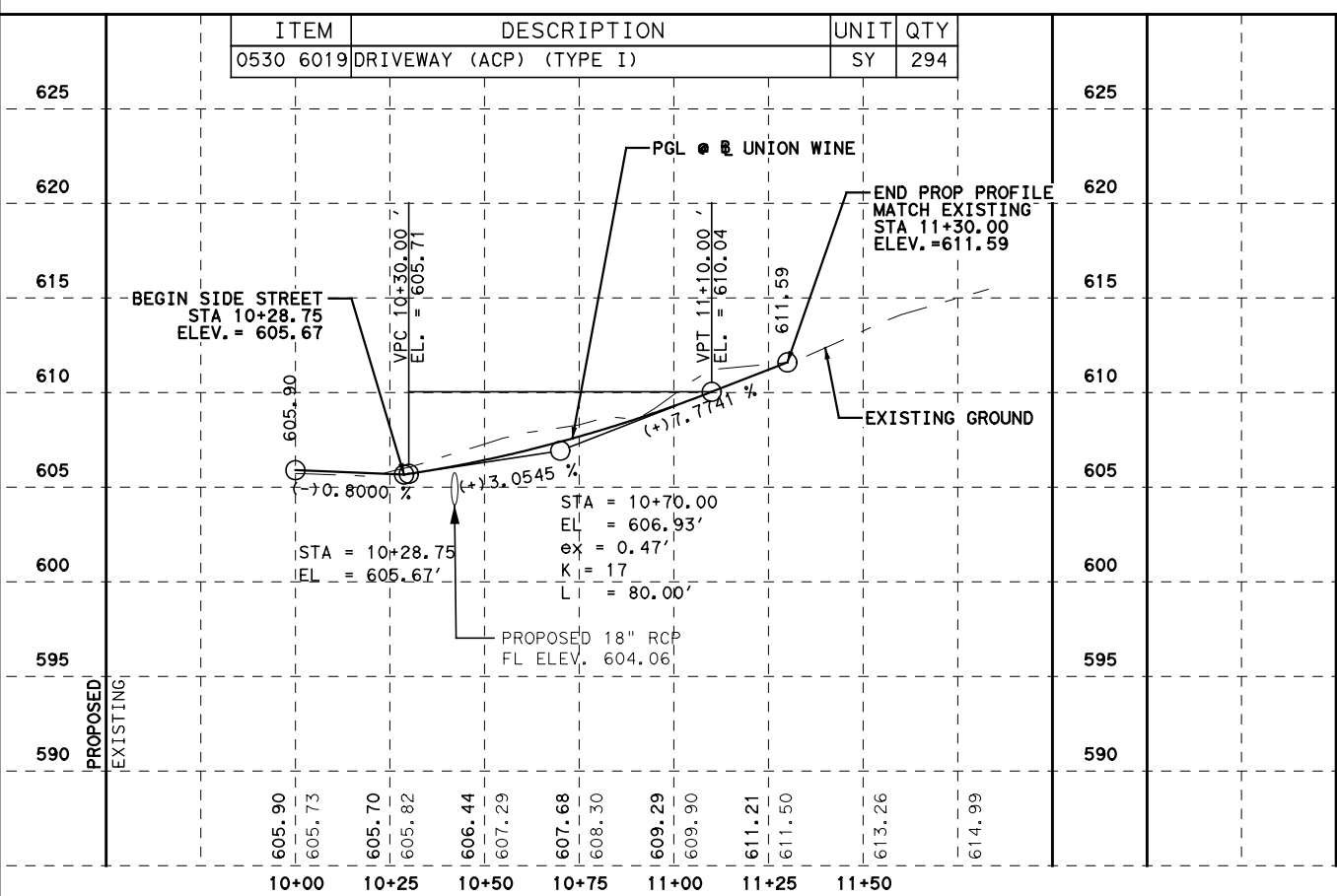
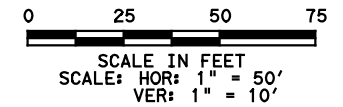
LEGEND



INTERSECTION UNION WINE RD



INTERSECTION RIVER PARK DR



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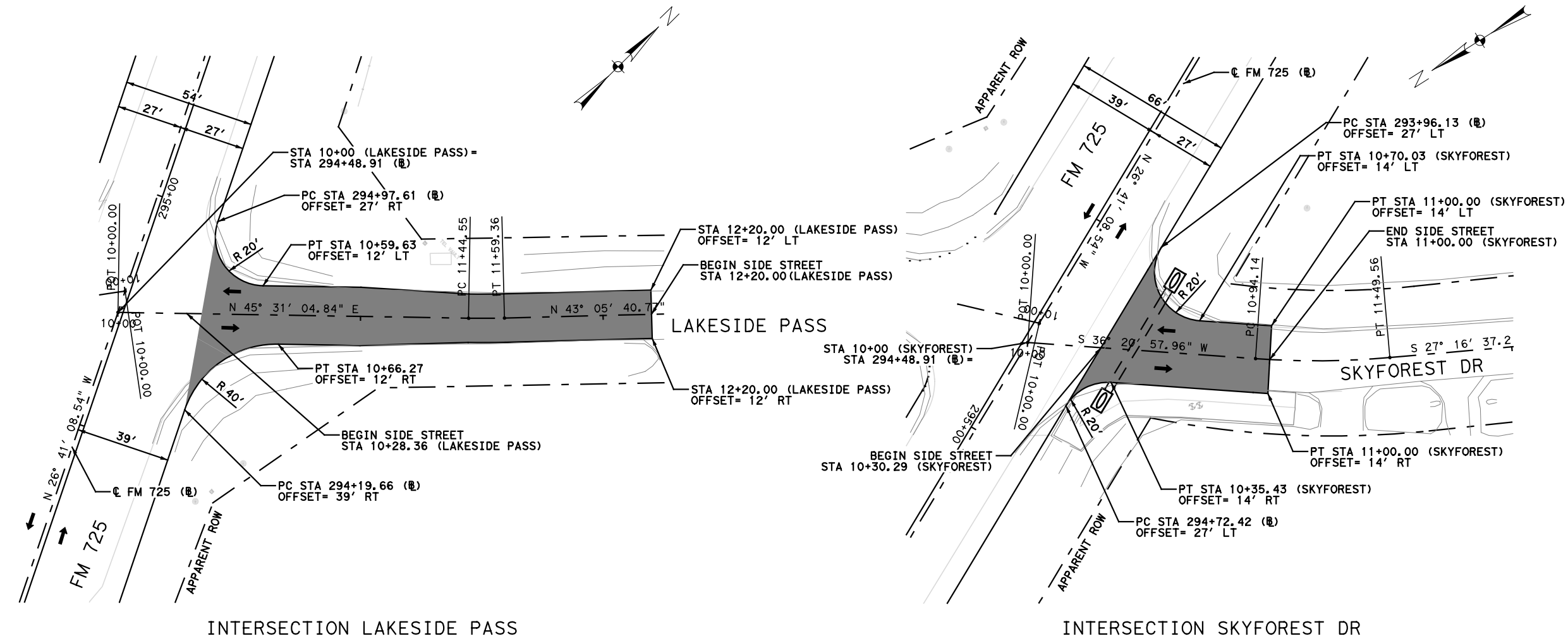
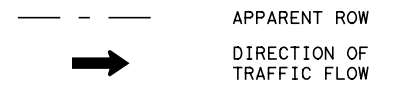
100 NE INTERSTATE 410 LOOP
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SHEET 9 OF 11			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 142
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

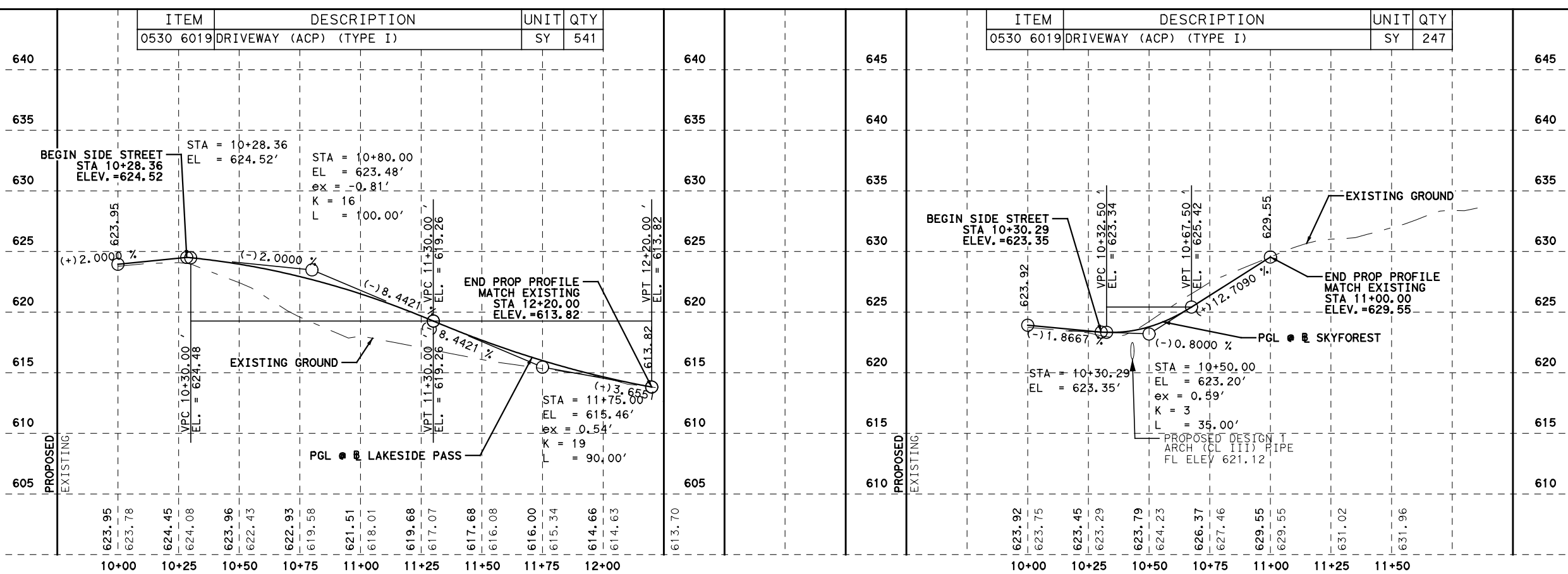
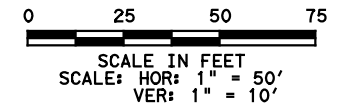
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LEGEND



INTERSECTION LAKESIDE PASS

INTERSECTION SKYFOREST DR



ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	541

ITEM	DESCRIPTION	UNIT	QTY
0530 6019	DRIVEWAY (ACP) (TYPE I)	SY	247

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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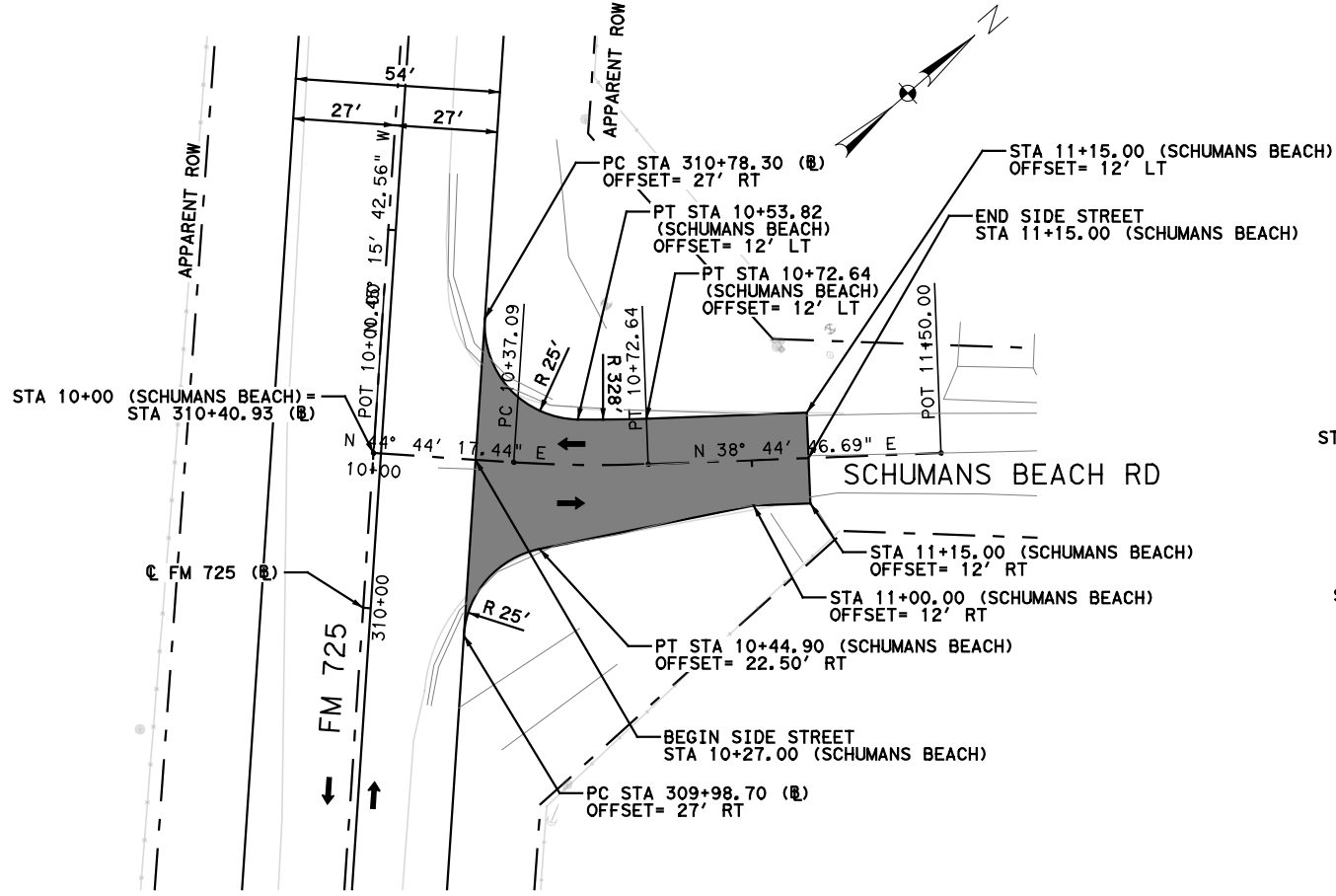
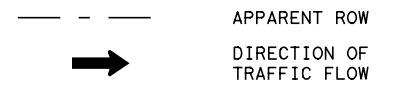
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 INTERSECTING STREET
 PLAN & PROFILE**

SHEET 10 OF 11

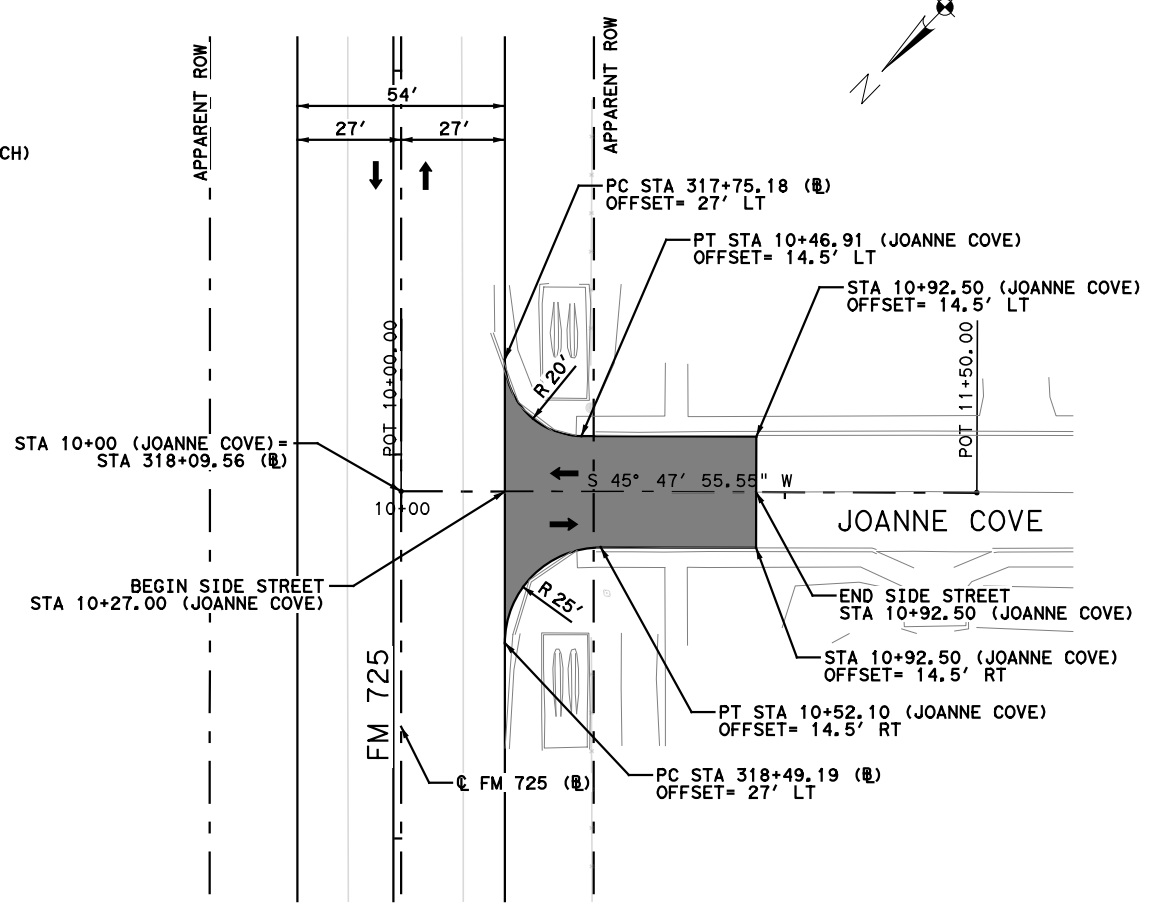
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HIGHWAY NO. FM 725		

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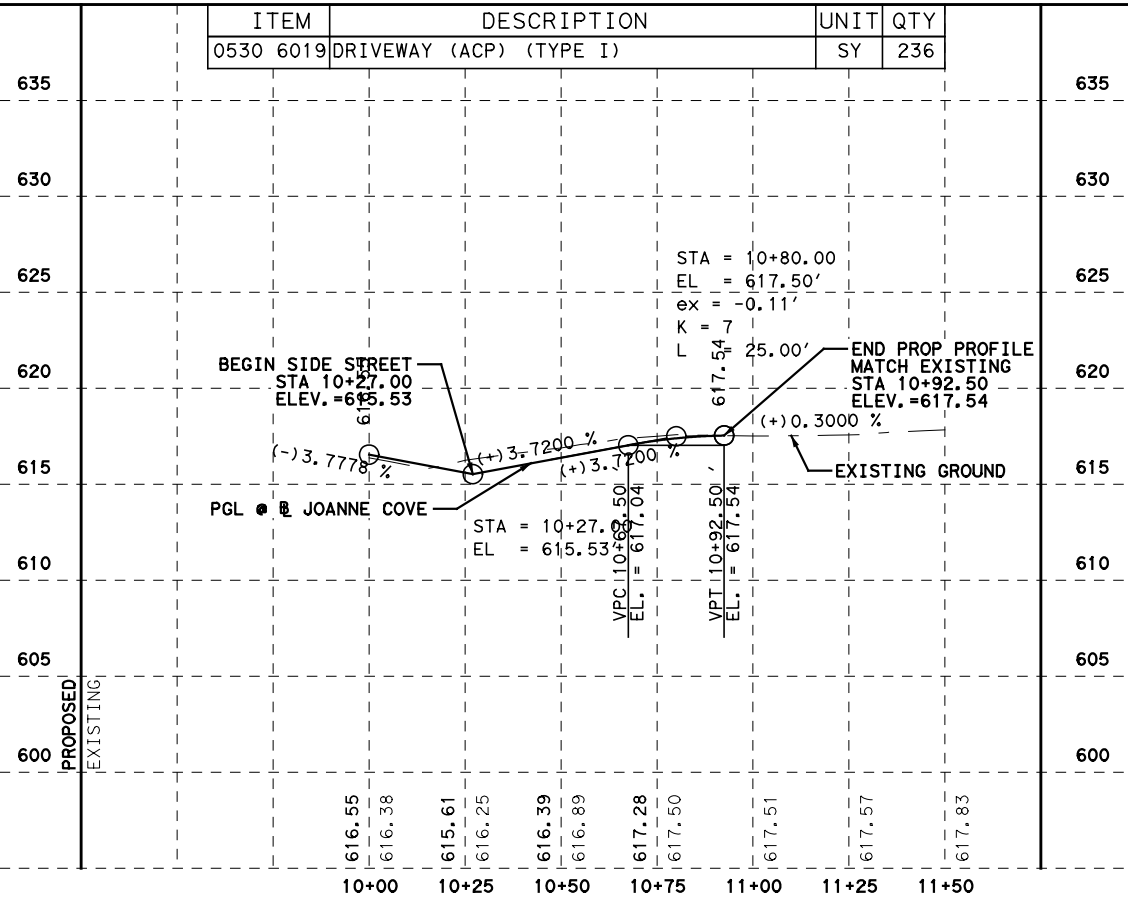
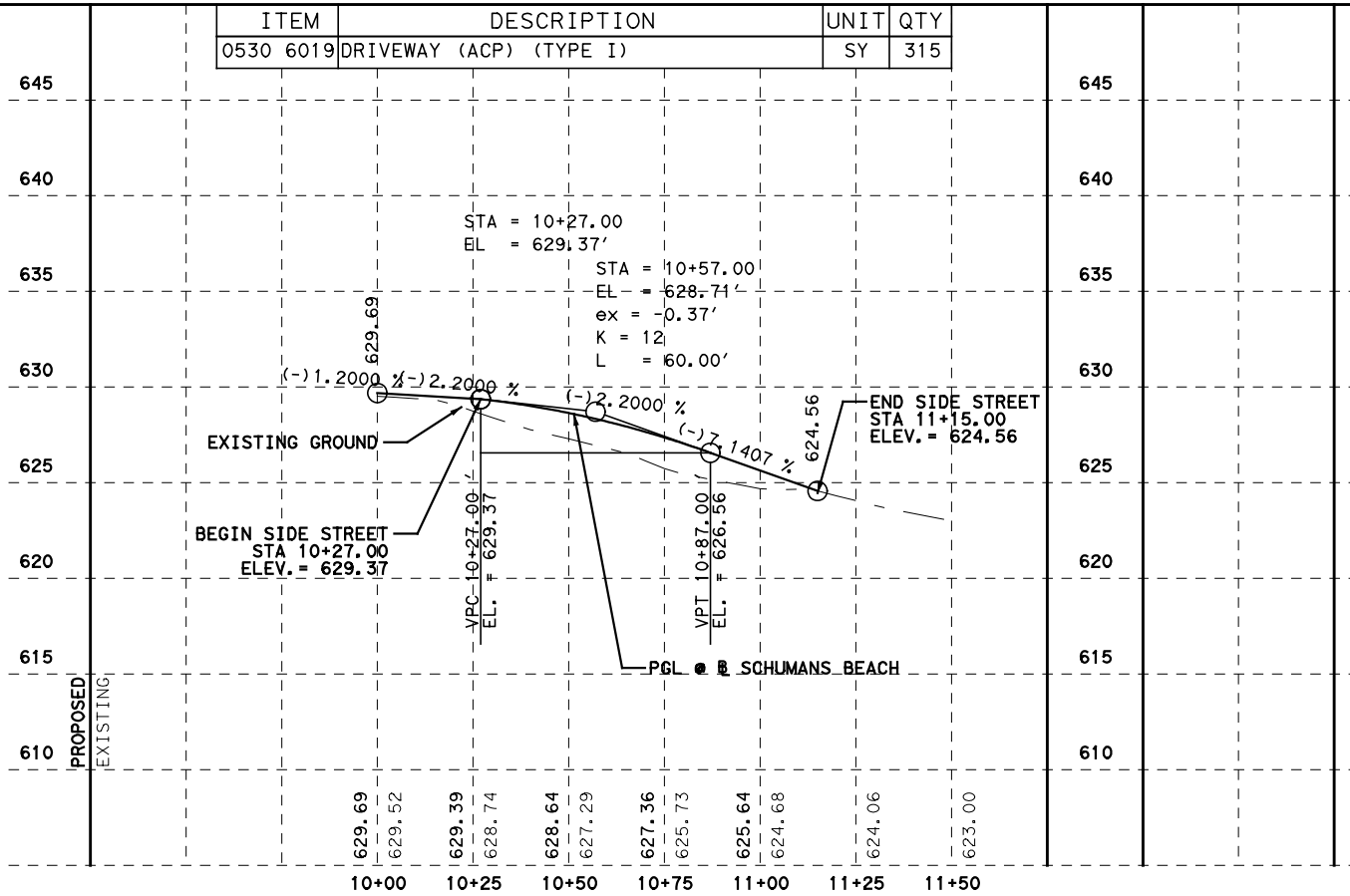
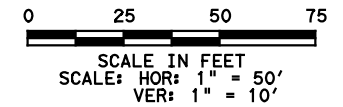
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INTERSECTION SCHUMANS BEACH RD



INTERSECTION JOANNE COVE



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HALFF 100 NE INTERSTATE 410 LOOP
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SAN ANTONIO, TEXAS 78216
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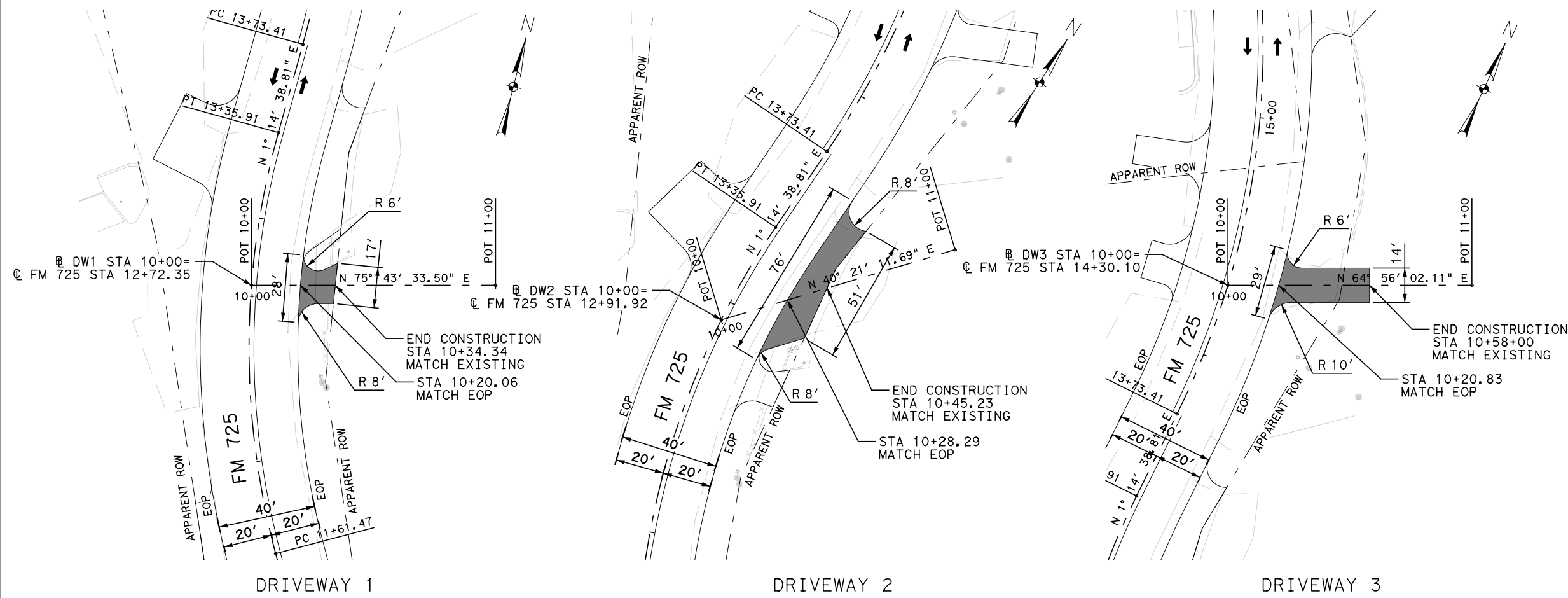
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INTERSECTING STREET
PLAN & PROFILE**

SHEET 11 OF 11

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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
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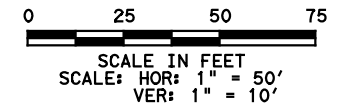
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LEGEND

--- APPARENT ROW

→ DIRECTION OF TRAFFIC FLOW



ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	25
0530 6004	DRIVEWAY (CONC)	SY	25

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	78
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	78

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	61
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	61

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

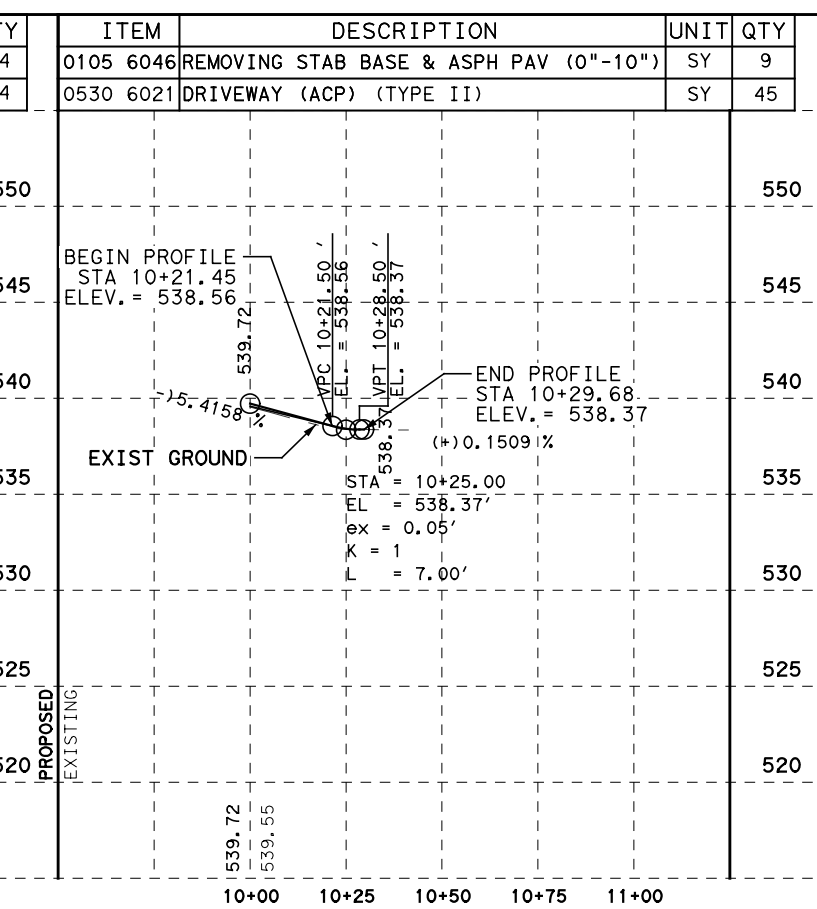
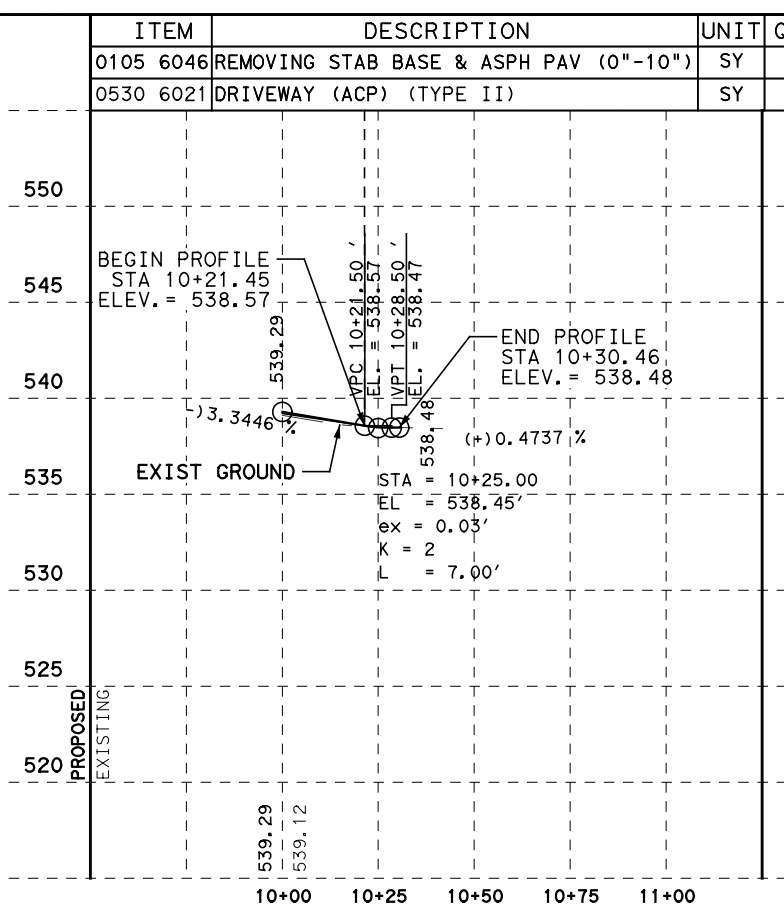
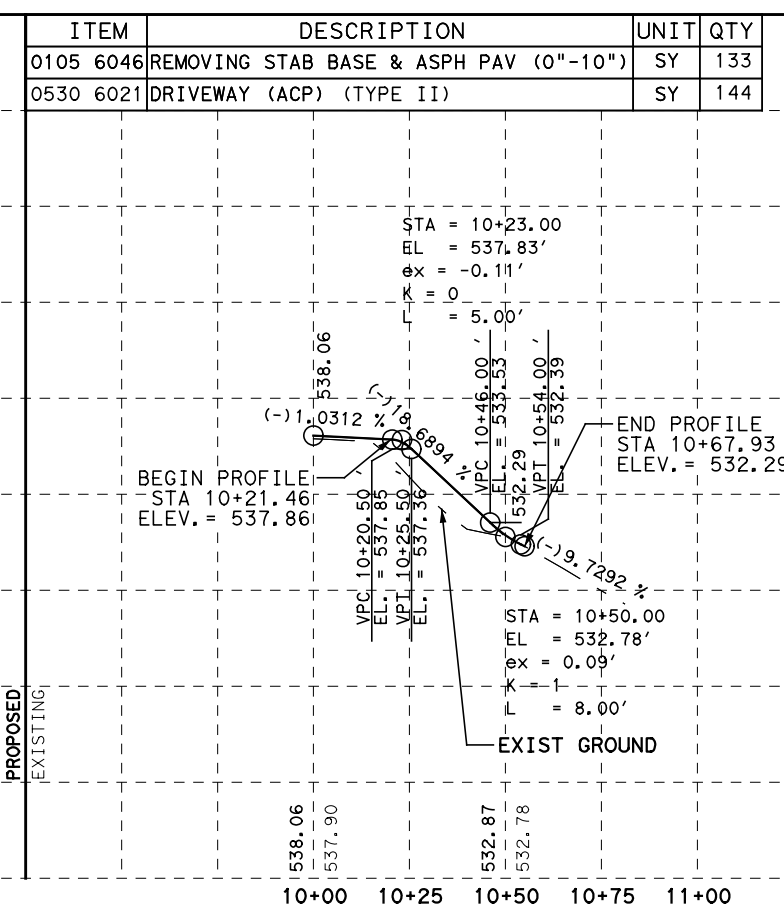
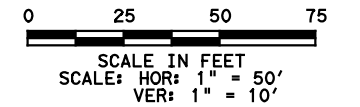
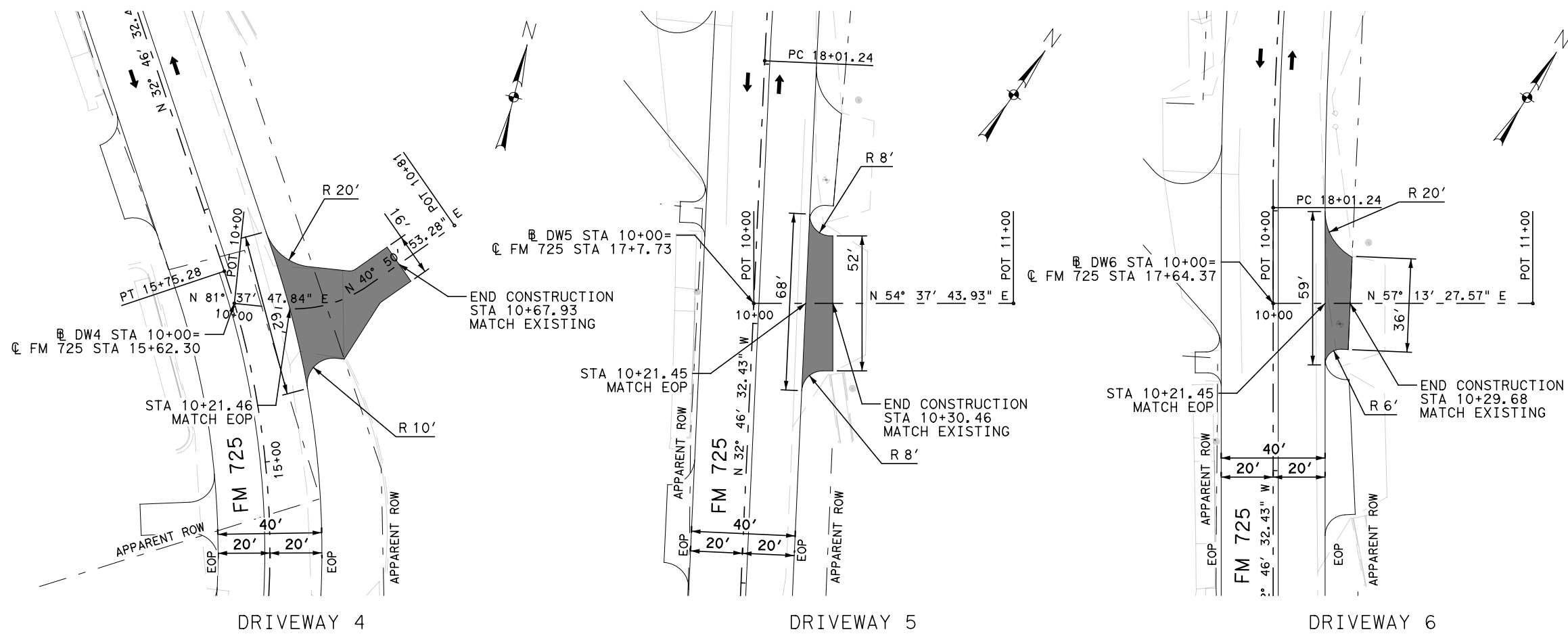
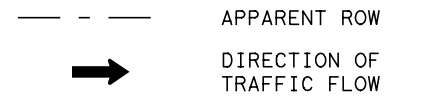
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**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 1 OF 55

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 145
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

LEGEND



4/28/2021

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107215
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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

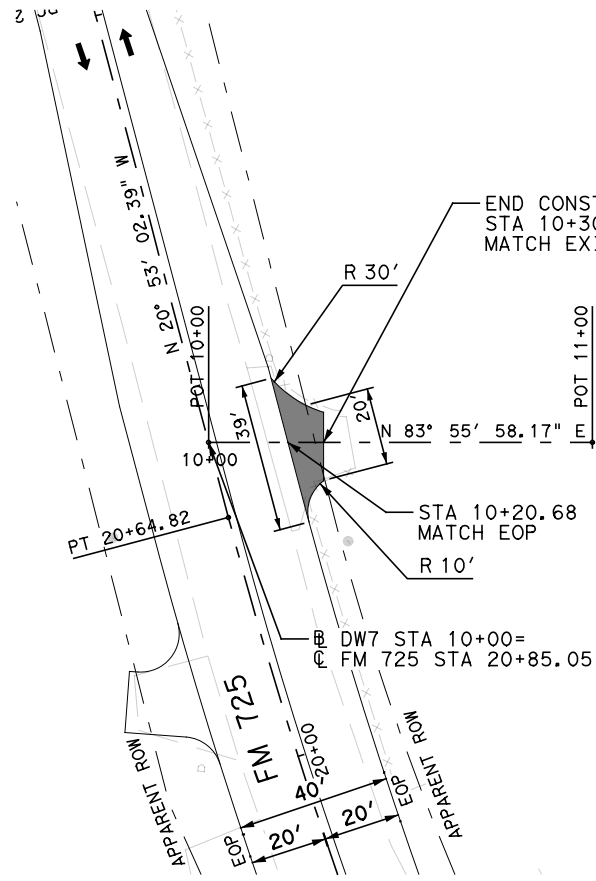
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FM 725 DRIVEWAYS PLAN & PROFILE

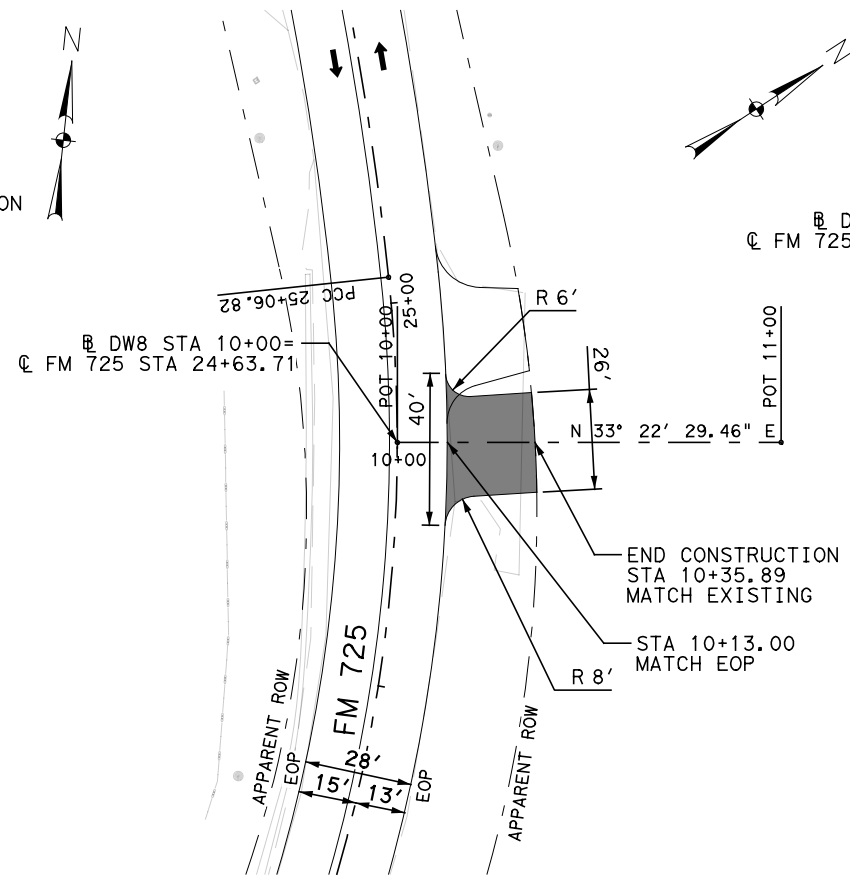
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

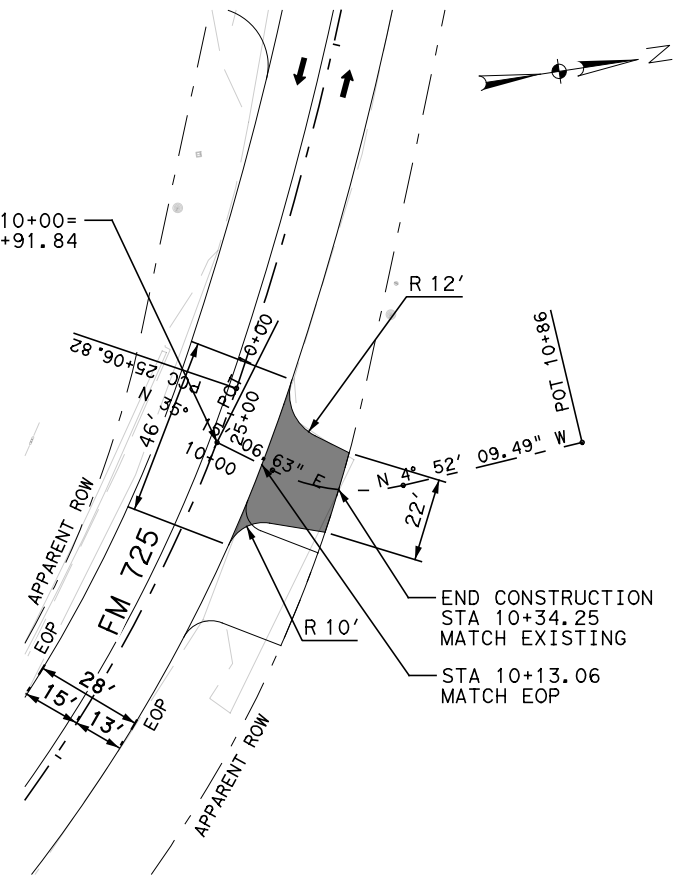
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DRIVEWAY 7

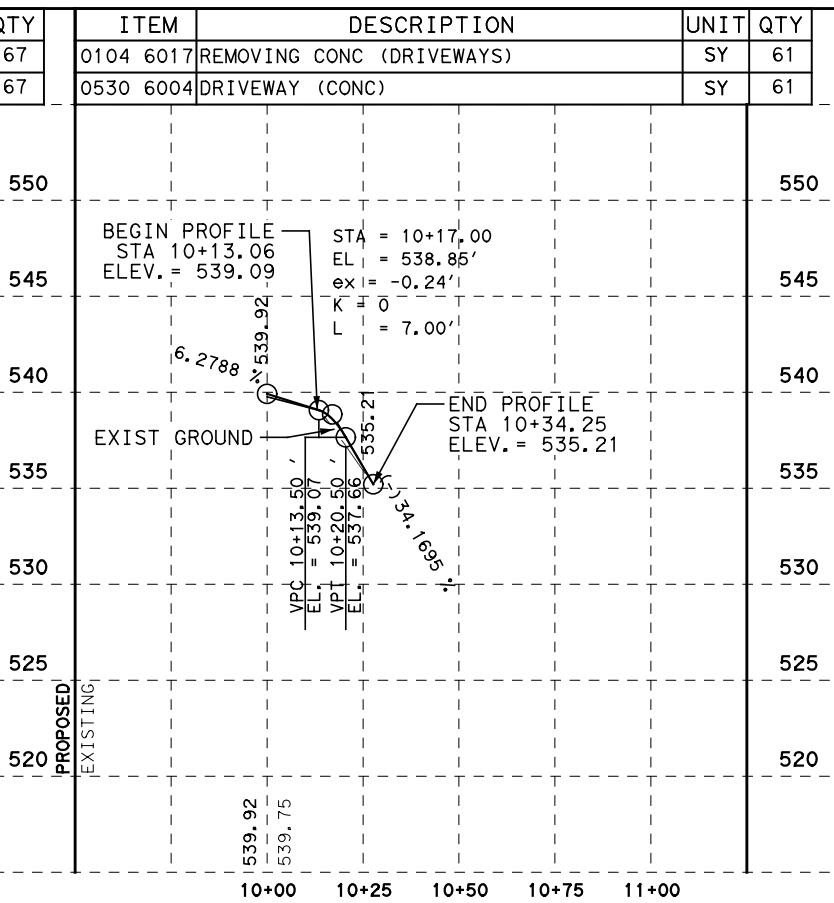
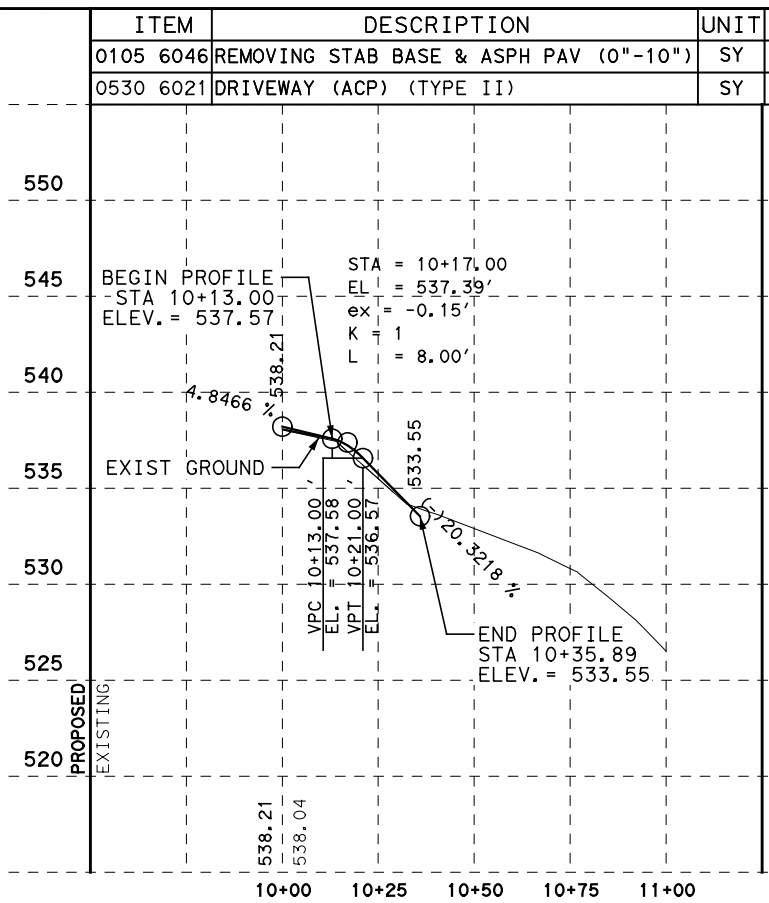
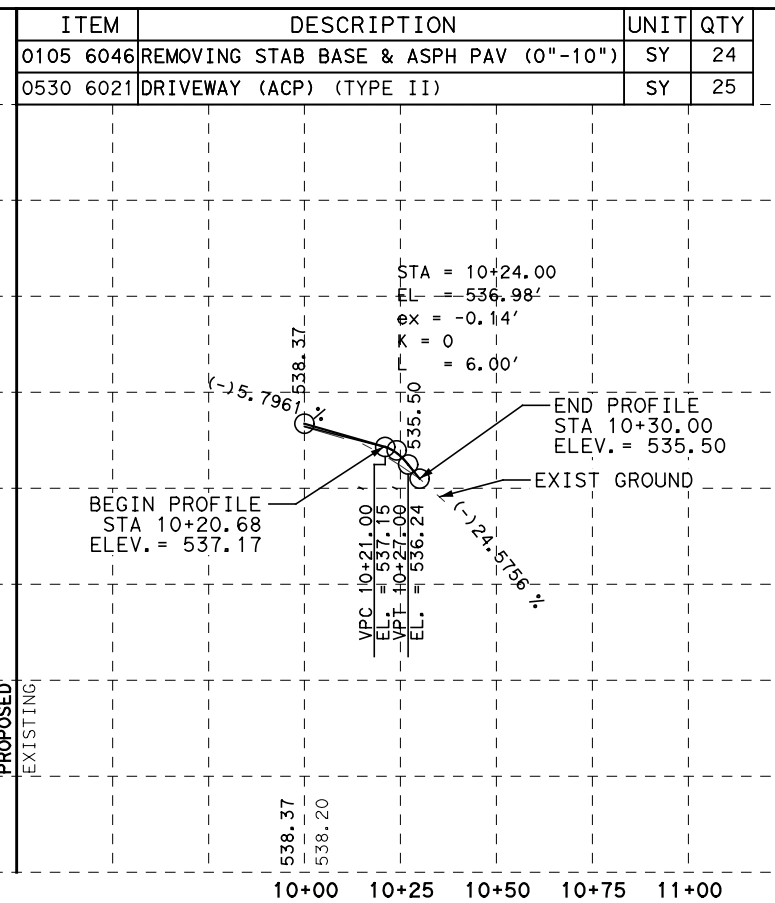
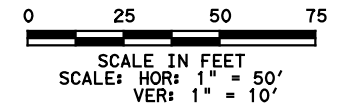
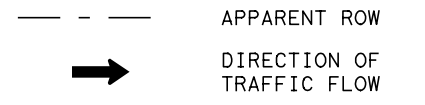


DRIVEWAY 8



DRIVEWAY 9

LEGEND



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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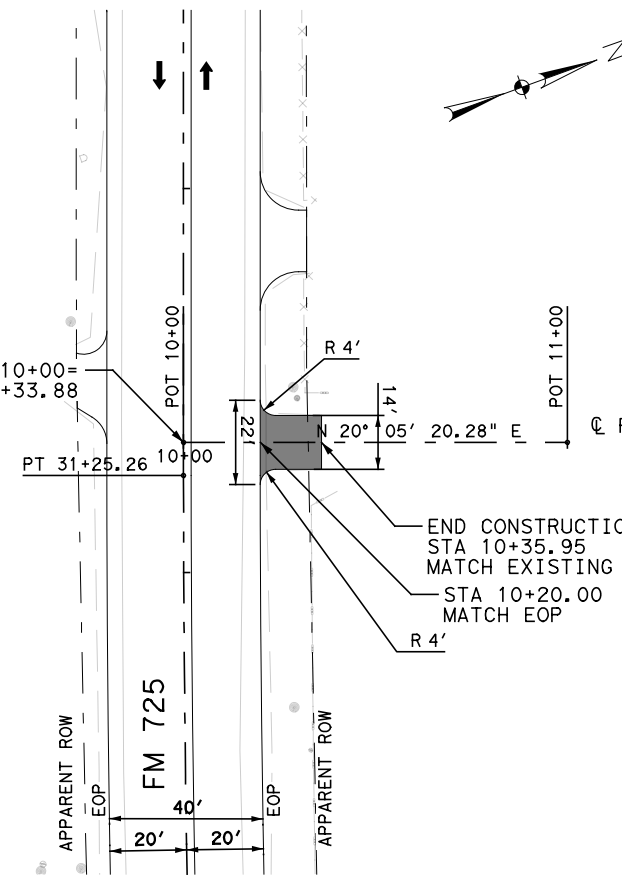
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 3 OF 55

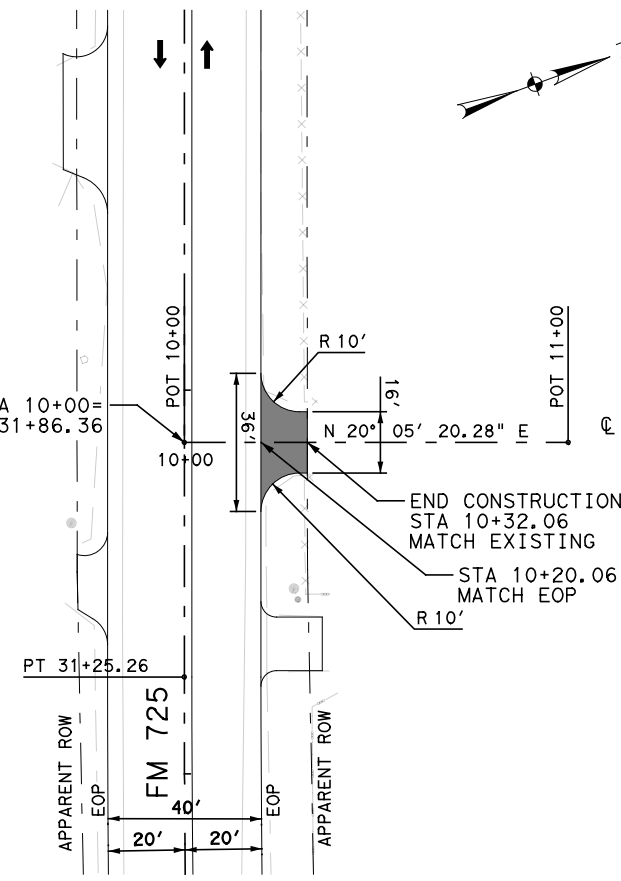
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CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

LEGEND

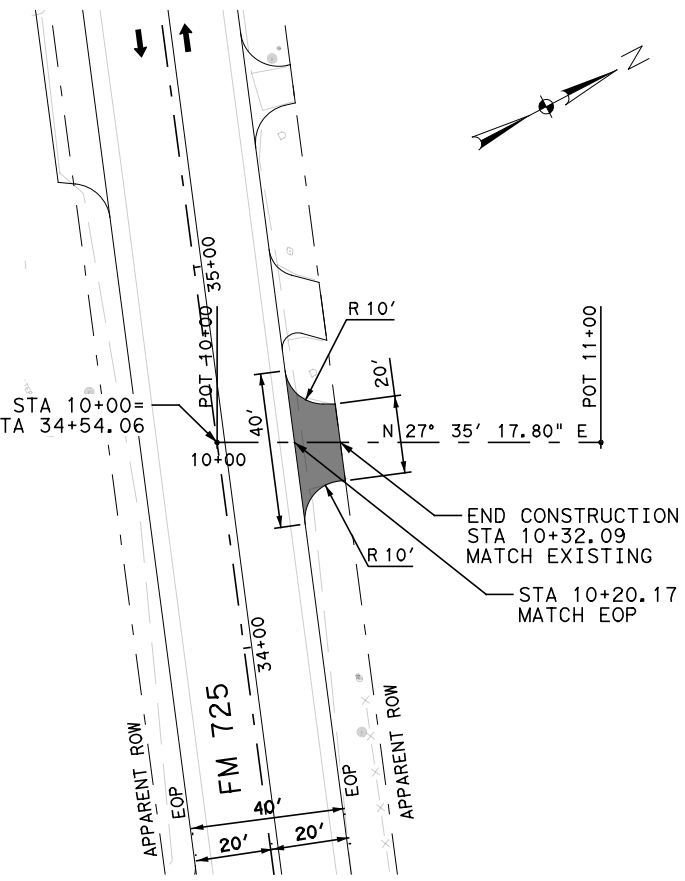
- APPARENT ROW
- DIRECTION OF TRAFFIC FLOW



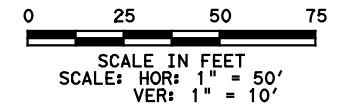
DRIVEWAY 10



DRIVEWAY 11



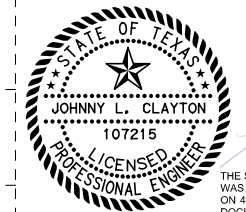
DRIVEWAY 12



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	26
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	26

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	27
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	27

ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	32
0530 6004	DRIVEWAY (CONC)	SY	32



4/28/2021

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NO.	REVISION	BY	DATE

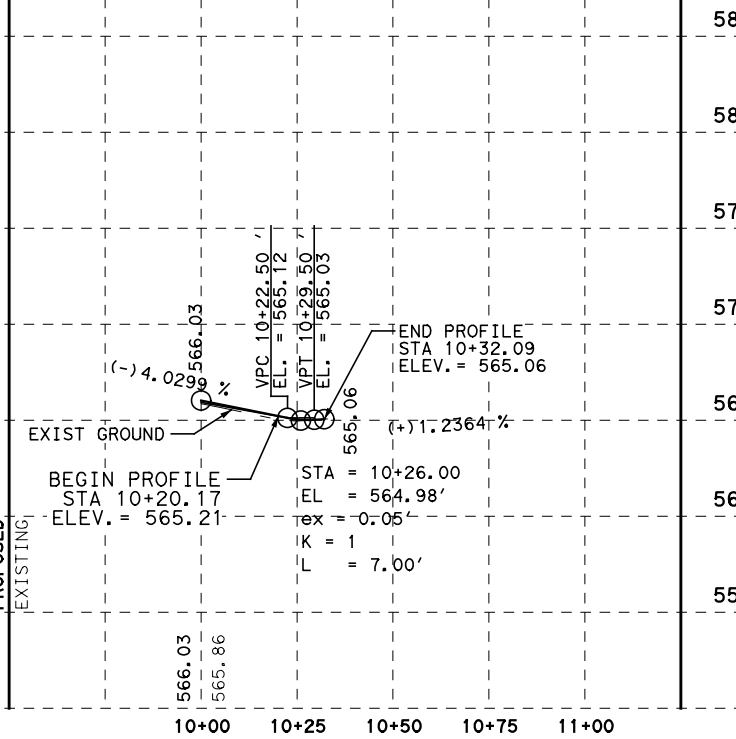
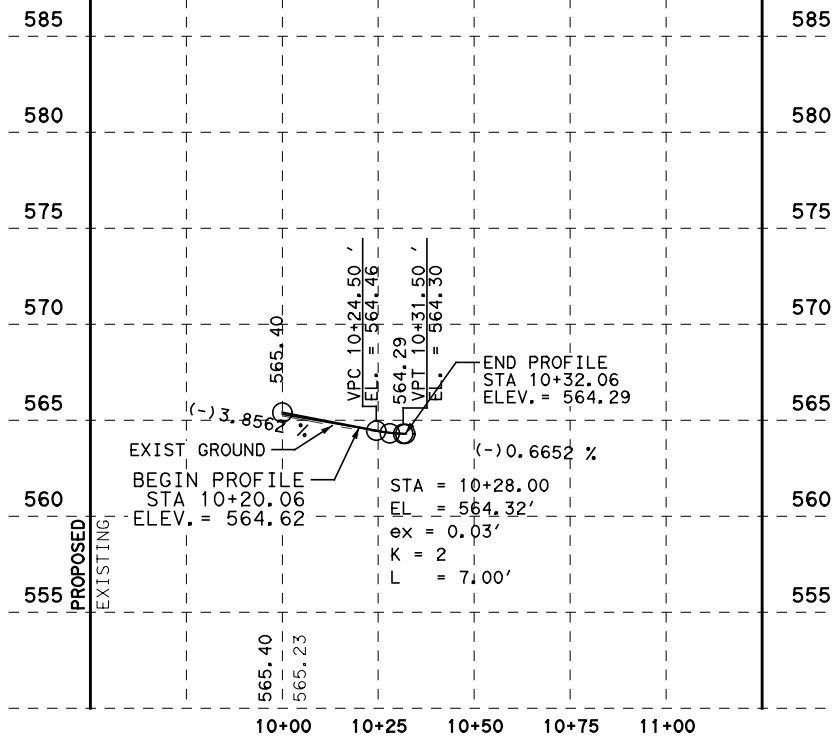
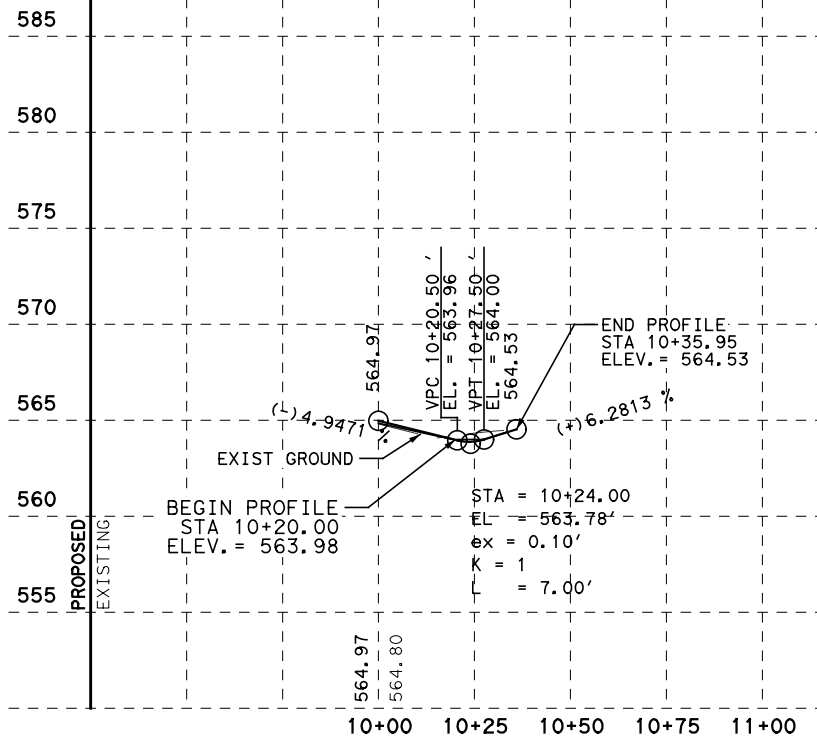
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TEL (210) 798-1895 FIRM #F-312



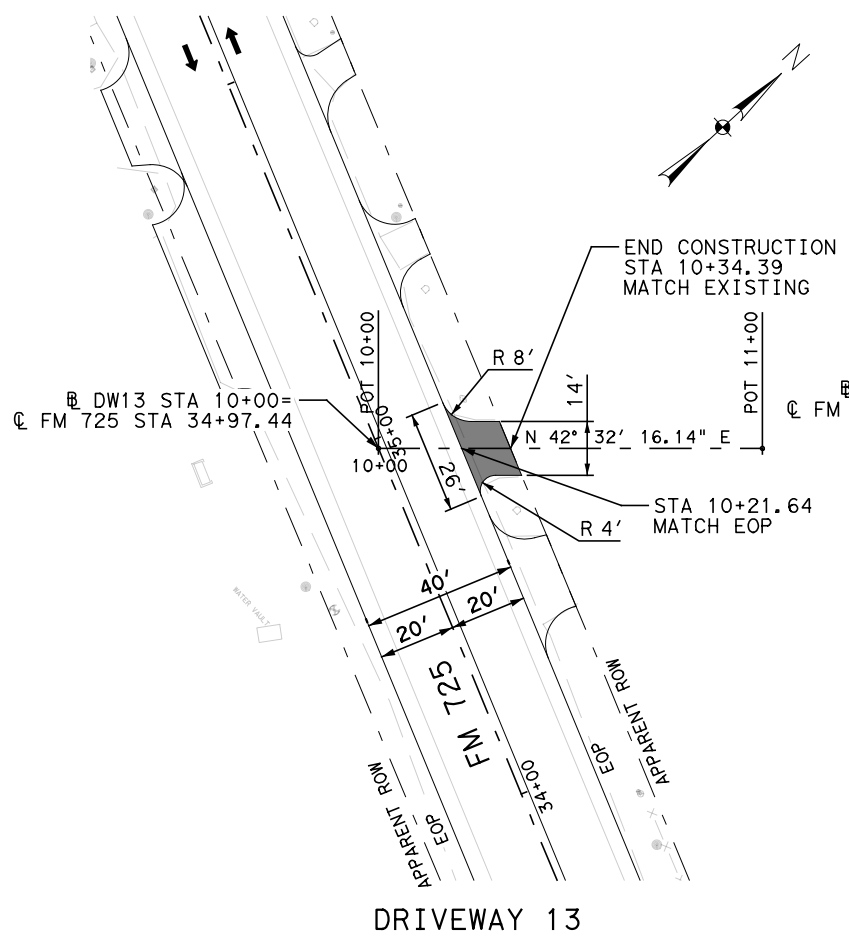
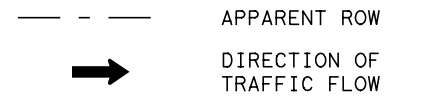
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 4 OF 55

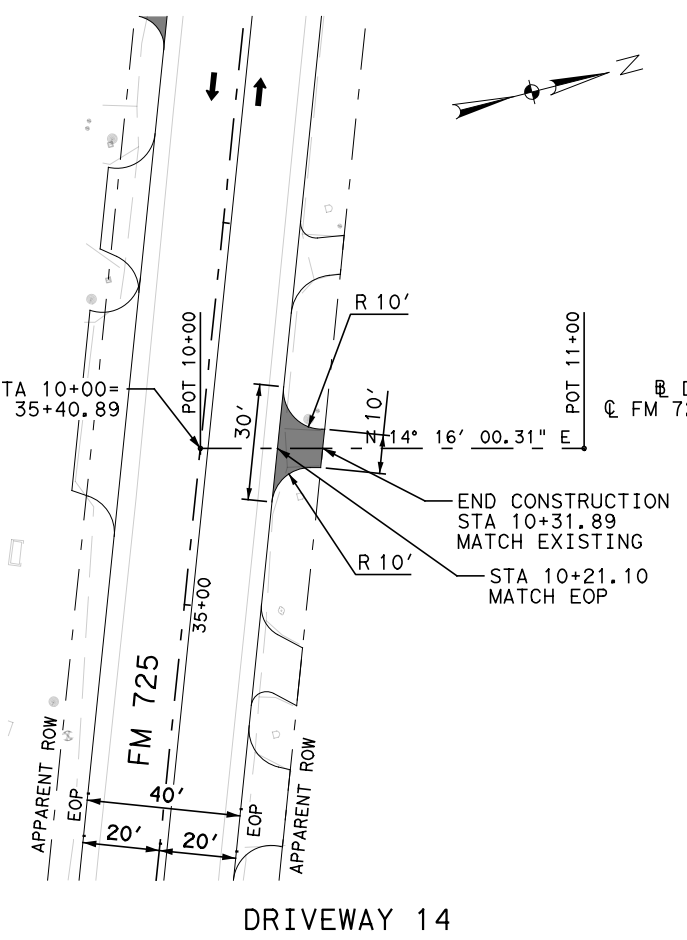
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6	See Title Sheet	148	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



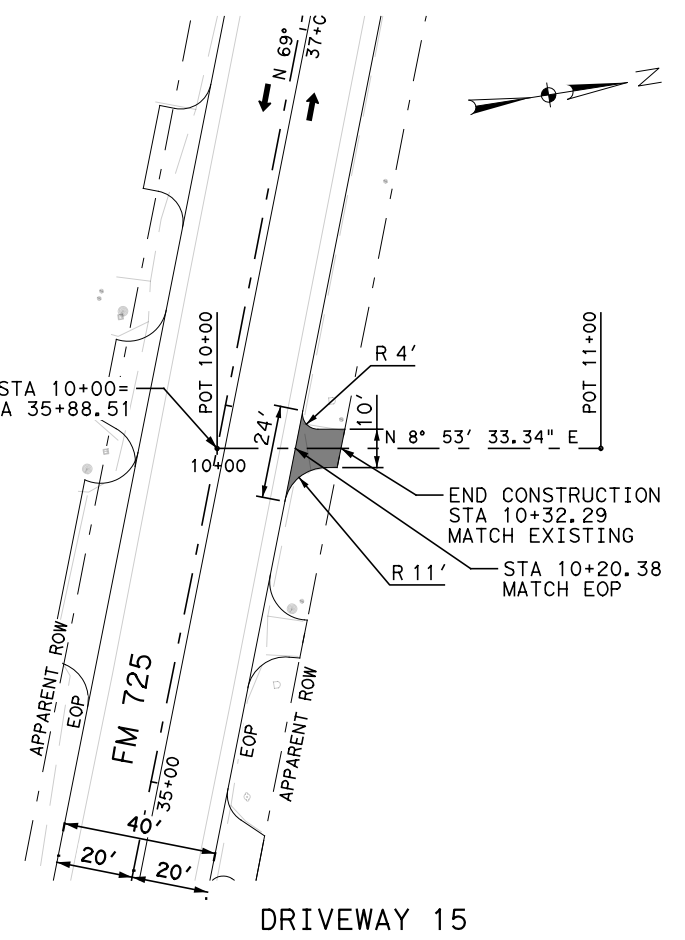
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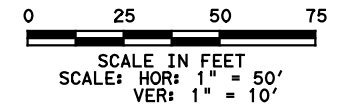
DRIVEWAY 13



DRIVEWAY 14



DRIVEWAY 15



ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	22
0530 6004	DRIVEWAY (CONC)	SY	22

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	6
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	18

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	6
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	16

STATION	PROPOSED	EXISTING
585		
580		
575		
570		
565		
560		
555		

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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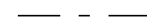

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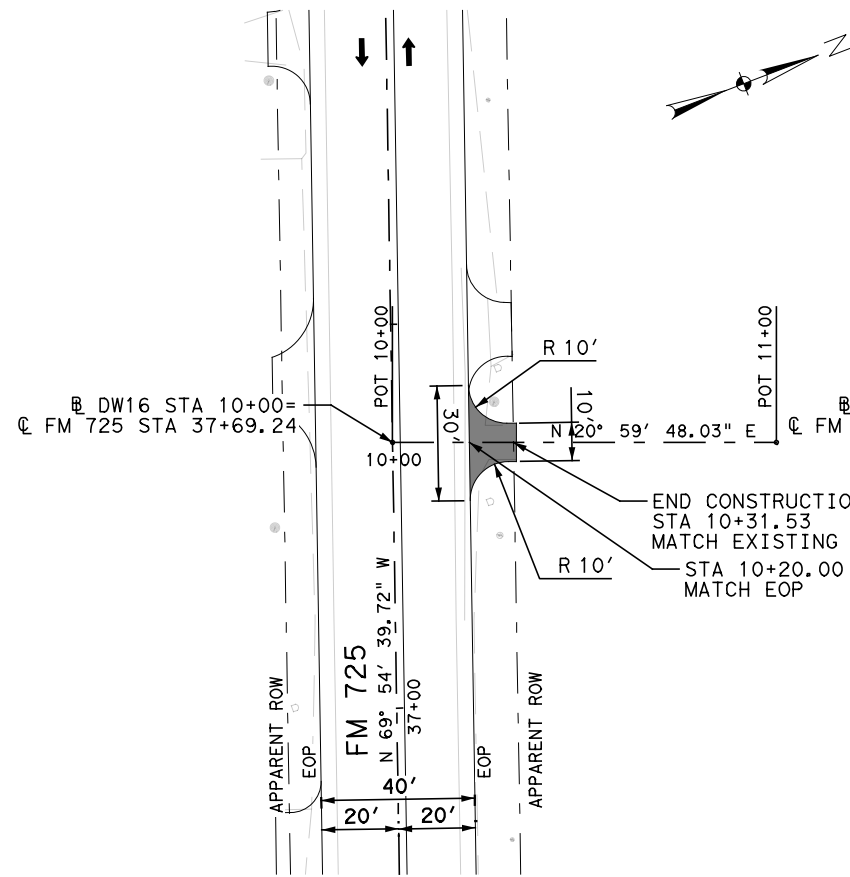
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 5 OF 55

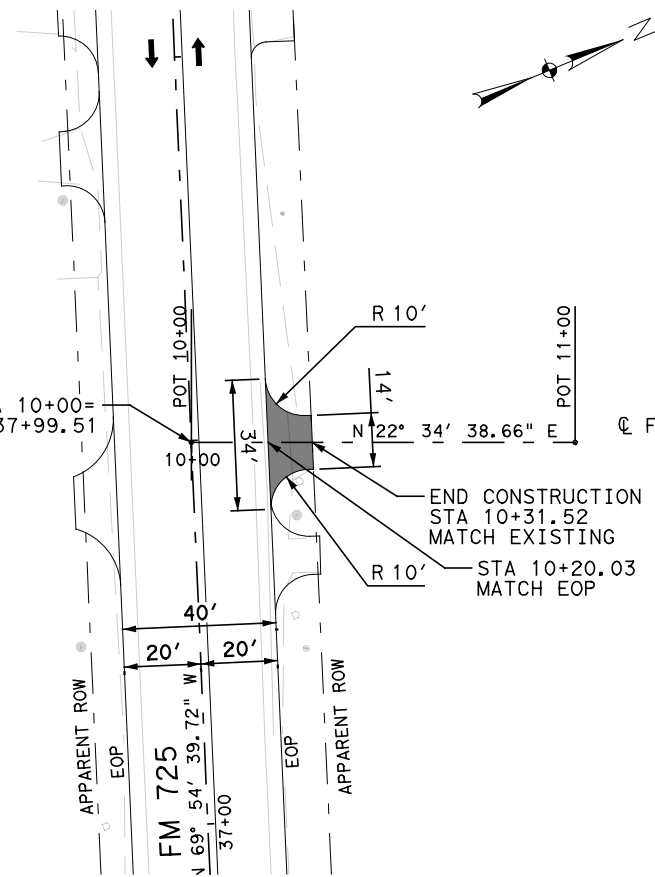
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6	See Title Sheet	149	
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CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

LEGEND

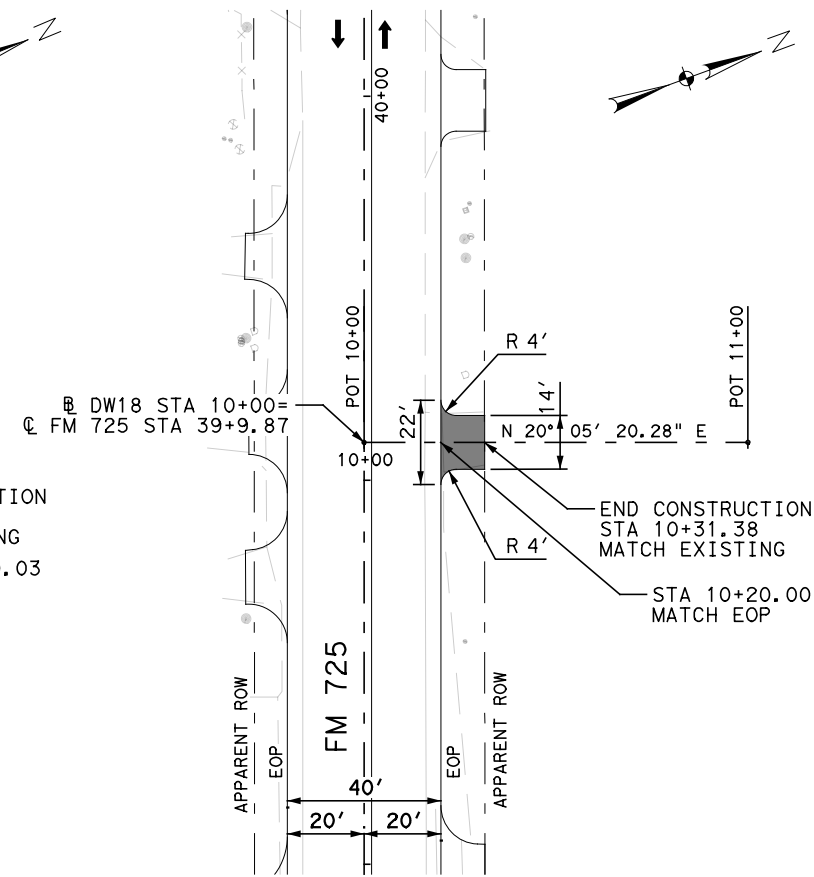
-  APPARENT ROW
-  DIRECTION OF TRAFFIC FLOW



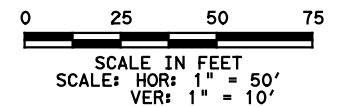
DRIVEWAY 16



DRIVEWAY 17



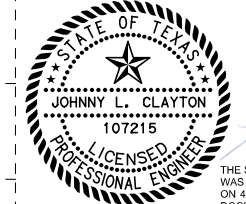
DRIVEWAY 18



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	17
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	19

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	23
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	23

ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	19
0530 6004	DRIVEWAY (CONC)	SY	19



4/28/2021

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NO.	REVISION	BY	DATE

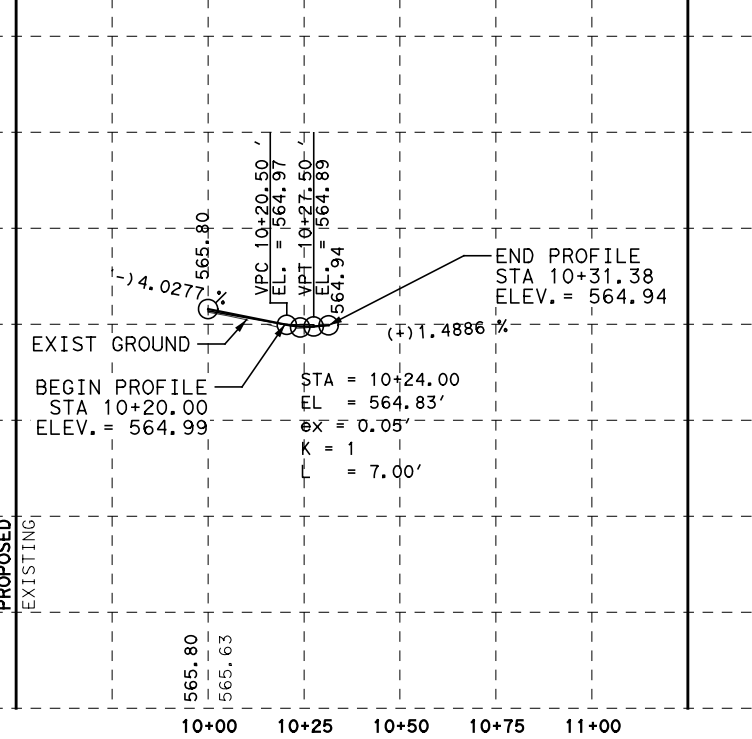
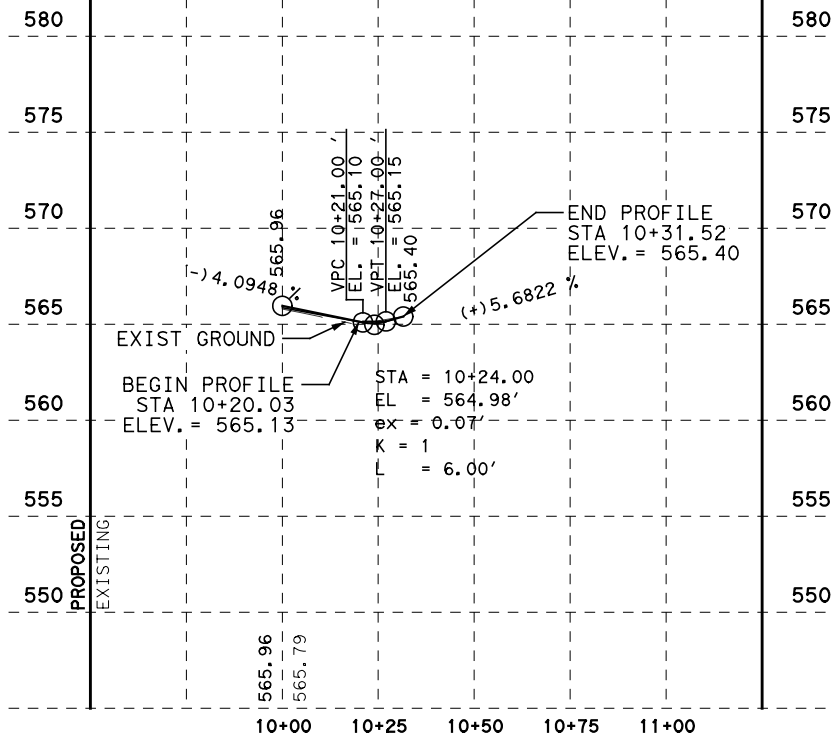
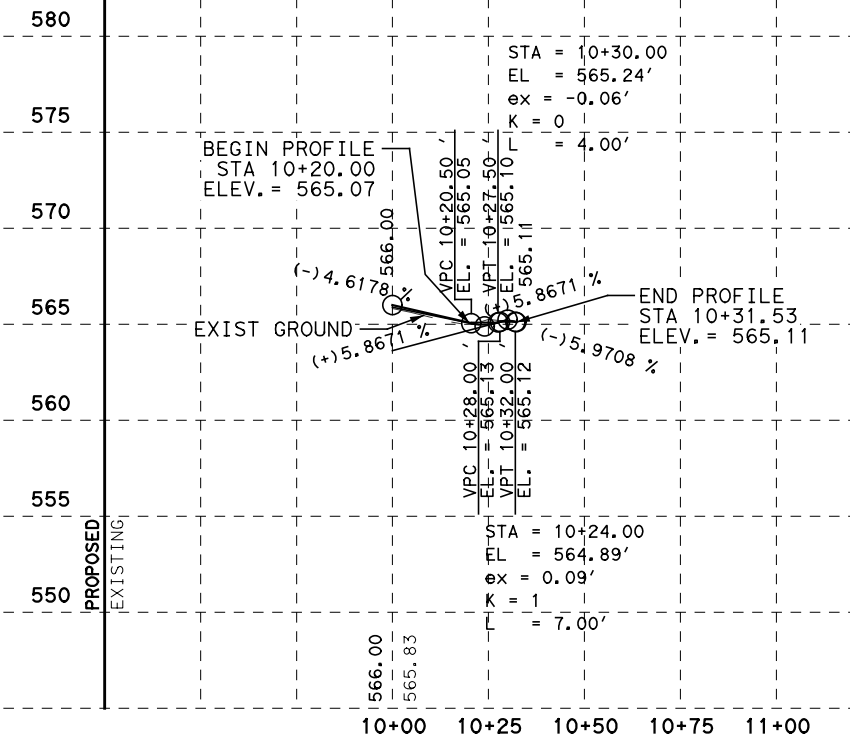
HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
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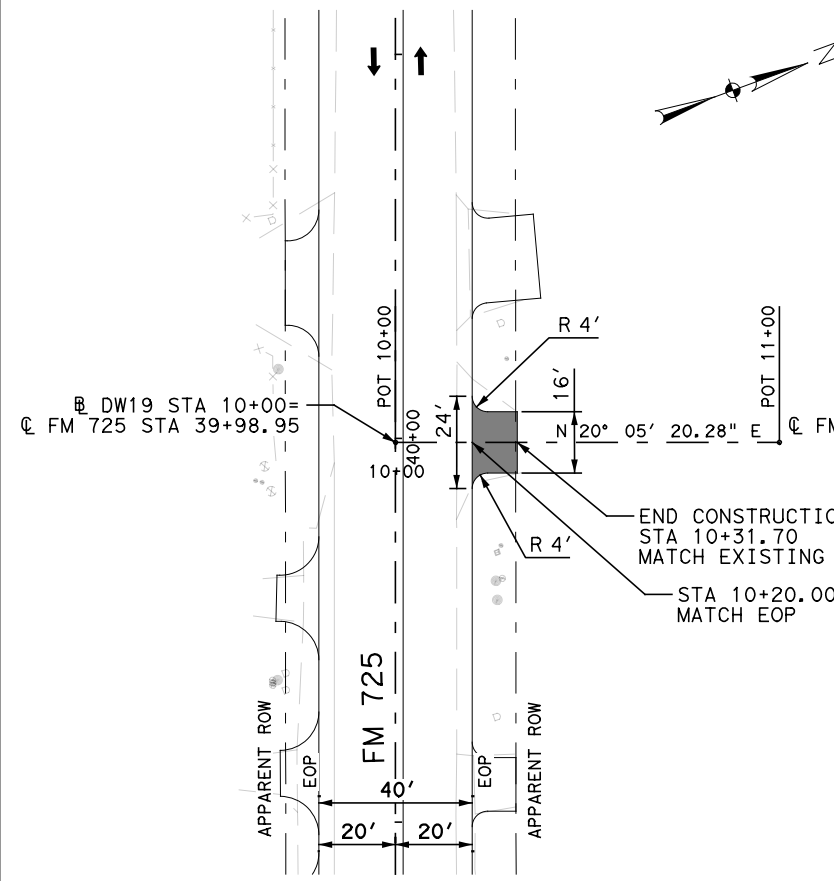
FM 725
DRIVEWAYS
PLAN & PROFILE

SHEET 6 OF 55

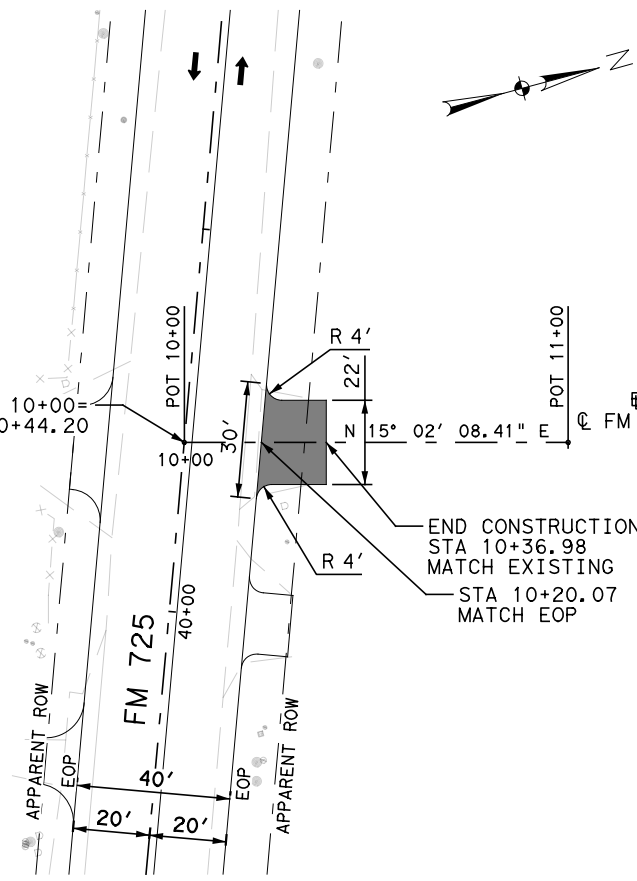
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



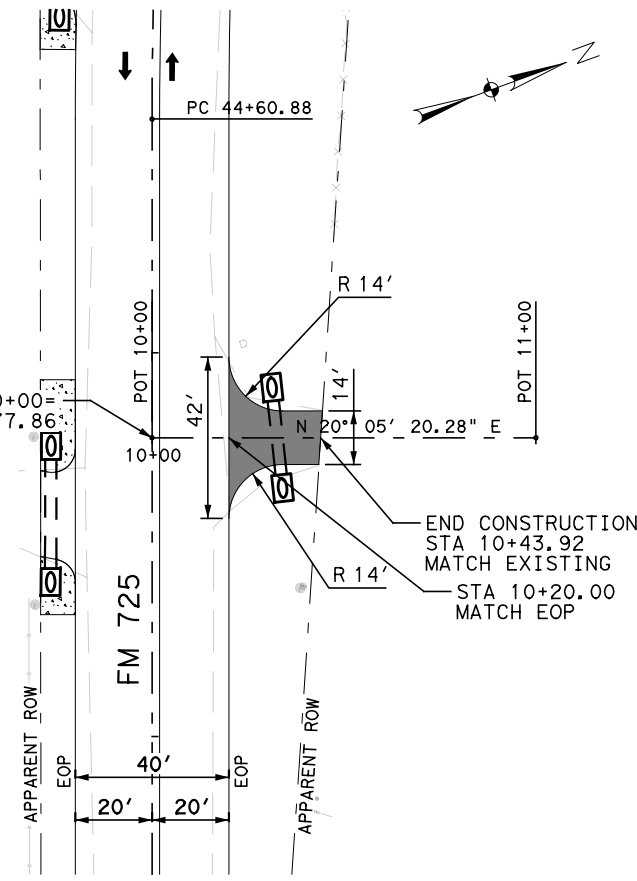
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DRIVEWAY 19



DRIVEWAY 20

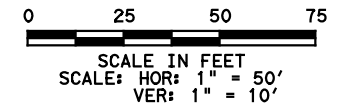


DRIVEWAY 21

LEGEND

--- APPARENT ROW

→ DIRECTION OF TRAFFIC FLOW



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	22

580		580	
575		575	
570		570	
565		565	
560		560	
555		555	
550		550	

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	43

580		580	
575		575	
570		570	
565		565	
560		560	
555		555	
550		550	

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	47

580		580	
575		575	
570		570	
565		565	
560		560	
555		555	
550		550	

4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

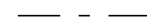

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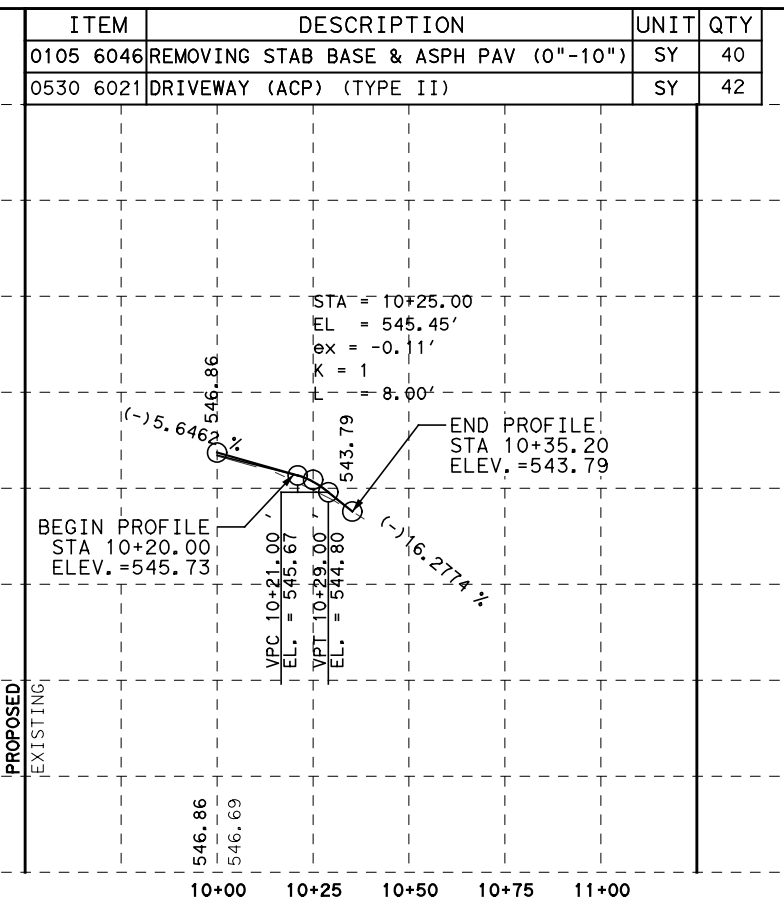
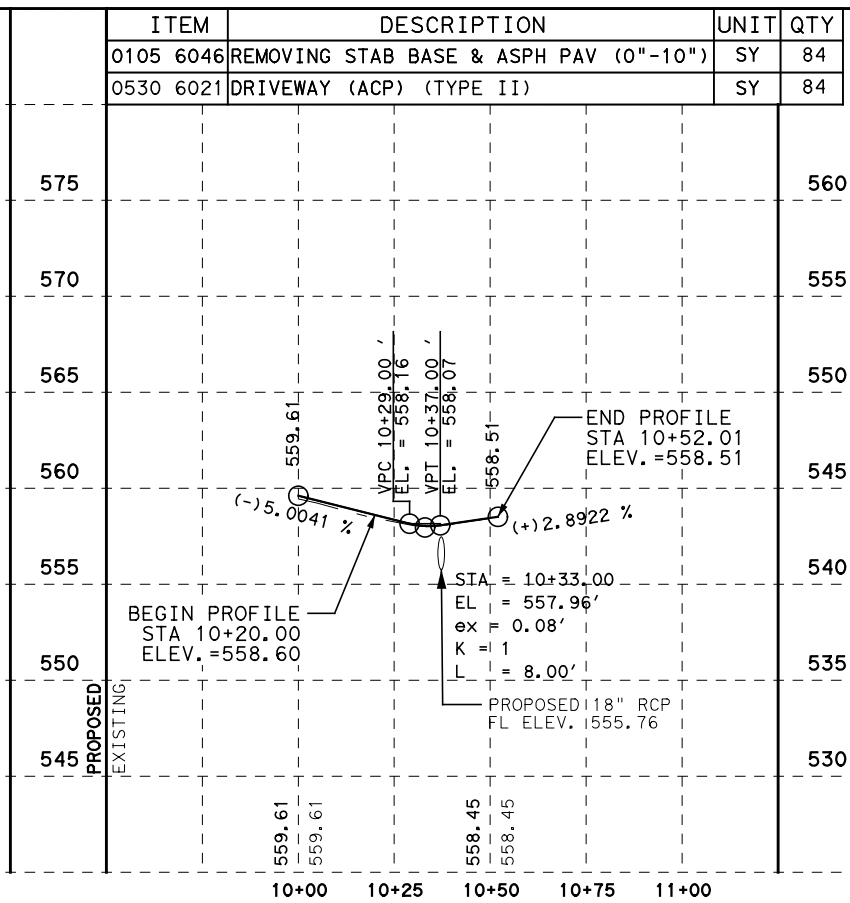
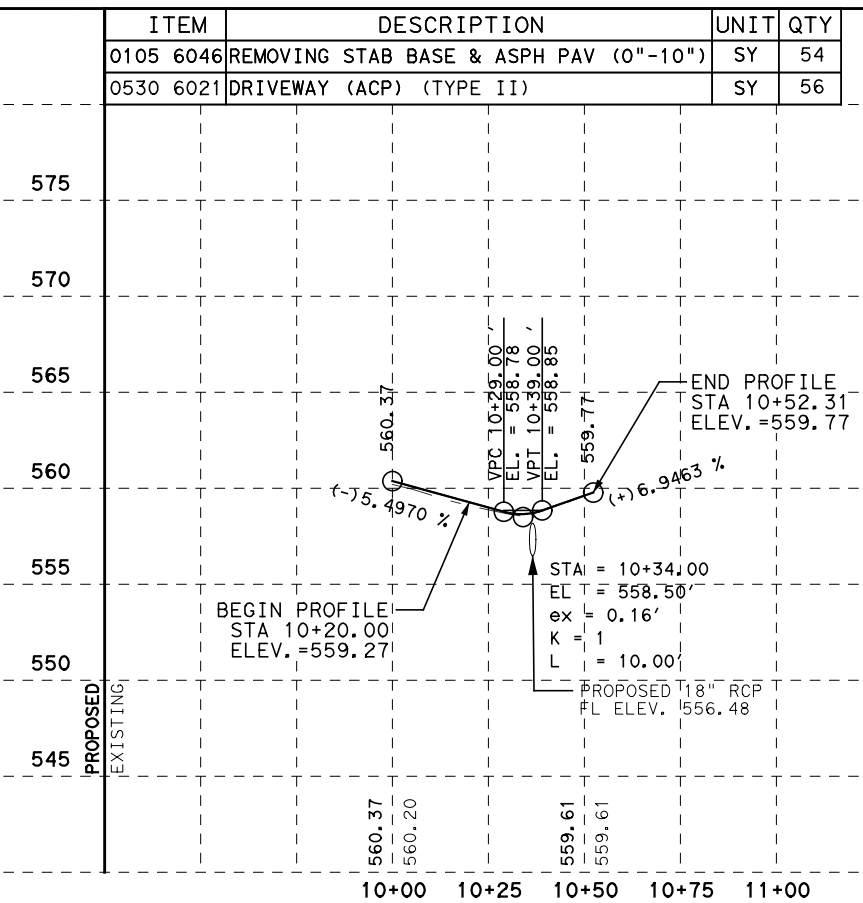
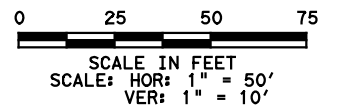
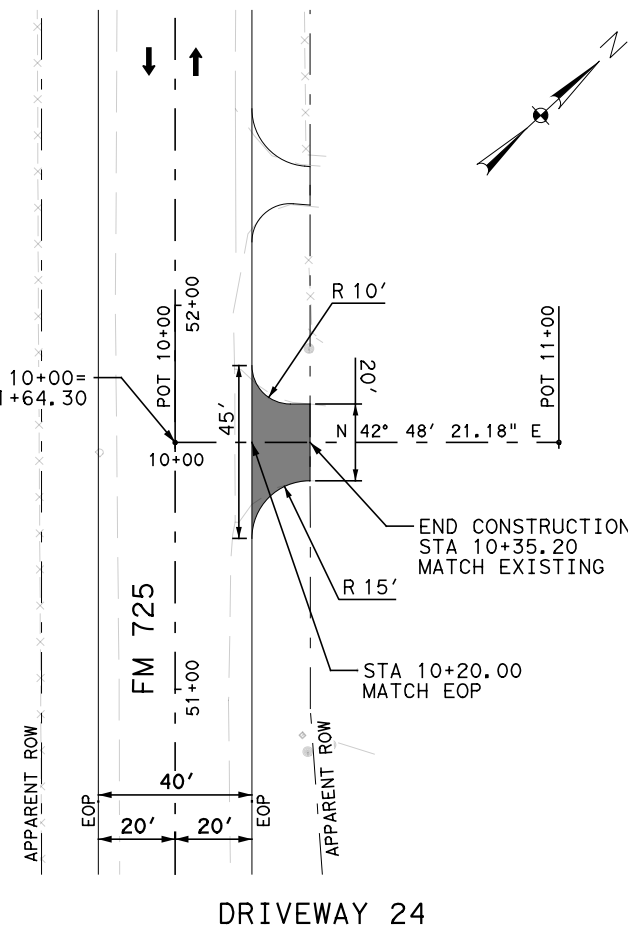
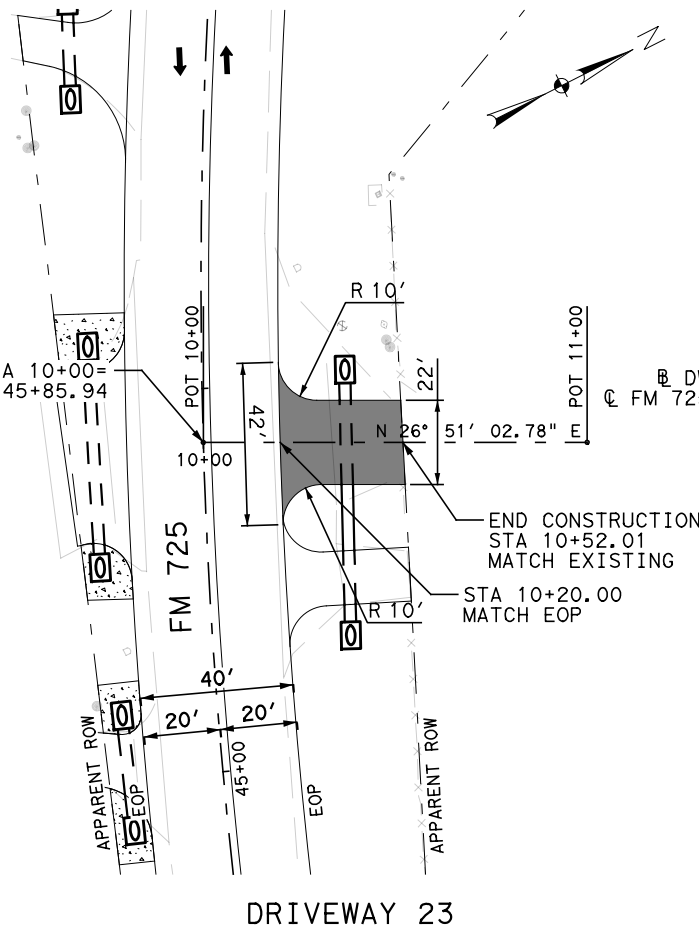
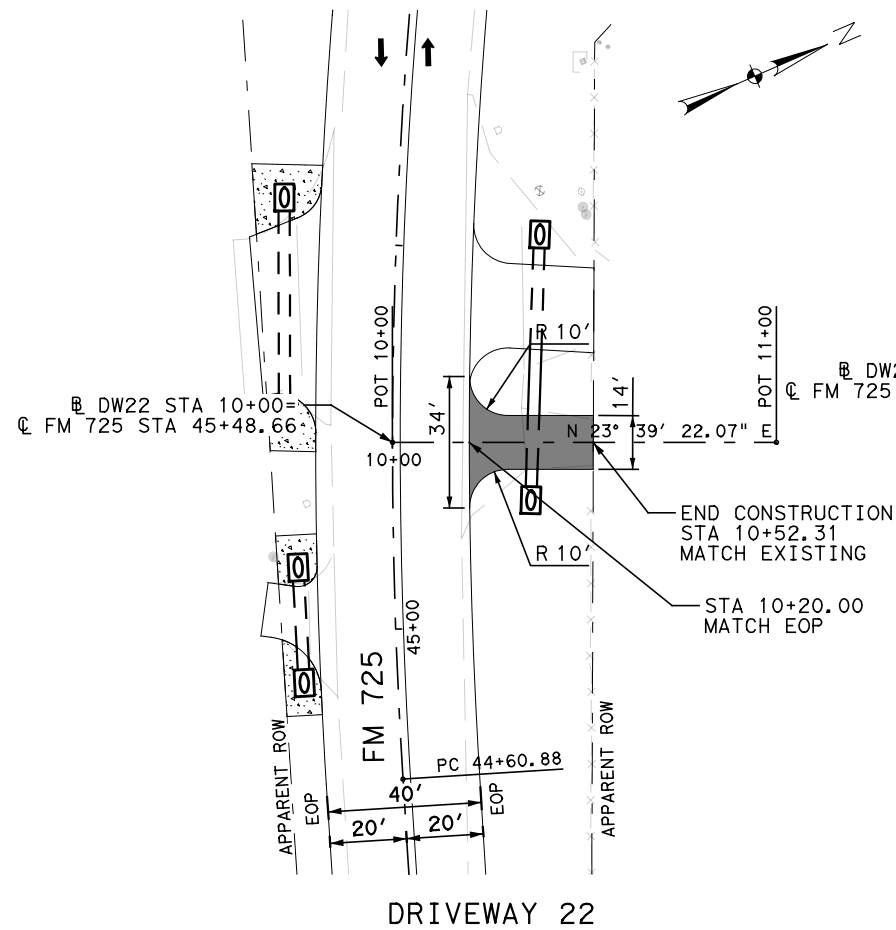
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 7 OF 55

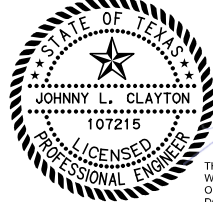
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6	See Title Sheet	151	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

LEGEND

-  APPARENT ROW
-  DIRECTION OF TRAFFIC FLOW




4/28/2021




JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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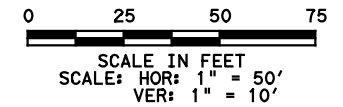
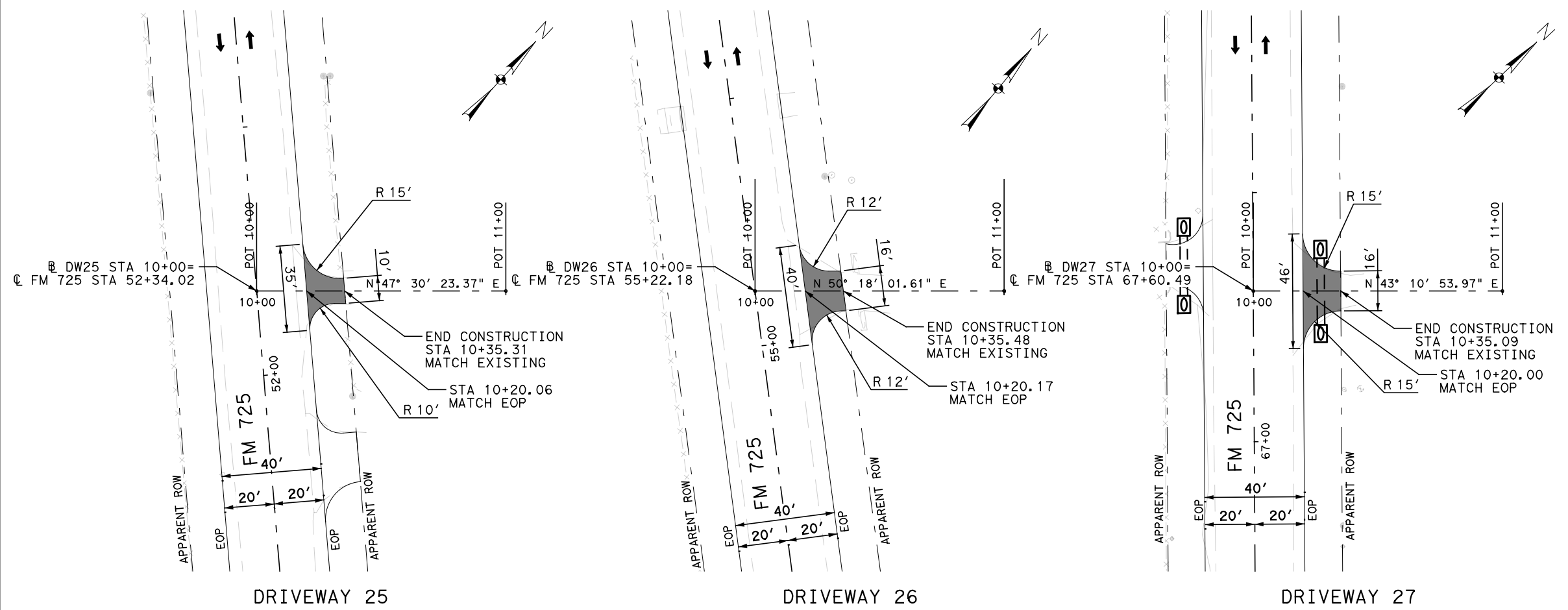
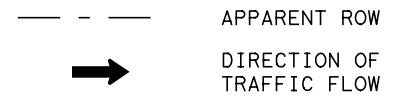
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**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 8 OF 55

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 152
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	24
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	25
560			
555			
550			
545			
540			
535			
530			

ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	34
0530 6004	DRIVEWAY (BORC)	SY	35
560			
555			
550			
545			
540			
535			
530			

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	38
575			
570			
565			
560			
555			
550			
545			
540			
535			
530			

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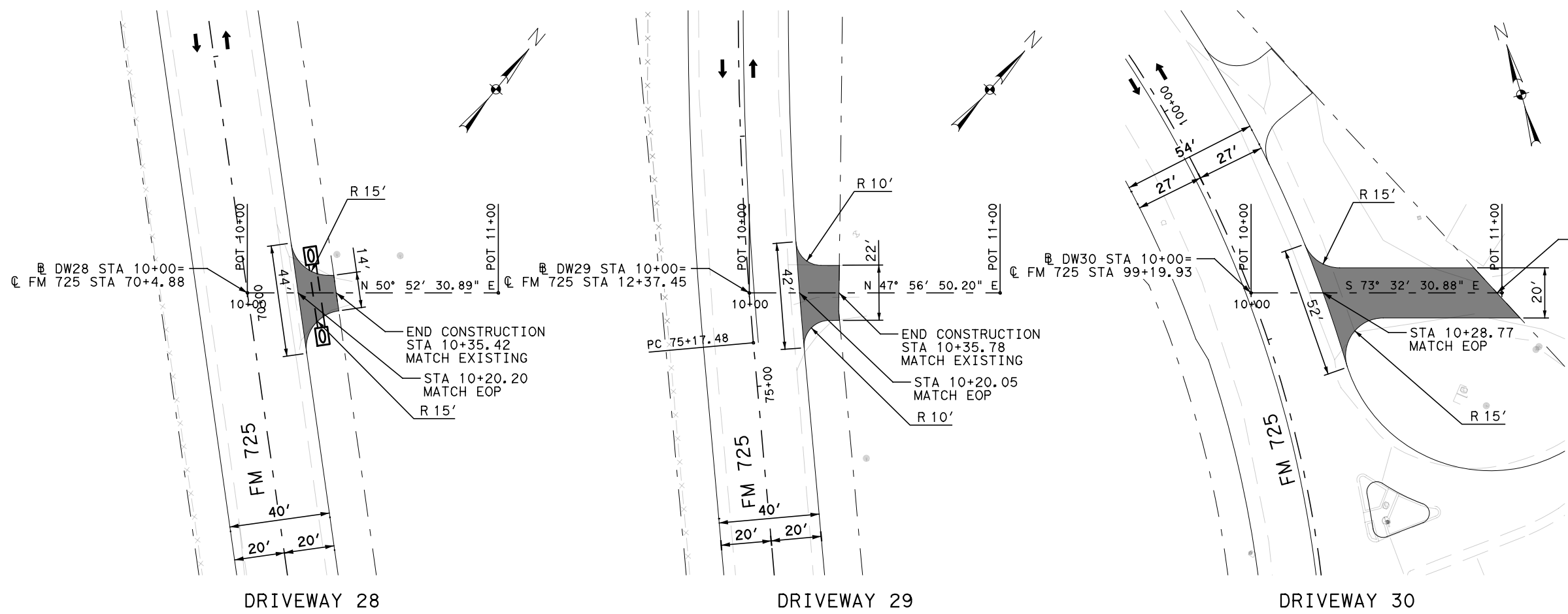
NO.	REVISION	BY	DATE

FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 9 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	153	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

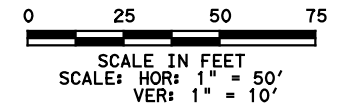
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LEGEND

--- APPARENT ROW

→ DIRECTION OF TRAFFIC FLOW



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	24
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	26
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	167

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	24
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	26
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	167

4/28/2021

JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

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HALFF 100 NE INTERSTATE 410 LOOP
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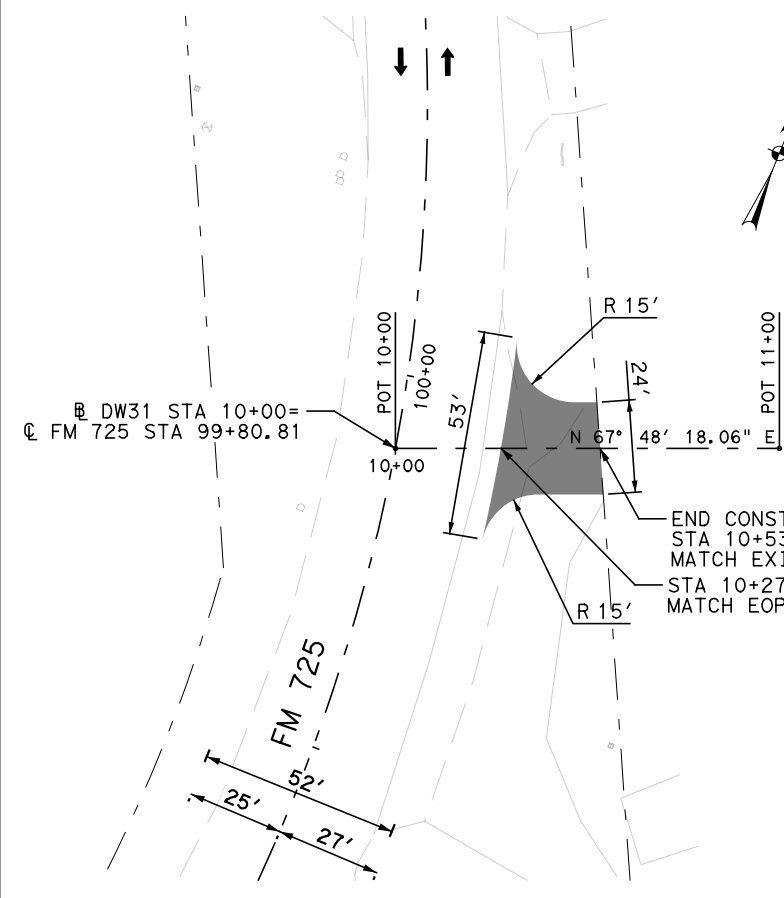
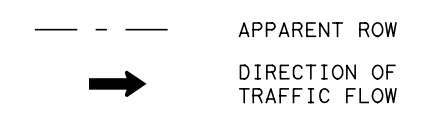
FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 10 OF 55

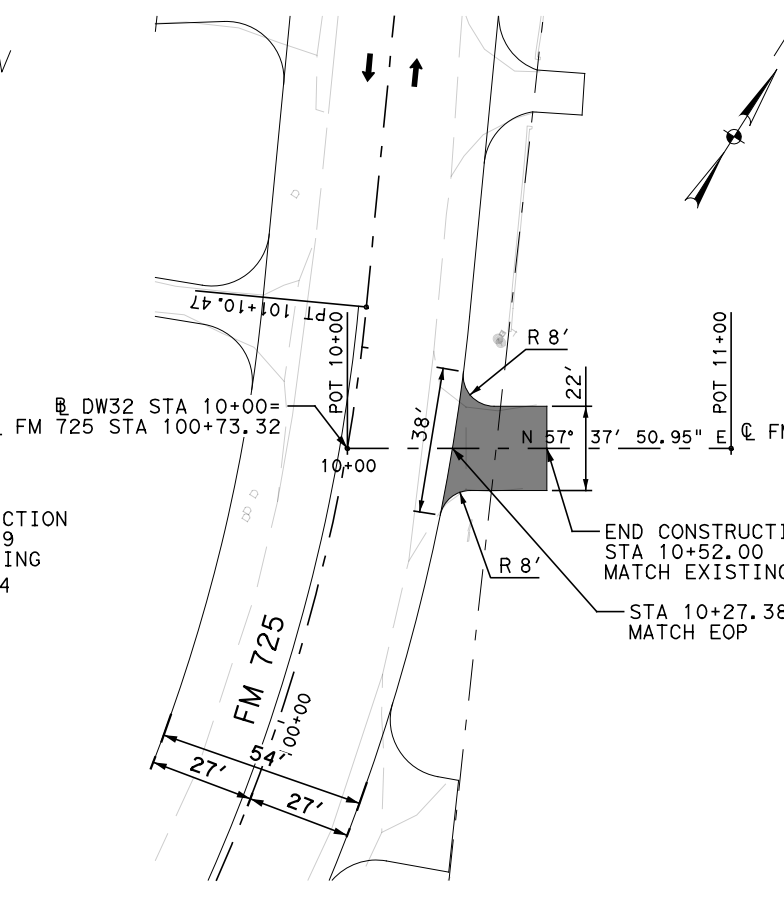
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6	See Title Sheet	154	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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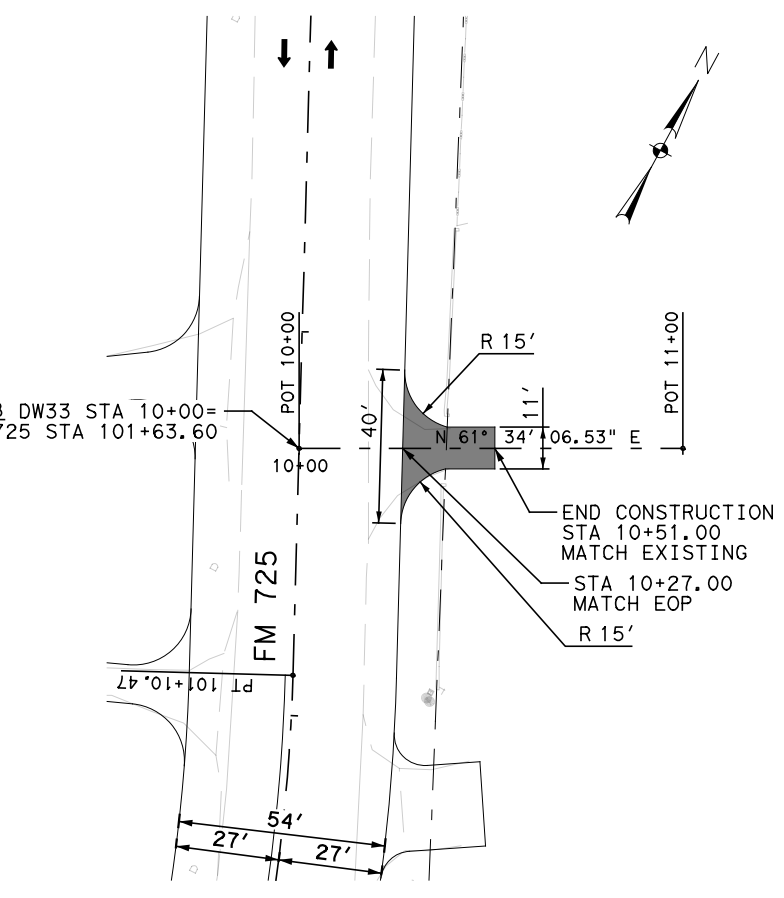
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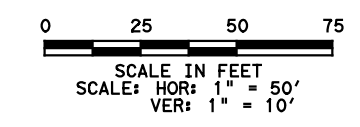
DRIVEWAY 31



DRIVEWAY 32



DRIVEWAY 33



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	22
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	79

575	STA = 10+30.00 EL = 562.46' ex = -0.11' K = 0
570	L = 5.00'
565	BEGIN PROFILE STA 10+27.44 ELEV. = 562.40
560	END PROFILE STA 10+53.29 ELEV. = 559.11
555	STA = 10+50.00 EL = 559.32' ex = 0.07'
550	L = 6.00'
545	PROPOSED EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	11
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	64

575	STA = 10+31.00 EL = 562.04' ex = -0.09' K = 0
570	L = 4.82'
565	BEGIN PROFILE STA 10+27.38 ELEV. = 562.00
560	END PROFILE STA 10+52.00 ELEV. = 559.45
555	STA = 10+49.00 EL = 559.58' ex = 0.07'
550	L = 6.00'
545	PROPOSED EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	39
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	39

575	STA = 10+30.00 EL = 562.09' ex = -0.08' K = 0
570	L = 5.00'
565	BEGIN PROFILE STA 10+27.00 ELEV. = 562.05
560	END PROFILE STA 10+51.00 ELEV. = 560.09
555	STA = 10+47.00 EL = 560.10' ex = 0.11'
550	L = 8.00'
545	PROPOSED EXISTING

4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

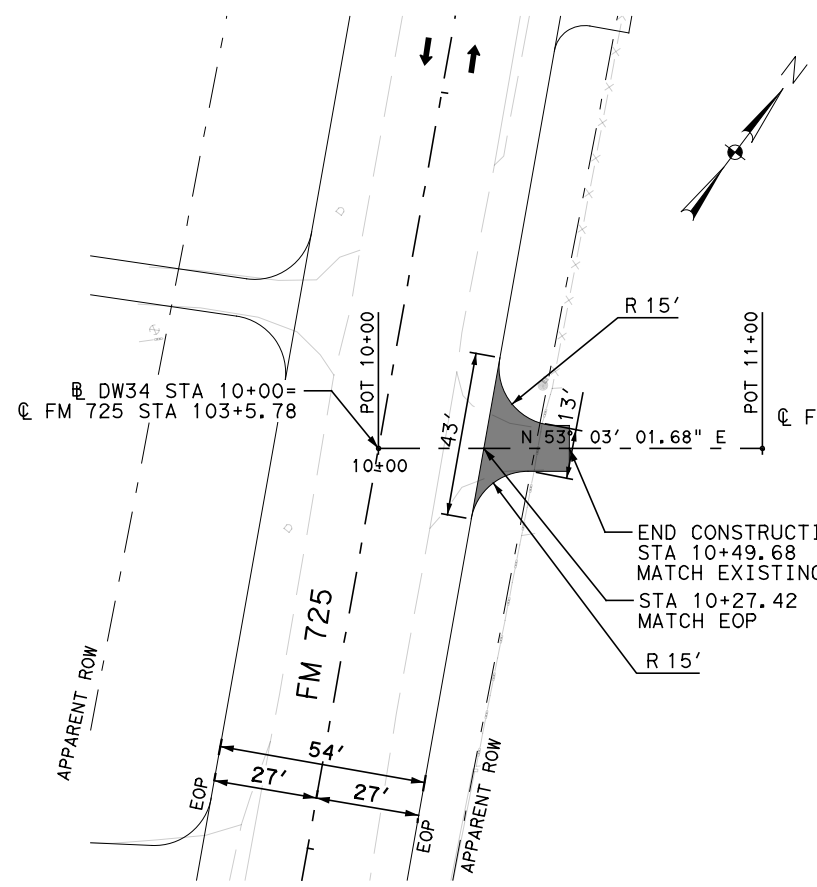
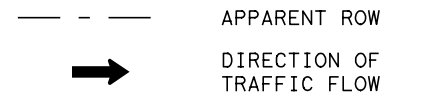
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**FM 725
DRIVEWAYS
PLAN & PROFILE**

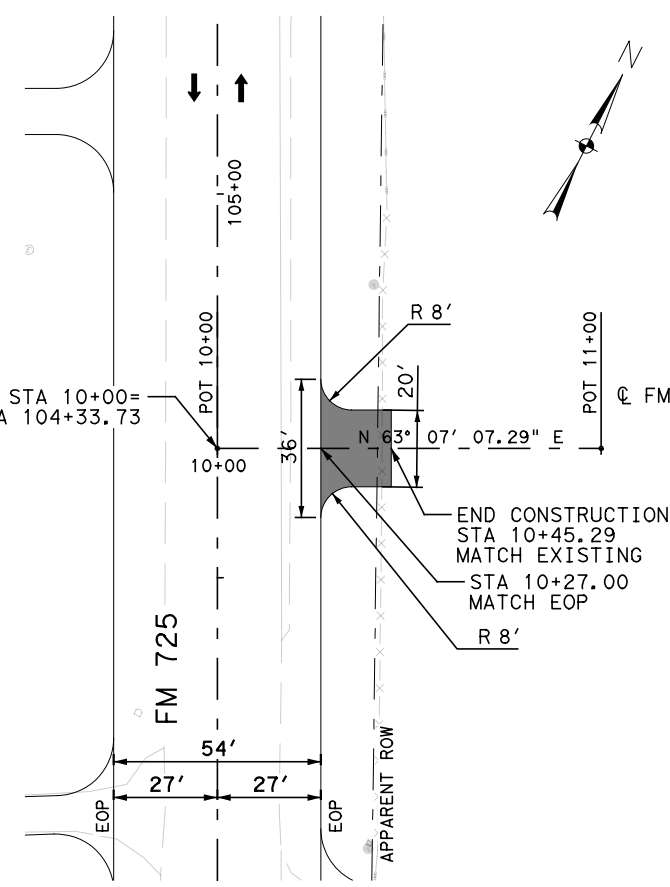
SHEET 11 OF 55

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 155
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

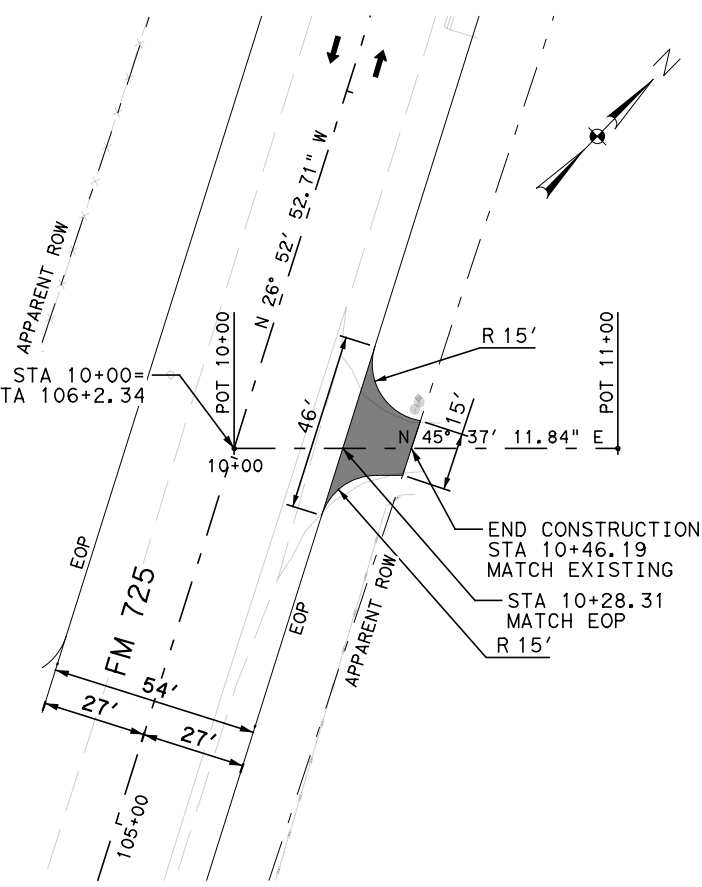
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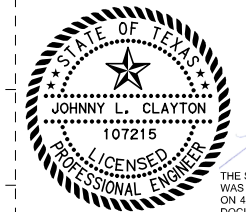
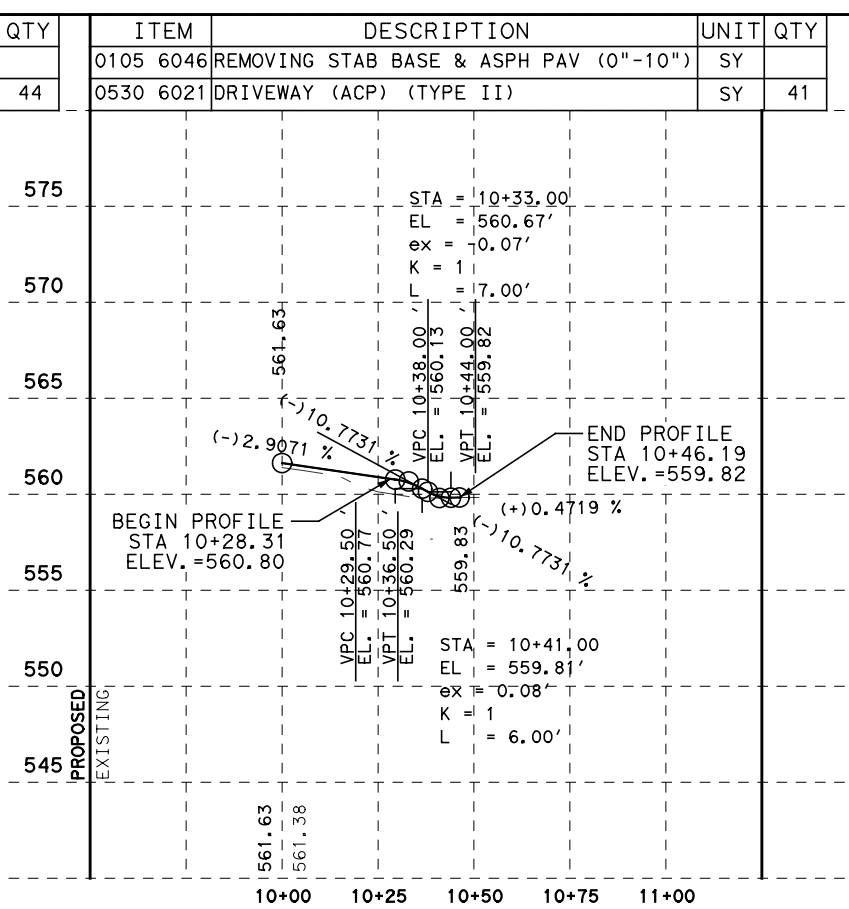
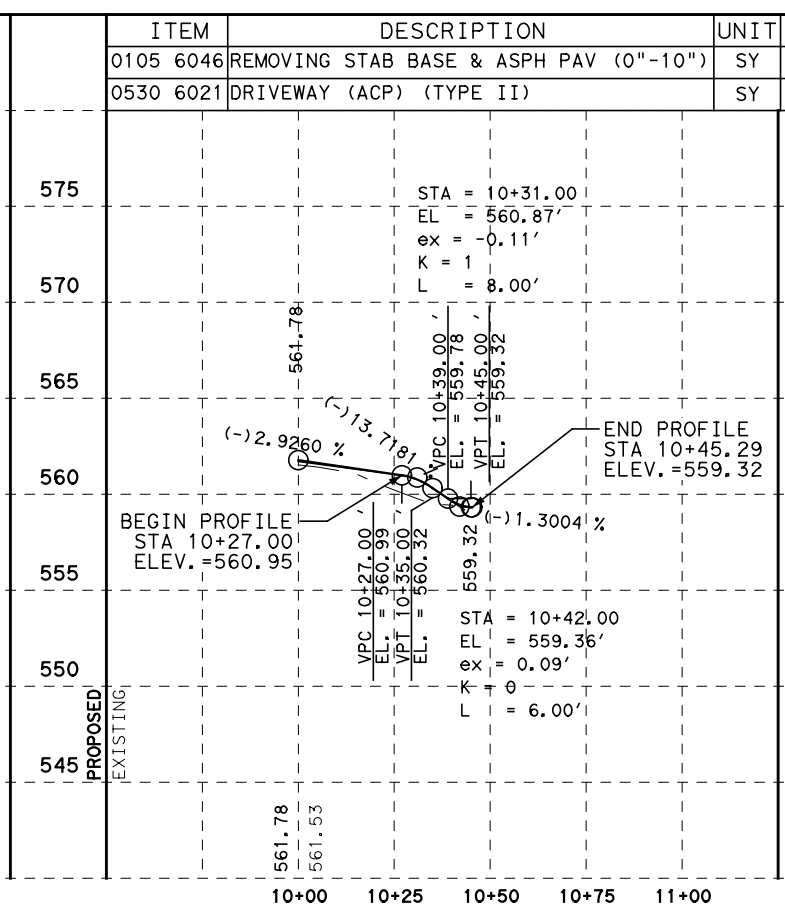
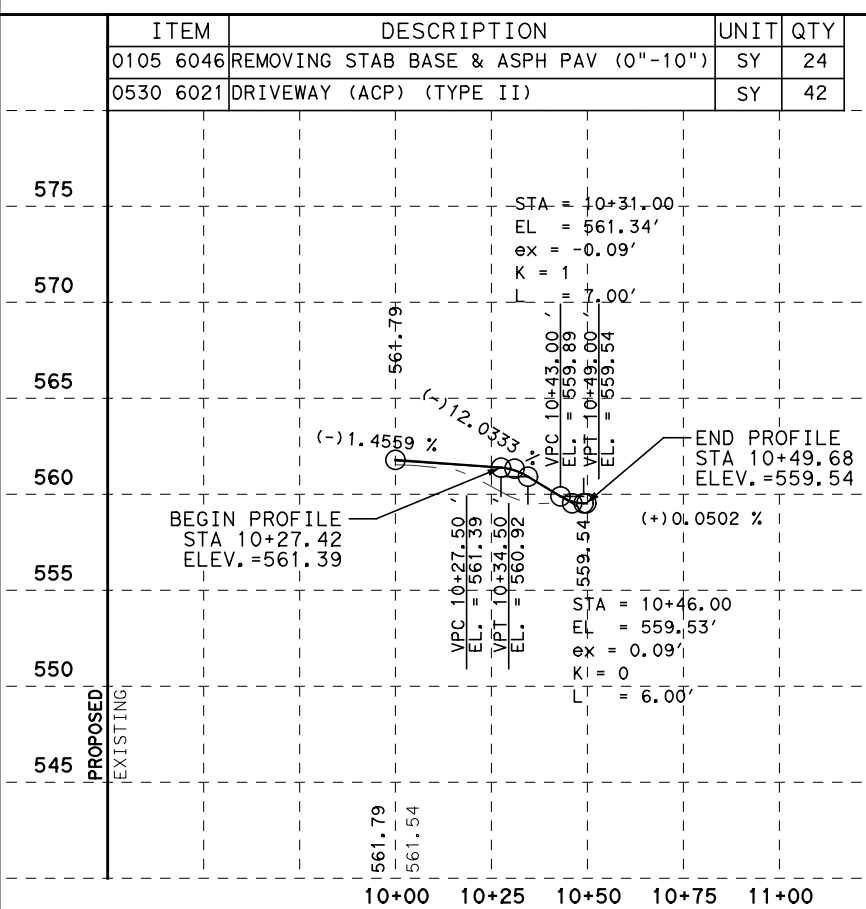
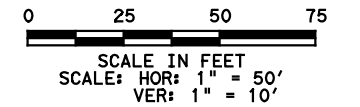
DRIVEWAY 34



DRIVEWAY 35



DRIVEWAY 36



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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312



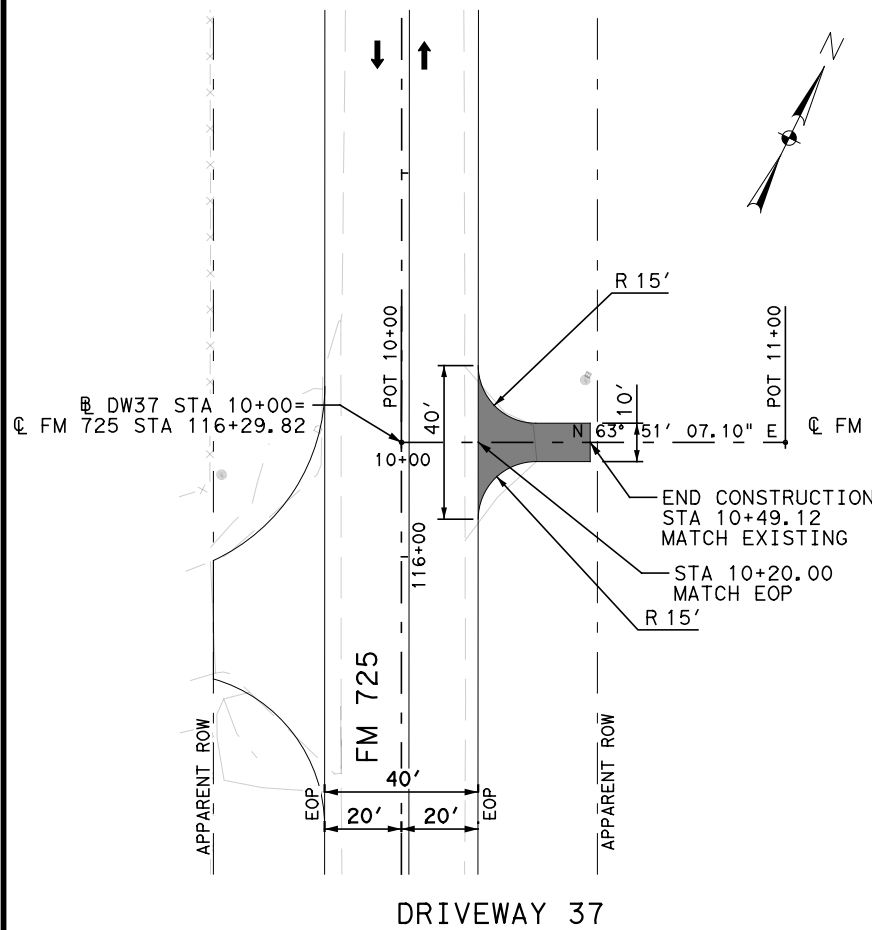
FM 725
DRIVEWAYS
PLAN & PROFILE

SHEET 12 OF 55

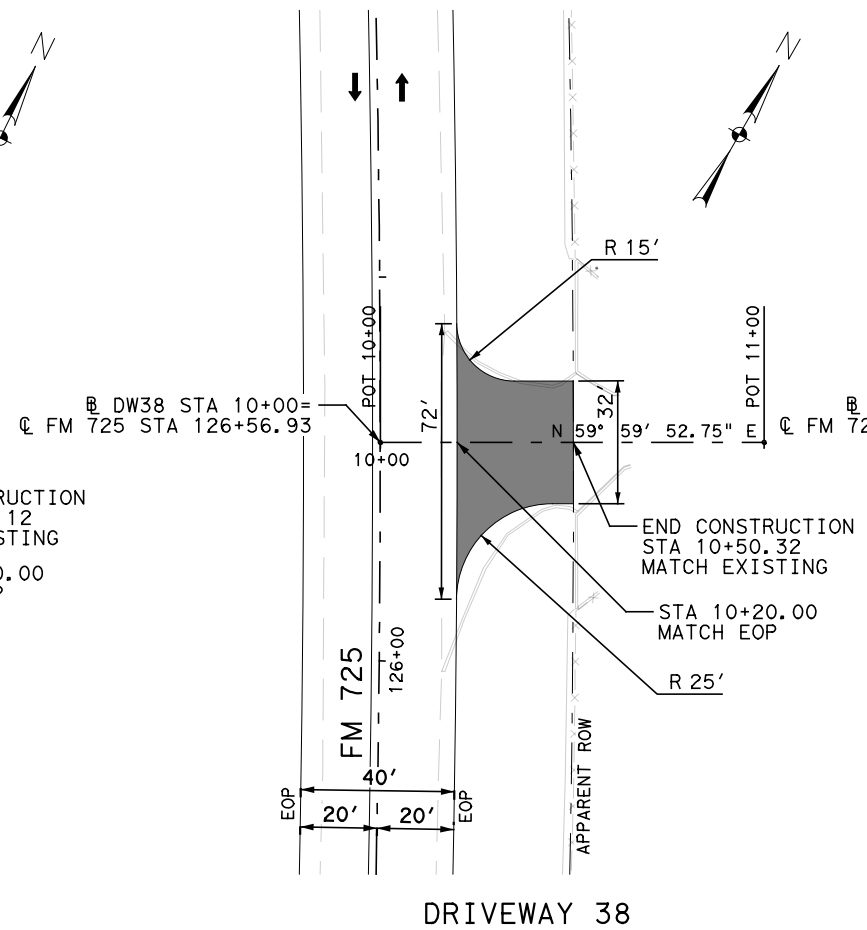
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6	See Title Sheet	156	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

LEGEND

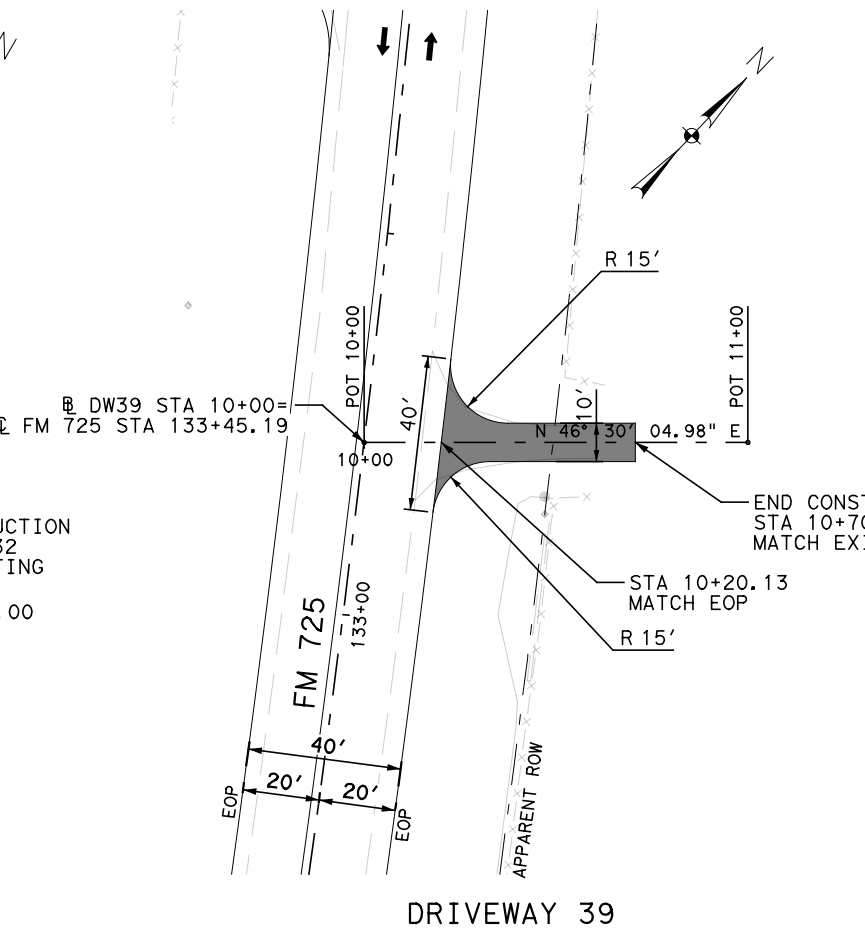
- APPARENT ROW
- DIRECTION OF TRAFFIC FLOW



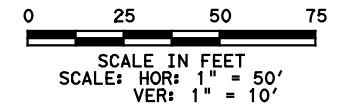
DRIVEWAY 37



DRIVEWAY 38



DRIVEWAY 39



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	27
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

575	PROPOSED	EXISTING	EL. = 567.27	EL. = 567.02
570	PROPOSED	EXISTING	EL. = 566.82	EL. = 566.40
565	PROPOSED	EXISTING	EL. = 565.77	EL. = 565.45
560	PROPOSED	EXISTING	EL. = 565.88	EL. = 565.17
555	PROPOSED	EXISTING	EL. = 565.88	EL. = 565.17
550	PROPOSED	EXISTING	EL. = 565.17	EL. = 565.17
545	PROPOSED	EXISTING	EL. = 565.17	EL. = 565.17

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	128

590	PROPOSED	EXISTING	EL. = 579.19	EL. = 578.94
585	PROPOSED	EXISTING	EL. = 579.96	EL. = 577.69
580	PROPOSED	EXISTING	EL. = 577.69	EL. = 577.69
575	PROPOSED	EXISTING	EL. = 579.71	EL. = 579.53
570	PROPOSED	EXISTING	EL. = 577.70	EL. = 577.70
565	PROPOSED	EXISTING	EL. = 579.53	EL. = 579.53
560	PROPOSED	EXISTING	EL. = 579.53	EL. = 579.53

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	68

605	PROPOSED	EXISTING	EL. = 591.26	EL. = 591.01
600	PROPOSED	EXISTING	EL. = 591.86	EL. = 588.50
595	PROPOSED	EXISTING	EL. = 591.76	EL. = 588.26
590	PROPOSED	EXISTING	EL. = 591.26	EL. = 591.26
585	PROPOSED	EXISTING	EL. = 588.26	EL. = 588.26
580	PROPOSED	EXISTING	EL. = 588.29	EL. = 588.29
575	PROPOSED	EXISTING	EL. = 588.29	EL. = 588.29

4/28/2021

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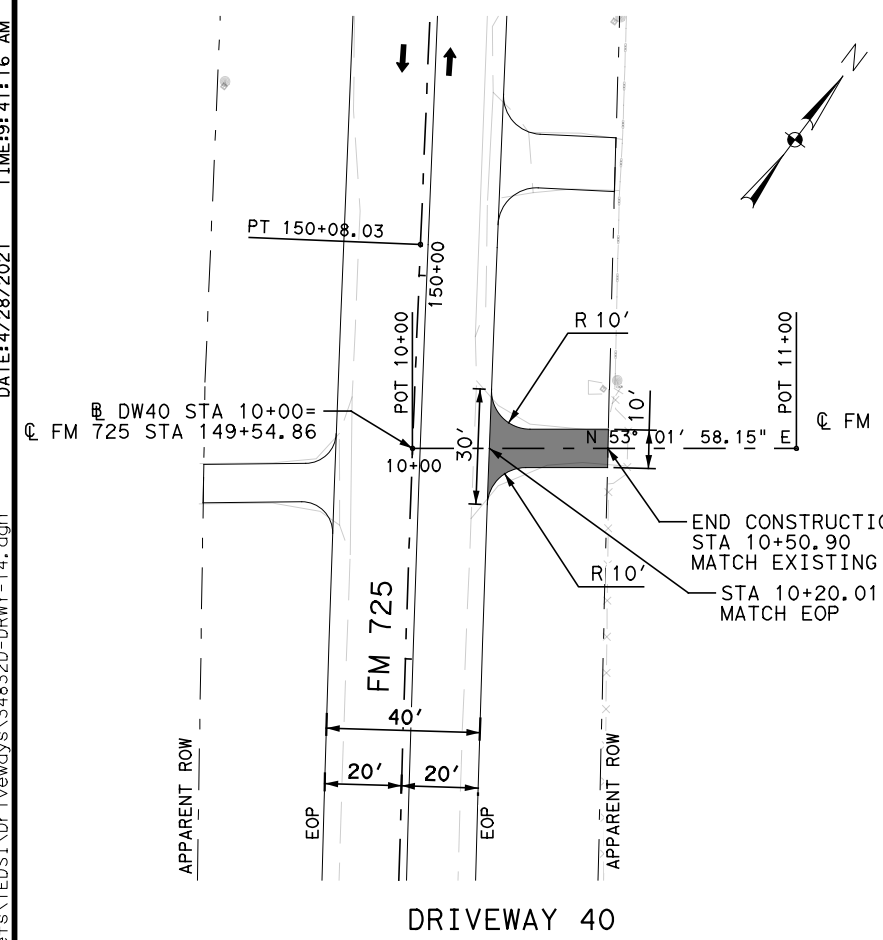
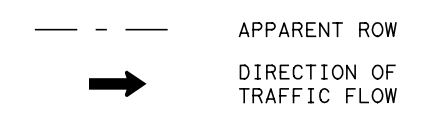
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 13 OF 55

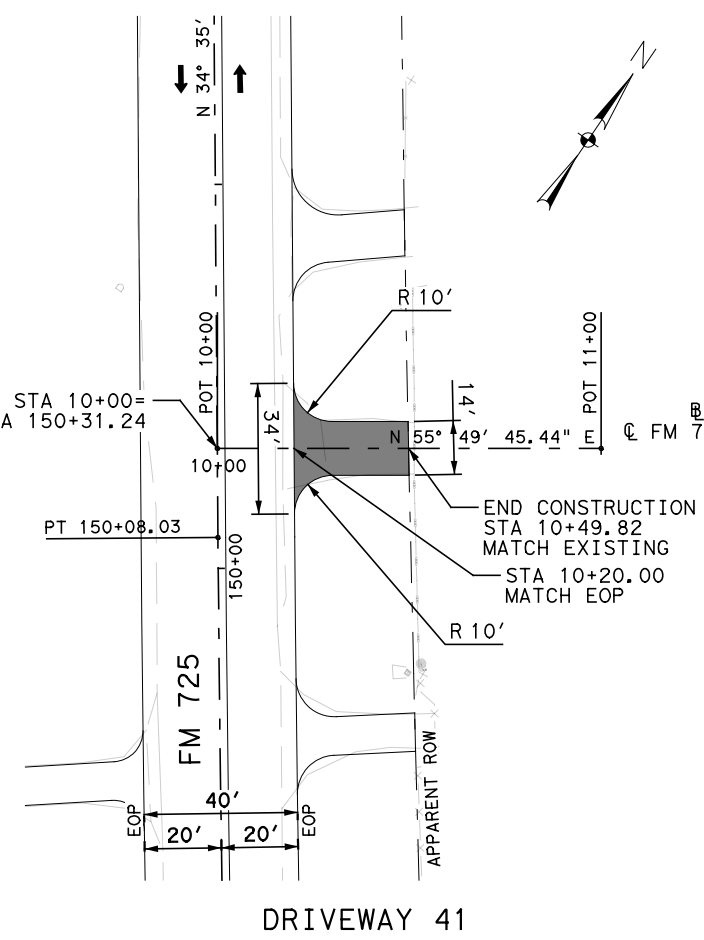
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6	See Title Sheet	157	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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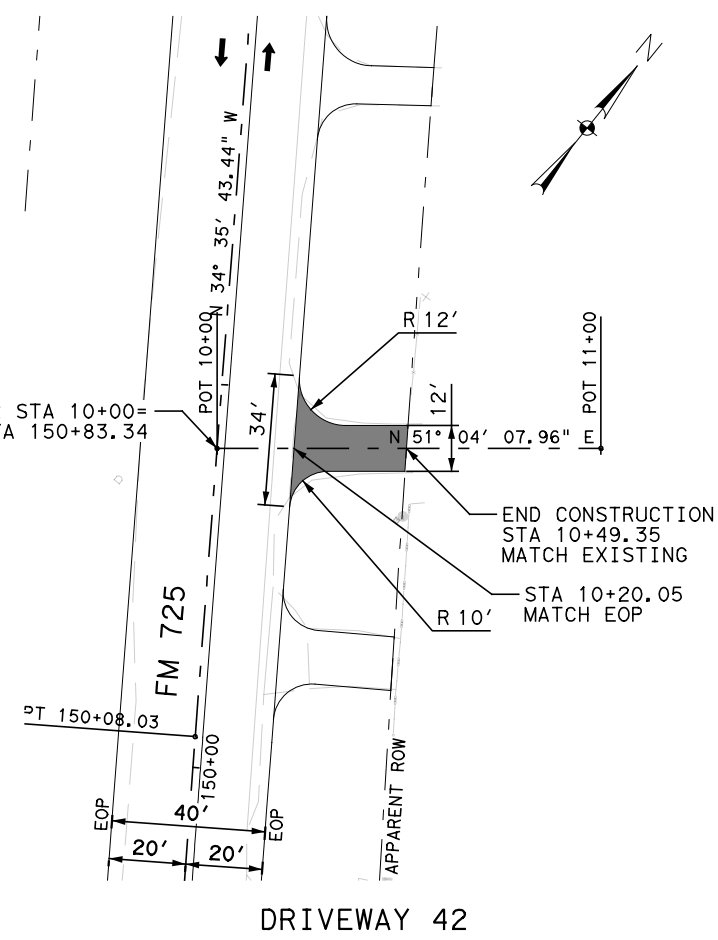
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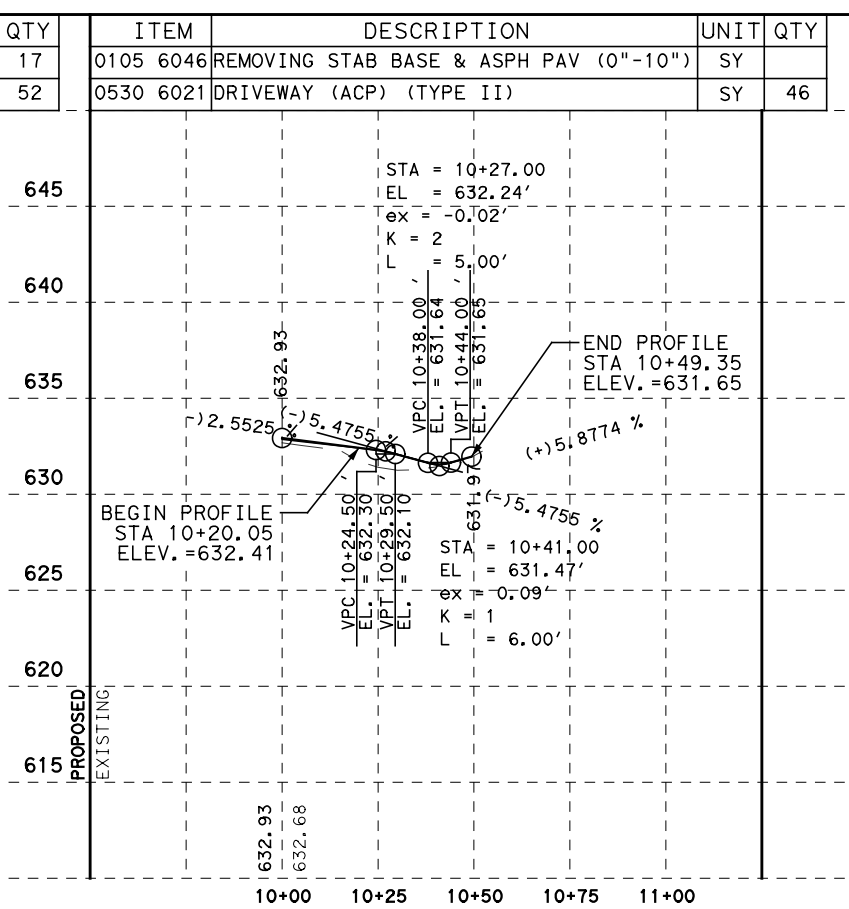
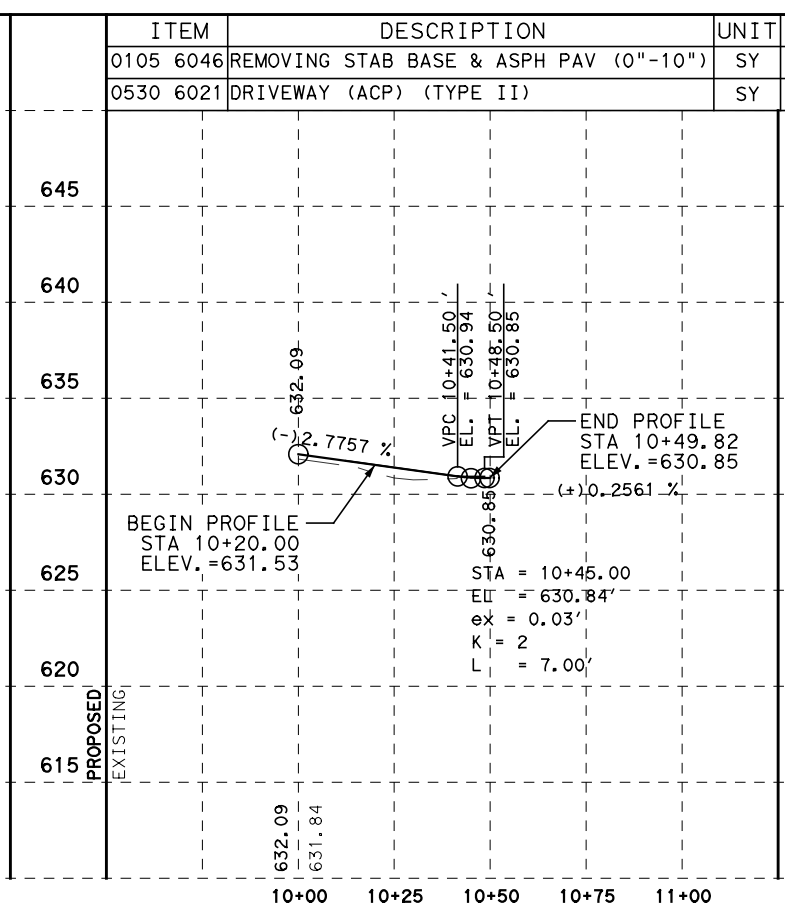
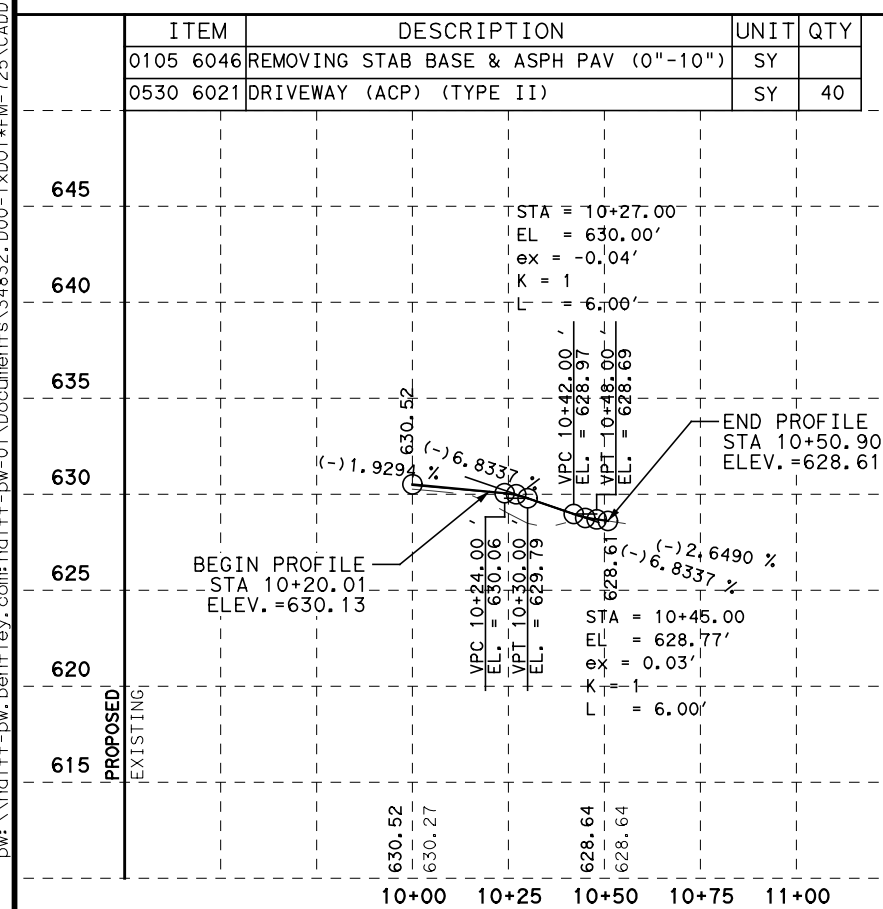
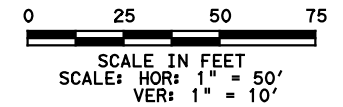
DRIVEWAY 40



DRIVEWAY 41



DRIVEWAY 42



4/28/2021

JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

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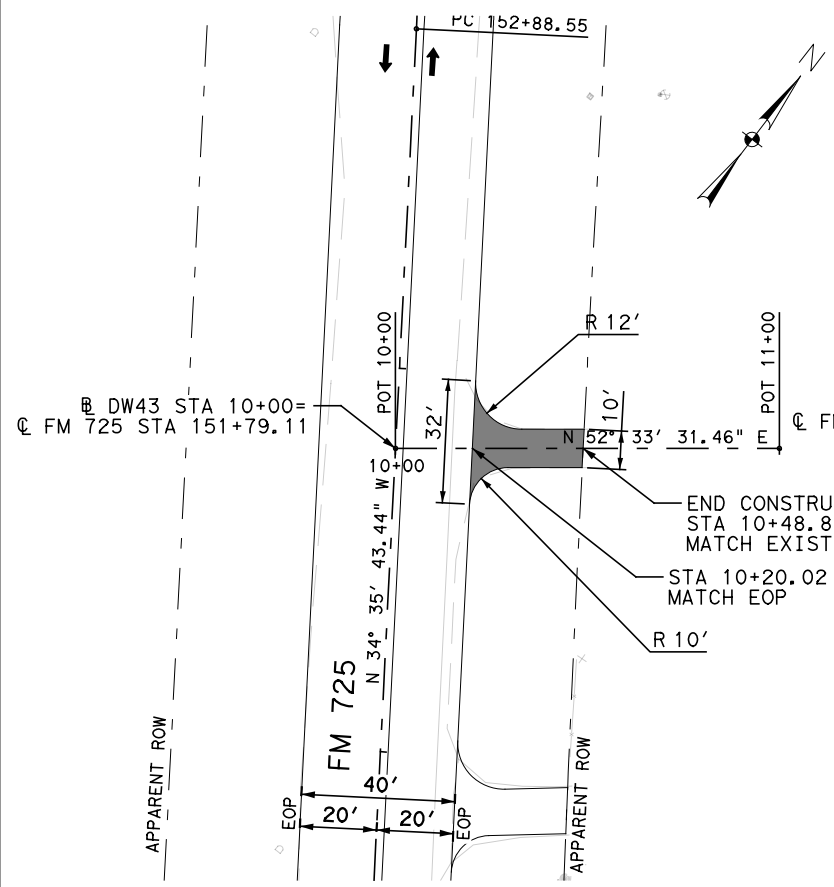
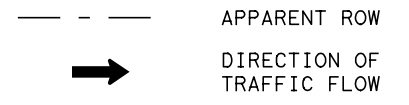
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 14 OF 55

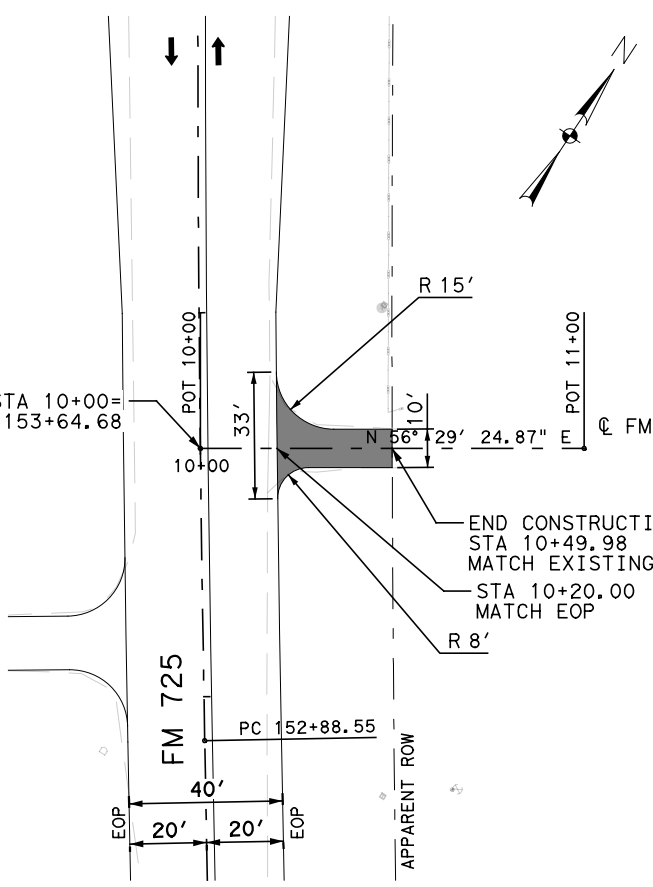
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6	See Title Sheet	158	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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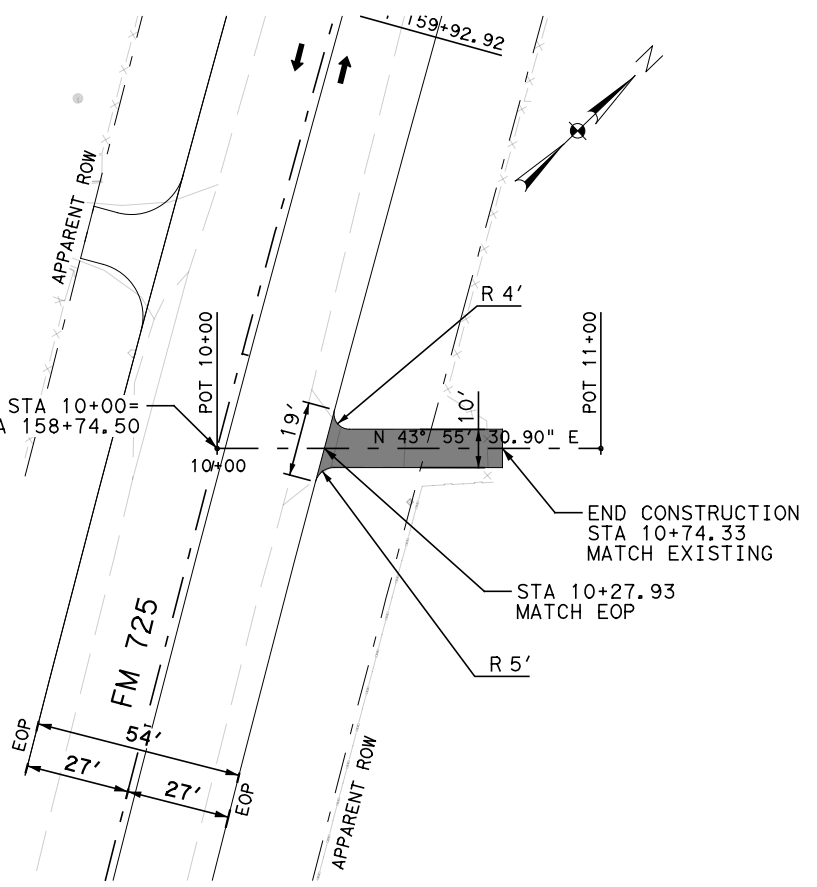
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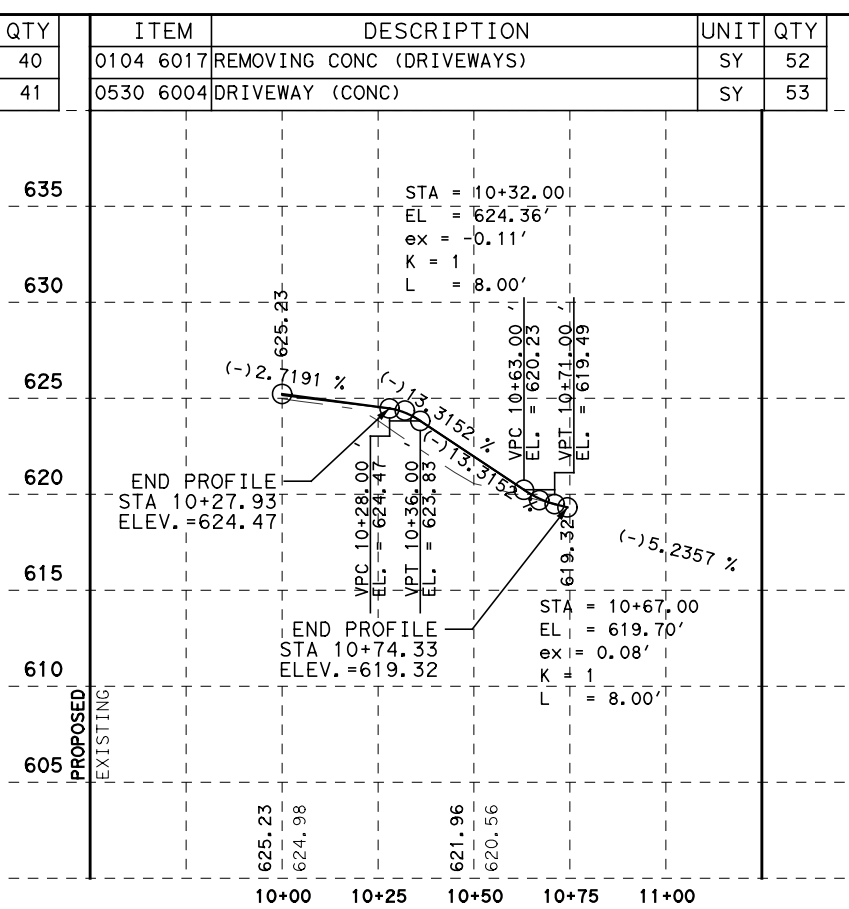
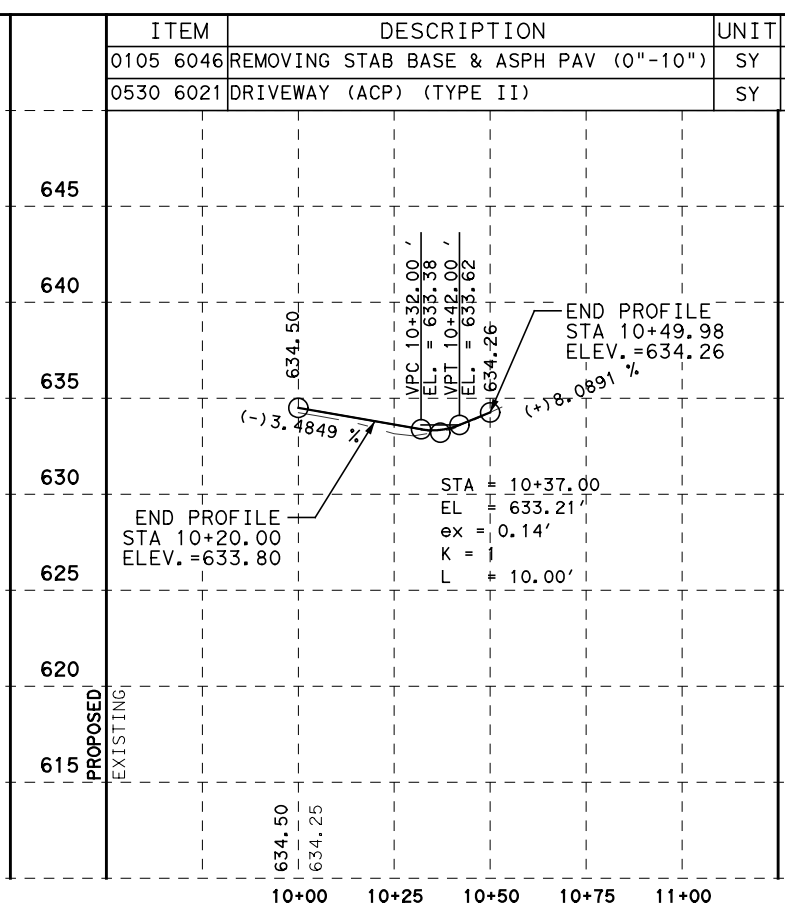
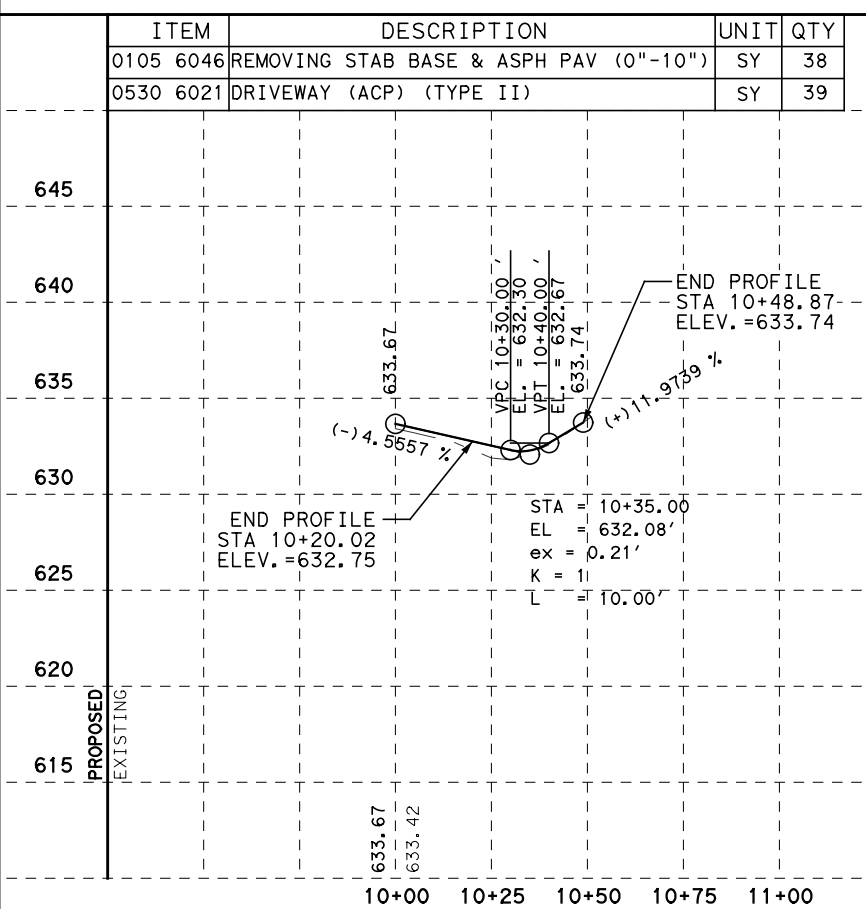
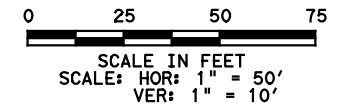
DRIVEWAY 43



DRIVEWAY 44



DRIVEWAY 45



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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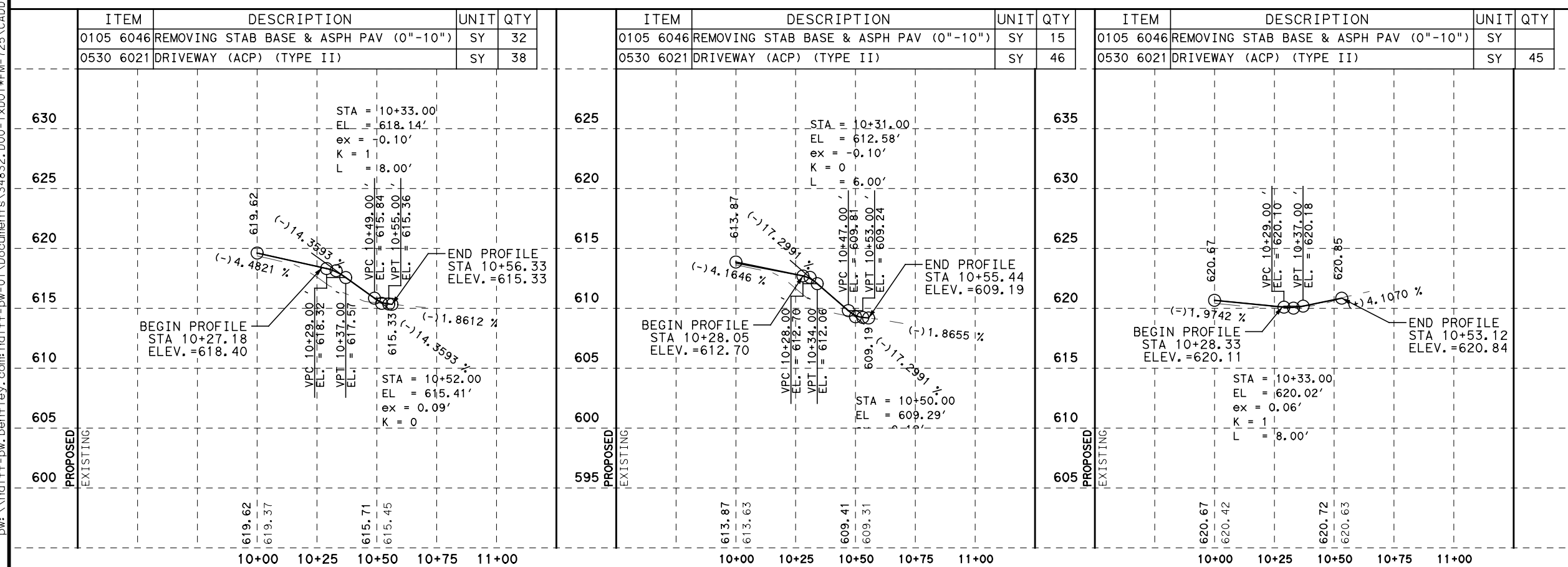
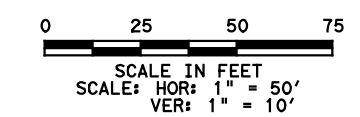
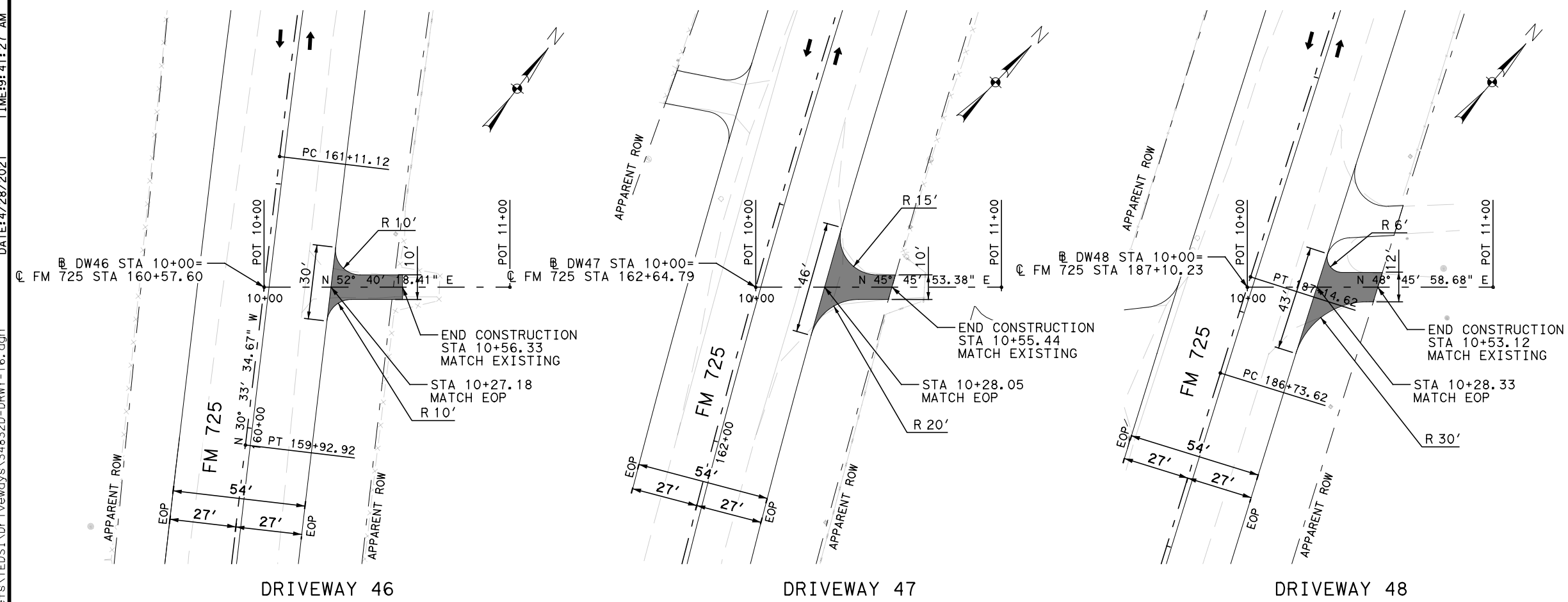
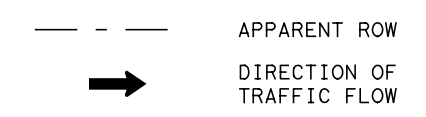
FM 725
DRIVEWAYS
PLAN & PROFILE

SHEET 15 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	159	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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NO.	REVISION	BY	DATE

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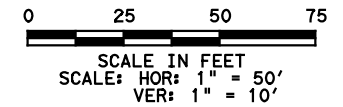
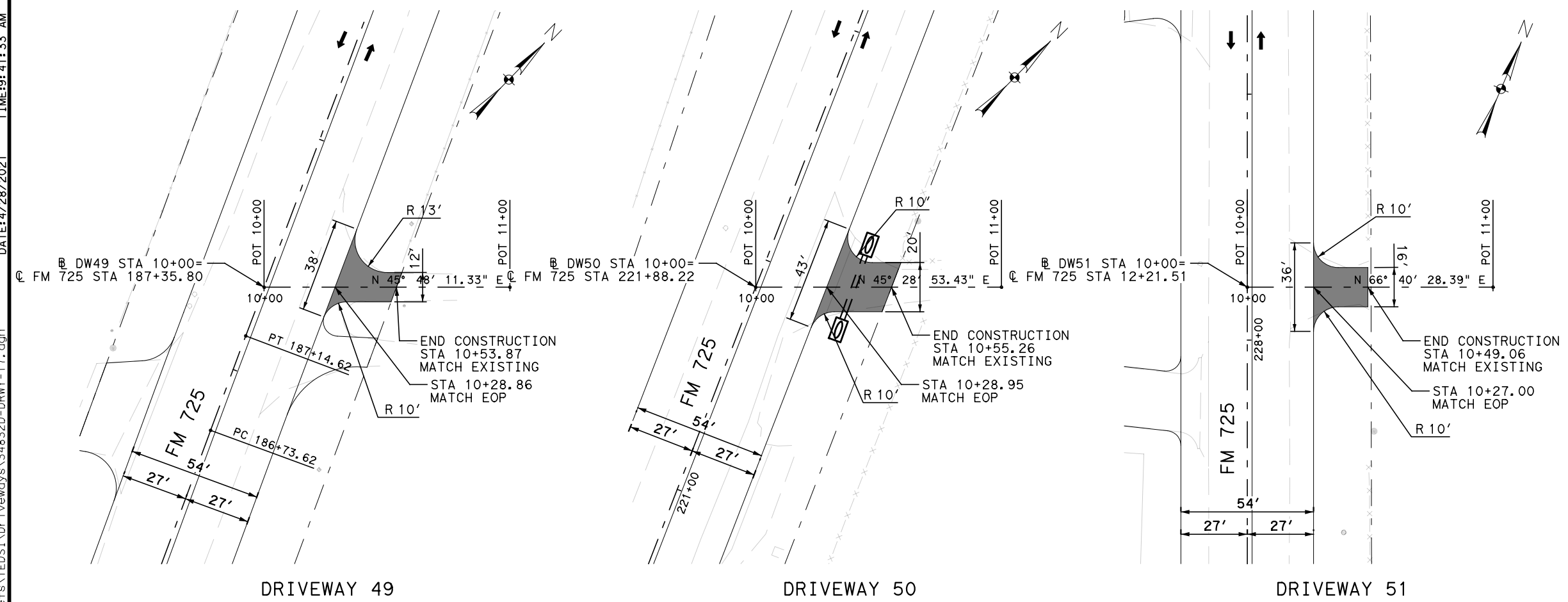
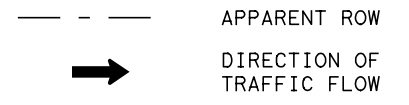
FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 16 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	160	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	62
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	62
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	65

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	44
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

STATION	ELEVATION	PROPOSED	EXISTING
10+00	620.64		620.39
10+25	620.54		620.50
10+50	620.66		620.66
10+75	620.66		620.66
11+00	620.66		620.66

STATION	ELEVATION	PROPOSED	EXISTING
10+00	588.99		588.74
10+25	588.64		588.61
10+50	588.96		588.96
10+75	588.96		588.96
11+00	588.96		588.96

STATION	ELEVATION	PROPOSED	EXISTING
10+00	592.84		592.59
10+25	592.84		592.84
10+50	594.51		594.51
10+75	594.51		594.51
11+00	594.51		594.51

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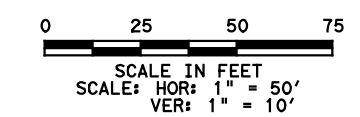
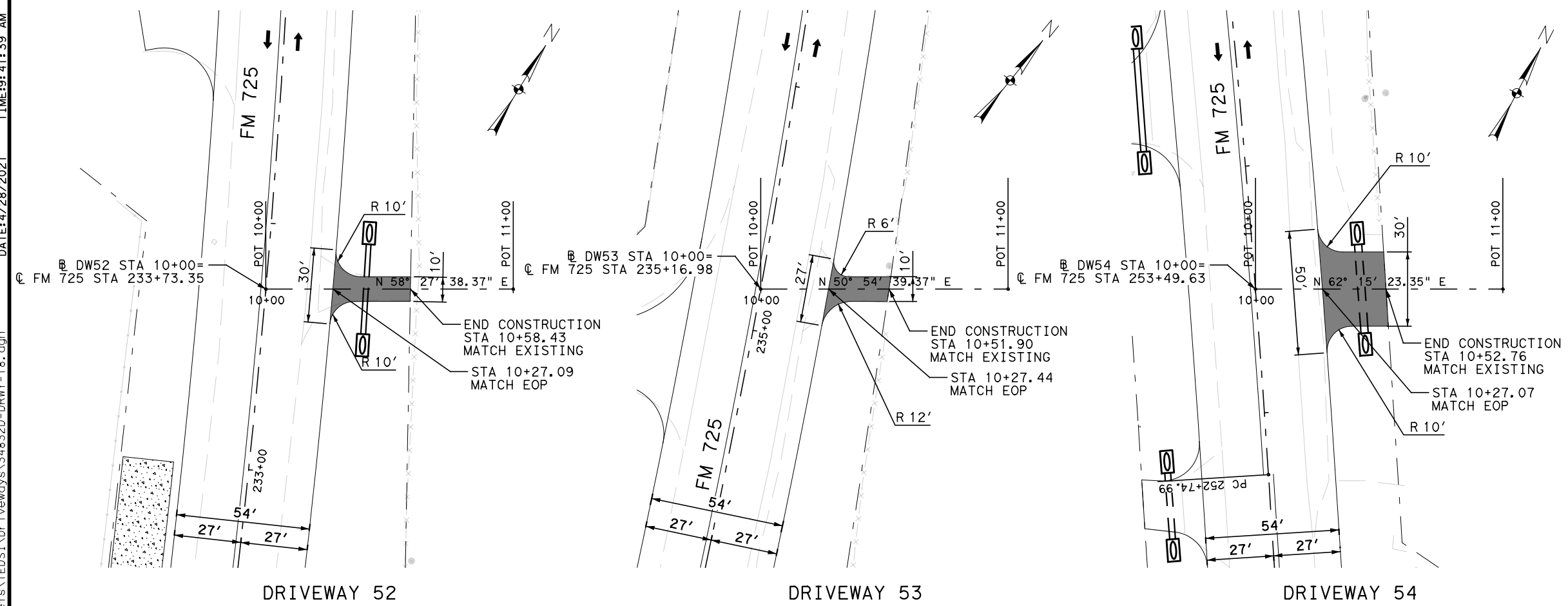
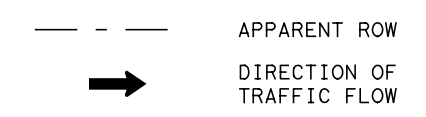
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 17 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	161	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	40

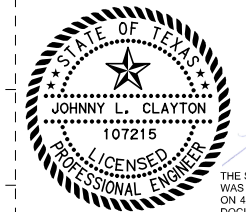
ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	31

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	91

STATION	ELEVATION	DESCRIPTION
10+00	592.37	BEGIN PROFILE STA 10+27.09 ELEV. = 592.20
10+25	592.12	
10+50	591.57	
10+75	591.56	
11+00		END PROFILE STA 10+58.43 ELEV. = 591.97

STATION	ELEVATION	DESCRIPTION
10+00	592.76	BEGIN PROFILE STA 10+27.44 ELEV. = 592.49
10+25	592.51	
10+50	591.42	
10+75	591.41	
11+00		END PROFILE STA 10+51.90 ELEV. = 591.53

STATION	ELEVATION	DESCRIPTION
10+00	616.59	BEGIN PROFILE STA 10+27.07 ELEV. = 616.64
10+25	616.42	
10+50	614.83	
10+75		
11+00		END PROFILE STA 10+52.76 ELEV. = 614.99



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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



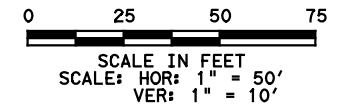
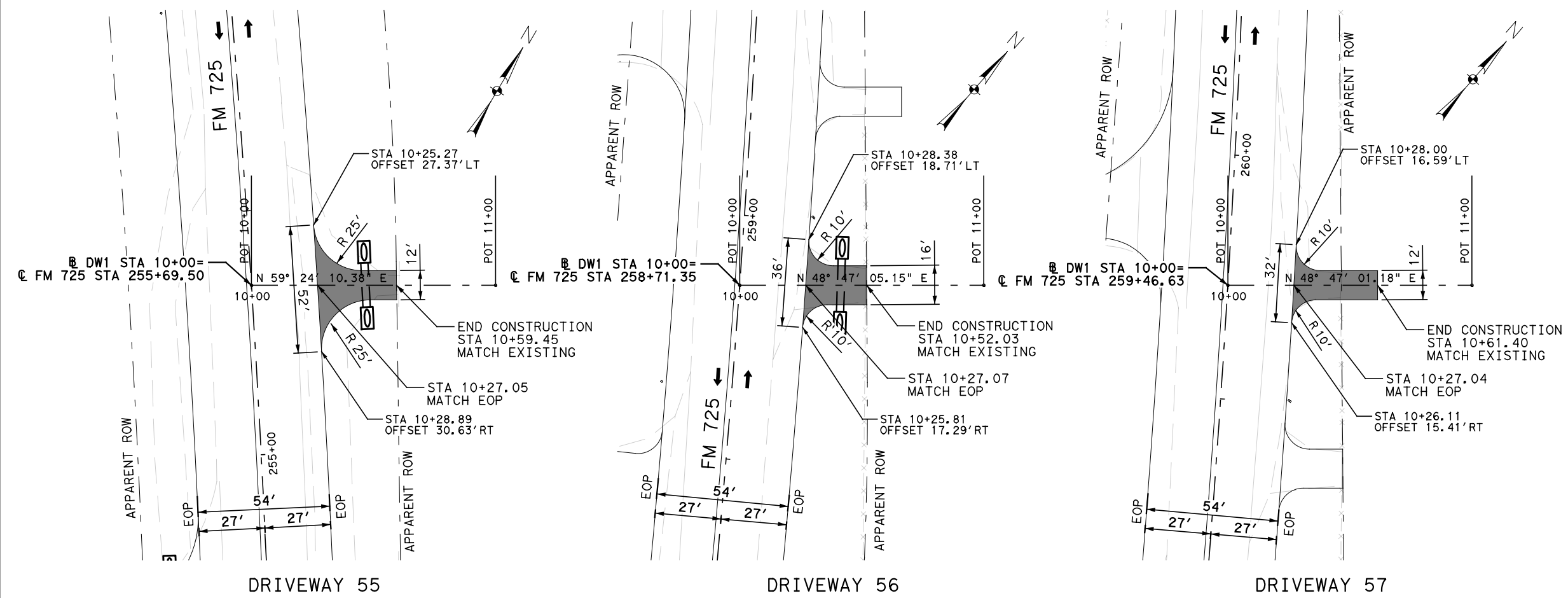
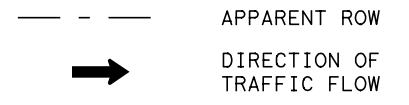
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 18 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	162	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	63

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	50

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	51

STATION	ELEVATION	DESCRIPTION
10+00	620.81	BEGIN PROFILE STA 10+27.05 ELEV. = 620.58
10+25	620.64	
10+50	619.24	END PROFILE STA 10+59.45 ELEV. = 619.24
10+75	619.19	
11+00		

STATION	ELEVATION	DESCRIPTION
10+00	626.74	BEGIN PROFILE STA 10+27.07 ELEV. = 627.26
10+25	626.57	
10+50	625.67	END PROFILE STA 10+52.03 ELEV. = 625.63
10+75	625.62	
11+00		

STATION	ELEVATION	DESCRIPTION
10+00	628.19	BEGIN PROFILE STA 10+27.04 ELEV. = 628.64
10+25	628.02	
10+50	626.36	END PROFILE STA 10+61.40 ELEV. = 626.36
10+75	626.38	
11+00		

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

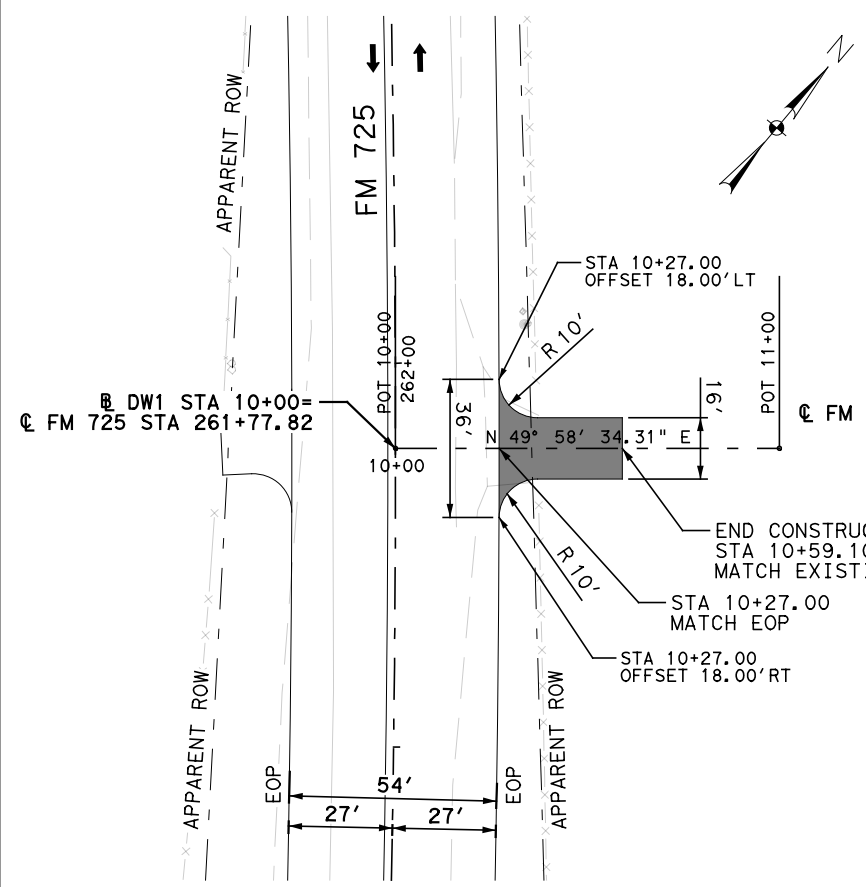
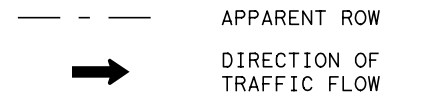
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**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

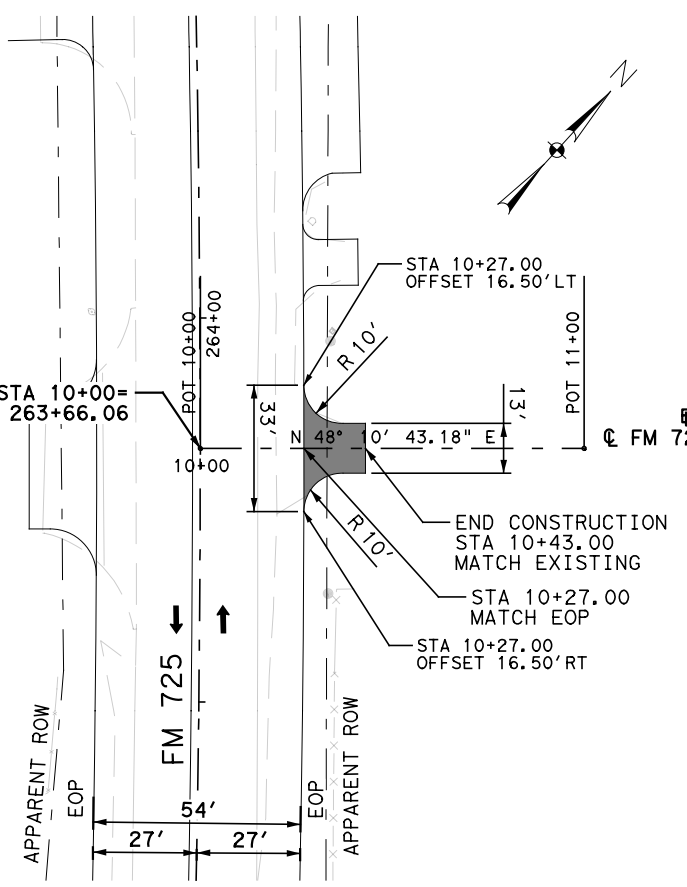
SHEET 19 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	163	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

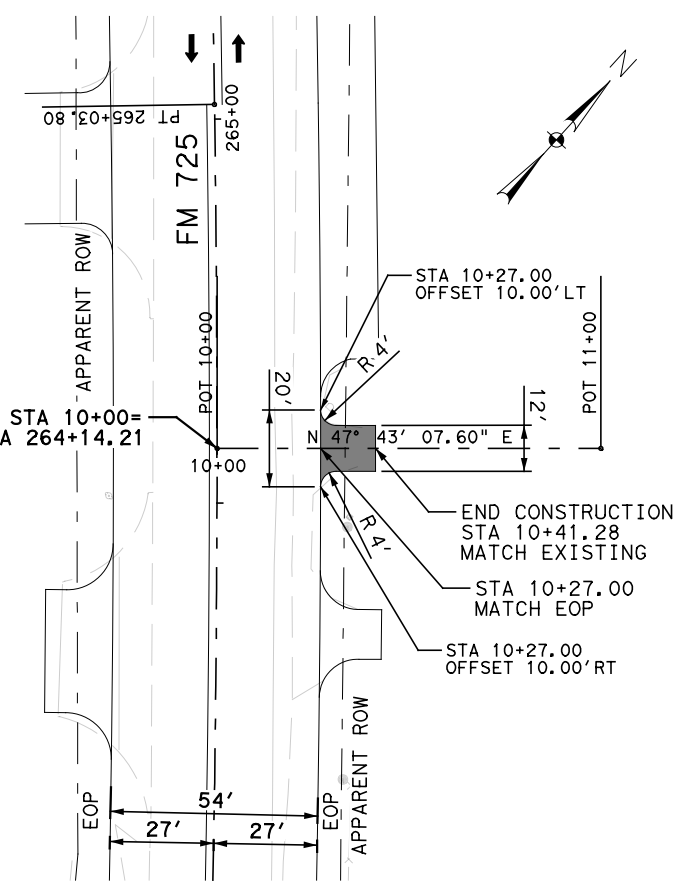
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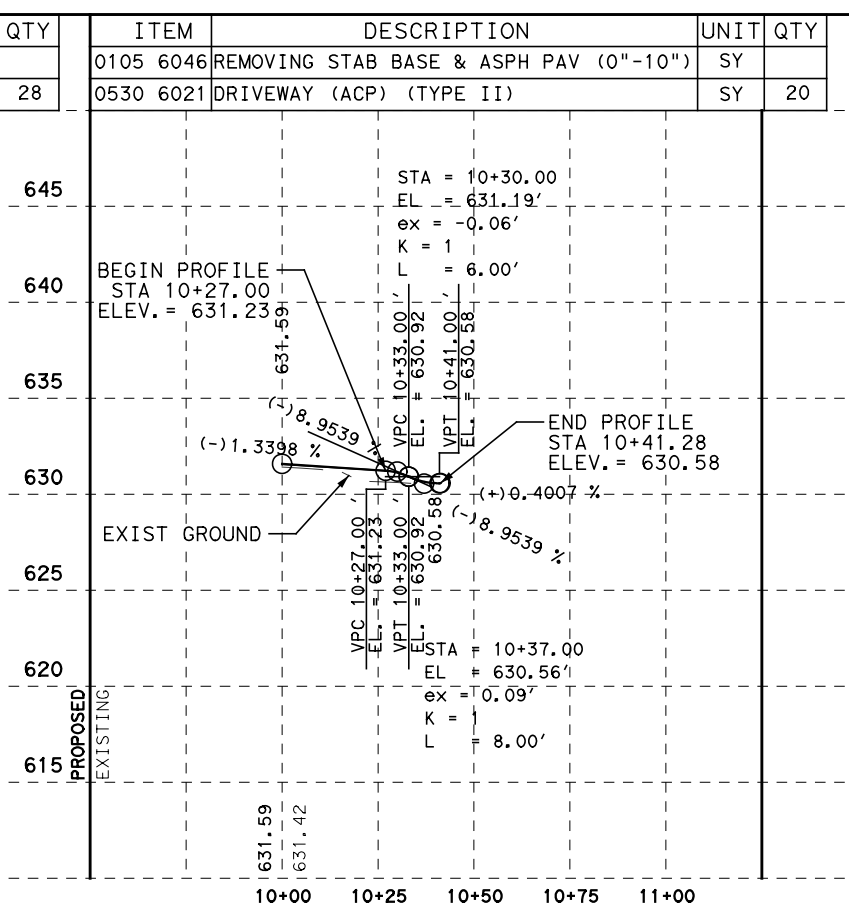
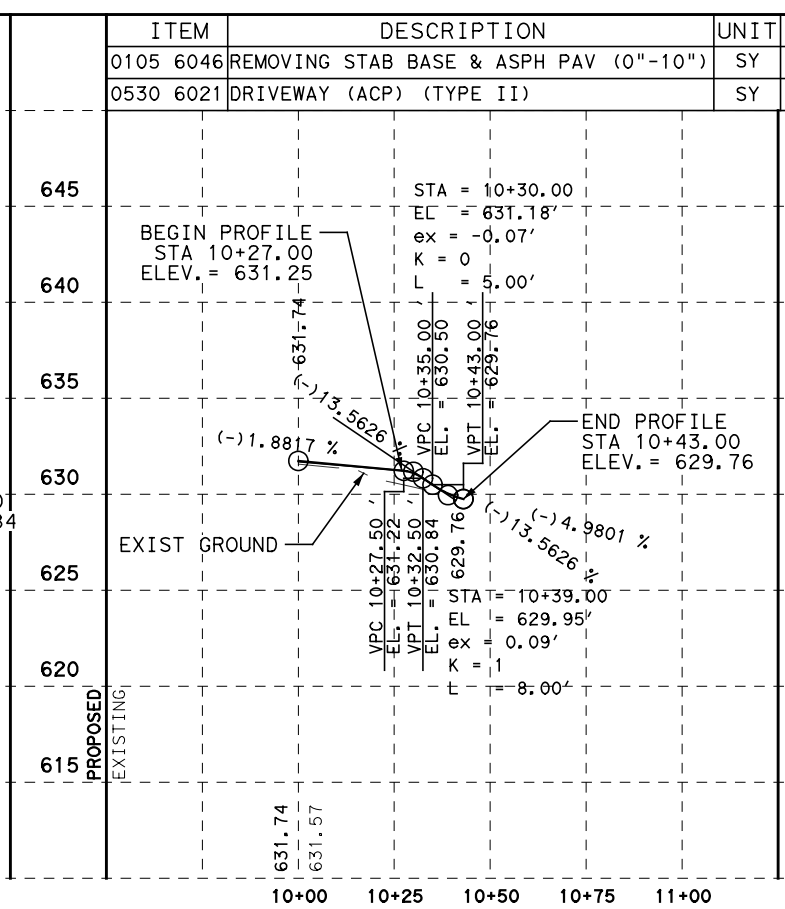
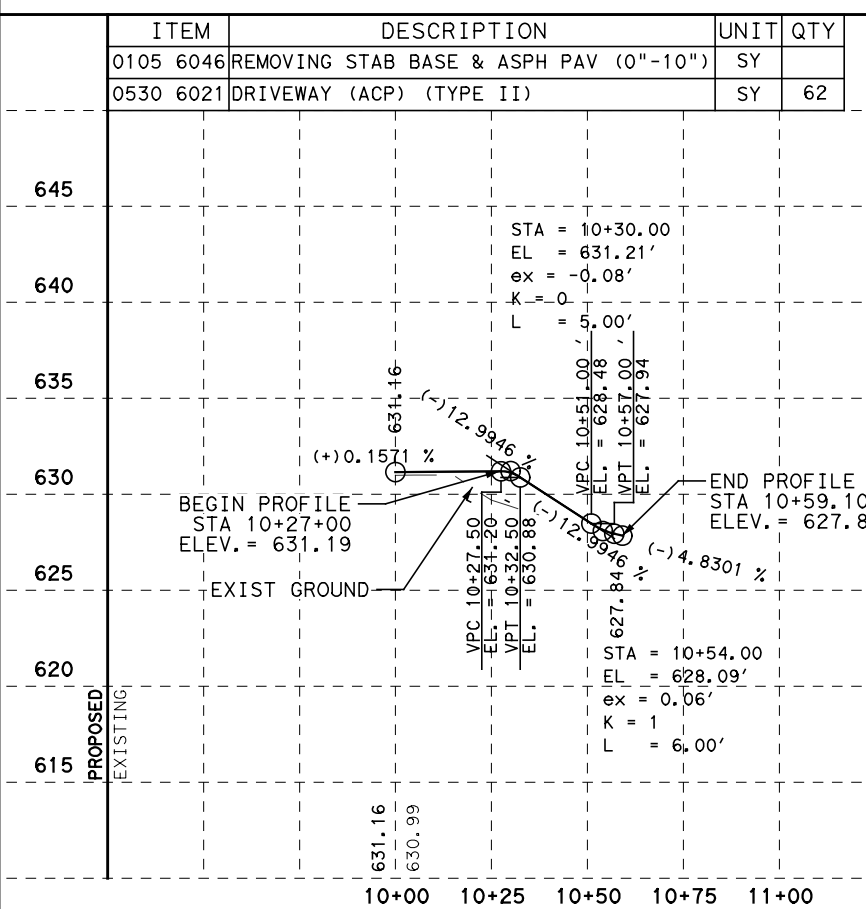
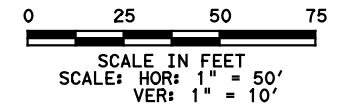
DRIVEWAY 58



DRIVEWAY 59



DRIVEWAY 60



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NO.	REVISION	BY	DATE

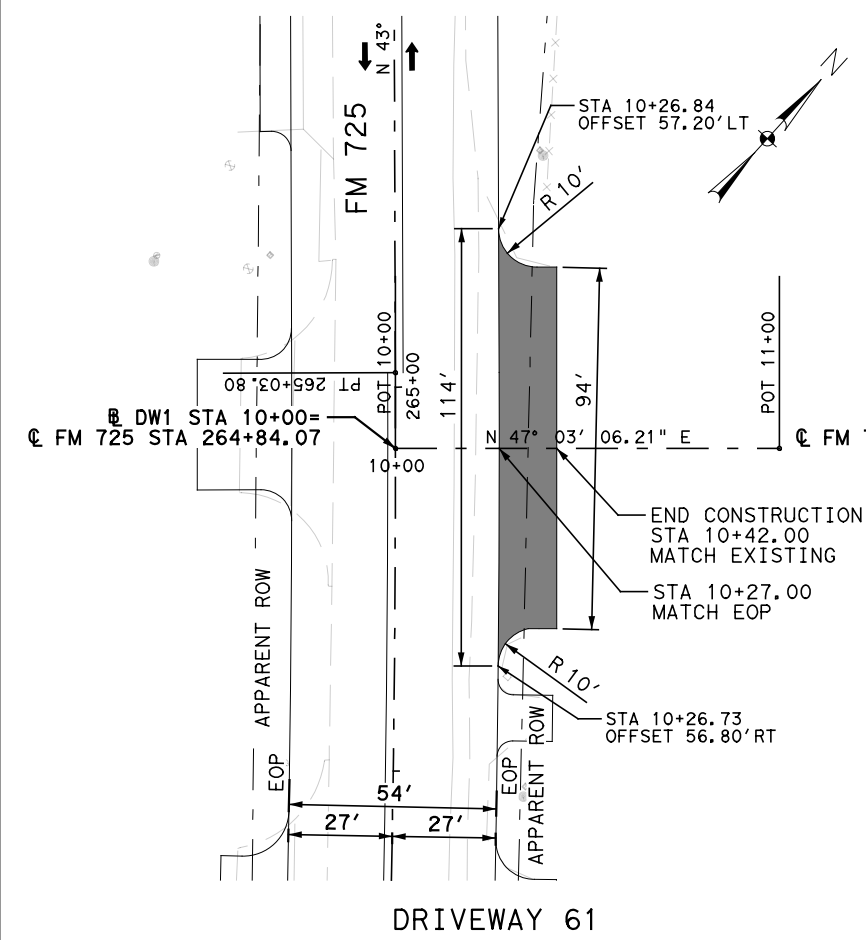
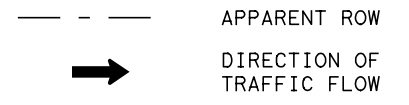
HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

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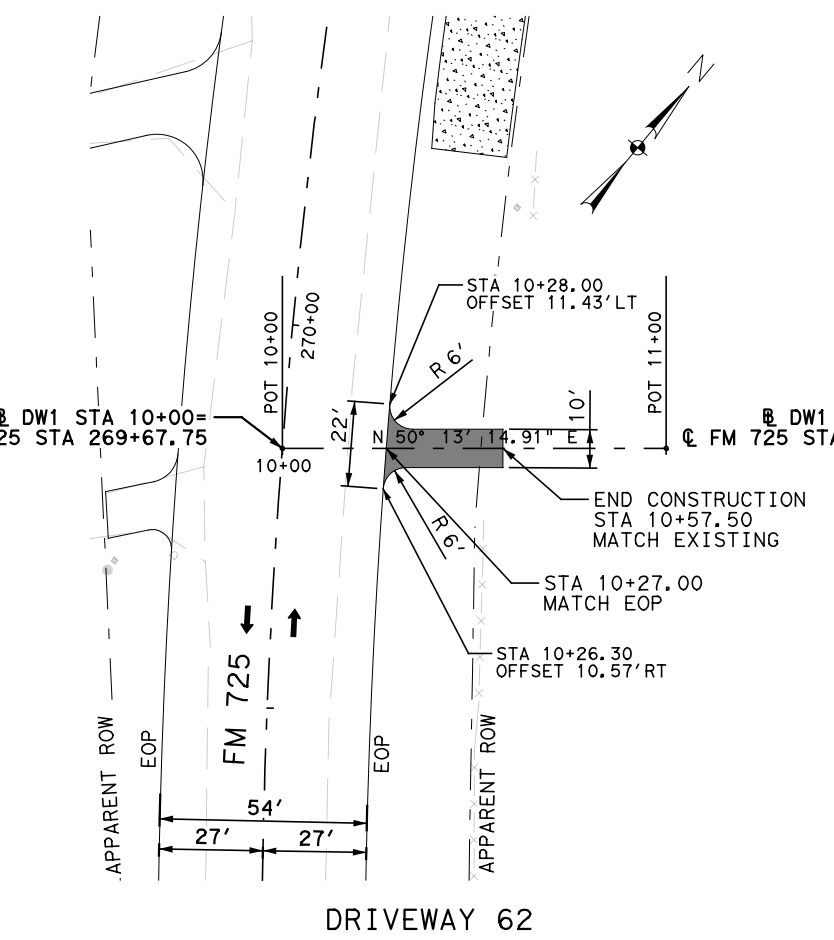
FM 725 DRIVEWAYS PLAN & PROFILE		
SHEET 20 OF 55		
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 164
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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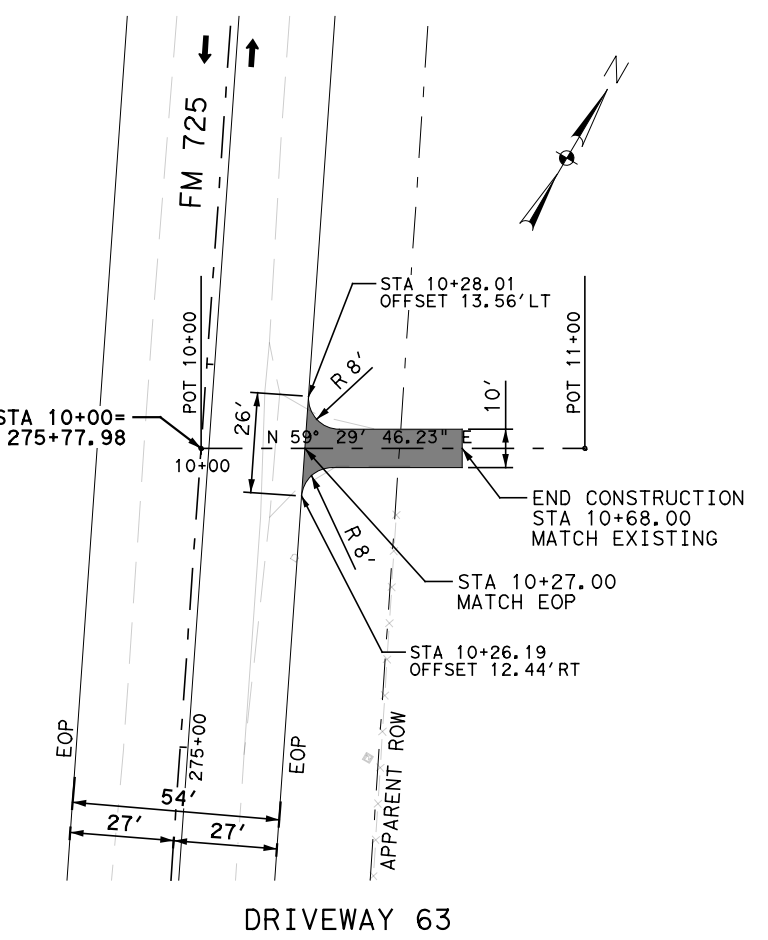
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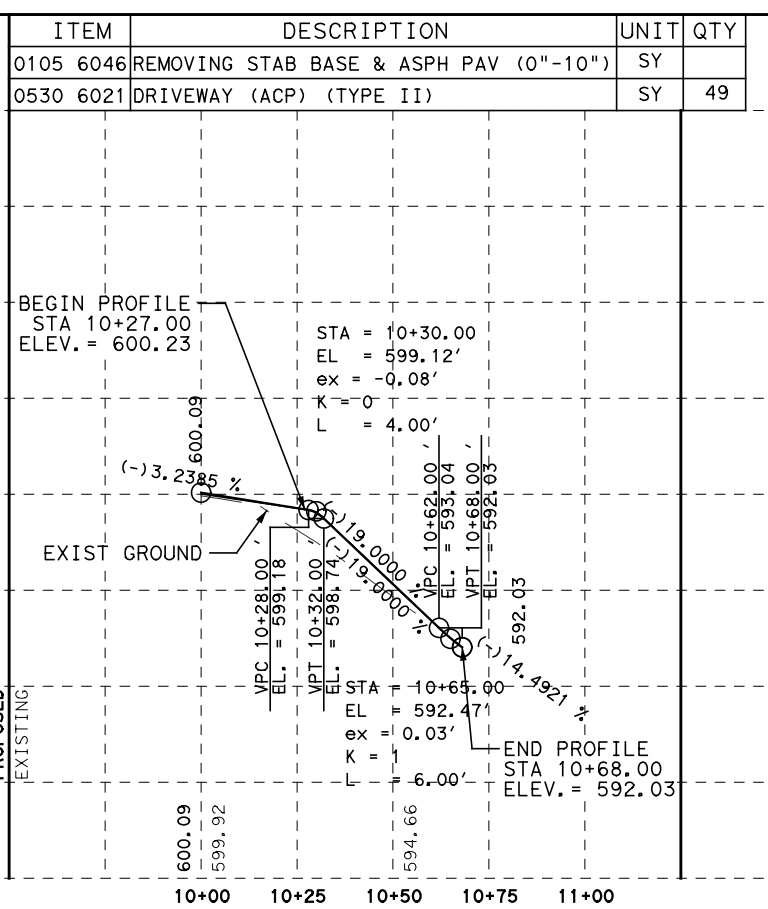
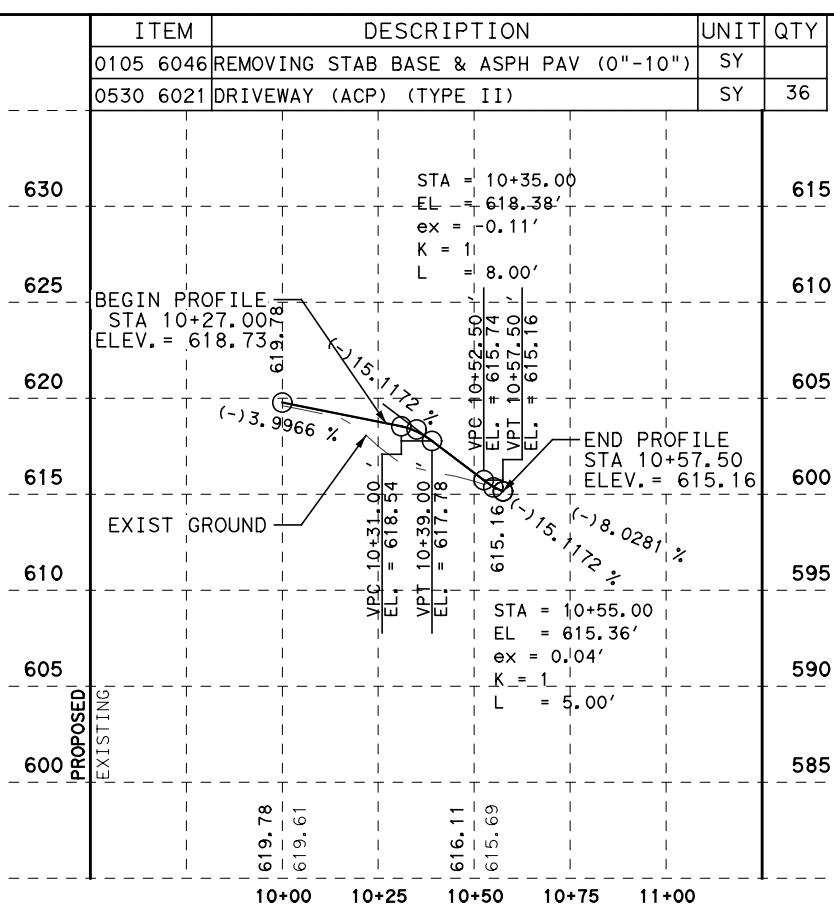
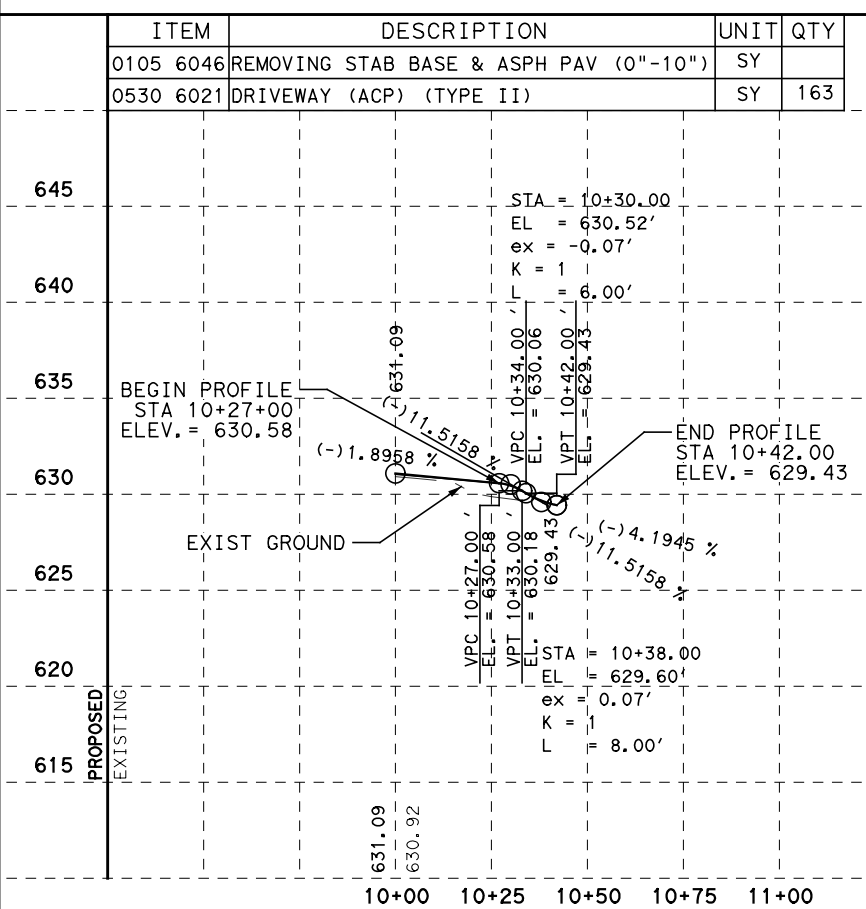
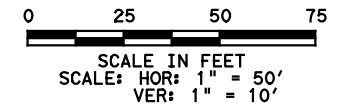
DRIVEWAY 61



DRIVEWAY 62



DRIVEWAY 63



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NO.	REVISION	BY	DATE

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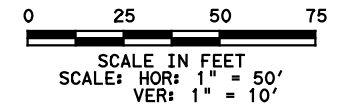
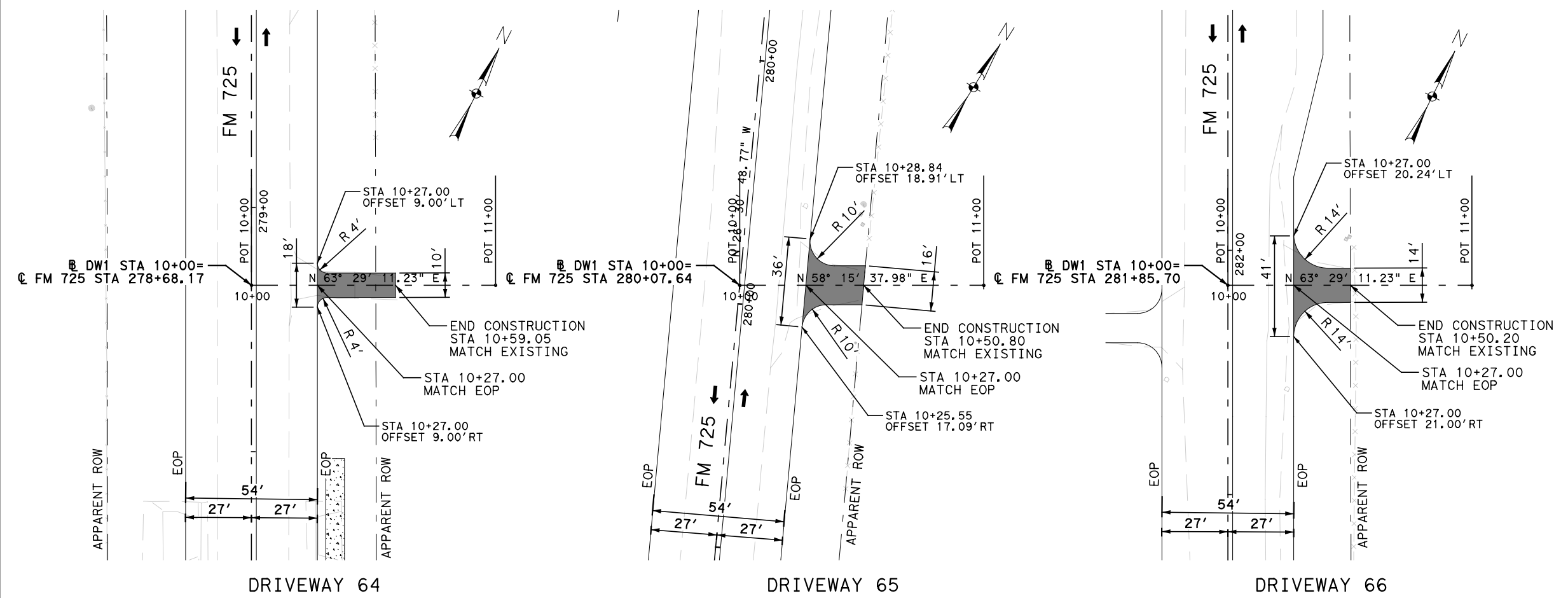
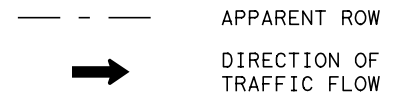
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 21 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	165	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DATE: 4/28/2021 TIME: 9:42:07 AM
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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	18
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	37

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	47
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	47

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	46
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	46

STATION	ELEVATION	DESCRIPTION
10+00	597.98	EXIST GROUND
10+25	597.81	EXIST GROUND
10+50	593.62	EXIST GROUND
10+75	592.83	EXIST GROUND
11+00	592.40	EXIST GROUND

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

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SUITE 200
SAN ANTONIO, TEXAS 78216
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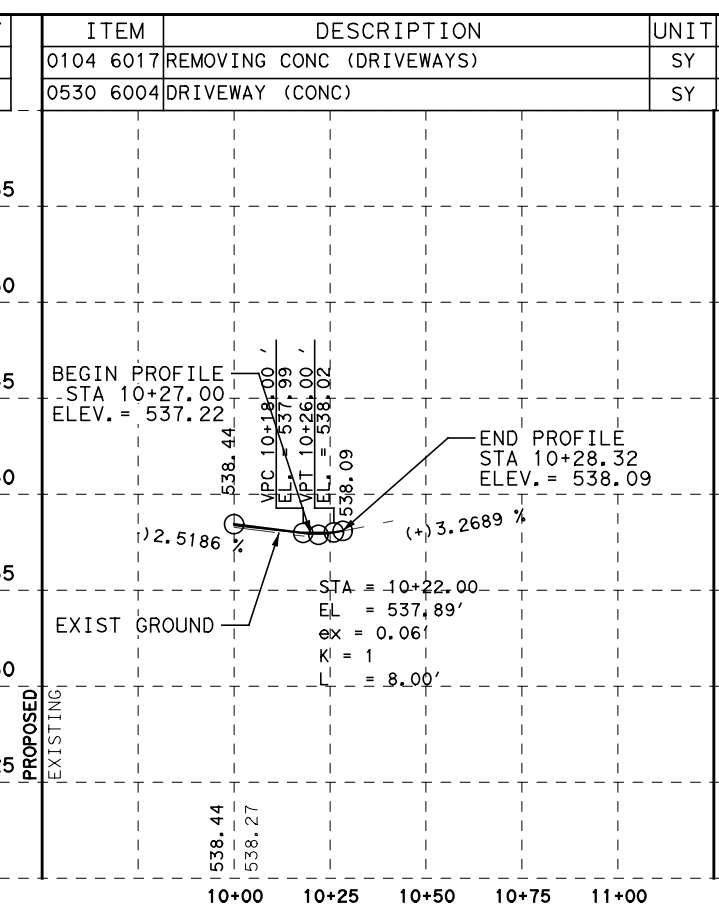
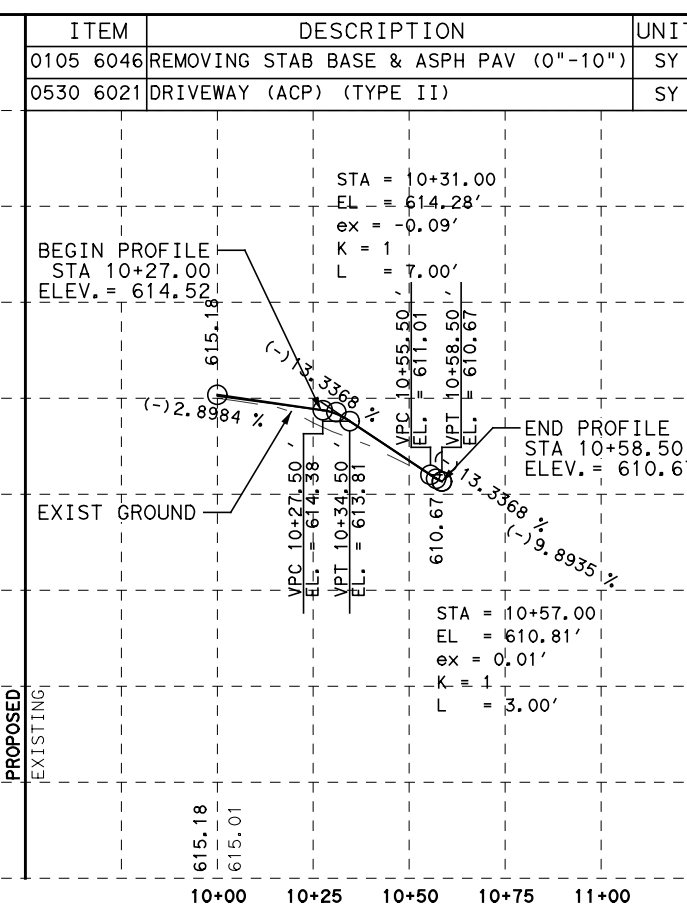
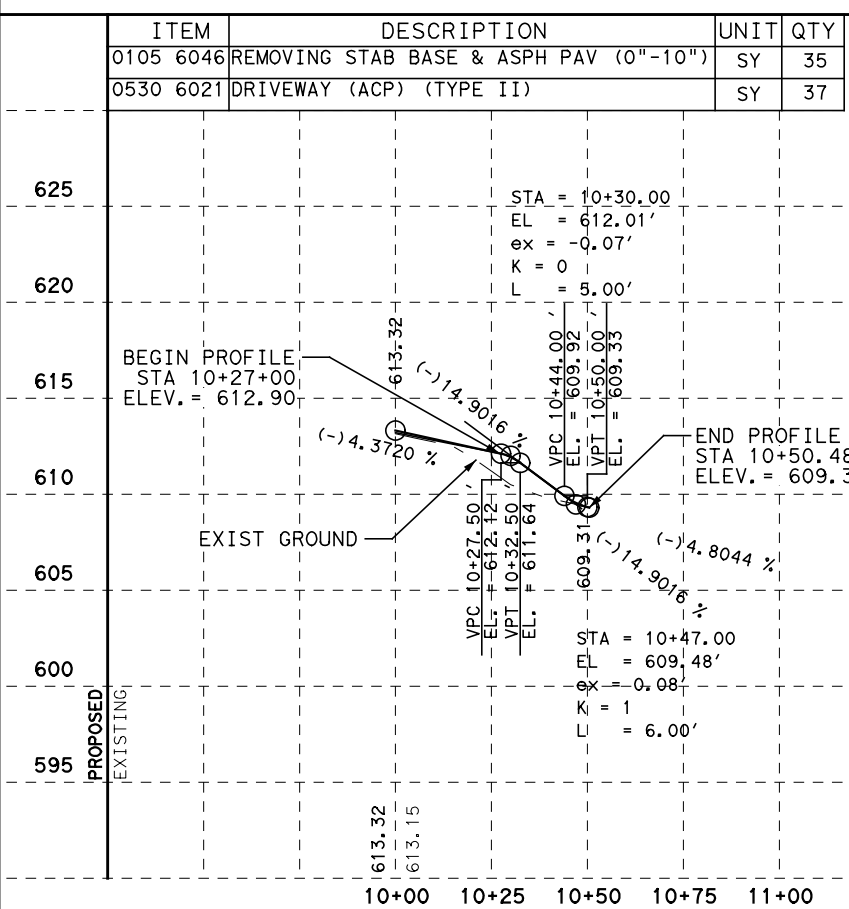
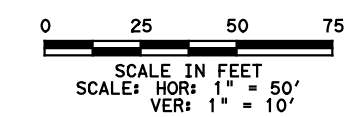
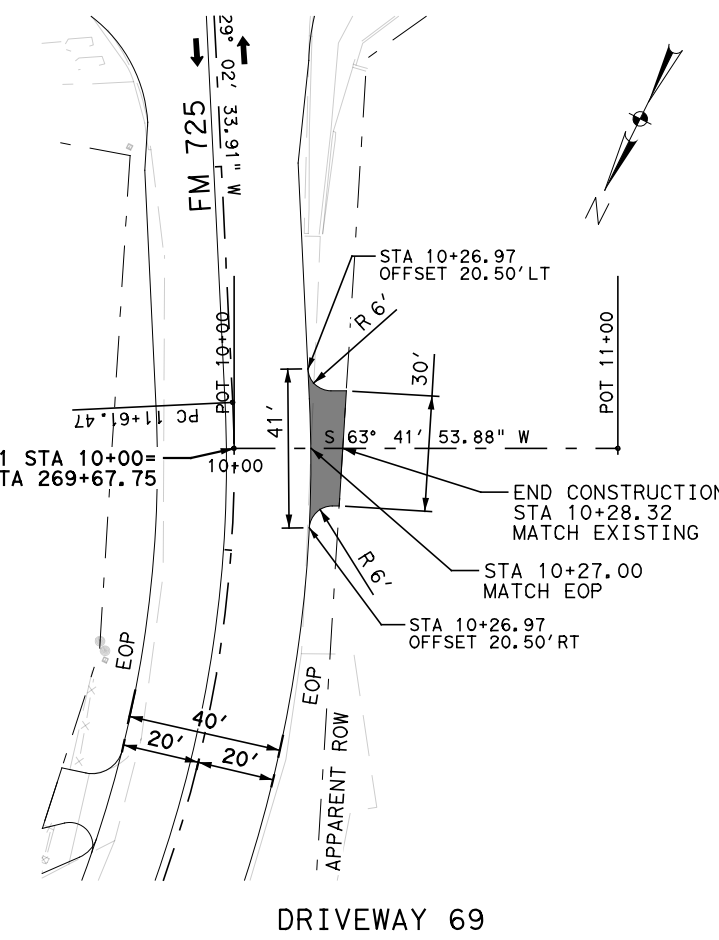
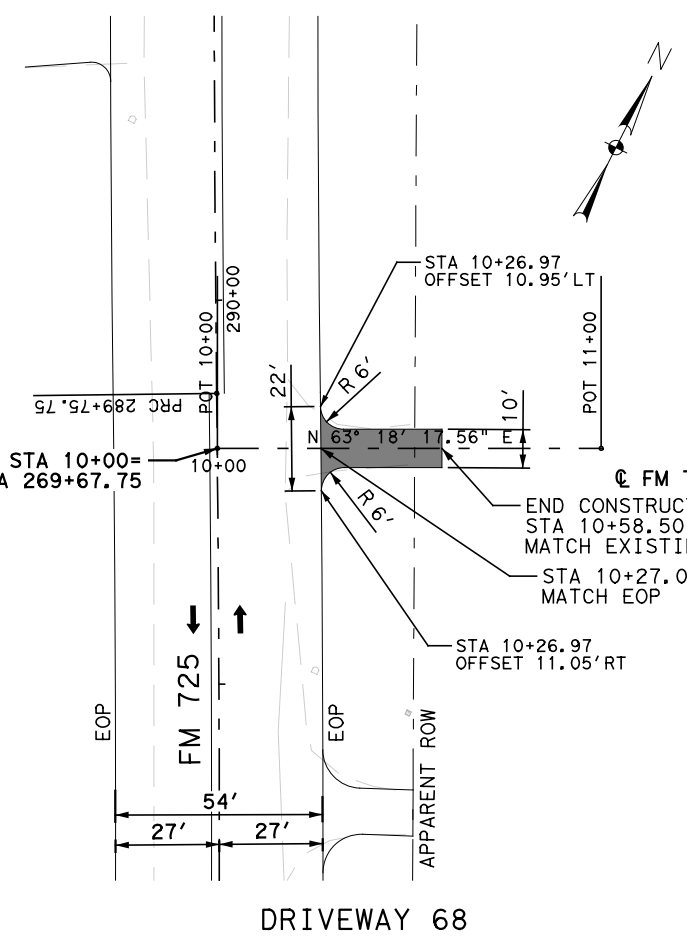
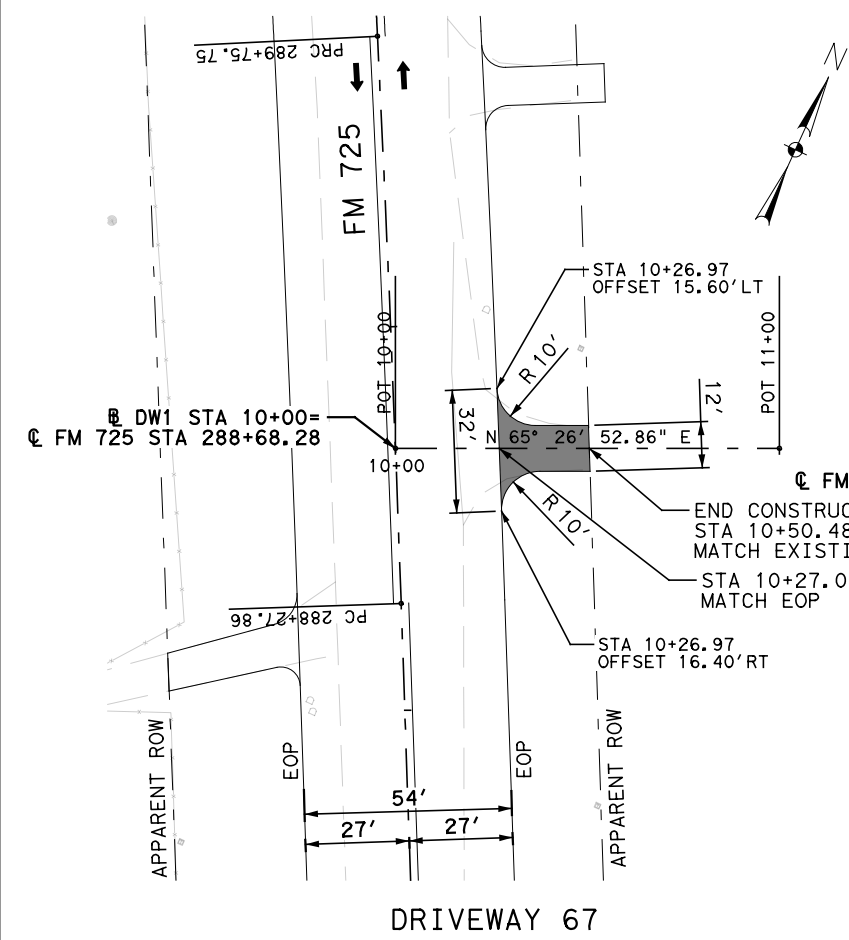
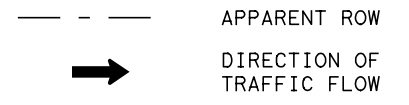
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 22 OF 55

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 166
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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LEGEND



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JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

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ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	35
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	37
625			
620			
615			
610			
605			
600			
595			

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	37
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	37
625			
620			
615			
610			
605			
600			
595			

ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	30
0530 6004	DRIVEWAY (CONC)	SY	30
555			
550			
545			
540			
535			
530			
525			

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

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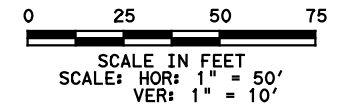
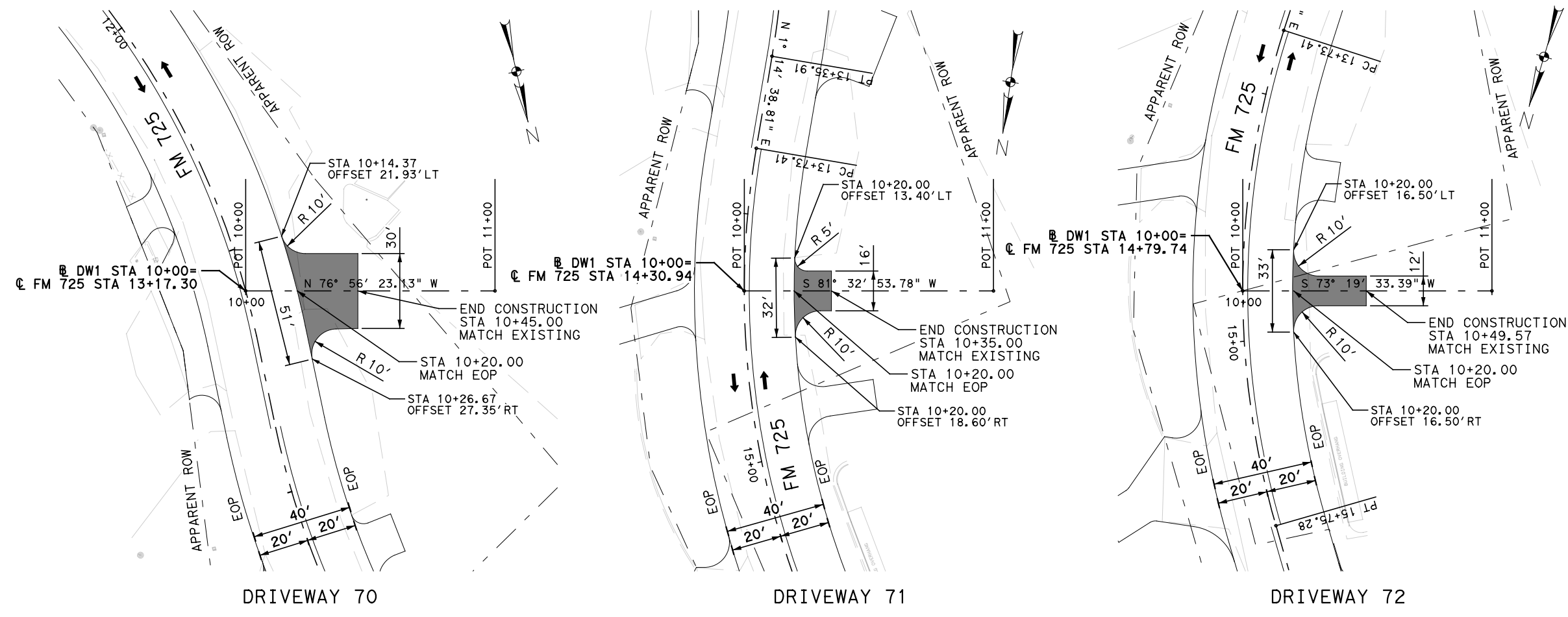
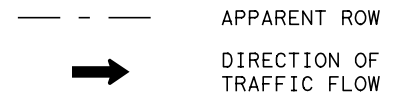
FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 23 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	167	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	6
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	88

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	30
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	30

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	14
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	45

STATION	ELEVATION	DESCRIPTION
10+00	538.92	BEGIN PROFILE
10+25	538.87	VPC
10+32.50	538.88	VPT
10+50	539.13	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	538.27	BEGIN PROFILE
10+20.00	538.27	VPC
10+24.00	538.24	VPT
10+35.00	538.38	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	538.49	BEGIN PROFILE
10+38.50	538.32	VPC
10+45.50	538.35	VPT
10+49.57	538.41	END PROFILE

4/28/2021

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NO.	REVISION	BY	DATE

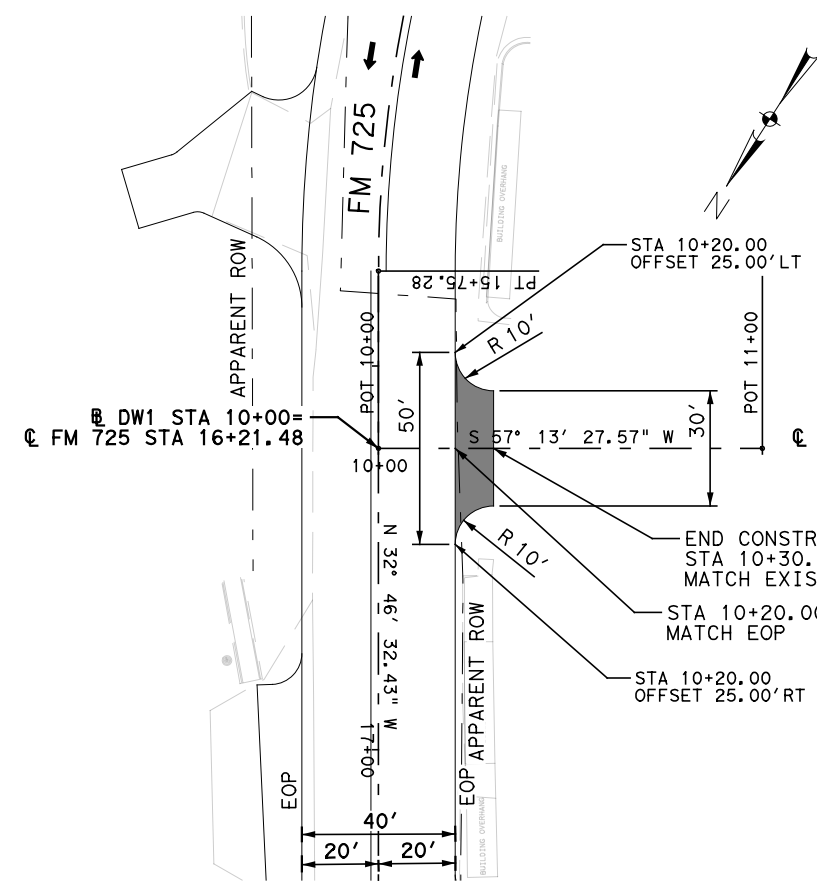
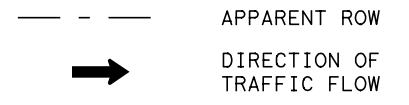
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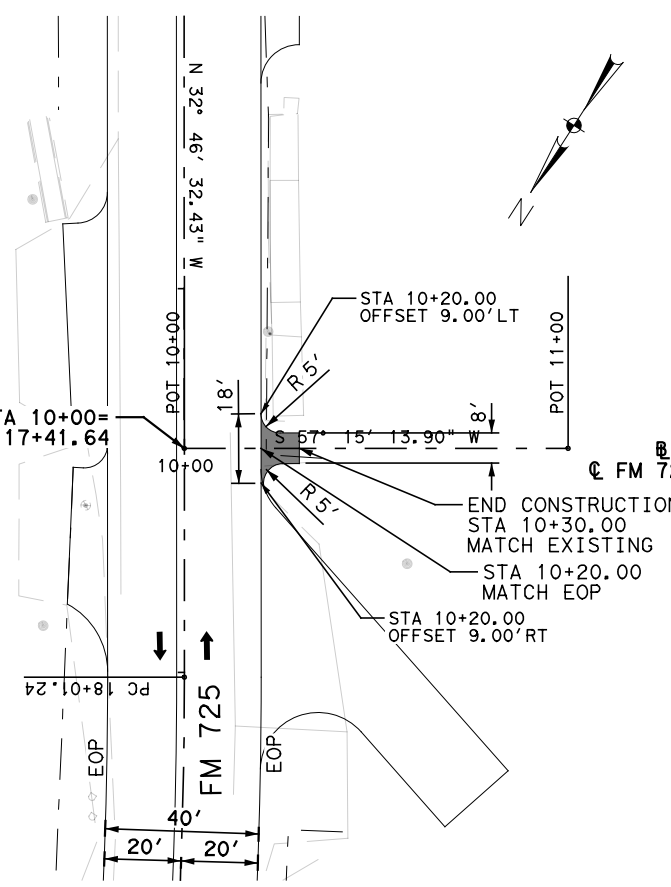
FM 725 DRIVEWAYS PLAN & PROFILE		
SHEET 24 OF 55		
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	168
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
		HIGHWAY NO.
		FM 725

DATE: 4/28/2021 TIME: 9:42:28 AM
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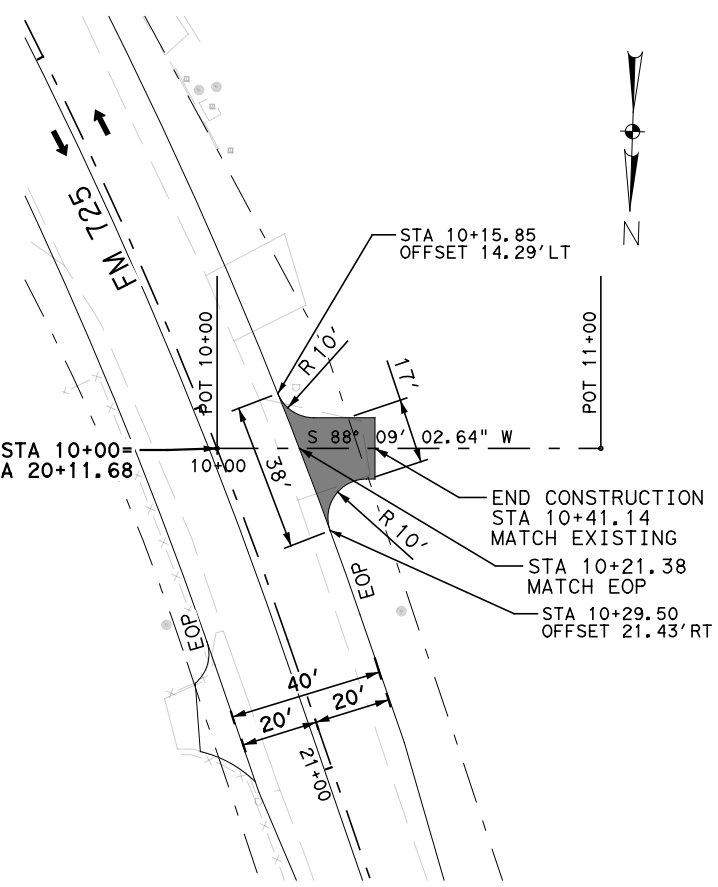
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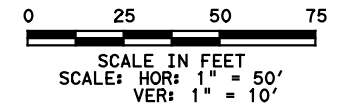
DRIVEWAY 73



DRIVEWAY 74



DRIVEWAY 75



ITEM	DESCRIPTION	UNIT	QTY	ITEM	DESCRIPTION	UNIT	QTY	ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	39	0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	10	0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	39	0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	11	0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	42

STATION	ELEVATION	DESCRIPTION
10+00	538.23	EXIST GROUND
10+00	538.06	EXIST GROUND
10+19.50	538.46	VPC
10+24.50	538.46	VPT
10+22.00	539.91	STA
10+24.00	539.90	VPC
10+24.00	539.90	VPT
10+27.00	539.90	STA
10+24.00	540.01	VPC
10+30.00	540.01	VPT
10+22.00	539.53	VPC
10+28.00	539.74	VPT
10+25.00	539.49	STA
10+21.38	601.84	STA

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NO.	REVISION	BY	DATE

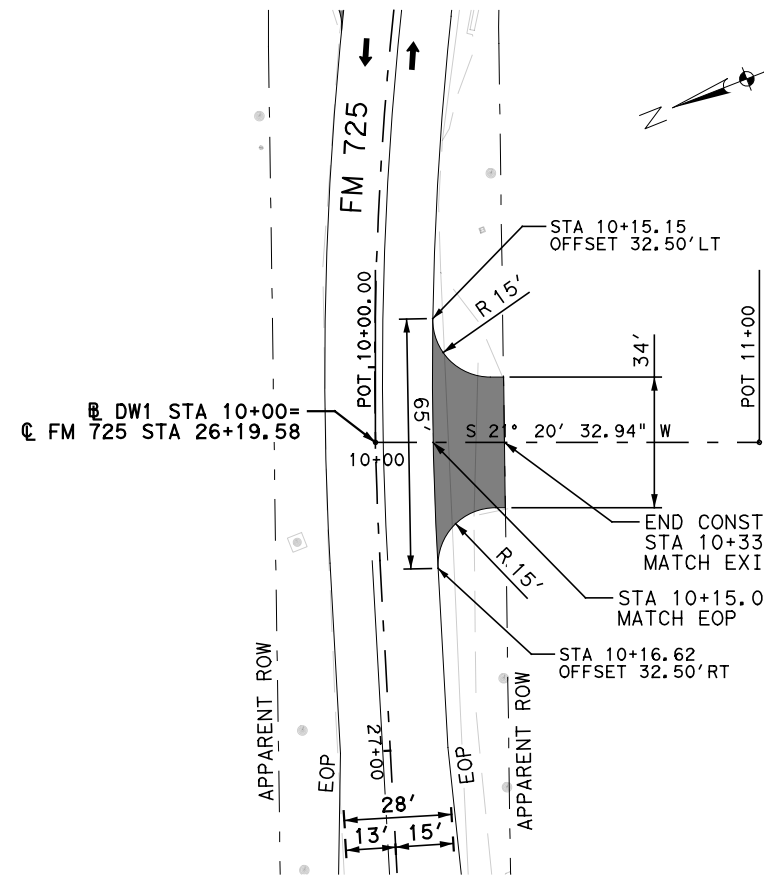
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 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

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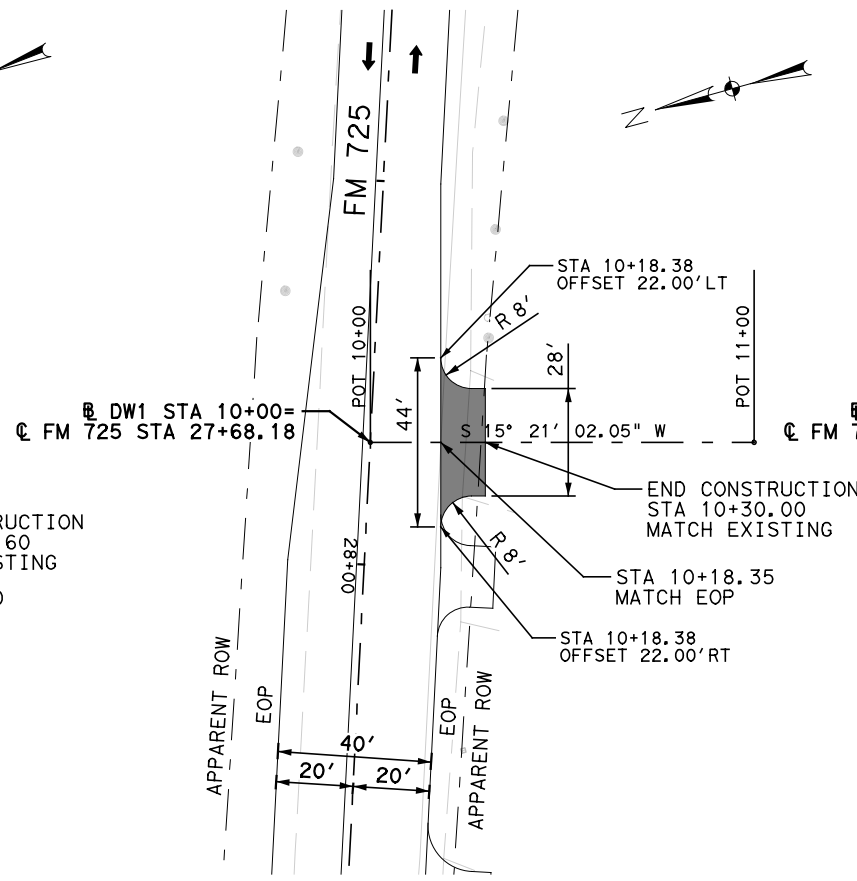
FM 725 DRIVEWAYS PLAN & PROFILE			
SHEET 25 OF 55			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		169
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

LEGEND

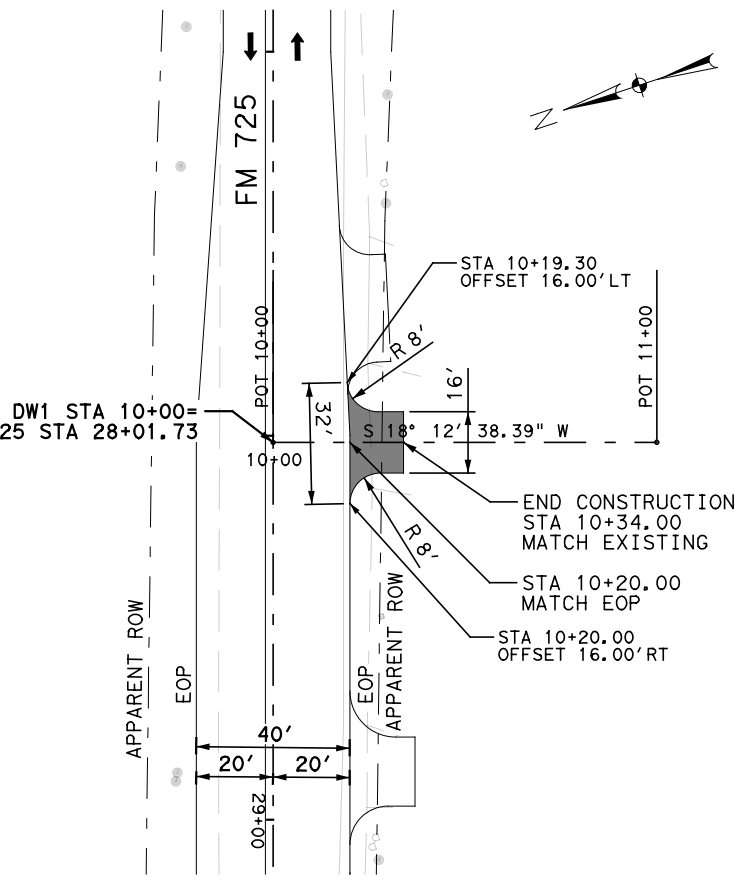
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- DIRECTION OF TRAFFIC FLOW



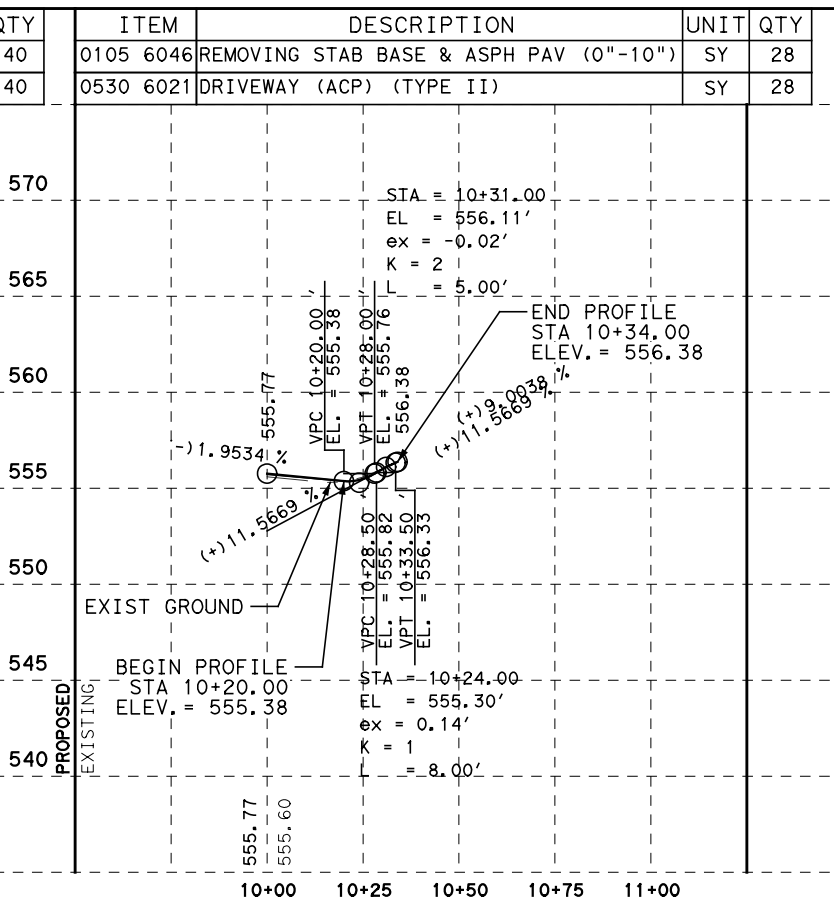
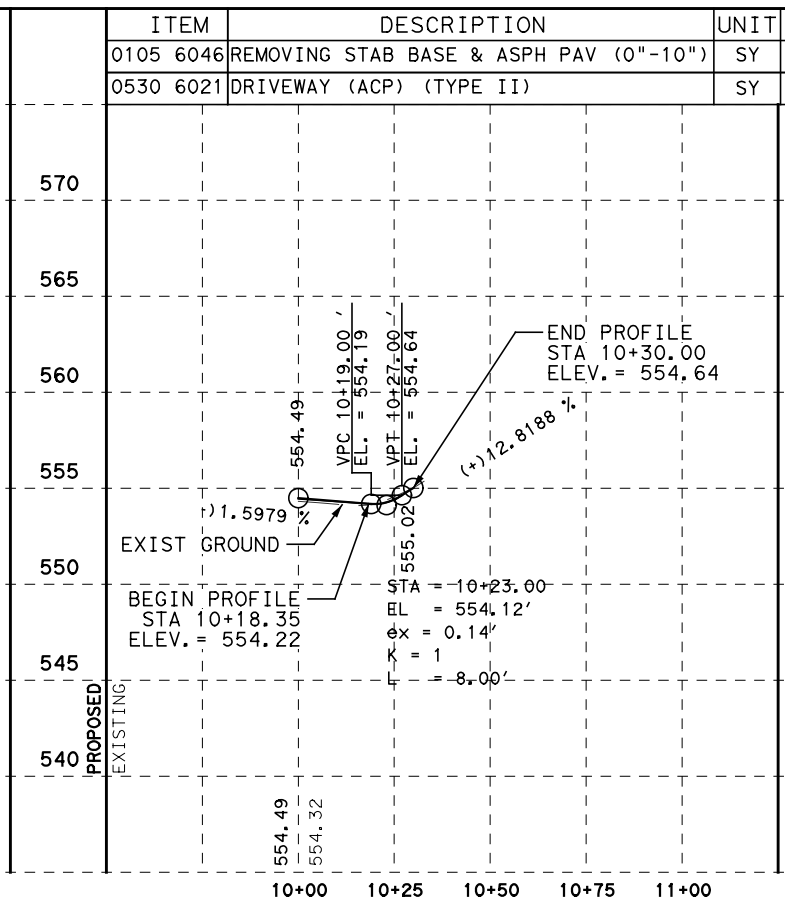
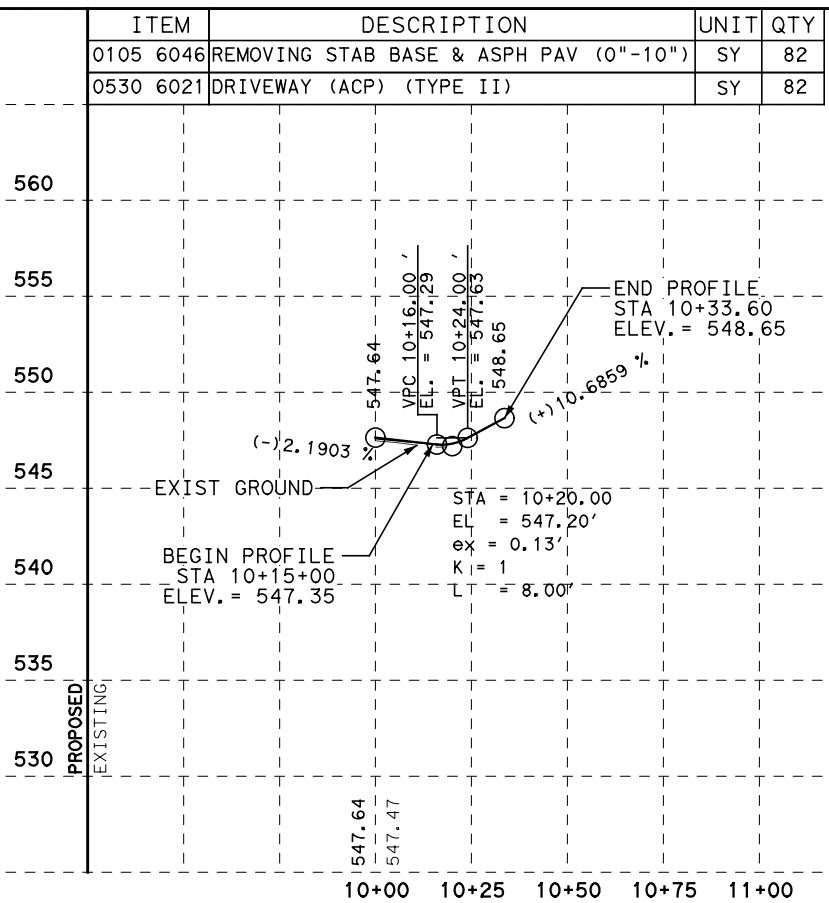
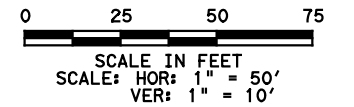
DRIVEWAY 76



DRIVEWAY 77



DRIVEWAY 78



4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

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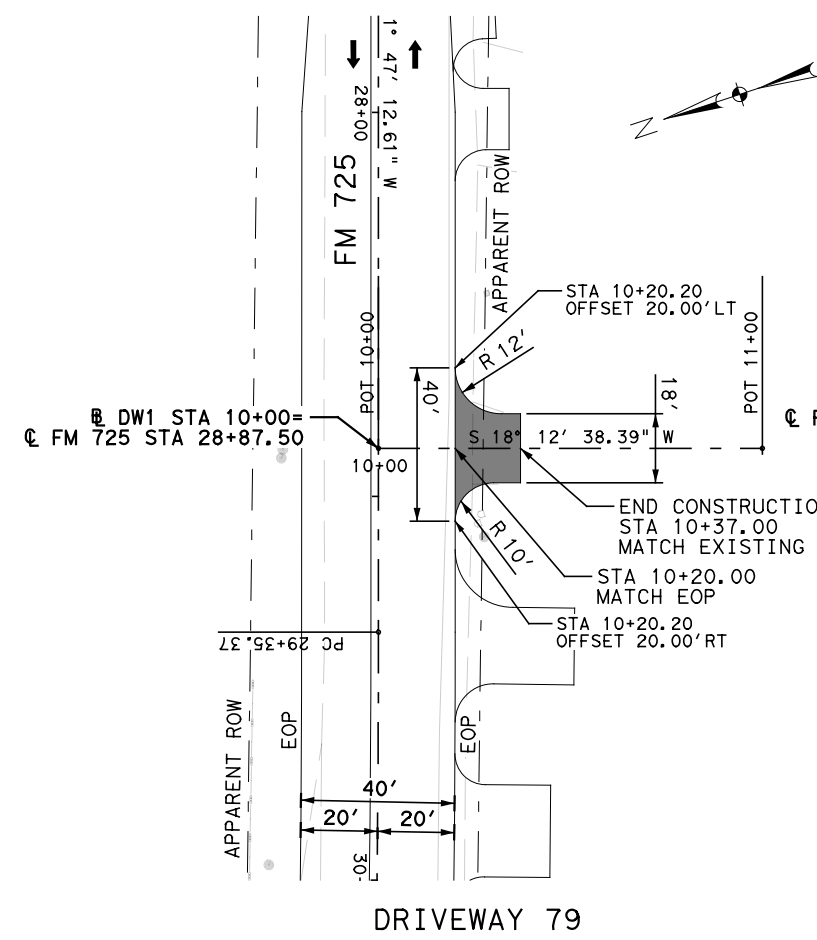
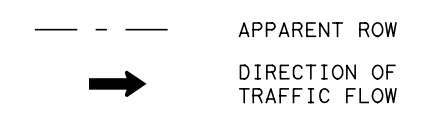
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 26 OF 55

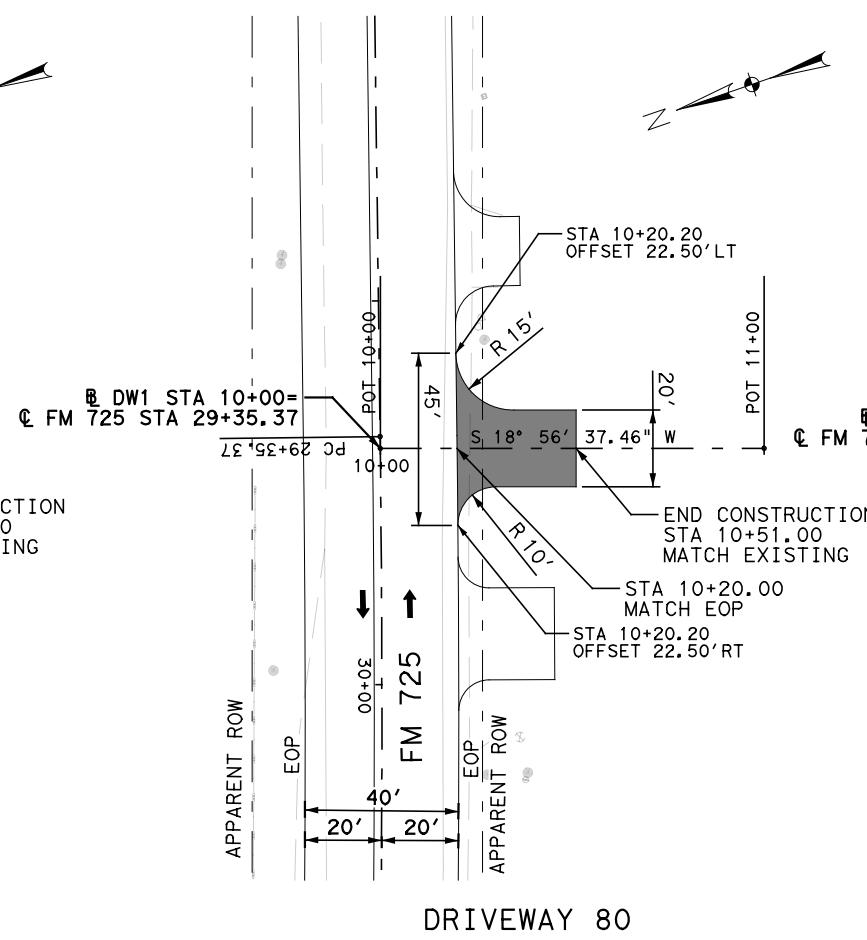
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6	See Title Sheet	170	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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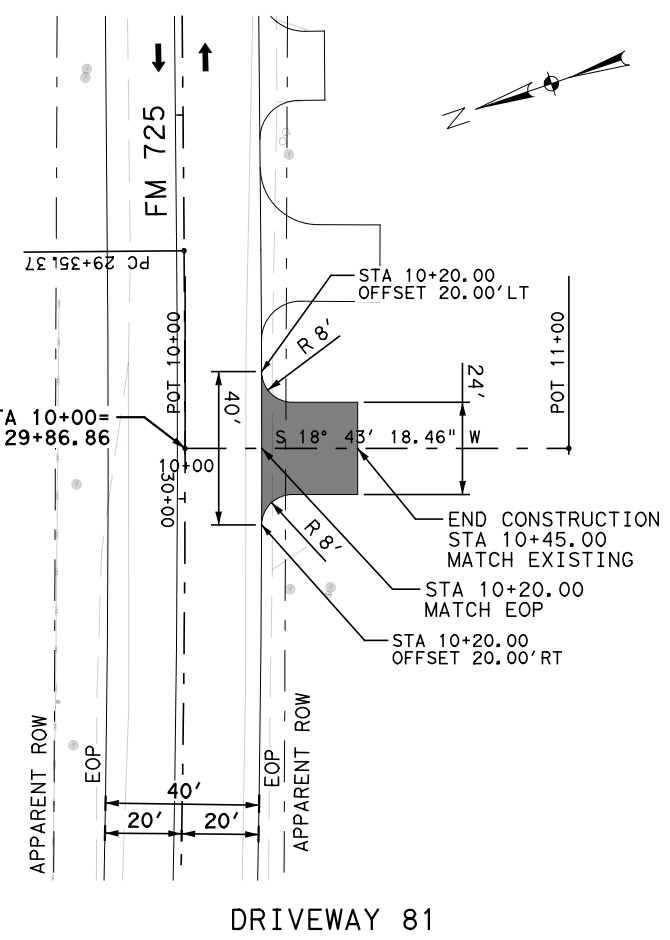
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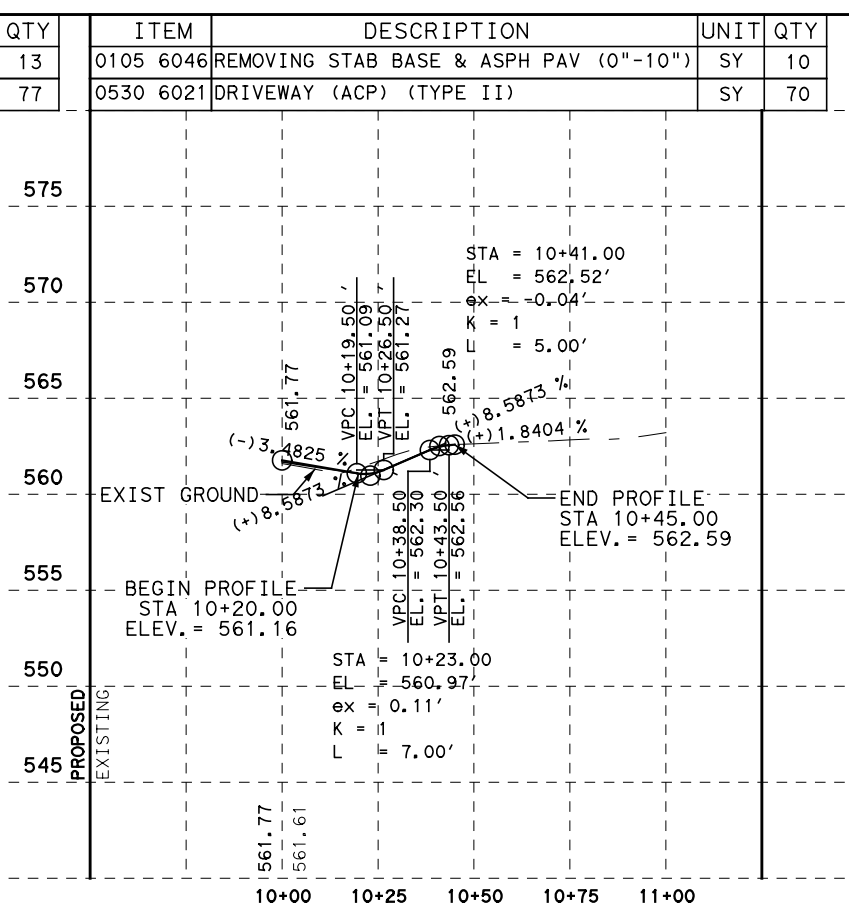
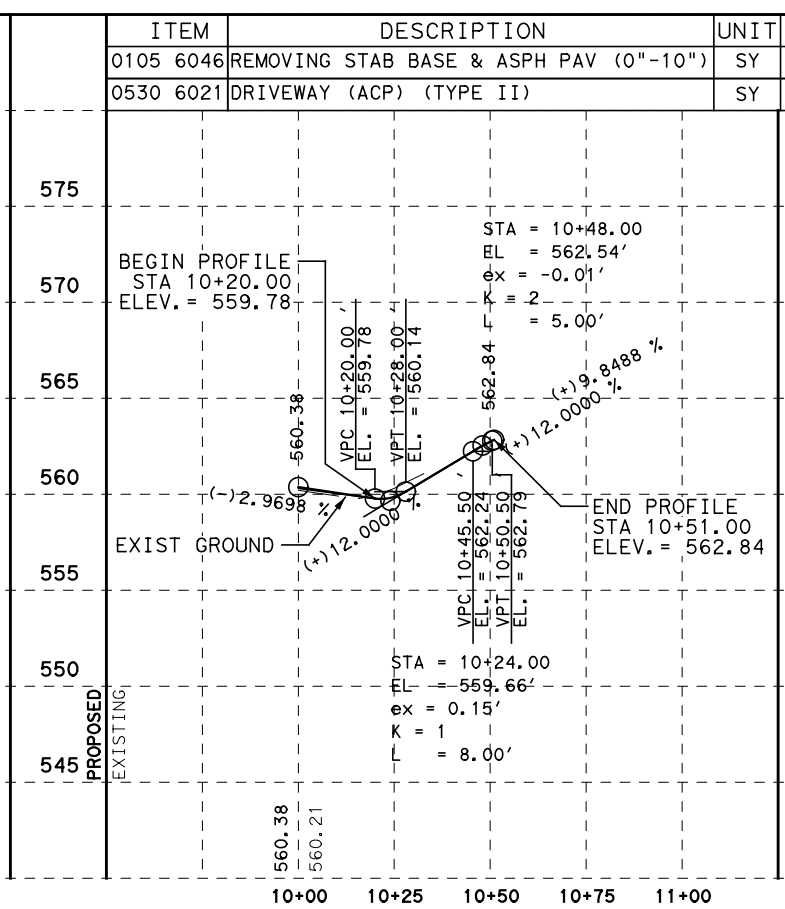
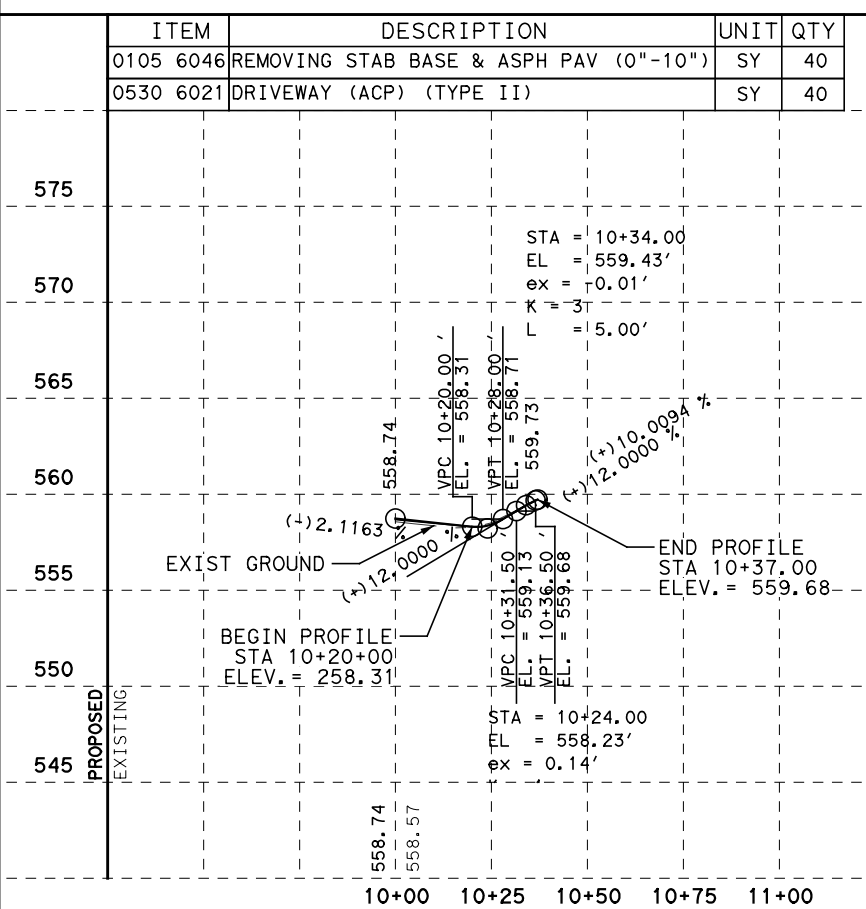
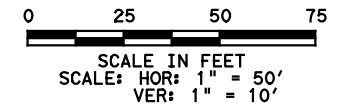
DRIVEWAY 79



DRIVEWAY 80



DRIVEWAY 81



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NO.	REVISION	BY	DATE

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 SAN ANTONIO, TEXAS 78216
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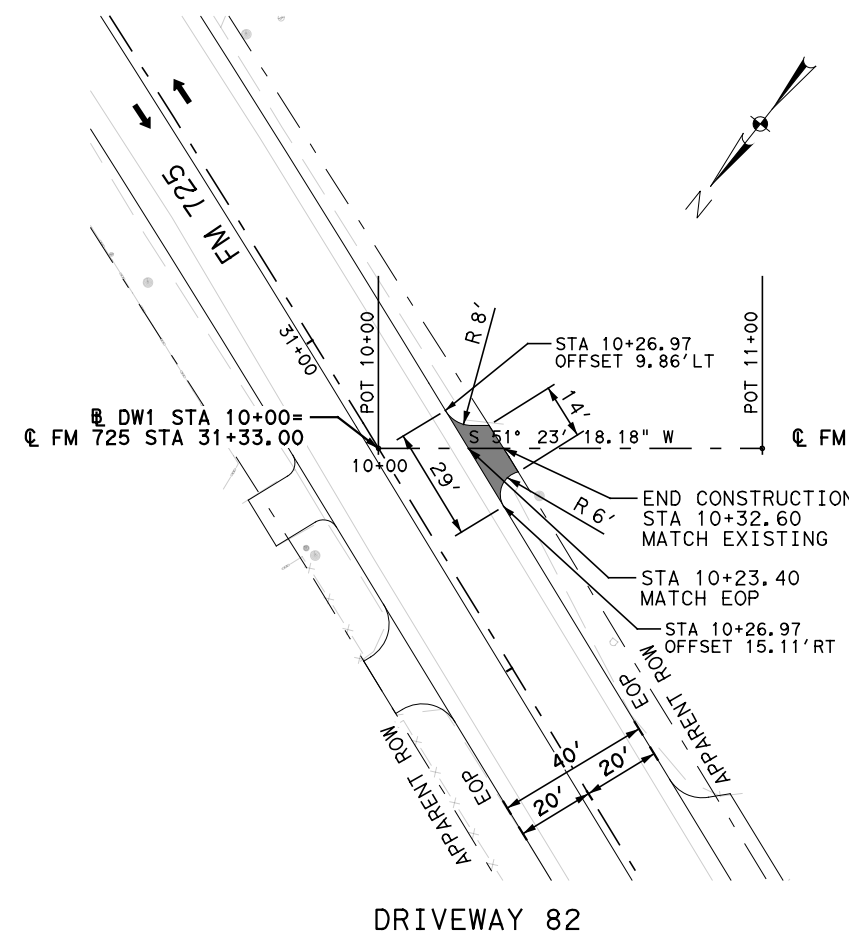
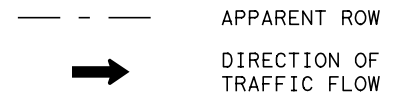
FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 27 OF 55

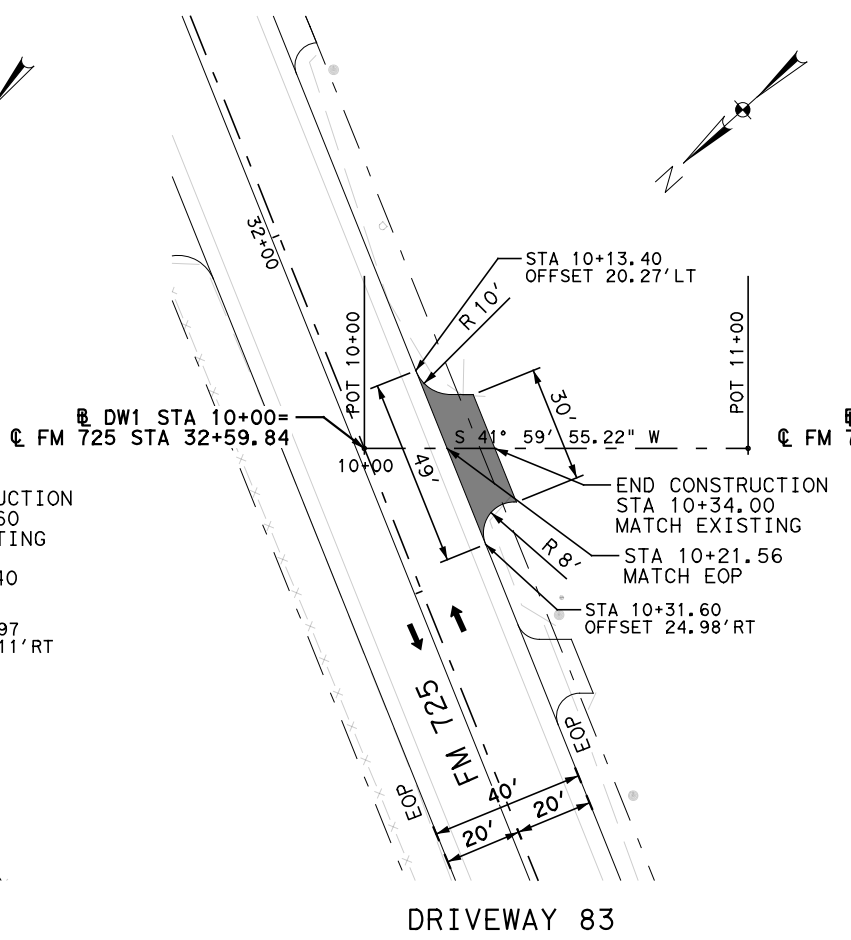
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6	See Title Sheet	171	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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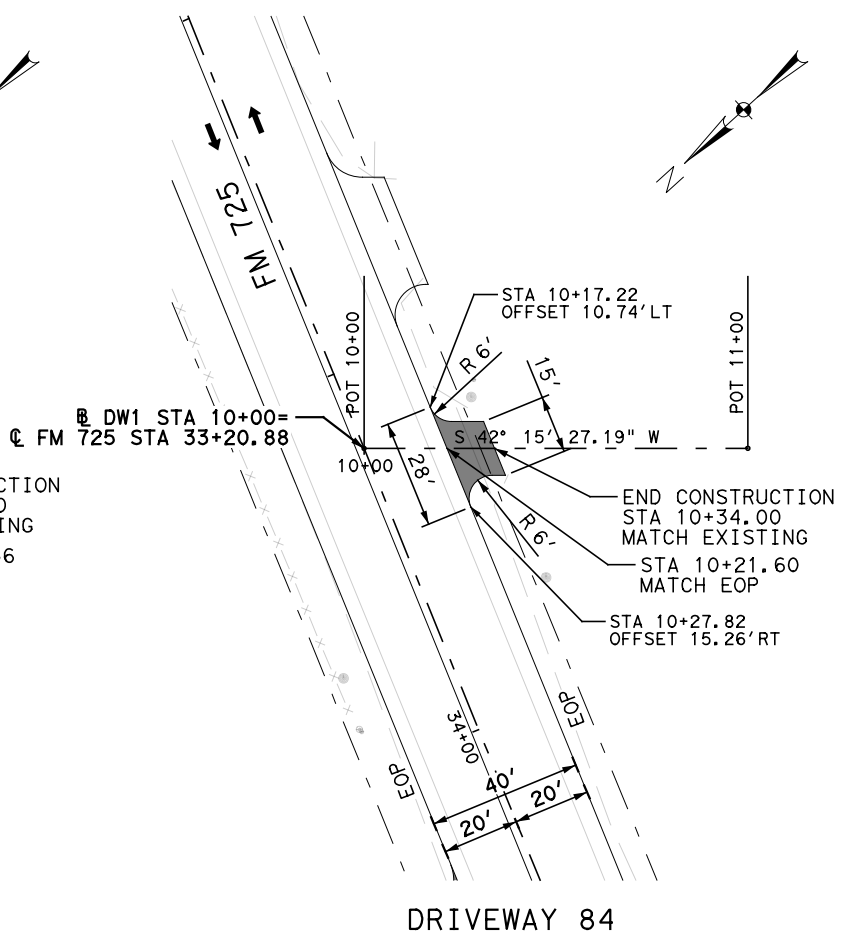
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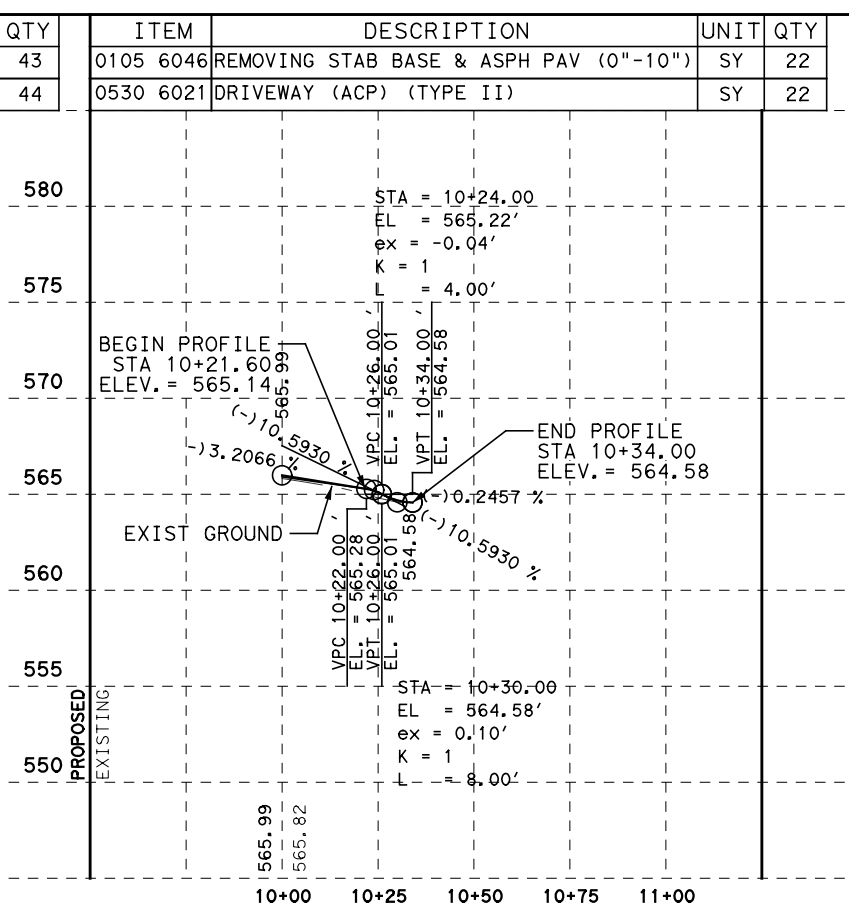
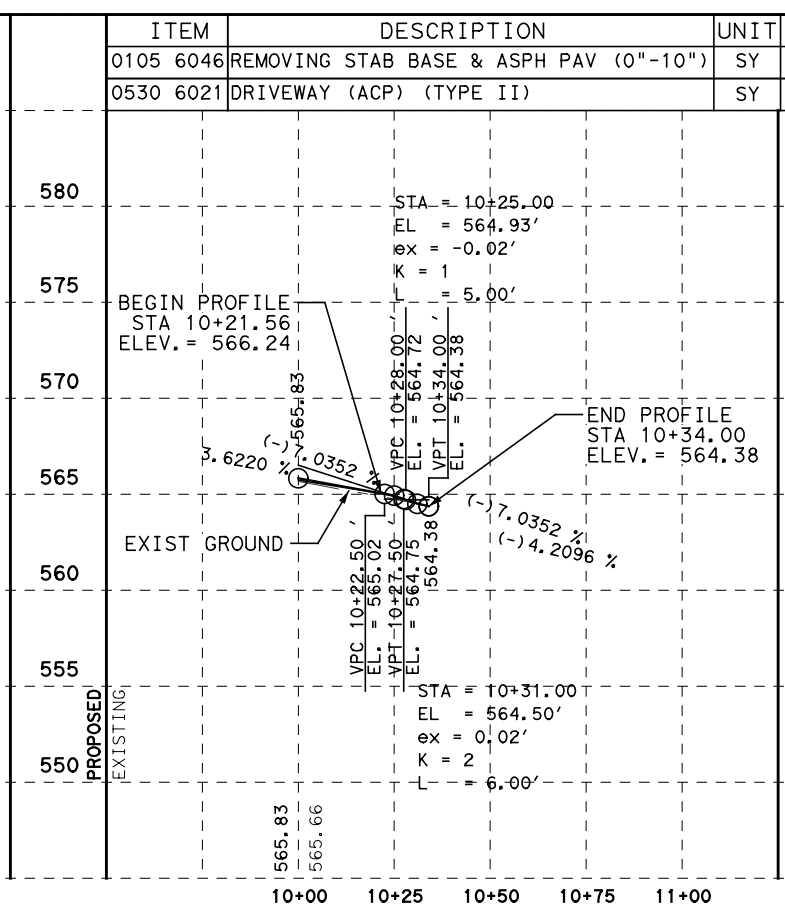
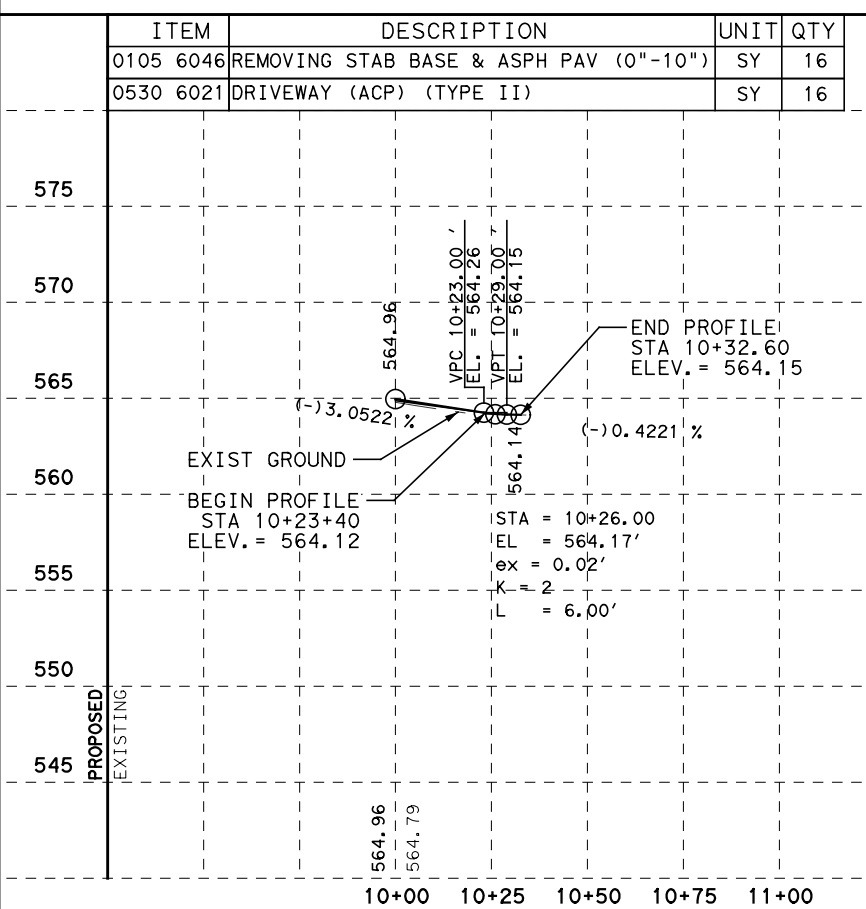
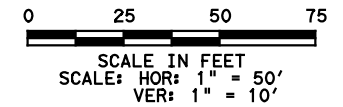
DRIVEWAY 82



DRIVEWAY 83



DRIVEWAY 84



4/28/2021

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NO.	REVISION	BY	DATE

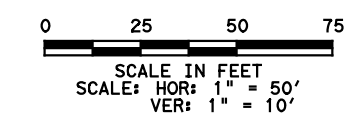
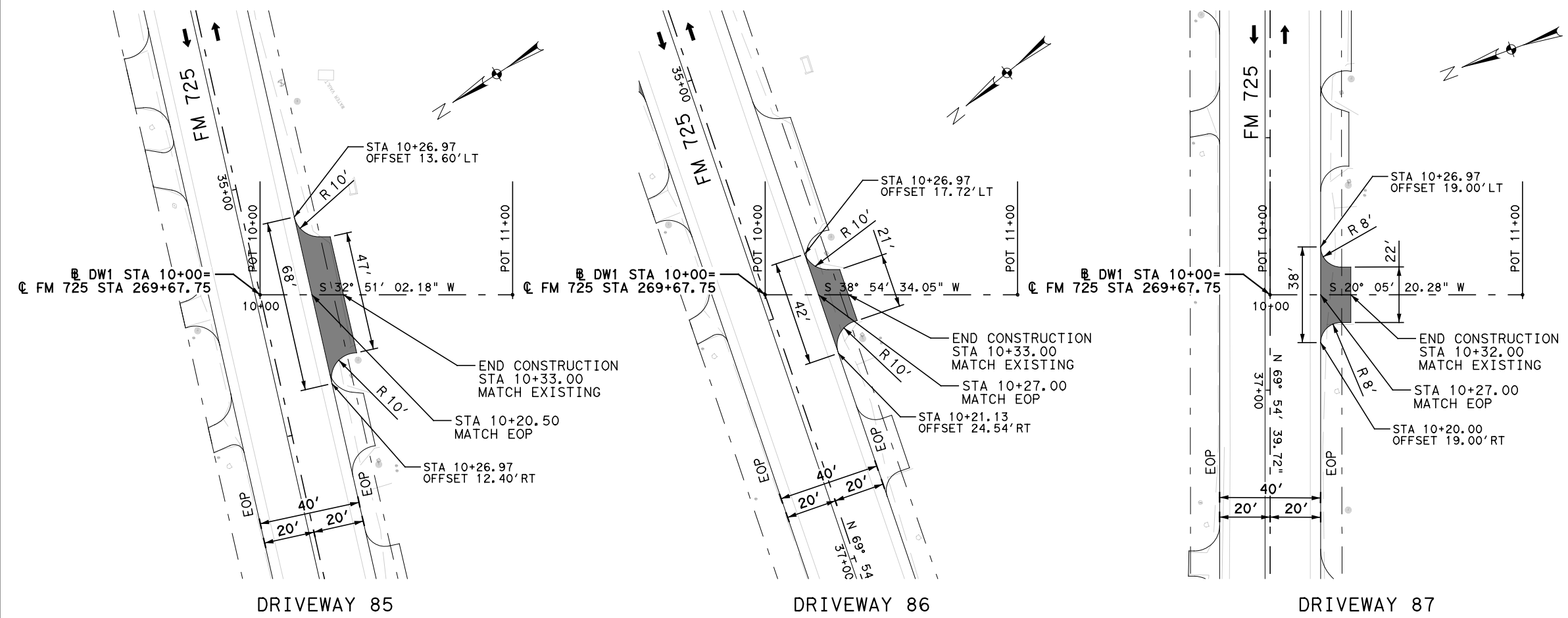
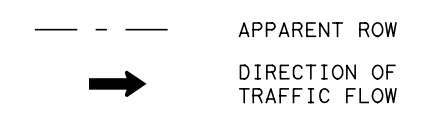
FM 725 DRIVEWAYS PLAN & PROFILE

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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	172	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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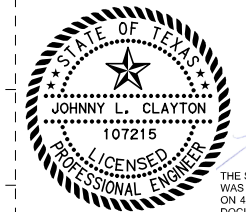


ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	69
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	70

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	15
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	33

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	13
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	33

STATION	ELEVATION	DESCRIPTION
575	565.30	BEGIN PROFILE STA 10+27+00
570	564.05	END PROFILE STA 10+33+00
565	564.68	END PROFILE STA 10+33+00
560	564.34	STA 10+30+00
555	564.72	STA 10+29+00
550	564.75	STA 10+28+00
545	565.83	EXISTING



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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



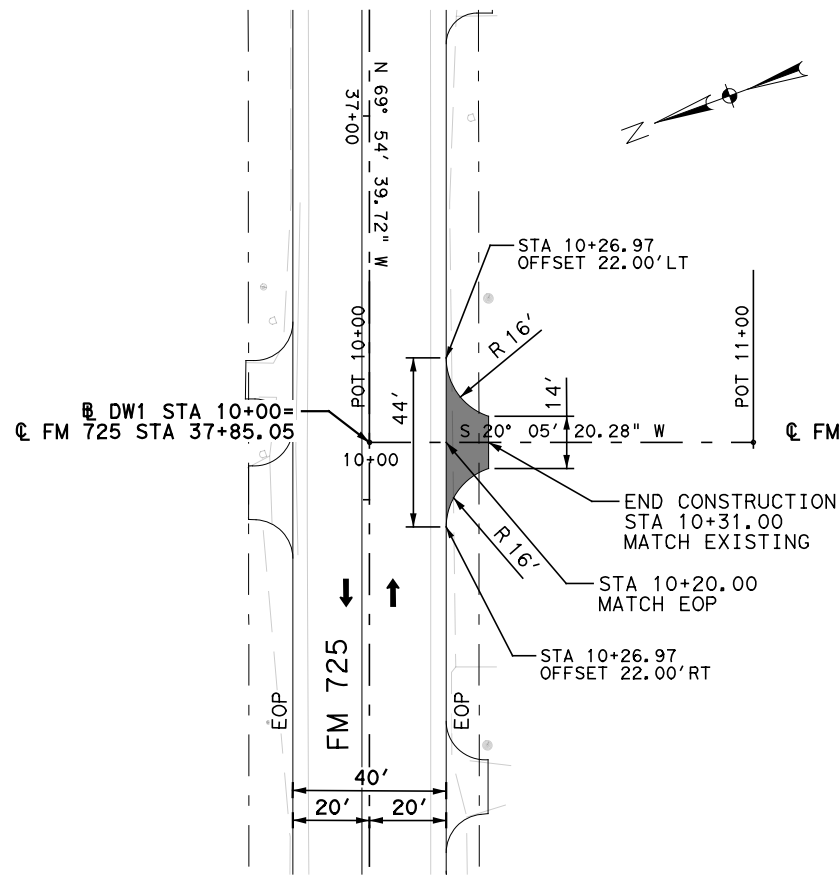
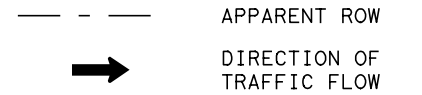
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 29 OF 55

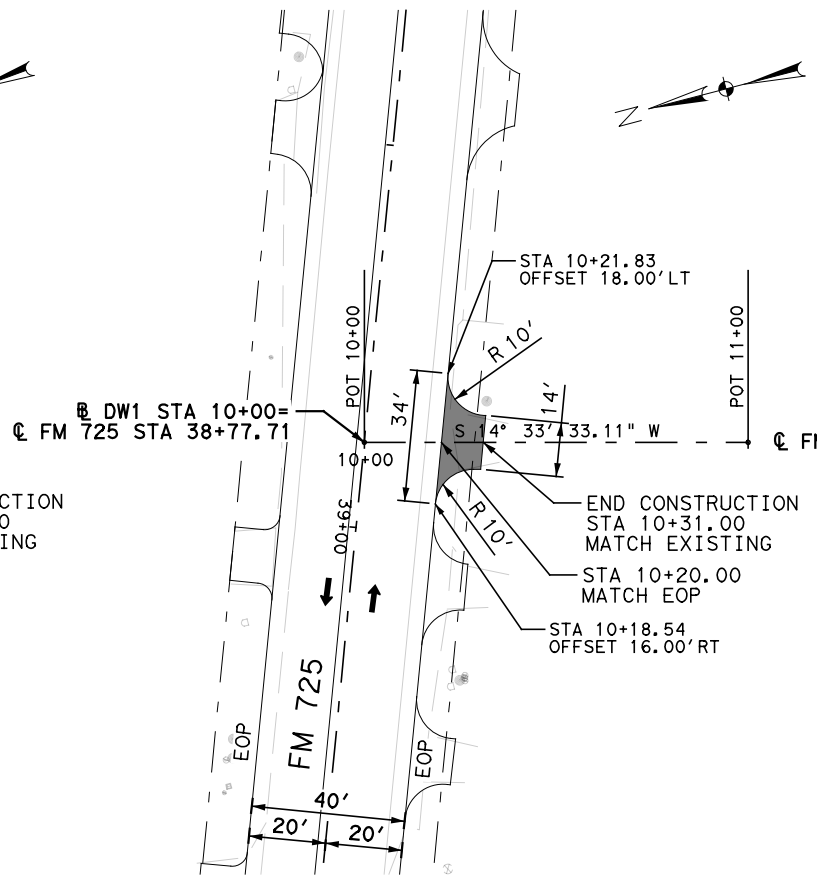
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6	See Title Sheet	173	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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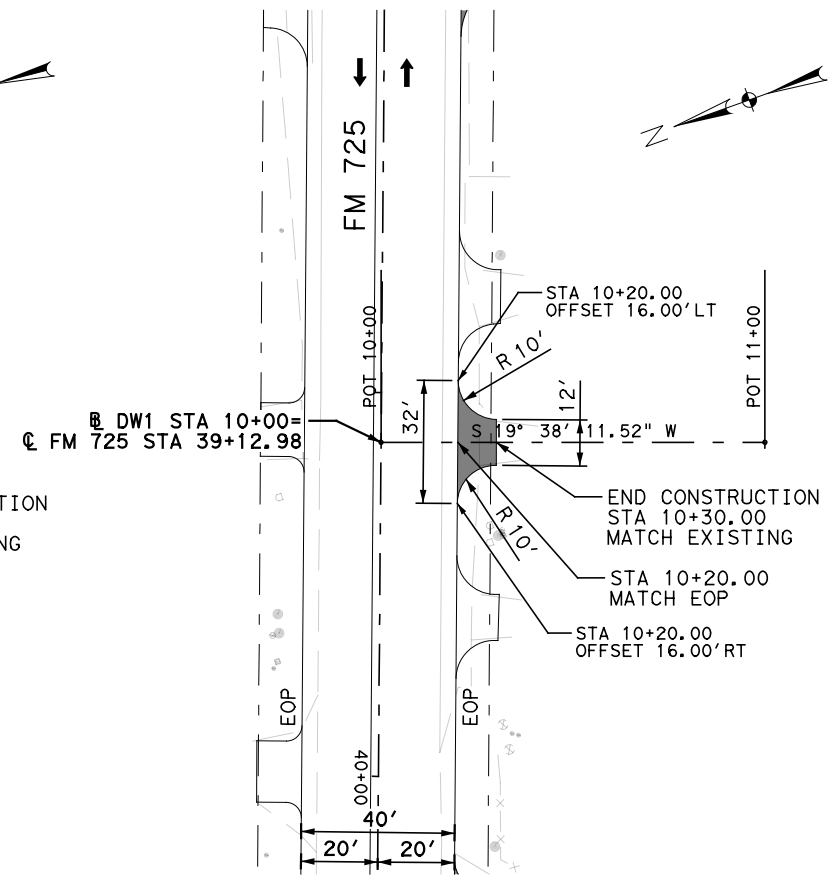
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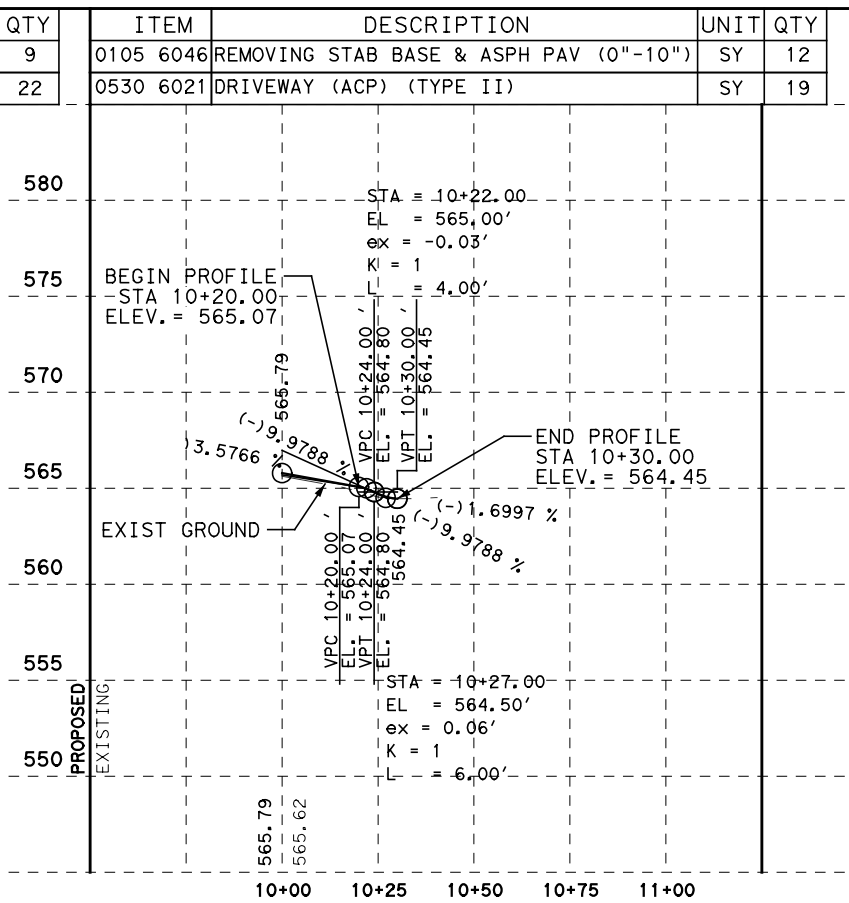
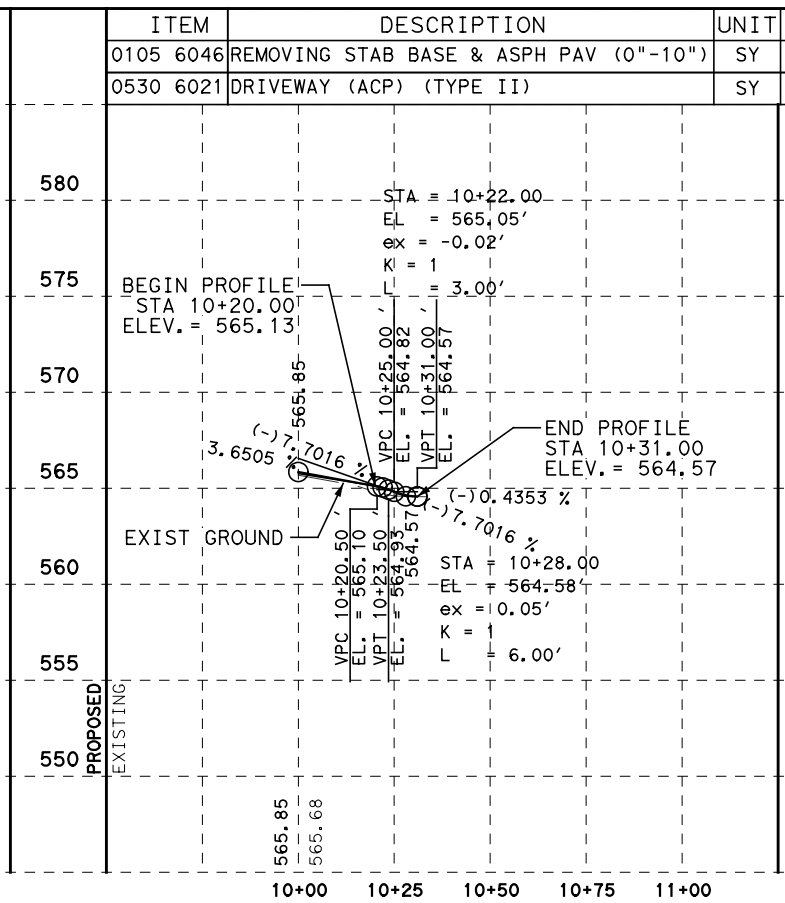
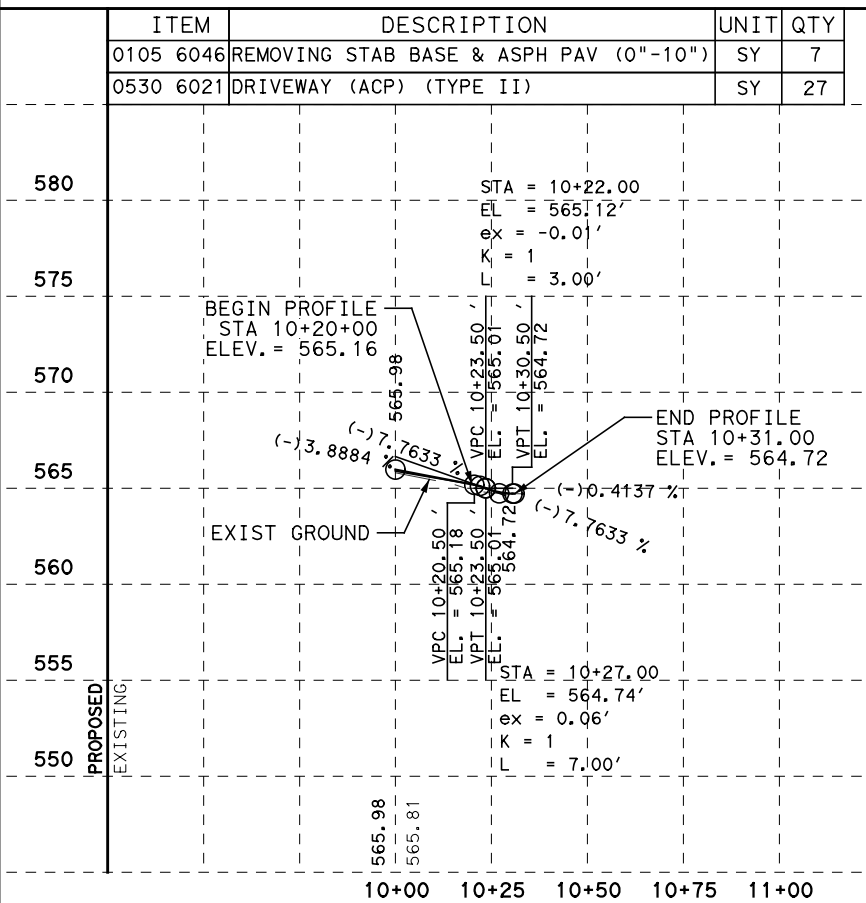
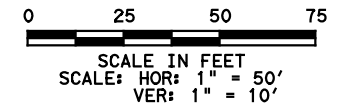
DRIVEWAY 88



DRIVEWAY 89



DRIVEWAY 90



4/28/2021

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NO.	REVISION	BY	DATE

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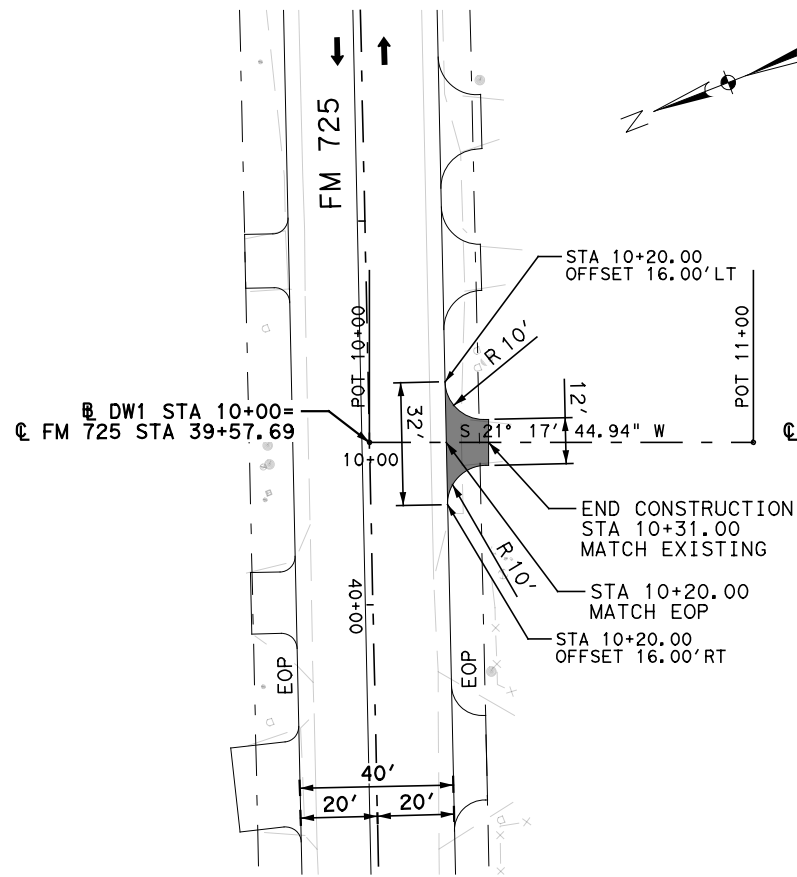
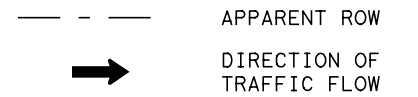
FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 30 OF 55

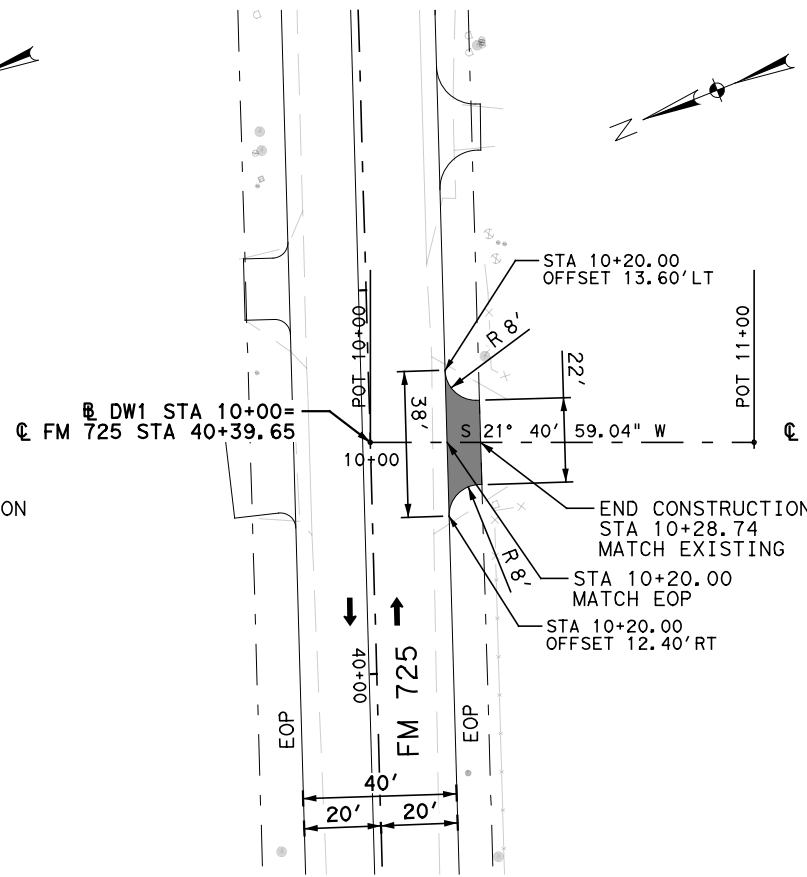
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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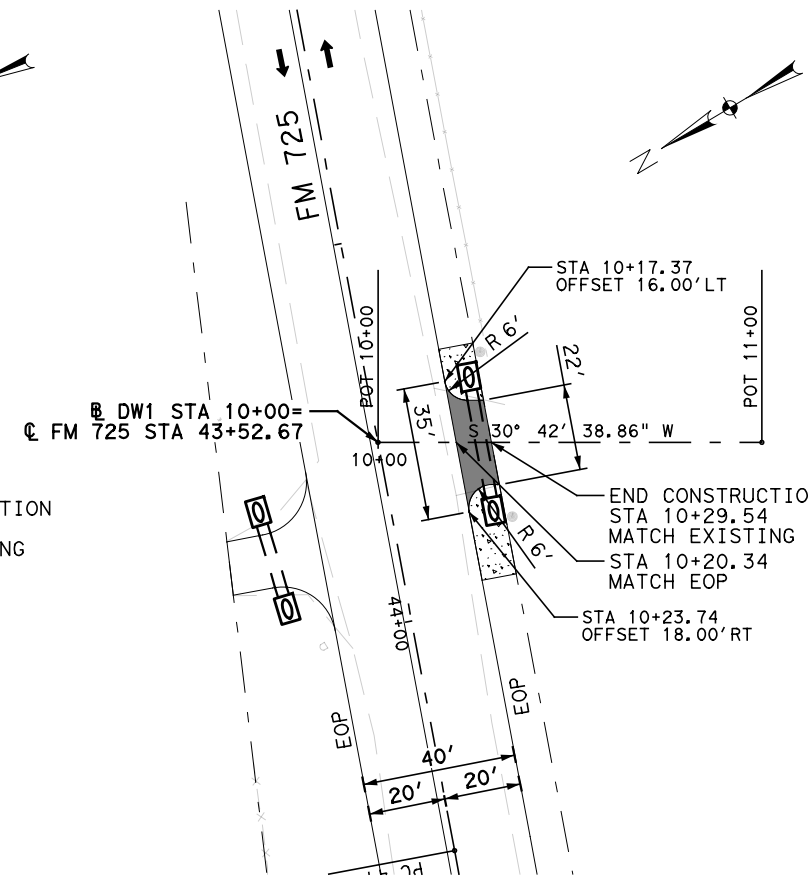
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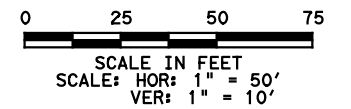
DRIVEWAY 91



DRIVEWAY 92



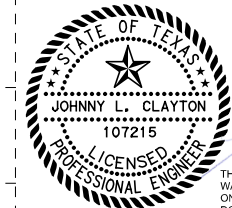
DRIVEWAY 93



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	10
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	20

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	25

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	25



4/28/2021

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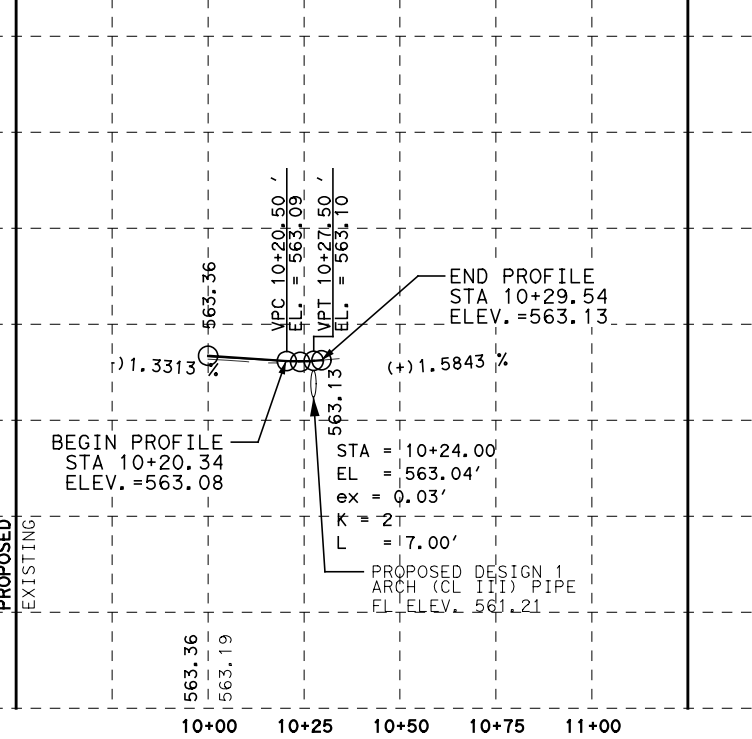
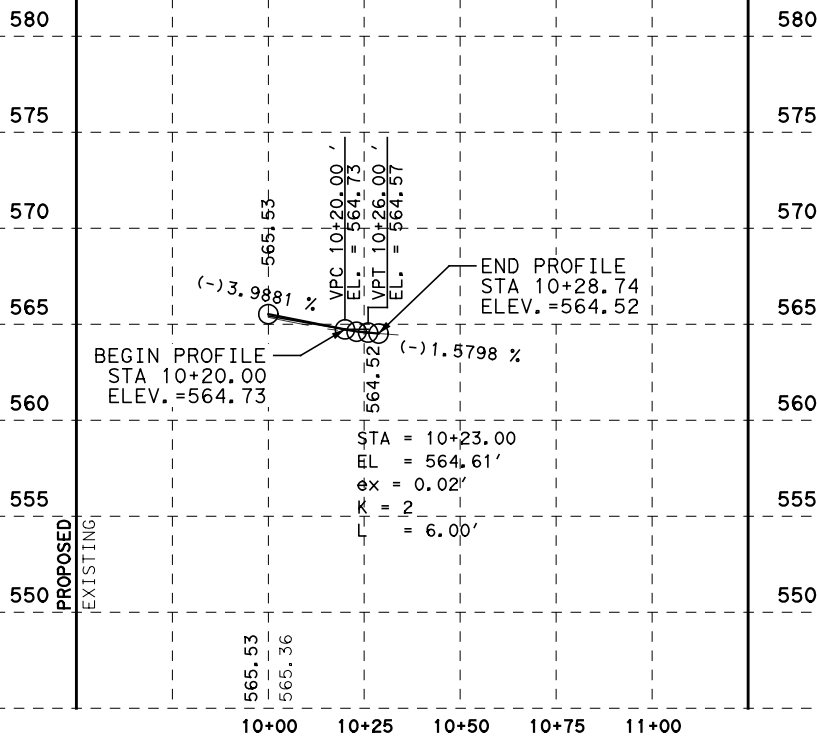
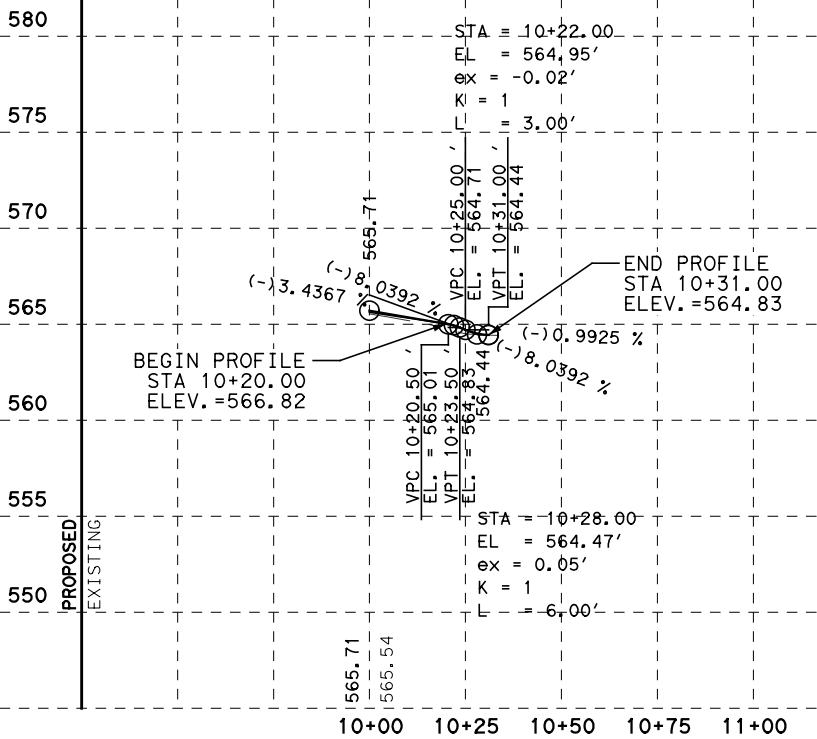
HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



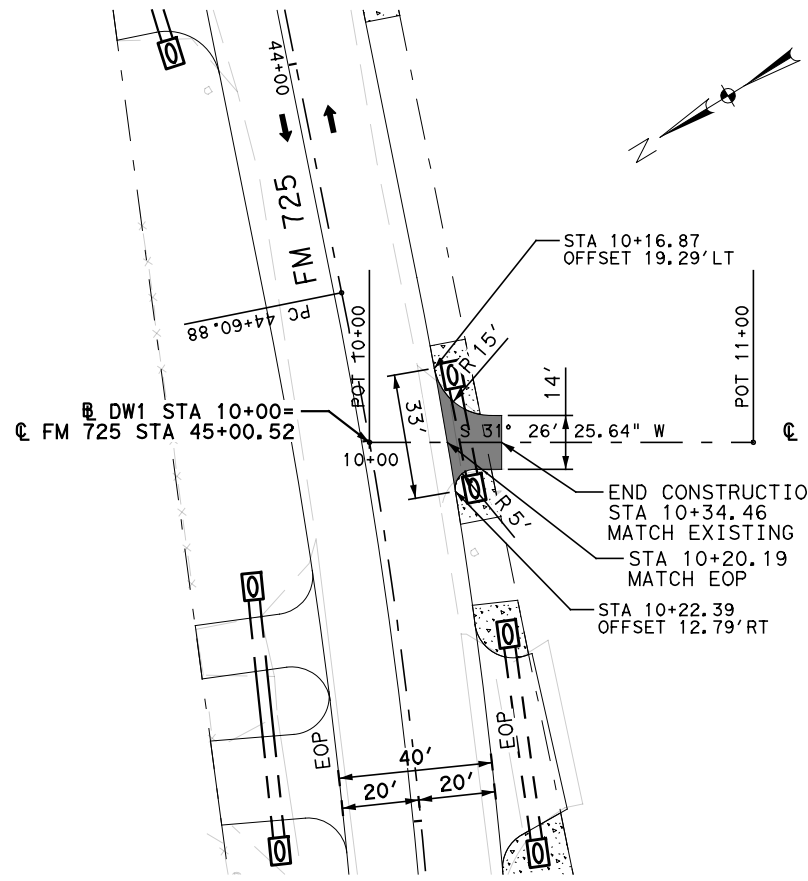
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 31 OF 55

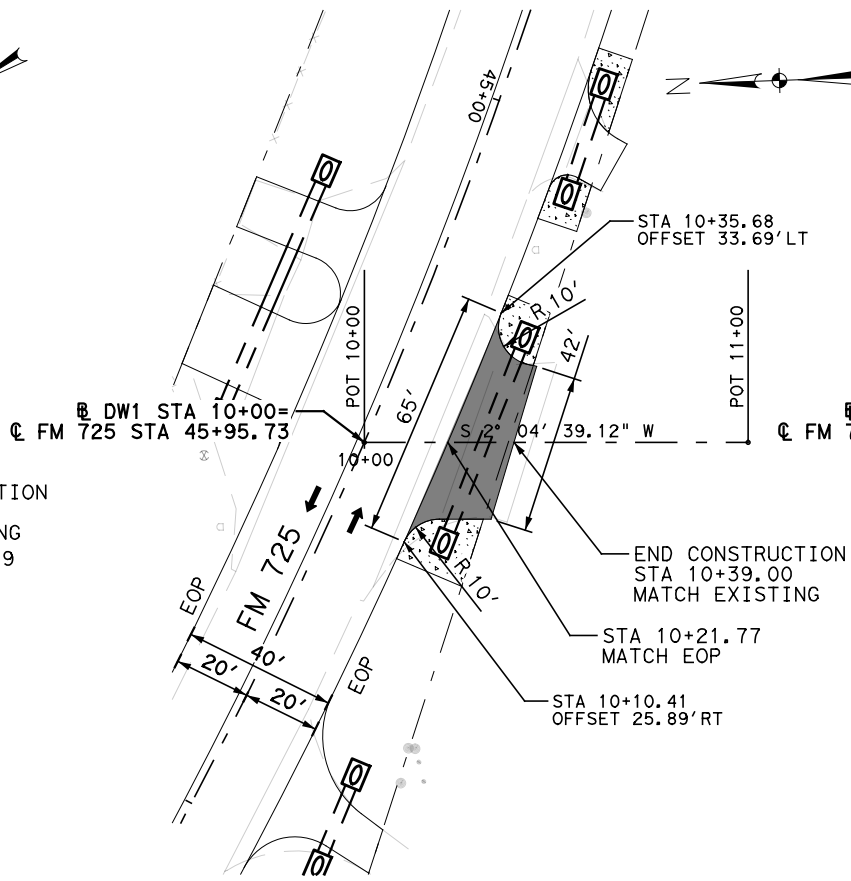
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	175	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



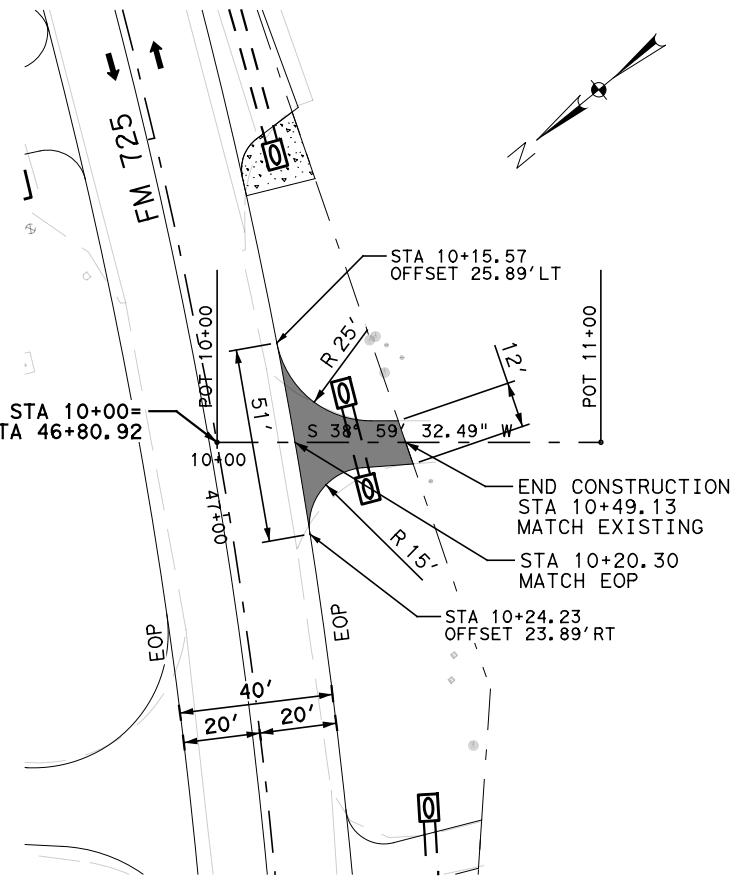
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DRIVEWAY 94

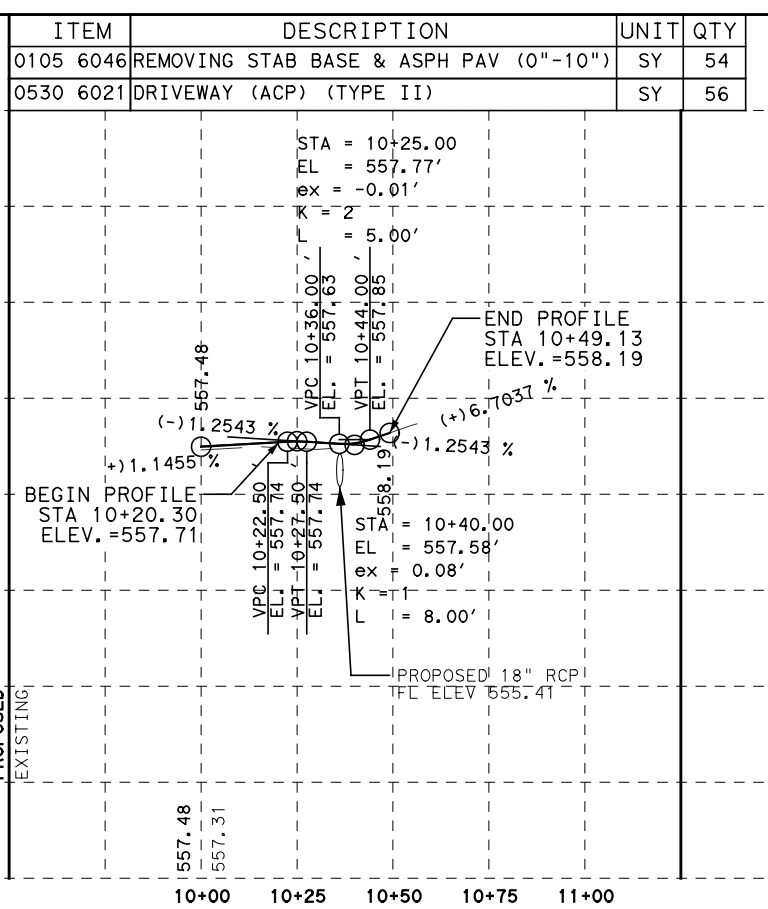
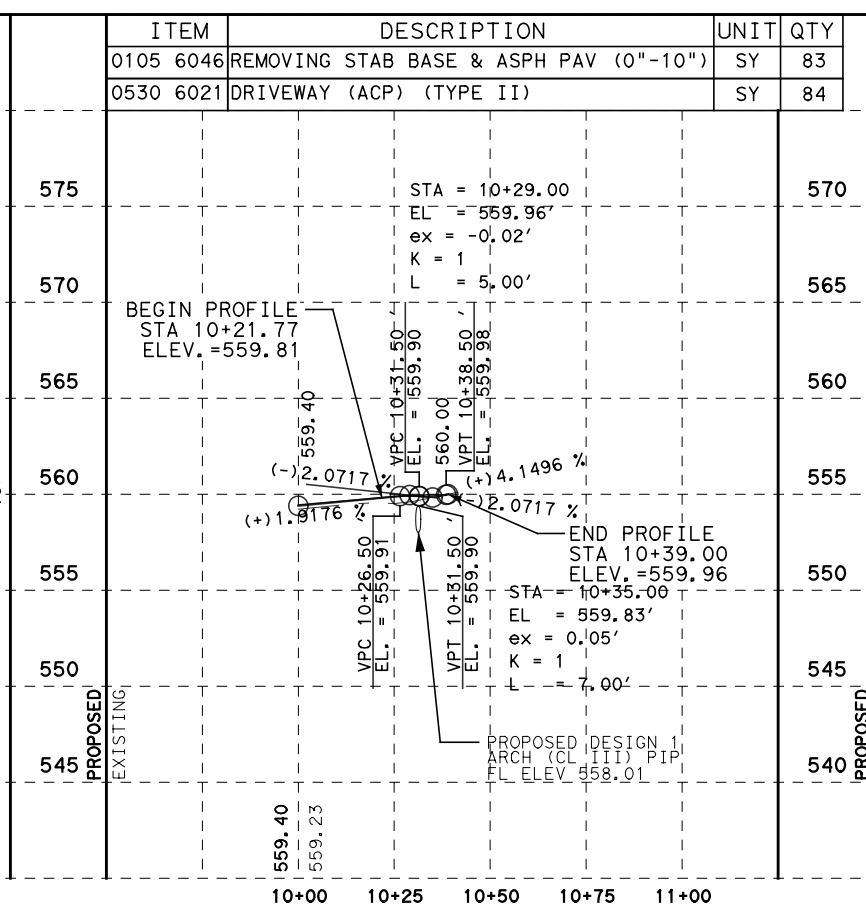
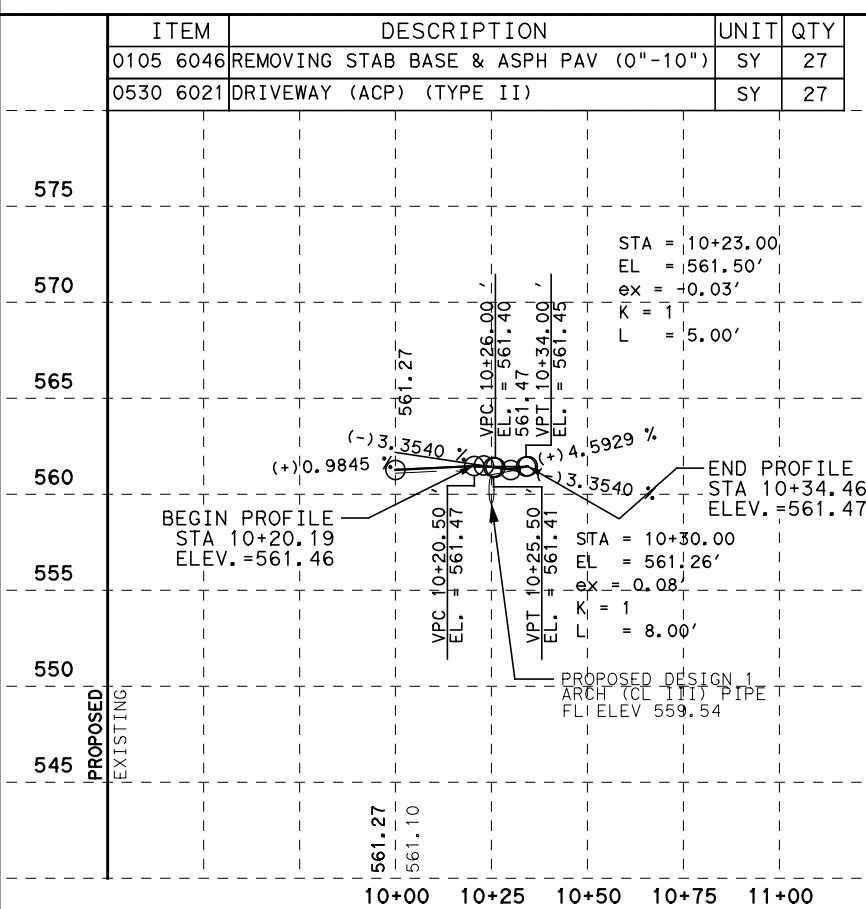
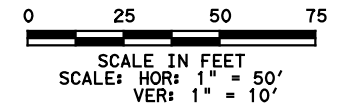
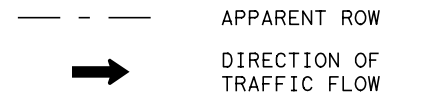


DRIVEWAY 95



DRIVEWAY 96

LEGEND



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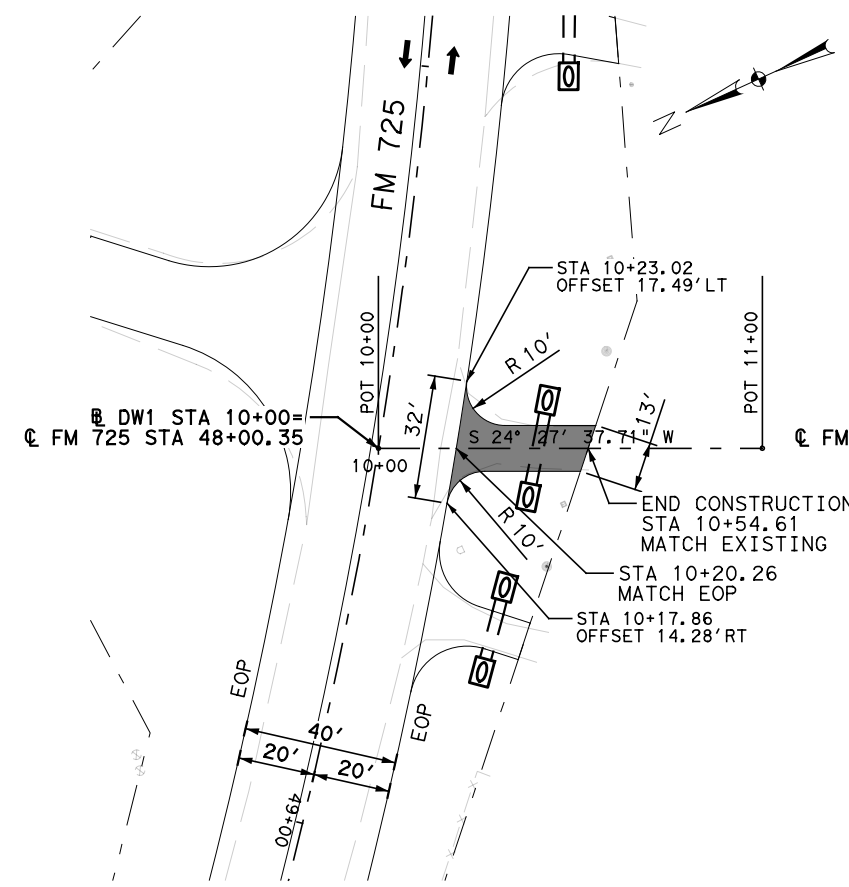
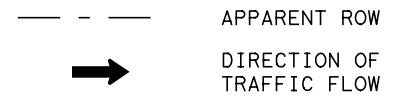
NO.	REVISION	BY	DATE

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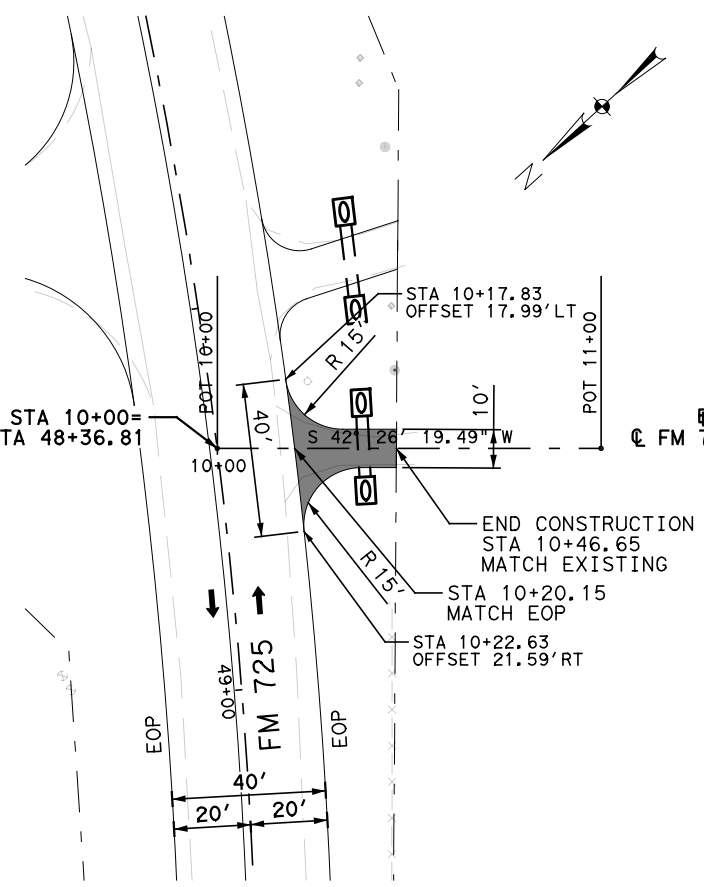
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SHEET 32 OF 55			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		176
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

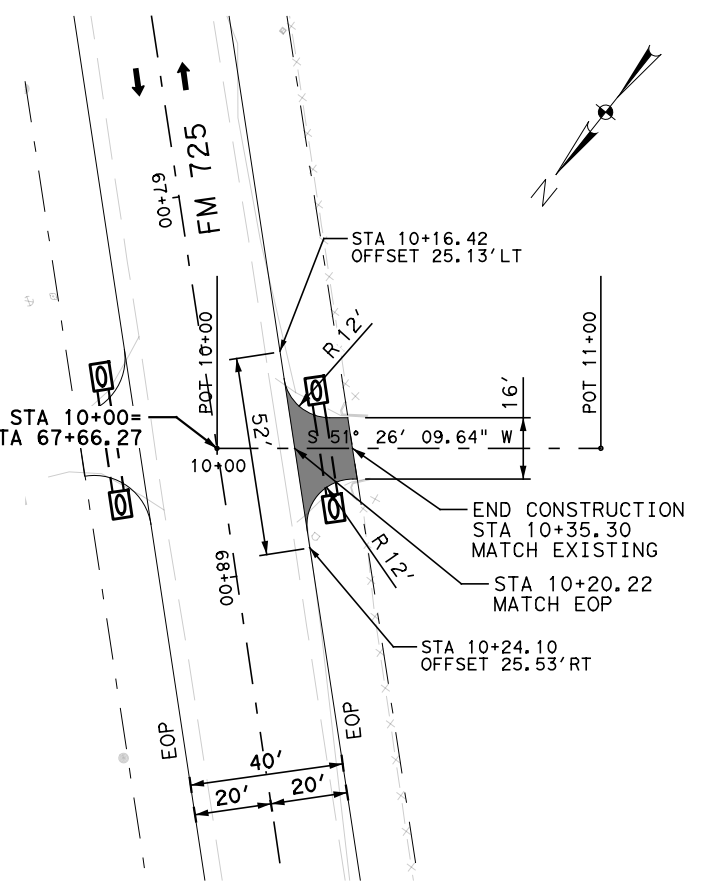
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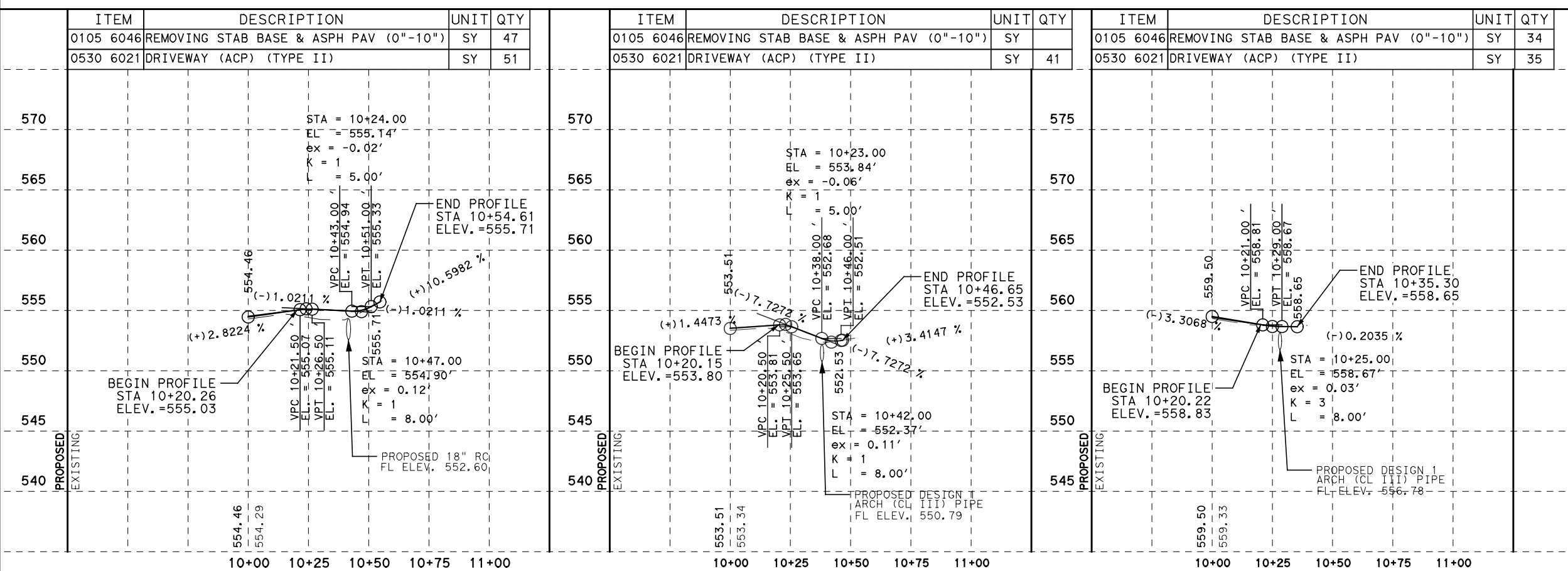
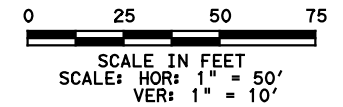
DRIVEWAY 97



DRIVEWAY 98



DRIVEWAY 99



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	47
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	51

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	41
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	41

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	34
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	35

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
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**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 33 OF 55

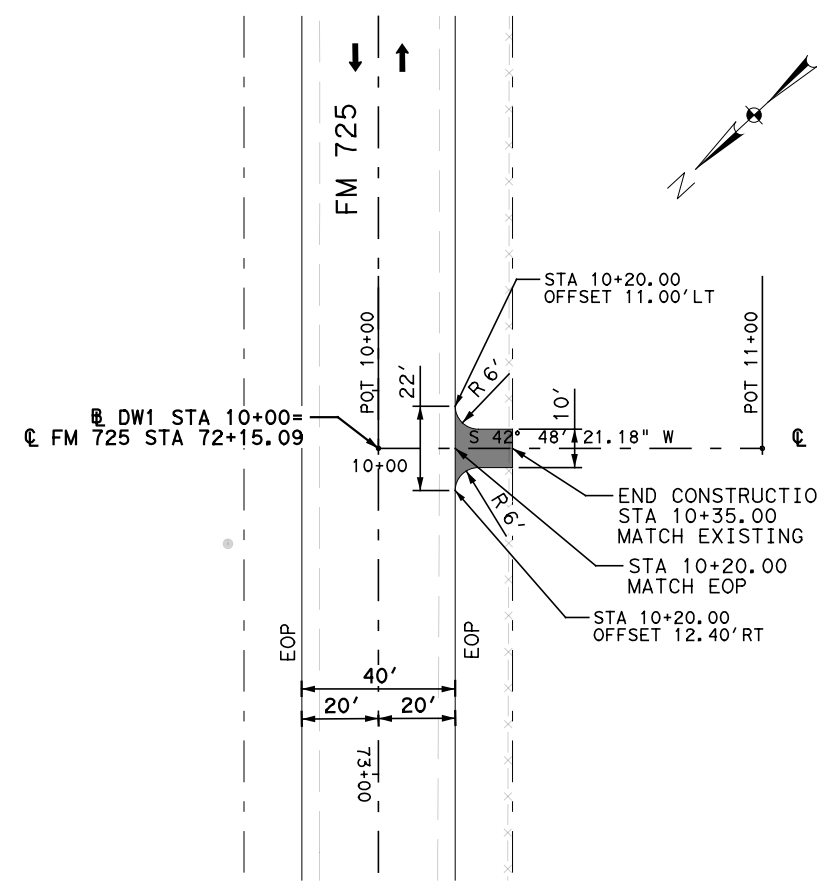
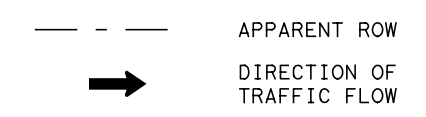
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6	See Title Sheet	177

STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE

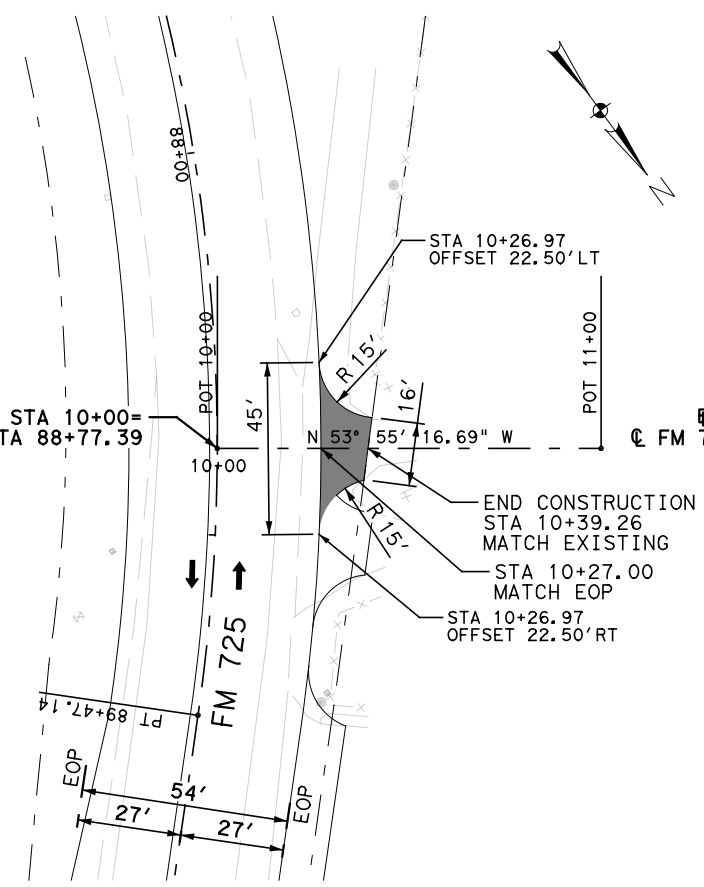
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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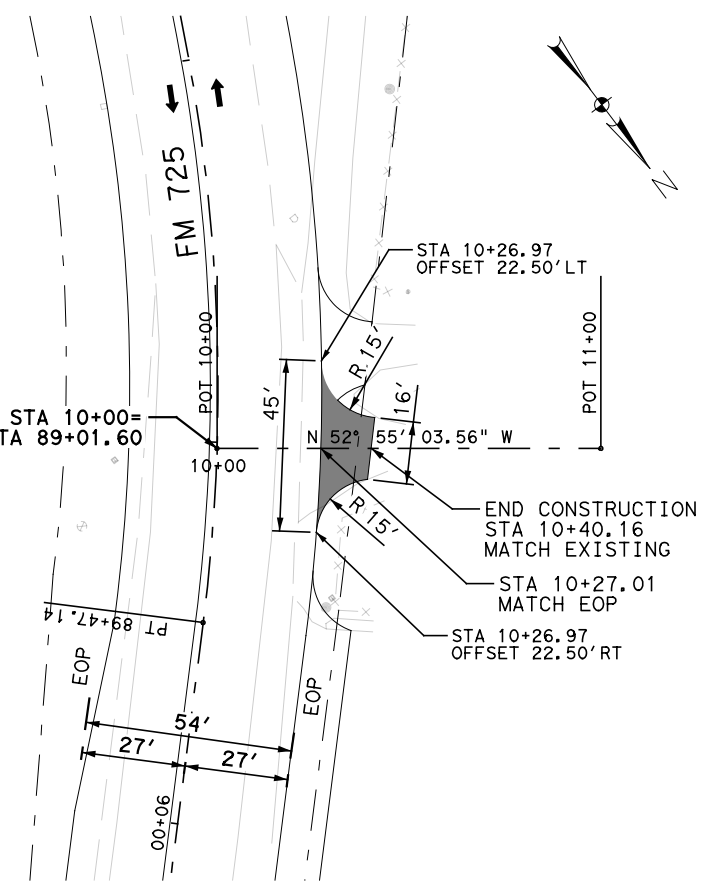
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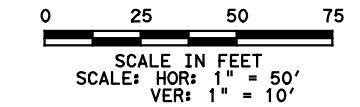
DRIVEWAY 100



DRIVEWAY 101



DRIVEWAY 102



ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	19
0530 6004	DRIVEWAY (CONC)	SY	19

575	STA = 10+22.00 EL = 560.13' EX = -0.03'		
570	L = 4.00'		
565	END PROFILE STA 10+35.00 ELEV. = 559.30		
560	BEGIN PROFILE STA 10+20.00 ELEV. = 560.21		
555	STA = 10+30.00 EL = 559.28' EX = 0.08'		
550	L = 6.00'		
545	PROPOSED EXISTING		

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	31

575	STA = 10+30.00 EL = 561.86' EX = -0.05'		
570	L = 6.00'		
565	END PROFILE STA 10+39.26 ELEV. = 561.23		
560	BEGIN PROFILE STA 10+27.00 ELEV. = 561.90		
555	STA = 10+37.00 EL = 561.26' EX = 0.04'		
550	L = 4.00'		
545	PROPOSED EXISTING		

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	32

575	STA = 10+30.00 EL = 561.83' EX = -0.05'		
570	L = 5.00'		
565	END PROFILE STA 10+40.16 ELEV. = 561.11		
560	BEGIN PROFILE STA 10+27.01 ELEV. = 561.87		
555	STA = 10+37.00 EL = 561.13' EX = 0.07'		
550	L = 6.00'		
545	PROPOSED EXISTING		

4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

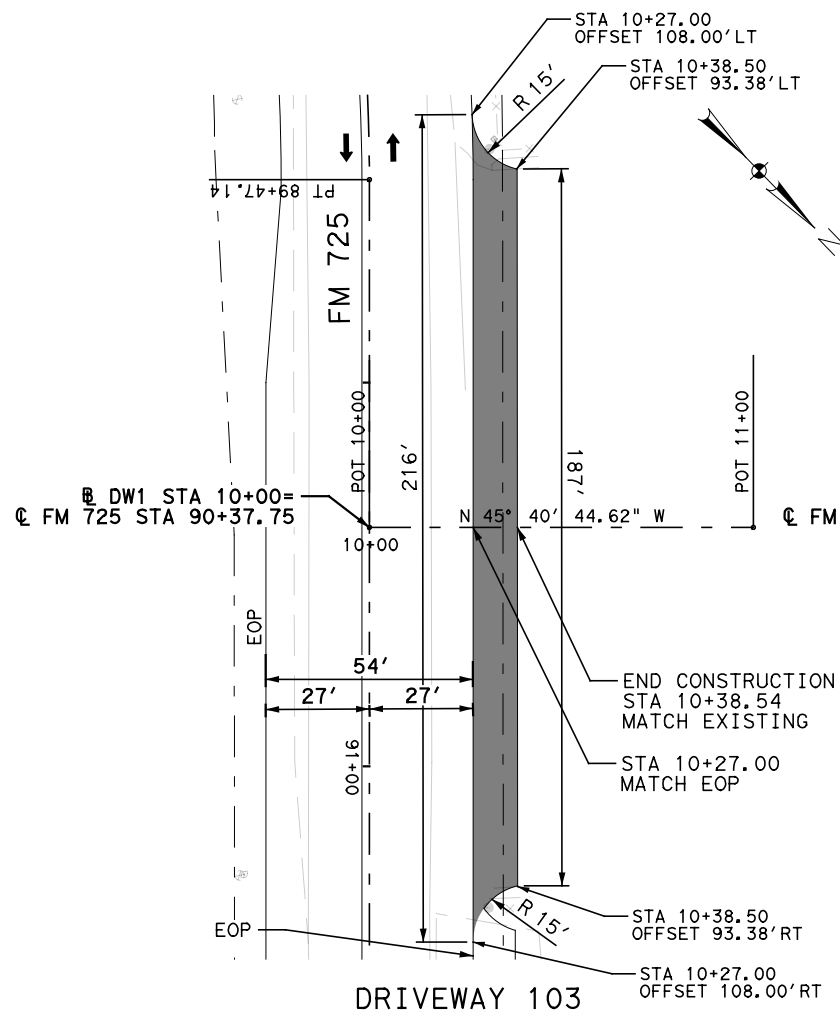
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FM 725
DRIVEWAYS
PLAN & PROFILE

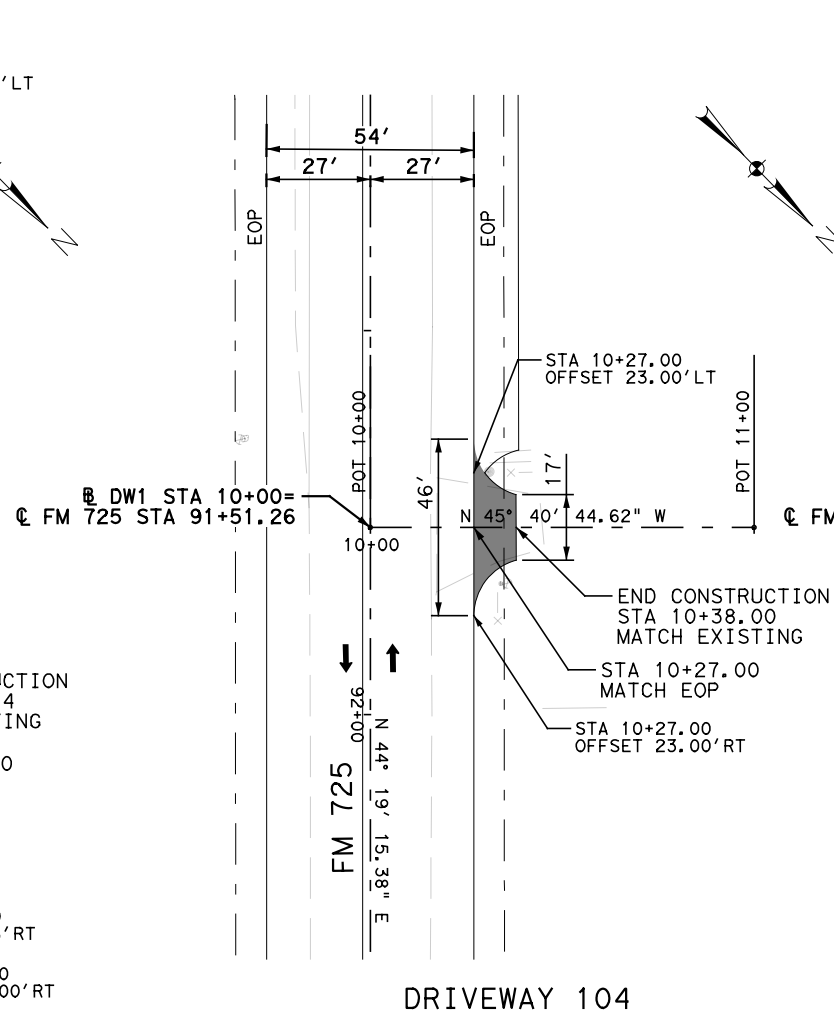
SHEET 34 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	178	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

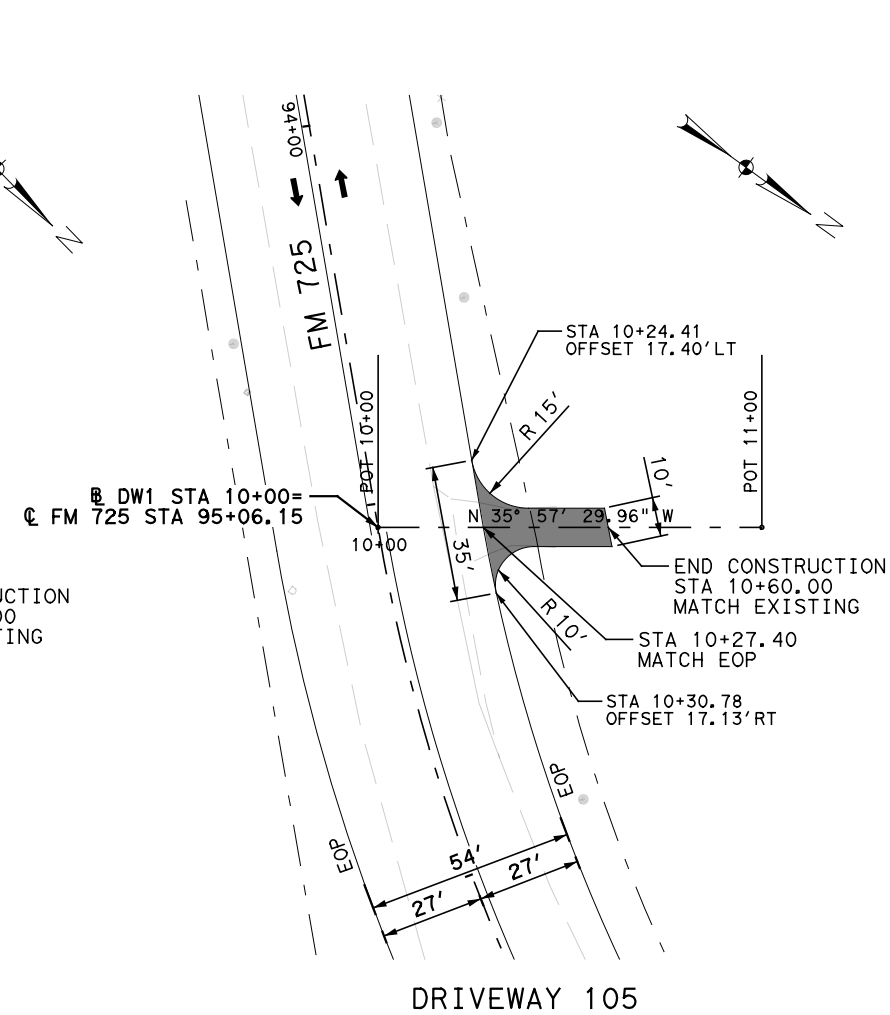
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DRIVEWAY 103

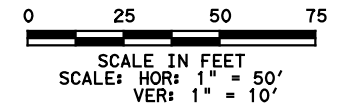
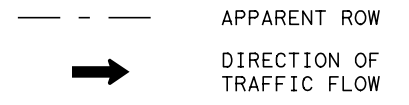


DRIVEWAY 104



DRIVEWAY 105

LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	248
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	248

575	STA = 10+29.00 EL = 561.24' ex = -0.02' K = 1 L = 4.00'
570	
565	END PROFILE STA 10+38.54 ELEV. = 560.85
560	BEGIN PROFILE STA 10+27.00 ELEV. = 561.29
555	VPC 10+27.00 EL = 561.29 VPT 10+31.00 EL = 561.07 L = 4.00'
550	VPC 10+35.00 EL = 560.82' ex = 0.07'
545	PROPOSED EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	26
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	30

575	
570	
565	END PROFILE STA 10+38.00 ELEV. = 560.75
560	BEGIN PROFILE STA 10+27.00 ELEV. = 560.94
555	STA = 10+34.00 EL = 560.69' ex = 0.05' K = 1 L = 7.00'
550	
545	PROPOSED EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	44
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	44

575	
570	
565	END PROFILE STA 10+60.00 ELEV. = 560.37
560	BEGIN PROFILE STA 10+27.40 ELEV. = 560.37
555	STA = 10+55.00 EL = 560.34' ex = -0.02' K = 1 L = 3.93'
550	VPC 10+53.00 EL = 560.26 VPT 10+57.00 EL = 560.26 L = 4.00'
545	PROPOSED EXISTING

4/28/2021

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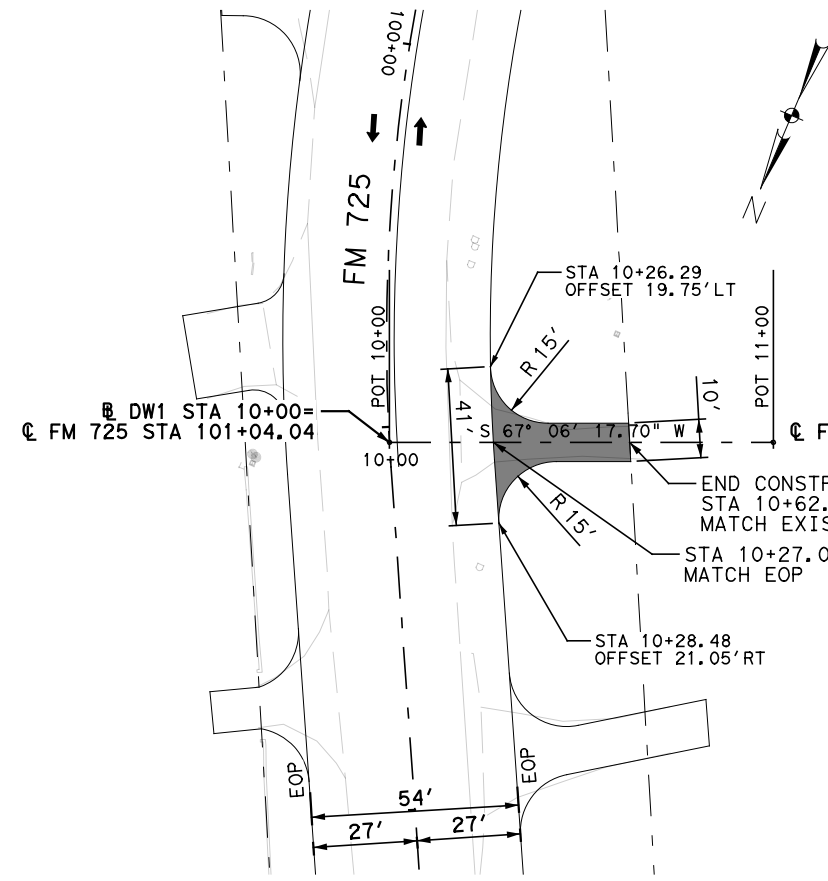
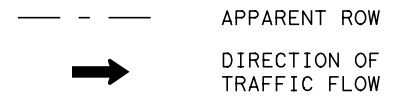
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 35 OF 55

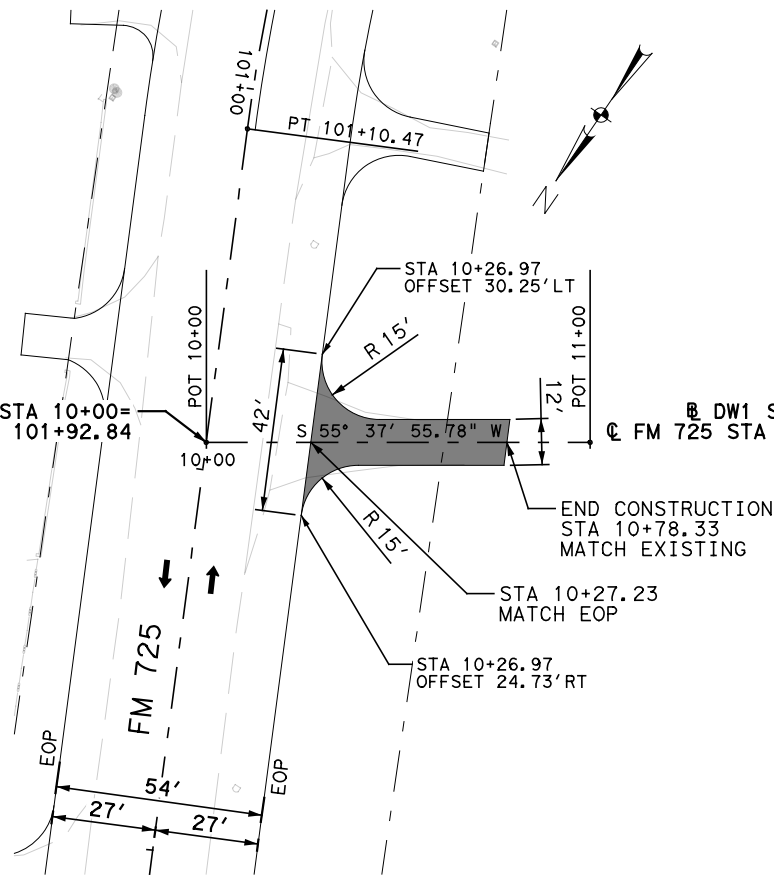
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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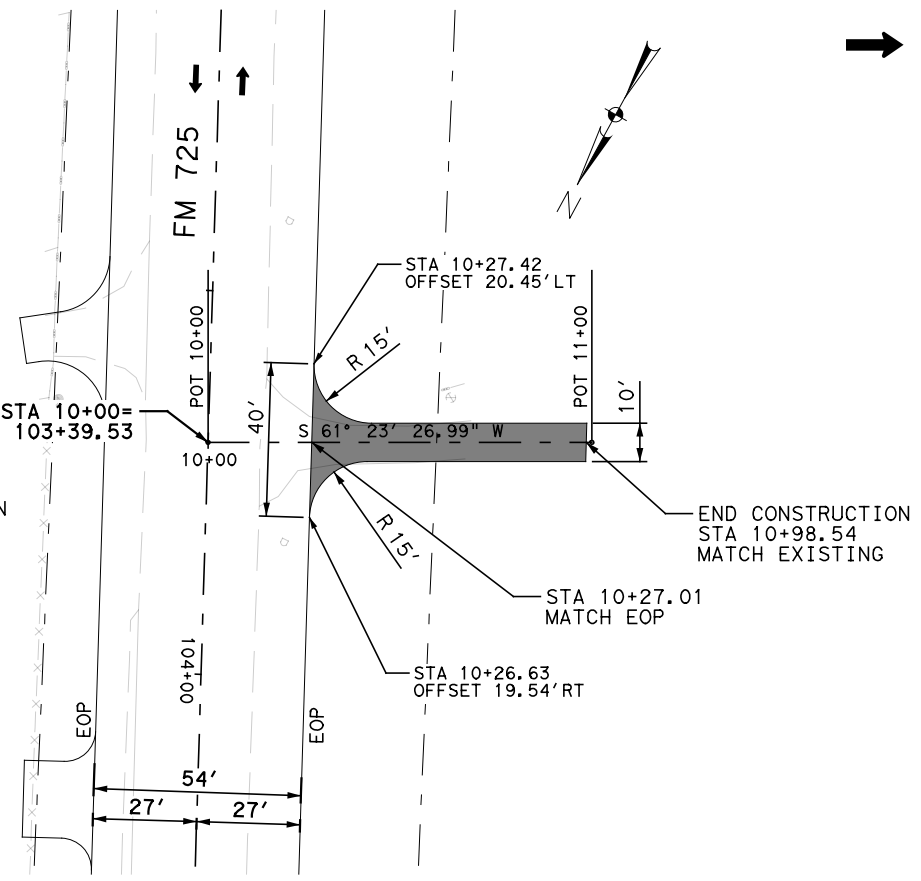
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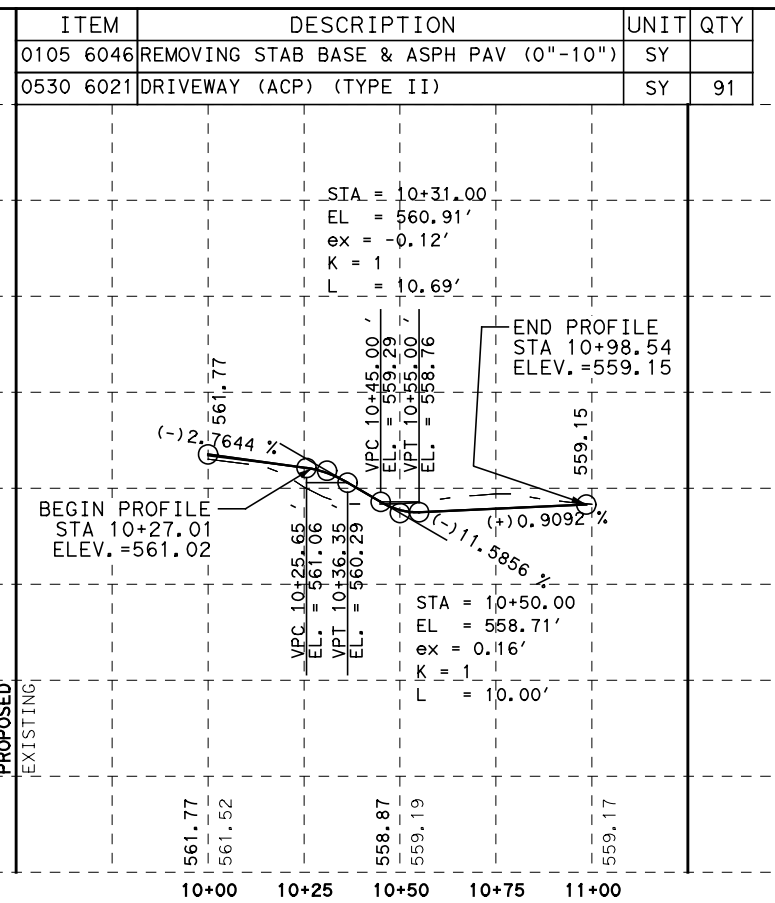
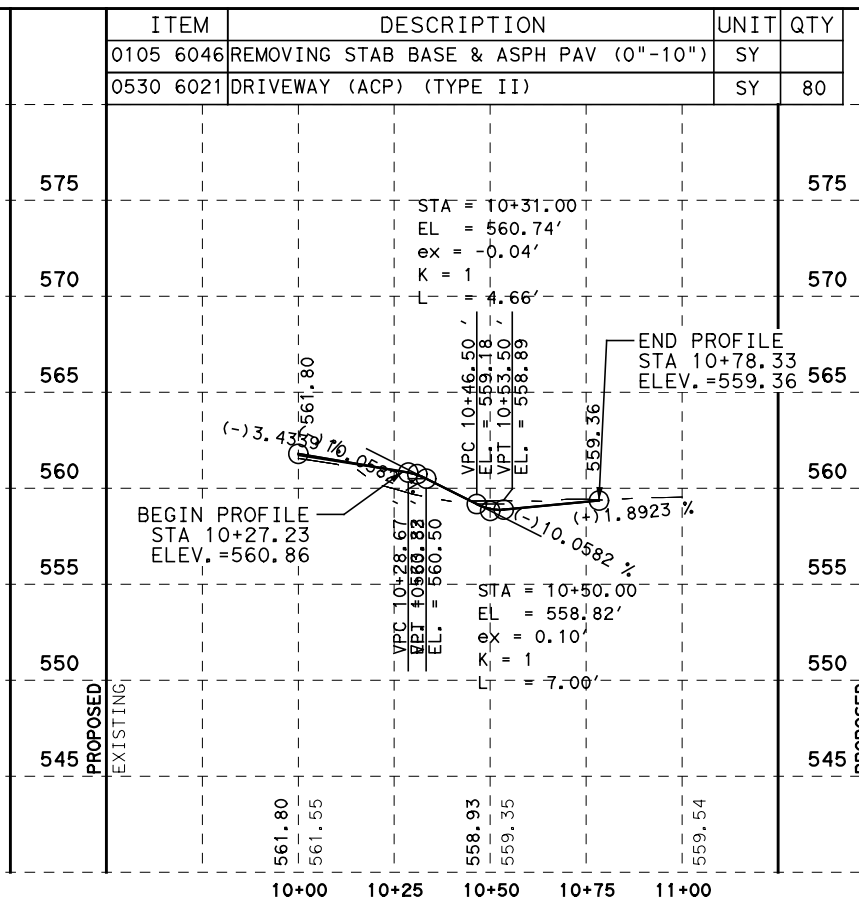
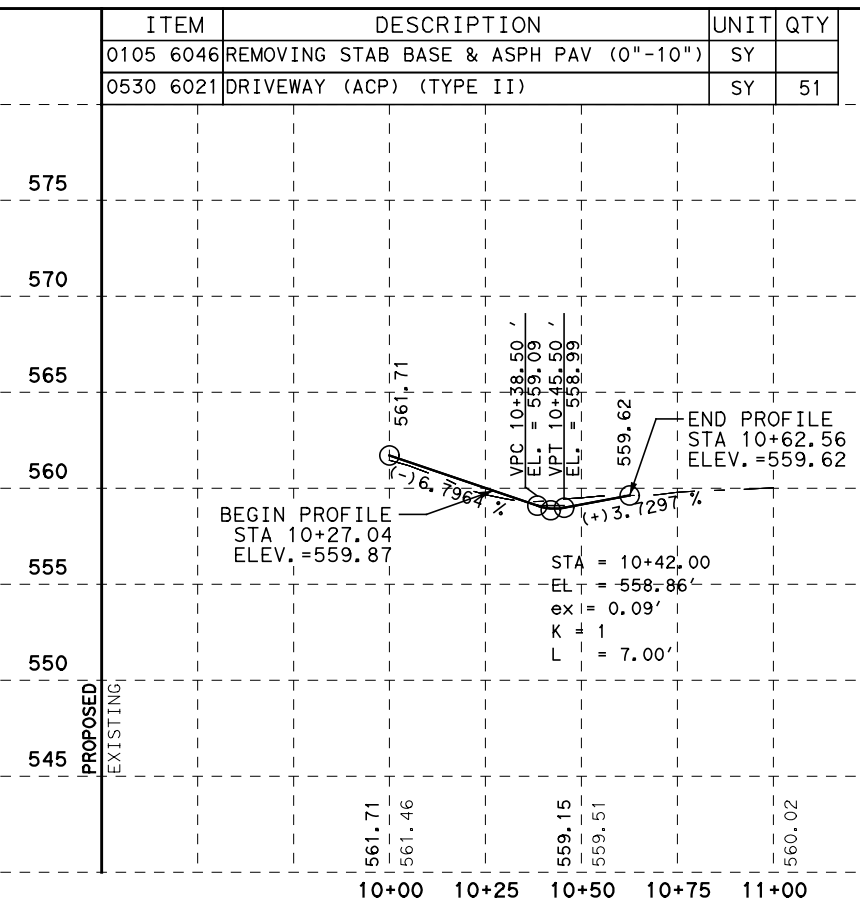
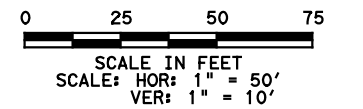
DRIVEWAY 106



DRIVEWAY 107



DRIVEWAY 108



4/28/2021

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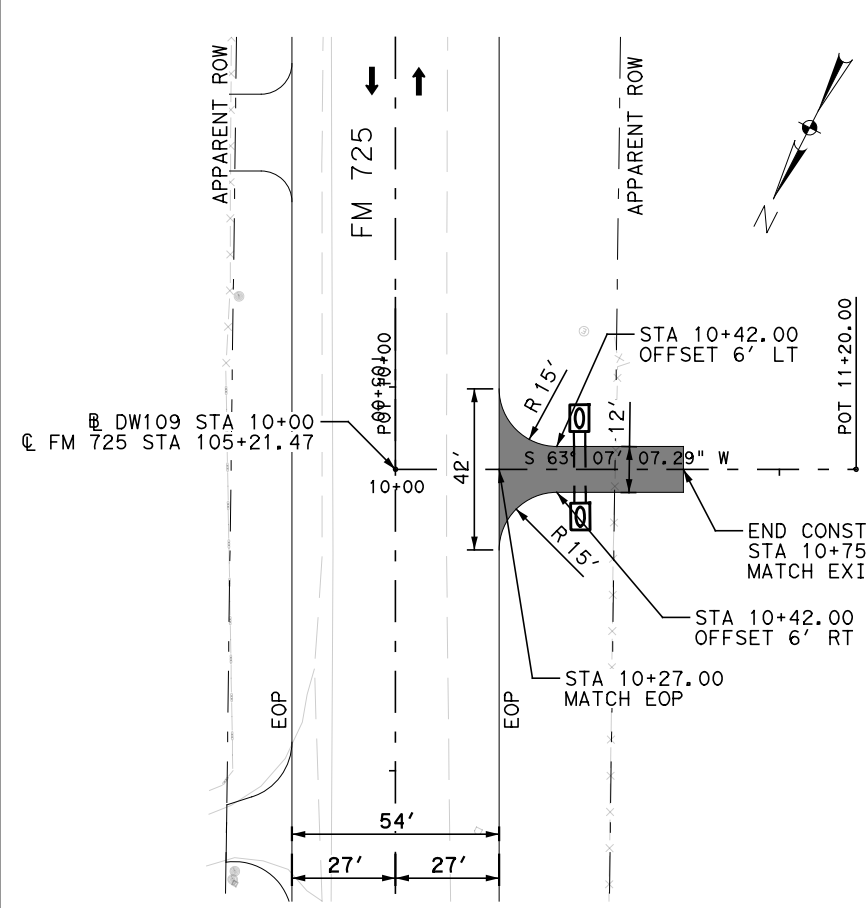
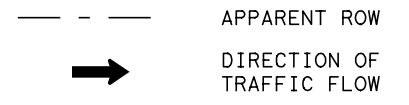
NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
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 SAN ANTONIO, TEXAS 78216
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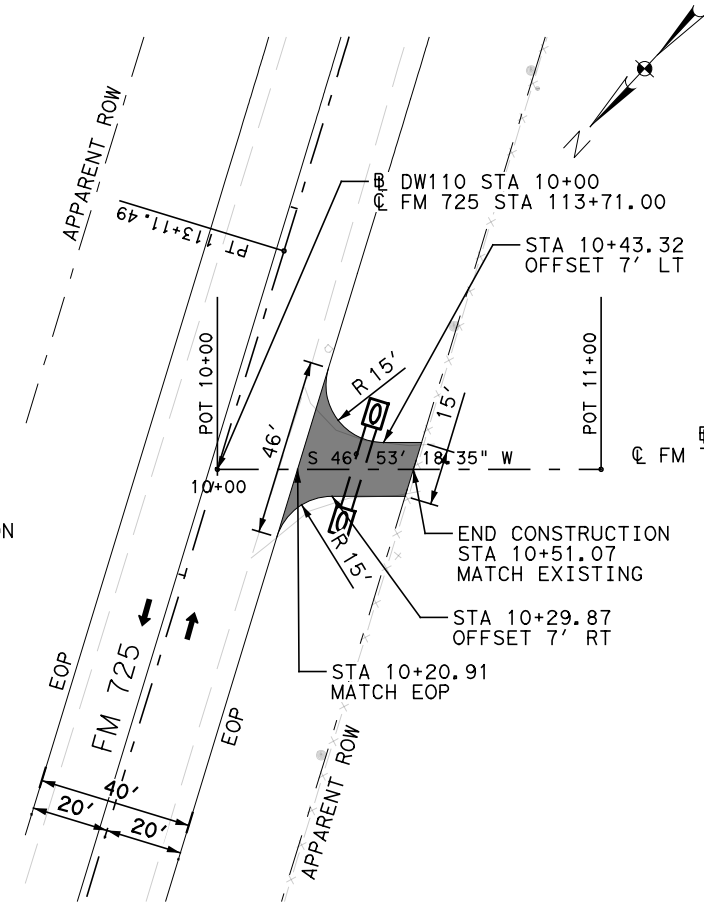
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SHEET 36 OF 55			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 180
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

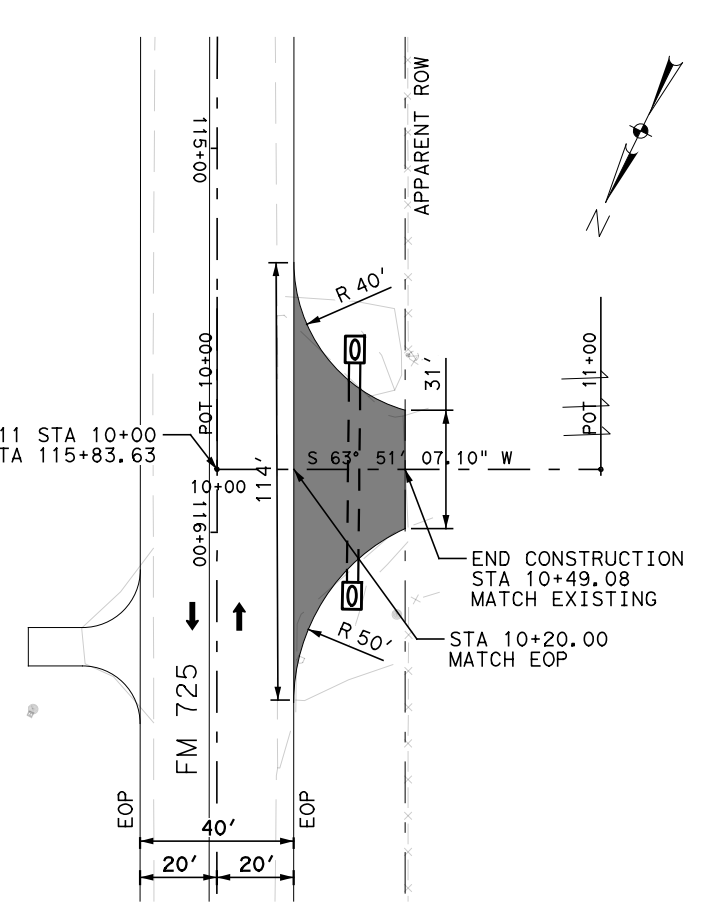
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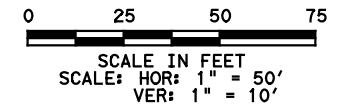
DRIVEWAY 109



DRIVEWAY 110

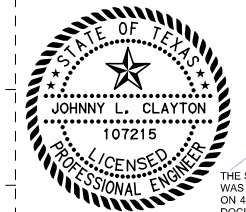


DRIVEWAY 111



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	75
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	60
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	163
0530 6004	DRIVEWAY (CONC)	SY	173

STATION	ELEVATION	DESCRIPTION
10+00	561.73	EXIST GROUND
10+25	561.48	EXIST GROUND
10+31.00	561.24	BEGIN PROFILE
10+50	560.35	EXIST GROUND
10+75	559.27	END PROFILE
10+20.91	564.55	BEGIN PROFILE
10+42.00	562.76	EXIST GROUND
10+51.07	562.077	END PROFILE
10+20.00	566.47	BEGIN PROFILE
10+45.00	564.71	EXIST GROUND
10+49.08	564.56	END PROFILE



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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
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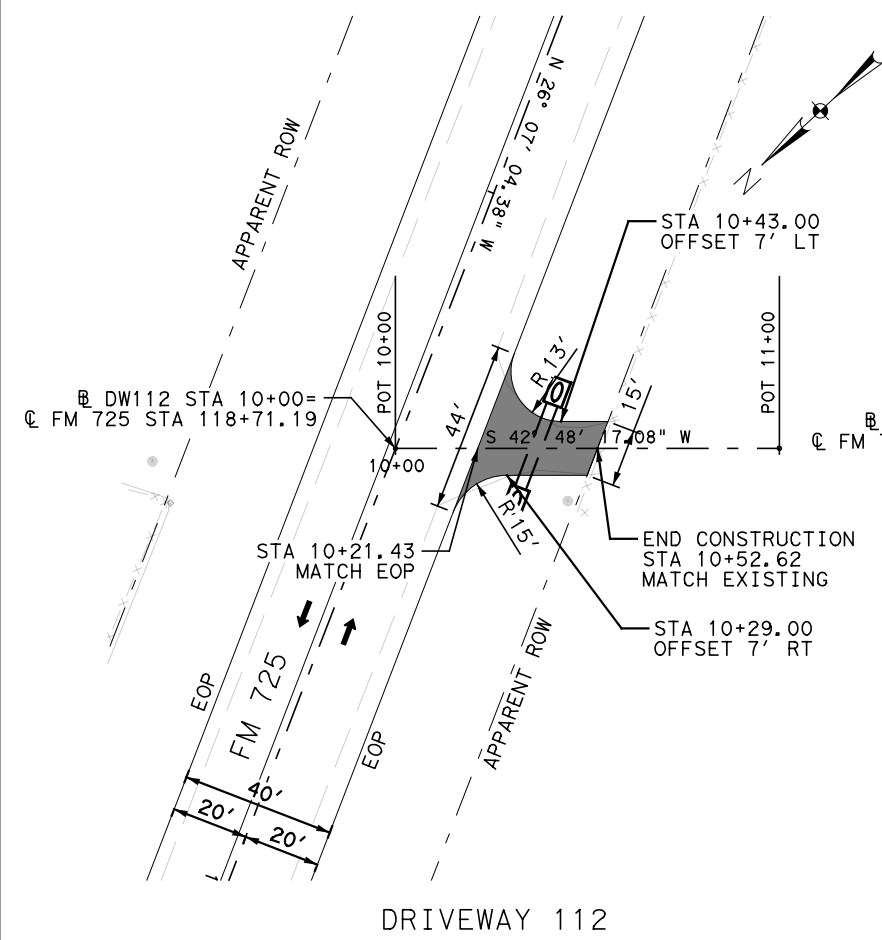
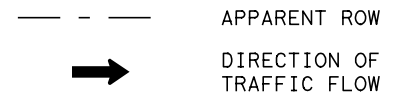
FM 725
DRIVEWAYS
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SHEET 37 OF 55

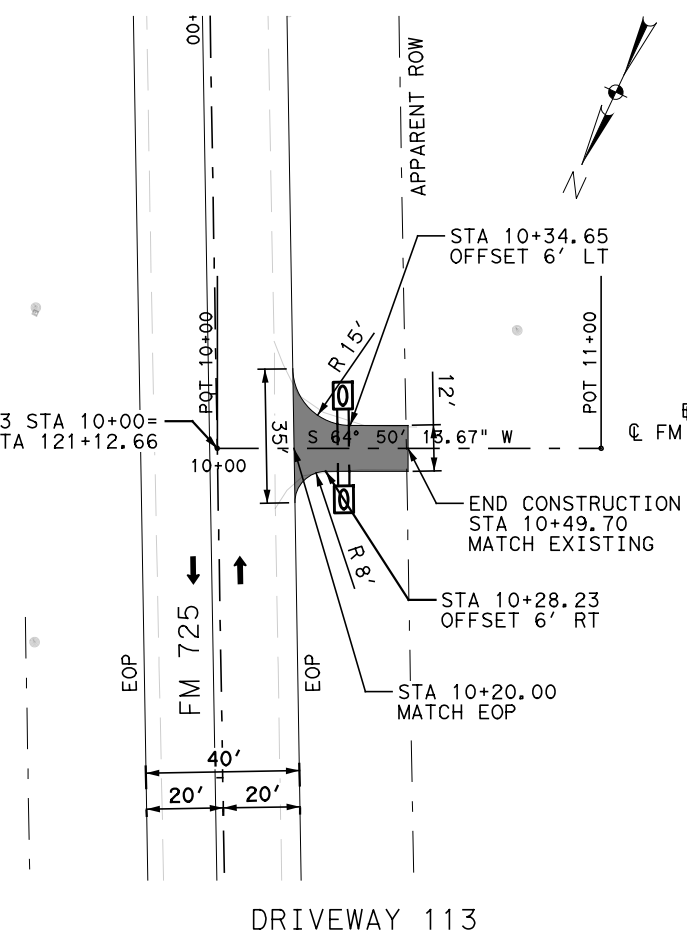
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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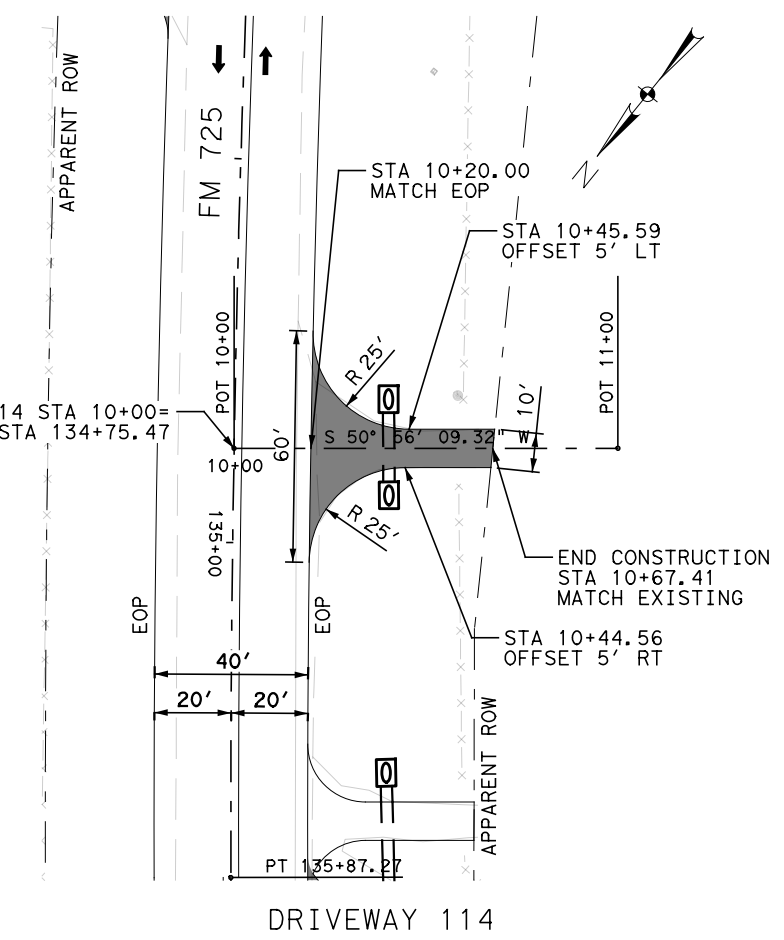
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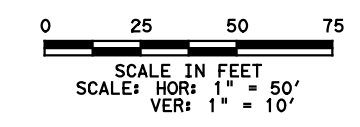
DRIVEWAY 112



DRIVEWAY 113



DRIVEWAY 114



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	60

585		STA = 10+25.00 EL = 568.75' ex = -0.01'
580	BEGIN PROFILE STA 10+20.00 ELEV. = 570.83	END PROFILE STA 10+49.70 ELEV. = 570.77
575		
570	EXIST GROUND	END PROFILE STA 10+52.62 ELEV. = 568.14
565	EXIST GROUND	STA = 10+45.00 EL = 568.09' ex = 0.03'
560	BEGIN PROFILE STA 10+21.43 ELEV. = 568.81	END PROFILE STA 10+43.00 ELEV. = 570.15
555	PROPOSED 18" RCP FL ELEV. = 565.68	PROPOSED 18" RCP FL ELEV. = 568.07

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	47

585		STA = 10+25.00 EL = 570.73' ex = -0.02'
580	BEGIN PROFILE STA 10+20.00 ELEV. = 570.83	END PROFILE STA 10+49.70 ELEV. = 570.77
575		
570	EXIST GROUND	END PROFILE STA 10+43.00 ELEV. = 570.15
565	EXIST GROUND	STA = 10+40.00 EL = 569.86' ex = 0.11'
560	BEGIN PROFILE STA 10+21.43 ELEV. = 568.81	END PROFILE STA 10+43.00 ELEV. = 570.15
555	PROPOSED 18" RCP FL ELEV. = 565.68	PROPOSED 18" RCP FL ELEV. = 568.07

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	8
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	83

605		STA = 10+23.00 EL = 593.07' ex = -0.04'
600	BEGIN PROFILE STA 10+20.00 ELEV. = 593.14	END PROFILE STA 10+67.41 ELEV. = 592.22
595		
590	EXIST GROUND	END PROFILE STA 10+43.00 ELEV. = 591.75
585	EXIST GROUND	STA = 10+40.00 EL = 591.67' ex = 0.08'
580	BEGIN PROFILE STA 10+21.43 ELEV. = 568.81	END PROFILE STA 10+43.00 ELEV. = 570.15
575	PROPOSED 18" RCP FL ELEV. = 565.68	PROPOSED 18" RCP FL ELEV. = 589.41

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NO.	REVISION	BY	DATE

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 SAN ANTONIO, TEXAS 78216
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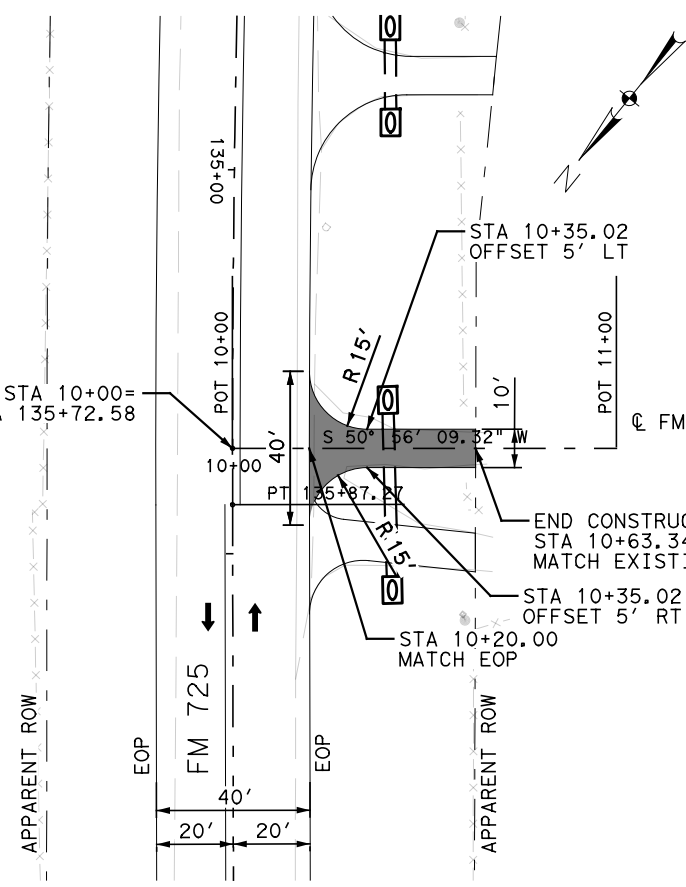
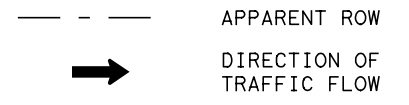
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 38 OF 55

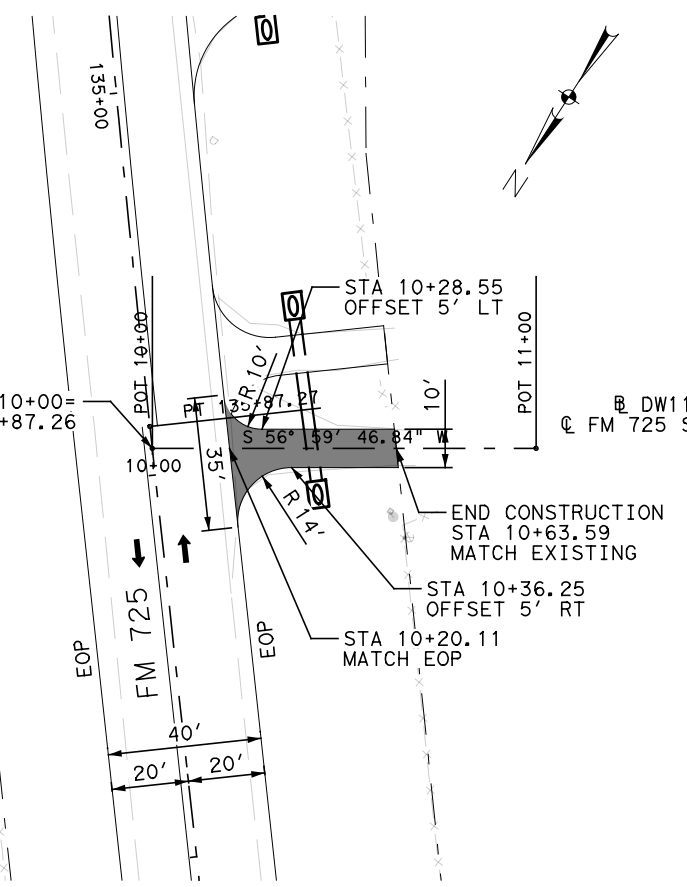
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6	See Title Sheet	182	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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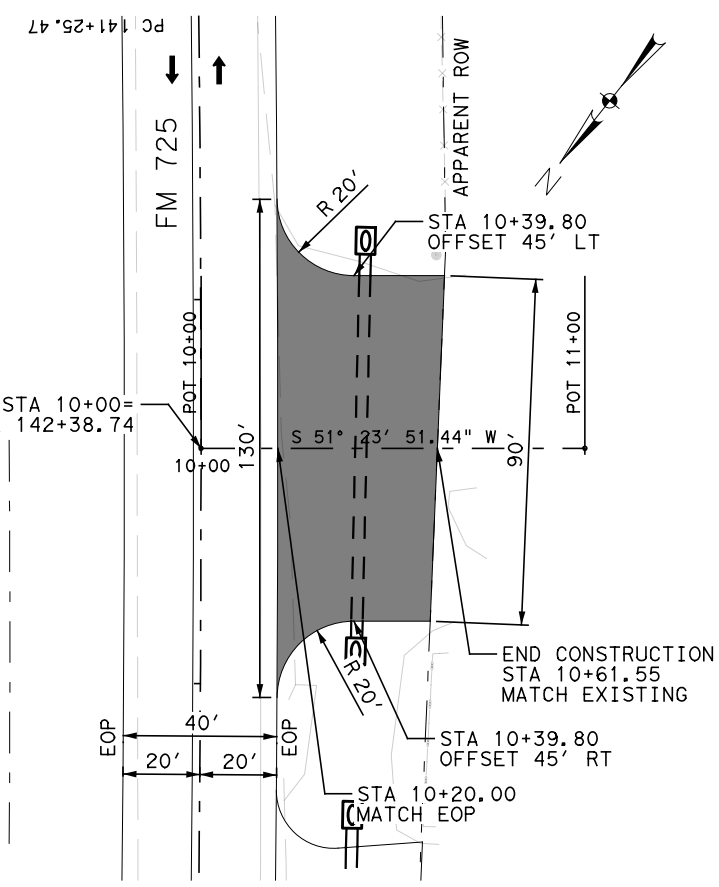
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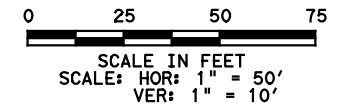
DRIVEWAY 115



DRIVEWAY 116



DRIVEWAY 117



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	5
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	59
605	STA = 10+25.00 EL = 594.78' ex = -0.01' K = 4		
600	BEGIN PROFILE STA 10+20.11 ELEV. = 595.31		
595	END PROFILE STA 10+63.34 ELEV. = 594.10		
590	BEGIN PROFILE STA 10+20.00 ELEV. = 594.89		
585	EXIST GROUND		
580	PROPOSED 18" RCP FL ELEV. 591.60		
575	EXIST GROUND		
605	STA = 10+25.00 EL = 611.55' ex = -0.06' K = 1 L = 6.00'		
620	BEGIN PROFILE STA 10+20.11 ELEV. = 595.31		
615	END PROFILE STA 10+63.59 ELEV. = 594.85		
610	BEGIN PROFILE STA 10+20.00 ELEV. = 611.43		
605	EXIST GROUND		
600	PROPOSED 18" RCP FL ELEV. 592.07		
595	EXIST GROUND		
605	STA = 10+25.00 EL = 609.98' ex = 0.07' K = 1 L = 16.00'		
620	BEGIN PROFILE STA 10+20.00 ELEV. = 611.43		
615	END PROFILE STA 10+61.55 ELEV. = 609.98		
610	BEGIN PROFILE STA 10+20.00 ELEV. = 611.43		
605	EXIST GROUND		
600	PROPOSED 18" RCP FL ELEV. 607.54		
595	EXIST GROUND		

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NO.	REVISION	BY	DATE

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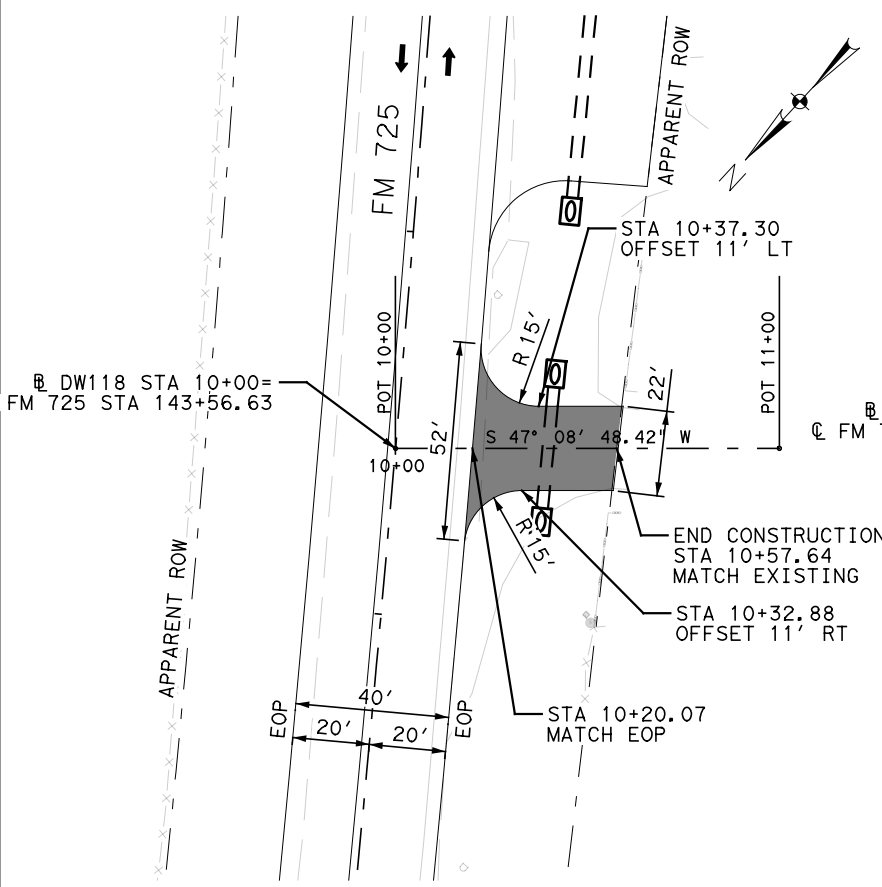
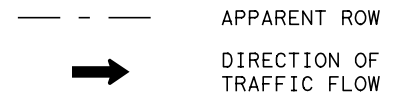
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 39 OF 55

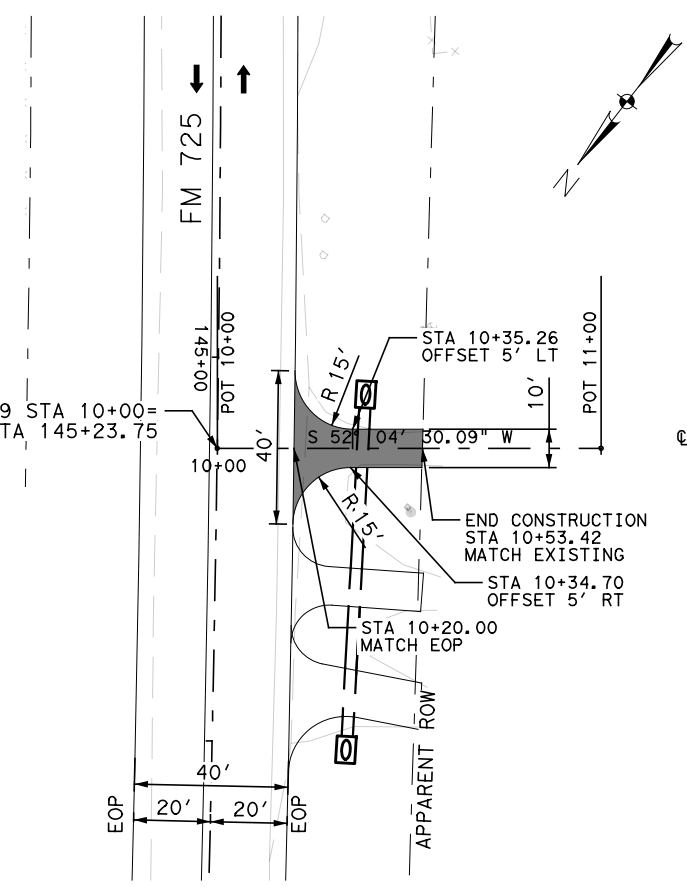
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6	See Title Sheet	183	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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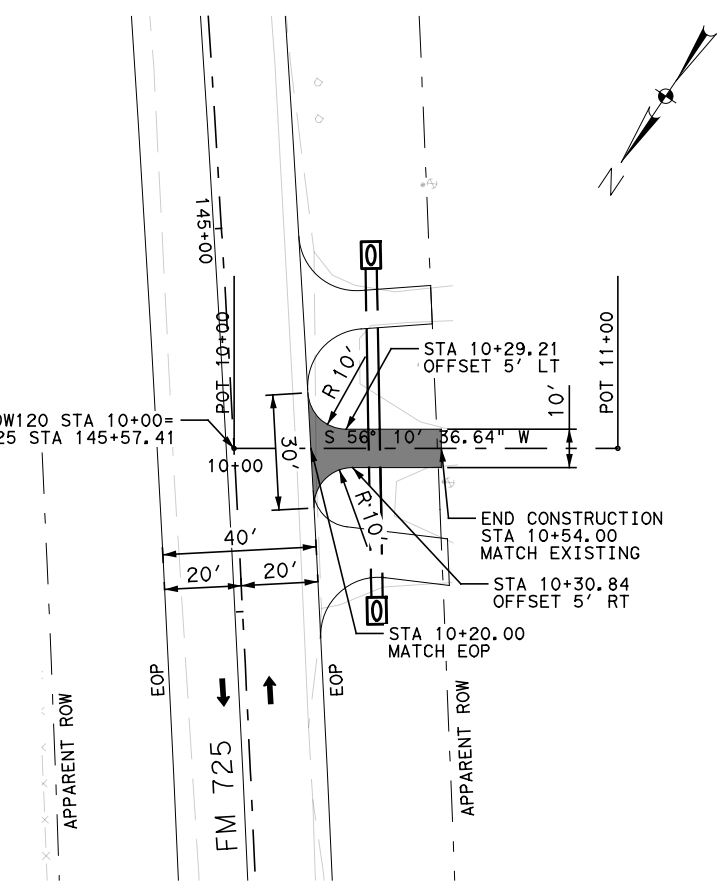
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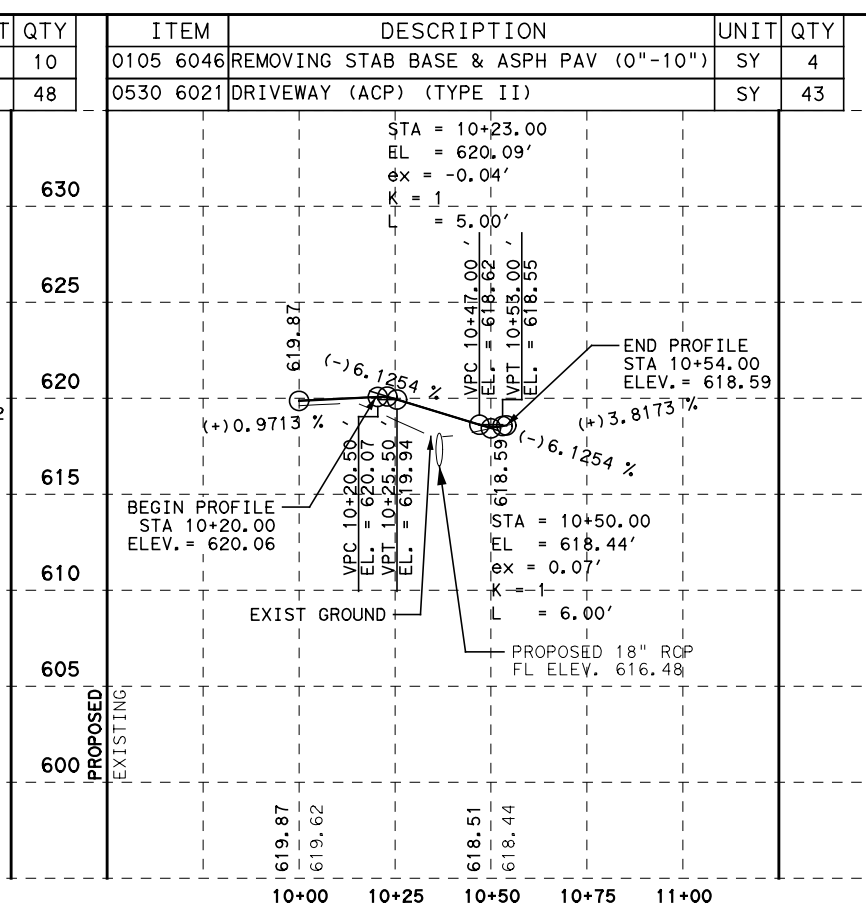
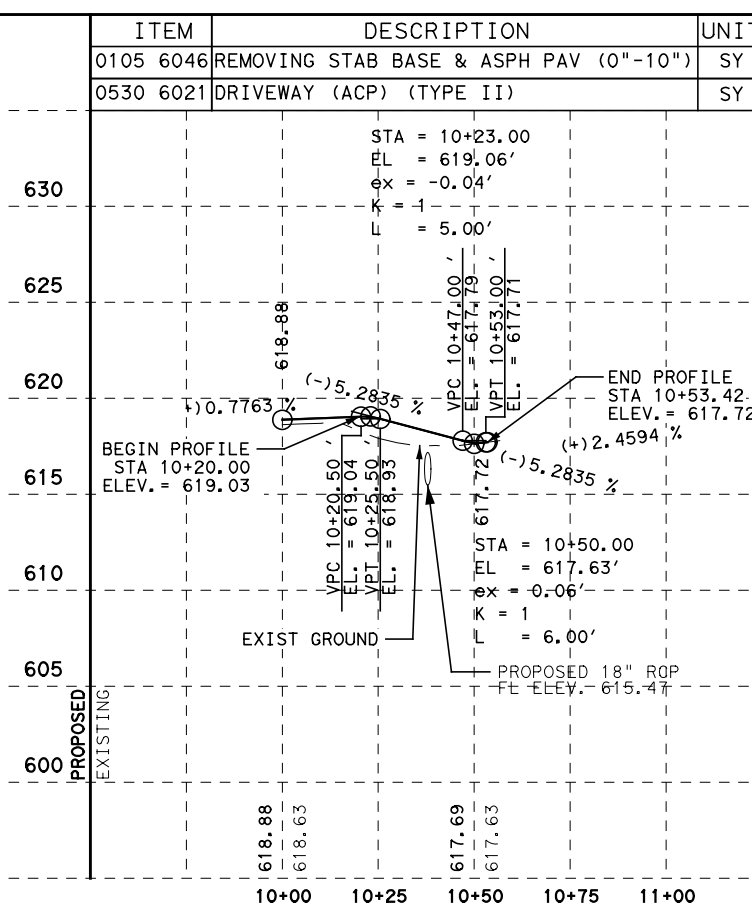
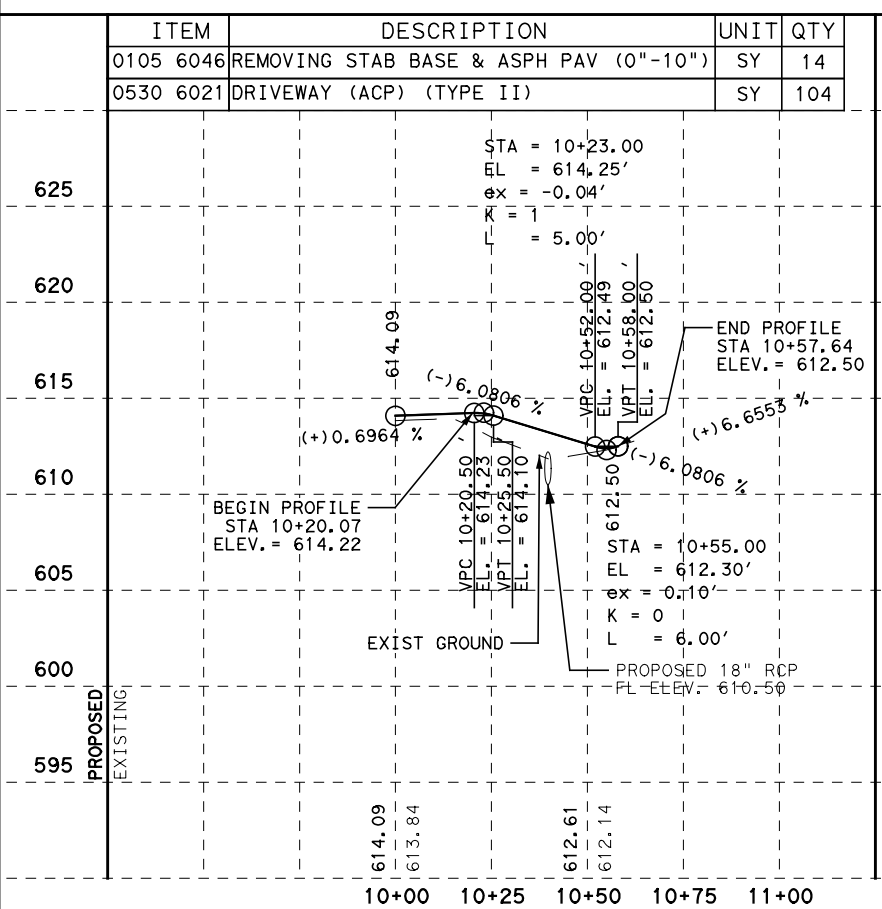
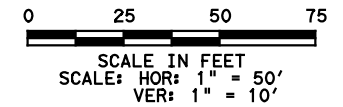
DRIVEWAY 118



DRIVEWAY 119



DRIVEWAY 120



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NO.	REVISION	BY	DATE

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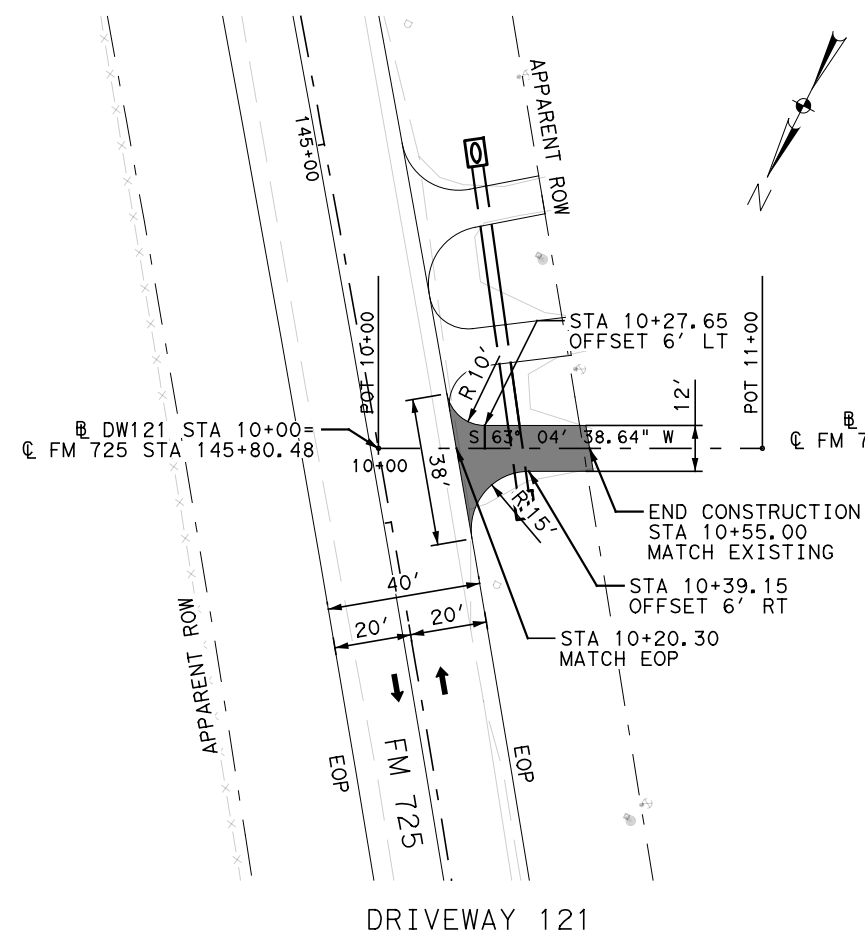
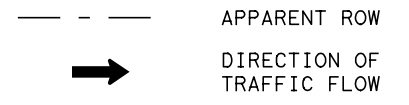
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 40 OF 55

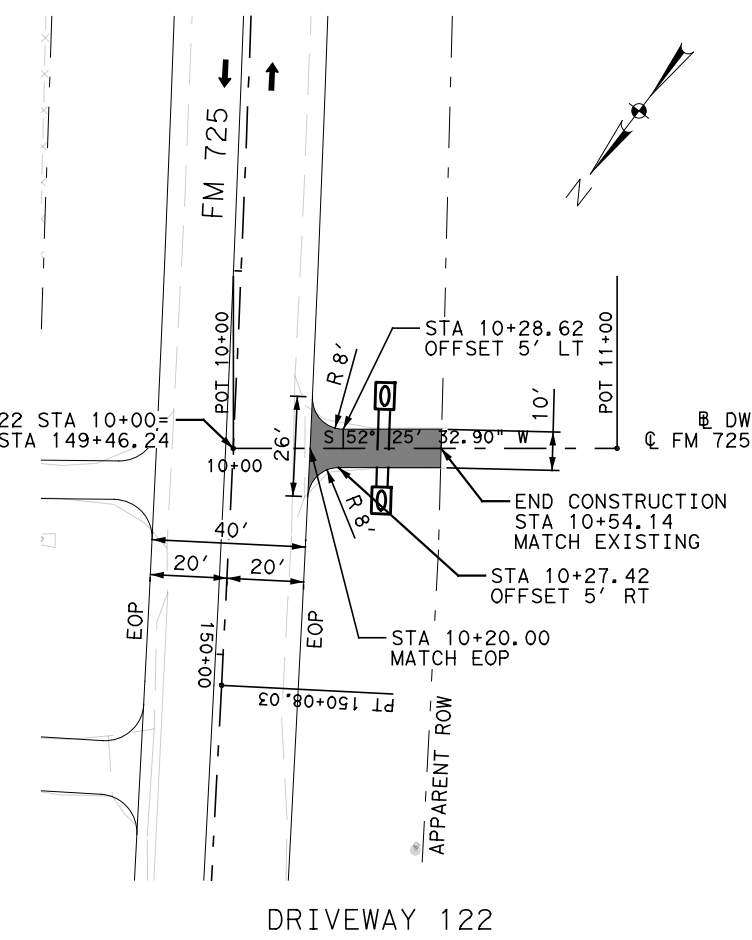
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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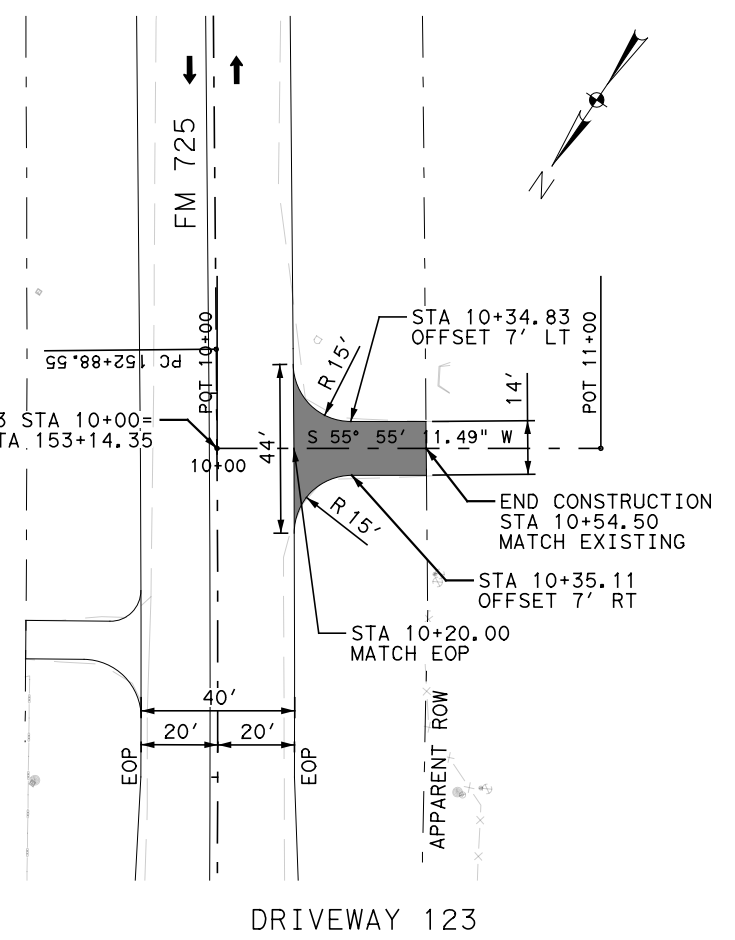
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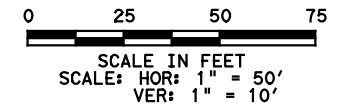
DRIVEWAY 121



DRIVEWAY 122



DRIVEWAY 123



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	3
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	56

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	41
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	41

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	65
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	65

STATION	ELEVATION	DESCRIPTION
10+00	620.48	EXIST GROUND
10+25	620.23	EXIST GROUND
10+50	619.59	EXIST GROUND
10+75	619.46	EXIST GROUND
11+00	617.24	EXIST GROUND
10+20.30	620.69	BEGIN PROFILE
10+25.00	620.75	STA
10+51.00	619.51	STA
10+55.00	619.72	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	630.29	EXIST GROUND
10+25	630.04	EXIST GROUND
10+50	627.61	EXIST GROUND
10+75	627.47	EXIST GROUND
11+00	625.71	EXIST GROUND
10+20.00	629.97	BEGIN PROFILE
10+23.00	629.92	STA
10+51.00	627.49	STA
10+54.14	627.52	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	634.51	EXIST GROUND
10+25	634.26	EXIST GROUND
10+50	637.24	EXIST GROUND
10+75	637.19	EXIST GROUND
11+00	637.79	EXIST GROUND
10+20.00	634.35	BEGIN PROFILE
10+26.00	634.31	STA
10+54.50	637.85	END PROFILE

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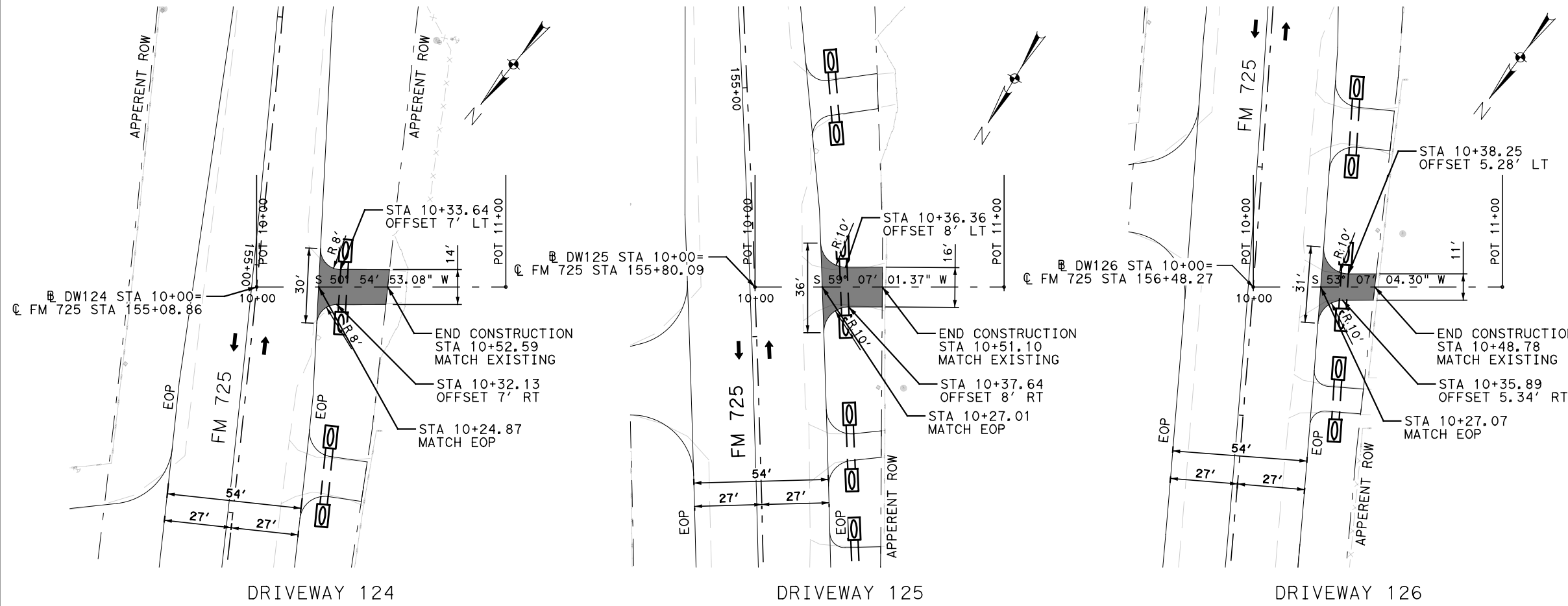
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FM 725 DRIVEWAYS PLAN & PROFILE

SHEET 41 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	185	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

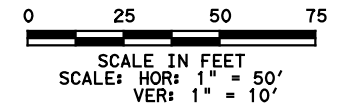
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LEGEND

--- APPARENT ROW

→ DIRECTION OF TRAFFIC FLOW



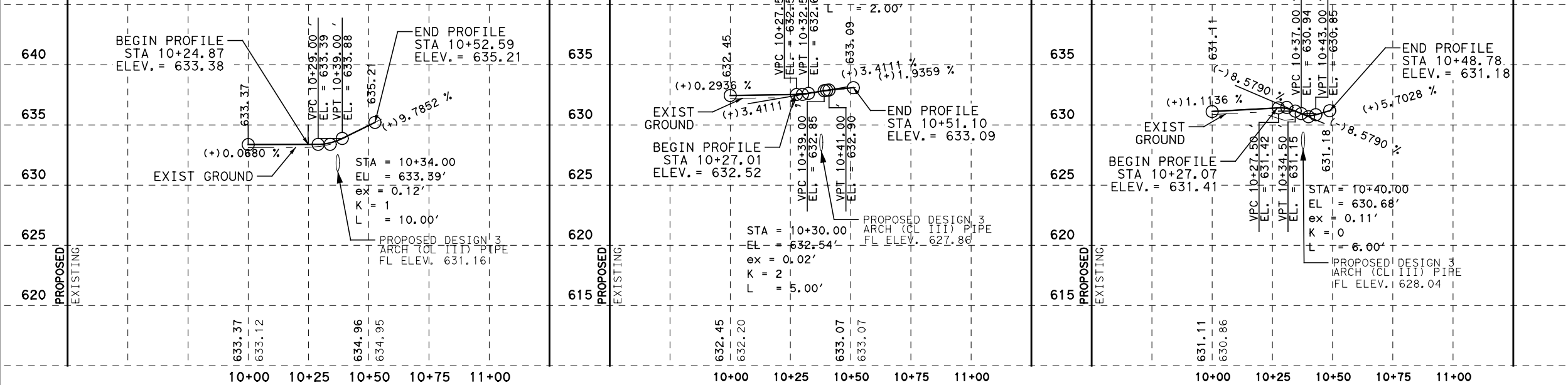
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0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	46
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	47

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	48
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	48

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	31
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	31

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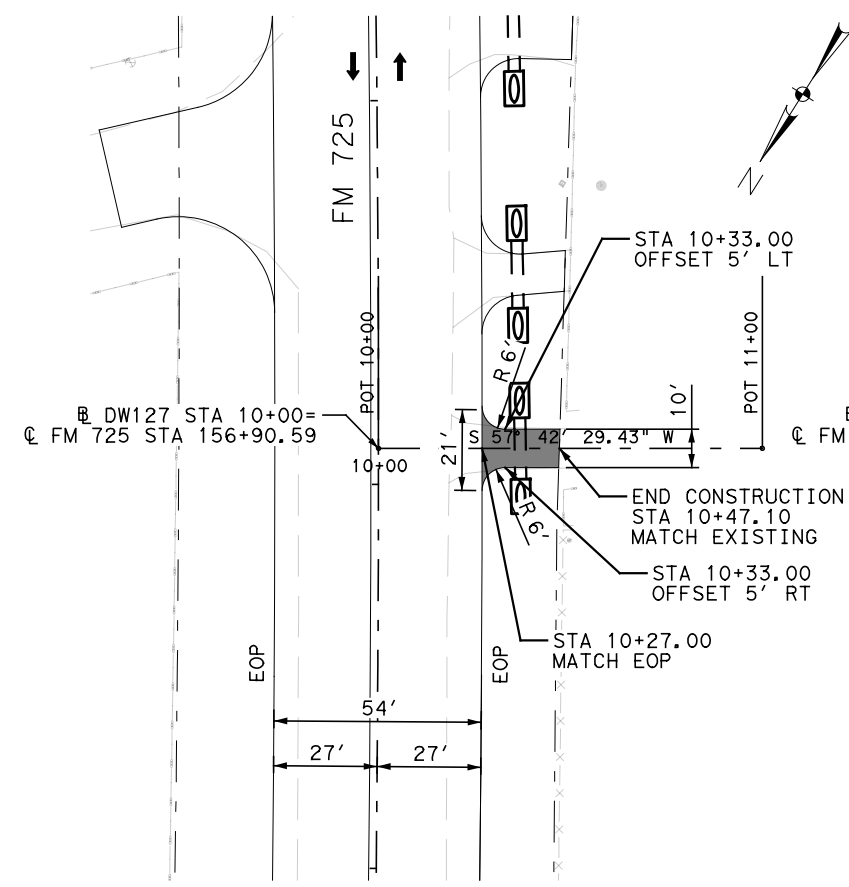
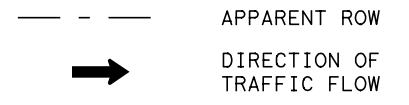
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 42 OF 55

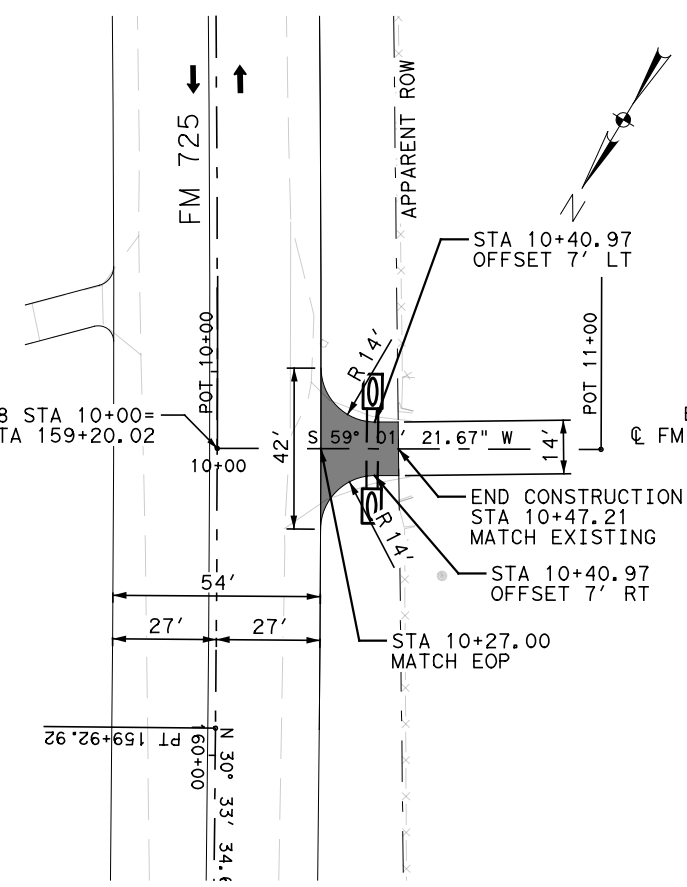
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6	See Title Sheet	186	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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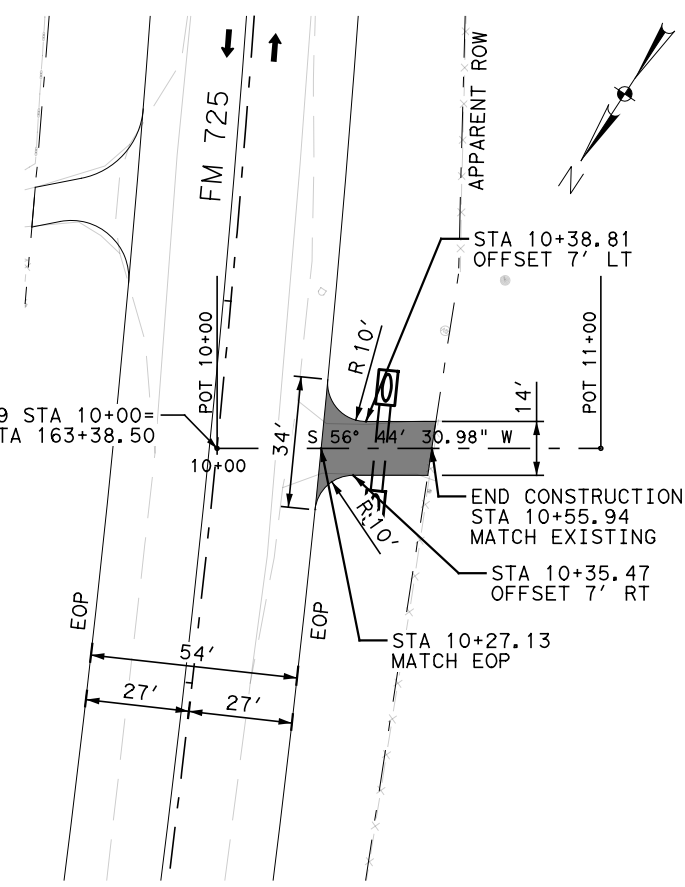
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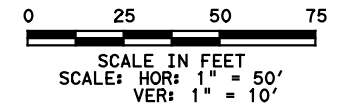
DRIVEWAY 127



DRIVEWAY 128



DRIVEWAY 129



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	25

STATION	ELEVATION	DESCRIPTION
10+00	630.21	BEGIN PROFILE STA 10+27.00 ELEV. = 630.32
10+25	629.96	EXIST GROUND
10+30.00	630.34'	STA = 10+30.00 EL = 630.34' ex = -0.07'
10+35.00	629.92	VPC 10+35.00 EL = 629.92
10+41.00	629.65	VPT 10+41.00 EL = 629.65
10+47.01	629.21	END PROFILE STA 10+47.01 ELEV. = 629.21
10+27.00	629.66'	STA = 10+27.00 EL = 629.66' ex = 0.06'
10+38.00	629.66'	STA = 10+38.00 EL = 629.66' ex = 0.06'
10+27.00	626.89'	PROPOSED DESIGN 3 ARCH (CL III) PIPE FL ELEV. 626.89'

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	41

STATION	ELEVATION	DESCRIPTION
10+00	623.95	BEGIN PROFILE STA 10+27.00 ELEV. = 623.85
10+25	623.70	EXIST GROUND
10+31.00	623.84'	STA = 10+31.00 EL = 623.84' ex = -0.05'
10+37.50	623.41	VPC 10+37.50 EL = 623.41
10+42.50	623.24	VPT 10+42.50 EL = 623.24
10+47.21	623.22	END PROFILE STA 10+47.21 ELEV. = 623.22
10+27.00	623.85	STA = 10+27.00 EL = 623.85 ex = 0.04'
10+40.00	623.25'	STA = 10+40.00 EL = 623.25' ex = 0.04'
10+27.00	620.57	PROPOSED DESIGN 3 ARCH (CL III) PIPE FL ELEV. 620.57

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	50

STATION	ELEVATION	DESCRIPTION
10+00	611.79	BEGIN PROFILE STA 10+27.13 ELEV. = 612.23
10+25	611.54	EXIST GROUND
10+30.00	612.29'	STA = 10+30.00 EL = 612.29' ex = -0.06'
10+37.00	611.73	VPC 10+37.00 EL = 611.73
10+43.00	611.47	VPT 10+43.00 EL = 611.47
10+55.94	611.40	END PROFILE STA 10+55.94 ELEV. = 611.40
10+27.13	611.49'	STA = 10+27.13 EL = 611.49' ex = 0.06'
10+40.00	611.49'	STA = 10+40.00 EL = 611.49' ex = 0.06'
10+27.13	608.95	PROPOSED DESIGN 3 ARCH (CL III) PIPE FL ELEV. 608.95

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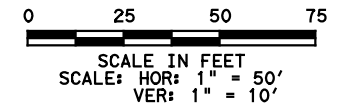
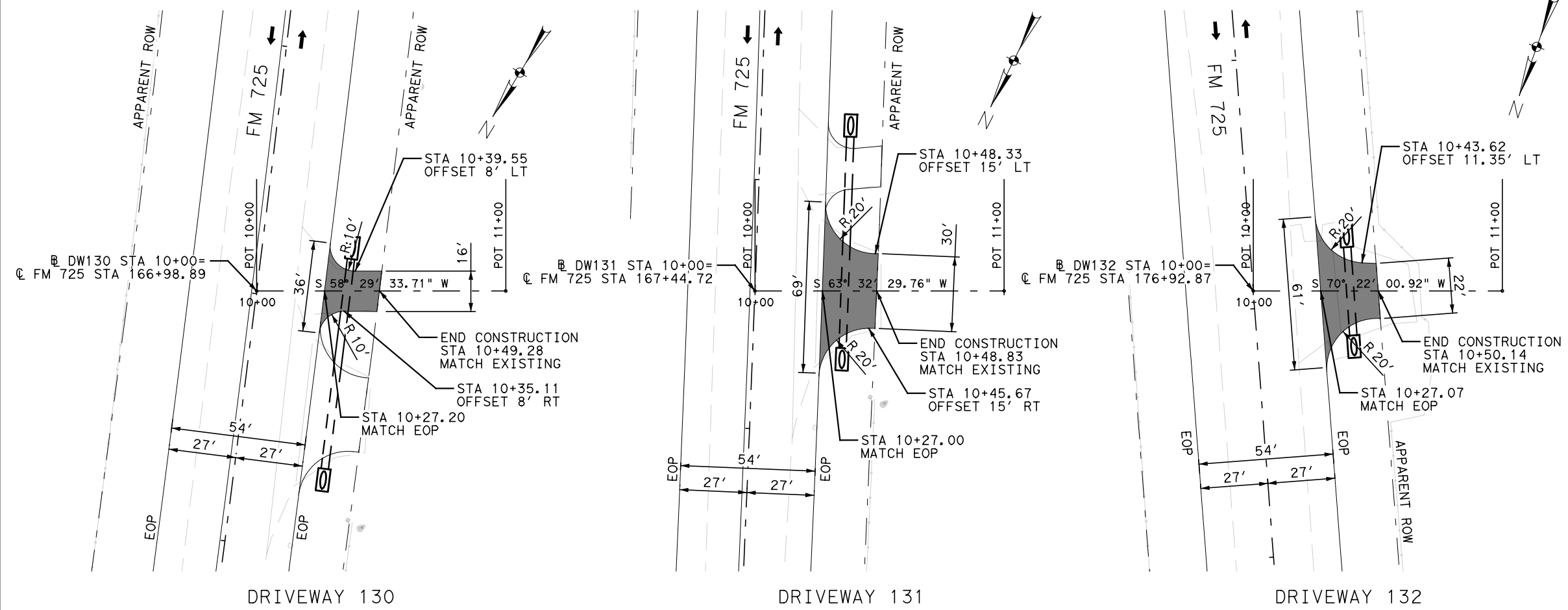
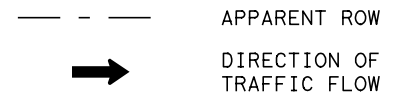
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

SHEET 43 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	187	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	91
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	92
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	77
0530 6004	DRIVEWAY (CONC)	SY	77

STATION	ELEVATION	DESCRIPTION
10+00	602.39	EXIST GROUND
10+25	602.34	EXIST GROUND
10+50	602.61	EXIST GROUND
10+75	602.54	EXIST GROUND
11+00	602.54	EXIST GROUND
10+00	600.89	EXIST GROUND
10+25	600.86	EXIST GROUND
10+50	601.23	EXIST GROUND
10+75	601.23	EXIST GROUND
11+00	601.23	EXIST GROUND
10+00	598.81	EXIST GROUND
10+25	598.56	EXIST GROUND
10+50	598.24	EXIST GROUND
10+75	598.24	EXIST GROUND
11+00	598.24	EXIST GROUND

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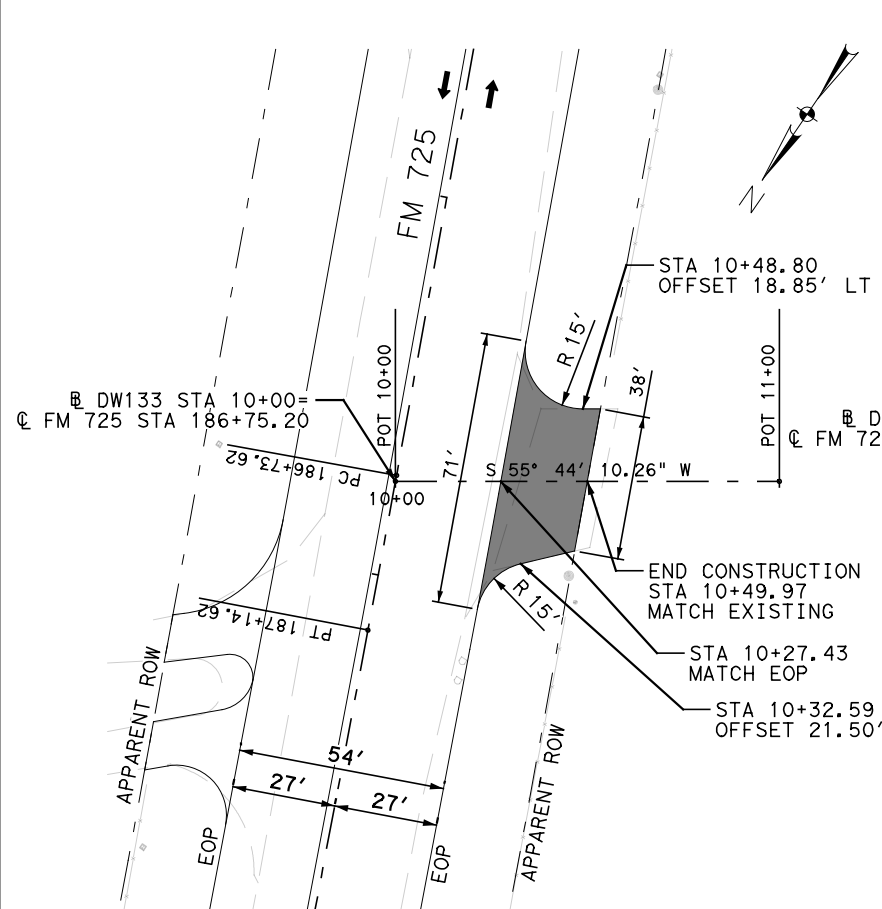
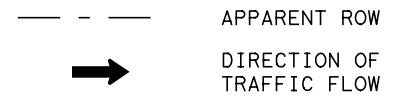
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 DRIVEWAYS
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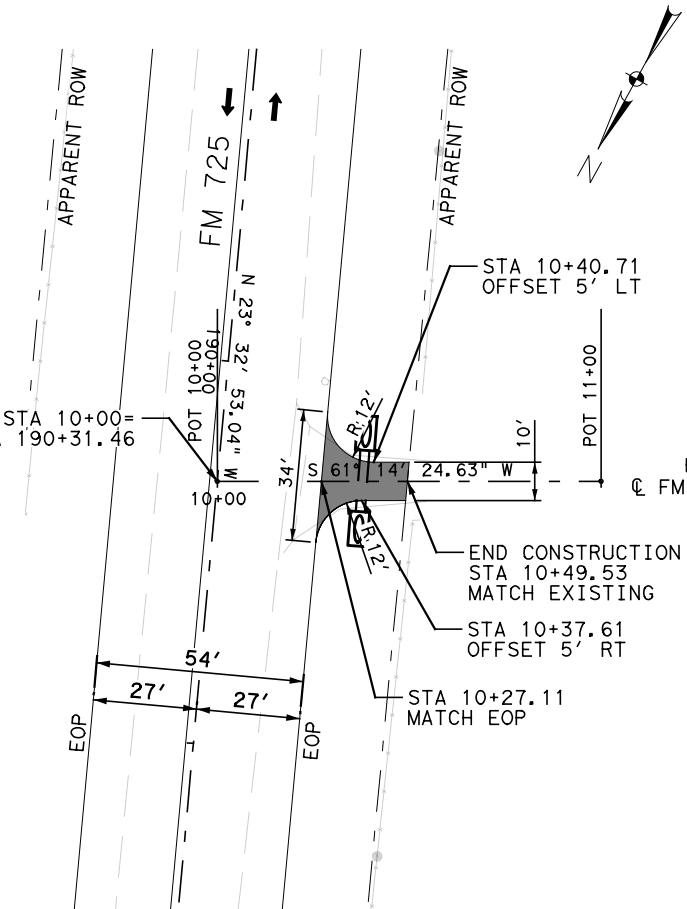
SHEET 44 OF 55

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	188	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

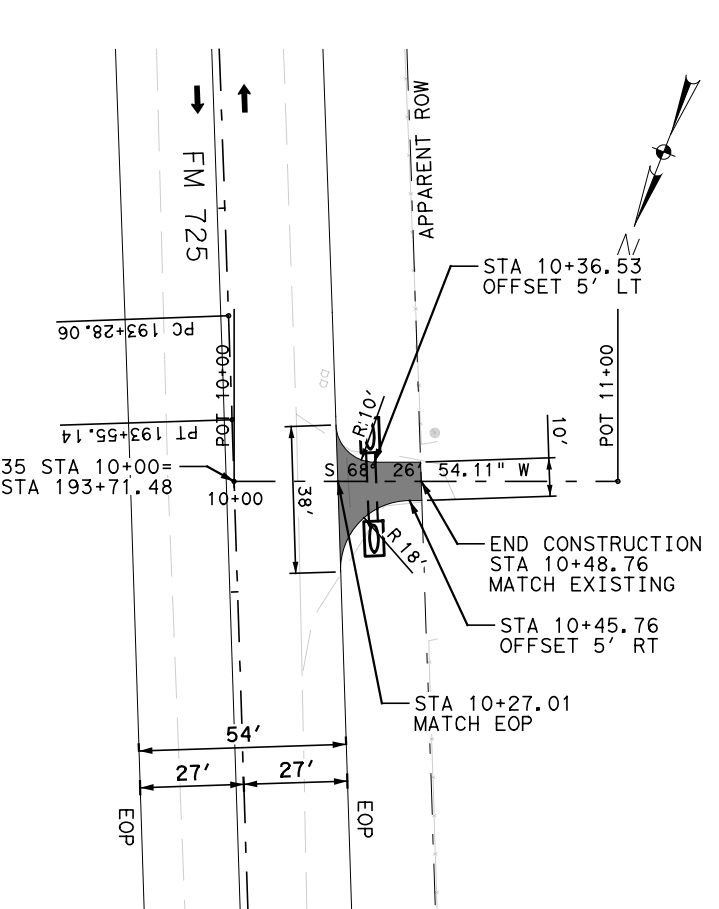
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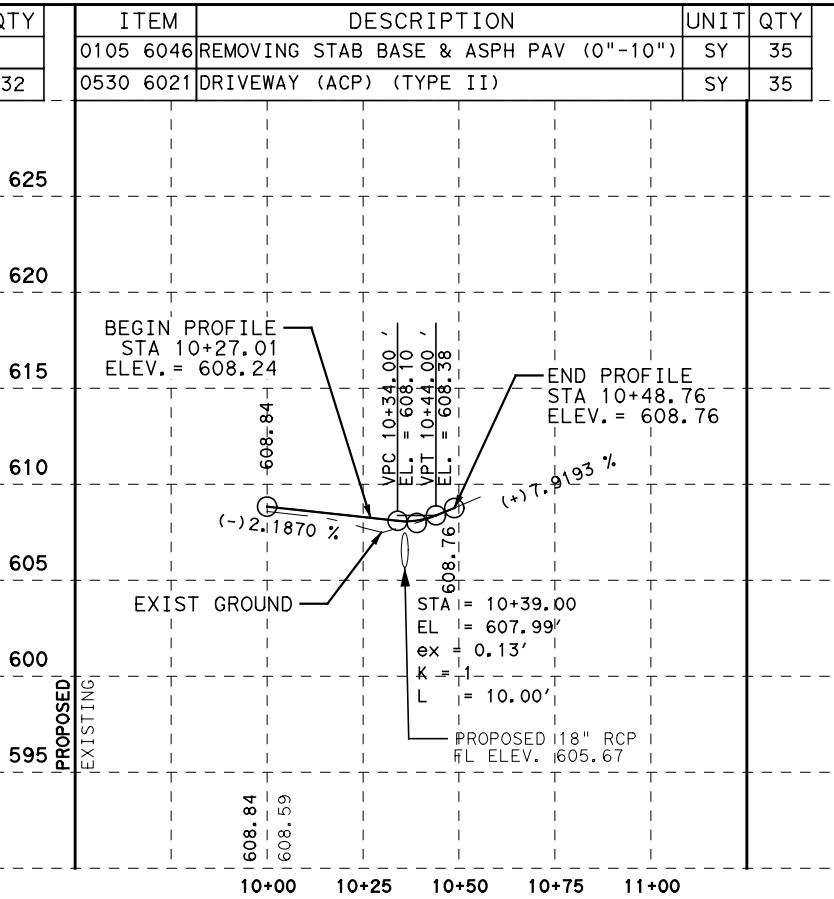
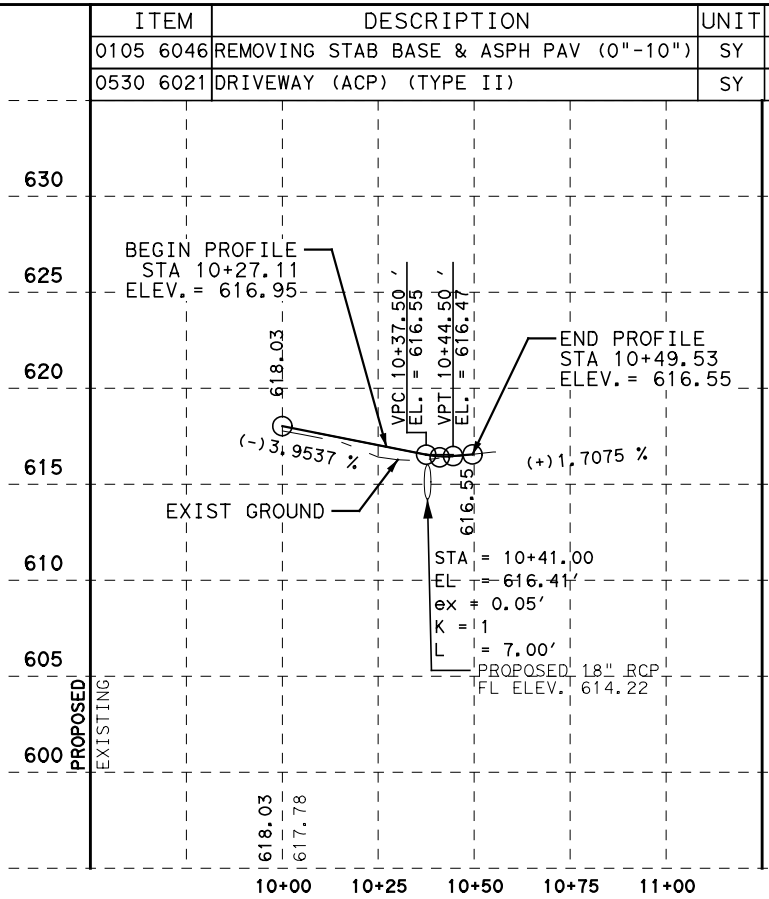
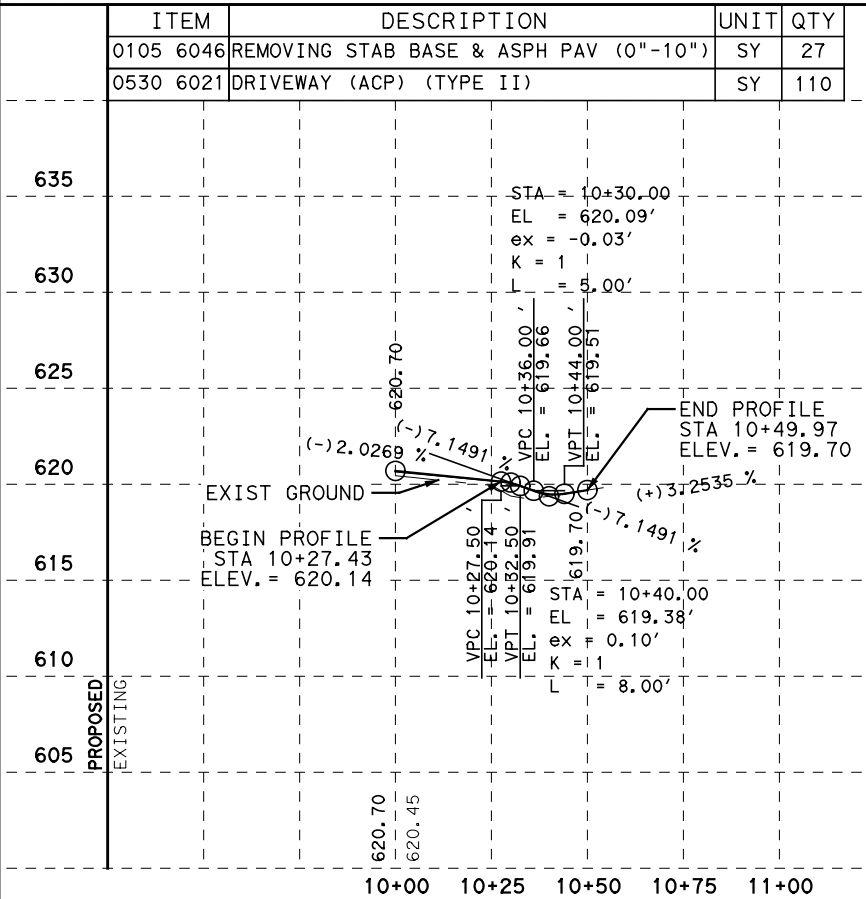
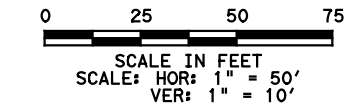
DRIVEWAY 133



DRIVEWAY 134



DRIVEWAY 135



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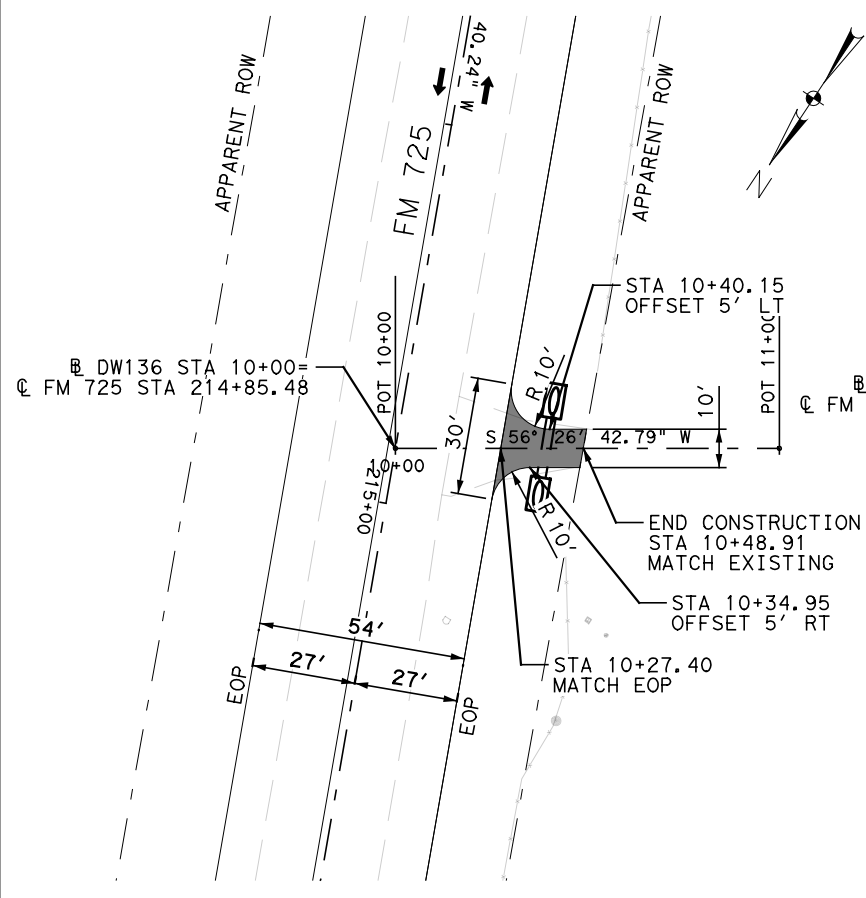
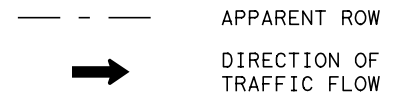
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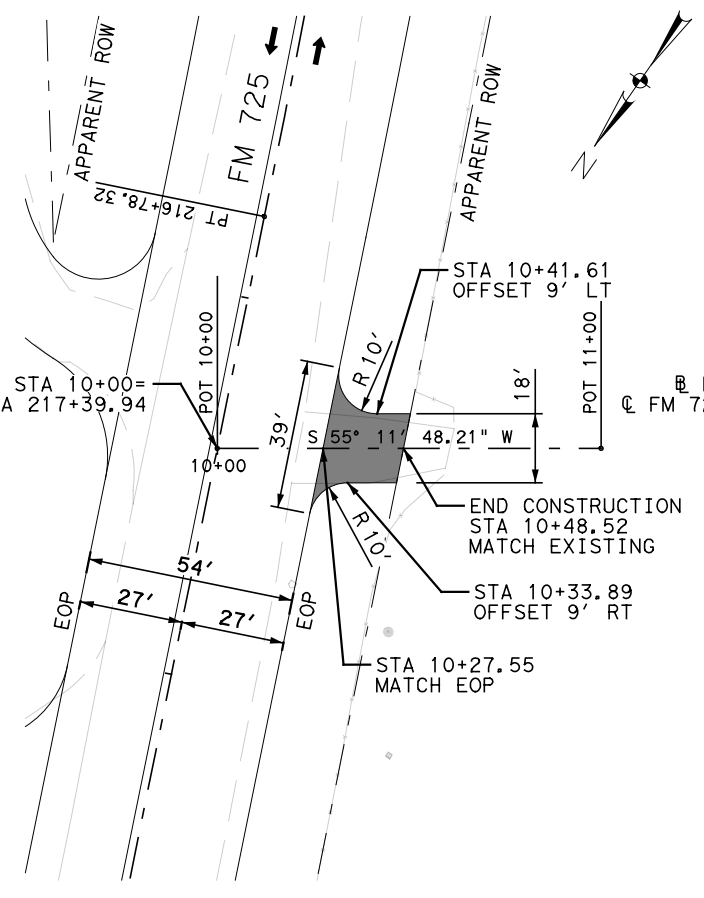
FM 725 DRIVEWAYS PLAN & PROFILE			
SHEET 45 OF 55			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		189
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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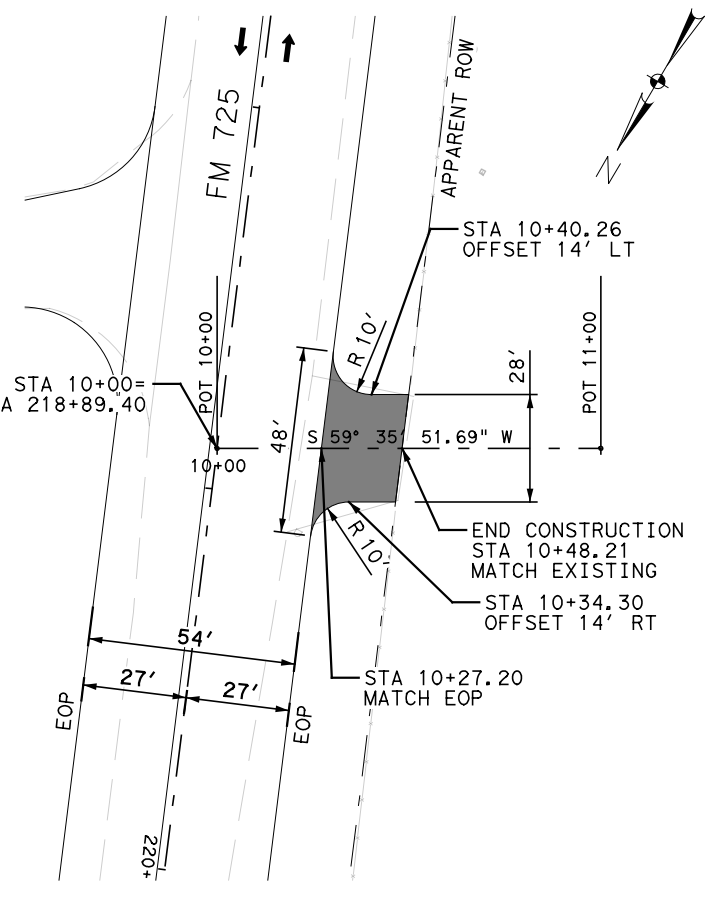
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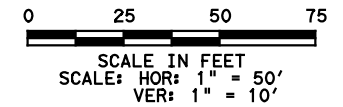
DRIVEWAY 136



DRIVEWAY 137



DRIVEWAY 138



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	28
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	30

590	STA = 10+30.00 EL = 576.81' ex = -0.02'
585	K = 2 L = 5.00'
580	END PROFILE STA 10+48.91 ELEV. = 576.01
575	EXIST GROUND
570	BEGIN PROFILE STA 10+27.40 ELEV. = 576.90
565	PROPOSED 18" RCP FL ELEV. 574.15
560	EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	48
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	48

595	STA = 10+31.00 EL = 581.07' ex = -0.06'
590	K = 1 L = 6.00'
585	END PROFILE STA 10+48.52 ELEV. = 579.33
580	EXIST GROUND
575	BEGIN PROFILE STA 10+27.55 ELEV. = 581.19
570	PROPOSED 18" RCP FL ELEV. 574.15
565	EXISTING

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	71
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	71

595	STA = 10+30.00 EL = 583.26' ex = -0.02'
590	BEGIN PROFILE STA 10+27.20 ELEV. = 583.39
585	K = 2 L = 5.00'
580	EXIST GROUND
575	BEGIN PROFILE STA 10+27.20 ELEV. = 583.39
570	PROPOSED 18" RCP FL ELEV. 574.15
565	EXISTING

4/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

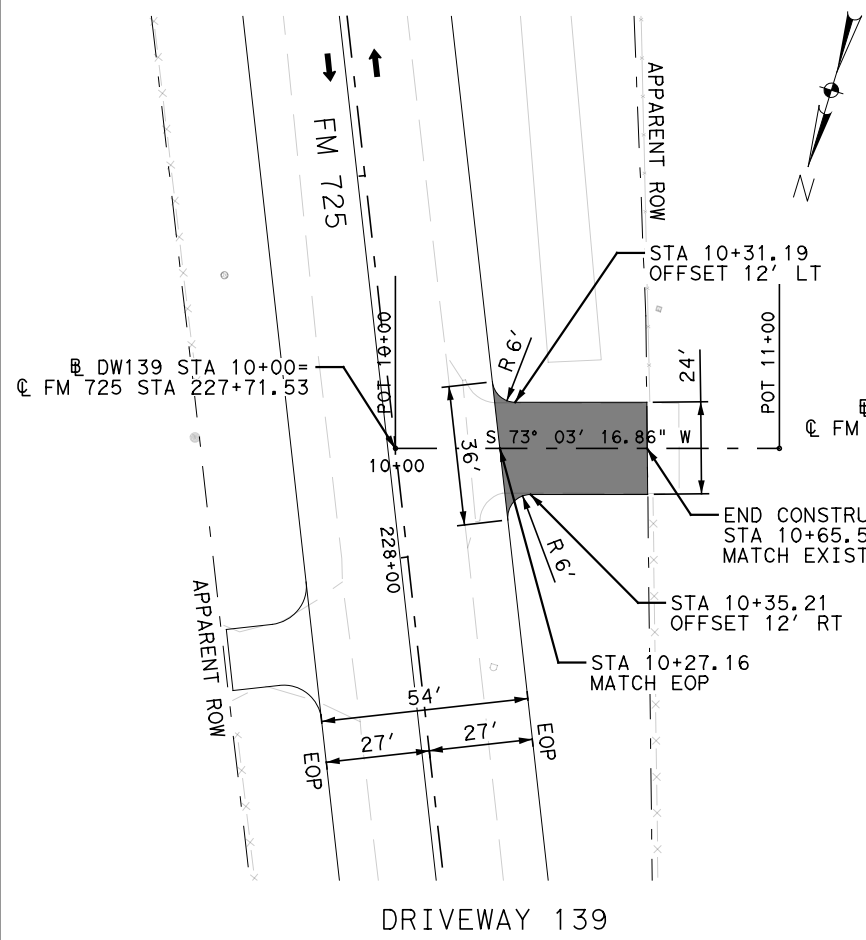
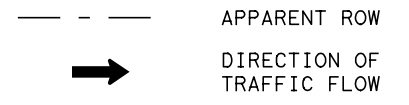
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FM 725
DRIVEWAYS
PLAN & PROFILE

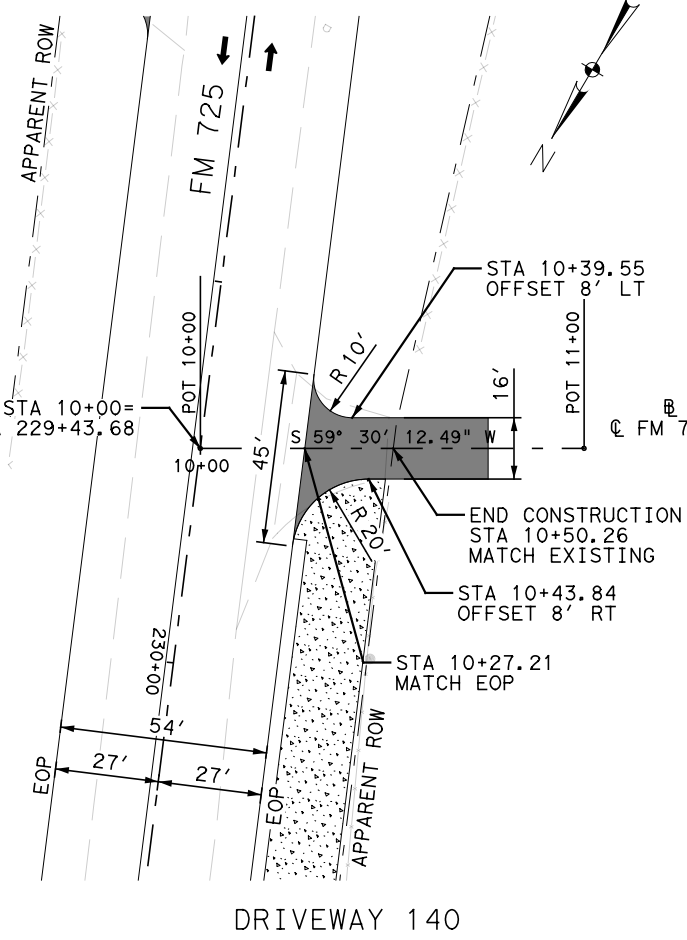
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6	See Title Sheet	190	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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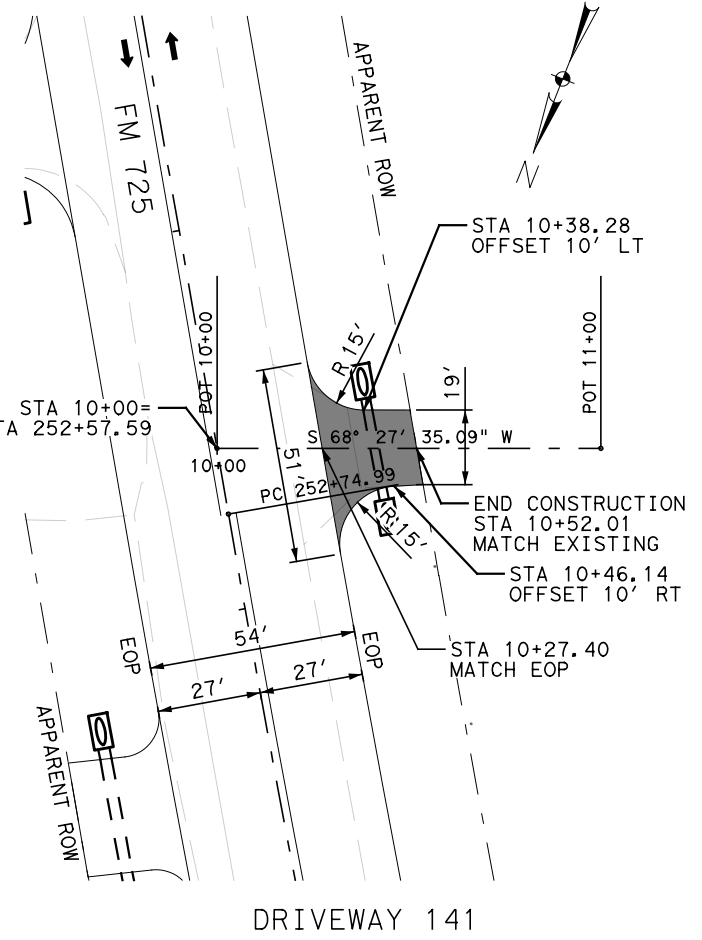
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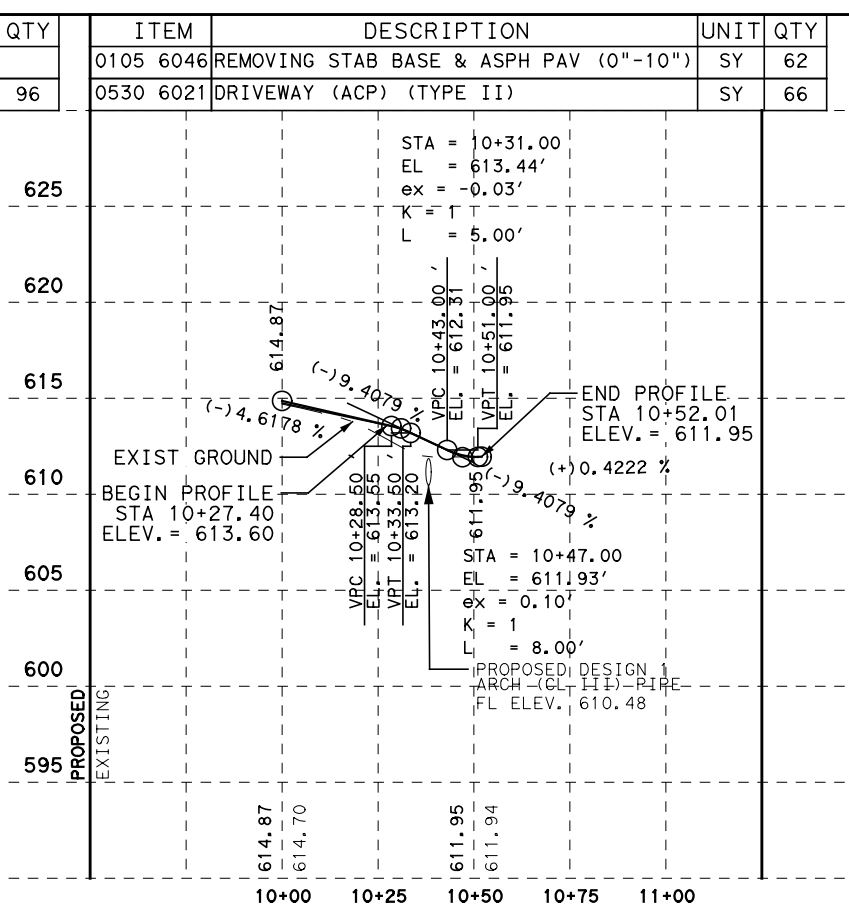
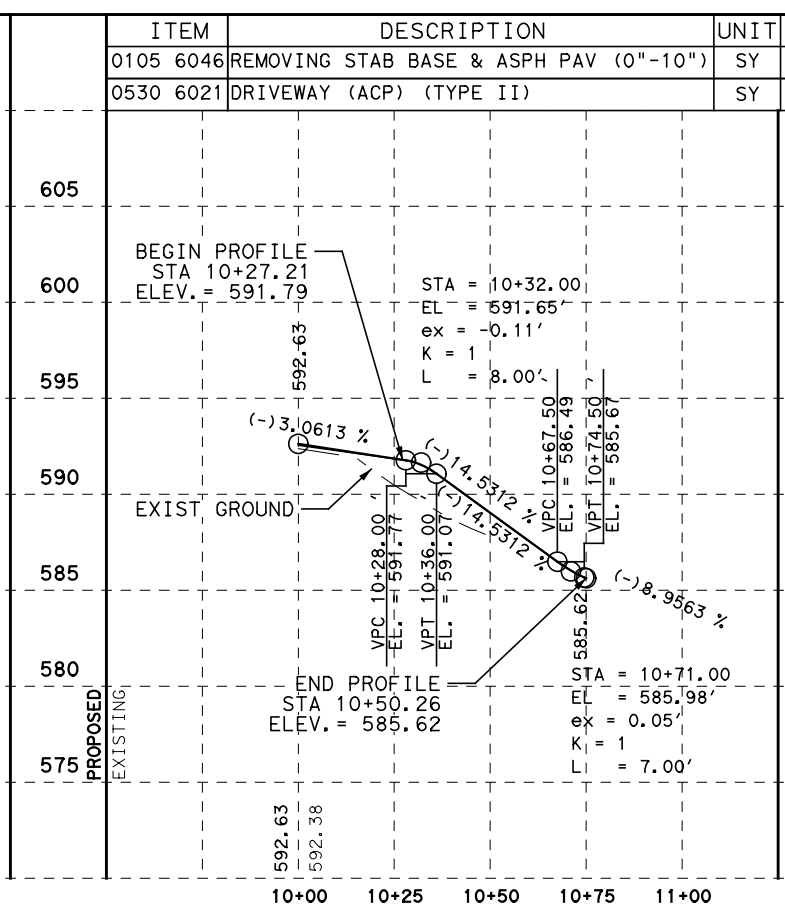
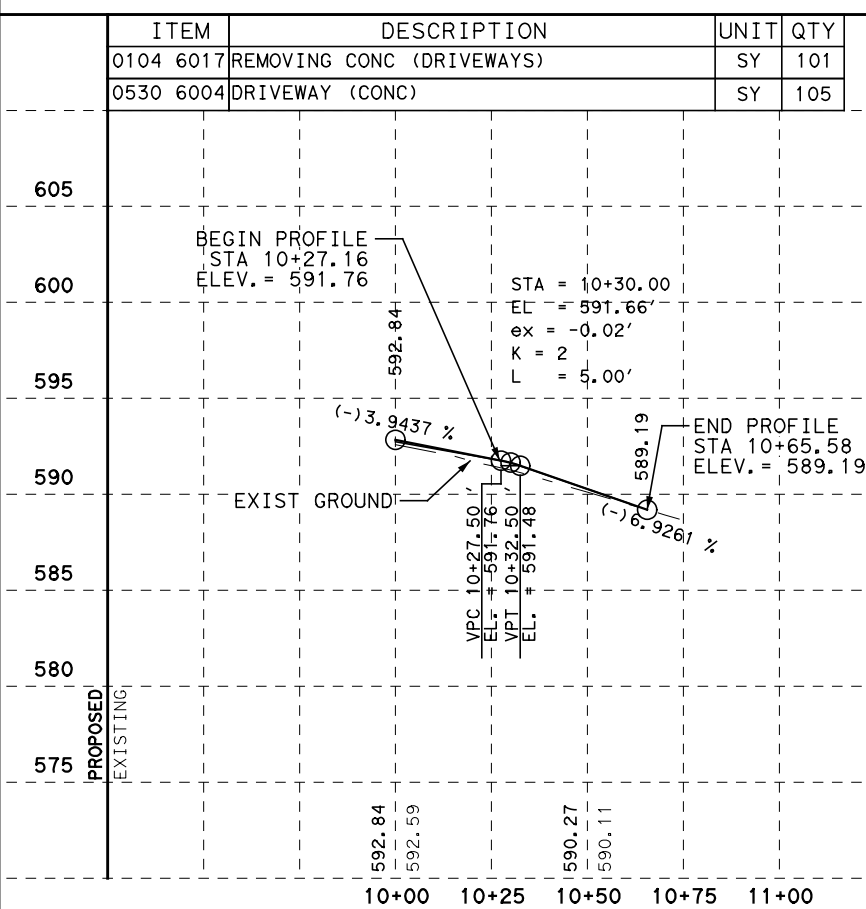
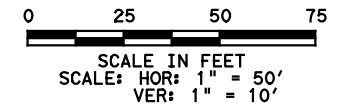
DRIVEWAY 139



DRIVEWAY 140



DRIVEWAY 141



4/28/2021

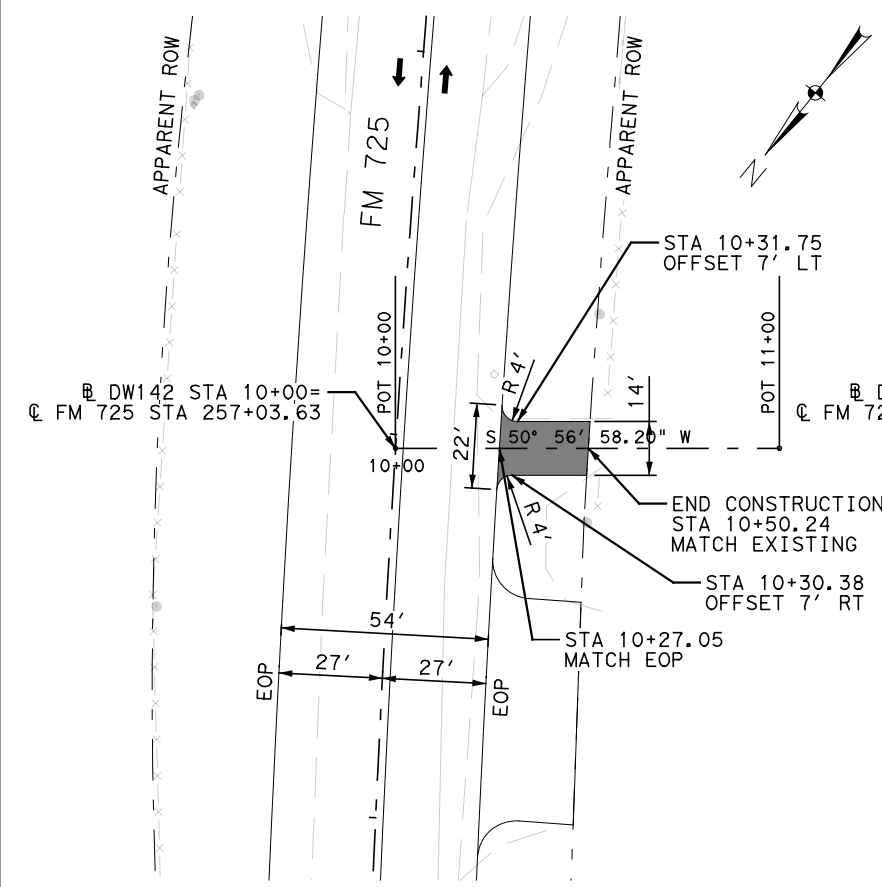
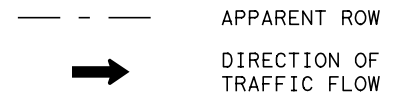
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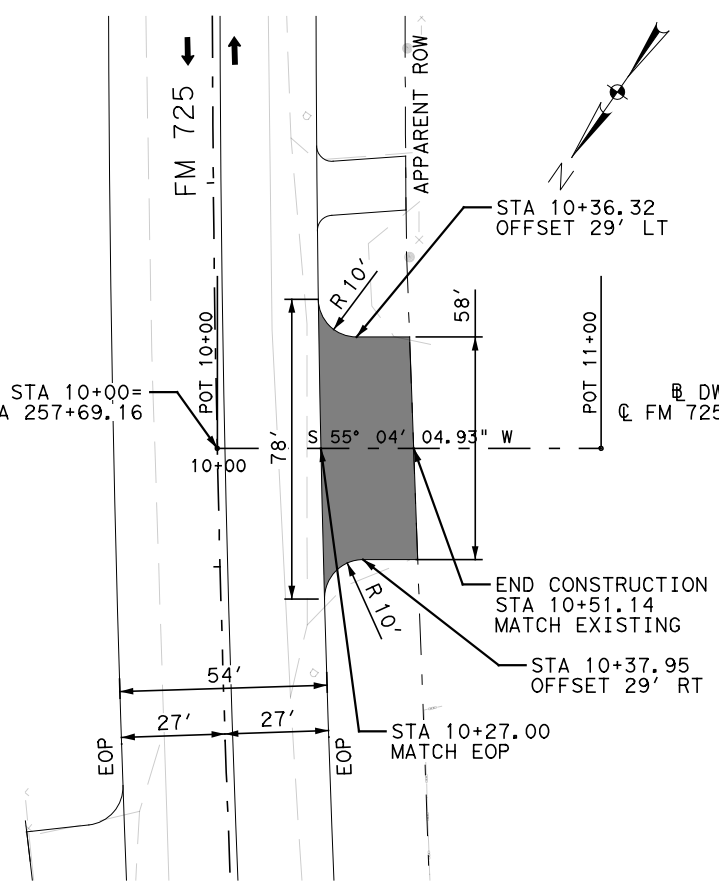
FM 725 DRIVEWAYS PLAN & PROFILE			
SHEET 47 OF 55			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		191
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
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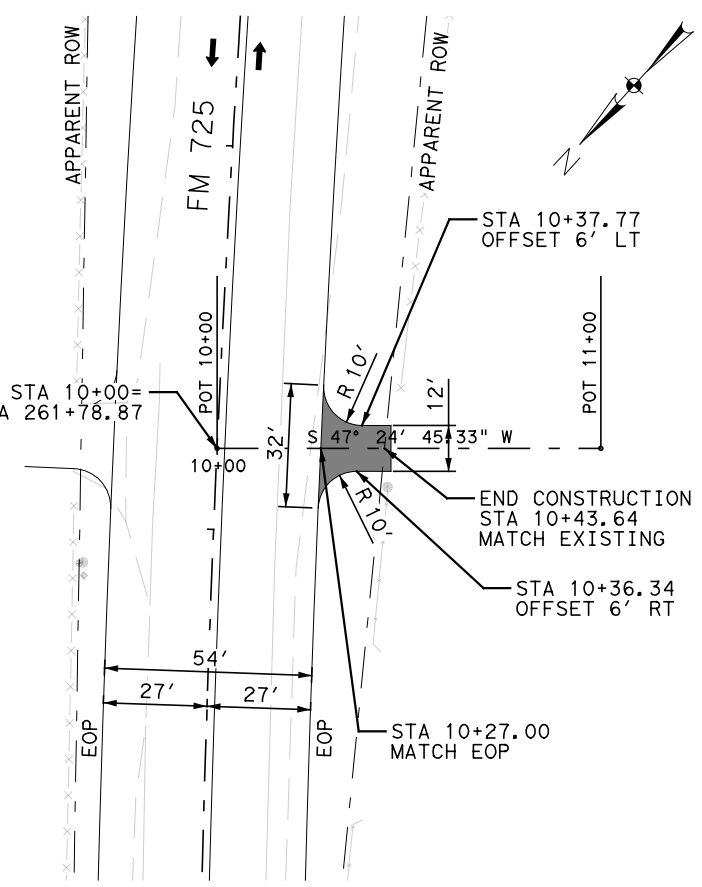
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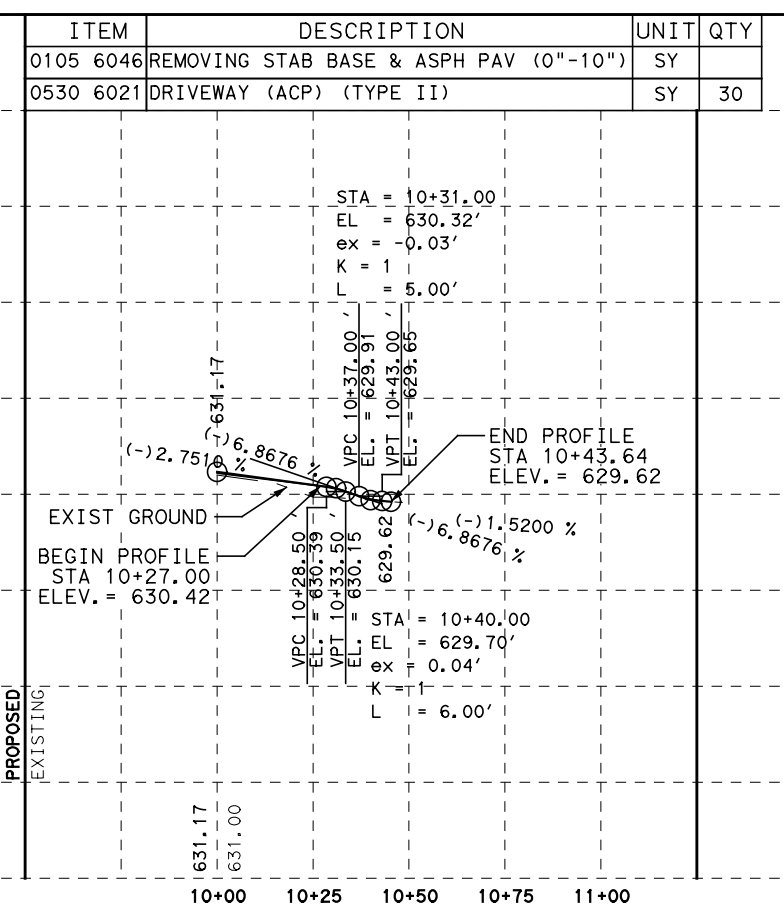
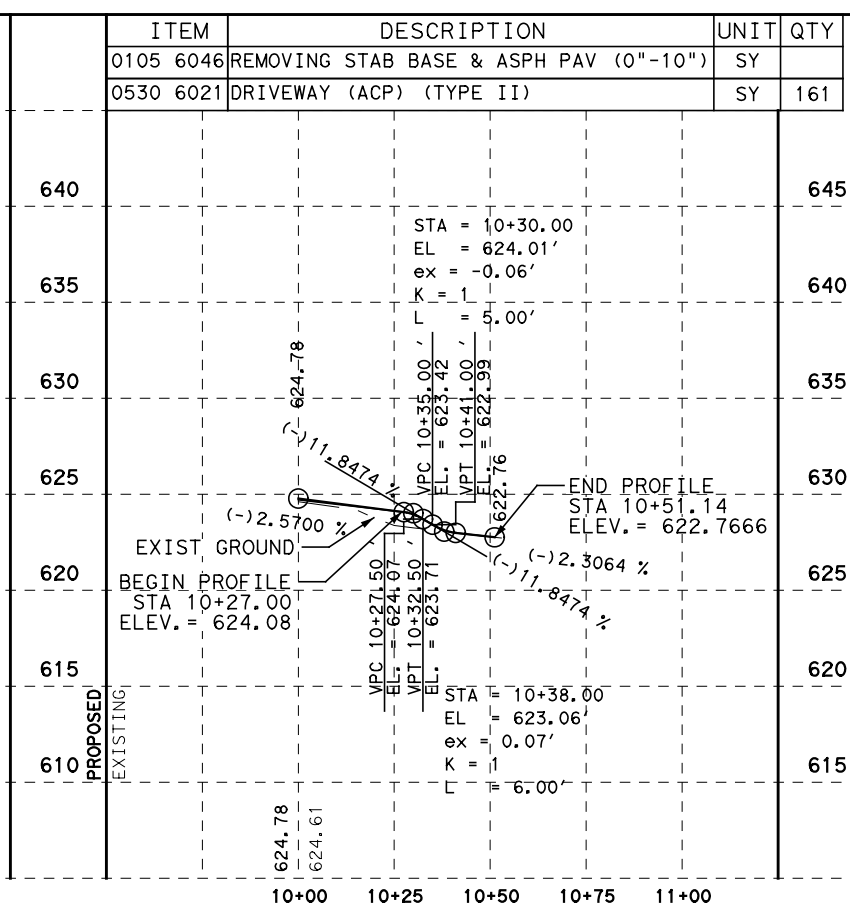
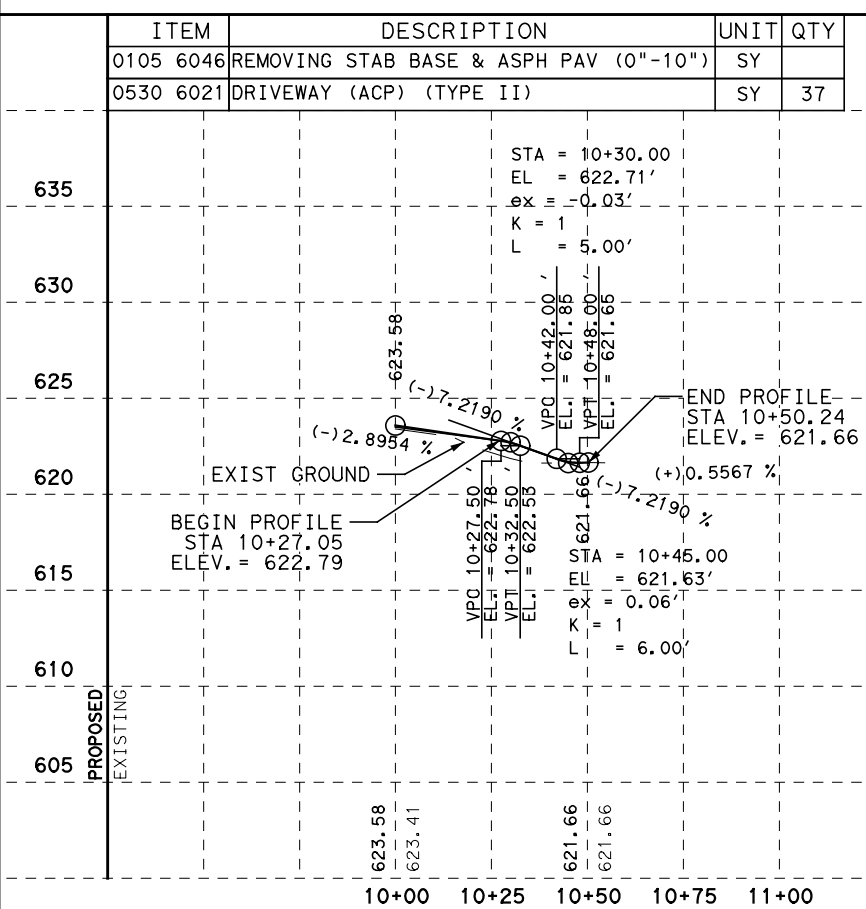
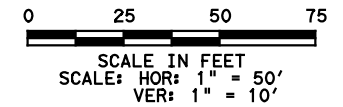
DRIVEWAY 142



DRIVEWAY 143



DRIVEWAY 144



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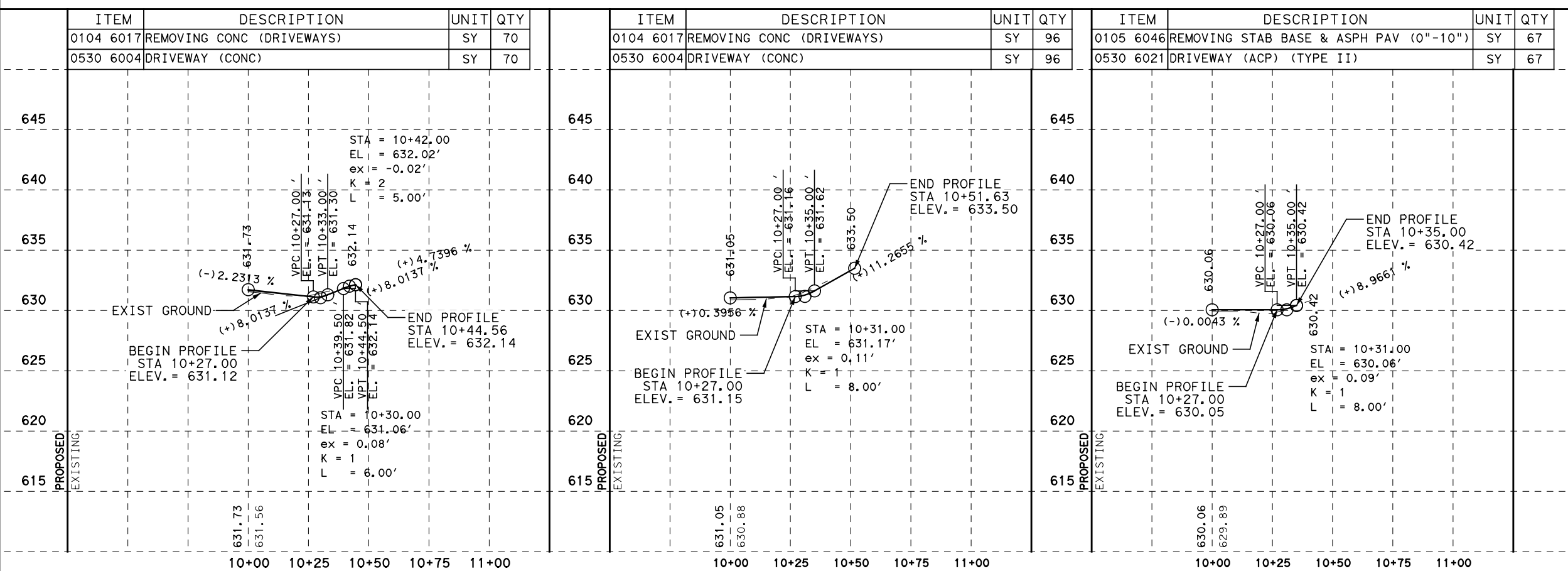
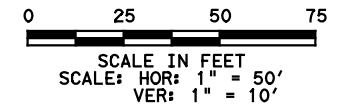
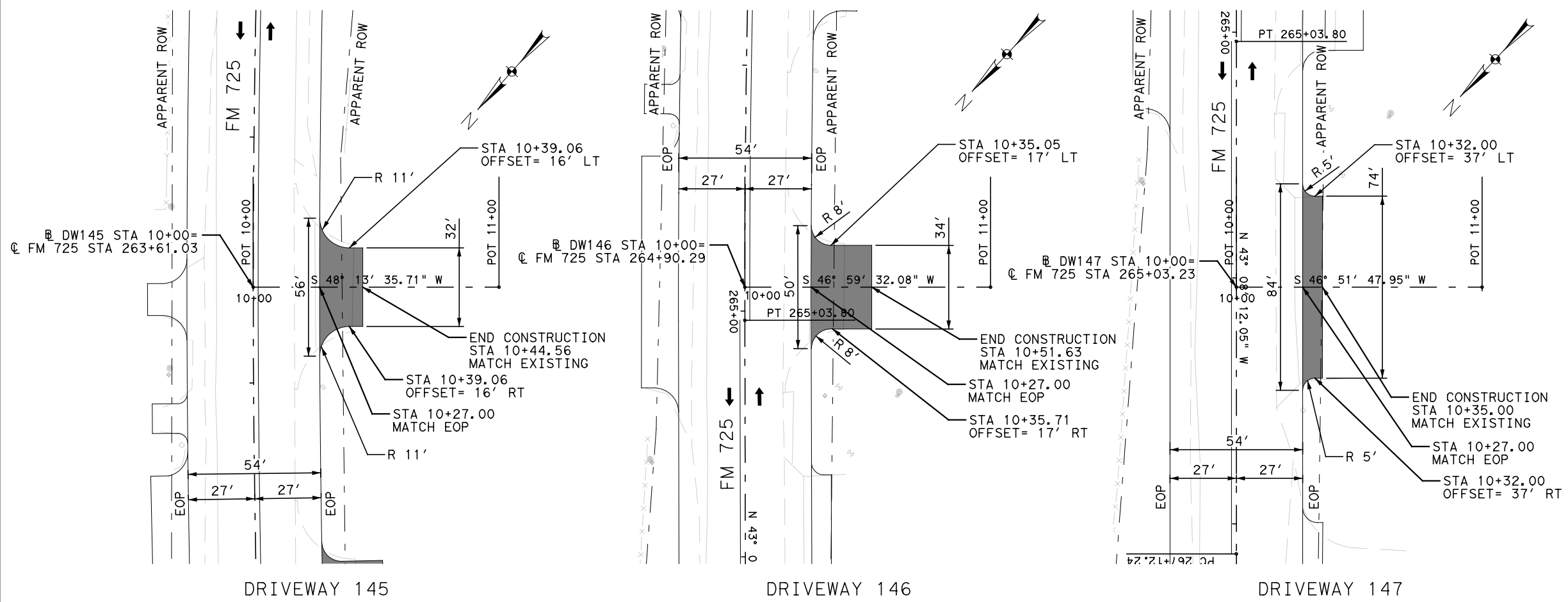
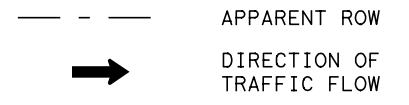
FM 725 DRIVEWAYS PLAN & PROFILE

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6	See Title Sheet	192	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	70
0530 6004	DRIVEWAY (CONC)	SY	70

ITEM	DESCRIPTION	UNIT	QTY
0104 6017	REMOVING CONC (DRIVEWAYS)	SY	96
0530 6004	DRIVEWAY (CONC)	SY	96

ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	67
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	67

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NO.	REVISION	BY	DATE

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 SAN ANTONIO, TEXAS 78216
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 DRIVEWAYS
 PLAN & PROFILE**

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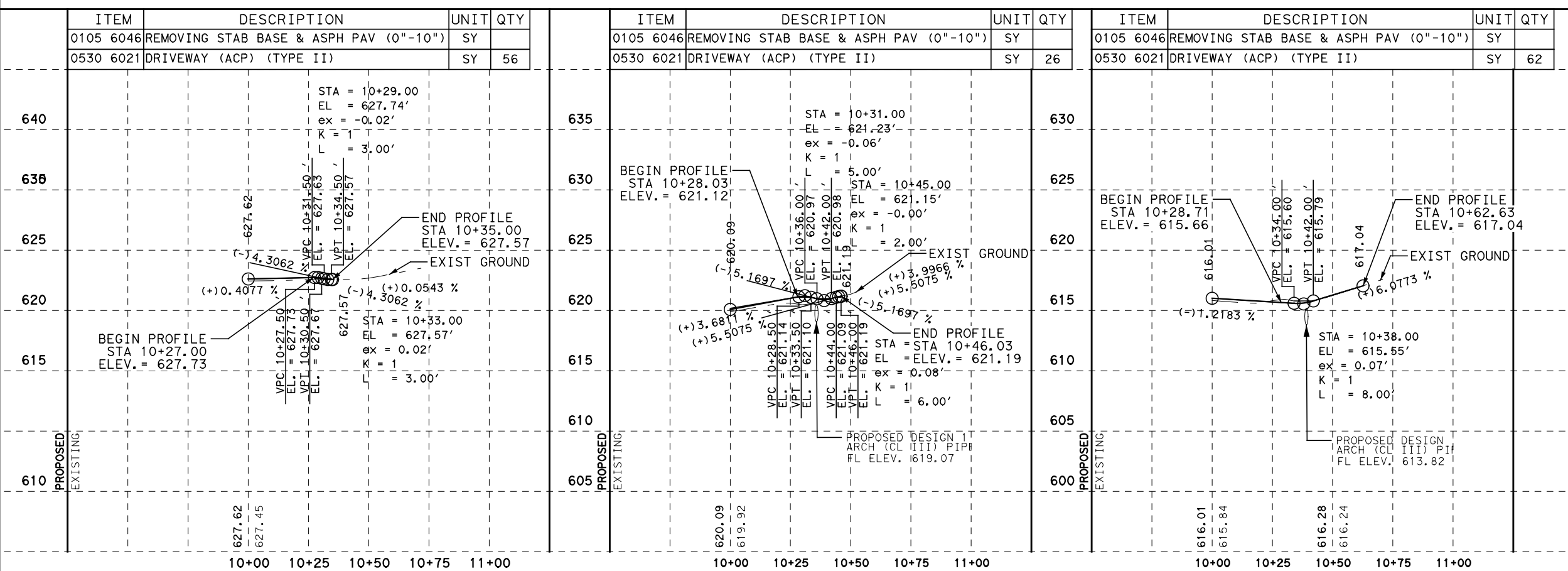
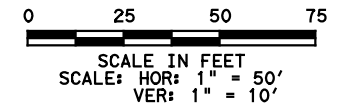
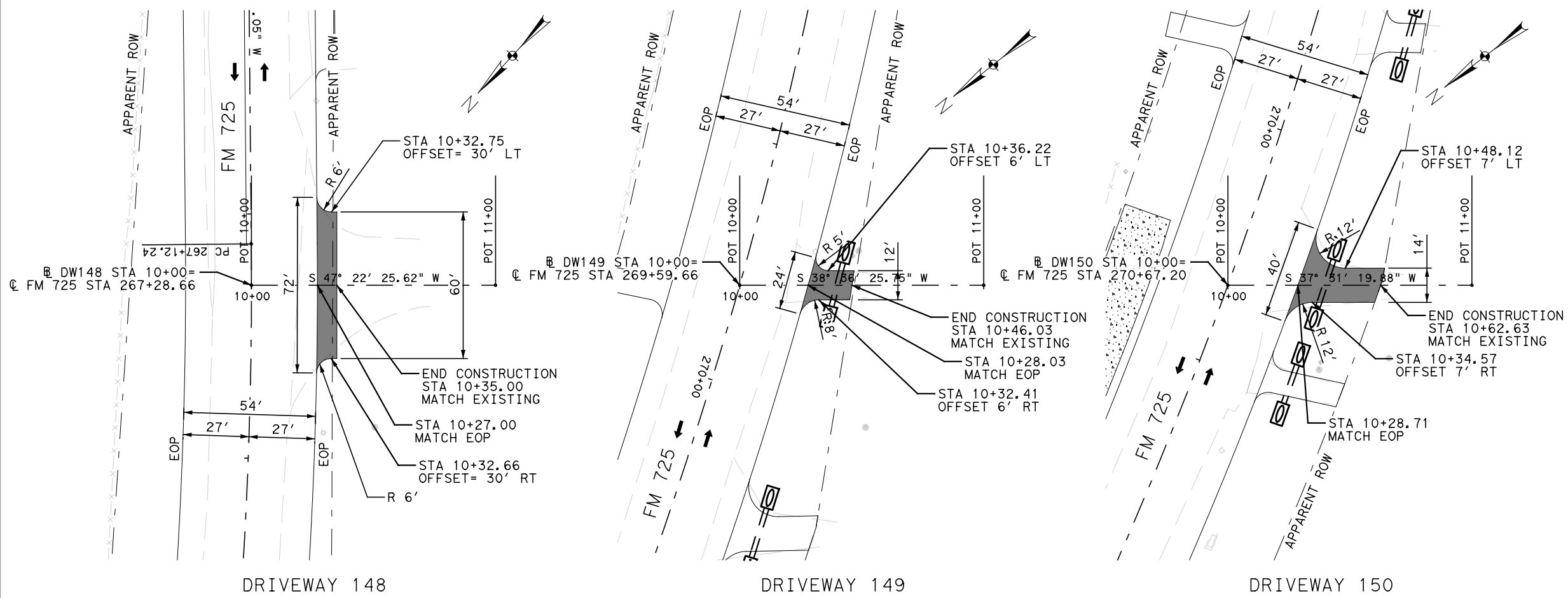
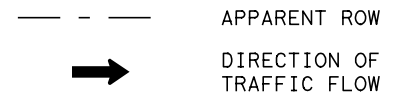
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	193

STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE

CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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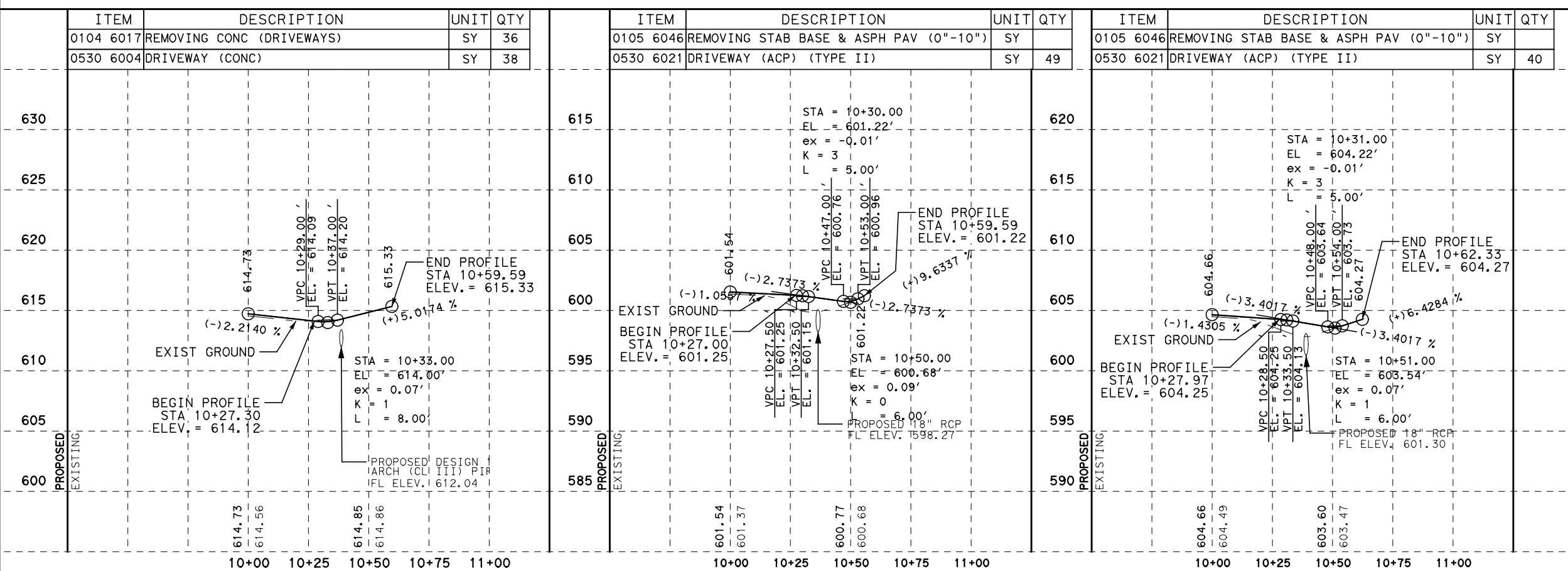
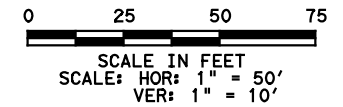
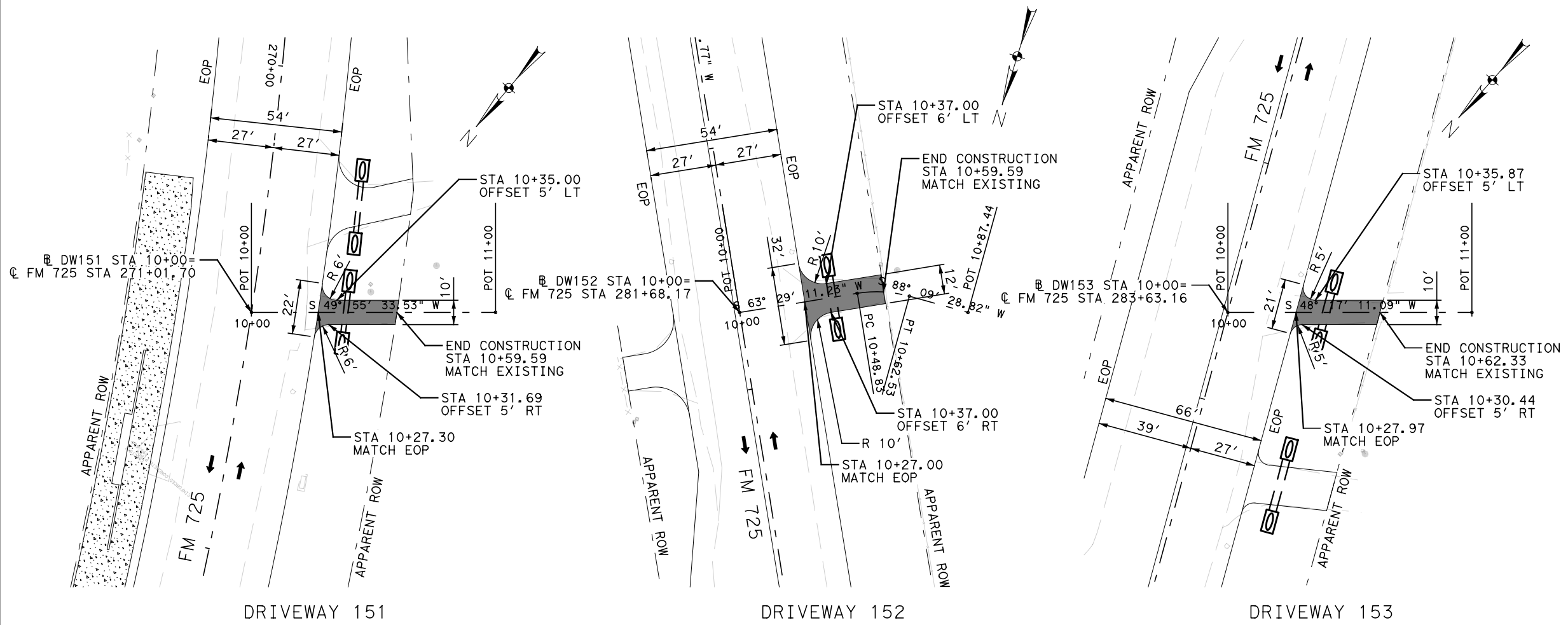
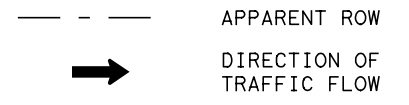
FM 725 DRIVEWAYS PLAN & PROFILE

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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	194	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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100 NE INTERSTATE 410 LOOP
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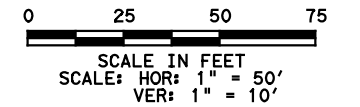
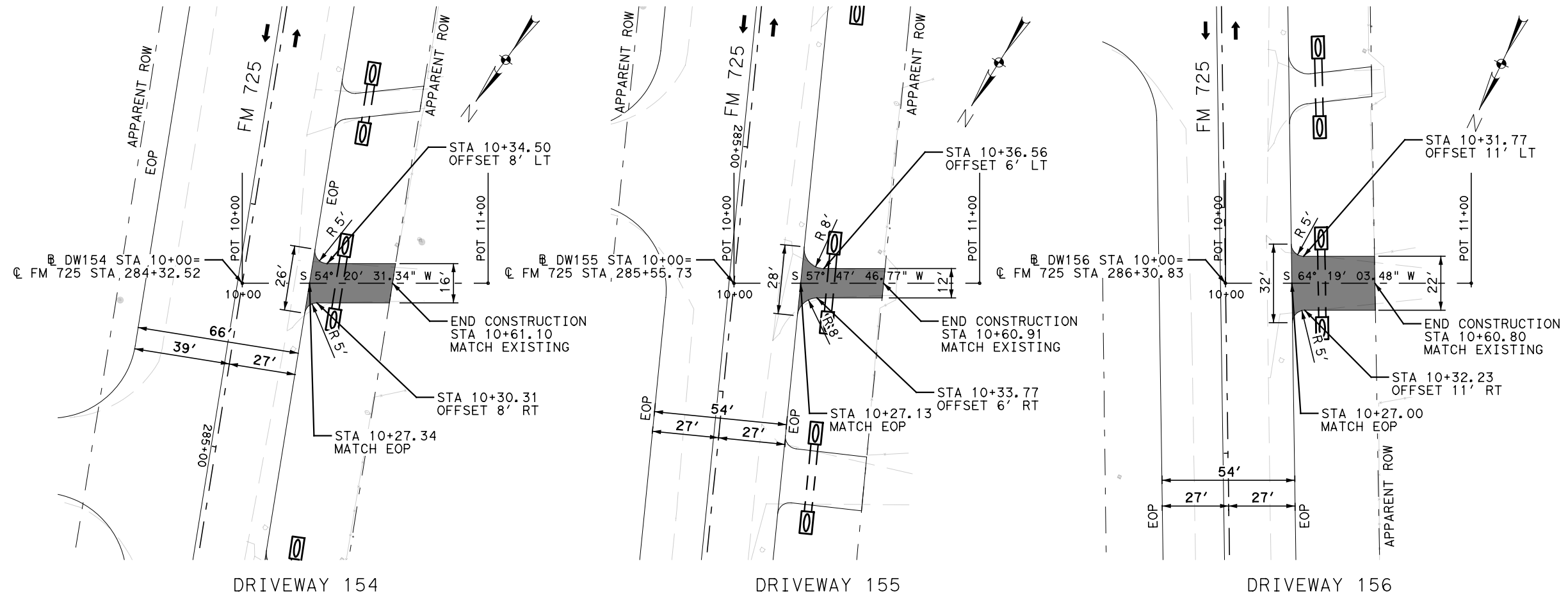
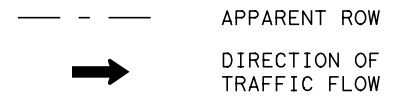
**FM 725
 DRIVEWAYS
 PLAN & PROFILE**

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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	62
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	49
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	84

STATION	ELEVATION	DESCRIPTION
10+00	605.88	EXIST GROUND
10+25	605.71	EXIST GROUND
10+50	605.54	EXIST GROUND
10+75	605.55	EXIST GROUND
11+00	605.73	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	607.85	EXIST GROUND
10+25	607.68	EXIST GROUND
10+50	608.01	EXIST GROUND
10+75	608.00	EXIST GROUND
11+00	608.44	END PROFILE

STATION	ELEVATION	DESCRIPTION
10+00	609.10	EXIST GROUND
10+25	608.93	EXIST GROUND
10+50	609.69	EXIST GROUND
10+75	609.70	EXIST GROUND
11+00	610.25	END PROFILE

4/28/2021

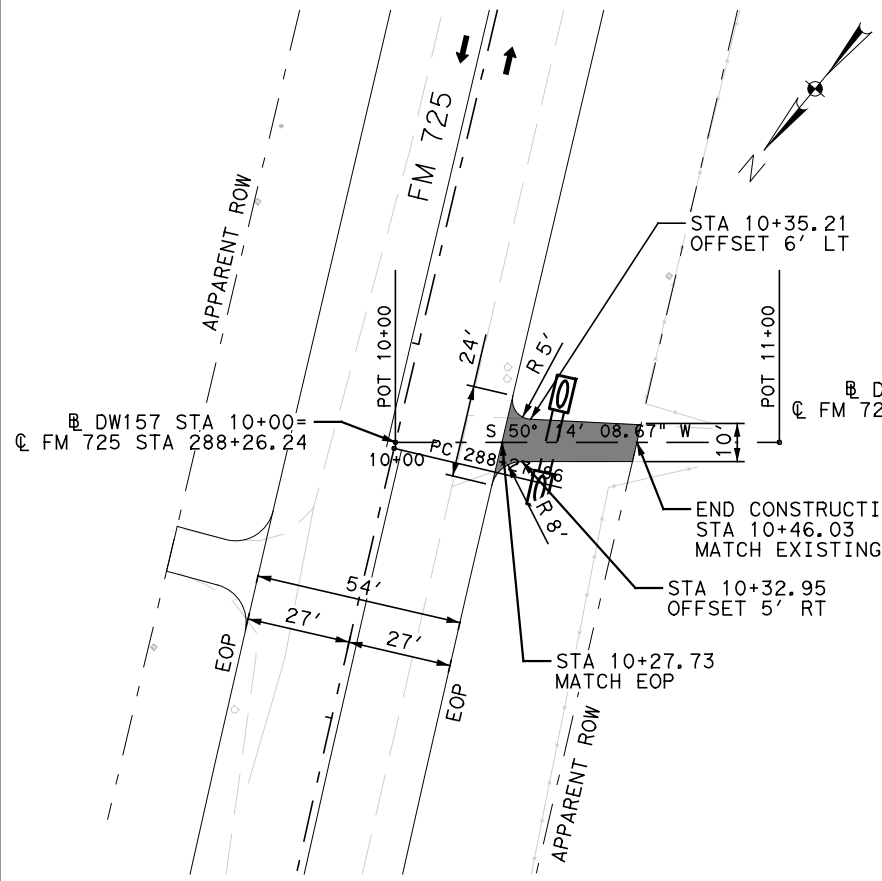
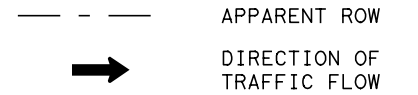
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NO.	REVISION	BY	DATE

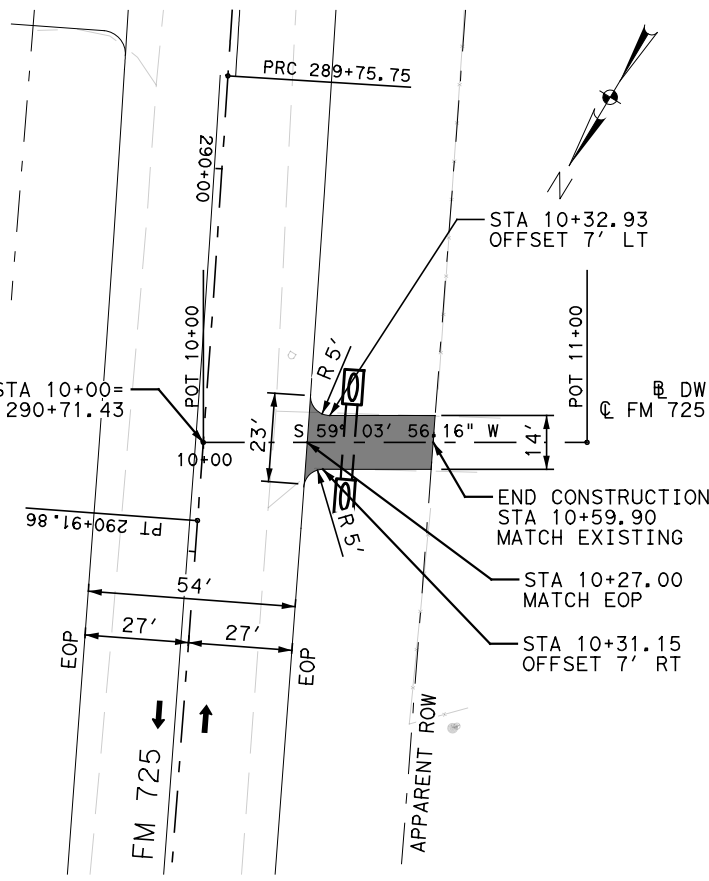
FM 725 DRIVEWAYS PLAN & PROFILE		
SHEET 52 OF 55		
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	196
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
		HIGHWAY NO.
		FM 725

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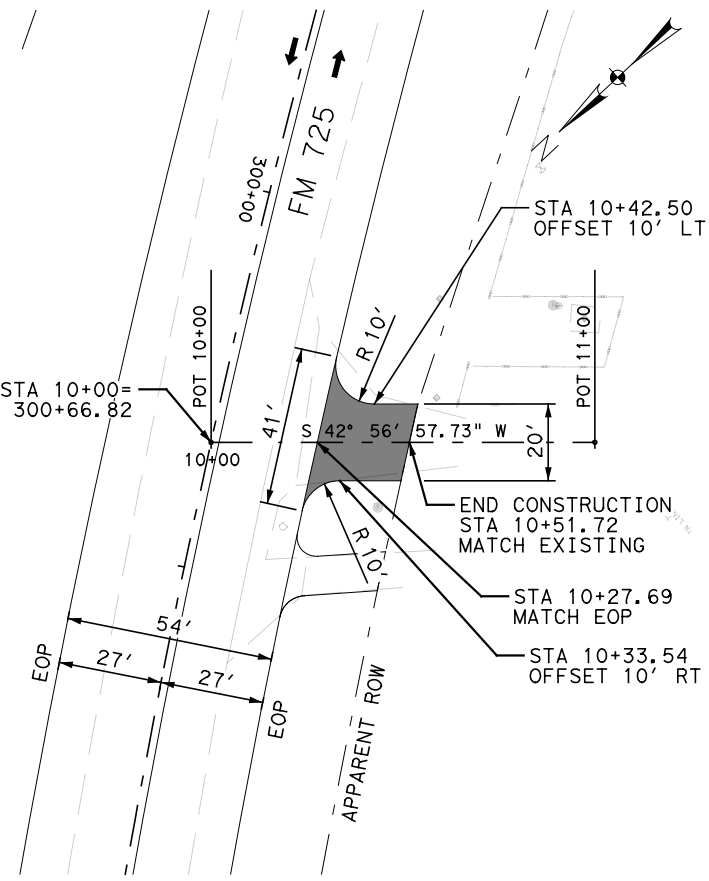
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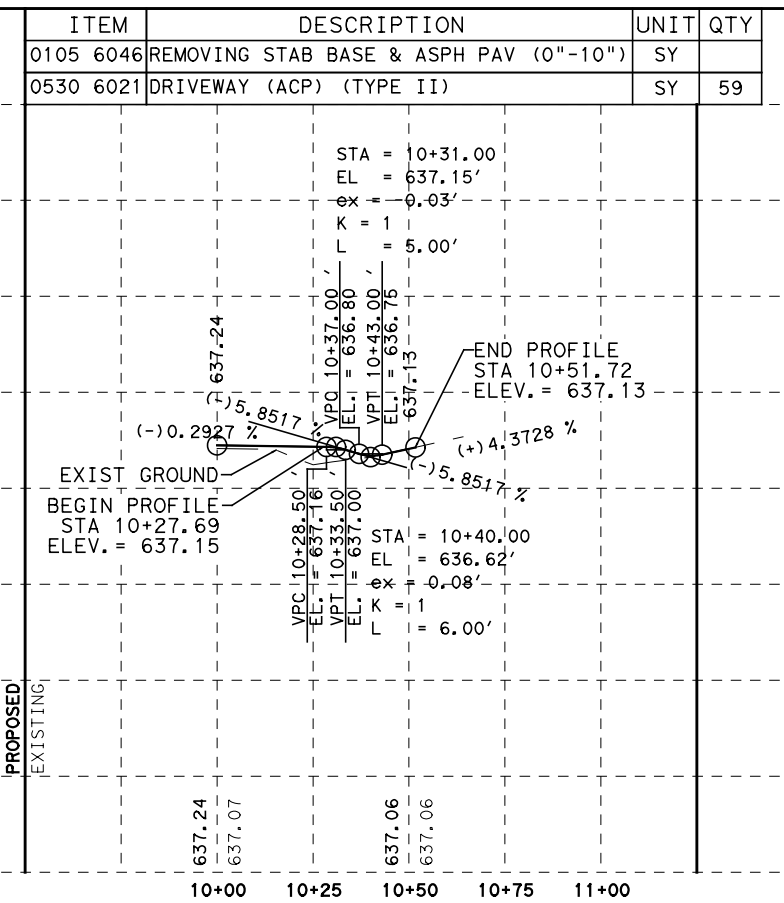
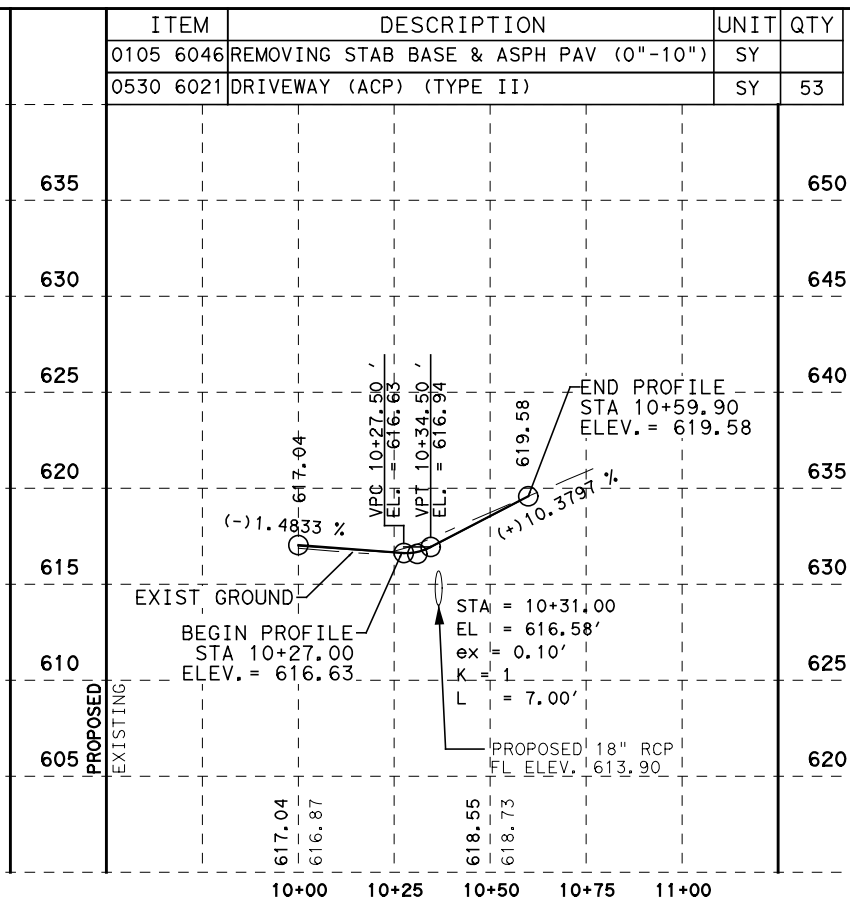
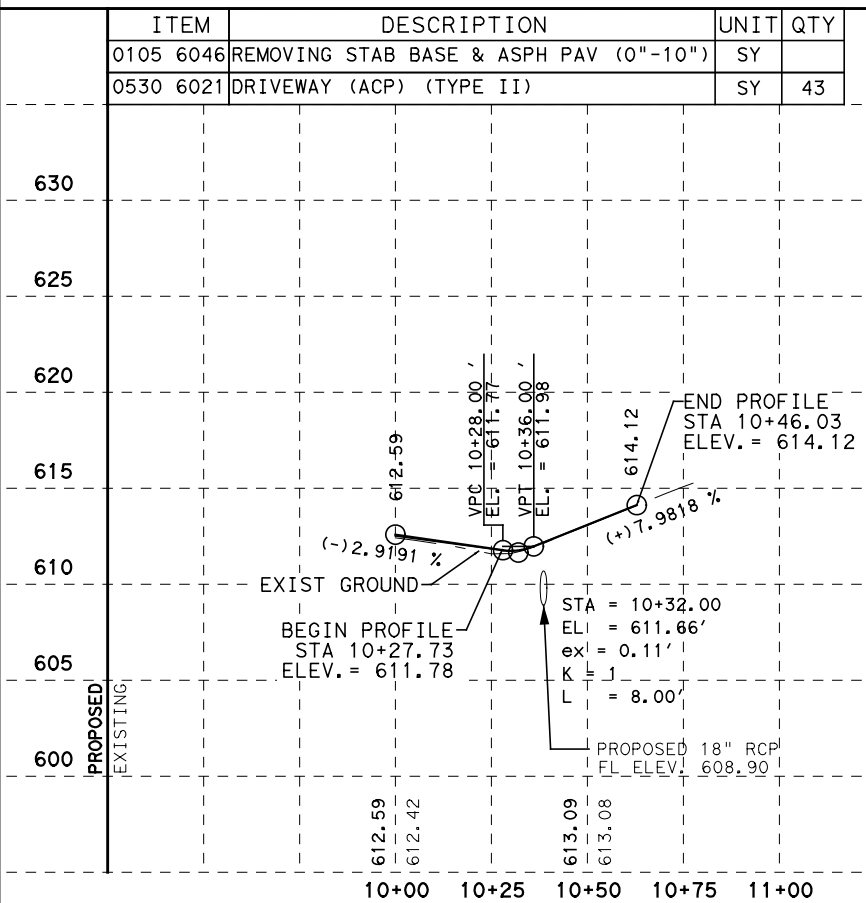
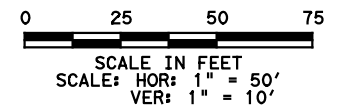
DRIVEWAY 157



DRIVEWAY 158



DRIVEWAY 159



4/28/2021

JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
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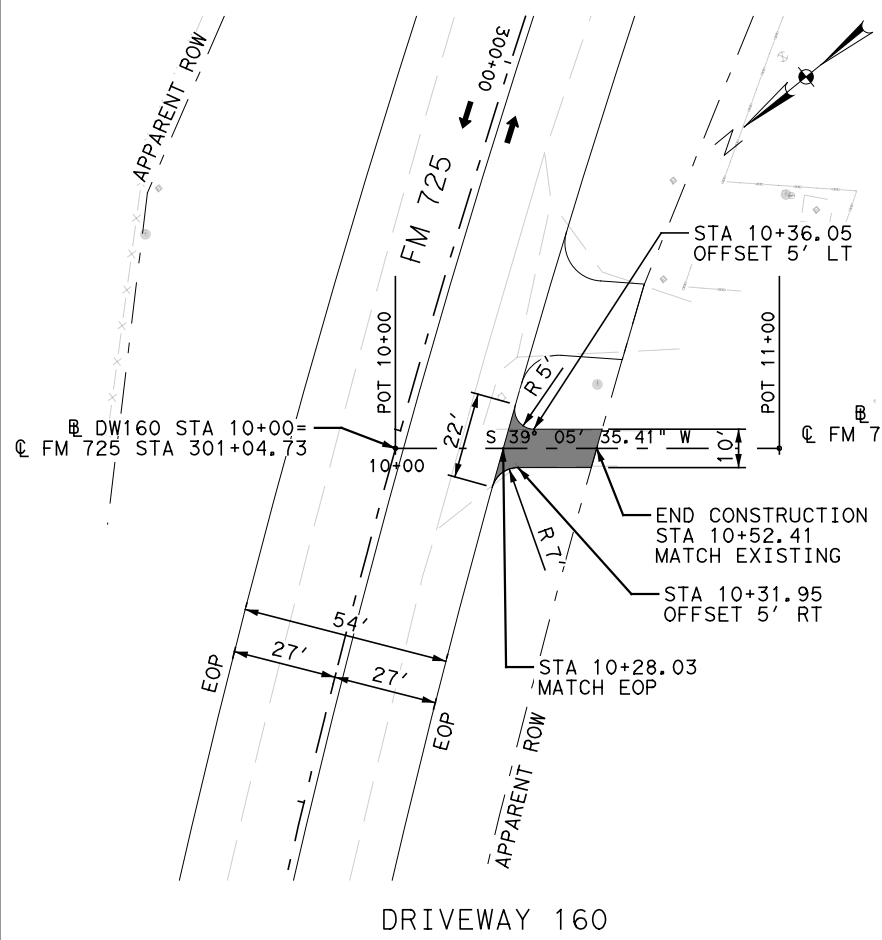
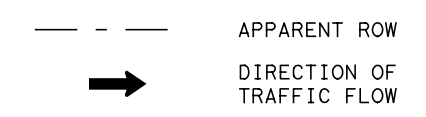
**FM 725
DRIVEWAYS
PLAN & PROFILE**

SHEET 53 OF 55

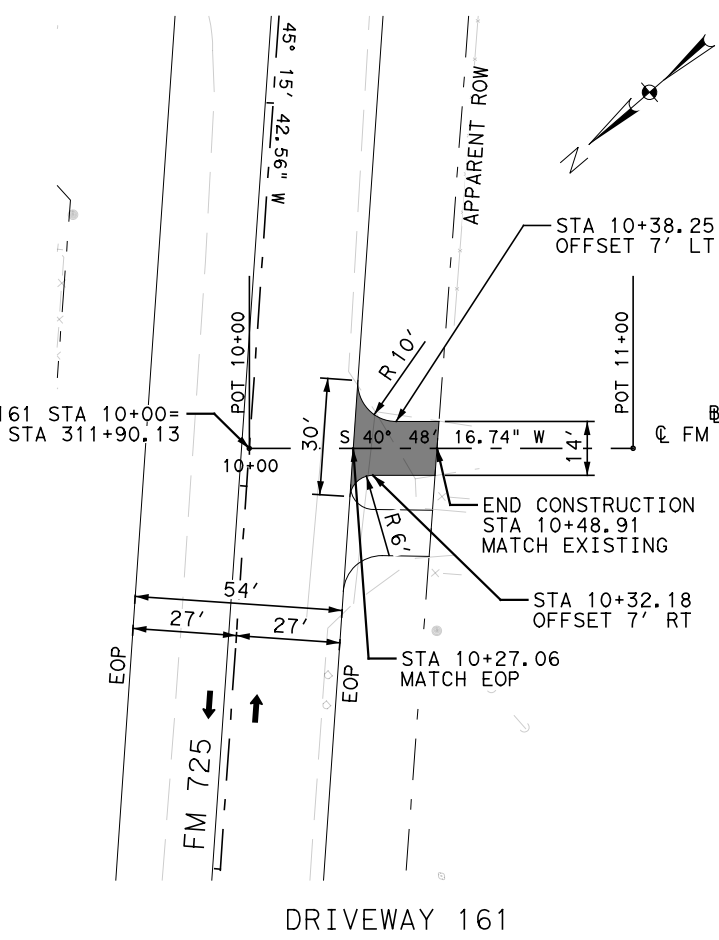
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6	See Title Sheet	197	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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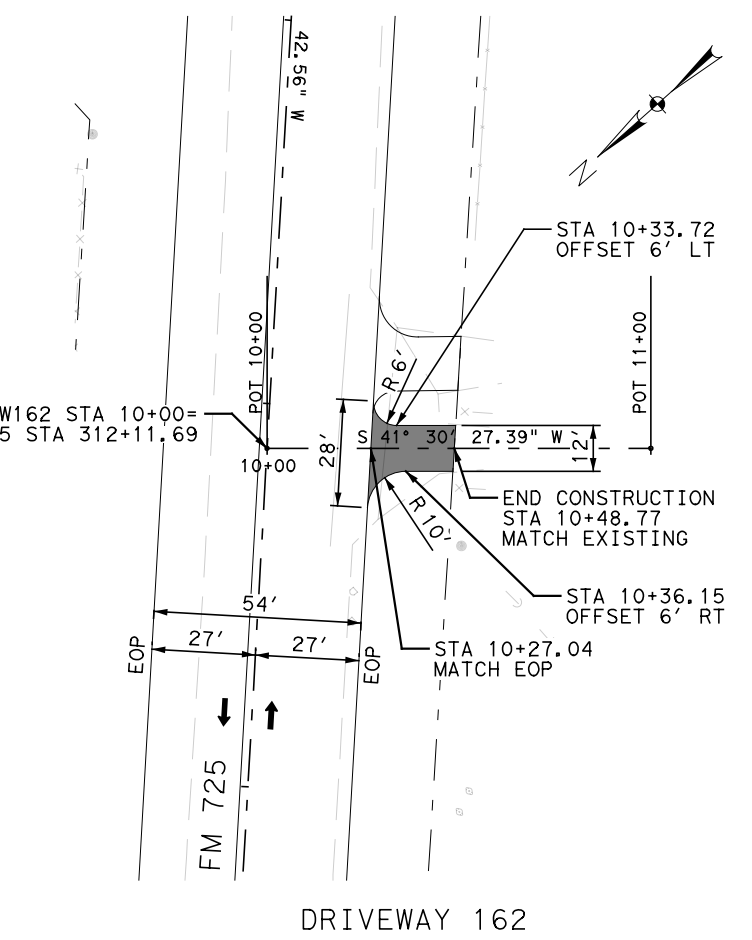
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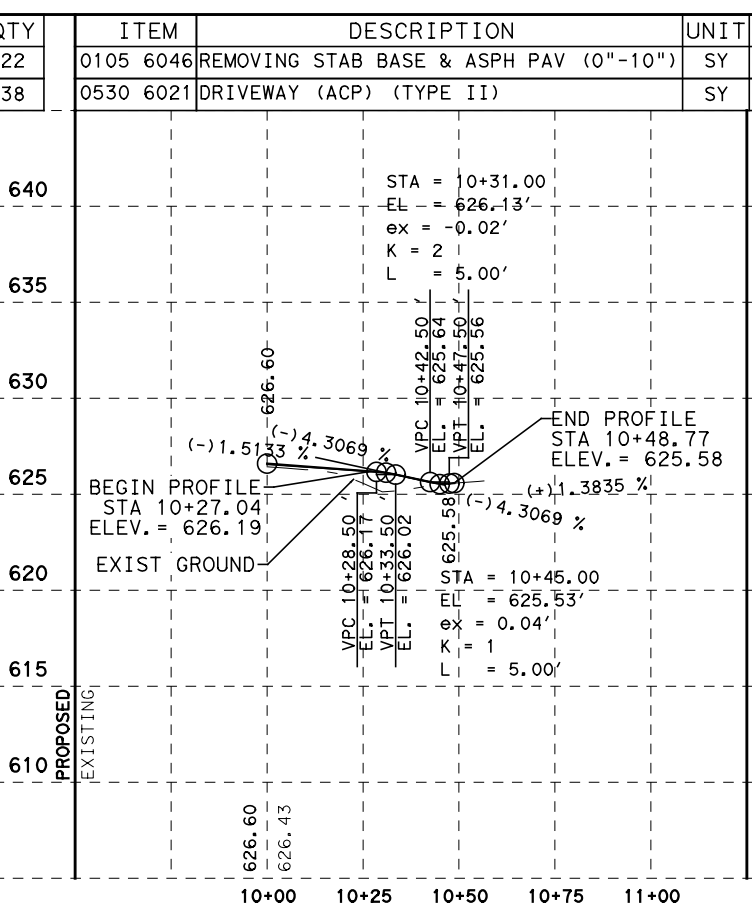
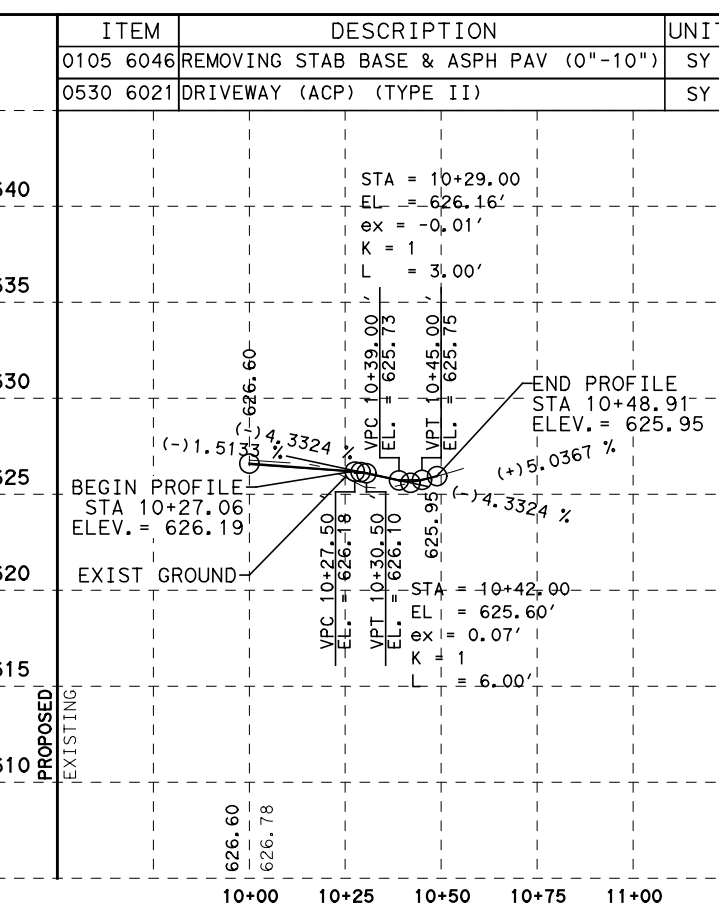
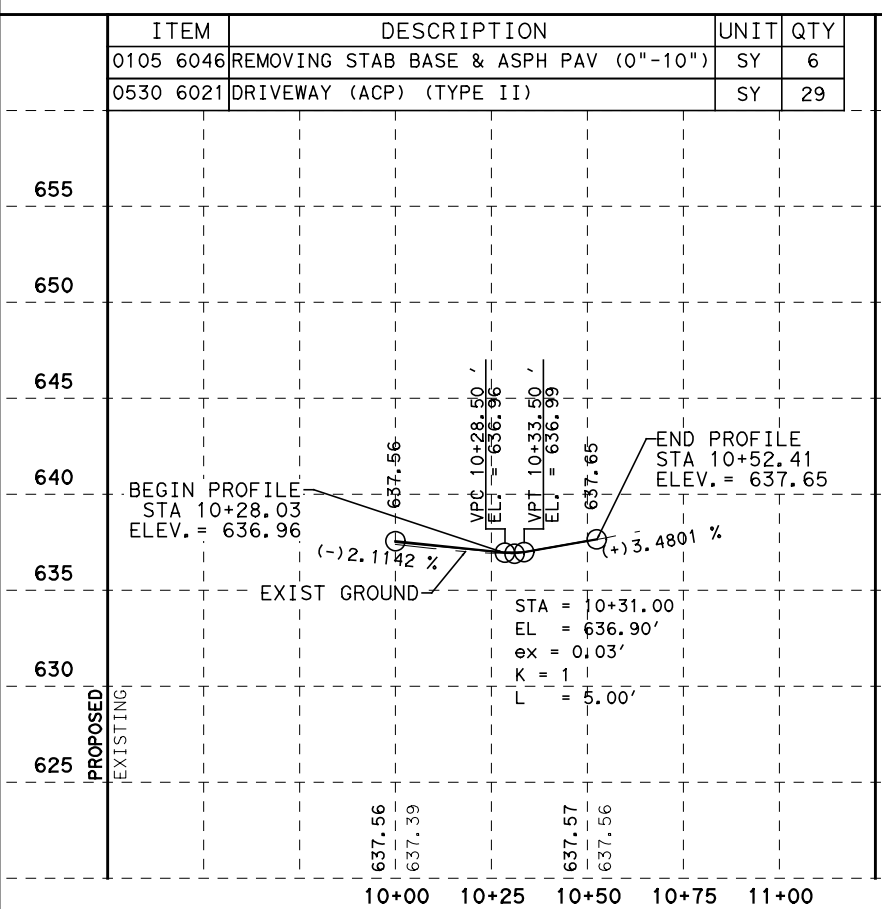
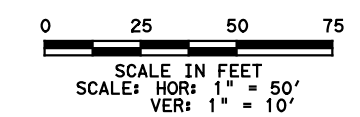
DRIVEWAY 160



DRIVEWAY 161



DRIVEWAY 162



4/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
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 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation
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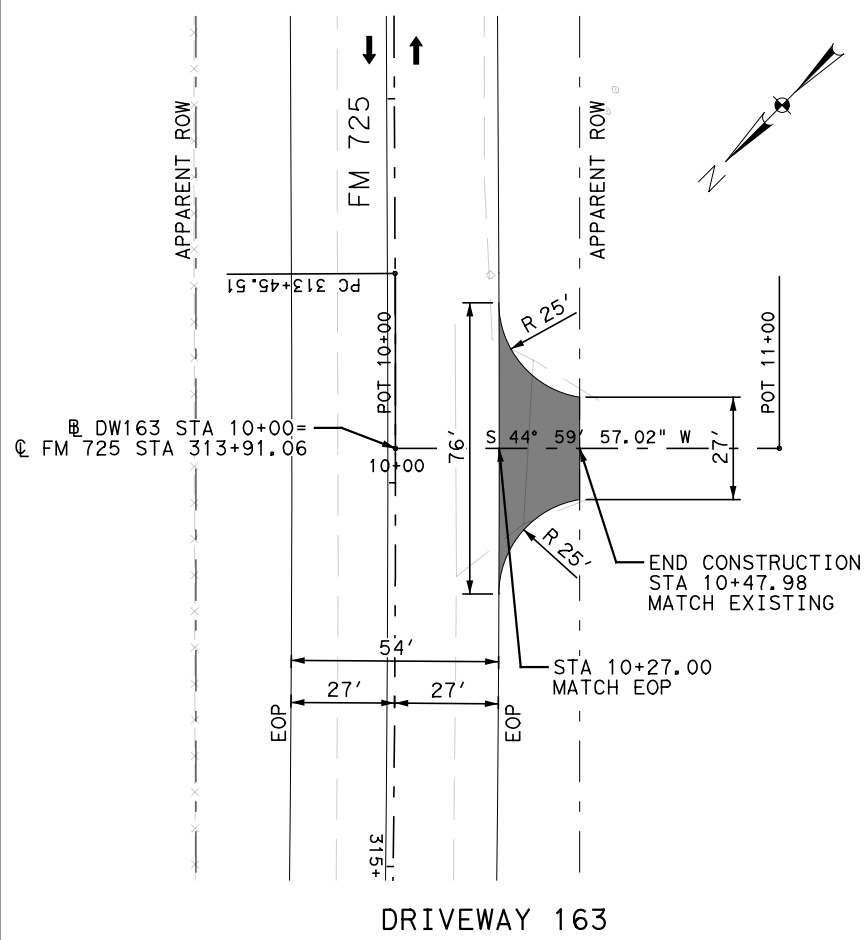
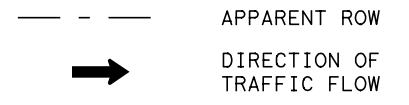
FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 54 OF 55

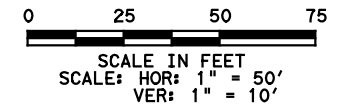
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6	See Title Sheet	198	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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LEGEND

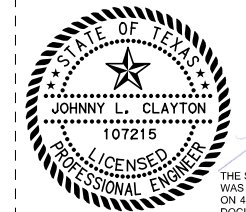


DRIVEWAY 163



ITEM	DESCRIPTION	UNIT	QTY
0105 6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY	90
0530 6021	DRIVEWAY (ACP) (TYPE II)	SY	91

640		640
635		635
630	BEGIN PROFILE STA 10+27.00 ELEV. = 622.52	630
625	END PROFILE STA 10+47.98 ELEV. = 622.12	625
620	EXIST GROUND	620
615	STA = 10+41.00 EL = 621.94' EX = 0.07' K = 1 L = 8.00'	615
610		610



4/28/2021

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NO.	REVISION	BY	DATE

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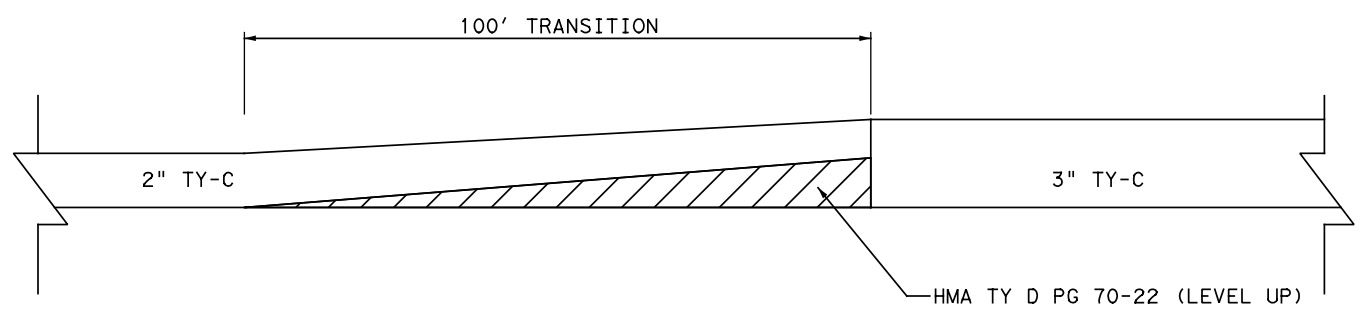
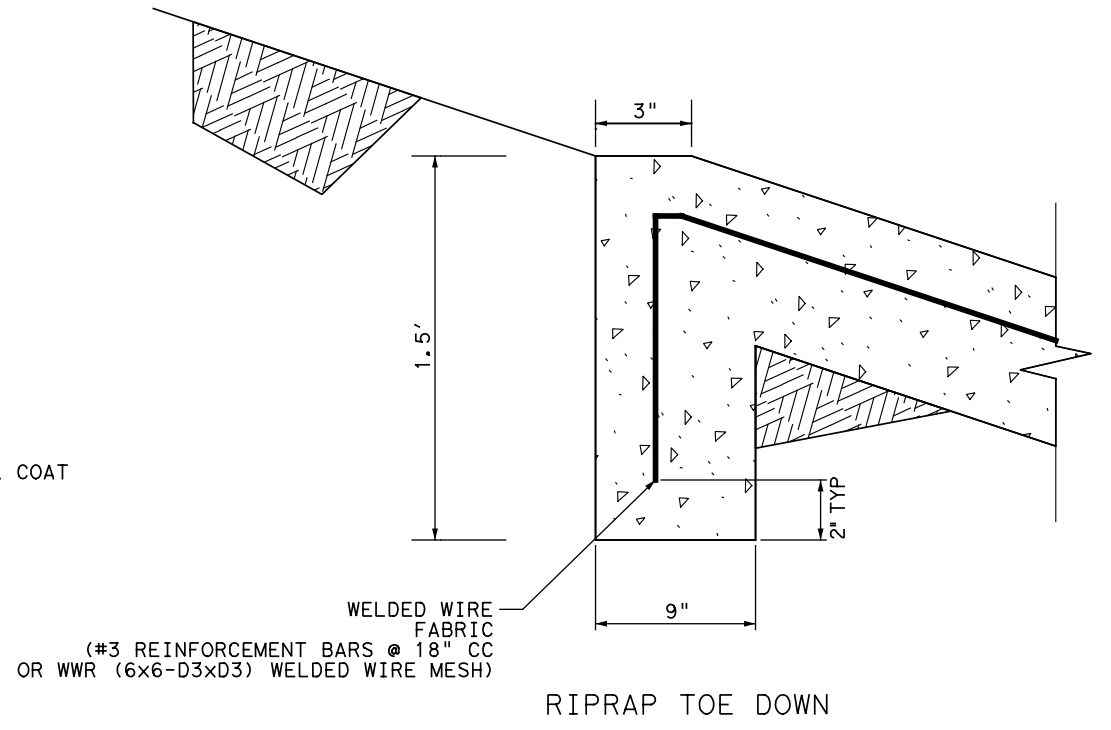
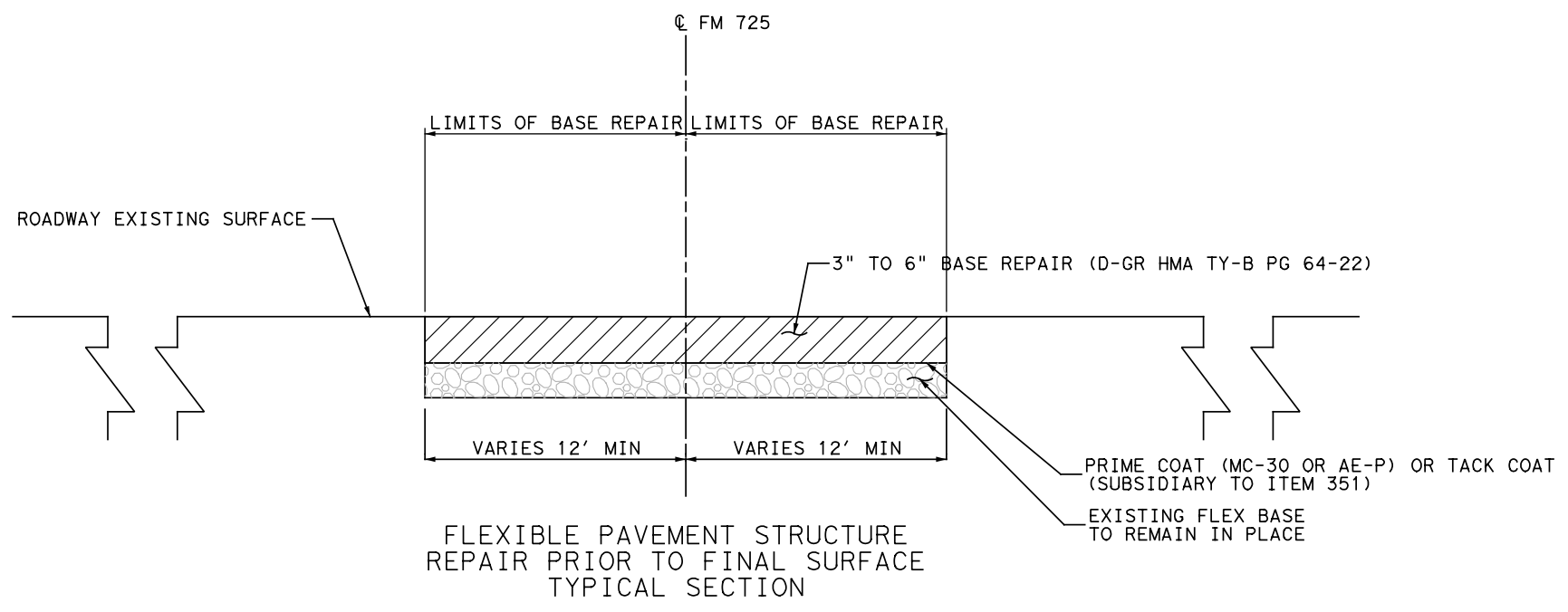


FM 725
 DRIVEWAYS
 PLAN & PROFILE

SHEET 55 OF 55

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 199
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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NOTES:

- TACK COAT REQUIRED BETWEEN LIFTS OF HMA (SUBSIDIARY TO ITEM 351).
- THE TYPICAL REPAIR DIMENSION SHALL BE A MINIMUM WIDTH OF 12 FT AND A MINIMUM LENGTH OF 20 FT. THESE DIMENSIONS MAY DIFFER BASED UPON THE AREA THAT IS IN NEED OF REPAIR.
- THE USE OF A ROTOMILL WILL BE USED FOR THE REMOVAL OF THE EXISTING PAVEMENT STRUCTURE AND SHALL BE SUBSIDIARY TO ITEM 351, "FLEXIBLE PAVEMENT STRUCTURE REPAIR."
- ACP (TY B) (BASE) SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO ITEM 351.
- THE REPAIR LOCATIONS AND THE SIZE OF EACH LOCATION IS SUBJECT TO CHANGE AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

4/28/2021

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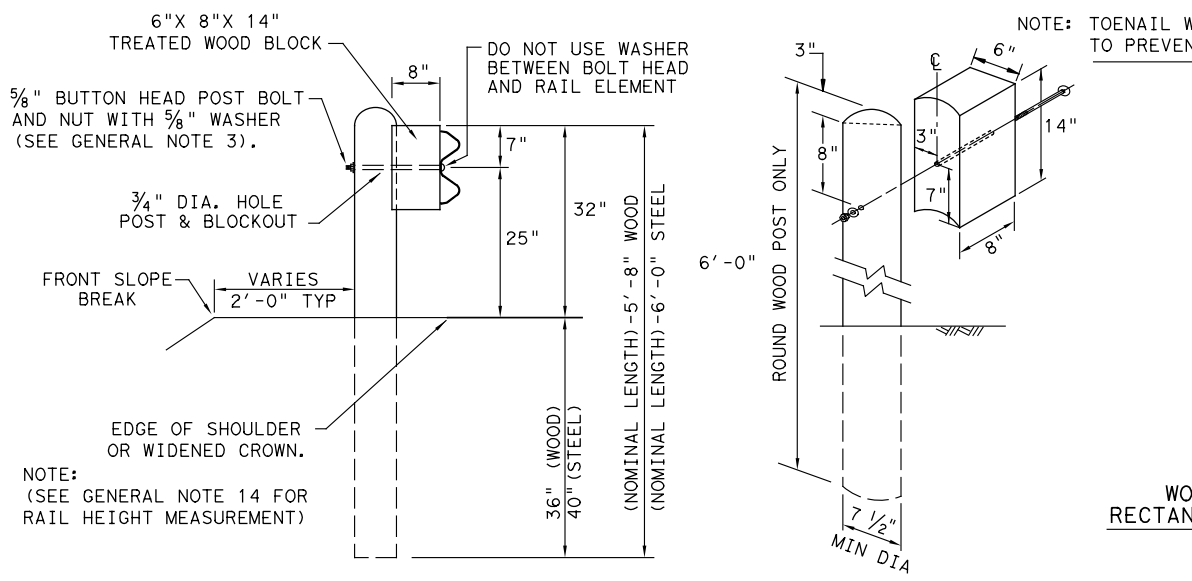
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FM 725

MISCELLANEOUS ROADWAY DETAILS

SCALE: NTS		SHEET 1 OF 1	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	200	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

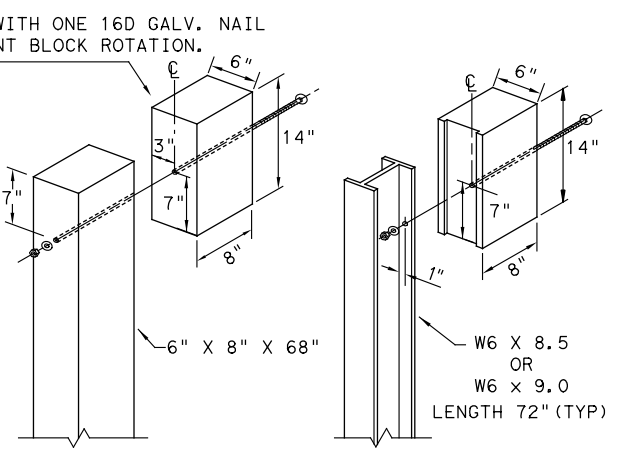
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TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

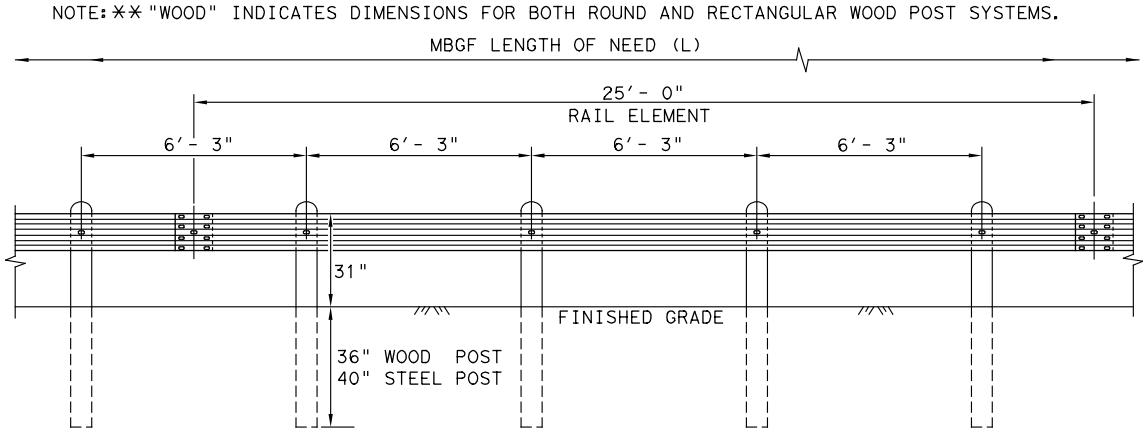


WOOD BLOCK TO RECTANGULAR WOOD POST

ROUTED WOOD BLOCK TO I-BEAM STEEL POST

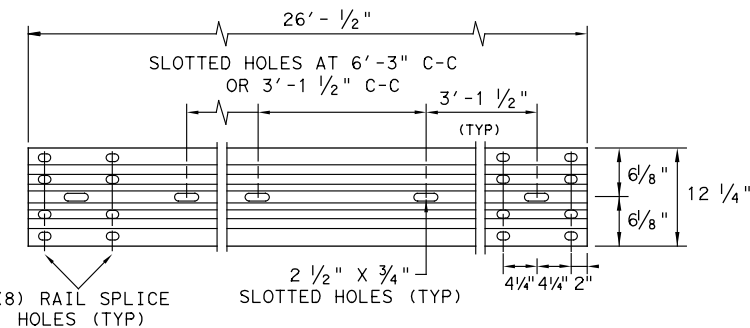
GENERAL NOTES

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 (FWC16d) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.



ELEVATION MID-SPAN RAIL SPLICE

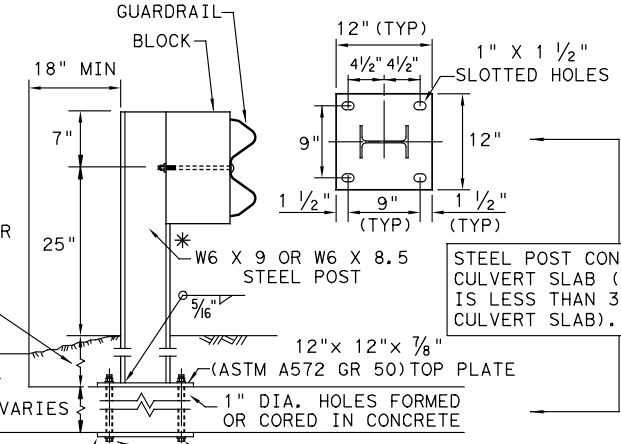
SHOWING A 25'-0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

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

* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.

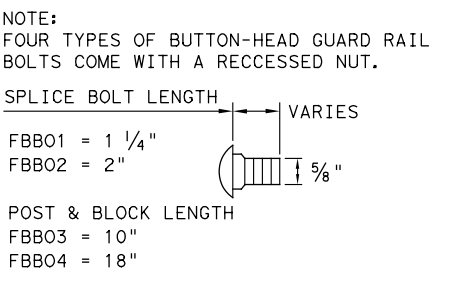


LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

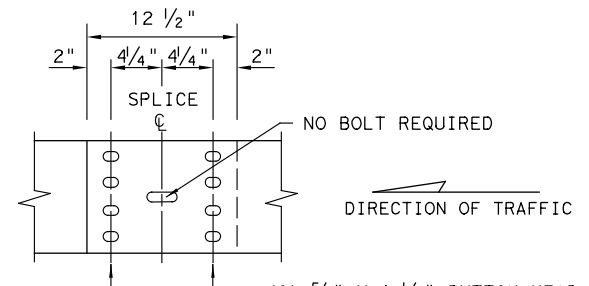
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR 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.



BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.

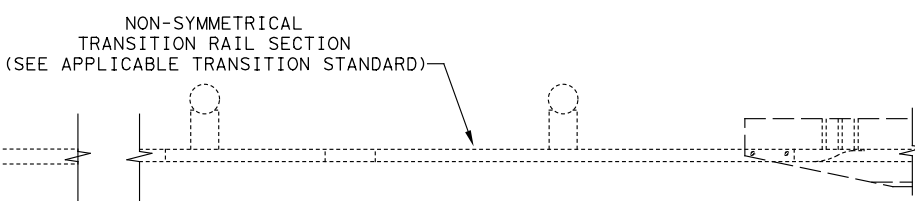
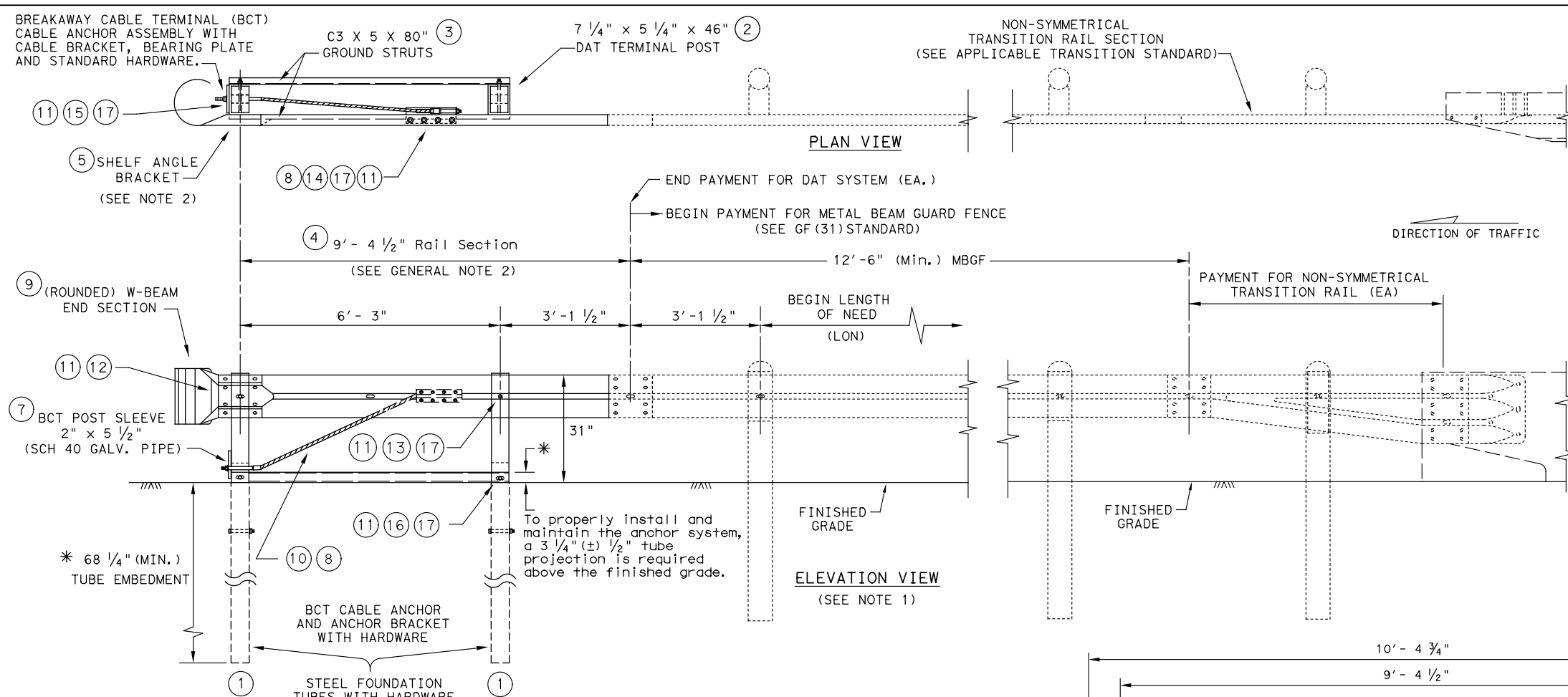


MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

		Design Division Standard	
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF(31)-19			
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP
©TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0215	09	035
	DIST	COUNTY	SHEET NO.
	SAN	GUADALUPE	201

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- 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.

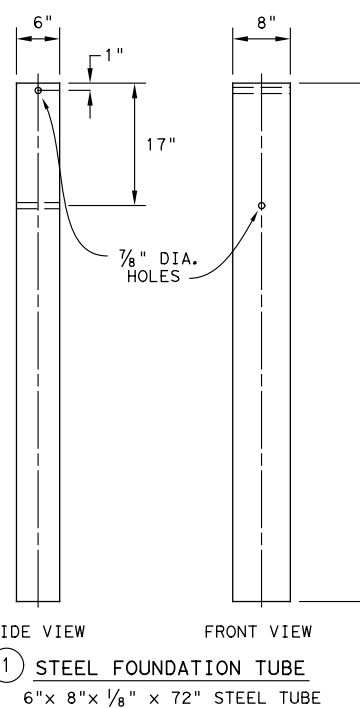
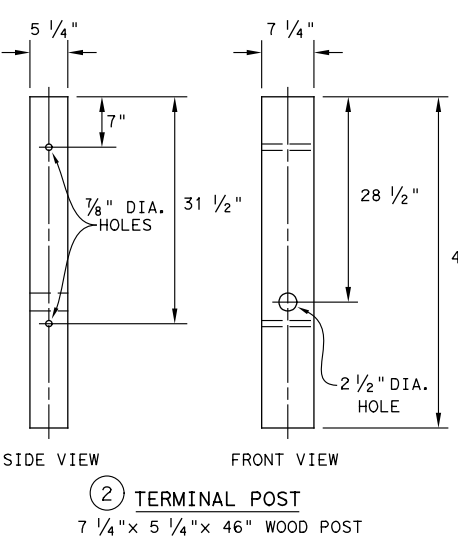
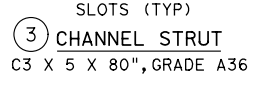
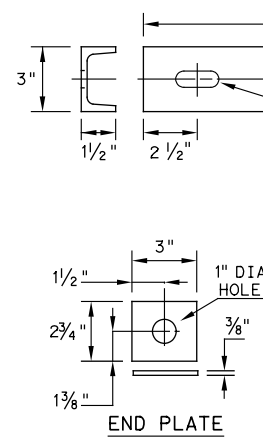
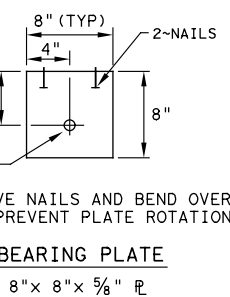
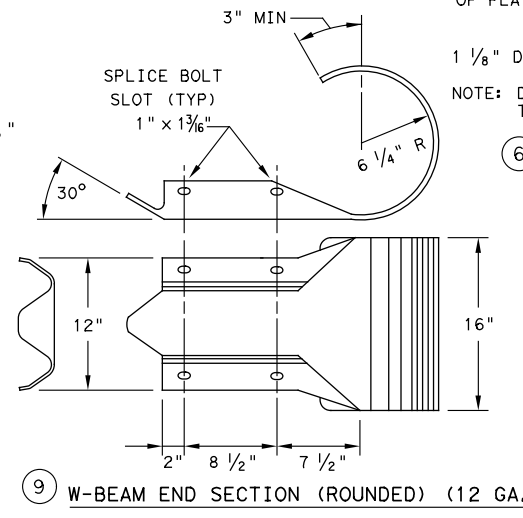
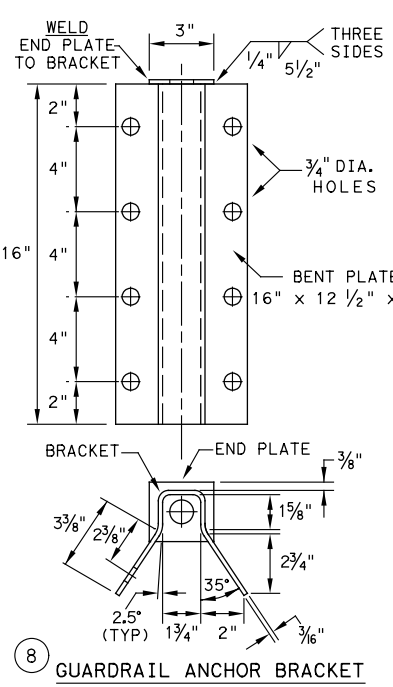
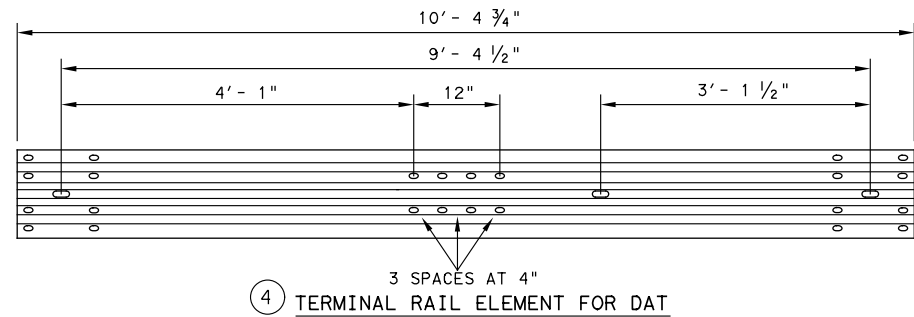
MOW STRIP INSTALLATION

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.

DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

#	(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



Design Division Standard

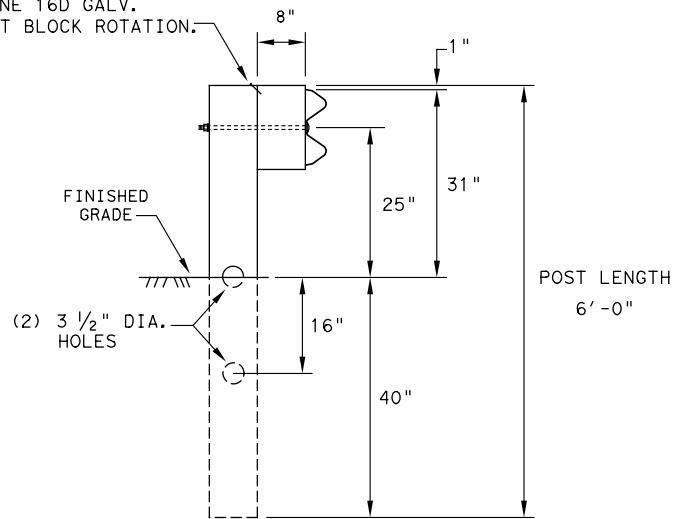
METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT
GF(31) DAT-19

FILE: gf31dat19.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	202	

DATE: 2/28/2021
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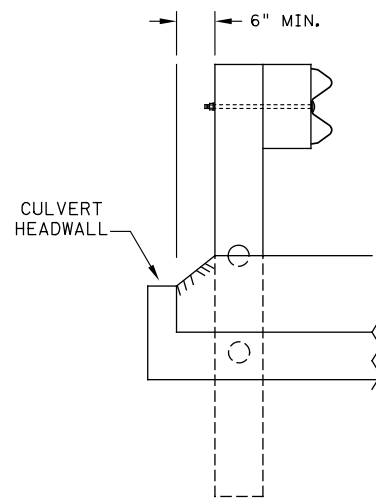
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 FILE: pw:\halff-pw.bentley.com:halff-pw-01\Documents\34832.D00-TXDOT_FM-725\CADD\Sheets\HALFF\Standards\Roadway\gf31\1s19.dgn

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.



RECTANGULAR CRT POST
(6" X 8" X 6' LONG)

(6) CRT REQUIRED
SEE ELEVATION DETAIL FOR LOCATIONS



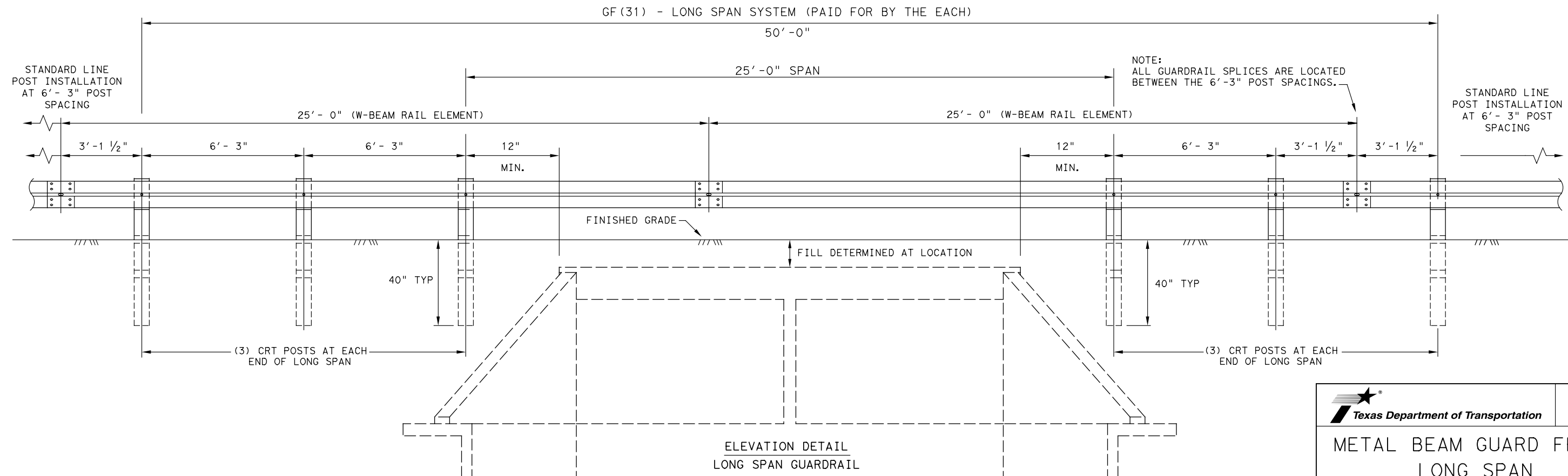
LATERAL OFFSET BETWEEN THE
GUARDRAIL AND THE CULVERT HEADWALL

GENERAL NOTES

1. THE TYPE OF LINE POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF THE TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENT SHALL MEET ALL REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 12'-6" OR 25'-0" NOMINAL LENGTHS.
3. RAIL POST HOLES ARE OFFSET 3'-1 1/2" FROM STANDARD GUARDRAIL TO ACCOMMODATE THE MIDSPAN SPLICING.
4. 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 NO MORE THAN 1" BEYOND IT.
5. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
7. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
8. REFER TO GF(31) STANDARD SHEET FOR ADDITIONAL DETAILS.
9. FLAME CUTTING OF HOLES IN GUARDRAIL SHALL NOT BE PERMITTED. IF YOU ENCOUNTER MIS-ALIGNED BOLT HOLES IN GUARDRAIL CONTACT THE DESIGN DIVISION FOR ADDITIONAL INFORMATION & OPTIONS.

NOTE: SEE GF(31) STANDARD FOR STANDARD LINE POSTS.

DIRECTION OF TRAFFIC



ELEVATION DETAIL
LONG SPAN GUARDRAIL

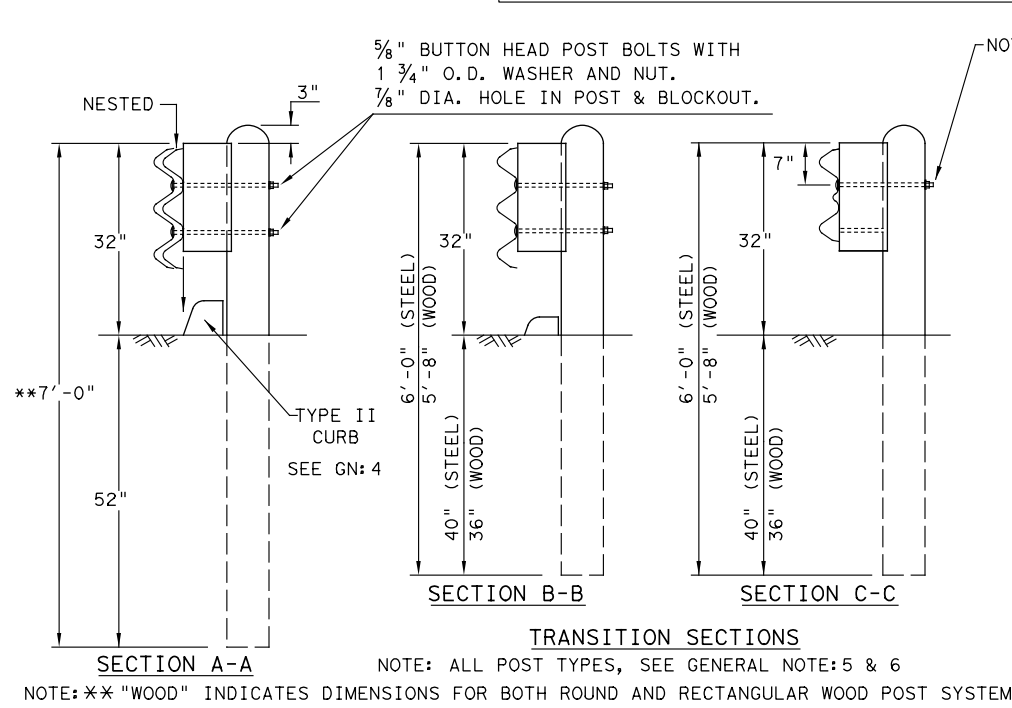
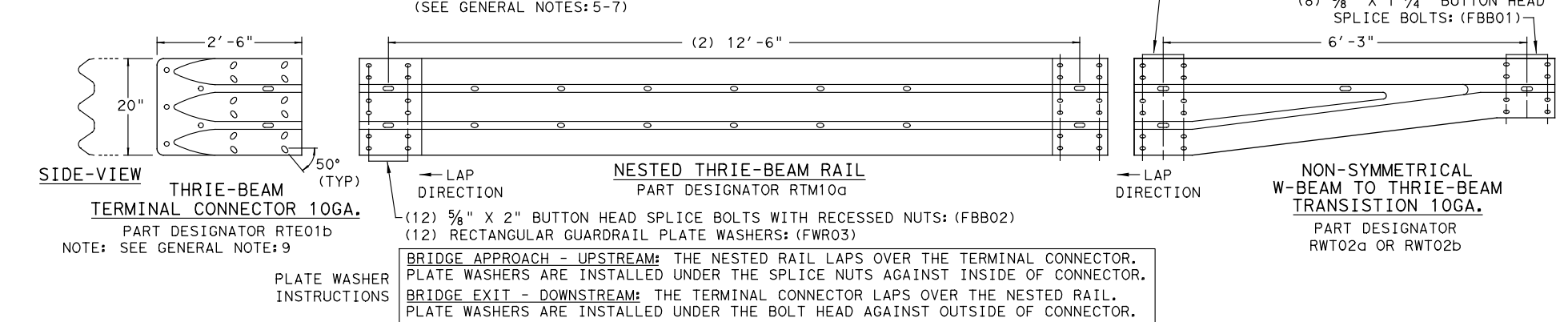
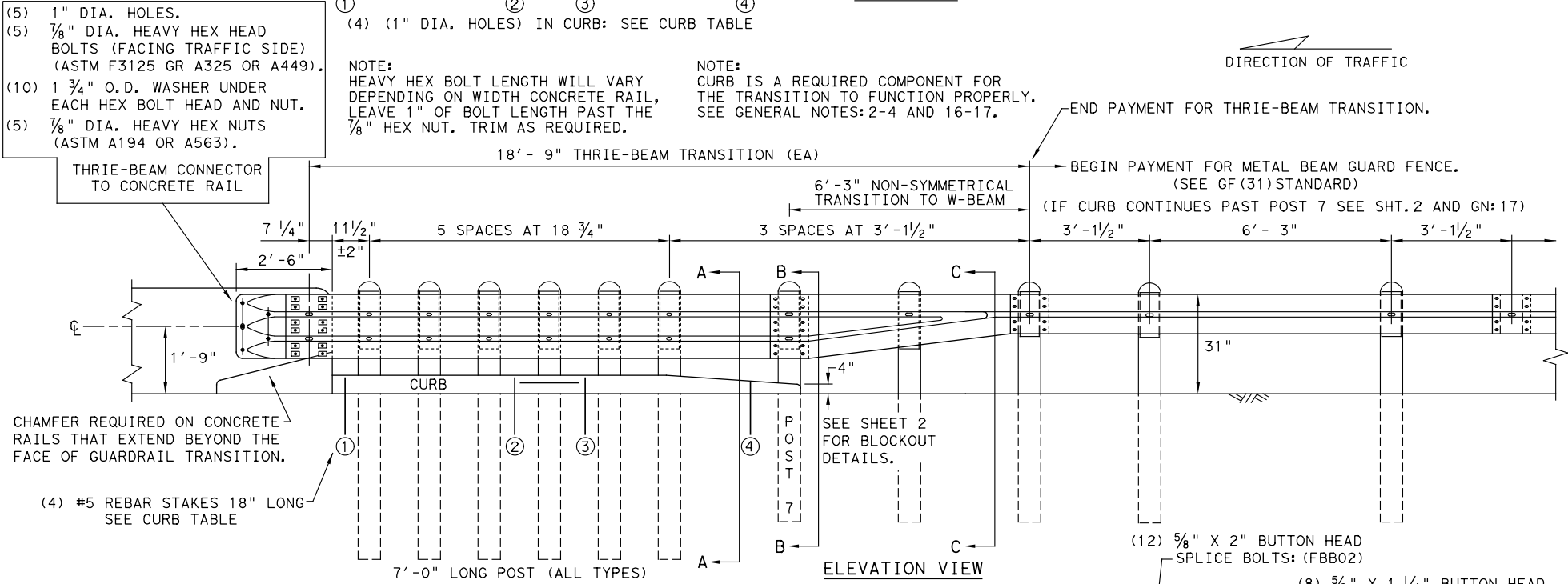
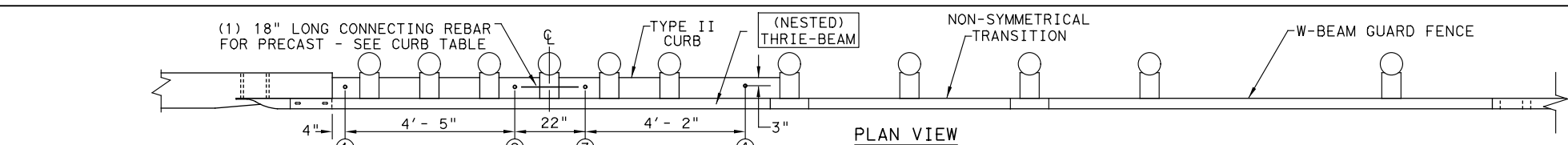


METAL BEAM GUARD FENCE
LONG SPAN
TL-3 MASH COMPLIANT

GF(31)LS-19

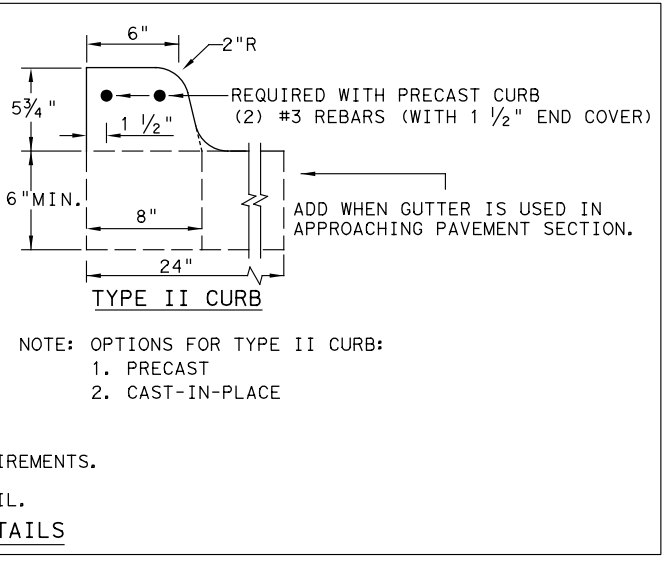
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THRIE-BEAM TERMINAL - CURB TABLE	
PRECAST CURB FULL LENGTH EQUALS 12' - 2"	
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.	
CURB (1) LENGTH 5' - 8"	
CURB (2) LENGTH 6' - 6"	
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7	
CONNECTING PRECAST CURB SECTIONS (1) & (2):	
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.	
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.	
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:	
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB.	
FILL HOLES WITH APPROVED GROUT MIXTURE.	

* NOTES: NOT NEEDED FOR CAST-IN-PLACE. SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS. PERCUSSION DRILLING IS NOT PERMITTED WITH: TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.



GENERAL NOTES

- CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
- CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5-3/4" HEIGHT); SEE CURRENT CCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE:17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
- CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
- UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
- FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
- THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF (31) STANDARD SHEET.
- THE POST LENGTH SHALL BE MARKED ON ALL 7' - 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
- POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
- RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
- 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.
- FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
- CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
- WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
- UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TxDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
- REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
- THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
- IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION
SHEET 1 OF 2

Design Division Standard

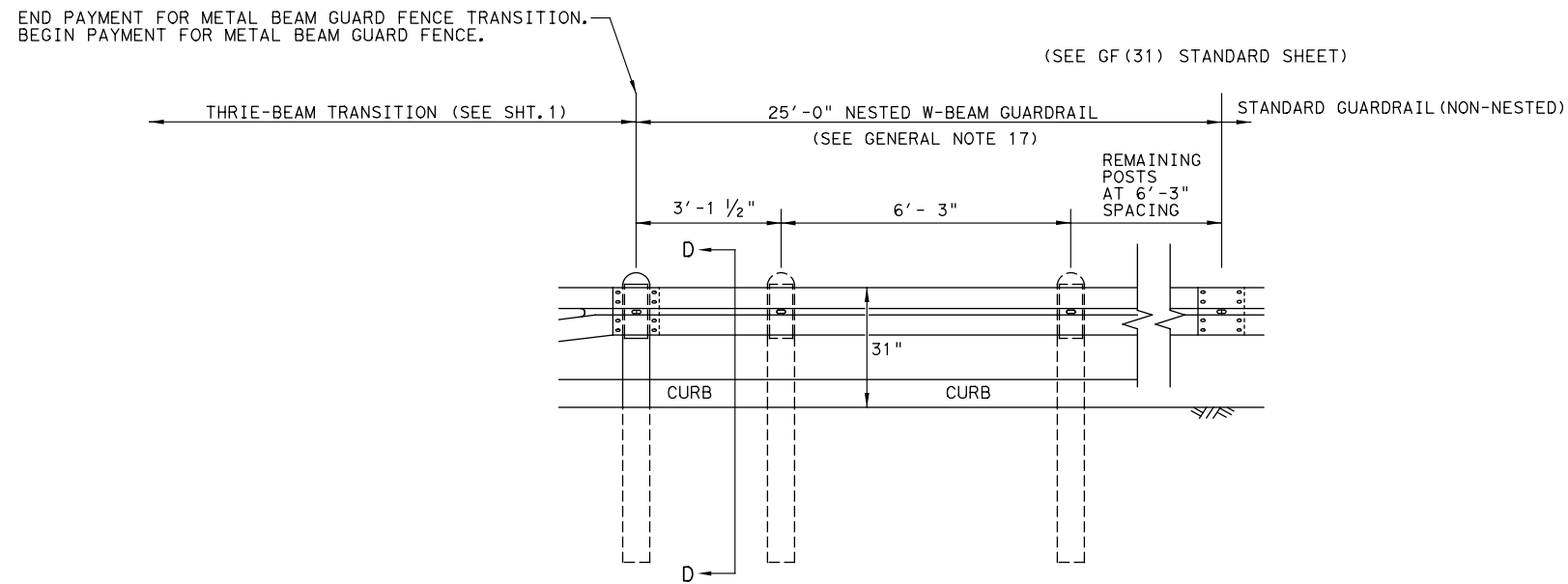
METAL BEAM GUARD FENCE
THRIE-BEAM TRANSITION
TL-3 MASH COMPLIANT
GF(31) TR TL3-20

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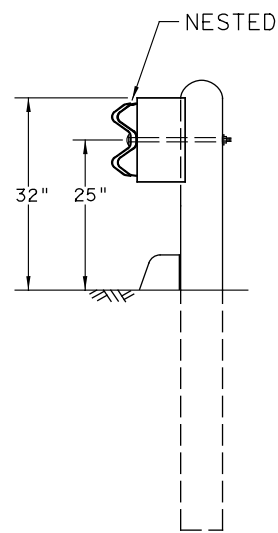
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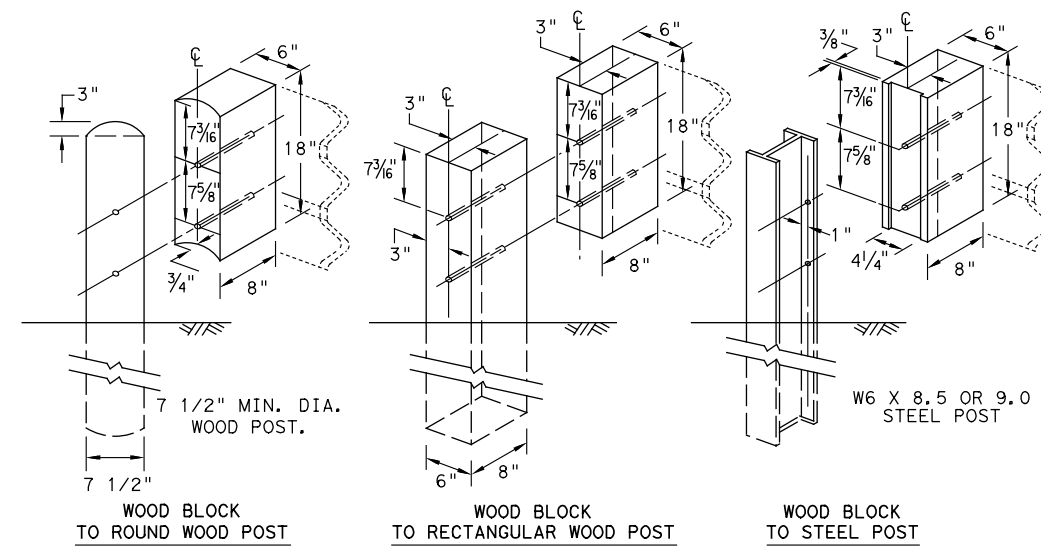
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

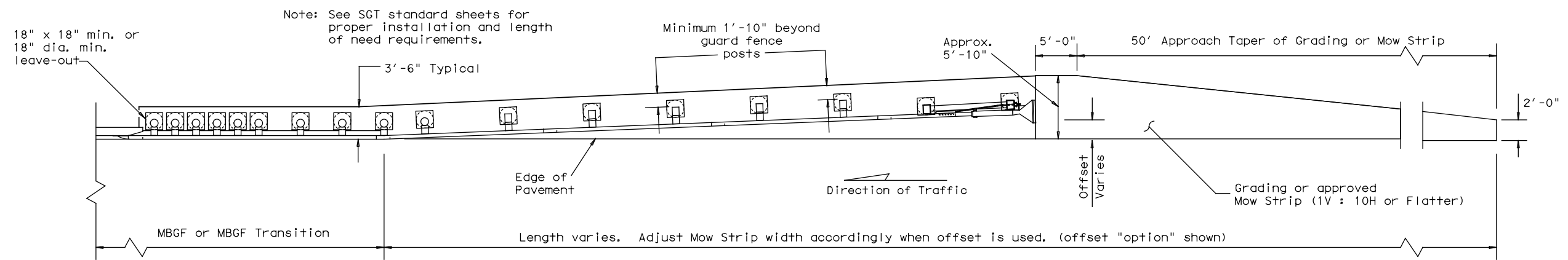
SHEET 2 OF 2



METAL BEAM GUARD FENCE
 THREE-BEAM TRANSITION
 TL-3 MASH COMPLIANT
 GF (31) TR TL3-20

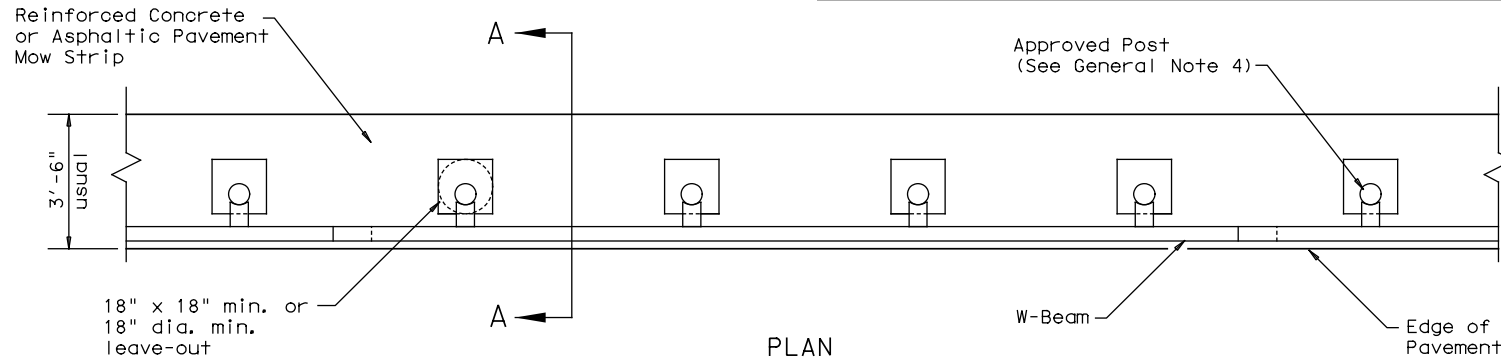
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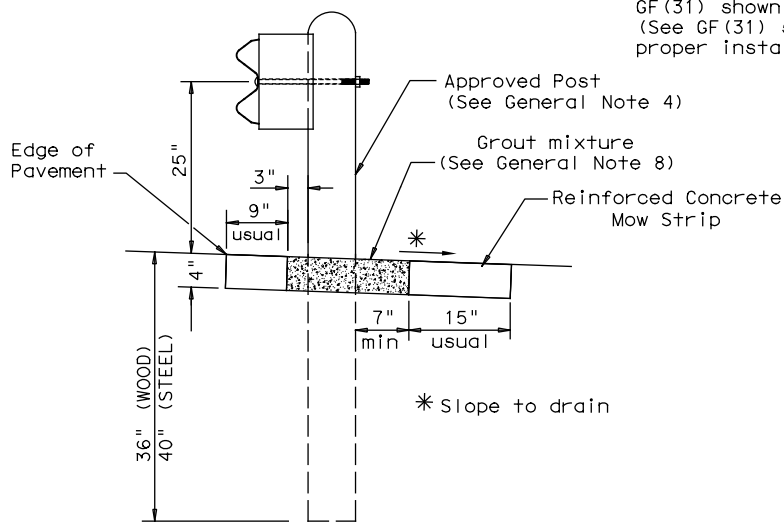
GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

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.



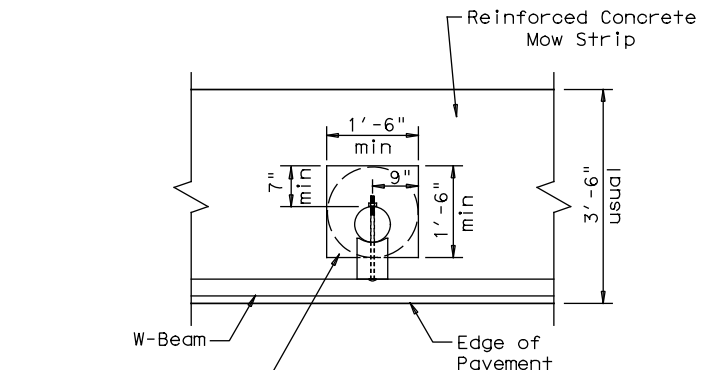
PLAN

GF(31) shown with Mow Strip
 (See GF(31) standard sheet for proper installation)



SECTION A-A

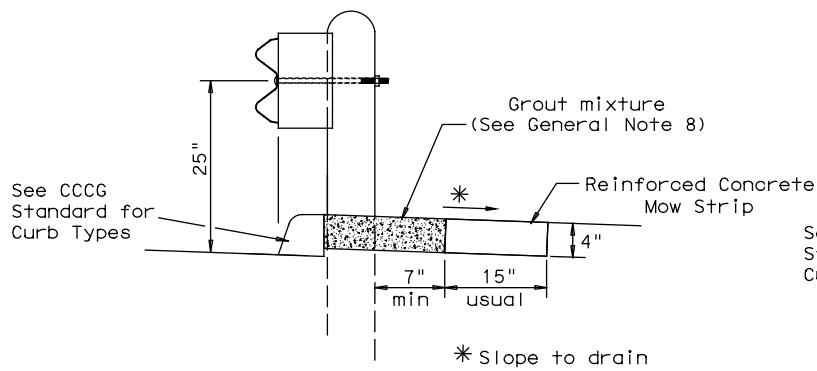
Typical



MOW STRIP DETAIL

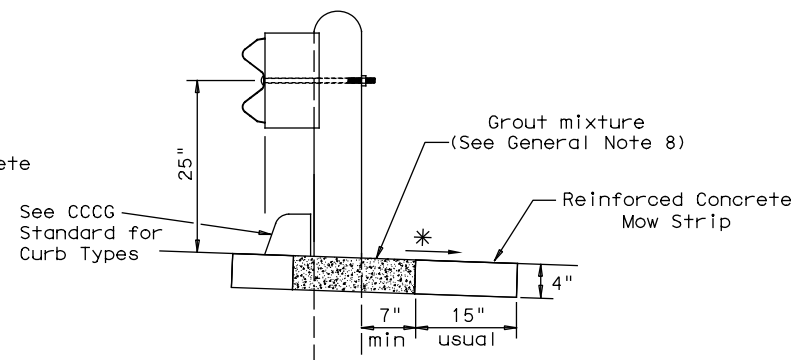
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

- 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 1/2" 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.



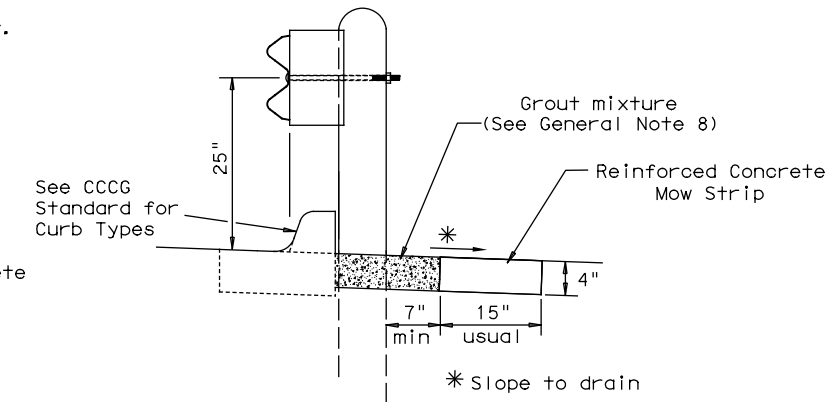
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



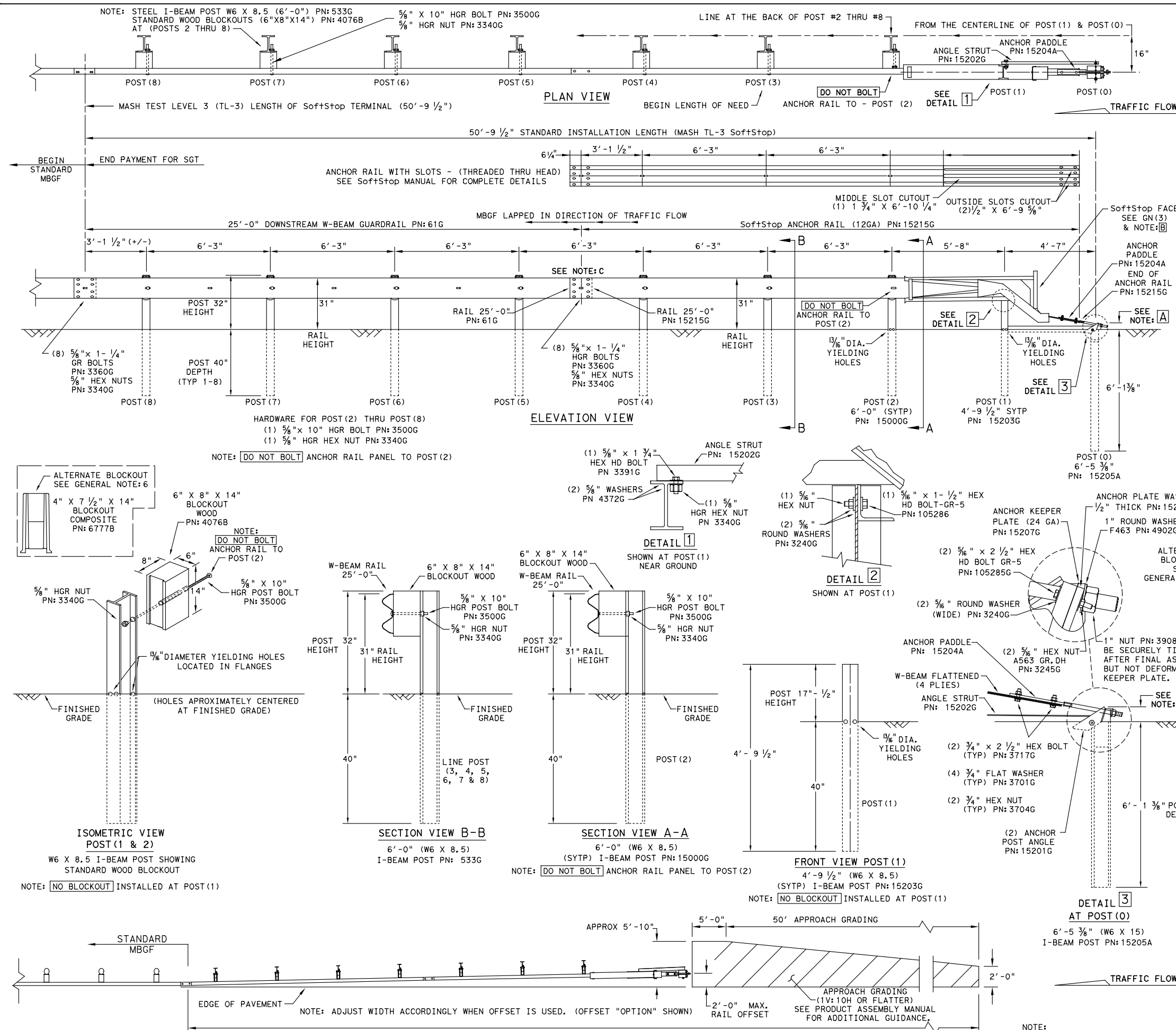
CURB OPTION (3)



METAL BEAM GUARD FENCE (MOW STRIP)
TL-3 MASH COMPLIANT
GF (31) MS-19

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- GENERAL NOTES**
- 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
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - 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.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MGBF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
 - DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
 - 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 3/8")
15203G	1	POST #1 - (SYTP) (6'-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

Texas Department of Transportation
Design Division Standard

**TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT (10S) 31-16**

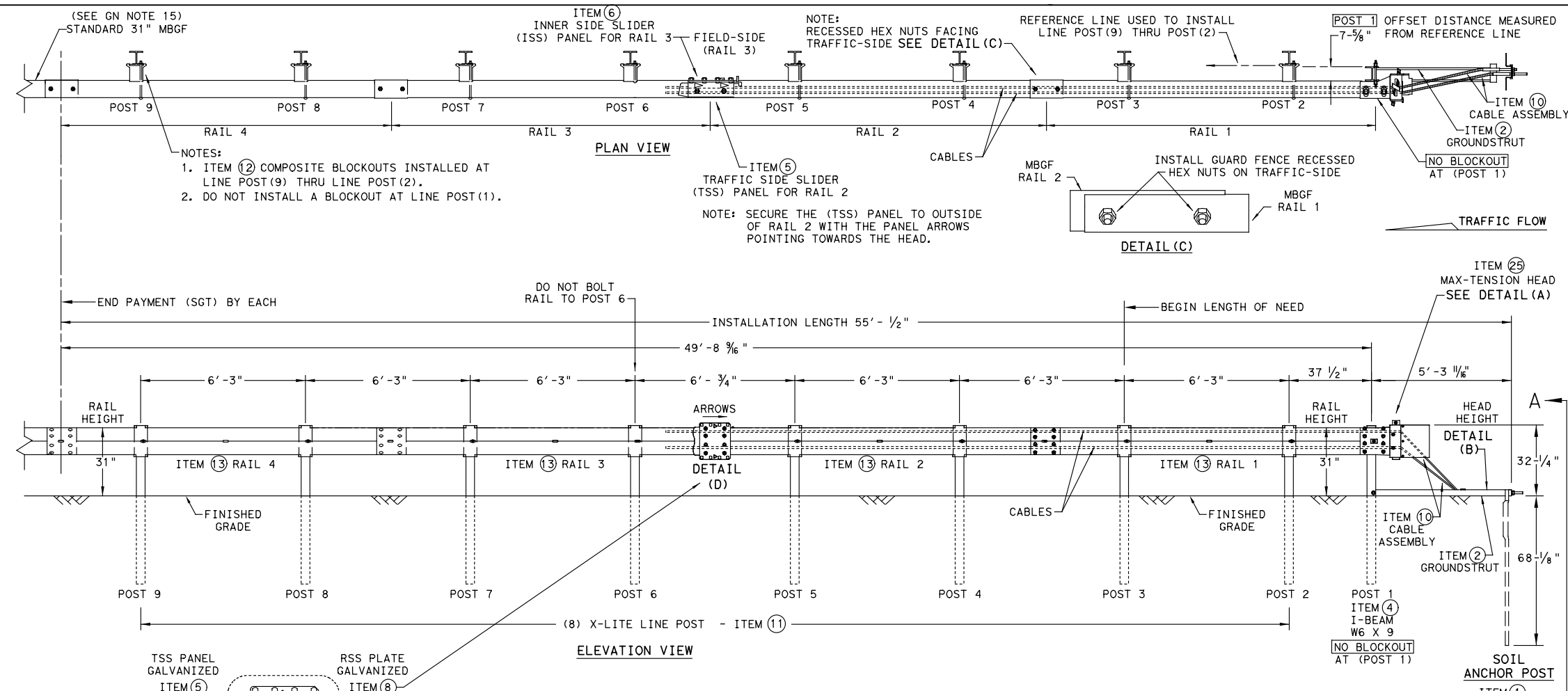
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DATE: FILE:

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

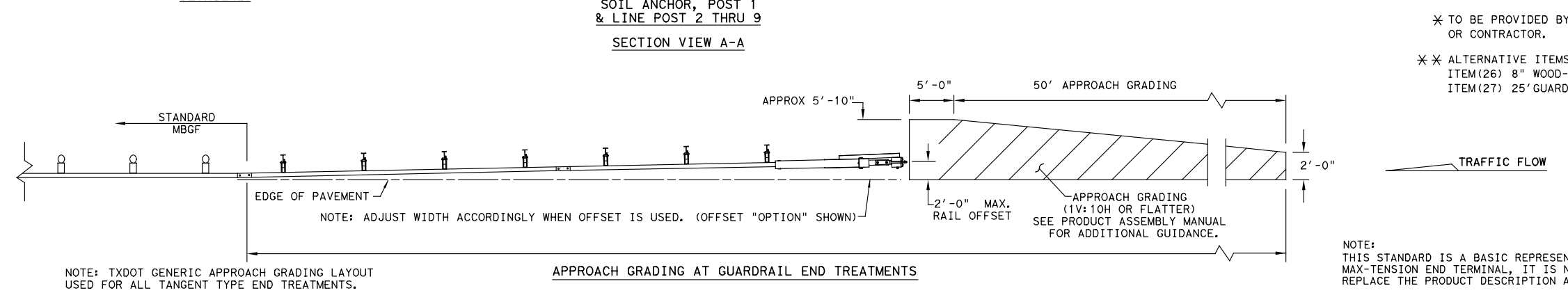
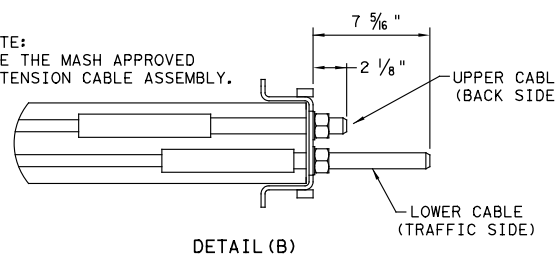
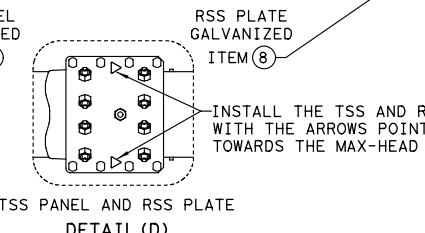
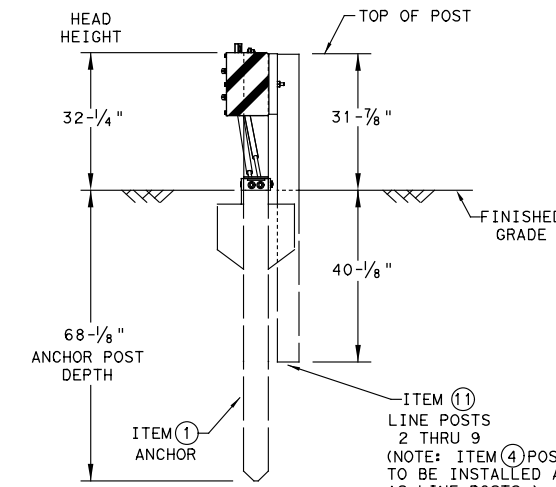
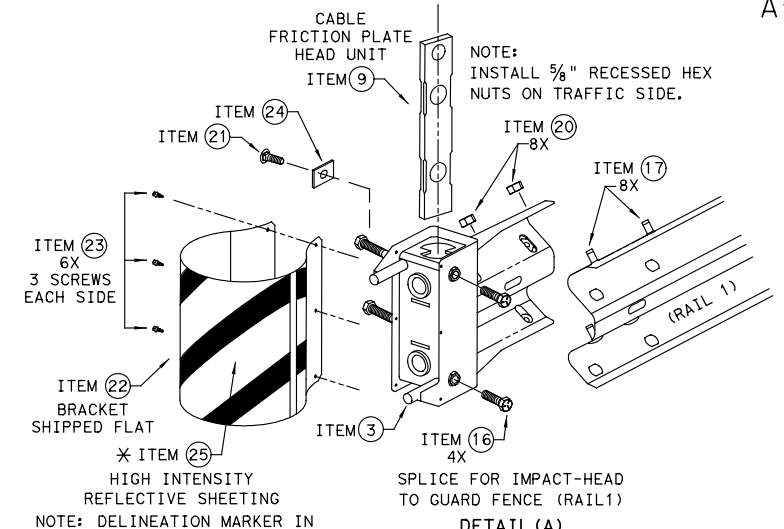
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- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
 - FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE: MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
 - COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
 - MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
 - IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
 - THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
 - A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM#	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT. - GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST - GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5) GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5) GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2) MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2) MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5) GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1



* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
 ITEM (26) 8" WOOD-BLOCKOUTS
 ITEM (27) 25' GUARD FENCE PANELS

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

Texas Department of Transportation
 Design Division Standard

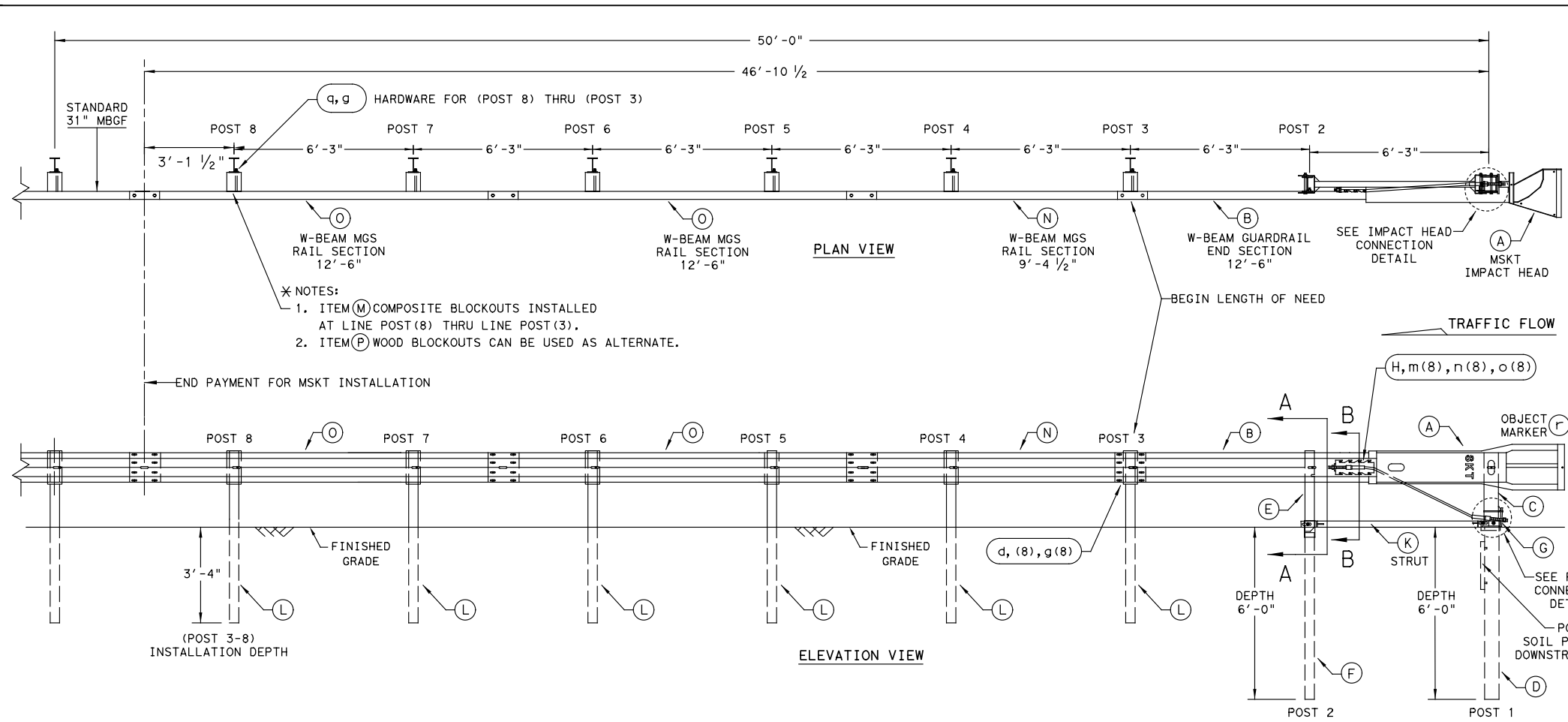
**MAX-TENSION END TERMINAL
 MASH - TL-3**

SGT (11S) 31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.	
SAN	GUADALUPE		205	

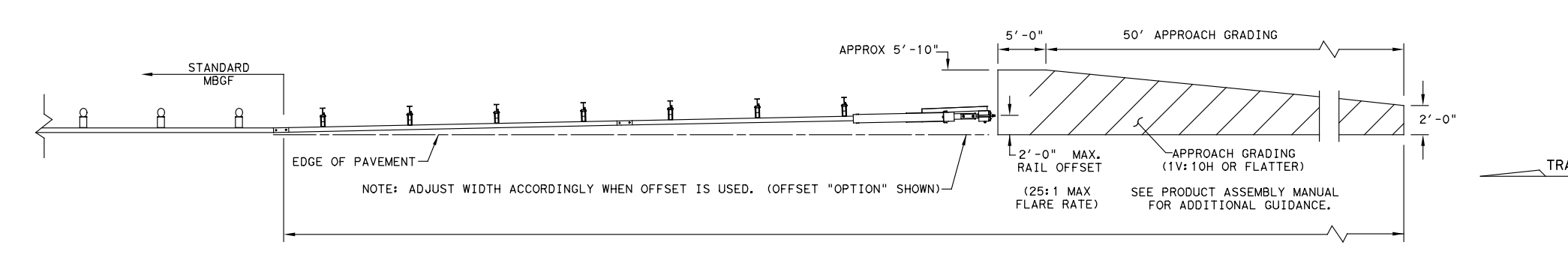
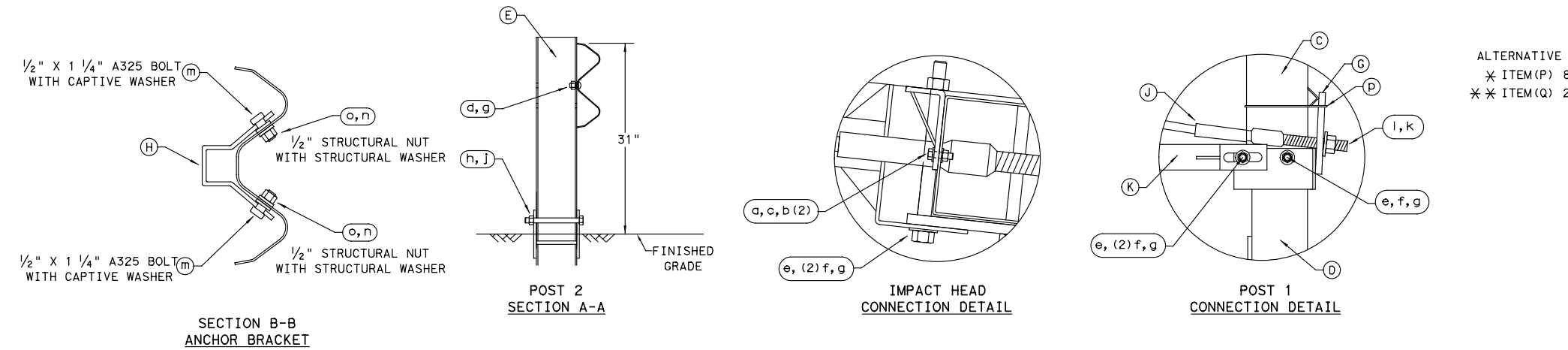
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- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
 - 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.
 - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBSGF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBSGF.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
 - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBSGF PANELS, ONE 25'-0" MBSGF PANEL IS ALSO ALLOWED IN ITS PLACE.
 - 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 1/8" O.D. x 3/8" 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



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

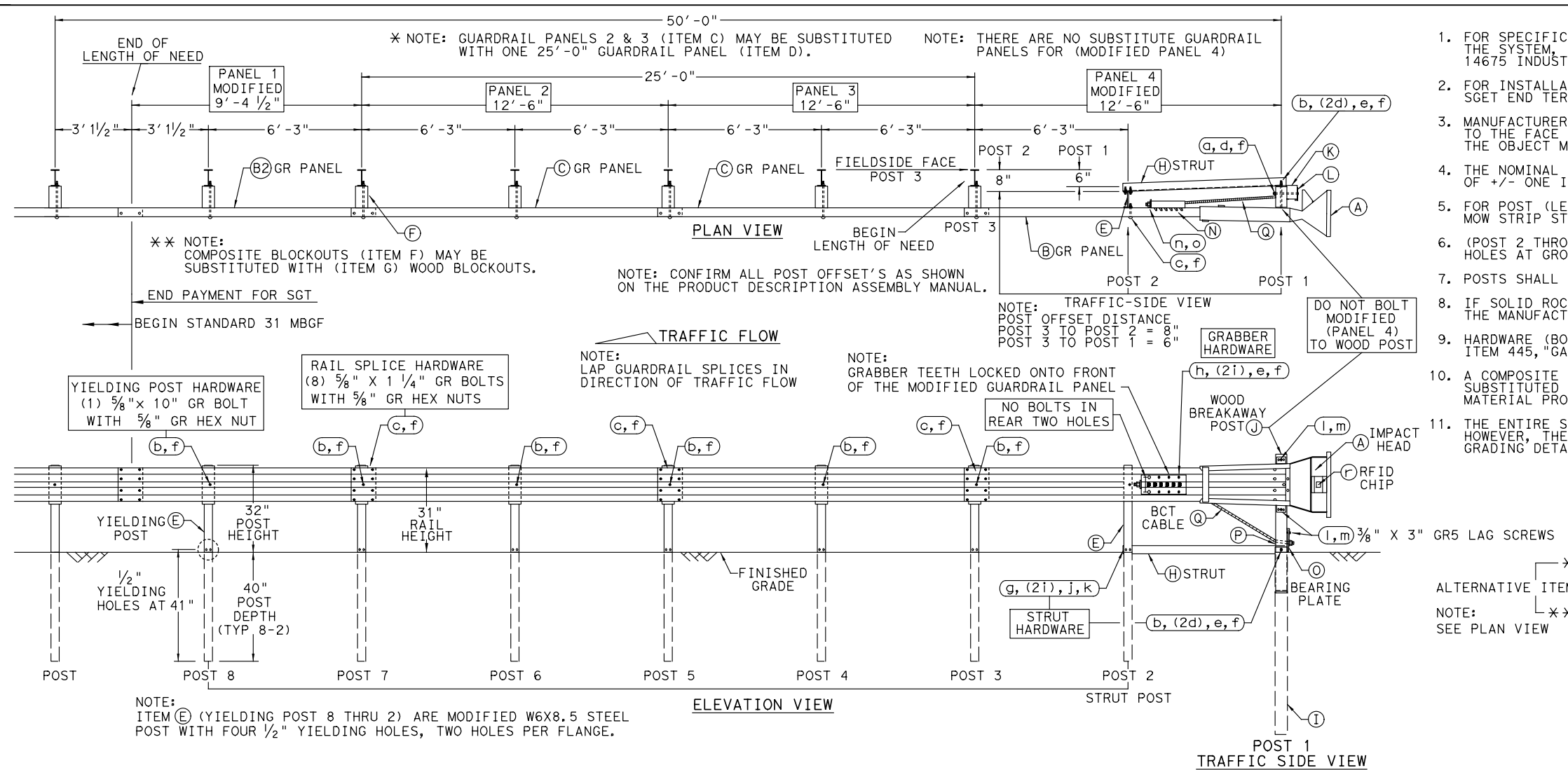
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Design Division Standard

SINGLE GUARDRAIL TERMINAL
 MSKT-MASH-TL-3
 SGT (12S) 31-18

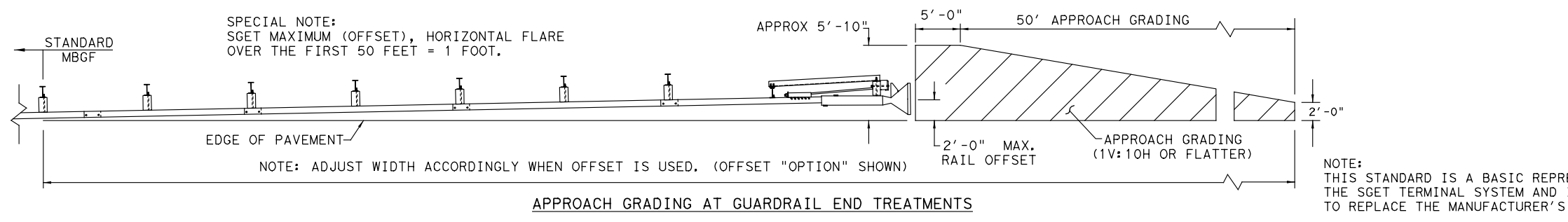
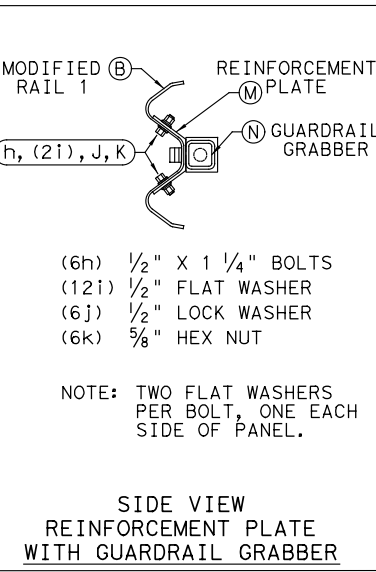
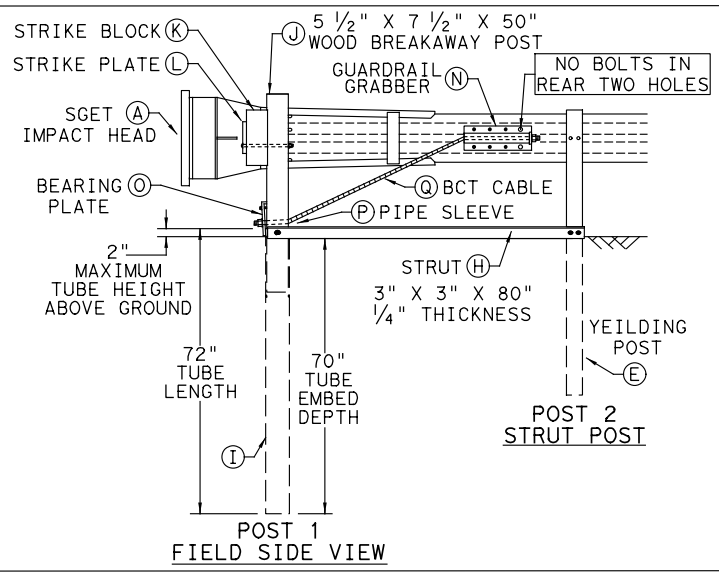
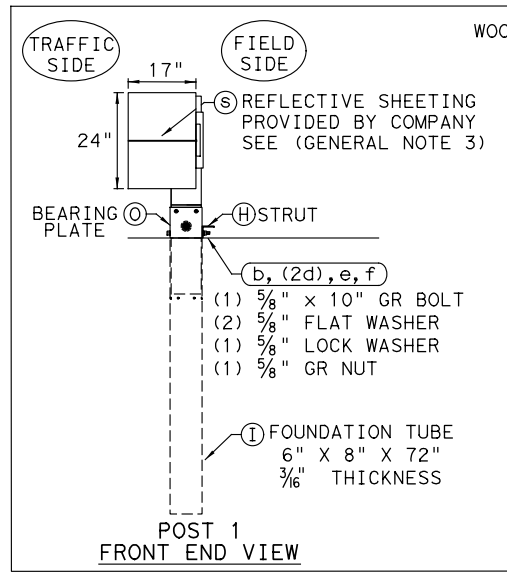
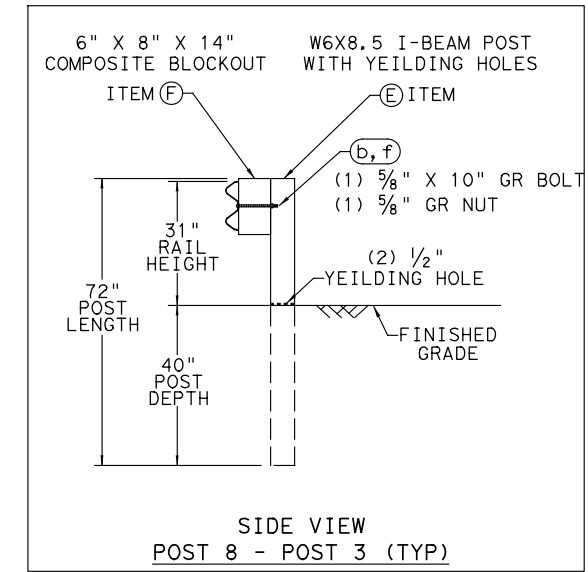
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DIST	COUNTY	SHEET NO.		
SAN	GUADALUPE			206

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- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
 - MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
 - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

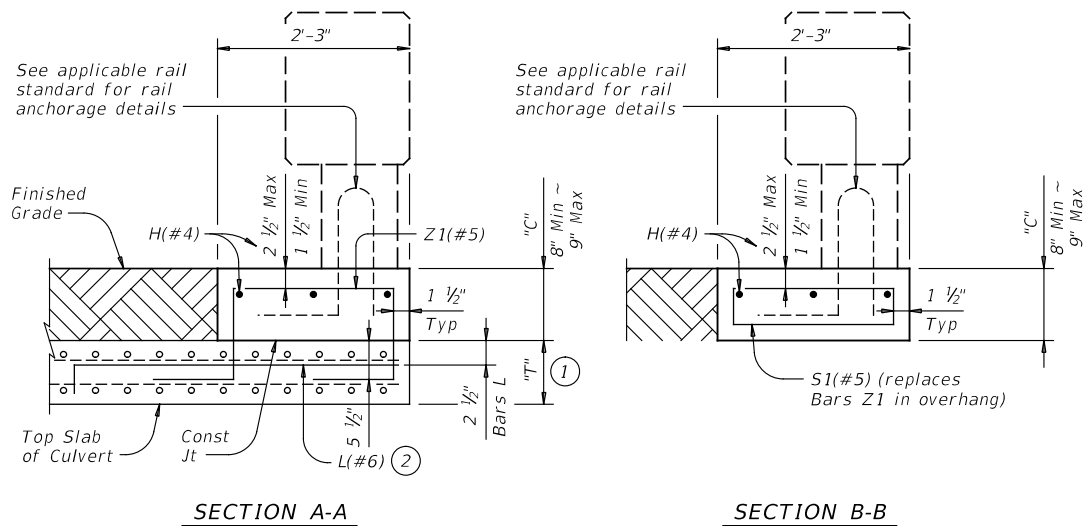
ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WB08
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
SMALL HARDWARE			
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



Design Division Standard
 SPIG INDUSTRY, LLC
 SINGLE GUARDRAIL TERMINAL
 SGET - TL-3 - MASH
 SGT (15) 31-20
 FILE: sgt153120.dgn
 DN: TXDOT
 CK: KM
 DW: VP
 CK: VP
 © TXDOT: APRIL 2020
 CONT: 0215
 SECT: 09
 JOB: 035
 HIGHWAY: FM 725
 REVISIONS
 DIST: COUNTY
 SAN: GUADALUPE
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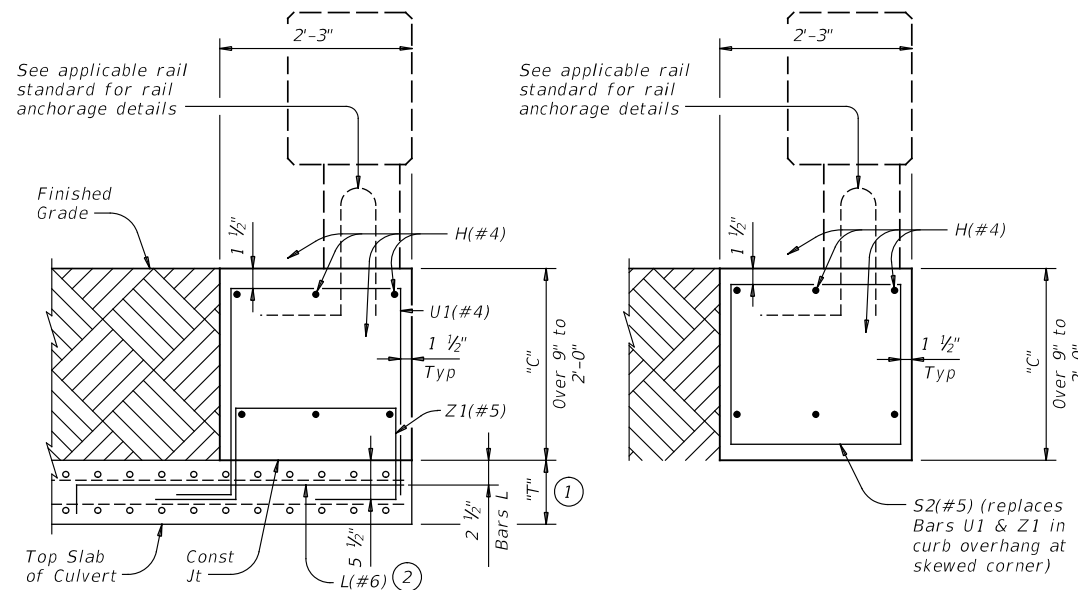


SECTION A-A

SECTION B-B

TYPE 1 CURB

Used for curbs from 8" to 9" (Showing "C" = 9"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.

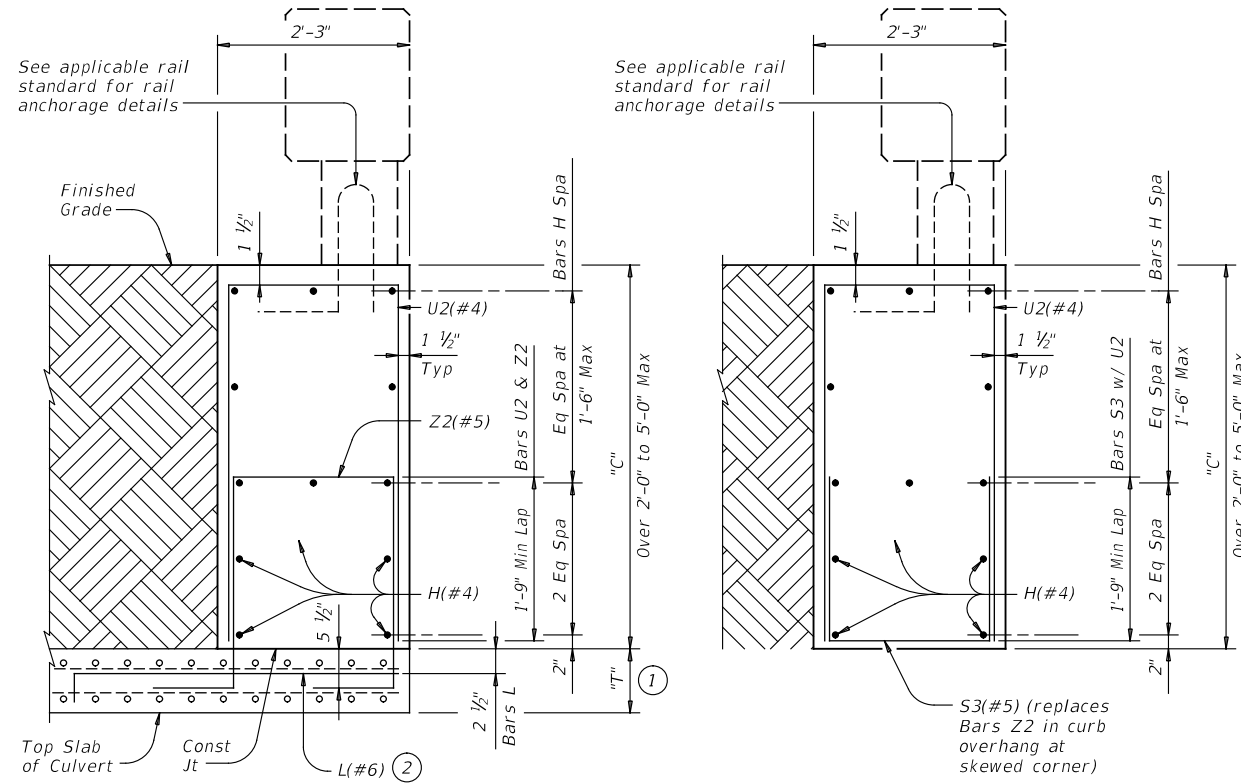


SECTION A-A

SECTION B-B

TYPE 2 CURB

Used for curbs over 9" to 2'-0" (Showing "C" = 2'-0"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.

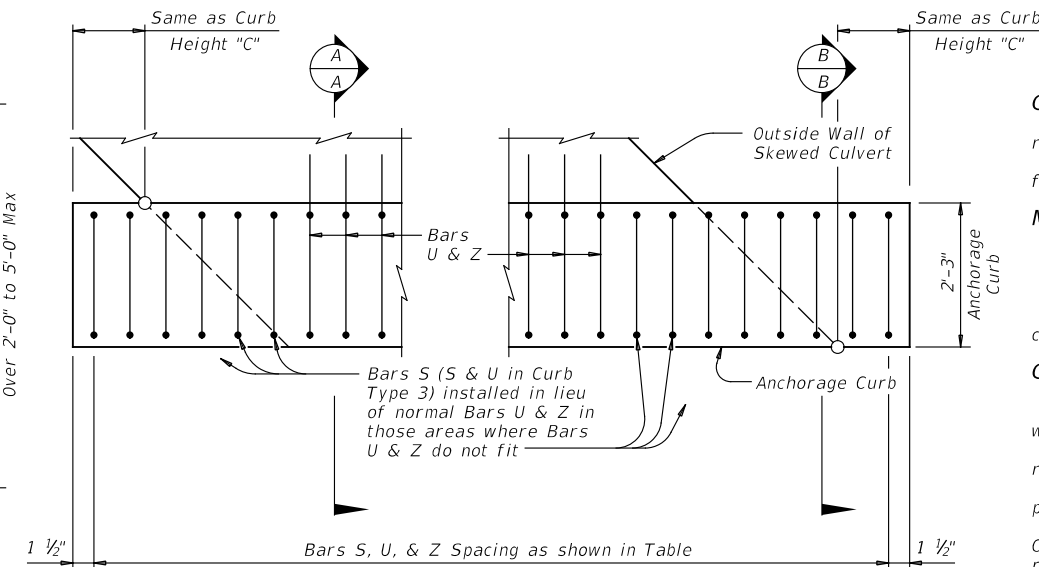


SECTION A-A

SECTION B-B

TYPE 3 CURB

Used for curbs over 2'-0" to 5'-0" (Showing "C" = 4'-0"). Showing T223 Rail, other rails similar. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.



TYPICAL CURB PLAN

Showing typical installation on skewed culvert. (Bars L(#5) on T223 and C223 Rails are not used for this structure). Bars RH(#5) required on standards T80HT, T80SS and T224 are not required when used with the RAC standard.

TABLE OF REINFORCING SPACING		
Curb Height "C"	Section Type	Bars S, U, & Z Spa
8" to 9"	1	12"
Over 9" to 2'-0"	2	9"
Over 2'-0" to 3'-0"	3	7"
Over 3'-0" to 5'-0"	3	5"

TABLE OF ESTIMATED QUANTITIES (4)			
Curb Height "C"	Section Type	Reinf Steel (Lb/LF)	Class "C" Concrete (CY/LF)
8"	1	21.5	0.056
9"	1	21.5	0.063
1'-0"	2	29.7	0.083
1'-6"	2	30.6	0.125
2'-0"	2	31.5	0.167
3'-0"	3	44.6	0.250
4'-0"	3	56.8	0.333
5'-0"	3	60.0	0.417

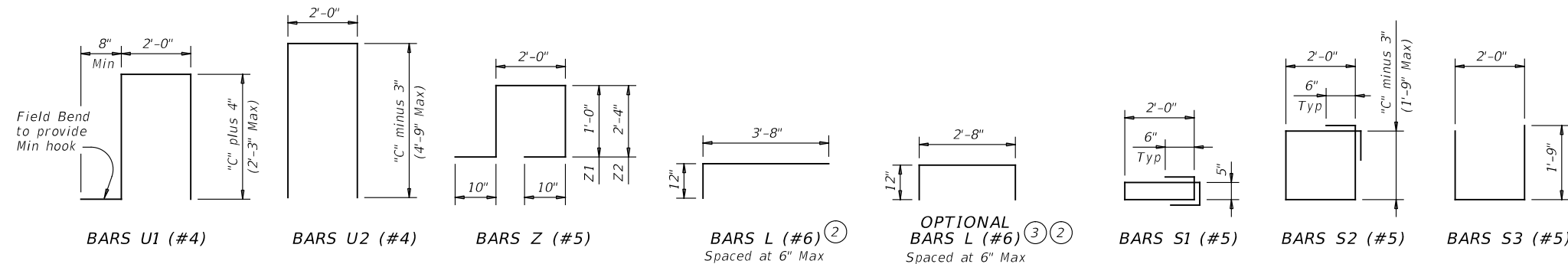
- "T" is equal to the culvert top slab thickness. For Precast Boxes with slabs less than 8" thick, see SCP-MD Standard for additional details.
- Tilt Bars L hook as necessary to maintain cover.
- Optional Bars L are to be used only for Precast Box Culverts with 3'-0" closure pours.
- Quantities shown are for Contractor's information only. Quantities are per Linear Foot of curb length. The values for each section type in table can be interpolated for intermediate values of Curb Height, "C".

CONSTRUCTION NOTES:
 When using this anchorage curb, omit normal culvert curb reinforcing bars K and H shown on the culvert standard sheets. For vehicle safety, the top of the curb must be flush with the finished grade.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Galvanize all reinforcing steel if required elsewhere.
 Provide bar laps, where required, as follows:
 Uncoated or galvanized ~ #4 = 1'-11"
 Provide Class "C" concrete (f'c=3,600 psi). Provide Class "C" (HPC) concrete if shown elsewhere in the plans.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. The rail anchorage curb details have sufficient strength for use with all standard rail types. See appropriate rail standard for approved design speed restrictions, notes and details not shown. This anchorage curb is considered part of the Box Culvert for payment. These details are for use with curbs that are 8" to 5'-0" tall only. Curb heights that are less than or greater than those shown will require special design.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



Texas Department of Transportation Bridge Division Standard

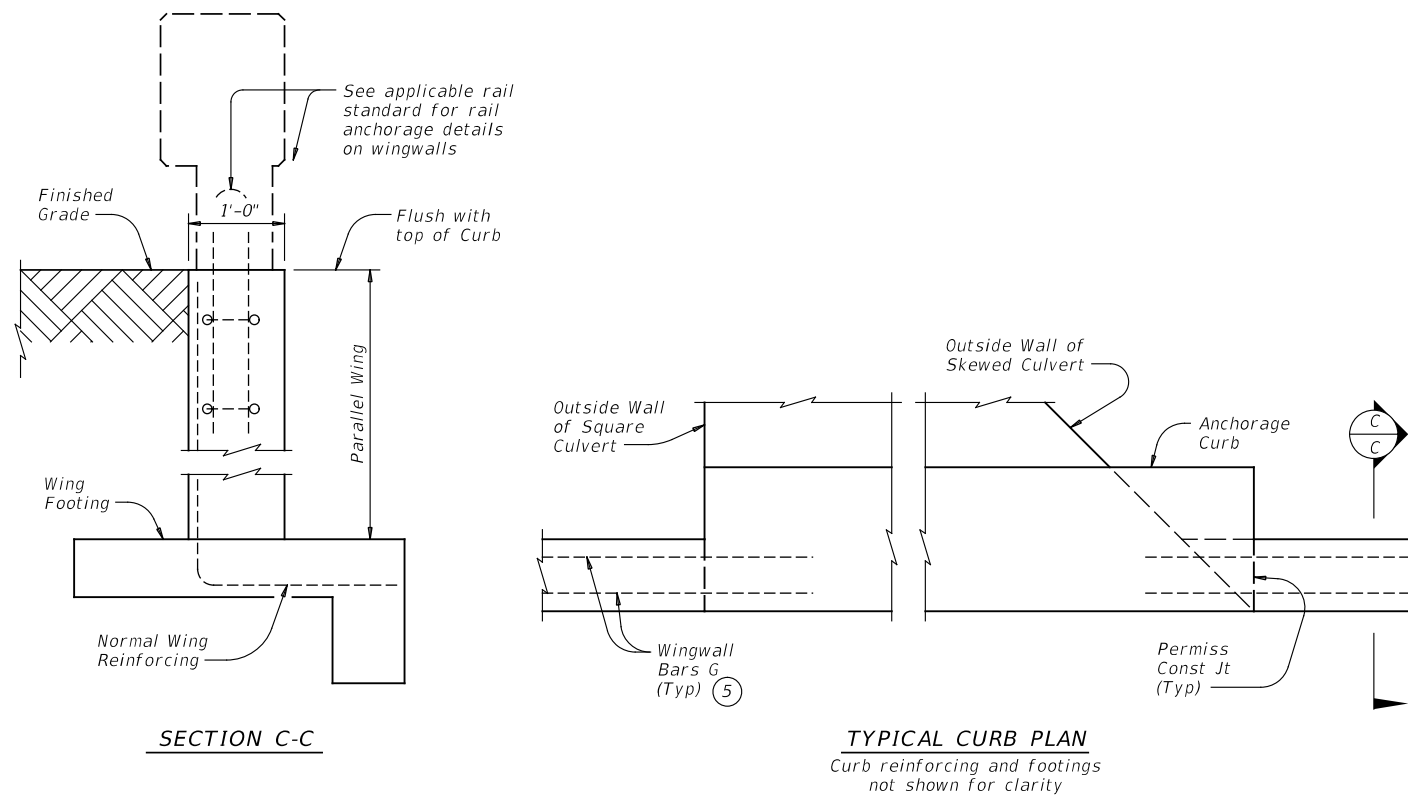
RAIL ANCHORAGE CURB BOX CULVERT RAIL MOUNTING DETAILS (CURBS 8" TO 5'-0" TALL ONLY)

RAC

FILE: racste01-20.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
REVISIONS	CONT	SECT	JOB	HIGHWAY
0215	09	035	FM 725	
DIST	COUNTY		SHEET NO.	
SAN	GUADALUPE		208	

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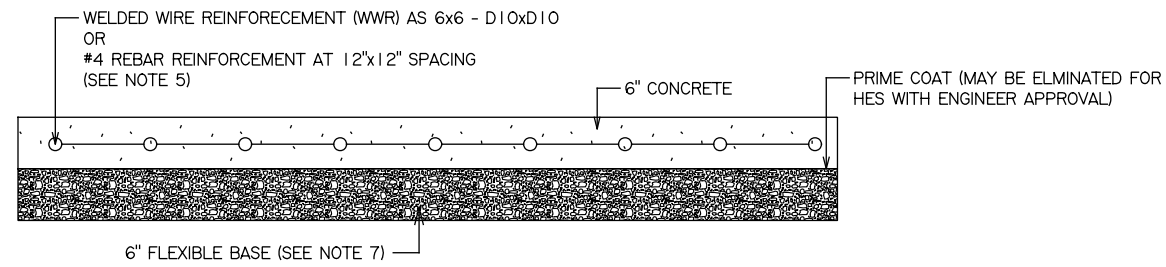
INSTALLATION AT PARALLEL CULVERT WINGWALLS

See culvert wingwall standard for bars and details not shown.

⑤ Bars G (#5), as identified on the PARALLEL WINGS PW standard sheet, must extend 1'-6" into the Anchorage Curb similar to that shown for a normal culvert curb.

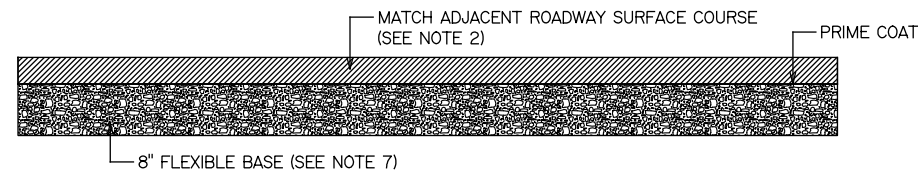
SHEET 2 OF 2

			Bridge Division Standard		
<p>RAIL ANCHORAGE CURB BOX CULVERT RAIL MOUNTING DETAILS <i>(CURBS 8" TO 5'-0" TALL ONLY)</i></p> <p style="font-size: 1.2em;">RAC</p>					
FILE: racste01-20.dgn		DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020		CONT: 0215	SECT: 09	JOB: 035	HIGHWAY: FM 725
REVISIONS					
		DIST: SAN	COUNTY: GUADALUPE		SHEET NO.: 209



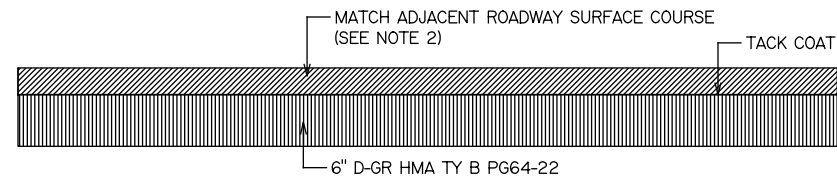
TYPICAL CONCRETE DRIVEWAY

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



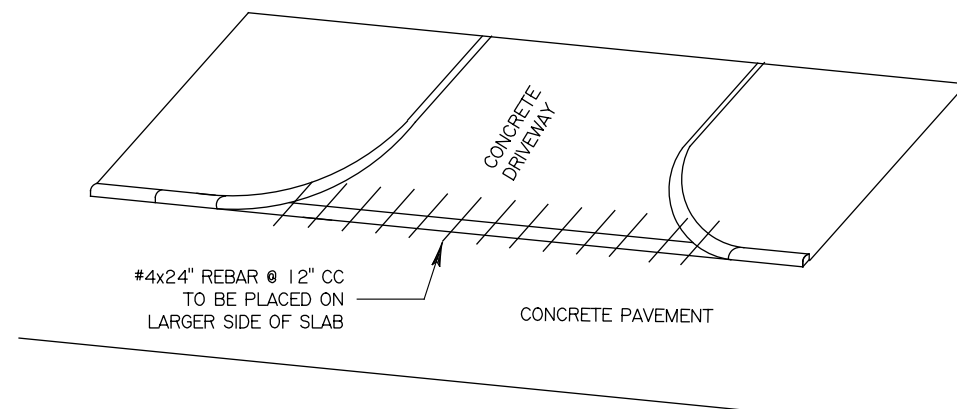
TYPICAL ROADWAY DRIVEWAY (TYPE 1)

PAID AS DRIVEWAYS ACP (TYPE 1)

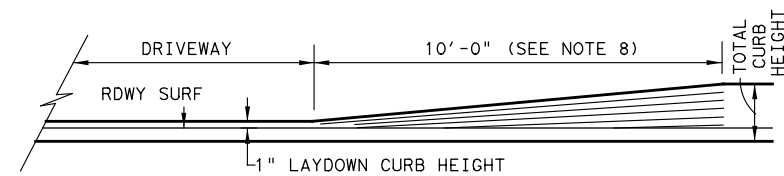


TYPICAL ROADWAY DRIVEWAY (TYPE 2)

PAID AS DRIVEWAYS ACP (TYPE 2)



TIE BAR PLACEMENT WITH CRCP



LAYDOWN CURB AT DRIVEWAYS DETAIL

NOTES:

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

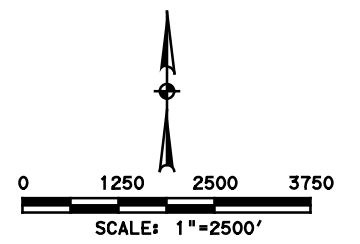
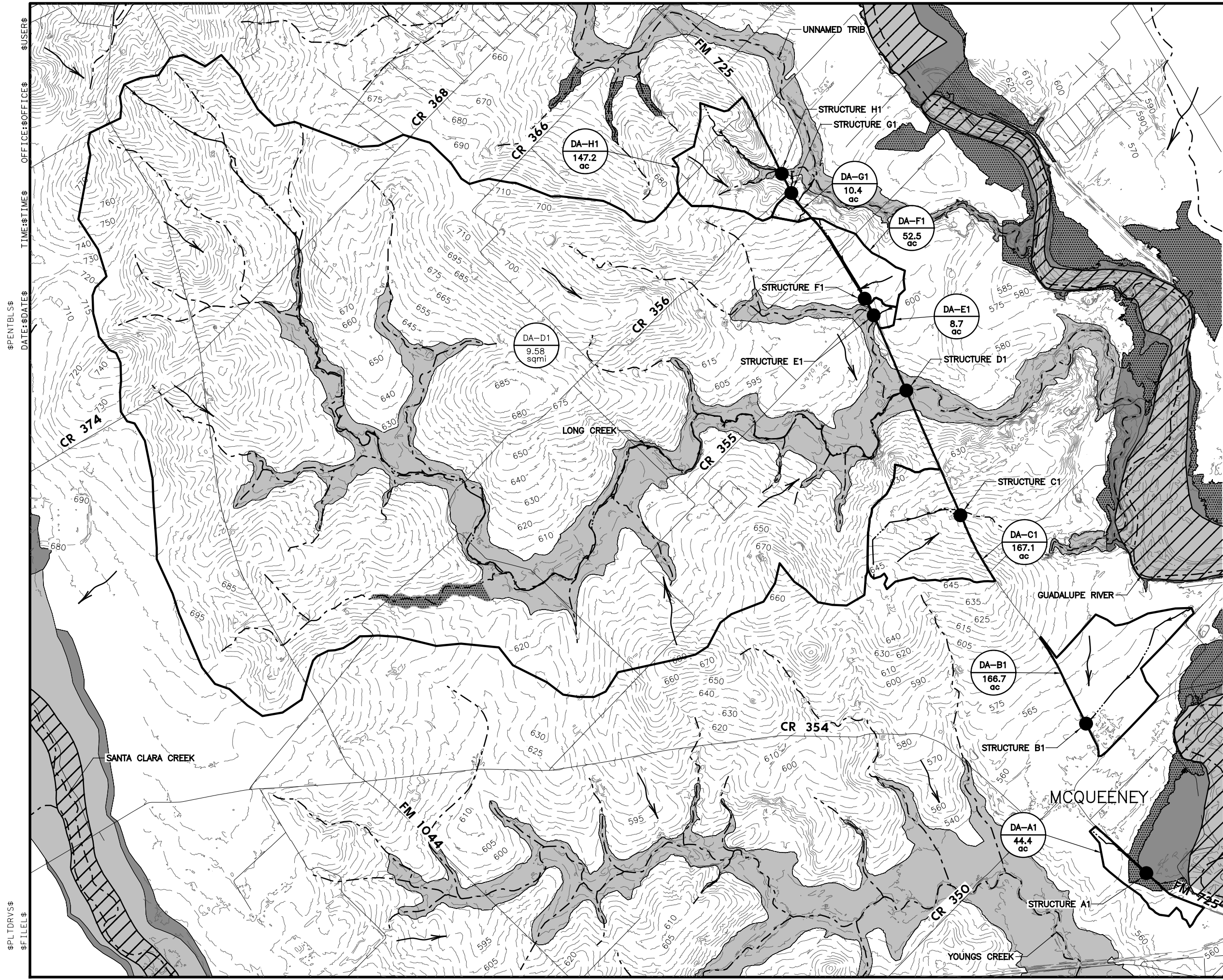
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DRIVEWAY DETAILS
San Antonio District Standard
Sheet (1 of 1)

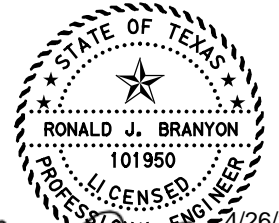
T:\Engdata\Standards\Drivewaydetails.dgn		PREPARED BY AND FOR USE OF TxDOT.			
ORIGINAL DRAWING DATE: 8/1/2020	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET	
REVISIONS	SAN	6		210	
	COUNTY	CONTROL SECTION	JOB	HIGHWAY	
	GUADALUPE	0215 09	035	FM 725	



- DRAINAGE LEGEND**
- DA-XX
X.X
ac
 - DRAINAGE AREA
 - CROSS DRAINAGE STRUCTURE
 - EFFECTIVE FLOODWAY
 - EFFECTIVE ZONE A SFHA
 - EFFECTIVE ZONE AE SFHA
 - EFFECTIVE ZONE X 0.2% AC
 - FLOW
 - FLOW PATH
 - STREAM CL
 - 5-FT LIDAR CONTOURS
 - EXTERNAL DA BOUNDARY

1. FOR DRAINAGE AREA CALCULATIONS REFER TO THE DRAINAGE AREA HYDROLOGIC DATA SHEET.
2. EFFECTIVE FLOODPLAIN SOURCE FEMA FIRM PANELS 48187C0115F, 48187C0120F, 48187C0255F, AND 48187C0260F EFFECTIVE NOVEMBER 2, 2007.
3. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



Ron Branyon
HR
 HDR
 Firm Registration No. F-754
 613 NW Loop 410, Suite 700
 San Antonio, Texas 78216
 210.841.2800

HALFF
 100 NE LOOP 410, SUITE 200
 SAN ANTONIO, TEXAS 78216-4741
 TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation
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**FM 725
 DRAINAGE
 EXTERNAL DRAINAGE
 AREA MAP**

SHEET 1 OF 1

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 211
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
		HIGHWAY NO. FM 725

\$PENLDRVSS \$FILEL\$ \$SPLTRVSS \$DATE: \$DATE\$ \$TIME: \$TIME\$ \$OFFICE: \$OFFICE\$ \$USERS\$

\$USERS\$ OFFICE:\$OFFICES\$ TIME:\$TIME\$ DATE:\$DATE\$ \$PENTBL\$ \$PLTDV\$ \$FILEL\$

Rational Method Hydrologic Computations (Interior Drainage)

Structure No.	STA	Area (ACRE)	Area (SQ. MI)	C-Value	Tc (MIN)	I5 (IN/HR)	Q5* (CFS)	I10 (IN/HR)	Q10 (CFS)	I25 (IN/HR)	Q25 (CFS)	I50 (IN/HR)	Q50 (CFS)	I100 (IN/HR)	Q100 (CFS)
A1	55+94	44.4	0.07	0.25	61.5	2.36	27	2.85	33	4	41	4.07	47	4.65	53
B1	107+40	166.7	0.26	0.22	95.6	1.84	68	2.23	82	3	102 **	3.21	118	3.69	136
C1	173+27	167.1	0.26	0.20	33.2	3.46	116	4.15	139	5	171 **	5.82	195	6.61	221
E1	232+00	8.7	0.01	0.22	26.8	3.91	8	4.68	10	6	12	6.53	13	7.39	15
F1	237+08	52.5	0.08	0.22	29.5	3.71	43	4.44	51	5	62	6.21	71	7.04	81
G1	271+66	10.4	0.02	0.38	19.1	4.66	19	5.55	23	7	27	7.70	31	8.67	35
H1	277+65	147.2	0.23	0.29	25.5	4.02	171	4.80	204	6	249	6.70	285	7.58	322

C-Values: Composite runoff values developed using SSURGO soil classification and landuse including undeveloped (sand, 0%-3% & black soil, 0%-3%), industrial, residential (1/8 ac, 1/4 ac, 1/2 ac, 1 ac, and 2 ac lots), industrial, commercial, and impervious areas.

*Design storm

**25-YR Design storm unless otherwise noted.

Structure H1 located in FEMA Flood Zone A

CN Loss Method Hydrologic Computations (External Drainage)

Structure No.	STA	Contributing Subbasin(s)	Area (ACRE)	Area (SQ. MI)	Composite CN	Tlag (MIN)	Q10 (CFS)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)
-	-	D1	6,129	9.58	69.0	167.13	3,397	5,114	6,574	8,243
-	-	E1	9	0.01	74.7	16.06	27	37	45	54
-	-	F1	52	0.08	75.9	17.68	154	212	257	306

Composite CN: Composite curve number values developed using SSURGO hydrologic soil groups and landuse including undeveloped, industrial, residential (1/4 ac, 1/2 ac, 1 ac, and 2ac lots), and impervious areas.

Cumulative External Drainage Hydrologic Computations

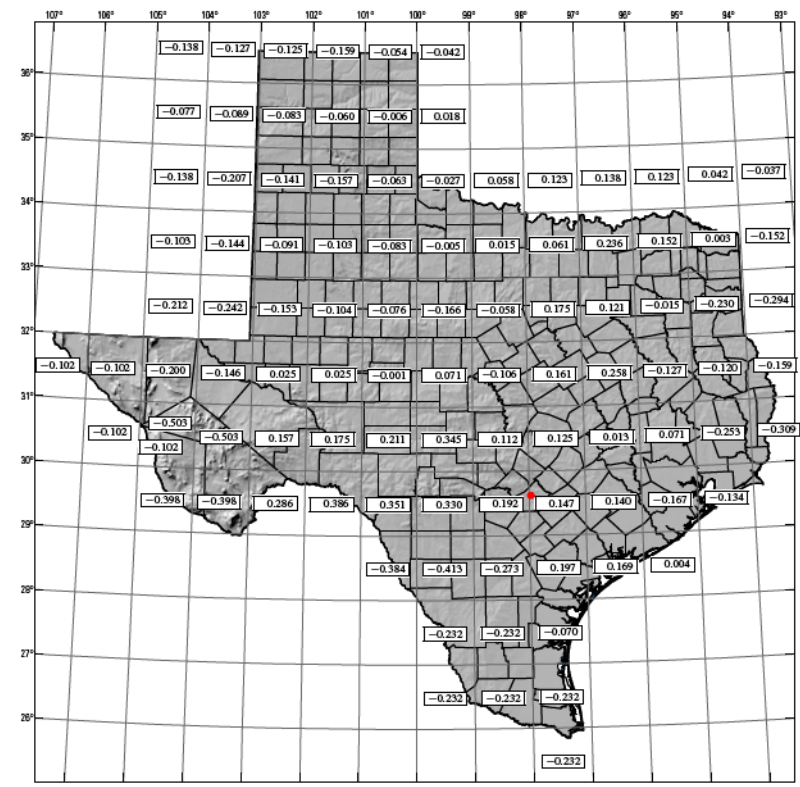
Structure No.	STA	Contributing Subbasin(s)	Area (ACRE)	Area (SQ. MI)	Q10 (CFS)	Q25* (CFS)	Q50 (CFS)	Q100 (CFS)
D1	210+00	D1, E1, F1	6,191	9.67	3,408	5,130	6,594	8,268

*Design storm

Structure D1 located in FEMA Flood Zone A

Regional Regression Computations

Structure No.	STA	Contributing Subbasin(s)	Area (ACRE)	Area (SQ. MI)	MEAN ANNUAL PRECIP. (IN)	MAIN CHANNEL SLOPE (FT/FT)	OmegaEm PARAMETER	DESIGN YEAR	a	b	c	d	e	f	Q (cfs)
D1	210+00	D1, E1, F1	6,191	9.67	33	0.00407	0.147	10-YR	13.62	-11.97	1.203	0.403	0.918	-0.0289	2,560
								25-YR	11.79	-9.819	1.14	0.446	0.945	-0.0374	3,749
								50-YR	11.17	-8.997	1.105	0.476	0.961	-0.0424	4,784
								100-YR	10.82	-8.448	1.071	0.507	0.969	-0.0467	6,004



Base from Texas Natural Resources Information System digital data
 Scale 1:7,500,000
 Albers equal-area projection, datum NAD 83
 Standard parallels 27°30' and 35°00', latitude of origin 31°00', central meridian -100°00'
 Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

HILL-SHADE RELIEF IN TEXAS WITH SUPERIMPOSED VALUES OF OmegaEm PARAMETER THAT REPRESENTS A GENERALIZED TERRAIN AND CLIMATE INDEX FOR REGIONALIZATION OF PEAK-STREAMFLOW FREQUENCY

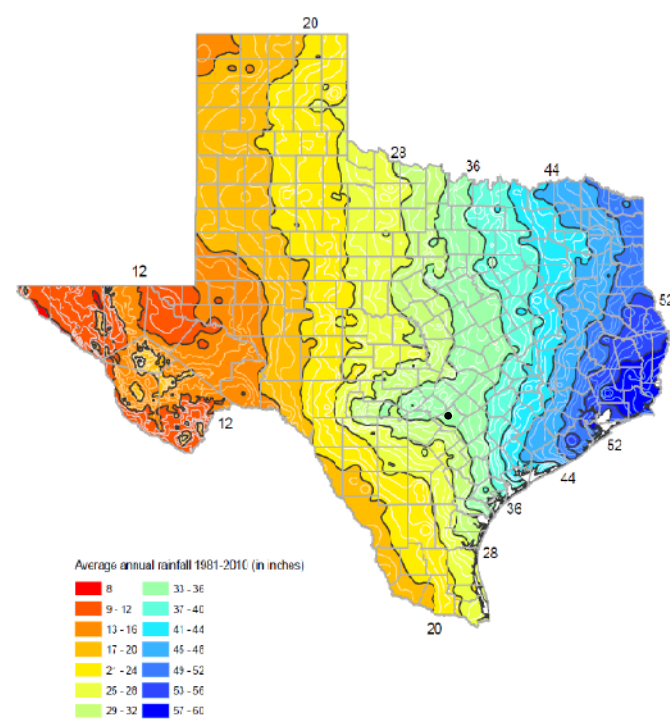


Figure 4-6. Mean annual precipitation, in inches (Source: Texas Water Development Board 2017)

MEAN ANNUAL PRECIPITATION (P) MAP OF TEXAS

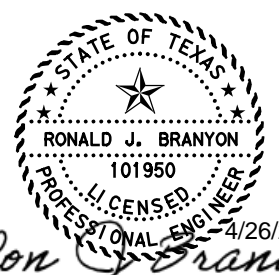
DESIGN REQUIREMENTS:

- MINOR CULVERTS 5-YEAR DESIGN STORM EVENT CAPACITY.
- BRIDGE CLASS CULVERTS 25-YEAR DESIGN STORM EVENT CAPACITY.
- LESS THAN 1-FOOT RISE IN 100-YEAR WSE OUTSIDE TXDOT ROW PER FEMA GUIDELINES.
- NO SIGNIFICANT ADVERSE IMPACTS TO EXISTING INSURABLE STRUCTURES.

NOTES:

- TXDOT HYDRAULIC DESIGN MANUAL (HDM), SEPTEMBER 2019, WAS USED TO DETERMINE HYDROLOGIC DATA.
- BASE CN DEVELOPED USING SSURGO HYDROLOGIC SOIL GROUPS AND LANDUSE CURVE NUMBERS WITH ANTECEDENT MOISTURE CONDITION (AMC) II. CN CLIMATIC ADJUSTMENT FACTOR OF -15 APPLIED PER HDM FIGURE 4-22, WITH A BASE CN LOWER LIMIT OF AMC I.
- PEAK FLOWS (HEC-HMS V4.3) DEVELOPED USING ATLAS 14 DDF INFORMATION LOCATED IN GUADALUPE COUNTY ZONE 1 PER THE TXDOT EBDLKUP-2019-V6.2.10 SPREADSHEET.
- OMEGA EM REGIONAL REGRESSION EQUATIONS COMPARED TO TR-55 METHOD BECAUSE DRAINAGE AREAS > 5 SQ MI AND < 10 SQ MI.
- EFFECTIVE FLOODPLAIN SOURCE FIRM PANELS 48187C0115F AND 48187C0260F EFFECTIVE NOVEMBER 2, 2007.
- INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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 HDR
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Texas Department of Transportation
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**FM 725
 DRAINAGE
 HYDROLOGIC
 DATA SHEET**

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	212	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Q CULVERT A1

Beginning chain CULV_A1 description

Point A101 N 13,767,768.8005 E 2,271,253.3372 Sta 10+00.00

Course from A101 to A102 N 43° 00' 52.00" E Dist 85.1745

Point A102 N 13,767,831.0785 E 2,271,311.4418 Sta 10+85.17

Ending chain CULV_A1 description

Q CULVERT B1

Beginning chain CULV_B1 description

Point B101 N 13,771,823.8236 E 2,269,611.0554 Sta 10+00.00

Course from B101 to B102 N 63° 22' 56.01" E Dist 100.0011

Point B102 N 13,771,868.6277 E 2,269,700.4579 Sta 11+00.00

Ending chain CULV_B1 description

Q CULVERT C1

Beginning chain CULV_C1 description

Point C101 N 13,777,452.0962 E 2,266,231.6591 Sta 10+00.00

Course from C101 to C102 N 66° 15' 49.01" E Dist 100.0003

Point C102 N 13,777,492.3492 E 2,266,323.2000 Sta 11+00.00

Ending chain CULV_C1 description

Q CULVERT D1

Beginning chain CULV_D1 description

Point D101 N 13,780,934.4186 E 2,264,814.6476 Sta 10+00.00

Course from D101 to D102 N 66° 36' 25.43" E Dist 99.9954

Point D102 N 13,780,974.1203 E 2,264,906.4237 Sta 11+00.00

Ending chain CULV_D1 description

Q CULVERT E1

Beginning chain CULV_E1 description

Point E101 N 13,782,833.2400 E 2,263,883.2664 Sta 10+00.00

Course from E101 to E102 N 65° 49' 34.71" E Dist 116.2750

Point E102 N 13,782,880.8551 E 2,263,989.3450 Sta 11+16.28

Ending chain CULV_E1 description

Q CULVERT F1

Beginning chain CULV_F1 description

Point F101 N 13,783,278.2288 E 2,263,650.3325 Sta 10+00.00

Course from F101 to F102 N 58° 47' 29.69" E Dist 97.4334

Point F102 N 13,783,328.7142 E 2,263,733.6661 Sta 10+97.43

Ending chain CULV_F1 description

Q CULVERT G1

Beginning chain CULV_G1 description

Point G101 N 13,786,105.6619 E 2,261,672.0545 Sta 10+00.00

Course from G101 to G102 N 60° 19' 49.94" E Dist 111.0056

Point G102 N 13,786,160.6092 E 2,261,768.5068 Sta 11+11.01

Ending chain CULV_G1 description

Q CULVERT H1

Beginning chain CULV_H1 description

Point H101 N 13,786,642.7071 E 2,261,401.3327 Sta 10+00.00

Course from H101 to H102 N 63° 06' 47.87" E Dist 109.9999

Point H102 N 13,786,692.4521 E 2,261,499.4418 Sta 11+10.00

Ending chain CULV_H1 description



2/28/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725

CULVERT
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 213
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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☉ DITCH RR-S

Beginning chain D_RRS description
 Feature: Grade_DitchBottom

=====

Point 1988	N	13,766,512.8625	E	2,273,833.5846	Sta	10+00.00
Course from 1988 to 1989 N 72° 12' 53.12" W Dist 45.0809						
Point 1989	N	13,766,526.6325	E	2,273,790.6582	Sta	10+45.08
Course from 1989 to 1990 N 73° 48' 00.12" W Dist 73.0322						
Point 1990	N	13,766,547.0078	E	2,273,720.5258	Sta	11+18.11
Course from 1990 to 1991 N 71° 16' 35.20" W Dist 51.1088						
Point 1991	N	13,766,563.4139	E	2,273,672.1218	Sta	11+69.22
Course from 1991 to 1992 N 72° 22' 35.06" W Dist 41.5273						
Point 1992	N	13,766,575.9867	E	2,273,632.5436	Sta	12+10.75
Course from 1992 to 1993 N 71° 20' 19.63" W Dist 54.6442						
Point 1993	N	13,766,593.4713	E	2,273,580.7722	Sta	12+65.39
Course from 1993 to 1994 N 71° 59' 12.05" W Dist 41.6457						
Point 1994	N	13,766,606.3498	E	2,273,541.1678	Sta	13+07.04
Course from 1994 to 1995 N 73° 53' 01.08" W Dist 24.8071						
Point 1995	N	13,766,613.2360	E	2,273,517.3356	Sta	13+31.85
Course from 1995 to 1996 N 72° 28' 41.04" W Dist 37.0938						
Point 1996	N	13,766,624.4038	E	2,273,481.9629	Sta	13+68.94
Course from 1996 to 1997 N 70° 00' 03.31" W Dist 70.4329						
Point 1997	N	13,766,648.4922	E	2,273,415.7772	Sta	14+39.37

=====

☉ DITCH A1-N1

Beginning chain D_A1N1 description
 Feature: Grade_DitchLine

=====

Point 1244	N	13,767,019.0809	E	2,272,553.0760	Sta	10+00.00
Course from 1244 to 1245 N 70° 46' 06.35" W Dist 17.1607						
Point 1245	N	13,767,024.7334	E	2,272,536.8730	Sta	10+17.16
Course from 1245 to 1246 N 70° 28' 53.17" W Dist 110.1834						
Point 1246	N	13,767,061.5470	E	2,272,433.0214	Sta	11+27.34
Course from 1246 to 1247 N 67° 51' 49.23" W Dist 106.7454						
Point 1247	N	13,767,101.7699	E	2,272,334.1442	Sta	12+34.09
Course from 1247 to 1248 N 64° 12' 14.22" W Dist 47.5303						
Point 1248	N	13,767,122.4537	E	2,272,291.3504	Sta	12+81.62
Course from 1248 to 1249 N 75° 55' 46.87" W Dist 36.1878						
Point 1249	N	13,767,131.2514	E	2,272,256.2483	Sta	13+17.81
Course from 1249 to 1250 S 85° 48' 37.20" W Dist 8.4396						
Point 1250	N	13,767,130.6348	E	2,272,247.8313	Sta	13+26.25
Course from 1250 to 1252 N 65° 38' 37.17" W Dist 103.8912						
Point 1252	N	13,767,173.4806	E	2,272,153.1866	Sta	14+30.14

☉ DITCH A1-N1 CONT.

Course from 1252 to 1253 N 64° 24' 47.19" W Dist 98.2208

Point 1253	N	13,767,215.9001	E	2,272,064.5981	Sta	15+28.36
Course from 1253 to 1254 N 63° 54' 13.89" W Dist 73.8421						
Point 1254	N	13,767,248.3817	E	2,271,998.2837	Sta	16+02.20

Ending chain D_A1N1 description

☉ DITCH A1-N2

Beginning chain D_A1N2 description
 Feature: Grade_DitchLine

=====

Point 1283	N	13,768,344.4661	E	2,270,748.7083	Sta	10+00.00
Course from 1283 to 1284 N 50° 17' 03.83" W Dist 72.7284						
Point 1284	N	13,768,390.9379	E	2,270,692.7638	Sta	10+72.73
Course from 1284 to 1285 N 46° 25' 53.45" W Dist 111.7985						
Point 1285	N	13,768,467.9918	E	2,270,611.7600	Sta	11+84.53
Course from 1285 to 1286 N 44° 54' 30.01" W Dist 43.4122						
Point 1286	N	13,768,498.7379	E	2,270,581.1121	Sta	12+27.94
Course from 1286 to 1287 N 47° 31' 36.34" W Dist 144.8170						
Point 1287	N	13,768,596.5250	E	2,270,474.2962	Sta	13+72.76
Course from 1287 to 1288 N 50° 46' 59.73" W Dist 14.2899						
Point 1288	N	13,768,605.5599	E	2,270,463.2249	Sta	13+87.05
Course from 1288 to 1289 N 47° 11' 52.34" W Dist 34.0228						
Point 1289	N	13,768,628.6773	E	2,270,438.2622	Sta	14+21.07
Course from 1289 to 1290 N 43° 25' 59.38" W Dist 41.4381						
Point 1290	N	13,768,658.7687	E	2,270,409.7732	Sta	14+62.51
Course from 1290 to 1291 N 47° 05' 31.54" W Dist 125.9823						
Point 1291	N	13,768,744.5402	E	2,270,317.4976	Sta	15+88.49
Course from 1291 to 1292 N 52° 20' 40.90" W Dist 31.3112						
Point 1292	N	13,768,763.6685	E	2,270,292.7085	Sta	16+19.80
Course from 1292 to 1293 N 47° 17' 20.69" W Dist 43.3225						
Point 1293	N	13,768,793.0541	E	2,270,260.8758	Sta	16+63.12
Course from 1293 to 1294 N 45° 12' 12.76" W Dist 50.7043						
Point 1294	N	13,768,828.7799	E	2,270,224.8953	Sta	17+13.83
Course from 1294 to 1295 N 47° 25' 10.21" W Dist 129.9836						
Point 1295	N	13,768,916.7301	E	2,270,129.1848	Sta	18+43.81
Course from 1295 to 1296 N 47° 09' 20.19" W Dist 311.3877						
Point 1296	N	13,769,128.4768	E	2,269,900.8743	Sta	21+55.20
Course from 1296 to 1297 N 48° 13' 00.17" W Dist 3.1081						
Point 1297	N	13,769,130.5478	E	2,269,898.5567	Sta	21+58.31

=====

Ending chain D_A1N2 description

2/28/2021

JOHNNY L. CLAYTON
107215

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.		REVISION		BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312					
Texas Department of Transportation © 2021					
FM 725 DITCH HORIZONTAL ALIGNMENT DATA					
SHEET 1 OF 13					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				214
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

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Q DITCH A1-S1

Beginning chain D_A1S1 description
 Feature: Grade_DitchBottom

=====			
Point 1255	N	13,766,962.5823 E	2,272,555.5536 Sta 10+00.00
Course from 1255 to 1256 N 70° 33' 40.31" W Dist 41.2165			
Point 1256	N	13,766,976.2992 E	2,272,516.6865 Sta 10+41.22
Course from 1256 to 1257 N 69° 52' 20.82" W Dist 65.5033			
Point 1257	N	13,766,998.8396 E	2,272,455.1836 Sta 11+06.72
Course from 1257 to 1258 N 70° 08' 45.96" W Dist 35.1656			
Point 1258	N	13,767,010.7826 E	2,272,422.1082 Sta 11+41.89
Course from 1258 to 1259 N 69° 37' 34.52" W Dist 100.9356			
Point 1259	N	13,767,045.9226 E	2,272,327.4870 Sta 12+42.82
Course from 1259 to 1260 N 72° 47' 35.79" W Dist 46.7772			
Point 1260	N	13,767,059.7602 E	2,272,282.8033 Sta 12+89.60
Course from 1260 to 1261 N 69° 35' 32.92" W Dist 30.7839			
Point 1261	N	13,767,070.4944 E	2,272,253.9516 Sta 13+20.38
Course from 1261 to 1262 N 66° 42' 07.60" W Dist 23.0514			
Point 1262	N	13,767,079.6115 E	2,272,232.7798 Sta 13+43.43
Course from 1262 to 1263 N 69° 39' 15.05" W Dist 76.5374			
Point 1263	N	13,767,106.2225 E	2,272,161.0175 Sta 14+19.97
Course from 1263 to 1264 N 65° 27' 11.69" W Dist 15.1652			
Point 1264	N	13,767,112.5226 E	2,272,147.2228 Sta 14+35.14
Course from 1264 to 1265 N 69° 26' 48.02" W Dist 30.9513			
Point 1265	N	13,767,123.3890 E	2,272,118.2417 Sta 14+66.09
Course from 1265 to 1266 N 72° 41' 42.55" W Dist 30.9405			
Point 1266	N	13,767,132.5924 E	2,272,088.7017 Sta 14+97.03
Course from 1266 to 1267 N 66° 28' 03.12" W Dist 63.1800			
Point 1267	N	13,767,157.8182 E	2,272,030.7761 Sta 15+60.21
Course from 1267 to 1268 N 67° 23' 39.18" W Dist 47.5779			
Point 1268	N	13,767,176.1066 E	2,271,986.8535 Sta 16+07.79
Course from 1268 to 1269 N 65° 14' 32.15" W Dist 66.7734			
Point 1269	N	13,767,204.0701 E	2,271,926.2176 Sta 16+74.56
Course from 1269 to 1270 N 60° 33' 55.37" W Dist 59.0290			
Point 1270	N	13,767,233.0787 E	2,271,874.8082 Sta 17+33.59
Course from 1270 to 1271 N 54° 23' 31.06" W Dist 27.6734			
Point 1271	N	13,767,249.1912 E	2,271,852.3092 Sta 17+61.26
Course from 1271 to 1272 N 50° 29' 35.19" W Dist 75.9652			
Point 1272	N	13,767,297.5181 E	2,271,793.6984 Sta 18+37.23
Course from 1272 to 1273 N 46° 16' 46.32" W Dist 37.0452			
Point 1273	N	13,767,323.1215 E	2,271,766.9251 Sta 18+74.27
Course from 1273 to 1274 N 49° 55' 36.95" W Dist 77.6195			
Point 1274	N	13,767,373.0901 E	2,271,707.5288 Sta 19+51.89

Q DITCH A1-S1 CONT.

Course from 1274 to 1275 N 47° 25' 20.85" W Dist 18.2612			
Point 1275	N	13,767,385.4454 E	2,271,694.0820 Sta 19+70.15
Course from 1275 to 1276 N 46° 50' 44.41" W Dist 88.5555			
Point 1276	N	13,767,446.0144 E	2,271,629.4795 Sta 20+58.71
Course from 1276 to 1277 N 46° 52' 11.79" W Dist 66.3196			
Point 1277	N	13,767,491.3542 E	2,271,581.0792 Sta 21+25.03
Course from 1277 to 1278 N 46° 35' 21.50" W Dist 96.5295			
Point 1278	N	13,767,557.6915 E	2,271,510.9557 Sta 22+21.56
Course from 1278 to 1279 N 47° 08' 01.59" W Dist 106.8858			
Point 1279	N	13,767,630.4047 E	2,271,432.6144 Sta 23+28.44
Course from 1279 to 1280 N 47° 46' 54.65" W Dist 130.8683			
Point 1280	N	13,767,718.3424 E	2,271,335.6944 Sta 24+59.31
Course from 1280 to 1281 N 47° 02' 45.43" W Dist 84.6630			
Point 1281	N	13,767,776.0327 E	2,271,273.7295 Sta 25+43.97
Course from 1281 to 1282 N 23° 26' 42.23" W Dist 11.3878			
Point 1282	N	13,767,786.4803 E	2,271,269.1986 Sta 25+55.36
=====			
Ending chain D_A1S1 description			

Q DITCH A1-S2

Beginning chain D_A1S2 description
 Feature: Grade_DitchBottom

=====			
Point 912	N	13,767,789.3583 E	2,271,265.8425 Sta 10+00.00
Course from 912 to 913 N 70° 21' 38.57" W Dist 14.5711			
Point 913	N	13,767,794.2556 E	2,271,252.1190 Sta 10+14.57
Course from 913 to 914 N 38° 01' 56.63" W Dist 19.1394			
Point 914	N	13,767,809.3310 E	2,271,240.3271 Sta 10+33.71
Course from 914 to 915 N 46° 32' 58.28" W Dist 69.7969			
Point 915	N	13,767,857.3323 E	2,271,189.6567 Sta 11+03.51
Course from 915 to 916 N 46° 47' 39.82" W Dist 93.4861			
Point 916	N	13,767,921.3346 E	2,271,121.5145 Sta 11+96.99
Course from 916 to 917 N 46° 51' 28.69" W Dist 107.5416			
Point 917	N	13,767,994.8726 E	2,271,043.0456 Sta 13+04.54
Course from 917 to 918 N 47° 46' 17.42" W Dist 46.9978			
Point 918	N	13,768,026.4593 E	2,271,008.2451 Sta 13+51.53
Course from 918 to 919 N 47° 04' 24.47" W Dist 49.8854			
Point 919	N	13,768,060.4342 E	2,270,971.7177 Sta 14+01.42
Course from 919 to 920 N 45° 59' 40.93" W Dist 92.2602			
Point 920	N	13,768,124.5297 E	2,270,905.3572 Sta 14+93.68
Course from 920 to 921 N 46° 33' 46.47" W Dist 108.5776			
Point 921	N	13,768,199.1830 E	2,270,826.5157 Sta 16+02.26
Course from 921 to 922 N 47° 15' 39.41" W Dist 100.6175			

2/28/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.				REVISION				BY		DATE	
HALFF				100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312							
Texas Department of Transportation				© 2021							
FM 725				DITCH							
HORIZONTAL ALIGNMENT DATA											
								SHEET 2 OF 13			
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.				SHEET					
6		SEE TITLE SHEET				215					
STATE		DISTRICT		COUNTY							
TEXAS		SAT		GUADALUPE							
CONTROL		SECTION		JOB		HIGHWAY NO.					
0215		09		035		FM 725					

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Q DITCH A1-S2 CONT.

Point 922	N 13,768,267.4681 E	2,270,752.6170 Sta	17+02.87
Course from 922 to 923 N 47° 23' 28.03" W Dist 97.4545			
Point 923	N 13,768,333.4438 E	2,270,680.8913 Sta	18+00.33
Course from 923 to 924 N 47° 34' 09.34" W Dist 100.8190			
Point 924	N 13,768,401.4662 E	2,270,606.4775 Sta	19+01.15
Course from 924 to 925 N 47° 23' 16.04" W Dist 201.0285			
Point 925	N 13,768,537.5691 E	2,270,458.5300 Sta	21+02.18
Course from 925 to 926 N 48° 42' 25.69" W Dist 35.2893			
Point 926	N 13,768,560.8568 E	2,270,432.0155 Sta	21+37.46
Course from 926 to 927 N 50° 00' 31.94" W Dist 17.1540			
Point 927	N 13,768,571.8812 E	2,270,418.8730 Sta	21+54.62
Course from 927 to 928 N 47° 06' 04.22" W Dist 35.1677			
Point 928	N 13,768,595.8200 E	2,270,393.1107 Sta	21+89.79
Course from 928 to 929 N 48° 40' 02.31" W Dist 10.6314			
Point 929	N 13,768,602.8413 E	2,270,385.1277 Sta	22+00.42
Course from 929 to 930 N 47° 27' 21.31" W Dist 154.5260			
Point 930	N 13,768,707.3252 E	2,270,271.2795 Sta	23+54.94
Course from 930 to 931 N 47° 04' 35.27" W Dist 55.9870			
Point 931	N 13,768,745.4536 E	2,270,230.2823 Sta	24+10.93
Course from 931 to 932 N 46° 52' 56.39" W Dist 88.3522			
Point 932	N 13,768,805.8423 E	2,270,165.7894 Sta	24+99.28
Course from 932 to 933 N 47° 26' 46.91" W Dist 107.8662			
Point 933	N 13,768,878.7900 E	2,270,086.3304 Sta	26+07.15
=====			
Ending chain D_A1S2 description			

Q DITCH B1-N2

Beginning chain D_B1N2 description
 Feature: Grade_DitchLine
 =====

Point 1006	N 13,771,892.9353 E	2,269,675.7220 Sta	10+00.00
Course from 1006 to 1007 N 24° 14' 26.92" W Dist 26.2724			
Point 1007	N 13,771,916.8912 E	2,269,664.9353 Sta	10+26.27
Course from 1007 to 1008 N 27° 20' 48.37" W Dist 183.6483			
Point 1008	N 13,772,080.0154 E	2,269,580.5719 Sta	12+09.92
Course from 1008 to 1009 N 27° 55' 05.58" W Dist 165.0216			
Point 1009	N 13,772,225.8313 E	2,269,503.3070 Sta	13+74.94
Course from 1009 to 1010 N 26° 44' 16.27" W Dist 98.2952			
Point 1010	N 13,772,313.6162 E	2,269,459.0831 Sta	14+73.24
Course from 1010 to 1011 N 25° 53' 10.45" W Dist 134.1088			
Point 1011	N 13,772,434.2689 E	2,269,400.5331 Sta	16+07.35
Course from 1011 to 1012 N 26° 49' 59.29" W Dist 79.9298			
Point 1012	N 13,772,505.5922 E	2,269,364.4533 Sta	16+87.28

Q DITCH B1-N2 CONT.

Course from 1012 to 1013 N 25° 16' 24.57" W Dist 128.9120			
Point 1013	N 13,772,622.1648 E	2,269,309.4157 Sta	18+16.19
Course from 1013 to 1014 N 24° 36' 36.77" W Dist 59.3116			
Point 1014	N 13,772,676.0886 E	2,269,284.7158 Sta	18+75.50
Course from 1014 to 1015 N 20° 55' 36.56" W Dist 55.0559			
Point 1015	N 13,772,727.5129 E	2,269,265.0512 Sta	19+30.56
Course from 1015 to 1016 N 27° 35' 15.59" W Dist 123.9423			
Point 1016	N 13,772,837.3634 E	2,269,207.6529 Sta	20+54.50
Course from 1016 to 1017 N 27° 59' 28.63" W Dist 86.8068			
Point 1017	N 13,772,914.0155 E	2,269,166.9112 Sta	21+41.30
Course from 1017 to 1018 N 28° 16' 08.36" W Dist 91.4588			
Point 1018	N 13,772,994.5663 E	2,269,123.5952 Sta	22+32.76
Course from 1018 to 1019 N 25° 27' 24.46" W Dist 105.8257			
Point 1019	N 13,773,090.1174 E	2,269,078.1081 Sta	23+38.59
Course from 1019 to 1020 N 25° 36' 46.19" W Dist 116.0864			
Point 1020	N 13,773,194.7967 E	2,269,027.9254 Sta	24+54.68
Course from 1020 to 1021 N 26° 08' 27.95" W Dist 83.3934			
Point 1021	N 13,773,269.6599 E	2,268,991.1837 Sta	25+38.07
Course from 1021 to 1022 N 27° 08' 25.96" W Dist 70.8327			
Point 1022	N 13,773,332.6932 E	2,268,958.8716 Sta	26+08.90
Course from 1022 to 1023 N 27° 24' 04.27" W Dist 71.6977			
Point 1023	N 13,773,396.3468 E	2,268,925.8750 Sta	26+80.60
Course from 1023 to 1024 N 29° 26' 56.11" W Dist 72.4564			
Point 1024	N 13,773,459.4415 E	2,268,890.2520 Sta	27+53.06
Course from 1024 to 1025 N 28° 19' 32.08" W Dist 69.7298			
Point 1025	N 13,773,520.8222 E	2,268,857.1665 Sta	28+22.79
Course from 1025 to 1026 N 33° 31' 52.90" W Dist 31.0244			
Point 1026	N 13,773,546.6837 E	2,268,840.0288 Sta	28+53.81
Course from 1026 to 1027 N 29° 36' 43.49" W Dist 62.6892			
Point 1027	N 13,773,601.1851 E	2,268,809.0525 Sta	29+16.50
Course from 1027 to 1028 N 28° 36' 42.34" W Dist 59.3932			
Point 1028	N 13,773,653.3255 E	2,268,780.6108 Sta	29+75.89
Course from 1028 to 1029 N 31° 46' 53.85" W Dist 61.3747			
Point 1029	N 13,773,705.4977 E	2,268,748.2858 Sta	30+37.27
Course from 1029 to 1030 N 31° 10' 11.02" W Dist 88.5072			
Point 1030	N 13,773,781.2278 E	2,268,702.4767 Sta	31+25.77
Course from 1030 to 1031 N 31° 27' 55.64" W Dist 146.7373			
Point 1031	N 13,773,906.3881 E	2,268,625.8821 Sta	32+72.51
Course from 1031 to 1032 N 34° 17' 15.03" W Dist 122.8646			
Point 1032	N 13,774,007.9015 E	2,268,556.6668 Sta	33+95.38
Course from 1032 to 1033 N 34° 26' 21.70" W Dist 55.7205			



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NO.		REVISION		BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312					
© 2021					
FM 725 DITCH HORIZONTAL ALIGNMENT DATA					
SHEET 3 OF 13					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				216
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

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Q DITCH B1-N2 CONT.

Point 1033 N 13,774,053.8556 E 2,268,525.1550 Sta 34+51.10
 Course from 1033 to 1034 N 34° 14' 21.96" W Dist 28.2271
 Point 1034 N 13,774,077.1907 E 2,268,509.2729 Sta 34+79.32
 Course from 1034 to 1035 N 37° 54' 44.57" W Dist 38.6200
 Point 1035 N 13,774,107.6600 E 2,268,485.5427 Sta 35+17.94
 Course from 1035 to 1036 N 37° 13' 19.96" W Dist 50.3004
 Point 1036 N 13,774,147.7140 E 2,268,455.1156 Sta 35+68.24
 =====
 Ending chain D_B1N2 description

Q DITCH B1-S1

Beginning chain D_B1S1 description
 Feature: Grade_DitchBottom
 =====
 Point 1998 N 13,770,553.1870 E 2,269,640.6311 Sta 10+00.00
 Course from 1998 to 1999 N 44° 25' 02.91" E Dist 67.1675
 Point 1999 N 13,770,601.1620 E 2,269,687.6403 Sta 10+67.17
 Course from 1999 to 2004 N 43° 35' 36.72" E Dist 128.8936
 Point 2004 N 13,770,694.5131 E 2,269,776.5173 Sta 11+96.06
 Course from 2004 to 2005 N 41° 23' 47.37" E Dist 73.9728
 Point 2005 N 13,770,750.0039 E 2,269,825.4330 Sta 12+70.03
 Course from 2005 to 2006 N 42° 43' 44.72" E Dist 17.5555
 Point 2006 N 13,770,762.8996 E 2,269,837.3450 Sta 12+87.59
 Course from 2006 to 2007 N 46° 34' 21.82" E Dist 24.1802
 Point 2007 N 13,770,779.5219 E 2,269,854.9058 Sta 13+11.77
 Course from 2007 to 2008 N 38° 27' 30.90" E Dist 49.8234
 Point 2008 N 13,770,818.5365 E 2,269,885.8934 Sta 13+61.59
 Course from 2008 to 2009 N 30° 50' 39.96" E Dist 52.3671
 Point 2009 N 13,770,863.4969 E 2,269,912.7425 Sta 14+13.96
 Course from 2009 to 2010 N 24° 17' 25.84" E Dist 40.3897
 Point 2010 N 13,770,900.3109 E 2,269,929.3573 Sta 14+54.35
 Course from 2010 to 2011 N 18° 31' 57.04" E Dist 56.1096
 Point 2011 N 13,770,953.5109 E 2,269,947.1913 Sta 15+10.46
 Course from 2011 to 2012 N 11° 17' 52.84" E Dist 36.5019
 Point 2012 N 13,770,989.3054 E 2,269,954.3425 Sta 15+46.96
 Course from 2012 to 2013 N 7° 03' 13.45" E Dist 28.2902
 Point 2013 N 13,771,017.3815 E 2,269,957.8165 Sta 15+75.25
 Course from 2013 to 2014 N 3° 49' 08.37" E Dist 34.8772
 Point 2014 N 13,771,052.1812 E 2,269,960.1395 Sta 16+10.13
 Course from 2014 to 2015 N 0° 10' 49.42" E Dist 18.2473
 Point 2015 N 13,771,070.4284 E 2,269,960.1970 Sta 16+28.38
 Course from 2015 to 2016 N 4° 02' 23.23" W Dist 12.0261
 Point 2016 N 13,771,082.4246 E 2,269,959.3497 Sta 16+40.40

Q DITCH B1-S1 CONT.

Course from 2016 to 2017 N 3° 56' 54.46" W Dist 35.4612
 Point 2017 N 13,771,117.8016 E 2,269,956.9079 Sta 16+75.86
 Course from 2017 to 2018 N 17° 00' 45.90" W Dist 61.3313
 Point 2018 N 13,771,176.4491 E 2,269,938.9633 Sta 17+37.19
 Course from 2018 to 2019 N 22° 42' 04.80" W Dist 41.7852
 Point 2019 N 13,771,214.9971 E 2,269,922.8373 Sta 17+78.98
 Course from 2019 to 2020 N 22° 32' 30.03" W Dist 64.0818
 Point 2020 N 13,771,274.1831 E 2,269,898.2712 Sta 18+43.06
 Course from 2020 to 2021 N 37° 35' 40.04" W Dist 53.1028
 Point 2021 N 13,771,316.2590 E 2,269,865.8748 Sta 18+96.16
 Course from 2021 to 2022 N 26° 03' 21.92" W Dist 34.9395
 Point 2022 N 13,771,347.6474 E 2,269,850.5277 Sta 19+31.10
 Course from 2022 to 2023 N 24° 01' 07.68" W Dist 92.9445
 Point 2023 N 13,771,432.5440 E 2,269,812.6959 Sta 20+24.05
 Course from 2023 to 2024 N 40° 02' 26.27" W Dist 30.5698
 Point 2024 N 13,771,455.9479 E 2,269,793.0294 Sta 20+54.62
 Course from 2024 to 2025 N 26° 35' 43.46" W Dist 18.7886
 Point 2025 N 13,771,472.7485 E 2,269,784.6179 Sta 20+73.41
 Course from 2025 to 2026 N 19° 47' 08.61" W Dist 53.3470
 Point 2026 N 13,771,522.9462 E 2,269,766.5598 Sta 21+26.75
 Course from 2026 to 2027 N 27° 13' 22.96" W Dist 143.8616
 Point 2027 N 13,771,650.8726 E 2,269,700.7495 Sta 22+70.62
 Course from 2027 to 2028 N 28° 03' 37.08" W Dist 56.0333
 Point 2028 N 13,771,700.3193 E 2,269,674.3914 Sta 23+26.65
 Course from 2028 to 2029 N 22° 22' 39.62" W Dist 100.2225
 Point 2029 N 13,771,792.9945 E 2,269,636.2357 Sta 24+26.87
 =====
 Ending chain D_B1S1 description

Q DITCH B1-S2

Beginning chain D_B1S2 description
 Feature: Grade_DitchBottom
 =====
 Point 2030 N 13,771,873.0060 E 2,269,592.5906 Sta 10+00.00
 Course from 2030 to 2031 N 23° 24' 56.37" W Dist 8.1821
 Point 2031 N 13,771,880.5143 E 2,269,589.3390 Sta 10+08.18
 Course from 2031 to 2032 N 25° 25' 45.64" W Dist 48.3503
 Point 2032 N 13,771,924.1802 E 2,269,568.5776 Sta 10+56.53
 Course from 2032 to 2033 N 25° 53' 57.94" W Dist 59.8468
 Point 2033 N 13,771,978.0161 E 2,269,542.4369 Sta 11+16.38
 Course from 2033 to 2034 N 25° 58' 26.93" W Dist 373.7773
 Point 2034 N 13,772,314.0388 E 2,269,378.7353 Sta 14+90.16
 Course from 2034 to 2035 N 24° 25' 08.02" W Dist 56.4680



2/28/2021
 THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE
		100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312	
FM 725 DITCH HORIZONTAL ALIGNMENT DATA			
SHEET 4 OF 13			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		217
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Q DITCH B1-S2 CONT.

Point 2035 N 13,772,365.4556 E 2,269,355.3912 Sta 15+46.62
 Course from 2035 to 2036 N 26° 00' 44.21" W Dist 82.5953
 Point 2036 N 13,772,439.6841 E 2,269,319.1679 Sta 16+29.22
 Course from 2036 to 2037 N 26° 34' 50.99" W Dist 120.0338
 Point 2037 N 13,772,547.0308 E 2,269,265.4575 Sta 17+49.25
 Course from 2037 to 2038 N 25° 28' 01.24" W Dist 77.6092
 Point 2038 N 13,772,617.0990 E 2,269,232.0862 Sta 18+26.86
 Course from 2038 to 2039 N 25° 52' 17.31" W Dist 113.2405
 Point 2039 N 13,772,718.9900 E 2,269,182.6733 Sta 19+40.10
 Course from 2039 to 2040 N 26° 16' 55.33" W Dist 44.8862
 Point 2040 N 13,772,759.2361 E 2,269,162.7981 Sta 19+84.99
 Course from 2040 to 2041 N 25° 05' 49.03" W Dist 34.5414
 Point 2041 N 13,772,790.5165 E 2,269,148.1473 Sta 20+19.53
 Course from 2041 to 2042 N 25° 35' 18.70" W Dist 26.4142
 Point 2042 N 13,772,814.3400 E 2,269,136.7389 Sta 20+45.95
 Course from 2042 to 2043 N 26° 12' 54.32" W Dist 43.6935
 Point 2043 N 13,772,853.5393 E 2,269,117.4376 Sta 20+89.64
 Course from 2043 to 2044 N 25° 52' 04.65" W Dist 142.9059
 Point 2044 N 13,772,982.1263 E 2,269,055.0880 Sta 22+32.54
 Course from 2044 to 2045 N 25° 44' 10.00" W Dist 132.4837
 Point 2045 N 13,773,101.4680 E 2,268,997.5600 Sta 23+65.03
 Course from 2045 to 2046 N 25° 58' 55.37" W Dist 91.3577
 Point 2046 N 13,773,183.5923 E 2,268,957.5372 Sta 24+56.39
 Course from 2046 to 2047 N 27° 06' 51.14" W Dist 64.3836
 Point 2047 N 13,773,240.9001 E 2,268,928.1934 Sta 25+20.77
 Course from 2047 to 2048 N 28° 35' 27.46" W Dist 89.8708
 Point 2048 N 13,773,319.8119 E 2,268,885.1854 Sta 26+10.64
 Course from 2048 to 2049 N 29° 53' 11.95" W Dist 126.5131
 Point 2049 N 13,773,429.5005 E 2,268,822.1457 Sta 27+37.15
 Course from 2049 to 2050 N 30° 49' 19.59" W Dist 278.2095
 Point 2050 N 13,773,668.4163 E 2,268,679.5983 Sta 30+15.36
 Course from 2050 to 2051 N 33° 03' 00.53" W Dist 291.2866
 Point 2051 N 13,773,912.5709 E 2,268,520.7385 Sta 33+06.65
 Course from 2051 to 2052 N 35° 11' 56.64" W Dist 318.7521
 Point 2052 N 13,774,173.0405 E 2,268,337.0037 Sta 36+25.40
 Course from 2052 to 2053 N 39° 15' 17.59" W Dist 34.2023
 Point 2053 N 13,774,199.5247 E 2,268,315.3615 Sta 36+59.60
 Course from 2053 to 2054 N 39° 17' 06.66" W Dist 58.8804
 Point 2054 N 13,774,245.0983 E 2,268,278.0796 Sta 37+18.48
 Course from 2054 to 2055 N 37° 11' 53.59" W Dist 32.8038
 Point 2055 N 13,774,271.2281 E 2,268,258.2472 Sta 37+51.29

Q DITCH B1-S2 CONT.

Course from 2055 to 2056 N 40° 27' 04.85" W Dist 62.8087
 Point 2056 N 13,774,319.0228 E 2,268,217.4968 Sta 38+14.10
 Course from 2056 to 2057 N 39° 26' 05.80" W Dist 381.5876
 Point 2057 N 13,774,613.7406 E 2,267,975.1118 Sta 41+95.68
 Course from 2057 to 2058 N 40° 46' 54.57" W Dist 39.4073
 Point 2058 N 13,774,643.5799 E 2,267,949.3717 Sta 42+35.09
 Course from 2058 to 2059 N 40° 07' 58.24" W Dist 66.9678
 Point 2059 N 13,774,694.7803 E 2,267,906.2068 Sta 43+02.06
 Course from 2059 to 2060 N 37° 18' 45.12" W Dist 401.9084
 Point 2060 N 13,775,014.4345 E 2,267,662.5850 Sta 47+03.97
 Course from 2060 to 2061 N 34° 47' 00.27" W Dist 100.5175
 Point 2061 N 13,775,096.9910 E 2,267,605.2422 Sta 48+04.49
 Course from 2061 to 2062 N 36° 33' 34.10" W Dist 324.9438
 Point 2062 N 13,775,357.9985 E 2,267,411.6872 Sta 51+29.43
 Course from 2062 to 2063 N 35° 40' 38.03" W Dist 35.0186
 Point 2063 N 13,775,386.4446 E 2,267,391.2637 Sta 51+64.45
 Course from 2063 to 2064 N 31° 33' 09.06" W Dist 39.1003
 Point 2064 N 13,775,419.7644 E 2,267,370.8033 Sta 52+03.55
 Course from 2064 to 2065 N 31° 50' 21.04" W Dist 56.9885
 Point 2065 N 13,775,468.1780 E 2,267,340.7398 Sta 52+60.54
 Course from 2065 to 2066 N 34° 22' 16.04" W Dist 234.1570
 Point 2066 N 13,775,661.4508 E 2,267,208.5461 Sta 54+94.69

=====
 Ending chain D_B1S2 description

Q DITCH C1-N1

Beginning chain D_C1N1 description
 Feature: Grade_DitchLine
 =====
 Point 1880 N 13,776,822.7706 E 2,266,608.4089 Sta 10+00.00
 Course from 1880 to 1881 N 25° 01' 39.42" W Dist 154.9317
 Point 1881 N 13,776,963.1548 E 2,266,542.8643 Sta 11+54.93
 Course from 1881 to 1882 N 24° 00' 53.24" W Dist 124.1670
 Point 1882 N 13,777,076.5739 E 2,266,492.3318 Sta 12+79.10
 Course from 1882 to 1883 N 24° 28' 25.35" W Dist 172.3164
 Point 1883 N 13,777,233.4080 E 2,266,420.9453 Sta 14+51.42
 Course from 1883 to 1884 N 21° 48' 50.20" W Dist 198.3904
 Point 1884 N 13,777,417.5927 E 2,266,347.2247 Sta 16+49.81
 Course from 1884 to 1885 N 30° 34' 44.67" W Dist 34.1472
 Point 1885 N 13,777,446.9910 E 2,266,329.8531 Sta 16+83.95
 =====
 Ending chain D_C1N1 description

2/28/2021

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NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
© 2021			
FM 725 DITCH HORIZONTAL ALIGNMENT DATA			
SHEET 5 OF 13			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		218
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Q DITCH C1-N2

Beginning chain D_C1N2 description
 Feature: Grade_DitchLine

Point 2141	N	13,777,505.0827	E	2,266,308.3337	Sta	10+00.00
Course from 2141 to 2142 N 23° 45' 54.50" W Dist 94.3891						
Point 2142	N	13,777,591.4681	E	2,266,270.2960	Sta	10+94.39
Course from 2142 to 2143 N 24° 04' 14.15" W Dist 35.4018						
Point 2143	N	13,777,623.7914	E	2,266,255.8570	Sta	11+29.79
Course from 2143 to 2144 N 25° 38' 21.67" W Dist 52.6069						
Point 2144	N	13,777,671.2185	E	2,266,233.0937	Sta	11+82.40
Course from 2144 to 2145 N 26° 03' 16.47" W Dist 86.2257						
Point 2145	N	13,777,748.6815	E	2,266,195.2211	Sta	12+68.62
Course from 2145 to 2146 N 23° 35' 33.51" W Dist 81.3307						
Point 2146	N	13,777,823.2142	E	2,266,162.6700	Sta	13+49.95
Course from 2146 to 2147 N 23° 57' 35.09" W Dist 145.6286						
Point 2147	N	13,777,956.2941	E	2,266,103.5310	Sta	14+95.58
Course from 2147 to 2148 N 23° 03' 17.49" W Dist 126.8485						
Point 2148	N	13,778,073.0112	E	2,266,053.8555	Sta	16+22.43
Course from 2148 to 2149 N 25° 32' 32.40" W Dist 95.8223						
Point 2149	N	13,778,159.4685	E	2,266,012.5391	Sta	17+18.25
Course from 2149 to 2150 N 24° 54' 17.39" W Dist 99.8754						
Point 2150	N	13,778,250.0563	E	2,265,970.4803	Sta	18+18.13
Course from 2150 to 2151 N 23° 13' 19.64" W Dist 75.8509						
Point 2151	N	13,778,319.7620	E	2,265,940.5726	Sta	18+93.98
Course from 2151 to 2152 N 24° 26' 01.29" W Dist 82.3156						
Point 2152	N	13,778,394.7055	E	2,265,906.5235	Sta	19+76.30

Ending chain D_C1N2 description

Q DITCH C1-S1

Beginning chain D_C1S1 description
 Feature: Grade_DitchBottom

Point 1823	N	13,775,755.2197	E	2,267,147.1868	Sta	10+00.00
Course from 1823 to 1824 N 35° 31' 24.16" W Dist 123.9382						
Point 1824	N	13,775,856.0903	E	2,267,075.1743	Sta	11+23.94
Course from 1824 to 1825 N 33° 12' 40.74" W Dist 258.5810						
Point 1825	N	13,776,072.4337	E	2,266,933.5422	Sta	13+82.52
Course from 1825 to 1826 N 32° 07' 05.29" W Dist 127.0474						
Point 1826	N	13,776,180.0370	E	2,266,865.9953	Sta	15+09.57
Course from 1826 to 1827 N 30° 39' 43.71" W Dist 21.1929						
Point 1827	N	13,776,198.2669	E	2,266,855.1874	Sta	15+30.76
Course from 1827 to 1828 N 28° 31' 11.09" W Dist 5.6658						
Point 1828	N	13,776,203.2452	E	2,266,852.4822	Sta	15+36.43

Q DITCH C1-S1 CONT.

Course from 1828 to 1829 N 30° 14' 59.98" W Dist 17.4332						
Point 1829	N	13,776,218.3046	E	2,266,843.6998	Sta	15+53.86
Course from 1829 to 1830 N 31° 10' 56.97" W Dist 38.7474						
Point 1830	N	13,776,251.4539	E	2,266,823.6377	Sta	15+92.61
Course from 1830 to 1831 N 31° 35' 24.48" W Dist 34.8437						
Point 1831	N	13,776,281.1344	E	2,266,805.3852	Sta	16+27.45
Course from 1831 to 1832 N 28° 03' 38.35" W Dist 38.6074						
Point 1832	N	13,776,315.2035	E	2,266,787.2241	Sta	16+66.06
Course from 1832 to 1833 N 27° 43' 34.50" W Dist 33.6120						
Point 1833	N	13,776,344.9561	E	2,266,771.5862	Sta	16+99.67
Course from 1833 to 1834 N 29° 26' 17.45" W Dist 68.1925						
Point 1834	N	13,776,404.3440	E	2,266,738.0707	Sta	17+67.86
Course from 1834 to 1835 N 34° 26' 57.48" W Dist 13.6590						
Point 1835	N	13,776,415.6076	E	2,266,730.3441	Sta	17+81.52
Course from 1835 to 1836 N 30° 56' 58.73" W Dist 8.4511						
Point 1836	N	13,776,422.8555	E	2,266,725.9978	Sta	17+89.97
Course from 1836 to 1837 N 35° 17' 14.16" W Dist 10.1059						
Point 1837	N	13,776,431.1046	E	2,266,720.1598	Sta	18+00.08
Course from 1837 to 1838 N 34° 41' 09.39" W Dist 28.4848						
Point 1838	N	13,776,454.5272	E	2,266,703.9498	Sta	18+28.56
Course from 1838 to 1839 N 29° 54' 44.74" W Dist 20.9751						
Point 1839	N	13,776,472.7082	E	2,266,693.4900	Sta	18+49.54
Course from 1839 to 1840 N 29° 40' 09.93" W Dist 22.3586						
Point 1840	N	13,776,492.1355	E	2,266,682.4226	Sta	18+71.90
Course from 1840 to 1841 N 28° 35' 57.75" W Dist 29.1948						
Point 1841	N	13,776,517.7682	E	2,266,668.4475	Sta	19+01.09
Course from 1841 to 1842 N 27° 59' 56.98" W Dist 11.8222						
Point 1842	N	13,776,528.2066	E	2,266,662.8975	Sta	19+12.91
Course from 1842 to 1843 N 27° 30' 02.84" W Dist 38.2747						
Point 1843	N	13,776,562.1565	E	2,266,645.2238	Sta	19+51.19
Course from 1843 to 1844 N 27° 46' 20.86" W Dist 3.5247						
Point 1844	N	13,776,565.2751	E	2,266,643.5814	Sta	19+54.71
Course from 1844 to 1845 N 29° 43' 58.28" W Dist 37.5801						
Point 1845	N	13,776,597.9077	E	2,266,624.9433	Sta	19+92.29
Course from 1845 to 1846 N 27° 45' 31.62" W Dist 9.5487						
Point 1846	N	13,776,606.3575	E	2,266,620.4960	Sta	20+01.84
Course from 1846 to 1847 N 27° 06' 41.79" W Dist 19.8803						
Point 1847	N	13,776,624.0534	E	2,266,611.4360	Sta	20+21.72
Course from 1847 to 1848 N 24° 53' 33.24" W Dist 11.0036						
Point 1848	N	13,776,634.0347	E	2,266,606.8044	Sta	20+32.73
Course from 1848 to 1849 N 23° 34' 19.60" W Dist 20.2762						

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NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
Texas Department of Transportation © 2021			
FM 725			
DITCH HORIZONTAL ALIGNMENT DATA			
SHEET 6 OF 13			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		219
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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 DATE: 2/28/2021

Q DITCH C1-S1 CONT.

Point 1849	N	13,776,652.6191	E	2,266,598.6959	Sta	20+53.00
Course from 1849 to 1850 N 21° 22' 26.08" W Dist 22.7387						
Point 1850	N	13,776,673.7938	E	2,266,590.4087	Sta	20+75.74
Course from 1850 to 1851 N 23° 00' 23.95" W Dist 12.8756						
Point 1851	N	13,776,685.6453	E	2,266,585.3765	Sta	20+88.62
Course from 1851 to 1852 N 26° 22' 05.33" W Dist 25.4530						
Point 1852	N	13,776,708.4501	E	2,266,574.0718	Sta	21+14.07
Course from 1852 to 1853 N 20° 41' 17.93" W Dist 16.7194						
Point 1853	N	13,776,724.0913	E	2,266,568.1651	Sta	21+30.79
Course from 1853 to 1854 N 22° 34' 57.50" W Dist 24.9460						
Point 1854	N	13,776,747.1247	E	2,266,558.5855	Sta	21+55.73
Course from 1854 to 1855 N 23° 11' 42.31" W Dist 22.7279						
Point 1855	N	13,776,768.0155	E	2,266,549.6338	Sta	21+78.46
Course from 1855 to 1856 N 23° 22' 11.84" W Dist 29.8097						
Point 1856	N	13,776,795.3797	E	2,266,537.8093	Sta	22+08.27
Course from 1856 to 1857 N 22° 55' 48.65" W Dist 51.3762						
Point 1857	N	13,776,842.6962	E	2,266,517.7926	Sta	22+59.65
Course from 1857 to 1858 N 24° 49' 38.06" W Dist 50.2036						
Point 1858	N	13,776,888.2599	E	2,266,496.7130	Sta	23+09.85
Course from 1858 to 1859 N 24° 12' 49.08" W Dist 91.2479						
Point 1859	N	13,776,971.4800	E	2,266,459.2885	Sta	24+01.10
Course from 1859 to 1860 N 20° 43' 21.26" W Dist 10.3854						
Point 1860	N	13,776,981.1936	E	2,266,455.6137	Sta	24+11.48
Course from 1860 to 1861 N 24° 27' 58.02" W Dist 27.9752						
Point 1861	N	13,777,006.6568	E	2,266,444.0276	Sta	24+39.46
Course from 1861 to 1862 N 25° 08' 44.13" W Dist 11.7744						
Point 1862	N	13,777,017.3154	E	2,266,439.0244	Sta	24+51.23
Course from 1862 to 1863 N 23° 58' 11.59" W Dist 5.3556						
Point 1863	N	13,777,022.2091	E	2,266,436.8487	Sta	24+56.59
Course from 1863 to 1864 N 24° 55' 01.61" W Dist 47.2512						
Point 1864	N	13,777,065.0621	E	2,266,416.9414	Sta	25+03.84
Course from 1864 to 1865 N 26° 50' 24.65" W Dist 10.4465						
Point 1865	N	13,777,074.3832	E	2,266,412.2248	Sta	25+14.29
Course from 1865 to 1866 N 24° 57' 18.08" W Dist 8.7196						
Point 1866	N	13,777,082.2887	E	2,266,408.5460	Sta	25+23.01
Course from 1866 to 1867 N 27° 14' 05.08" W Dist 6.6239						
Point 1867	N	13,777,088.1783	E	2,266,405.5146	Sta	25+29.63
Course from 1867 to 1868 N 20° 18' 38.65" W Dist 14.4040						
Point 1868	N	13,777,101.6867	E	2,266,400.5148	Sta	25+44.04
Course from 1868 to 1869 N 24° 38' 25.93" W Dist 42.0119						
Point 1869	N	13,777,139.8731	E	2,266,382.9990	Sta	25+86.05

Q DITCH C1-S1 CONT.

Course from 1869 to 1870 N 23° 14' 57.88" W Dist 17.1158						
Point 1870	N	13,777,155.5990	E	2,266,376.2428	Sta	26+03.16
Course from 1870 to 1871 N 24° 16' 59.40" W Dist 14.8153						
Point 1871	N	13,777,169.1035	E	2,266,370.1501	Sta	26+17.98
Course from 1871 to 1872 N 23° 38' 57.26" W Dist 33.6508						
Point 1872	N	13,777,199.9282	E	2,266,356.6515	Sta	26+51.63
Course from 1872 to 1873 N 22° 50' 31.23" W Dist 18.9972						
Point 1873	N	13,777,217.4357	E	2,266,349.2770	Sta	26+70.63
Course from 1873 to 1874 N 23° 32' 44.84" W Dist 73.3473						
Point 1874	N	13,777,284.6762	E	2,266,319.9761	Sta	27+43.97
Course from 1874 to 1875 N 24° 07' 37.09" W Dist 59.5653						
Point 1875	N	13,777,339.0379	E	2,266,295.6282	Sta	28+03.54
Course from 1875 to 1876 N 22° 12' 14.39" W Dist 5.8875						
Point 1876	N	13,777,344.4888	E	2,266,293.4032	Sta	28+09.43
Course from 1876 to 1877 N 22° 38' 55.92" W Dist 17.0903						
Point 1877	N	13,777,360.2612	E	2,266,286.8221	Sta	28+26.52
Course from 1877 to 1878 N 21° 24' 34.15" W Dist 28.5888						
Point 1878	N	13,777,386.8772	E	2,266,276.3863	Sta	28+55.11
Course from 1878 to 1879 N 23° 54' 56.26" W Dist 61.6756						
Point 1879	N	13,777,443.2576	E	2,266,251.3835	Sta	29+16.78
=====						
Ending chain D_C1S1 description						

Q DITCH C1-S2

Beginning chain D_C1S2 description						
Feature: Grade_DitchBottom						
=====						
Point 1523	N	13,777,494.8555	E	2,266,224.5305	Sta	10+00.00
Course from 1523 to 1524 N 23° 53' 44.66" W Dist 272.9371						
Point 1524	N	13,777,744.3976	E	2,266,113.9709	Sta	12+72.94
Course from 1524 to 1525 N 23° 38' 31.62" W Dist 106.1772						
Point 1525	N	13,777,841.6631	E	2,266,071.3915	Sta	13+79.11
Course from 1525 to 1526 N 24° 18' 05.36" W Dist 338.1821						
Point 1526	N	13,778,149.8797	E	2,265,932.2167	Sta	17+17.30
Course from 1526 to 1527 N 23° 51' 53.24" W Dist 253.1068						
Point 1527	N	13,778,381.3466	E	2,265,829.8148	Sta	19+70.40
Course from 1527 to 1528 N 23° 41' 52.71" W Dist 130.3490						
Point 1528	N	13,778,500.7041	E	2,265,777.4256	Sta	21+00.75
Course from 1528 to 1529 N 23° 38' 30.08" W Dist 173.0749						
Point 1529	N	13,778,659.2530	E	2,265,708.0198	Sta	22+73.83
=====						
Ending chain D_C1S2 description						

2/28/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.				REVISION				BY		DATE	
				100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312							
				FM 725							
				DITCH							
				HORIZONTAL ALIGNMENT DATA							
				SHEET 7 OF 13							
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.				SHEET					
6		SEE TITLE SHEET				220					
STATE		DISTRICT		COUNTY							
TEXAS		SAT		GUADALUPE							
CONTROL		SECTION		JOB		HIGHWAY NO.					
0215		09		035		FM 725					

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☉ DITCH D1-N1

Beginning chain D_D1N1 description
 Feature: Grade_DitchLine

Point 1562	N	13,778,826.7324	E	2,265,716.3392	Sta	10+00.00
Course from 1562 to 1563 N 22° 52' 54.35" W Dist 107.6132						
Point 1563	N	13,778,925.8774	E	2,265,674.4959	Sta	11+07.61
Course from 1563 to 1564 N 27° 42' 38.28" W Dist 45.4645						
Point 1564	N	13,778,966.1274	E	2,265,653.3547	Sta	11+53.08
Course from 1564 to 1565 N 22° 02' 43.93" W Dist 132.5758						
Point 1565	N	13,779,089.0101	E	2,265,603.5932	Sta	12+85.65
Course from 1565 to 1566 N 22° 02' 13.60" W Dist 144.0841						
Point 1566	N	13,779,222.5676	E	2,265,549.5318	Sta	14+29.74
Course from 1566 to 1567 N 21° 05' 20.17" W Dist 152.2649						
Point 1567	N	13,779,364.6343	E	2,265,494.7444	Sta	15+82.00
Course from 1567 to 1568 N 26° 42' 17.53" W Dist 81.9418						
Point 1568	N	13,779,437.8356	E	2,265,457.9201	Sta	16+63.94
Course from 1568 to 1569 N 23° 06' 44.70" W Dist 43.3648						
Point 1569	N	13,779,477.7198	E	2,265,440.8979	Sta	17+07.31
Course from 1569 to 1570 N 22° 01' 32.40" W Dist 39.0052						
Point 1570	N	13,779,513.8783	E	2,265,426.2701	Sta	17+46.31
Course from 1570 to 1571 N 21° 01' 49.87" W Dist 110.2775						
Point 1571	N	13,779,616.8101	E	2,265,386.6953	Sta	18+56.59
Course from 1571 to 1572 N 16° 03' 50.67" W Dist 29.0253						
Point 1572	N	13,779,644.7021	E	2,265,378.6636	Sta	18+85.62
Course from 1572 to 1573 N 15° 10' 55.84" W Dist 32.8535						
Point 1573	N	13,779,676.4089	E	2,265,370.0597	Sta	19+18.47
Course from 1573 to 1574 N 19° 40' 44.65" W Dist 39.0265						
Point 1574	N	13,779,713.1561	E	2,265,356.9174	Sta	19+57.50
Course from 1574 to 1575 N 42° 55' 23.81" W Dist 18.2659						
Point 1575	N	13,779,726.5315	E	2,265,344.4780	Sta	19+75.76
Course from 1575 to 1576 N 36° 02' 58.82" W Dist 45.4709						
Point 1576	N	13,779,763.2951	E	2,265,317.7190	Sta	20+21.23
Course from 1576 to 1577 N 21° 54' 28.96" W Dist 36.7481						
Point 1577	N	13,779,797.3894	E	2,265,304.0076	Sta	20+57.98
Course from 1577 to 1578 N 23° 17' 56.94" W Dist 202.6349						
Point 1578	N	13,779,983.5000	E	2,265,223.8590	Sta	22+60.62
Course from 1578 to 1579 N 9° 56' 06.78" W Dist 32.8380						
Point 1579	N	13,780,015.8455	E	2,265,218.1934	Sta	22+93.46

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 Ending chain D_D1N1 description

☉ DITCH D1-N2

Beginning chain D_D1N2 description
 Feature: Grade_DitchLine

Point 1589	N	13,780,898.8389	E	2,264,827.0285	Sta	10+00.00
Course from 1589 to 1590 N 22° 57' 33.79" W Dist 56.4983						
Point 1590	N	13,780,950.8615	E	2,264,804.9898	Sta	10+56.50
Course from 1590 to 1591 N 23° 19' 28.53" W Dist 96.1348						
Point 1591	N	13,781,039.1398	E	2,264,766.9262	Sta	11+52.63
Course from 1591 to 1592 N 27° 54' 24.79" W Dist 48.3664						
Point 1592	N	13,781,081.8817	E	2,264,744.2889	Sta	12+01.00
Course from 1592 to 1593 N 26° 14' 02.88" W Dist 51.4807						
Point 1593	N	13,781,128.0597	E	2,264,721.5324	Sta	12+52.48
Course from 1593 to 1594 N 25° 24' 57.53" W Dist 30.0130						
Point 1594	N	13,781,155.1679	E	2,264,708.6512	Sta	12+82.49
Course from 1594 to 1595 N 23° 34' 38.98" W Dist 98.9982						
Point 1595	N	13,781,245.9017	E	2,264,669.0530	Sta	13+81.49
Course from 1595 to 1596 N 22° 27' 20.28" W Dist 102.6584						
Point 1596	N	13,781,340.7761	E	2,264,629.8408	Sta	14+84.15
Course from 1596 to 1597 N 25° 53' 17.64" W Dist 40.0976						
Point 1597	N	13,781,376.8497	E	2,264,612.3335	Sta	15+24.25
Course from 1597 to 1598 N 25° 53' 19.34" W Dist 40.0780						
Point 1598	N	13,781,412.9057	E	2,264,594.8345	Sta	15+64.33
Course from 1598 to 1599 N 24° 56' 02.81" W Dist 35.2392						
Point 1599	N	13,781,444.8604	E	2,264,579.9785	Sta	15+99.56
Course from 1599 to 1602 N 22° 52' 11.98" W Dist 29.0929						
Point 1602	N	13,781,471.6663	E	2,264,568.6717	Sta	16+28.66
Course from 1602 to 1603 N 24° 49' 22.94" W Dist 63.4779						
Point 1603	N	13,781,529.2794	E	2,264,542.0226	Sta	16+92.14
Course from 1603 to 1604 N 21° 53' 54.69" W Dist 163.8733						
Point 1604	N	13,781,681.3286	E	2,264,480.9038	Sta	18+56.01
Course from 1604 to 1605 N 24° 27' 20.49" W Dist 57.3915						
Point 1605	N	13,781,733.5710	E	2,264,457.1443	Sta	19+13.40
Course from 1605 to 1606 N 23° 22' 34.54" W Dist 53.8031						
Point 1606	N	13,781,782.9579	E	2,264,435.7970	Sta	19+67.20
Course from 1606 to 1607 N 26° 35' 13.93" W Dist 79.1738						
Point 1607	N	13,781,853.7593	E	2,264,400.3620	Sta	20+46.38
Course from 1607 to 1608 N 21° 07' 02.68" W Dist 72.8924						
Point 1608	N	13,781,921.7566	E	2,264,374.1004	Sta	21+19.27
Course from 1608 to 1609 N 24° 39' 32.39" W Dist 53.4632						
Point 1609	N	13,781,970.3443	E	2,264,351.7946	Sta	21+72.73
Course from 1609 to 1610 N 25° 38' 16.22" W Dist 29.3139						
Point 1610	N	13,781,996.7722	E	2,264,339.1110	Sta	22+02.05

2/28/2021

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NO.				REVISION				BY		DATE	
6				SEE TITLE SHEET				221			
STATE				DISTRICT				COUNTY			
TEXAS				SAT				GUADALUPE			
CONTROL				SECTION				JOB		HIGHWAY NO.	
0215				09				035		FM 725	

100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation
 © 2021

FM 725

DITCH
 HORIZONTAL ALIGNMENT DATA

SHEET 8 OF 13

ah3891
 TXDOT*MON*PENTABLE.tb1
 TIME:16:31:37 PM OFFICE:SAN
 DATE: 2/28/2021
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Q DITCH D1-N2 CONT.

Course from 1610 to 1611 N 23° 55' 19.10" W Dist 50.4853

Point 1611 N 13,782,042.9207 E 2,264,318.6396 Sta 22+52.53

Course from 1611 to 1612 N 22° 59' 55.57" W Dist 49.2726

Point 1612 N 13,782,088.2767 E 2,264,299.3883 Sta 23+01.80

Course from 1612 to 1613 N 23° 26' 09.05" W Dist 50.2865

Point 1613 N 13,782,134.4149 E 2,264,279.3882 Sta 23+52.09

Course from 1613 to 1614 N 23° 28' 35.64" W Dist 49.2531

Point 1614 N 13,782,179.5910 E 2,264,259.7671 Sta 24+01.34

Course from 1614 to 1615 N 23° 22' 11.85" W Dist 50.7473

Point 1615 N 13,782,226.1751 E 2,264,239.6373 Sta 24+52.09

Course from 1615 to 1616 N 22° 53' 58.09" W Dist 49.7551

Point 1616 N 13,782,272.0090 E 2,264,220.2768 Sta 25+01.85

Course from 1616 to 1617 N 23° 18' 55.56" W Dist 50.1166

Point 1617 N 13,782,318.0331 E 2,264,200.4410 Sta 25+51.96

Course from 1617 to 1618 N 23° 13' 37.67" W Dist 49.9590

Point 1618 N 13,782,363.9429 E 2,264,180.7383 Sta 26+01.92

Course from 1618 to 1619 N 22° 41' 48.92" W Dist 43.2712

Point 1619 N 13,782,403.8631 E 2,264,164.0419 Sta 26+45.19

Course from 1619 to 1620 N 26° 28' 04.62" W Dist 6.5978

Point 1620 N 13,782,409.7693 E 2,264,161.1013 Sta 26+51.79

Course from 1620 to 1621 N 23° 22' 12.23" W Dist 50.3111

Point 1621 N 13,782,455.9530 E 2,264,141.1444 Sta 27+02.10

Course from 1621 to 1622 N 26° 09' 38.15" W Dist 49.9948

Point 1622 N 13,782,500.8264 E 2,264,119.1023 Sta 27+52.10

Course from 1622 to 1623 N 52° 03' 59.99" W Dist 3.1201

Point 1623 N 13,782,502.7445 E 2,264,116.6414 Sta 27+55.22

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Ending chain D_D1N2 description

Q DITCH D1-S1

Beginning chain D_D1S1 description
 Feature: Grade_DitchBottom

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Point 1542 N 13,778,707.4298 E 2,265,689.6706 Sta 10+00.00

Course from 1542 to 1543 N 23° 38' 20.57" W Dist 159.7596

Point 1543 N 13,778,853.7839 E 2,265,625.6113 Sta 11+59.76

Course from 1543 to 1544 N 23° 31' 03.51" W Dist 36.3383

Point 1544 N 13,778,887.1038 E 2,265,611.1112 Sta 11+96.10

Course from 1544 to 1545 N 24° 43' 29.78" W Dist 100.2793

Point 1545 N 13,778,978.1900 E 2,265,569.1681 Sta 12+96.38

Course from 1545 to 1546 N 24° 26' 12.75" W Dist 60.2612

Point 1546 N 13,779,033.0529 E 2,265,544.2386 Sta 13+56.64

Course from 1546 to 1547 N 23° 54' 53.10" W Dist 99.2652

Q DITCH D1-S1 CONT.

Point 1547 N 13,779,123.7962 E 2,265,503.9988 Sta 14+55.90

Course from 1547 to 1548 N 22° 25' 35.13" W Dist 87.8123

Point 1548 N 13,779,204.9673 E 2,265,470.4987 Sta 15+43.72

Course from 1548 to 1549 N 22° 41' 05.77" W Dist 97.9987

Point 1549 N 13,779,295.3848 E 2,265,432.7041 Sta 16+41.71

Course from 1549 to 1550 N 23° 59' 17.52" W Dist 86.5001

Point 1550 N 13,779,374.4138 E 2,265,397.5376 Sta 17+28.21

Course from 1550 to 1551 N 24° 36' 48.20" W Dist 98.2031

Point 1551 N 13,779,463.6941 E 2,265,356.6367 Sta 18+26.42

Course from 1551 to 1552 N 23° 23' 43.98" W Dist 88.8257

Point 1552 N 13,779,545.2170 E 2,265,321.3661 Sta 19+15.24

Course from 1552 to 1553 N 23° 03' 25.87" W Dist 285.3986

Point 1553 N 13,779,807.8164 E 2,265,209.5899 Sta 22+00.64

Course from 1553 to 1554 N 22° 43' 40.10" W Dist 134.5593

Point 1554 N 13,779,931.9272 E 2,265,157.6024 Sta 23+35.20

Course from 1554 to 1555 N 24° 24' 31.98" W Dist 168.2417

Point 1555 N 13,780,085.1314 E 2,265,088.0772 Sta 25+03.44

Course from 1555 to 1556 N 24° 22' 17.69" W Dist 192.1628

Point 1556 N 13,780,260.1703 E 2,265,008.7807 Sta 26+95.61

Course from 1556 to 1557 N 23° 08' 44.41" W Dist 144.4310

Point 1557 N 13,780,392.9758 E 2,264,952.0092 Sta 28+40.04

Course from 1557 to 1558 N 23° 38' 54.45" W Dist 65.3970

Point 1558 N 13,780,452.8809 E 2,264,925.7770 Sta 29+05.43

Course from 1558 to 1559 N 23° 55' 01.79" W Dist 152.6440

Point 1559 N 13,780,592.4178 E 2,264,863.8927 Sta 30+58.08

Course from 1559 to 1560 N 23° 50' 06.04" W Dist 140.8647

Point 1560 N 13,780,721.2686 E 2,264,806.9687 Sta 31+98.94

Course from 1560 to 1561 N 18° 52' 13.20" W Dist 58.0397

Point 1561 N 13,780,776.1888 E 2,264,788.1970 Sta 32+56.98

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Ending chain D_D1S1 description

Q DITCH D1-S2

Beginning chain D_D1S2 description
 Feature: Grade_DitchBottom

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Point 1580 N 13,780,884.8189 E 2,264,737.6471 Sta 10+00.00

Course from 1580 to 1581 N 22° 34' 40.38" W Dist 78.2564

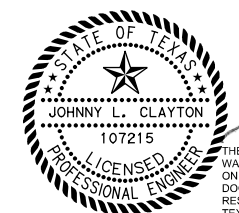
Point 1581 N 13,780,957.0776 E 2,264,707.6014 Sta 10+78.26

Course from 1581 to 1582 N 22° 47' 09.53" W Dist 62.6265

Point 1582 N 13,781,014.8166 E 2,264,683.3468 Sta 11+40.88

Course from 1582 to 1583 N 22° 42' 12.38" W Dist 88.8842

Point 1583 N 13,781,096.8136 E 2,264,649.0409 Sta 12+29.77



2/28/2021

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NO.		REVISION		BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312					
© 2021					
FM 725 DITCH HORIZONTAL ALIGNMENT DATA					
SHEET 9 OF 13					
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.				SHEET
6	SEE TITLE SHEET				222
STATE	DISTRICT	COUNTY			
TEXAS	SAT	GUADALUPE			
CONTROL	SECTION	JOB	HIGHWAY NO.		
0215	09	035	FM 725		

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 DATE: 2/28/2021

Q DITCH D1-S2 CONT.

Course from 1583 to 1584 N 23° 29' 31.88" W Dist 47.6338

Point 1584 N 13,781,140.4993 E 2,264,630.0529 Sta 12+77.40

Course from 1584 to 1585 N 23° 55' 24.10" W Dist 49.7757

Point 1585 N 13,781,185.9987 E 2,264,609.8681 Sta 13+27.18

Course from 1585 to 1586 N 23° 57' 24.29" W Dist 114.0271

Point 1586 N 13,781,290.2026 E 2,264,563.5678 Sta 14+41.20

Course from 1586 to 1587 N 23° 54' 04.20" W Dist 107.7879

Point 1587 N 13,781,388.7472 E 2,264,519.8964 Sta 15+48.99

Course from 1587 to 1588 N 21° 55' 01.13" W Dist 97.5190

Point 1588 N 13,781,479.2181 E 2,264,483.4962 Sta 16+46.51

Ending chain D_DIS2 description

Q DITCH E1-N2

Beginning chain D_E1N2 description
 Feature: Grade_DitchLine

Point 2067 N 13,782,875.9224 E 2,263,960.4348 Sta 10+00.00

Course from 2067 to 2068 N 22° 20' 33.28" W Dist 115.6668

Point 2068 N 13,782,982.9058 E 2,263,916.4648 Sta 11+15.67

Course from 2068 to 2069 N 28° 07' 40.15" W Dist 196.7873

Point 2069 N 13,783,156.4522 E 2,263,823.6913 Sta 13+12.45

Ending chain D_E1N2 description

Q DITCH F1-N1

Beginning chain D_F1N1 description
 Feature: Grade_DitchLine

Point 1638 N 13,783,221.7099 E 2,263,787.8949 Sta 10+00.00

Course from 1638 to 1639 N 26° 25' 10.98" W Dist 20.3580

Point 1639 N 13,783,239.9417 E 2,263,778.8368 Sta 10+20.36

Course from 1639 to 1640 N 30° 32' 50.67" W Dist 36.0293

Point 1640 N 13,783,270.9704 E 2,263,760.5249 Sta 10+56.39

Course from 1640 to 1641 N 31° 05' 54.91" W Dist 29.7421

Point 1641 N 13,783,296.4379 E 2,263,745.1627 Sta 10+86.13

Course from 1641 to 1642 N 30° 50' 04.54" W Dist 16.7843

Point 1642 N 13,783,310.8498 E 2,263,736.5597 Sta 11+02.91

Course from 1642 to 1643 N 32° 21' 39.11" W Dist 5.5354

Point 1643 N 13,783,315.5255 E 2,263,733.5969 Sta 11+08.45

Course from 1643 to 1644 N 45° 19' 20.73" W Dist 10.9493

Point 1644 N 13,783,323.2241 E 2,263,725.8111 Sta 11+19.40

Ending chain D_F1N1 description

Q DITCH F1-N2

Beginning chain D_F1N2 description
 Feature: Grade_DitchLine

Point 1665 N 13,783,323.7833 E 2,263,716.0012 Sta 10+00.00

Course from 1665 to 1666 N 28° 02' 23.67" W Dist 147.0241

Point 1666 N 13,783,453.5497 E 2,263,646.8871 Sta 11+47.02

Course from 1666 to 1667 N 30° 19' 41.02" W Dist 86.6342

Point 1667 N 13,783,528.3279 E 2,263,603.1412 Sta 12+33.66

Course from 1667 to 1668 N 31° 25' 39.96" W Dist 49.2885

Point 1668 N 13,783,570.3857 E 2,263,577.4410 Sta 12+82.95

Course from 1668 to 1669 N 31° 25' 38.64" W Dist 49.2699

Point 1669 N 13,783,612.4278 E 2,263,551.7508 Sta 13+32.22

Course from 1669 to 1670 N 32° 18' 01.04" W Dist 53.2558

Point 1670 N 13,783,657.4427 E 2,263,523.2932 Sta 13+85.47

Course from 1670 to 1671 N 32° 27' 10.84" W Dist 53.9001

Point 1671 N 13,783,702.9253 E 2,263,494.3700 Sta 14+39.37

Course from 1671 to 1672 N 32° 55' 32.52" W Dist 63.5256

Point 1672 N 13,783,756.2472 E 2,263,459.8406 Sta 15+02.90

Course from 1672 to 1673 N 33° 01' 20.64" W Dist 68.6944

Point 1673 N 13,783,813.8445 E 2,263,422.4044 Sta 15+71.59

Course from 1673 to 1674 N 31° 01' 48.52" W Dist 77.5995

Point 1674 N 13,783,880.3393 E 2,263,382.4027 Sta 16+49.19

Course from 1674 to 1675 N 30° 37' 06.87" W Dist 117.0706

Point 1675 N 13,783,981.0876 E 2,263,322.7763 Sta 17+66.26

Course from 1675 to 1676 N 21° 40' 05.95" W Dist 21.3384

Point 1676 N 13,784,000.9181 E 2,263,314.8974 Sta 17+87.60

Course from 1676 to 1677 N 32° 48' 21.06" W Dist 100.0300

Point 1677 N 13,784,084.9945 E 2,263,260.7018 Sta 18+87.63

Course from 1677 to 1678 N 29° 47' 30.94" W Dist 99.3391

Point 1678 N 13,784,171.2045 E 2,263,211.3449 Sta 19+86.97

Course from 1678 to 1679 N 32° 34' 31.25" W Dist 100.7212

Point 1679 N 13,784,256.0807 E 2,263,157.1158 Sta 20+87.69

Course from 1679 to 1680 N 30° 39' 17.89" W Dist 113.2506

Point 1680 N 13,784,353.5049 E 2,263,099.3731 Sta 22+00.94

Course from 1680 to 1681 N 31° 33' 06.39" W Dist 88.0131

Point 1681 N 13,784,428.5068 E 2,263,053.3185 Sta 22+88.96

Course from 1681 to 1682 N 31° 19' 31.77" W Dist 115.8066

Point 1682 N 13,784,527.4321 E 2,262,993.1107 Sta 24+04.76

Course from 1682 to 1683 N 31° 18' 53.28" W Dist 82.9397

Point 1683 N 13,784,598.2895 E 2,262,950.0037 Sta 24+87.70

Course from 1683 to 1684 N 29° 52' 38.71" W Dist 97.7961

Point 1684 N 13,784,683.0878 E 2,262,901.2869 Sta 25+85.50



NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
© 2021			
FM 725 DITCH HORIZONTAL ALIGNMENT DATA			
SHEET 10 OF 13			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		223
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Q DITCH F1-N2 CONT.

Course from 1684 to 1685 N 31° 57' 33.60" W Dist 108.5319

Point 1685 N 13,784,775.1689 E 2,262,843.8391 Sta 26+94.03

Course from 1685 to 1686 N 31° 57' 36.20" W Dist 95.3489

Point 1686 N 13,784,856.0646 E 2,262,793.3683 Sta 27+89.38

Course from 1686 to 1687 N 34° 02' 05.11" W Dist 21.5868

Point 1687 N 13,784,873.9535 E 2,262,781.2863 Sta 28+10.97

Course from 1687 to 1688 N 31° 26' 12.11" W Dist 37.5382

Point 1688 N 13,784,905.9817 E 2,262,761.7080 Sta 28+48.50

Course from 1688 to 1689 N 33° 33' 44.68" W Dist 52.3336

Point 1689 N 13,784,949.5904 E 2,262,732.7756 Sta 29+00.84

Course from 1689 to 1690 N 35° 00' 23.14" W Dist 97.0864

Point 1690 N 13,785,029.1127 E 2,262,677.0802 Sta 29+97.92

Course from 1690 to 1691 N 35° 43' 17.38" W Dist 57.3153

Point 1691 N 13,785,075.6450 E 2,262,643.6169 Sta 30+55.24

Course from 1691 to 1692 N 39° 07' 28.75" W Dist 44.4486

Point 1692 N 13,785,110.1271 E 2,262,615.5694 Sta 30+99.69

Course from 1692 to 1693 N 40° 22' 06.58" W Dist 44.1902

Point 1693 N 13,785,143.7954 E 2,262,586.9474 Sta 31+43.88

Course from 1693 to 1694 N 39° 24' 39.21" W Dist 84.3021

Point 1694 N 13,785,208.9283 E 2,262,533.4259 Sta 32+28.18

=====
Ending chain D_FIN2 description

Q DITCH F1-S

Beginning chain D_F1S1 description
Feature: Grade_DitchBottom

=====
Point 1645 N 13,783,293.7524 E 2,263,666.4721 Sta 10+00.00

Course from 1645 to 1646 N 36° 35' 14.97" W Dist 66.3442

Point 1646 N 13,783,347.0233 E 2,263,626.9276 Sta 10+66.34

Course from 1646 to 1647 N 33° 45' 02.98" W Dist 65.2852

Point 1647 N 13,783,401.3054 E 2,263,590.6564 Sta 11+31.63

Course from 1647 to 1648 N 35° 04' 38.56" W Dist 80.5472

Point 1648 N 13,783,467.2234 E 2,263,544.3673 Sta 12+12.18

Course from 1648 to 1649 N 30° 15' 50.50" W Dist 237.4402

Point 1649 N 13,783,672.3033 E 2,263,424.7009 Sta 14+49.62

Course from 1649 to 1650 N 31° 35' 24.15" W Dist 149.9753

Point 1650 N 13,783,800.0550 E 2,263,346.1381 Sta 15+99.59

Course from 1650 to 1651 N 31° 10' 08.94" W Dist 274.9312

Point 1651 N 13,784,035.2980 E 2,263,203.8430 Sta 18+74.52

Course from 1651 to 1652 N 32° 06' 42.99" W Dist 25.7527

Point 1652 N 13,784,057.1108 E 2,263,190.1535 Sta 19+00.28

Course from 1652 to 1653 N 31° 52' 31.95" W Dist 128.3490

Q DITCH F1-S CONT.

Point 1653 N 13,784,166.1044 E 2,263,122.3755 Sta 20+28.63

Course from 1653 to 1654 N 30° 47' 37.94" W Dist 79.7215

Point 1654 N 13,784,234.5864 E 2,263,081.5620 Sta 21+08.35

Course from 1654 to 1655 N 31° 07' 01.38" W Dist 176.0424

Point 1655 N 13,784,385.2986 E 2,262,990.5854 Sta 22+84.39

Course from 1655 to 1656 N 33° 34' 11.12" W Dist 150.4976

Point 1656 N 13,784,510.6952 E 2,262,907.3675 Sta 24+34.89

Course from 1656 to 1657 N 28° 24' 06.65" W Dist 24.1180

Point 1657 N 13,784,531.9102 E 2,262,895.8957 Sta 24+59.00

Course from 1657 to 1658 N 29° 54' 00.49" W Dist 31.1360

Point 1658 N 13,784,558.9019 E 2,262,880.3747 Sta 24+90.14

Course from 1658 to 1659 N 32° 00' 07.53" W Dist 102.0197

Point 1659 N 13,784,645.4175 E 2,262,826.3093 Sta 25+92.16

Course from 1659 to 1660 N 31° 56' 28.73" W Dist 231.9309

Point 1660 N 13,784,842.2318 E 2,262,703.6062 Sta 28+24.09

Course from 1660 to 1661 N 32° 41' 25.39" W Dist 94.0186

Point 1661 N 13,784,921.3581 E 2,262,652.8268 Sta 29+18.11

Course from 1661 to 1662 N 33° 39' 16.99" W Dist 43.6742

Point 1662 N 13,784,957.7121 E 2,262,628.6232 Sta 29+61.78

Course from 1662 to 1663 N 33° 09' 23.82" W Dist 15.4724

Point 1663 N 13,784,970.6653 E 2,262,620.1609 Sta 29+77.26

Course from 1663 to 1664 N 36° 45' 37.24" W Dist 43.0028

Point 1664 N 13,785,005.1168 E 2,262,594.4250 Sta 30+20.26

=====
Ending chain D_F1S1 description

Q DITCH G1-N2

Beginning chain D_G1N2 description
Feature: Grade_DitchLine

=====
Point 1720 N 13,786,152.3781 E 2,261,755.0870 Sta 10+00.00

Course from 1720 to 1721 N 12° 54' 45.86" W Dist 38.8464

Point 1721 N 13,786,190.2421 E 2,261,746.4061 Sta 10+38.85

Course from 1721 to 1722 N 27° 59' 17.69" W Dist 34.4394

Point 1722 N 13,786,220.6536 E 2,261,730.2441 Sta 10+73.29

Course from 1722 to 1723 N 28° 00' 51.13" W Dist 33.2000

Point 1723 N 13,786,249.9636 E 2,261,714.6503 Sta 11+06.49

Course from 1723 to 1724 N 27° 16' 39.90" W Dist 35.2669

Point 1724 N 13,786,281.3087 E 2,261,698.4873 Sta 11+41.75

Course from 1724 to 1725 N 26° 13' 52.02" W Dist 156.3889

Point 1725 N 13,786,421.5924 E 2,261,629.3645 Sta 12+98.14

=====
Ending chain D_G1N2 description

2/28/2021

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

© 2021

FM 725

DITCH
HORIZONTAL ALIGNMENT DATA

SHEET 11 OF 13

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	224	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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Q DITCH H1-S1 CONT.

Course from 1902 to 1903	N 28° 21' 05.82" W	Dist 53.4489	
Point 1903	N 13,786,237.8570 E	2,261,625.1155 Sta	11+15.24
Course from 1903 to 1904	N 26° 51' 26.26" W	Dist 78.9183	
Point 1904	N 13,786,308.2627 E	2,261,589.4626 Sta	11+94.16
Course from 1904 to 1905	N 23° 30' 59.10" W	Dist 69.2448	
Point 1905	N 13,786,371.7564 E	2,261,561.8331 Sta	12+63.40
Course from 1905 to 1906	N 25° 21' 29.57" W	Dist 54.2235	
Point 1906	N 13,786,420.7554 E	2,261,538.6104 Sta	13+17.62
Course from 1906 to 1907	N 27° 20' 40.77" W	Dist 93.1755	
Point 1907	N 13,786,503.5194 E	2,261,495.8110 Sta	14+10.80
Course from 1907 to 1908	N 27° 45' 11.93" W	Dist 102.3521	
Point 1908	N 13,786,594.0970 E	2,261,448.1491 Sta	15+13.15
Course from 1908 to 1909	N 21° 33' 08.07" W	Dist 49.2042	
Point 1909	N 13,786,639.8610 E	2,261,430.0740 Sta	15+62.36

Ending chain D_HIS1 description

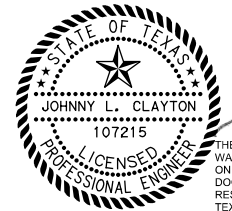
Q DITCH H1-S2

Beginning chain D_HIS2 description
 Feature: Grade_DitchBottom

Point 2085	N 13,786,655.3884 E	2,261,420.0854 Sta	10+00.00
Course from 2085 to 2086	N 58° 10' 37.19" W	Dist 11.3740	
Point 2086	N 13,786,661.3859 E	2,261,410.4212 Sta	10+11.37
Course from 2086 to 2087	N 27° 49' 17.50" W	Dist 62.4324	
Point 2087	N 13,786,716.6015 E	2,261,381.2828 Sta	10+73.81
Course from 2087 to 2088	N 26° 39' 54.00" W	Dist 70.2327	
Point 2088	N 13,786,779.3647 E	2,261,349.7642 Sta	11+44.04
Course from 2088 to 2089	N 25° 15' 38.91" W	Dist 69.6348	
Point 2089	N 13,786,842.3406 E	2,261,320.0483 Sta	12+13.67
Course from 2089 to 2090	N 24° 33' 16.81" W	Dist 30.7694	
Point 2090	N 13,786,870.3274 E	2,261,307.2617 Sta	12+44.44
Course from 2090 to 2091	N 25° 09' 03.76" W	Dist 122.8444	
Point 2091	N 13,786,981.5250 E	2,261,255.0521 Sta	13+67.29
Course from 2091 to 2092	N 26° 36' 33.47" W	Dist 53.7455	
Point 2092	N 13,787,029.5778 E	2,261,230.9793 Sta	14+21.03
Course from 2092 to 2093	N 26° 32' 57.27" W	Dist 35.4250	
Point 2093	N 13,787,061.2672 E	2,261,215.1455 Sta	14+56.46
Course from 2093 to 2094	N 26° 35' 37.16" W	Dist 70.1080	
Point 2094	N 13,787,123.9580 E	2,261,183.7609 Sta	15+26.57
Course from 2094 to 2095	N 26° 37' 33.04" W	Dist 30.9989	
Point 2095	N 13,787,151.6695 E	2,261,169.8684 Sta	15+57.56
Course from 2095 to 2096	N 26° 35' 33.72" W	Dist 76.9489	

Q DITCH H1-S2 CONT.

Point 2096	N 13,787,220.4781 E	2,261,135.4226 Sta	16+34.51
Course from 2096 to 2097	N 26° 35' 14.62" W	Dist 49.1567	
Point 2097	N 13,787,264.4366 E	2,261,113.4220 Sta	16+83.67
Course from 2097 to 2098	N 26° 35' 41.56" W	Dist 77.2389	
Point 2098	N 13,787,333.5031 E	2,261,078.8437 Sta	17+60.91
Course from 2098 to 2099	N 26° 39' 50.30" W	Dist 17.9433	
Point 2099	N 13,787,349.5382 E	2,261,070.7915 Sta	17+78.85
Course from 2099 to 2102	N 26° 35' 09.04" W	Dist 135.8757	
Point 2102	N 13,787,471.0471 E	2,261,009.9820 Sta	19+14.73
Course from 2102 to 2103	N 26° 36' 02.07" W	Dist 96.8939	
Point 2103	N 13,787,557.6847 E	2,260,966.5960 Sta	20+11.62
Course from 2103 to 2104	N 26° 37' 39.79" W	Dist 51.6708	
Point 2104	N 13,787,603.8752 E	2,260,943.4376 Sta	20+63.29
Course from 2104 to 2105	N 26° 34' 24.16" W	Dist 113.9302	
Point 2105	N 13,787,705.7700 E	2,260,892.4717 Sta	21+77.22
Course from 2105 to 2106	N 26° 37' 42.96" W	Dist 94.0076	
Point 2106	N 13,787,789.8063 E	2,260,850.3369 Sta	22+71.23
Course from 2106 to 2107	N 26° 26' 10.83" W	Dist 22.0837	
Point 2107	N 13,787,809.5807 E	2,260,840.5052 Sta	22+93.31
Course from 2107 to 2108	N 26° 47' 58.59" W	Dist 17.6763	
Point 2108	N 13,787,825.3584 E	2,260,832.5354 Sta	23+10.99
Course from 2108 to 2109	N 26° 34' 17.55" W	Dist 107.7853	
Point 2109	N 13,787,921.7591 E	2,260,784.3215 Sta	24+18.78
Course from 2109 to 2110	N 26° 40' 39.83" W	Dist 67.1200	
Point 2110	N 13,787,981.7339 E	2,260,754.1865 Sta	24+85.90
Course from 2110 to 2111	N 27° 12' 10.62" W	Dist 68.8927	
Point 2111	N 13,788,043.0065 E	2,260,722.6926 Sta	25+54.79
Course from 2111 to 2112	N 26° 57' 56.06" W	Dist 68.8533	
Point 2112	N 13,788,104.3740 E	2,260,691.4708 Sta	26+23.64
Course from 2112 to 2113	N 26° 35' 46.36" W	Dist 80.4474	
Point 2113	N 13,788,176.3088 E	2,260,655.4545 Sta	27+04.09
Course from 2113 to 2114	N 26° 35' 35.45" W	Dist 75.8597	
Point 2114	N 13,788,244.1431 E	2,260,621.4957 Sta	27+79.95
Course from 2114 to 2115	N 26° 36' 37.03" W	Dist 100.1992	
Point 2115	N 13,788,333.7286 E	2,260,576.6145 Sta	28+80.15
Course from 2115 to 2116	N 27° 57' 19.40" W	Dist 79.7696	
Point 2116	N 13,788,404.1901 E	2,260,539.2198 Sta	29+59.92
Course from 2116 to 2117	N 28° 25' 16.39" W	Dist 28.6981	
Point 2117	N 13,788,429.4293 E	2,260,525.5609 Sta	29+88.62
Course from 2117 to 2118	N 29° 10' 59.65" W	Dist 45.7717	
Point 2118	N 13,788,469.3910 E	2,260,503.2424 Sta	30+34.39



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725

DITCH
 HORIZONTAL ALIGNMENT DATA

SHEET 12 OF 13

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		225
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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☉ DITCH H1-S2 CONT.

Point 2096	N	13,787,220.4781 E	2,261,135.4226 Sta	16+34.51
Course from 2096 to 2097 N 26° 35' 14.62" W Dist 49.1567				
Point 2097	N	13,787,264.4366 E	2,261,113.4220 Sta	16+83.67
Course from 2097 to 2098 N 26° 35' 41.56" W Dist 77.2389				
Point 2098	N	13,787,333.5031 E	2,261,078.8437 Sta	17+60.91
Course from 2098 to 2099 N 26° 39' 50.30" W Dist 17.9433				
Point 2099	N	13,787,349.5382 E	2,261,070.7915 Sta	17+78.85
Course from 2099 to 2102 N 26° 35' 09.04" W Dist 135.8757				
Point 2102	N	13,787,471.0471 E	2,261,009.9820 Sta	19+14.73
Course from 2102 to 2103 N 26° 36' 02.07" W Dist 96.8939				
Point 2103	N	13,787,557.6847 E	2,260,966.5960 Sta	20+11.62
Course from 2103 to 2104 N 26° 37' 39.79" W Dist 51.6708				
Point 2104	N	13,787,603.8752 E	2,260,943.4376 Sta	20+63.29
Course from 2104 to 2105 N 26° 34' 24.16" W Dist 113.9302				
Point 2105	N	13,787,705.7700 E	2,260,892.4717 Sta	21+77.22
Course from 2105 to 2106 N 26° 37' 42.96" W Dist 94.0076				
Point 2106	N	13,787,789.8063 E	2,260,850.3369 Sta	22+71.23
Course from 2106 to 2107 N 26° 26' 10.83" W Dist 22.0837				
Point 2107	N	13,787,809.5807 E	2,260,840.5052 Sta	22+93.31
Course from 2107 to 2108 N 26° 47' 58.59" W Dist 17.6763				
Point 2108	N	13,787,825.3584 E	2,260,832.5354 Sta	23+10.99
Course from 2108 to 2109 N 26° 34' 17.55" W Dist 107.7853				
Point 2109	N	13,787,921.7591 E	2,260,784.3215 Sta	24+18.78
Course from 2109 to 2110 N 26° 40' 39.83" W Dist 67.1200				
Point 2110	N	13,787,981.7339 E	2,260,754.1865 Sta	24+85.90
Course from 2110 to 2111 N 27° 12' 10.62" W Dist 68.8927				
Point 2111	N	13,788,043.0065 E	2,260,722.6926 Sta	25+54.79
Course from 2111 to 2112 N 26° 57' 56.06" W Dist 68.8533				
Point 2112	N	13,788,104.3740 E	2,260,691.4708 Sta	26+23.64
Course from 2112 to 2113 N 26° 35' 46.36" W Dist 80.4474				
Point 2113	N	13,788,176.3088 E	2,260,655.4545 Sta	27+04.09
Course from 2113 to 2114 N 26° 35' 35.45" W Dist 75.8597				
Point 2114	N	13,788,244.1431 E	2,260,621.4957 Sta	27+79.95
Course from 2114 to 2115 N 26° 36' 37.03" W Dist 100.1992				
Point 2115	N	13,788,333.7286 E	2,260,576.6145 Sta	28+80.15
Course from 2115 to 2116 N 27° 57' 19.40" W Dist 79.7696				
Point 2116	N	13,788,404.1901 E	2,260,539.2198 Sta	29+59.92
Course from 2116 to 2117 N 28° 25' 16.39" W Dist 28.6981				
Point 2117	N	13,788,429.4293 E	2,260,525.5609 Sta	29+88.62
Course from 2117 to 2118 N 29° 10' 59.65" W Dist 45.7717				
Point 2118	N	13,788,469.3910 E	2,260,503.2424 Sta	30+34.39

☉ DITCH H1-S2 CONT.

Course from 2118 to 2119 N 29° 29' 43.13" W Dist 37.9696				
Point 2119	N	13,788,502.4396 E	2,260,484.5480 Sta	30+72.36
Course from 2119 to 2120 N 29° 36' 51.87" W Dist 37.8690				
Point 2120	N	13,788,535.3618 E	2,260,465.8346 Sta	31+10.23
Course from 2120 to 2121 N 29° 25' 39.85" W Dist 32.7847				
Point 2121	N	13,788,563.9165 E	2,260,449.7267 Sta	31+43.01
Course from 2121 to 2122 N 29° 48' 30.58" W Dist 26.5693				
Point 2122	N	13,788,586.9704 E	2,260,436.5190 Sta	31+69.58
Course from 2122 to 2123 N 31° 01' 04.37" W Dist 26.8757				
Point 2123	N	13,788,610.0031 E	2,260,422.6698 Sta	31+96.46
Course from 2123 to 2124 N 33° 48' 28.58" W Dist 20.4918				
Point 2124	N	13,788,627.0299 E	2,260,411.2679 Sta	32+16.95
Course from 2124 to 2125 N 22° 30' 21.25" W Dist 46.3528				
Point 2125	N	13,788,669.8524 E	2,260,393.5251 Sta	32+63.30
=====				
Ending chain D_H1S2 description				



2/28/2021

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NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312



FM 725

DITCH
 HORIZONTAL ALIGNMENT DATA

SHEET 13 OF 13

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 226
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

\$PENLBS\$ TIME:\$TIME\$ OFFICE:\$OFFICES\$ \$USERS\$
 \$PLTDRVS\$ \$FILEL\$ DATE:\$DATE\$

Existing Culvert Hydraulic Calculations

Structure No.	Drainage Area (AC)	STA	*Allowable Hw (ft)	Design Frequency	Design Q (cfs)	100-YR Q (cfs)	Hydrologic Method	Existing Size and Type	Length (ft)	Slope (ft/ft)	Design HW (ft)	100-YR HW (ft)	Design VOUT (fps)	100-YR VOUT (fps)	Hydraulic Method
A1	44.4	55+94.48	544.07	5yr	27	53	Rational	1 - DES 4(A) CMP	40.5	0.0008	543.96	544.64	7.34	8.03	HY8
B1	166.7	107+38.80	561.29	25yr	102	136	Rational	6 - DES 4(A) CMP	40.5	0.0017	560.25	560.99	5.28	6.68	HEC-RAS
C1	167.1	173+27.68	592.01	25yr	171	221	Rational	4 - 5'x3' MBC	50	0.0113	588.87	589.31	8.97	9.63	HEC-RAS
D1	6190.5	209+93.93	573.58	25yr	5130	8268	CN	9 - 10'x7' MBC	42	0.0018	572.78	572.78	8.91	11.58	HEC-RAS
E1	8.7	231+99.39	591.84	5yr	8	15	Rational	1 - DES 4 CMP	55.65	0.0983	588.41	588.95	8.70	10.77	HY8
F1	52.5	237+07.85	592.71	5yr	43	81	Rational	1 - DES 5 CMP	40.11	0.0103	592.57	593.08	8.12	7.55	HY8
G1	10.4	271+66.33	612.06	5yr	19	35	Rational	1 - 30" CMP	67	0.1003	608.78	610.15	12.30	13.91	HY8
H1	147.2	277+64.93	597.55	5yr	171	322	Rational	3 - DES 7 CMP	47.5	0.0449	594.73	597.04	11.02	13.53	HEC-RAS

*Allowable HW = Edge of Travel Lane.
 **D1 drainage area includes E1 & F1

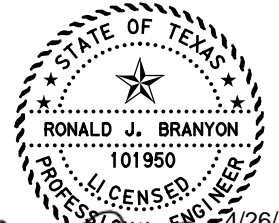
- NOTES:**
- TXDOT HYDRAULIC DESIGN MANUAL (HDM), SEPTEMBER 2019, WAS USED TO DETERMINE HYDRAULIC DATA.
 - HYDROLOGIC & HYDRAULIC MODELS DEVELOPED WITH HEC-HMS V. 4.3, HEC-RAS V. 5.0.7, AND HY-8 V. 7.60.

Proposed Culvert Hydraulic Calculations

Structure No.	Drainage Area	STA	*Allowable Hw (ft)	Design Frequency	Design Q (cfs)	100-YR Q (cfs)	Hydrologic Method	Proposed Size and Type	Length (ft)	Slope (ft/ft)	Design HW (ft)	100-YR HW (ft)	Design VOUT (fps)	100-YR VOUT (fps)	Hydraulic Method
A1	44.4	55+94.48	544.29	5yr	27	53	Rational	Extend Existing Culvert	50.0	0.0008	543.92	544.81	7.34	8.23	HY8
B1	166.7	107+38.80	561.54	25yr	102	136	Rational	Extend Existing Culvert	62.5	0.0017	560.11	560.76	5.92	6.73	HEC-RAS
C1	167.1	173+27.68	592.26	25yr	171	221	Rational	Extend Existing Culvert	63.0	0.0113	588.79	589.16	8.83	9.49	HEC-RAS
D1	6190.5	209+93.93	573.83	25yr	5130	8268	CN	Extend Existing Culvert	56.0	0.0018	572.91	575.78	8.70	11.85	HEC-RAS
E1	8.7	231+99.39	592.09	5yr	8	15	Rational	Extend Existing Culvert	82.0	0.0983/0.0846	589.86	590.40	10.29	12.37	HY8
F1	52.5	237+07.85	593.05	5yr	43	81	Rational	Extend Existing Culvert	62.0	0.0103	592.91	593.33	8.12	7.51	HY8
G1	10.4	271+66.33	612.23	5yr	19	35	Rational	Extend Existing Culvert	72.0	0.1003	608.92	610.32	12.26	14.28	HY8
H1	147.2	277+64.93	597.72	5yr	171	322	Rational	Extend Existing Culvert	75.0	0.0449	595.32	597.79	11.27	13.40	HEC-RAS

*Allowable HW = Edge of Travel Lane.
 **D1 drainage area includes E1 & F1

NO.	REVISION	BY	DATE



Ron Branyon 4/26/2021

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FM 725
HYDRAULIC
SUMMARY SHEET

SHEET 1 OF 1

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 227
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

EXISTING CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: A1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
542.99	2 year	20.00	20.00	0	1
* 543.96	5 year	27.00	27	0	1
544.54	10 year	33.00	30.79	1.97	25
544.59	25 year	41.00	31.13	9.74	6
544.62	50 year	47.00	31.3	15.55	4
544.64	100 year	53.00	31.43	21.24	3
544.49	Overtopping	30.49	30.49	0	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: A1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	20.00	20.00	542.99	2.029	2.375	7-M2c	1.85	1.164	1.164	0.632	6.328	2.163
5 year	27.00	27	543.96	2.693	3.345	7-M2c	1.85	1.381	1.381	0.699	7.343	2.297
10 year	33.00	30.79	544.54	3.132	3.917	7-M2c	1.85	1.48	1.48	0.747	7.928	2.397
25 year	41.00	31.13	544.59	3.175	3.973	7-M2c	1.85	1.488	1.488	0.802	7.983	2.514
50 year	47.00	31.3	544.62	3.197	4.002	7-M2c	1.85	1.492	1.492	0.839	8.011	2.592
100 year	53.00	31.43	544.64	3.214	4.024	7-M2c	1.85	1.495	1.495	0.89	8.033	2.526

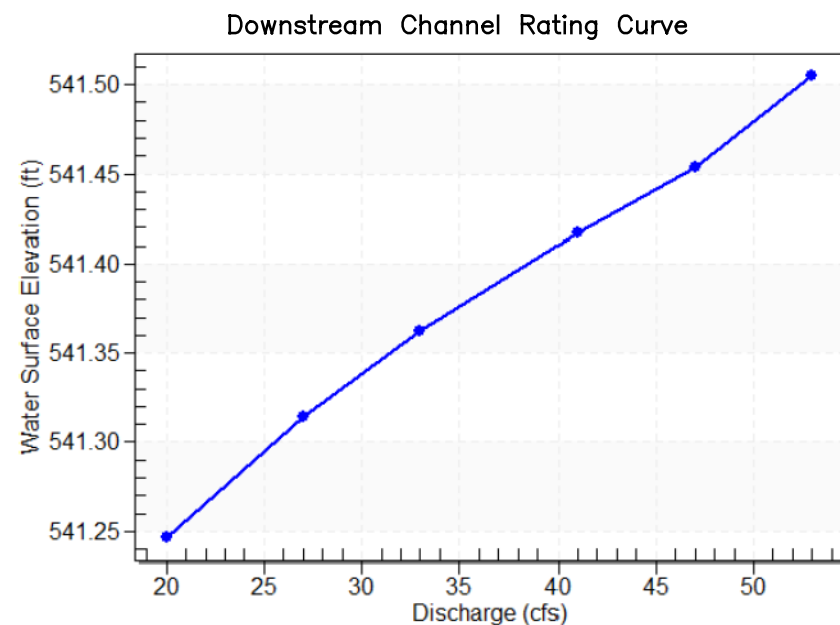
Straight Culvert

Inlet Elevation (invert): 540.62 ft Outlet Elevation (invert): 540.59 ft
Culvert Length: 40.50 ft Culvert Slope: 0.0007

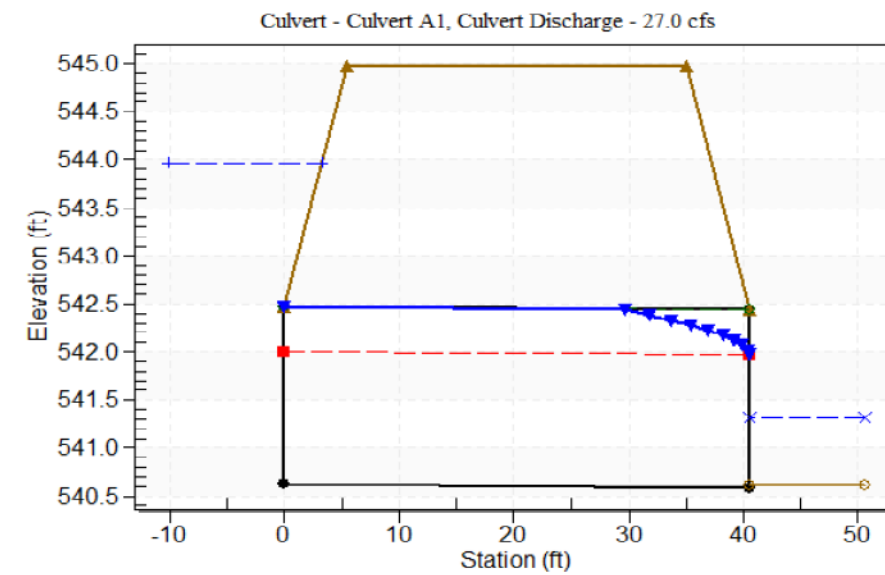
Table 3 - Downstream Channel Rating Curve (Crossing: A1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
20	541.25	0.63	2.16	0.59	0.74
27	541.31	0.7	2.3	0.65	0.75
33	541.36	0.75	2.4	0.7	0.75
41	541.42	0.8	2.51	0.75	0.76
47	541.45	0.84	2.59	0.79	0.77
53	541.50	0.89	2.53	0.83	0.76

Tailwater Rating Curve Plot for Crossing: A1



Water Surface Profile Plot for Culvert: A1
Crossing A1, Design Discharge - 27.0 cfs
Culvert A1, Culvert Discharge - 27.0 cfs



Tailwater Channel Data - A1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.015

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0	542.96	0.035
2	18.275	541.468	0.035
3	44.35	541.634	0.035
4	73.685	541.063	0.035
5	76.945	540.926	0.035
6	80.204	540.631	0.035
7	83.464	540.615	0.035
8	86.723	540.846	0.035
9	89.983	540.969	0.035
10	119.318	541.909	0.035
11	132.356	542.155	0.035
12	145.394	543.267	0.035
13	148.653	543.285	0.035

Roadway Data for Crossing: A1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
1	0	544.98
2	49.12	544.73
3	94.97	544.62
4	131.00	544.54
5	134.27	544.52
6	237.66	544.49
7	395.72	544.95

Roadway Surface: Paved
Roadway Top Width: 29.50 ft

Site Data - A1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 540.62 ft
Outlet Station: 40.50 ft
Outlet Elevation: 540.59 ft
Number of Barrels: 1

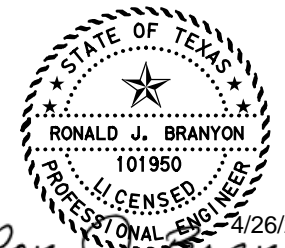
Culvert Data Summary - A1

Barrel Shape: Pipe Arch
Barrel Span: 36.10 in
Barrel Rise: 22.20 in
Barrel Material: Steel or Aluminum
Embedment: 0.00 in
Barrel Manning's n: 0.0240
Culvert Type: Straight
Inlet Configuration: Headwall
Inlet Depression: None

NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
3. VERTICAL DATUM IS NAVD88
4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



Ron J. Branyon

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FM 725
HYDRAULIC CALCULATION
DATA SHEET
STRUCTURE A1
EXISTING CONDITIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	228	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

\$PENLDRVSS \$FILEL\$ \$DATE:\$TIME\$ \$OFFICE:\$OFFICES\$ \$USERS\$

HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

PROPOSED CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: A1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
542.96	2 year	20.00	20.00	0	1
* 543.90	5 year	27.00	27	0	1
544.69	10 year	33.00	32.24	0.53	45
544.76	25 year	41.00	32.65	8.15	6
544.78	50 year	47.00	32.79	13.92	4
544.81	100 year	53.00	32.94	19.95	4
544.66	Overtopping	32.06	32.06	0	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: A1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	20.00	20.00	542.96	2.029	2.329	7-M2c	1.85	1.164	1.164	0.649	6.328	2.176
5 year	27.00	27.00	543.9	2.693	3.271	7-M2c	1.85	1.381	1.381	0.717	7.343	2.307
10 year	33.00	32.24	544.69	3.318	4.058	7-M2c	1.85	1.514	1.514	0.766	8.165	2.405
25 year	41.00	32.65	544.76	3.372	4.125	7-M2c	1.85	1.523	1.523	0.821	8.232	2.52
50 year	47.00	32.79	544.78	3.39	4.155	7-M2c	1.85	1.526	1.526	0.858	8.254	2.598
100 year	53.00	32.94	544.81	3.41	4.179	7-M2c	1.85	1.529	1.529	0.905	8.279	2.566

 Straight Culvert
 Inlet Elevation (invert): 540.63 ft Outlet Elevation (invert): 540.59 ft
 Culvert Length: 49.00 ft Culvert Slope: 0.0008

Tailwater Channel Data - A1

Tailwater Channel Option: Irregular Channel
 Channel Slope: 0.015

Roadway Data for Crossing: A1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
 Irregular Roadway Cross-Section:

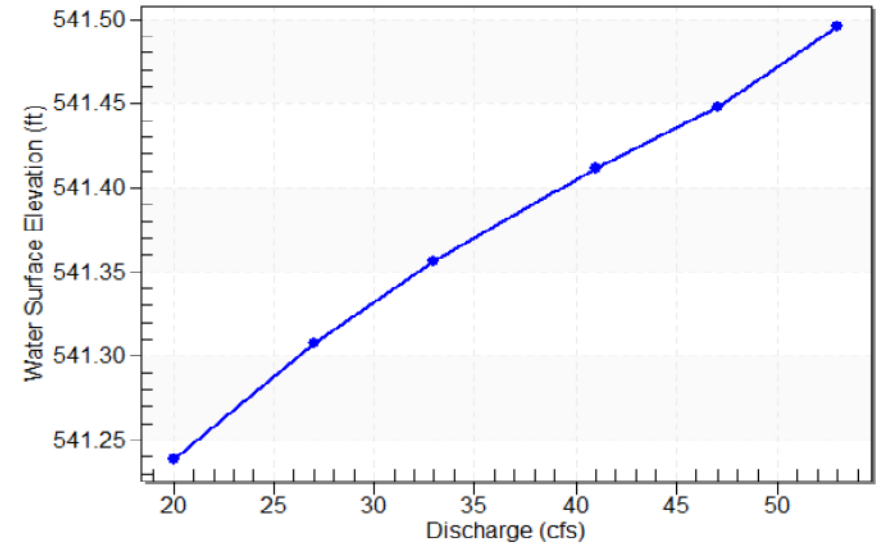
Coord No.	Station (ft)	Elevation (ft)	Manning's n	Coord No.	Station (ft)	Elevation (ft)
1	0	542.96	0.035	1	0	545.15
2	18.275	541.47	0.035	2	49.12	544.90
3	44.35	541.63	0.035	3	94.97	544.79
4	73.685	541.06	0.035	4	131.00	544.71
5	76.945	540.93	0.035	5	134.27	544.69
6	80.204	540.59	0.035	6	237.66	544.66
7	83.464	540.59	0.035	7	395.72	545.12
8	86.723	540.85	0.035			
9	89.983	540.97	0.035			
10	119.318	541.91	0.035			
11	132.356	542.16	0.035			
12	145.394	543.27	0.035			
13	148.653	543.29				

Roadway Surface: Paved
 Roadway Top Width: 40.00 ft

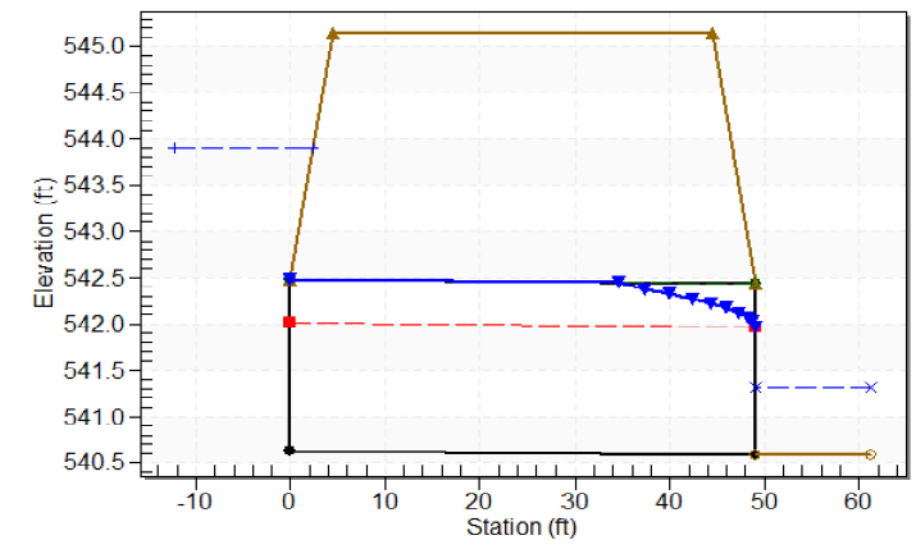
Table 3 - Downstream Channel Rating Curve (Crossing: A1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
20	541.24	0.65	2.18	0.61	0.74
27	541.31	0.72	2.31	0.67	0.75
33	541.36	0.77	2.41	0.72	0.76
41	541.41	0.82	2.52	0.77	0.76
47	541.45	0.86	2.6	0.8	0.77
53	541.50	0.91	2.57	0.85	0.77

Tailwater Rating Curve Plot for Crossing: A1
 Downstream Channel Rating Curve



Water Surface Profile Plot for Culvert: A1
 Crossing A1, Design Discharge - 27.0 cfs
 Culvert A1, Culvert Discharge - 27.0 cfs



Site Data - A1

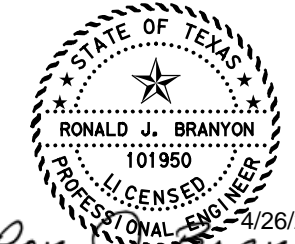
Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 540.63 ft
 Outlet Station: 49.00 ft
 Outlet Elevation: 540.59 ft
 Number of Barrels: 1

Culvert Data Summary - A1

Barrel Shape: Pipe Arch
 Barrel Span: 36.10 in
 Barrel Rise: 22.20 in
 Barrel Material: Steel or Aluminum
 Embedment: 0.00 in
 Barrel Manning's n: 0.0210
 Culvert Type: Straight
 Inlet Configuration: Headwall
 Inlet Depression: None

- NOTES:
1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
 2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
 3. VERTICAL DATUM IS NAVD88
 4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET
 STRUCTURE A1
 PROPOSED CONDITIONS**

SHEET 1 OF 1

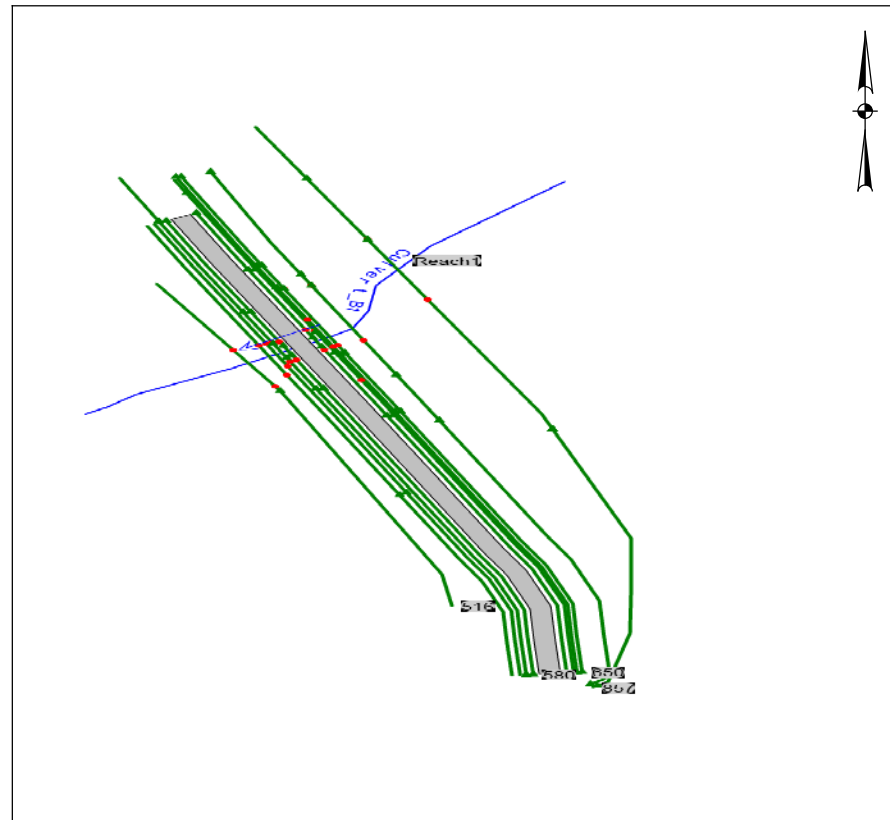
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	229	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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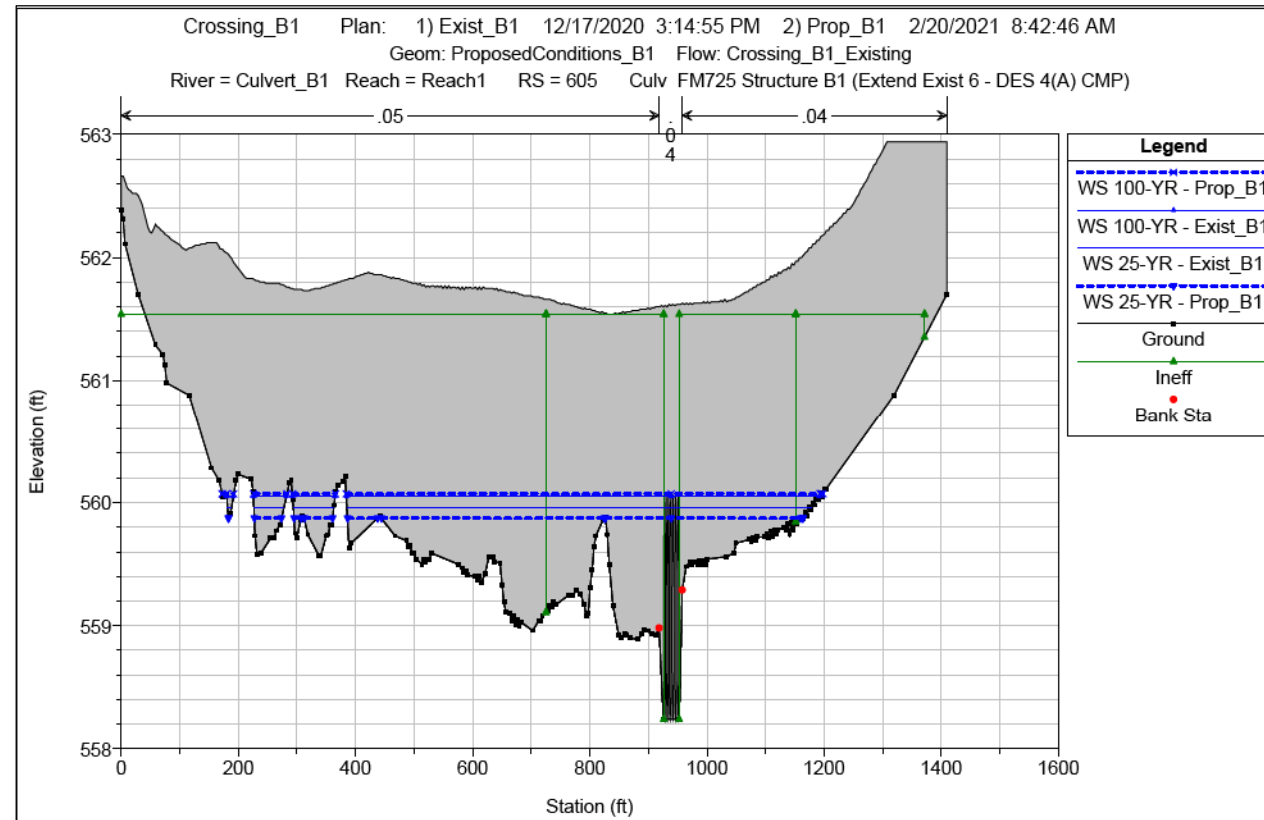
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STRUCTURE B1

HEC-RAS CROSS SECTION LAYOUT

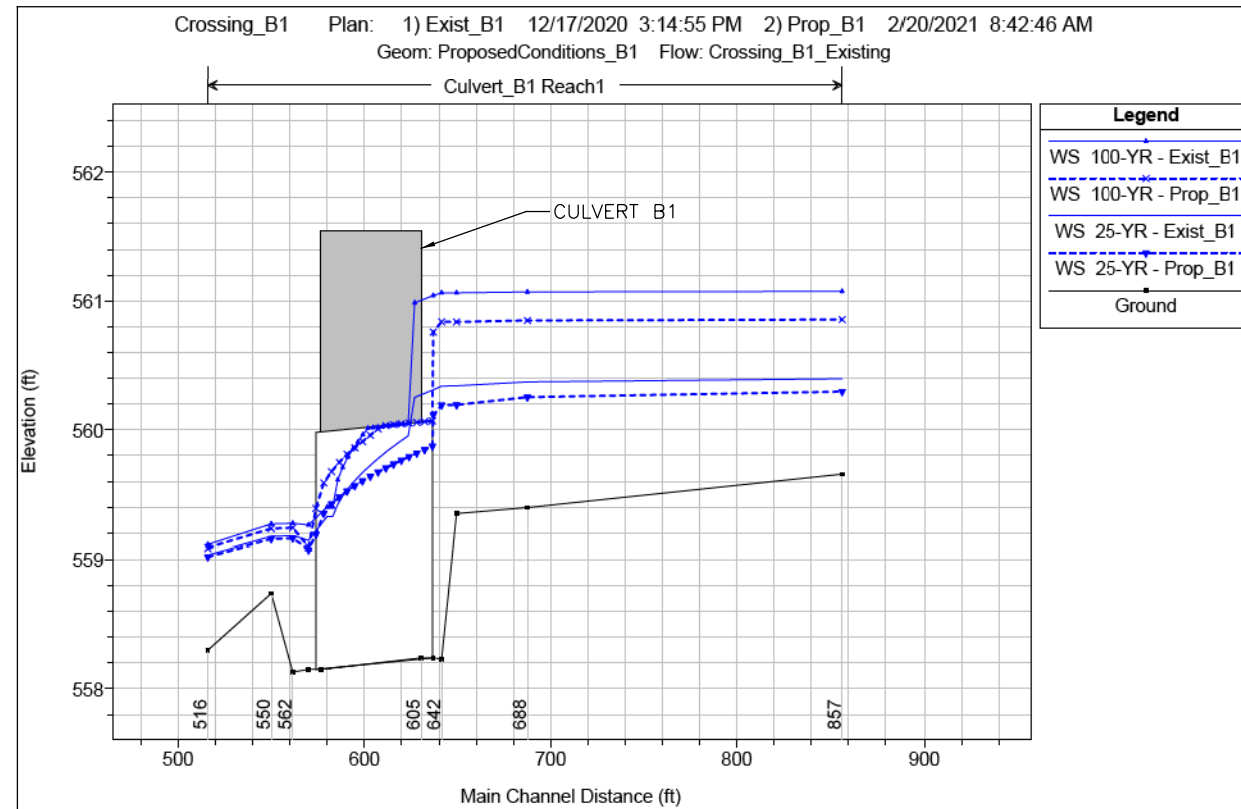


HEC-RAS STRUCTURE UPSTREAM SECTION



- NOTES:
1. HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
 2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.005 FT/FT TO DETERMINE STARTING WATER SURFACE ELEVATIONS.
 3. VERTICAL DATUM IS NAVD 88.
 4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

HEC-RAS PROFILE



NO.	REVISION	BY	DATE

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**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET 1
 STRUCTURE B1**

SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 230
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

\$PENLDRVSS \$FILEL\$ \$SPTBLSS DATE:\$TIME:\$ OFFICE:\$OFFICES \$USERS\$

EXISTING 25 YEAR

PROPOSED 25 YEAR

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch1
Reach1	857	25-YR	Exist_B1	102.00	559.66	560.40	559.82	560.40	0.00	0.20	601.00	1201.43	0.05
Reach1	857	25-YR	Prop_B1	102.00	559.66	560.30	559.82	560.30	0.00	0.23	491.70	1124.19	0.06
Reach1	857	100-YR	Exist_B1	136.00	559.66	561.07	559.86	561.07	0.00	0.11	1519.66	1439.27	0.02
Reach1	857	100-YR	Prop_B1	136.00	559.66	560.86	559.86	560.86	0.00	0.14	1211.82	1367.26	0.02
Reach1	688	25-YR	Exist_B1	102.00	559.40	560.37	559.74	560.38	0.00	0.60	171.13	955.83	0.14
Reach1	688	25-YR	Prop_B1	102.00	559.40	560.25	559.73	560.26	0.00	0.72	142.12	906.01	0.18
Reach1	688	100-YR	Exist_B1	136.00	559.40	561.07	559.79	561.07	0.00	0.40	351.19	1368.95	0.06
Reach1	688	100-YR	Prop_B1	136.00	559.40	560.85	559.79	560.85	0.00	0.48	293.36	1312.80	0.08
Reach1	650	25-YR	Exist_B1	102.00	559.35	560.34	559.83	560.35	0.00	0.86	119.85	1058.29	0.18
Reach1	650	25-YR	Prop_B1	102.00	559.35	560.19	559.83	560.21	0.00	1.10	93.41	999.75	0.26
Reach1	650	100-YR	Exist_B1	136.00	559.35	561.06	559.89	561.07	0.00	0.55	254.57	1305.89	0.08
Reach1	650	100-YR	Prop_B1	136.00	559.35	560.84	559.89	560.84	0.00	0.66	212.14	1256.78	0.11
Reach1	642	25-YR	Exist_B1	102.00	559.09	560.34	559.66	560.35	0.00	0.71	162.42	1074.13	0.13
Reach1	642	25-YR	Prop_B1	102.00	558.23	560.19	559.06	560.20	0.00	0.77	159.86	1040.31	0.13
Reach1	642	100-YR	Exist_B1	136.00	559.09	561.06	559.72	561.07	0.00	0.49	304.16	1277.06	0.07
Reach1	642	100-YR	Prop_B1	136.00	558.23	560.84	559.23	560.84	0.00	0.55	286.37	1190.54	0.07
Reach1	637	25-YR	Exist_B1	102.00	558.89	560.31	559.55	560.34	0.00	1.41	72.16	1081.03	0.23
Reach1	637	25-YR	Prop_B1	102.00	558.24	560.11	559.01	560.18	0.00	2.05	49.67	980.31	0.26
Reach1	637	100-YR	Exist_B1	136.00	558.89	561.04	559.64	561.06	0.00	1.18	115.69	1263.19	0.15
Reach1	637	100-YR	Prop_B1	136.00	558.24	560.76	559.17	560.82	0.00	2.04	66.74	1177.18	0.23
Reach1	627	25-YR	Exist_B1	102.00	558.22	560.25	559.15	560.32	0.00	2.07	49.26	345.51	0.27
Reach1	627	100-YR	Exist_B1	136.00	558.22	560.99	559.32	561.05	0.00	1.98	68.64	995.39	0.22
Reach1	605			Culvert									
Reach1	580	25-YR	Exist_B1	102.00	558.16	559.33	559.10	559.56	0.01	3.85	26.52	28.70	0.68
Reach1	580	100-YR	Exist_B1	136.00	558.16	559.40	559.26	559.76	0.01	4.78	28.46	29.28	0.81
Reach1	570	25-YR	Exist_B1	102.00	558.49	559.14	559.14	559.42	0.02	4.25	24.01	791.00	0.99
Reach1	570	25-YR	Prop_B1	102.00	558.15	559.08	558.91	559.34	0.01	4.09	24.95	713.67	0.75
Reach1	570	100-YR	Exist_B1	136.00	558.49	559.26	559.26	559.60	0.02	4.69	29.01	955.67	0.99
Reach1	570	100-YR	Prop_B1	136.00	558.15	559.09	559.08	559.54	0.02	5.35	25.43	730.29	0.97
Reach1	562	25-YR	Exist_B1	102.00	558.52	559.18	558.68	559.18	0.00	0.44	287.57	799.70	0.10
Reach1	562	25-YR	Prop_B1	102.00	558.13	559.16	559.16	559.16	0.00	0.47	325.81	781.94	0.09
Reach1	562	100-YR	Exist_B1	136.00	558.52	559.28	558.71	559.28	0.00	0.50	343.44	873.04	0.10
Reach1	562	100-YR	Prop_B1	136.00	558.13	559.24	559.24	559.24	0.00	0.54	391.33	852.36	0.10
Reach1	550	25-YR	Exist_B1	102.00	558.74	559.17	558.79	559.18	0.00	0.48	219.71	590.00	0.13
Reach1	550	25-YR	Prop_B1	102.00	558.74	559.15	559.16	559.16	0.00	0.50	212.85	584.44	0.14
Reach1	550	100-YR	Exist_B1	136.00	558.74	559.27	558.83	559.27	0.00	0.54	269.72	663.99	0.13
Reach1	550	100-YR	Prop_B1	136.00	558.74	559.23	559.24	559.24	0.00	0.57	260.58	625.92	0.15
Reach1	516	25-YR	Exist_B1	102.00	558.30	559.04	558.96	559.14	0.01	2.60	40.11	171.15	0.73
Reach1	516	25-YR	Prop_B1	102.00	558.30	559.02	558.95	559.12	0.01	2.54	44.25	166.15	0.72
Reach1	516	100-YR	Exist_B1	136.00	558.30	559.11	559.04	559.24	0.01	2.86	50.29	238.73	0.74
Reach1	516	100-YR	Prop_B1	136.00	558.30	559.09	559.04	559.20	0.01	2.78	56.16	212.22	0.74

Plan: Exist_B1	Culvert_B1	Reach1	RS: 605	Culv Group:
	Culvert #1	Profile: 25-YR		
Q Culv Group (cfs)	102	Culv Full Len (ft)		
# Barrels	6	Culv Vel US (ft/s)	3.96	
Q Barrel (cfs)	17	Culv Vel DS (ft/s)	5.28	
E.G. US. (ft)	560.32	Culv Inv El Up (ft)	558.22	
W.S. US. (ft)	560.25	Culv Inv El Dn (ft)	558.15	
E.G. DS (ft)	559.56	Culv Frctn Ls (ft)	0.44	
W.S. DS (ft)	559.33	Culv Exit Loss (ft)	0.2	
Delta EG (ft)	0.76	Culv Entr Loss (ft)	0.12	
Delta WS (ft)	0.92	Q Weir (cfs)		
E.G. IC (ft)	559.93	Weir Sta Lft (ft)		
E.G. OC (ft)	560.32	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	559.95	Weir Max Depth (ft)		
Culv WS Outlet (ft)	559.33	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	1.83	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	1.04	Min El Weir Flow (ft)	561.36	

Plan: Prop_B1	Culvert_B1	Reach1	RS: 605	Culv Group:
	Culvert #1	Profile: 25-YR		
Q Culv Group (cfs)	102	Culv Full Len (ft)		
# Barrels	6	Culv Vel US (ft/s)	4.06	
Q Barrel (cfs)	17	Culv Vel DS (ft/s)	5.92	
E.G. US. (ft)	560.18	Culv Inv El Up (ft)	558.24	
W.S. US. (ft)	560.11	Culv Inv El Dn (ft)	558.15	
E.G. DS (ft)	559.34	Culv Frctn Ls (ft)	0.4	
W.S. DS (ft)	559.08	Culv Exit Loss (ft)	0.4	
Delta EG (ft)	0.85	Culv Entr Loss (ft)	0.05	
Delta WS (ft)	1.04	Q Weir (cfs)		
E.G. IC (ft)	559.95	Weir Sta Lft (ft)		
E.G. OC (ft)	560.18	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	559.87	Weir Max Depth (ft)		
Culv WS Outlet (ft)	559.19	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	1.83	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	1.04	Min El Weir Flow (ft)	561.55	

EXISTING 100 YEAR

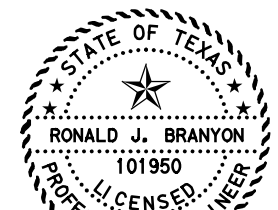
Plan: Exist_B1	Culvert_B1	Reach1	RS: 605	Culv Group:
	Culvert #1	Profile: 100-YR		
Q Culv Group (cfs)	136	Culv Full Len (ft)	22.85	
# Barrels	6	Culv Vel US (ft/s)	5.17	
Q Barrel (cfs)	22.67	Culv Vel DS (ft/s)	6.68	
E.G. US. (ft)	561.05	Culv Inv El Up (ft)	558.22	
W.S. US. (ft)	560.99	Culv Inv El Dn (ft)	558.15	
E.G. DS (ft)	559.76	Culv Frctn Ls (ft)	0.75	
W.S. DS (ft)	559.4	Culv Exit Loss (ft)	0.34	
Delta EG (ft)	1.29	Culv Entr Loss (ft)	0.21	
Delta WS (ft)	1.58	Q Weir (cfs)		
E.G. IC (ft)	560.45	Weir Sta Lft (ft)		
E.G. OC (ft)	561.05	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	560.05	Weir Max Depth (ft)		
Culv WS Outlet (ft)	559.4	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	1.83	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	1.24	Min El Weir Flow (ft)	561.36	

PROPOSED 100 YEAR

Plan: Prop_B1	Culvert_B1	Reach1	RS: 605	Culv Group:
	Culvert #1	Profile: 100-YR		
Q Culv Group (cfs)	136	Culv Full Len (ft)	28.17	
# Barrels	6	Culv Vel US (ft/s)	5.17	
Q Barrel (cfs)	22.67	Culv Vel DS (ft/s)	6.73	
E.G. US. (ft)	560.82	Culv Inv El Up (ft)	558.24	
W.S. US. (ft)	560.76	Culv Inv El Dn (ft)	558.15	
E.G. DS (ft)	559.54	Culv Frctn Ls (ft)	0.65	
W.S. DS (ft)	559.09	Culv Exit Loss (ft)	0.56	
Delta EG (ft)	1.29	Culv Entr Loss (ft)	0.08	
Delta WS (ft)	1.67	Q Weir (cfs)		
E.G. IC (ft)	560.47	Weir Sta Lft (ft)		
E.G. OC (ft)	560.82	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	560.07	Weir Max Depth (ft)		
Culv WS Outlet (ft)	559.39	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	1.83	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	1.24	Min El Weir Flow (ft)	561.55	

- NOTES:
 1. HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
 2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.005 FT/FT TO DETERMINE STARTING WATER SURFACE ELEVATIONS.
 3. VERTICAL DATUM IS NAVD 88.
 4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET 2
 STRUCTURE B1**

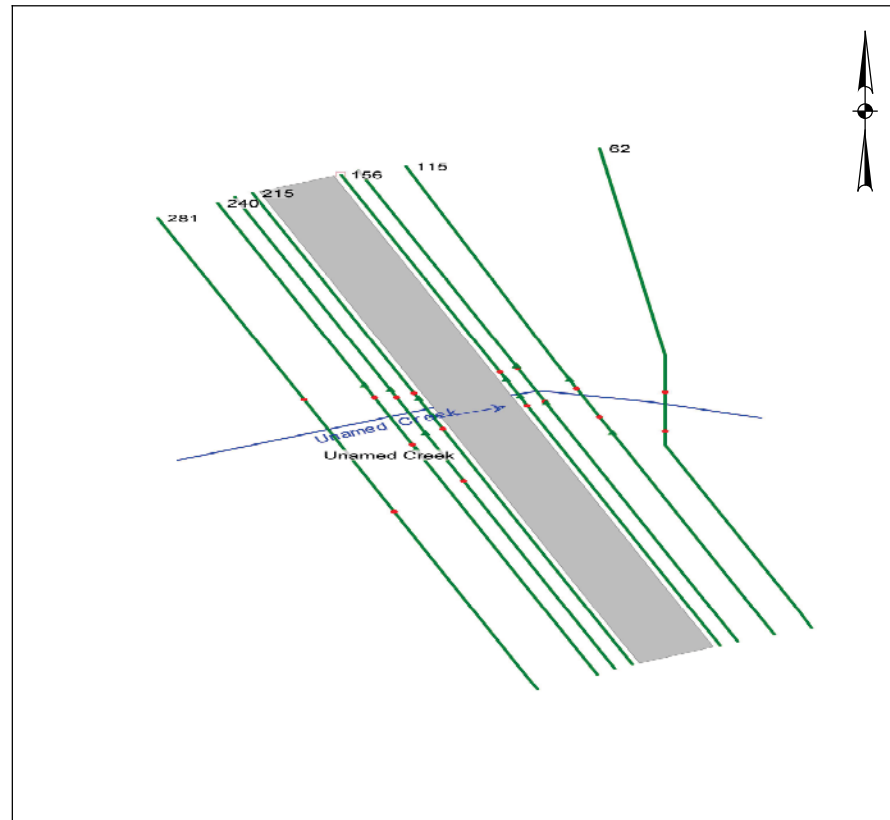
SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	231	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

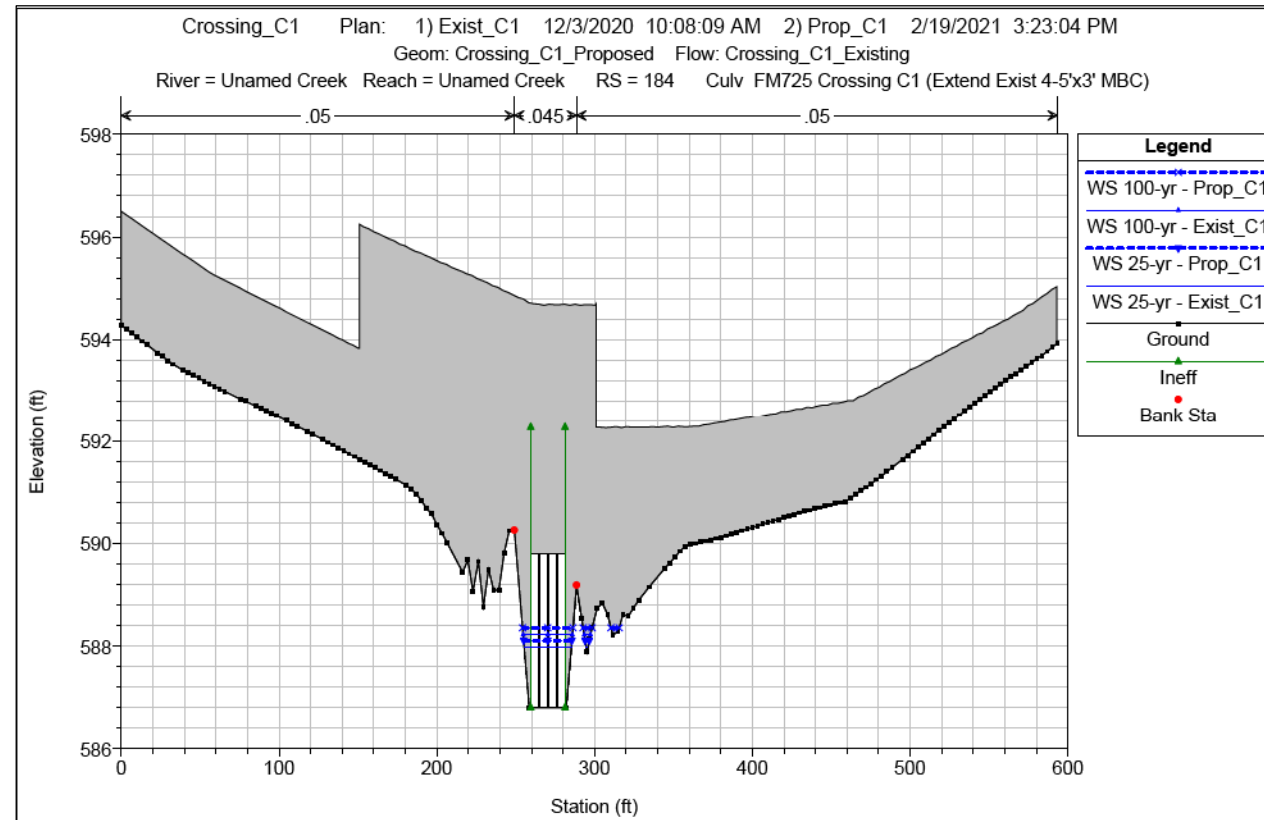
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STRUCTURE C1

HEC-RAS CROSS SECTION LAYOUT

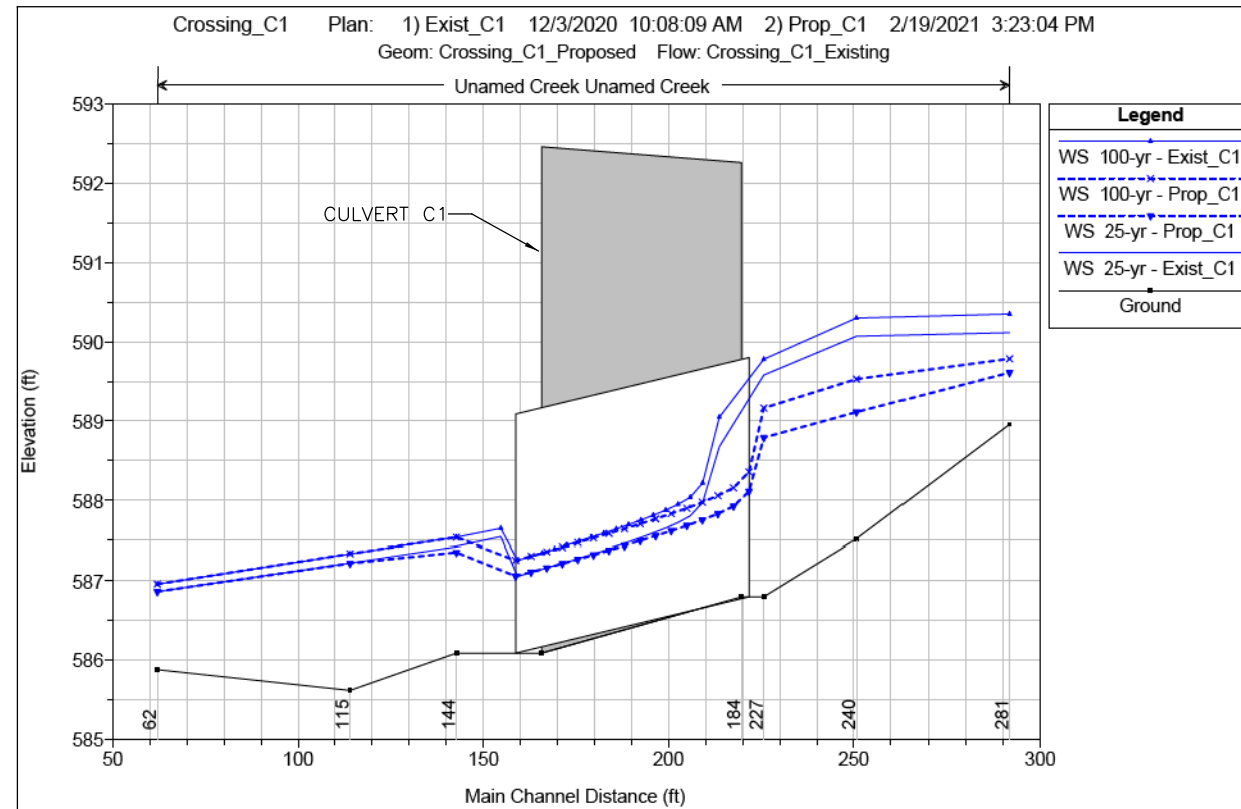


HEC-RAS STRUCTURE UPSTREAM SECTION



- NOTES:
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HEC-RAS PROFILE



NO.	REVISION	BY	DATE

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FM 725
HYDRAULIC CALCULATION
DATA SHEET 1
STRUCTURE C1

SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 232
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

\$PENLDRVSS \$FILEL\$ \$DATE:\$TIME\$ OFFICE:\$OFFICES\$ \$USERS\$

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Unamed Creek	281	25-yr	Exist_C1	171.00	588.96	590.12		590.13	0.00	1.05	175.28	200.51	0.18
Unamed Creek	281	25-yr	Prop_C1	171.00	588.96	589.61		589.68	0.01	2.22	80.11	172.26	0.54
Unamed Creek	281	100-yr	Exist_C1	221.00	588.96	590.35		590.37	0.00	1.08	226.06	222.48	0.17
Unamed Creek	281	100-yr	Prop_C1	221.00	588.96	589.79		589.85	0.01	2.10	111.22	187.82	0.44
Unamed Creek	240	25-yr	Exist_C1	171.00	587.52	590.07	588.79	590.10	0.00	1.35	135.05	231.79	0.17
Unamed Creek	240	25-yr	Prop_C1	171.00	587.52	589.11	588.79	589.26	0.01	3.08	58.19	87.81	0.56
Unamed Creek	240	100-yr	Exist_C1	221.00	587.52	590.30	588.96	590.33	0.00	1.53	153.59	244.13	0.19
Unamed Creek	240	100-yr	Prop_C1	221.00	587.52	589.53	588.96	589.63	0.00	2.58	91.40	157.19	0.40
Unamed Creek	227	25-yr	Exist_C1	171.00	587.89	589.58	589.58	590.02	0.03	5.31	32.23	111.01	1.00
Unamed Creek	227	25-yr	Prop_C1	171.00	586.80	588.79	588.04	589.03	0.01	3.95	43.34	67.47	0.49
Unamed Creek	227	100-yr	Exist_C1	221.00	587.89	589.78	589.78	590.25	0.03	5.50	40.48	130.88	0.99
Unamed Creek	227	100-yr	Prop_C1	221.00	586.80	589.16	588.28	589.45	0.01	4.30	51.43	91.01	0.49
Unamed Creek	215	25-yr	Exist_C1	171.00	586.60	588.68	587.83	588.89	0.00	3.74	45.70	38.09	0.46
Unamed Creek	215	100-yr	Exist_C1	221.00	586.60	589.05	588.06	589.31	0.00	4.10	53.91	42.06	0.46
Unamed Creek	184												
Unamed Creek	156	25-yr	Exist_C1	171.00	586.08	587.55	587.32	587.99	0.01	5.36	31.90	31.52	0.78
Unamed Creek	156	100-yr	Exist_C1	221.00	586.08	587.65	587.55	588.30	0.02	6.48	34.13	31.88	0.91
Unamed Creek	144	25-yr	Exist_C1	171.00	586.09	587.43	587.32	587.76	0.02	4.62	37.15	60.57	0.87
Unamed Creek	144	25-yr	Prop_C1	171.00	586.09	587.36	587.31	587.92	0.02	6.02	28.40	51.17	0.94
Unamed Creek	144	100-yr	Exist_C1	221.00	586.09	587.54	587.51	587.97	0.02	5.26	42.27	65.42	0.94
Unamed Creek	144	100-yr	Prop_C1	221.00	586.09	587.54	587.54	588.26	0.02	6.79	32.54	65.45	1.00
Unamed Creek	115	25-yr	Exist_C1	171.00	585.62	587.22	586.90	587.35	0.01	3.07	62.49	136.19	0.49
Unamed Creek	115	25-yr	Prop_C1	171.00	585.62	587.22	586.90	587.35	0.01	3.08	62.31	136.13	0.49
Unamed Creek	115	100-yr	Exist_C1	221.00	585.62	587.34	587.03	587.50	0.01	3.51	70.33	138.64	0.54
Unamed Creek	115	100-yr	Prop_C1	221.00	585.62	587.34	587.03	587.51	0.01	3.50	70.38	138.65	0.54
Unamed Creek	62	25-yr	Exist_C1	171.00	585.88	586.87	586.70	586.96	0.01	2.51	70.06	141.15	0.61
Unamed Creek	62	25-yr	Prop_C1	171.00	585.88	586.87	586.70	586.96	0.01	2.51	70.06	141.15	0.61
Unamed Creek	62	100-yr	Exist_C1	221.00	585.88	586.96	586.78	587.07	0.01	2.54	83.87	150.77	0.62
Unamed Creek	62	100-yr	Prop_C1	221.00	585.88	586.96	586.78	587.07	0.01	2.54	83.87	150.77	0.62

EXISTING 100 YEAR

Q Culv Group (cfs)	221	Culv Full Len (ft)	
# Barrels	4	Culv Vel US (ft/s)	7.08
Q Barrel (cfs)	55.25	Culv Vel DS (ft/s)	9.39
E.G. US. (ft)	589.31	Culv Inv El Up (ft)	586.66
W.S. US. (ft)	589.05	Culv Inv El Dn (ft)	586.08
E.G. DS (ft)	588.3	Culv Frctn Ls (ft)	0.37
W.S. DS (ft)	587.65	Culv Exit Loss (ft)	0.33
Delta EG (ft)	1.01	Culv Entr Loss (ft)	0.31
Delta WS (ft)	1.4	Q Weir (cfs)	
E.G. IC (ft)	589.15	Weir Sta Lft (ft)	
E.G. OC (ft)	589.31	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	588.22	Weir Max Depth (ft)	
Culv WS Outlet (ft)	587.26	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.08	Weir Flow Area (sq ft)	
Culv Cr+ Depth (ft)	1.56	Min El Weir Flow (ft)	592.46

- NOTES:
 1. HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
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 3. VERTICAL DATUM IS NAVD 88.
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NO.	REVISION	BY	DATE

EXISTING 25 YEAR

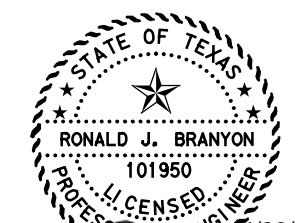
Q Culv Group (cfs)	171	Culv Full Len (ft)	
# Barrels	4	Culv Vel US (ft/s)	6.5
Q Barrel (cfs)	42.75	Culv Vel DS (ft/s)	8.76
E.G. US. (ft)	588.89	Culv Inv El Up (ft)	586.66
W.S. US. (ft)	588.68	Culv Inv El Dn (ft)	586.08
E.G. DS (ft)	587.99	Culv Frctn Ls (ft)	0.38
W.S. DS (ft)	587.55	Culv Exit Loss (ft)	0.26
Delta EG (ft)	0.9	Culv Entr Loss (ft)	0.26
Delta WS (ft)	1.13	Q Weir (cfs)	
E.G. IC (ft)	588.74	Weir Sta Lft (ft)	
E.G. OC (ft)	588.89	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	587.97	Weir Max Depth (ft)	
Culv WS Outlet (ft)	587.06	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	0.91	Weir Flow Area (sq ft)	
Culv Cr+ Depth (ft)	1.31	Min El Weir Flow (ft)	592.46

PROPOSED 25 YEAR

Q Culv Group (cfs)	171	Culv Full Len (ft)	
# Barrels	4	Culv Vel US (ft/s)	6.5
Q Barrel (cfs)	42.75	Culv Vel DS (ft/s)	8.83
E.G. US. (ft)	589.03	Culv Inv El Up (ft)	586.8
W.S. US. (ft)	588.79	Culv Inv El Dn (ft)	586.09
E.G. DS (ft)	587.92	Culv Frctn Ls (ft)	0.5
W.S. DS (ft)	587.36	Culv Exit Loss (ft)	0.35
Delta EG (ft)	1.12	Culv Entr Loss (ft)	0.26
Delta WS (ft)	1.44	Q Weir (cfs)	
E.G. IC (ft)	588.88	Weir Sta Lft (ft)	
E.G. OC (ft)	589.03	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	588.11	Weir Max Depth (ft)	
Culv WS Outlet (ft)	587.06	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	0.92	Weir Flow Area (sq ft)	
Culv Cr+ Depth (ft)	1.31	Min El Weir Flow (ft)	592.47

PROPOSED 100 YEAR

Q Culv Group (cfs)	221	Culv Full Len (ft)	
# Barrels	4	Culv Vel US (ft/s)	7.08
Q Barrel (cfs)	55.25	Culv Vel DS (ft/s)	9.49
E.G. US. (ft)	589.45	Culv Inv El Up (ft)	586.8
W.S. US. (ft)	589.16	Culv Inv El Dn (ft)	586.09
E.G. DS (ft)	588.26	Culv Frctn Ls (ft)	0.49
W.S. DS (ft)	587.54	Culv Exit Loss (ft)	0.4
Delta EG (ft)	1.2	Culv Entr Loss (ft)	0.31
Delta WS (ft)	1.63	Q Weir (cfs)	
E.G. IC (ft)	589.29	Weir Sta Lft (ft)	
E.G. OC (ft)	589.45	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	588.36	Weir Max Depth (ft)	
Culv WS Outlet (ft)	587.25	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.09	Weir Flow Area (sq ft)	
Culv Cr+ Depth (ft)	1.56	Min El Weir Flow (ft)	592.47



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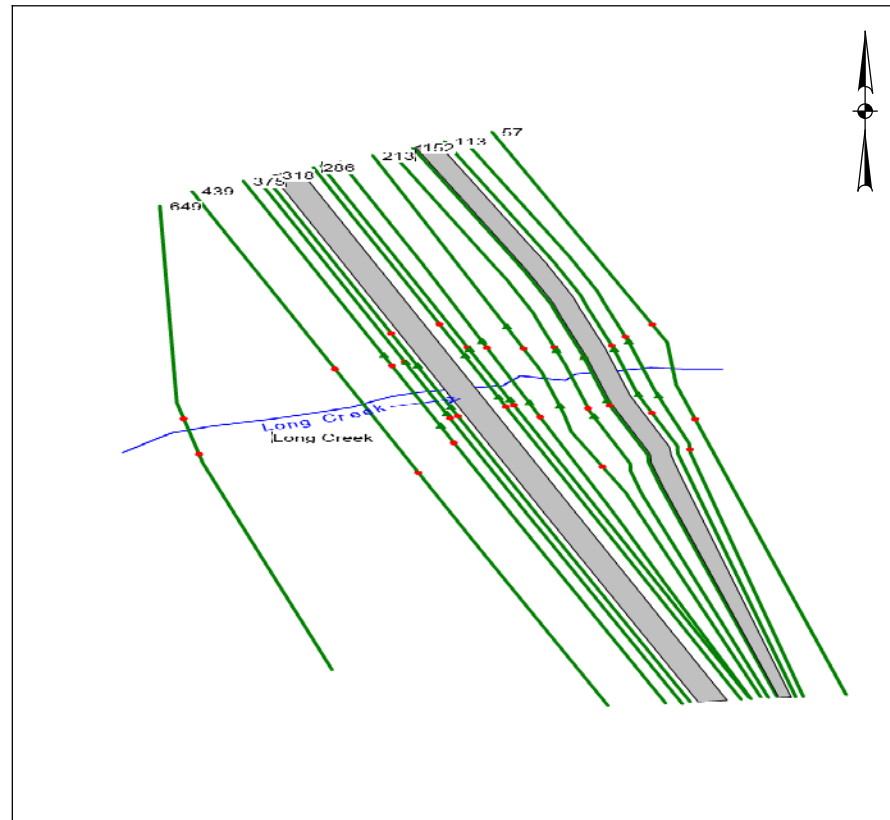
**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET 2
 STRUCTURE C1**

SHEET 2 OF 2

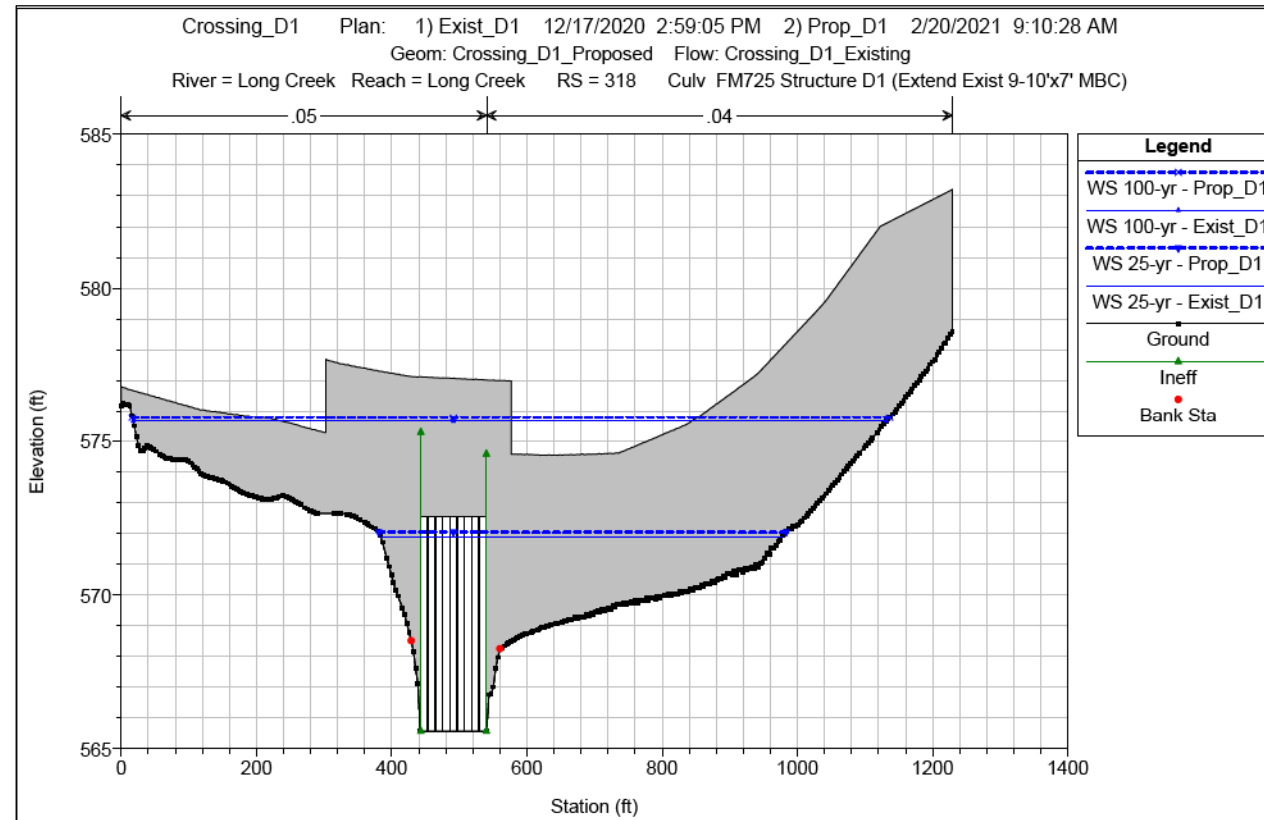
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	233
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
		HIGHWAY NO.
		FM 725

STRUCTURE D1

HEC-RAS CROSS SECTION LAYOUT

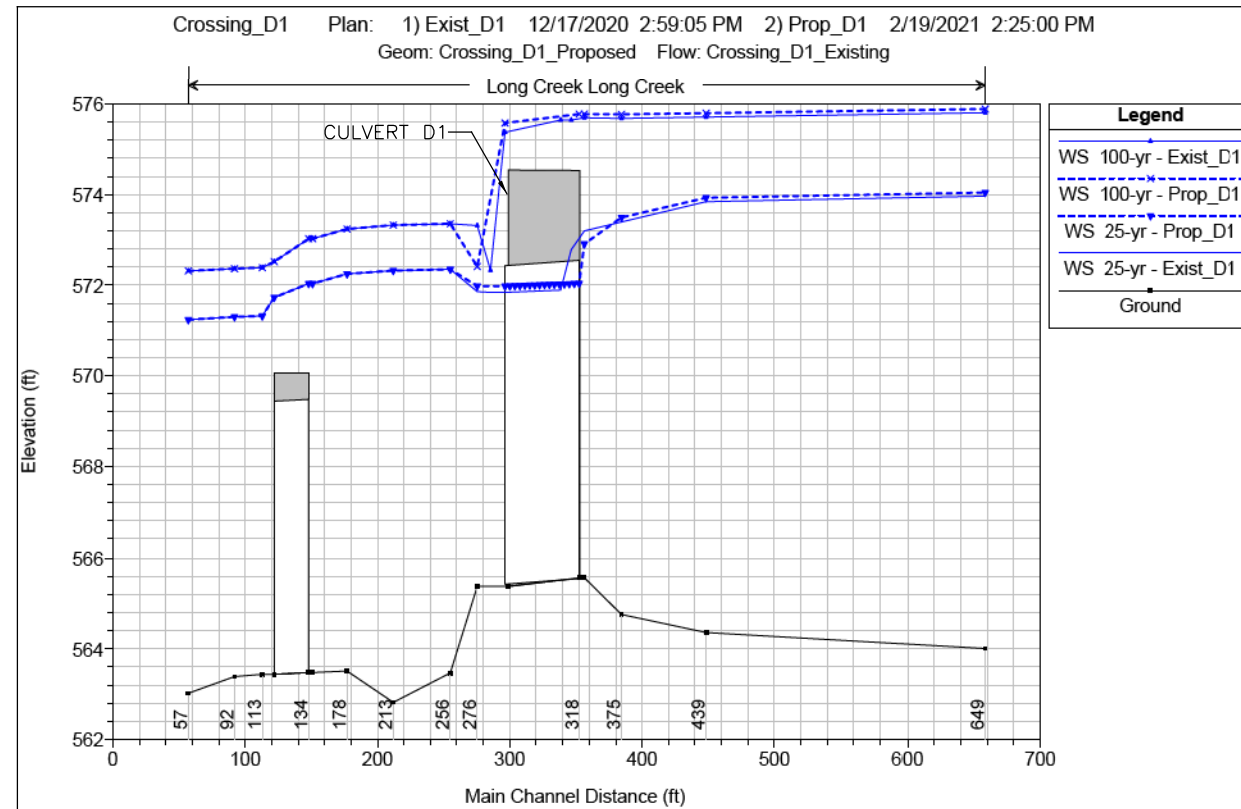


HEC-RAS STRUCTURE UPSTREAM SECTION



- NOTES:
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HEC-RAS PROFILE



NO.	REVISION	BY	DATE

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FM 725 HYDRAULIC CALCULATION DATA SHEET 1 STRUCTURE D1

SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 234
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

\$PENLBS\$ TIME:\$TIME\$ OFFICE:\$OFFICES\$ \$USERS\$
 \$SPENTBL\$ DATE:\$DATE\$
 \$PLTDV\$ \$FILEL\$

\$PLTDRV\$ \$FILEL\$
 \$PENLBS\$ \$DATE\$ \$TIME\$ \$OFFICE\$ \$USERS\$

EXISTING 25 YEAR

PROPOSED 25 YEAR

Plan: Exist_D1		Long Creek Culvert #1	Long Creek RS: 318 Profile: 25-yr	Culv Group:
Q Culv Group (cfs)	5130	Culv Full Len (ft)		
# Barrels	9	Culv Vel US (ft/s)	8.96	
Q Barrel (cfs)	570	Culv Vel DS (ft/s)	8.91	
E.G. US. (ft)	573.64	Culv Inv El Up (ft)	565.53	
W.S. US. (ft)	572.78	Culv Inv El Dn (ft)	565.44	
E.G. DS (ft)	572.91	Culv Frctn Ls (ft)	0.06	
W.S. DS (ft)	571.84	Culv Exit Loss (ft)	0.16	
Delta EG (ft)	0.73	Culv Entr Loss (ft)	0.5	
Delta WS (ft)	0.94	Q Weir (cfs)		
E.G. IC (ft)	573.07	Weir Sta Lft (ft)		
E.G. OC (ft)	573.64	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	571.89	Weir Max Depth (ft)		
Culv WS Outlet (ft)	571.84	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	5.63	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	4.66	Min El Weir Flow (ft)	574.29	

Plan: Prop_D1		Long Creek Culvert #1	Long Creek RS: 318 Profile: 25-yr	Culv Group:
Q Culv Group (cfs)	5130	Culv Full Len (ft)		
# Barrels	9	Culv Vel US (ft/s)	8.78	
Q Barrel (cfs)	570	Culv Vel DS (ft/s)	8.7	
E.G. US. (ft)	573.72	Culv Inv El Up (ft)	565.55	
W.S. US. (ft)	572.91	Culv Inv El Dn (ft)	565.43	
E.G. DS (ft)	572.98	Culv Frctn Ls (ft)	0.08	
W.S. DS (ft)	571.98	Culv Exit Loss (ft)	0.17	
Delta EG (ft)	0.73	Culv Entr Loss (ft)	0.48	
Delta WS (ft)	0.93	Q Weir (cfs)		
E.G. IC (ft)	573.09	Weir Sta Lft (ft)		
E.G. OC (ft)	573.72	Weir Sta Rgt (ft)		
Culvert Control	Outlet	Weir Submerg		
Culv WS Inlet (ft)	572.04	Weir Max Depth (ft)		
Culv WS Outlet (ft)	571.98	Weir Avg Depth (ft)		
Culv Nml Depth (ft)	5.63	Weir Flow Area (sq ft)		
Culv Crt Depth (ft)	4.66	Min El Weir Flow (ft)	574.58	

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Long Creek	649	25-yr	Exist_D1	5130.00	564.01	573.97		574.03	0.00	2.64	2849.38	782.24	0.17
Long Creek	649	25-yr	Prop_D1	5130.00	564.01	574.04		574.10	0.00	2.58	2909.77	785.79	0.17
Long Creek	649	100-yr	Exist_D1	8268.00	564.01	575.81		575.87	0.00	2.66	4413.77	907.35	0.15
Long Creek	649	100-yr	Prop_D1	8268.00	564.01	575.89		575.95	0.00	2.62	4488.21	919.97	0.15
Long Creek	439	25-yr	Exist_D1	5130.00	564.36	573.84		573.92	0.00	2.50	2539.29	739.07	0.17
Long Creek	439	25-yr	Prop_D1	5130.00	564.36	573.93		574.00	0.00	2.45	2601.66	749.64	0.17
Long Creek	439	100-yr	Exist_D1	8268.00	564.36	575.71		575.79	0.00	2.59	4078.29	935.10	0.16
Long Creek	439	100-yr	Prop_D1	8268.00	564.36	575.80		575.87	0.00	2.55	4159.42	941.59	0.16
Long Creek	375	25-yr	Exist_D1	5130.00	564.76	573.40	570.46	573.83	0.00	5.39	981.01	689.24	0.37
Long Creek	375	25-yr	Prop_D1	5130.00	564.76	573.49	570.46	573.92	0.00	5.30	997.20	698.28	0.37
Long Creek	375	100-yr	Exist_D1	8268.00	564.76	575.68	571.78	575.76	0.00	2.67	3921.59	905.78	0.16
Long Creek	375	100-yr	Prop_D1	8268.00	564.76	575.77	571.78	575.85	0.00	2.62	4001.91	938.76	0.16
Long Creek	358	25-yr	Exist_D1	5130.00	564.10	573.20	569.84	573.75	0.00	5.98	858.11	830.27	0.39
Long Creek	358	25-yr	Prop_D1	5130.00	565.57	572.91	570.01	573.72	0.00	7.20	712.01	760.86	0.47
Long Creek	358	100-yr	Exist_D1	8268.00	564.10	575.69	571.27	575.74	0.00	2.28	5089.61	1115.66	0.13
Long Creek	358	100-yr	Prop_D1	8268.00	565.57	575.78	571.66	575.82	0.00	2.13	5201.71	1119.64	0.12
Long Creek	347	25-yr	Exist_D1	5130.00	565.63	572.78	570.07	573.64	0.00	7.42	691.26	620.60	0.49
Long Creek	347	100-yr	Exist_D1	8268.00	565.63	575.65	571.75	575.73	0.00	2.83	4006.15	1082.87	0.18
Long Creek	318												
Long Creek	286	25-yr	Exist_D1	5130.00	565.44	571.84	569.88	572.91	0.00	8.29	618.74	347.17	0.58
Long Creek	286	100-yr	Exist_D1	8268.00	565.44	572.33	571.55	574.72	0.01	12.42	665.75	389.16	0.83
Long Creek	276	25-yr	Exist_D1	5130.00	563.42	571.86	570.16	572.81	0.00	7.81	657.17	521.73	0.58
Long Creek	276	25-yr	Prop_D1	5130.00	565.38	571.98	569.83	572.98	0.00	8.04	637.67	538.14	0.55
Long Creek	276	100-yr	Exist_D1	8268.00	563.42	573.32	571.63	573.63	0.00	5.46	2292.42	893.09	0.37
Long Creek	276	100-yr	Prop_D1	8268.00	565.38	572.41	571.50	574.71	0.01	12.17	679.34	677.74	0.81
Long Creek	256	25-yr	Exist_D1	5130.00	563.47	572.35	570.06	572.51	0.00	3.60	1774.91	677.43	0.27
Long Creek	256	25-yr	Prop_D1	5130.00	563.47	572.35	570.06	572.51	0.00	3.60	1774.91	677.43	0.27
Long Creek	256	100-yr	Exist_D1	8268.00	563.47	573.36	570.90	573.57	0.00	4.39	2568.92	857.25	0.30
Long Creek	256	100-yr	Prop_D1	8268.00	563.47	573.36	570.90	573.57	0.00	4.39	2568.92	857.25	0.30
Long Creek	213	25-yr	Exist_D1	5130.00	562.82	572.32	569.53	572.46	0.00	3.13	1961.81	716.19	0.24
Long Creek	213	25-yr	Prop_D1	5130.00	562.82	572.32	569.53	572.46	0.00	3.13	1961.81	716.19	0.24
Long Creek	213	100-yr	Exist_D1	8268.00	562.82	573.33	570.37	573.50	0.00	3.74	2754.10	850.98	0.27
Long Creek	213	100-yr	Prop_D1	8268.00	562.82	573.33	570.37	573.50	0.00	3.74	2754.10	850.98	0.27
Long Creek	178	25-yr	Exist_D1	5130.00	563.51	572.25	569.32	572.41	0.00	3.79	1848.56	730.32	0.26
Long Creek	178	25-yr	Prop_D1	5130.00	563.51	572.25	569.32	572.41	0.00	3.79	1848.56	730.32	0.26
Long Creek	178	100-yr	Exist_D1	8268.00	563.51	573.24	570.89	573.46	0.00	4.54	2649.61	871.96	0.29
Long Creek	178	100-yr	Prop_D1	8268.00	563.51	573.24	570.89	573.46	0.00	4.54	2649.61	871.96	0.29
Long Creek	152	25-yr	Exist_D1	5130.00	563.48	572.04	567.98	572.34	0.00	4.85	1523.02	699.73	0.30
Long Creek	152	25-yr	Prop_D1	5130.00	563.48	572.04	567.98	572.34	0.00	4.85	1523.02	699.73	0.30
Long Creek	152	100-yr	Exist_D1	8268.00	563.48	573.03	569.64	573.38	0.00	5.65	2294.94	834.68	0.33
Long Creek	152	100-yr	Prop_D1	8268.00	563.48	573.03	569.64	573.38	0.00	5.65	2294.94	834.68	0.33
Long Creek	134												
Long Creek	113	25-yr	Exist_D1	5130.00	563.44	571.32	567.92	571.59	0.00	4.59	1507.67	586.07	0.33
Long Creek	113	25-yr	Prop_D1	5130.00	563.44	571.32	567.92	571.59	0.00	4.59	1507.67	586.07	0.33
Long Creek	113	100-yr	Exist_D1	8268.00	563.44	572.39	570.38	572.72	0.00	5.39	2218.23	808.47	0.36
Long Creek	113	100-yr	Prop_D1	8268.00	563.44	572.39	570.38	572.72	0.00	5.39	2218.23	808.47	0.36
Long Creek	92	25-yr	Exist_D1	5130.00	563.39	571.30	569.44	571.53	0.00	4.07	1526.03	599.15	0.35
Long Creek	92	25-yr	Prop_D1	5130.00	563.39	571.30	569.44	571.53	0.00	4.07	1526.03	599.15	0.35
Long Creek	92	100-yr	Exist_D1	8268.00	563.39	572.37	570.39	572.65	0.00	4.75	2246.52	783.66	0.36
Long Creek	92	100-yr	Prop_D1	8268.00	563.39	572.37	570.39	572.65	0.00	4.75	2246.52	783.66	0.36
Long Creek	57	25-yr	Exist_D1	5130.00	563.02	571.24	569.45	571.45	0.00	4.08	1621.70	625.55	0.34
Long Creek	57	25-yr	Prop_D1	5130.00	563.02	571.24	569.45	571.45	0.00	4.08	1621.70	625.55	0.34
Long Creek	57	100-yr	Exist_D1	8268.00	563.02	572.31	570.36	572.57	0.00	4.69	2367.64	747.67	0.35
Long Creek	57	100-yr	Prop_D1	8268.00	563.02	572.31	570.36	572.57	0.00	4.69	2367.64	747.67	0.35

EXISTING 100 YEAR

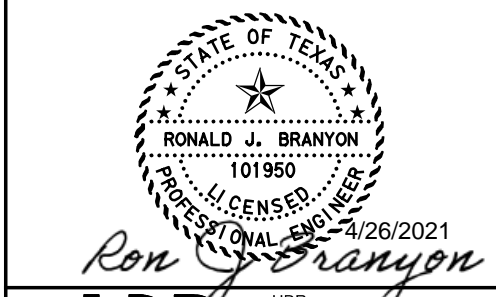
Plan: Exist_D1		Long Creek Culvert #1	Long Creek RS: 318 Profile: 100-yr	Culv Group:
Q Culv Group (cfs)	7295.09	Culv Full Len (ft)	42	
# Barrels	9	Culv Vel US (ft/s)	11.58	
Q Barrel (cfs)	810.57	Culv Vel DS (ft/s)	11.58	
E.G. US. (ft)	575.72	Culv Inv El Up (ft)	565.53	
W.S. US. (ft)	575.65	Culv Inv El Dn (ft)	565.44	
E.G. DS (ft)	574.72	Culv Frctn Ls (ft)	0.16	
W.S. DS (ft)	572.33	Culv Exit Loss (ft)	0	
Delta EG (ft)	1	Culv Entr Loss (ft)	0.83	
Delta WS (ft)	3.32	Q Weir (cfs)	972.91	
E.G. IC (ft)	575.88	Weir Sta Lft (ft)	141.93	
E.G. OC (ft)	575.72	Weir Sta Rgt (ft)	863.91	
Culvert Control	Outlet	Weir Submerg	0	
Culv WS Inlet (ft)	572.53	Weir Max Depth (ft)	1.44	
Culv WS Outlet (ft)	572.64	Weir Avg Depth (ft)	0.78	
Culv Nml Depth (ft)	7	Weir Flow Area (sq ft)	368.32	
Culv Crt Depth (ft)	5.89	Min El Weir Flow (ft)	574.29	

PROPOSED 100 YEAR

Plan: Prop_D1		Long Creek Culvert #1	Long Creek RS: 318 Profile: 100-yr	Culv Group:
Q Culv Group (cfs)	7466.49	Culv Full Len (ft)	56	
# Barrels	9	Culv Vel US (ft/s)	11.85	
Q Barrel (cfs)	829.61	Culv Vel DS (ft/s)	11.85	
E.G. US. (ft)	575.81	Culv Inv El Up (ft)	565.55	
W.S. US. (ft)	575.78	Culv Inv El Dn (ft)	565.43	
E.G. DS (ft)	574.71	Culv Frctn Ls (ft)	0.23	
W.S. DS (ft)	572.41	Culv Exit Loss (ft)	0	
Delta EG (ft)	1.1	Culv Entr Loss (ft)	0.87	
Delta WS (ft)	3.37	Q Weir (cfs)	801.51	
E.G. IC (ft)	576.03	Weir Sta Lft (ft)	195.07	
E.G. OC (ft)	575.81	Weir Sta Rgt (ft)	853.79	
Culvert Control	Outlet	Weir Submerg	0	
Culv WS Inlet (ft)	572.55	Weir Max Depth (ft)	1.29	
Culv WS Outlet (ft)	572.53	Weir Avg Depth (ft)	0.79	
Culv Nml Depth (ft)	7	Weir Flow Area (sq ft)	303.53	
Culv Crt Depth (ft)	5.98	Min El Weir Flow (ft)	574.58	

- NOTES:
- 1. HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
 - 2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.005 FT/FT TO DETERMINE STARTING WATER SURFACE ELEVATIONS.
 - 3. VERTICAL DATUM IS NAVD 88.
 - 4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

EXISTING CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: E-1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
588.24	2 year	6.00	6.00	0.00	1
* 588.41	5 year	8.00	8.00	0.00	1
588.58	10 year	10.00	10.00	0.00	1
588.73	25 year	12.00	12.00	0.00	1
588.80	50 year	13.00	13.00	0.00	1
588.95	100 year	15.00	15.00	0.00	1
591.87	Overtopping	40.51	40.51	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: E1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	6.00	6.00	588.24	0.833	0.0*	1-S2n	0.328	0.574	0.328	0.361	7.873	3.500
5 year	8.00	8.00	588.41	1.002	0.0*	1-S2n	0.382	0.678	0.382	0.408	8.700	3.780
10 year	10.00	10.00	588.58	1.165	0.0*	1-S2n	0.431	0.772	0.431	0.449	9.395	4.011
25 year	12.00	12.00	588.73	1.319	0.0*	1-S2n	0.476	0.860	0.476	0.486	9.994	4.207
50 year	13.00	13.00	588.80	1.394	0.0*	1-S2n	0.497	0.902	0.497	0.503	10.273	4.297
100 year	15.00	15.00	588.95	1.542	0.0*	1-S2n	0.540	0.982	0.540	0.534	10.771	4.460

Straight Culvert

Inlet Elevation (invert): 587.41 ft Outlet Elevation (invert): 581.61 ft
Culvert Length: 55.65 ft Culvert Slope: 0.0983

Tailwater Channel Data - E1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.054

Roadway Data for Crossing: E1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Table 3 - Downstream Channel Rating Curve (Crossing: E1)

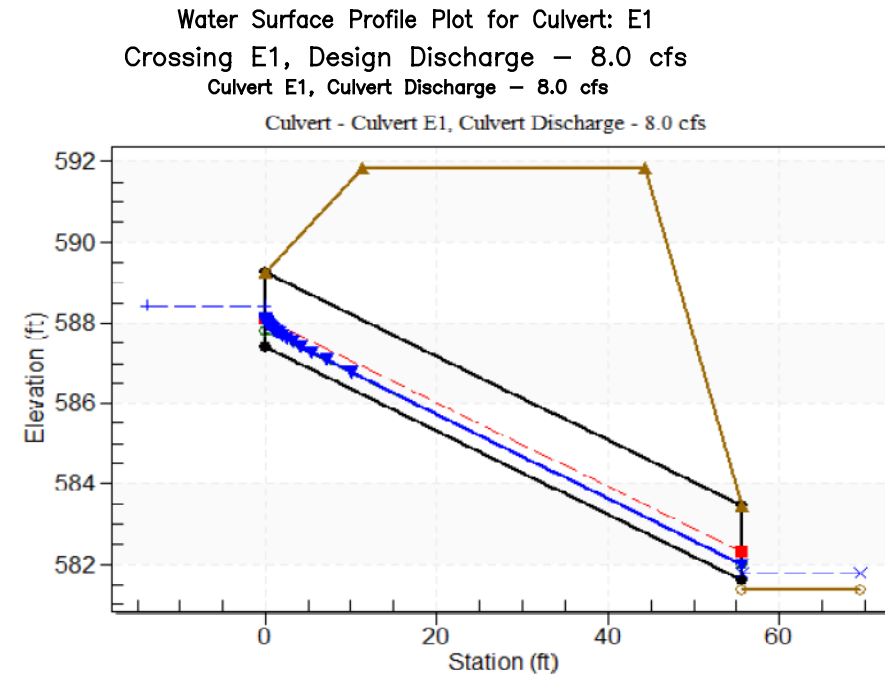
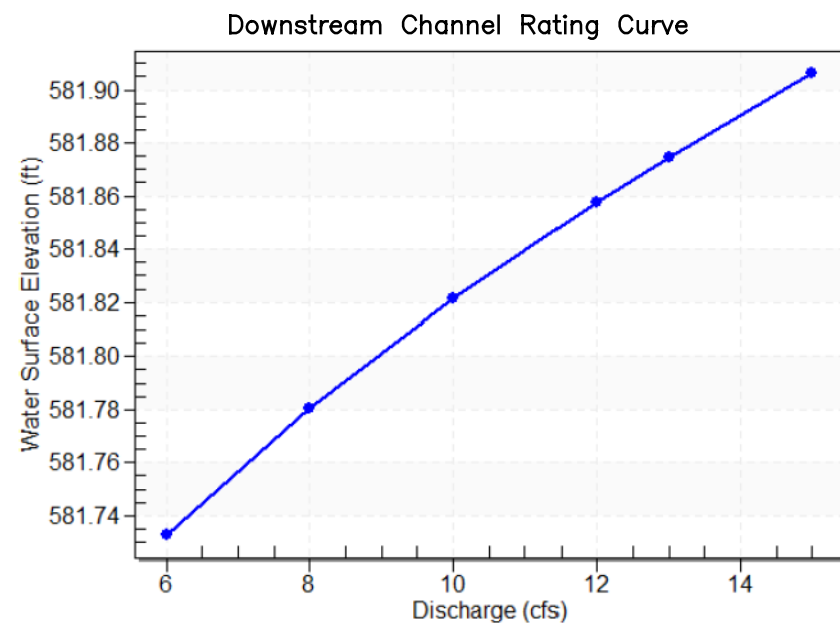
Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
6	581.73	0.36	3.50	1.22	1.34
8	581.78	0.41	3.78	1.38	1.36
10	581.82	0.45	4.01	1.51	1.38
12	581.86	0.49	4.21	1.64	1.40
13	581.87	0.50	4.30	1.69	1.41
15	581.91	0.53	4.46	1.80	1.42

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	585.04	0.0350
2	23.81	583.92	0.0350
3	33.28	583.92	0.0350
4	36.43	583.75	0.0350
5	64.82	581.47	0.0350
6	67.97	581.37	0.0350
7	71.13	582.08	0.0350
8	74.28	582.90	0.0350
9	77.39	583.23	0.0350
10	80.50	583.35	0.0350
11	83.61	583.44	0.0350
12	86.72	583.45	0.0350
13	114.72	583.23	0.0350
14	145.11	587.05	

Coord No.	Station (ft)	Elevation (ft)
1	0.00	591.86
2	37.58	591.87
3	70.99	591.95

Roadway Surface: Paved
Roadway Top Width: 33.00 ft

Tailwater Rating Curve Plot for Crossing: E1



Site Data - E1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 587.41 ft
Outlet Station: 55.65 ft
Outlet Elevation: 581.61 ft
Number of Barrels: 1

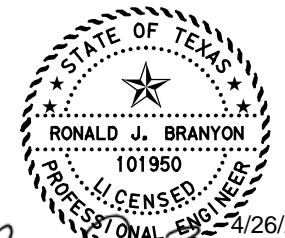
Culvert Data Summary - E1

Barrel Shape: Pipe Arch
Barrel Span: 36.10 in
Barrel Rise: 22.20 in
Barrel Material: Steel or Aluminum
Embedment: 0.00 in
Barrel Manning's n: 0.0240
Culvert Type: Straight
Inlet Configuration: Headwall
Inlet Depression: None

NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
3. VERTICAL DATUM IS NAVD88
4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



Ron J. Branyon

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FM 725
HYDRAULIC CALCULATION
DATA SHEET
STRUCTURE E1
EXISTING CONDITIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	236	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

\$PENLDRVSS \$FILEL\$ \$DATE:\$TIME\$ \$OFFICE:\$OFFICES\$ \$USERS\$

HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

PROPOSED CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: E-1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
589.69	2 year	6.00	6.00	0.00	1
* 589.86	5 year	8.00	8.00	0.00	1
590.02	10 year	10.00	10.00	0.00	1
590.18	25 year	12.00	12.00	0.00	1
590.25	50 year	13.00	13.00	0.00	1
590.40	100 year	15.00	15.00	0.00	1
592.12	Overtopping	32.48	32.48	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: E1

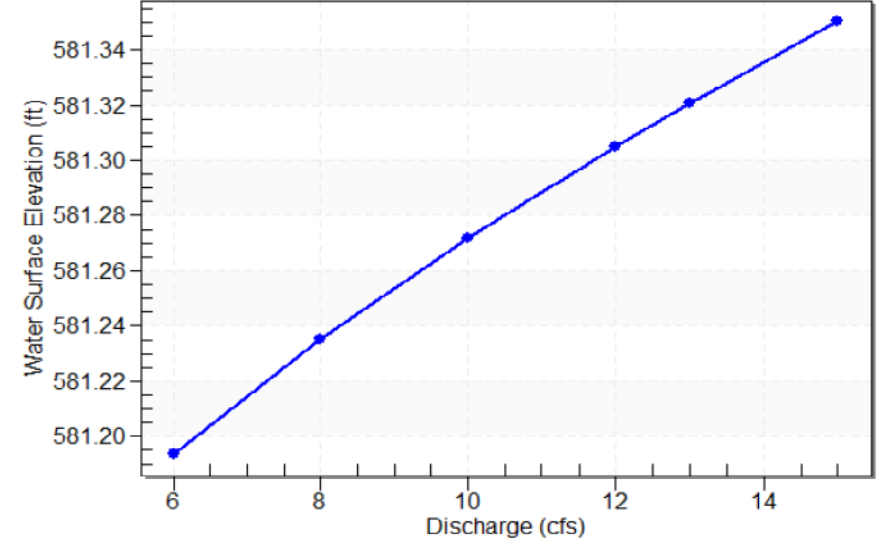
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	6.00	6.00	589.69	0.839	0.0*	1-S2n	0.000	0.574	0.285	0.234	9.435	3.336
5 year	8.00	8.00	589.86	1.009	0.0*	1-S2n	0.000	0.574	0.334	0.275	10.288	3.664
10 year	10.00	10.00	590.02	1.173	0.0*	1-S2n	0.000	0.574	0.379	0.312	10.994	3.934
25 year	12.00	12.00	590.18	1.326	0.0*	1-S2n	0.000	0.574	0.421	0.345	11.600	4.166
50 year	13.00	13.00	590.25	1.401	0.0*	1-S2n	0.000	0.574	0.441	0.361	11.873	4.271
100 year	15.00	15.00	590.40	1.550	0.0*	1-S2n	0.000	0.630	0.480	0.390	12.374	4.464

Single Broken-back Culvert
Inlet Elevation (invert): 588.85 ft Break Elevation (invert): 582.06 ft
Culvert Length: 82.00 ft Culvert Slope: 0.0983
Steep Culvert Section Slope 0.0846

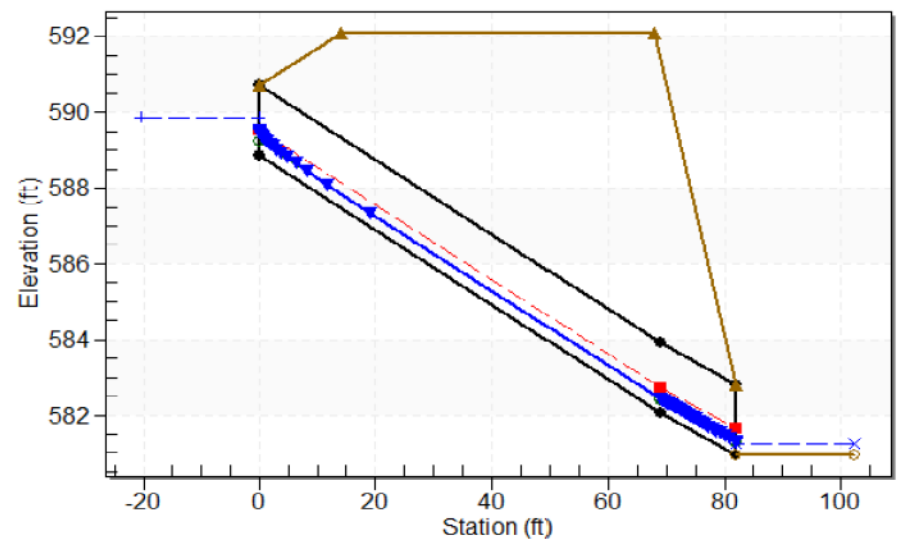
Table 3 - Downstream Channel Rating Curve (Crossing: E1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
6	581.19	0.23	3.34	0.79	1.32
8	581.24	0.28	3.66	0.93	1.35
10	581.27	0.31	3.93	1.05	1.37
12	581.31	0.35	4.17	1.16	1.39
13	581.32	0.36	4.27	1.22	1.40
15	581.35	0.39	4.46	1.31	1.42

Tailwater Rating Curve Plot for Crossing: E1
Downstream Channel Rating Curve



Water Surface Profile Plot for Culvert: E1
Crossing E1, Design Discharge - 8.0 cfs
Culvert E1, Culvert Discharge - 8.0 cfs
Culvert - Culvert E1, Culvert Discharge - 8.0 cfs



Tailwater Channel Data - E1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.054

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	585.04	0.0350
2	23.81	583.92	0.0350
3	33.28	583.92	0.0350
4	36.43	583.75	0.0350
5	64.82	581.14	0.0350
6	67.97	581.14	0.0350
7	71.13	581.14	0.0350
8	74.28	582.90	0.0350
9	77.39	583.23	0.0350
10	80.50	583.35	0.0350
11	83.61	583.44	0.0350
12	86.72	583.45	0.0350
13	114.72	583.23	0.0350
14	145.11	587.05	

Roadway Data for Crossing: E1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
1	0.00	592.11
2	37.58	592.12
3	70.99	592.20

Roadway Surface: Paved
Roadway Top Width: 54.00 ft

Site Data - E1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 588.85 ft
Break Station: 69.00 ft
Break Elevation: 582.06 ft
Outlet Station: 82.00
Outlet Elevation: 580.96
Number of Barrels: 1

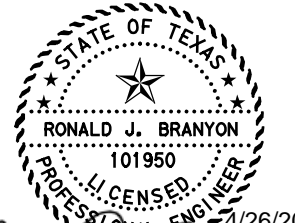
Culvert Data Summary - E1

Barrel Shape: Pipe Arch
Barrel Span: 36.10 in
Barrel Rise: 22.20 in
Upper Section Material: Steel or Aluminum
Lower Section Material: Concrete
Embedment: 0.00 in
Upper Section Manning's n: 0.0220
Lower Section Manning's n: 0.015
Culvert Type: Single Broken-back
Inlet Configuration: Headwall
Inlet Depression: None

NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
3. VERTICAL DATUM IS NAVD88
4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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FM 725 HYDRAULIC CALCULATION DATA SHEET STRUCTURE E1 PROPOSED CONDITIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	237	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

EXISTING CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: F1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
591.72	2 year	32.00	32.00	0.00	1
* 592.57	5 year	43.00	43.00	0.00	1
592.91	10 year	51.00	45.59	5.22	15
592.99	25 year	62.00	46.10	15.80	6
593.04	50 year	71.00	46.26	24.54	4
593.08	100 year	81.00	46.41	34.50	4
592.75	Overtopping	44.46	44.46	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: F1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	32.00	32.00	591.72	2.454	2.525	7-M2c	1.798	1.408	1.408	1.281	7.002	3.387
5 year	43.00	43.00	592.57	3.259	3.380	7-M2c	2.217	1.666	1.666	1.476	8.118	3.516
10 year	51.00	45.59	592.91	3.481	3.719	7-M2t	2.217	1.719	1.924	1.802	7.741	2.377
25 year	62.00	46.10	592.99	3.526	3.804	7-M2t	2.217	1.729	1.987	1.865	7.674	2.501
50 year	71.00	46.26	593.04	3.541	3.847	7-M2t	2.217	1.733	2.029	1.907	7.612	2.618
100 year	81.00	46.41	593.08	3.555	3.890	7-M2t	2.217	1.735	2.073	1.951	7.553	2.736

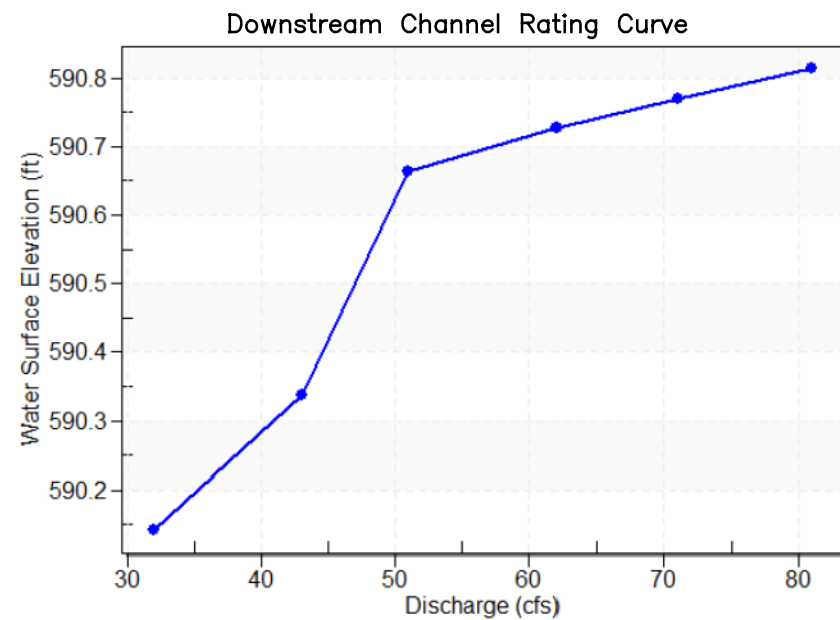
Straight Culvert

Inlet Elevation (invert): 589.19 ft Outlet Elevation (invert): 588.74 ft
Culvert Length: 40.11 ft Culvert Slope: 0.0103

Table 3 - Downstream Channel Rating Curve (Crossing: F1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
32	590.14	1.28	3.39	0.80	0.70
43	590.34	1.48	3.52	0.92	0.71
51	590.66	1.80	2.38	1.12	0.64
62	590.73	1.86	2.50	1.16	0.65
71	590.77	1.91	2.62	1.19	0.66
81	590.81	1.95	2.74	1.22	0.67

Tailwater Rating Curve Plot for Crossing: F1



Tailwater Channel Data - F1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.010

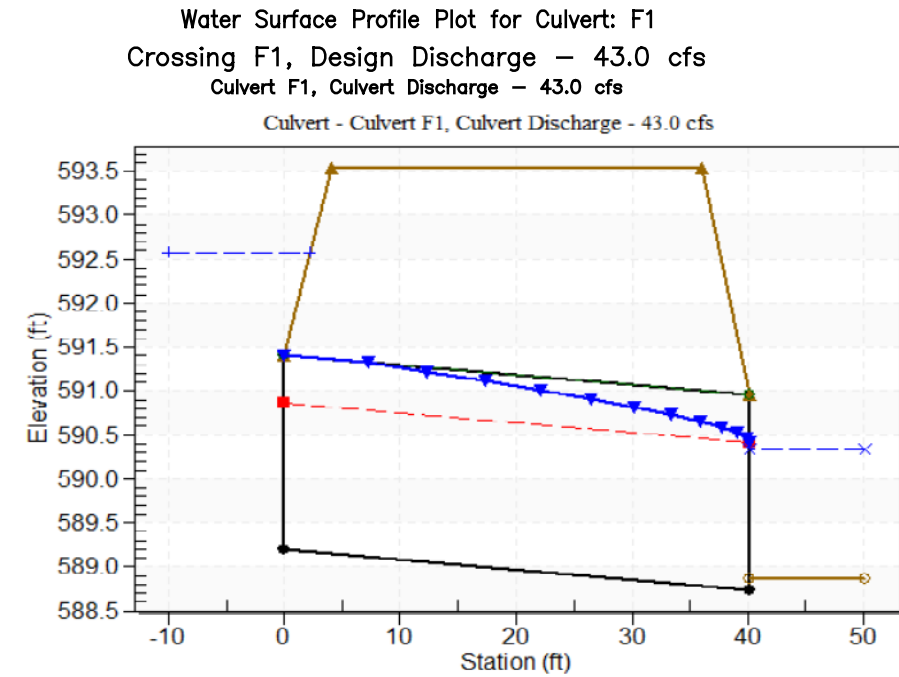
Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	591.89	0.0350
2	17.84	590.56	0.0350
3	29.64	590.56	0.0350
4	32.59	590.48	0.0350
5	35.54	590.23	0.0350
6	38.48	589.60	0.0350
7	41.43	588.86	0.0350
8	44.38	588.93	0.0350
9	47.55	589.94	0.0350
10	50.73	590.43	0.0350
11	57.07	590.56	0.0350
12	60.24	590.56	0.0350
13	69.68	590.70	0.0350
14	88.22	592.00	0.0350

Roadway Data for Crossing: F1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
1	0.00	593.54
2	104.16	592.97
3	214.82	592.75

Roadway Surface: Paved
Roadway Top Width: 32.00 ft



Site Data - F1

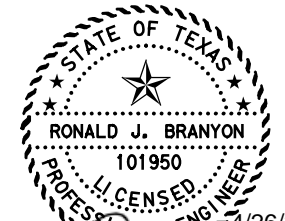
Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 589.19 ft
Outlet Station: 40.11 ft
Outlet Elevation: 588.74 ft
Number of Barrels: 1

Culvert Data Summary - F1

Barrel Shape: Pipe Arch
Barrel Span: 43.30 in
Barrel Rise: 26.60 in
Barrel Material: Steel or Aluminum
Embedment: 0.00 in
Barrel Manning's n: 0.0240
Culvert Type: Straight
Inlet Configuration: Headwall
Inlet Depression: None
NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
3. VERTICAL DATUM IS NAVD88
4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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FM 725
HYDRAULIC CALCULATION
DATA SHEET
STRUCTURE F1
EXISTING CONDITIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	238	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

PROPOSED CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: F1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
591.90	2 year	32.00	32.00	0.00	1
* 592.91	5 year	43.00	43.00	0.00	1
593.16	10 year	51.00	45.30	5.49	13
593.24	25 year	62.00	46.03	15.87	6
593.29	50 year	71.00	46.33	24.49	4
593.33	100 year	81.00	46.36	34.55	4
593.00	Overtopping	43.82	43.82	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: F1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	32.00	32.00	591.90	2.592	2.631	7-M2c	1.611	1.408	1.408	1.216	7.002	4.121
5 year	43.00	43.00	592.91	3.642	3.461	7-M2c	2.217	1.666	1.666	1.412	8.118	4.336
10 year	51.00	45.30	593.16	3.892	3.763	7-M2c	2.217	1.714	1.714	1.532	8.363	4.455
25 year	62.00	46.03	593.24	3.973	3.856	7-M2c	2.217	1.728	1.728	1.693	8.442	4.495
50 year	71.00	46.33	593.29	4.007	4.017	7-M2t	2.217	1.734	2.052	2.032	7.580	2.976
100 year	81.00	46.36	593.33	4.010	4.060	7-M2t	2.217	1.734	2.096	2.076	7.508	3.089

 Straight Culvert
 Inlet Elevation (invert): 589.27 ft Outlet Elevation (invert): 588.63 ft
 Culvert Length: 62.00 ft Culvert Slope: 0.0103

Tailwater Channel Data - F1

Tailwater Channel Option: Irregular Channel
 Channel Slope: 0.010

Roadway Data for Crossing: F1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
 Irregular Roadway Cross-Section:

Table 3 - Downstream Channel Rating Curve (Crossing: F1)

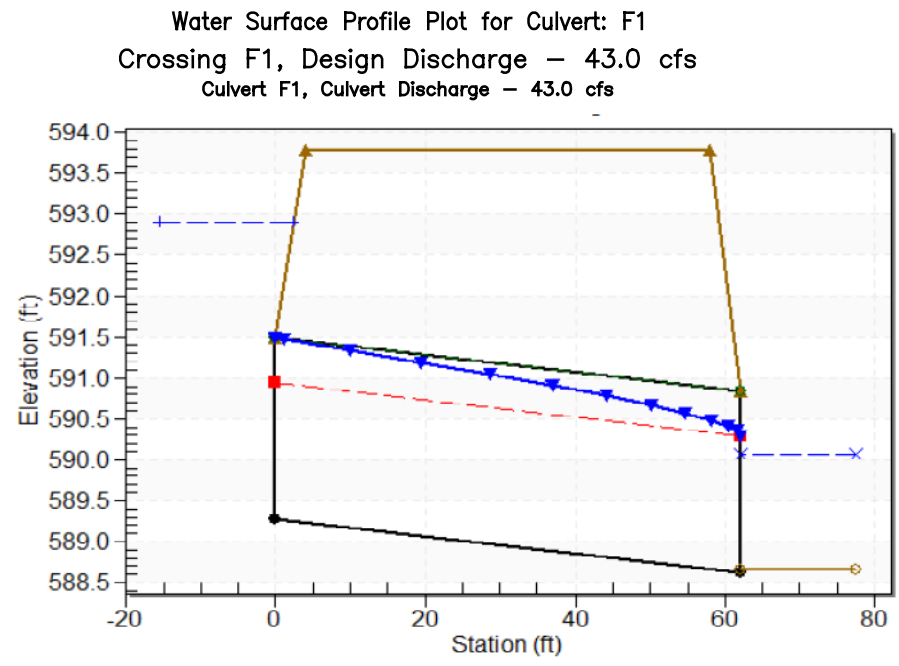
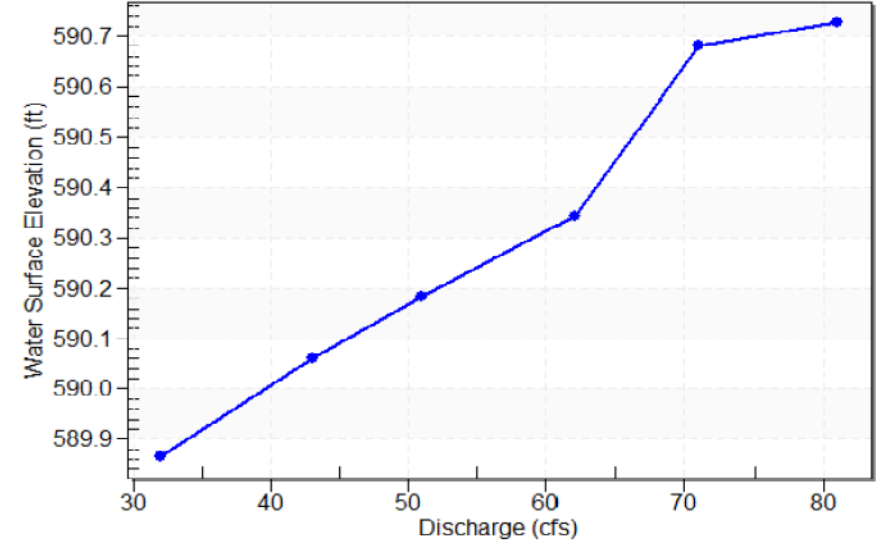
Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
32	589.87	1.22	4.12	1.08	0.83
43	590.06	1.41	4.34	1.25	0.84
51	590.18	1.53	4.45	1.36	0.85
62	590.34	1.69	4.50	1.50	0.85
71	590.68	2.03	2.98	1.80	0.78
81	590.73	2.08	3.09	1.84	0.78

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	591.89	0.0350
2	17.84	590.56	0.0350
3	29.64	590.56	0.0350
4	32.59	590.48	0.0350
5	35.54	590.23	0.0350
6	38.48	589.60	0.0350
7	41.43	588.65	0.0350
8	44.38	588.65	0.0350
9	47.55	589.94	0.0350
10	50.73	590.43	0.0350
11	57.07	590.56	0.0350
12	60.24	590.56	0.0350
13	69.68	590.70	0.0350
14	88.22	592.00	

Coord No.	Station (ft)	Elevation (ft)
1	0.00	593.79
2	104.16	593.22
3	214.82	593.00

Roadway Surface: Paved
 Roadway Top Width: 54.00 ft

Tailwater Rating Curve Plot for Crossing: F1
 Downstream Channel Rating Curve



Site Data - F1

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 589.27 ft
 Outlet Station: 62.00 ft
 Outlet Elevation: 588.63 ft
 Number of Barrels: 1

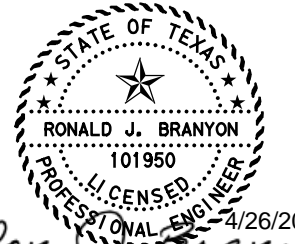
Culvert Data Summary - F1

Barrel Shape: Pipe Arch
 Barrel Span: 43.30 in
 Barrel Rise: 26.60 in
 Barrel Material: Steel or Aluminum
 Embedment: 0.00 in
 Barrel Manning's n: 0.0210
 Culvert Type: Straight
 Inlet Configuration: Mitered to Conform to Slope

NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
3. VERTICAL DATUM IS NAVD88
4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



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**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET
 STRUCTURE F1
 PROPOSED CONDITIONS**

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	239	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
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HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

EXISTING CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: G1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
608.33	2 year	14.00	14.00	0.00	1
* 608.78	5 year	19.00	19.00	0.00	1
609.18	10 year	23.00	23.00	0.00	1
609.61	25 year	27.00	27.00	0.00	1
609.97	50 year	31.00	29.98	0.98	11
610.15	100 year	35.00	31.32	3.64	10
612.35	Overtopping	27.92	27.92	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: G1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	14.00	14.00	608.33	1.850	0.0*	1-S2n	0.750	1.259	0.750	1.462	11.292	2.421
5 year	19.00	19.00	608.78	2.305	0.0*	1-S2n	0.881	1.478	0.881	1.647	12.299	2.627
10 year	23.00	23.00	609.18	2.696	0.0*	5-S2n	0.976	1.632	0.976	1.776	12.958	2.764
25 year	27.00	27.00	609.61	3.131	0.0*	5-S2n	1.066	1.771	1.066	1.893	13.528	2.883
50 year	31.00	29.98	609.97	3.495	0.0*	5-S2n	1.131	1.866	1.153	2.000	13.562	2.989
100 year	35.00	31.32	610.15	3.670	0.0*	5-S2n	1.159	1.906	1.169	2.099	13.911	3.087

Straight Culvert
Inlet Elevation (invert): 606.48 ft Outlet Elevation (invert): 599.60 ft
Culvert Length: 67.35 ft Culvert Slope: 0.1027

Tailwater Channel Data - G1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.005

Roadway Data for Crossing: G1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Table 3 - Downstream Channel Rating Curve (Crossing: G1)

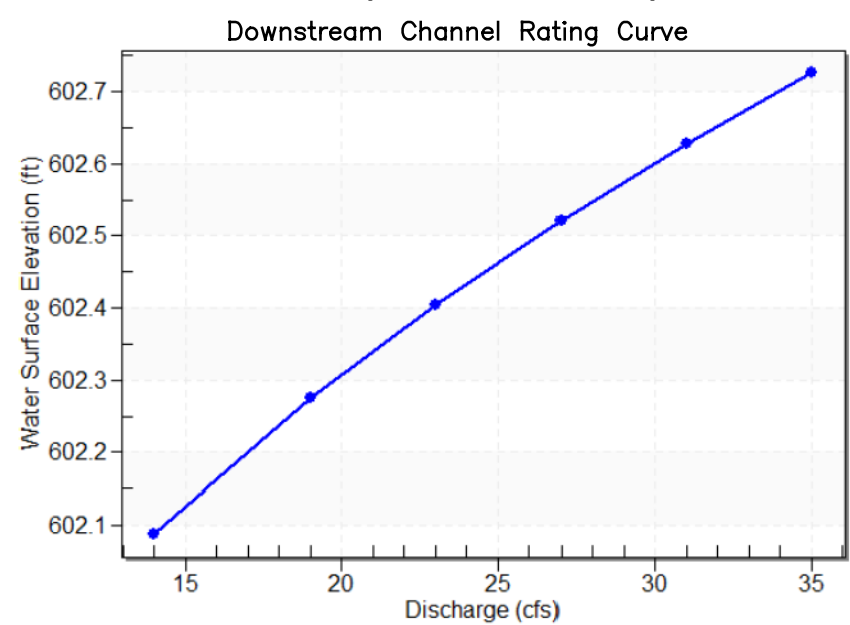
Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
14	602.09	1.46	2.42	0.46	0.48
19	602.27	1.65	2.63	0.51	0.49
23	602.40	1.78	2.76	0.55	0.50
27	602.52	1.89	2.88	0.59	0.50
31	602.63	2.00	2.99	0.62	0.51
35	602.73	2.10	3.09	0.65	0.51

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	610.21	0.035
2	22.89	607.57	0.035
3	26.16	606.92	0.035
4	29.43	605.59	0.035
5	32.70	603.51	0.035
6	35.97	601.64	0.035
7	38.62	600.63	0.035
8	41.28	601.52	0.035
9	43.94	602.66	0.035
10	47.05	604.17	0.035
11	50.16	605.47	0.035
12	78.14	608.77	0.035

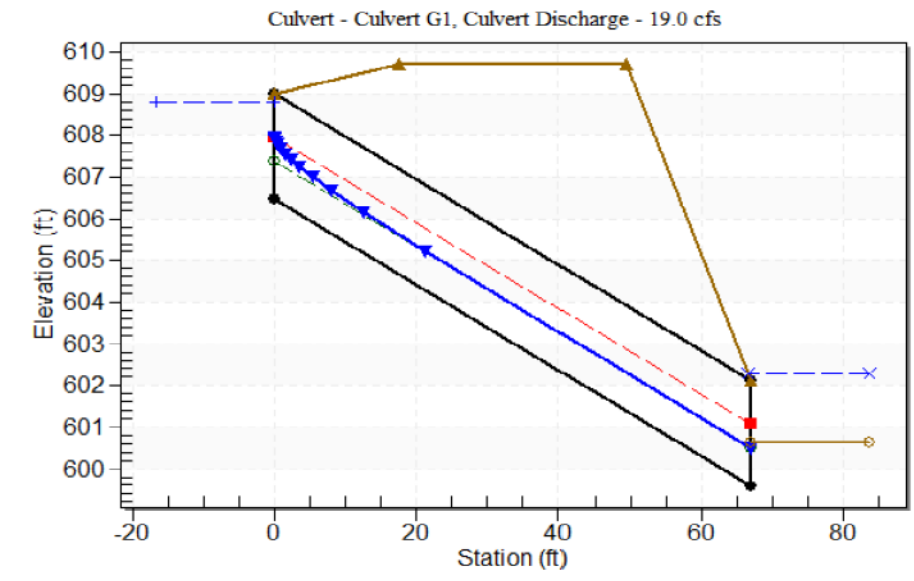
Coord No.	Station (ft)	Elevation (ft)
1	0.00	609.72
2	75.23	612.35
3	135.15	614.40

Roadway Surface: Paved
Roadway Top Width: 32.00 ft

Tailwater Rating Curve Plot for Crossing: G1



Water Surface Profile Plot for Culvert: G1
Crossing G1, Design Discharge - 19.0 cfs
Culvert G1, Culvert Discharge - 19.0 cfs



Site Data - G1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 606.48 ft
Outlet Station: 67.00 ft
Outlet Elevation: 599.60 ft
Number of Barrels: 1

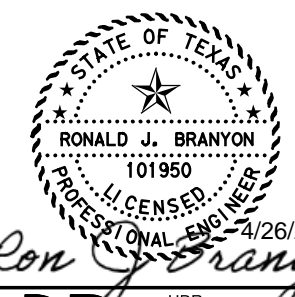
Culvert Data Summary - G1

Barrel Shape: Circular
Barrel Diameter: 2.50 ft
Barrel Material: Corrugated Steel
Embedment: 0.00 in
Barrel Manning's n: 0.0240
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: None

NOTES:

1. FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
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100 NE LOOP 410, SUITE 200
SAN ANTONIO, TEXAS 78216-4741
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation
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FM 725
HYDRAULIC CALCULATION
DATA SHEET
STRUCTURE G1
EXISTING CONDITIONS

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	240	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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HY-8 Culvert Analysis Report

Crossing Discharge Data
Discharge Selection Method: Recurrence

PROPOSED CONDITIONS

Table 1 - Summary of Culvert Flows at Crossing: G1

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	A1-2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
608.52	2 year	14.00	14.00	0.00	1
* 608.92	5 year	19.00	19.00	0.00	1
609.23	10 year	23.00	23.00	0.00	1
609.57	25 year	27.00	27.00	0.00	1
609.95	50 year	31.00	31.00	0.00	1
610.32	100 year	35.00	34.58	0.39	11
612.77	Overtopping	32.90	32.90	0.00	Overtopping

* Design Storm

Table 2 - Culvert Summary Table: G1

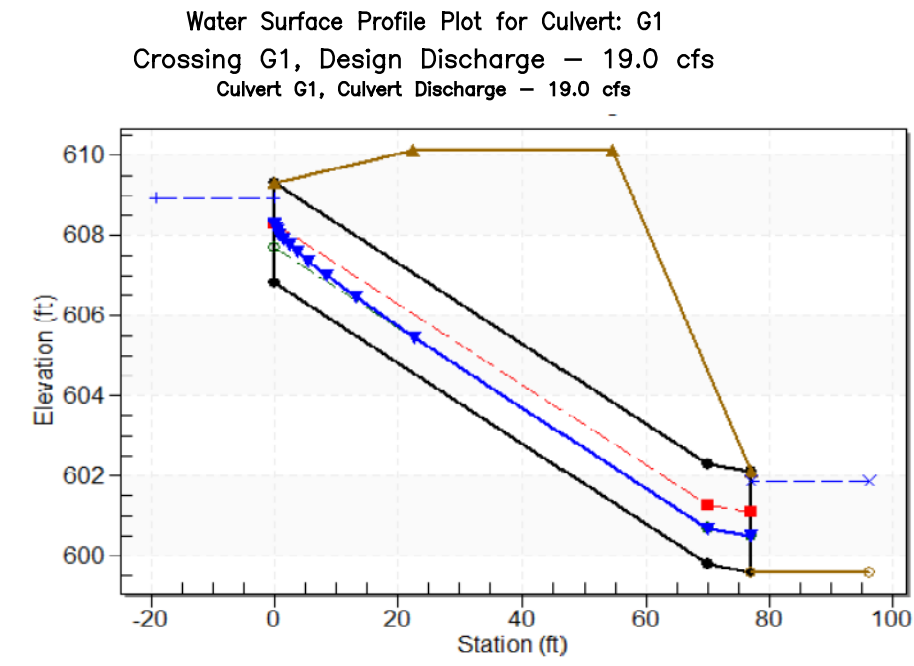
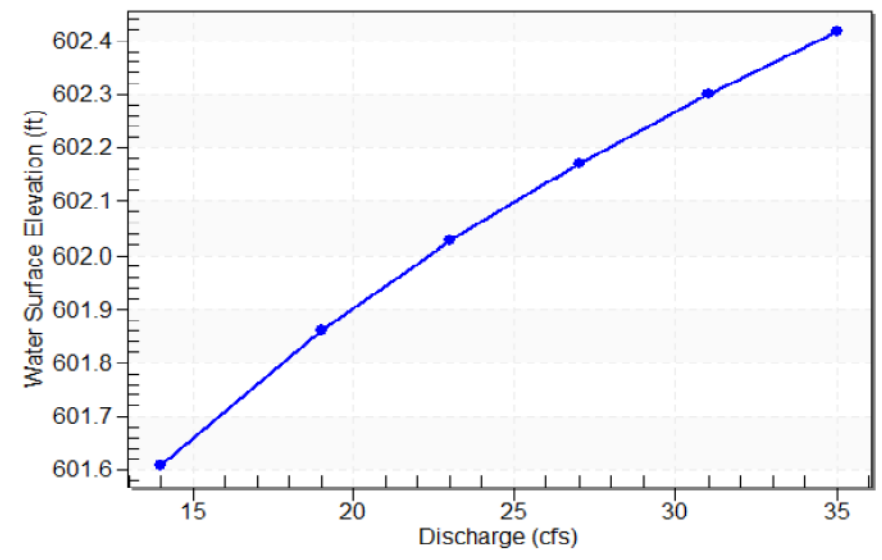
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	14.00	14.00	608.52	1.705	0.0*	1-S2n	0.000	0.000	0.756	2.009	11.183	2.581
5 year	19.00	19.00	608.92	2.096	0.0*	1-S2n	0.000	0.000	0.883	2.261	12.261	2.743
10 year	23.00	23.00	609.23	2.414	0.0*	1-S2n	0.000	0.000	0.983	2.426	12.834	2.855
25 year	27.00	27.00	609.57	2.754	0.0*	5-S2n	0.000	0.000	1.074	2.570	13.396	2.957
50 year	31.00	31.00	609.95	3.127	0.0*	5-S2n	0.000	0.000	1.179	2.699	13.611	3.050
100 year	35.00	34.58	610.32	3.497	0.0*	5-S2n	0.000	0.977	1.237	2.816	14.280	3.135

Single Broken-back Culvert
Inlet Elevation (invert): 606.82 ft Break Elevation (invert): 599.80 ft
Culvert Length: 77.00 ft Culvert Slope: 0.1003
Steep Culvert Section Slope 0.0286

Table 3 - Downstream Channel Rating Curve (Crossing: G1)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
14	601.61	2.01	2.58	0.63	0.46
19	601.86	2.26	2.74	0.71	0.47
23	602.03	2.43	2.86	0.76	0.47
27	602.17	2.57	2.96	0.80	0.48
31	602.30	2.70	3.05	0.84	0.49
35	602.42	2.82	3.13	0.88	0.49

Tailwater Rating Curve Plot for Crossing: G1
Downstream Channel Rating Curve



Tailwater Channel Data - G1

Tailwater Channel Option: Irregular Channel
Channel Slope: 0.005

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0.00	610.21	0.035
2	22.89	607.57	0.035
3	26.16	606.92	0.035
4	29.43	605.59	0.035
5	32.70	603.51	0.035
6	35.97	601.64	0.035
7	38.62	599.60	0.035
8	41.28	601.52	0.035
9	43.94	602.66	0.035
10	47.05	604.17	0.035
11	50.16	605.47	0.035
12	78.14	608.77	0.035

Roadway Data for Crossing: G1

Roadway Profile Shape: Irregular Roadway Shape (coordinates)
Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
1	0.00	610.14
2	75.23	612.77
3	135.15	614.82

Roadway Surface: Paved
Roadway Top Width: 54.00 ft

Site Data - G1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 606.82 ft
Break Station: 70.00 ft
Break Elevation: 599.80 ft
Outlet Station: 77.00
Outlet Elevation: 599.60 ft
Number of Barrels: 1

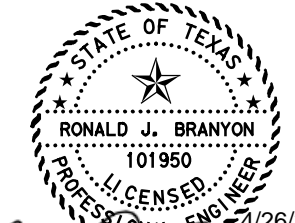
Culvert Data Summary - G1

Barrel Shape: Circular
Barrel Diameter: 2.5 ft
Upper Section Material: Corrugated Steel
Lower Section Material: Concrete
Embedment: 0.00 in
Upper Section Manning's n: 0.024
Lower Section Manning's n: 0.013
Culvert Type: Single Broken-back
Inlet Configuration: Square Edge with Headwall
Inlet Depression: None

NOTES:

- FHWA HY-8 VERSION 7.6 WAS USED TO MODEL RIVERINE FLOWS AT THIS STRUCTURE SITE FOR EXISTING AND PROPOSED CONDITIONS.
- A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SPECIFIED SLOPE TO DETERMINE STARTING WATER SURFACE ELEVATIONS. SLOPE DERIVED FROM USGS 1 METER LIDAR (2011 & 2017).
- VERTICAL DATUM IS NAVD88
- INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

NO.	REVISION	BY	DATE



Ron J. Branyon

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FM 725 HYDRAULIC CALCULATION DATA SHEET STRUCTURE G1 PROPOSED CONDITIONS

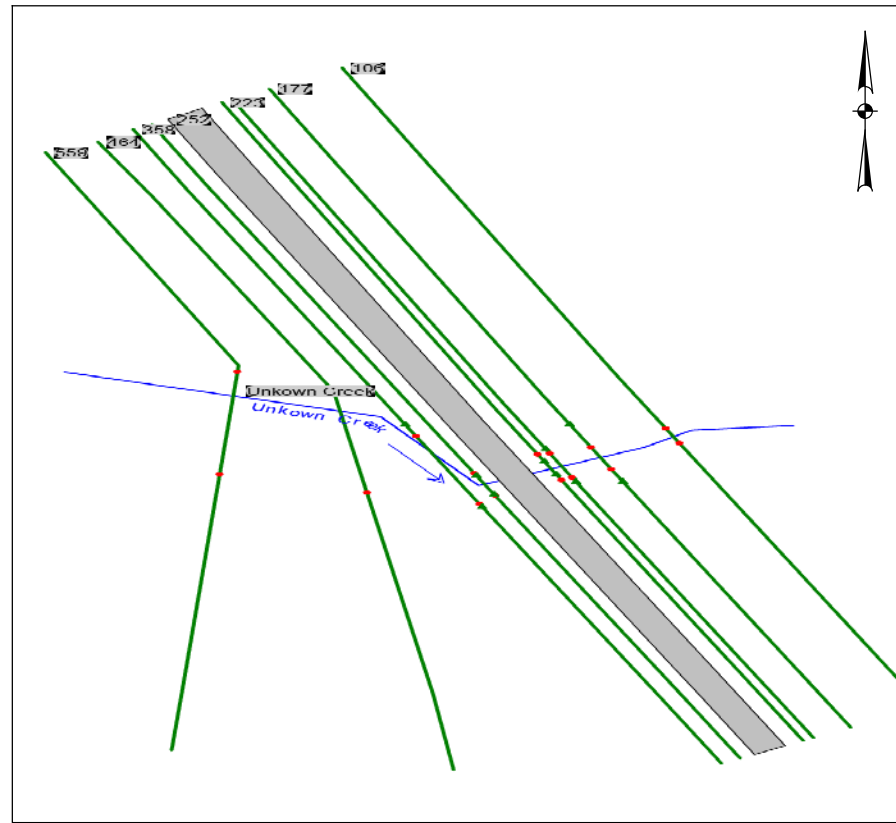
SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	241	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

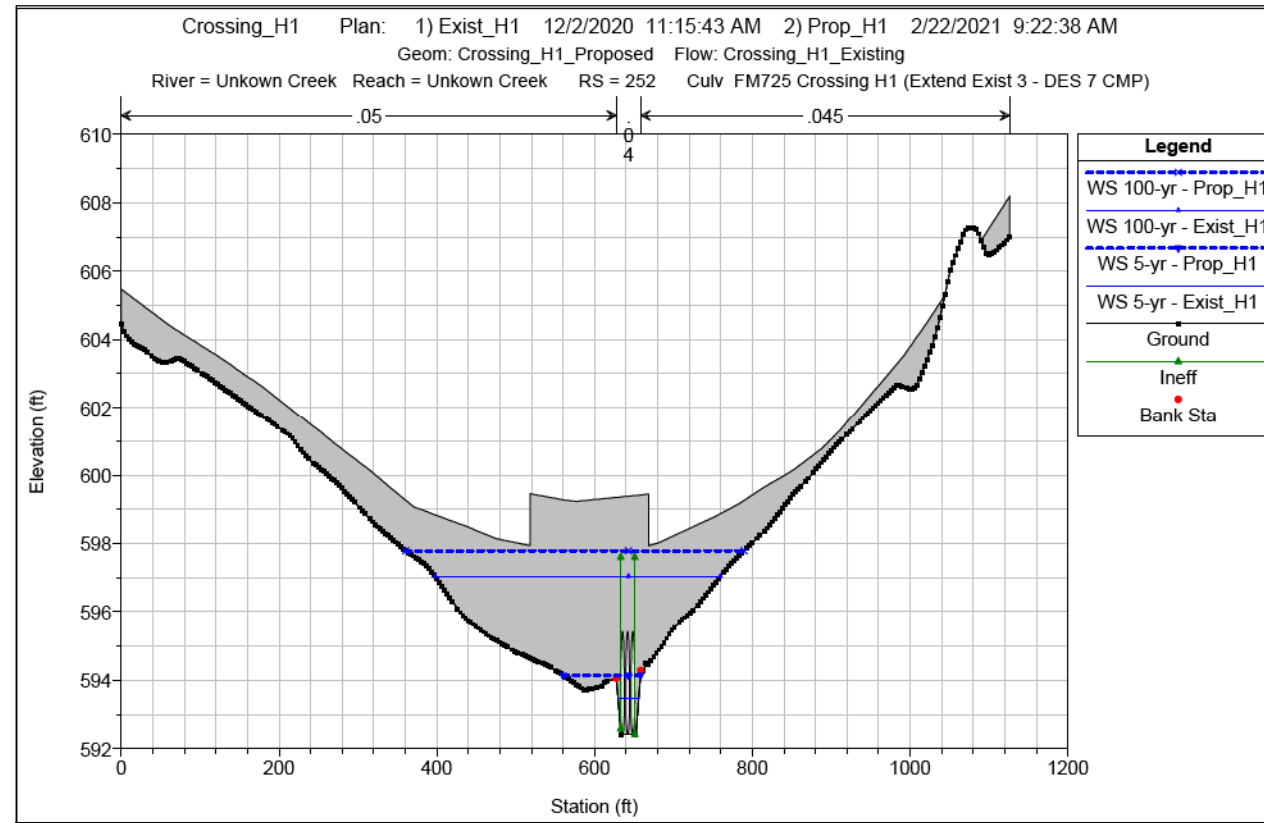
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STRUCTURE H1

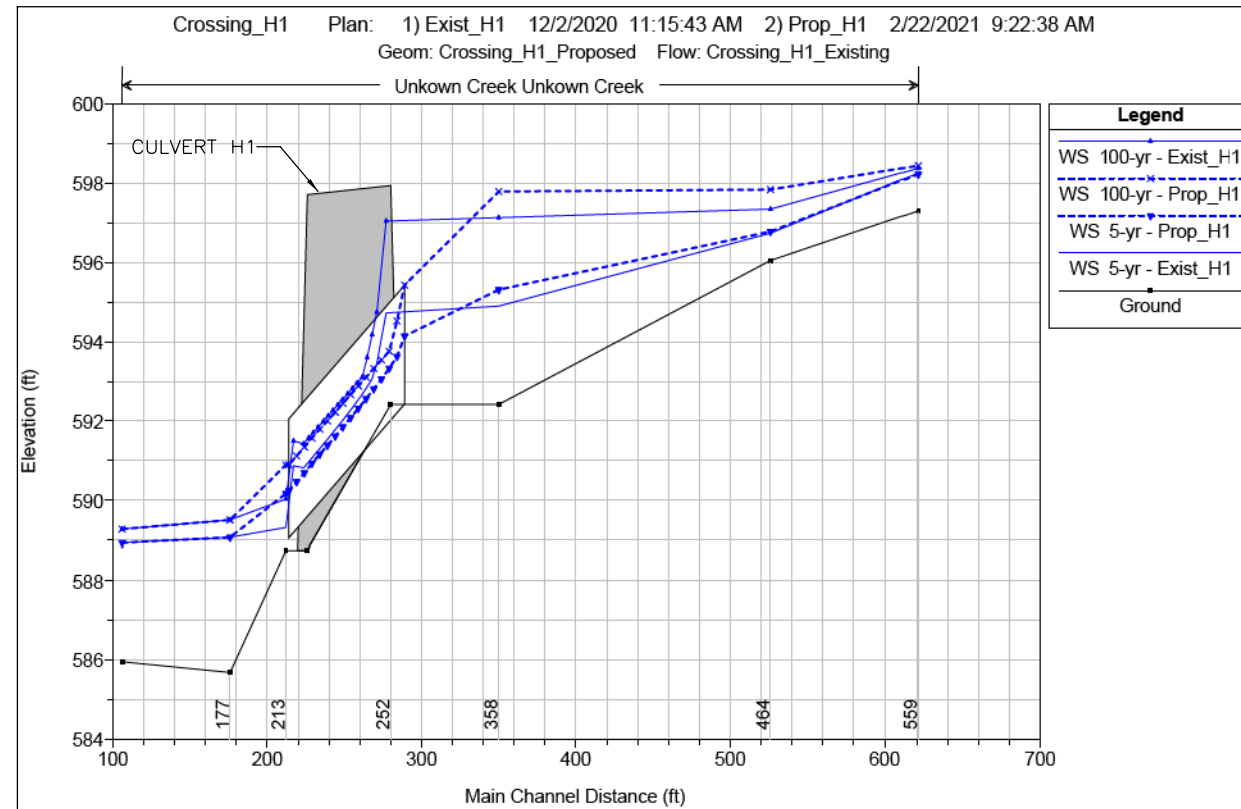
HEC-RAS CROSS SECTION LAYOUT



HEC-RAS STRUCTURE UPSTREAM SECTION

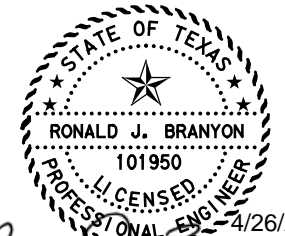


HEC-RAS PROFILE



- NOTES:
1. HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
 2. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.005 FT/FT TO DETERMINE STARTING WATER SURFACE ELEVATIONS.
 3. VERTICAL DATUM IS NAVD 88.
 4. INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

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**FM 725
 HYDRAULIC CALCULATION
 DATA SHEET 1
 STRUCTURE H1**

SHEET 1 OF 2

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 242
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

\$PENLDRVSS \$FILEL\$ \$PLTDRVSS \$DATE\$ \$TIME\$ \$OFFICE\$ \$USERS\$

\$PENLDRVSS \$FILEL\$ \$DATE:\$TIME\$ OFFICE:\$OFFICES\$ \$USERS\$

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Unkown Creek	559	5-yr	Exist_H1	171.00	597.30	598.26	598.13	598.35	0.01	2.43	71.89	179.92	0.65
Unkown Creek	559	5-yr	Prop_H1	171.00	597.30	598.23	598.13	598.33	0.02	2.62	66.39	177.65	0.73
Unkown Creek	559	100-yr	Exist_H1	322.00	597.30	598.37	598.33	598.57	0.02	3.56	93.46	195.45	0.85
Unkown Creek	559	100-yr	Prop_H1	322.00	597.30	598.44	598.33	598.59	0.01	3.13	106.98	196.86	0.71
Unkown Creek	464	5-yr	Exist_H1	171.00	596.05	596.74	596.67	596.86	0.02	2.79	61.74	165.79	0.78
Unkown Creek	464	5-yr	Prop_H1	171.00	596.05	596.78	596.67	596.88	0.01	2.50	69.24	172.49	0.67
Unkown Creek	464	100-yr	Exist_H1	322.00	596.05	597.35		597.40	0.00	1.91	181.54	232.21	0.34
Unkown Creek	464	100-yr	Prop_H1	322.00	596.05	597.84		597.86	0.00	1.19	302.02	255.12	0.17
Unkown Creek	358	5-yr	Exist_H1	171.00	593.72	594.90	594.43	594.94	0.00	1.56	114.71	187.42	0.30
Unkown Creek	358	5-yr	Prop_H1	171.00	592.42	595.32	593.83	595.48	0.00	3.28	52.07	228.10	0.34
Unkown Creek	358	100-yr	Exist_H1	322.00	593.72	597.13	594.65	597.14	0.00	0.76	440.45	367.33	0.08
Unkown Creek	358	100-yr	Prop_H1	322.00	592.42	597.79	594.58	597.79	0.00	0.53	1064.87	428.95	0.04
Unkown Creek	285	5-yr	Exist_H1	171.00	591.95	594.73	593.28	594.81	0.00	2.28	75.13	65.90	0.27
Unkown Creek	285	100-yr	Exist_H1	322.00	591.95	597.04	593.91	597.11	0.00	2.09	153.92	362.92	0.17
Unkown Creek	252			Culvert									
Unkown Creek	223	5-yr	Exist_H1	171.00	589.45	590.87	590.87	591.47	0.02	6.20	27.59	26.84	1.00
Unkown Creek	223	100-yr	Exist_H1	322.00	589.45	591.50	591.50	592.41	0.01	7.67	42.00	33.20	1.00
Unkown Creek	213	5-yr	Exist_H1	171.00	585.17	589.32	586.85	589.37	0.00	1.76	96.95	32.46	0.18
Unkown Creek	213	5-yr	Prop_H1	171.00	588.76	590.17	590.17	590.86	0.02	6.66	25.69	34.52	1.00
Unkown Creek	213	100-yr	Exist_H1	322.00	585.17	590.03	587.49	590.14	0.00	2.66	121.06	35.04	0.25
Unkown Creek	213	100-yr	Prop_H1	322.00	588.76	590.89	590.89	591.95	0.01	8.24	39.06	44.39	1.00
Unkown Creek	177	5-yr	Exist_H1	171.00	585.69	589.07	588.05	589.32	0.01	3.97	43.06	23.52	0.52
Unkown Creek	177	5-yr	Prop_H1	171.00	585.69	589.07	588.05	589.32	0.01	3.97	43.04	23.51	0.52
Unkown Creek	177	100-yr	Exist_H1	322.00	585.69	589.51	589.03	590.04	0.02	5.88	55.82	39.10	0.77
Unkown Creek	177	100-yr	Prop_H1	322.00	585.69	589.51	589.03	590.05	0.02	5.92	54.40	39.07	0.78
Unkown Creek	106	5-yr	Exist_H1	171.00	585.96	588.94	587.60	588.97	0.00	1.77	164.68	306.76	0.21
Unkown Creek	106	5-yr	Prop_H1	171.00	585.96	588.94	587.60	588.97	0.00	1.77	164.68	306.76	0.21
Unkown Creek	106	100-yr	Exist_H1	322.00	585.96	589.28	588.40	589.31	0.00	1.94	273.86	328.84	0.21
Unkown Creek	106	100-yr	Prop_H1	322.00	585.96	589.28	588.40	589.31	0.00	1.94	273.86	328.84	0.21

EXISTING 100 YEAR

Plan: Exist_H1 Unkown Creek Unkown Creek RS: 252 Culv			
Group: Culvert #1 Profile: 100-yr			
Q Culv Group (cfs)	322	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	9.42
Q Barrel (cfs)	107.33	Culv Vel DS (ft/s)	13.53
E.G. US. (ft)	597.11	Culv Inv El Up (ft)	591.75
W.S. US. (ft)	597.04	Culv Inv El Dn (ft)	589.61
E.G. DS (ft)	592.41	Culv Frctn Ls (ft)	2.15
W.S. DS (ft)	591.5	Culv Exit Loss (ft)	1.86
Delta EG (ft)	4.7	Culv Entr Loss (ft)	0.69
Delta WS (ft)	5.55	Q Weir (cfs)	
E.G. IC (ft)	597.11	Weir Sta Lft (ft)	
E.G. OC (ft)	596.77	Weir Sta Rgt (ft)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (ft)	594.75	Weir Max Depth (ft)	
Culv WS Outlet (ft)	591.43	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.83	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.48	Min El Weir Flow (ft)	597.63

- NOTES:
- HEC-RAS 5.0.7 USED FOR HYDRAULIC ANALYSIS
 - A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.005 FT/FT TO DETERMINE STARTING WATER SURFACE ELEVATIONS.
 - VERTICAL DATUM IS NAVD 88.
 - INITIAL COORDINATION TO INFORM THE GUADALUPE COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON DECEMBER 18, 2020.

EXISTING 5 YEAR

Plan: Exist_H1 Unkown Creek Unkown Creek RS: 252 Culv			
Group: Culvert #1 Profile: 5-yr			
Q Culv Group (cfs)	171	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	7.6
Q Barrel (cfs)	57	Culv Vel DS (ft/s)	11.02
E.G. US. (ft)	594.81	Culv Inv El Up (ft)	591.75
W.S. US. (ft)	594.73	Culv Inv El Dn (ft)	589.61
E.G. DS (ft)	591.47	Culv Frctn Ls (ft)	1.65
W.S. DS (ft)	590.87	Culv Exit Loss (ft)	1.24
Delta EG (ft)	3.34	Culv Entr Loss (ft)	0.45
Delta WS (ft)	3.85	Q Weir (cfs)	
E.G. IC (ft)	594.5	Weir Sta Lft (ft)	
E.G. OC (ft)	594.81	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	593.46	Weir Max Depth (ft)	
Culv WS Outlet (ft)	590.82	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.18	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.71	Min El Weir Flow (ft)	597.63

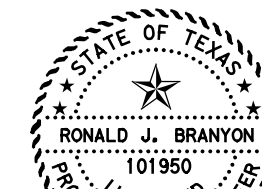
PROPOSED 5 YEAR

Plan: Prop_H1 Unkown Creek Unkown Creek RS: 252 Culv			
Group: Culvert #1 Profile: 5-yr			
Q Culv Group (cfs)	171	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	7.6
Q Barrel (cfs)	57	Culv Vel DS (ft/s)	11.27
E.G. US. (ft)	595.49	Culv Inv El Up (ft)	592.43
W.S. US. (ft)	595.32	Culv Inv El Dn (ft)	589.06
E.G. DS (ft)	590.86	Culv Frctn Ls (ft)	2.82
W.S. DS (ft)	590.17	Culv Exit Loss (ft)	1.36
Delta EG (ft)	4.63	Culv Entr Loss (ft)	0.45
Delta WS (ft)	5.14	Q Weir (cfs)	
E.G. IC (ft)	595.18	Weir Sta Lft (ft)	
E.G. OC (ft)	595.49	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	594.14	Weir Max Depth (ft)	
Culv WS Outlet (ft)	590.24	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.18	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.71	Min El Weir Flow (ft)	597.95

PROPOSED 100 YEAR

Plan: Prop_H1 Unkown Creek Unkown Creek RS: 252 Culv			
Group: Culvert #1 Profile: 100-yr			
Q Culv Group (cfs)	322	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	9.42
Q Barrel (cfs)	107.33	Culv Vel DS (ft/s)	13.4
E.G. US. (ft)	597.79	Culv Inv El Up (ft)	592.43
W.S. US. (ft)	597.79	Culv Inv El Dn (ft)	589.06
E.G. DS (ft)	591.95	Culv Frctn Ls (ft)	3.41
W.S. DS (ft)	590.89	Culv Exit Loss (ft)	1.74
Delta EG (ft)	5.84	Culv Entr Loss (ft)	0.69
Delta WS (ft)	6.9	Q Weir (cfs)	
E.G. IC (ft)	597.79	Weir Sta Lft (ft)	
E.G. OC (ft)	597.45	Weir Sta Rgt (ft)	
Culvert Control	Inlet	Weir Submerg	
Culv WS Inlet (ft)	595.43	Weir Max Depth (ft)	
Culv WS Outlet (ft)	590.9	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.84	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.48	Min El Weir Flow (ft)	597.95

NO.	REVISION	BY	DATE



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4/26/2021

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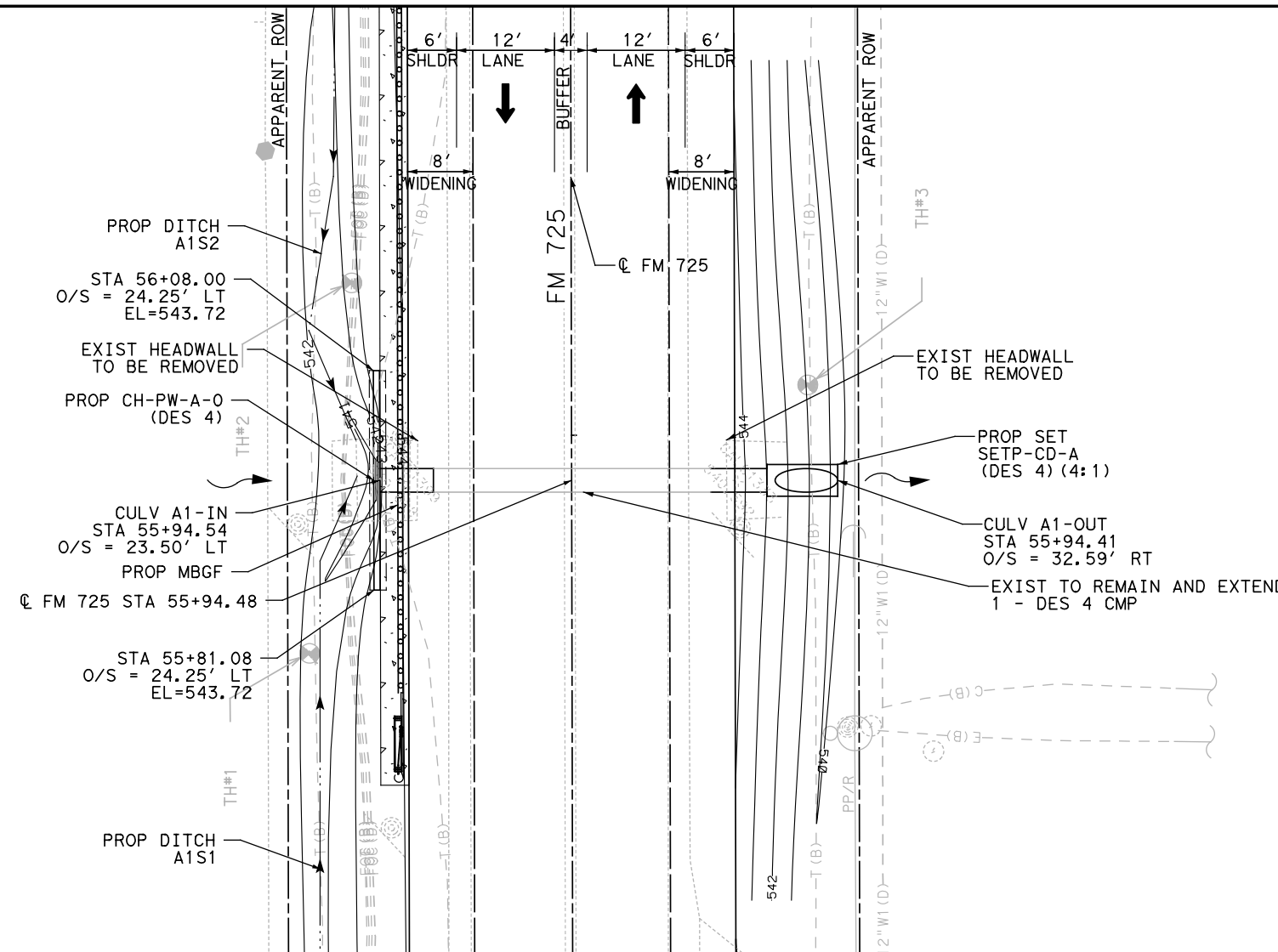
FM 725 HYDRAULIC CALCULATION DATA SHEET 2 STRUCTURE H1

SHEET 2 OF 2

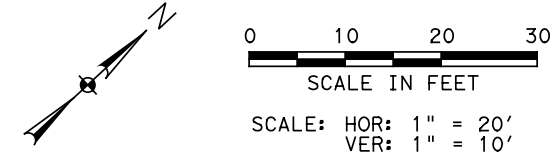
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6	SEE TITLE SHEET	243	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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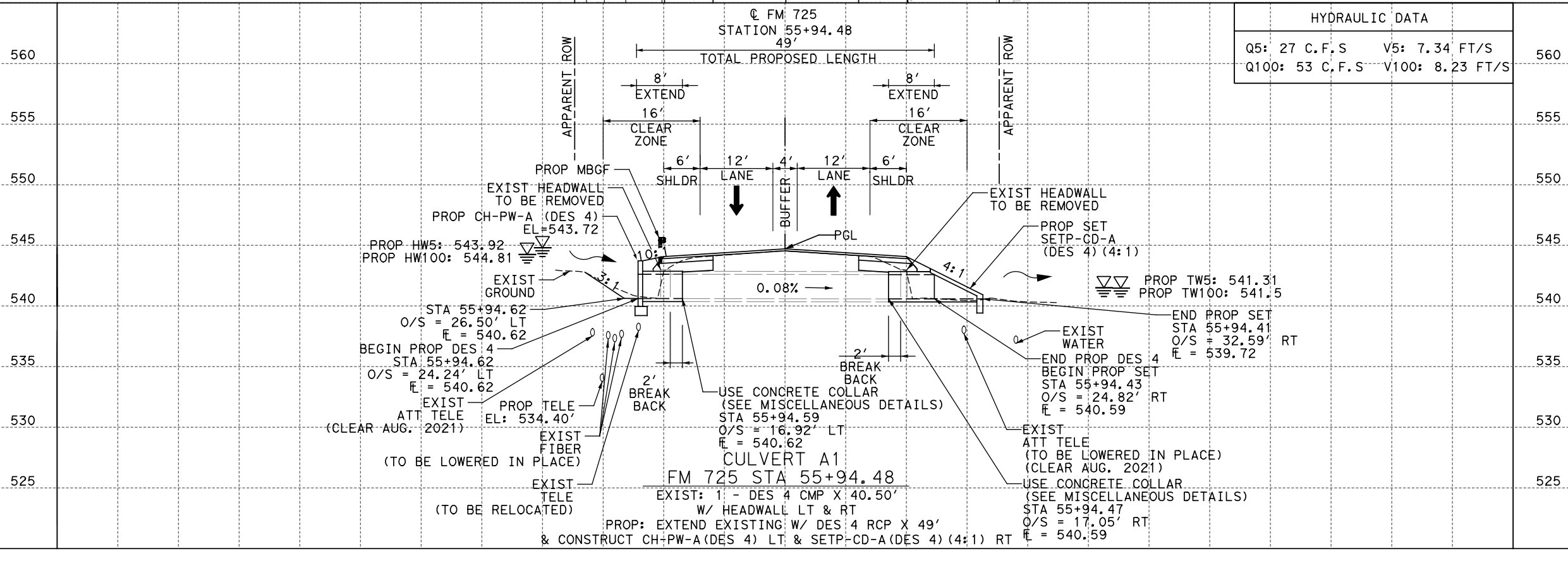
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ESTIMATED QUANTITIES				
ITEM NO.		DESCRIPTION	UNIT	QTY
400	6005	CEM STABIL BKFL	CY	9
464	6033	RC PIPE (ARCH) (CL III) (DES 4)	LF	16
466	6111	HEADWALL (CH - PW - A - 0) (DES = 4)	EA	1
467	6553	SET (TY II) (DES 4) (RCP) (4:1) (C)	EA	1
480	6001	CLEAN EXIST CULVERTS	EA	1
496	6006	REMOV STR (HEADWALL)	EA	2



- NOTES:
- EXISTING STRUCTURE ALIGNMENT, GRADES, AND ELEVATIONS SHALL BE FIELD VERIFIED PRIOR TO START OF CONSTRUCTION.
 - EXISTING UTILITIES SHOWN ARE APPROXIMATE. FIELD VERIFY LOCATIONS & ELEVATIONS PRIOR TO START OF CONSTRUCTION.
 - SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL INFORMATION.
 - SEE TRAFFIC CONTROL PLAN SHEETS FOR ADDITIONAL INFORMATION ON CULVERT CONSTRUCTION.
 - THESE PLANS SHOW THE CONTRACTOR THE APPROXIMATE LOCATIONS OF PROPOSED NEW UTILITIES, RELOCATIONS, OR ADJUSTMENTS FOR INFORMATION PURPOSES ONLY. THE LOCATIONS OF PROPOSED WATER MAINS, GAS MAINS, STORM SEWERS, SANITARY SEWERS, ELECTRIC, FIBER OPTIC LINES AND OTHER UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE BEST INFORMATION AVAILABLE. THE INFORMATION SHOWN CONCERNING TYPE AND LOCATION OF UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ASCERTAIN THEIR EXACT LOCATION FROM THE UTILITY COMPANIES BY FIELD INSPECTION OR VERIFICATION.



HYDRAULIC DATA	
Q5: 27 C.F.S	V5: 7.34 FT/S
Q100: 53 C.F.S	V100: 8.23 FT/S

NO. REVISION BY DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation © 2021

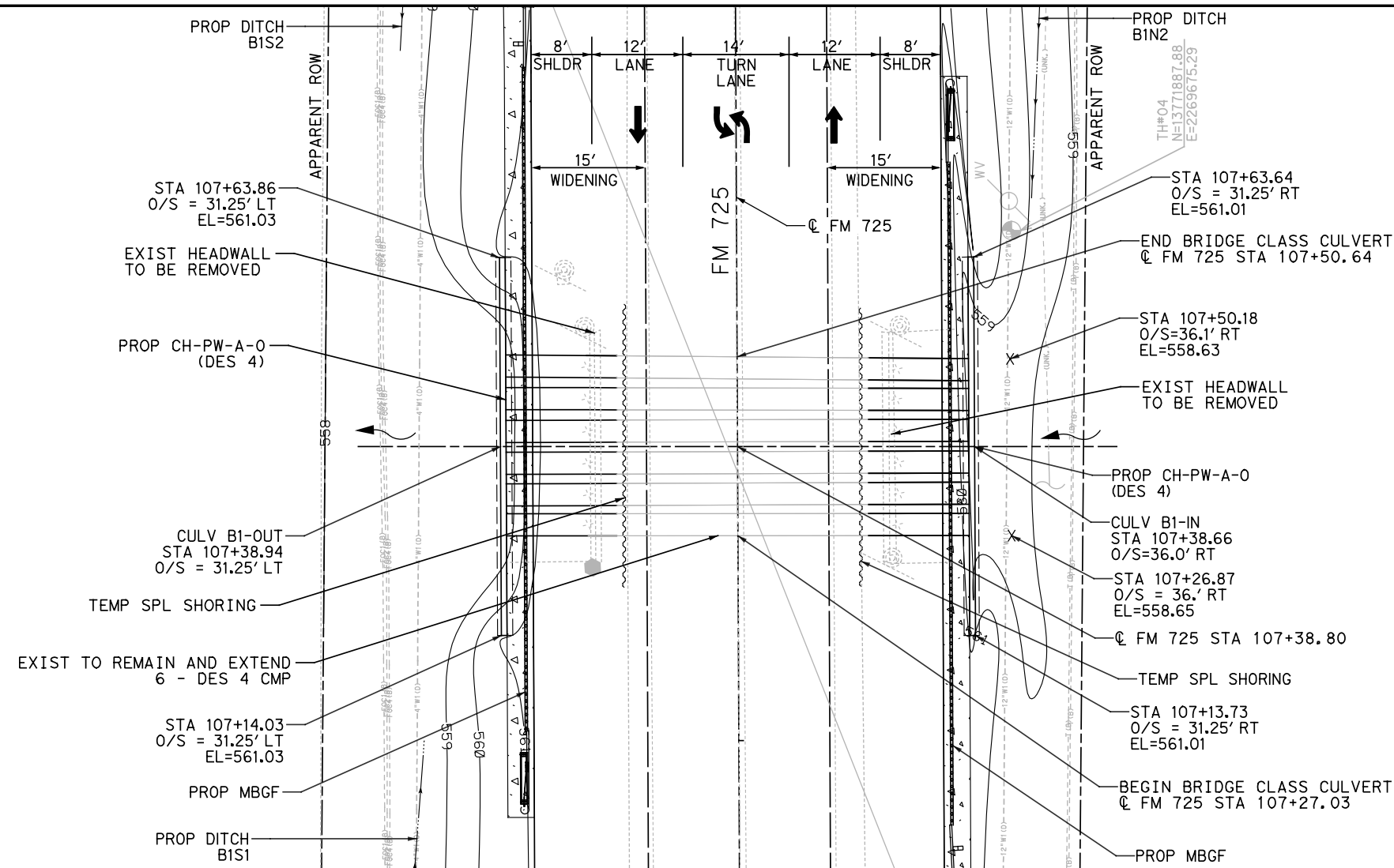
FM 725
CULVERT LAYOUTS

SCALE: 1"=20'H, 1"=10'V SHEET 1 OF 8

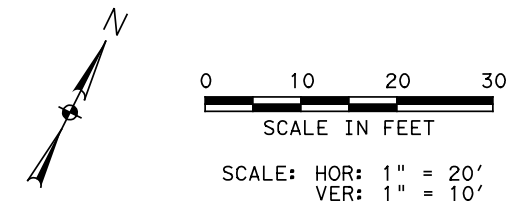
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	244	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

4/27/2021
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER
THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 4/27/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

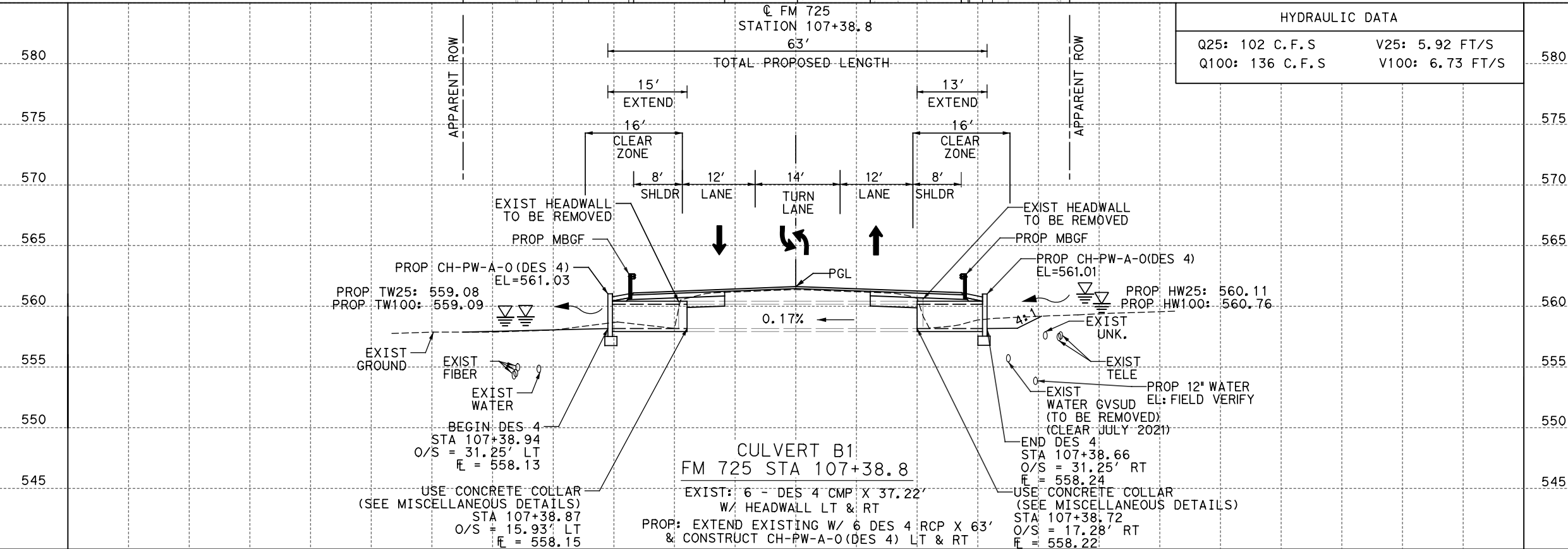
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ITEM NO.		DESCRIPTION	UNIT	QTY
400	6005	CEM STABIL BKFL	CY	42
403	6001	TEMPORARY SPL SHORING	SF	91
464	6033	RC PIPE (ARCH) (CL I II) (DES 4)	LF	168
466	6111	HEADWALL (CH - PW - A - 0) (DES= 4)	EA	2
480	6001	CLEAN EXIST CULVERTS	EA	1
496	6006	REMOV STR (HEADWALL)	EA	2



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HYDRAULIC DATA	
Q25: 102 C.F.S	V25: 5.92 FT/S
Q100: 136 C.F.S	V100: 6.73 FT/S

STATE OF TEXAS
 JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER
 4/28/2021
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NO.	REVISION	BY	DATE

HALFF
 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

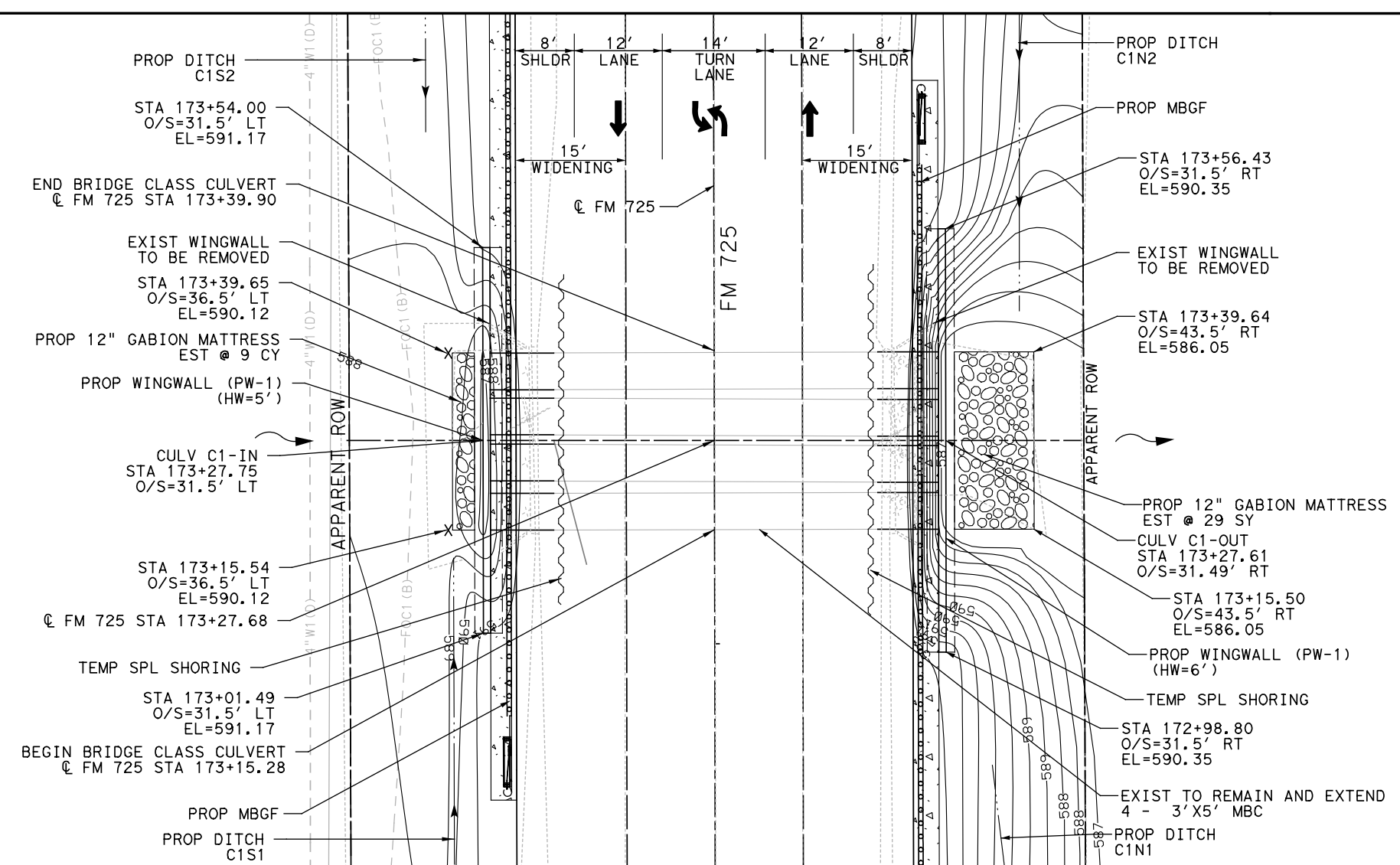
Texas Department of Transportation
 © 2021

FM 725
CULVERT LAYOUTS

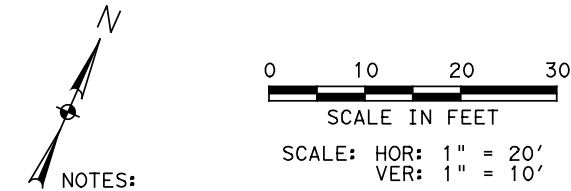
SCALE: 1"=20'H, 1"=10'V SHEET 2 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		245
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

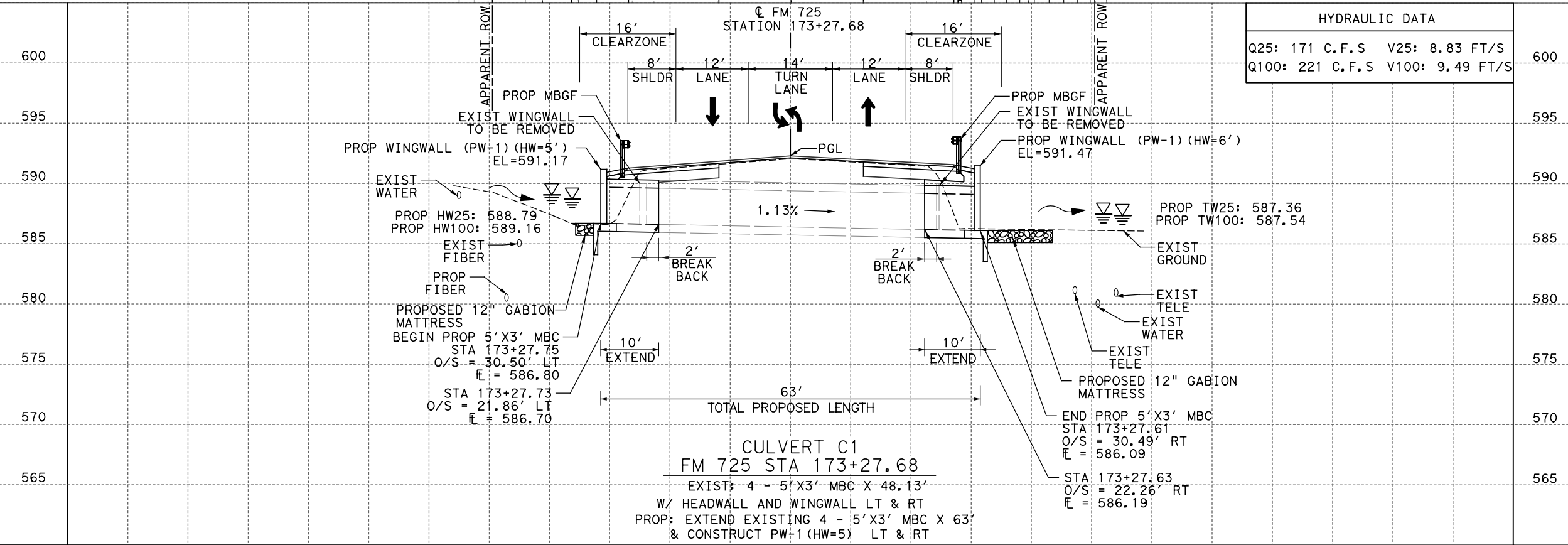
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		ESTIMATED QUANTITIES	
ITEM NO.	DESCRIPTION	UNIT	QTY
400 6005	CEM STABIL BKFL	CY	33
403 6001	TEMPORARY SPL SHORING	SF	211
459 6007	GABION MATTRESSES (GALV) (12 IN)	SY	38
462 6051	CONC BOX CULV (5 FT X 3 FT) (EXTEND)	LF	80
466 6180	WINGWALL (PW - 1) (HW=5 FT)	EA	1
466 6181	WINGWALL (PW - 1) (HW=6 FT)	EA	1
480 6001	CLEAN EXIST CULVERTS	EA	1
496 6005	REMOVE STR (WINGWALL)	EA	2



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HYDRAULIC DATA	
Q25: 171 C.F.S	V25: 8.83 FT/S
Q100: 221 C.F.S	V100: 9.49 FT/S

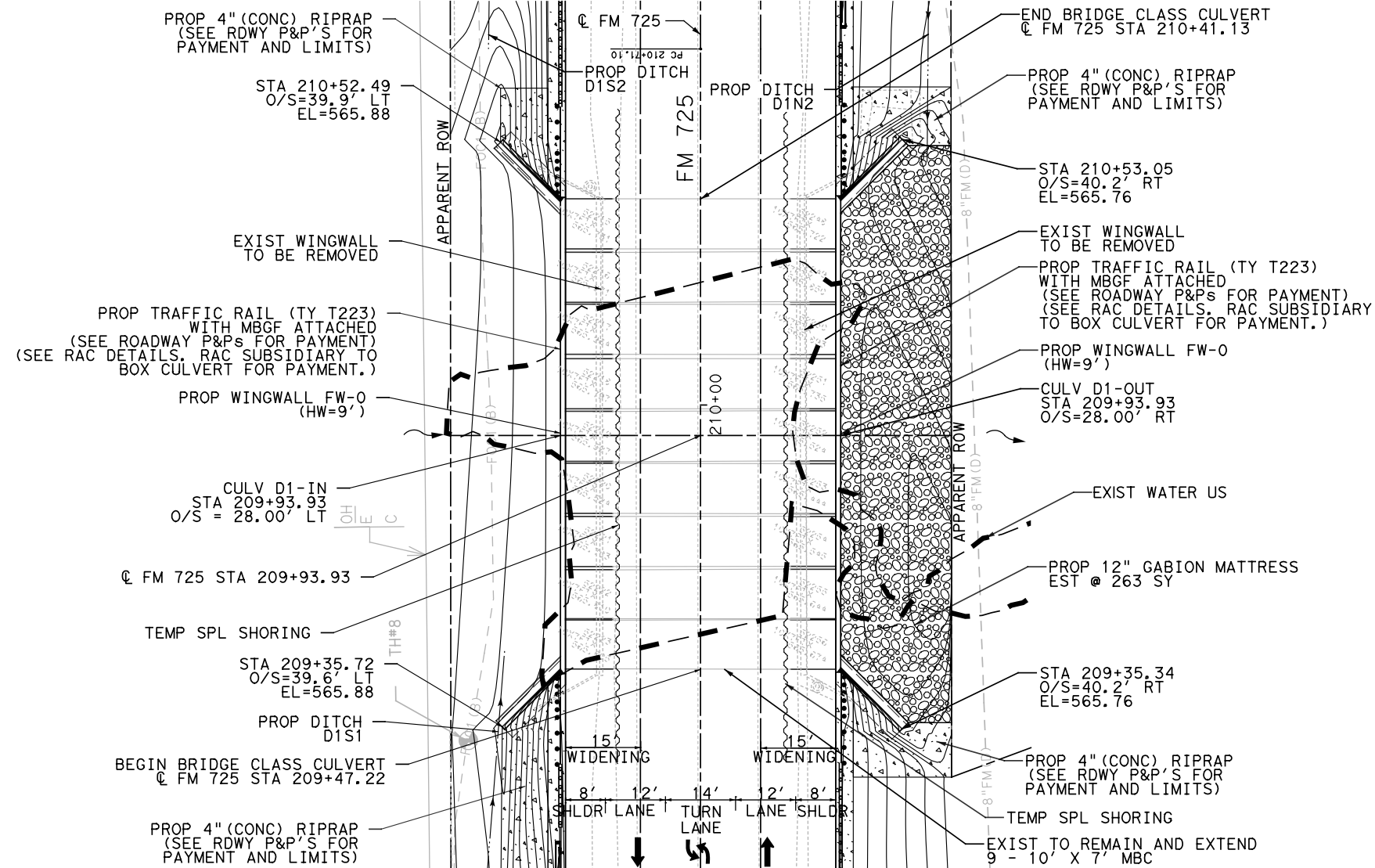
NO.	REVISION	BY	DATE

FM 725
 CULVERT LAYOUTS

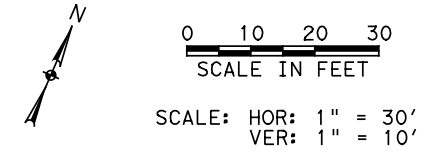
SCALE: 1"=20'H, 1"=10'V SHEET 3 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	246	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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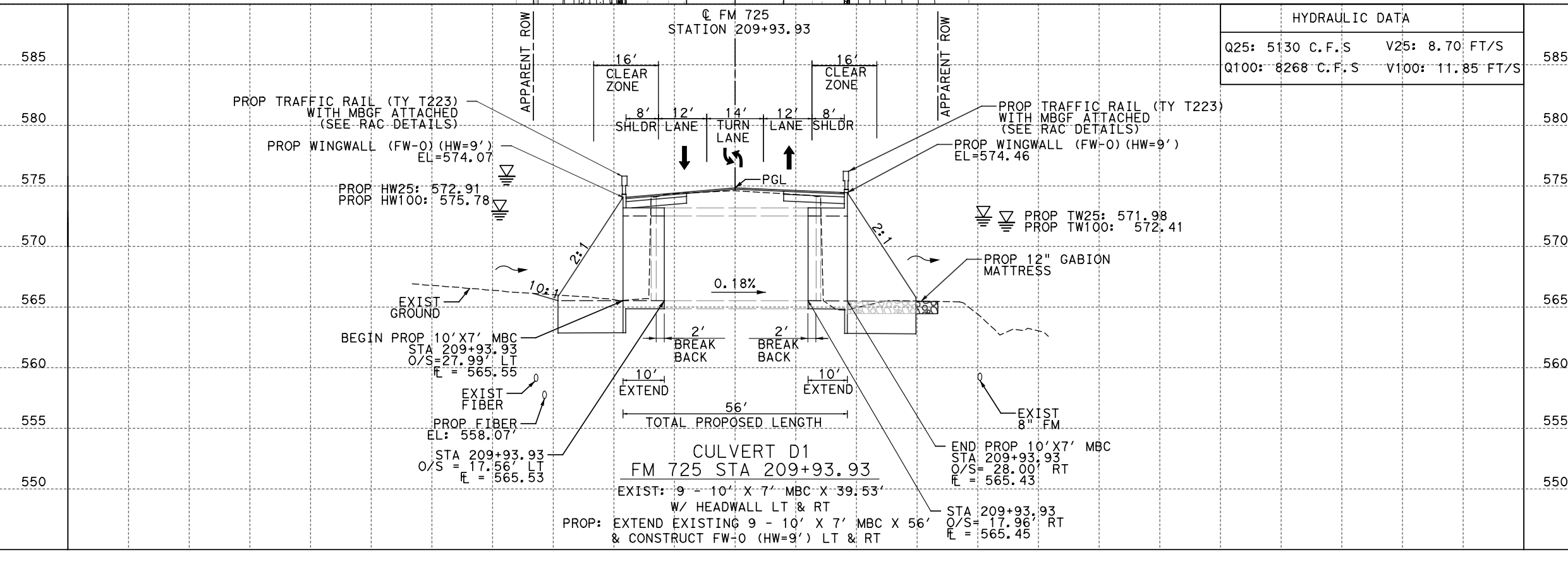


ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
400 6005	CEM STABIL BKFL	CY	43
400 6006	CUT & RESTORING PAV	SY	135
403 6001	TEMPORARY SPL SHORING	SF	601
459 6007	GABION MATTRESSES (GALV) (12 IN)	SY	263
462 6075	CONC BOX CULV (10 FT X 7 FT) (EXTEND)	LF	180
466 6156	WINGWALL (FW - 0) (HW=9 FT)	EA	2
480 6001	CLEAN EXIST CULVERTS	EA	1
496 6005	REMOV STR (WINGWALL)	EA	2

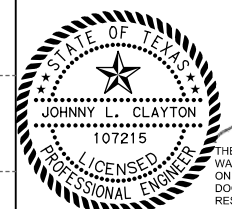


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HYDRAULIC DATA			
Q25:	5130 C.F.S	V25:	8.70 FT/S
Q100:	8268 C.F.S	V100:	11.85 FT/S



4/29/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 4/29/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

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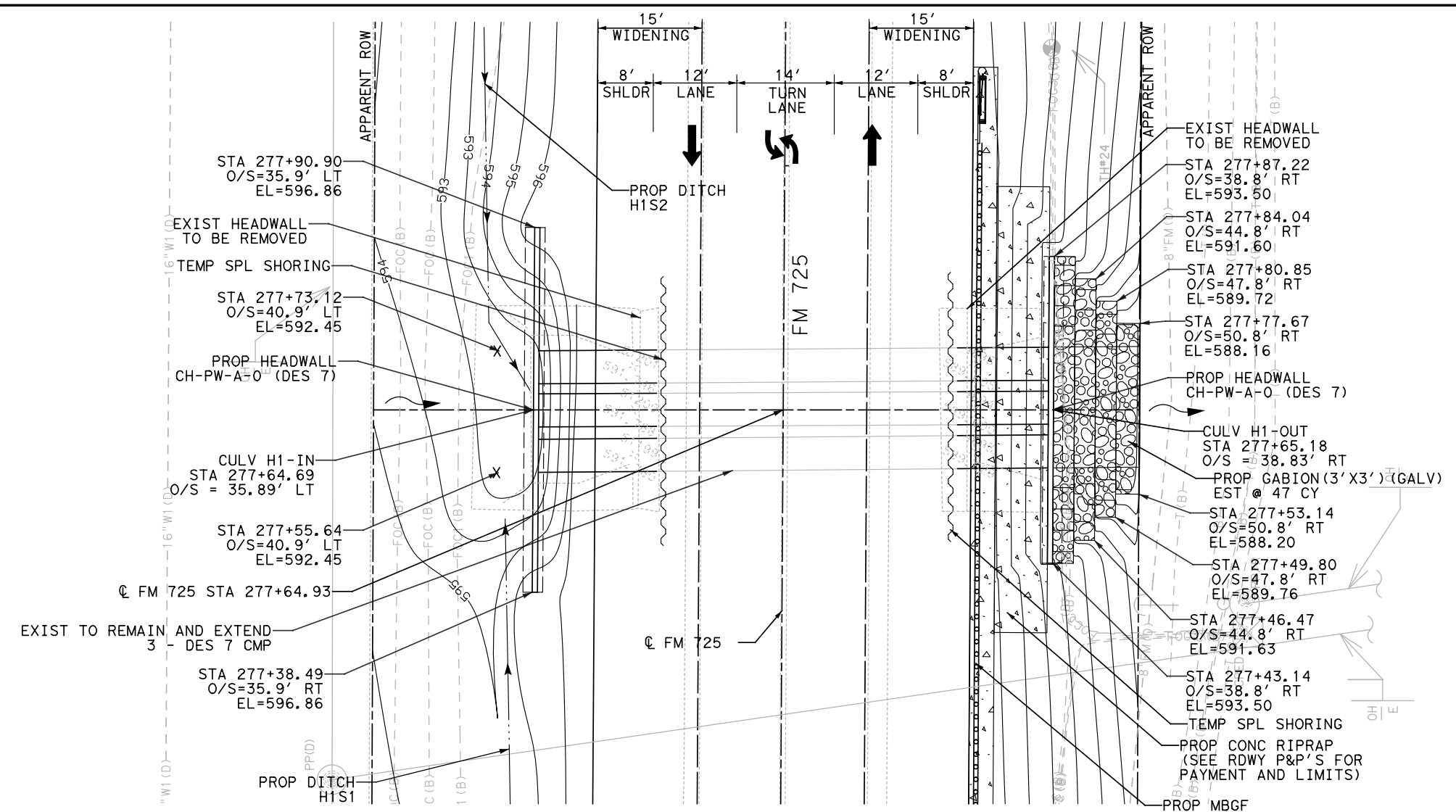
FM 725

CULVERT LAYOUTS

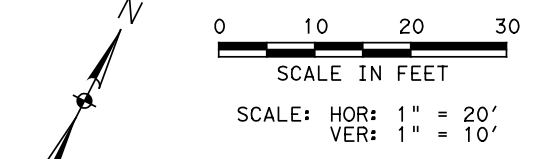
SCALE: 1"=30'H, 1"=10'V SHEET 4 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		247
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

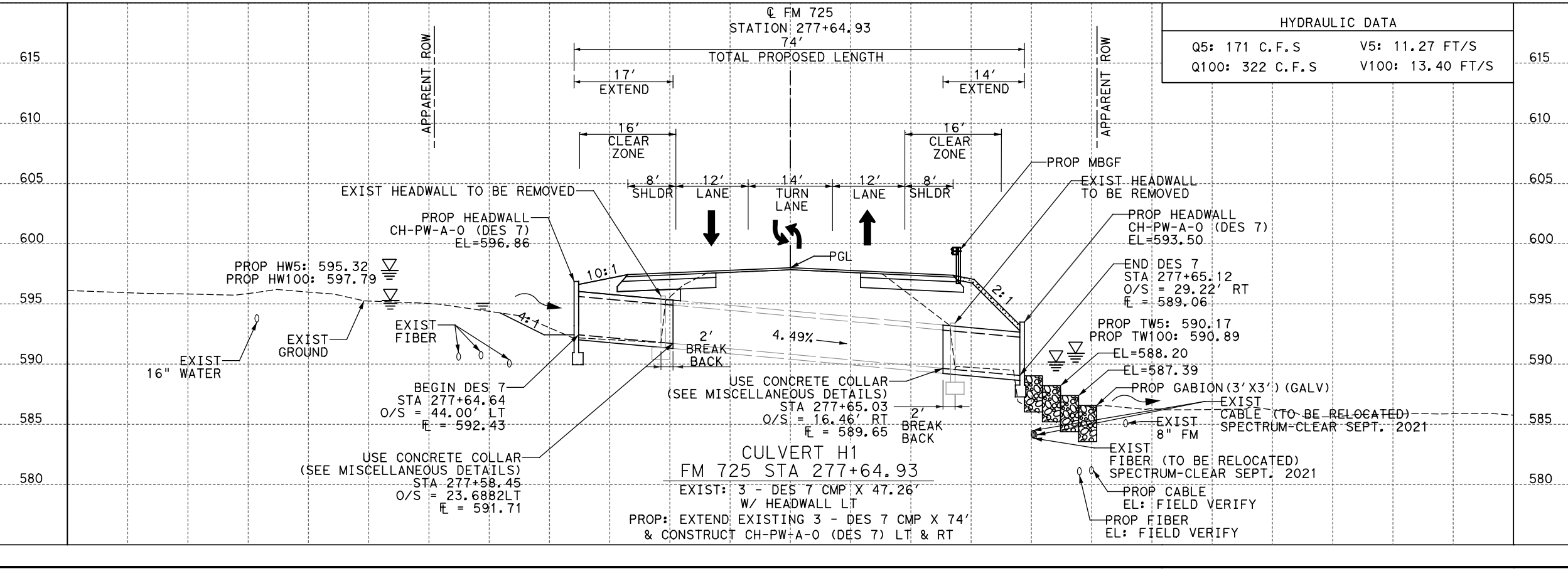
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ITEM NO.		DESCRIPTION	UNIT	QTY
400	6005	CEM STABIL BKFL	CY	72
403	6001	TEMPORARY SPL SHORING	SF	199
459	6009	GABIONS (3' X 3') (GALV)	CY	47
460	6024	CMP AR (GAL STL DES 7)	LF	93
466	6114	HEADWALL (CH - PW - A - 0) (DES= 7)	EA	2
480	6001	CLEAN EXIST CULVERTS	EA	1
496	6006	REMOV STR (HEADWALL)	EA	2



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HYDRAULIC DATA	
Q5: 171 C.F.S	V5: 11.27 FT/S
Q100: 322 C.F.S	V100: 13.40 FT/S

STATE OF TEXAS
 4/28/2021
 JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER
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NO.	REVISION	BY	DATE

HALFF
 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312
 Texas Department of Transportation
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FM 725 CULVERT LAYOUTS

SCALE: 1"=20'H, 1"=10'V SHEET 8 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	251	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DITCH RR-S table with columns: FM 725 STATION, OFFSET, FLOWLINE ELEVATION, TOP OF DITCH, SLOPE, BOTTOM WIDTH, LEFT SIDE SLOPE, RIGHT SIDE, DEPTH, MANNING'S 'n', DITCH MATERIAL, AREA, P, R, DESIGN Q, V, SHEAR, WSEL, FREEBOARD, REMARKS.

DITCH A1-S1 table with columns: FM 725 STATION, OFFSET, FLOWLINE ELEVATION, TOP OF DITCH, SLOPE, BOTTOM WIDTH, LEFT SIDE SLOPE, RIGHT SIDE, DEPTH, MANNING'S 'n', DITCH MATERIAL, AREA, P, R, DESIGN Q, V, SHEAR, WSEL, FREEBOARD, REMARKS.

DITCH A1-S2 table with columns: FM 725 STATION, OFFSET, FLOWLINE ELEVATION, TOP OF DITCH, SLOPE, BOTTOM WIDTH, LEFT SIDE SLOPE, RIGHT SIDE, DEPTH, MANNING'S 'n', DITCH MATERIAL, AREA, P, R, DESIGN Q, V, SHEAR, WSEL, FREEBOARD, REMARKS.

DITCH B1-S1 table with columns: FM 725 STATION, OFFSET, FLOWLINE ELEVATION, TOP OF DITCH, SLOPE, BOTTOM WIDTH, LEFT SIDE SLOPE, RIGHT SIDE, DEPTH, MANNING'S 'n', DITCH MATERIAL, AREA, P, R, DESIGN Q, V, SHEAR, WSEL, FREEBOARD, REMARKS.

- NOTES: 1. HYDROLOGY DETERMINED USING RATIONAL METHOD. 2. DITCH CALCS ARE DONE IN 100 FT INTERVALS. 3. SEE PRESENT LAYOUT AND ROADWAY PLAN AND PROFILE SHEETS FOR DITCH LOCATIONS. 4. DITCHES DESIGNED TO CONTAIN Q2. 5. UTILIZE NATIVE GRASS MIXTURE (RETARDANCE CLASS B) THAT CAN TOLERATE SHEAR STRESS UP TO 2.10 LBS./SQFT.

Professional Engineer seal for JOHNNY L. CLAYTON, LICENSED PROFESSIONAL ENGINEER 107215, with a signature and date 4/27/2021. Includes text: 'THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 4/27/2021...'.

Revision table with columns: NO., REVISION, BY, DATE.

HALFF logo and address: 100 NE INTERSTATE 410 LOOP SUITE 200, SAN ANTONIO, TEXAS 78216, TEL (210) 798-1895, FIRM #F-312. Also Texas Department of Transportation logo with © 2021.

Project title: FM 725 DITCH HYDRAULIC CALCULATIONS. Scale: NTS, SHEET 1 OF 8. Includes a table with columns: FED. RD. DIV. NO., FEDERAL AID PROJECT NO., SHEET, STATE, DISTRICT, COUNTY, CONTROL, SECTION, JOB, HIGHWAY NO.

DITCH B1-S2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
152+00	33.86	632.62	633.89	1.19%	0.00	4.0	10.9	1.27	0.035	GRASS	12.00	19.10	0.63	6.16	2.12	0.23	633.25	0.65	
151+00	34.25	631.43	633.23	1.19%	0.00	4.0	7.9	1.80	0.035	GRASS	19.34	21.82	0.89	6.16	2.23	0.25	632.11	1.12	
150+00	37.17	627.75	629.94	3.68%	0.00	4.0	4.9	2.19	0.035	GRASS	21.34	19.98	1.07	6.16	3.65	0.69	628.37	1.57	
149+00	38.21	624.63	626.16	3.12%	0.00	4.0	4.3	1.53	0.035	GRASS	9.74	13.11	0.74	6.16	3.48	0.62	625.28	0.88	
148+00	36.21	622.28	623.62	2.35%	0.00	4.0	4.2	1.34	0.035	GRASS	7.33	11.26	0.65	6.16	3.15	0.49	622.97	0.65	
147+00	35.13	619.96	621.78	2.32%	0.00	4.0	4.2	1.82	0.035	GRASS	13.51	15.29	0.88	6.16	3.13	0.49	620.65	1.13	
146+00	35.02	617.61	619.80	2.35%	0.00	4.0	4.4	2.19	0.035	GRASS	20.09	18.86	1.07	6.16	3.13	0.49	618.30	1.50	
145+00	38.78	614.82	617.26	2.79%	0.00	4.0	5.3	2.44	0.035	GRASS	27.90	23.36	1.19	6.16	3.26	0.54	615.46	1.81	
144+00	39.11	611.79	613.81	3.03%	0.00	4.0	5.2	2.02	0.035	GRASS	18.70	18.94	0.99	6.16	3.37	0.58	612.42	1.39	
143+00	40.35	609.16	611.55	2.63%	0.00	4.0	5.5	2.39	0.035	GRASS	27.09	23.20	1.17	6.16	3.17	0.51	609.80	1.75	
142+00	42.51	606.51	609.05	2.65%	0.00	4.0	5.9	2.54	0.035	GRASS	31.94	25.70	1.24	6.16	3.15	0.51	607.14	1.91	
141+00	45.46	604.08	606.09	2.43%	0.00	4.0	7.8	2.01	0.035	GRASS	23.81	24.08	0.99	6.16	2.93	0.45	604.68	1.41	
140+00	43.42	601.71	603.45	2.37%	0.00	4.0	9.4	1.74	0.035	GRASS	20.28	23.62	0.86	6.16	2.81	0.42	602.28	1.17	
139+00	42.89	599.33	601.14	2.38%	0.00	4.0	9.8	1.81	0.035	GRASS	22.53	25.25	0.89	6.16	2.80	0.41	599.90	1.24	
138+00	42.47	596.94	598.73	2.39%	0.00	4.0	9.0	1.79	0.035	GRASS	20.72	23.52	0.88	6.16	2.84	0.42	597.52	1.21	
137+00	42.05	594.47	596.73	2.47%	0.00	4.0	7.7	2.26	0.035	GRASS	29.70	26.73	1.11	6.16	2.95	0.45	595.07	1.66	
136+00	41.38	592.12	594.87	2.35%	0.00	4.0	6.5	2.75	0.035	GRASS	39.55	29.33	1.35	6.16	2.97	0.45	592.75	2.12	DRIVEWAY
135+00	40.76	589.96	592.93	2.16%	0.00	4.0	5.7	2.97	0.035	GRASS	42.69	29.37	1.45	6.16	2.93	0.43	590.62	2.31	
134+00	39.97	588.01	589.98	1.95%	0.00	4.0	6.0	1.97	0.035	GRASS	19.50	20.19	0.97	6.16	2.80	0.39	588.67	1.31	
133+00	42.83	586.27	587.67	1.74%	0.00	4.0	7.1	1.40	0.035	GRASS	10.88	15.81	0.69	6.16	2.62	0.35	586.92	0.75	
132+00	43.98	584.53	585.61	1.74%	0.00	4.0	7.8	1.08	0.035	GRASS	6.88	12.95	0.53	6.16	2.58	0.34	585.17	0.44	
131+00	43.53	582.80	583.83	1.73%	0.00	4.0	7.6	1.03	0.035	GRASS	6.18	12.14	0.51	6.16	2.59	0.34	583.44	0.39	
130+00	44.97	581.21	582.18	1.59%	0.00	4.0	8.2	0.97	0.035	GRASS	5.74	12.01	0.48	6.16	2.47	0.31	581.85	0.33	
129+00	44.71	579.61	580.86	1.60%	0.00	4.0	8.5	1.25	0.035	GRASS	9.81	15.89	0.62	6.16	2.47	0.31	580.24	0.62	
128+00	43.10	578.02	579.84	1.59%	0.00	4.0	7.2	1.82	0.035	GRASS	18.45	20.68	0.89	6.16	2.53	0.32	578.68	1.16	
127+00	43.27	576.42	578.03	1.60%	0.00	4.0	7.7	1.61	0.035	GRASS	15.18	19.15	0.79	6.16	2.51	0.32	577.07	0.96	
126+00	41.73	574.83	576.27	1.59%	0.00	4.0	7.9	1.44	0.035	GRASS	12.31	17.42	0.71	6.16	2.49	0.31	575.47	0.79	
125+00	38.95	573.24	574.92	1.59%	0.00	4.0	6.6	1.68	0.035	GRASS	14.96	18.14	0.82	6.16	2.56	0.33	573.92	1.01	
124+00	35.65	571.90	573.48	1.34%	0.00	4.0	5.6	1.58	0.035	GRASS	12.01	15.55	0.77	6.16	2.46	0.30	572.62	0.86	
123+00	33.14	571.04	572.16	0.86%	0.00	4.0	6.2	1.12	0.035	GRASS	6.42	11.67	0.55	6.16	2.05	0.20	571.81	0.36	
122+00	32.45	570.18	571.46	0.86%	0.00	4.0	7.7	1.28	0.035	GRASS	9.63	15.24	0.63	6.16	1.99	0.19	570.91	0.56	
121+00	32.92	567.99	570.55	2.19%	0.00	4.0	4.8	2.56	0.035	GRASS	28.77	23.04	1.25	6.16	3.02	0.45	568.67	1.88	
120+00	33.53	567.12	569.82	0.87%	0.00	4.0	4.6	2.70	0.035	GRASS	31.39	23.86	1.32	6.16	2.15	0.22	567.93	1.88	
119+00	33.97	566.03	568.26	1.09%	0.00	4.0	4.6	2.23	0.035	GRASS	21.47	19.76	1.09	6.16	2.33	0.26	566.81	1.45	
118+00	34.41	565.28	567.71	0.74%	0.00	4.0	4.8	2.43	0.035	GRASS	25.81	21.81	1.18	6.16	2.01	0.19	566.12	1.59	
117+00	34.85	564.59	566.91	0.69%	0.00	4.0	5.1	2.32	0.035	GRASS	24.57	21.69	1.13	6.16	1.94	0.18	565.42	1.49	
116+00	35.40	563.16	564.87	1.43%	0.00	4.0	4.4	1.71	0.035	GRASS	12.30	14.81	0.83	6.16	2.59	0.33	563.91	0.96	
115+00	35.76	562.28	564.56	0.88%	0.00	4.0	4.5	2.28	0.035	GRASS	22.20	20.01	1.11	6.16	2.16	0.22	563.10	1.46	
114+00	35.15	561.39	563.31	0.89%	0.00	4.0	4.2	1.92	0.035	GRASS	15.20	16.30	0.93	6.16	2.18	0.22	562.22	1.09	
113+00	36.37	560.49	562.06	0.62%	0.00	4.0	4.7	1.57	0.035	GRASS	10.69	13.97	0.76	6.16	1.88	0.16	561.36	0.70	
112+00	37.45	559.87	560.93	0.62%	0.00	4.0	5.1	1.06	0.035	GRASS	5.12	9.89	0.52	6.16	1.86	0.16	560.72	0.21	
111+00	38.51	559.25	560.06	0.62%	0.00	14.0	6.0	0.81	0.035	GRASS	6.56	16.30	0.40	6.16	1.54	0.12	559.88	0.18	
110+00	40.02	558.73	559.78	0.52%	0.00	10.6	7.0	1.05	0.035	GRASS	9.70	18.60	0.52	6.16	1.49	0.11	559.41	0.37	
109+00	41.62	558.48	559.36	0.25%	0.00	12.2	7.1	0.88	0.035	GRASS	7.47	17.08	0.44	6.16	1.11	0.06	559.24	0.12	
108+00	43.72	558.22	558.91	0.26%	0.00	14.4	6.0	0.69	0.035	GRASS	4.87	14.21	0.34	6.16	1.11	0.06	558.96	-0.05	
107+39																			CULVERT

DITCH C1-S1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
154+00	27.77	633.38	634.41	1.66%	0.00	8.2	4.0	1.03	0.035	GRASS	6.47	12.75	0.51	0.63	1.42	0.14	633.65	0.76	
155+00	34.60	631.72	633.43	1.66%	0.00	4.0	5.8	1.71	0.035	GRASS	14.33	17.11	0.84	12.33	3.15	0.45	632.61	0.82	
156+00	35.86	630.42	631.51	1.30%	0.00	4.0	4.8	1.09	0.035	GRASS	5.24	9.86	0.53	12.33	2.95	0.39	631.39	0.12	
157+00	37.06	627.62	629.03	2.80%	0.00	4.0	4.1	1.41	0.035	GRASS	8.06	11.78	0.68	12.33	4.00	0.74	628.49	0.54	
158+00	38.96	624.26	624.95	3.36%	0.00	22.2	4.2	0.69	0.035	GRASS	6.29	18.32	0.34	12.33	3.23	0.56	624.80	0.15	
159+00	40.26	621.79	622.40	2.47%	0.00	16.3	5.1	0.61	0.035	GRASS	3.99	13.17	0.30	12.28	3.03	0.47	622.40	0.00	
160+00	40.39	618.89	619.84	2.90%	0.00	4.0	5.8	0.95	0.035	GRASS	4.40	9.47	0.47	12.33	3.89	0.71	619.70	0.14	
161+00	37.54	615.92	617.42	2.97%	0.00	4.0	4.4	1.50	0.035	GRASS	9.42	12.91	0.73	12.33	4.06	0.77	616.77	0.65	
162+00	35.32	613.45	615.53	2.47%	0.00	3.7	4.0	2.08	0.035	GRASS	16.70	16.59	1.01	12.33	3.86	0.68	614.36	1.17	
163+00	42.56	610.07	612.13	3.38%	0.00	7.9	4.8	2.06	0.035	GRASS	27.01	26.57	1.02	12.33	3.87	0.74	610.78	1.35	
164+00	44.27	607.19	608.70	2.88%	0.00	4.0	5.3	1.51	0.035	GRASS	10.59	14.36	0.74	12.33	3.92	0.72	608.01	0.69	
165+00	40.90	604.52	605.59	2.67%	0.00	4.0	4.7	1.07	0.035	GRASS	4.97	9.54	0.52	12.33	3.87	0.69	605.38	0.21	
166+00	37.44	602.13	603.12	2.39%	0.00	3.6	3.8	0.99	0.035	GRASS	3.60	7.54	0.48	12.33	3.85	0.67	603.06	0.06	
167+00																			DRIVEWAY
168+00	35.86	597.20	599.25	2.10%	0.00	4.0	4.3	2.05	0.035	GRASS	17.48	17.54	1.00	12.33	3.57	0.58	598.11	1.14	
169+00	36.79	595.10	596.53	2.10%	0.00	4.0	5.4	1.43	0.035	GRASS	9.65	13.81	0.70	12.33	3.47	0.56	595.97	0.56	
170+00	37.48	592.95	593.98	2.15%	0.00	4.0	6.2	1.03	0.035	GRASS	5.38	10.66	0.50	12.33	3.44	0.55	593.79	0.19	
171+00	37.05	590.81	592.21	2.14%	0.00	10.1	5.3	1.40	0.035	GRASS	15.14	21							

DITCH C1-S2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
186+00	37.95	618.38	619.13	1.35%	0.00	9.4	6.9	0.75	0.035	GRASS	4.58	12.32	0.37	4.47	2.01	0.22	618.90	0.23	
185+00	38.61	617.03	618.08	1.35%	0.00	7.0	5.7	1.05	0.035	GRASS	7.00	13.49	0.52	4.47	2.13	0.24	617.60	0.48	
184+00	39.2	615.31	616.29	1.72%	0.00	7.1	5.7	0.98	0.035	GRASS	6.14	12.69	0.48	4.47	2.33	0.29	615.86	0.43	
183+00	39.64	613.06	614.21	2.25%	0.00	6.2	5.2	1.15	0.035	GRASS	7.58	13.39	0.57	4.47	2.64	0.38	613.60	0.61	
182+00	39.91	610.52	611.63	2.54%	0.00	5.3	5.2	1.11	0.035	GRASS	6.47	11.88	0.55	4.47	2.82	0.43	611.07	0.56	
181+00	40.17	607.55	608.71	2.97%	0.00	4.5	5.5	1.16	0.035	GRASS	6.73	11.84	0.57	4.47	3.03	0.49	608.09	0.62	
180+00	39.78	604.57	605.89	2.98%	0.00	5.7	5.1	1.32	0.035	GRASS	9.44	14.54	0.65	4.47	2.98	0.48	605.10	0.79	
179+00	39.28	601.6	602.89	2.97%	0.00	6.0	5.2	1.29	0.035	GRASS	9.29	14.63	0.63	4.47	2.95	0.48	602.12	0.77	
178+00	38.78	598.62	599.90	2.98%	0.00	6.3	4.7	1.28	0.035	GRASS	9.02	14.33	0.63	4.47	2.96	0.48	599.14	0.76	
177+00	38.79	595.65	598.29	2.97%	0.00	4.2	4.3	2.64	0.035	GRASS	29.62	23.05	1.28	4.47	3.14	0.52	596.23	2.06	
176+00	39.15	593.32	594.26	2.33%	0.00	4.0	4.7	0.94	0.035	GRASS	3.85	8.40	0.46	4.47	2.85	0.42	593.92	0.34	
175+00	39.21	591.83	592.46	1.49%	0.00	4.0	5.4	0.63	0.035	GRASS	1.86	6.05	0.31	4.47	2.37	0.29	592.46	0.00	
174+00	39.22	590.01	590.64	1.82%	0.00	4.0	5.9	0.63	0.035	GRASS	1.97	6.38	0.31	4.47	2.52	0.33	590.61	0.03	
173+27																			CULVERT

DITCH D1-S1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
188+00	34.99	618.55	619.99	3.29%	0.00	8.6	5.6	1.44	0.035	GRASS	14.65	20.56	0.71	16.01	3.99	0.77	619.30	0.69	
189+00	35.25	617.14	618.94	1.41%	0.00	7.7	3.8	1.80	0.035	GRASS	18.61	21.03	0.89	16.01	3.05	0.41	618.10	0.84	
190+00	37.26	614.91	616.81	2.23%	0.00	9.2	3.8	1.90	0.035	GRASS	23.46	25.05	0.94	16.01	3.51	0.57	615.75	1.06	
191+00	38.37	613.13	614.61	1.78%	0.00	10.2	4.3	1.48	0.035	GRASS	15.92	21.76	0.73	16.01	3.15	0.46	613.97	0.64	
192+00	37.73	611.22	612.41	1.91%	0.00	9.5	4.8	1.19	0.035	GRASS	10.15	17.24	0.59	16.01	3.24	0.49	612.05	0.36	
193+00	36.05	608.35	610.12	2.87%	0.00	7.9	4.2	1.77	0.035	GRASS	18.94	21.72	0.87	16.01	3.93	0.72	609.17	0.95	
194+00	36.14	604.80	607.11	3.55%	0.00	11.0	3.8	2.31	0.035	GRASS	39.57	34.66	1.14	16.01	4.05	0.80	605.53	1.58	
195+00	38.02	601.08	602.32	3.72%	0.00	12.3	4.0	1.24	0.035	GRASS	12.54	20.43	0.61	16.01	4.03	0.80	601.78	0.54	
196+00	38.48	597.87	599.25	3.21%	0.00	10.7	4.8	1.38	0.035	GRASS	14.79	21.64	0.68	16.01	3.86	0.72	598.60	0.65	
197+00	37.95	594.73	595.79	3.14%	0.00	12.8	5.6	1.06	0.035	GRASS	10.31	19.60	0.53	16.01	3.68	0.67	595.42	0.37	
198+00	37.36	591.66	593.13	3.07%	0.00	10.6	5.8	1.47	0.035	GRASS	17.76	24.36	0.73	16.01	3.75	0.68	592.38	0.75	
199+00	36.75	588.94	590.55	2.72%	0.00	10.1	5.0	1.61	0.035	GRASS	19.56	24.53	0.80	16.01	3.66	0.64	589.70	0.85	
200+00	35.59	586.39	588.27	2.55%	0.00	8.0	4.9	1.88	0.035	GRASS	22.79	24.55	0.93	16.01	3.71	0.64	587.21	1.06	
201+00	36.49	583.27	585.27	3.12%	0.00	7.8	4.7	2.00	0.035	GRASS	24.98	25.32	0.99	16.01	4.03	0.77	584.07	1.20	
202+00	38.25	579.90	581.08	3.37%	0.00	11.3	4.3	1.18	0.035	GRASS	10.87	18.61	0.58	16.01	3.93	0.75	580.62	0.46	
203+00	39.45	576.61	577.42	3.29%	0.00	16.0	4.3	0.81	0.035	GRASS	6.65	16.53	0.40	16.01	3.65	0.67	577.27	0.15	
204+00	40.35	573.69	574.67	2.92%	0.00	19.0	3.9	0.98	0.035	GRASS	10.99	22.58	0.49	16.01	3.39	0.58	574.33	0.34	
205+00	38.34	571.70	572.93	1.99%	0.00	4.0	4.2	1.23	0.035	GRASS	6.19	10.36	0.60	16.01	3.75	0.62	572.72	0.21	
206+00	41.17	569.64	570.99	2.06%	0.00	4.0	3.1	1.35	0.035	GRASS	6.45	9.94	0.65	16.01	3.92	0.66	570.71	0.28	
207+00	41.19	568.56	569.82	1.08%	0.00	4.0	2.7	1.26	0.035	GRASS	5.33	8.83	0.60	16.01	3.11	0.40	569.80	0.02	
208+00	40.74	567.49	569.22	1.07%	0.00	4.0	2.1	1.73	0.035	GRASS	9.16	11.19	0.82	16.01	3.16	0.41	568.78	0.44	
209+00	39.28	566.59	567.93	0.90%	0.00	6.1	1.6	1.34	0.035	GRASS	6.93	10.84	0.64	16.01	2.80	0.33	567.81	0.12	
209+93																			CULVERT

DITCH D1-S2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
216+00	39.16	576.13	576.38	1.67%	0.00	81.1	4.1	0.25	0.035	GRASS	2.66	21.34	0.12	0.43	0.80	0.06	576.24	0.14	
215+00	38.82	574.46	575.89	1.67%	0.00	13.9	3.9	1.43	0.035	GRASS	18.17	25.64	0.71	1.67	1.66	0.17	574.80	1.09	
214+00	38.39	573.40	575.26	1.06%	0.00	6.4	4.0	1.86	0.035	GRASS	17.87	19.59	0.91	1.67	1.60	0.15	573.85	1.41	
213+00	38.40	572.94	574.29	0.46%	0.00	5.8	4.2	1.35	0.035	GRASS	9.12	13.78	0.66	1.67	1.18	0.07	573.47	0.82	
212+00	40.14	572.35	572.99	0.59%	0.00	13.7	4.8	0.64	0.035	GRASS	3.78	11.92	0.32	1.67	1.11	0.07	572.75	0.24	
211+00	41.90	571.22	571.74	1.13%	0.00	17.6	4.0	0.52	0.035	GRASS	2.92	11.30	0.26	1.67	1.37	0.12	571.56	0.18	
210+00																			NO DITCH
209+93																			CULVERT

DITCH F1-S																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
263+00	0.00																		NO DITCH
262+00	0.00																		NO DITCH
261+00	0.00																		NO DITCH
260+00	0.00																		NO DITCH
259+00	0.00																		NO DITCH
258+00	0.00																		NO DITCH
257+00	0.00																		DRIVEWAY
256+00	34.79	618.8	619.31	2.67%	0.00	4.0	4.7	0.51	0.035	GRASS	1.13	4.56	0.25	3.40	2.80	0.43	619.33	-0.02	
255+00	38.57	616.13	617.25	2.67%	0.00	4.0	5.1	1.12	0.035	GRASS	5.73	10.47	0.55	3.40	2.77	0.42	616.65	0.60	
254+00	40.53	613.82	614.69	2.31%	0.00	4.0	5.5	0.87	0.035	GRASS	3.58	8.42	0.43	3.40	2.61	0.37	614.34	0.35	
253+00	37.58	611.31	612.97	2.51%	0.00	4.0	4.4	1.66	0.035	GRASS	11.60	14.37	0.81	6.81	2.69	0.40	612.46	0.51	
252+00	0.00																		NO DITCH
251+00	0.00																		NO DITCH
250+00	36.37	607.22	608.16	1.65%	0.00	4.0	4.1	0.94	0.035	GRASS	3.57	7.83	0.46	6.81	2.83	0.39	607.99	0.17	
249+00	36.74	605.57	606.50	1.65%	0.00	4.0	4.0	0.93	0.035	GRASS	3.47	7.70	0.45	6.81	2.84	0.39	606.34	0.16	
248+00	37.36	604.08	605.02	1.49%	0.00	4.0	4.0	0.94	0.035	GRASS	3.53	7.74	0.46	10.21	3.02	0.41	605.00	0.02	
247+00	37.64	602.76	603.85	1.32%	0.00	4.0	4.0	1.09	0.035	GRASS	4.76	9.01	0.53	10.21	2.89	0.38	603.70	0.15	
246+00	36.76	601.41	602.53	1.35%	0.00	4.0	4.0	1.12	0.035	GRASS	5.04	9.27	0.54	10.21	2.91	0.38	602.34	0.19	
245+00	36.95	600.03	601.28	1.38%	0.00	4.0	4.6	1.25	0.035	GRASS	6.68	10.98	0.61	10.21	2.89	0.38	600.94	0.34	
244+00	37.36	598.93	600.12	1.10%	0.00	4.0	5.0	1.19	0.035	GRASS	6.37	10.97	0.58	10.21	2.63	0.31	599.86	0.26	
243+00	37.68	597.57	598.81	1.36%	0.00	4.0	6.1	1.24</											

DITCH G1-S																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH ELEVATION (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S 'n'	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _v (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
268+00	41.37	625.56	625.76	4.29%	0.00	42.0	11.7	0.20	0.035	GRASS	1.07	10.75	0.10	1.83	1.85	0.26	625.75	0.01	
269+00	38.11	621.27	623.38	4.29%	0.00	4.0	4.5	2.11	0.035	GRASS	18.88	18.39	1.03	7.56	4.12	0.86	621.93	1.45	
270+00	37.67	616.45	618.14	4.82%	0.00	4.0	4.7	1.69	0.035	GRASS	12.48	15.15	0.82	7.54	4.27	0.93	617.09	1.05	
271+00	38.39	612.29	614.07	4.16%	0.00	4.0	6.4	1.78	0.035	GRASS	16.49	18.89	0.87	7.56	3.88	0.78	612.90	1.17	
271+66																			CULVERT

DITCH G1-S2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH ELEVATION (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S 'n'	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _v (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
271+77	32.49	610.15	611.53	4.16%	0.00	9.2	4.0	1.38	0.035	GRASS	12.56	18.45	0.68	7.64	3.68	0.72	610.71	0.82	

DITCH H1-S1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH ELEVATION (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S 'n'	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _v (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
273+00	39.26	605.62	606.54	3.47%	0.00	4.0	9.0	0.92	0.035	GRASS	5.50	12.12	0.45	10.26	3.71	0.70	606.27	0.27	
274+00	38.83	602.15	603.41	3.47%	0.00	13.0	9.4	1.26	0.035	GRASS	17.75	28.29	0.63	10.26	3.26	0.57	602.68	0.73	
275+00	35.19	599.50	601.03	2.65%	0.00	8.2	5.4	1.53	0.035	GRASS	15.92	21.04	0.76	10.26	3.32	0.55	600.17	0.86	
276+00	36.49	597.29	599.11	2.21%	0.00	12.8	5.2	1.82	0.035	GRASS	29.84	33.04	0.90	10.26	2.90	0.43	597.92	1.19	
277+00	38.66	595.08	596.54	2.21%	0.00	19.7	4.1	1.46	0.035	GRASS	25.39	34.99	0.73	10.26	2.70	0.39	595.64	0.90	
277+65																			CULVERT

DITCH H1-S2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH ELEVATION (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S 'n'	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _v (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
300+00	30.20	635.13	635.93	3.59%	0.00	22.7	4.0	0.80	0.035	GRASS	8.55	21.50	0.40	5.94	2.75	0.45	635.53	0.40	
299+00	33.48	631.54	633.16	3.59%	0.00	6.5	4.0	1.62	0.035	GRASS	13.83	17.40	0.79	5.94	3.45	0.63	632.11	1.05	
298+00	35.59	628.99	631.14	2.55%	0.00	4.7	4.0	2.15	0.035	GRASS	20.04	19.13	1.05	5.94	3.17	0.51	629.65	1.49	
297+00	35.37	626.96	629.05	2.03%	0.00	4.2	4.0	2.09	0.035	GRASS	17.95	17.68	1.02	5.94	2.95	0.43	627.66	1.39	
296+00	34.32	625.23	627.06	1.73%	0.00	4.3	4.0	1.83	0.035	GRASS	13.81	15.54	0.89	5.94	2.77	0.38	625.95	1.11	
295+00	38.36	623.14	625.25	2.09%	0.00	3.4	5.4	2.11	0.035	GRASS	19.63	19.11	1.03	5.94	2.93	0.43	623.82	1.43	
294+00	38.52	620.34	622.33	2.80%	0.00	4.5	5.8	1.99	0.035	GRASS	20.32	20.81	0.98	11.88	3.76	0.67	621.12	1.21	
293+00	38.01	618.73	620.68	1.61%	0.00	5.3	5.6	1.95	0.035	GRASS	20.82	21.71	0.96	11.88	3.01	0.42	619.58	1.10	
292+00	37.58	617.15	618.57	1.58%	0.00	6.7	7.5	1.42	0.035	GRASS	14.24	20.25	0.70	11.88	2.81	0.38	617.92	0.65	
291+00	37.76	615.58	617.15	1.57%	0.00	7.1	6.9	1.57	0.035	GRASS	17.13	22.05	0.78	11.88	2.82	0.38	616.36	0.79	
290+00	38.33	613.77	615.29	1.81%	0.00	5.5	7.5	1.52	0.035	GRASS	14.91	19.86	0.75	11.88	3.02	0.44	614.55	0.74	
289+00	39.33	611.77	613.46	2.00%	0.00	4.0	7.3	1.69	0.035	GRASS	16.15	19.44	0.83	11.88	3.24	0.49	612.58	0.88	
288+00	39.46	609.83	611.33	1.94%	0.00	4.0	8.3	1.50	0.035	GRASS	13.88	18.78	0.74	17.82	3.47	0.54	610.74	0.59	
287+00	39.30	607.93	609.61	1.90%	0.00	4.0	7.4	1.68	0.035	GRASS	16.02	19.39	0.83	17.82	3.51	0.55	608.88	0.73	
286+00	39.16	606.10	607.88	1.83%	0.00	4.0	6.9	1.78	0.035	GRASS	17.19	19.66	0.87	17.82	3.50	0.54	607.07	0.81	
285+00	39.01	604.34	606.13	1.76%	0.00	4.0	6.7	1.79	0.035	GRASS	17.14	19.51	0.88	17.82	3.46	0.53	605.32	0.81	
284+00	38.87	602.65	604.67	1.69%	0.00	4.0	5.9	2.02	0.035	GRASS	20.16	20.38	0.99	17.82	3.47	0.53	603.67	1.00	
283+00	38.60	600.99	602.90	1.66%	0.00	4.0	5.0	1.91	0.035	GRASS	16.47	17.67	0.93	17.82	3.52	0.54	602.05	0.85	
282+00	38.60	599.38	601.24	1.61%	0.00	4.0	4.7	1.86	0.035	GRASS	15.08	16.64	0.91	23.76	3.77	0.59	600.58	0.66	
281+00	39.28	597.36	598.85	2.02%	0.00	4.0	4.9	1.49	0.035	GRASS	9.86	13.57	0.73	23.76	4.09	0.70	598.50	0.35	
280+00	41.77	594.80	596.78	2.56%	0.00	4.0	4.2	1.98	0.035	GRASS	16.03	16.67	0.96	23.76	4.55	0.88	595.93	0.85	
279+00	43.51	592.99	594.73	1.81%	0.00	4.0	3.8	1.74	0.035	GRASS	11.78	13.98	0.84	23.76	4.04	0.67	594.22	0.51	
278+00	42.90	592.31	593.84	0.68%	0.00	4.0	3.3	1.53	0.035	GRASS	8.56	11.60	0.74	23.76	2.84	0.31	593.82	0.02	
277+65																			CULVERT

DITCH A1-N1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH ELEVATION (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S 'n'	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _v (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS

- NOTES:
- HYDROLOGY DETERMINED USING RATIONAL METHOD.
 - DITCH CALCS ARE DONE IN 100 FT INTERVALS.
 - SEE PRESENT LAYOUT AND ROADWAY PLAN AND PROFILE SHEETS FOR DITCH LOCATIONS.
 - DITCHES DESIGNED TO CONTAIN Q2.
 - UTILIZE NATIVE GRASS MIXTURE (RETARDANCE CLASS B) THAT CAN TOLERATE SHEAR STRESS UP TO 2.10 LBS./SQFT.

4/27/2021

JOHNNY L. CLAYTON
 107215
 LICENSED PROFESSIONAL ENGINEER

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 4/27/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

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FM 725
 DITCH HYDRAULIC CALCULATIONS

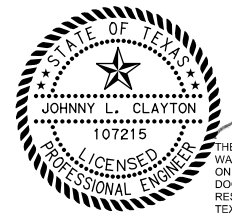
SCALE: NTS SHEET 4 OF 8

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		255
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DITCH A1-N1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
41+00	27.24	563.41	564.22	0.68%	0.00	5.9	4.0	0.81	0.035	GRASS	3.26	8.20	0.40	1.04	1.21	0.09	563.83	0.40	
42+00	26.24	562.73	563.95	0.68%	0.00	4.6	4.0	1.22	0.035	GRASS	6.40	10.77	0.59	1.04	1.25	0.09	563.17	0.78	
43+00	29.63	561.29	563.32	1.44%	0.00	5.2	4.0	2.03	0.035	GRASS	19.09	19.22	0.99	1.04	1.63	0.16	561.66	1.66	
44+00	28.25	559.75	561.84	1.54%	0.00	4.0	3.0	2.09	0.035	GRASS	15.09	15.07	1.00	1.04	1.78	0.19	560.16	1.68	
45+00	34.07	557.52	560.14	2.23%	0.00	5.4	4.0	2.62	0.035	GRASS	32.11	25.10	1.28	1.04	1.92	0.23	557.86	2.28	
46+00	37.27	555.46	558.19	2.06%	0.00	6.0	4.0	2.73	0.035	GRASS	37.29	27.87	1.34	1.04	1.83	0.21	555.80	2.39	IN SET
47+00																			NO DITCH
48+00																			NO DITCH
49+00																			NO DITCH
50+00																			NO DITCH
51+00																			NO DITCH
52+00																			NO DITCH
53+00																			NO DITCH
54+00																			NO DITCH
55+00																			NO DITCH
55+94																			CULVERT

DITCH A1-N2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
75+00	28.51	559.27	559.86	0.35%	0.00	7.8	4.0	0.59	0.035	GRASS	2.06	7.09	0.29	1.54	1.00	0.05	559.78	0.08	
74+00	28.45	558.92	559.64	0.35%	0.00	5.5	4.0	0.72	0.035	GRASS	2.46	6.99	0.35	1.54	1.05	0.06	559.48	0.16	
73+00	28.38	558.62	559.60	0.30%	0.00	4.6	4.0	0.98	0.035	GRASS	4.11	8.62	0.48	1.54	1.02	0.05	559.21	0.39	
72+00	28.31	558.32	559.66	0.30%	0.00	4.0	4.0	1.34	0.035	GRASS	7.19	11.06	0.65	1.54	1.03	0.06	558.93	0.73	
71+00	28.70	558.04	559.57	0.28%	0.00	4.0	4.0	1.53	0.035	GRASS	9.35	12.59	0.74	1.54	1.01	0.05	558.66	0.91	
70+00	27.09	557.76	559.51	0.28%	0.00	3.0	4.0	1.75	0.035	GRASS	10.61	12.66	0.84	1.54	1.04	0.05	558.41	1.09	DRIVEWAY
69+00	29.86	557.46	559.21	0.30%	0.00	4.1	3.0	1.75	0.035	GRASS	10.79	12.84	0.84	1.54	1.06	0.06	558.11	1.11	
68+00	28.51	557.16	558.91	0.30%	0.00	4.1	3.8	1.74	0.035	GRASS	11.99	14.19	0.85	1.54	1.04	0.06	557.78	1.13	
67+00	28.06	556.48	558.25	0.68%	0.00	4.4	4.0	1.77	0.035	GRASS	13.09	15.24	0.86	1.54	1.39	0.11	556.99	1.25	
66+00	28.65	556.00	556.96	0.48%	0.00	9.0	4.0	0.96	0.035	GRASS	6.02	12.69	0.47	1.54	1.10	0.07	556.46	0.50	
65+00	26.24	554.32	555.26	1.68%	0.00	6.7	4.0	0.94	0.035	GRASS	4.69	10.19	0.46	1.54	1.84	0.20	554.72	0.54	
64+00	26.44	551.77	552.80	2.55%	0.00	4.3	4.0	1.03	0.035	GRASS	4.42	8.82	0.50	1.54	2.28	0.31	552.18	0.63	
63+00																			NO DITCH
62+00																			NO DITCH
61+00																			NO DITCH
60+00																			NO DITCH
59+00																			NO DITCH
58+00																			NO DITCH
57+00																			NO DITCH
56+00																			NO DITCH
55+94																			CULVERT

- NOTES:
1. HYDROLOGY DETERMINED USING RATIONAL METHOD.
 2. DITCH CALCS ARE DONE IN 100 FT INTERVALS.
 3. SEE PRESENT LAYOUT AND ROADWAY PLAN AND PROFILE SHEETS FOR DITCH LOCATIONS.
 4. DITCHES DESIGNED TO CONTAIN Q2.



2/28/2021

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E., #107215 ON 2/28/2021. ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312



FM 725
DITCH HYDRAULIC CALCULATIONS

SCALE: NTS SHEET 5 OF 8

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 257
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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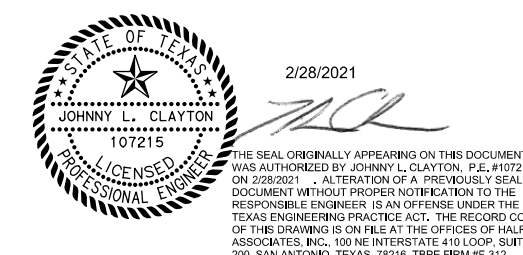
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
133+00	40.26	586.41	587.94	1.81%	0.00	4.6	4.0	1.52	0.035	GRASS	9.98	13.43	0.74	6.01	2.80	0.39	587.12	0.82	
132+00	40.85	584.60	585.46	1.81%	0.00	4.3	4.0	0.86	0.035	GRASS	3.06	7.32	0.42	6.01	2.83	0.39	585.32	0.14	
131+00	39.93	583.26	584.40	1.34%	0.00	4.6	4.0	1.14	0.035	GRASS	5.61	10.10	0.56	6.01	2.50	0.30	584.01	0.39	
130+00	38.70	581.81	582.86	1.45%	0.00	5.0	4.0	1.05	0.035	GRASS	4.96	9.66	0.51	6.01	2.56	0.32	582.53	0.33	
129+00	36.19	580.32	581.31	1.49%	0.00	4.5	4.0	0.99	0.035	GRASS	4.18	8.67	0.48	6.01	2.61	0.33	581.05	0.26	
128+00	34.98	578.63	579.90	1.69%	0.00	4.3	4.0	1.27	0.035	GRASS	6.72	10.87	0.62	6.01	2.75	0.37	579.35	0.55	
127+00	34.03	576.86	577.90	1.76%	0.00	4.2	4.0	1.03	0.035	GRASS	4.39	8.73	0.50	6.01	2.81	0.39	577.59	0.31	
126+00	34.78	575.10	576.28	1.77%	0.00	4.0	4.0	1.18	0.035	GRASS	5.64	9.82	0.57	6.01	2.82	0.39	575.82	0.46	
125+00	34.86	573.55	574.62	1.55%	0.00	4.4	4.0	1.07	0.035	GRASS	4.82	9.23	0.52	6.01	2.66	0.35	574.28	0.34	
124+00	35.65	571.98	573.25	1.57%	0.00	4.8	4.0	1.27	0.035	GRASS	7.16	11.53	0.62	6.01	2.64	0.34	572.69	0.56	
123+00	35.88	570.41	572.21	1.57%	0.00	5.0	4.0	1.80	0.035	GRASS	14.53	16.55	0.88	6.01	2.63	0.34	571.12	1.09	
122+00	35.57	569.23	571.09	1.18%	0.00	5.0	4.0	1.86	0.035	GRASS	15.59	17.18	0.91	6.01	2.36	0.27	569.98	1.11	
121+00	34.66	568.30	570.32	0.93%	0.00	5.1	4.0	2.02	0.035	GRASS	18.65	18.91	0.99	6.01	2.15	0.22	569.08	1.24	
120+00	33.71	567.36	569.32	0.94%	0.00	5.0	4.0	1.96	0.035	GRASS	17.23	18.02	0.96	6.01	2.17	0.22	568.15	1.17	
119+00	37.41	566.43	567.93	0.93%	0.00	6.1	4.0	1.50	0.035	GRASS	11.35	15.44	0.74	6.01	2.11	0.21	567.18	0.75	
118+00	40.49	565.95	567.45	0.48%	0.00	8.7	4.0	1.50	0.035	GRASS	14.29	19.29	0.74	6.01	1.56	0.12	566.73	0.72	
117+00	42.81	565.60	566.38	0.35%	0.00	13.3	4.0	0.78	0.035	GRASS	5.21	13.57	0.38	6.01	1.28	0.08	566.34	0.04	
116+00	36.78	564.67	565.53	0.93%	0.00	8.9	4.0	0.86	0.035	GRASS	4.75	11.22	0.42	6.01	1.99	0.20	565.35	0.17	
115+00	35.17	563.30	564.67	1.37%	0.00	6.1	4.0	1.37	0.035	GRASS	9.49	14.15	0.67	6.01	2.43	0.29	564.00	0.67	
114+00	35.30	561.99	563.53	1.31%	0.00	5.1	4.0	1.54	0.035	GRASS	10.74	14.29	0.75	6.01	2.45	0.29	562.73	0.80	
113+00	35.24	561.16	562.63	0.83%	0.00	5.1	4.0	1.47	0.035	GRASS	9.84	13.71	0.72	6.01	2.07	0.20	561.96	0.67	
112+00	35.19	560.41	561.82	0.75%	0.00	5.3	4.0	1.41	0.035	GRASS	9.34	13.52	0.69	6.01	1.98	0.18	561.22	0.61	
111+00	36.42	559.77	561.07	0.64%	0.00	6.2	4.0	1.30	0.035	GRASS	8.54	13.44	0.64	6.01	1.83	0.16	560.57	0.49	
110+00	38.31	559.23	560.46	0.54%	0.00	7.0	4.0	1.23	0.035	GRASS	8.35	13.81	0.60	6.01	1.68	0.13	560.03	0.43	
109+00	39.31	558.82	559.94	0.41%	0.00	6.4	4.0	1.12	0.035	GRASS	6.54	11.90	0.55	6.01	1.54	0.11	559.69	0.25	
108+00	40.12	558.42	559.47	0.40%	0.00	4.7	4.0	1.04	0.035	GRASS	4.75	9.33	0.51	6.01	1.58	0.11	559.36	0.11	
107+39																			CULVERT

FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
168+00	36.88	596.65	596.96	2.24%	0.00	4.1	103.7	0.31	0.035	GRASS	5.18	33.46	0.15	0.86	1.00	0.09	596.78	0.18	
169+00	36.65	594.41	595.04	2.24%	0.00	4.1	32.6	0.63	0.035	GRASS	7.29	23.22	0.31	0.86	1.31	0.13	594.60	0.44	
170+00	35.44	592.66	593.17	1.75%	0.00	4.4	46.2	0.51	0.035	GRASS	6.57	25.83	0.25	0.86	1.11	0.10	592.84	0.33	
171+00	36.50	590.81	591.07	1.85%	0.00	4.3	301.5	0.26	0.035	GRASS	10.33	79.53	0.13	0.86	0.72	0.05	590.90	0.17	
172+00																			NO DITCH
173+00																			NO DITCH
173+28																			CULVERT

FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
185+00																			NO DITCH
184+00																			NO DITCH
183+00	34.54	613.66	614.94	2.49%	0.00	4.0	12.6	1.28	0.035	GRASS	13.62	21.48	0.63	8.59	2.95	0.45	614.25	0.69	
182+00	33.65	611.17	612.21	2.49%	0.00	4.0	16.4	1.04	0.035	GRASS	11.02	21.34	0.52	9.58	2.89	0.44	611.74	0.47	
181+00	33.82	608.12	608.96	3.05%	0.00	4.0	19.9	0.84	0.035	GRASS	8.43	20.20	0.42	9.58	3.00	0.49	608.64	0.32	
180+00	38.74	605.28	605.75	2.84%	0.00	7.2	25.2	0.47	0.035	GRASS	3.58	15.28	0.23	9.58	2.71	0.41	605.75	0.00	
179+00	38.47	602.32	602.84	2.96%	0.00	6.1	47.1	0.52	0.035	GRASS	7.20	27.73	0.26	9.58	2.43	0.35	602.70	0.14	
178+00	37.44	599.63	600.05	2.69%	0.00	5.6	89.0	0.42	0.035	GRASS	8.34	39.78	0.21	9.58	2.03	0.26	599.95	0.10	
177+00	37.40	597.01	597.42	2.62%	0.00	6.6	82.4	0.41	0.035	GRASS	7.48	36.52	0.20	9.58	2.04	0.27	597.33	0.09	
176+00	37.38	594.39	594.78	2.62%	0.00	6.1	98.4	0.39	0.035	GRASS	7.95	40.80	0.19	9.58	1.96	0.25	594.70	0.08	
175+00	40.89	591.91	592.75	2.48%	0.00	6.4	4.0	0.84	0.035	GRASS	3.68	8.92	0.41	9.58	3.39	0.56	592.65	0.10	
174+00	41.66	588.94	590.41	2.97%	0.00	4.4	3.1	1.47	0.035	GRASS	8.14	11.46	0.71	9.58	3.90	0.72	589.75	0.66	
173+28																			CULVERT

NOTES:

- HYDROLOGY DETERMINED USING RATIONAL METHOD.
- DITCH CALCS ARE DONE IN 100 FT INTERVALS.
- SEE PRESENT LAYOUT AND ROADWAY PLAN AND PROFILE SHEETS FOR DITCH LOCATIONS.
- DITCHES DESIGNED TO CONTAIN Q2.



NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
FM 725 DITCH HYDRAULIC CALCULATIONS			
SCALE: NTS		SHEET 6 OF 8	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	258	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DITCH D1-N1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
188+00	29.19	619.54	620.52	1.68%	0.00	4.0	21.4	0.98	0.035	GRASS	12.21	25.06	0.49	0.90	1.31	0.12	619.77	0.75	
189+00	33.32	617.86	619.44	1.68%	0.00	4.0	8.2	1.58	0.035	GRASS	15.18	19.50	0.78	3.59	2.21	0.27	618.38	1.06	
190+00	35.36	615.91	618.00	1.95%	0.00	4.0	6.4	2.09	0.035	GRASS	22.60	22.05	1.03	3.59	2.43	0.32	616.44	1.56	
191+00	37.63	613.52	614.88	2.39%	0.00	4.0	10.0	1.36	0.035	GRASS	12.95	19.28	0.67	3.59	2.44	0.34	613.98	0.90	
192+00	40.42	610.34	611.86	3.18%	0.00	4.0	8.2	1.52	0.035	GRASS	14.13	18.87	0.75	3.59	2.80	0.45	610.80	1.06	
193+00	44.96	607.02	608.37	3.32%	0.00	4.0	39.1	1.35	0.035	GRASS	39.27	58.35	0.67	3.59	2.09	0.29	607.30	1.07	
194+00	45.43	603.72	604.47	3.30%	0.00	6.0	21.8	0.75	0.035	GRASS	7.81	20.91	0.37	3.59	2.33	0.34	604.05	0.42	
195+00	44.42	599.89	600.60	3.83%	0.00	4.6	43.5	0.71	0.035	GRASS	12.12	34.22	0.35	3.59	2.15	0.31	600.15	0.45	
196+00	47.85	595.61	596.37	4.28%	0.00	5.1	4.0	0.76	0.035	GRASS	2.63	7.08	0.37	3.59	3.36	0.63	596.09	0.28	
197+00	56.70	591.64	592.35	3.97%	0.00	6.4	9.3	0.71	0.035	GRASS	3.94	11.20	0.35	3.59	2.88	0.49	592.04	0.31	
198+00	47.34	588.64	589.26	3.00%	0.00	4.5	4.0	0.62	0.035	GRASS	1.64	5.44	0.30	3.59	2.98	0.48	589.17	0.09	
199+00	45.79	585.79	586.42	2.85%	0.00	4.2	4.0	0.63	0.035	GRASS	1.62	5.29	0.31	3.59	2.96	0.47	586.34	0.08	
200+00	45.95	583.11	583.68	2.68%	0.00	4.1	4.0	0.57	0.035	GRASS	1.32	4.77	0.28	3.59	2.89	0.45	583.66	0.02	
201+00				0.00%	0.00														NO DITCH
202+00				0.00%	0.00														NO DITCH
203+00				0.00%	0.00														NO DITCH
204+00				0.00%	0.00														NO DITCH
205+00				0.00%	0.00														NO DITCH
206+00				0.00%	0.00														NO DITCH
207+00				0.00%	0.00														NO DITCH
208+00				0.00%	0.00														NO DITCH
209+00				0.00%	0.00														NO DITCH
209+95				0.00%	0.00														CULVERT

DITCH D1-N2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
228+00	33.67	590.91	592.58	0.22%	0.00	4.0	4.3	1.67	0.035	GRASS	11.55	14.23	0.81	6.90	1.33	0.07	592.03	0.55	
227+00	33.12	590.69	592.22	0.22%	0.00	4.0	4.4	1.53	0.035	GRASS	9.77	13.14	0.74	6.90	1.33	0.07	591.81	0.41	
226+00	34.22	590.11	591.91	0.58%	0.00	4.0	3.9	1.80	0.035	GRASS	12.75	14.62	0.87	6.90	1.93	0.17	591.06	0.85	
225+00	33.11	589.68	591.21	0.43%	0.00	4.0	4.7	1.53	0.035	GRASS	10.21	13.69	0.75	6.90	1.69	0.13	590.65	0.56	
224+00	31.25	589.43	590.49	0.25%	0.00	4.0	7.2	1.06	0.035	GRASS	6.27	12.03	0.52	6.90	1.30	0.07	590.41	0.08	
223+00	31.73	588.68	589.87	0.75%	0.00	4.0	8.5	1.19	0.035	GRASS	8.82	15.04	0.59	6.90	1.91	0.18	589.44	0.43	
222+00	37.34	586.15	588.59	2.53%	0.00	3.9	4.0	2.44	0.035	GRASS	23.49	19.86	1.18	6.90	3.35	0.55	586.87	1.72	
221+00	35.50	584.67	585.73	1.48%	0.00	3.2	4.0	1.06	0.035	GRASS	4.03	7.89	0.51	6.90	2.80	0.37	585.50	0.23	
220+00	39.81	583.31	584.84	1.36%	0.00	4.2	4.0	1.53	0.035	GRASS	9.56	12.87	0.74	6.90	2.64	0.33	584.11	0.73	
219+00	40.87	581.94	583.02	1.37%	0.00	4.5	4.0	1.08	0.035	GRASS	4.96	9.43	0.53	6.90	2.62	0.33	582.73	0.29	
218+00	38.38	580.19	581.35	1.75%	0.00	4.7	4.0	1.16	0.035	GRASS	5.86	10.37	0.57	6.90	2.86	0.40	580.93	0.42	
217+00	37.95	579.00	580.23	1.19%	0.00	4.5	4.0	1.23	0.035	GRASS	6.43	10.74	0.60	6.90	2.49	0.29	579.81	0.42	
216+00	39.57	576.42	577.28	2.58%	0.00	4.2	27.5	0.86	0.035	GRASS	11.72	27.37	0.43	6.90	2.42	0.34	576.84	0.44	
215+00	41.43	574.31	575.48	2.11%	0.00	4.1	9.2	1.17	0.035	GRASS	9.14	15.83	0.58	6.90	2.77	0.40	574.92	0.56	
214+00	39.82	573.38	574.64	0.93%	0.00	4.0	22.8	1.26	0.035	GRASS	21.28	33.96	0.63	6.90	1.72	0.16	573.93	0.71	
213+00	40.28	572.46	573.58	0.92%	0.00	4.1	4.0	1.12	0.035	GRASS	5.08	9.34	0.54	6.90	2.28	0.24	573.32	0.26	
212+00	46.35	571.54	572.58	0.92%	0.00	5.2	4.0	1.04	0.035	GRASS	4.99	9.82	0.51	6.90	2.22	0.23	572.36	0.22	
211+00	45.68	570.61	571.96	0.93%	0.00	4.1	4.0	1.35	0.035	GRASS	7.38	11.26	0.66	6.90	2.29	0.24	571.47	0.49	
209+95																			CULVERT

DITCH E1-N1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
229+00	32.91	590.73	592.21	0.25%	0.00	4.0	5.2	1.48	0.035	GRASS	10.05	13.91	0.72	1.91	0.99	0.05	591.38	0.83	
230+00	33.57	590.48	592.13	0.25%	0.00	4.0	5.3	1.65	0.035	GRASS	12.66	15.70	0.81	1.91	0.98	0.05	591.13	1.00	
231+00	35.91	589.80	592.03	0.68%	0.00	4.0	6.7	2.23	0.035	GRASS	26.65	24.35	1.09	1.91	1.39	0.11	590.31	1.72	
231+99																			CULVERT

DITCH E1-N2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{wave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
235+00	39.00	590.60	591.52	0.82%	0.00	6.1	14.0	0.92	0.035	GRASS	8.51	18.60	0.46	2.72	1.40	0.11	591.04	0.48	
234+00	39.71	589.78	590.74	0.82%	0.00	5.1	4.0	0.96	0.035	GRASS	4.20	8.96	0.47	2.72	1.69	0.15	590.38	0.36	
233+00	40.78	589.47	592.01	0.31%	0.00	5.2	8.5	2.54	0.035	GRASS	44.03	35.06	1.26	2.72	1.43	0.09	589.76	2.25	
232+00	38.79	589.15	592.63	0.32%	0.00	4.0	7.2	3.48	0.035	GRASS	67.82	39.64	1.71	2.72	1.43	0.09	589.51	3.12	
231+99																			CULVERT

DITCH F1-N1																		
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE SLOPE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)						

DITCH F1-N2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
259+00	40.38	624.55	625.91	2.13%	0.00	4.1	5.9	1.36	0.035	GRASS	9.28	13.92	0.67	5.92	2.87	0.42	625.19	0.72	
258+00	45.51	622.42	623.97	2.13%	0.00	5.5	4.0	1.55	0.035	GRASS	11.39	15.03	0.76	5.92	2.90	0.43	623.08	0.89	
257+00	47.21	620.04	621.93	2.38%	0.00	5.6	4.0	1.89	0.035	GRASS	17.22	18.62	0.92	5.92	3.01	0.46	620.68	1.25	
256+00	46.98	617.66	619.81	2.38%	0.00	5.3	4.0	2.15	0.035	GRASS	21.38	20.36	1.05	5.92	3.04	0.47	618.31	1.50	
255+00	44.95	615.83	617.97	1.83%	0.00	4.7	4.0	2.14	0.035	GRASS	19.94	19.13	1.04	5.92	2.80	0.39	616.53	1.44	
254+00	42.99	614.12	616.04	1.71%	0.00	4.4	4.3	1.92	0.035	GRASS	16.13	17.23	0.94	5.92	2.72	0.37	614.82	1.22	
253+00	42.71	612.28	614.20	1.84%	0.00	4.5	4.0	1.92	0.035	GRASS	15.67	16.77	0.93	5.92	2.82	0.39	612.98	1.22	
252+00	40.08	610.60	611.41	1.68%	0.00	4.4	4.0	0.81	0.035	GRASS	2.75	6.98	0.39	5.92	2.73	0.37	611.32	0.09	
251+00	39.93	608.76	609.81	1.84%	0.00	4.2	4.0	1.05	0.035	GRASS	4.54	8.90	0.51	5.92	2.84	0.40	609.47	0.34	
250+00	39.80	607.08	607.85	1.68%	0.00	5.1	9.9	0.77	0.035	GRASS	4.45	11.67	0.38	5.92	2.38	0.30	607.66	0.19	
249+00	39.93	605.84	606.65	1.24%	0.00	4.0	12.6	0.81	0.035	GRASS	5.45	13.58	0.40	5.92	2.07	0.22	606.43	0.22	
248+00	38.55	604.82	605.20	1.02%	0.00	4.0	89.9	0.38	0.035	GRASS	6.78	35.72	0.19	5.92	1.25	0.10	605.14	0.06	
247+00	40.60	603.01	603.73	1.81%	0.00	4.0	58.7	0.72	0.035	GRASS	16.25	45.24	0.36	5.92	1.72	0.19	603.34	0.39	
246+00	37.82	601.35	602.77	1.66%	0.00	4.0	10.0	1.42	0.035	GRASS	14.11	20.13	0.70	5.92	2.41	0.30	601.94	0.83	
245+00	37.27	600.21	600.98	1.14%	0.00	4.0	20.4	0.77	0.035	GRASS	7.23	18.89	0.38	5.92	1.83	0.18	600.73	0.25	
244+00	34.92	599.39	600.25	0.82%	0.00	4.0	18.2	0.86	0.035	GRASS	8.22	19.26	0.43	5.92	1.65	0.14	599.96	0.29	
243+00	34.17	598.17	599.16	1.22%	0.00	4.0	16.5	0.99	0.035	GRASS	10.02	20.40	0.49	5.92	1.96	0.21	598.71	0.45	
242+00	36.95	596.77	597.63	1.40%	0.00	4.0	20.7	0.86	0.035	GRASS	9.13	21.36	0.43	5.92	1.97	0.21	597.26	0.37	
241+00	39.14	595.03	596.05	1.74%	0.00	4.0	18.9	1.02	0.035	GRASS	11.89	23.46	0.51	5.92	2.18	0.26	595.52	0.53	
240+00	40.03	593.09	594.23	1.94%	0.00	4.0	11.6	1.14	0.035	GRASS	10.16	18.01	0.56	5.92	2.49	0.33	593.64	0.59	
239+00	39.00	591.49	592.46	1.60%	0.00	4.0	8.6	0.97	0.035	GRASS	5.92	12.39	0.48	5.92	2.44	0.31	592.11	0.35	
238+00	37.27	590.63	591.39	0.86%	0.00	4.0	12.8	0.76	0.035	GRASS	4.84	12.86	0.38	5.92	1.80	0.17	591.26	0.13	
237+08																			CULVERT

DITCH G1-N1																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
271+00	47.01	605.72	607.02	6.19%	0.00	4.0	3.8	1.30	0.035	GRASS	6.59	10.47	0.63	0.04	1.31	0.17	605.81	1.21	
271+66																			CULVERT

DITCH G1-N2																			
FM 725 STATION	OFFSET	FLOWLINE ELEVATION	TOP OF DITCH (ft)	SLOPE (%)	BOTTOM WIDTH (ft)	LEFT SIDE SLOPE (x:1)	RIGHT SIDE (x:1)	DEPTH (ft)	MANNING'S "n"	DITCH MATERIAL	AREA (sf)	P (ft)	R (ft)	DESIGN Q (cfs)	V (ft/sec)	SHEAR _{ave} (lb/sf)	WSEL (ft)	FREEBOARD (ft)	REMARKS
274+00	46.16	599.14	600.38	0.20%	0.00	3.7	3.8	1.24	0.035	GRASS	5.76	9.61	0.60	0.11	0.46	0.02	599.39	0.99	
273+00	45.82	599.34	604.90	0.20%	0.00	2.2	1.1	5.56	0.035	GRASS	51.16	21.77	2.35	0.21	0.63	0.02	599.79	5.11	
272+00	45.91	599.53	604.40	0.19%	0.00	1.6	1.3	4.87	0.035	GRASS	34.27	17.14	2.00	0.21	0.63	0.02	600.01	4.39	

NOTES:

1. HYDROLOGY DETERMINED USING RATIONAL METHOD.
2. DITCH CALCS ARE DONE IN 100 FT INTERVALS.
3. SEE PRESENT LAYOUT AND ROADWAY PLAN AND PROFILE SHEETS FOR DITCH LOCATIONS.
4. DITCHES DESIGNED TO CONTAIN Q2.

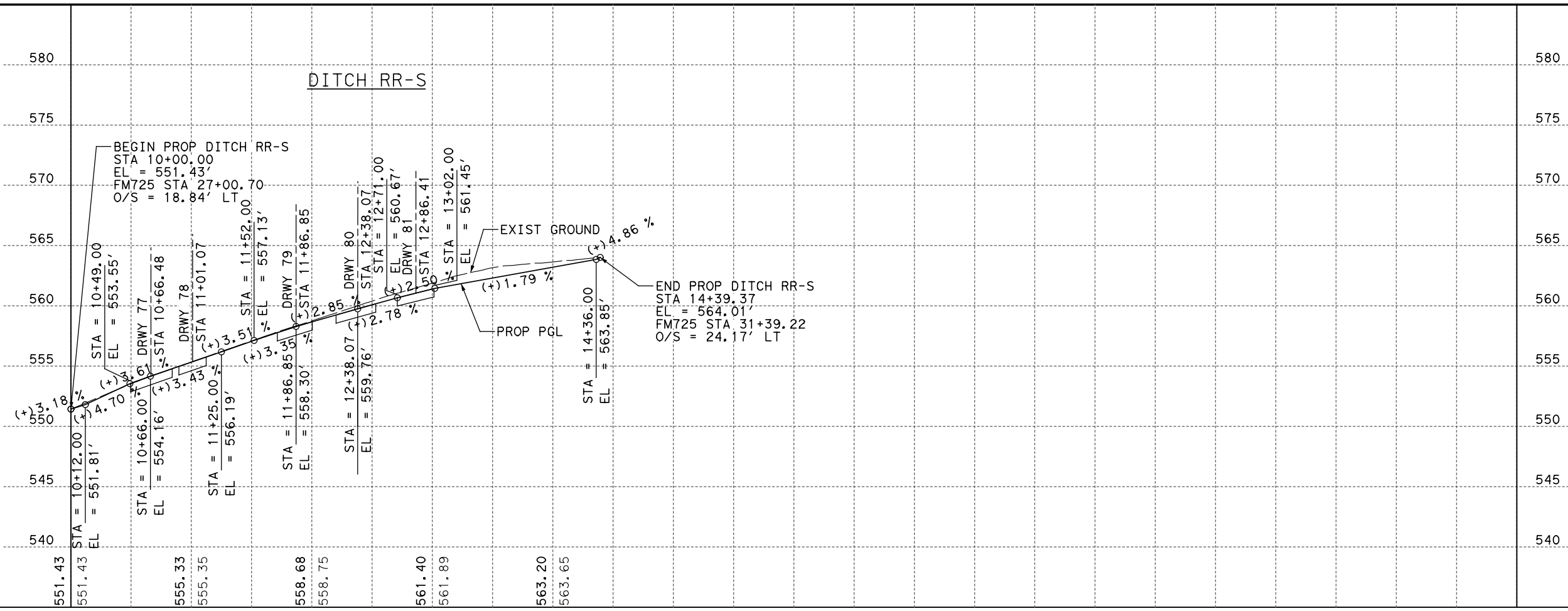


2/28/2021

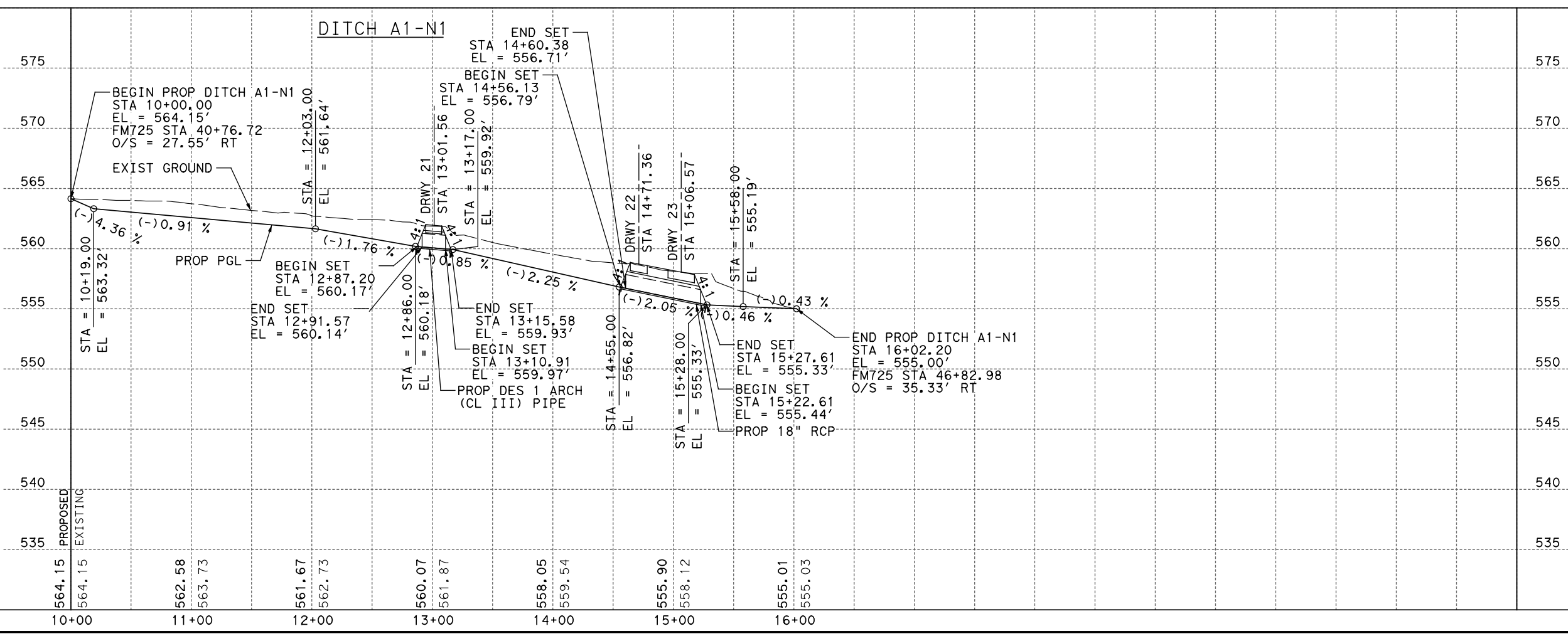
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NO.	REVISION	BY	DATE
100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312			
FM 725 DITCH HYDRAULIC CALCULATIONS			
SCALE: NTS			
SHEET 8 OF 8			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		260
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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- NOTES:
1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL INFORMATION.
 2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR DITCH HORIZONTAL ALIGNMENT INFORMATION.



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 107215
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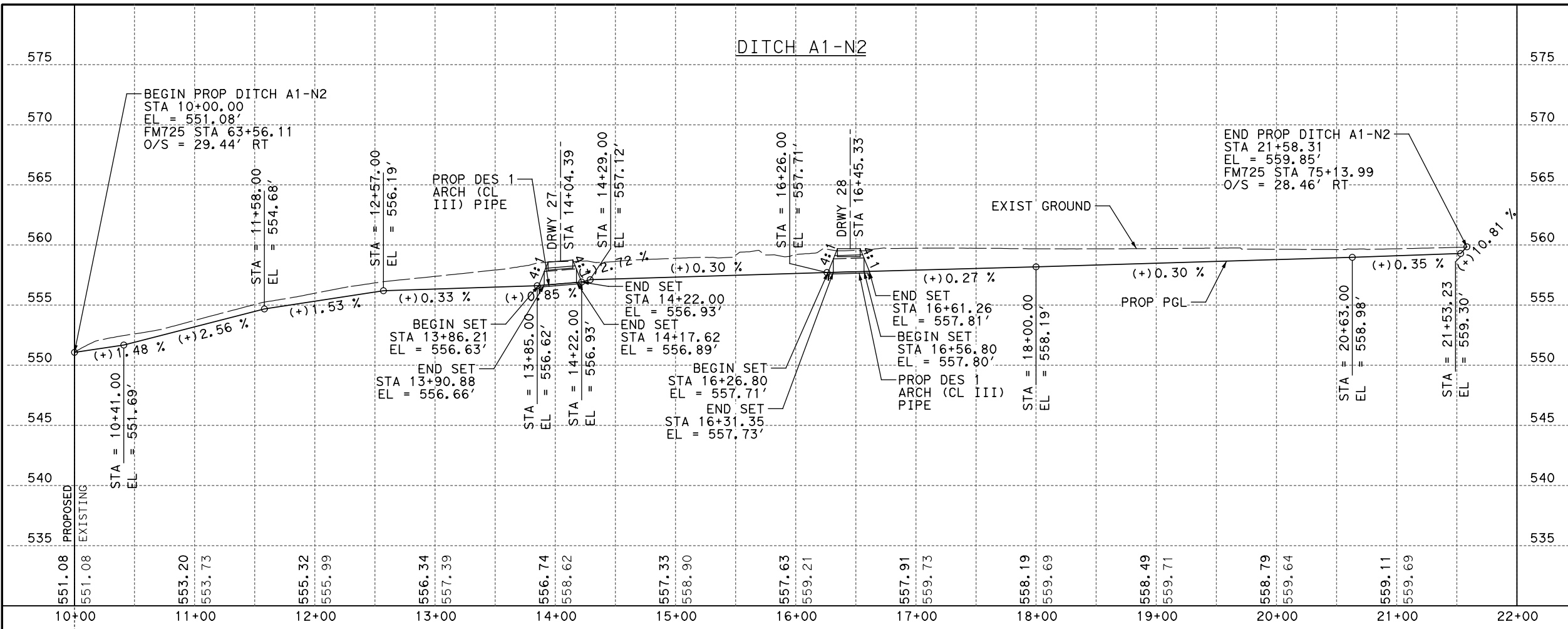
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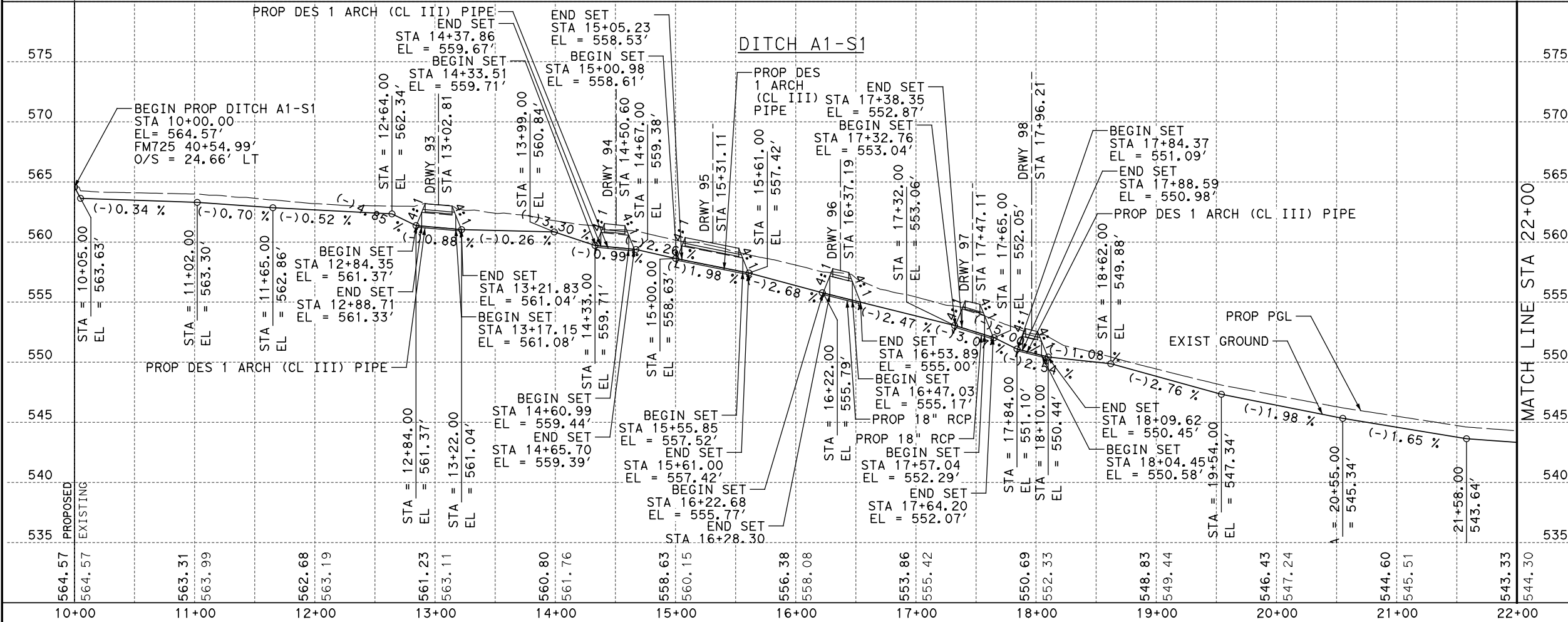
DITCH PROFILES

SCALE: 1" = 100' H, 1" = 10' V SHEET 1 OF 17

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 261
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



NOTES:
 1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL INFORMATION.
 2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR DITCH HORIZONTAL ALIGNMENT INFORMATION.



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HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

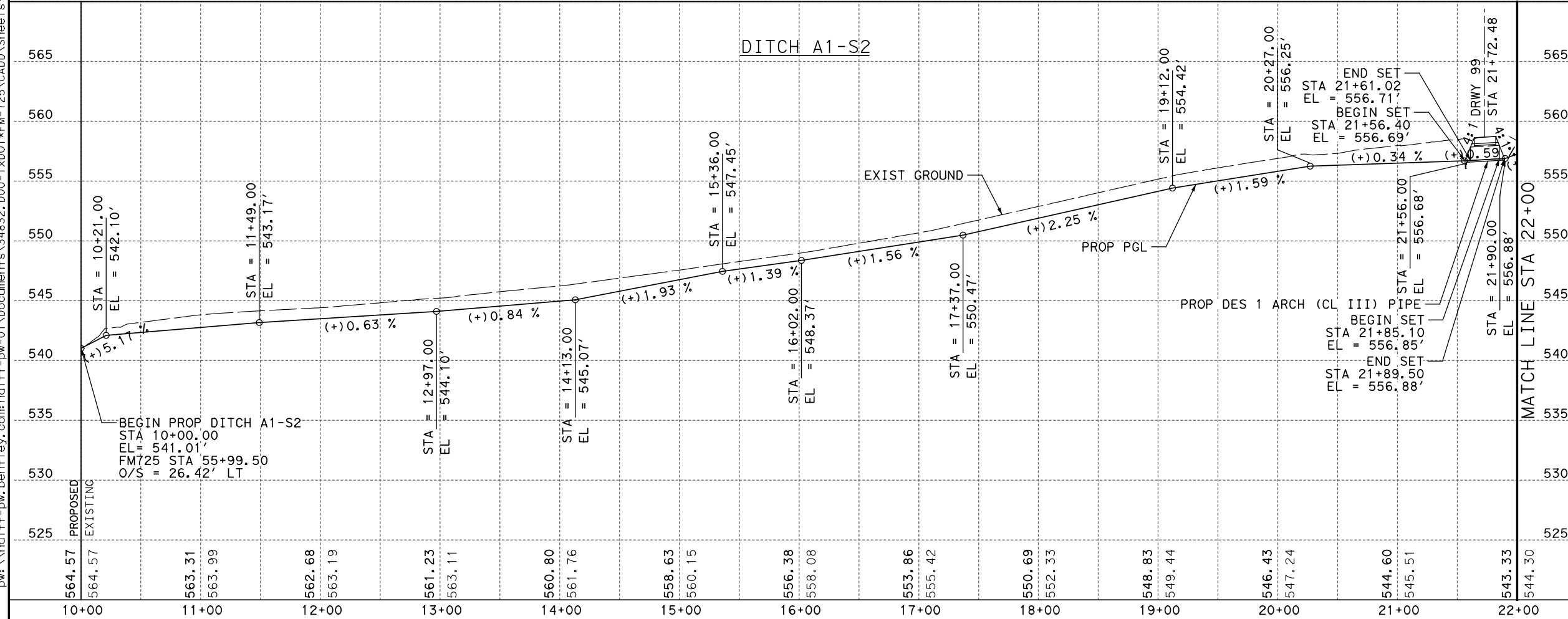
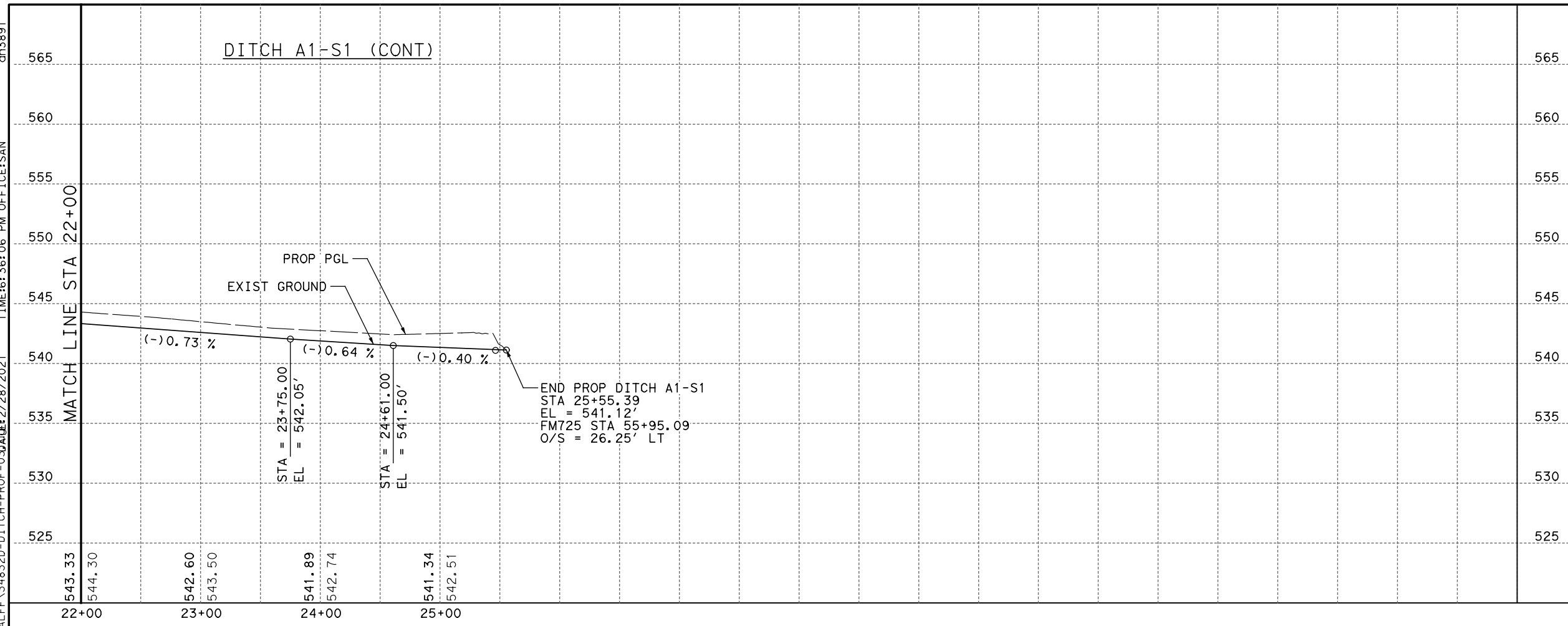
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 DITCH PROFILES

SCALE: 1"=100'H, 1"=10'V SHEET 2 OF 17

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	262	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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NOTES:

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NO.	REVISION	BY	DATE

100 NE INTERSTATE 410 LOOP
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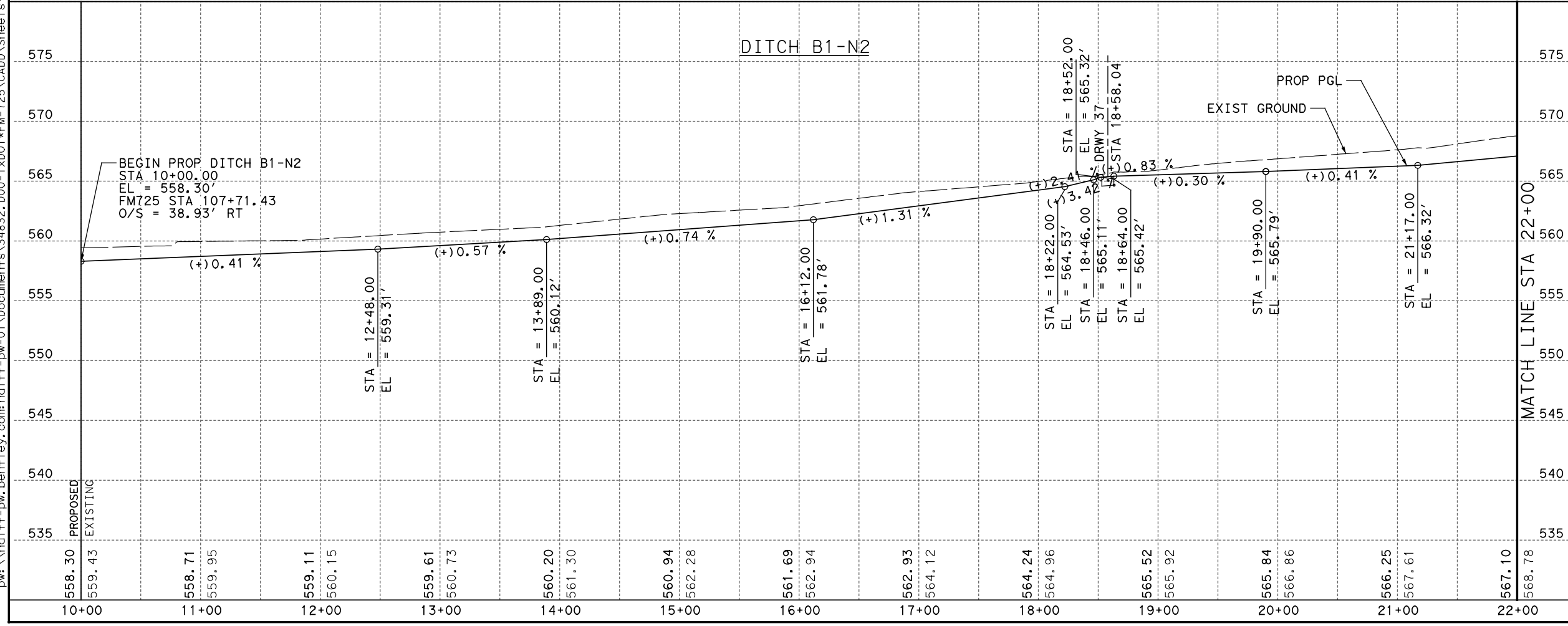
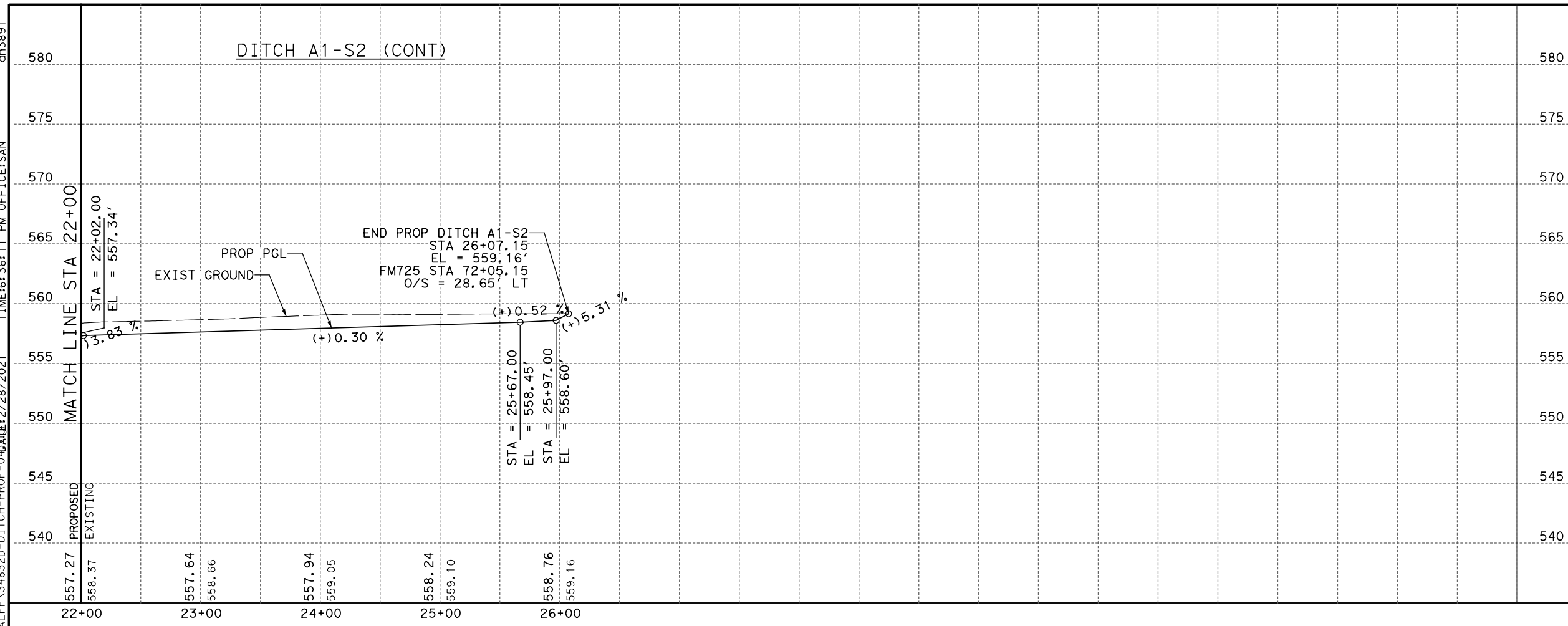
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 DITCH PROFILES

SCALE: 1" = 100'H, 1" = 10'V SHEET 3 OF 17

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	SEE TITLE SHEET	263	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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- NOTES:
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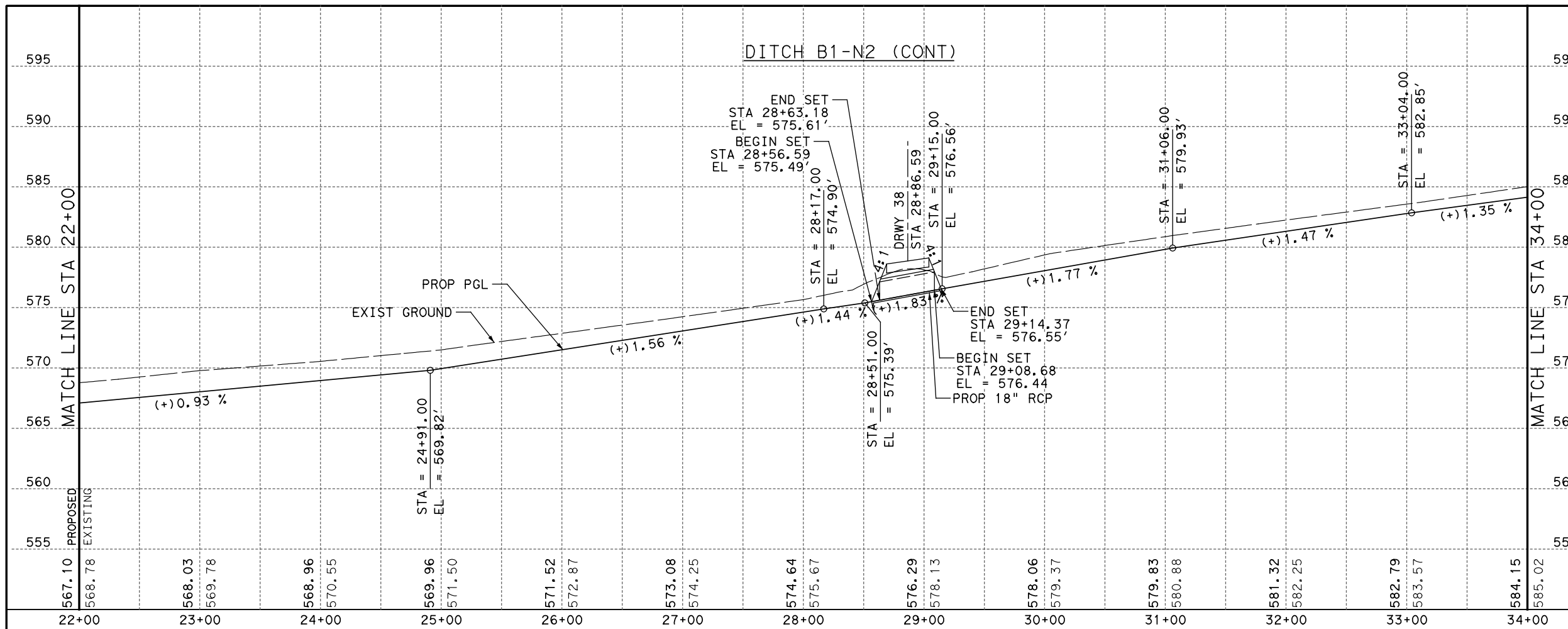
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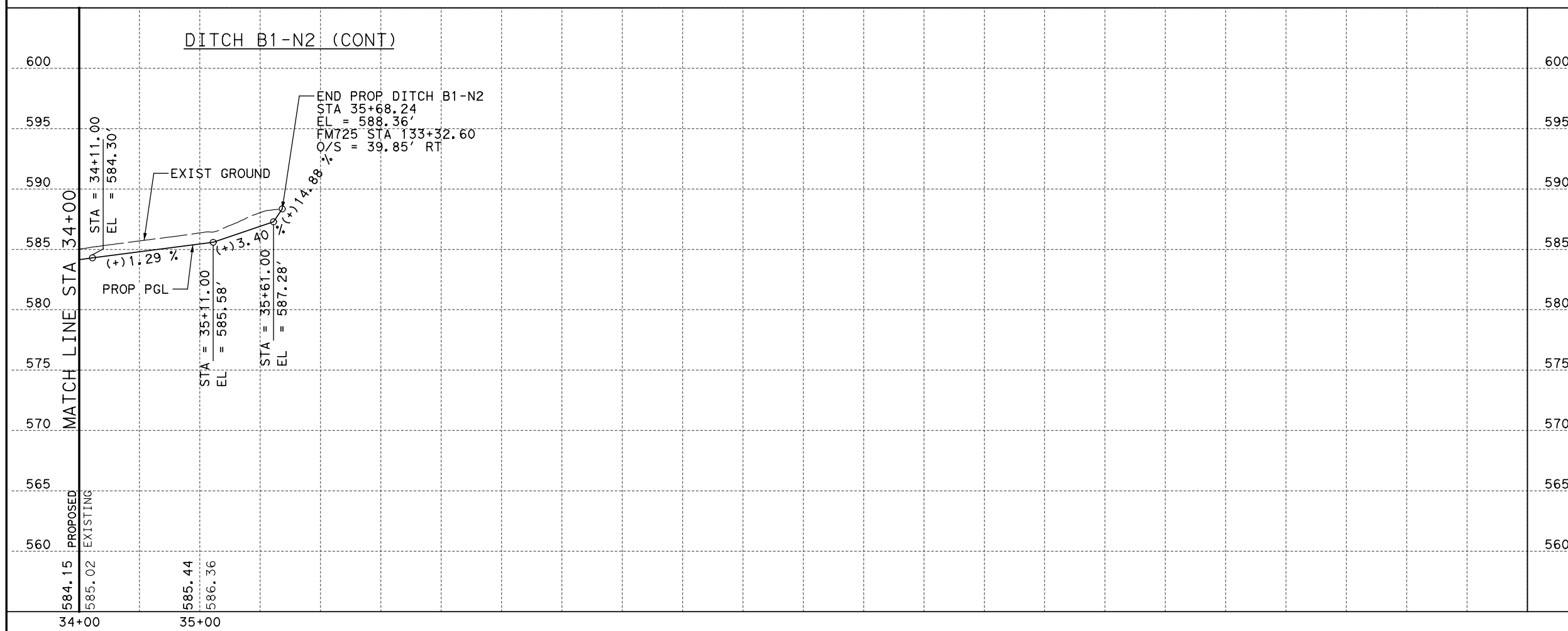
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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		264
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



NOTES:

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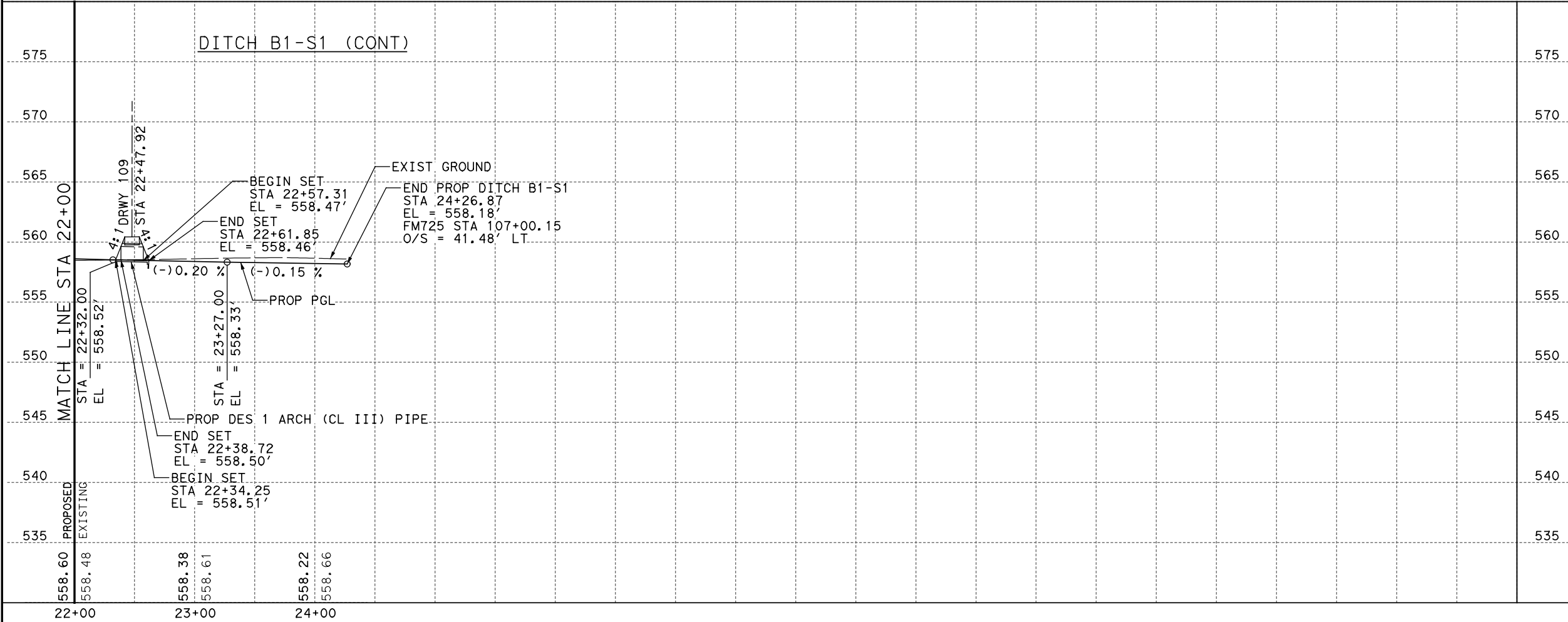
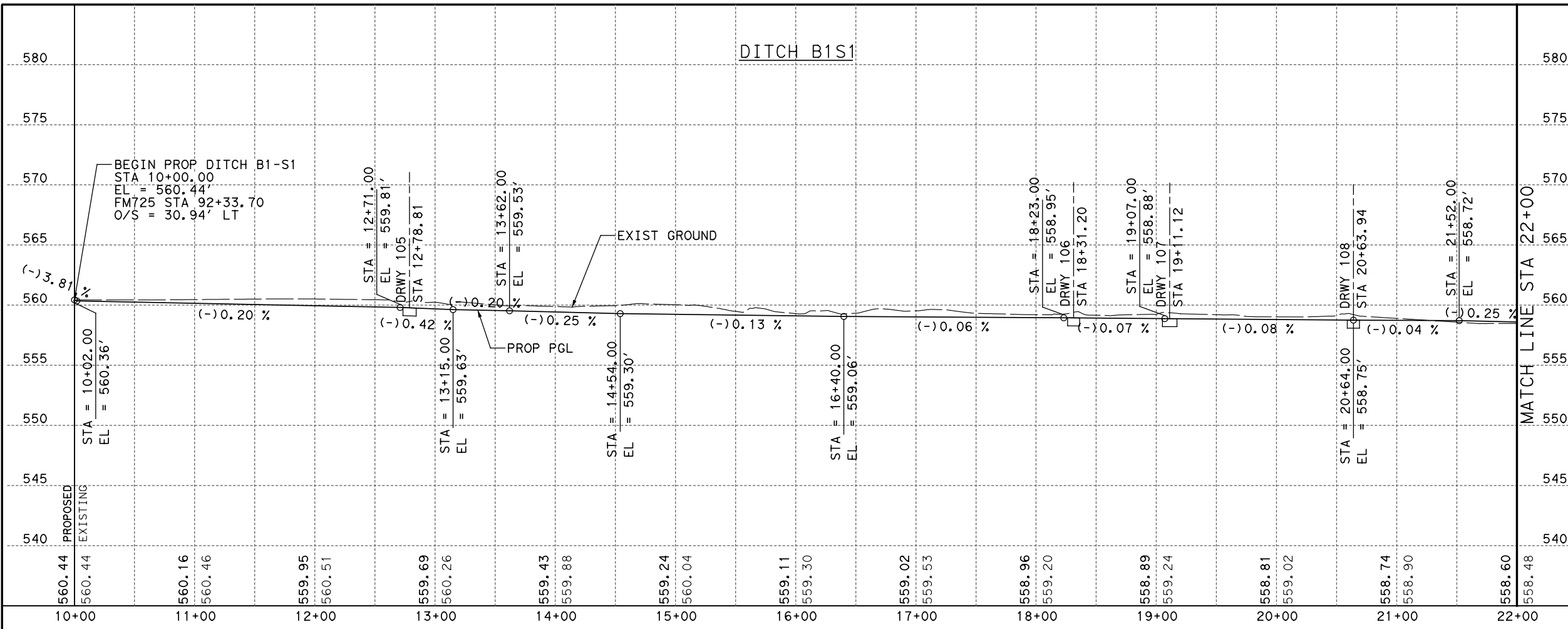
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DITCH PROFILES

SCALE: 1" = 100' H, 1" = 10' V SHEET 5 OF 17

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 265
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



NOTES:
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 2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR DITCH HORIZONTAL ALIGNMENT INFORMATION.

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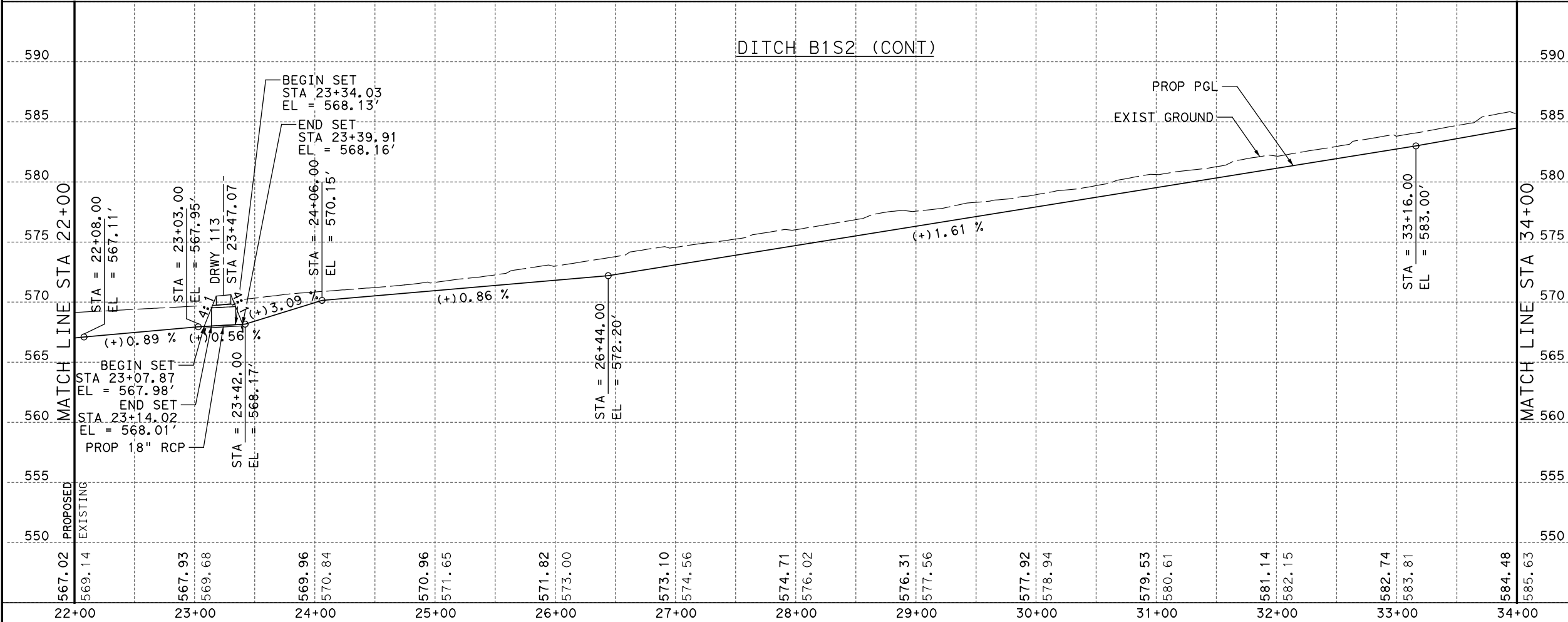
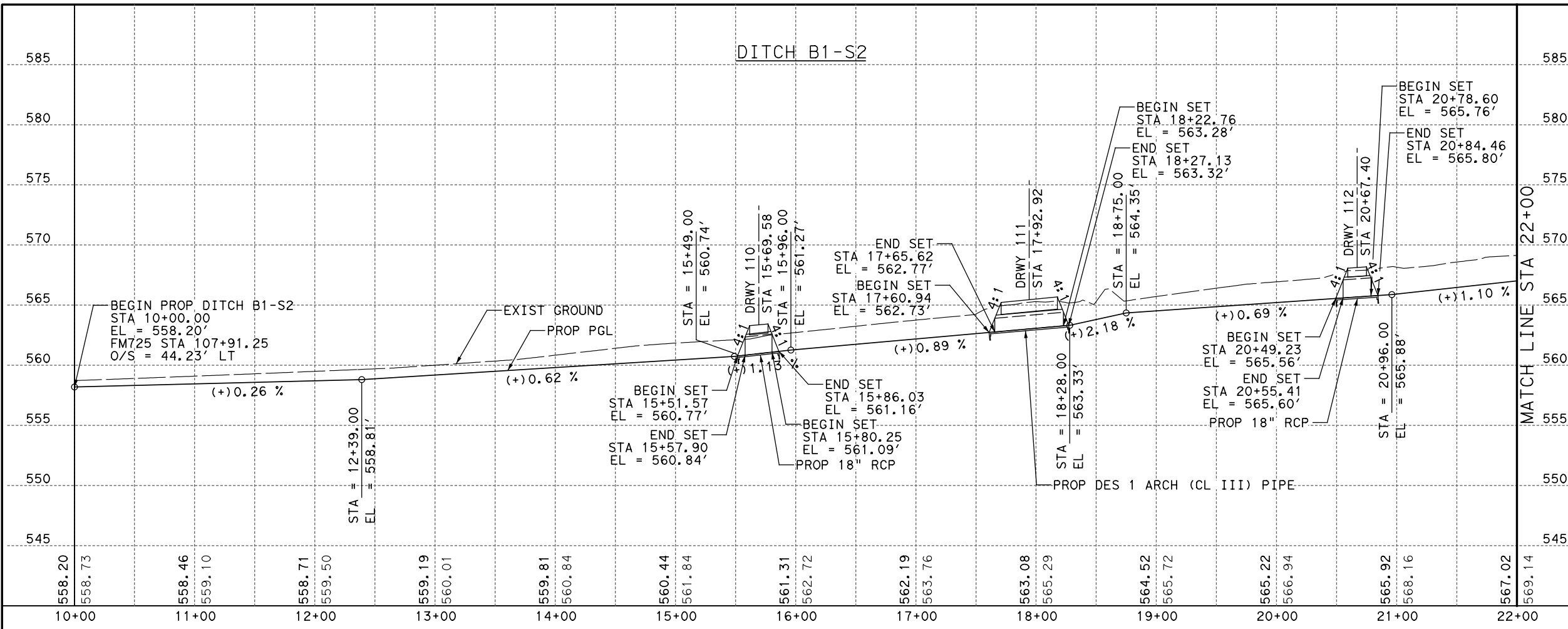
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 DITCH PROFILES

SCALE: 1" = 100'H, 1" = 10'V SHEET 6 OF 17

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 266
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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NO.	REVISION	BY	DATE

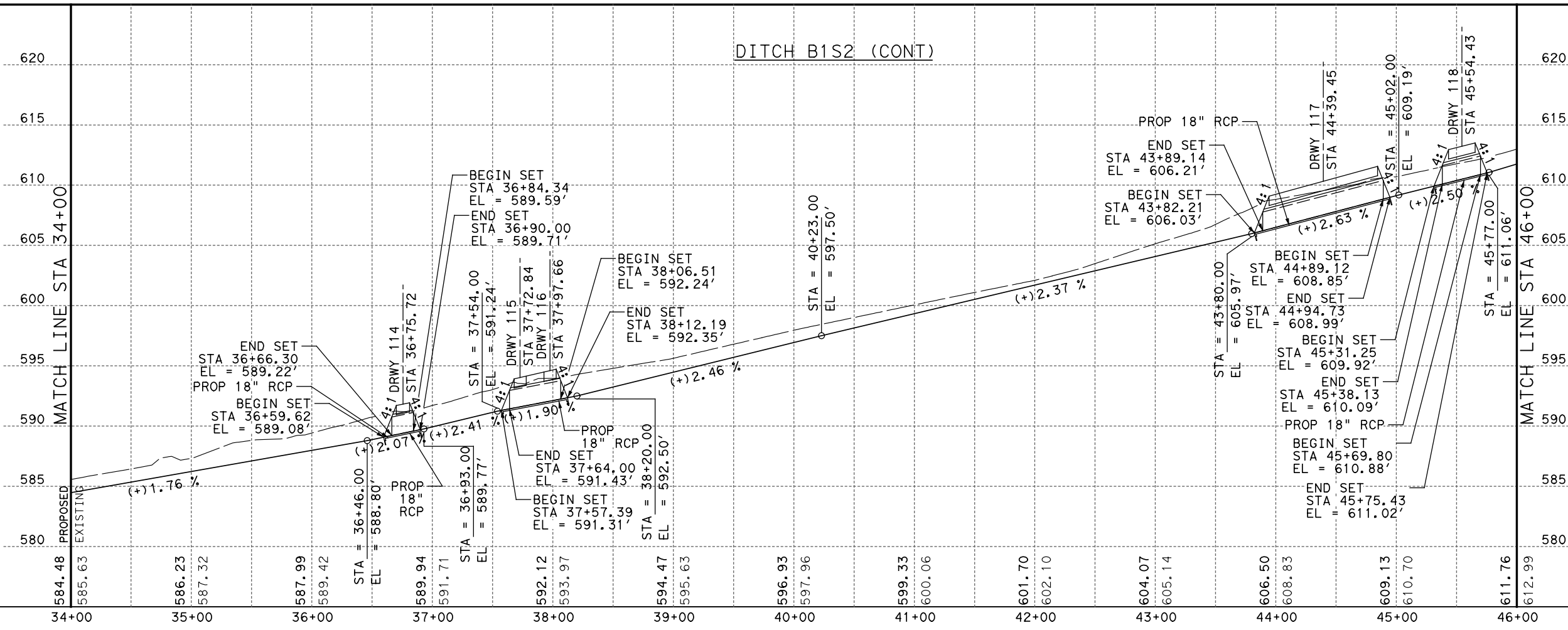
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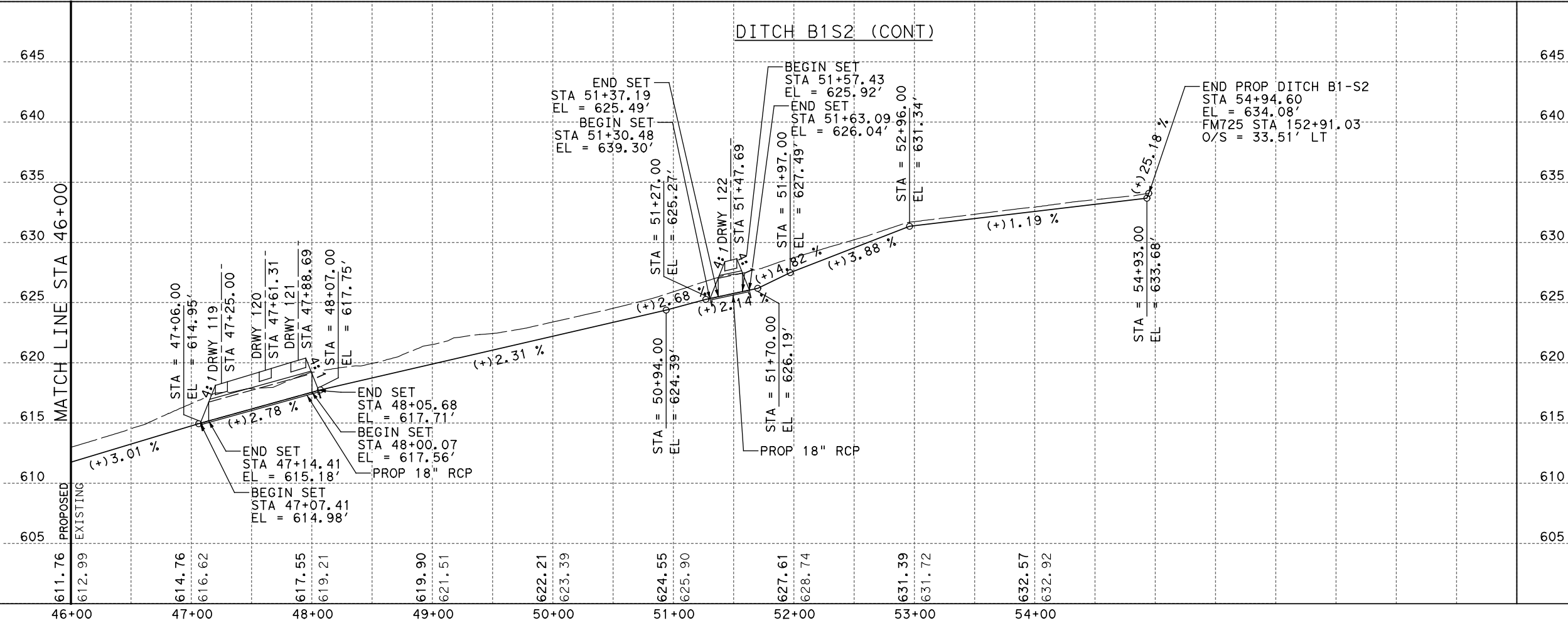
FM 725
 DITCH PROFILES

SCALE: 1"=100'H, 1"=10'V SHEET 7 OF 17

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 267
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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NO.	REVISION	BY	DATE

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 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

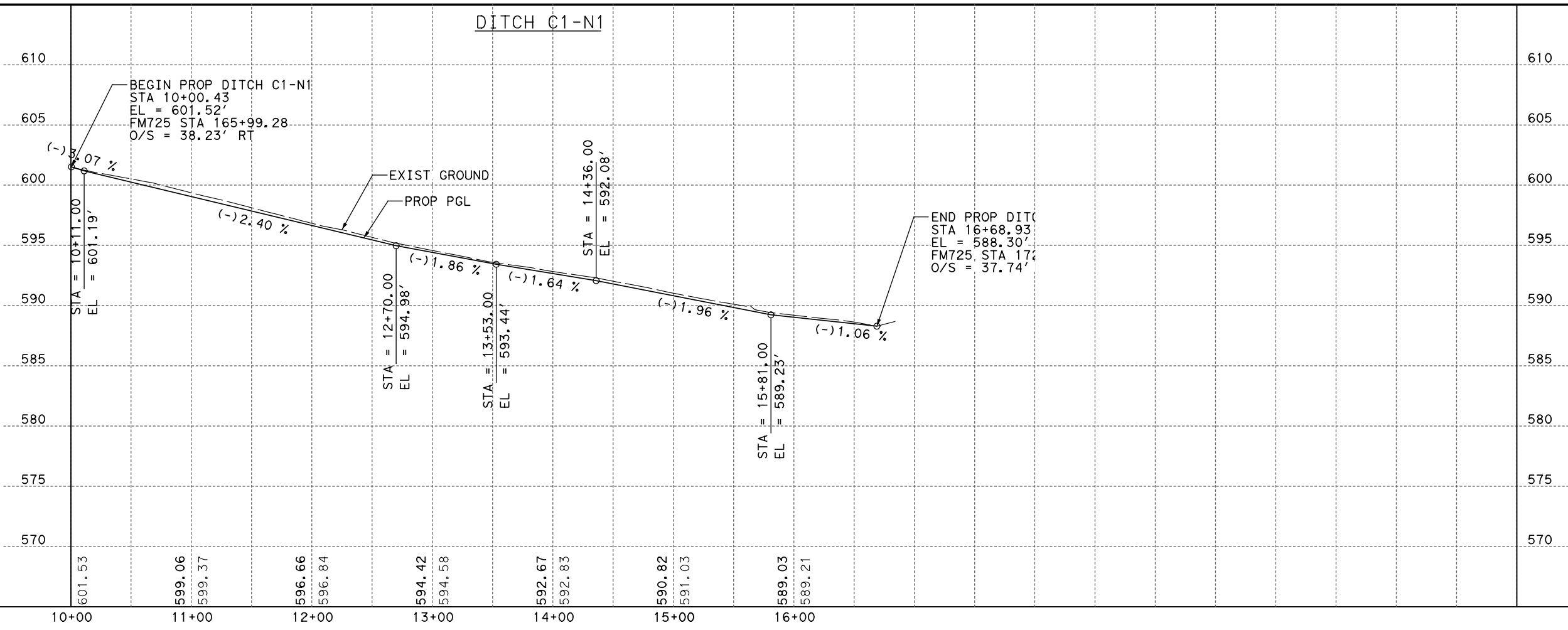
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 DITCH PROFILES

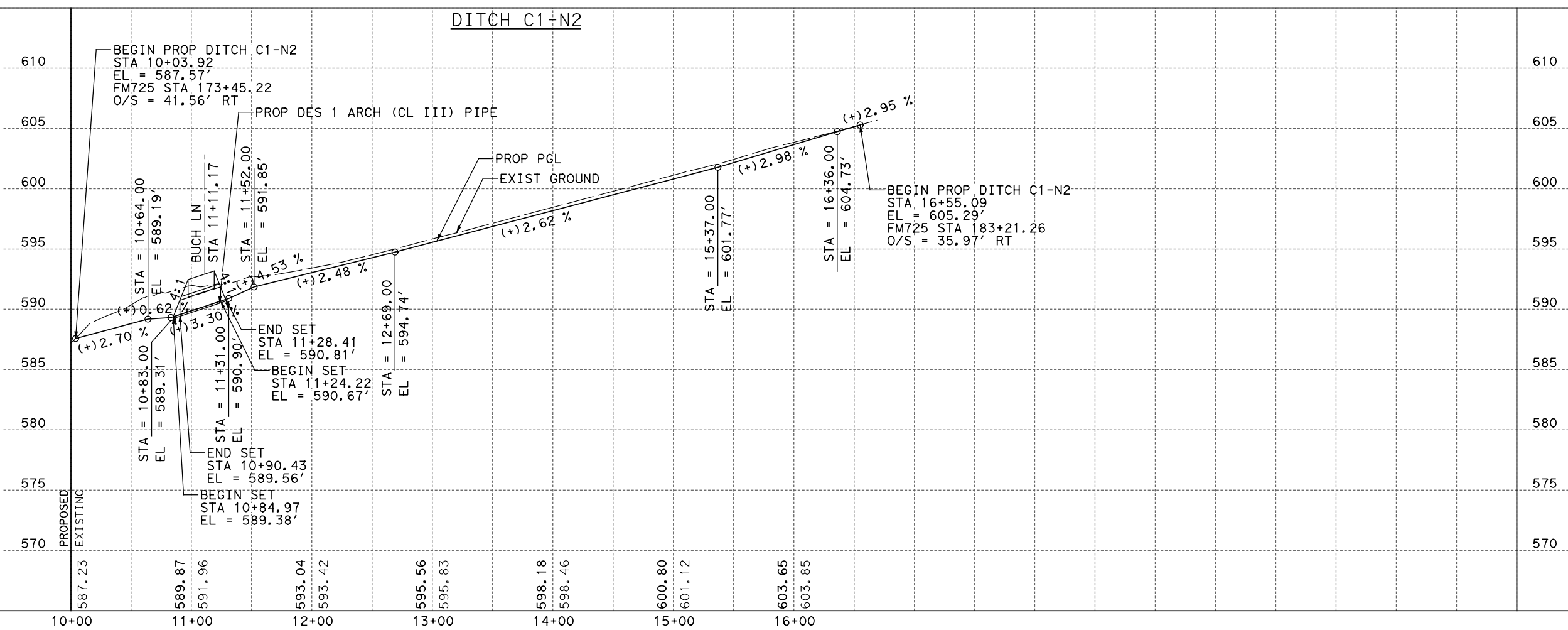
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FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	SHEET 268
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

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 2/28/2021



- NOTES:**
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STATE OF TEXAS

JOHNNY L. CLAYTON

107215

LICENSED PROFESSIONAL ENGINEER

2/28/2021

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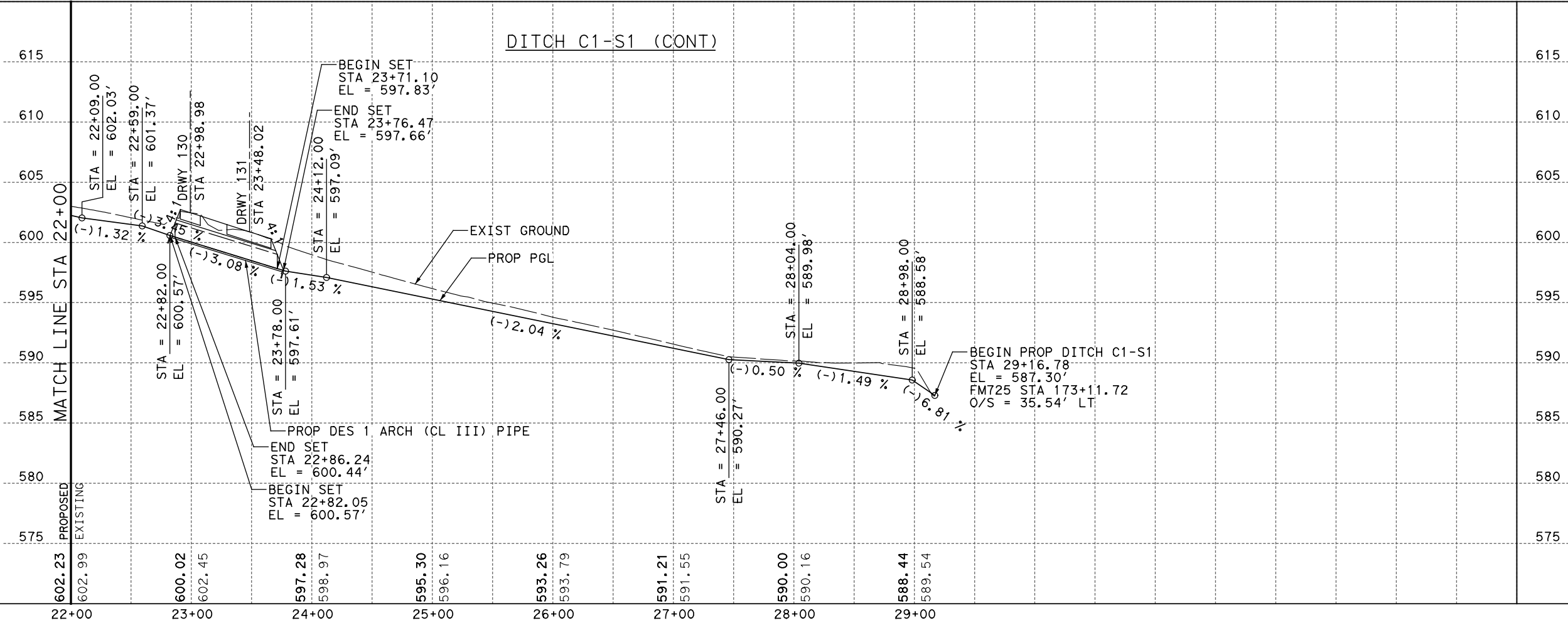
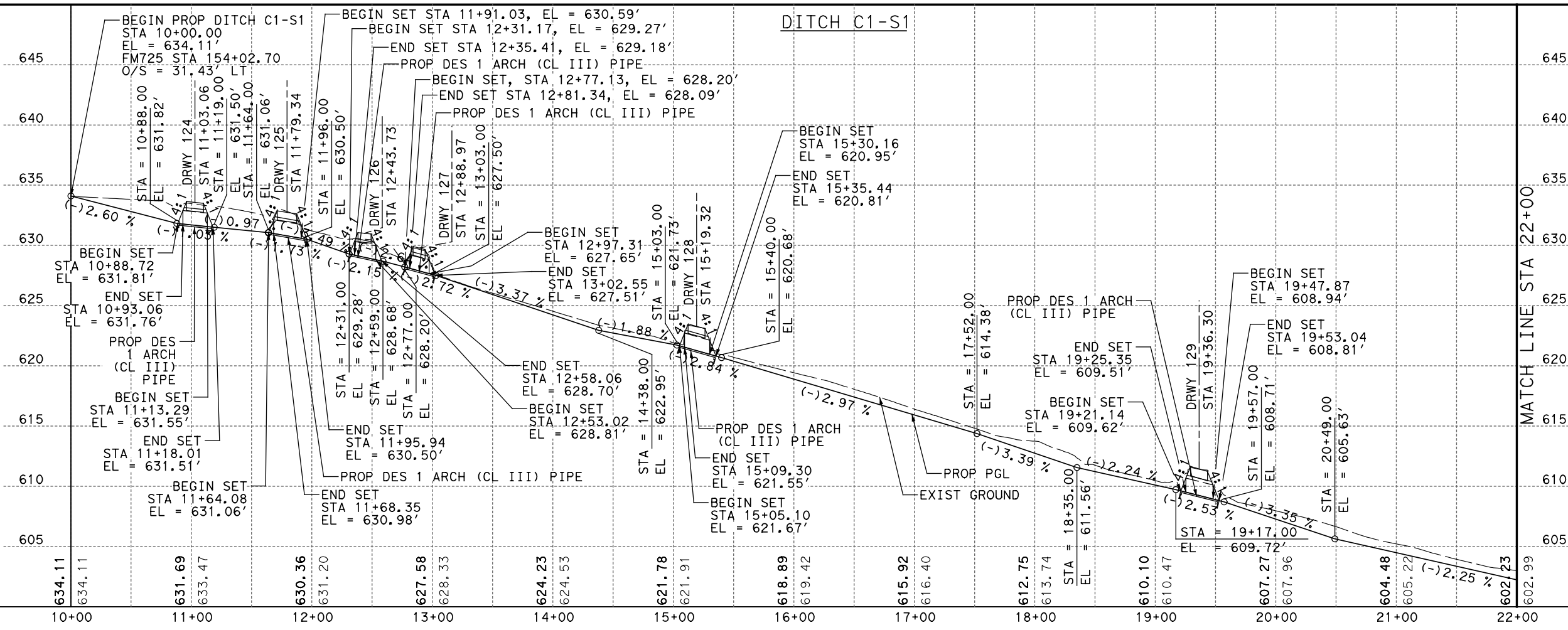
FM 725

DITCH PROFILES

SCALE: 1" = 100' H, 1" = 10' V SHEET 9 OF 17

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	269
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
HIGHWAY NO.		
FM 725		

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- NOTES:
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NO.	REVISION	BY	DATE

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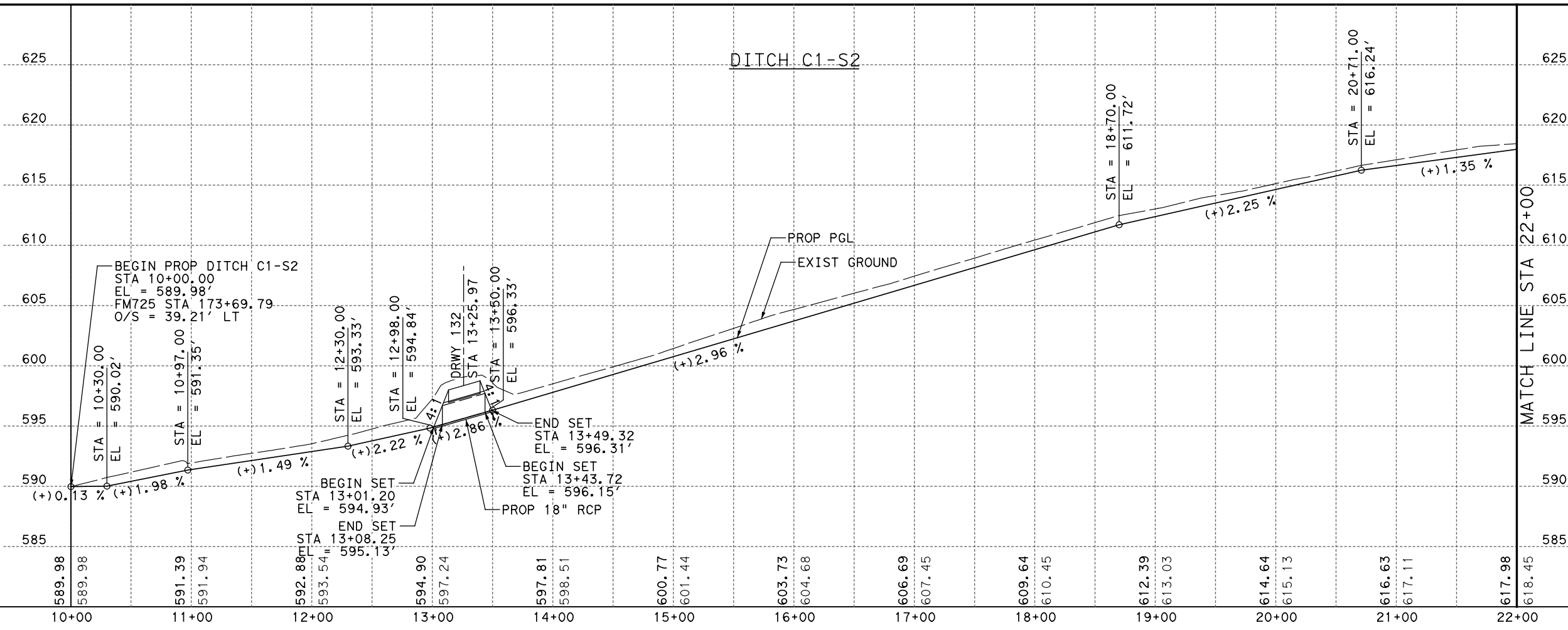
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FM 725
 DITCH PROFILES

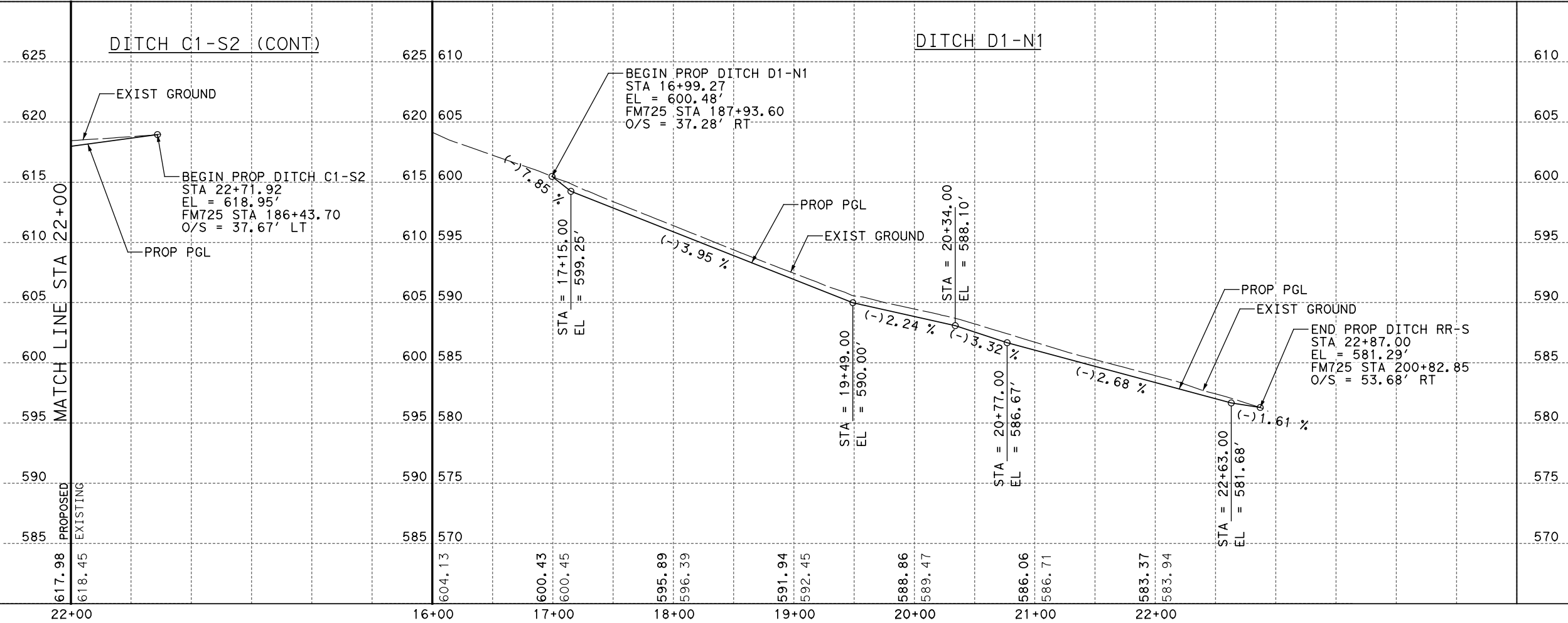
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

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- NOTES:
1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR ADDITIONAL INFORMATION.
 2. SEE HORIZONTAL ALIGNMENT DATA SHEETS FOR DITCH HORIZONTAL ALIGNMENT INFORMATION.



STATE OF TEXAS

JOHNNY L. CLAYTON

107215

PROFESSIONAL ENGINEER

2/28/2021

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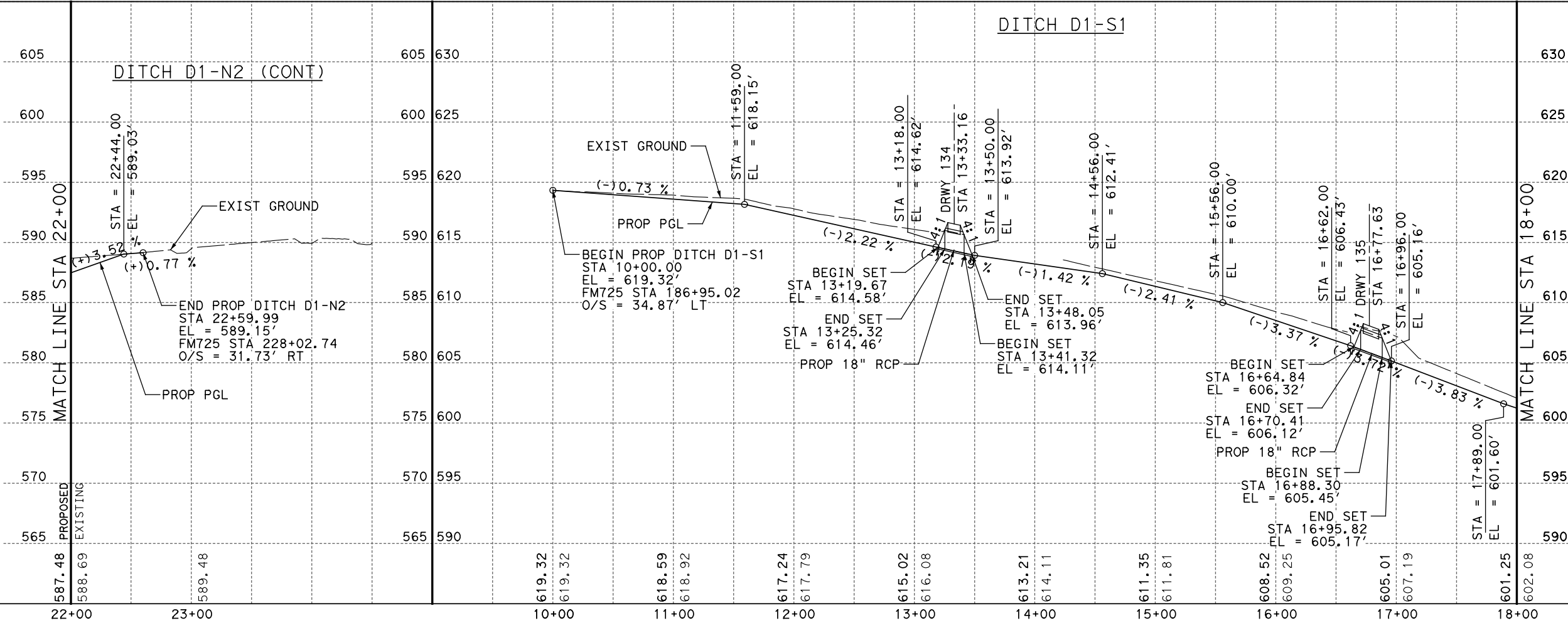
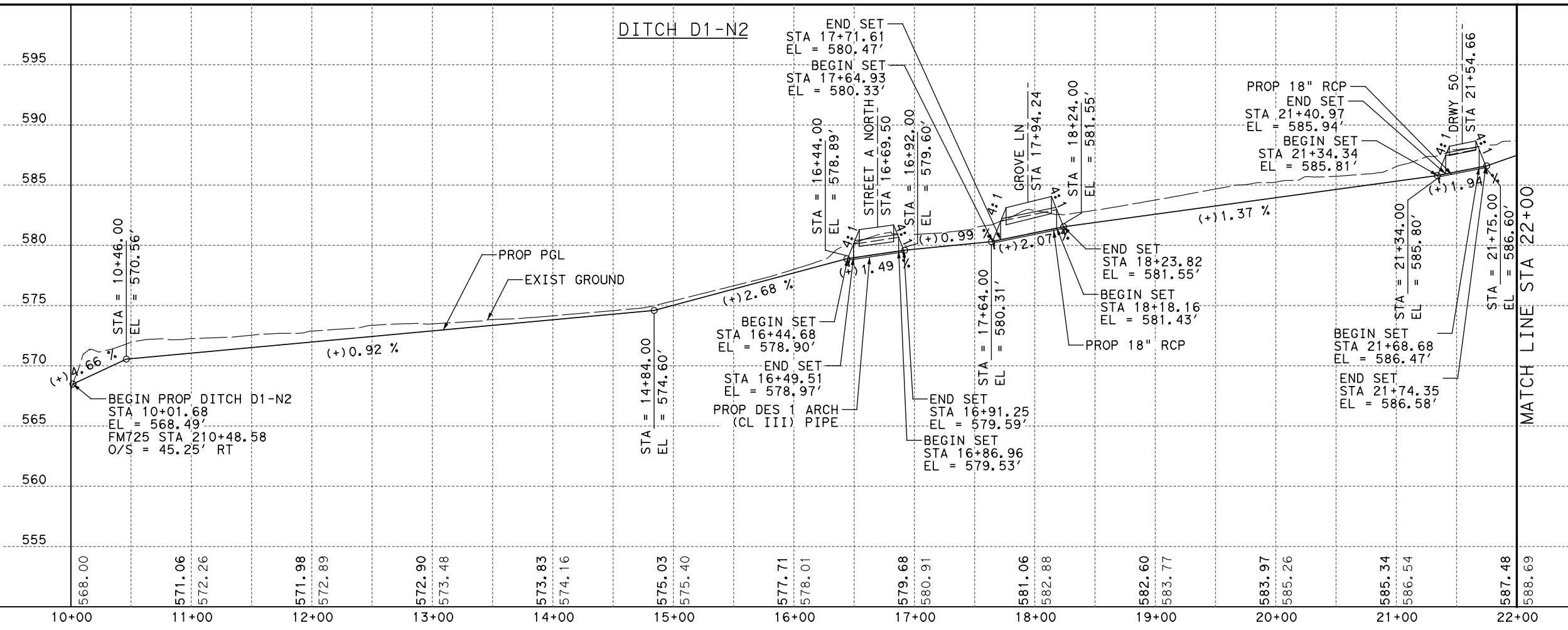
FM 725

DITCH PROFILES

SCALE: 1"=100'H, 1"=10'V SHEET 11 OF 17

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	271
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
HIGHWAY NO.		
FM 725		

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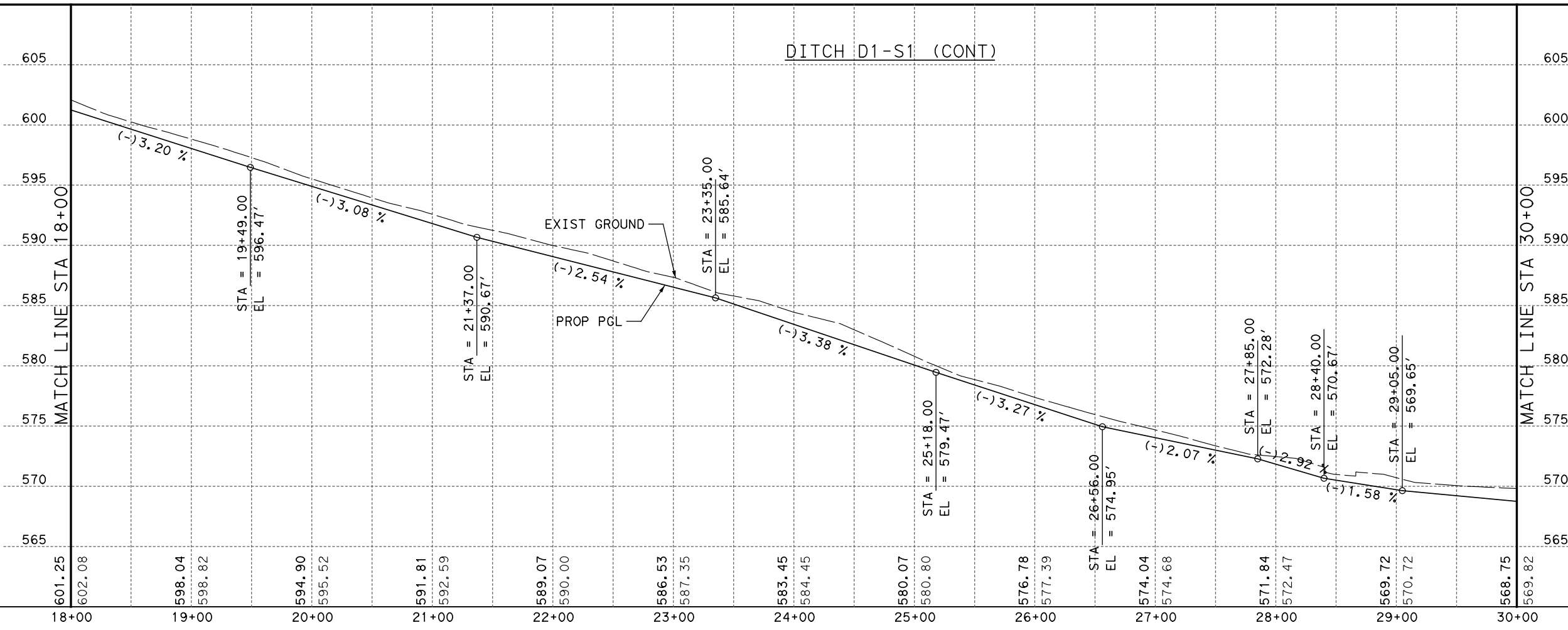
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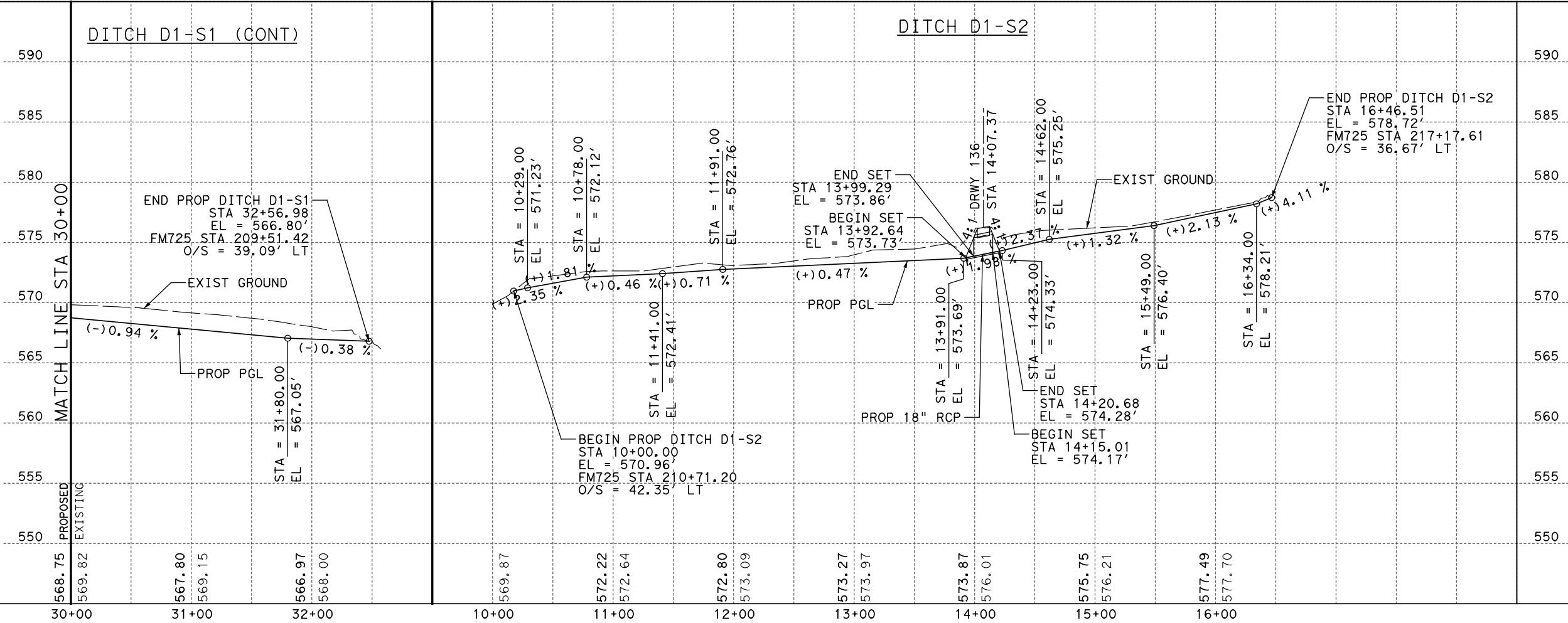
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TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

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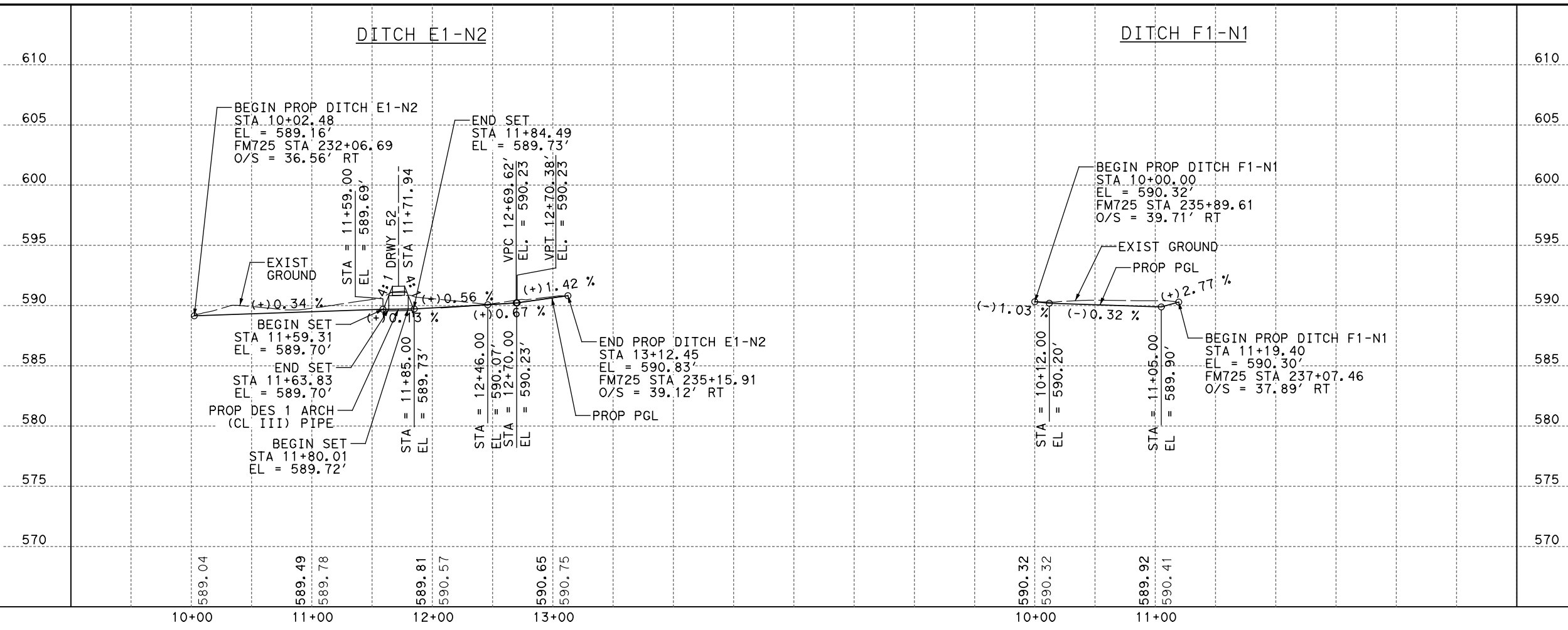
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DITCH PROFILES

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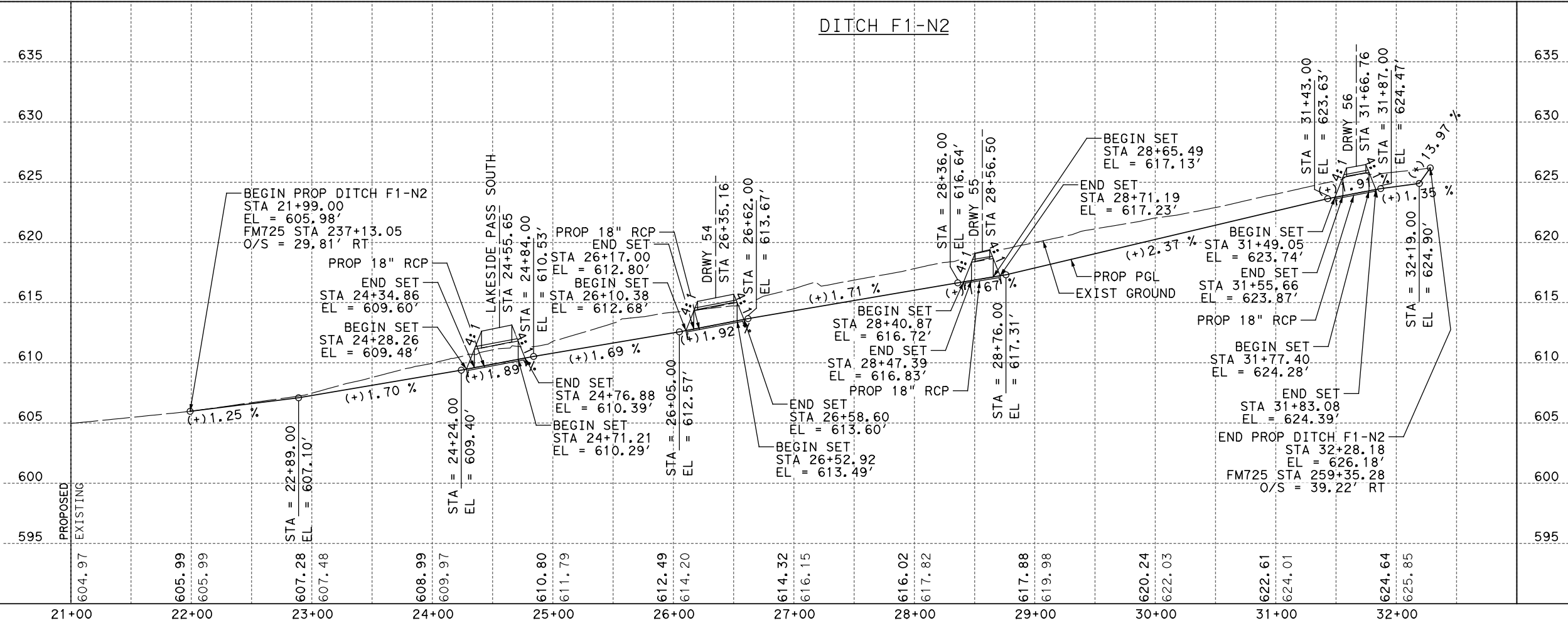
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TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
HIGHWAY NO.		
FM 725		

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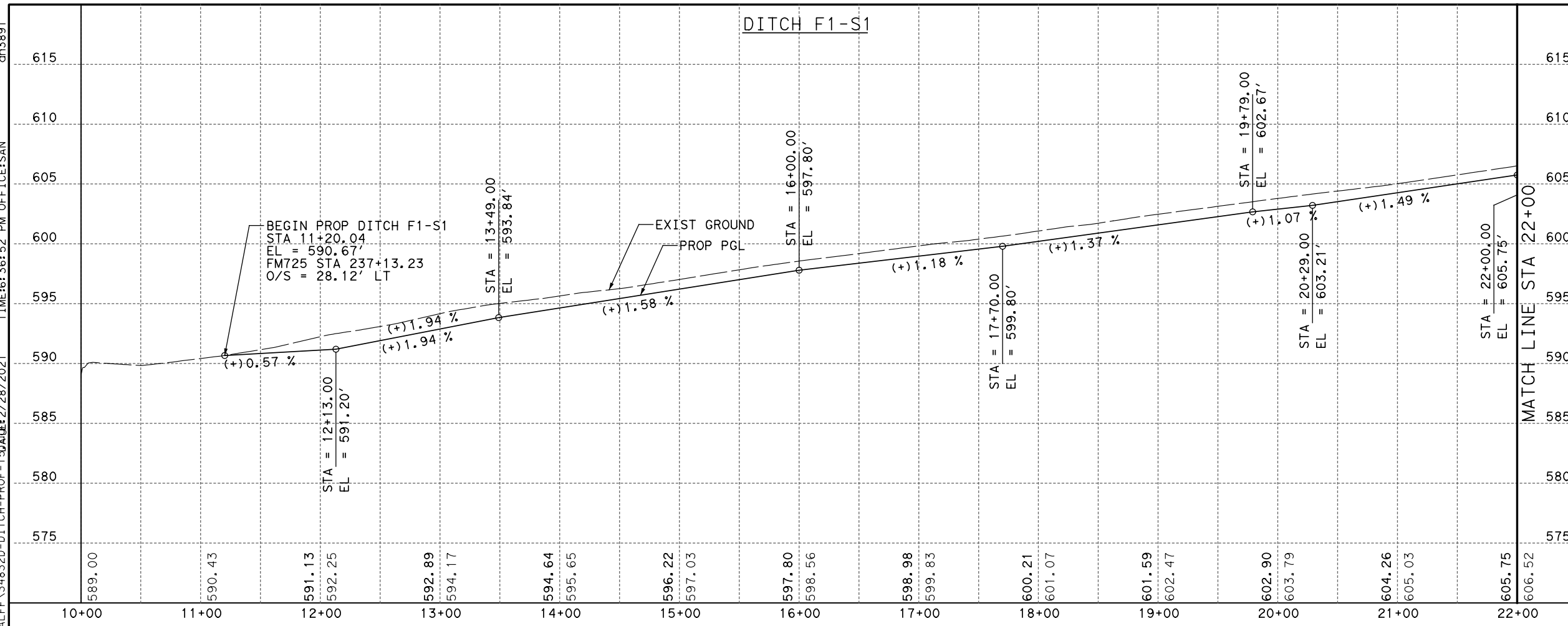
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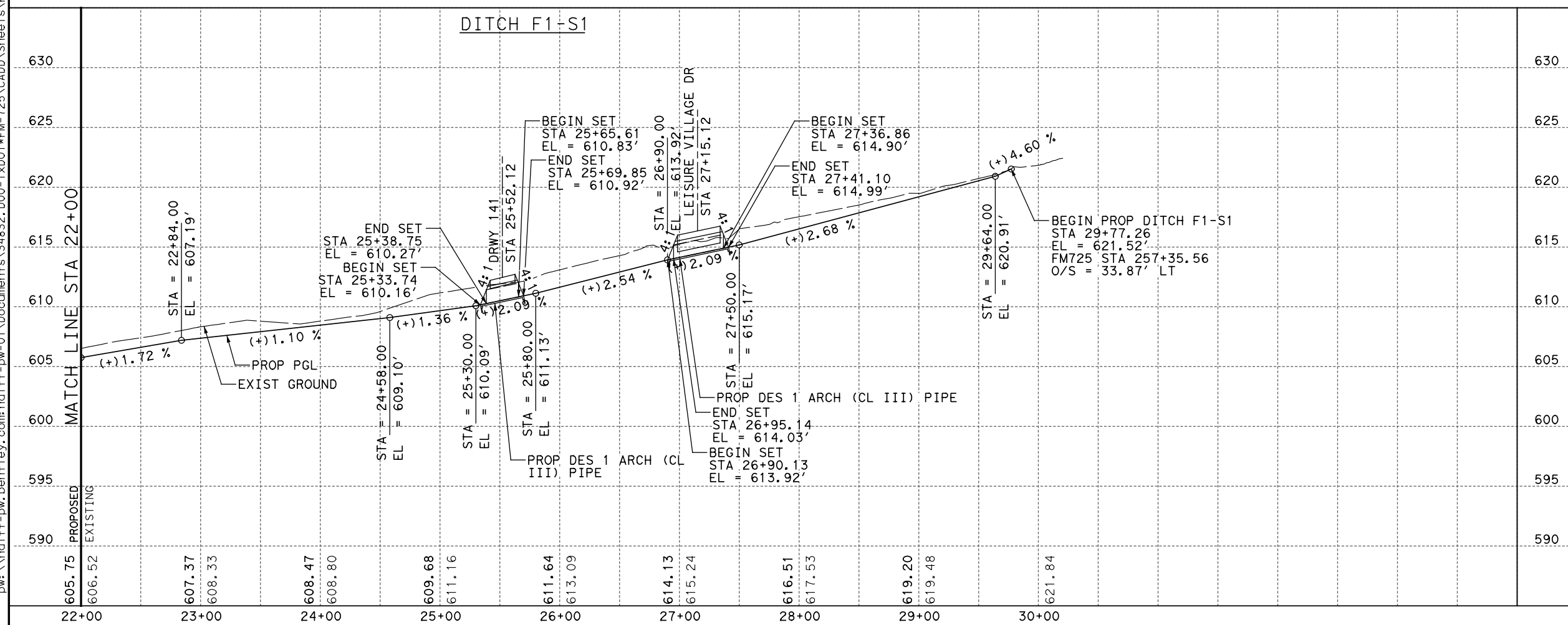
FM 725
DITCH PROFILES

SCALE: 1"=100'H, 1"=10'V SHEET 14 OF 17

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		SHEET 274
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



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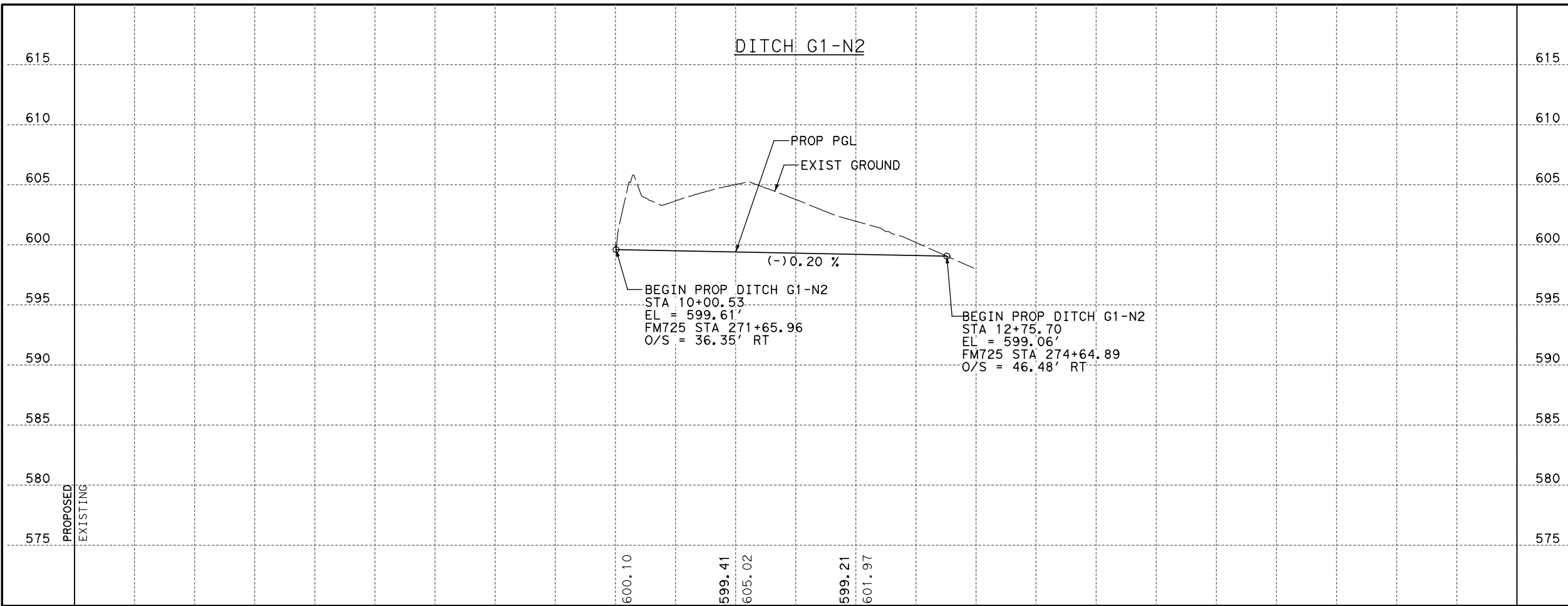
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DITCH PROFILES

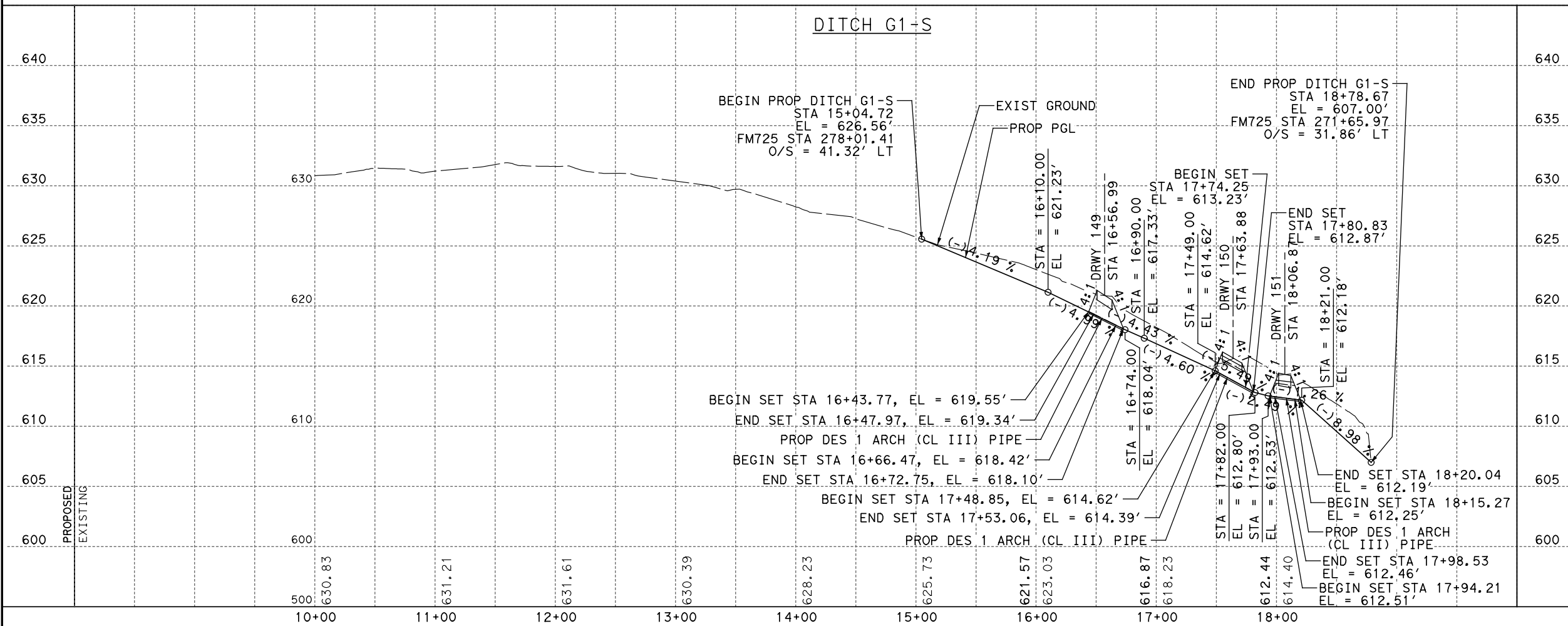
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



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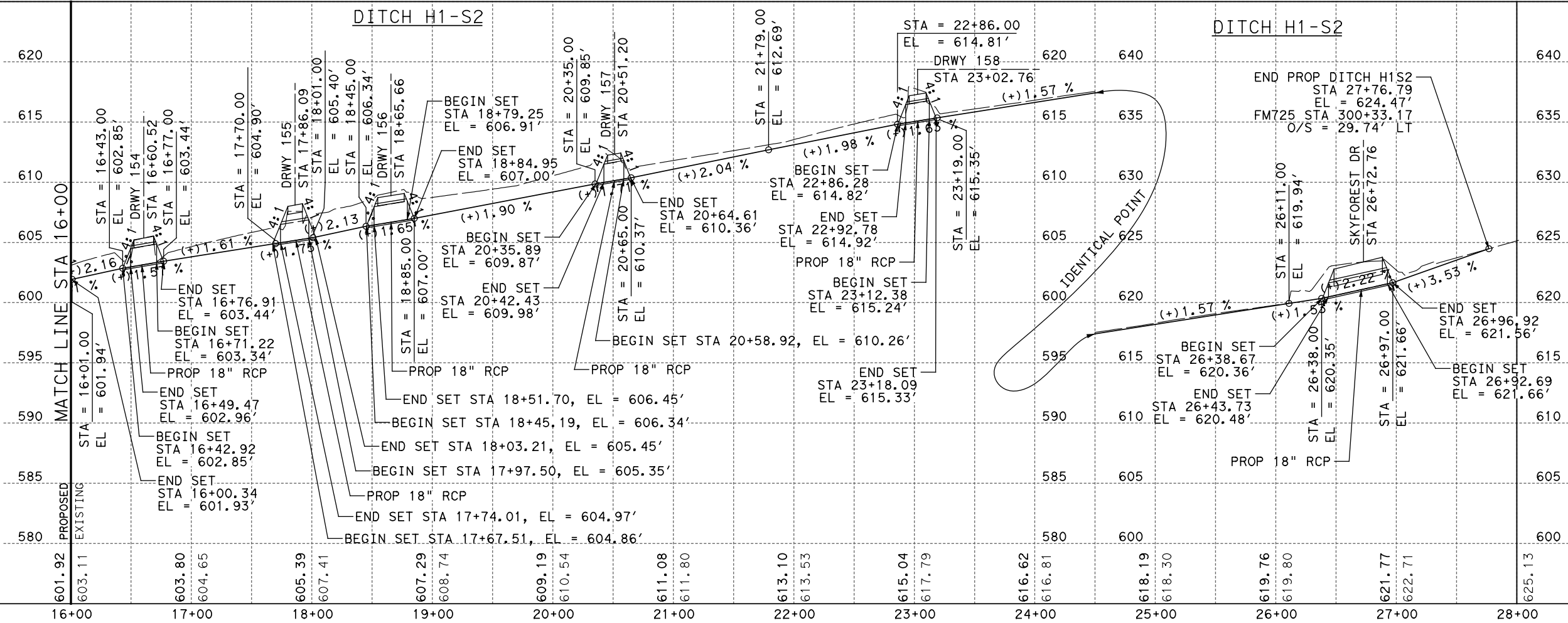
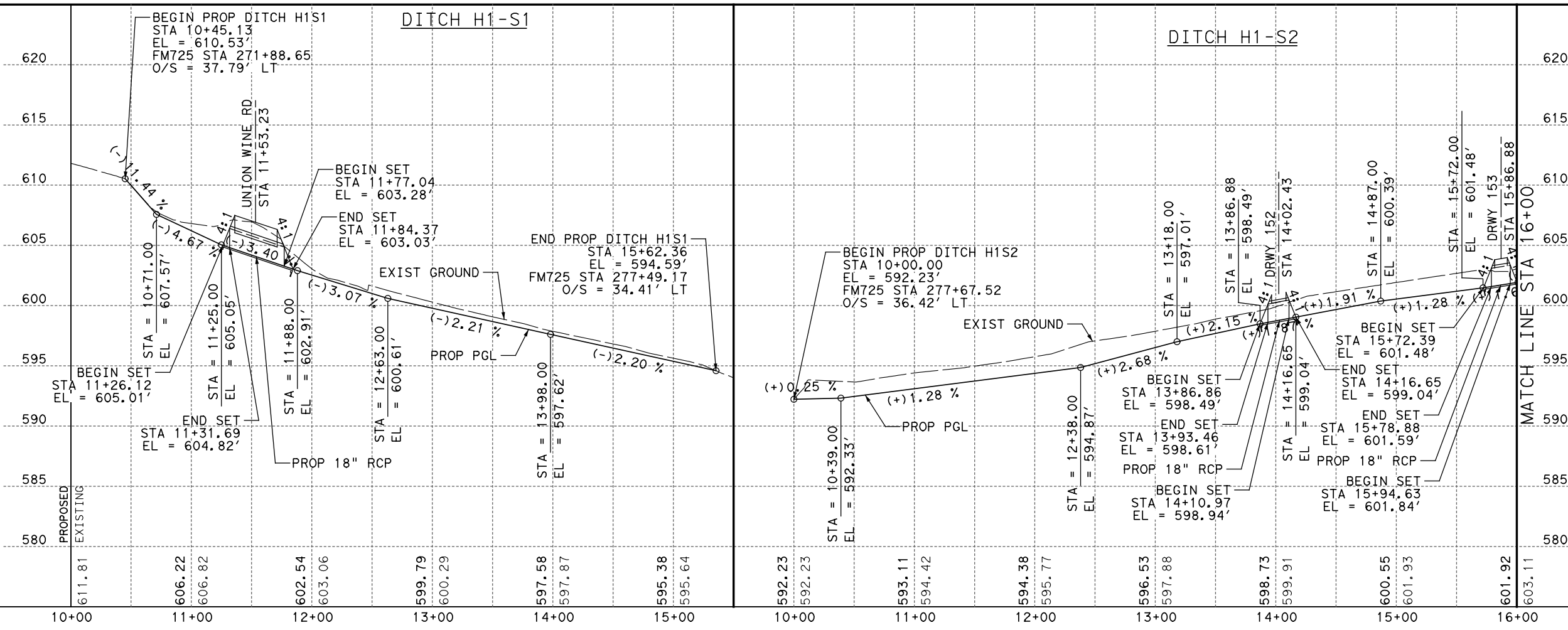
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DITCH PROFILES

SCALE: 1"=100'H, 1"=10'V SHEET 16 OF 17

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STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
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DITCH PROFILES

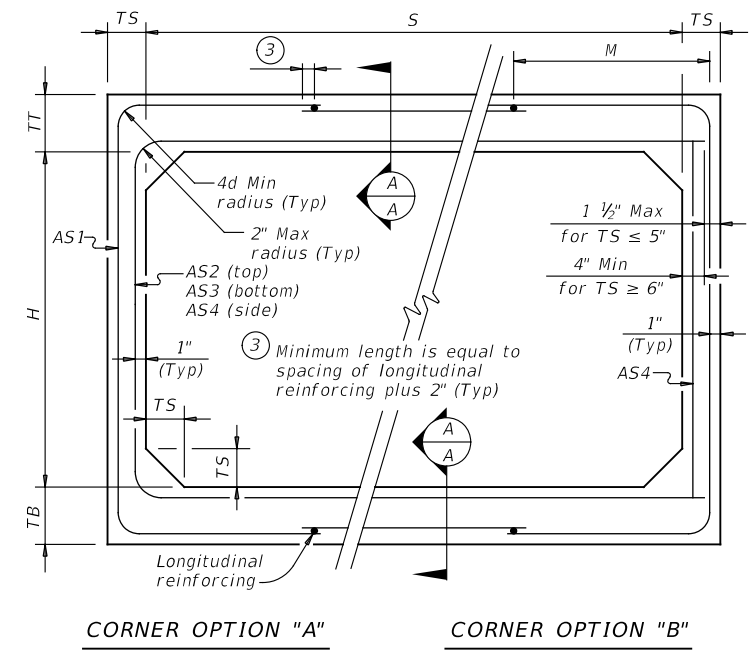
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FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
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TEXAS	SAT	GUADALUPE
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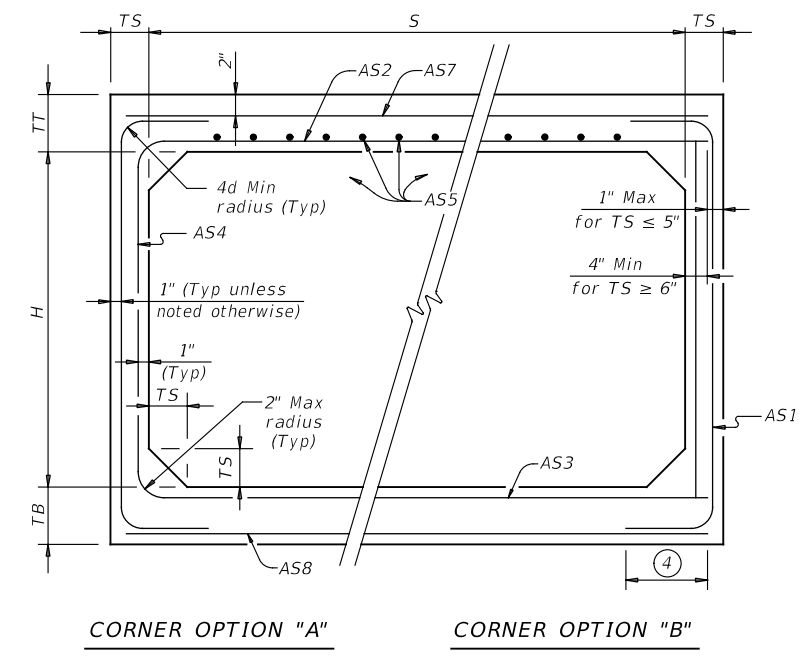
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BOX DATA

SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ⁽²⁾							⁽¹⁾ Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8	
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
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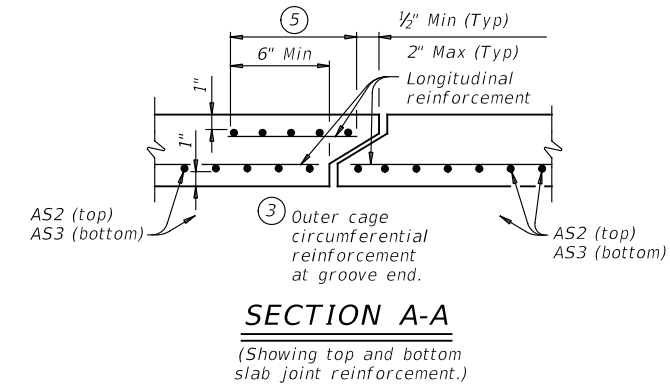


FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT

⁽⁴⁾ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
 Provide 0.03 sq. in./ft. minimum longitudinal reinforcing at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
 Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

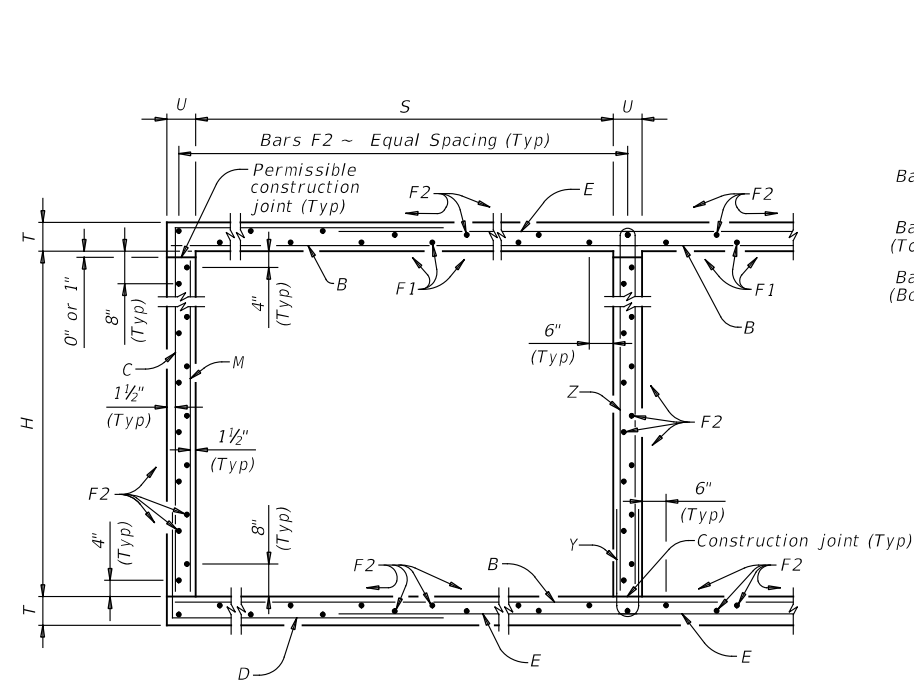
⁽¹⁾ For box length = 8'-0"
⁽²⁾ AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcing per linear foot of box length. AS5 is minimum required area of reinforcing per linear foot of box width.

HL93 LOADING

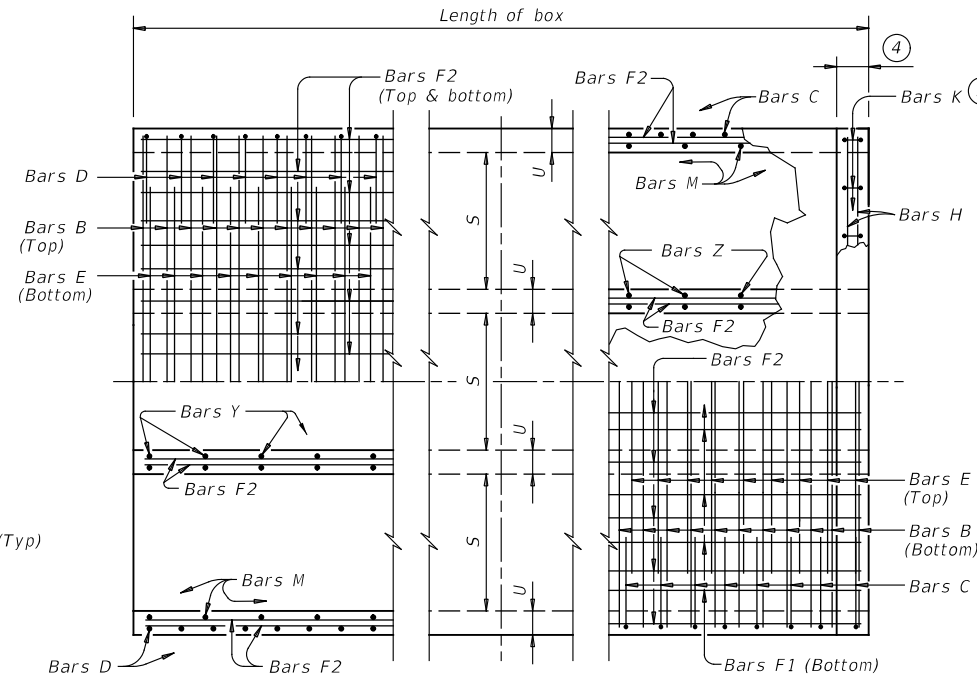
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SINGLE BOX CULVERTS PRECAST 5'-0" SPAN			
SCP-5			
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TXDOT	0215	09	035
February 2020	REVISIONS	JOB	HIGHWAY
		035	FM 725
		COUNTY	SHEET NO.
		SAN	GUADALUPE
			278

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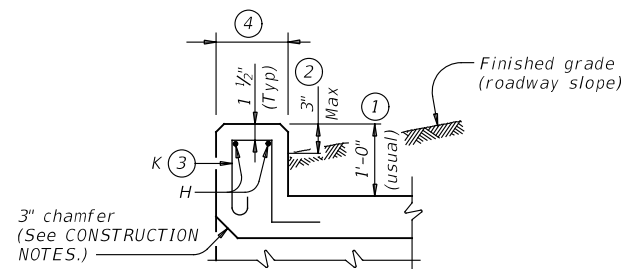
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TYPICAL SECTION

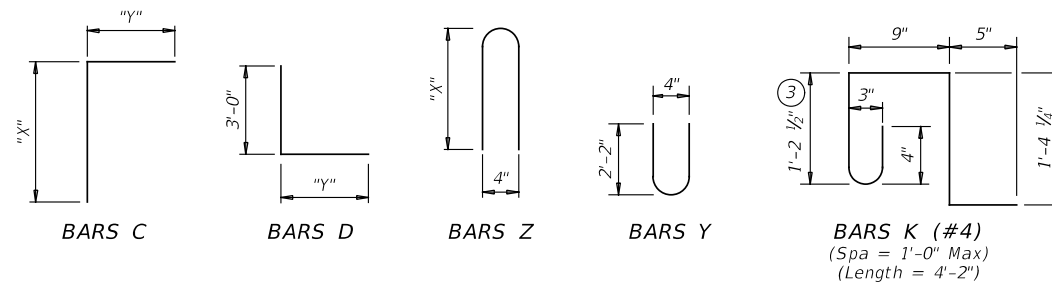


BOTTOM SLAB **TOP SLAB**
PART PLANS



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
4'-0"	4'-6 1/2"	5'-9"
5'-0"	5'-6 1/2"	5'-9"
6'-0"	6'-6 1/2"	5'-9"
7'-0"	7'-6 1/2"	5'-9"
8'-0"	8'-6 1/2"	5'-9"
9'-0"	9'-6 1/2"	5'-9"
10'-0"	10'-6 1/2"	5'-9"



- 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.
- 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.
- 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.
- 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, and Bars Y and Z 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 Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-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.



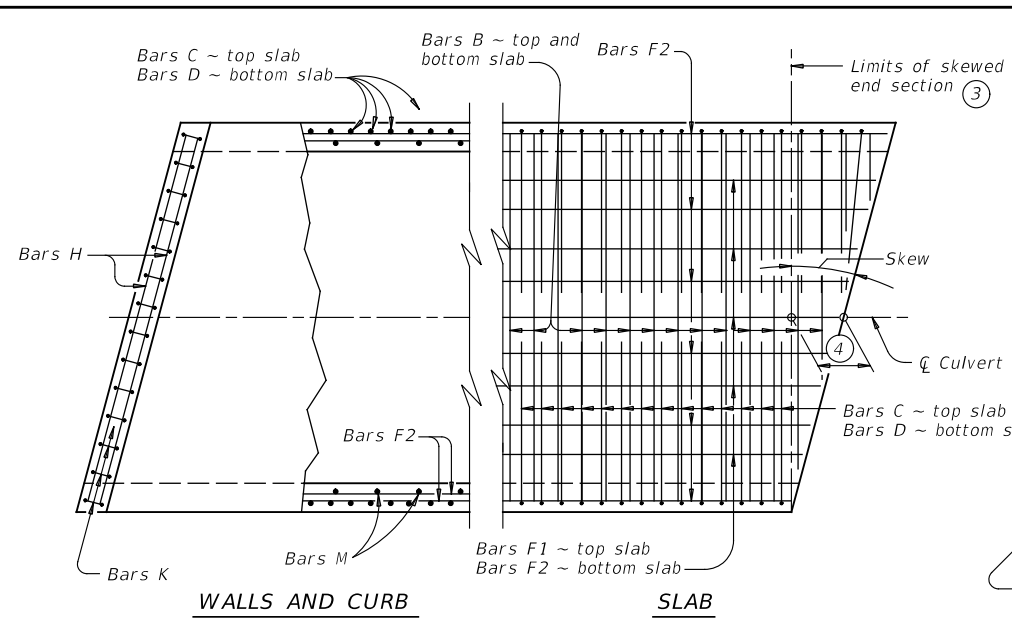
**MULTIPLE BOX CULVERTS
 CAST-IN-PLACE
 10'-0" SPAN
 0' TO 7' FILL**

MC-10-7

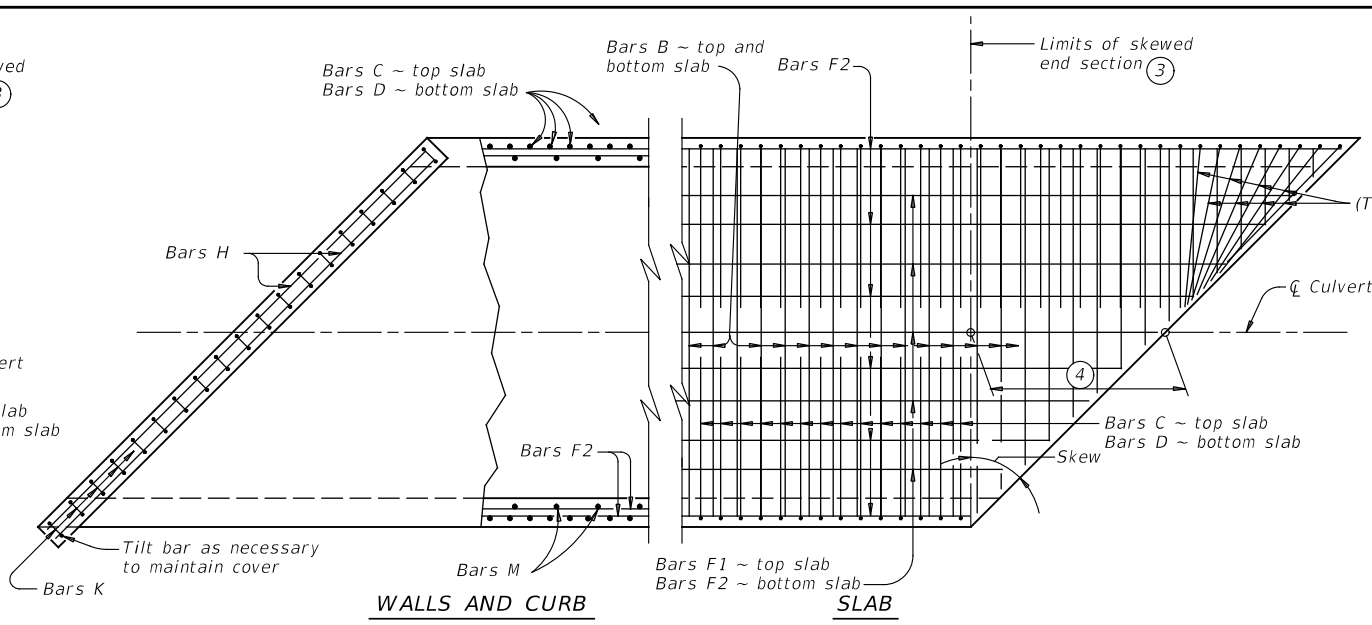
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©TXDOT February 2020	CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.	
SAN	GUADALUPE		279	

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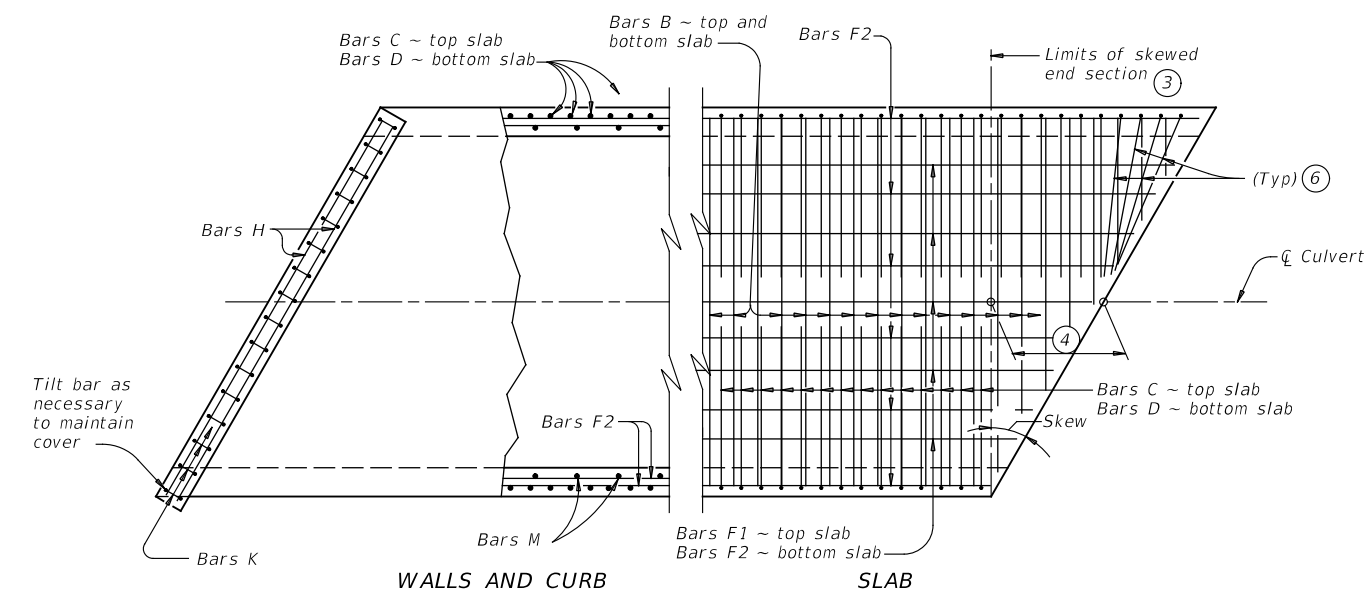
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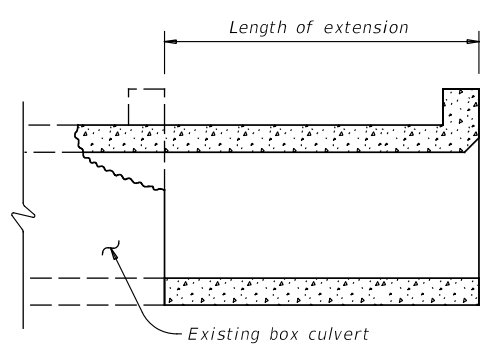
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



LENGTHENING DETAIL

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 anchor 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, N_{ba}, 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 $[One\ half\ of\ overall\ width] \times [tangent\ of\ the\ skew\ angle]$
- 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 conflict in 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 1/2" 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.

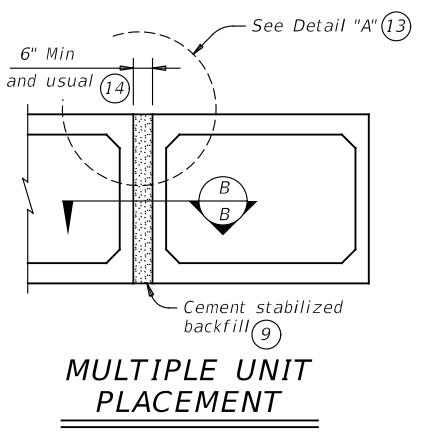
Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

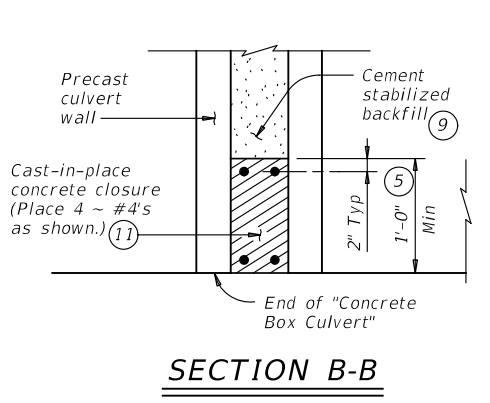
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SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS			
SCC-MD			
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DIST	COUNTY	SHEET NO.	
SAN	GUADALUPE	281	

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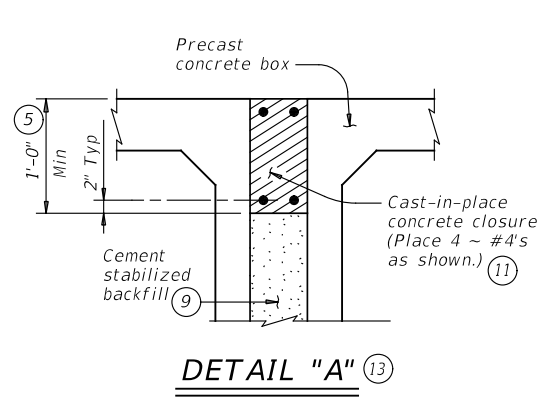
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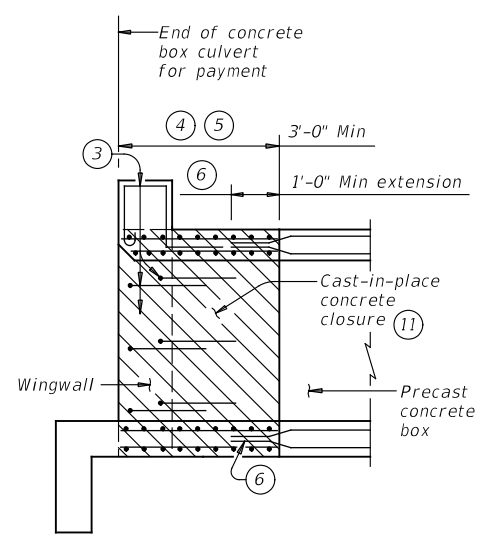
MULTIPLE UNIT PLACEMENT



SECTION B-B

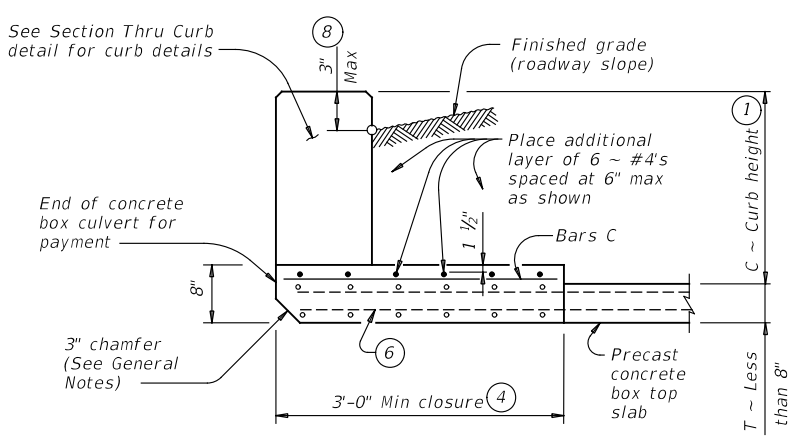


DETAIL "A"

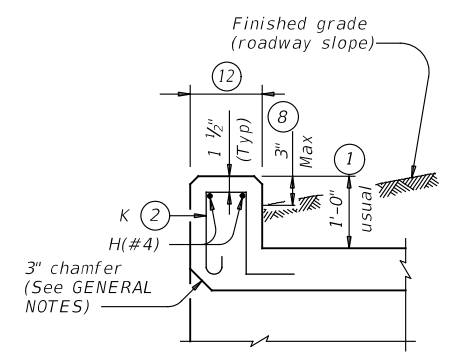


WINGWALL CONNECTION

(Also applies to safety end treatment.)



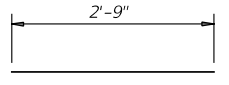
SECTION THRU TOP SLABS LESS THAN 8"



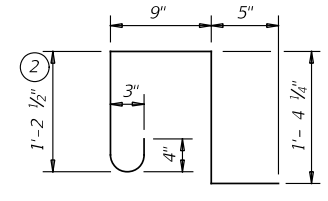
SECTION THRU CURB

QUANTITIES PER FOOT OF CURB

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")

- 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.
- 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.
- 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.
- 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.
- 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.
- Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- 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.
- 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.
- Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- All curb concrete and reinforcing is considered part of the box culvert for payment.
- Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 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".
- 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.

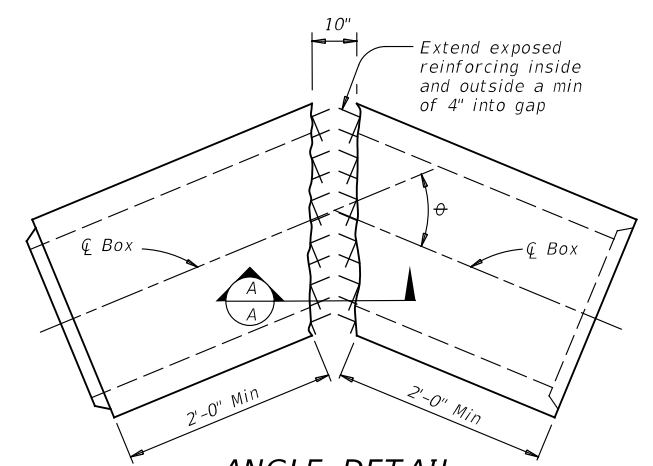
MATERIAL NOTES:

- 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.

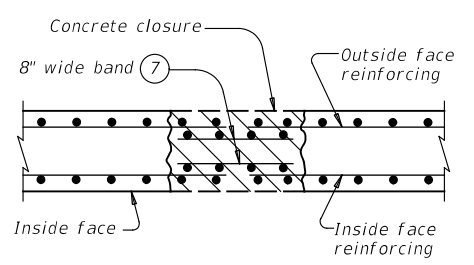
GENERAL NOTES:

- 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.

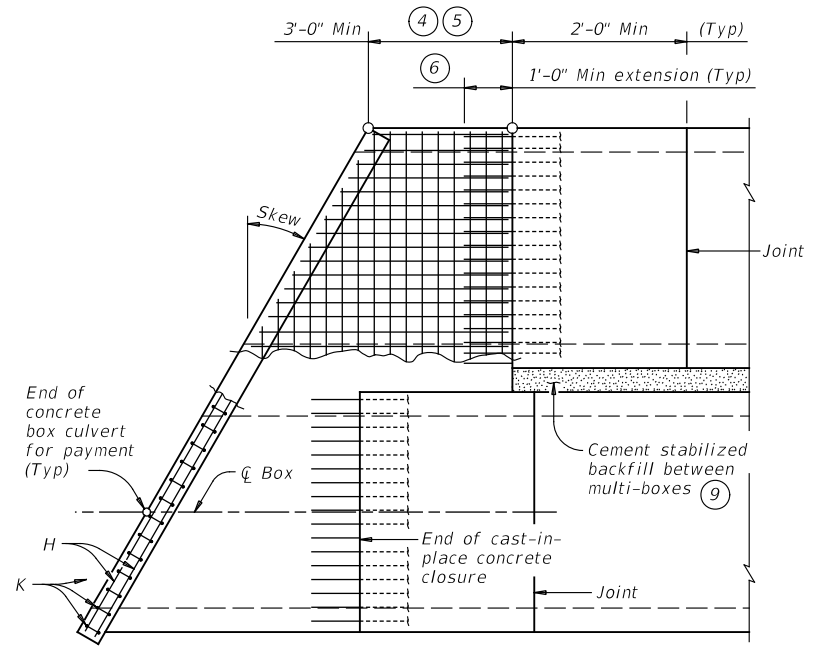
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

HL93 LOADING

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
REVISIONS	0215	09	035	FM 725
DIST	COUNTY	SHEET NO.		
SAN	GUADALUPE	282		

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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) (CY) (2)	Class "C" Conc (Wingwall) (CY) (3)	Total Wingwall Area (SF)
CULVERT C1 (Lt)	4 ~ 5'x 3'	6.5'	SCP-5	PW-1	0°	3:1	6"	6"	1.000'	4.500'	N/A	N/A	13.500'	25.500'	N/A	0.0	0.9	9.5	122
CULVERT C1 (Rt)	4 ~ 5'x 3'	6.5'	SCP-5	PW-1	0°	3:1	6"	6"	2.000'	5.500'	N/A	N/A	16.500'	25.500'	N/A	0.0	1.9	12.9	182
CULVERT D1 (Lt)	9 ~ 10'x 7'	2.5'	MC-10-7	FW-0	0°	2:1	8"	7"	1.000'	8.417'	16.167'	9.344'	18.668'	95.833'	N/A	0.0	3.5	13.5	163
CULVERT D1 (Rt)	9 ~ 10'x 7'	2.5'	MC-10-7	FW-0	0°	2:1	8"	7"	1.000'	8.417'	16.167'	9.344'	18.668'	95.833'	N/A	0.0	3.5	13.5	163

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 for 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)

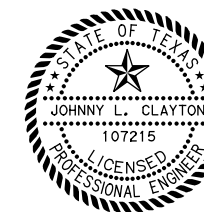
Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
Area for four wingwalls (two structure ends) if Both.

- 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.

SPECIAL NOTE:

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.



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				Bridge Division Standard	
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BCS					
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REV:	0215 09	CONT:	SECT:	JOB:	HIGHWAY:
				035	FM 725
DIST:	COUNTY:		SHEET NO.:		
SAN	GUADALUPE		283		

DATE: 2/28/2021 6:37:18 PM
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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

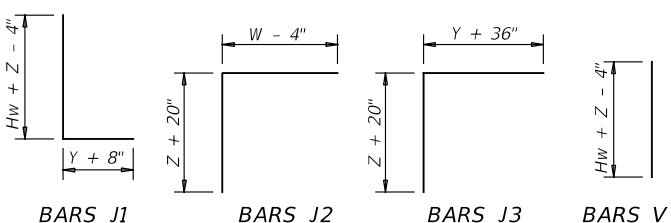
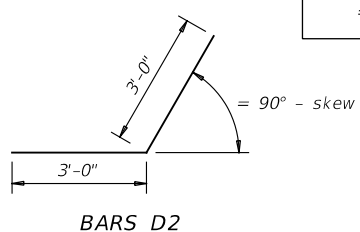
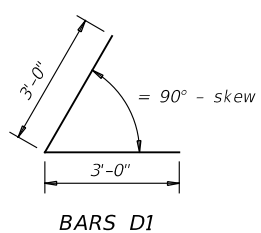
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings)		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



WING DIMENSION FORMULAS:
(All values are in feet.)

$Hw = H + T + C$
 $Lw = (Hw)(SL) \div \cosine(\theta)$ for Type PW-1
 $Lw = (Hw - 1')(SL) \div \cosine(\theta)$ for Type PW-2 and $Hw \ge 4'$
 $Lw = (Hw - 0.5')(SL) \div \cosine(\theta)$ for Type PW-2 and $Hw < 4'$

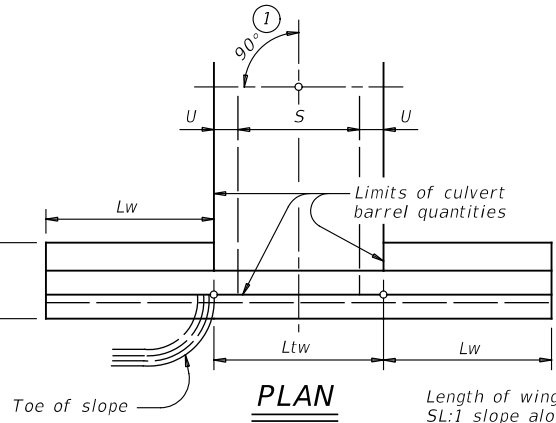
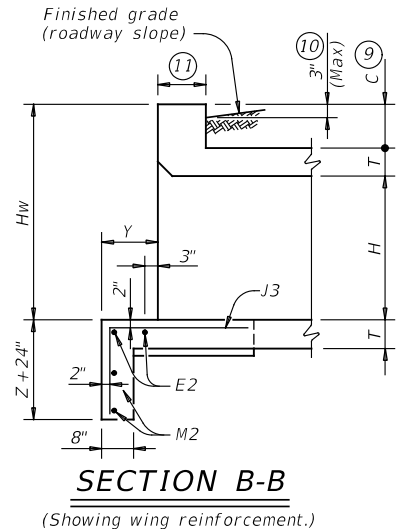
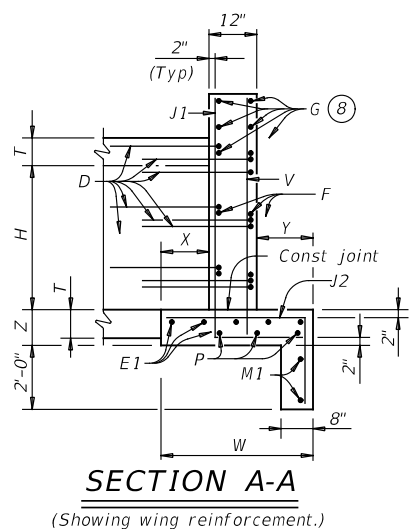
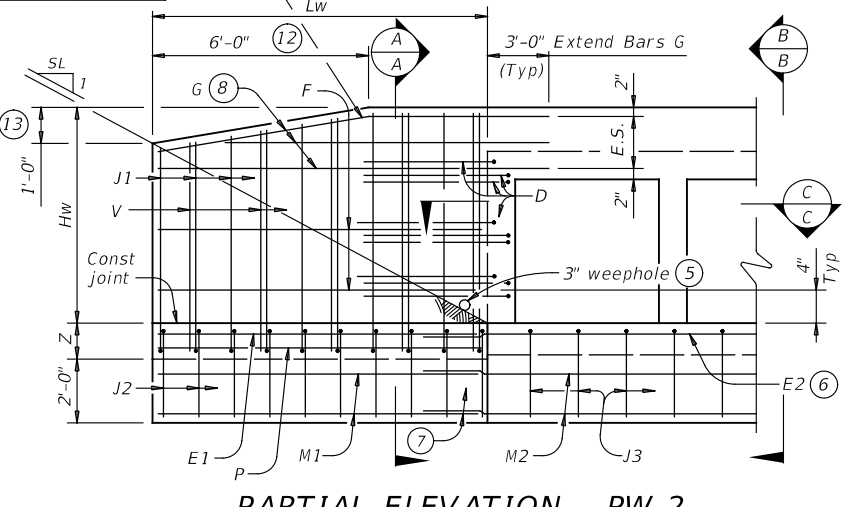
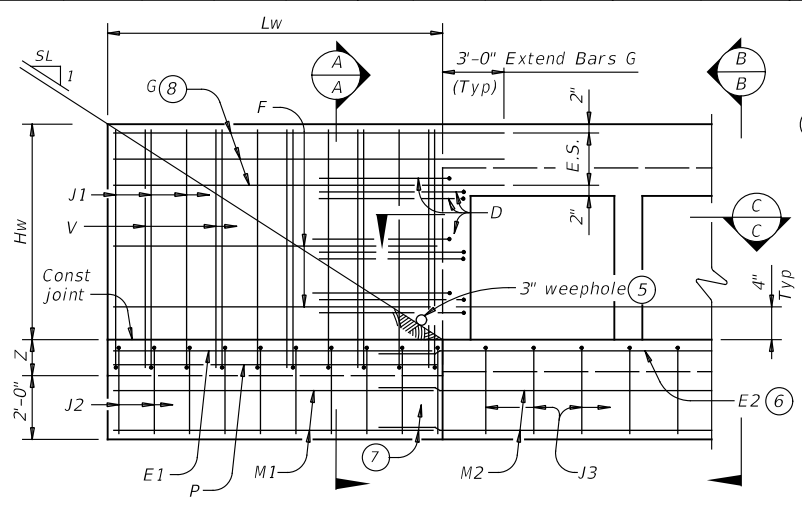
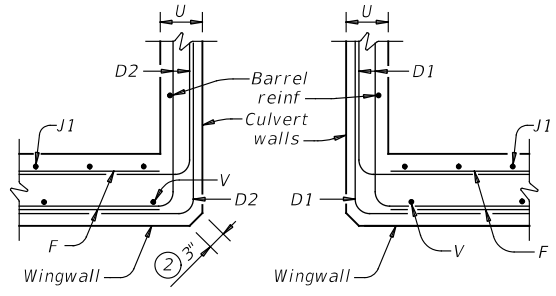
For cast-in-place culverts:
 $Ltw = [(N)(S) + (N + 1)(U)] \div \cosine(\theta)$

For precast culverts:
 $Ltw = [(N)(2U + S) + (N - 1)(0.5')] \div \cosine(\theta)$
 Total Wingwall Area (two wings ~ SF)
 $= (2)(Hw)(Lw)$ for Type PW-1
 $= (2)(Hw)(Lw) - 6 SF$ for Type PW-2 and $Hw \ge 4'$
 $= (2)(Hw)(Lw) - 1.5 SF$ for Type PW-2 and $Hw < 4'$

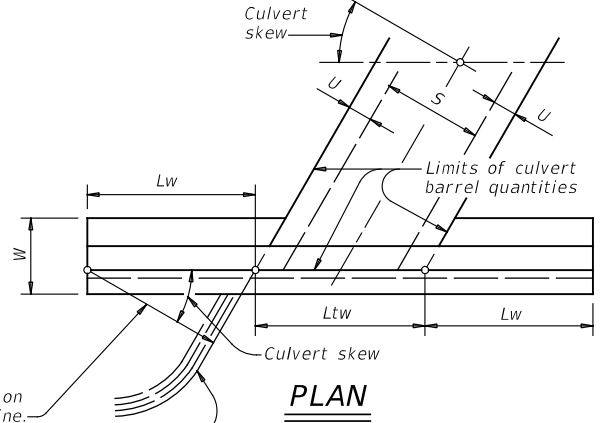
Hw = Height of wingwall
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans
 $SL:1$ = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)
 θ = Culvert skew

See applicable box culvert standard sheet for S, H, T, and U values.

- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"
For 30° skew ~ 2"
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
- 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 Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- 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.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.



DETAILS FOR NON-SKEWED BOX CULVERTS



DETAILS FOR SKEWED BOX CULVERTS (Showing 30° skew.)

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation Bridge Division Standard

CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

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©TXDOT February 2020	CONT SECT	JOB	HIGHWAY	
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DIST	COUNTY	SHEET NO.		
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TABLE OF DIMENSIONS AND REINFORCING STEEL
 (Wings for one structure end)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2-wings)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa		
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
 (2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$Hw = H + T + C - 0.250'$
 $A = (Hw - 0.333') (SL)$
 $B = (A) \text{ tangent } (30^\circ)$
 $Lw = (A) \div \text{cosine } (30^\circ)$

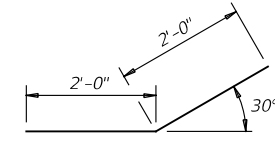
For cast-in-place culverts:
 $Ltw = (N) (S) + (N + 1) (U)$

For precast culverts:
 $Ltw = (N) (2U + S) + (N - 1) (0.5')$

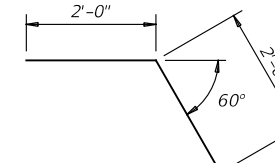
Total wingwall area (two wings ~ SF) = $(Hw + 0.333') (Lw)$

Hw = Height of wingwall
 SL:1 = Side slope ratio (horizontal:1 vertical)
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans

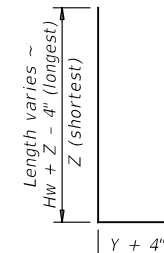
See applicable box culvert standard sheet for H, S, T, and U values.



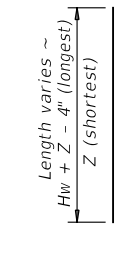
BARS D



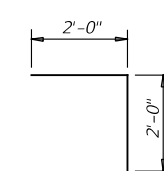
BARS R



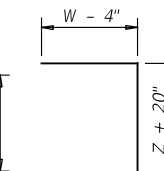
BARS J1



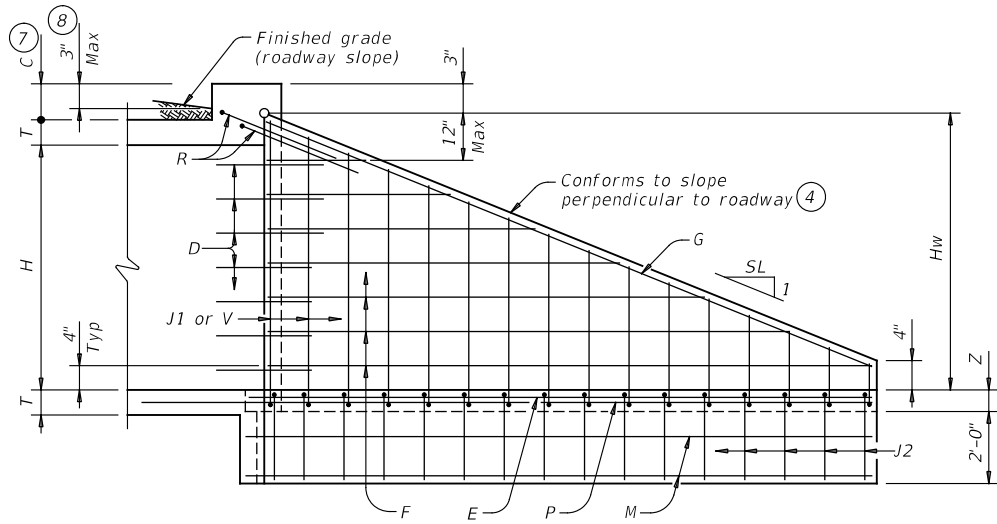
BARS V



BARS L

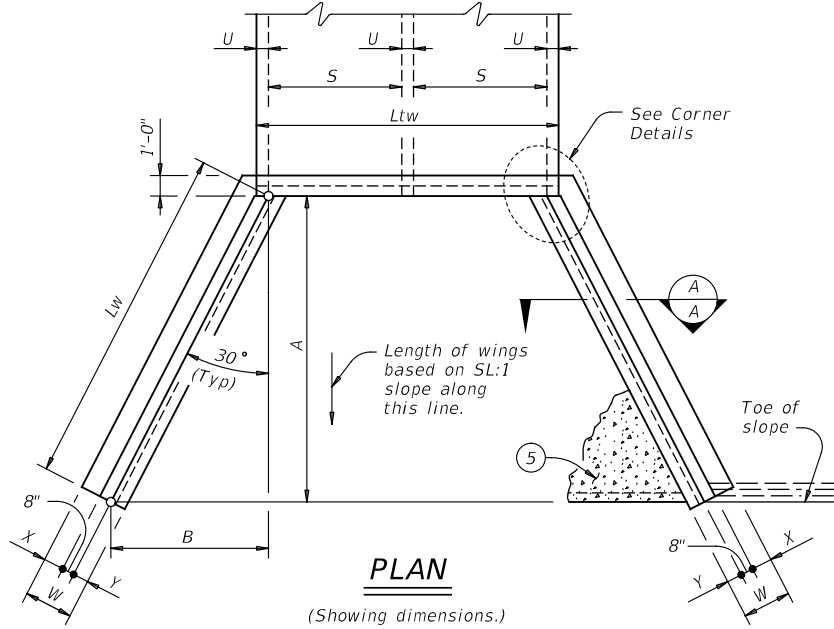


BARS J2



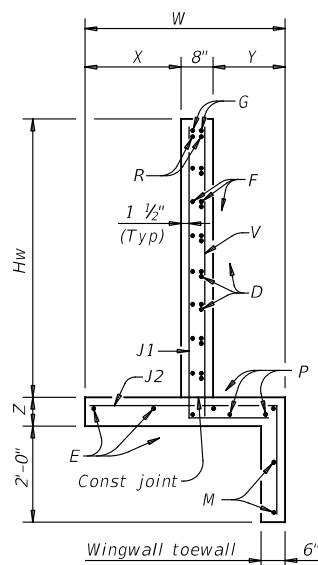
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

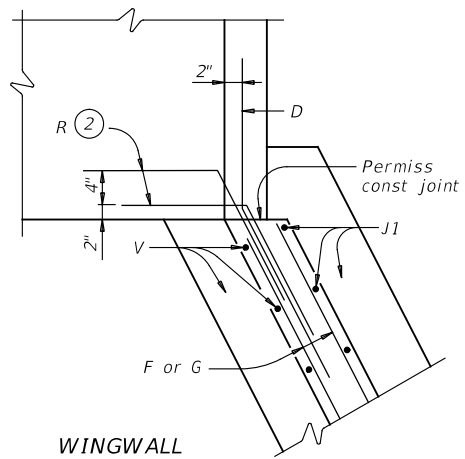


PLAN

(Showing dimensions.)



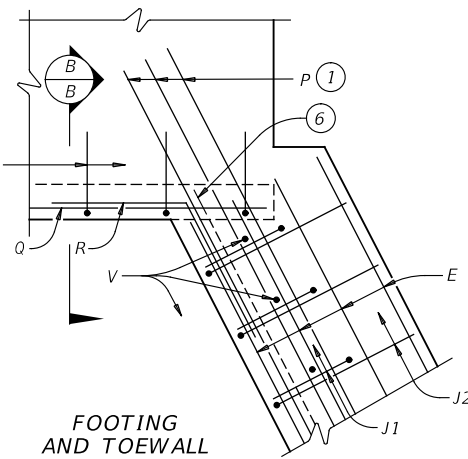
SECTION A-A



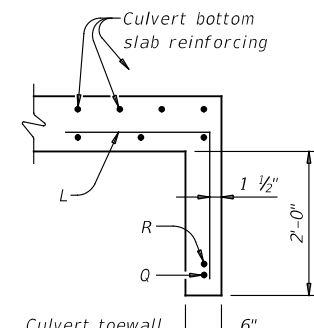
WINGWALL

CORNER DETAILS

(Culvert and culvert toewall reinforcing not shown for clarity.)



FOOTING AND TOEWALL



SECTION B-B

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 #2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 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 Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- 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.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

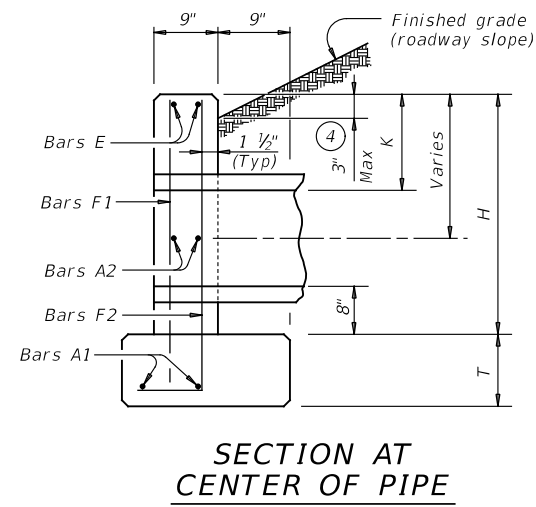
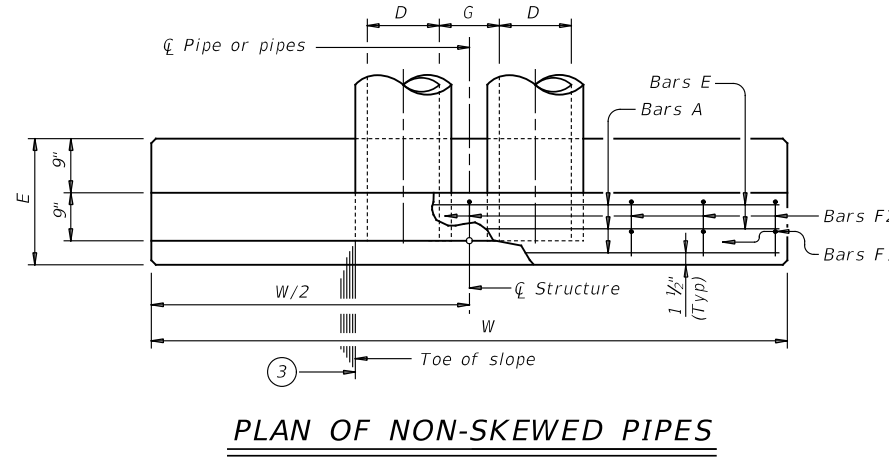
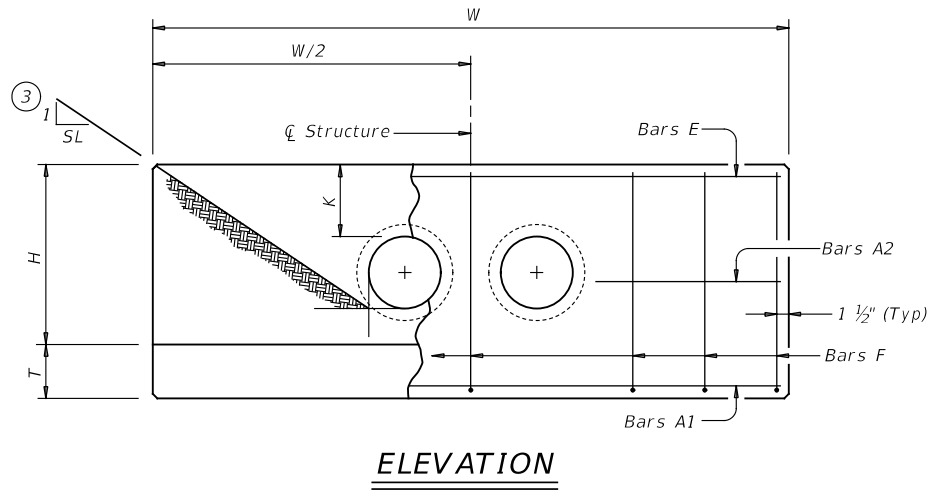
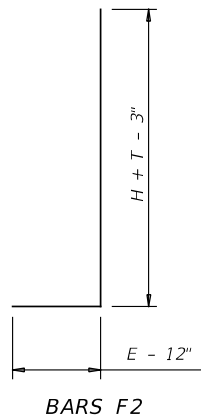
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

				Bridge Division Standard	
CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS					
FW-0					
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©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY	SHEET NO.	
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TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL

Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Add'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	



- 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

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.

Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

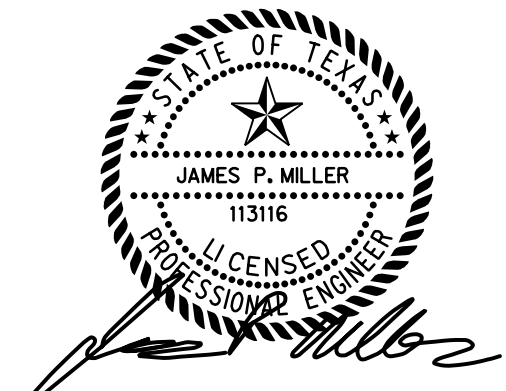
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY		SHEET NO.
	SAN	GUADALUPE		286

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

DATE: FILE:

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL

Slope	Dia of Pipe (D)	Values for One Pipe		Values To Be Added for Each Add'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
3:1	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
	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"	43'-0"	812	8.3	4'-8"	44	0.6
	33"	47'-9"	912	9.9	5'-11"	51	0.8
	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	



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JAMES P. MILLER PE NO. 113116 ON 4/14/2021. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES AT 14800 ST MARY'S LANE, HOUSTON, TEXAS 77079 TBPE FIRM *F-312

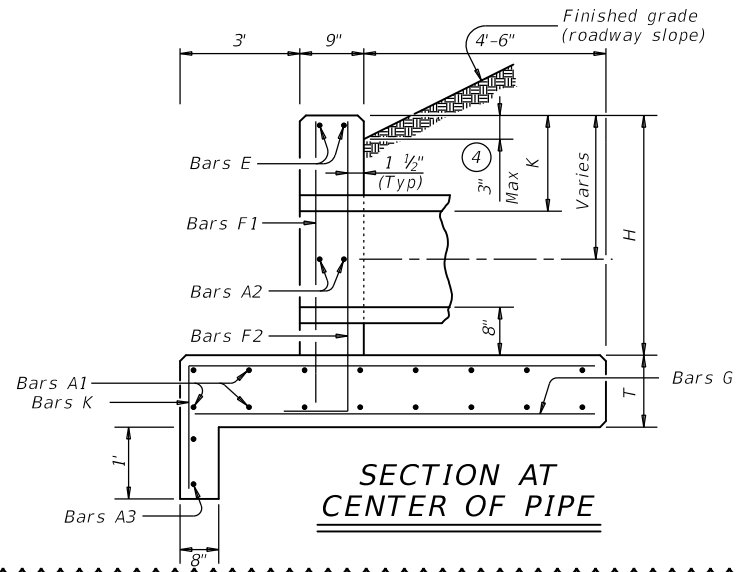
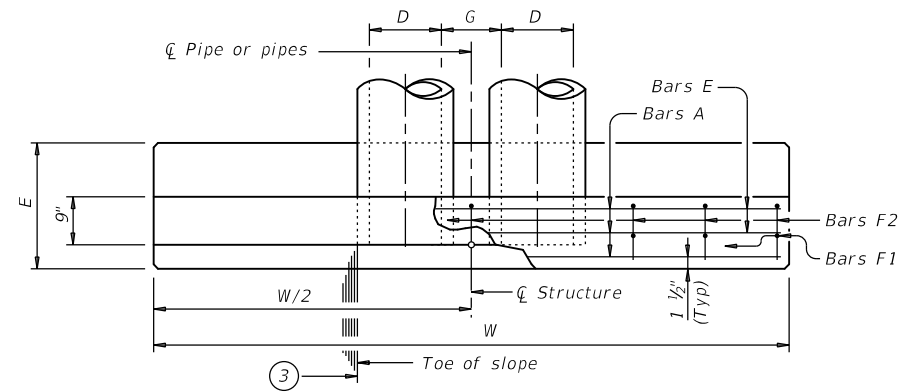
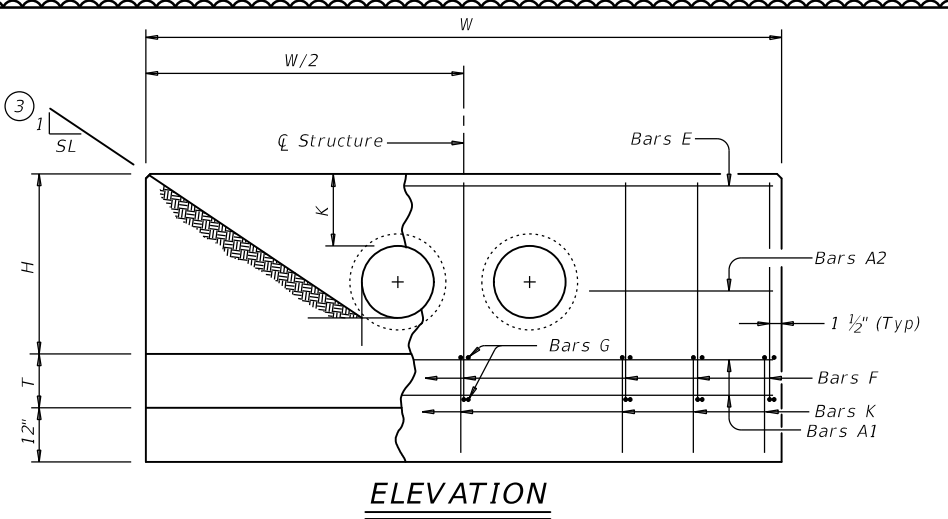
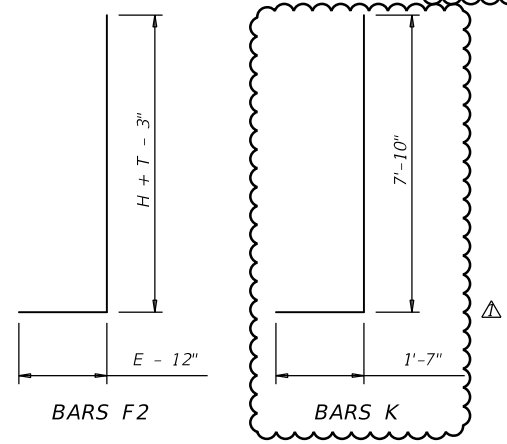


TABLE OF CONSTANT DIMENSIONS

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"	4'-3"	7'-5"	1'-0"	8'-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'-8"	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

Bar	Size	Spa	No.
A1	#5	1'-0"	~
A2	#5	1'-6"	~
A3	#5	~	2
E	#5	1'-6"	~
F	#5	1'-0"	~
G	#5	1'-0"	~
K	#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.

- Total quantities include one 3'-1" lap for bars over 60' in length.
- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- Indicated slope is perpendicular to centerline pipe or pipes.
- 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.
- Dimensions shown are usual and maximum.
- Quantities shown are for one structure end only (one headwall).

Texas Department of Transportation
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS (MOD)
CH-PW-0(MOD)

FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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0215	09		035	FM 725
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	SAT	GUADALUPE	286A	

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TABLE OF VARIABLE DIMENSIONS (5) AND QUANTITIES FOR ONE HEADWALL

Slope	Size of Pipe Arch		Values for One Pipe		Values To Be Added for Each Add'l Pipe				
	Span	Rise	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	
2:1	1	17"	13"	9'-9"	130	1.1	2'-5"	28	0.3
	2	21"	15"	10'-9"	139	1.3	2'-11"	33	0.3
	3	28"	20"	13'-0"	184	1.8	3'-9"	43	0.5
	4	35"	24"	14'-11"	249	2.2	4'-7"	50	0.6
	5	42"	29"	17'-2"	311	3.2	5'-5"	69	0.9
	6	49"	33"	19'-1"	342	3.8	6'-3"	77	1.1
	7	57"	38"	21'-5"	438	4.7	7'-2"	86	1.4
	8	64"	43"	23'-8"	508	5.6	8'-2"	110	1.6
	9	71"	47"	25'-7"	577	6.5	9'-1"	120	2.0
3:1	1	17"	13"	13'-11"	182	1.6	2'-5"	28	0.3
	2	21"	15"	15'-3"	196	1.8	2'-11"	33	0.3
	3	28"	20"	18'-4"	270	2.6	3'-9"	42	0.5
	4	35"	24"	20'-11"	356	3.2	4'-7"	50	0.6
	5	42"	29"	24'-0"	434	4.5	5'-5"	70	0.9
	6	49"	33"	26'-7"	499	5.4	6'-3"	77	1.1
	7	57"	38"	29'-9"	628	6.7	7'-2"	87	1.4
	8	64"	43"	32'-10"	715	7.9	8'-2"	111	1.6
	9	71"	47"	35'-5"	798	9.2	9'-1"	120	2.0
4:1	1	17"	13"	18'-1"	236	2.1	2'-5"	28	0.3
	2	21"	15"	19'-9"	268	2.4	2'-11"	33	0.3
	3	28"	20"	23'-8"	336	3.3	3'-9"	42	0.5
	4	35"	24"	26'-11"	460	4.2	4'-7"	50	0.6
	5	42"	29"	30'-10"	557	5.8	5'-5"	69	0.9
	6	49"	33"	34'-1"	653	6.9	6'-3"	78	1.1
	7	57"	38"	38'-1"	819	8.6	7'-2"	87	1.4
	8	64"	43"	42'-0"	950	10.2	8'-2"	111	1.7
	9	71"	47"	45'-3"	1,053	11.9	9'-1"	120	2.0
6:1	1	17"	13"	26'-5"	343	3.1	2'-5"	29	0.3
	2	21"	15"	28'-9"	381	3.5	2'-11"	33	0.3
	3	28"	20"	34'-4"	504	4.9	3'-9"	42	0.5
	4	35"	24"	38'-11"	673	6.1	4'-7"	50	0.6
	5	42"	29"	44'-6"	823	8.5	5'-5"	70	0.9
	6	49"	33"	49'-1"	945	10.1	6'-3"	78	1.1
	7	57"	38"	54'-9"	1,227	12.5	7'-2"	87	1.4
	8	64"	43"	60'-4"	1,407	14.8	8'-2"	110	1.7
	9	71"	47"	64'-11"	1,571	17.3	9'-1"	119	2.0

- Total quantities include one 3'-1" lap for bars over 60 ft in length.
- Quantities shown are for metal pipe and will decrease slightly for concrete pipe installations.
- 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.
- K is measure from top of curb to inside face of pipe.
- Dimensions shown are usual and maximum.
- Quantities shown are for one structure end only (one headwall).
- Indicated slope is perpendicular to centerline pipe or pipes.

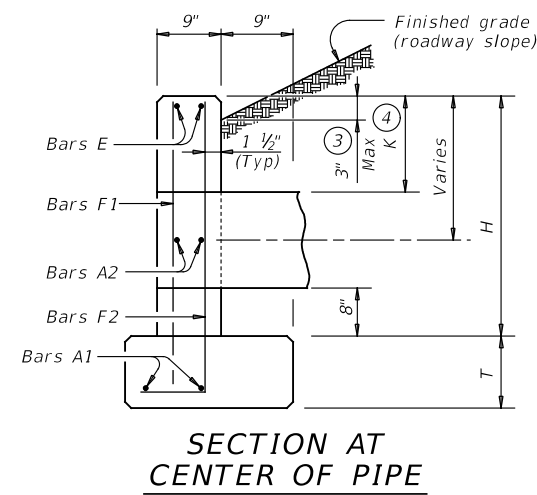
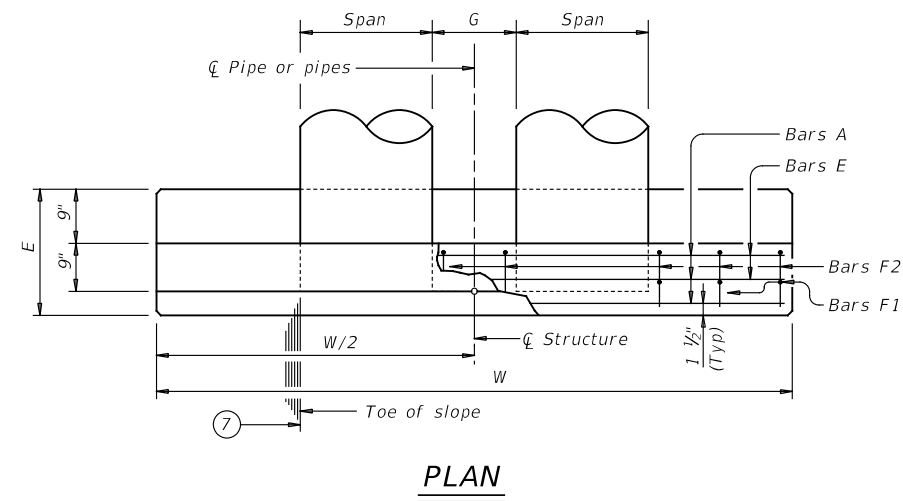
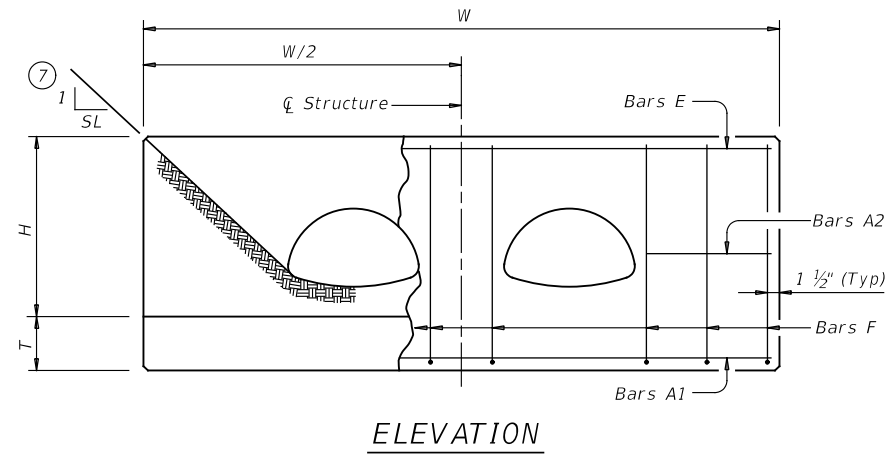
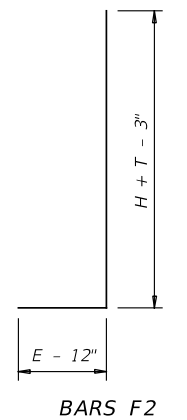


TABLE OF CONSTANT DIMENSIONS

Design	Size of Pipe Arch		G	K (5)	H	T	E
	Span	Rise					
1	17"	13"	1'-0"	1'-0"	2'-7"	0'-10"	1'-6"
2	21"	15"	1'-2"	1'-0"	2'-9"	0'-10"	1'-6"
3	28"	20"	1'-5"	1'-0"	3'-2"	0'-10"	1'-10"
4	35"	24"	1'-8"	1'-0"	3'-6"	0'-10"	2'-0"
5	42"	29"	1'-11"	1'-0"	3'-11"	1'-0"	2'-4"
6	49"	33"	2'-2"	1'-0"	4'-3"	1'-0"	2'-6"
7	57"	38"	2'-5"	1'-0"	4'-8"	1'-0"	2'-10"
8	64"	43"	2'-10"	1'-0"	5'-1"	1'-0"	3'-0"
9	71"	47"	3'-2"	1'-0"	5'-5"	1'-0"	3'-4"

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.



Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED ARCH PIPE CULVERTS

CH-PW-A-0

FILE: chpa0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	287	

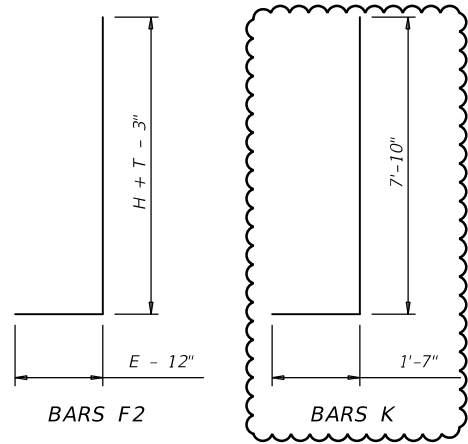
TABLE OF VARIABLE DIMENSIONS ⑤ AND QUANTITIES FOR ONE HEADWALL

Slope	Design	Size of Pipe Arch		Values for One Pipe		Values To Be Added for Each Add'l Pipe			
		Span	Rise	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②
2:1	1	17"	13"	9'-9"	130	1.1	2'-5"	28	0.3
	2	21"	15"	10'-9"	139	1.3	2'-11"	33	0.3
	3	28"	20"	13'-0"	184	1.8	3'-9"	43	0.5
	4	35"	24"	14'-11"	249	2.2	4'-7"	50	0.6
	5	42"	29"	17'-2"	311	3.2	5'-5"	69	0.9
	6	49"	33"	19'-1"	342	3.8	6'-3"	77	1.1
	7	57"	38"	21'-5"	438	4.7	7'-2"	86	1.4
	8	64"	43"	23'-8"	508	5.6	8'-2"	110	1.6
	9	71"	47"	25'-7"	577	6.5	9'-1"	120	2.0
3:1	1	17"	13"	13'-11"	182	1.6	2'-5"	28	0.3
	2	21"	15"	15'-3"	196	1.8	2'-11"	33	0.3
	3	28"	20"	18'-4"	270	2.6	3'-9"	42	0.5
	4	35"	24"	20'-11"	356	3.2	4'-7"	50	0.6
	5	42"	29"	24'-0"	434	4.5	5'-5"	70	0.9
	6	49"	33"	26'-7"	499	5.4	6'-3"	77	1.1
	7	57"	38"	29'-9"	628	6.7	7'-2"	87	1.4
	8	64"	43"	32'-10"	715	7.9	8'-2"	111	1.6
	9	71"	47"	35'-5"	798	9.2	9'-1"	120	2.0
4:1	1	17"	13"	18'-1"	236	2.1	2'-5"	28	0.3
	2	21"	15"	19'-9"	268	2.4	2'-11"	33	0.3
	3	28"	20"	23'-8"	336	3.3	3'-9"	42	0.5
	4	35"	24"	26'-11"	460	4.2	4'-7"	50	0.6
	5	42"	29"	30'-10"	557	5.8	5'-5"	69	0.9
	6	49"	33"	34'-1"	653	6.9	6'-3"	78	1.1
	7	57"	38"	38'-1"	819	8.6	7'-2"	87	1.4
	8	64"	43"	42'-0"	950	10.2	8'-2"	111	1.7
	9	71"	47"	45'-3"	1,053	11.9	9'-1"	120	2.0
6:1	1	17"	13"	26'-5"	343	3.1	2'-5"	29	0.3
	2	21"	15"	28'-9"	381	3.5	2'-11"	33	0.3
	3	28"	20"	34'-4"	504	4.8	3'-9"	42	0.5
	4	35"	24"	42'-3"	1,394	10.8	~	~	~
	5	42"	29"	47'-0"	823	8.5	~	~	~
	6	49"	33"	49'-1"	945	10.1	6'-3"	78	1.1
	7	57"	38"	54'-9"	1,227	12.5	7'-2"	87	1.4
	8	64"	43"	60'-4"	1,407	14.8	8'-2"	110	1.7
	9	71"	47"	64'-11"	1,571	17.3	9'-1"	119	2.0

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DATE: FILE:

- ① Total quantities include one 3'-1" lap for bars over 60 ft in length.
- ② Quantities shown are for metal pipe and will decrease slightly for concrete pipe installations.
- ③ 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.
- ④ K is measure from top of curb to inside face of pipe.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).
- ⑦ Indicated slope is perpendicular to centerline pipe or pipes.



4/14/2021

STATE OF TEXAS
 JAMES P. MILLER
 113116
 LICENSED PROFESSIONAL ENGINEER

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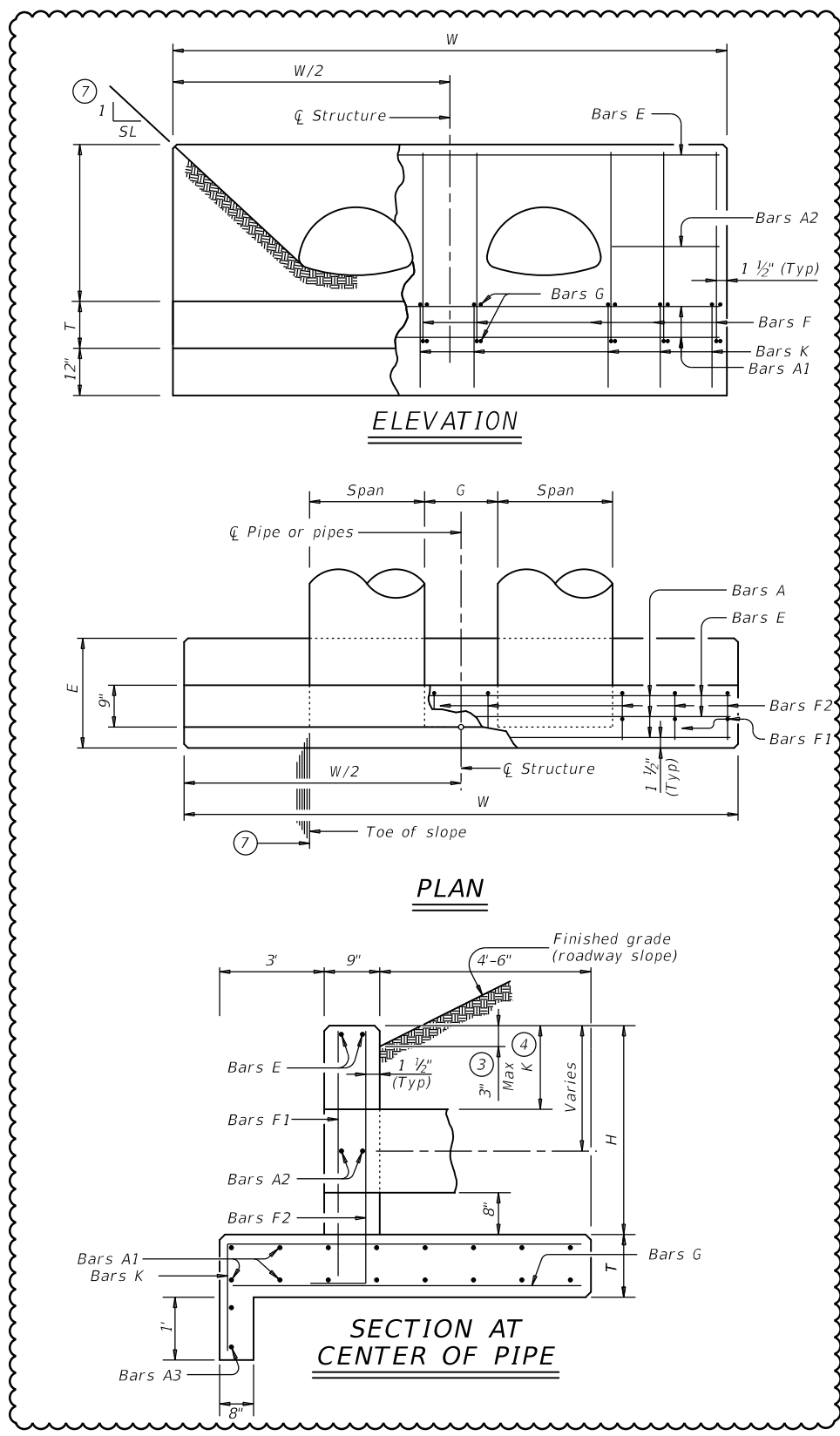


TABLE OF CONSTANT DIMENSIONS

Design	Size of Pipe Arch		G	K ⑤	H	T	E
	Span	Rise					
1	17"	13"	1'-0"	1'-0"	2'-7"	0'-10"	1'-6"
2	21"	15"	1'-2"	1'-0"	2'-9"	0'-10"	1'-6"
3	28"	20"	1'-5"	1'-0"	3'-7"	0'-10"	1'-10"
4	35"	24"	1'-8"	3'-0"	5'-6"	1'-0"	8'-3"
5	42"	29"	2'-1"	3'-1"	5'-11"	1'-0"	8'-3"
6	49"	33"	2'-2"	1'-0"	4'-3"	1'-0"	2'-6"
7	57"	38"	2'-5"	1'-0"	4'-8"	1'-0"	2'-10"
8	64"	43"	2'-10"	1'-0"	5'-1"	1'-0"	3'-0"
9	71"	47"	3'-2"	1'-0"	5'-5"	1'-0"	3'-4"

TABLE OF ⑥ REINFORCING STEEL

Bar	Size	Spa	No.
A1	#5	1'-0"	~
A2	#5	1'-6"	~
A3	#5	~	2
E	#5	1'-6"	~
F	#5	1'-0"	~
G	#5	1'-0"	~
K	#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

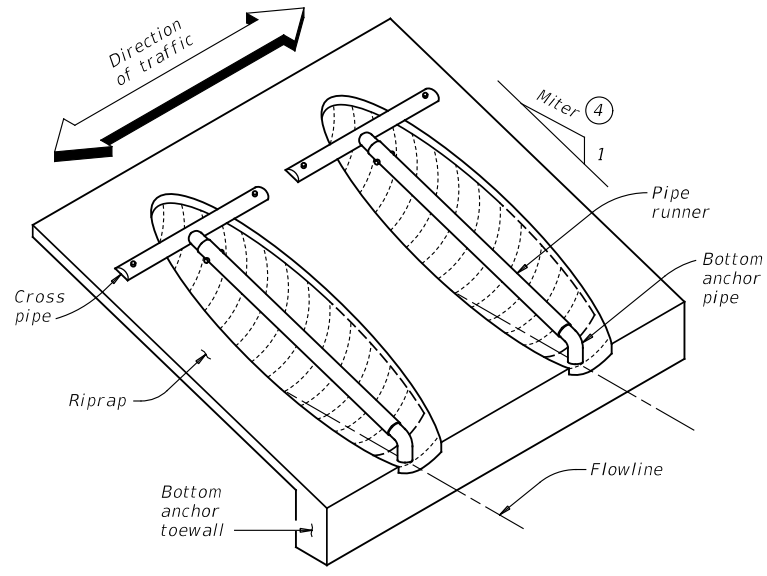
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED ARCH PIPE CULVERTS (MOD)

CH-PW-A-0(MOD)

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REVISIONS	0215	09	035	EM 725
MODIFIED 35' SPAN WALL	DIST	COUNTY	SHEET NO.	
	SAT	GUADALUPE	287A	

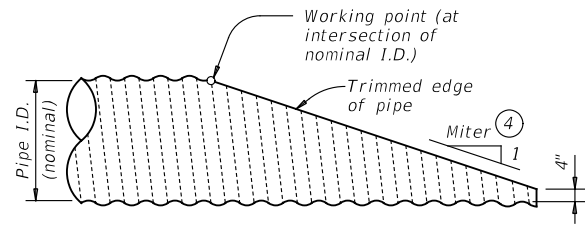
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CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS ①③



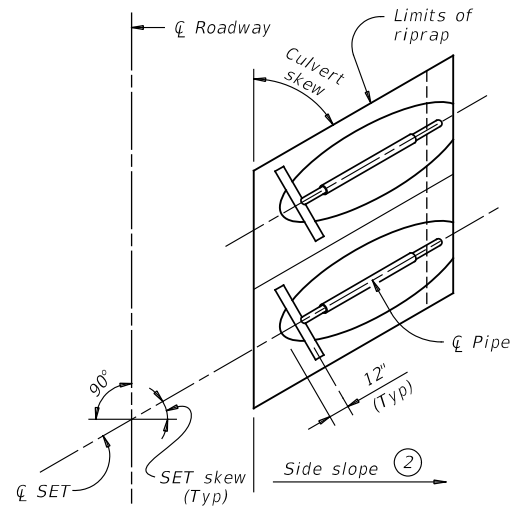
ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)



SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details of reinforced concrete pipe (RCP) culvert are similar.)



PLAN OF SKEWED INSTALLATION

Corrugated Metal Pipe (CMP) Culverts

Design	Pipe Culvert Span	Pipe Culvert Rise	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	
1	17"	13"	1' - 0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	21"	15"	1' - 2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	28"	20"	1' - 5"	3' - 9"	N/A	N/A	3' - 5"	4' - 7"	N/A	N/A	4' - 11"	6' - 5"	N/A	N/A	7' - 11"	10' - 2"	N/A
4	35"	24"	1' - 8"	4' - 4"	3' - 10"	4' - 0"	4' - 7"	6' - 0"	5' - 5"	5' - 8"	6' - 6"	8' - 4"	8' - 8"	9' - 1"	10' - 3"	12' - 11"	N/A
5	42"	29"	1' - 11"	4' - 11"	5' - 1"	5' - 4"	6' - 1"	7' - 10"	7' - 2"	7' - 5"	8' - 6"	10' - 9"	11' - 2"	11' - 8"	13' - 2"	16' - 6"	N/A
6	49"	33"	2' - 2"	5' - 6"	6' - 2"	6' - 5"	7' - 4"	N/A	8' - 6"	8' - 10"	10' - 0"	N/A	13' - 3"	13' - 9"	15' - 6"	N/A	N/A
7	57"	38"	2' - 5"	6' - 2"	7' - 6"	7' - 9"	N/A	N/A	10' - 2"	10' - 7"	N/A	N/A	15' - 9"	16' - 4"	N/A	N/A	N/A

Reinforced Concrete Pipe (RCP) Culverts

Design	Pipe Culvert Span	Pipe Culvert Rise	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		
1	22"	13 1/2"	1' - 0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	26"	15 1/2"	1' - 2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	28 1/2"	18"	1' - 5"	3' - 9 1/2"	N/A	N/A	2' - 10"	3' - 10"	N/A	N/A	4' - 2"	5' - 5"	N/A	N/A	6' - 9"	8' - 9"	N/A	N/A
4	36 1/4"	22 1/2"	1' - 8"	4' - 5 1/4"	3' - 5"	3' - 7"	4' - 2"	5' - 6"	4' - 11"	5' - 1"	5' - 11"	7' - 7"	7' - 11"	8' - 3"	9' - 5"	11' - 11"	N/A	N/A
5	43 3/4"	26 5/8"	1' - 11"	4' - 0 3/4"	4' - 6"	4' - 8"	5' - 5"	6' - 11"	6' - 4"	6' - 7"	7' - 6"	9' - 7"	10' - 0"	10' - 5"	11' - 9"	14' - 10"	N/A	N/A
6	51 1/8"	31 5/16"	2' - 2"	5' - 8"	5' - 9"	6' - 0"	6' - 10"	N/A	7' - 11"	8' - 3"	9' - 4"	N/A	12' - 4"	12' - 10"	14' - 6"	N/A	N/A	N/A
7	58 1/2"	36"	2' - 5"	6' - 3 1/2"	6' - 11"	7' - 3"	N/A	N/A	9' - 6"	9' - 11"	N/A	N/A	14' - 9"	15' - 4"	N/A	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS ④

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

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"

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED ③

Design	Single Pipe Culvert	Multiple Pipe Culverts
1 and 2	Skews thru 45°	Skews thru 45°
3	Skews thru 35°	Skews thru 10°
4	Normal (no skew)	Always required
5 thru 7	Always required	Always required

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 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:

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. 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.

- 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 Runners Lengths table.
- ② Recommended values of 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.
- ③ 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 Design 1 through 5 culvert pipe sizes, the skew must not exceed 45°.
 - For Design 6 culvert pipes, the skew must not exceed 30°.
 - For Design 7 culvert pipes, the skew must not exceed 15°.

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".

- ④ Miter = slope of mitered end of pipe culvert.

Texas Department of Transportation
Bridge Division Standard

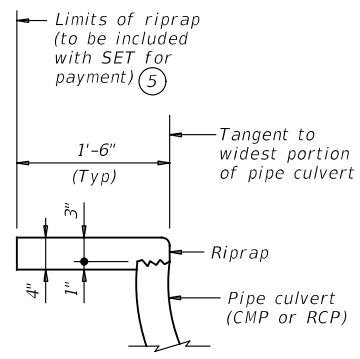
SAFETY END TREATMENT FOR DESIGN 1 TO 7 ARCH PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

SETP-CD-A

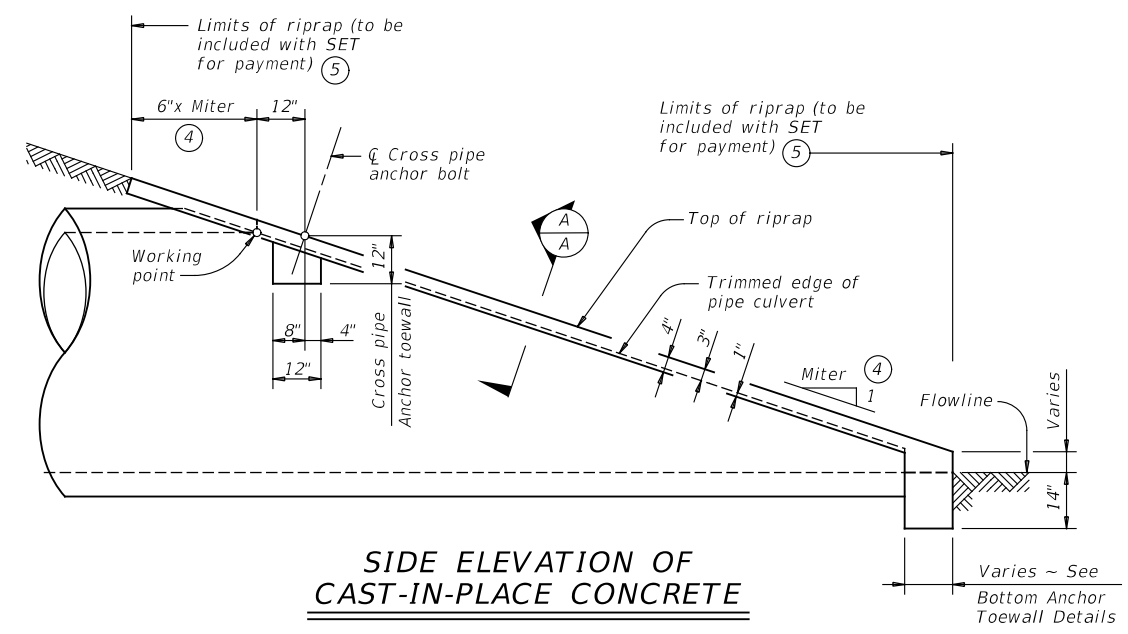
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DIST	COUNTY		SHEET NO.	
SAN	GUADALUPE		288	

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SHOWING TYPICAL PIPE CULVERT AND RIPRAP
SECTION A-A



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.)

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) ⑥
FOR BOTH CORRUGATED METAL PIPE CULVERTS AND CONCRETE PIPE CULVERTS

Design	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
1	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
2	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	1.0
3	0.6	0.6	0.7	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.2
4	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.4
5	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.7
6	0.9	1.0	1.0	N/A	1.1	1.1	1.2	N/A	1.4	1.5	1.6	N/A
7	1.0	1.1	N/A	N/A	1.3	1.3	N/A	N/A	1.7	1.7	N/A	N/A

- ④ Miter = slope of mitered end of pipe culvert.
- 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 pipe culvert. For multiple pipe culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.



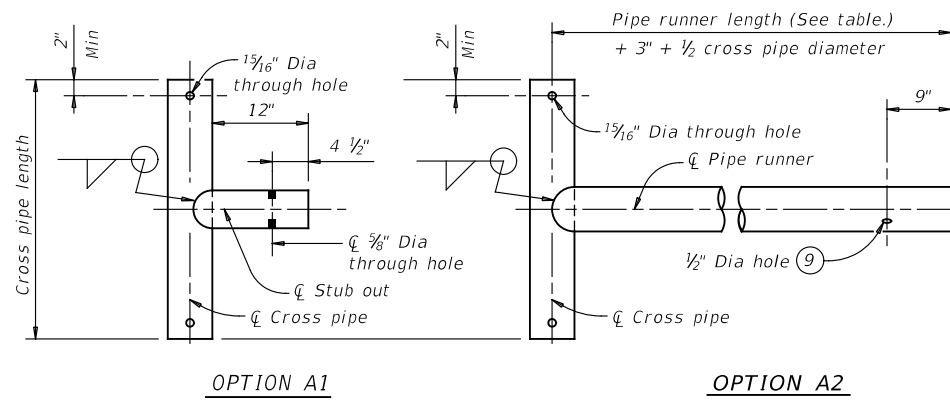
SAFETY END TREATMENT
FOR DESIGN 1 TO 7
ARCH PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD-A

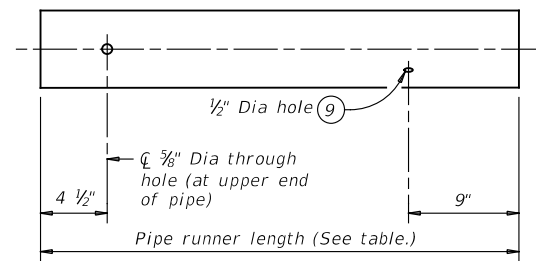
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	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	289	

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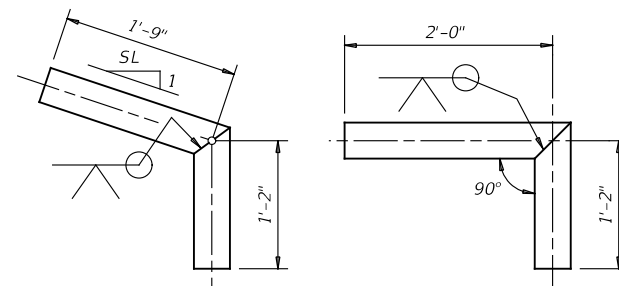


CROSS PIPE AND CONNECTIONS DETAILS

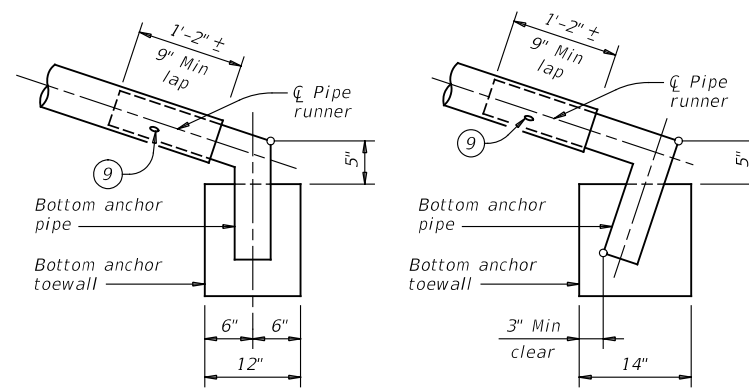


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

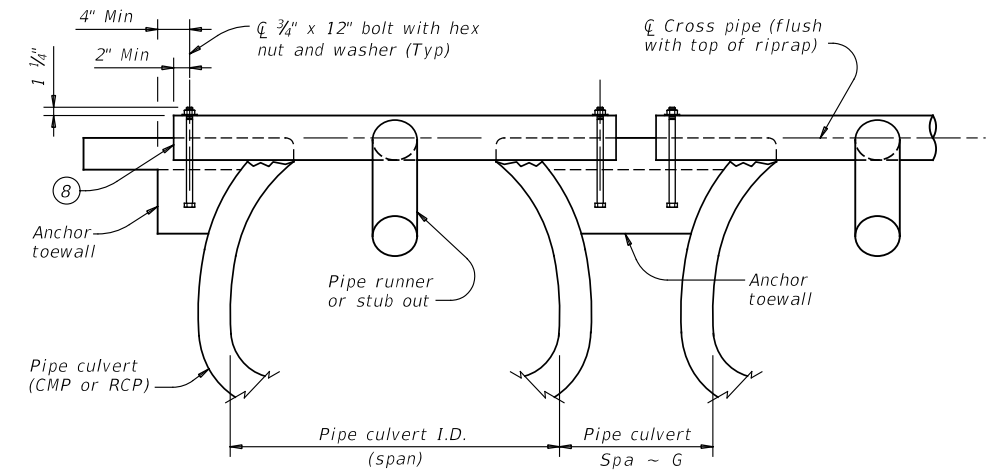


BOTTOM ANCHOR PIPE DETAILS



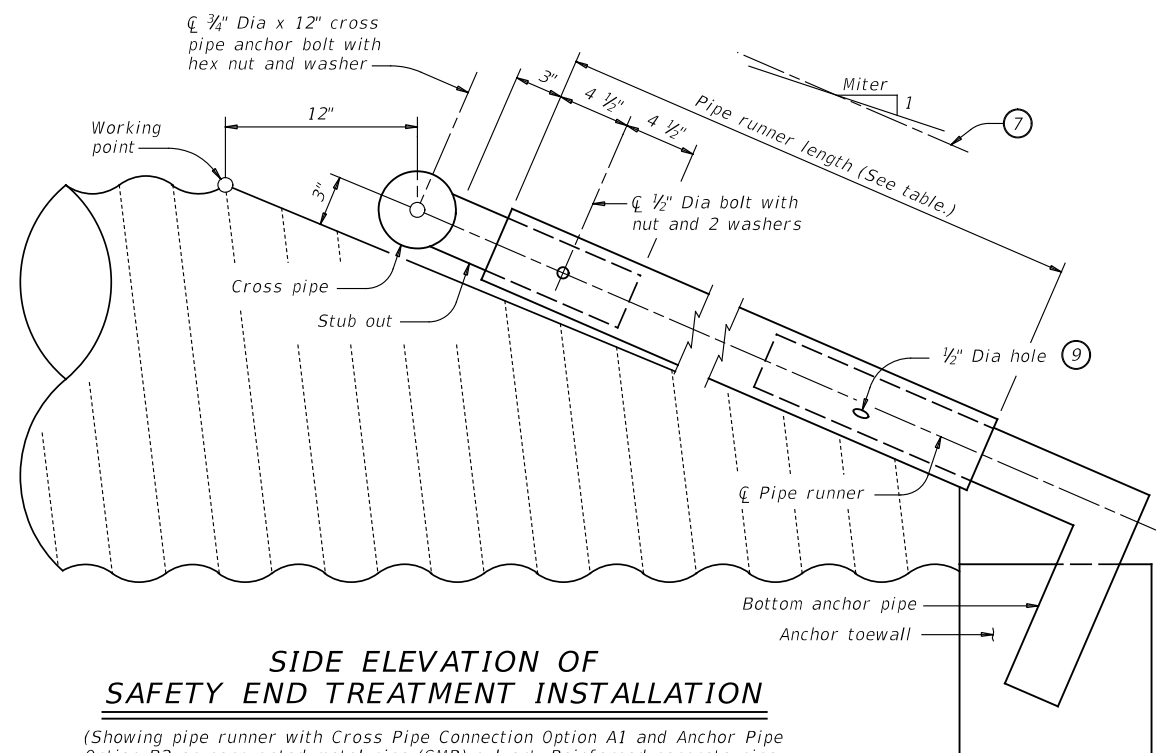
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)



SHOWING CROSS PIPE AND ANCHOR TOEWALL

SECTION A-A



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 (RCP) culvert details are similar. Riprap not shown for clarity.)

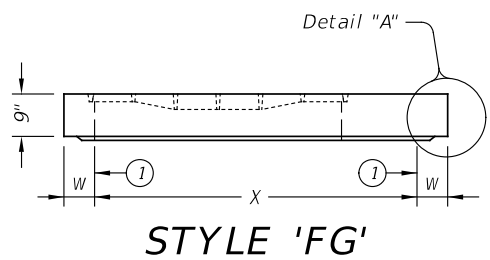
- ⑦ Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.
- ⑧ Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- ⑨ After installation, inspect the 1#2" 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.

SHEET 3 OF 3

		Bridge Division Standard	
SAFETY END TREATMENT FOR DESIGN 1 TO 7 ARCH PIPE CULVERTS TYPE II ~ CROSS DRAINAGE			
SETP-CD-A			
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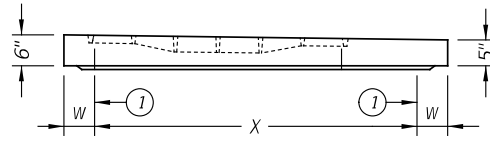
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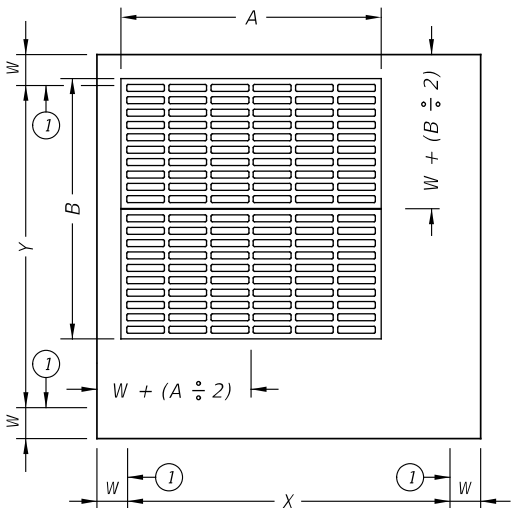
STYLE 'FG'

ORIENT TAPER TO CORRESPOND WITH ROADWAY CROSS-SLOPE.



STYLE 'SFG'

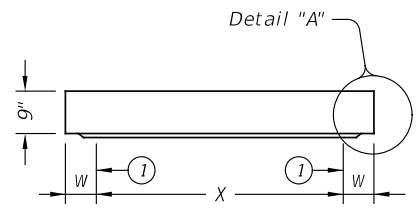
ELEVATION VIEW



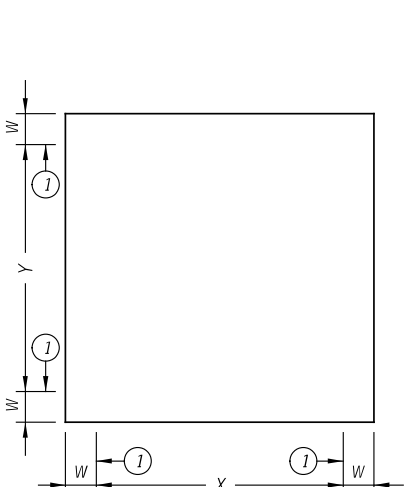
PLAN VIEW

CAST-IN FRAME & GRATE

STYLES 'FG' & 'SFG'



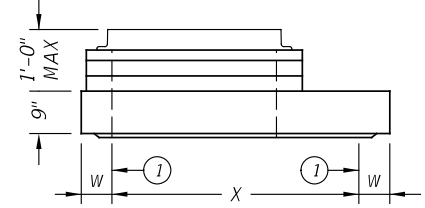
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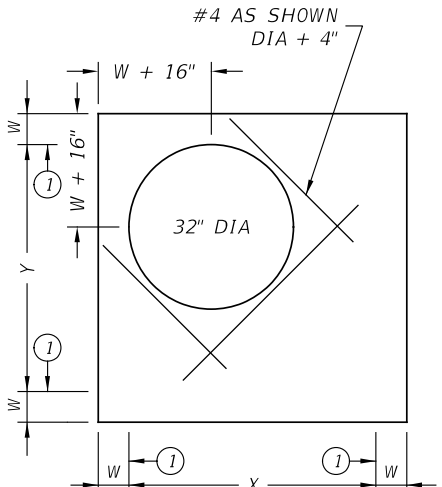
PLAN VIEW

NO OPENINGS

STYLE 'SL'



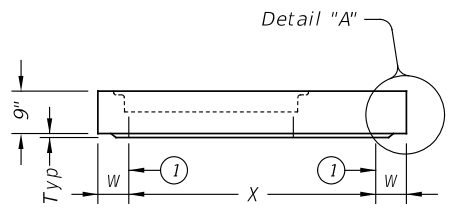
ELEVATION VIEW



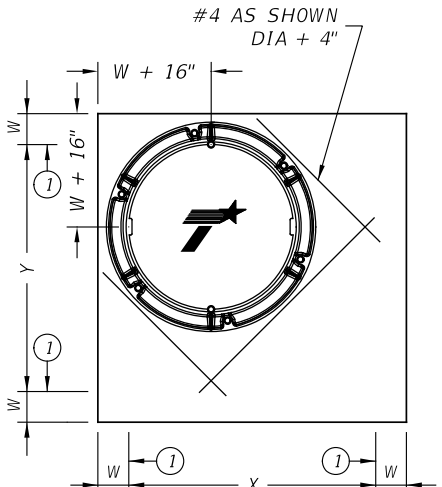
PLAN VIEW

SHIP LOOSE RING & COVER

STYLE 'RH'



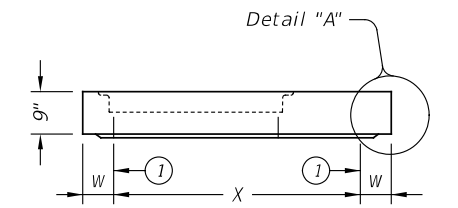
ELEVATION VIEW



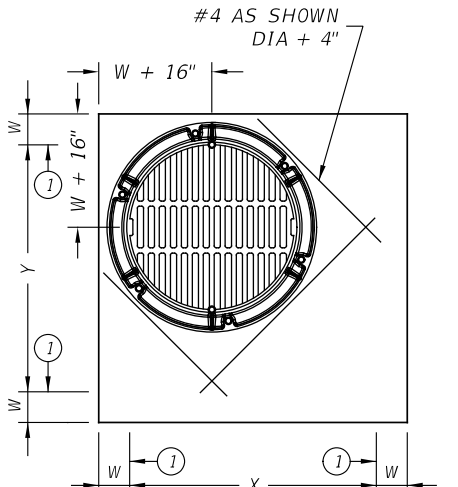
PLAN VIEW

32" DIA CAST-IN RING & COVER

STYLE 'RC'



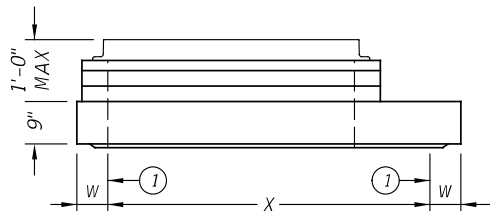
ELEVATION VIEW



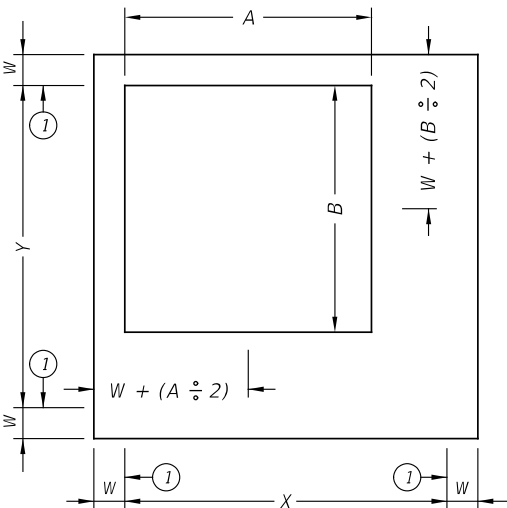
PLAN VIEW

32" DIA CAST-IN RING & GRATE

STYLE 'RG'



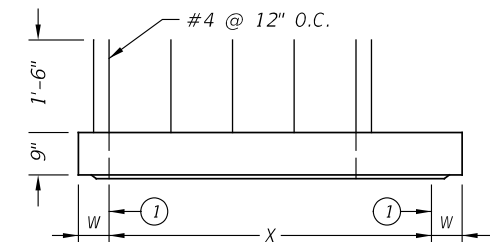
ELEVATION VIEW



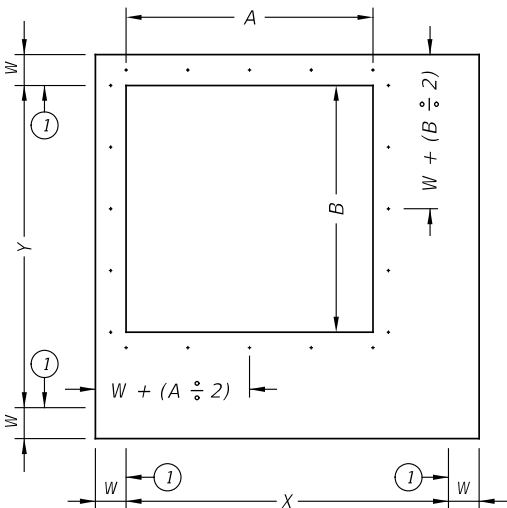
PLAN VIEW

SHIP LOOSE FRAME & GRATE

STYLE 'SH'



ELEVATION VIEW



PLAN VIEW

EXPOSED REBAR

STYLE 'SI'

① Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING

SHEET 1 OF 2



PRECAST SLAB LID

PSL

FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 0215	SECT 09	JOB 035	HIGHWAY FM 725
REVISIONS	DIST SAN	COUNTY GUADALUPE	SHEET NO. 291	

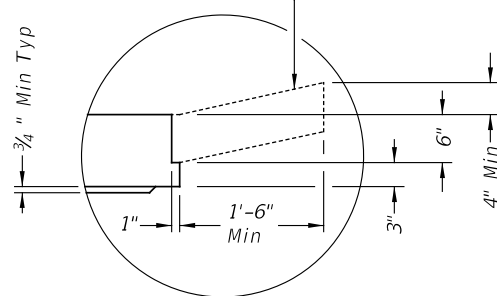
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information provided herein.

DATE: 2/28/2021 6:37:36 PM
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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 in ² /ft	0.37 in ² /ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in ² /ft	0.37 in ² /ft
SFG	3'x3'	6"	3'x3'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x4'	6"	n/a	0.34 in ² /ft	0.34 in ² /ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in ² /ft	0.41 in ² /ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in ² /ft	0.41 in ² /ft
SFG	4'x4'	6"	4'x4'	0.32 in ² /ft	0.32 in ² /ft
SL	3'x5'	6"	n/a	0.39 in ² /ft	0.39 in ² /ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in ² /ft	0.48 in ² /ft
SFG	3'x5'	6"	3'x5'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x5'	6"	n/a	0.42 in ² /ft	0.42 in ² /ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in ² /ft	0.42 in ² /ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in ² /ft	0.66 in ² /ft
SL	5'x5'	6"	n/a	0.36 in ² /ft	0.36 in ² /ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in ² /ft	0.43 in ² /ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in ² /ft	0.63 in ² /ft
SL	5'x6'	6"/8"	n/a	0.48 in ² /ft	0.48 in ² /ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in ² /ft	0.60 in ² /ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in ² /ft	0.60 in ² /ft
SL	6'x6'	6"/8"	n/a	0.43 in ² /ft	0.43 in ² /ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in ² /ft	0.59 in ² /ft
SL	8'x8'	8"/10"	n/a	0.45 in ² /ft	0.45 in ² /ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in ² /ft	0.45 in ² /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 3/4" 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 3/4".
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 1/2 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



Bridge Division Standard

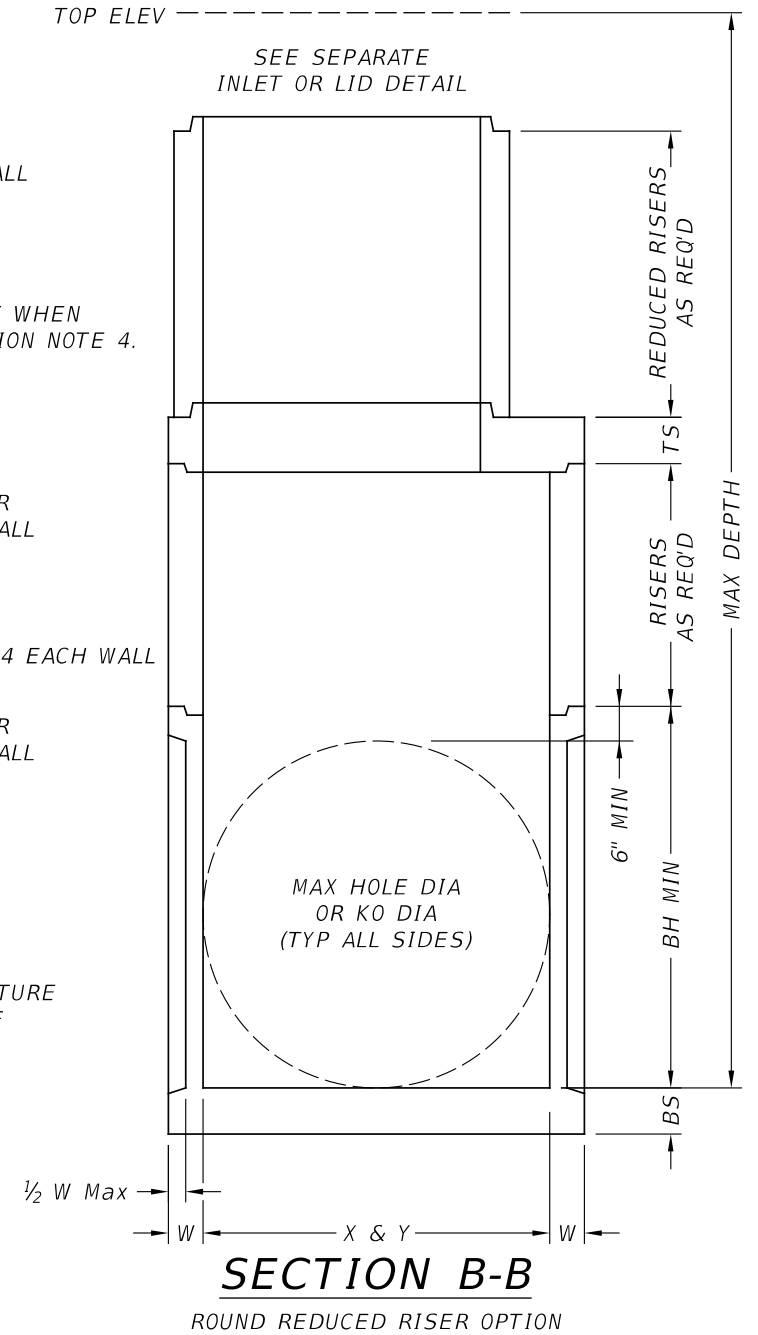
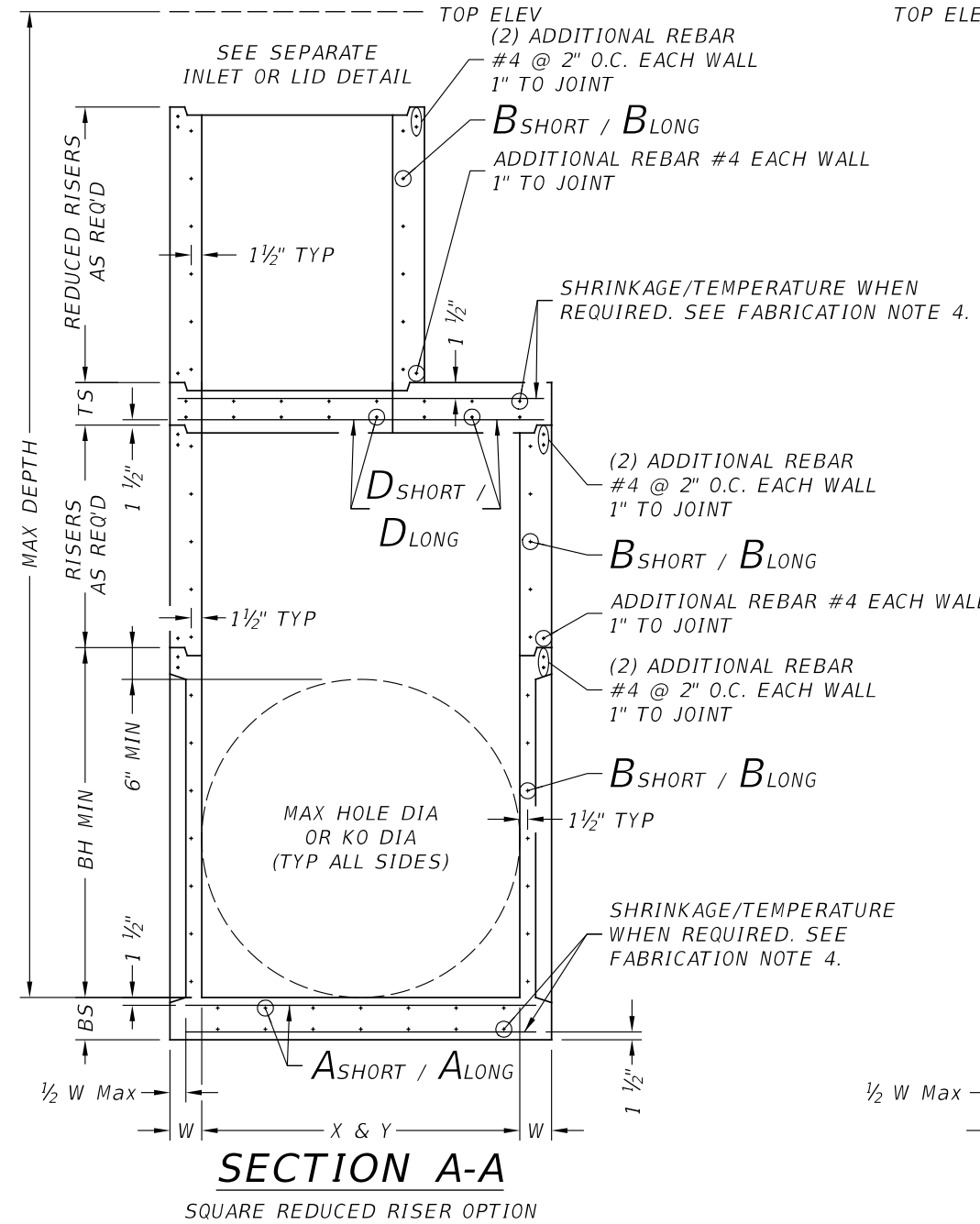
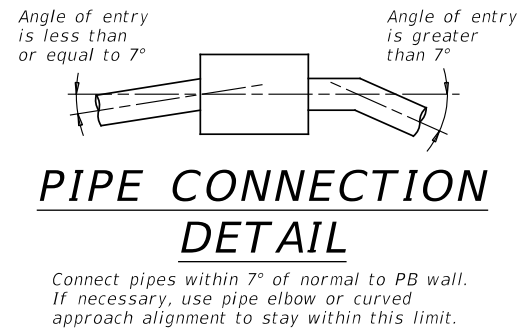
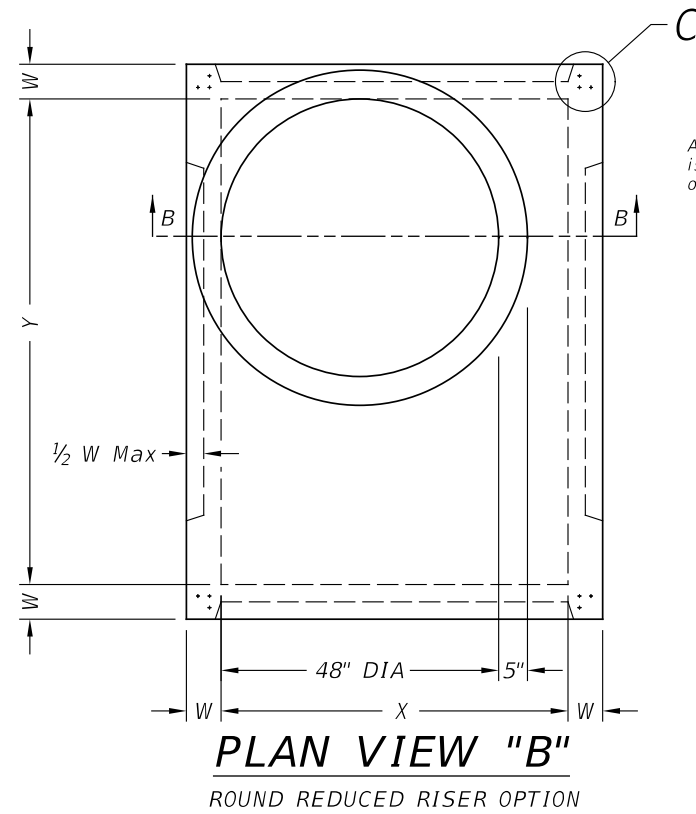
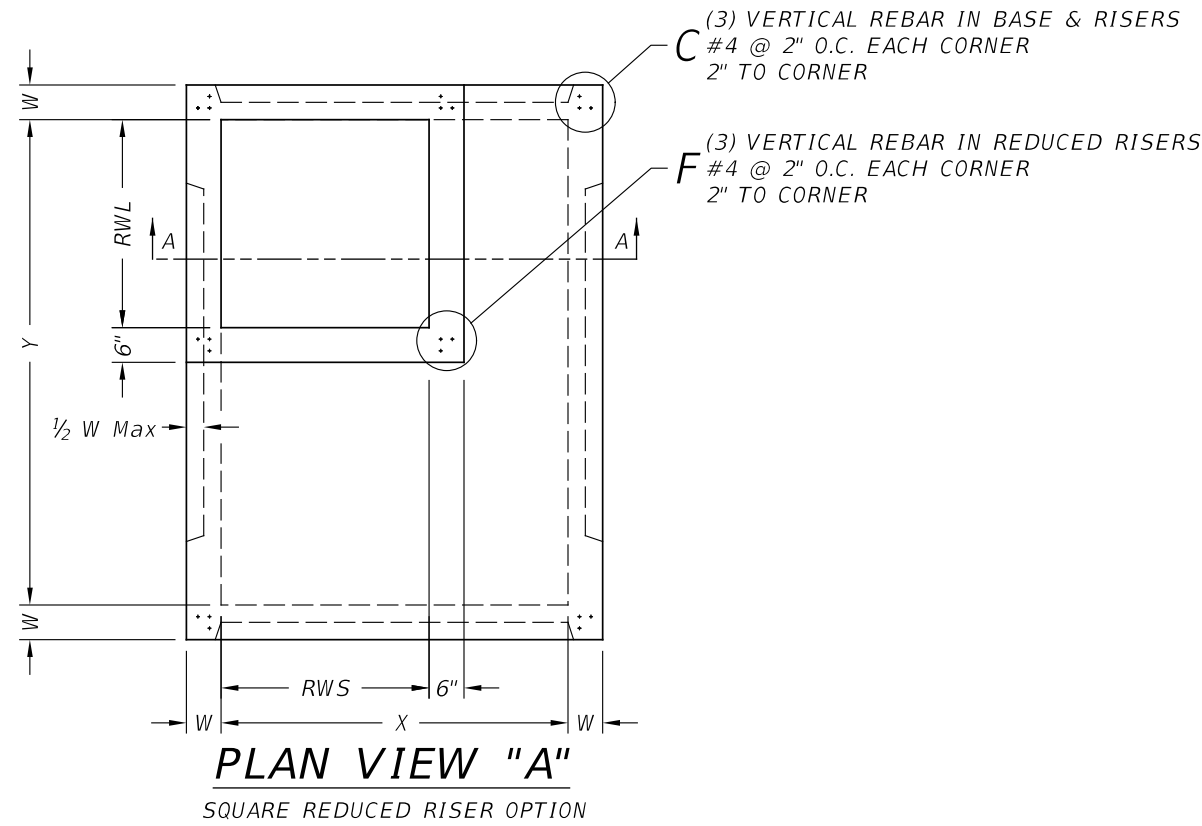
PRECAST SLAB LID

PSL

FILE: prest05-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	292	

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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 1/2" 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 in²/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 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

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 1/2 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."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING		Bridge Division Standard	
PRECAST BASE			
PB			
FILE: prestd01-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT February 2020	CONT 0215	SECT 09	JOB 035
REVISIONS	COUNTY		HIGHWAY
	SAN GUADALUPE		FM 725
	SHEET NO.		293

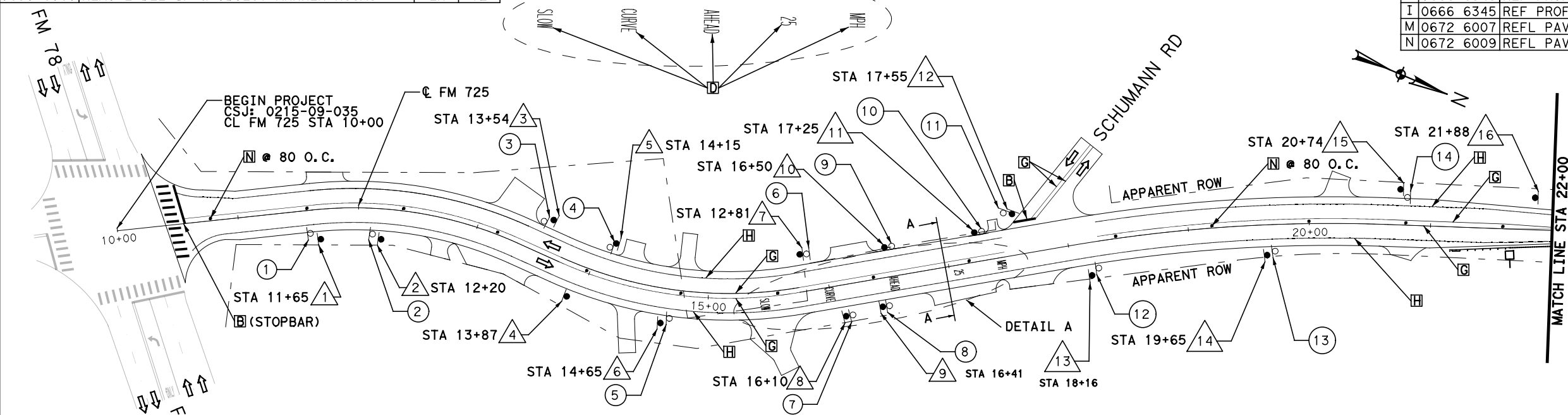
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ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	22
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
0644 6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1
0644 6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	2
0644 6064	IN BRIDGE MNT CLEARANCE SIGN ASSM (TYN)	EA	2
0644 6076	REMOVE SM RD SN SUP&AM	EA	29
0658 6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	9
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	12

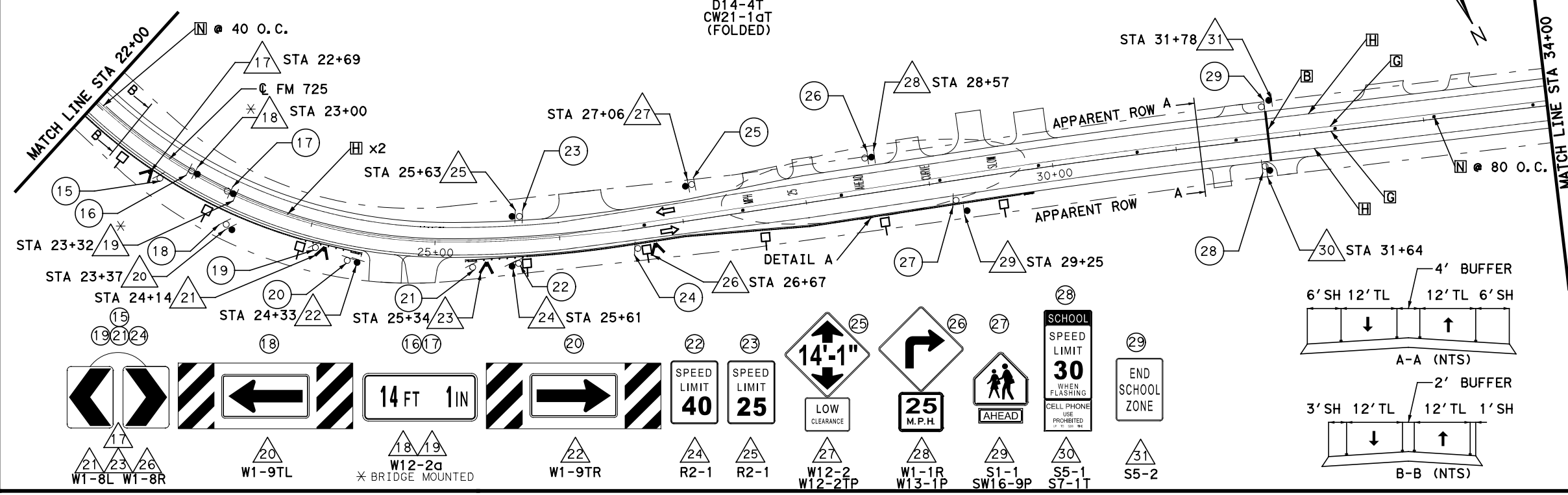
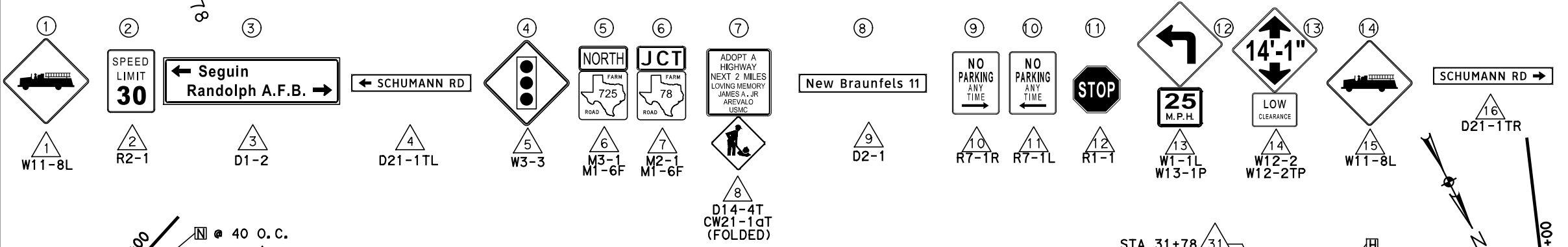
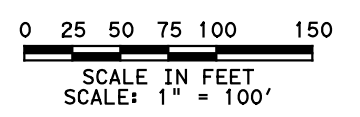
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0666 6224	PAVEMENT SEALER 4"	LF	4992
0666 6225	PAVEMENT SEALER 6"	LF	4548
0666 6230	PAVEMENT SEALER 24"	LF	175
0666 6232	PAVEMENT SEALER (WORD)	LF	10
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	175
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	10
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4188
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4548
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	804
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	54

DETAIL A (NTS)



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - ⇨ DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▬ DELINEATOR (D-SW)
 - ∨ LED CHEVRON



NAME _____ DATE 4/27/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895/FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

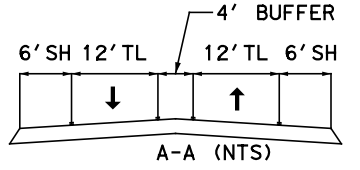
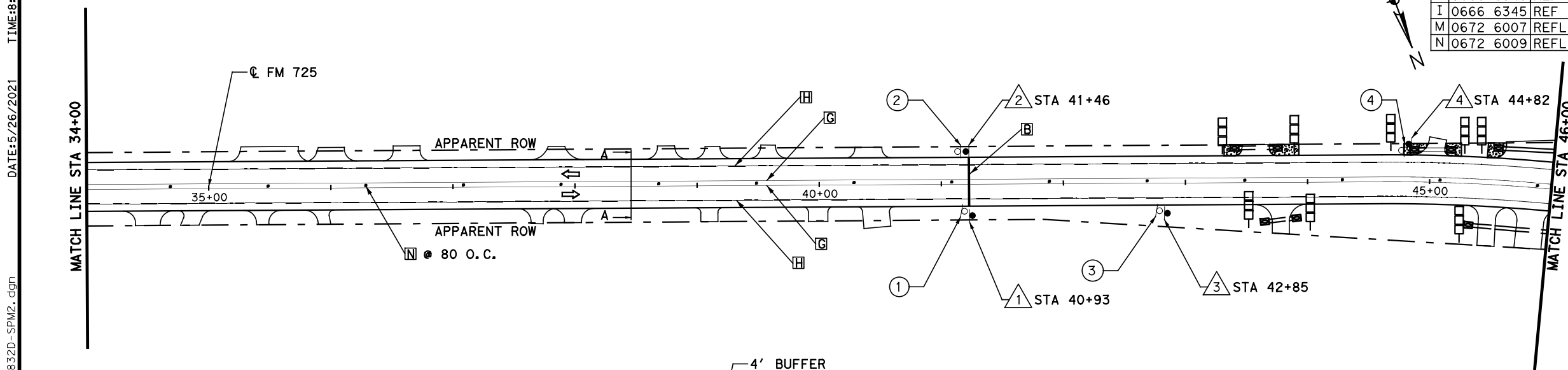
Texas Department of Transportation
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FM 725 SIGNING & PAVEMENT MARKINGS LAYOUT			
SHEET 1 OF 14			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	294	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

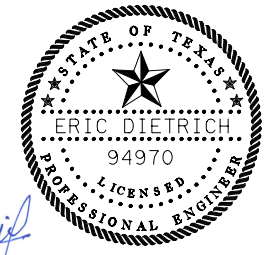
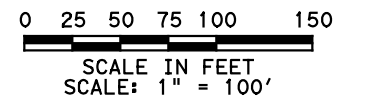
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0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	10
0658 6099	INSTL OM ASSM (OM-2Z) (WFLX)GND	EA	18
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	1

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	4762
0666 6225	PAVEMENT SEALER 6"	LF	4706
0666 6230	PAVEMENT SEALER 24"	LF	71
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	71
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL)	LF	
G 0666 6315	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	4762
H 0666 6343	REF PROF PAV MRK TYI (W) 6" (SLD) (100MIL)	LF	4706
I 0666 6345	REF PROF PAV MRK TYI (Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	30



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▬ DELINEATOR (D-SW)
 - ∨ LED CHEVRON



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

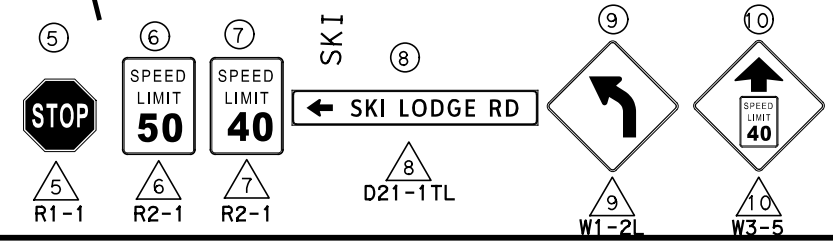
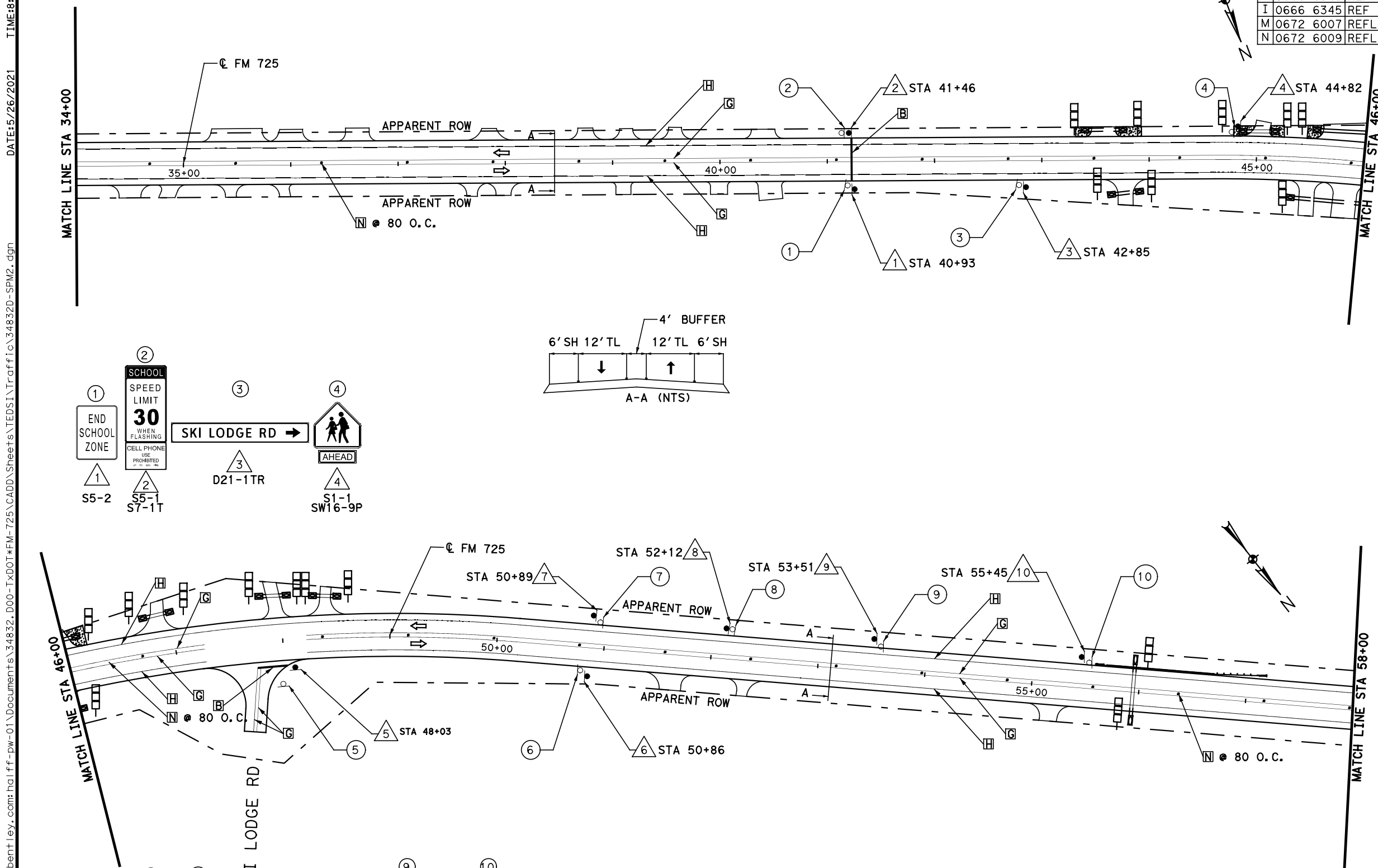
TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898



**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 2 OF 14

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	295
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL SECTION	JOB	HIGHWAY NO.
0215	09 035	FM 725



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ITEM	DESCRIPTION	UNIT	QTY
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0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	3
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0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	2

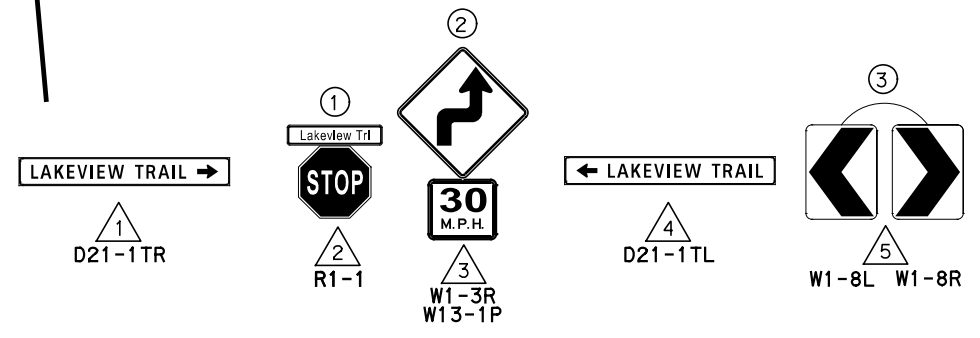
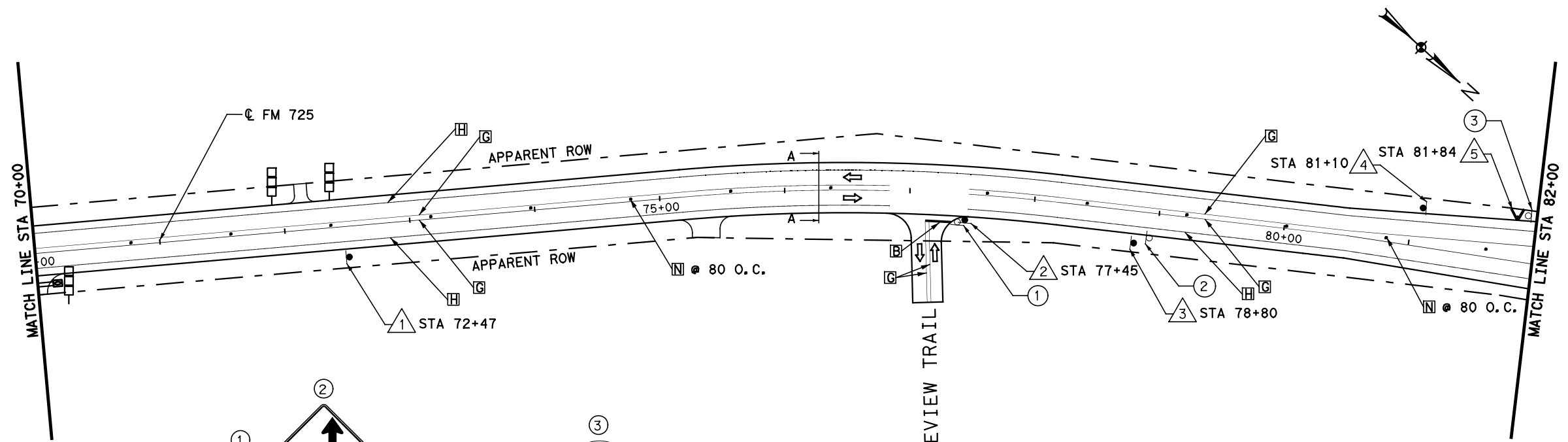
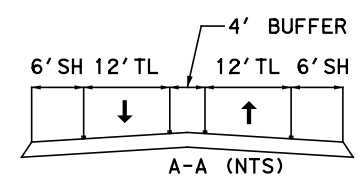
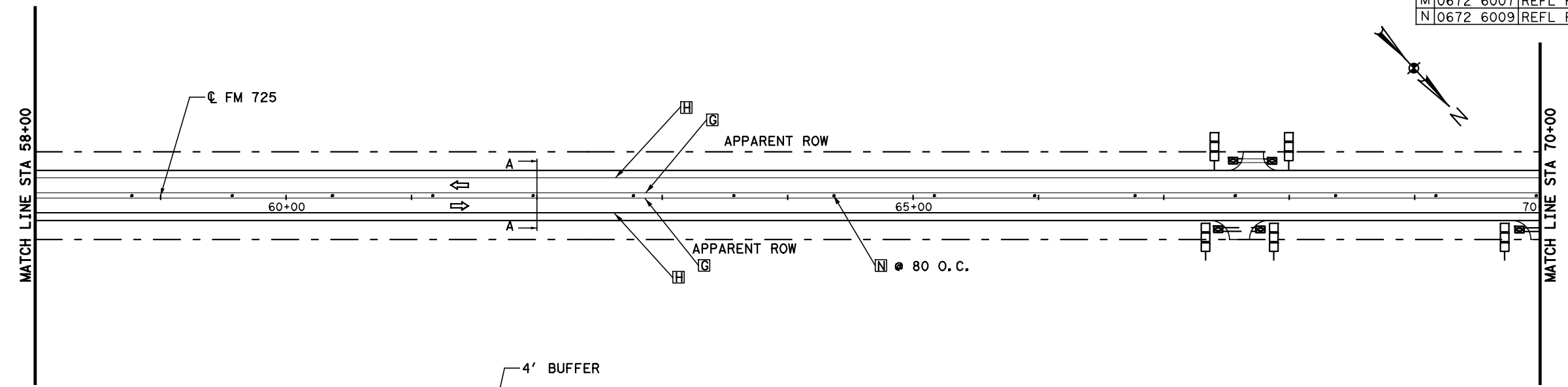
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0666 6225	PAVEMENT SEALER 6"	LF	4737
0666 6230	PAVEMENT SEALER 24"	LF	22
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	22
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4785
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4737
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	30

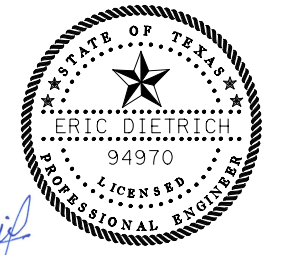
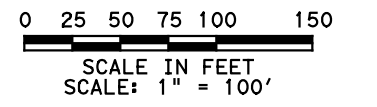
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DATE: 5/26/2021

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- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △# PROPOSED SIGNS
 - ⇨ DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▬ DELINEATOR (D-SW)
 - ∨ LED CHEVRON



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

TBPE F-1640



**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 3 OF 14

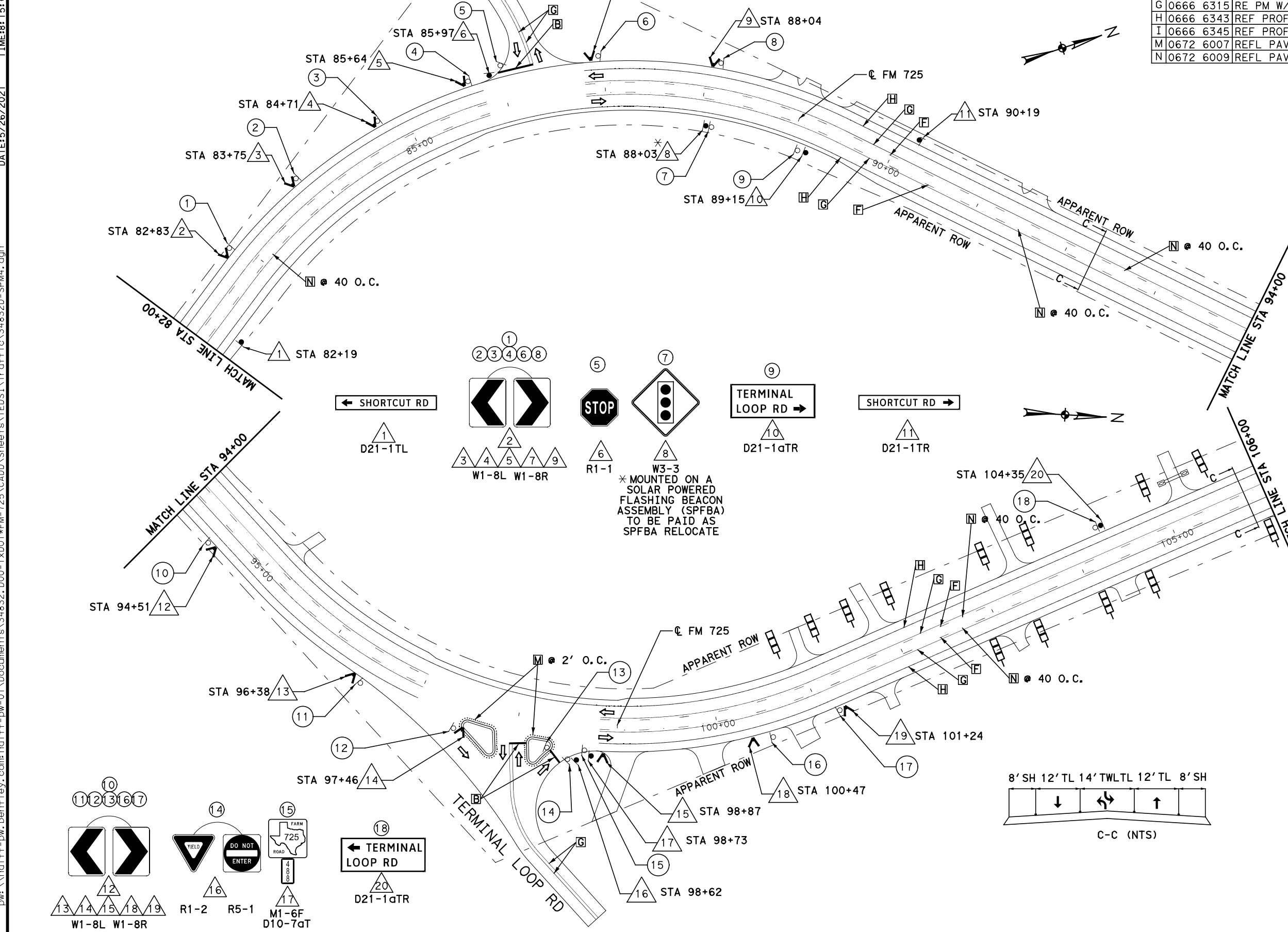
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	296	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TIME: 8:15:05 AM
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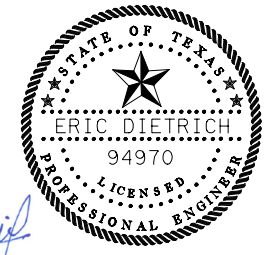
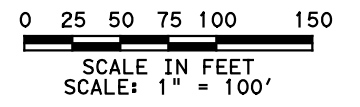
ESTIMATED QUANTITIES SIGNING				
ITEM	DESCRIPTION	UNIT	QTY	
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14	
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3	
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA		
0644 6076	REMOVE SM RD SN SUP&AM	EA	18	
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	13	

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.				
ITEM	DESCRIPTION	UNIT	QTY	
0666 6224	PAVEMENT SEALER 4"	LF	5741	
0666 6225	PAVEMENT SEALER 6"	LF	4343	
0666 6230	PAVEMENT SEALER 24"	LF	88	
0666 6232	PAVEMENT SEALER (WORD)	LF		
0666 6233	PAVEMENT SEALER (MED NOSE)	LF		

ESTIMATED QUANTITIES PAVEMENT MARKINGS				
ITEM	DESCRIPTION	UNIT	QTY	
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF		
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	88	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA		
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA		
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA		
F 0666 6312	RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL)	LF	1000	
G 0666 6315	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	4741	
H 0666 6343	REF PROF PAV MRK TY I (W) 6" (SLD) (100MIL)	LF	4343	
I 0666 6345	REF PROF PAV MRK TY I (Y) 4" (SLD) (100MIL)	LF		
M 0672 6007	REFL PAV MRKR TY I-C	EA	99	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	100	



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - DELINEATOR (D-SW)
 - ∨ LED CHEVRON



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

Texas Department of Transportation
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**FM 725
 SIGNING & PAVEMENT MARKINGS
 LAYOUT**

SHEET 4 OF 14

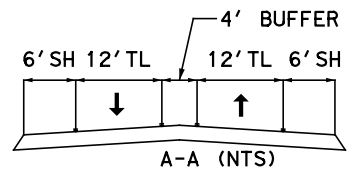
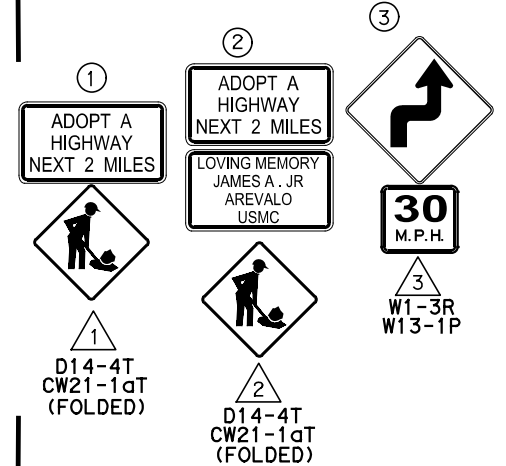
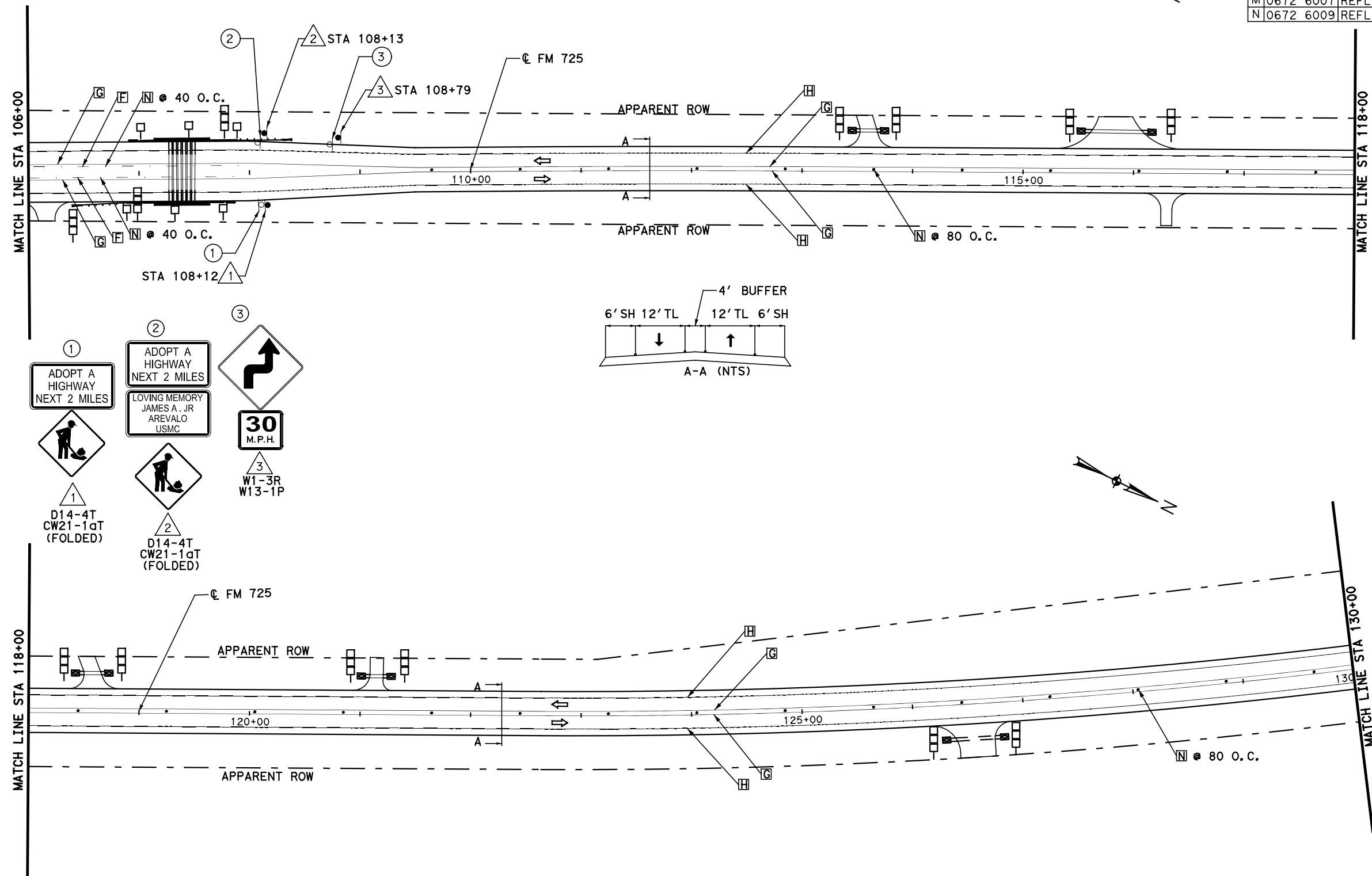
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	297	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

TIME: 8:26:35 AM
 DATE: 5/26/2021
 pw: \\halff-pw-bentley.com:halff-pw-01\Documents\34832_000-TXD01\FM-725\CADD\Sheets\Traffic\34832D-SPM5.dgn

ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
0644 6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1
0644 6076	REMOVE SM RD SN SUP&AM	EA	3
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	13
0658 6062	INSTR DEL ASSM (D-SW) SZ1 (BRF) GF2 BI	EA	6
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	8

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	4900
0666 6225	PAVEMENT SEALER 6"	LF	4800
0666 6230	PAVEMENT SEALER 24"	LF	
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

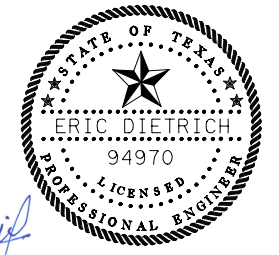
ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	100
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4800
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4800
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	37



SIGNING LEGEND:

- # EXISTING SIGNS TO BE REMOVED
- △# PROPOSED SIGNS
- ⇨ DIRECTION OF TRAFFIC FLOW
- OBJECT MARKER (OM-2Z)
- ▬ DELINEATOR (D-SW)
- ∨ LED CHEVRON

0 25 50 75 100 150
 SCALE IN FEET
 SCALE: 1" = 100'



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898



**FM 725
 SIGNING & PAVEMENT MARKINGS
 LAYOUT**

SHEET 5 OF 14

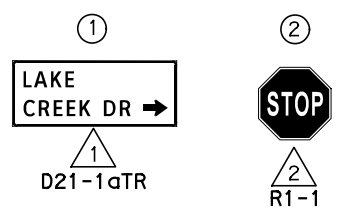
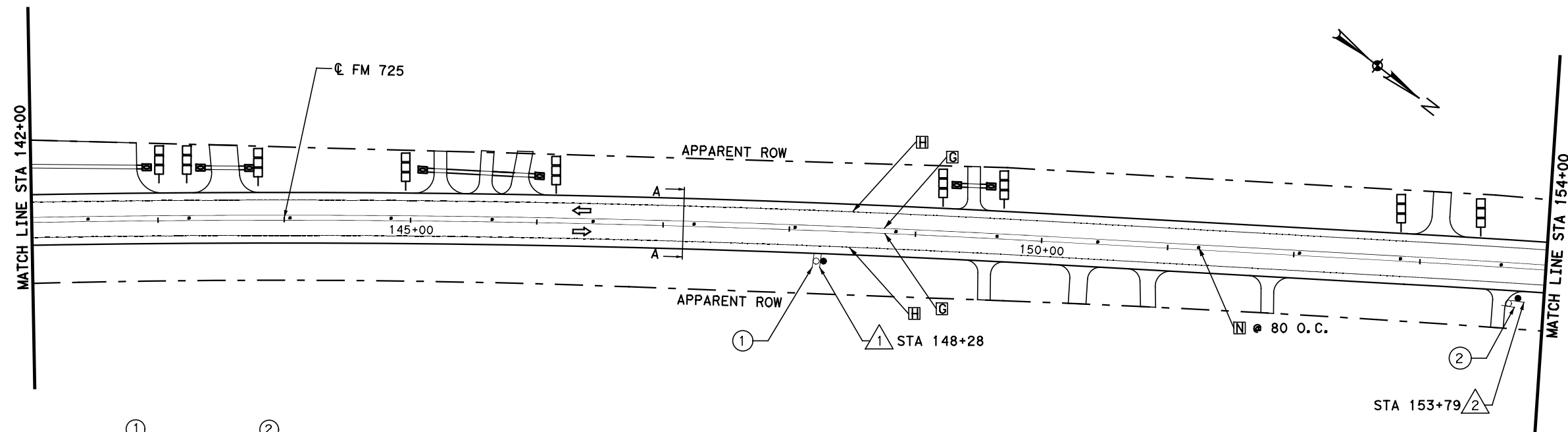
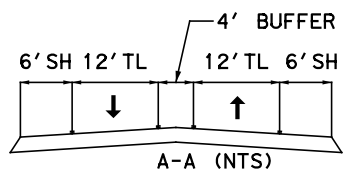
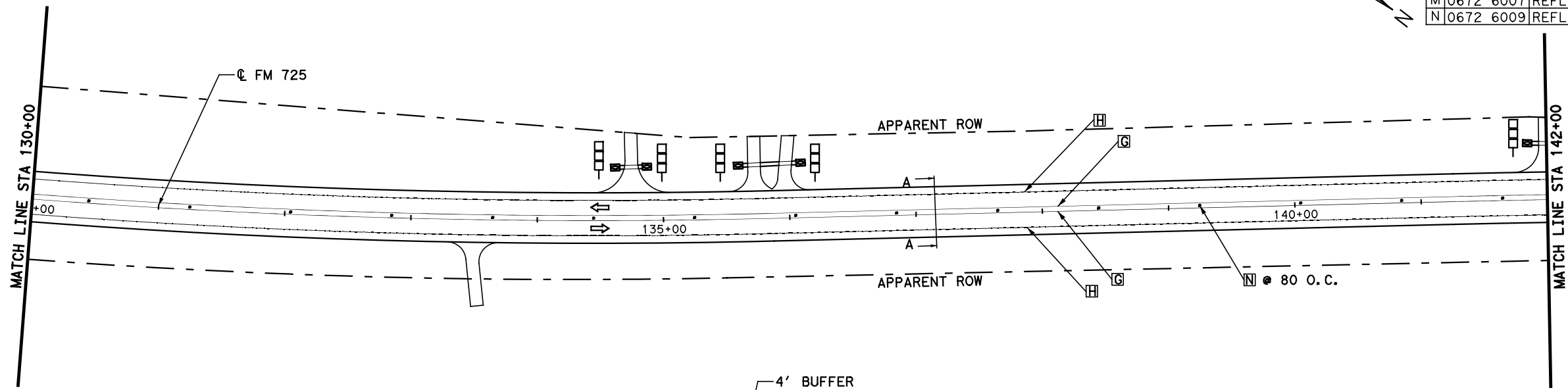
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STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

TIME: 8:15:34 AM
 DATE: 5/26/2021
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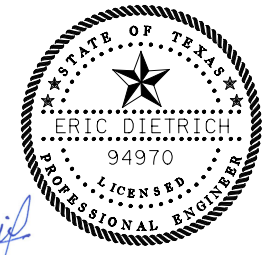
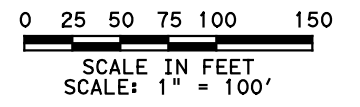
ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	2
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	14

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	4800
0666 6225	PAVEMENT SEALER 6"	LF	4800
0666 6230	PAVEMENT SEALER 24"	LF	
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4800
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4800
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	30



- SIGNING LEGEND:**
- ⊘ EXISTING SIGNS TO BE REMOVED
 - ⊠ PROPOSED SIGNS
 - ⇨ DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▭ DELINEATOR (D-SW)
 - ∨ LED CHEVRON



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898



**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 6 OF 14

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		299
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	6
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	3
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	19
0658 6062	INSTR DEL ASSM (D-SW) SZ1 (BRF) GF2 BI	EA	6
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	7

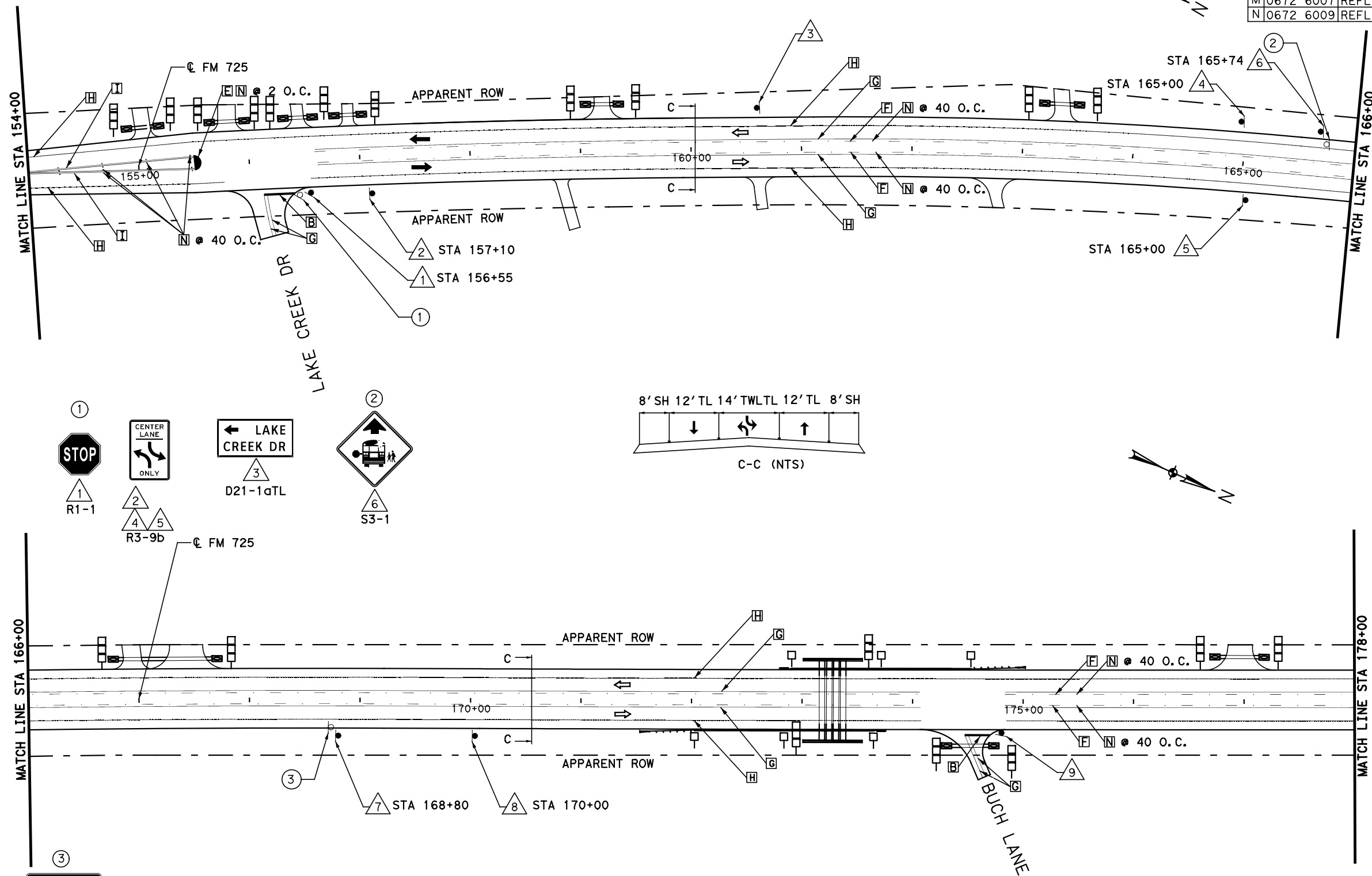
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ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	5948
0666 6225	PAVEMENT SEALER 6"	LF	4653
0666 6230	PAVEMENT SEALER 24"	LF	52
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	1

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	52
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	1
F 0666 6312	RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL)	LF	1040
G 0666 6315	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	4308
H 0666 6343	REF PROF PAV MRK TY I (W) 6" (SLD) (100MIL)	LF	4653
I 0666 6345	REF PROF PAV MRK TY I (Y) 4" (SLD) (100MIL)	LF	600
M 0672 6007	REFL PAV MRKR TY I-C	EA	18
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	55

TIME: 8:15:49 AM

DATE: 5/26/2021

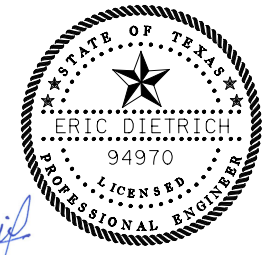
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SIGNING LEGEND:

- # EXISTING SIGNS TO BE REMOVED
- △# PROPOSED SIGNS
- ⇨ DIRECTION OF TRAFFIC FLOW
- OBJECT MARKER (OM-2Z)
- ▬ DELINEATOR (D-SW)
- ∨ LED CHEVRON

0 25 50 75 100 150
SCALE IN FEET
SCALE: 1" = 100'



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898



**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 7 OF 14

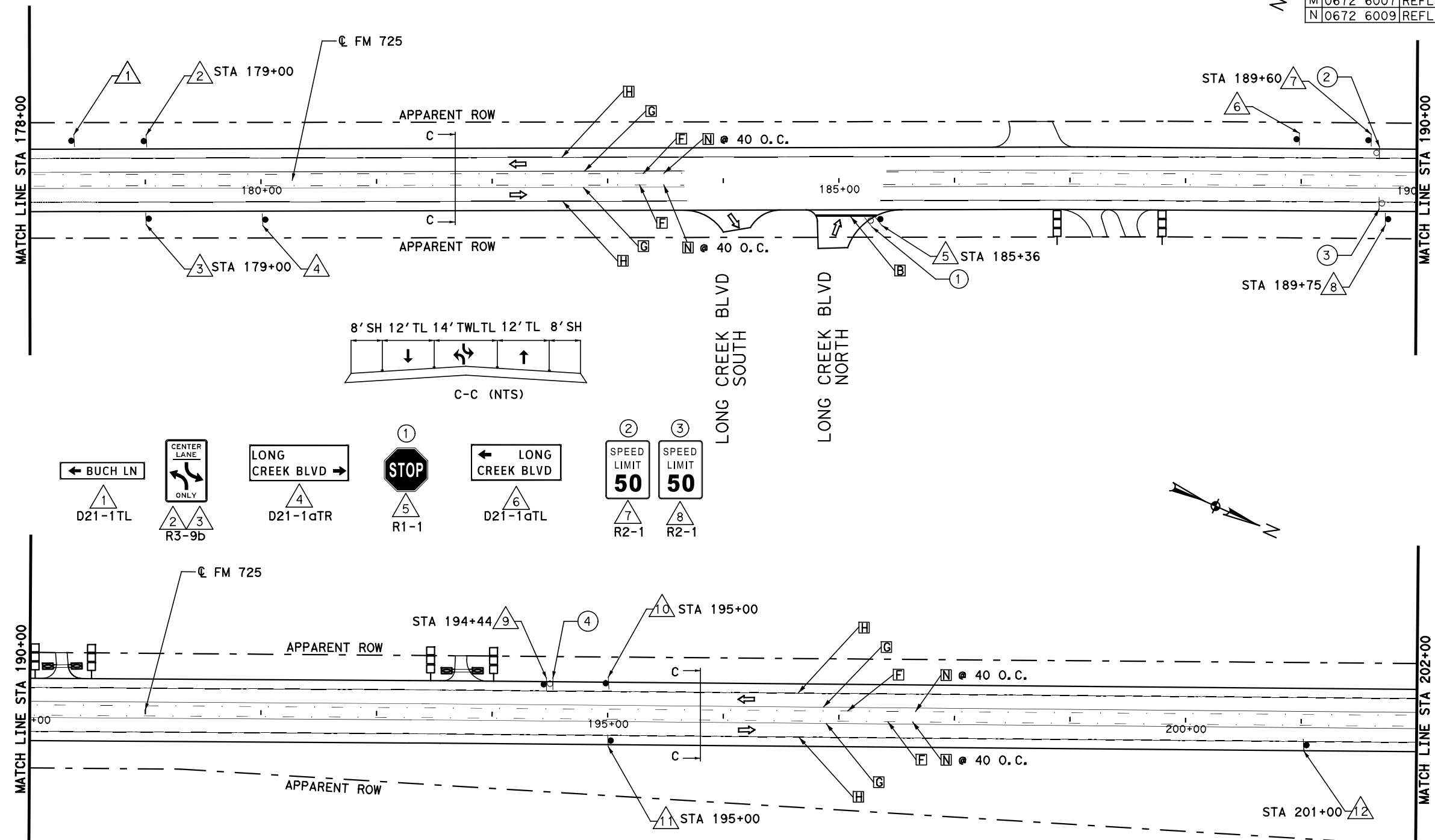
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	300
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL SECTION	JOB	HIGHWAY NO.
0215	09 035	FM 725

TIME: 8:16:04 AM
 DATE: 5/26/2021
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ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	7
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
0644 6076	REMOVE SM RD SN SUP&AM	EA	4
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	6

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	5694
0666 6225	PAVEMENT SEALER 6"	LF	4633
0666 6230	PAVEMENT SEALER 24"	LF	59
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

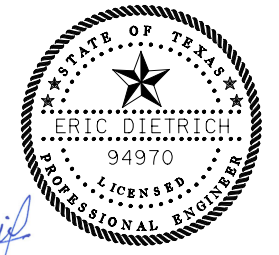
ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	59
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	1140
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4554
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4633
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	56



SIGNING LEGEND:

- # EXISTING SIGNS TO BE REMOVED
- △ PROPOSED SIGNS
- ⇨ DIRECTION OF TRAFFIC FLOW
- OBJECT MARKER (OM-2Z)
- ▬ DELINEATOR (D-SW)
- ∨ LED CHEVRON

0 25 50 75 100 150
SCALE IN FEET
SCALE: 1" = 100'



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898



**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 8 OF 14

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	301
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL SECTION	JOB	HIGHWAY NO.
0215 09	035	FM 725

④ ADOPT A HIGHWAY NEXT 2 MILES

⑨ D14-4T CW21-1aT (FOLDED)

⑩ ⑪ R3-9b

CENTER LANE ONLY

STREET A SOUTH →

⑫ D21-1aTR

① BUCH LN D21-1TL

② ③ CENTER LANE ONLY R3-9b

④ LONG CREEK BLVD D21-1aTR

⑤ STOP R1-1

⑥ LONG CREEK BLVD D21-1aTL

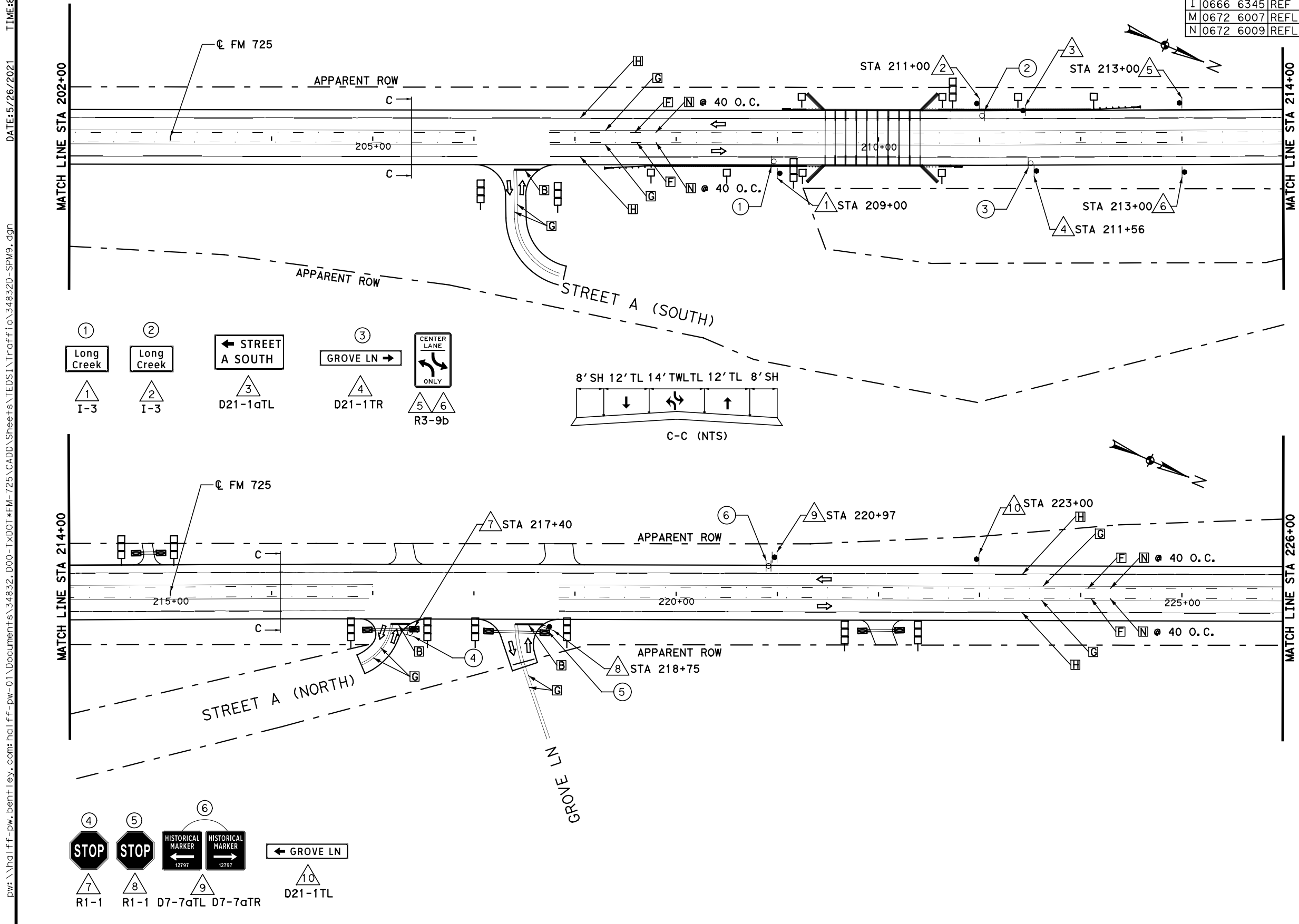
⑦ SPEED LIMIT 50 R2-1

⑧ SPEED LIMIT 50 R2-1

ESTIMATED QUANTITIES SIGNING				
ITEM	DESCRIPTION	UNIT	QTY	
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	6	
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3	
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA		
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA		
0644 6076	REMOVE SM RD SN SUP&AM	EA	6	
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX)GND	EA	12	
0658 6062	INSTR DEL ASSM (D-SW)SZ1(BRF)GF2 BI	EA	8	
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	3	

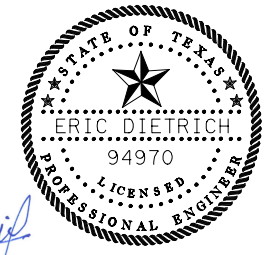
ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.				
ITEM	DESCRIPTION	UNIT	QTY	
0666 6224	PAVEMENT SEALER 4"	LF	5954	
0666 6225	PAVEMENT SEALER 6"	LF	4536	
0666 6230	PAVEMENT SEALER 24"	LF	68	
0666 6232	PAVEMENT SEALER (WORD)	LF		
0666 6233	PAVEMENT SEALER (MED NOSE)	LF		

ESTIMATED QUANTITIES PAVEMENT MARKINGS				
ITEM	DESCRIPTION	UNIT	QTY	
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF		
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	68	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA		
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA		
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA		
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	1080	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4874	
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4536	
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF		
M 0672 6007	REFL PAV MRKR TY I-C	EA		
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	108	



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - ⇨ DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▬ DELINEATOR (D-SW)
 - ∨ LED CHEVRON

0 25 50 75 100 150
 SCALE IN FEET
 SCALE: 1" = 100'



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895/FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

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**FM 725
 SIGNING & PAVEMENT MARKINGS
 LAYOUT**

SHEET 9 OF 14

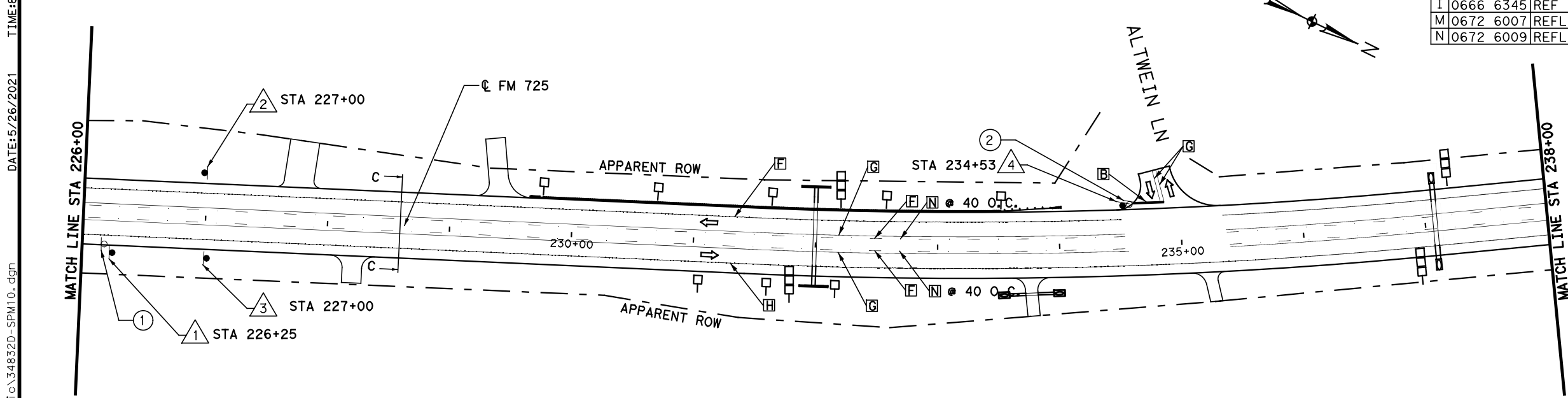
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	302
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL SECTION	JOB	HIGHWAY NO.
0215 09	035	FM 725

TIME: 8:16:19 AM
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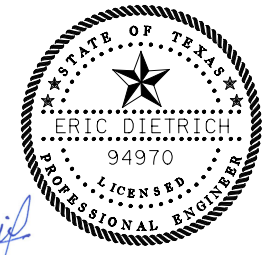
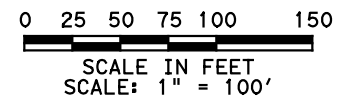
ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	3
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX)GND	EA	4
0658 6062	INSTR DEL ASSM (D-SW)SZ1(BRF)GF2 BI	EA	8
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	4

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	5890
0666 6225	PAVEMENT SEALER 6"	LF	4717
0666 6230	PAVEMENT SEALER 24"	LF	27
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	27
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	1160
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4730
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4717
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	116



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - ⇨ DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▣ DELINEATOR (D-SW)
 - ∨ LED CHEVRON



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

TBPE F-1640

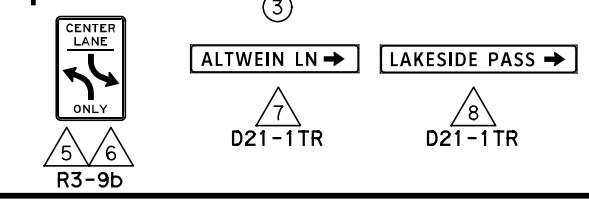
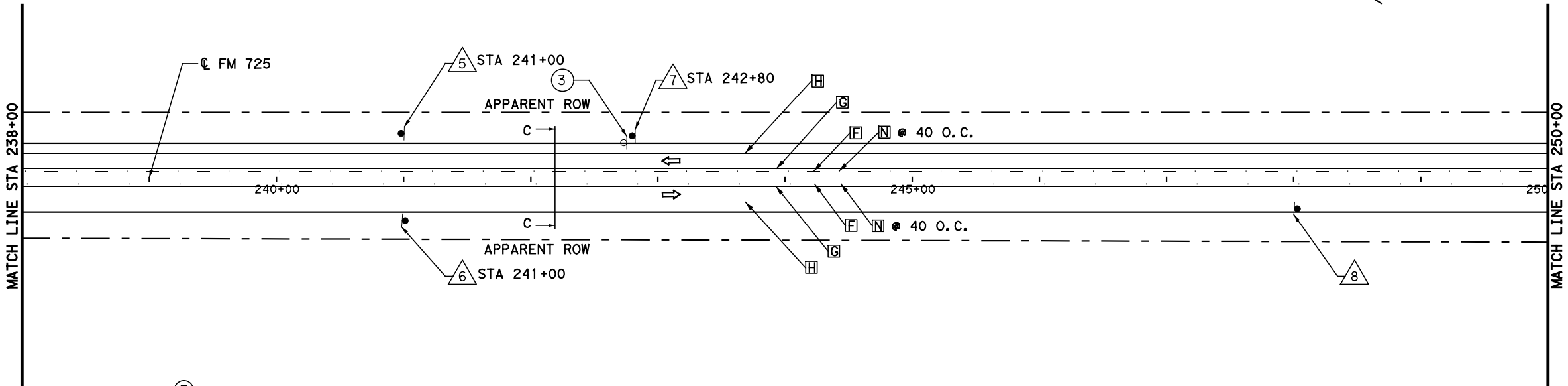
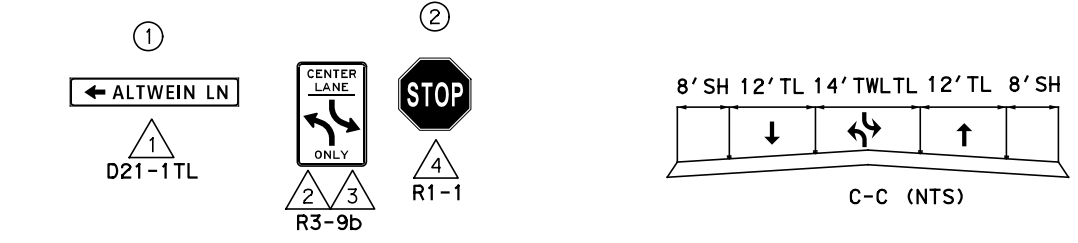


**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 10 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 303
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

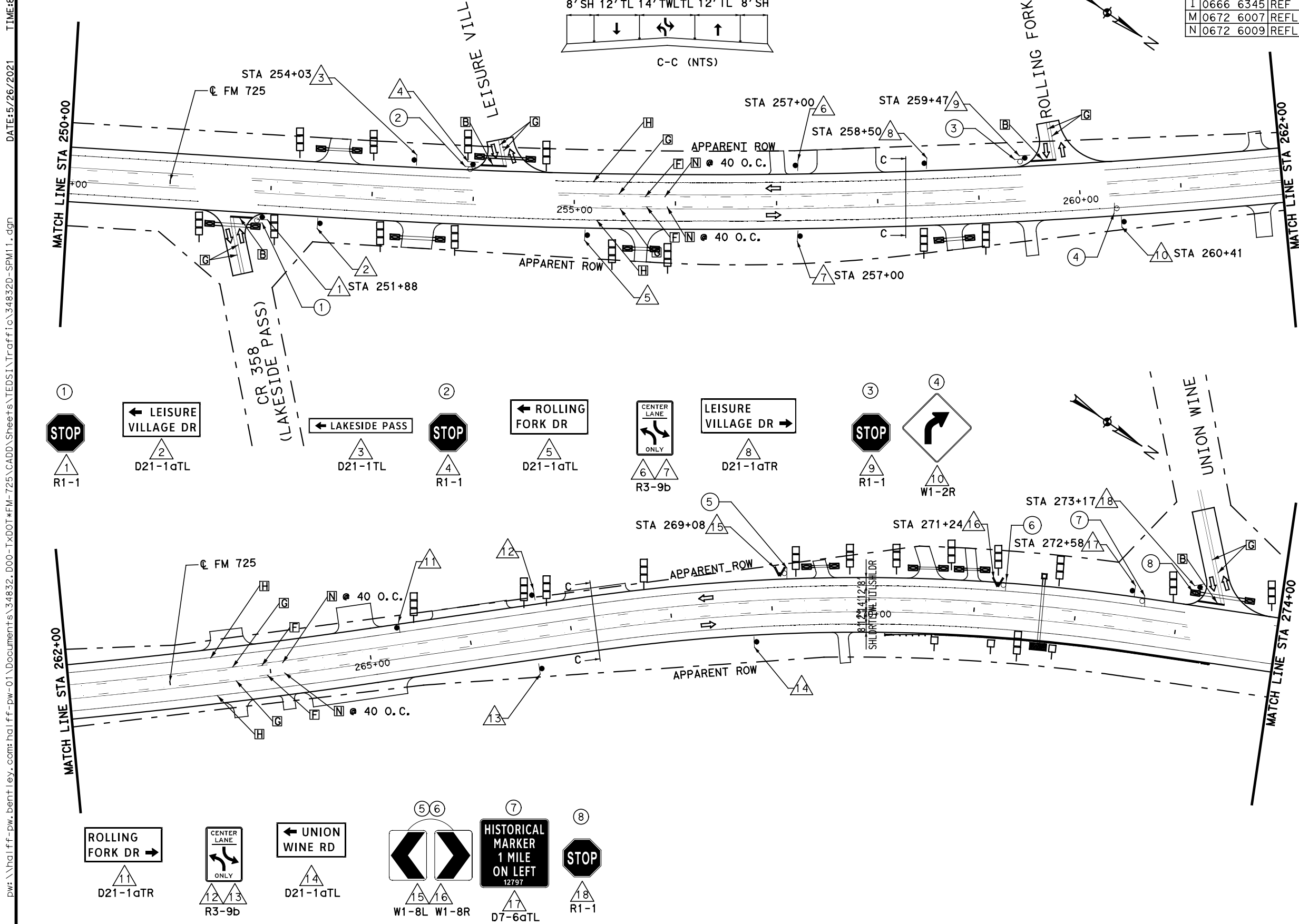
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ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	8
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	27
0658 6062	INSTR DEL ASSM (D-SW) SZ1 (BRF) GF2 BI	EA	3
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	6

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	5699
0666 6225	PAVEMENT SEALER 6"	LF	4481
0666 6230	PAVEMENT SEALER 24"	LF	99
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

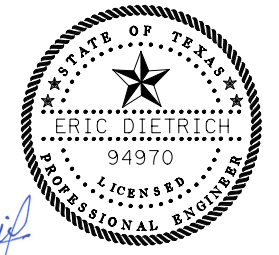
ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	99
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I (Y) 4" (BRK) (100MIL)	LF	1050
G 0666 6315	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	4649
H 0666 6343	REF PROF PAV MRK TY I (W) 6" (SLD) (100MIL)	LF	4481
I 0666 6345	REF PROF PAV MRK TY I (Y) 4" (SLD) (100MIL)	LF	
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	106



SIGNING LEGEND:

- # EXISTING SIGNS TO BE REMOVED
- △ PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW
- OBJECT MARKER (OM-2Z)
- ▬ DELINEATOR (D-SW)
- ∨ LED CHEVRON

0 25 50 75 100 150
SCALE IN FEET
SCALE: 1" = 100'



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

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**FM 725
SIGNING & PAVEMENT MARKINGS
LAYOUT**

SHEET 11 OF 14

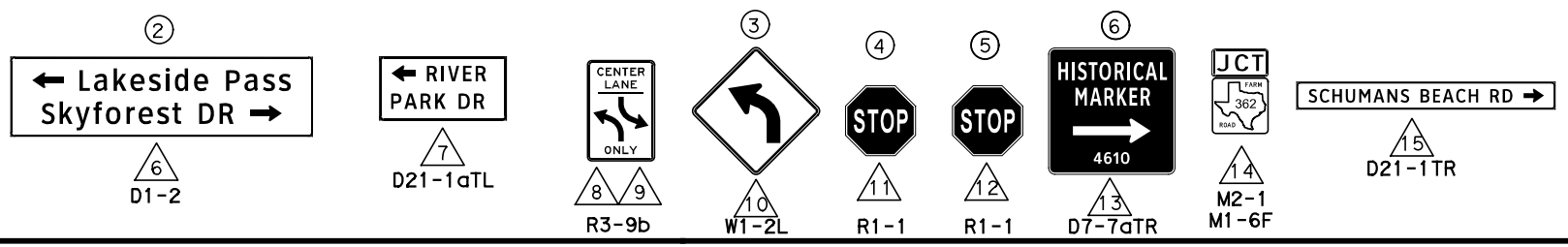
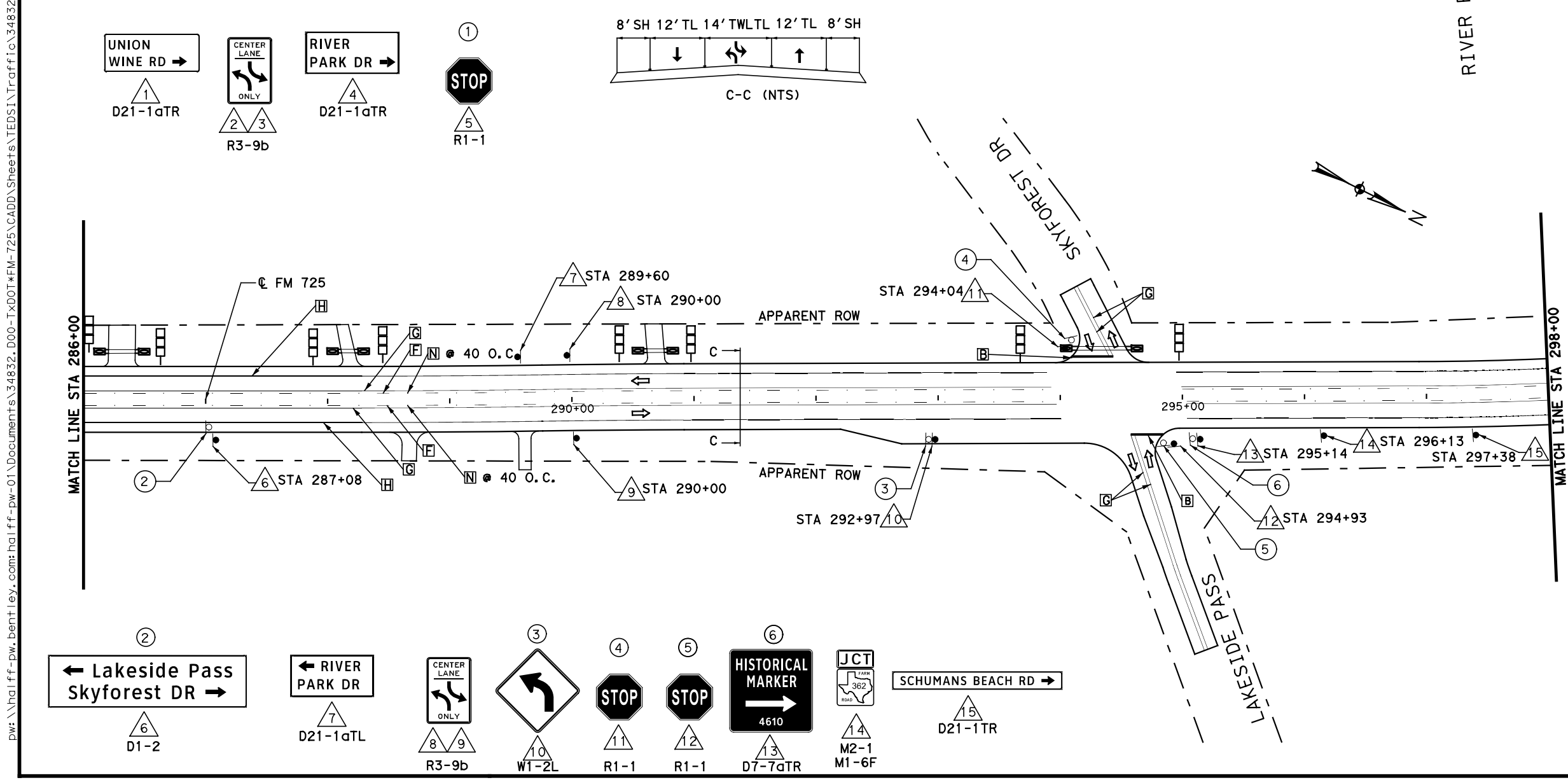
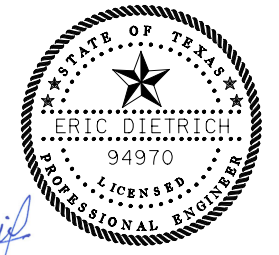
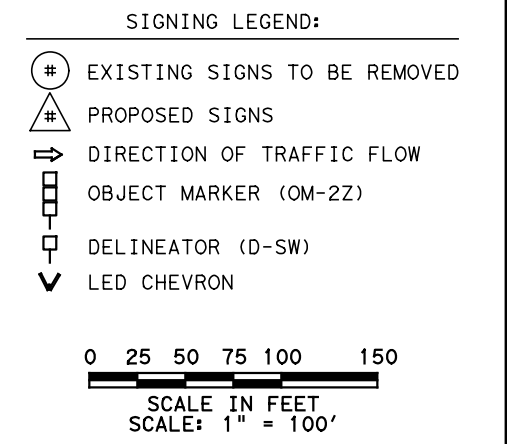
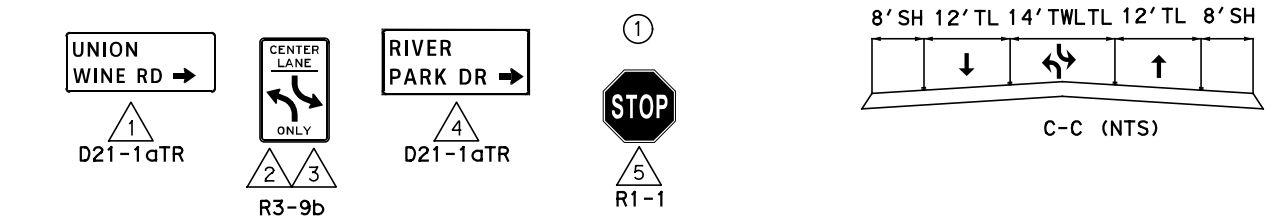
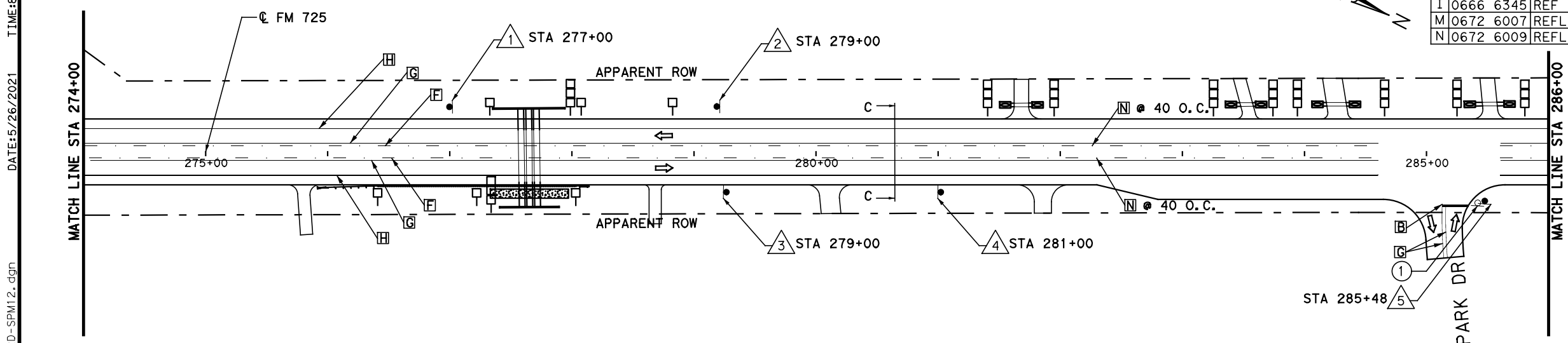
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	304
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL SECTION	JOB	HIGHWAY NO.
0215	09 035	FM 725

DATE: 5/26/2021 TIME: 8:16:49 AM
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ESTIMATED QUANTITIES SIGNING				
ITEM	DESCRIPTION	UNIT	QTY	
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	9	
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4	
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1	
0644 6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1	
0644 6076	REMOVE SM RD SN SUP&AM	EA	6	
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX)GND	EA	18	
0658 6062	INSTR DEL ASSM (D-SW)SZ1(BRF)GF2 BI	EA	6	
0658 6060	REMOVE DEL IN & OBJECT MARKER ASSMS	EA	12	

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.				
ITEM	DESCRIPTION	UNIT	QTY	
0666 6224	PAVEMENT SEALER 4"	LF	6572	
0666 6225	PAVEMENT SEALER 6"	LF	4491	
0666 6230	PAVEMENT SEALER 24"	LF	109	
0666 6232	PAVEMENT SEALER (WORD)	LF		
0666 6233	PAVEMENT SEALER (MED NOSE)	LF		

ESTIMATED QUANTITIES PAVEMENT MARKINGS				
ITEM	DESCRIPTION	UNIT	QTY	
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF		
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	109	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA		
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA		
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA		
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	1100	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	5472	
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4491	
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF		
M 0672 6007	REFL PAV MRKR TY I-C	EA		
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	109	



NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

TBPE F-1640



FM 725 SIGNING & PAVEMENT MARKINGS LAYOUT			
SHEET 12 OF 14			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 305	
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

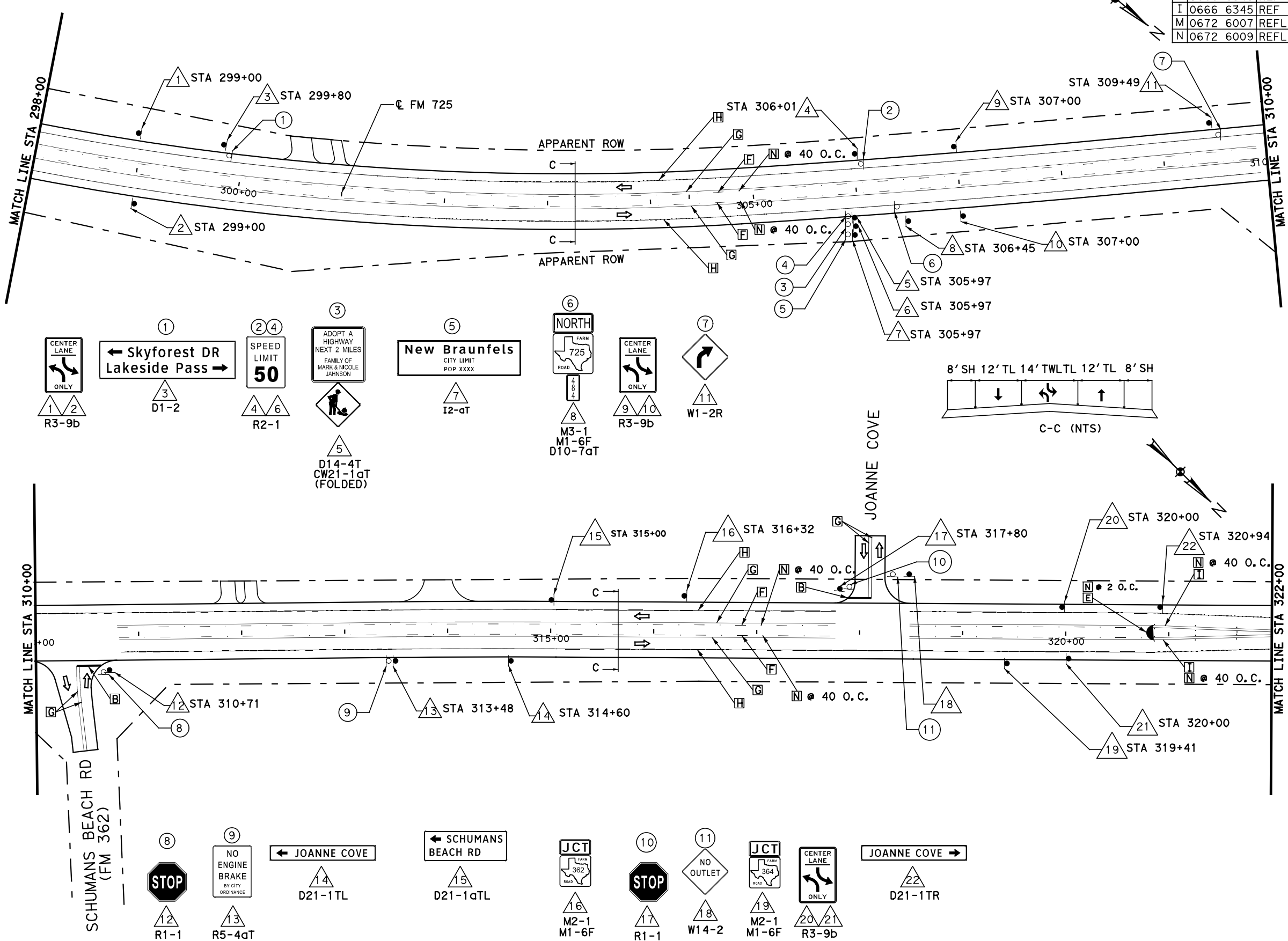
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ESTIMATED QUANTITIES SIGNING				
ITEM	DESCRIPTION	UNIT	QTY	
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	16	
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4	
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA		
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2	
0644 6076	REMOVE SM RD SN SUP&AM	EA	11	
0658 6099	INSTL OM ASSM (OM-2Z) (WFLX)GND	EA		

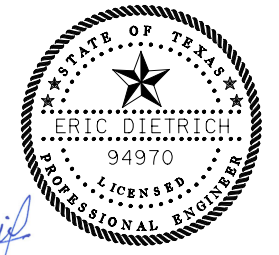
ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.				
ITEM	DESCRIPTION	UNIT	QTY	
0666 6224	PAVEMENT SEALER 4"	LF	5960	
0666 6225	PAVEMENT SEALER 6"	LF	4638	
0666 6230	PAVEMENT SEALER 24"	LF		
0666 6232	PAVEMENT SEALER (WORD)	LF		
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	1	

ESTIMATED QUANTITIES PAVEMENT MARKINGS				
ITEM	DESCRIPTION	UNIT	QTY	
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF		
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF		
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA		
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA		
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	1	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	1080	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	4418	
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	4638	
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	462	
M 0672 6007	REFL PAV MRKR TY I-C	EA		
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	138	



- SIGNING LEGEND:**
- # EXISTING SIGNS TO BE REMOVED
 - △ PROPOSED SIGNS
 - DIRECTION OF TRAFFIC FLOW
 - OBJECT MARKER (OM-2Z)
 - ▬ DELINEATOR (D-SW)
 - ∨ LED CHEVRON

0 25 50 75 100 150
 SCALE IN FEET
 SCALE: 1" = 100'



E. Dietrich

NAME: _____ DATE: 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

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**FM 725
 SIGNING & PAVEMENT MARKINGS
 LAYOUT**

SHEET 13 OF 14

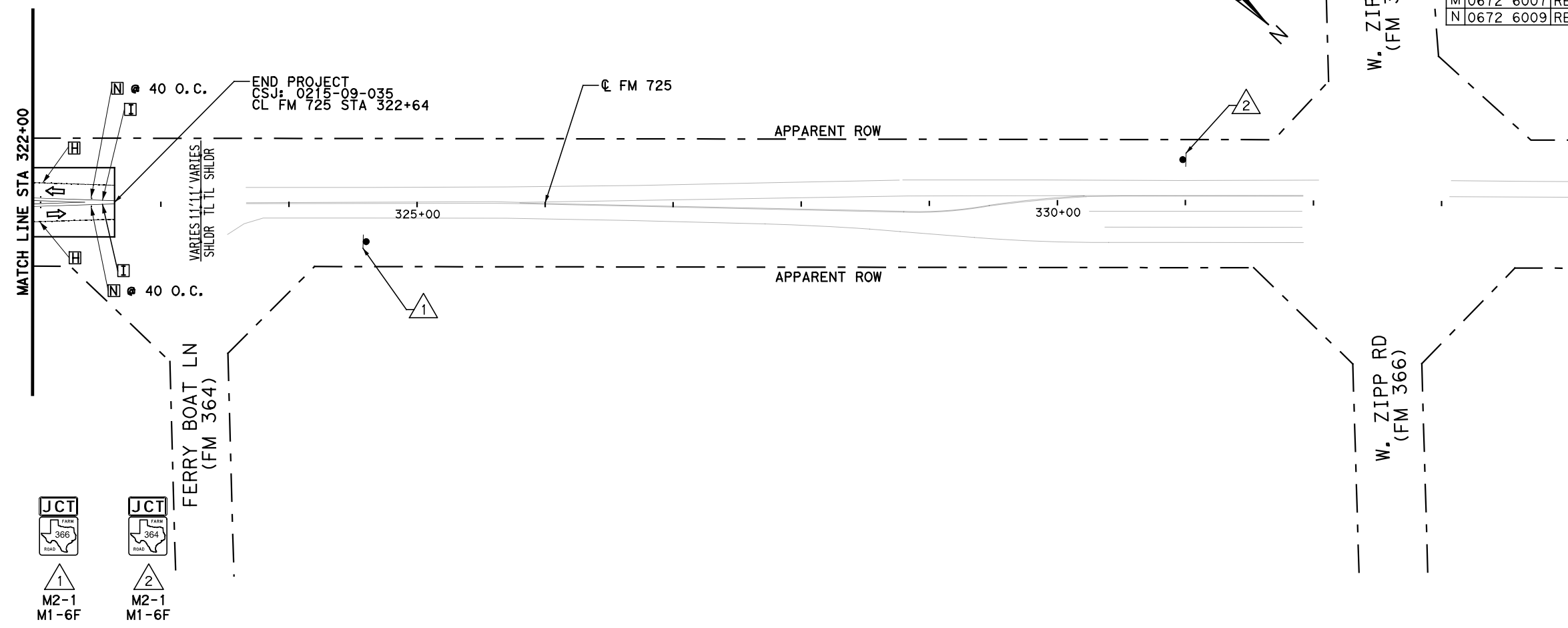
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6	See Title Sheet	306
STATE	DISTRICT	COUNTY
TEXAS	SAT	GUADALUPE
CONTROL	SECTION	JOB
0215	09	035
		HIGHWAY NO.
		FM 725

DATE: 5/26/2021
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ESTIMATED QUANTITIES SIGNING			
ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
0644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
0644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	
0644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
0644 6076	REMOVE SM RD SN SUP&AM	EA	
0658 6099	INSTR OM ASSM (OM-2Z) (WFLX) GND	EA	

ESTIMATED QUANTITIES PAVEMENT MARKINGS CONT.			
ITEM	DESCRIPTION	UNIT	QTY
0666 6224	PAVEMENT SEALER 4"	LF	252
0666 6225	PAVEMENT SEALER 6"	LF	172
0666 6230	PAVEMENT SEALER 24"	LF	
0666 6232	PAVEMENT SEALER (WORD)	LF	
0666 6233	PAVEMENT SEALER (MED NOSE)	LF	

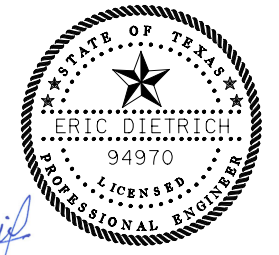
ESTIMATED QUANTITIES PAVEMENT MARKINGS			
ITEM	DESCRIPTION	UNIT	QTY
A 0666 6036	REFL PAV MRK TY I (W) 8" (SLD) (100MIL)	LF	
B 0666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	
C 0666 6054	REFL PAV MRK TY I (W) (ARROW) (100MIL)	EA	
D 0666 6078	REFL PAV MRK TY I (W) (WORD) (100MIL)	EA	
E 0666 6156	REFL PAV MRK TY I (Y) (MEDNOSE) (100MIL)	EA	
F 0666 6312	RE PM W/RET REQ TY I(Y) 4" (BRK) (100MIL)	LF	
G 0666 6315	RE PM W/RET REQ TY I(Y) 4" (SLD) (100MIL)	LF	
H 0666 6343	REF PROF PAV MRK TYI(W) 6" (SLD) (100MIL)	LF	172
I 0666 6345	REF PROF PAV MRK TYI(Y) 4" (SLD) (100MIL)	LF	252
M 0672 6007	REFL PAV MRKR TY I-C	EA	
N 0672 6009	REFL PAV MRKR TY II-A-A	EA	6



SIGNING LEGEND:

- EXISTING SIGNS TO BE REMOVED
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW
- OBJECT MARKER (OM-2Z)
- DELINEATOR (D-SW)
- LED CHEVRON

0 25 50 75 100 150
 SCALE IN FEET
 SCALE: 1" = 100'



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

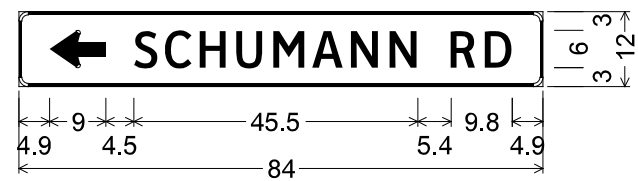
Texas Department of Transportation
 © 2020

**FM 725
 SIGNING & PAVEMENT MARKINGS
 LAYOUT**

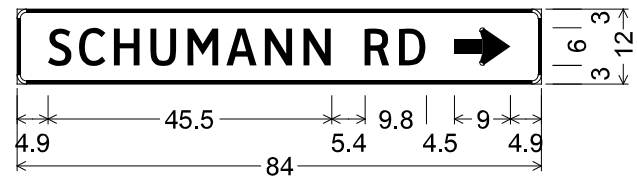
SHEET 14 OF 14

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		307
STATE	DISTRICT COUNTY		
TEXAS	SAT GUADALUPE		
CONTROL SECTION	JOB	HIGHWAY NO.	
0215 09	035	FM 725	

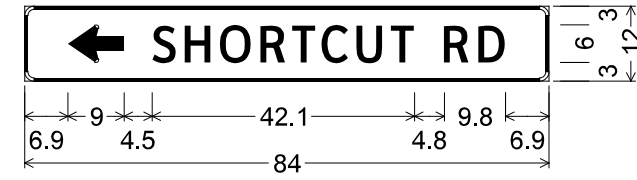
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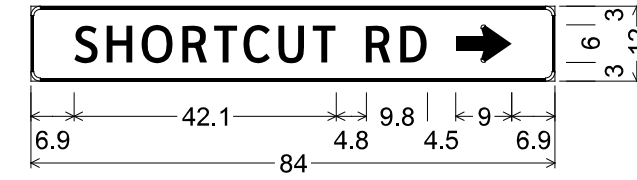
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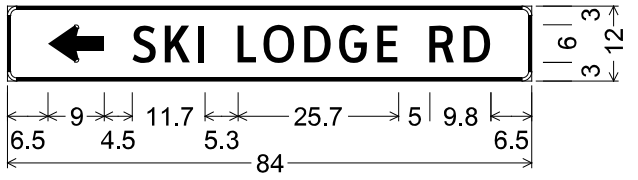
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 Standard Arrow Custom 9.0" X 6.0" 0';



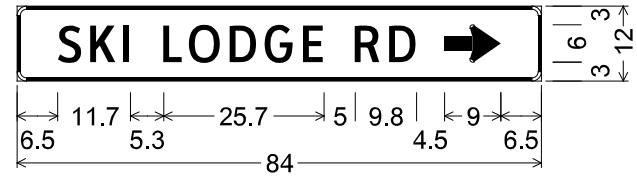
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 "SHORTCUT RD", ClearviewHwy-3-W;



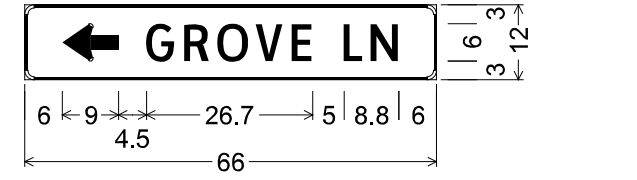
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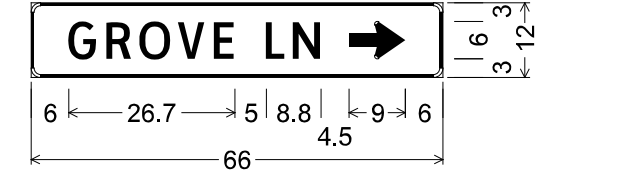
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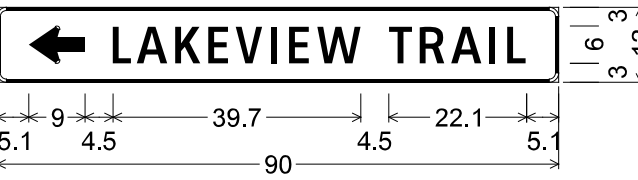
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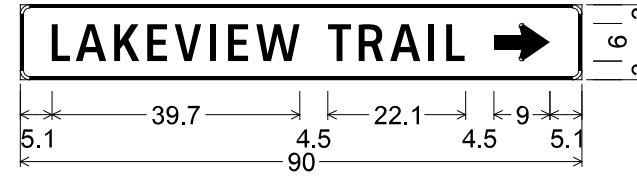
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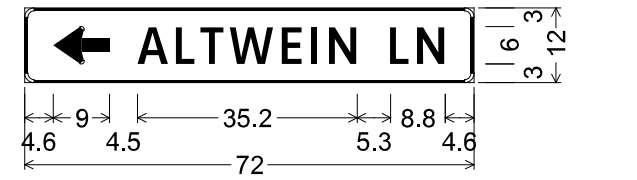
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 Standard Arrow Custom 9.0" X 6.0" 0';



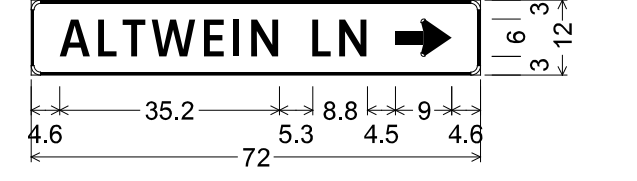
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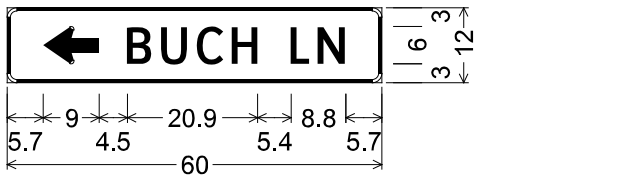
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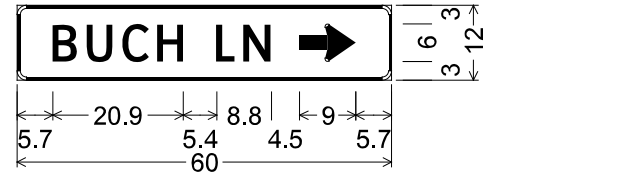
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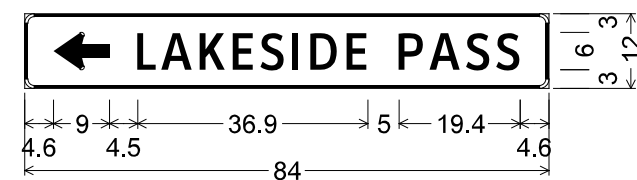
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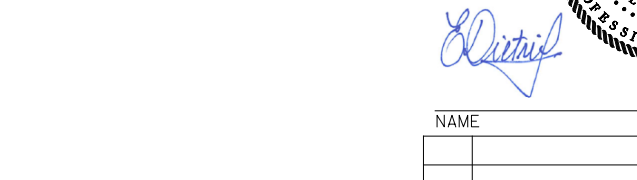
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 "BUCH LN", ClearviewHwy-3-W;



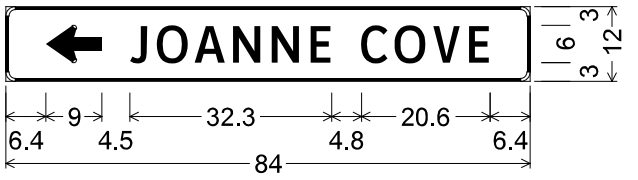
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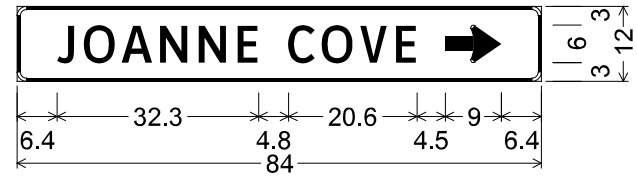
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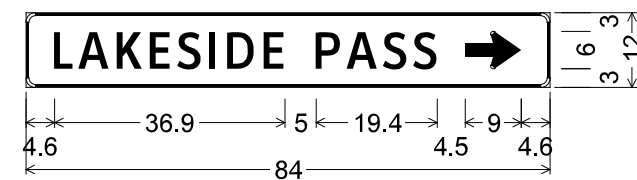
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 Standard Arrow Custom 9.0" X 6.0" 0';



D1-1;
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 Standard Arrow Custom 9.0" X 6.0" 180';
 "JOANNE COVE", ClearviewHwy-3-W;



D1-1;
 1.5" Radius, 0.5" Border, White on, Green;
 "JOANNE COVE", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.0" 0';



D1-1;
 1.5" Radius, 0.5" Border, White on, Green;
 "LAKESIDE PASS", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.0" 0';



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
TEDSI
 TBPE F-1640
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

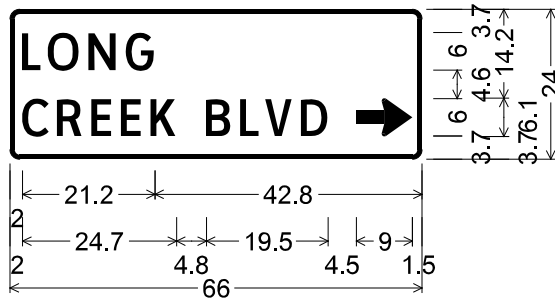
Texas Department of Transportation
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**FM 725
 SIGNS DETAILS**

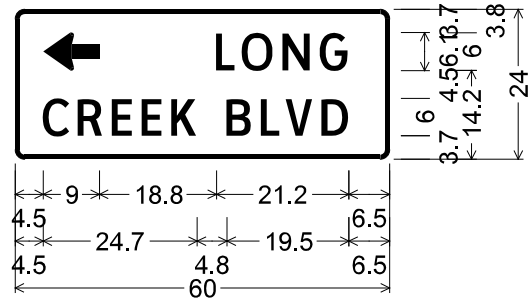
SHEET 1 OF 3

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 308
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

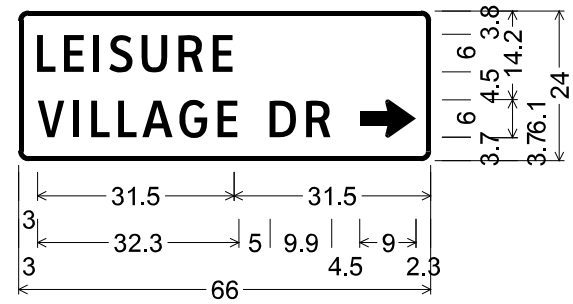
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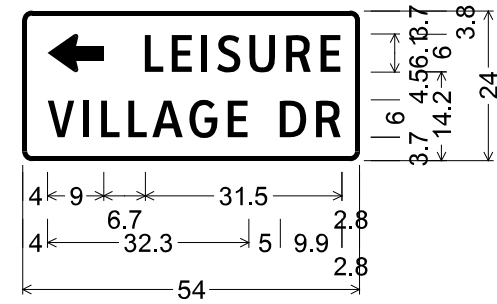
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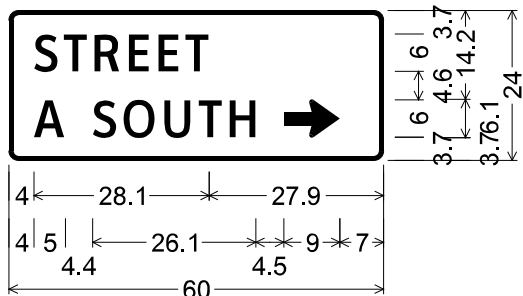
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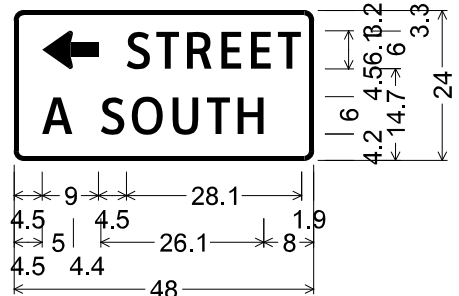
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 "VILLAGE DR", ClearviewHwy-3-W;
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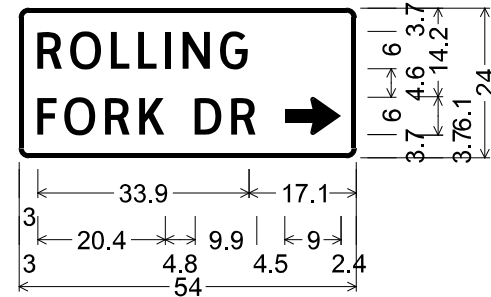
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 "VILLAGE DR", ClearviewHwy-3-W;



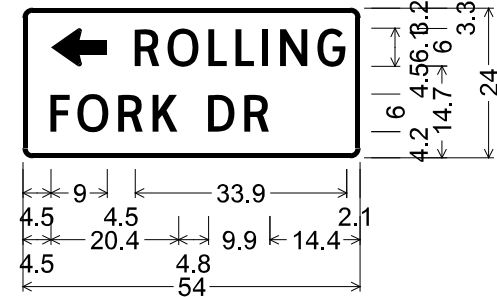
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 "A SOUTH", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0';



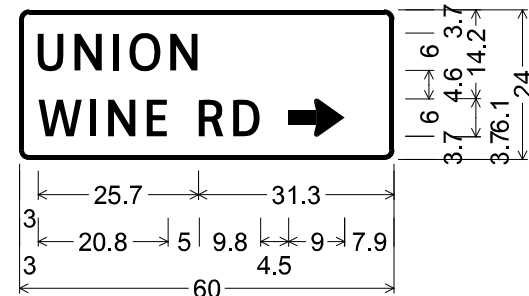
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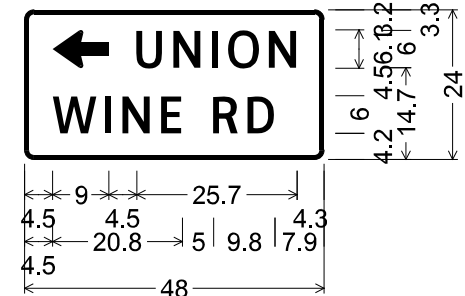
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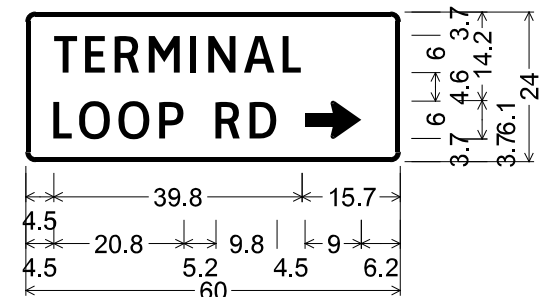
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 "FORK DR", ClearviewHwy-3-W;



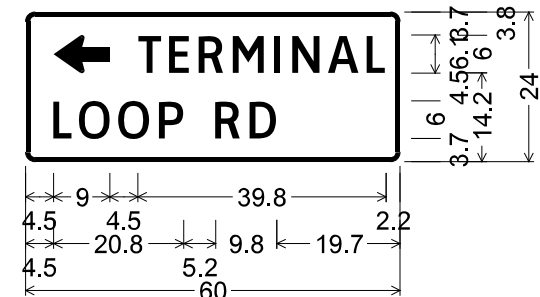
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 "WINE RD", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0';



D21-1aTL_VARx24;
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 "UNION", ClearviewHwy-3-W;
 "WINE RD", ClearviewHwy-3-W;



D21-1aTR_VARx24;
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 "TERMINAL", ClearviewHwy-3-W;
 "LOOP RD", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0';



D21-1aTL_VARx24;
 1.5" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.1" 180';
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 "LOOP RD", ClearviewHwy-3-W;



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

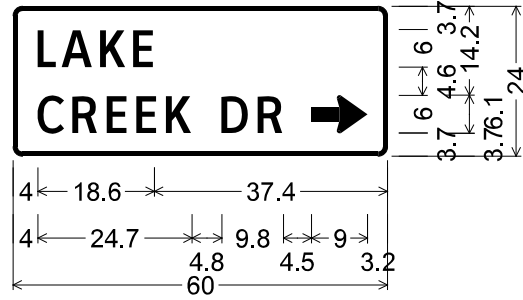
HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

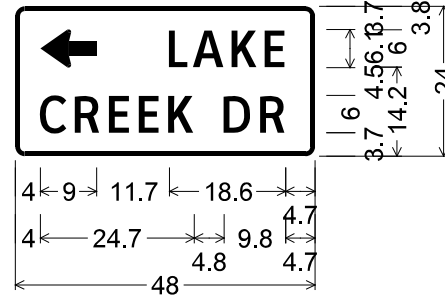


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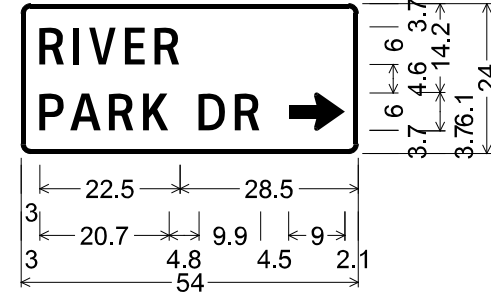
FM 725 SIGNS DETAILS			
SHEET 2 OF 3			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 309
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



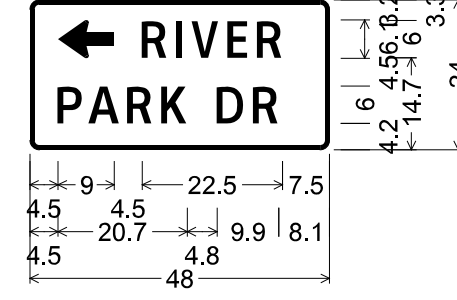
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 "CREEK DR", ClearviewHwy-3-W;
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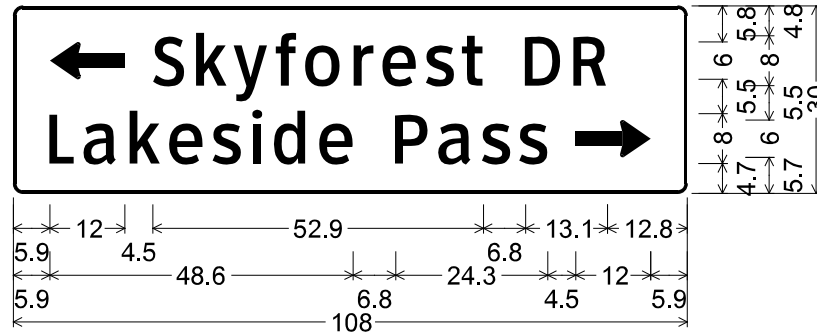
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 "CREEK DR", ClearviewHwy-3-W;



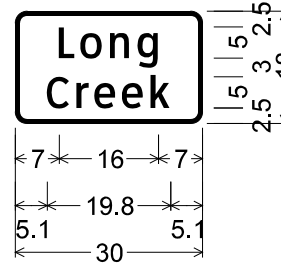
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 "PARK DR", ClearviewHwy-3-W;
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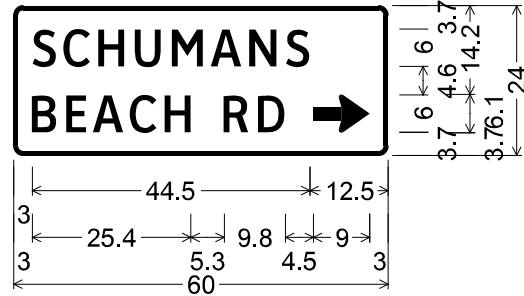
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 "PARK DR", ClearviewHwy-3-W;



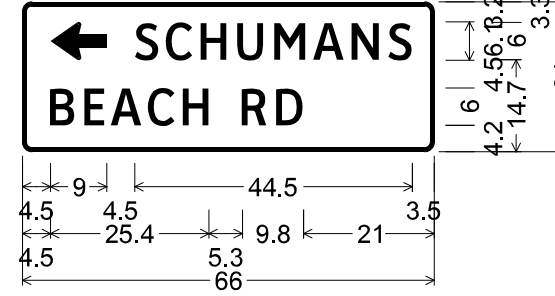
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 "Lakeside Pass", ClearviewHwy-3-W;
 Standard Arrow Custom 12.0" X 6.0" 0';



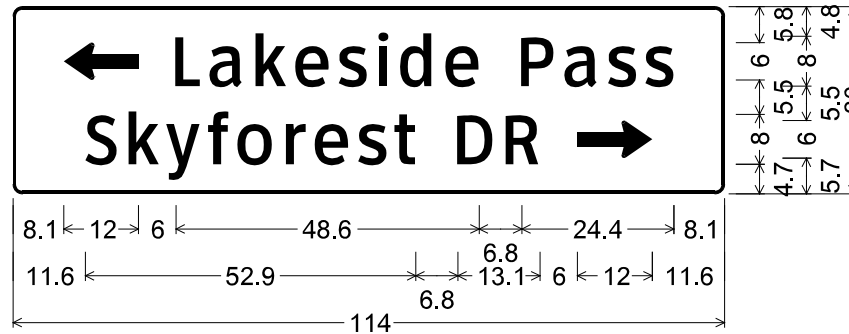
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 "Creek", ClearviewHwy-3-W;



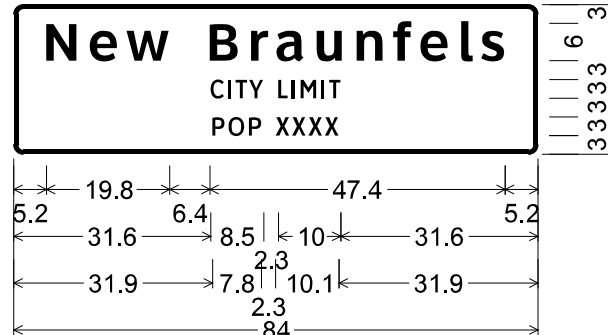
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 "BEACH RD", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.1" 0';



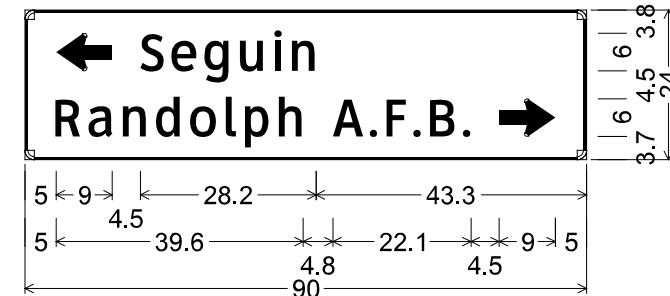
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 "SCHUMANS", ClearviewHwy-3-W;
 "BEACH RD", ClearviewHwy-3-W;



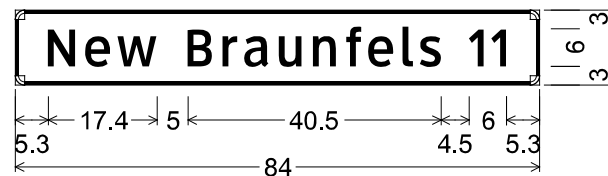
D1-2 LT-RT;
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 Standard Arrow Custom 12.0" X 6.0" 180';
 "Lakeside Pass", ClearviewHwy-3-W;
 "Skyforest DR", ClearviewHwy-3-W;
 Standard Arrow Custom 12.0" X 6.0" 0';



I-2aT;
 1.5" Radius, 0.8" Border, White on, Green;
 "New Braunfels", ClearviewHwy-5-W;
 "CITY LIMIT", ClearviewHwy-3-W;
 "POP XXXX", ClearviewHwy-3-W;



D1-2 LT-RT;
 1.5" Radius, 0.5" Border, White on, Green;
 Standard Arrow Custom 9.0" X 6.0" 180';
 "Seguin", ClearviewHwy-3-W;
 "Randolph A.F.B.", ClearviewHwy-3-W;
 Standard Arrow Custom 9.0" X 6.0" 0';



1.5" Radius, 0.5" Border, White on, Green;
 "New Braunfels", ClearviewHwy-3-W;
 "11", ClearviewHwy-3-W;



E. Dietrich

NAME _____ DATE 5/26/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
 SUITE 200
 SAN ANTONIO, TEXAS 78216
 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
 Consulting Engineers
 1201 Interstate Highway 2
 Mission, Texas 78572
 (936) 424-7898

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**FM 725
 SIGNS DETAILS**

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		310
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

DATE: 2/28/2021 6:37:41 PM
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 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TXDOT for any purpose whatsoever. TXDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

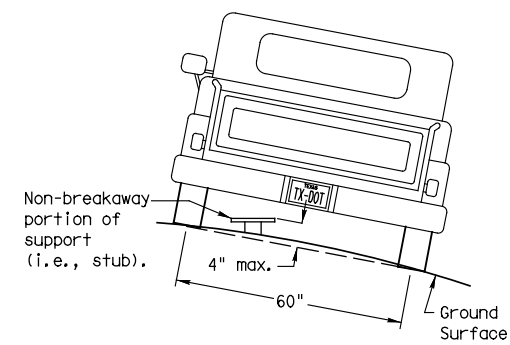
Post Type _____
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD (FRP))
 TWT = Thin-Walled Tubing (see SMD (TWT))
 10BWG = 10 BWG Tubing (see SMD (SLIP-1) to (SLIP-3))
 S80 = Schedule 80 Pipe (see SMD (SLIP-1) to (SLIP-3))

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-3))

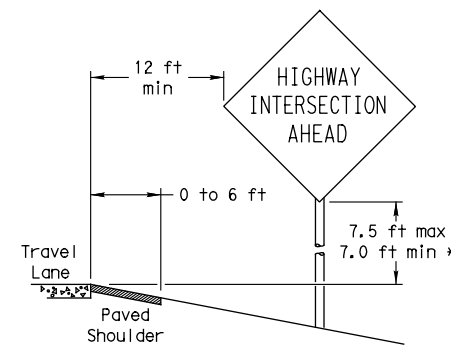
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

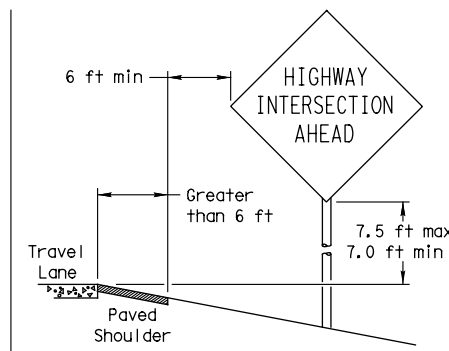
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

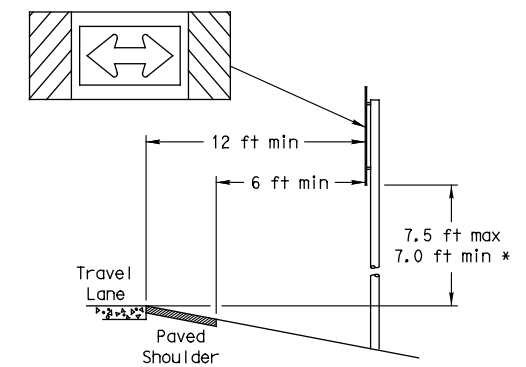
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

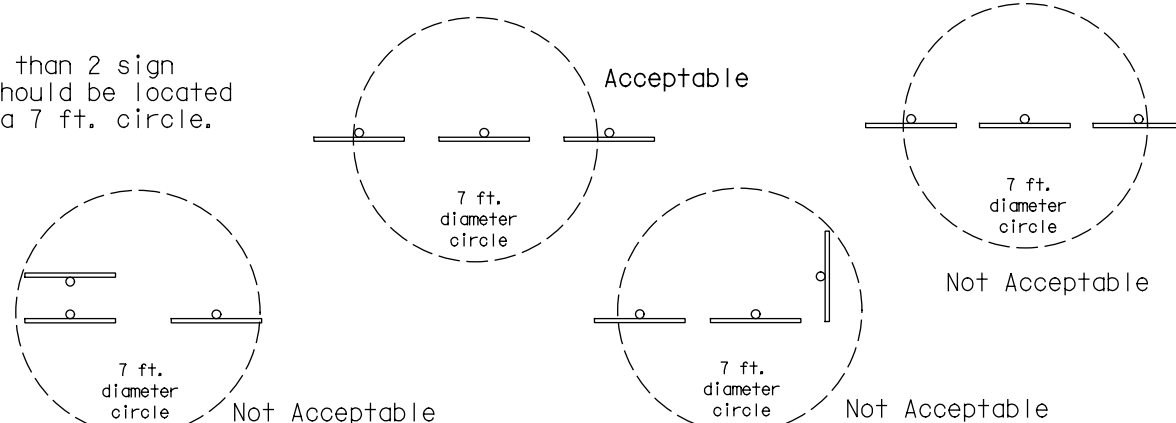
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

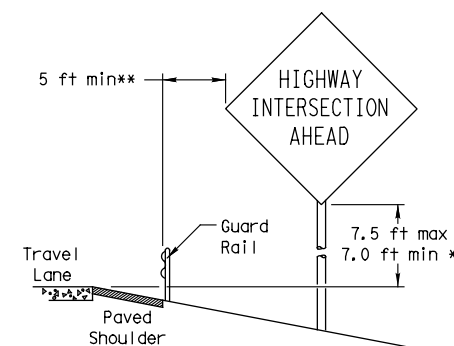


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

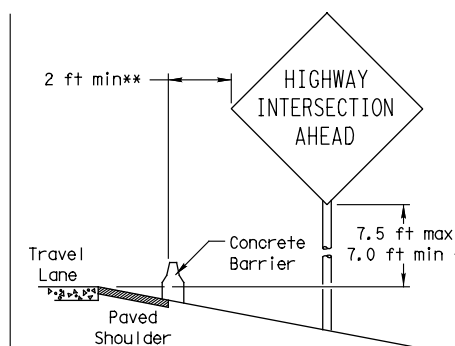
No more than 2 sign posts should be located within a 7 ft. circle.



BEHIND BARRIER



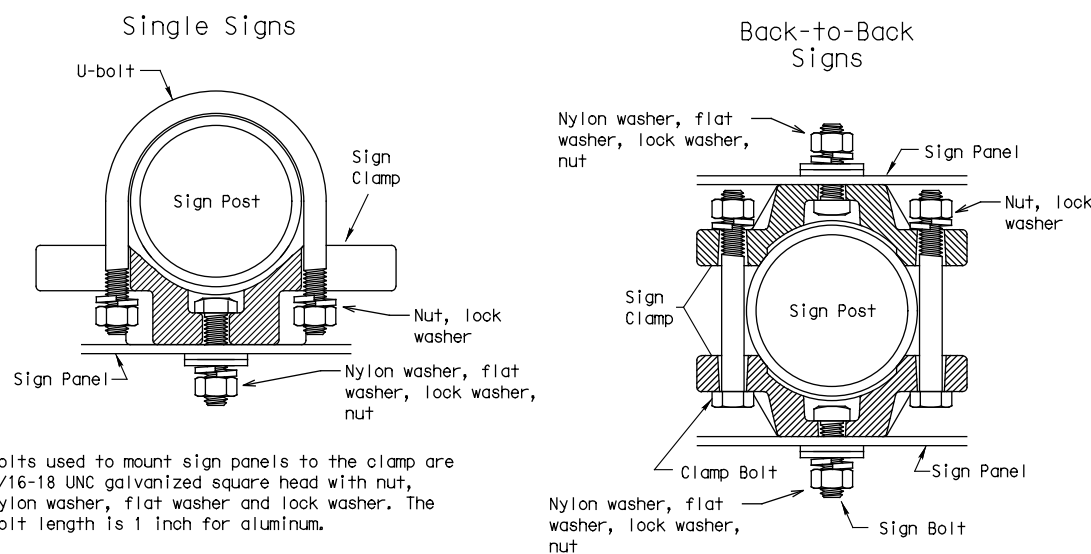
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

TYPICAL SIGN ATTACHMENT DETAIL



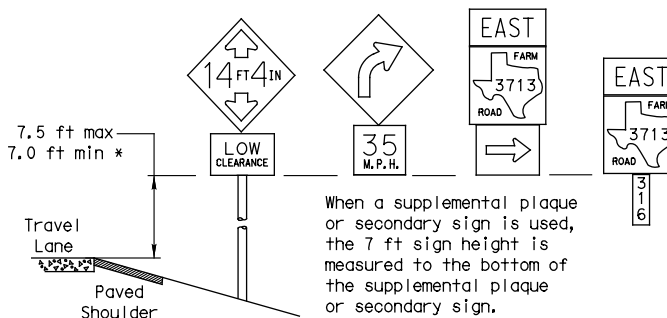
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

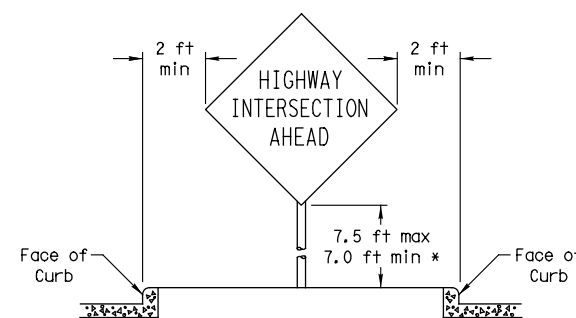
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

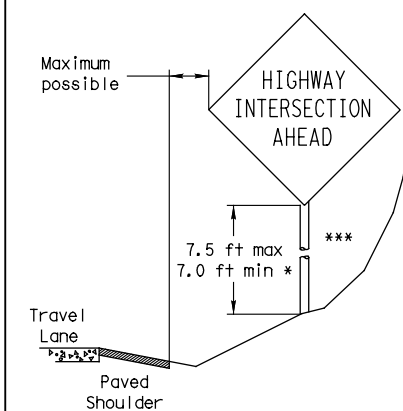


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

* 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>



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

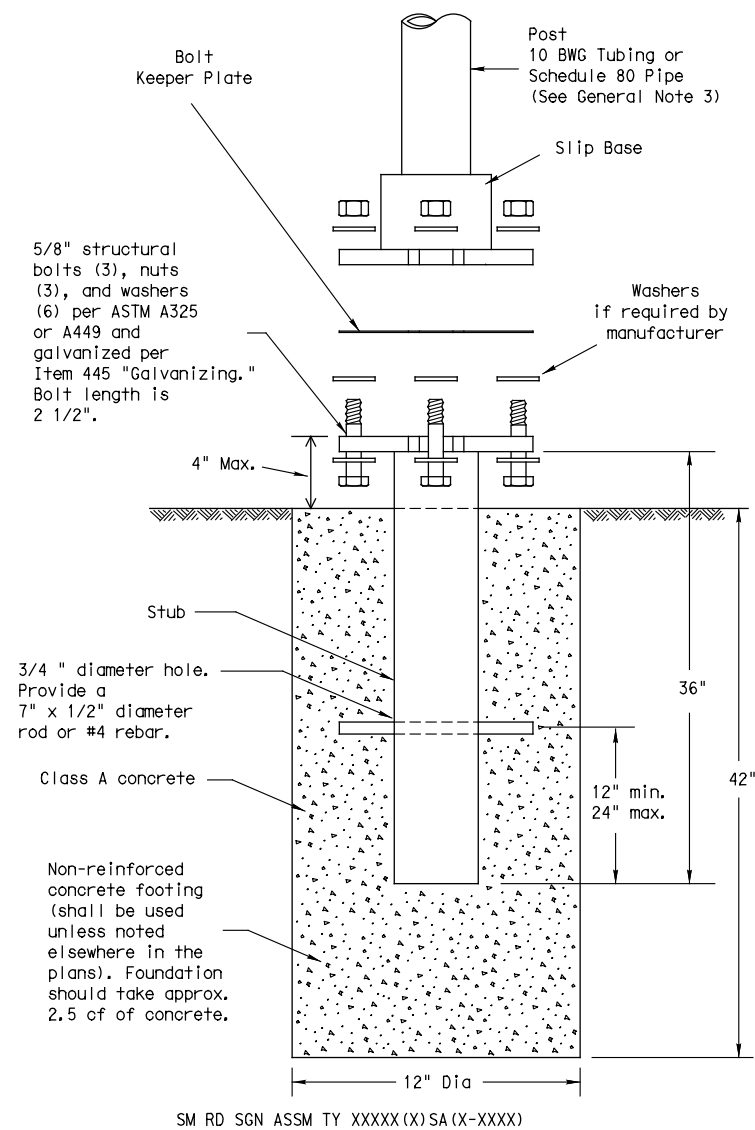
SMD (GEN) -08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
		SAN	GUADALUPE		311

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

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

GENERAL NOTES:

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

ASSEMBLY PROCEDURE

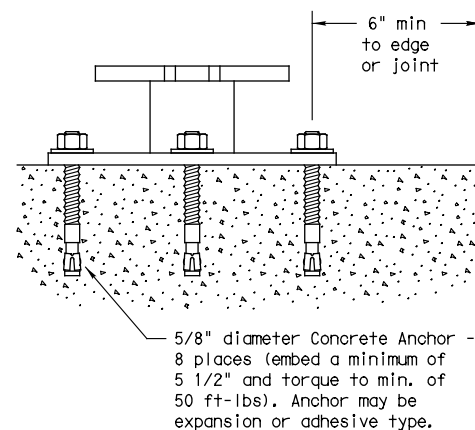
Foundation

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

Support

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

CONCRETE ANCHOR



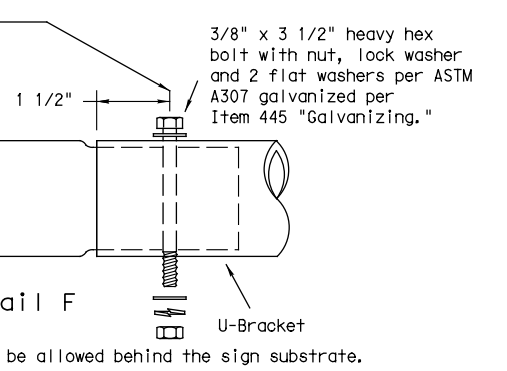
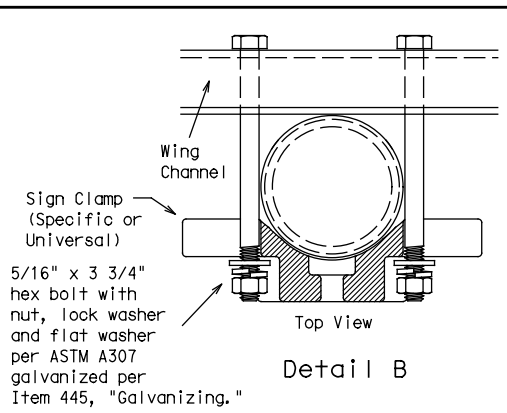
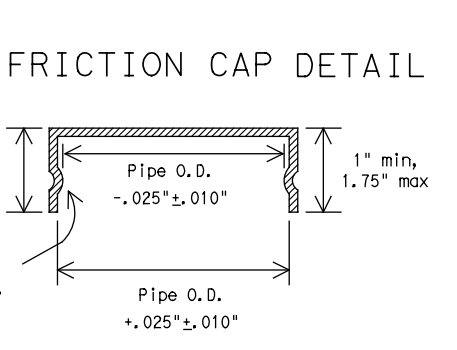
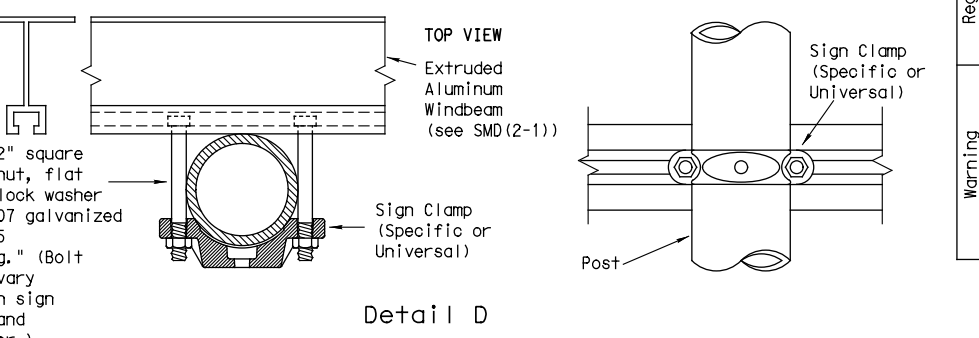
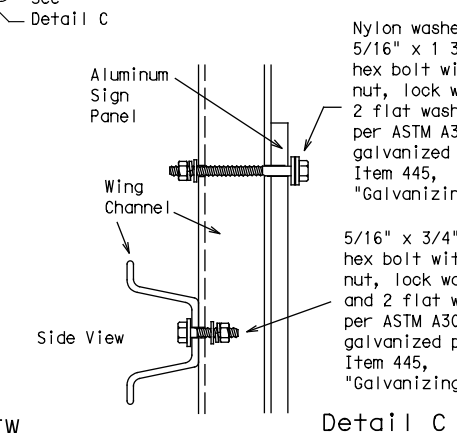
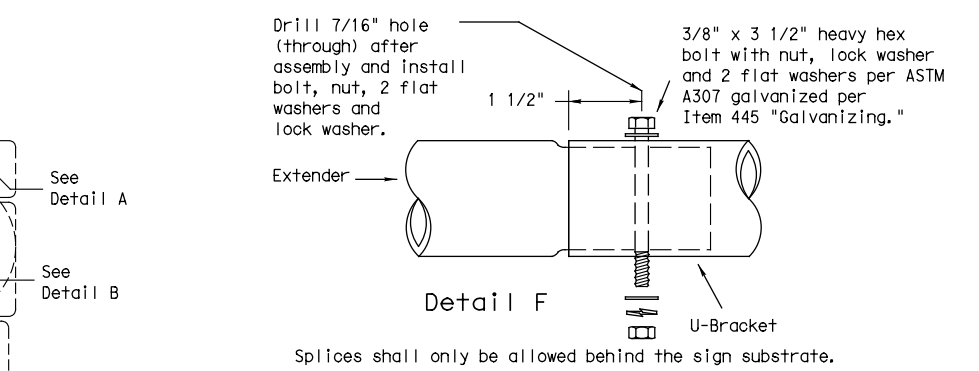
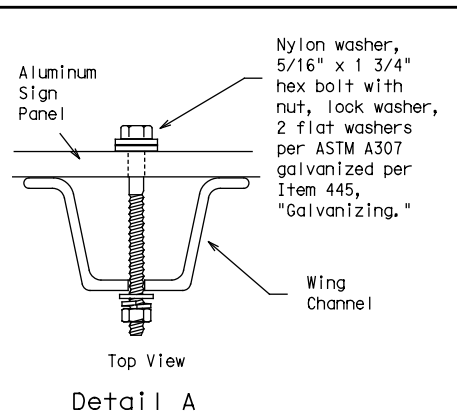
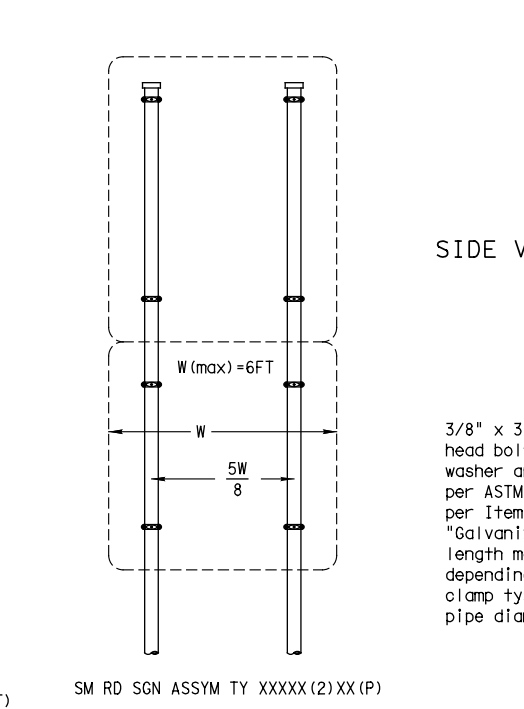
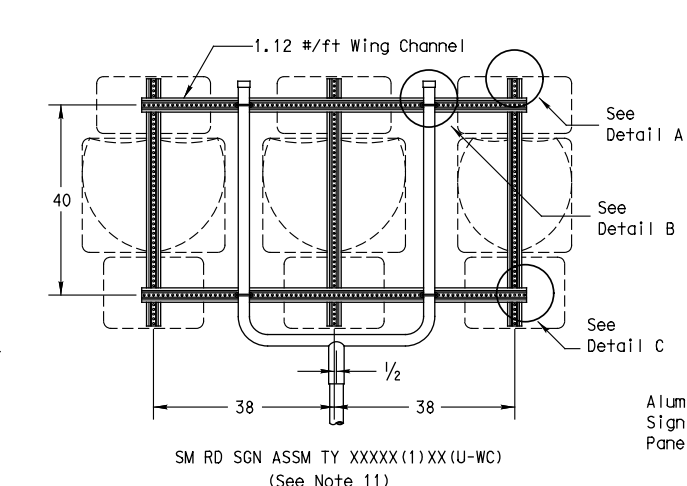
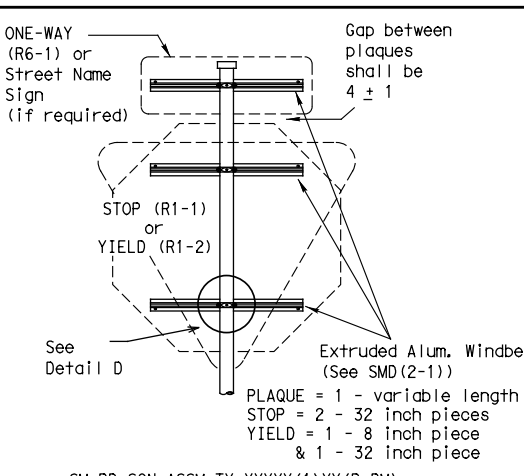
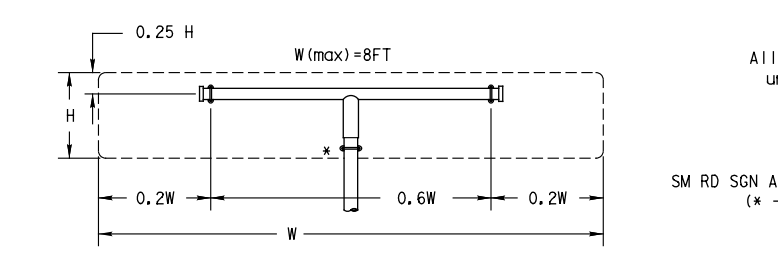
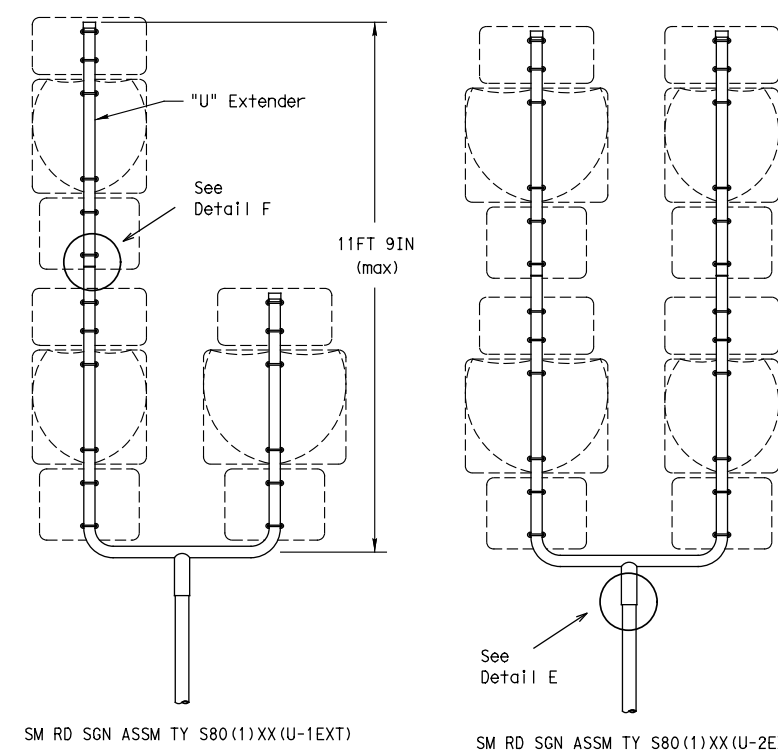
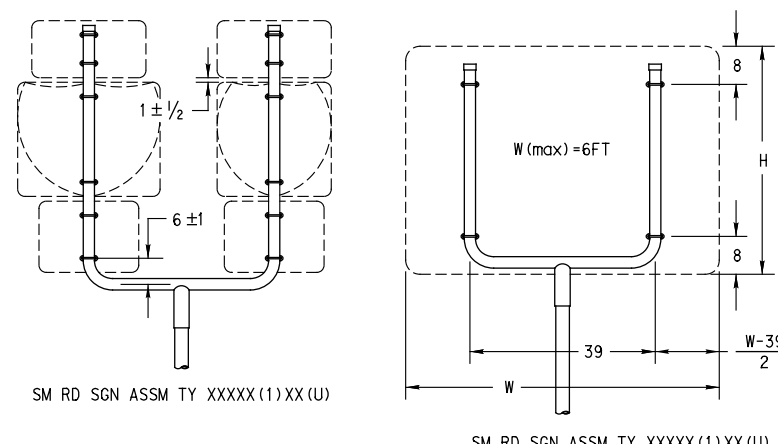
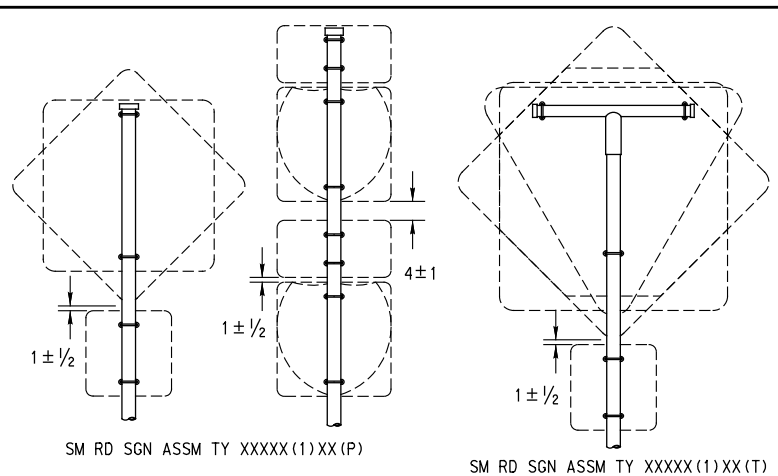
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized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



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08

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- 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)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)	
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)	

All dimensions are in english unless detailed otherwise.

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

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.

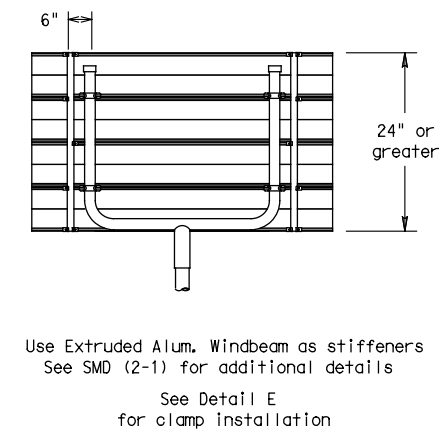
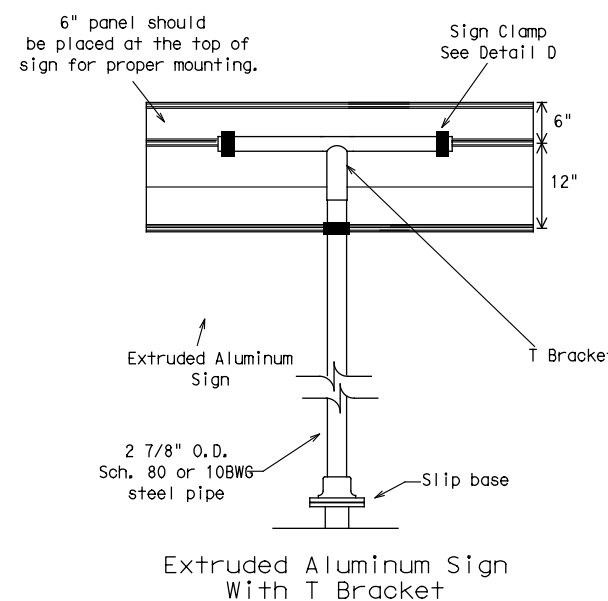
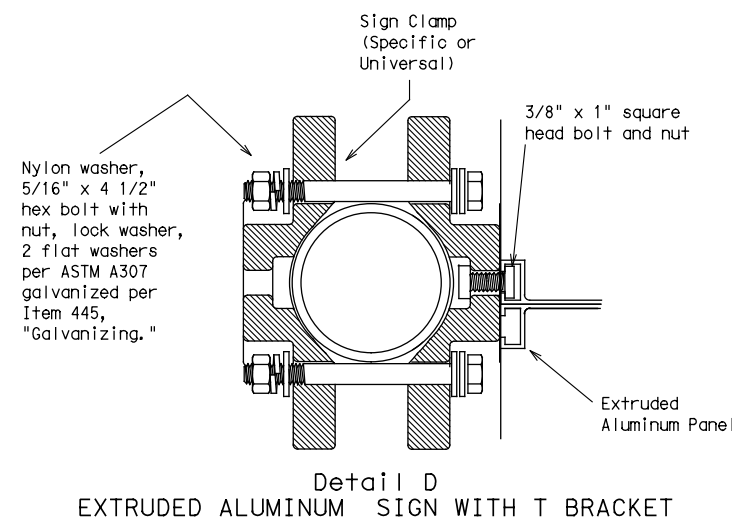
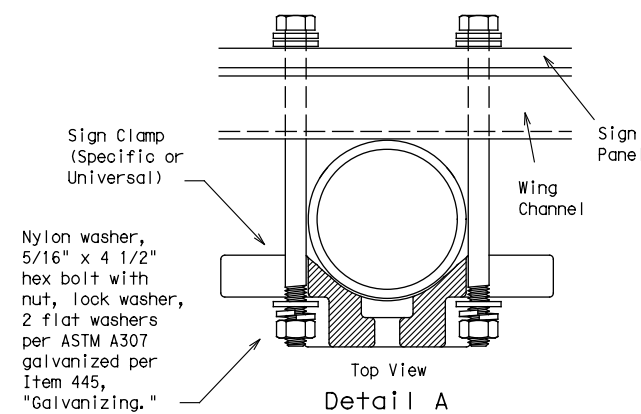
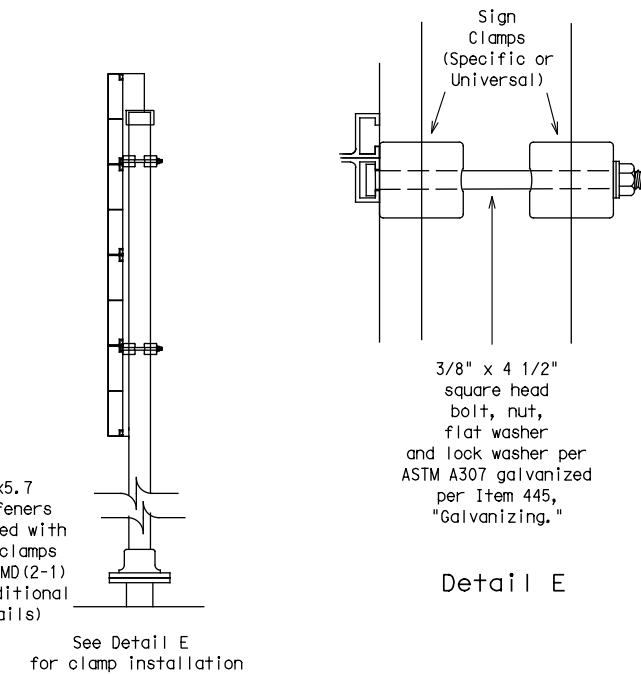
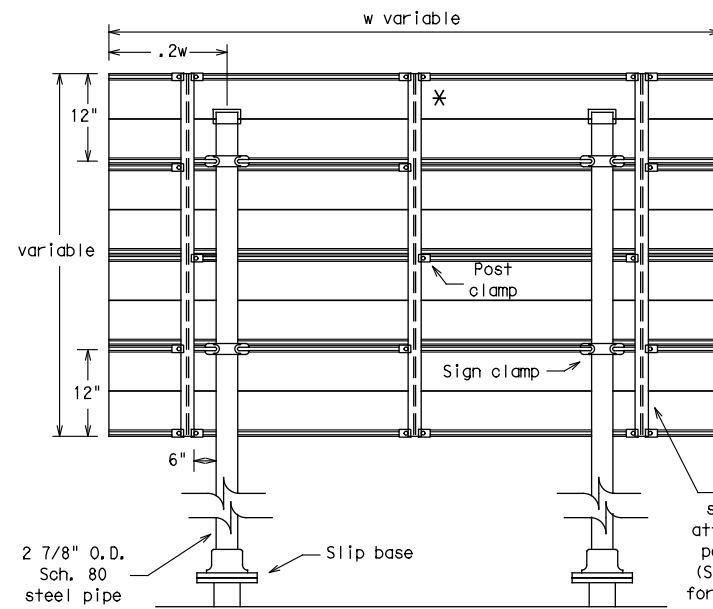
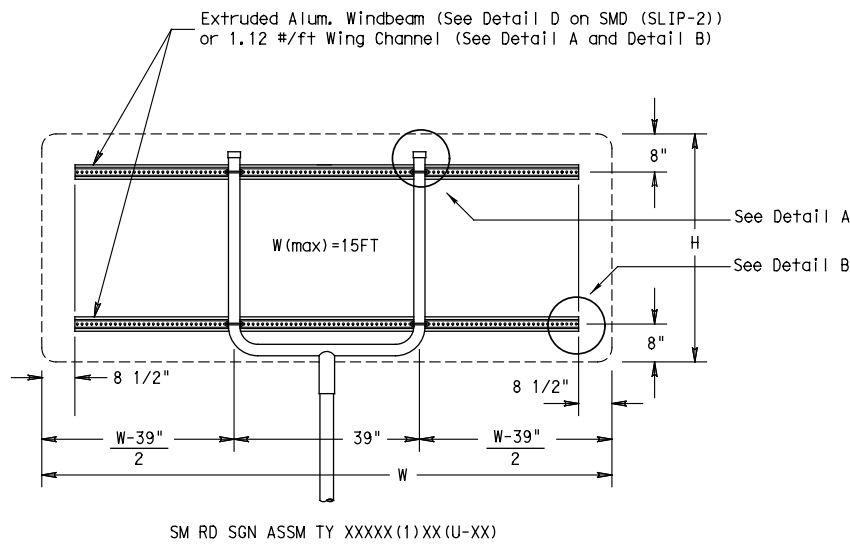
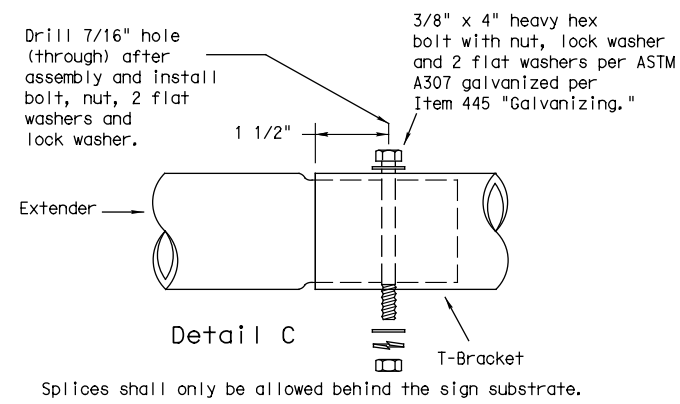
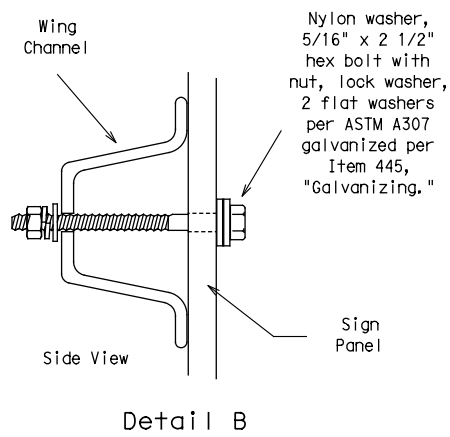
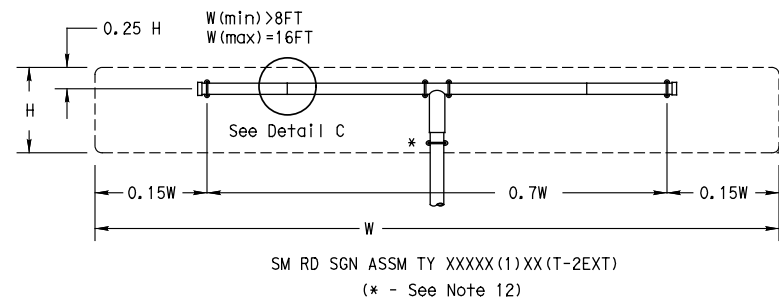
Texas Department of Transportation
 Traffic Operations Division

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

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GENERAL NOTES:

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

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



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

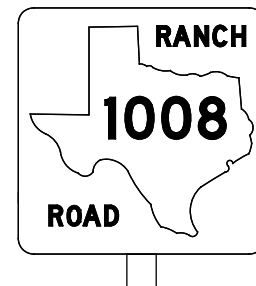
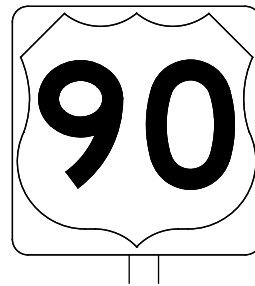
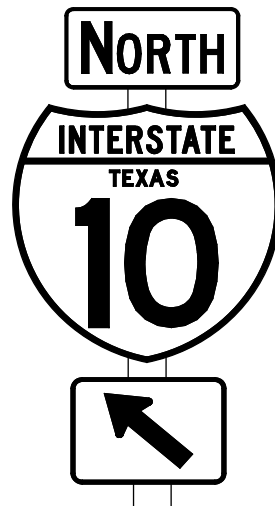
© TxDOT July 2002		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0215	09	035	FM 725
		DIST	COUNTY	SHEET NO.	
		SAN	GUADALUPE	314	

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REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

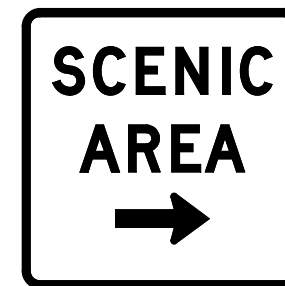
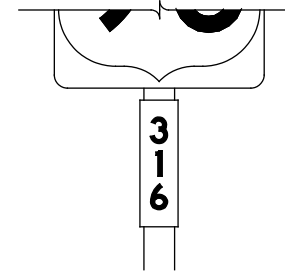
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

- 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).
- 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

- 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).
- 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.
- 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 out-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be out-out white sheeting applied to colored background sheeting.
- 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.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- 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/>



TYPICAL SIGN REQUIREMENTS

TSR(3) - 13

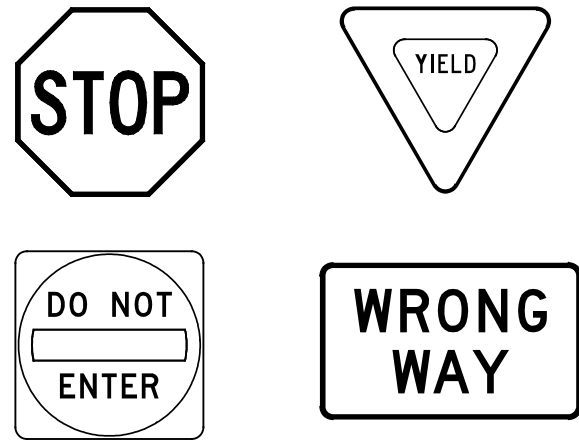
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©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0215	09	035	FM 725				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		SAN	GUADALUPE	315					

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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

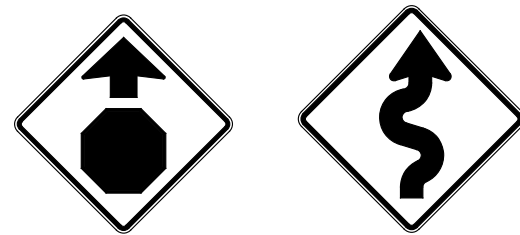
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



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

- 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).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- 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.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- 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.
- 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.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>



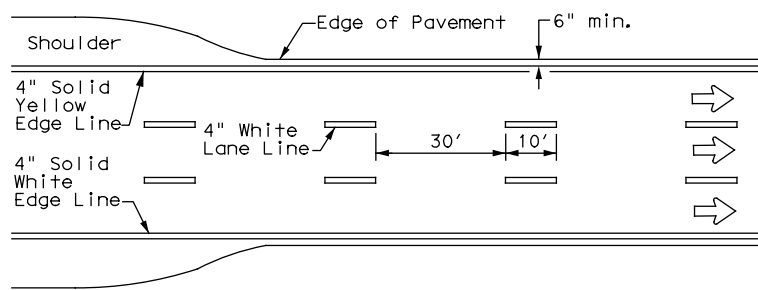
TYPICAL SIGN REQUIREMENTS

TSR(4) - 13

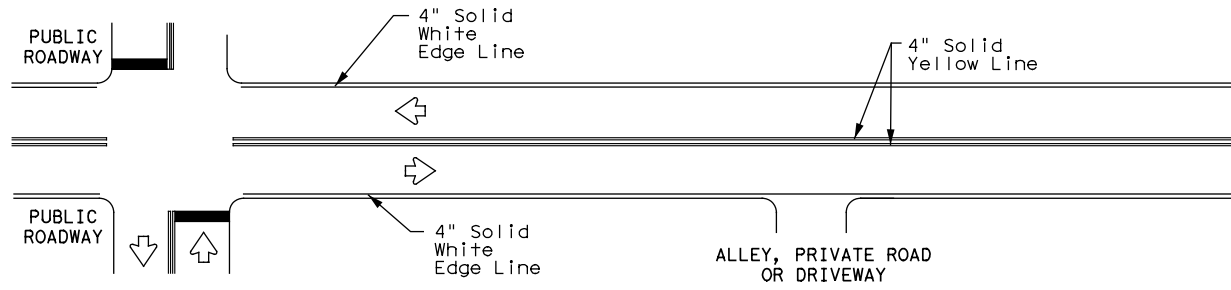
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© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0215	09	035	FM 725				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		SAN	GUADALUPE	316					

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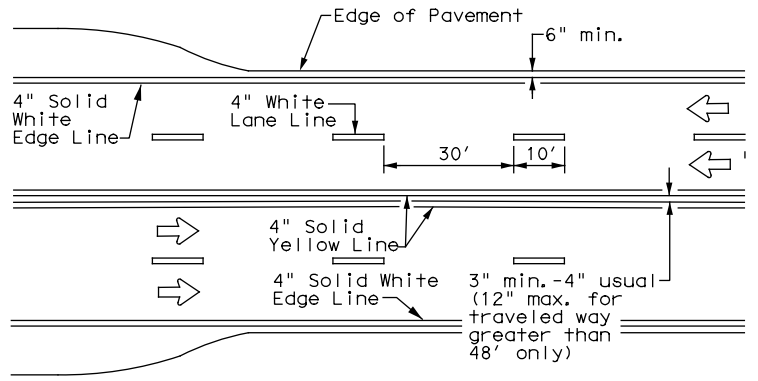
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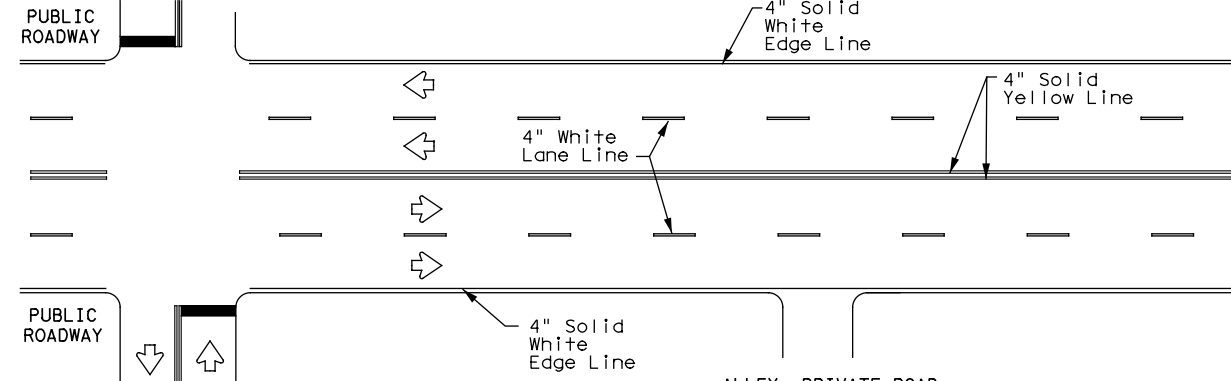
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



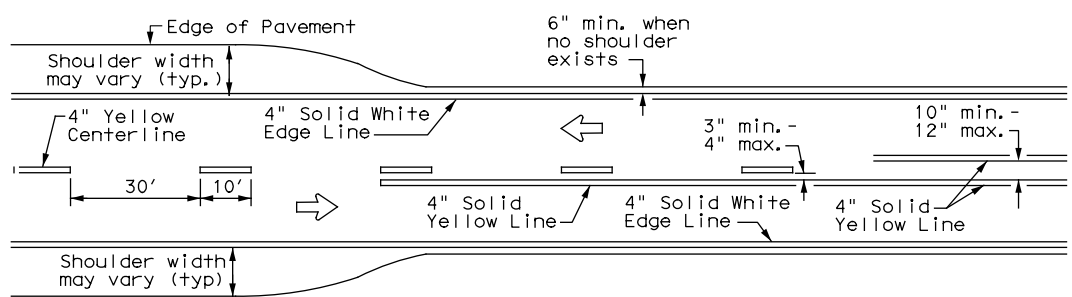
TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



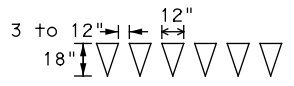
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



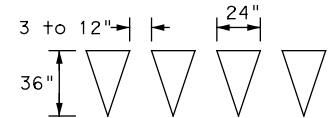
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

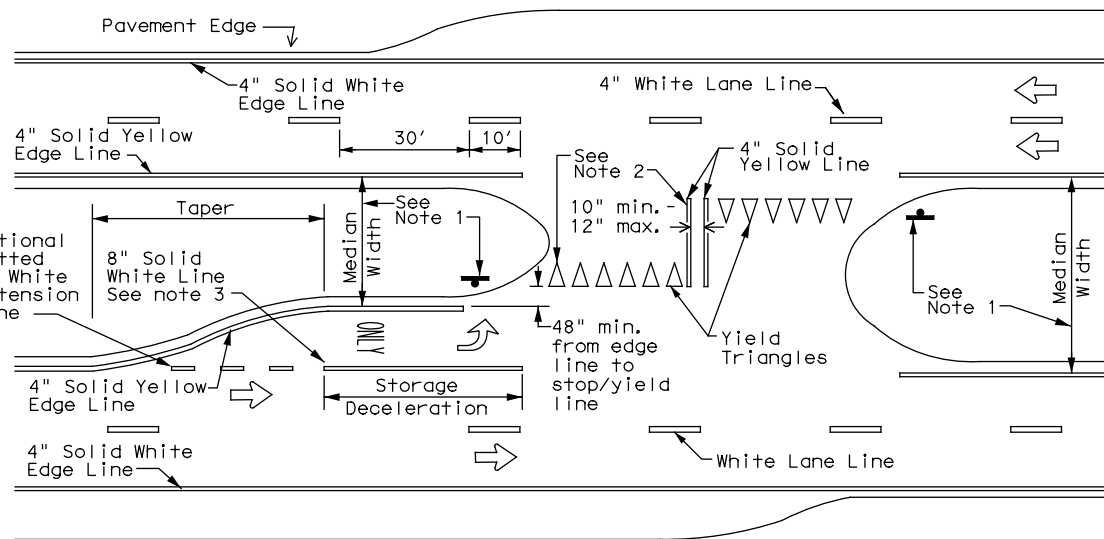


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

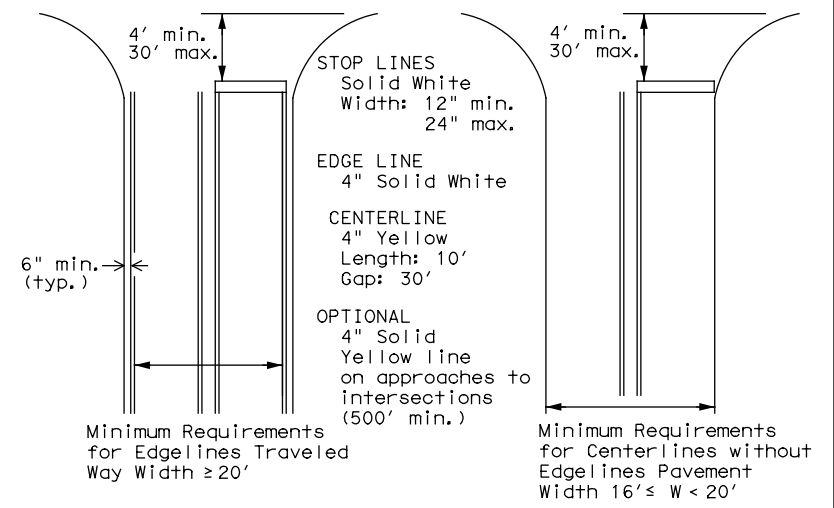
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
- 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 triangles shall only be used with yield signs.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed 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.
- 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



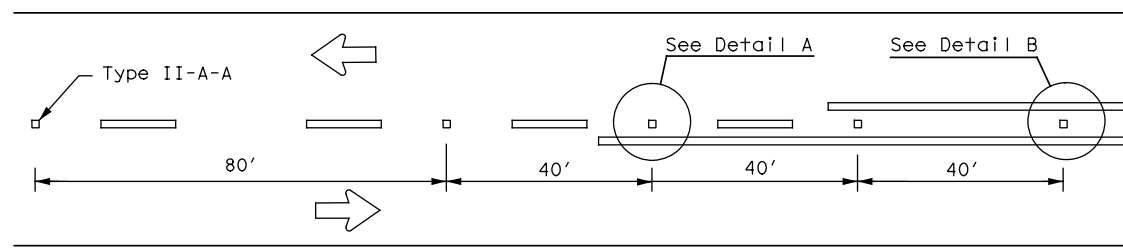
TYPICAL STANDARD
PAVEMENT MARKINGS

PM(1)-20

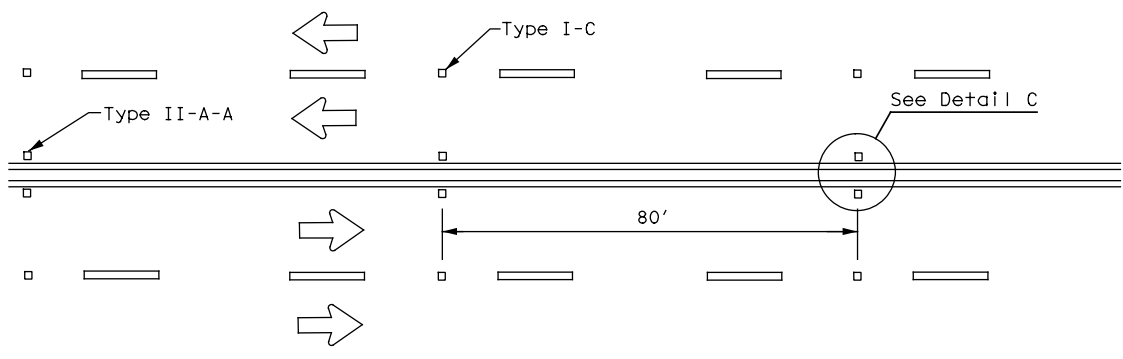
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© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0215	09	035	FM 725
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	SAN	GUADALUPE	317	

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

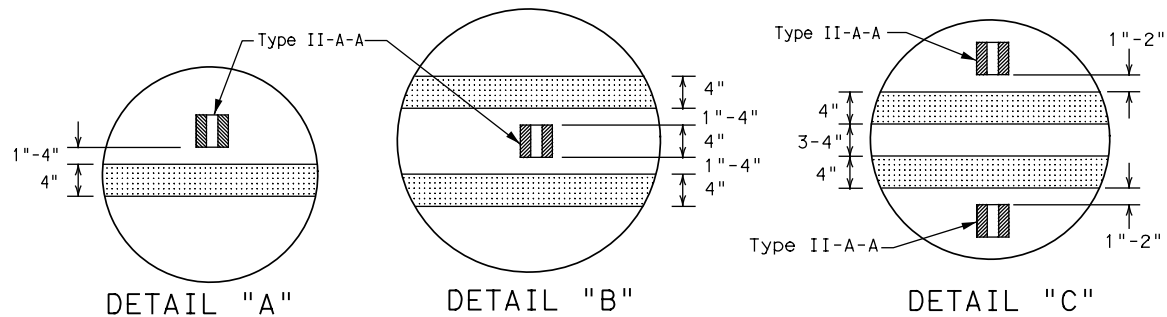
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CENTERLINE FOR ALL TWO LANE ROADWAYS



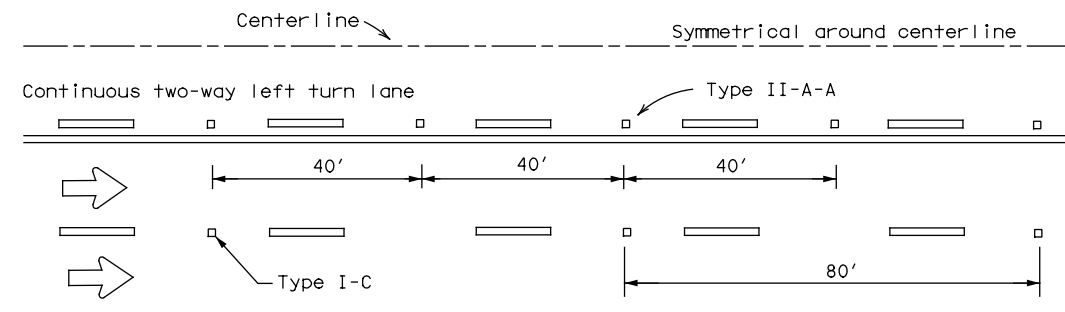
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS



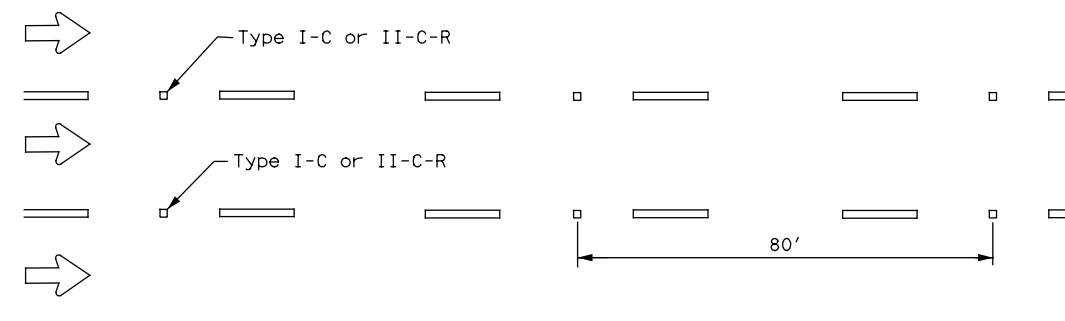
DETAIL "A"

DETAIL "B"

DETAIL "C"

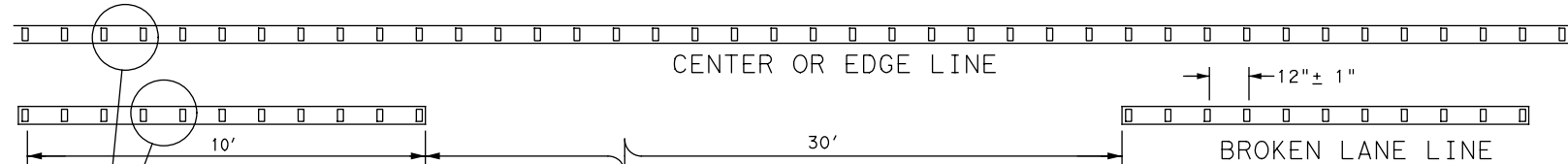


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



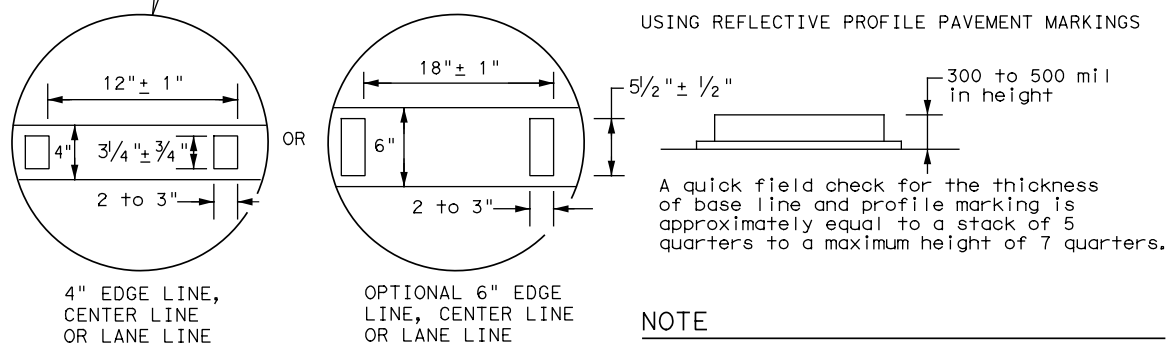
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE,
CENTER LINE
OR LANE LINE

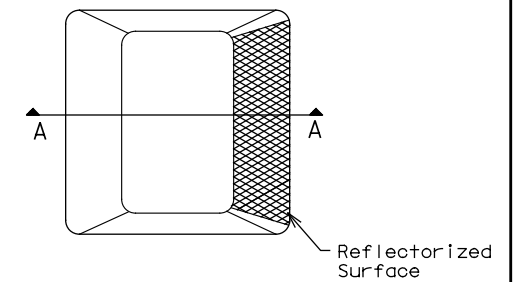
OPTIONAL 6" EDGE
LINE, CENTER LINE
OR LANE LINE

NOTE

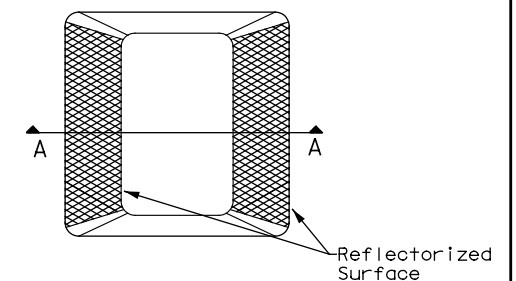
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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

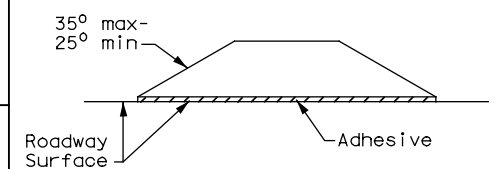
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

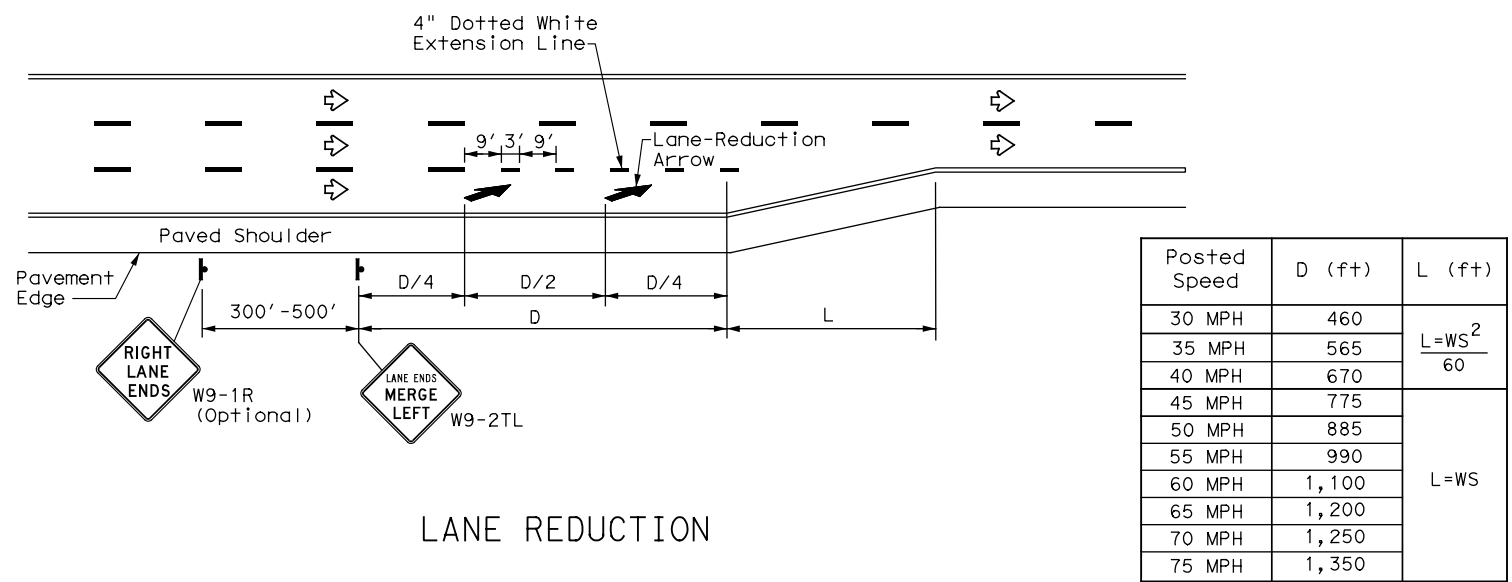


POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2) - 20

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© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	0215	09	035	FM 725
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	SAN	GUADALUPE	318	

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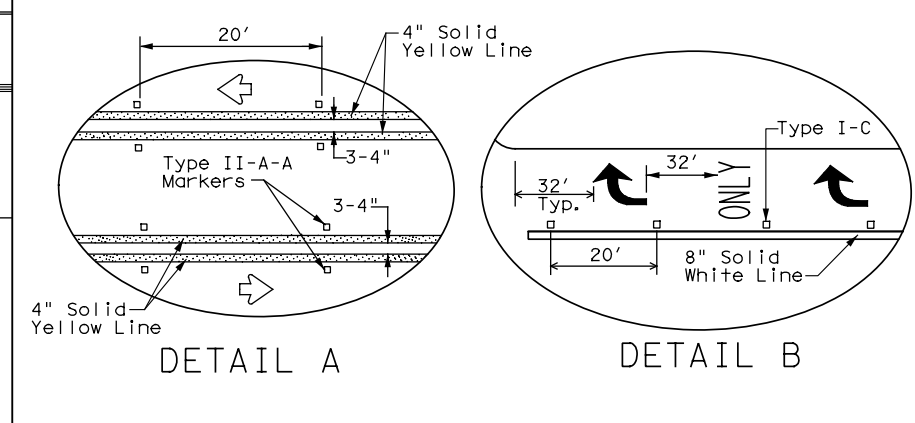
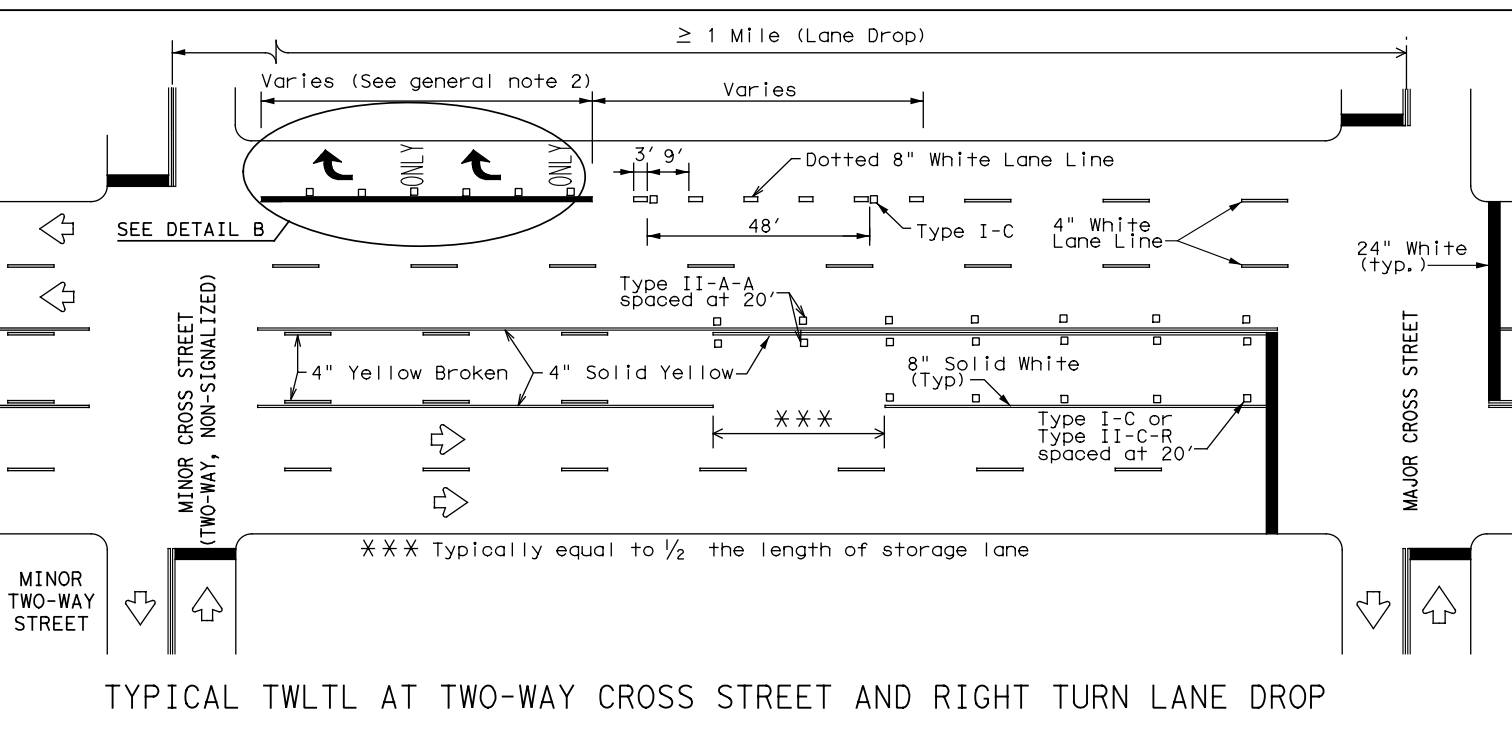
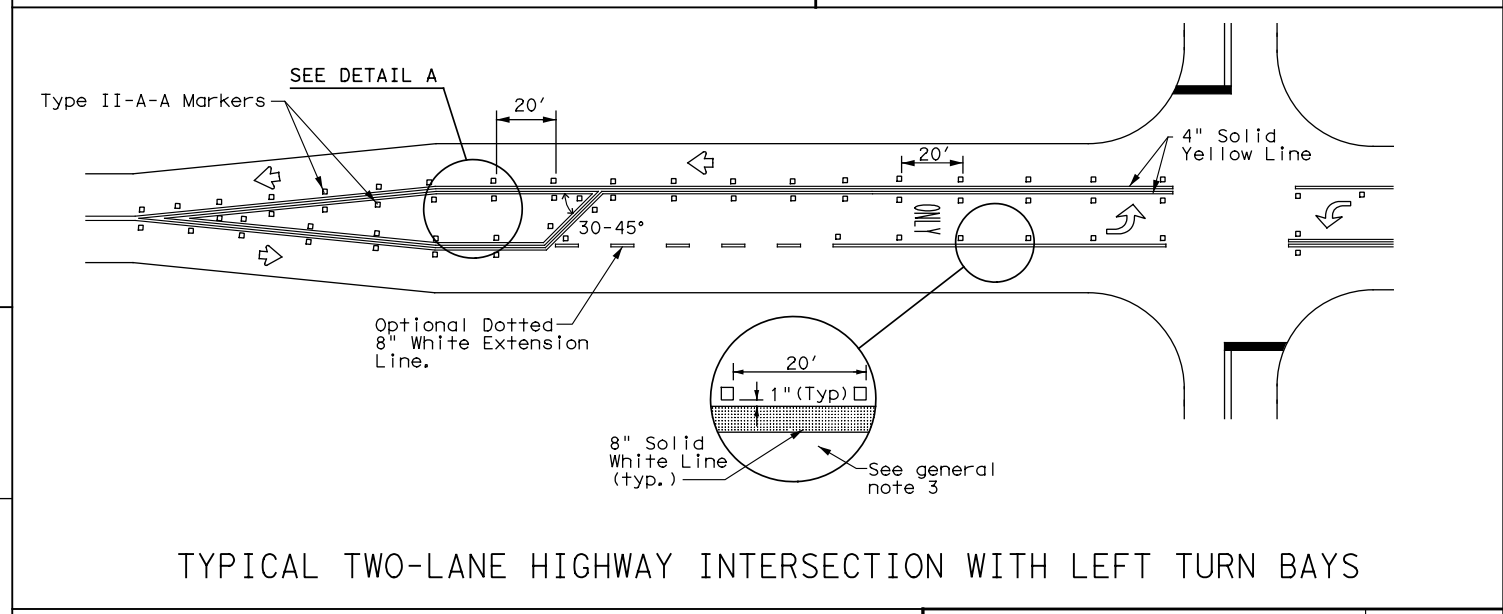
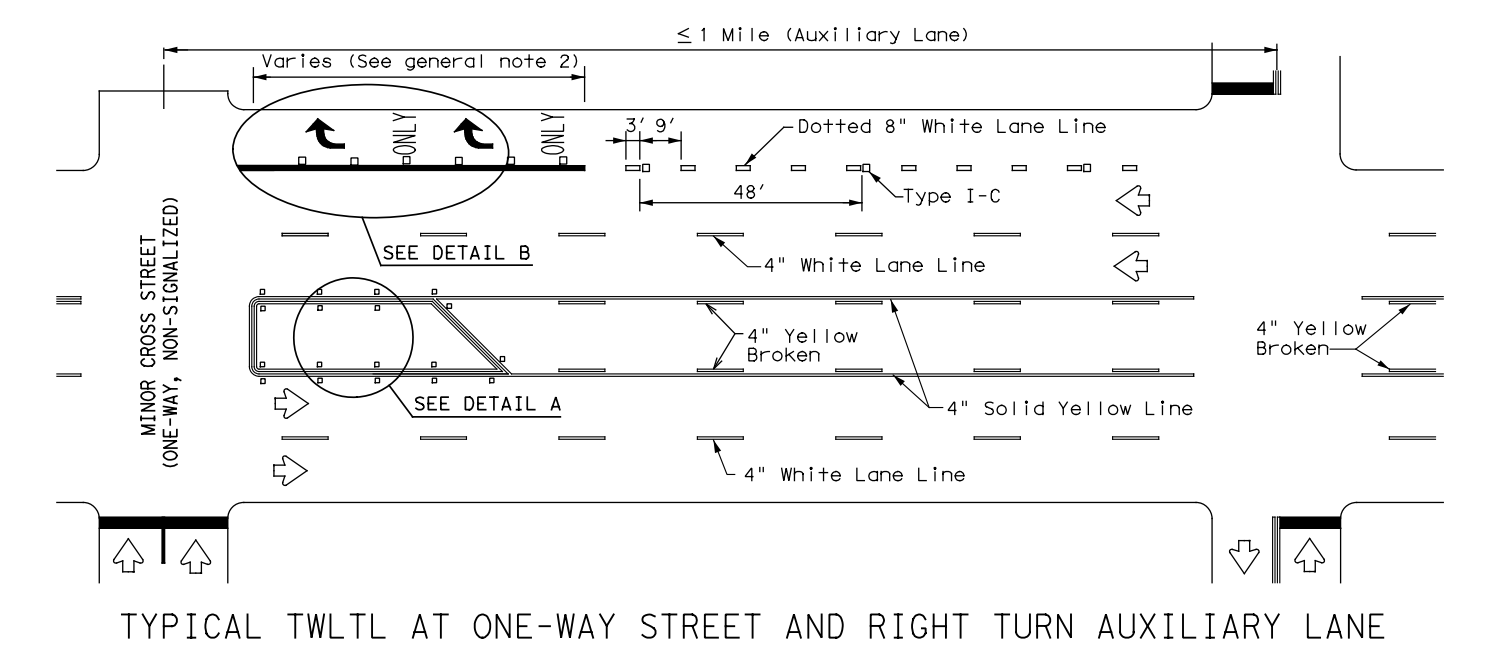
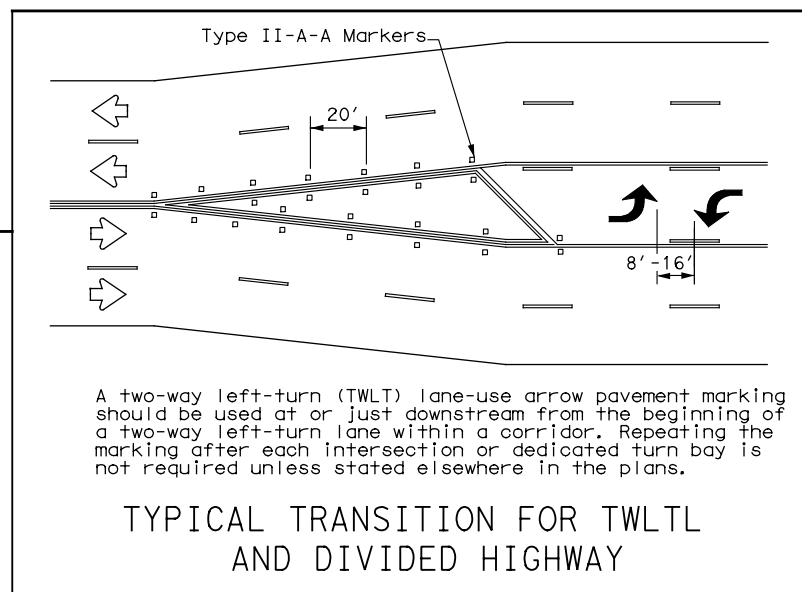
LANE REDUCTION

- NOTES
- 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.
 - 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.
 - 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.
 - For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

- GENERAL NOTES
- 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.
 - 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.
 - 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.
 - 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.



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	0215	09	035	FM 725
5-00 2-10	DIST	COUNTY	SHEET NO.	
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3-03 6-20				

22C


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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS					DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		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	
	3" ± 1/16"	4" ± 1/16"	6" ± 1/8"	3" ± 1/16"	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				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.				POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX	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 unit (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
MOUNT TYPE	GND				MOUNT TYPE	GND	GND, SRF	GND	GND, SRF	

OBJECT MARKERS									
DEVICE	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	
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting		Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective 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)			CHEVRONS				ONE DIRECTION LARGE ARROW		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.				
DEVICE	GF1	GF2	CTB	W1-8		W1-6							
SHEETING	Yellow, White, Red			SIZE (W x L)		18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)	
NOTE	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.			MOUNTING HEIGHT		4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT		7'-0"	
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.			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).							

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



DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

FILE: dcm1-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CK: TXDOT
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REVISIONS	0215	09	035	FM 725
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	SAN	GUADALUPE	320	

20A

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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS																										
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT																									
GND	GND	SRF	WAS	WAP	GF1																									
	EMBEDDED		SURFACE MOUNT	STEEL	PLASTIC																									
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.	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.		NOTE 1. Install per manufacturer's recommendations.																											
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS		CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN		DELINEATORS AND TYPE 2 OBJECT MARKERS																										
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)		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.		See general notes 1, 2 and 3.																										
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.																														
DELINATOR & OBJECT MARKER INSTALLATION D & OM(2)-20																														
<table border="1"> <tr> <td>FILE: dom2-20.dgn</td> <td>DN: TxDOT</td> <td>CK: TxDOT</td> <td>DN: TxDOT</td> <td>CK: TxDOT</td> </tr> <tr> <td>© TxDOT August 2004</td> <td>CONT</td> <td>SECT</td> <td>JOB</td> <td>HIGHWAY</td> </tr> <tr> <td>REVISIONS</td> <td>0215</td> <td>09</td> <td>035</td> <td>FM 725</td> </tr> <tr> <td>10-09 3-15</td> <td>DIST</td> <td>COUNTY</td> <td colspan="2">SHEET NO.</td> </tr> <tr> <td>4-10 7-20</td> <td>SAN</td> <td>GUADALUPE</td> <td colspan="2">321</td> </tr> </table>						FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT	© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY	REVISIONS	0215	09	035	FM 725	10-09 3-15	DIST	COUNTY	SHEET NO.		4-10 7-20	SAN	GUADALUPE	321	
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© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY																										
REVISIONS	0215	09	035	FM 725																										
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4-10 7-20	SAN	GUADALUPE	321																											
20B																														

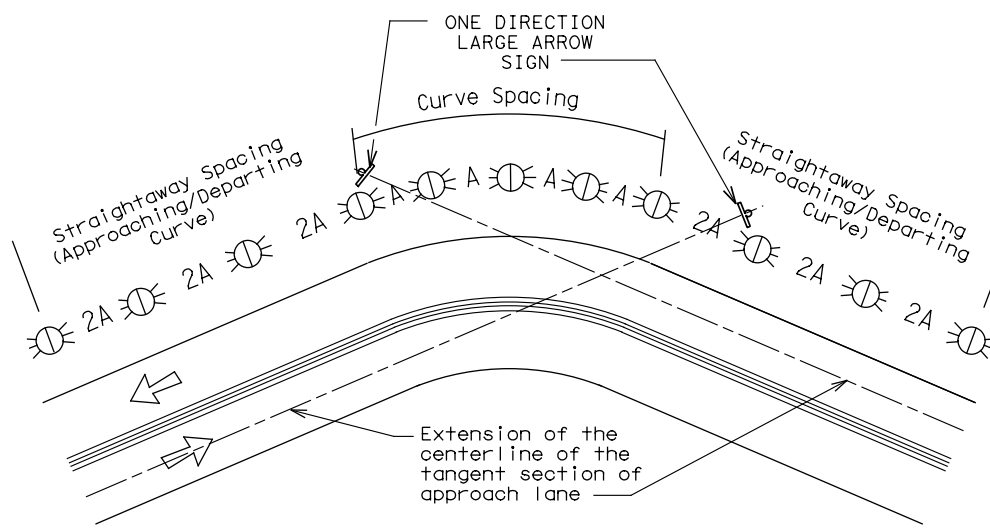
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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	● RPMs	● RPMs
15 MPH & 20 MPH	● RPMs and One Direction Large Arrow sign	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	● RPMs and Chevrons; or ● RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	● RPMs and Chevrons

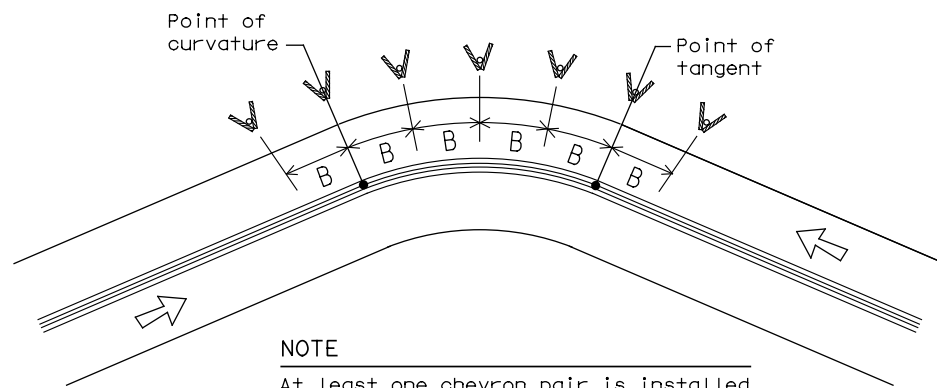
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	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	2x A	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

- 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.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

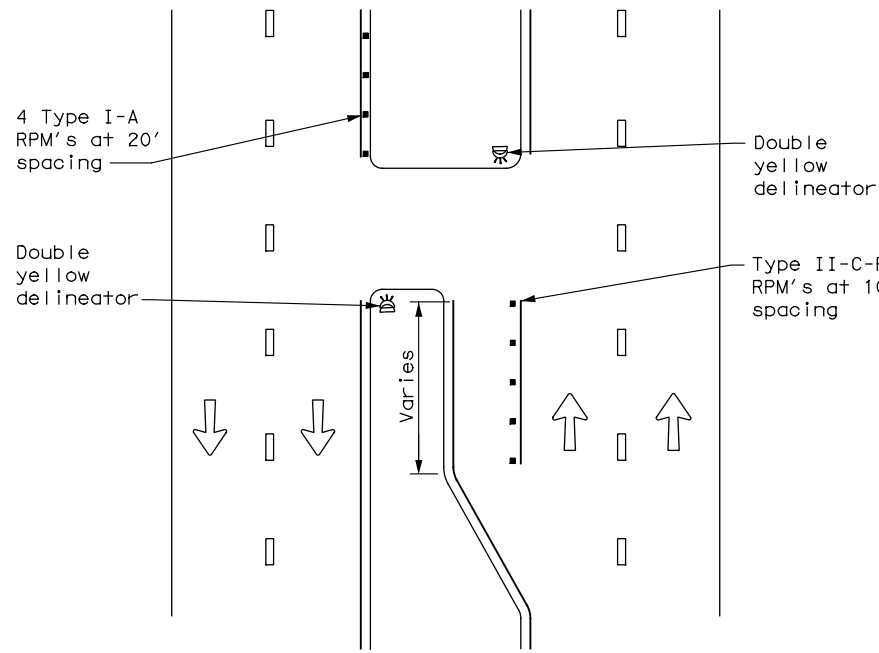
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© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	SAN	GUADALUPE	322	

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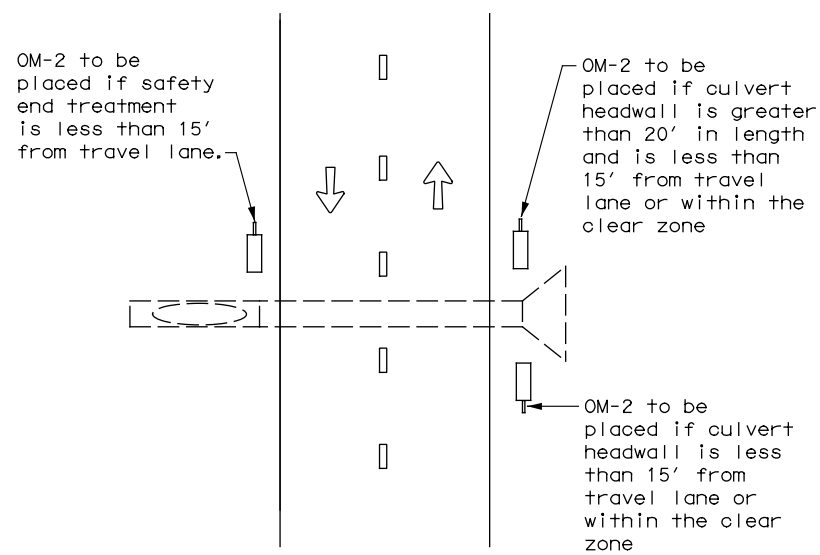
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CROSSOVERS



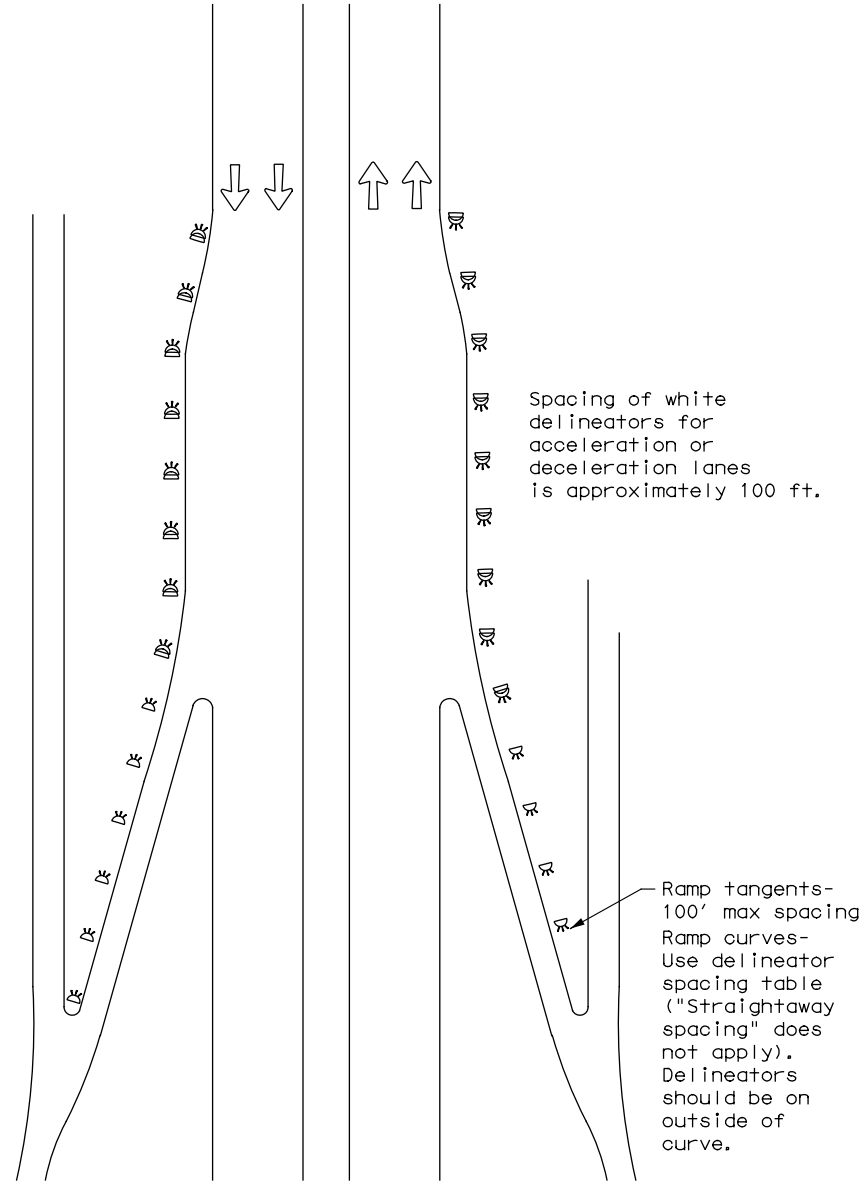
DETAIL 1

FOR CULVERTS WITHOUT MBGF



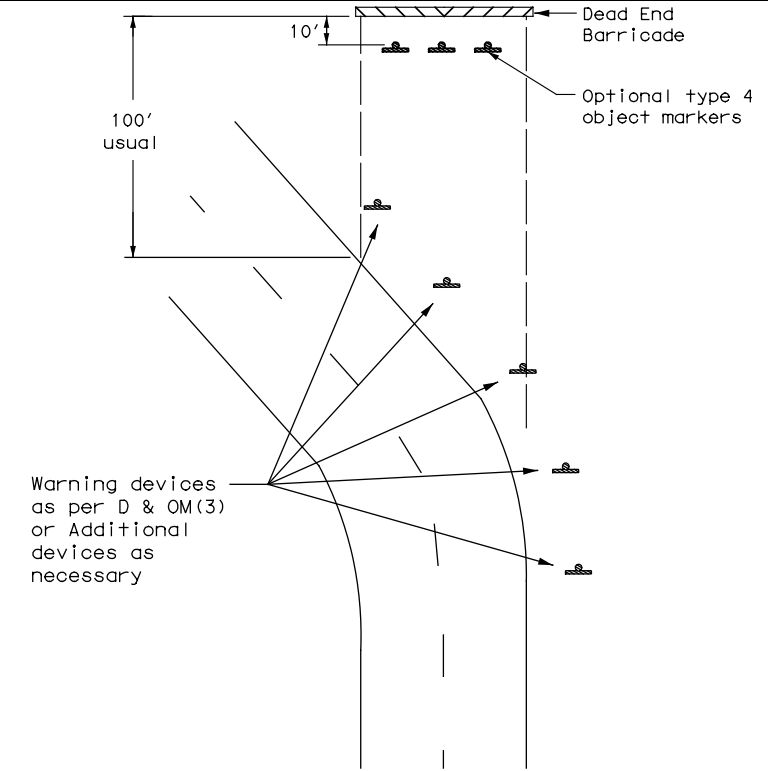
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



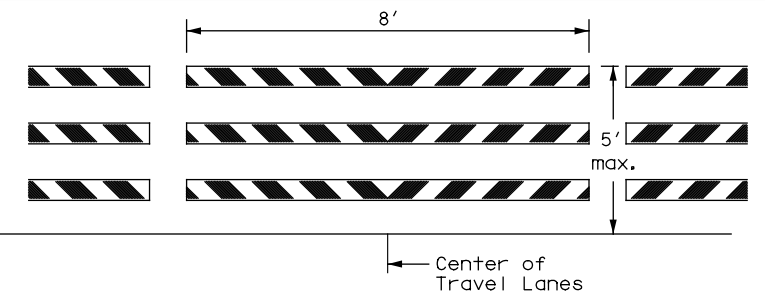
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- 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



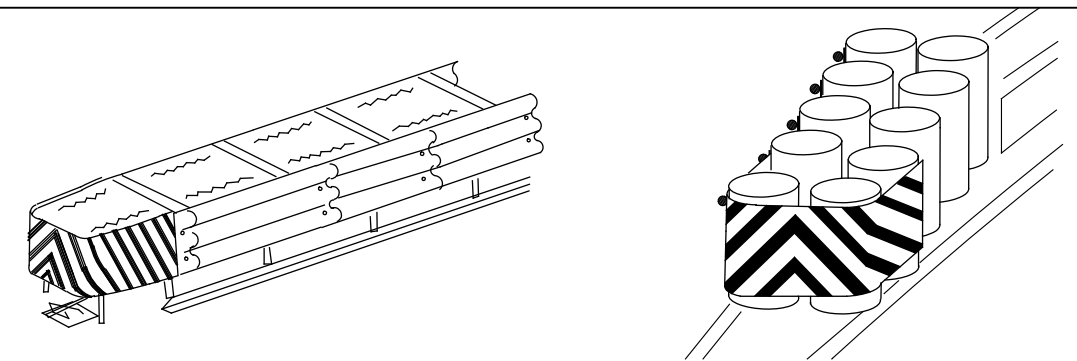
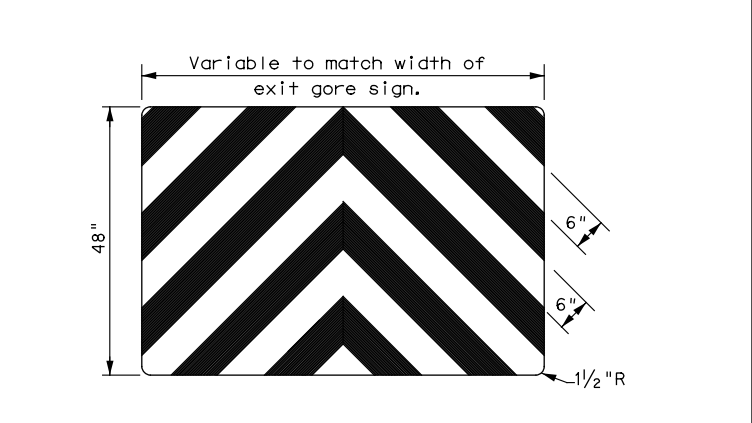
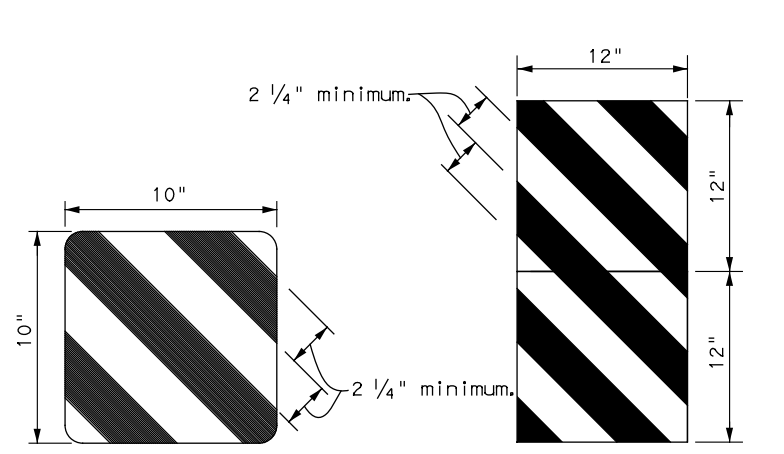
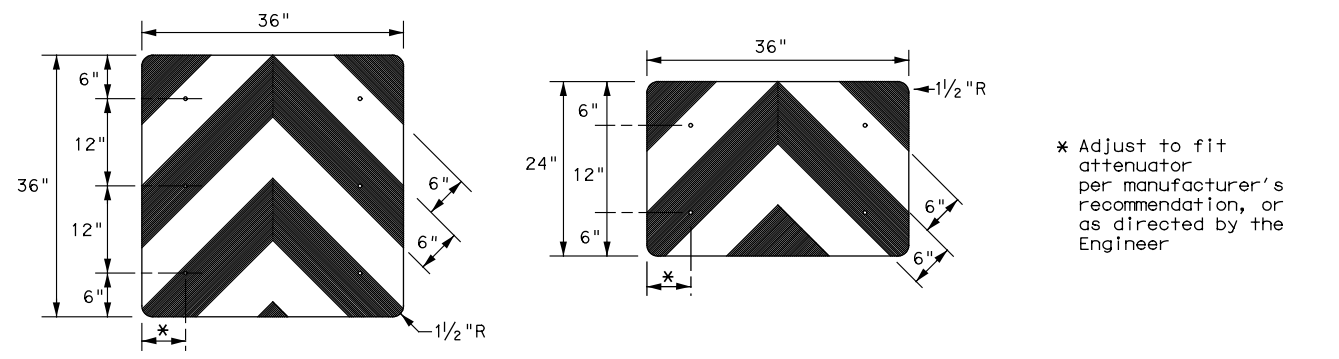
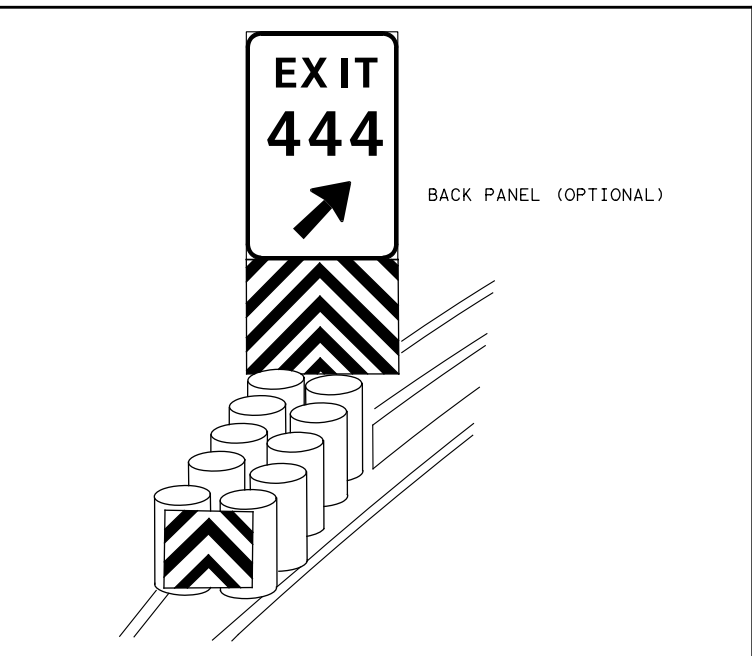
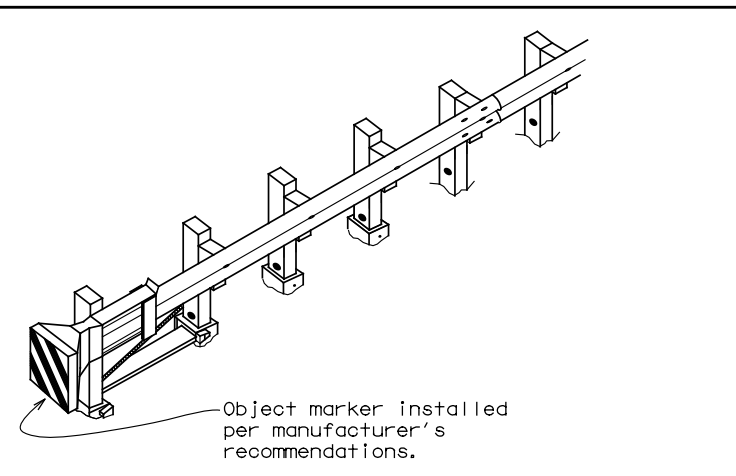
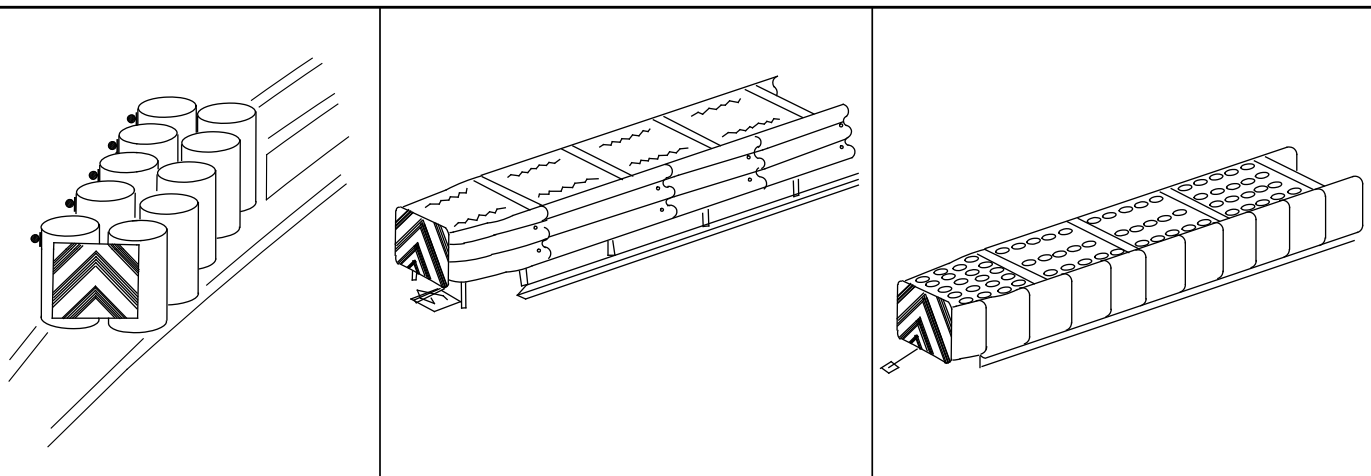
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

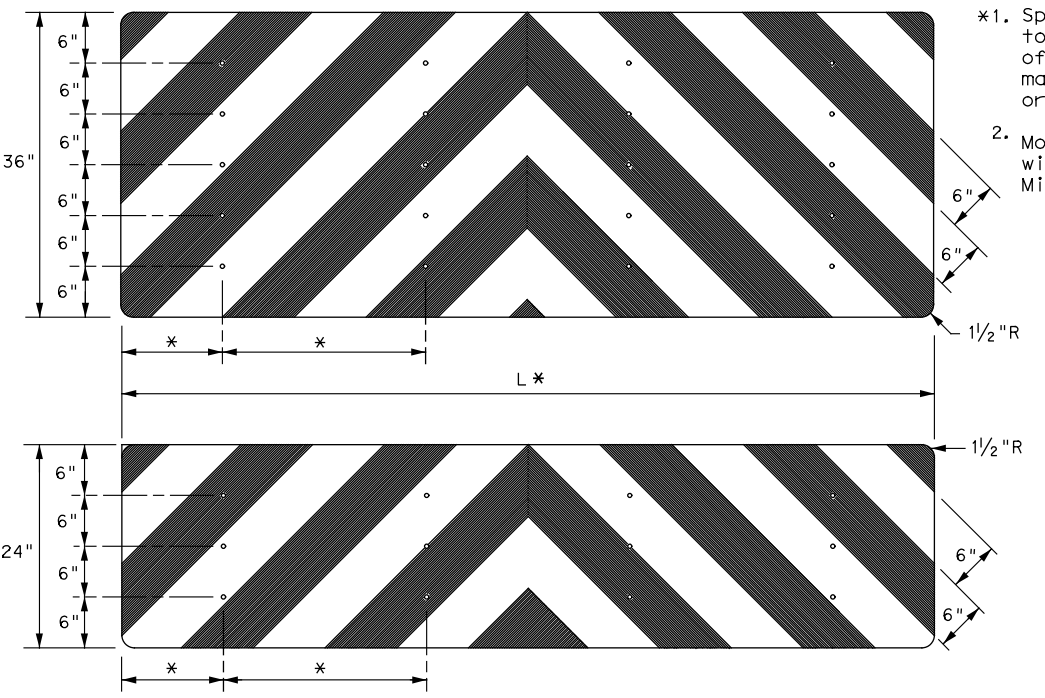
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3-15	DIST	COUNTY	SHEET NO.	
7-20	SAN	GUADALUPE	323	

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OBJECT MARKERS SMALLER THAN 3 FT²

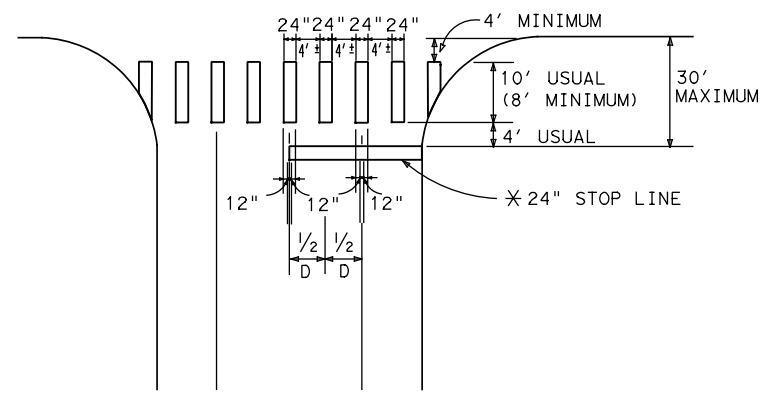


- NOTES**
- Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
 - Mounting should be flush with top of attenuator. Minimum size 96" x 24".

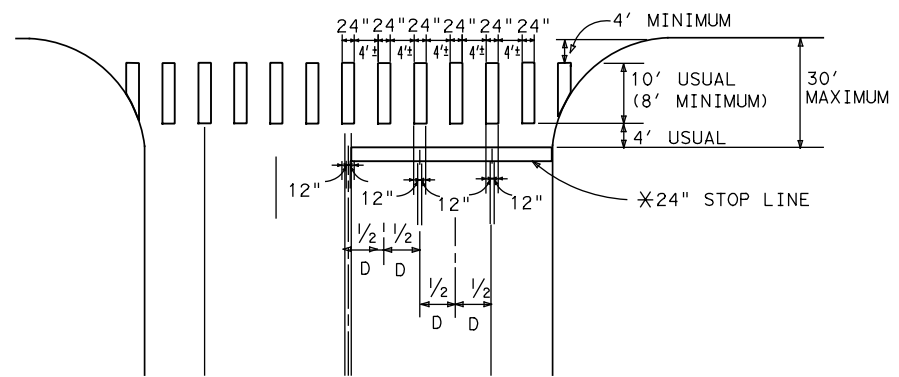
NOTES

- Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
- Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
- Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
- Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

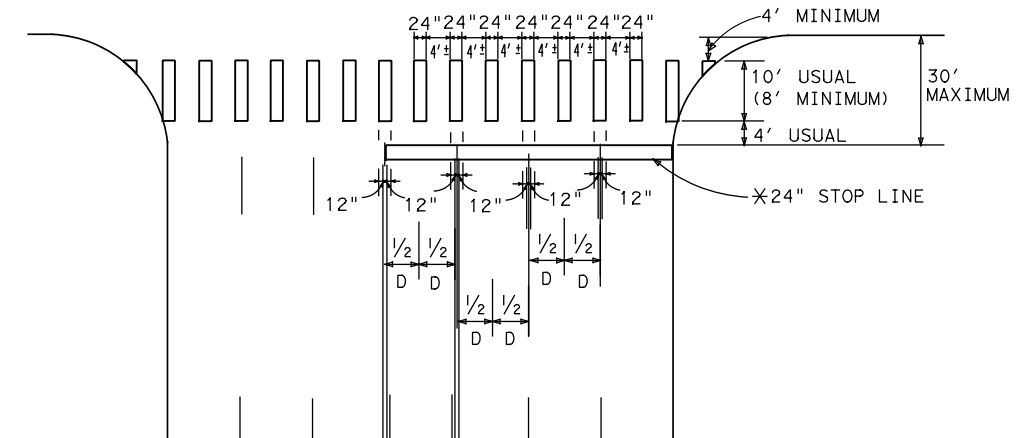
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DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA) - 20			
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© TXDOT December 1989	CONT SECT	JOB	HIGHWAY
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4-98 7-20			
20G			



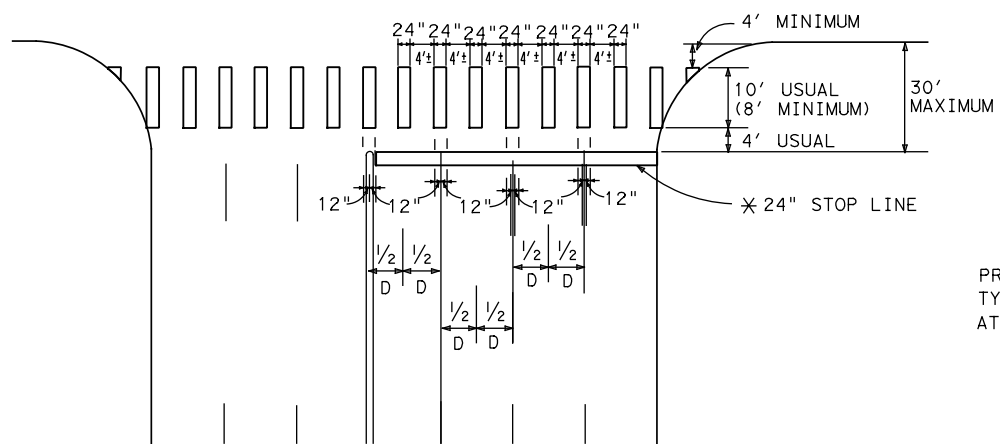
TWO LANES WITH SHOULDERS



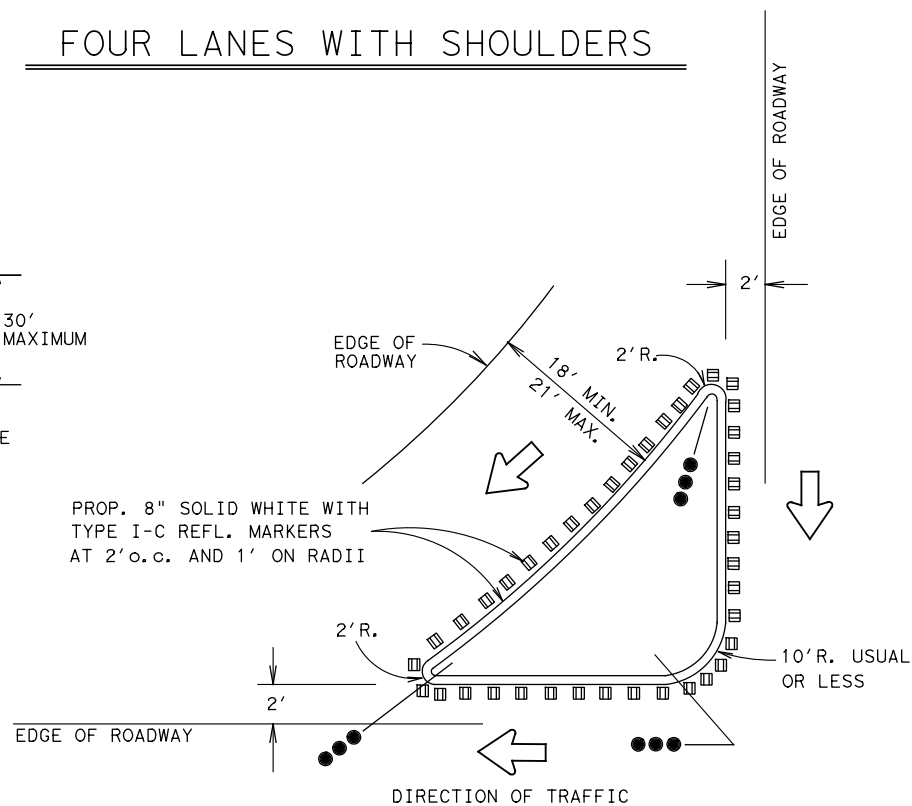
FOUR LANES WITH SHOULDERS



MULTI - LANES

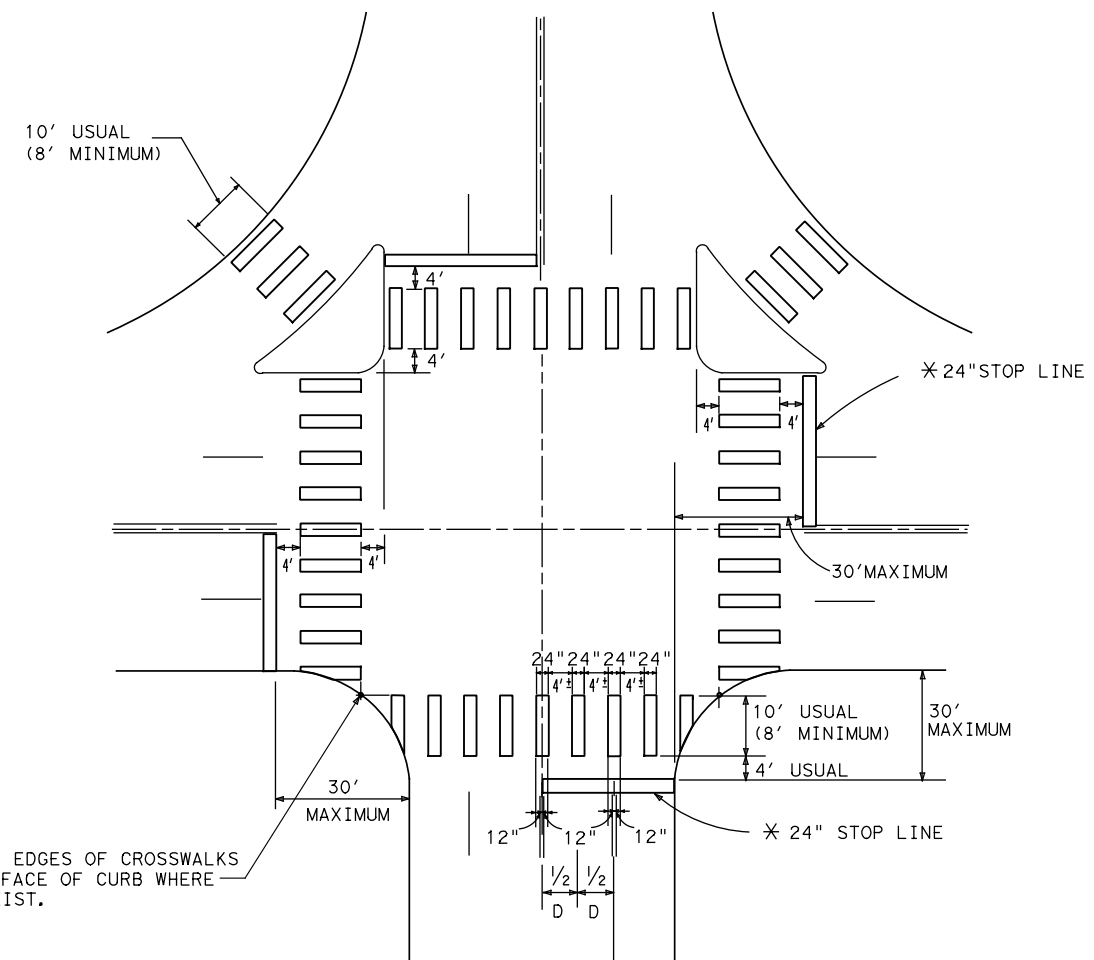


MULTI - LANE WITH MEDIAN

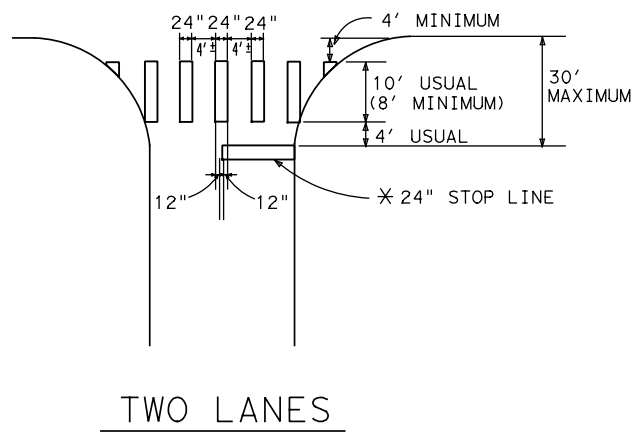


TYPICAL RIGHT TURN ISLAND WITH DELINEATION

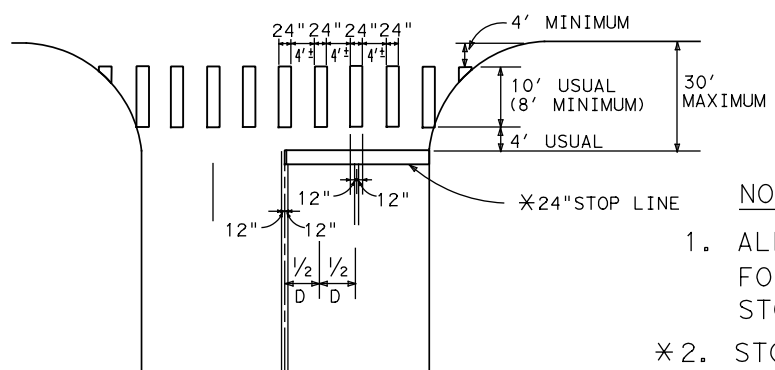
COMMON POINT OF OUTSIDE EDGES OF CROSSWALKS AT EDGE OF PAVEMENT OR FACE OF CURB WHERE NO RIGHT TURN ISLAND EXIST.



INTERSECTION WITH RIGHT - TURN ISLANDS



TWO LANES



FOUR LANES

NOTES:

1. ALL LONGITUDINAL LINES FORMING CROSSWALK AND STOP LINES SHALL BE WHITE
- *2. STOP LINES AS REQUIRED ON DETAILED PAVEMENT MARKING PLANS.
3. "D" IS EQUAL TO ONE HALF THE DISTANCE.

LEVELS DISPLAYED

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
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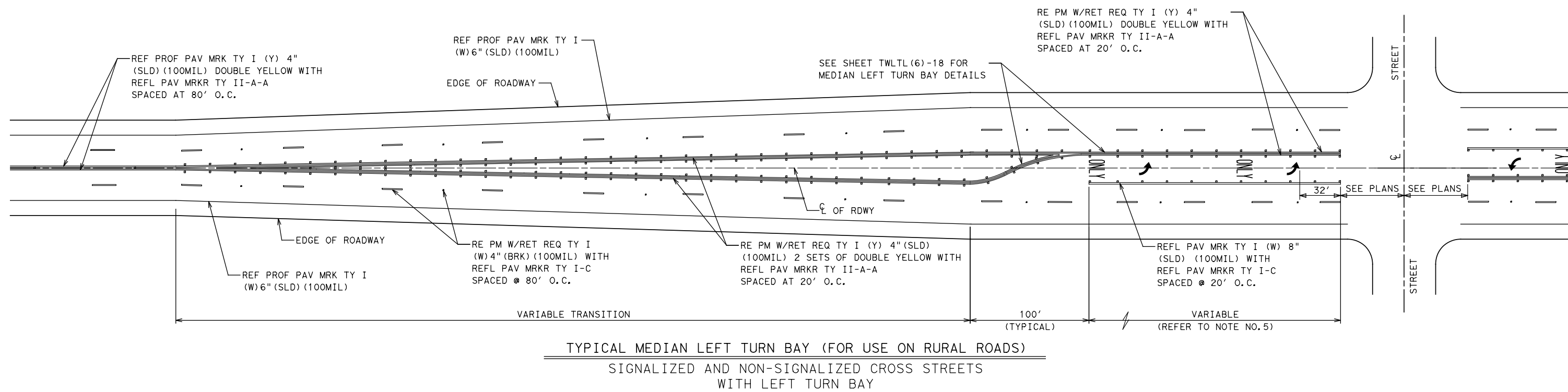
ACC:

San Antonio District Standard
TYPICAL CROSSWALK
DETAILS

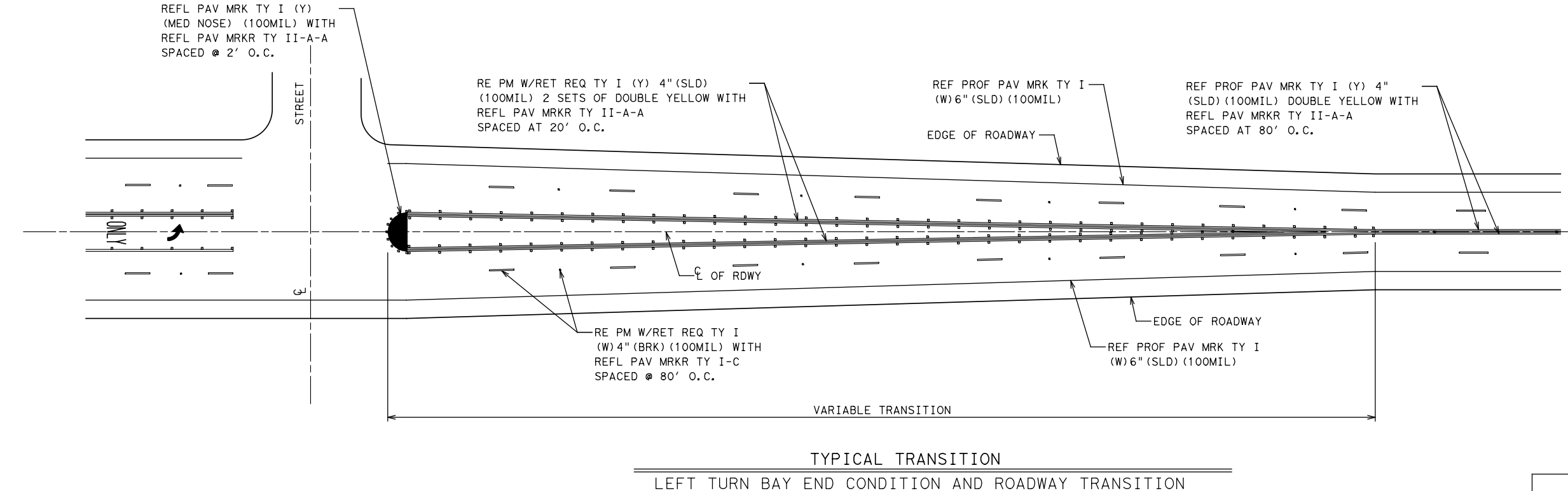
TCD-05
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REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
DEC 1999	6	SEE TITLE SHEET	326
AUG 2005	STATE	DIST.	COUNTY
	TEXAS	SAT	GUADALUPE
	CONT.	SECT.	JOB
	0215	09	035
			HIGHWAY NO.
			FM 725

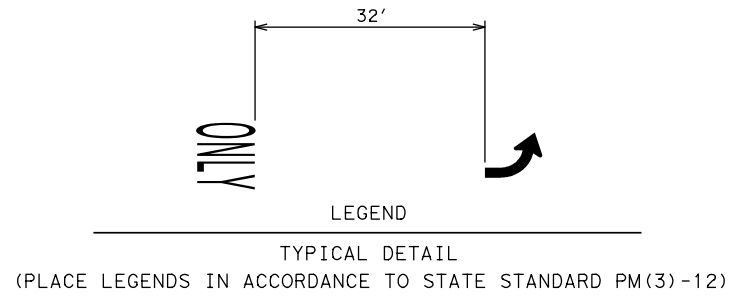
DRAWN BY: TED
 REVISED BY: MSD
 CHECKED BY: G.C./OMG
 DESIGNED BY: J.E./PMI
 PROJECT: 34832, D00-TxDOT*FM-725\CADD\Sheets\HALFF\Standard\Signing and Pavement\TWLTL(1)-21.dwg



TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)
 SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
 WITH LEFT TURN BAY



TYPICAL TRANSITION
 LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION



- NOTES:
- PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
 - PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
 - LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 215 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
 - REFER TO TXDOT STANDARD PM(3)-12 FOR MORE TURN LANE DETAILS.
 - REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

LEGEND

REFLECTIVE MARKER

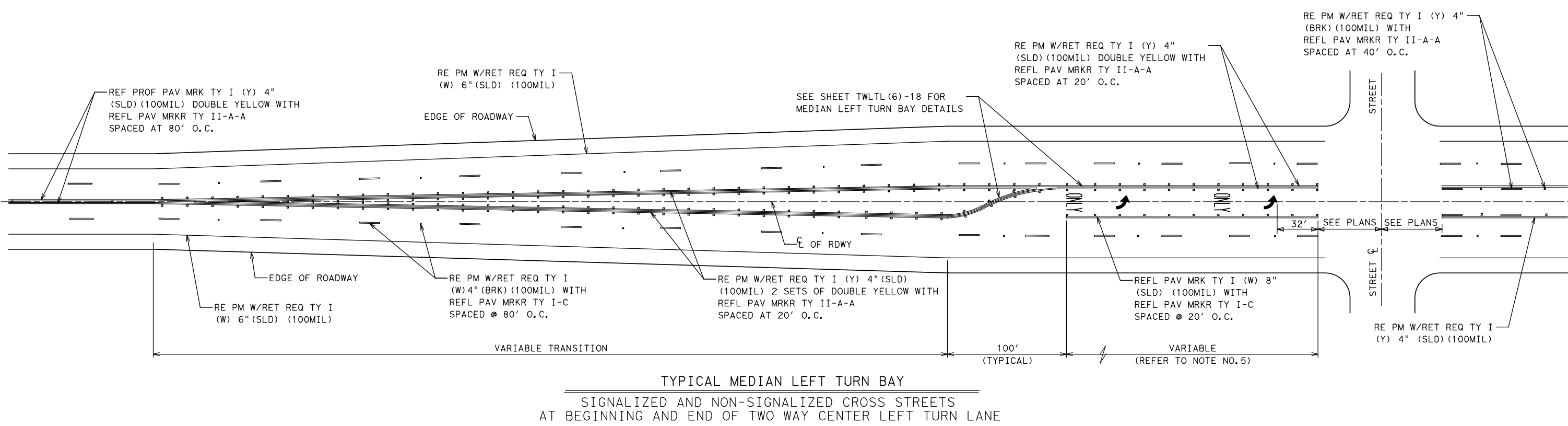


San Antonio District Standard
**TWO WAY LEFT TURN LANE
 AND LEFT TURN BAYS - RURAL ROADS**

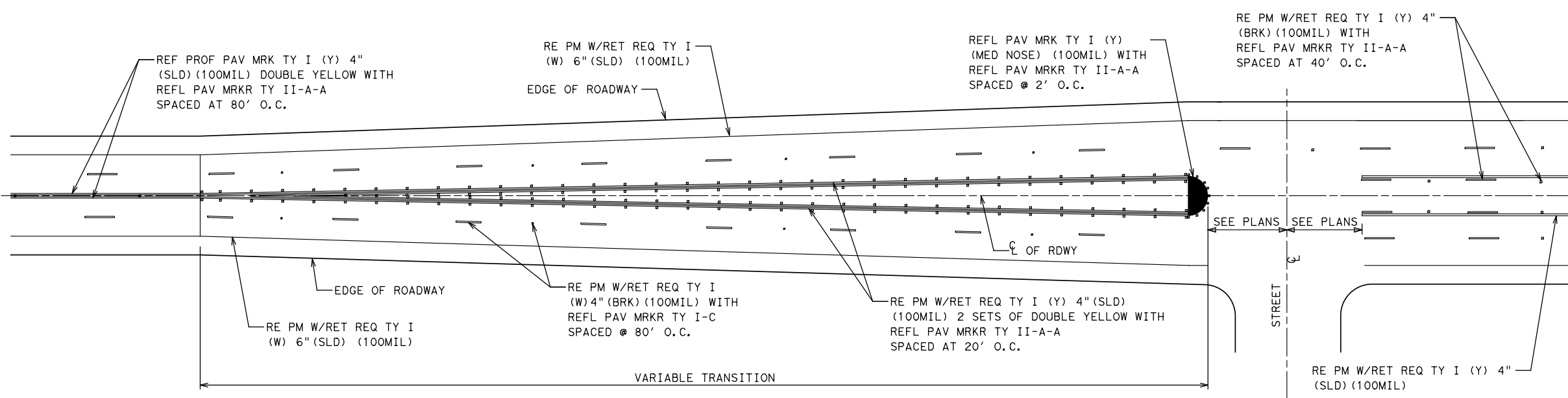
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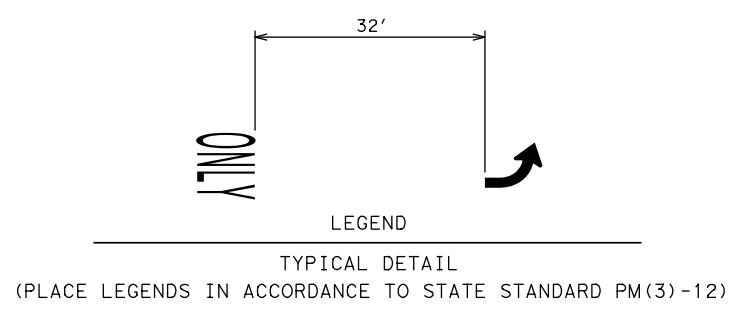
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TYPICAL MEDIAN LEFT TURN BAY
 SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
 AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



TYPICAL TRANSITION
 AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



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- LEGEND**
- REFLECTIVE MARKER

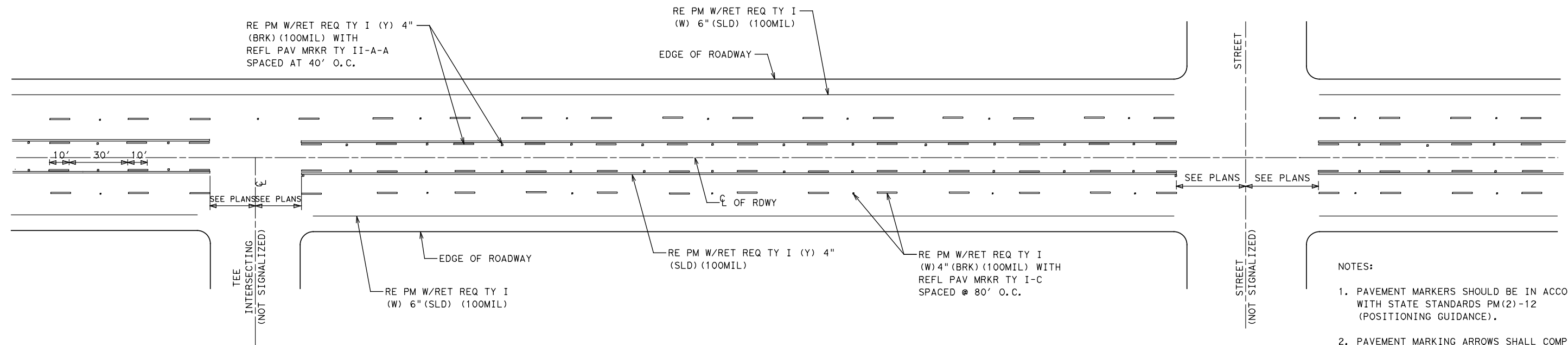
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San Antonio District Standard
**TWO WAY LEFT TURN LANE
 AND LEFT TURN BAYS - URBAN ROADS**

SCALE: NS TWLTL (1) -21

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CONT.	SECT.	JOB	HIGHWAY NO.
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 CHECKED BY: G.C./OMG
 REVISIONS: 6
 DATE: 02/21/2021

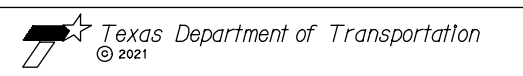


TWO WAY LEFT TURN LANE DETAILS
NON-SIGNALIZED INTERSECTIONS

- NOTES:
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LEGEND

□ REFLECTIVE MARKER

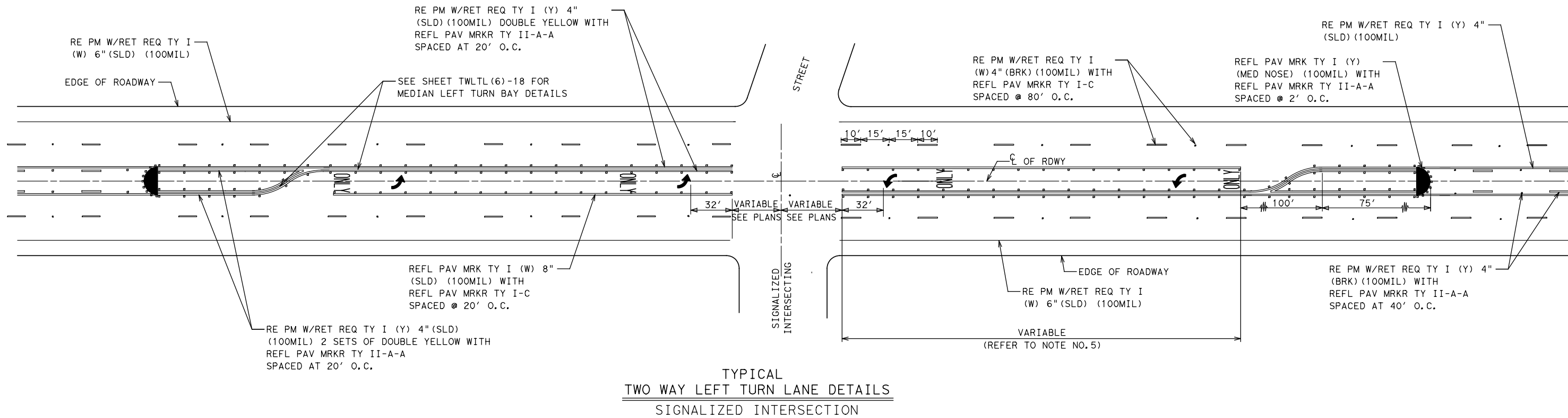


San Antonio District Standard
**TWO WAY LEFT TURN LANE
 AND LEFT TURN BAYS - URBAN ROADS**

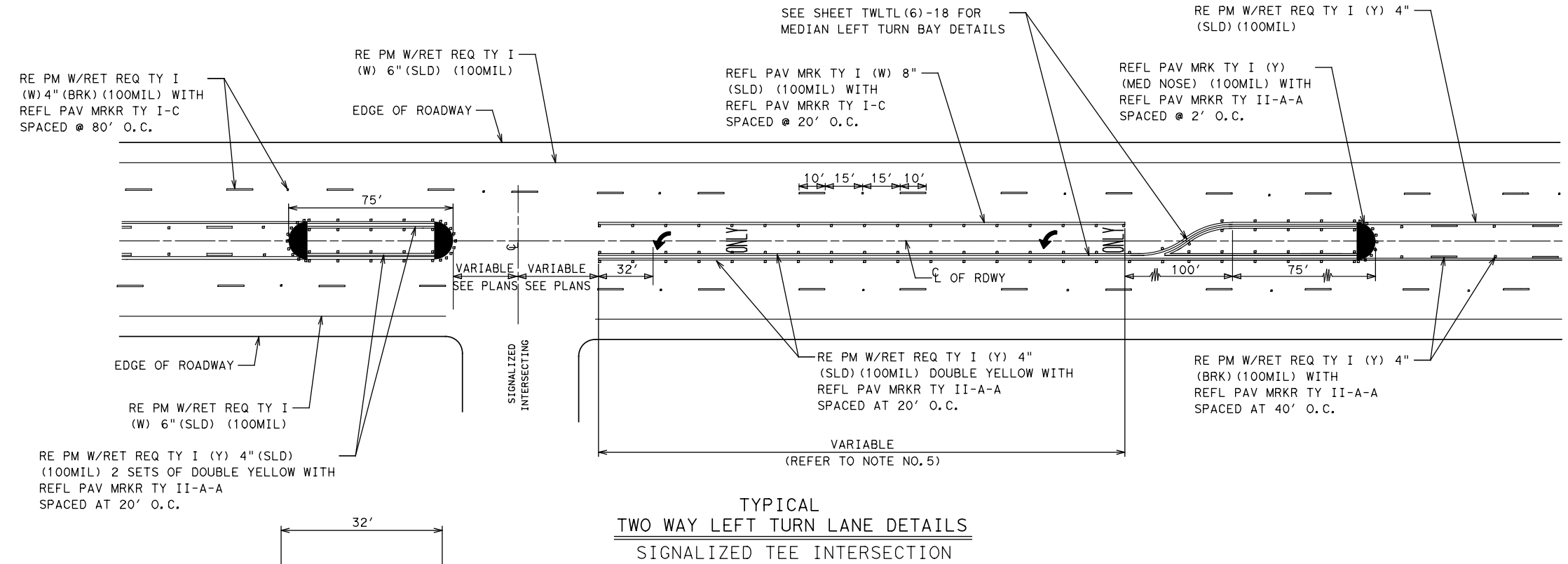
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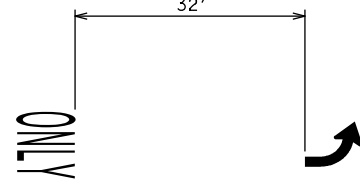
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**TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTION**



**TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION**



LEGEND
 TYPICAL DETAIL
 (PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

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☐ REFLECTIVE MARKER

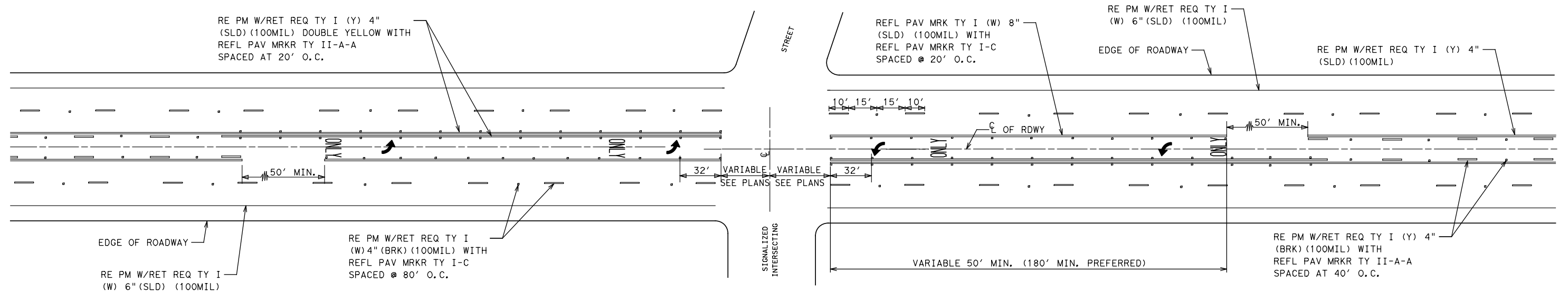


**San Antonio District Standard
TWO WAY LEFT TURN LANE
AND LEFT TURN BAYS - URBAN ROADS**

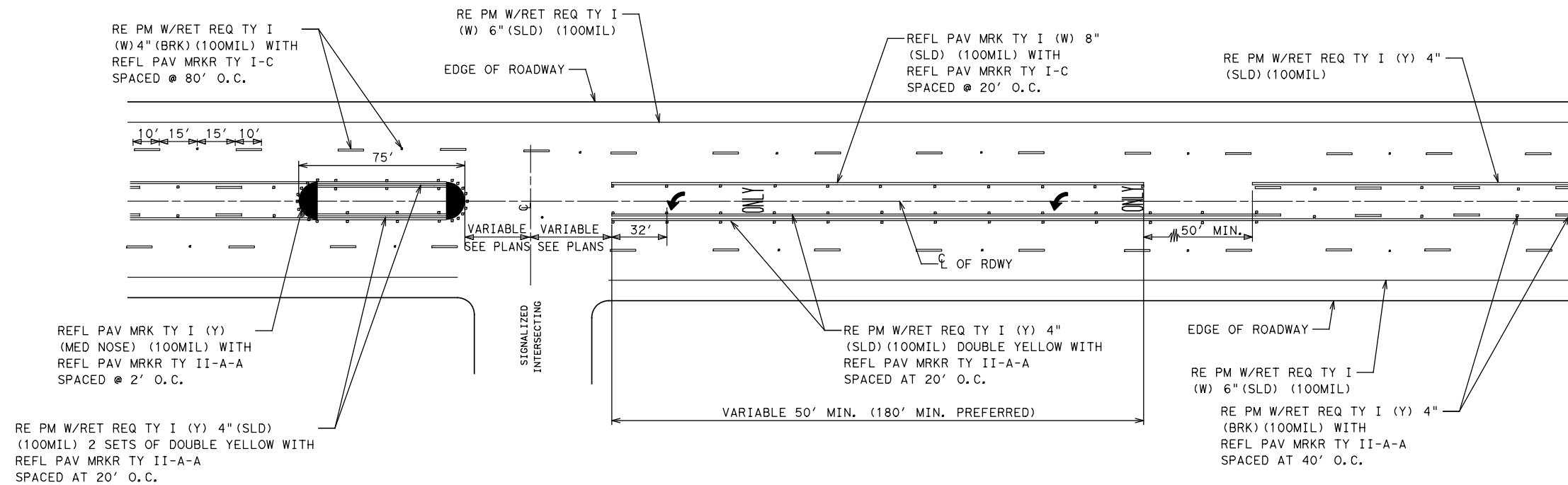
SCALE: NS TWLTL (1) -21

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MAY 2010	6	SEE TITLE SHEET	330
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STATE	DIST.	COUNTY	
TEXAS	SAN	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725

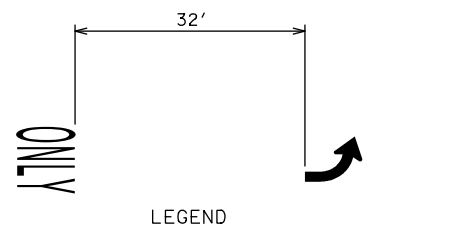
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**TYPICAL
 TWO WAY LEFT TURN LANE DETAILS
 SIGNALIZED INTERSECTION**



**TYPICAL
 TWO WAY LEFT TURN LANE DETAILS
 SIGNALIZED TEE INTERSECTION**

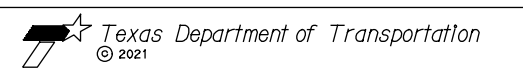


LEGEND
 TYPICAL DETAIL
 (PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

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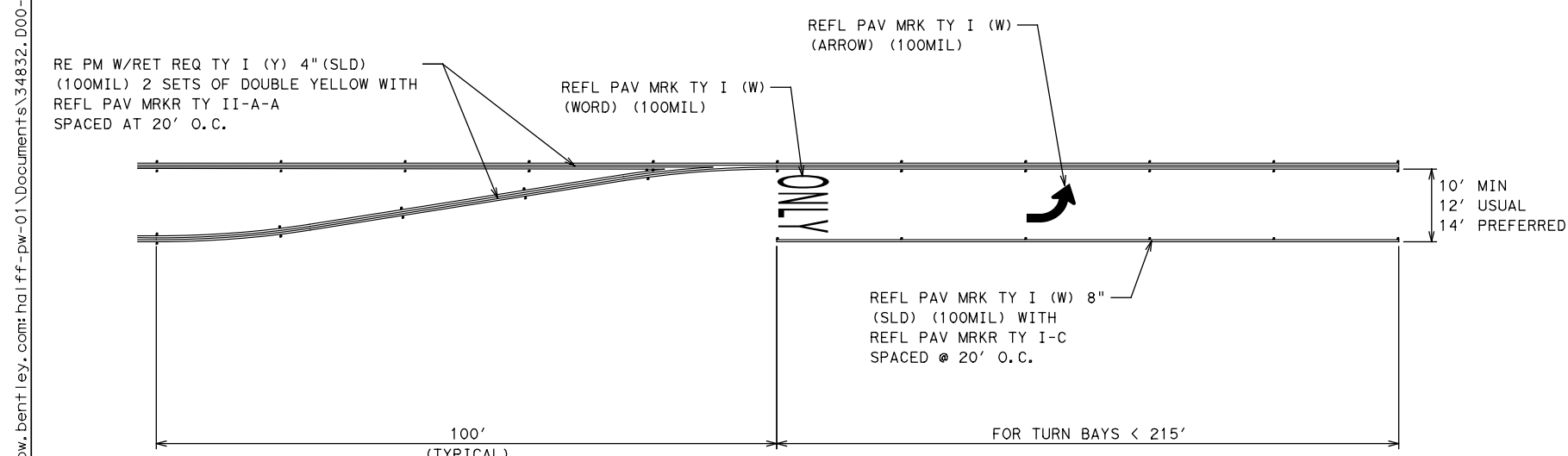
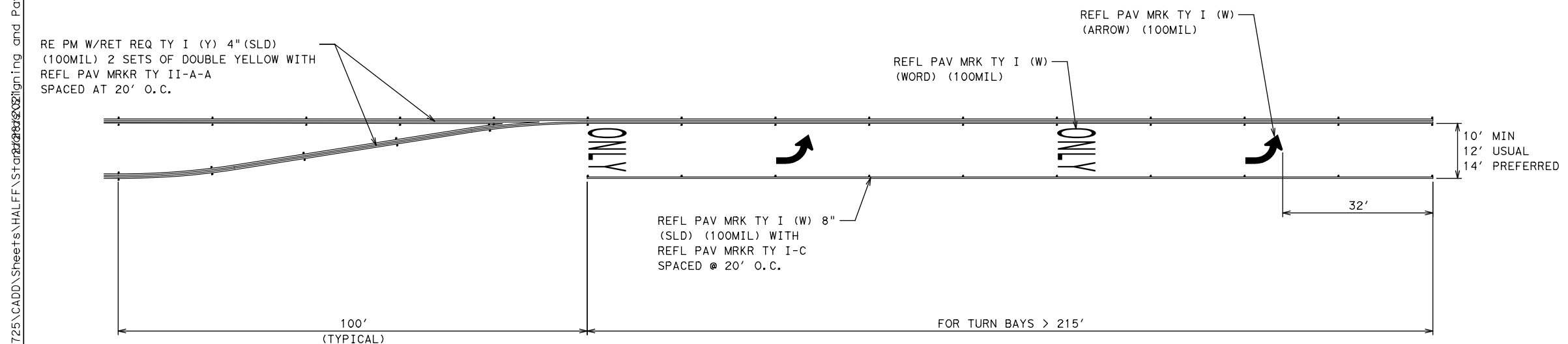
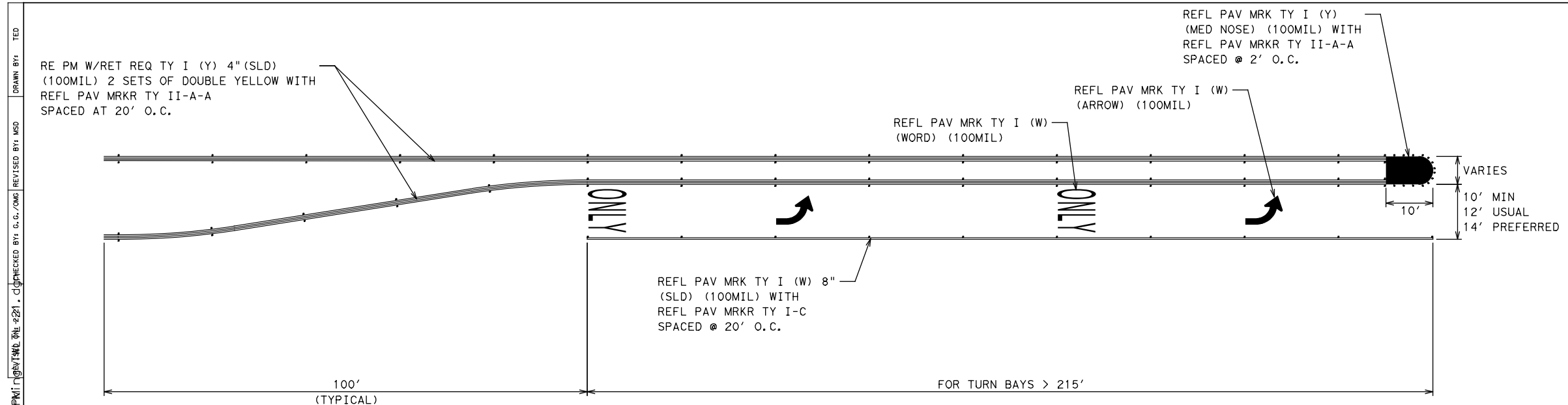
LEGEND

REFLECTIVE MARKER



San Antonio District Standard
**TWO WAY LEFT TURN LANE
 AND LEFT TURN BAYS - URBAN ROADS**

SCALE: NS		TWLTL (1) -21	
REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
MAY 2010	6	SEE TITLE SHEET	331
MAY 2018			
FEB 2021			
STATE	DIST.	COUNTY	
TEXAS	SAN	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0215	09	035	FM 725



MEDIAN LEFT TURN BAY DETAILS

- NOTES:
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San Antonio District Standard
TWO WAY LEFT TURN LANE
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SCALE: NS TWLTL (1) - 21

REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
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	CONT.	SECT.	JOB
	0215	09	035
			HIGHWAY NO.
			FM 725

DRAWN BY: TED
 REVISED BY: MSD
 CHECKED BY: G.C./OMG
 DESIGNED BY: J.S./J.M.
 PAVED BY: J.S./J.M.
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A. GENERAL SITE DATA

1. **PROJECT LIMITS:** From FM 78 to ZIPP RD
2. **PROJECT SITE MAPS:**
 * Project Latitude 29°37'35.24" Project Longitude 98°03'56.86"
 * Project Location Map: Shown on Title Sheet
 * Drainage Patterns: Shown on Drainage Area Maps (Sheets I69)
 * Approx. Slopes Anticipated After Major Gradients and Areas of Soil Disturbance: Shown on Typical Sections (Sheets 6-8)
 * Major Controls and Locations of Stabilization Practices: Shown on SW3P Sheets (Sheets 224-237)
 * Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.
 * Surface Waters and Discharge Locations: Shown on Drainage and Culvert Layout Sheets (Sheets 188-195)

3. **PROJECT DESCRIPTION:** Same description as stated on Title Sheet
 Non-Joint Bld Utilites are not part of this SW3P.

4. **FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:**
- Install controls down-slope of work area and Initiate Inspection and maintenance activities.
 - Begin phased construction with interim stabilization practices. Adjust erosion and sedimentation controls during construction to meet requirements and changing conditions and as directed/approved by the Engineer.
 - Major soil disturbing activities may include but are not limited to: right-of-way preparation, cut and/or fill to improve roadway profile, final grading and placement of topsoil and the following (if marked):
 Placement of road base
 Extensive ditch grading
 Upgrading or replacing culverts or bridges
 Temporary detour road(s)
 Other: _____

5. **EXISTING AND PROPOSED CONDITIONS:**

Description of existing vegetative cover: Native Grass and Weeds
 Percentage of existing vegetative cover: 90%
 Existing vegetative cover: (mark one) Thick or uniformly established
 Thin and Patchy
 None or minimal cover

Description of soils: (Provide classification and description of soils)
 Site Acreage: 76.63 Acres Acreage disturbed: 48.09 Acres
 Site runoff coefficient (pre-construction): _____ Site runoff coefficient (post-construction): _____

6. **RECEIVING WATERS:** (Mark all that apply)

A classified stream does not pass through project.
 A classified stream passes through project. Name _____ Segment Number _____

Name of receiving waters that will receive discharges from disturbed areas of the project: _____

Site is in a Municipal Separate Storm Sewer System (MS4).
 MS4 Operator (name): _____

B. BEST MANAGEMENT PRACTICES

General timing or sequence for Implementation of BMPs shall be as required and/or as directed/approved by the Engineer to provide adequate controls. BMPs shown on plan sheets are to be considered "proposed" unless/until install date is shown. BMPs are to reduce sediments from road construction activities.

1. **SOIL STABILIZATION PRACTICES:** (Select T = Temporary or P = Permanent, as applicable)

- | | |
|--|--|
| <input type="checkbox"/> SEEDING | <input type="checkbox"/> PRESERVATION OF NATURAL RESOURCES |
| <input type="checkbox"/> MULCHING (Hay or Straw) | <input type="checkbox"/> FLEXIBLE CHANNEL LINER |
| <input type="checkbox"/> BUFFER ZONES | <input type="checkbox"/> RIGID CHANNEL LINER |
| <input type="checkbox"/> PLANTING | <input checked="" type="checkbox"/> SOIL RETENTION BLANKET |
| <input type="checkbox"/> COMPOST/MULCH FILTER BERM | <input checked="" type="checkbox"/> COMPOST MANUFACTURED TOPSOIL |
| <input type="checkbox"/> SODDING | <input type="checkbox"/> OTHER: (Specify Practice) |

2. **STRUCTURAL PRACTICES:** (Select T = Temporary or P = Permanent, as applicable)

- | |
|---|
| <input type="checkbox"/> SILT FENCES |
| <input type="checkbox"/> HAY BALES |
| <input checked="" type="checkbox"/> ROCK FILTER DAMS |
| <input type="checkbox"/> DIVERSION, INTERCEPTOR, OR PERIMETER DIKES |
| <input type="checkbox"/> DIVERSION, INTERCEPTOR, OR PERIMETER SWALES |
| <input type="checkbox"/> DIVERSION DIKE AND SWALE COMBINATIONS |
| <input type="checkbox"/> PIPE SLOPE DRAINS |
| <input type="checkbox"/> PAVED FLUMES |
| <input checked="" type="checkbox"/> ROCK BEDDING AT CONSTRUCTION EXIT |
| <input type="checkbox"/> TIMBER MATTING AT CONSTRUCTION EXIT |
| <input type="checkbox"/> CHANNEL LINERS |
| <input type="checkbox"/> SEDIMENT TRAPS |
| <input type="checkbox"/> SEDIMENT BASINS |
| <input type="checkbox"/> STORM INLET SEDIMENT TRAP |
| <input type="checkbox"/> STONE OUTLET STRUCTURES |
| <input type="checkbox"/> CURBS AND GUTTERS |
| <input type="checkbox"/> STORM SEWERS |
| <input type="checkbox"/> VELOCITY CONTROL DEVICES |
| <input checked="" type="checkbox"/> OTHER: (BIO-LOGS) |

3. **STORM WATER MANAGEMENT:**

The proposed facility was designed in consideration of hydraulic design standards to convey stormwater in a manner that is protective of public safety and property. The control of erosion from the facility is inherent to the design. Additional factors affecting post-construction stormwater at the project location include: (mark all that apply)

- | |
|--|
| <input checked="" type="checkbox"/> Existing or new vegetation provides natural filtration. |
| <input checked="" type="checkbox"/> The design includes provisions for permanent erosion controls provided by strategically placed pervious and impervious surfaces. |
| <input type="checkbox"/> Project includes permanent sedimentation controls (other than grass). |
| <input checked="" type="checkbox"/> Velocities do not require dissipation devices. |
| <input type="checkbox"/> Velocity-dissipation devices included in the design. |
| <input type="checkbox"/> Other: _____ |

4. **NON-STORM WATER DISCHARGES:**

- Off-site discharges are prohibited except as follows:
- Discharges from fire fighting activities and/or fire hydrant flushings.
 - Vehicle, external building, and pavement wash water where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).
 - Plain water used to control dust.
 - Plain water originating from potable water sources.
 - Uncontaminated groundwater, spring water or accumulated stormwater.
 - Foundation or footing drains where flows are not contaminated with process materials such as solvents.
 - Other: _____

Concrete truck wash water discharges on the site should be prohibited or minimized. If allowed by the Engineer, they must be managed in a manner so as not to contaminate surface water. They must not be located in areas of concentrated flow. Concrete truck wash-out locations must be shown on the SW3P Layout and included in the inspections.

Hazardous material spill/leak shall be prevented or minimized. At a minimum, this includes asphalt products, fuels, oils, lubricants, solvents, paints, acids, concrete curing compounds and chemical additives for soil stabilization. BMPs shall be implemented to the storage areas of these products. All spills must be cleaned and disposed properly and reported to the Engineer. Report any release at or above the reportable quantity during a 24 hour period to the National Response Center at 1-800-424-8802.

C. OTHER REQUIREMENTS & PRACTICES

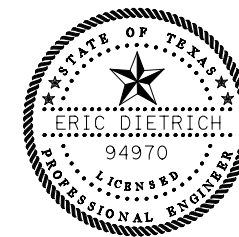
1. **MAINTENANCE:**
 All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed before the next anticipated storm event but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by protecting storm sewer inlets.
2. **INSPECTION:**
 For areas of the construction site that have not been finally stabilized, areas used for storage of materials, structural control measures, and locations where vehicles enter or exit the site, personnel provided by the permittee and familiar with the SW3P must inspect disturbed areas at least once every seven (7) calendar days. An Inspection and Maintenance Report shall be prepared for each inspection and the controls shall be revised on the SW3P within seven (7) calendar days following the inspection.
3. **WASTE MATERIALS:**
 All non-hazardous municipal waste materials such as litter, rubbish, trash and garbage located on or originating from the project shall be collected and stored in a securely lidded metal dumpster, provided by the contractor. The dumpster shall be emptied as necessary or as required by local regulation and the trash shall be hauled to a permitted disposal facility. The burying of non-hazardous municipal waste on the project shall not be permitted. Construction material waste sites, stockpiles and haul roads shall be constructed to minimize and control the amount of sediment that may enter receiving waters. Construction material waste sites shall not be located in any wetland, water body or stream bed. Construction staging areas and vehicle maintenance areas shall be constructed in a manner to minimize the runoff of pollutants.
4. **OFFSITE VEHICLE TRACKING:**
 Off-site vehicle tracking of sediments and the generation of dust must be minimized. Excess sediments on road shall be removed on a regular basis as directed/approved by the Engineer.
5. **OTHER:**
 See the EPIC sheet for additional environmental information.

Note To Designer:
 1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
 2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.

Design Consultant Logo here - delete block if not applicable



STORM WATER POLLUTION PREVENTION PLAN (SW3P)



Dietrich

, P.E. 2/26/2021

Signature of Registrant & Date

REVISION DATE: 10/12

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	See Title Sheet		FM 725
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	333
0215	09	035	

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) 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.

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 Storm Water Pollution Prevention Plan (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 Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: Yes No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

- No Permit Required
- Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
- Nationwide Permit 14 - PCN Required
- 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 (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1. Jurisdictional Crossing 1 at FM 725 and Zipp Road STA. 331+01.11, Nationwide Permit 14 (non-reporting)
2. Jurisdictional Crossing 2 at Long Creek approximately 850 ft south of Grove Lane STA. 209+93.93, Nationwide Permit 14 (non-reporting)
- 3.
- 4.
- 5.

401 Best Management Practices: (Not applicable if no USACE permit)

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

III. CULTURAL RESOURCES

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

No Action Required Required Action

Action No.

1. Prevent damage to historic buildings, porch supports, and bridge during the entire construction project.
2. Repair or replace in kind, at the contractor's expense, any historic materials damaged while executing the project. Locate replacement source for historic materials damaged during the course of work. Inform TxDOT Environmental Affairs Division or District Environmental Coordinator of proposed repairs, to facilitate consultation with the Texas Historical Commission.
3. Should plans change around these buildings, please contact District Environmental Coordinator to discuss whether additional consultation is required.

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. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:
 - A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.
 - B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.
2. See Item 5 in General Notes.
3. TERRESTRIAL REPTILE BMPs for eastern box turtle and western box turtle:
 - * Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
 - * For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
 - * Inform contractors that if reptiles are found on project site allow species to safely leave the project area.
 - * Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
 - * Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

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

4. AMPHIBIAN AND AQUATIC REPTILE BMPs for Woodhouse's toad: Unless absence of the species can be demonstrated, assume presence in suitable habitat and implement the following BMPs. Absence can only be demonstrated using TPWD-approved survey efforts) contact TPWD for minimum survey protocols for species and project site conditions).
 - * For projects within one mile of a known occupied location or observation of the species recorded from 1980 until the current year and suitable habitat is present, coordinate with TPWD.
 - * For new location roadway projects, coordinate with TPWD.
 - * For projects with existing right-of-way (ROW) when work is in water or will permanently impact a water feature and potential habitat exists for the target species complete the following:
 - * Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
 - * Minimize impacts to a wetland, temporary and permanent open water features, including depressions, and riverine habitats.
 - * Maintain hydrologic regime and connections between wetlands and other aquatic features.
 - * Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may direct impact, potential habitat for the target species.
 - * Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
 - * Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
 - * When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
 - * Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible.
 - * If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlets and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb or either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.
 - * For projects that require acquisition of additional ROW and work within that new ROW is in water or will permanently impact a water feature, implement a - i above plus j - l below, where applicable:
 - * For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80 feet long in each direction, or whichever is the lesser of the two.
 - * For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with overhangs.
 - * When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.



**ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS**

EPIC

SHEET 1 OF 2

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
© TxDOT	OCTOBER 2015	CONT	SECT	JOB
REVISIONS		0215	09	035
		DIST	COUNTY	SHEET NO.
		SAT	GUADALUPE	334

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

5. BAT BMPs for tricolored bat, big brown bat, and Mexican free-tailed bat:
- * To determine the appropriate best management practice to avoid or minimize impacts to bats, review the habitat description for the species of interest on the TPWD Rare, Threatened, and Endangered Species of Texas by County List or other trusted resources. All bat surveys and other activities that include direct contact with bats shall comply with TPWD-recommended white-nose syndrome protocols located on the TPWD Wildlife Habitat Assessment Program website under "Project Design and Construction."
 - * The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.
 - * For activities that have the potential to impact structures, cliffs or caves, or trees, a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
 - * For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
 - * If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
 - * Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50 degrees Fahrenheit AND minimum daytime temperatures are above 70 degrees Fahrenheit. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area. See Section 2: Standard Recommendations for recommended acceptable methods for excluding bats from structures.
 - * If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features, as practicable.
 - * Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.
 - * Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties) from April 1 through October 31. If removal of dead fronds is necessary at other times of the year, limit frond removal to extended warm periods (nighttime temperatures > 55 degrees Fahrenheit for at least two consecutive nights), so bats can move away from the disturbance and find new roosts.
 - * Large hollow trees, snags (dead standing trees), and tress with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
 - * Retain mature, large diameter hardwood forest species and native/ornamental palm tress where feasible.
 - * In all instances, avoid harm or death to bats. bats should only be handled as a last resort and after communication with TPWD.

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

6. ADDITIONAL BAT BMPs for tricolored bat, big brown bat, Mexican free-tailed bat:
- * Bat surveys of structures should include visual inspections of fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
 - * Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
 - * Avoid using materials that degrade quickly, like paper, steel wool or rags to close holes.
 - * Avoid using products or making structural modification that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
 - * Avoid using chemical and ultrasonic repellents.
 - * Avoid use of silicone, polyurethane or similar non-water-based caulk products.
 - * Avoid use of expandable foam products at occupied sites.
 - * Avoid the use of flexible netting attached with duct tape.
 - * In order to avoid entombing bats, exclusion activities should only be implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:
 - * Experience in bat exclusion (the individual, not just the company)
 - * Proof of rabies pre-exposure vaccinations.
 - * Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
 - * Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts
 - * Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death to bats.

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 immediated area, and contact the Engineer immediately.

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

Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

Does the project involve the demolition of a span bridge?

- Yes No (No further action required)

If "Yes", a pre-demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

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

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.



ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS

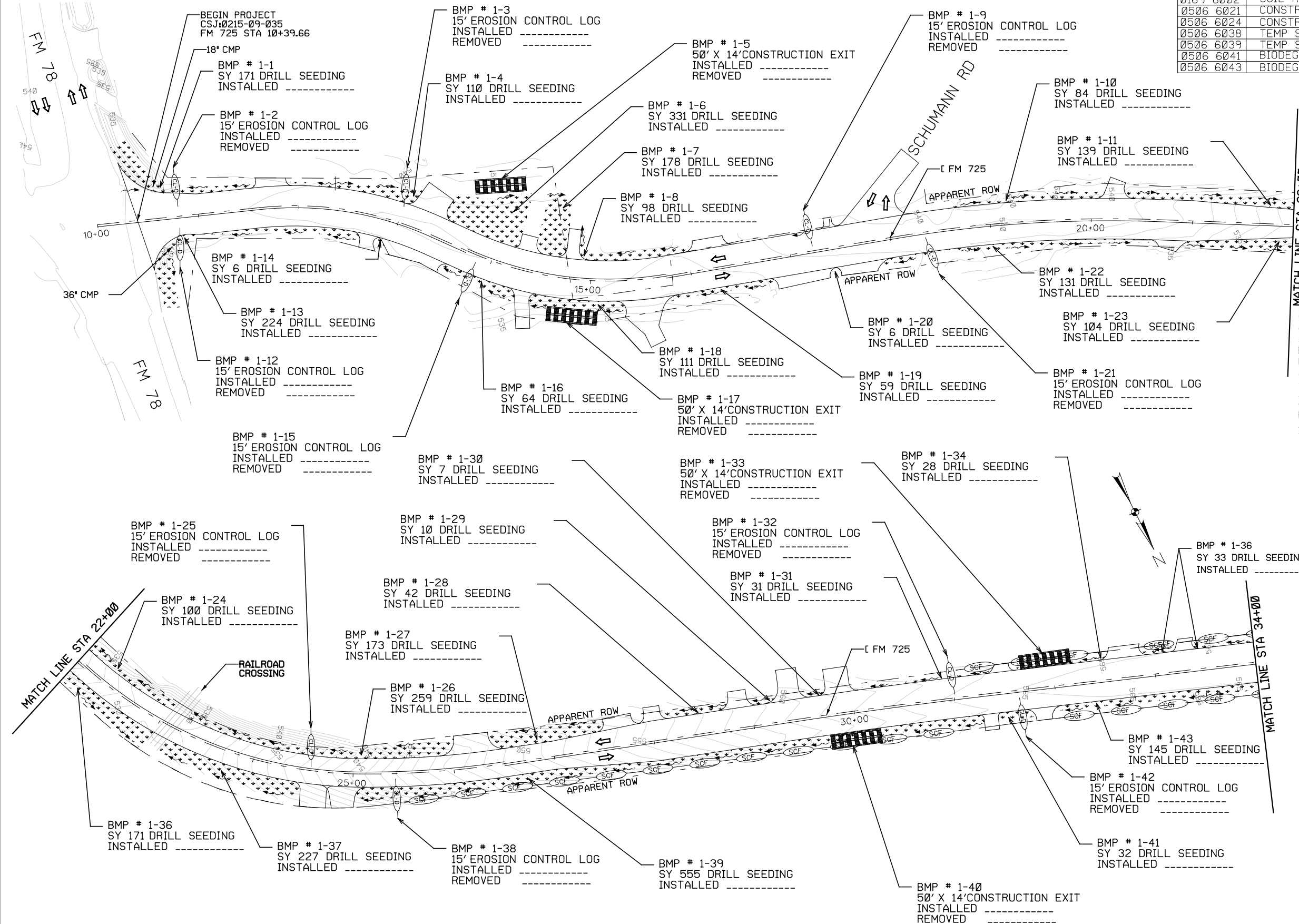
EPIC

SHEET 2 OF 2

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DN: BW	CK: GAG
© TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY	SHEET NO.	
	SAT	GUADALUPE	334A	

DATE: 4/27/2021 TIME: 3:41:56 PM C:\pw_working_half_prod\armando.diaz\dms14580\34832D-SW3P_1.dgn

ESTIMATED QTY SW3P 1			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	3629
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	3629
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3629
0166 6002	FERTILIZER	TON	0.04
0168 6001	VEGETATIVE WATERING	MG	56.70
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	3629
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1118
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1118
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	150
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	150

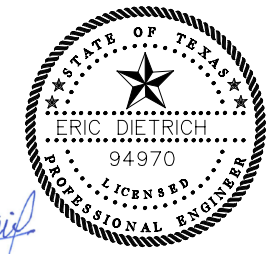


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
- INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
- SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

NAME _____ DATE 4/27/2021

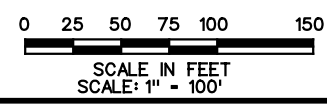
NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(936) 424-7898

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FM 725 SW3P LAYOUTS			
SHEET 1 OF 14			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 335
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725

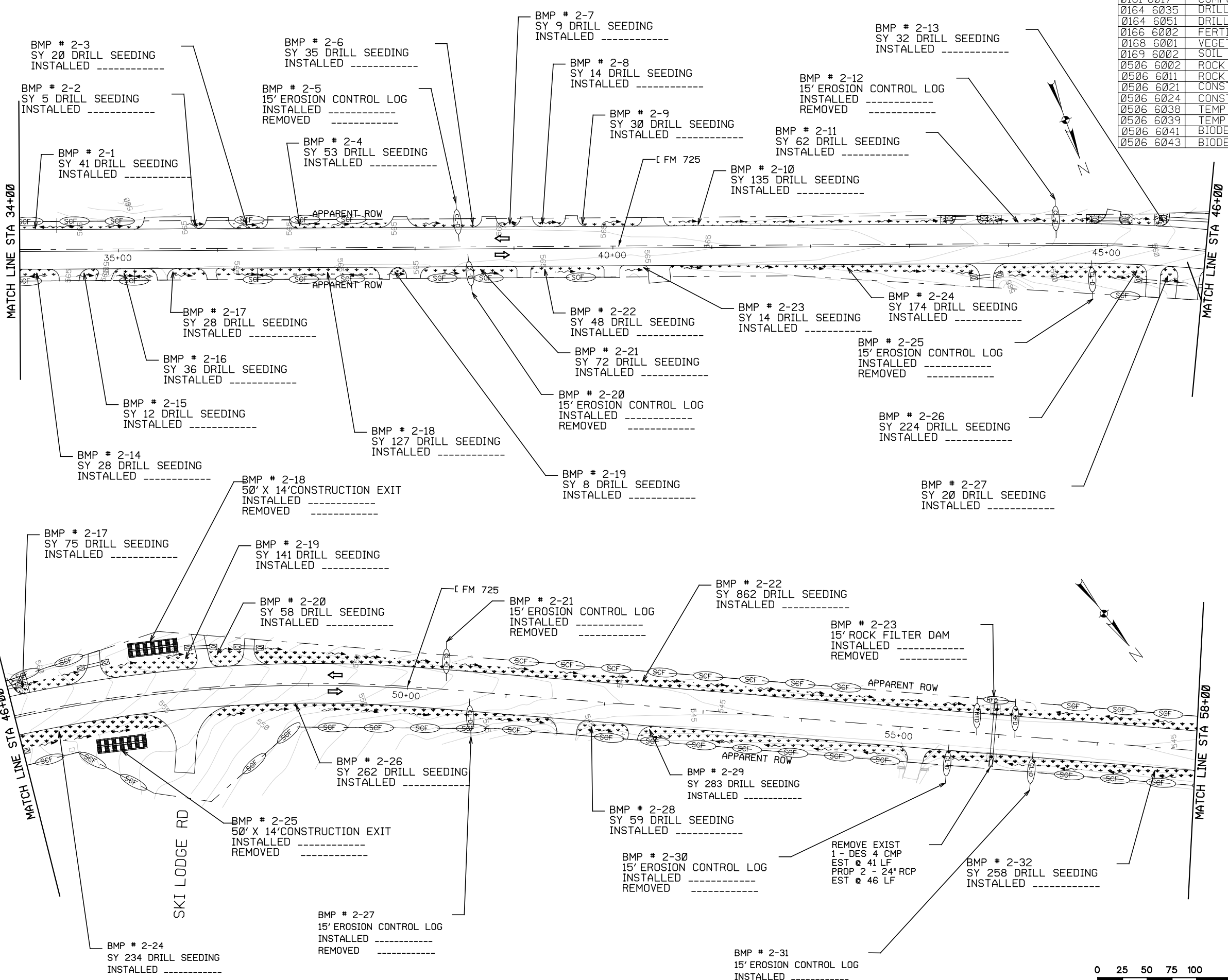


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ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	3459
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	3459
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3459
0166 6002	FERTILIZER	TON	0.04
0168 6001	VEGETATIVE WATERING	MG	54.0
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	3459
0506 6002	ROCK FILTER DAMS (INSTALL)(TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	156
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2206
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2206
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	120
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120

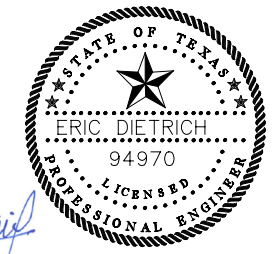


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

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- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

NAME _____ DATE 4/27/2021

NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

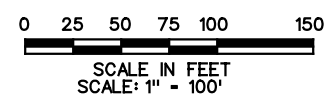
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**FM 725
SW3P LAYOUTS**

SHEET 2 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 336
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

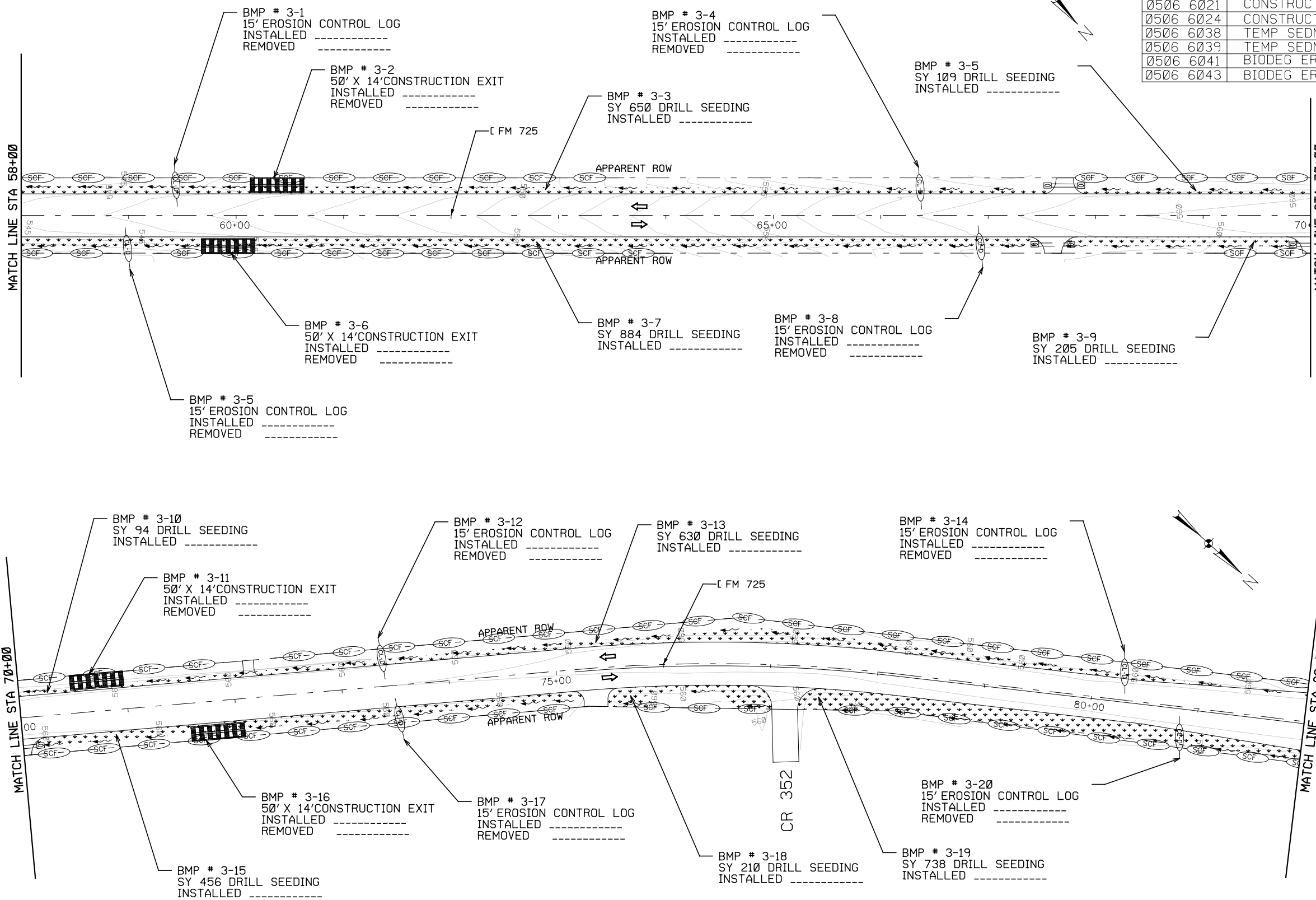


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ESTIMATED QTY SW3P 3			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	3976
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	3976
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3976
0166 6002	FERTILIZER	TON	0.04
0168 6001	VEGETATIVE WATERING	MG	62.13
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	3976
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3808
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3808
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	120
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120

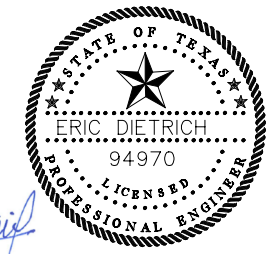


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
- INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

NAME _____ DATE 4/27/2021

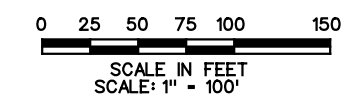
NO.	REVISION	BY	DATE

HALFF 100 NE INTERSTATE 410 LOOP SUITE 200 SAN ANTONIO, TEXAS 78216 TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
TEDSI Consulting Engineers
 1201 Interstate Highway 2 Mission, Texas 78572 (936) 424-7898
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FM 725			
SW3P LAYOUTS			
SHEET 3 OF 14			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 337
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



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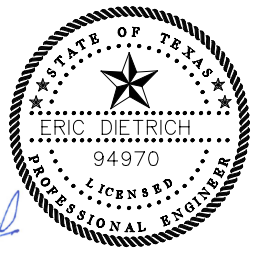
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ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	5360
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	5360
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5360
0166 6002	FERTILIZER	TON	0.06
0168 6001	VEGETATIVE WATERING	MG	83.75
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	5360
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	84
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	84
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3737
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3737
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	90
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	90

SW3P LEGEND:

- SCF SEDIMENT CONTROL FENCE
- CL-D EROSION CONTROL LOG DAM
- RFD ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
- INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
- SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



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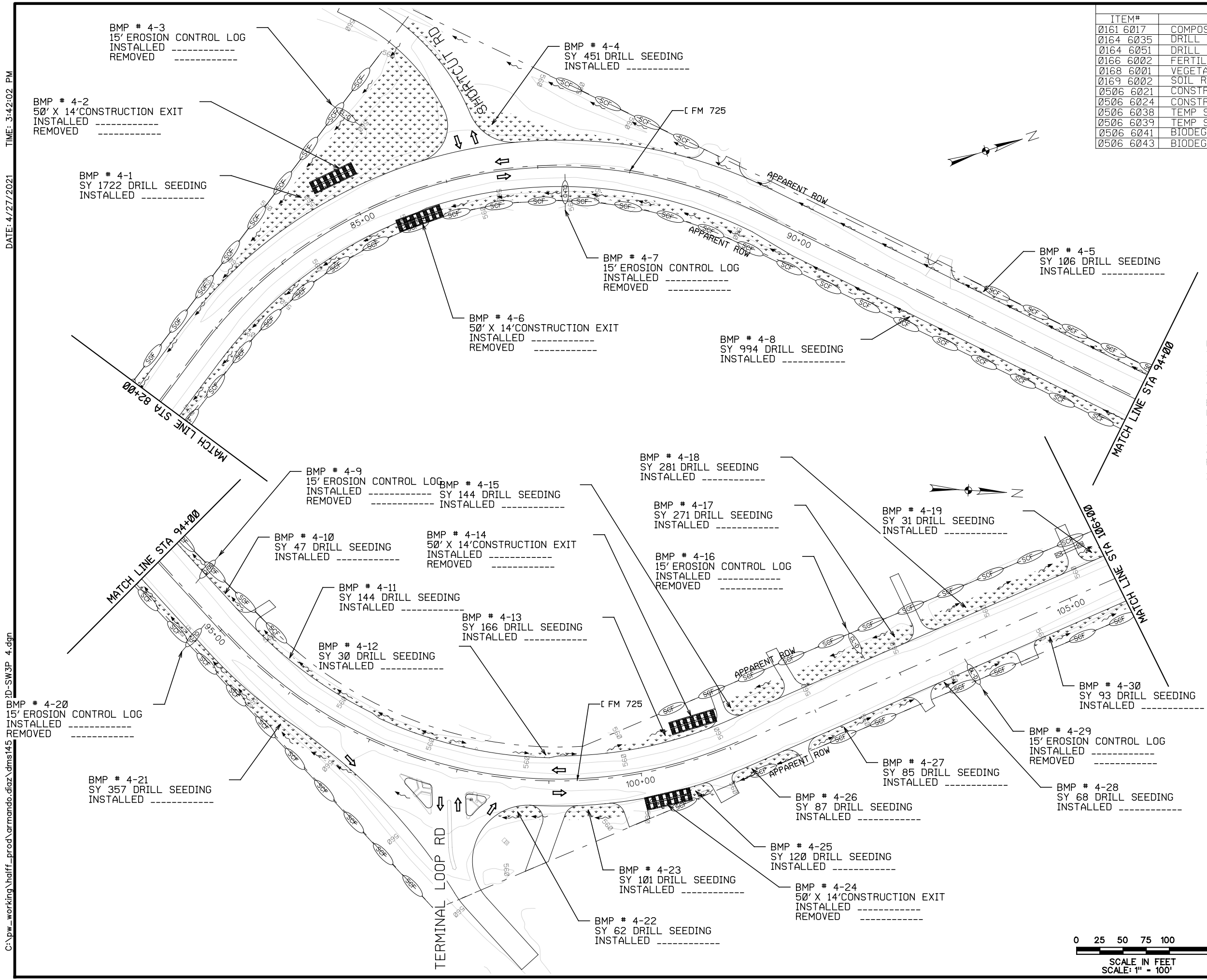
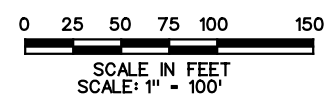
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SW3P LAYOUTS**

SHEET 4 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 338
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

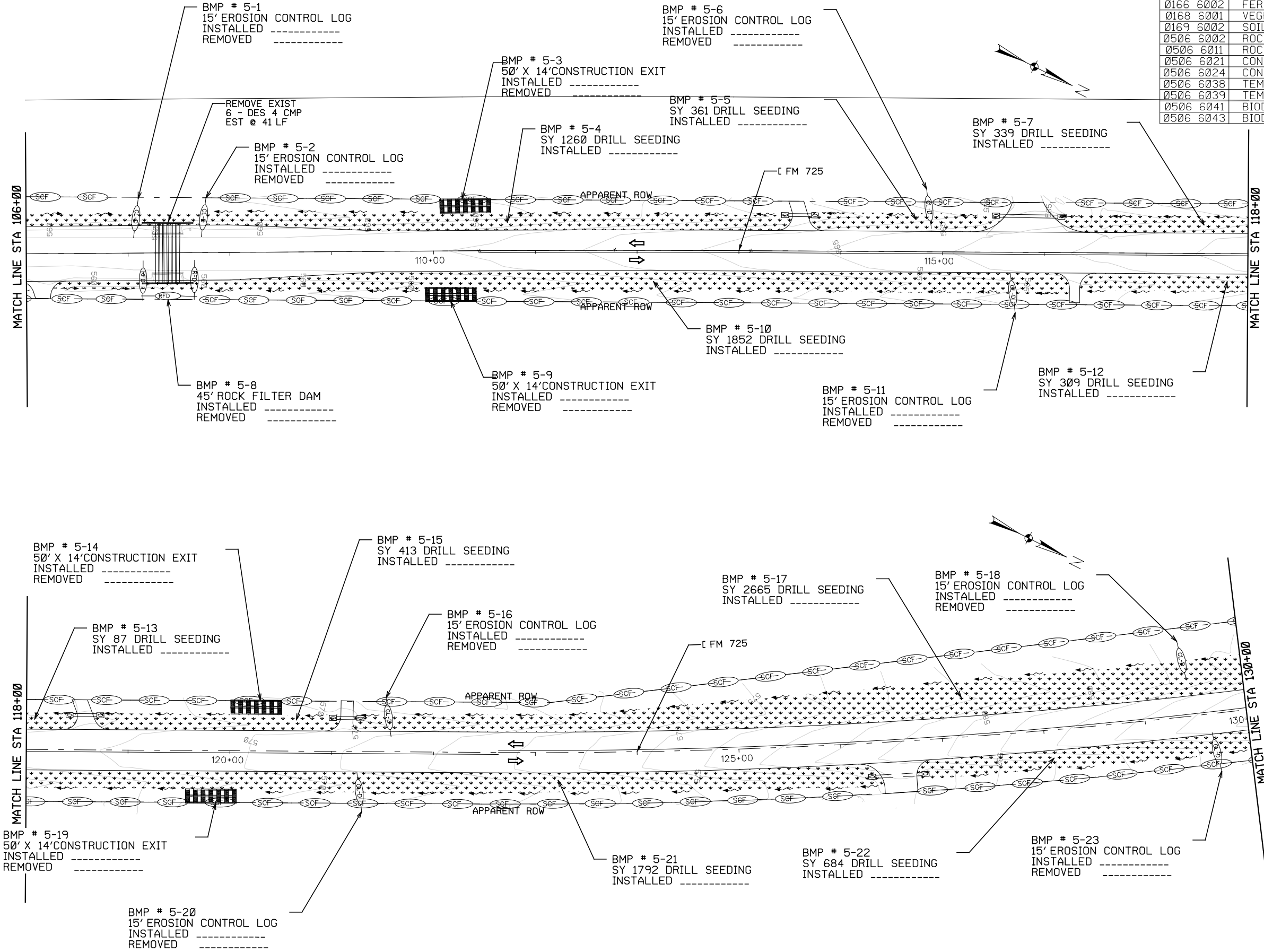


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ESTIMATED QTY SW3P 5			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	9762
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	9762
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	9762
0166 6002	FERTILIZER	TON	0.10
0168 6001	VEGETATIVE WATERING	MG	152.53
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	9762
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	4565
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	4565
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120

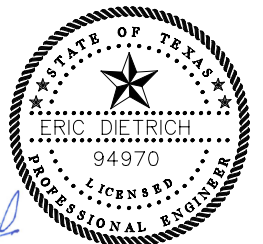


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
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- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



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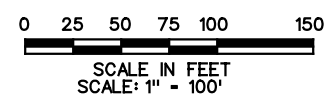
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SW3P LAYOUTS**

SHEET 5 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 339
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

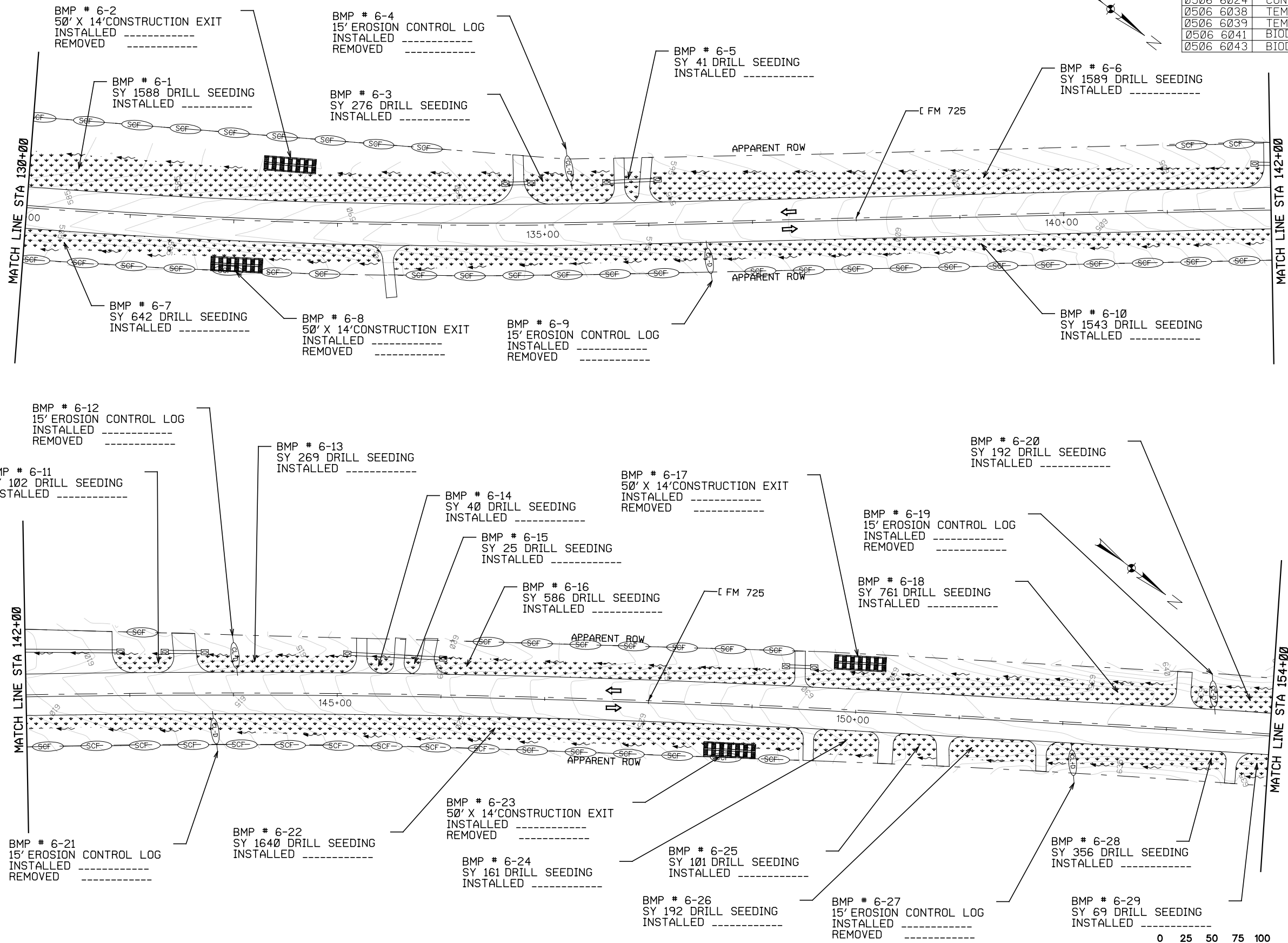


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ESTIMATED QTY SW3P 6			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	10173
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	10173
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	10173
0166 6002	FERTILIZER	TON	0.11
0168 6001	VEGETATIVE WATERING	MG	158.95
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	10173
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2854
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2854
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	90
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	90

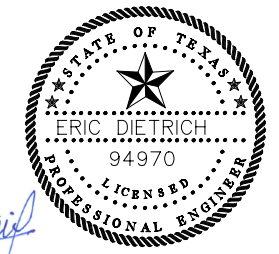


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

1. REFER TO SW3P STANDARD SHEETS FOR DETAILS.
2. INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
3. SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
4. CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
5. CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

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NO.	REVISION	BY	DATE

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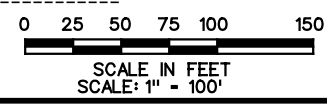
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FM 725 SW3P LAYOUTS

SHEET 6 OF 14

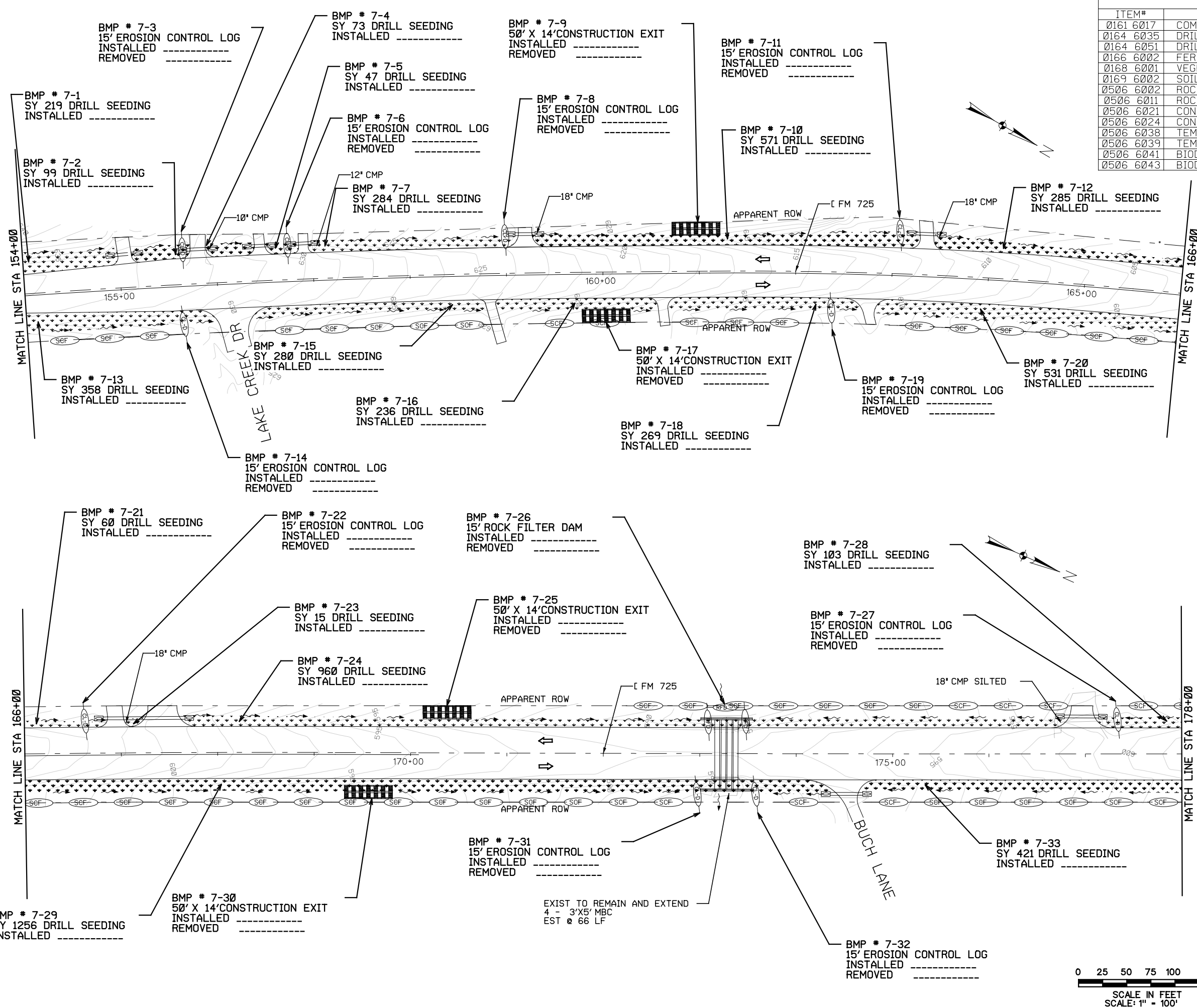
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	340	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



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ESTIMATED QTY SW3P 7			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	6067
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6067
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6067
0166 6002	FERTILIZER	TON	0.06
0168 6001	VEGETATIVE WATERING	MG	94.80
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	6067
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2757
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2757
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	150
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	150

SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
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- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

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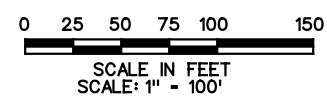
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SHEET 7 OF 14

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET	
6	See Title Sheet	341	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725

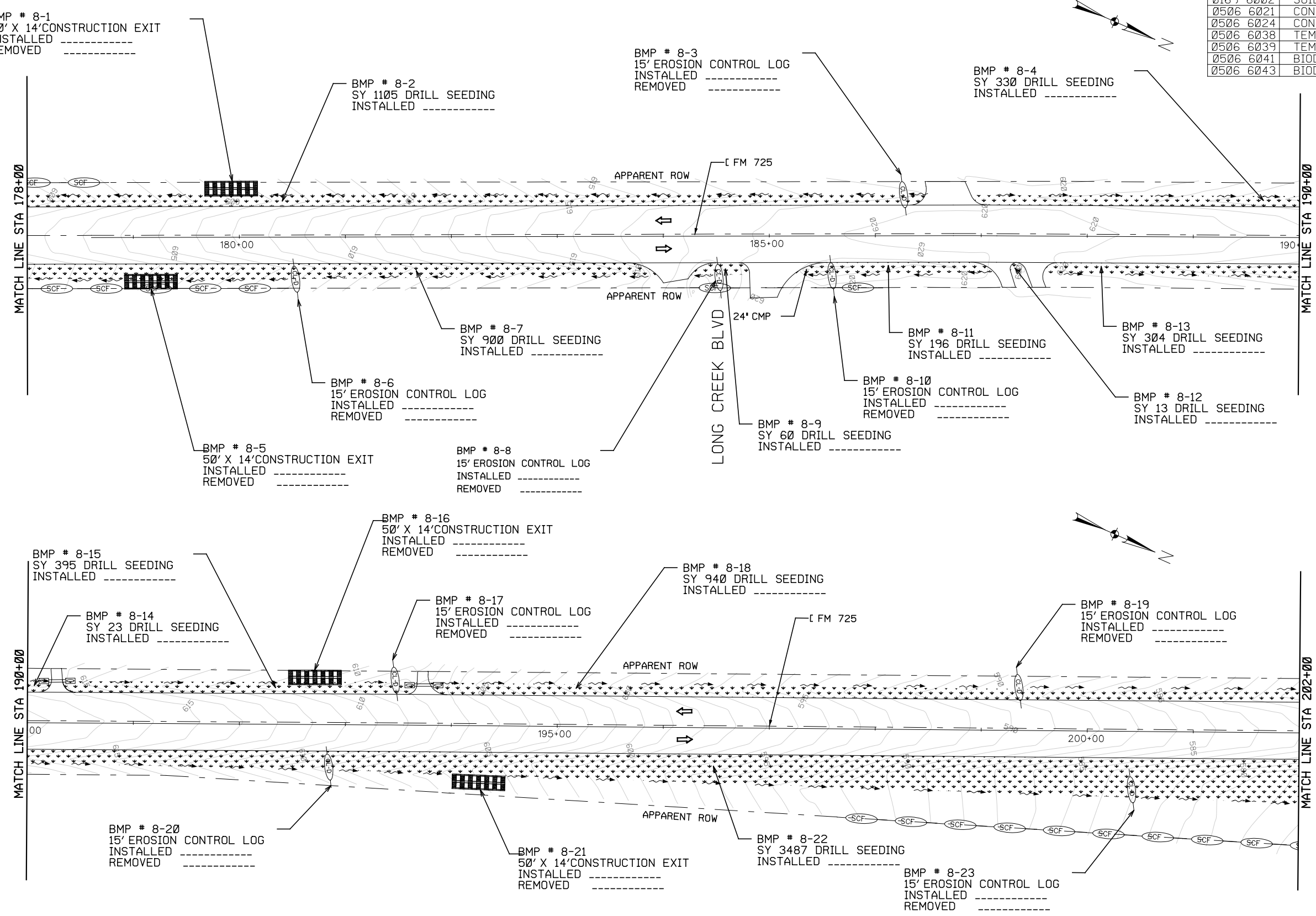


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ESTIMATED QTY SW3P 8			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	7753
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7753
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7753
0166 6002	FERTILIZER	TON	0.08
0168 6001	VEGETATIVE WATERING	MG	121.14
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	7753
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	966
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	966
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	120
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	120

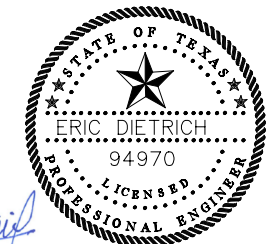


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
- INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



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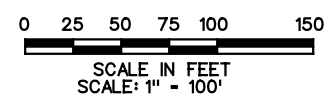
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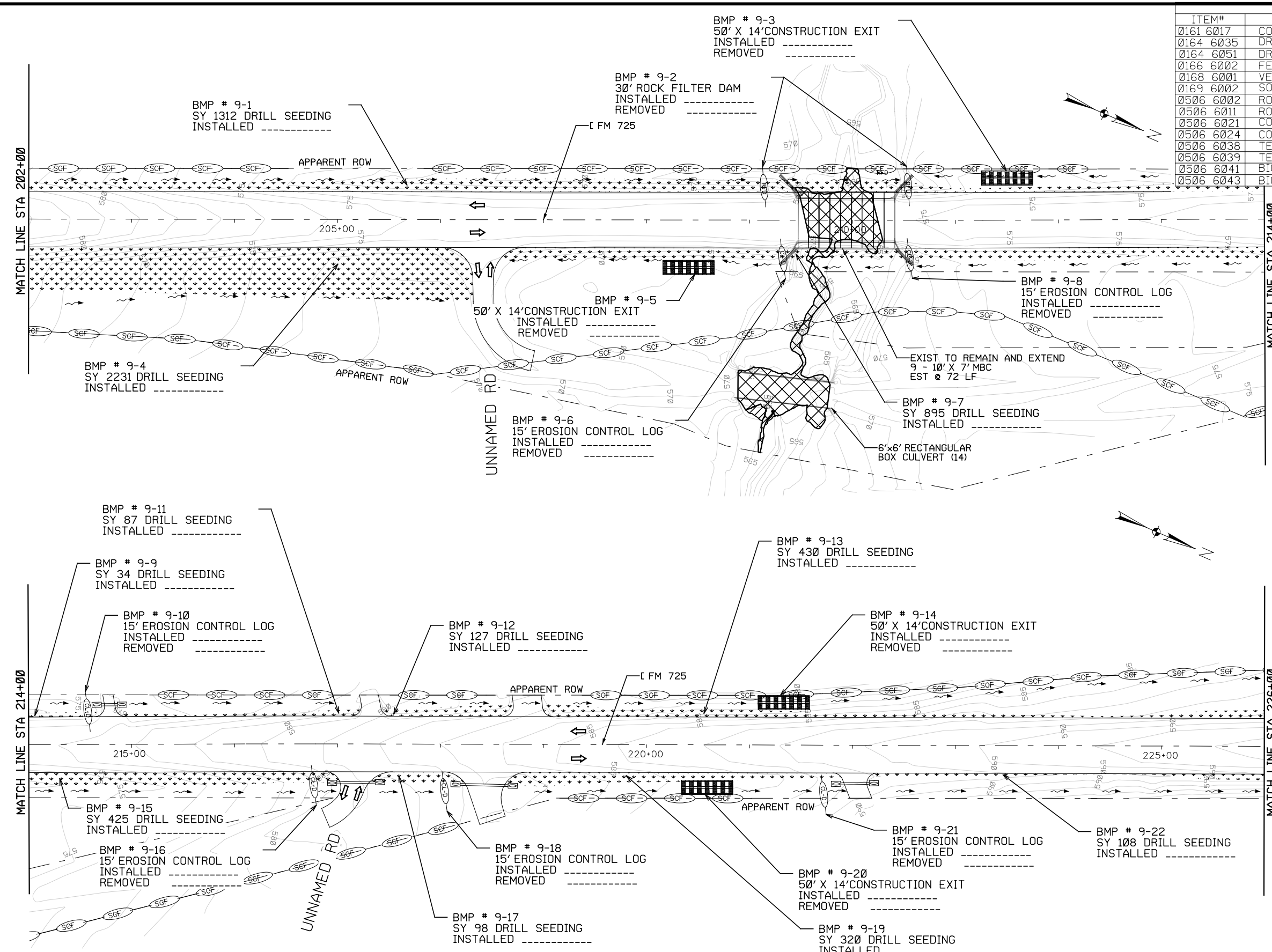
FM 725 SW3P LAYOUTS			
SHEET 8 OF 14			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		342
STATE	DISTRICT	COUNTY	
TEXAS	SAT	GUADALUPE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0215	09	035	FM 725



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ESTIMATED QTY SW3P 9			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	6067
0164 6035	DRILL SEEDING (PERM)(RURAL)	SY	6067
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6067
0166 6002	FERTILIZER	TON	0.06
0168 6001	VEGETATIVE WATERING	MG	94.8
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	6067
0506 6002	ROCK FILTER DAMS (INSTALL)(TY 2)	LF	30
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	30
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3937
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3937
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	90
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	90

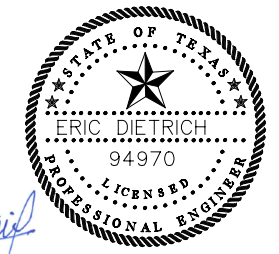


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

NAME _____ DATE 4/30/2021

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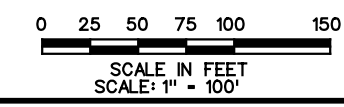
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SW3P LAYOUTS**

SHEET 9 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 343
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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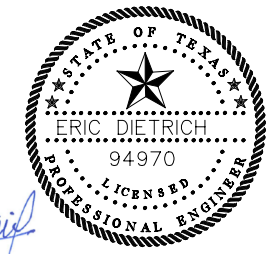
ESTIMATED QTY SW3P 10			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	5166
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5166
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5166
0166 6002	FERTILIZER	TON	0.05
0168 6001	VEGETATIVE WATERING	MG	80.72
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY B)	SY	5166
0506 6002	ROCK FILTER DAMS (INSTALL)(TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2012
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2012
0506 6041	BIODEG EROSN CONT LOGS (INSTL)(12")	LF	75
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	75

SW3P LEGEND:

	SEDIMENT CONTROL FENCE
	EROSION CONTROL LOG DAM
	ROCK FILTER DAM
	DRAINAGE FLOW
	DRILL SEEDING
	CONSTRUCTION EXIT (TYPE 2)
	TRAFFIC FLOW
	WATERBODY
	WETLAND

NOTES:

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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



Dietrich

NAME _____ DATE 4/27/2021

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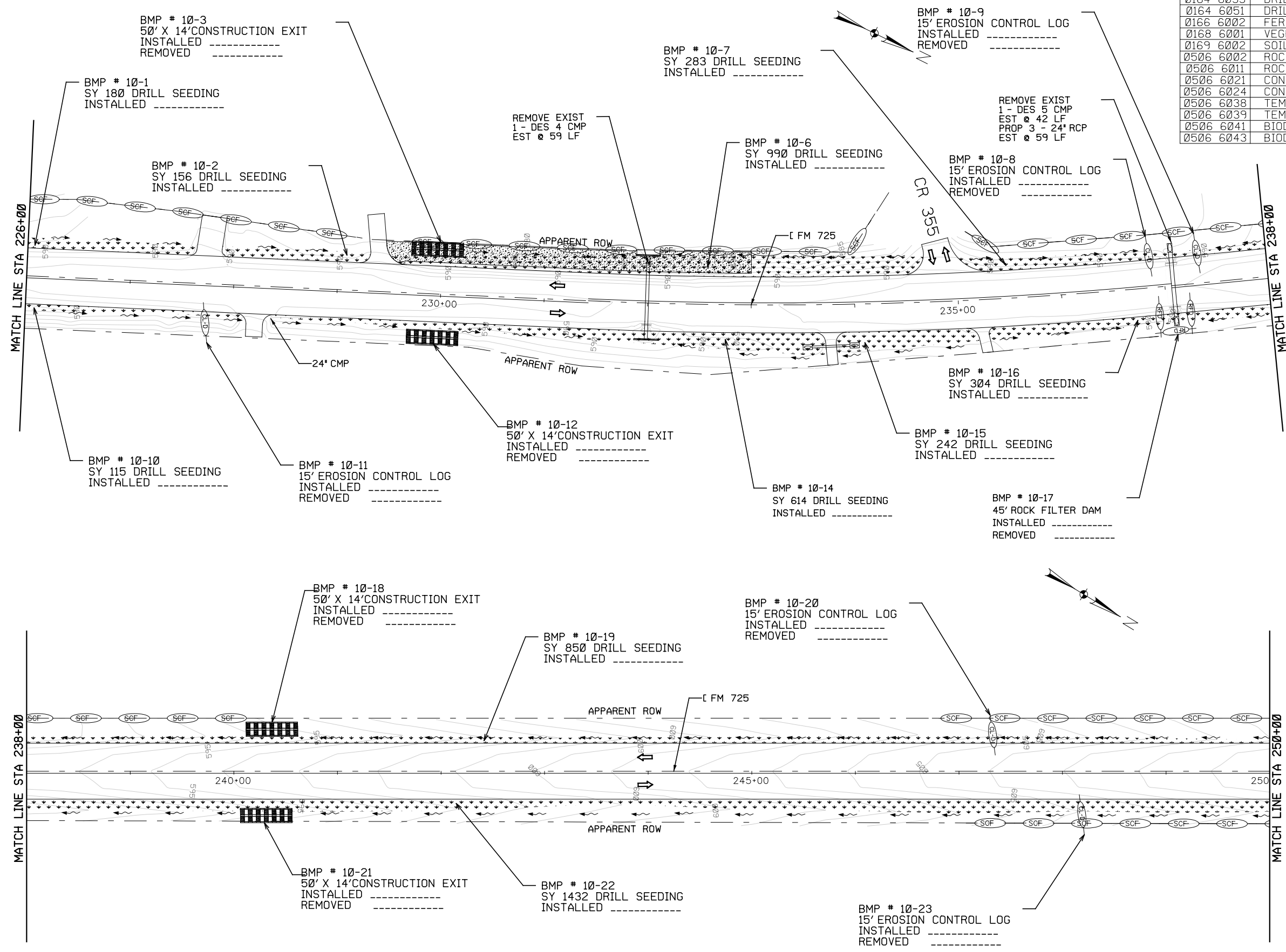
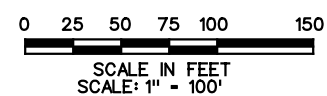
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SW3P LAYOUTS**

SHEET 10 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 344
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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DATE: 4/27/2021

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ESTIMATED QTY SW3P 11			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	5096
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5096
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5096
0166 6002	FERTILIZER	TON	0.05
0168 6001	VEGETATIVE WATERING	MG	79.63
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	5096
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2838
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2838
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	90
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	90

SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

- REFER TO SW3P STANDARD SHEETS FOR DETAILS.
- INSTALLED MEASURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED THROUGHOUT DURATION OF PROJECT OR AS DIRECTED BY THE ENGINEER.
- SW3P MEASURES SHOWN ARE MINIMUM REQUIREMENTS BASED UPON PROJECT DESIGN. INSTALLATION OF SW3P MEASURES WILL BE AS SHOWN AND MODIFIED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
- CONSTRUCTION EXITS TO BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER. THE SIZE OF THE CONSTRUCTION EXIT WILL BE 78 SY (50' x 14'). REFER TO STANDARD EC(3) FOR DETAILS.
- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

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SUITE 200
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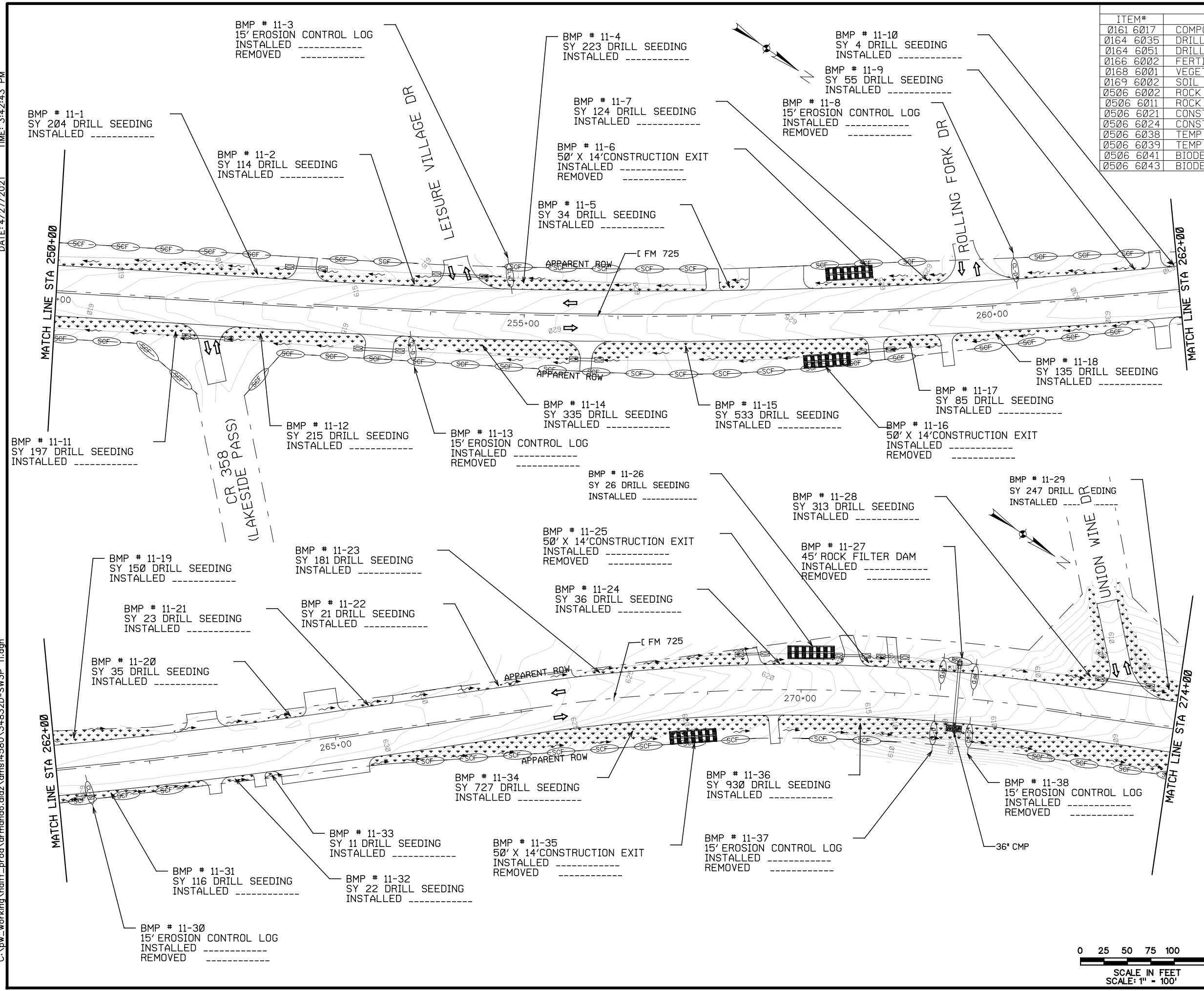
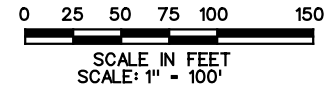
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**FM 725
SW3P LAYOUTS**

SHEET 11 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 345
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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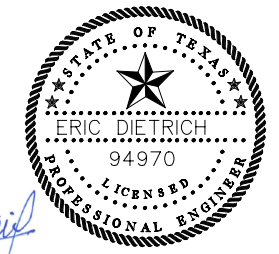
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0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4198
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	4198
0166 6002	FERTILIZER	TON	0.04
0168 6001	VEGETATIVE WATERING	MG	65.59
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	4198
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	45
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	45
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2517
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2517
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	150
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	150

SW3P LEGEND:

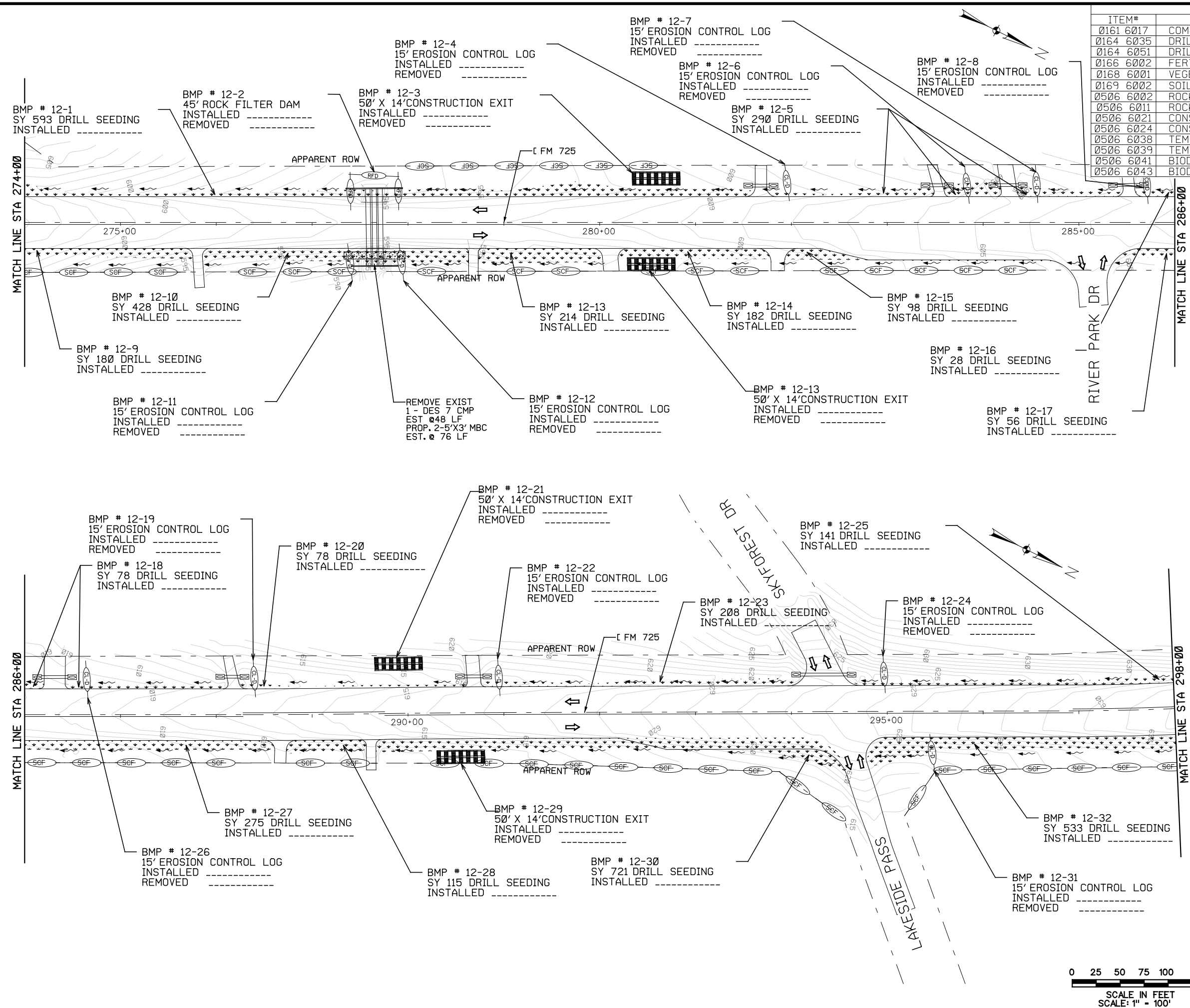
- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



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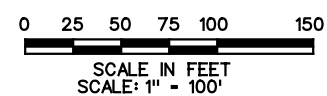
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**FM 725
SW3P LAYOUTS**

SHEET 12 OF 14

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 346
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		

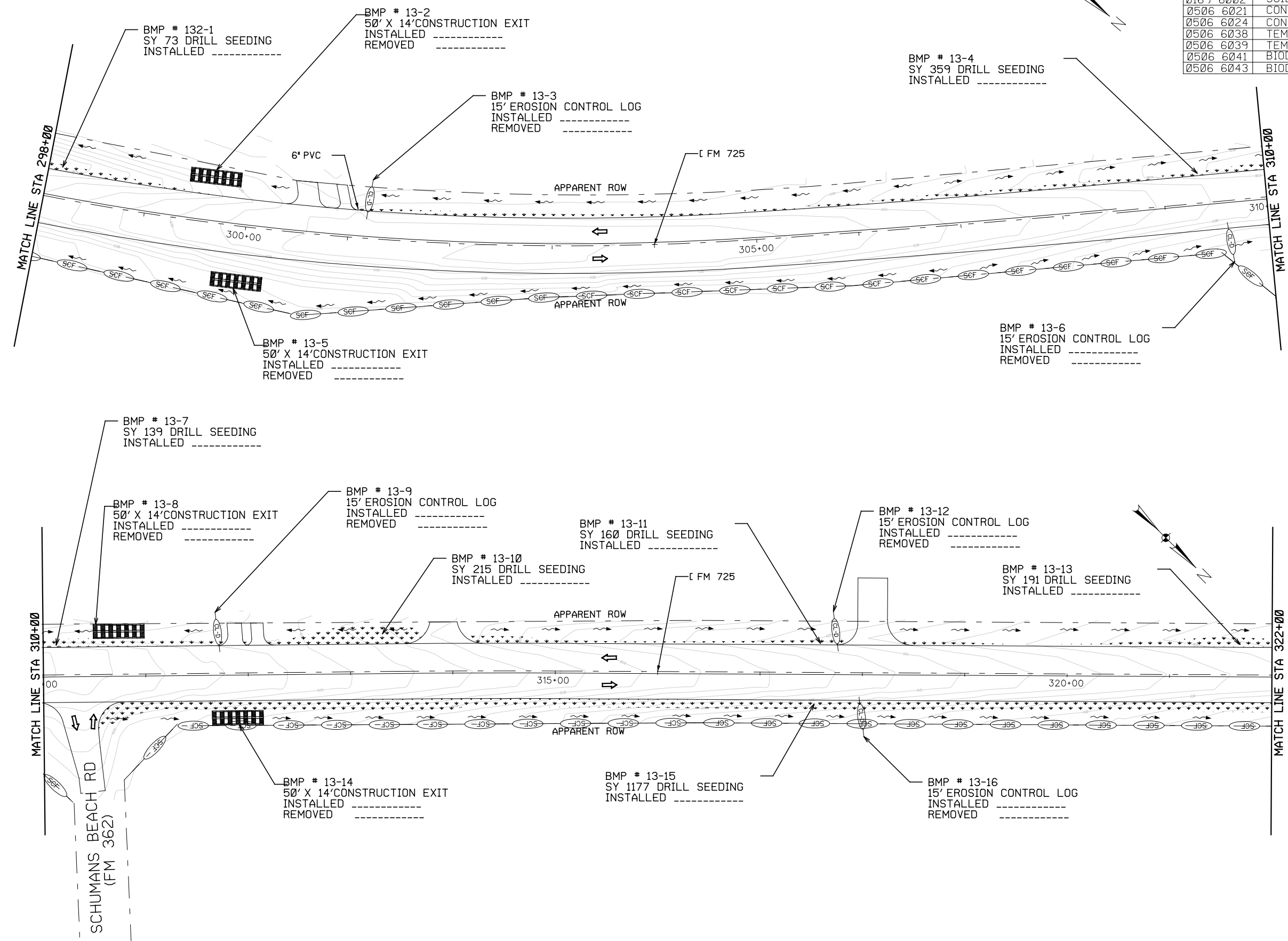


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DATE: 4/27/2021

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ESTIMATED QTY SW3P 13			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	2314
0164 6035	DRILL SEEDING (PERM) (RURAL)	SY	2314
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	2314
0166 6002	FERTILIZER	TON	0.02
0168 6001	VEGETATIVE WATERING	MG	36.16
0169 6002	SOIL RETENTION BLANKETS (CL 1)(TY	SY	2314
0506 6021	CONSTRUCTION EXITS (INSTALL)(TY	SY	312
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	312
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2424
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2424
0506 6041	BIODEG EROSN CONT LOGS (INSTL)	LF	75
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	75

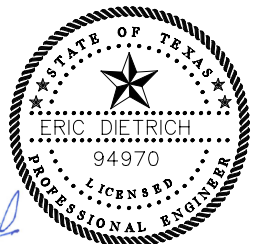


SW3P LEGEND:

- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG DAM
- ROCK FILTER DAM
- DRAINAGE FLOW
- DRILL SEEDING
- CONSTRUCTION EXIT (TYPE 2)
- TRAFFIC FLOW
- WATERBODY
- WETLAND

NOTES:

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- CONTRACTOR TO STAY OUT OF WATERBODIES AND WETLANDS.



E. Dietrich

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TEL (210) 798-1895 FIRM #F-312

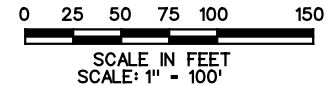
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**FM 725
SW3P LAYOUTS**

SHEET 13 OF 14

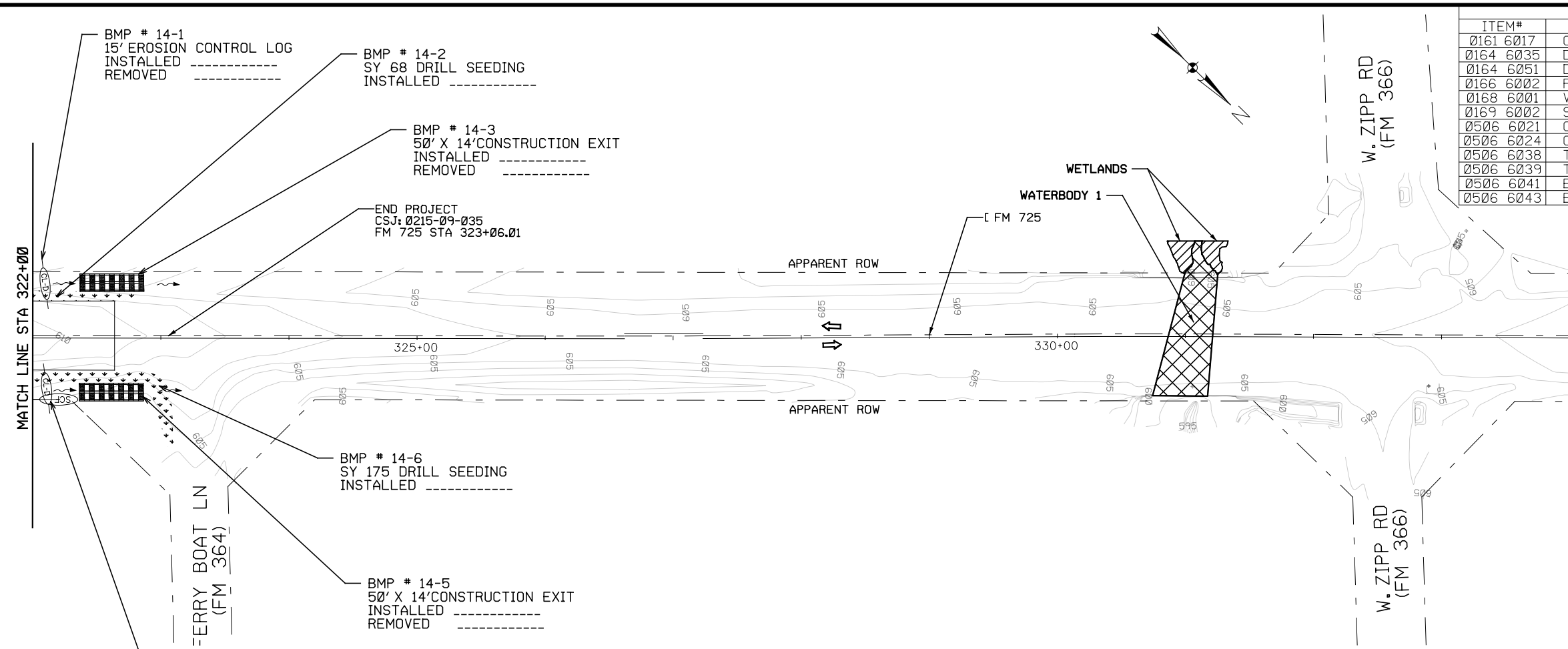
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet	SHEET 347
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE
CONTROL 0215	SECTION 09	JOB 035
HIGHWAY NO. FM 725		



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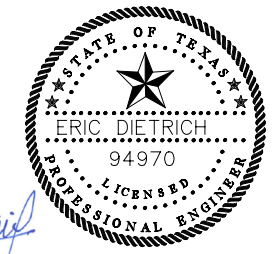
ESTIMATED QTY SW3P 14			
ITEM#	DESCRIPTION	UNIT	QTY
0161 6017	COMPOST MANUF TOPSOIL (4")	SY	243
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	243
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	243
0166 6002	FERTILIZER	TON	0.00
0168 6001	VEGETATIVE WATERING	MG	3.80
0169 6002	SOIL RETENTION BLANKETS (CL 1) (TY B)	SY	243
0506 6021	CONSTRUCTION EXITS (INSTALL) (TY 2)	SY	156
0506 6024	CONSTRUCTION EXITS (REMOVE)	SY	156
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	44
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	44
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	30
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	30

SW3P LEGEND:

	SEDIMENT CONTROL FENCE
	EROSION CONTROL LOG DAM
	ROCK FILTER DAM
	DRAINAGE FLOW
	DRILL SEEDING
	CONSTRUCTION EXIT (TYPE 2)
	TRAFFIC FLOW
	WATERBODY
	WETLAND

NOTES:

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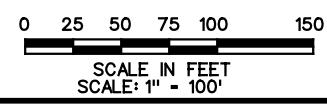
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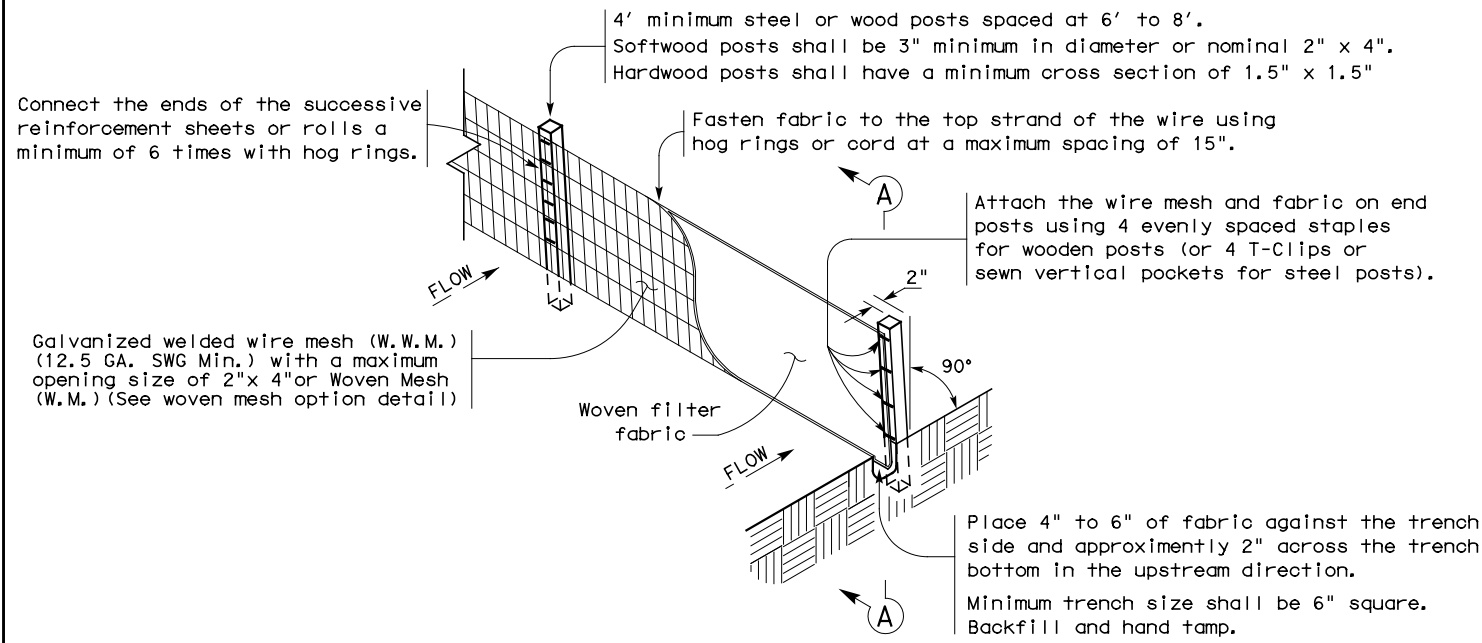
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FM 725 SW3P LAYOUTS			
SHEET 14 OF 14			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. See Title Sheet		SHEET 348
STATE TEXAS	DISTRICT SAT	COUNTY GUADALUPE	
CONTROL 0215	SECTION 09	JOB 035	HIGHWAY NO. FM 725



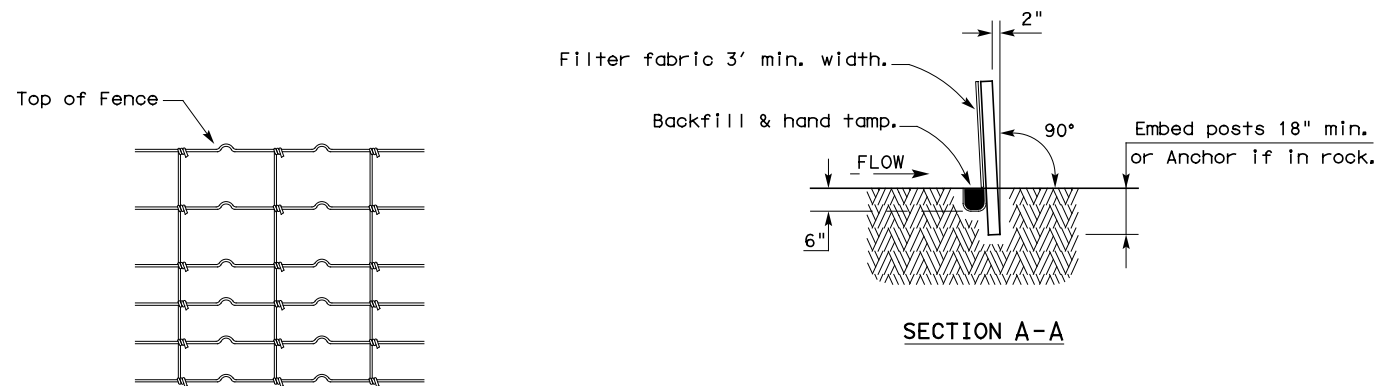
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TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

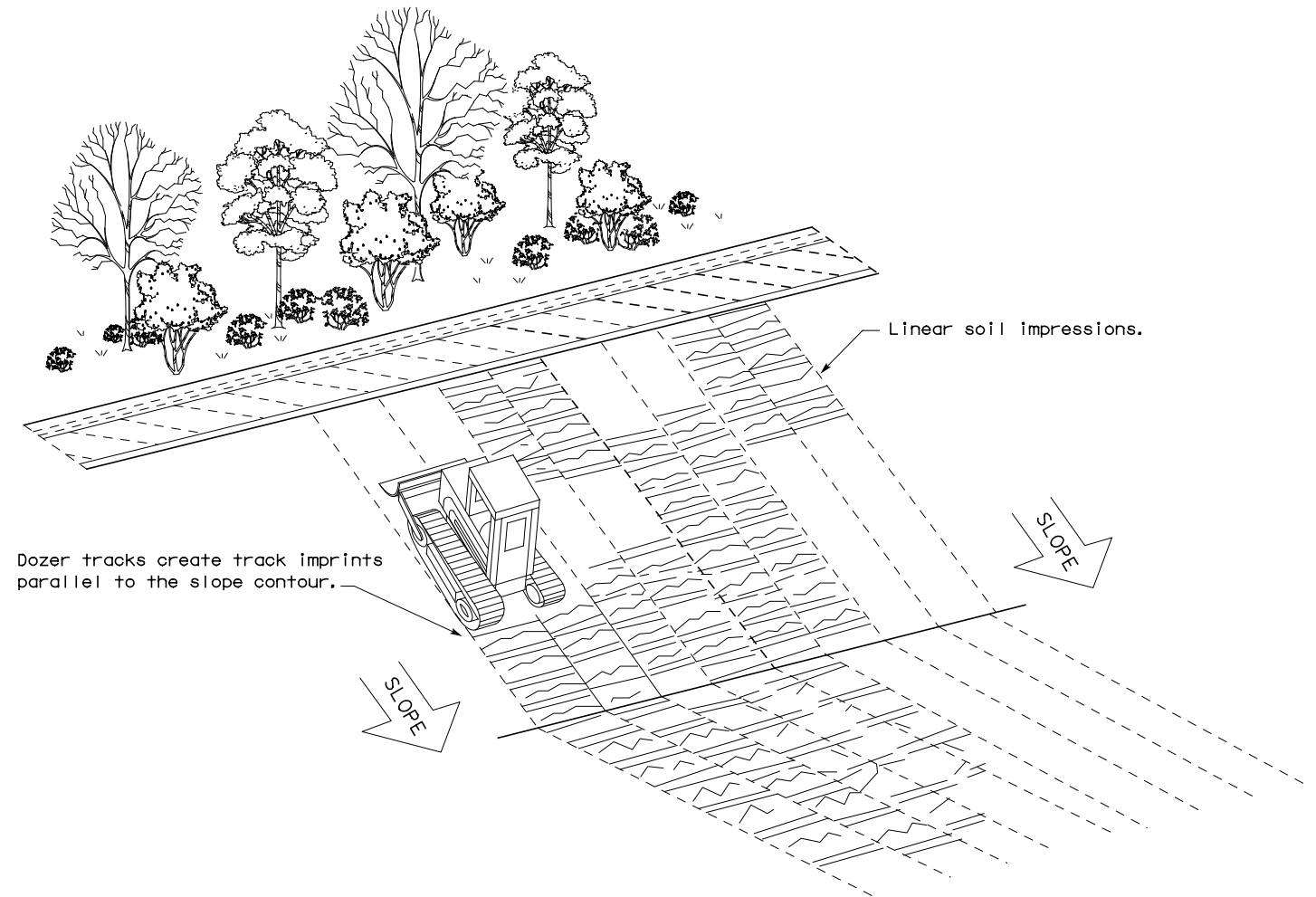
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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

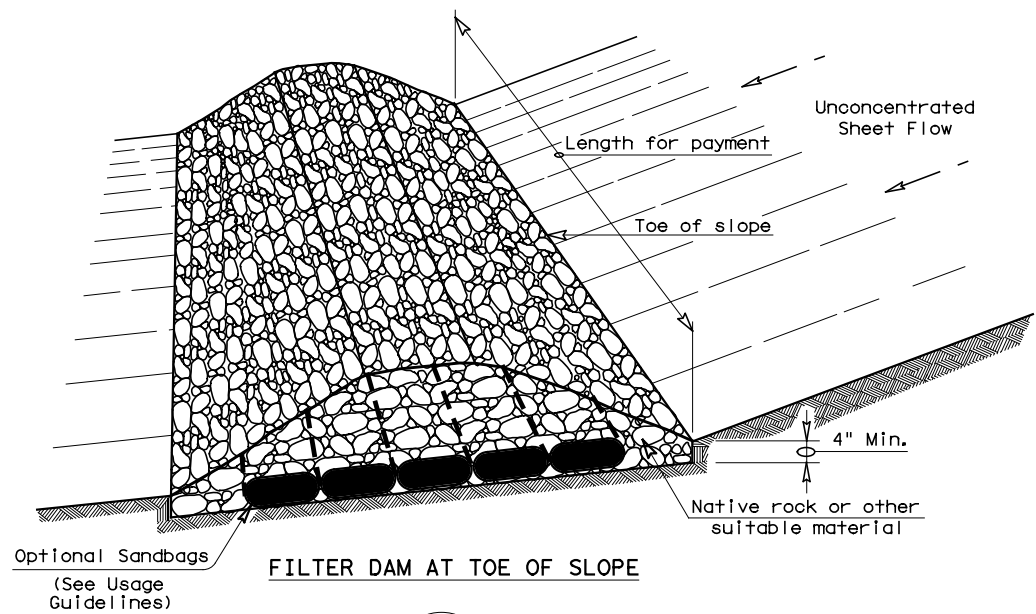


VERTICAL TRACKING

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1)-16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0215	09	035	FM 725	
	DIST	COUNTY		SHEET NO.	
	SAT	GUADALUPE		349	

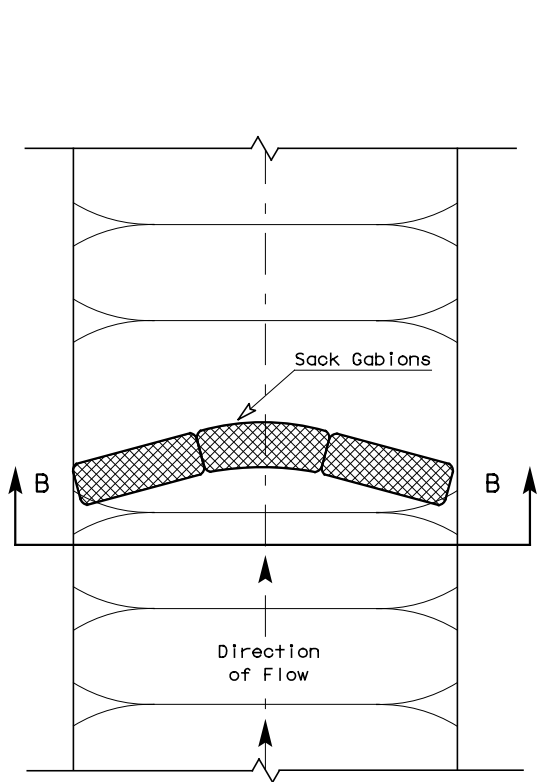
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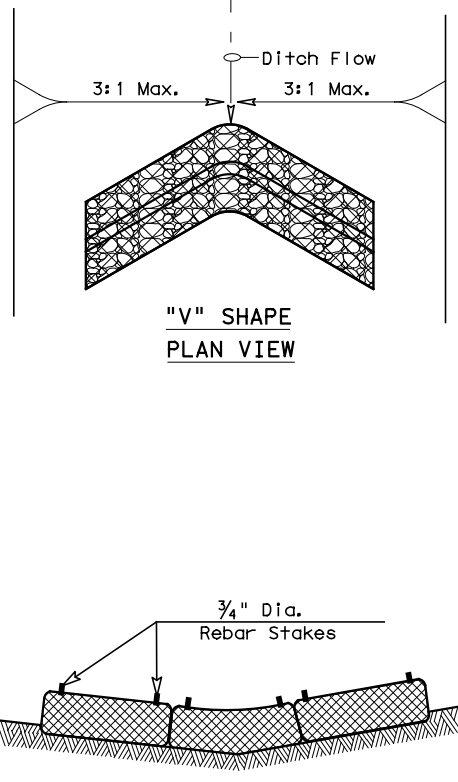


FILTER DAM AT TOE OF SLOPE

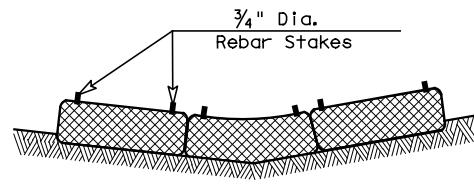
— (RFD1) —



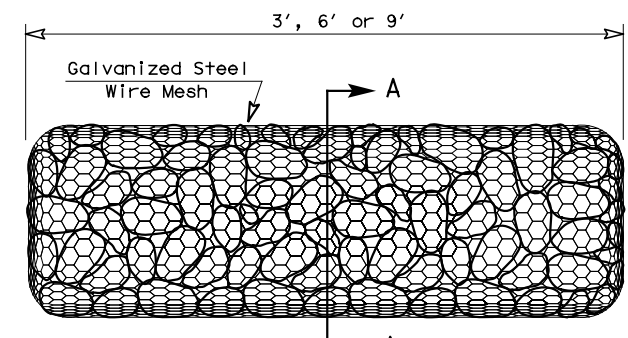
PLAN VIEW



"V" SHAPE PLAN VIEW

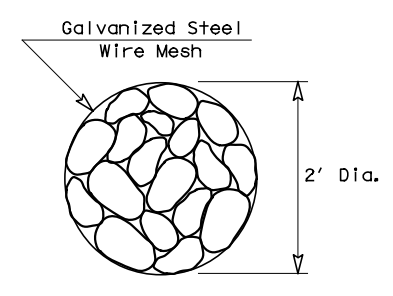


SECTION B-B

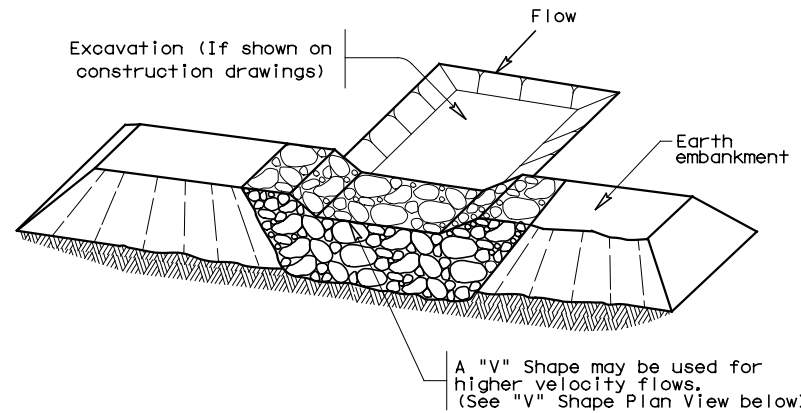


TYPE 4 (SACK GABIONS)

— (RFD4) —

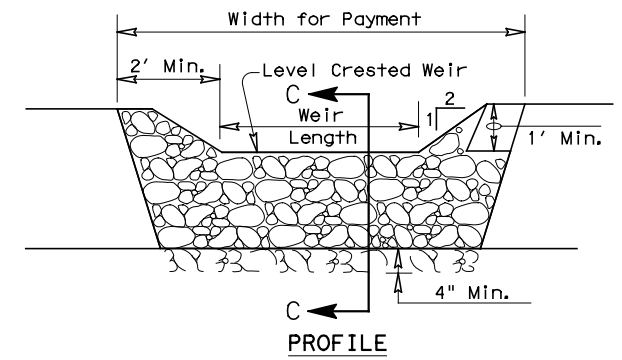


SECTION A-A

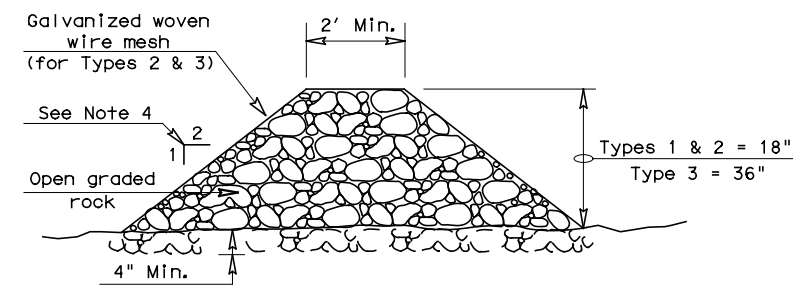


FILTER DAM AT SEDIMENT TRAP

— (RFD1) OR (RFD2) —



PROFILE



SECTION C-C

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/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

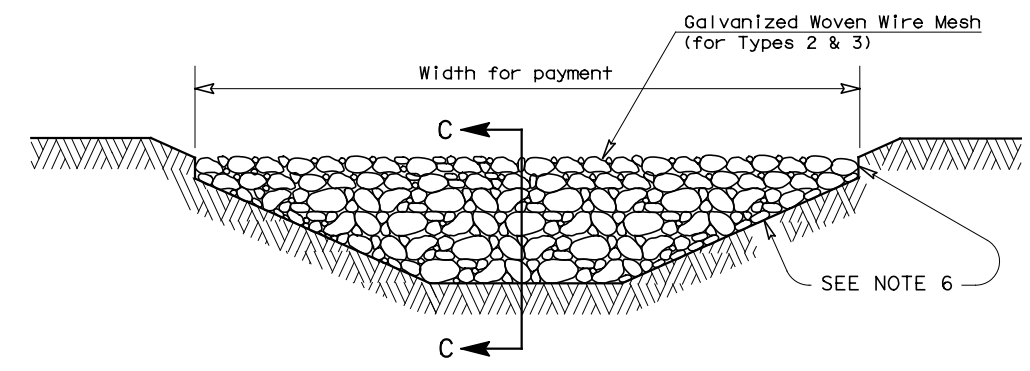
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 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.



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 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
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.

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) —

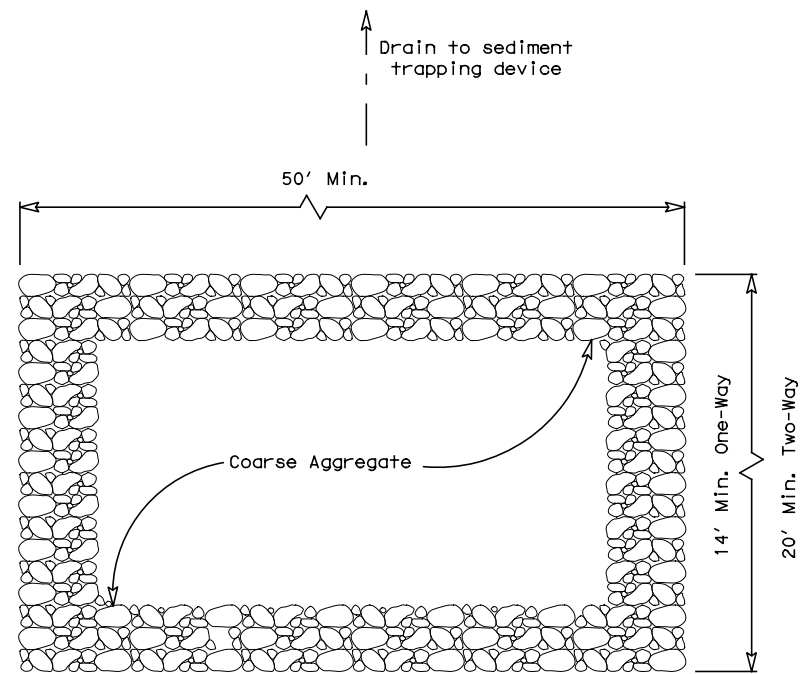


**TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
ROCK FILTER DAMS
EC (2) - 16**

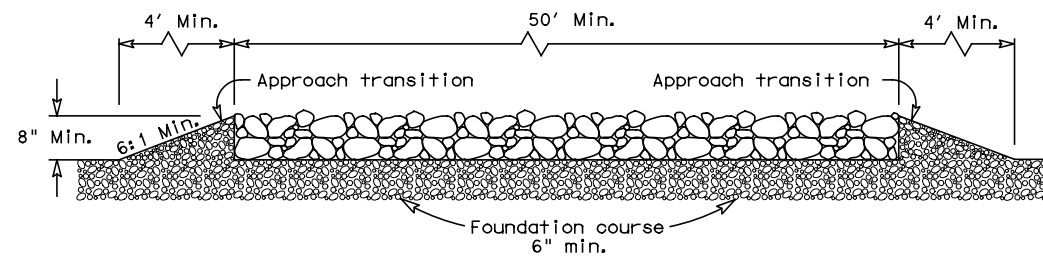
FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0215	09	035	FM 725
	DIST	COUNTY	SHEET NO.	
	SAT	GUADALUPE		350

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PLAN VIEW

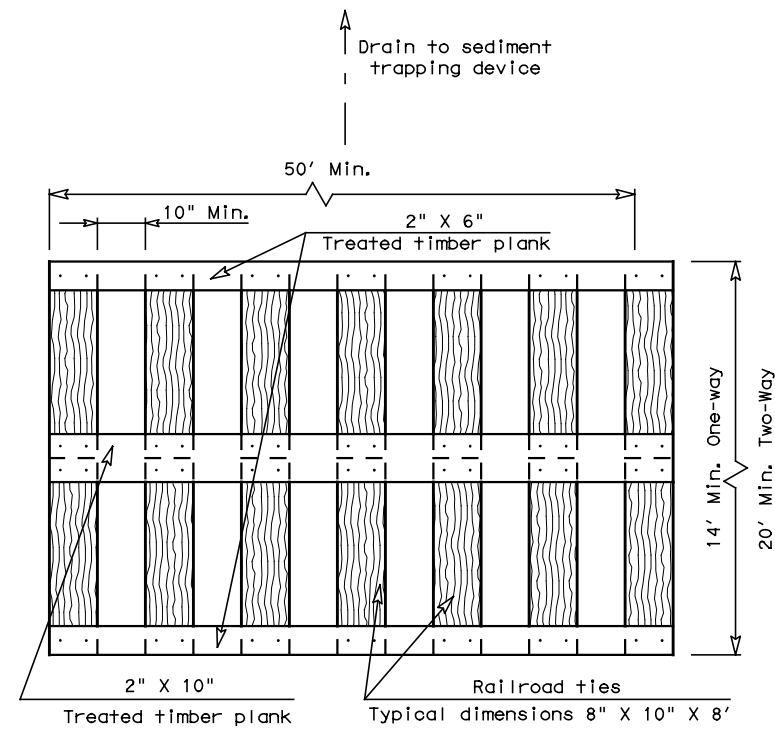


ELEVATION VIEW

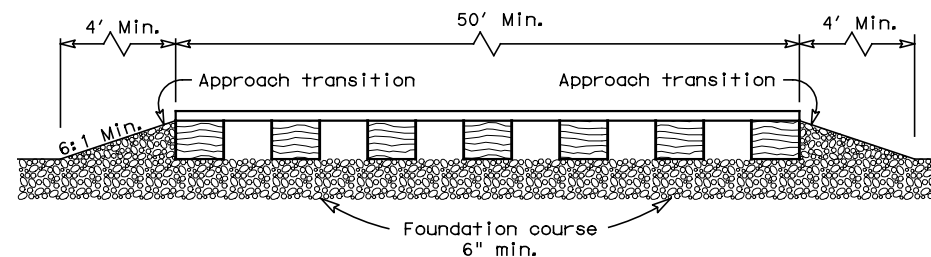
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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



PLAN VIEW

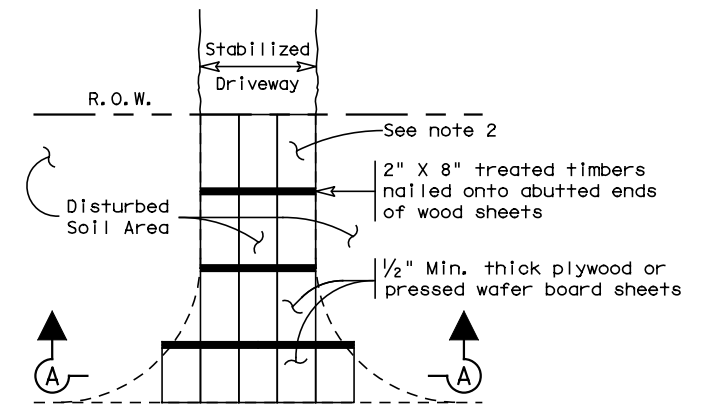


ELEVATION VIEW

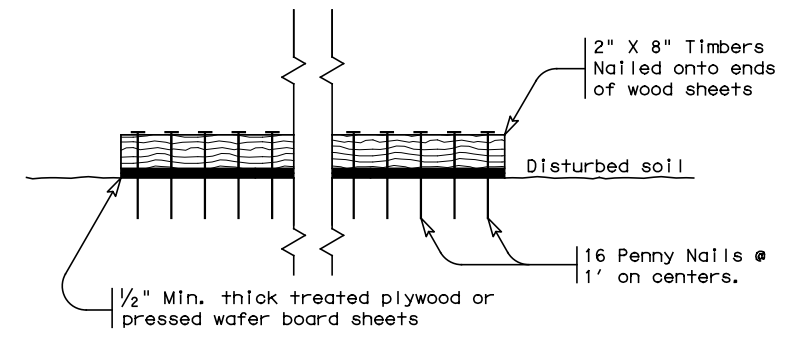
CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

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



PLAN VIEW



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

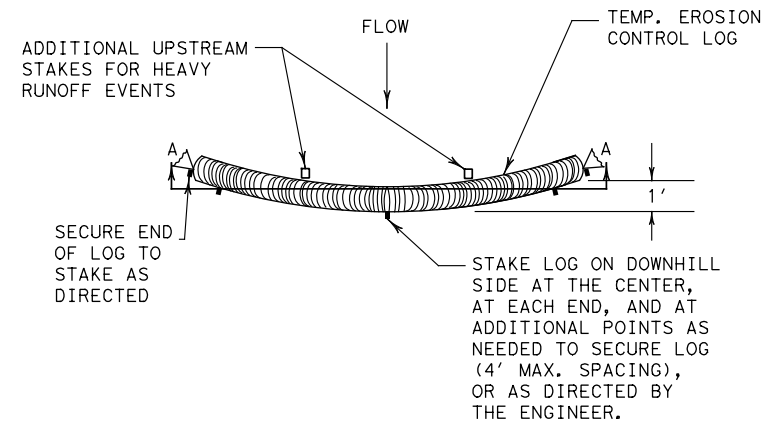
GENERAL NOTES (TYPE 3)

- The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
- 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.
- The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
- The guidelines shown hereon are suggestions only and may be modified by the Engineer.

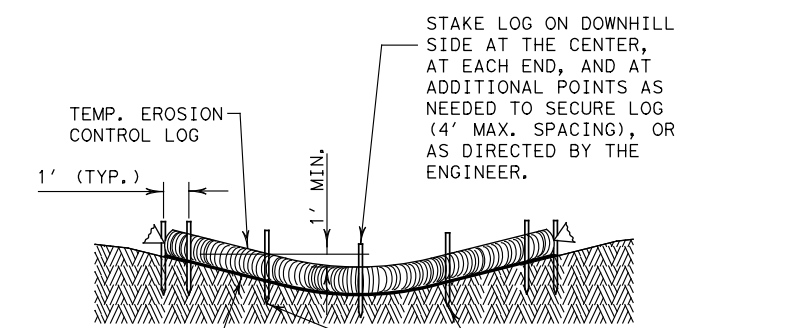
				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC (3) - 16					
FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0215	09	035	FM 725	
	DIST	COUNTY		SHEET NO.	
	SAT	GUADALUPE		351	

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 FILE: pw:\halff-pw.bentley.com:halff-pw-01\Documents\34832.D00-TxDOT_FM-725\CADD\Sheets\HALFF\Standards\Stormwater Pollution Prevention Plan\EC9-16.dgn



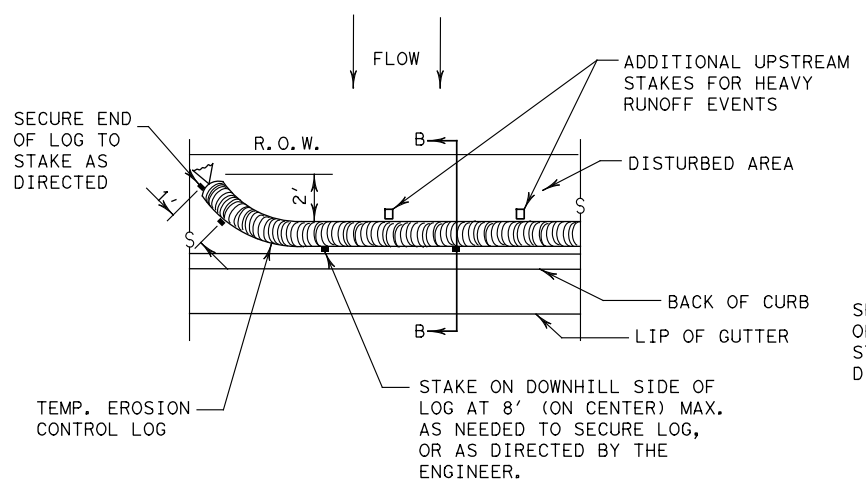
PLAN VIEW



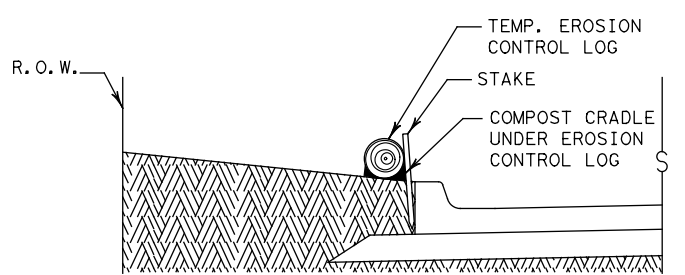
SECTION A-A

EROSION CONTROL LOG DAM

CL-D



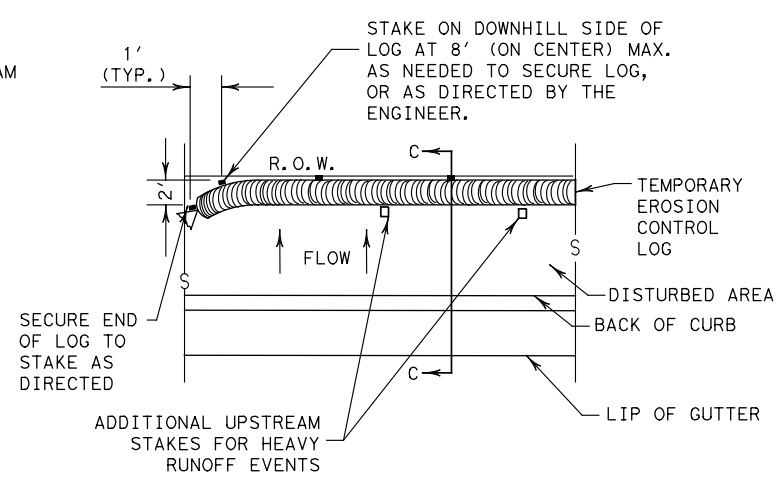
PLAN VIEW



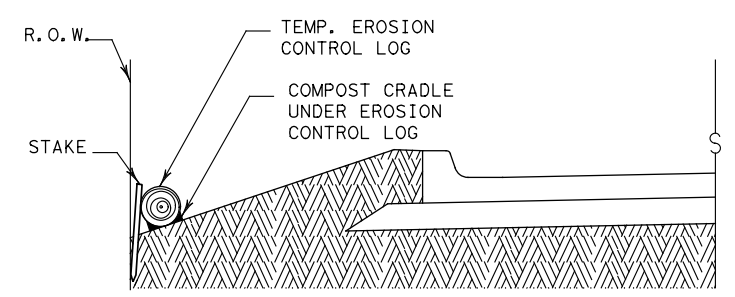
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



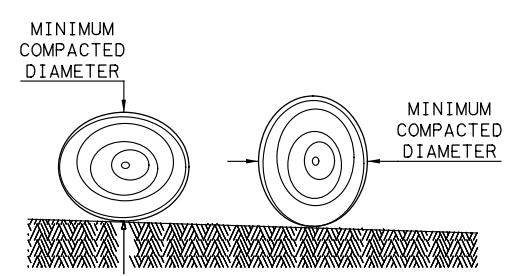
PLAN VIEW



SECTION C-C

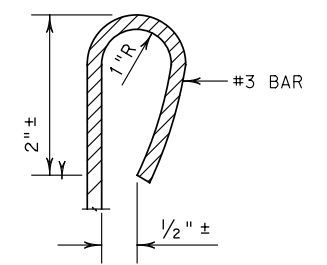
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

- 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



REBAR STAKE DETAIL

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.

GENERAL NOTES:

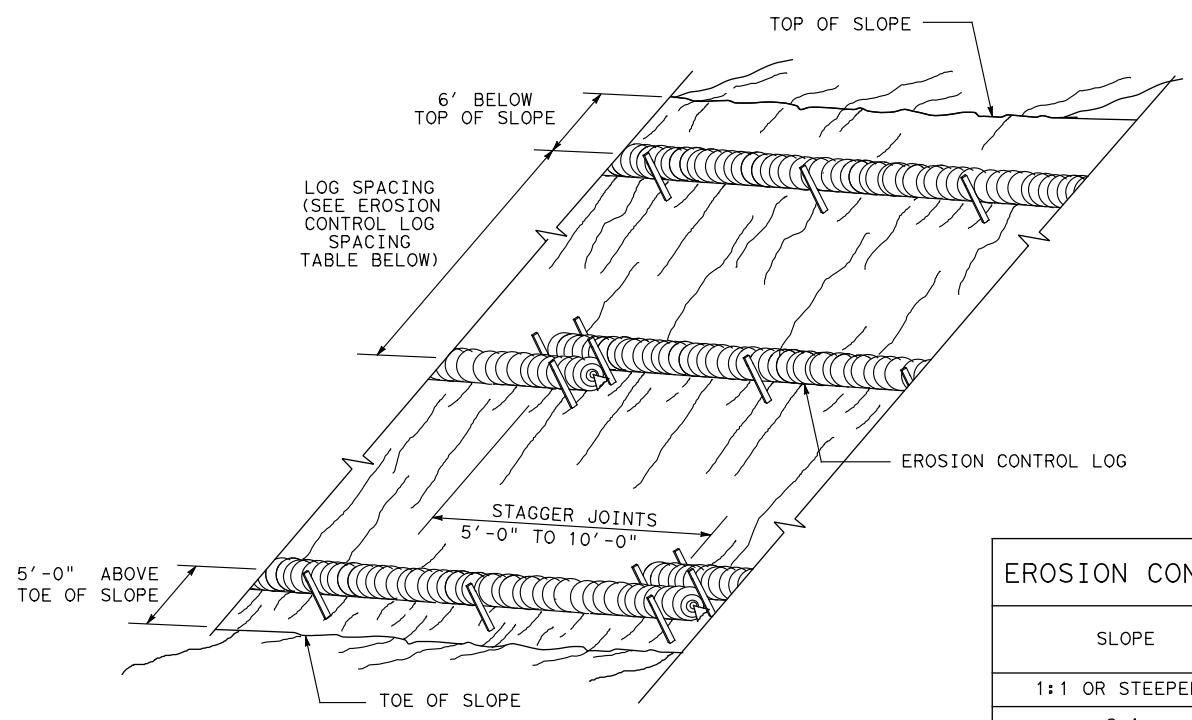
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE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

SHEET 1 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0215 09	035	FM 725
	DIST	COUNTY	SHEET NO.
	SAN	GUADALUPE	352

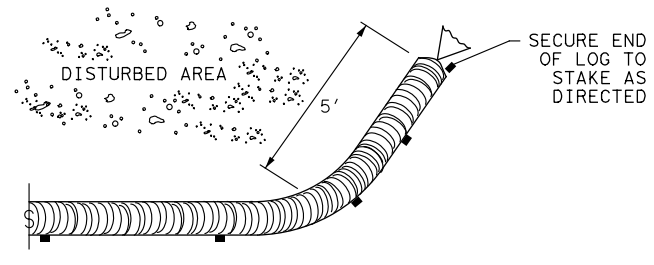
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EROSION CONTROL LOGS ON SLOPES
 STAKE AND TRENCHING ANCHORING

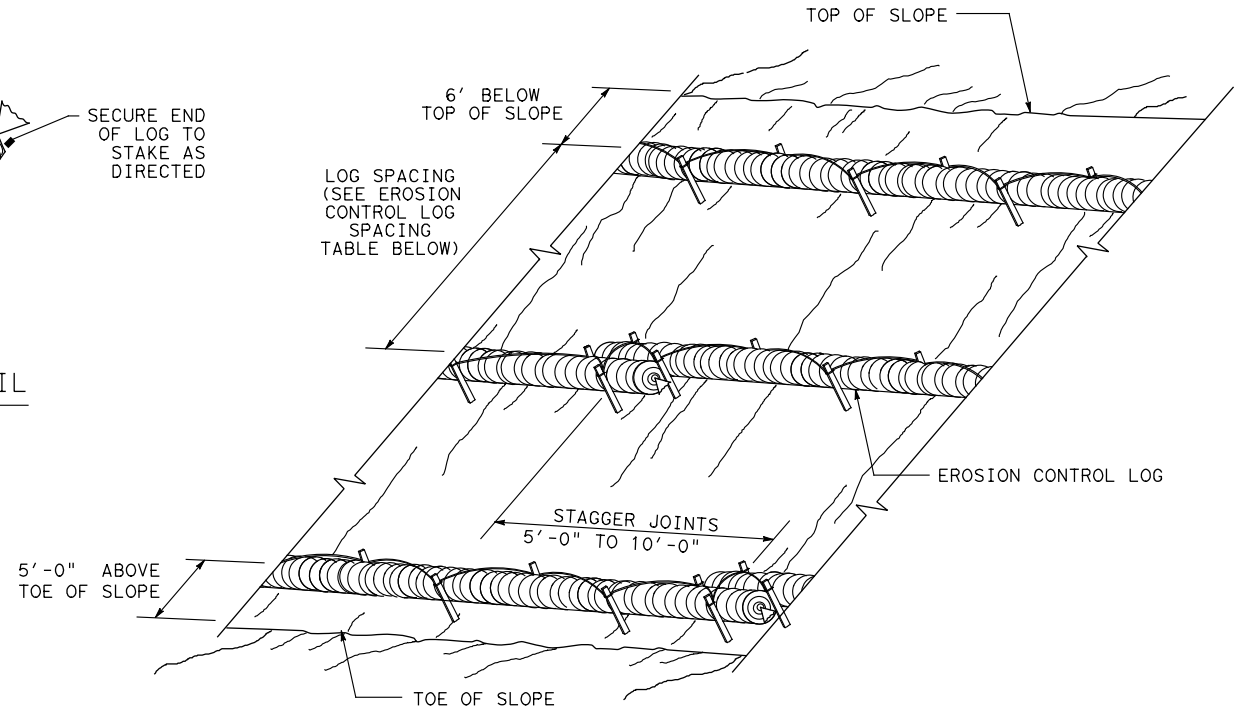
CL-SST



END SECTION RAP DETAIL

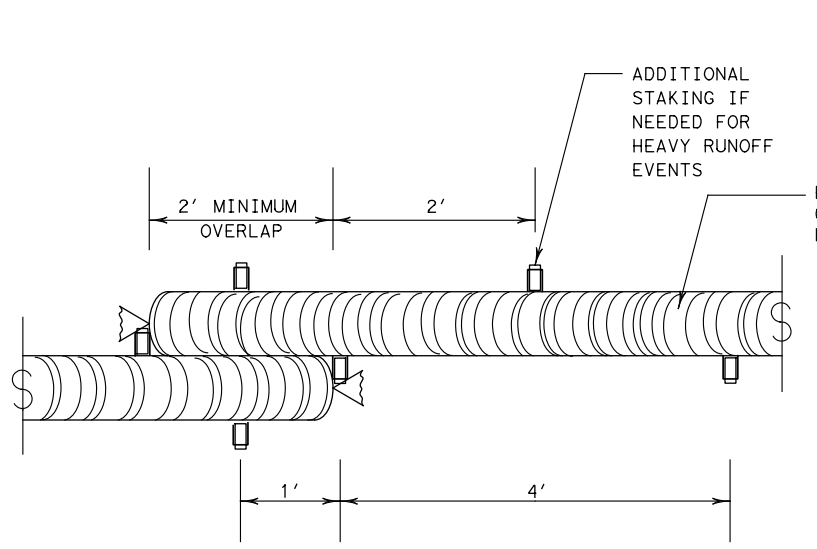
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



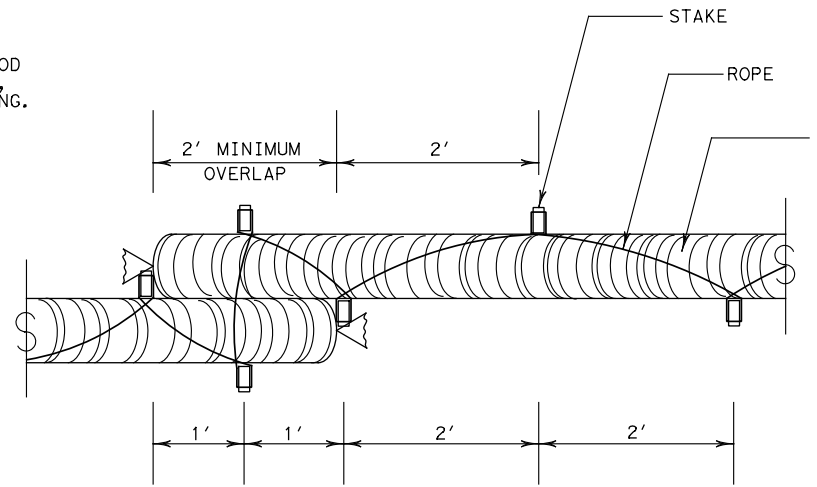
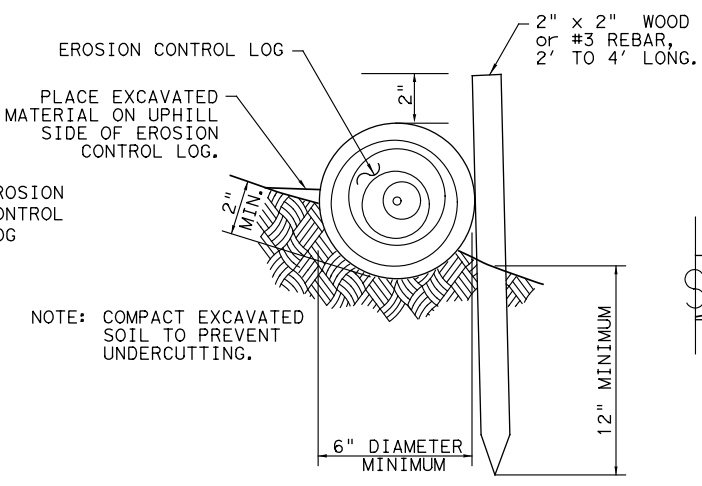
EROSION CONTROL LOGS ON SLOPES
 STAKE AND LASHING ANCHORING

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

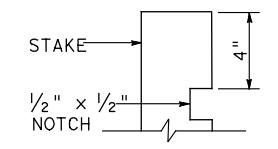
CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL

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



STAKE NOTCH DETAIL

SHEET 2 OF 3

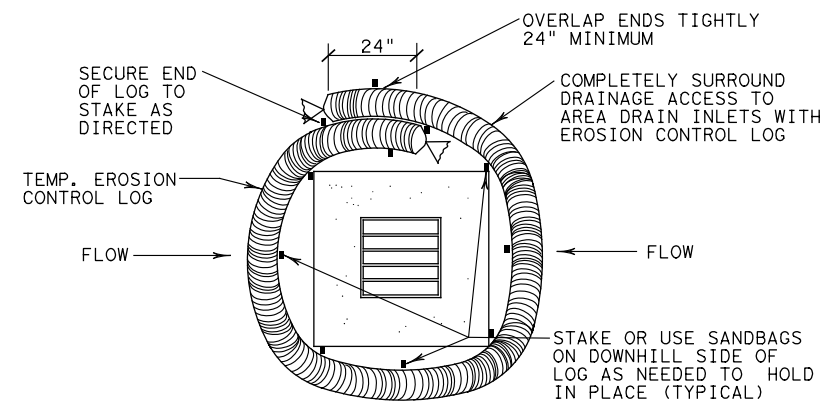
Texas Department of Transportation Design Division Standard

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
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REVISIONS	0215 09	035	FM 725	
	DIST	COUNTY	SHEET NO.	
	SAN	GUADALUPE	353	

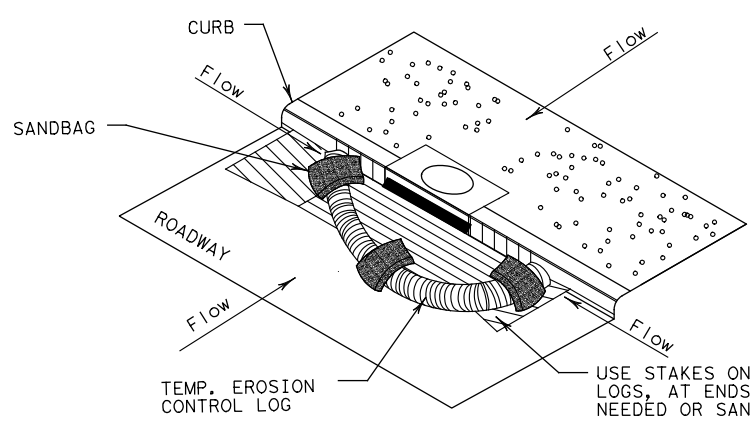
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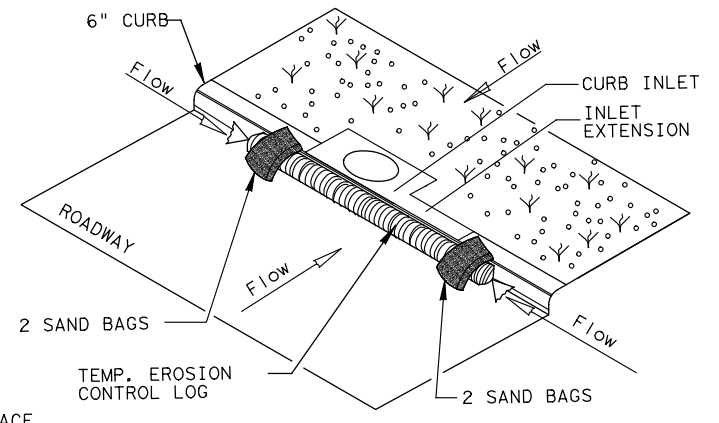
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

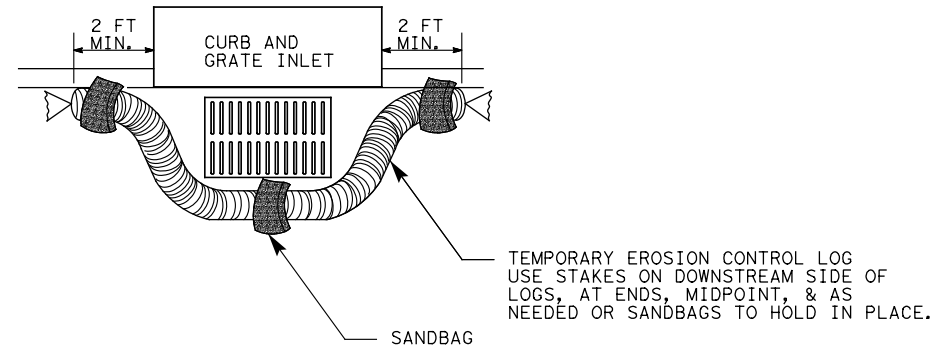
CL-CI



EROSION CONTROL LOG AT CURB INLET

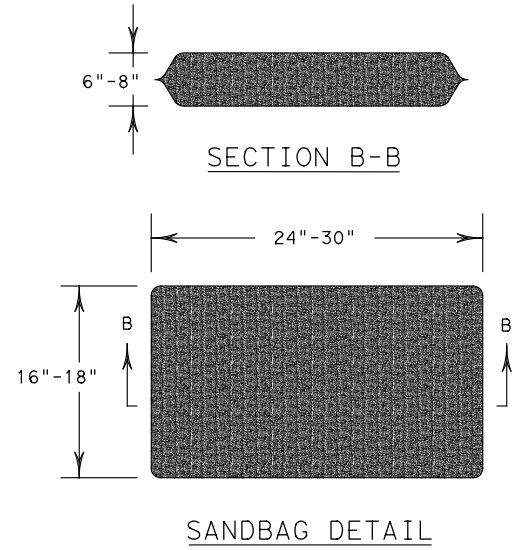
CL-CI

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



SHEET 3 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0215 09	035	FM 725
	DIST	COUNTY	SHEET NO.
	SAN	GUADALUPE	354

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DATE:
FILE:

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

DOT #: 742651L
 Crossing Type: **** Grade Separation - RR Over**
 RR Company Owning Track at Crossing: UPRR
 Operating RR Company at Track: UPRR
 RR MP: 178.730
 RR Subdivision: Glidden
 City: McQueeney
 County: Guadalupe
 CSJ at this Crossing: 0215-09-035
 Highway/Roadway name crossing the railroad: FM 725
 # of regularly scheduled trains per day at this crossing: 20
 # of switching movements per day at this crossing: 0
 % of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
Widen roadway by adding paved surface 5' toward existing metal beam guard fence. Replace metal beam guard fence and move 5' towards RR bridge columns. Restripe pavement.

Scope of Work at this Crossing to Be Performed by Railroad Company:
N/A

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 10
 On this project, night or weekend flagging is:
 Expected
 Not Expected
 Flagging services will be provided by:
 Railroad Company: TxDOT will pay flagging invoices
 Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT
 Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:
 UPRR - UP.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 BNSF - BNSF.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 KCS - KCS.info@railpros.com
 Call Center 877-315-0513, Select #1 for flagging
 - Bottom Line On-Track Safety Services
 botttomline076@aol.com, 903-767-7630

OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

Not Required
 Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:
 Required
 Not Required

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

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

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

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

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

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000 combined single limit
Railroad Protective Liability	
<input type="checkbox"/> Not Required	
<input checked="" type="checkbox"/> Non - Bridge Projects	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Projects	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:
 Not Required
 Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
 Required: Contractor to obtain (see Item 5, Article 8.4)
 With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

<http://www.txdot.gov/inside-txdot/division/rail/samples.html>

Approved ROE Agreement templates are not to be modified by the Contractor.

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

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:
 Not Required
 Required


See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
 Call Union Pacific Railroad
 Railroad Emergency Line at 888-877-7267
 Location: DOT 742651L
 RR Milepost 178.730
 Subdivision Glidden

				Rail Division	
RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS					
FILE:	RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
© TxDOT	June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0215	09	035	FM 725
3/2020		DIST	COUNTY	SHEET NO.	
		15	GUADALUPE	355	

PART 1 - GENERAL

1.01 DESCRIPTION

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

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

1.02 REQUEST FOR INFORMATION / CLARIFICATION

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

1.03 PLANS / SPECIFICATIONS

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

PART 2 - UTILITIES AND FIBER OPTIC

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

PART 3 - CONSTRUCTION

3.01 GENERAL

- A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.
- B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.
- C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.
- D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.
- E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.
- F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.
- G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

- A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.
- B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:
 - 1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.
 - 2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

- A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.
- B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.
- C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.
- D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
 - 1. Exactly what the work entails.
 - 2. The days and hours that work will be performed.
 - 3. The exact location of work, and proximity to the tracks.
 - 4. The type of window requested and the amount of time requested.
 - 5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.
- E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

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

3.05 RAILROAD SAFETY ORIENTATION

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

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."
- B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

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

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES



Abide by the following minimum temporary clearances during the course of construction:

- A. 15' - 0" (BNSF) (UPRR) and 14' - 0" (KCS) horizontal from centerline of track
- B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

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

3.08 APPROVAL OF REDUCED CLEARANCES

- A. Maintain minimum track clearances during construction as specified in Section 3.07.
- B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.
- C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

 Texas Department of Transportation		 Rail Division		
RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS				
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3.09 MAINTENANCE OF RAILROAD FACILITIES

- A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.
- B. Perform all such maintenance and repair of damages due to the Contractor's operations at Contractor's expense.
- C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD'S DESIGNATED REPRESENTATIVE

- A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
 1. Pre-construction meetings.
 2. Pile driving/drilling of caissons or drilled shafts.
 3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
 4. Erection of precast concrete or steel bridge superstructure.
 5. Placement of waterproofing (prior to placing ballast on bridge deck).
 6. Completion of the bridge structure.
- B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.
- C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

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

- A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.
- C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.
- D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
- E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

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

3.13 TRAFFIC CONTROL

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

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

- A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".
- B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

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

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

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

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


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

3.15 RAILROAD FLAGGING

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

3.16 CLEANING OF RIGHT-OF-WAY

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

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