FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	F 2023(121)		1
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0024	08	141	US 90

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
PROJECT NO. F 2023(121)
CSJ: 0024-08-141

BEXAR COUNTY
US 90

LIMITS FROM: HORAL ST
TO: SL 353

NET LENGTH OF ROADWAY = 42,812.800 FT = 8.108 MI
NET LENGTH OF BRIDGE = 3,797.200 FT = 0.719 MI
NET LENGTH OF PROJECT = 46,610.000 FT = 8.827 MI

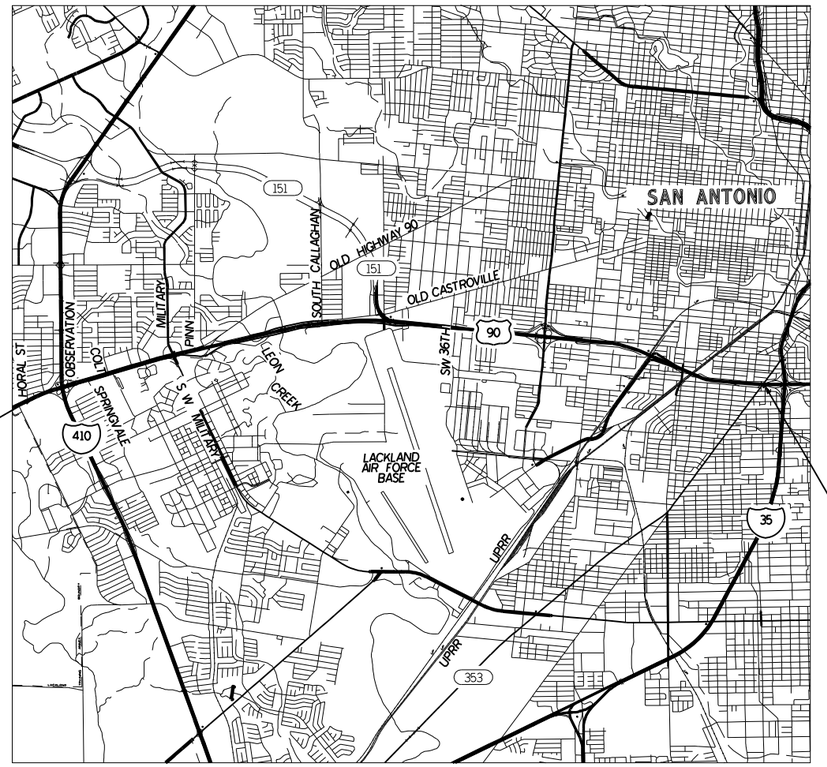
FOR THE CONSTRUCTION OF BASE REPAIR, MILL, INLAY, AND PAVEMENT MARKINGS.

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

DESIGN SPEED = N/A
AREA OF DISTURBED SOIL = 5.76 ACRES
ADT: FROM IH 410 TO SH 151: 75,300 (2022)
FROM SH 151 TO SL 353: 182,600 (2022)

ACCESSIBILITY STANDARDS = PROWAG



FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED
IN ACCORDANCE WITH THE PLANS.

P.E. _____
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

EXCEPTIONS: NONE
EQUATIONS: NONE
R.R. CROSSINGS: STA 537+00 AND STA 565+00

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: 11/10/2021
Gregg Granato, P.E.
DESIGN ENGINEER
0D08C713B58C45C...

RECOMMENDED FOR LETTING
Docusigned by: 11/10/2021
Clayton Kipps, P.E.
DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT
7...

RECOMMENDED FOR LETTING
Docusigned by: 11/10/2021
Lizette Colbert, P.E.
TRANSPORTATION ENGINEER SUPERVISOR

APPROVED FOR LETTING
Docusigned by: 11/16/2021
Gina Gallegos, P.E.
DISTRICT ENGINEER
124372CCDF604F5...

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

LEVELS DISPLAYED
1

COUNTY BEXAR PROJ. NO.
HWY. NO. US 90 LETTING DATE
DATE ACCEPTED

GENERAL

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2	INDEX OF SHEETS
3	PROJECT LAYOUT
4 - 9	TYPICAL SECTIONS
10, 10A-10F	GENERAL NOTES
11, 11A-11C	ESTIMATE AND QUANTITY
12 - 15	TCP SUMMARY
16 - 18	ROADWAY SUMMARY
19	BRIDGE SUMMARY
20 - 23	SIGNING AND PAVEMENT MARKING SUMMARY

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27 - 29	SCHEDULE OF BARRICADES & ADVANCED WARNING
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31	TRAFFIC CONTROL PLAN PHASE 1B-STEP 2A
32	TRAFFIC CONTROL PLAN PHASE 1B-STEP 2B
33	TRAFFIC CONTROL PLAN PHASE 1B-STEP 2C
34	TRAFFIC CONTROL PLAN PHASE 1B-STEP 3A
35	TRAFFIC CONTROL PLAN PHASE 1B-STEP 3B
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STATE OF TEXAS
TREY NEAL
106194
LICENSED
PROFESSIONAL ENGINEER

* STATE STANDARD
** SAN ANTONIO DISTRICT STANDARD

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

TREY A. NEAL, P.E.

10/27/2021
DATE

Kimley»Horn F-928

Texas Department of Transportation

US 90

INDEX OF SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	2
CONT.	SECT.	JOB	
0024	08	141	

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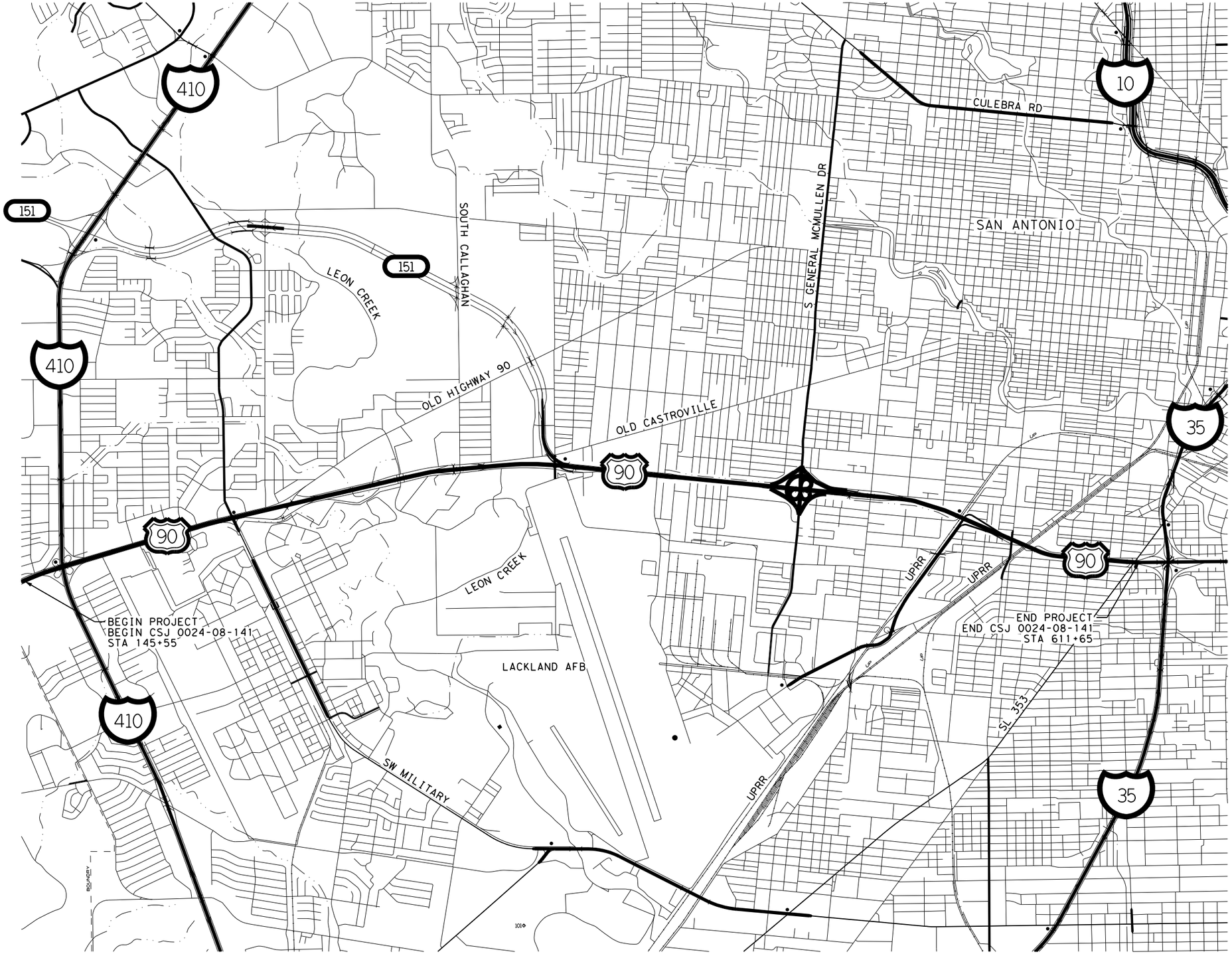

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4/1/2021

STATE OF TEXAS
TREY NEAL
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PROFESSIONAL ENGINEER

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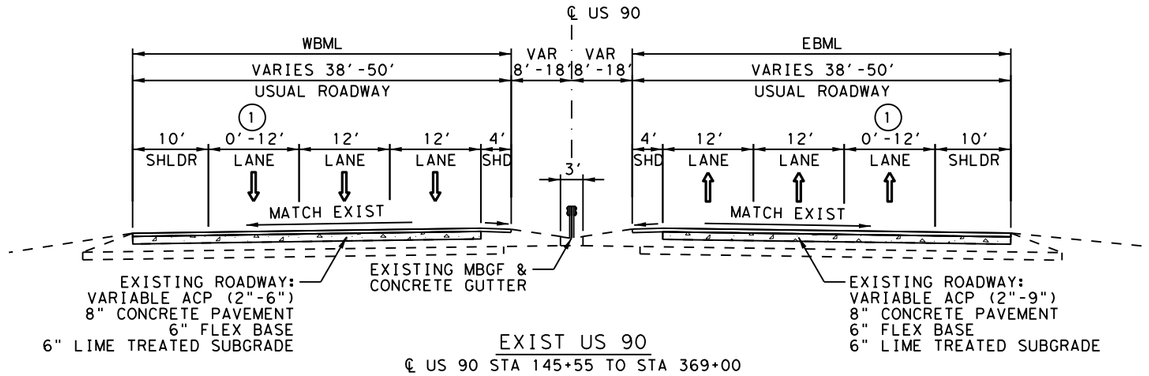
US 90

PROJECT LAYOUT

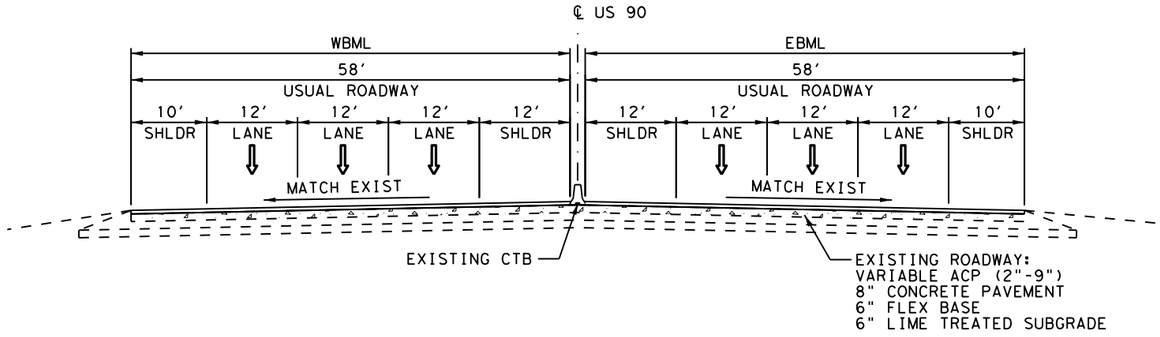
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.	
6		US 90	
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	3
CONT.	SECT.	JOB	
0024	08	141	



EXIST US 90

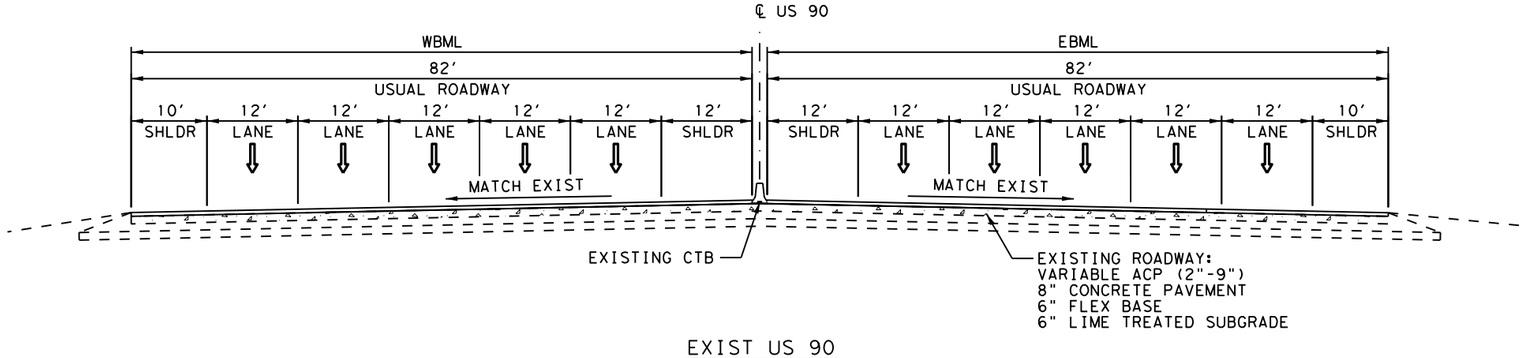
℄ US 90 STA 145+55 TO STA 369+00

(1) 0' - STA 145+55 TO STA 198+00
12' - STA 198+00 TO STA 369+00



EXIST US 90

℄ US 90 STA 369+00 TO STA 391+50



EXIST US 90

℄ US 90 STA 391+50 TO STA 403+70

NOTES

1. USUAL LANE AND SHOULDER WIDTHS SHOWN. REFER TO ROADWAY PLANS FOR ACTUAL WIDTHS.

0 5 10 15 20

SCALE: 1" = 20'

5/5/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

US 90

TYPICAL SECTIONS

SHEET 1 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	4
CONT.	SECT.	JOB	
0024	08	141	

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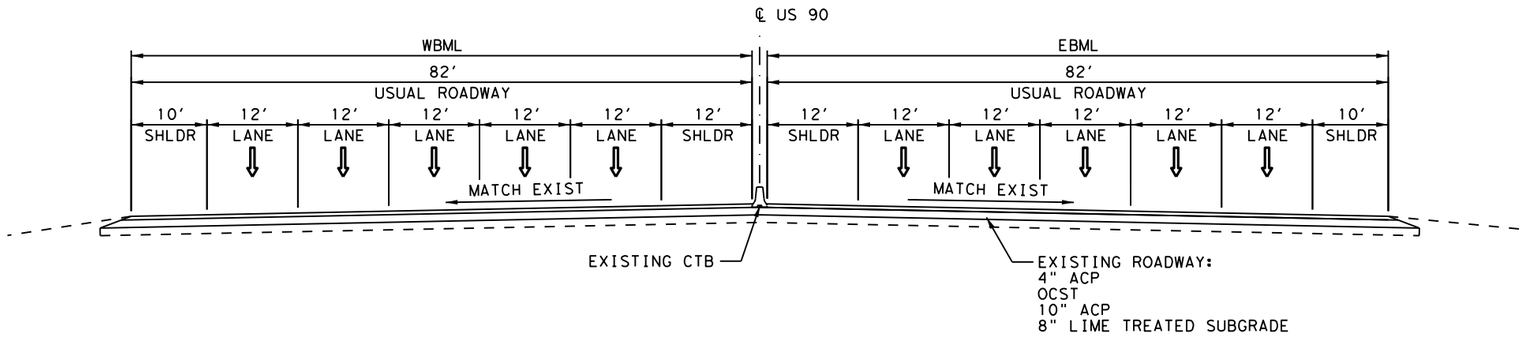

EXIST US 90

℄ US 90 STA 403+70 TO STA 424+30

NOTES

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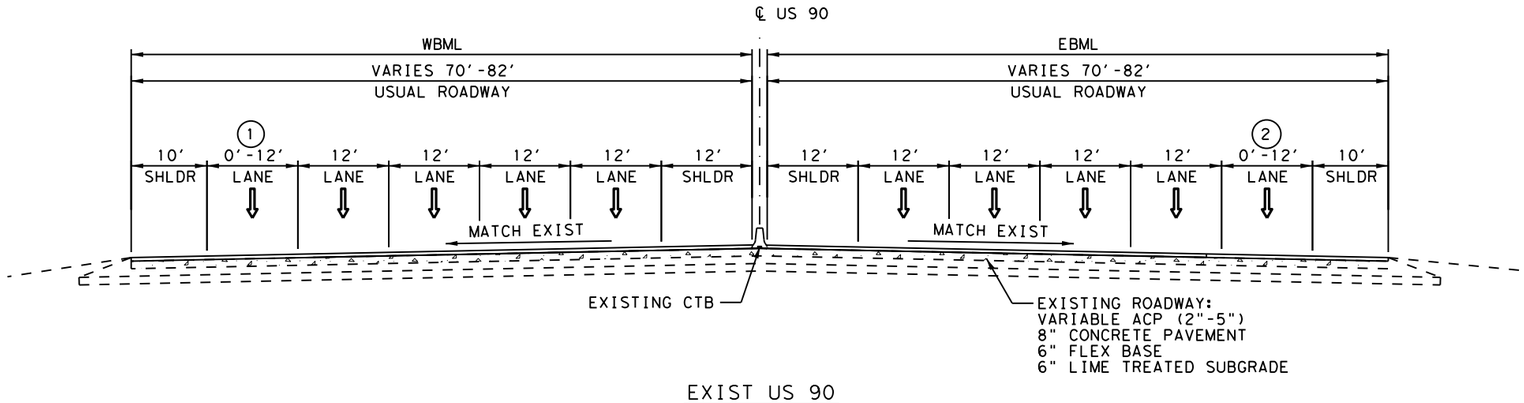

EXIST US 90

℄ US 90 STA 424+30 TO STA 611+00

① 12' - STA 424+30 TO STA 474+00
STA 495+00 TO STA 611+00
0' - STA 474+00 TO STA 495+00

② 12' - STA 424+30 TO STA 458+00
STA 487+00 TO STA 544+00
STA 550+00 TO STA 611+00
0' - STA 458+00 TO STA 487+00
STA 544+00 TO STA 550+00

0 5 10 15 20
SCALE: 1" = 20'

5/5/2021

STATE OF TEXAS
TREY NEAL
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US 90

TYPICAL SECTIONS

SHEET 2 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	5
CONT.	SECT.	JOB	
0024	08	141	

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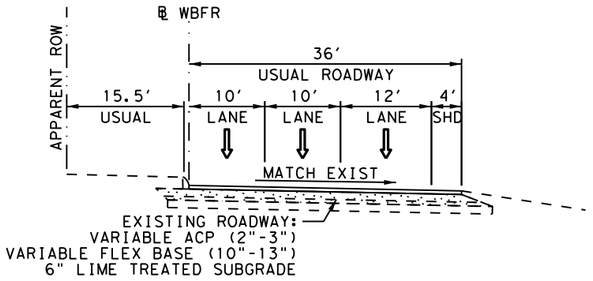
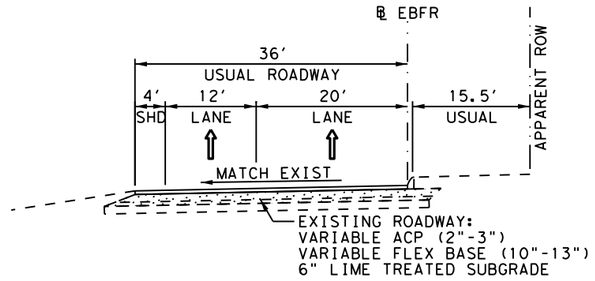


EXIST US 90 WBFR

℄ WBFR STA 174+15 TO STA 232+28



EXIST US 90 EBFR

℄ EBFR STA 173+50 TO STA 231+74

NOTES

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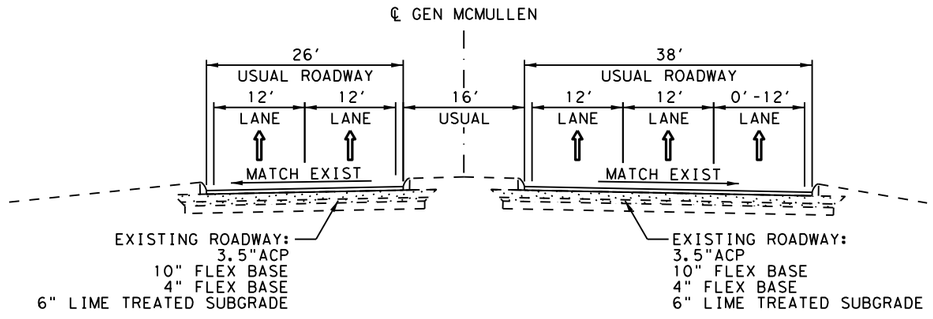

EXIST GENERAL MCMULLEN

℄ GEN MCMULLEN STA 84+35 TO STA 104+55

0 5 10 15 20

SCALE: 1" = 20′

5/5/2021

STATE OF TEXAS
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US 90

TYPICAL SECTIONS

SHEET 3 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	6
CONT.	SECT.	JOB	
0024	08	141	

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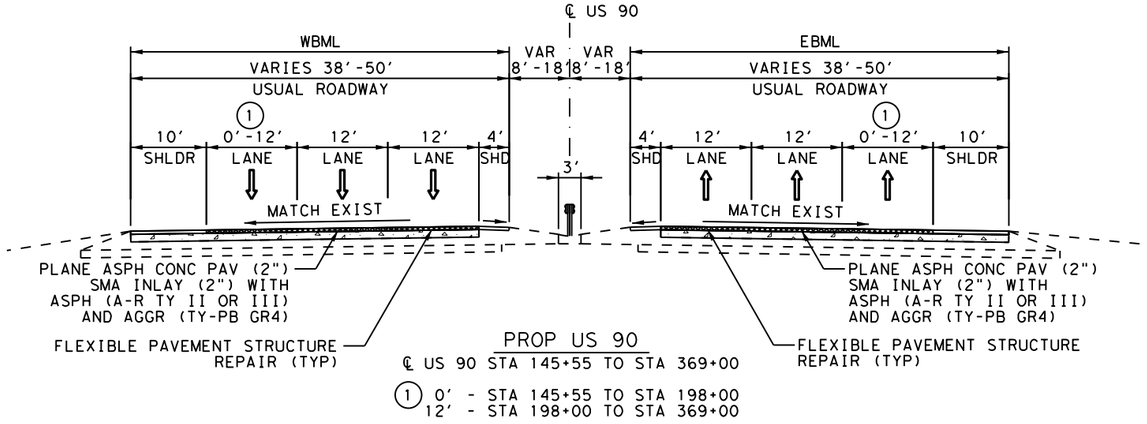
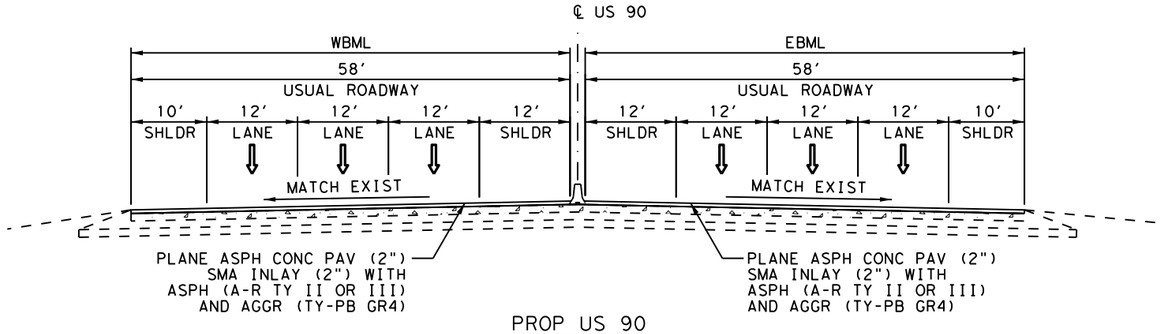


PROP US 90

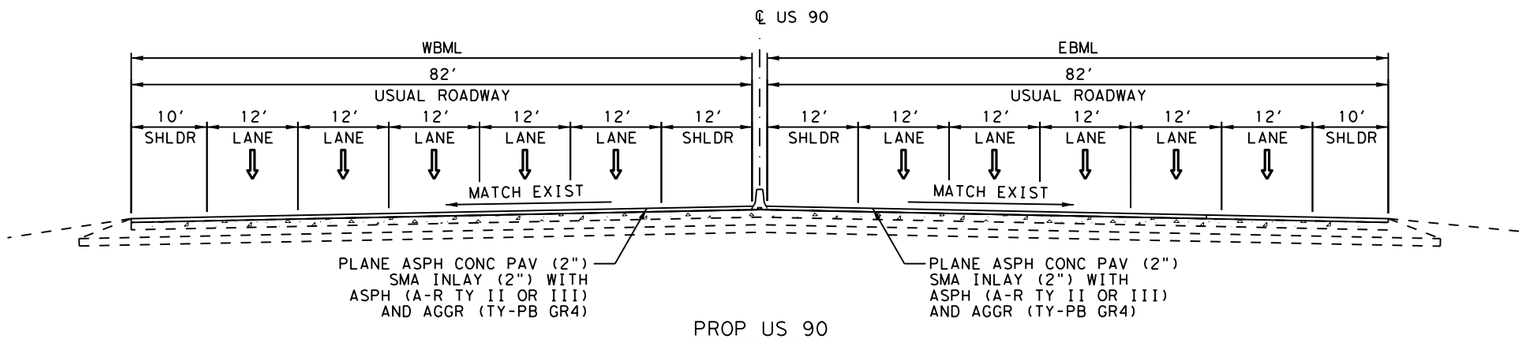
℄ US 90 STA 145+55 TO STA 369+00

(1) 0' - STA 145+55 TO STA 198+00
12' - STA 198+00 TO STA 369+00



PROP US 90

℄ US 90 STA 369+00 TO STA 391+50



PROP US 90

℄ US 90 STA 391+50 TO STA 403+70

NOTES

1. USUAL LANE AND SHOULDER WIDTHS SHOWN. REFER TO ROADWAY PLANS FOR ACTUAL WIDTHS.
2. REFER TO ROADWAY PLANS FOR ACTUAL FLEXIBLE PAVEMENT STRUCTURE REPAIR LOCATIONS.

0 5 10 15 20
SCALE: 1" = 20'

10/27/2021

STATE OF TEXAS
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Texas Department of Transportation

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TYPICAL SECTIONS

SHEET 4 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	7
CONT.	SECT.	JOB	
0024	08	141	

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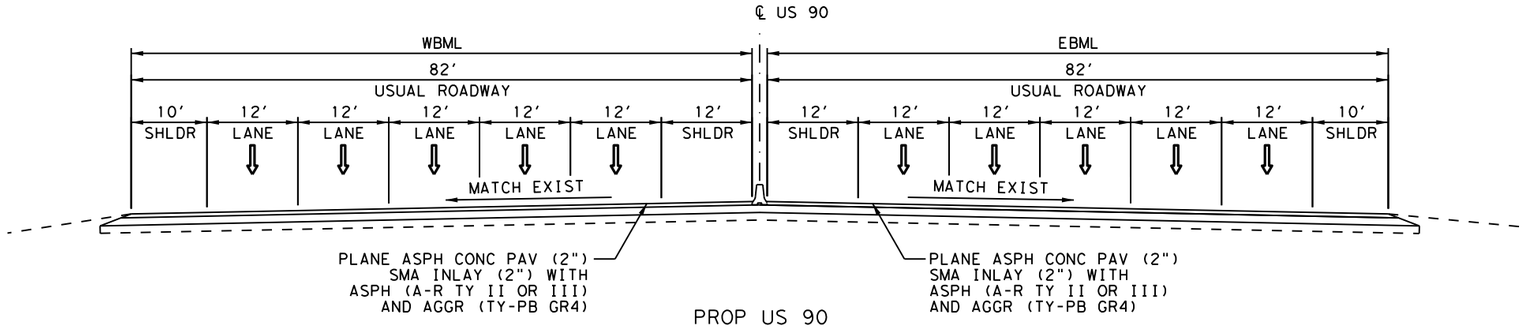
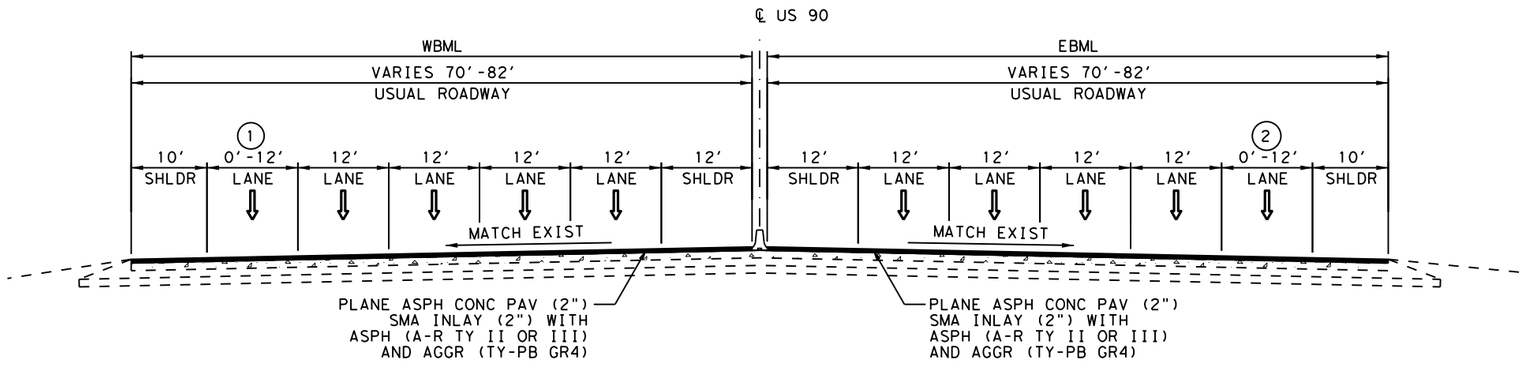


PROP US 90

℄ US 90 STA 403+70 TO STA 424+30



PROP US 90

℄ US 90 STA 424+30 TO STA 611+00

① 12' - STA 424+30 TO STA 474+00
STA 495+00 TO STA 611+00
0' - STA 474+00 TO STA 495+00

② 12' - STA 424+30 TO STA 458+00
STA 487+00 TO STA 544+00
STA 550+00 TO STA 611+00
0' - STA 458+00 TO STA 487+00
STA 544+00 TO STA 550+00

NOTES

1. USUAL LANE AND SHOULDER WIDTHS SHOWN. REFER TO ROADWAY PLANS FOR ACTUAL WIDTHS.

0 5 10 15 20
SCALE: 1" = 20'

10/27/2021

STATE OF TEXAS
TREY NEAL
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Texas Department of Transportation

US 90

TYPICAL SECTIONS

SHEET 5 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	8
CONT.	SECT.	JOB	
0024	08	141	

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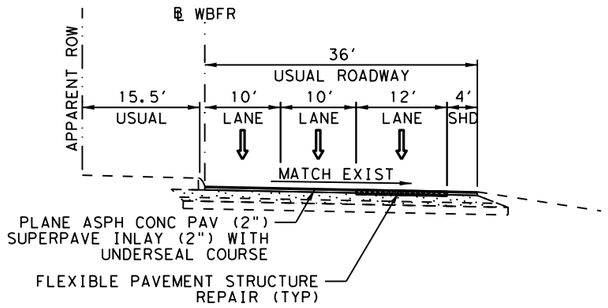
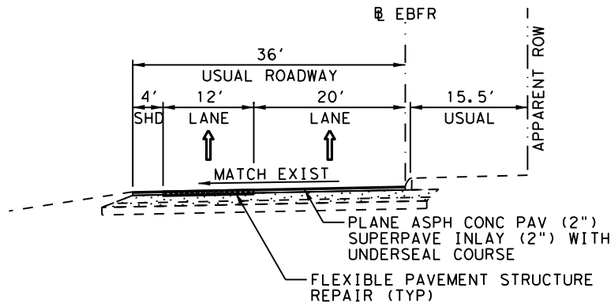


PROP US 90 WBFR

℄ WBFR STA 174+15 TO STA 232+28

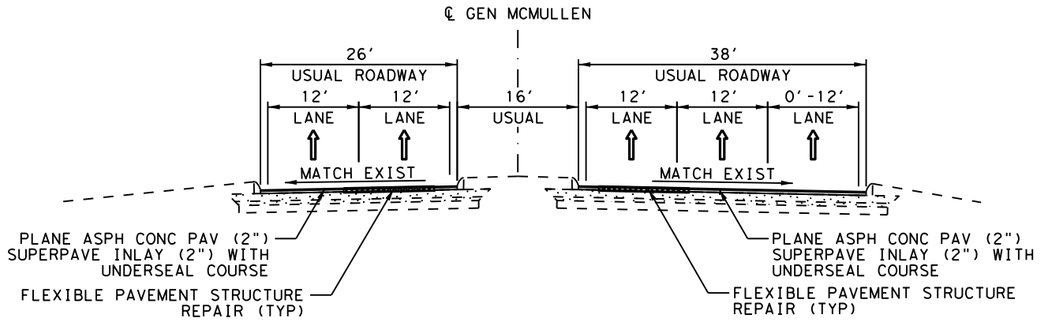


PROP US 90 EBFR

℄ EBFR STA 173+50 TO STA 231+74

NOTES

1. USUAL LANE AND SHOULDER WIDTHS SHOWN. REFER TO ROADWAY PLANS FOR ACTUAL WIDTHS.
2. REFER TO ROADWAY PLANS FOR ACTUAL FLEXIBLE PAVEMENT STRUCTURE REPAIR LOCATIONS.



PROP GENERAL MCMULLEN

℄ GEN MCMULLEN STA 84+35 TO STA 104+55

0 5 10 15 20

SCALE: 1" = 20'

10/27/2021

TREY NEAL
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PROFESSIONAL ENGINEER
STATE OF TEXAS

Kimley»Horn F-928

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US 90

TYPICAL SECTIONS

SHEET 6 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	9
CONT.	SECT.	JOB	
0024	08	141	

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**********GENERAL NOTES**********
2014 Specification Book

========== **Basis of Estimate** ==========

Item	Description	Rate	Area	Quant-Unit
3085-6001	Underseal Course	0.2 gal/sy	103,201 sy	20,640 gal

========== **Asphalt Concrete Pavement** ==========

Type	Location	Depth	Rate	Area	Quant-Unit
SMA-D SAC-A PG 76-22	ML	VAR. 2”(TYP)	115 lbs/sy-in	681,285 sy	78,698 tons
SP-C SAC-B PG 70-22	WBFR/EBFR IH 410 Loop Ramps General McMullen	2”	115 lbs/sy-in	103,201 sy	11,869 tons

========== **Surface Treatment Data** ==========

Item	Description	Rate	Area	Quant-Unit
316 6009	ASPH (A-R TYPE II or III)	0.44 gal/sy	681,285 sy	299,766 gal
316 6431	AGGR (TY-PB GR-4)	1 cy/125 sy	681,285 sy	5,450 cy

--General--
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 San Antonio: (210) 207-8642

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. 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 or GPS. 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 stockpiles, etc. cannot be placed over these valves or covers.

The Contractor has the option to adjust or construct all manholes and valves to final pavement elevations prior to the final mat of HMA or after final mat of HMA. If, between the final elevation adjustment and the final mat of HMA, 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 HMA 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.

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.
3. Call SAWS at (210) 233-2015.

Submit locate request for SAWS water and sewer to TXDOTlocates@saws.org.

In accordance with the Underground Facility Damage Prevention Act (One Call Bill) the phone number for a utility locator is 811. It is the Contractor's responsibility to plan for utility locators as needed.

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way. Call or email the TxDOT offices listed below for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above-mentioned utilities when working without having the utilities located prior to excavation.

For signal and ITS locates call TransGuide at 210-731-5136 or email *sat_its_locates@txdot.gov* for ITS locates and signal.request@txdot.gov for signal locates.

Contractor questions on this project are to be addressed to the following individual(s):
Sergio Garcia, PE (Area Engineer) *Sergio.Garcia@txdot.gov*
Danny Gallegos, PE (Assistant Area Engineer) *Danny.Gallegos@txdot.gov*

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/

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

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

A horizontal boom or equivalent equipment is required for construction in the vicinity of the CPS Energy electric lines to provide vertical clearance of equipment during construction. Contact CPS Energy Utility Coordination Group 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 CPS Energy Utility Coordination Group sixteen (16) week in anticipation of needed de-energization. The estimated duration for

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de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and back feed 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. This work is subsidiary to the various bid items.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows.

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

--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 5.76 AC. 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 Workweek.

Create and maintain a Bar Chart schedule.

A lane closure assessment fee will be assessed as per the "Lane Closure Assessment Fee Table" in the plans.

--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 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--
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.

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 162--
Furnish and place Bermuda grass sod.

--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 275--
The Engineer will designate a target cement content and optimum moisture content necessary to produce a stabilized mixture that meets the strength requirements and moisture susceptibility requirements shown in Table 1. The Contractor shall furnish the Engineer with representative samples of the materials to be used in production of the cement treated base.

Table 1
Requirements for Cement Treatment

Description	Minimum	Maximum
Cement Content (by dry weight of base)	2%	5%
	Procedure	Minimum
7-Day Unconfined Compressive Strength	Tex-120-E, Part I	150 psi
Retained Strength after Moisture Conditioning	Tex-120-E, Part I (Submerged in water for 24 hrs. after seven days of curing)	80% of 7—Day Unconfined Compressive Strength

Microcracking will be required in accordance with Item 275.4.7.

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--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.

--Item 305--
All reclaimable asphalt pavement (RAP) material will be retained by the Contractor.

--Item 316--
Asphalt season will be year round but meet temperature limitations specified in the standard specifications for Item 316.

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 330--
If LRA is stockpiled where it might get contaminated with foreign materials, the bottom of the stockpile cannot be used. A set of standard truck scales will be used to determine the quantity of

contaminated material that will be deducted. Unless approved, do not stockpile LRA more than 10 days prior to lay-down operations.

--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 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
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.

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 with this item.
Always keep
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. At least one lane has to remain open at all times.

For closures not listed in the TCP; the lane closures are limited to between the hours of 9:00 AM to 3:00 PM for daytime closures and 8:30 PM to 5:00 AM for nighttime closures. 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.

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 504--
A Type D Structure (Asphalt Mix Control Laboratory) is required for all projects that do not have a previously approved laboratory structure for TxDOT's exclusive use. The structure will include high speed internet service with WIFI signal, one desk, two chairs, and one file cabinet.

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

--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 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.

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

--Item 540--
Guard fence posts placed in proposed and/or existing areas of riprap, sidewalks or other concrete shall have an 18 inch +/- (square or round) leave-out in the concrete as shown in the state standard for MBGF and Mow Strip. After the posts are installed, fill the leave-outs with a Grout mixture as shown in the state standard for MBGF Mow Strip.

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 ½" from the edge of the hole.

--Item 542--
Salvage all undamaged/acceptable radius guardrail and deliver to the TxDOT maintenance section yard.

--Item 545--
See the Crash Cushion Summary Sheet.

--Item 585--
Use Surface Test Type B, pay adjustment schedule 3 to evaluate ride quality of travel lanes.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

Triangular Slipbase Systems with set screws are not allowed.

--Item 666--
Use TY II markings (vs. an acrylic or epoxy) on asphalt surfaces as the sealer for the TY I markings, unless otherwise approved by the Engineer.

--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 3076, 3077, 3079, 3080, 3081, & 3082--
Table 10 in Item 3076 and Table 11in 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.

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

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-paving meeting one month prior to the placement of the hot mix. The date and time of pre-paving meeting should be coordinated with the Engineer prior to scheduling.

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.

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 4171--

Install bridge identification numbers for each of the listed bridges in accordance with the special specification and San Antonio District Standard. Install the bridge identification number on two locations as shown on the plans, or as directed. For bridges in a two-way condition, install the bridge identification number on each outside beam on the upstream side of traffic. For bridges in a one-way condition, install the bridge identification number on each side, opposite corners on each outside beam. For culverts less than 5 ft. in height, install the bridge identification number on the headwall on upstream and downstream location. For culverts greater than 5 ft. in height, install the bridge identification number inside the first barrel on the upstream side of traffic and inside the last barrel on the opposite corner in the direction of traffic.

15-015-0024-08-210	15-015-0024-08-129	15-015-0024-05-208
15-015-0024-08-132	15-015-0024-08-137	15-015-0024-05-206
15-015-0024-08-141	15-015-0024-08-116	15-015-0024-05-207
15-015-0024-08-114	15-015-0024-08-312	15-015-0024-05-209
15-015-0024-08-142	15-015-0024-08-146	
15-015-0024-08-213	15-015-0024-08-211	
15-015-0024-08-130	15-015-0024-08-133	
15-015-0024-08-144	15-015-0024-08-115	
15-015-0024-08-117	15-015-0024-08-313	
15-015-0024-08-143	15-015-0024-08-147	
15-015-0024-08-212		

--Item 6185--

Three (3) 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.

--TMS General Notes--

The location of utilities (including TMS), either underground or overhead, if shown within the right of way are approximate and must be verified by the Contractor before beginning construction operations. TRANSGUIDE will provide Locates of TMS equipment, however, it is the responsibility of the Contractor to determine the depth of the Traffic Management conduit.

The Contractor Force Account shown as "Other: Contractor Force Account Work" on the estimate, will be used by Transguide to locate TMS equipment.

In accordance with the Underground Facility Damage Prevention Act (One Call Bill) the phone number for a utility locator is 1-800-545-6005. It is the Contractor's responsibility to make arrangements for utility locators as needed.

TxDOT (Traffic Management)	(210)731-5240
TxDOT (Traffic Signal)	(210)731-5131

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0024-08-141 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 90

			CONTROL SECTION JOB		**0024-08-141**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00061216**		
			COUNTY		**Bexar**		
			HIGHWAY		**US 90**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	465.000		465.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	2,022.000		2,022.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	273.000		273.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	899.000		899.000	
	162-6002	BLOCK SODDING	SY	12,778.000		12,778.000	
	168-6001	VEGETATIVE WATERING	MG	201.600		201.600	
	316-6009	ASPH (A-R TYPE II OR III)	GAL	299,766.000		299,766.000	
	316-6431	AGGR (TY-PB GR-4)	CY	5,450.000		5,450.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	7,592.000		7,592.000	
	351-6003	FLEXIBLE PAVEMENT STRUCTURE REPAIR(7")	SY	16,540.000		16,540.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	48,689.000		48,689.000	
	354-6023	PLANE ASPH CONC PAV(0" TO 4")	SY	67,328.000		67,328.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	717,001.000		717,001.000	
	420-6066	CL C CONC (RAIL FOUNDATION)	CY	38.000		38.000	
	429-6005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SF	156.000		156.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	217.000		217.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	1,679.000		1,679.000	
	438-6009	CLEANING EXISTING JOINTS	LF	4,584.000		4,584.000	
	450-6023	RAIL (TY SSTR)	LF	260.000		260.000	
	451-6005	RETROFIT RAIL (TY T221)	LF	1,694.000		1,694.000	
	454-6008	HEADER TYPE EXPANSION JOINT	CF	790.000		790.000	
	454-6009	JOINT SEALANT	LF	4,584.000		4,584.000	
	496-6099	REMOVE STR (RAIL)	LF	1,694.000		1,694.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	29.000		29.000	
	506-6035	SANDBAGS FOR EROSION CONTROL	EA	6.000		6.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	38,299.000		38,299.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	38,299.000		38,299.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)	LF	660.000		660.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	2,640.000		2,640.000	
	512-6049	PORT CTB (REMOVE)(SGL SLP)(TY 1)	LF	660.000		660.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	31,528.000		31,528.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	35.000		35.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	74.000		74.000	
	540-6037	MTL BM GD FEN TRANS (ANCHOR PLATE)	EA	10.000		10.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	27,349.000		27,349.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	97.000		97.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0024-08-141 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 90

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0024-08-141**			
		PROJECT ID		**A00061216**			
		COUNTY		**Bexar**			
		HIGHWAY		**US 90**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	28.000		28.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	79.000		79.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	56.000		56.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	4.000		4.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	1.000		1.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1.000		1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	7.000		7.000	
	644-6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	1.000		1.000	
	644-6067	IN SM RD SN SUP&AM (INST SIGN ONLY)	EA	1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	8.000		8.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	370.000		370.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	73.000		73.000	
	658-6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	40.000		40.000	
	658-6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	31.000		31.000	
	662-6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	1,510.000		1,510.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	2,808.000		2,808.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	3,006.000		3,006.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF	6,020.000		6,020.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	20,333.000		20,333.000	
	662-6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	62,995.000		62,995.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	98,611.000		98,611.000	
	662-6070	WK ZN PAV MRK REMOV (W)8"(LNDP)	LF	182.000		182.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	12,799.000		12,799.000	
	662-6072	WK ZN PAV MRK REMOV (W)12"(LNDP)	LF	2,558.000		2,558.000	
	662-6073	WK ZN PAV MRK REMOV (W)12"(SLD)	LF	15,062.000		15,062.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	1,060.000		1,060.000	
	662-6080	WK ZN PAV MRK REMOV (W)(ARROW)	EA	30.000		30.000	
	662-6081	WK ZN PAV MRK REMOV (W)(DBL ARROW)	EA	5.000		5.000	
	662-6082	WK ZN PAV MRK REMOV (W)(ENTR GORE)	EA	30.000		30.000	
	662-6083	WK ZN PAV MRK REMOV (W)(EXIT GORE)	EA	31.000		31.000	
	662-6090	WK ZN PAV MRK REMOV (W)(WORD)	EA	31.000		31.000	
	662-6092	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	EA	37.000		37.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	28,892.000		28,892.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	98,452.000		98,452.000	
	662-6102	WK ZN PAV MRK REMOV (Y)24"(SLD)	LF	161.000		161.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	24,453.000		24,453.000	
	666-6009	REFL PAV MRK TY I (W)4"(LNDP)(100MIL)	LF	364.000		364.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0024-08-141 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 90

		CONTROL SECTION JOB		**0024-08-141**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00061216**			
		COUNTY		**Bexar**			
		HIGHWAY		**US 90**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	12,799.000		12,799.000	
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	2,558.000		2,558.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	15,062.000		15,062.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1,219.000		1,219.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	30.000		30.000	
	666-6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	5.000		5.000	
	666-6072	REFL PAV MRK TY I(W)(LNDP ARW)(100MIL)	EA	22.000		22.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	31.000		31.000	
	666-6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	30.000		30.000	
	666-6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	31.000		31.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	37.000		37.000	
	666-6138	REFL PAV MRK TY I (Y)8"(SLD)(100MIL)	LF	161.000		161.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	320.000		320.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	320.000		320.000	
	666-6224	PAVEMENT SEALER 4"	LF	48,224.000		48,224.000	
	666-6225	PAVEMENT SEALER 6"	LF	258,868.000		258,868.000	
	666-6226	PAVEMENT SEALER 8"	LF	12,799.000		12,799.000	
	666-6228	PAVEMENT SEALER 12"	LF	17,620.000		17,620.000	
	666-6230	PAVEMENT SEALER 24"	LF	1,221.000		1,221.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	30.000		30.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	31.000		31.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	5.000		5.000	
	666-6237	PAVEMENT SEALER (LNDP ARROW)	EA	22.000		22.000	
	666-6239	PAVEMENT SEALER (ENTR GORE)	EA	30.000		30.000	
	666-6240	PAVEMENT SEALER (EXIT GORE)	EA	31.000		31.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	37.000		37.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	9,072.000		9,072.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	37,044.000		37,044.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	64,116.000		64,116.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	42,938.000		42,938.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	104,686.000		104,686.000	
	666-6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	104,320.000		104,320.000	
	672-6007	REFL PAV MRKR TY I-C	EA	92.000		92.000	
	672-6008	REFL PAV MRKR TY I-R	EA	420.000		420.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	53.000		53.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	5,676.000		5,676.000	
	730-6107	FULL - WIDTH MOWING	CYC	10.000		10.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0024-08-141 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 90

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0024-08-141**			
		PROJECT ID		**A00061216**			
		COUNTY		**Bexar**			
		HIGHWAY		**US 90**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	734-6002	LITTER REMOVAL	CYC	29.000		29.000	
	738-6003	CLEANING / SWEEPING (OUTSIDE MAIN LANE)	CYC	29.000		29.000	
	738-6005	CLEANING / SWEEPING (FRONTAGE ROAD)	CYC	9.000		9.000	
	738-6007	CLEANING / SWEEPING(ENTRANCE/EXIT RAMP)	CYC	29.000		29.000	
	3077-6023	SP MIXESSP-CSAC-B PG70-22	TON	11,851.000		11,851.000	
	3080-6007	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	TON	81,091.000		81,091.000	
	3085-6001	UNDERSEAL COURSE	GAL	20,608.000		20,608.000	
	4171-6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	50.000		50.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	924.000		924.000	
	6185-6002	TMA (STATIONARY)	DAY	891.000		891.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	60.000		60.000	
	6305-6007	LCS SYSTEM (REMOVE)	EA	52.000		52.000	
	18	OTHER: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

TCP SUMMARY

SHEET NO.	LOCATION	0502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	0512 6001 PORT CTB (FUR & INST) (SGL SLOPE) (TY 1)	0512 6025 PORT CTB (MOVE) (SGL SLP) (TY 1)	0512 6049 PORT CTB (REMOVE) (SGL SLP) (TY 1)	0545 6003 CRASH CUSH ATTEN (MOVE & RESET)	0545 6005 CRASH CUSH ATTEN (REMOVE)	0545 6019 CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	0662 6005 WK ZN PAV MRK NON-REMOV (W)6"(BRK)	0662 6008 WK ZN PAV MRK NON-REMOV (W)6"(SLD)	0662 6037 WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	0662 6060 WK ZN PAV MRK REMOV (W) 4"(BRK)	0662 6063 WK ZN PAV MRK REMOV (W) 4"(SLD)	0662 6064 WK ZN PAV MRK REMOV (W) 6"(BRK)
		MO	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	LF
PLANE & INLAY OPERATIONS														
	MAINLANES													
1	BEGIN PROJ TO STA 154+00													420
2	STA 154+00 TO STA 166+00													600
3	STA 166+00 TO STA 178+00											230	3317	600
4	STA 178+00 TO STA 190+00													600
5	STA 190+00 TO STA 202+00													650
6	STA 202+00 TO STA 214+00													900
7	STA 214+00 TO STA 226+00													1230
8	STA 226+00 TO STA 238+00													1200
9	STA 238+00 TO STA 250+00													1220
10	STA 250+00 TO STA 262+00													1200
11	STA 262+00 TO STA 274+00													1200
12	STA 274+00 TO STA 286+00													1200
13	STA 286+00 TO STA 298+00													1200
14	STA 298+00 TO STA 310+00													1200
15	STA 310+00 TO STA 322+00													1200
16	STA 322+00 TO STA 334+00													1210
17	STA 334+00 TO STA 346+00													1200
18	STA 346+00 TO STA 358+00													1200
19	STA 358+00 TO STA 370+00													1200
20	STA 370+00 TO STA 382+00													1200
21	STA 382+00 TO STA 394+00													1200
22	STA 394+00 TO STA 406+00													1200
23	STA 406+00 TO STA 418+00													2020
24	STA 418+00 TO STA 430+00													2480
25	STA 430+00 TO STA 442+00													2300
26	STA 442+00 TO STA 454+00													2100
27	STA 454+00 TO STA 466+00													2310
28	STA 466+00 TO STA 478+00													2220
29	STA 478+00 TO STA 490+00													2100
30	STA 490+00 TO STA 502+00													2390
31	STA 502+00 TO STA 514+00													2250
32	STA 514+00 TO STA 526+00													2430
33	STA 526+00 TO STA 538+00													2100
34	STA 538+00 TO STA 550+00													2110
35	STA 550+00 TO STA 562+00													2580
36	STA 562+00 TO STA 574+00													2710
37	STA 574+00 TO STA 586+00													2400
38	STA 586+00 TO STA 598+00													2165
39	STA 598+00 TO STA 610+00													1630
40	STA 610+00 TO END PROJ													160
	FRONTAGE ROADS													
1	STA 166+00 TO STA 178+00											310	1200	
2	STA 178+00 TO STA 190+00											720	1647	
3	STA 190+00 TO STA 202+00											700	160	
4	STA 202+00 TO STA 214+00											900	245	
5	STA 214+00 TO STA 226+00											900	84	
6	STA 226+00 TO STA 238+00											380	160	
	GENERAL MCMULLEN													
	BEGIN PROJ TO STA 95+10											720	6684	
	STA 95+10 TO END PROJ											1160	6836	
RAIL RETROFIT OPERATIONS														
	PHASE 1B - STEP 2A		660					1						
	PHASE 1B - STEP 2B			660		1				1510				760
	PHASE 1B - STEP 2C			660		1			760		1510			
	PHASE 1B - STEP 3A			660		1								
	PHASE 1B - STEP 3B			660		1				1298				750
	PHASE 1B - STEP 3C				660		1		750		1496			
	PROJECT TOTALS:	29	660	2640	660	4	1	1	1510	2808	3006	6020	20333	62995

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Kimley»Horn F-928

Texas Department of Transportation

US 90

TCP SUMMARY

SHEET 1 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	12
CONT.	SECT.	JOB	
0024	08	141	

TCP SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0662 6070 WK ZN PAV MRK REMOV (W) 8" (LNDP)	0662 6071 WK ZN PAV MRK REMOV (W) 8" (SLD)	0662 6072 WK ZN PAV MRK REMOV (W) 12" (LNDP)	0662 6073 WK ZN PAV MRK REMOV (W) 12" (SLD)	0662 6075 WK ZN PAV MRK REMOV (W) 24" (SLD)	0662 6080 WK ZN PAV MRK REMOV (W) (ARROW)	0662 6081 WK ZN PAV MRK REMOV (W) (DBL ARROW)	0662 6082 WK ZN PAV MRK REMOV (W) (ENTR GORE)	0662 6083 WK ZN PAV MRK REMOV (W) (EXIT GORE)	0662 6090 WK ZN PAV MRK REMOV (W) (WORD)	0662 6092 WK ZN PAV MRK REMOV (W) 36" (YLD TRI)	0662 6095 WK ZN PAV MRK REMOV (Y) 4" (SLD)	0662 6098 WK ZN PAV MRK REMOV (Y) 6" (SLD)
		LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	LF	LF
PLANE & INLAY OPERATIONS														
	MAINLANES													
1	BEGIN PROJ TO STA 154+00													1693
2	STA 154+00 TO STA 166+00		243		44					1				2549
3	STA 166+00 TO STA 178+00		450		123	400			2	2		14	3474	2400
4	STA 178+00 TO STA 190+00													2402
5	STA 190+00 TO STA 202+00		753	9	935		1		1	1				2570
6	STA 202+00 TO STA 214+00			300			1				2			2400
7	STA 214+00 TO STA 226+00		677		722				1	1				2559
8	STA 226+00 TO STA 238+00													2401
9	STA 238+00 TO STA 250+00		314		315					1				2569
10	STA 250+00 TO STA 262+00				294				2					2622
11	STA 262+00 TO STA 274+00													2400
12	STA 274+00 TO STA 286+00				130				1					2610
13	STA 286+00 TO STA 298+00													2400
14	STA 298+00 TO STA 310+00		444		204					1				2401
15	STA 310+00 TO STA 322+00				60									2401
16	STA 322+00 TO STA 334+00		367		411				1	1				3341
17	STA 334+00 TO STA 346+00		150		119					1				2767
18	STA 346+00 TO STA 358+00		293	189	618		2		1		1			2419
19	STA 358+00 TO STA 370+00			153	300		1		1		2			2529
20	STA 370+00 TO STA 382+00													2680
21	STA 382+00 TO STA 394+00		826		545					1				2677
22	STA 394+00 TO STA 406+00		1993	168	1836		2			1	2			1304
23	STA 406+00 TO STA 418+00		932	50	277		2			1	2			1785
24	STA 418+00 TO STA 430+00		834		419				1	1				3209
25	STA 430+00 TO STA 442+00			108	54		1	1			1			2400
26	STA 442+00 TO STA 454+00			231	281		2	2			2			2400
27	STA 454+00 TO STA 466+00		962		905				1	2				3225
28	STA 466+00 TO STA 478+00				300				2	1				3600
29	STA 478+00 TO STA 490+00		481	60	315		1		3	1	1			3303
30	STA 490+00 TO STA 502+00		272	33	729					1				2502
31	STA 502+00 TO STA 514+00		423	150	440				1	1				2401
32	STA 514+00 TO STA 526+00		200		78									2401
33	STA 526+00 TO STA 538+00			300			1				2			2401
34	STA 538+00 TO STA 550+00		481	21	407		1			1				2400
35	STA 550+00 TO STA 562+00		602	147	791		2	2	1	1	2			2400
36	STA 562+00 TO STA 574+00													2401
37	STA 574+00 TO STA 586+00			306			2				3			2401
38	STA 586+00 TO STA 598+00		542	141	1151		3		1	1	3			2400
39	STA 598+00 TO STA 610+00			192	1922		2		1		2			2400
40	STA 610+00 TO END PROJ		318		226					1				329
	FRONTAGE ROADS													
1	STA 166+00 TO STA 178+00					188			2	2		10	1729	
2	STA 178+00 TO STA 190+00					444	3		1		3		2420	
3	STA 190+00 TO STA 202+00								1	1		6	2458	
4	STA 202+00 TO STA 214+00					28	1				1		2400	
5	STA 214+00 TO STA 226+00								1			7	2395	
6	STA 226+00 TO STA 238+00									1			1204	
	GENERAL MCMULLEN													
	BEGIN PROJ TO STA 95+10	83					1		3	2	1		6402	
	STA 95+10 TO END PROJ	99	242		111		1		1	2	1		6410	
RAIL RETROFIT OPERATIONS														
	PHASE 1B - STEP 2A													
	PHASE 1B - STEP 2B													
	PHASE 1B - STEP 2C													
	PHASE 1B - STEP 3A													
	PHASE 1B - STEP 3B													
	PHASE 1B - STEP 3C													
	PROJECT TOTALS:	182	12799	2558	15062	1060	30	5	30	31	31	37	28892	98452

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Kimley»Horn F-928

US 90

TCP SUMMARY

SHEET 2 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	13
CONT.	SECT.	JOB	
0024	08	141	

TCP SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0662 6102 WK ZN PAV MRK REMOV (Y) 24" (SLD)	0662 6109 WK ZN PAV MRK SHT TERM (TAB) TY W	0666 6009 REFL PAV MRK TY I (W) 4" (LNDP) (100MIL)	0666 6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	0666 6300 RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)	0666 6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	0666 6306 RE PM W/RET REQ TY I (W) 6" (BRK) (100MIL)	0666 6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	0666 6343 REF PROF PAV MRK TY I (W) 6" (SLD) (100MIL)	0666 6347 REF PROF PAV MRK TY I (Y) 6" (SLD) (100MIL)	0730 6107 FULL - WIDTH MOWING	0734 6002 LITTER REMOVAL	0738 6003 CLEANING/ SWEEPING (OUTSIDE MAIN LANE)
		LF	EA	LF	LF	LF	LF	LF	LF	LF	LF	CYC	CYC	CYC
PLANE & INLAY OPERATIONS														
	MAINLANES													
1	BEGIN PROJ TO STA 154+00		126					169		433	452			
2	STA 154+00 TO STA 166+00		213					246		375	415			
3	STA 166+00 TO STA 178+00		307				4187	565	3628	1065	799			
4	STA 178+00 TO STA 190+00		180					451		1802	1802			
5	STA 190+00 TO STA 202+00		314											
6	STA 202+00 TO STA 214+00		670											
7	STA 214+00 TO STA 226+00		466											
8	STA 226+00 TO STA 238+00		360											
9	STA 238+00 TO STA 250+00		412											
10	STA 250+00 TO STA 262+00		435											
11	STA 262+00 TO STA 274+00		360					825		1650	1650			
12	STA 274+00 TO STA 286+00		397					375		750	750			
13	STA 286+00 TO STA 298+00		360											
14	STA 298+00 TO STA 310+00		401											
15	STA 310+00 TO STA 322+00		363											
16	STA 322+00 TO STA 334+00		444											
17	STA 334+00 TO STA 346+00		396											
18	STA 346+00 TO STA 358+00		673											
19	STA 358+00 TO STA 370+00		609											
20	STA 370+00 TO STA 382+00		360											
21	STA 382+00 TO STA 394+00		418											
22	STA 394+00 TO STA 406+00		706											
23	STA 406+00 TO STA 418+00		717											
24	STA 418+00 TO STA 430+00		825											
25	STA 430+00 TO STA 442+00		837											
26	STA 442+00 TO STA 454+00		953											
27	STA 454+00 TO STA 466+00		829											
28	STA 466+00 TO STA 478+00		771											
29	STA 478+00 TO STA 490+00		846											
30	STA 490+00 TO STA 502+00		828											
31	STA 502+00 TO STA 514+00		957											
32	STA 514+00 TO STA 526+00		733											
33	STA 526+00 TO STA 538+00		1030											
34	STA 538+00 TO STA 550+00		712											
35	STA 550+00 TO STA 562+00		1070											
36	STA 562+00 TO STA 574+00		813											
37	STA 574+00 TO STA 586+00		1128											
38	STA 586+00 TO STA 598+00		956											
39	STA 598+00 TO STA 610+00		872											
40	STA 610+00 TO END PROJ		90											
	FRONTAGE ROADS													
1	STA 166+00 TO STA 178+00		120			95	1742		843					
2	STA 178+00 TO STA 190+00	90	30		97	301	1066		1146					
3	STA 190+00 TO STA 202+00		60			273	429							
4	STA 202+00 TO STA 214+00	71			62	617	211		2124					
5	STA 214+00 TO STA 226+00		30			557	121		2192					
6	STA 226+00 TO STA 238+00		30			255	312		529					
	GENERAL MCMULLEN													
	BEGIN PROJ TO STA 95+10		150	83		251	3345		1625					
	STA 95+10 TO END PROJ		96	99		703	5298		1959					
RAIL RETROFIT OPERATIONS														
	PHASE 1B - STEP 2A													
	PHASE 1B - STEP 2B													
	PHASE 1B - STEP 2C													
	PHASE 1B - STEP 3A													
	PHASE 1B - STEP 3B													
	PHASE 1B - STEP 3C													
	PROJECT TOTALS:	161	24453	182	159	3052	16711	2631	14046	6075	5868	10	29	29

NOTE:
TY I PAVEMENT MARKINGS INTENDED TO REPLACE EXISTING PAVEMENT MARKINGS AFTER FLEXIBLE PAVEMENT STRUCTURE REPAIR IS COMPLETE.

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Kimley»Horn F-928

US 90

TCP SUMMARY

SHEET 3 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	14
CONT.	SECT.	JOB	
0024	08	141	

TCP SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0730 6107 FULL - WIDTH MOWING	0734 6002 LITTER REMOVAL	0738 6003 CLEANING/ SWEEPING (OUTSIDE MAIN LANE)	0738 6005 CLEANING/ SWEEPING (FRONTAGE ROAD)	0738 6007 CLEANING/ SWEEPING (ENTRANCE/ EXIT RAMP)	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN	6185 6002 TMA (STATIONARY)	6185 6005 TMA (MOBILE OPERATION)
		CYC	CYC	CYC	CYC	CYC	DAY	DAY	DAY
PLANE & INLAY OPERATIONS									
	MAINLANES								
1	BEGIN PROJ TO STA 154+00								
2	STA 154+00 TO STA 166+00								
3	STA 166+00 TO STA 178+00								
4	STA 178+00 TO STA 190+00								
5	STA 190+00 TO STA 202+00								
6	STA 202+00 TO STA 214+00								
7	STA 214+00 TO STA 226+00								
8	STA 226+00 TO STA 238+00								
9	STA 238+00 TO STA 250+00								
10	STA 250+00 TO STA 262+00								
11	STA 262+00 TO STA 274+00								
12	STA 274+00 TO STA 286+00								
13	STA 286+00 TO STA 298+00								
14	STA 298+00 TO STA 310+00								
15	STA 310+00 TO STA 322+00								
16	STA 322+00 TO STA 334+00								
17	STA 334+00 TO STA 346+00								
18	STA 346+00 TO STA 358+00								
19	STA 358+00 TO STA 370+00								
20	STA 370+00 TO STA 382+00								
21	STA 382+00 TO STA 394+00								
22	STA 394+00 TO STA 406+00								
23	STA 406+00 TO STA 418+00								
24	STA 418+00 TO STA 430+00								
25	STA 430+00 TO STA 442+00								
26	STA 442+00 TO STA 454+00								
27	STA 454+00 TO STA 466+00								
28	STA 466+00 TO STA 478+00								
29	STA 478+00 TO STA 490+00								
30	STA 490+00 TO STA 502+00								
31	STA 502+00 TO STA 514+00								
32	STA 514+00 TO STA 526+00								
33	STA 526+00 TO STA 538+00								
34	STA 538+00 TO STA 550+00								
35	STA 550+00 TO STA 562+00								
36	STA 562+00 TO STA 574+00								
37	STA 574+00 TO STA 586+00								
38	STA 586+00 TO STA 598+00								
39	STA 598+00 TO STA 610+00								
40	STA 610+00 TO END PROJ								
	FRONTAGE ROADS								
1	STA 166+00 TO STA 178+00								
2	STA 178+00 TO STA 190+00								
3	STA 190+00 TO STA 202+00								
4	STA 202+00 TO STA 214+00								
5	STA 214+00 TO STA 226+00								
6	STA 226+00 TO STA 238+00								
	GENERAL MCMULLEN								
	BEGIN PROJ TO STA 95+10								
	STA 95+10 TO END PROJ								
RAIL RETROFIT OPERATIONS									
	PHASE 1B - STEP 2A								
	PHASE 1B - STEP 2B								
	PHASE 1B - STEP 2C								
	PHASE 1B - STEP 3A								
	PHASE 1B - STEP 3B								
	PHASE 1B - STEP 3C								
	PROJECT TOTALS:	10	29	29	9	29	924	891	60

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Kimley»Horn F-928

US 90

TCP SUMMARY

SHEET 4 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	15
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SUMMARY

SHEET NO.	LOCATION	0100 6002 PREPARING ROW	0104 6009 REMOVING CONC (RIPRAP)	0104 6054 REMOVING CONCRETE (MOW STRIP)	0132 6003 EMBANKMENT (FINAL) (ORD COMP) (TY B) *	0162 6002 BLOCK SODDING	0168 6001 VEGETATIVE WATERING	ITEM 316 ASPH (A-R TYPE II OR III) **	ITEM 316 AGGR (TY-PB GR-4) **	ITEM 346 STONE-MTRX-ASPH SMA-D SAC-A PG76-22 **	0351 6002 FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	0351 6003 FLEXIBLE PAVEMENT STRUCTURE REPAIR (7")	0351 6004 FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")
		STA	SY	LF	CY	SY	MG	SY	SY	SY	SY	SY	SY
	MAINLANES												
1	BEGIN PROJ TO STA 154+00	7.3						7476	7476	7476			1220
2	STA 154+00 TO STA 166+00	12.0						11209	11209	11209			1928
3	STA 166+00 TO STA 178+00	12.0						10437	10437	10437		2131	10035
4	STA 178+00 TO STA 190+00	12.0			8	156	2.5	10304	10304	10304		4803	
5	STA 190+00 TO STA 202+00	12.0			18	362	5.7	13028	13028	13028			
6	STA 202+00 TO STA 214+00	12.0		50	14	257	4.1	13286	13286	13286			
7	STA 214+00 TO STA 226+00	12.0	56		24	355	5.6	15681	15681	15681			
8	STA 226+00 TO STA 238+00	12.0	94		47	663	10.4	13383	13383	13383			
9	STA 238+00 TO STA 250+00	12.0	427		108	746	11.7	14900	14900	14900			
10	STA 250+00 TO STA 262+00	12.0	225		43	183	2.9	14704	14704	14704			
11	STA 262+00 TO STA 274+00	12.0			11	225	3.6	13638	13638	13638		6606	
12	STA 274+00 TO STA 286+00	12.0			8	166	2.6	14637	14637	14637		3000	
13	STA 286+00 TO STA 298+00	12.0			8	168	2.7	13614	13614	13614			
14	STA 298+00 TO STA 310+00	12.0	167		56	597	9.4	14133	14133	14133			
15	STA 310+00 TO STA 322+00	12.0			21	420	6.6	13259	13259	13259			
16	STA 322+00 TO STA 334+00	12.0			25	459	7.2	16517	16517	16517			
17	STA 334+00 TO STA 346+00	12.0			18	356	5.6	14614	14614	14614			
18	STA 346+00 TO STA 358+00	12.0			1	18	0.3	16733	16733	16733			
19	STA 358+00 TO STA 370+00	12.0			2	59	1.0	15560	15560	15560			
20	STA 370+00 TO STA 382+00	12.0			9	187	3.0	16246	16246	16246			
21	STA 382+00 TO STA 394+00	12.0	63		10	25	0.4	16636	16636	16636			
22	STA 394+00 TO STA 406+00	12.0	245		27	195	3.1	18449	18449	18449			
23	STA 406+00 TO STA 418+00	12.0			4	72	1.2	14162	14162	14162			
24	STA 418+00 TO STA 430+00	12.0			20	430	6.8	27391	27391	27391			
25	STA 430+00 TO STA 442+00	12.0			7	152	2.4	21909	21909	21909			
26	STA 442+00 TO STA 454+00	12.0			6	141	2.2	21029	21029	21029			
27	STA 454+00 TO STA 466+00	12.0			7	129	2.1	24988	24988	24988			
28	STA 466+00 TO STA 478+00	12.0			13	258	4.1	22798	22798	22798			
29	STA 478+00 TO STA 490+00	12.0			8	171	2.7	24203	24203	24203			
30	STA 490+00 TO STA 502+00	12.0			19	389	6.1	20844	20844	20844			
31	STA 502+00 TO STA 514+00	12.0	138		40	174	2.8	21154	21154	21154			
32	STA 514+00 TO STA 526+00	12.0			3	97	1.6	20399	20399	20399			
33	STA 526+00 TO STA 538+00	12.0		223	4	86	1.4	20088	20088	20088			
34	STA 538+00 TO STA 550+00	12.0			35	673	10.5	19695	19695	19695			
35	STA 550+00 TO STA 562+00	12.0	281		42	401	6.3	23255	23255	23255			
36	STA 562+00 TO STA 574+00	12.0	122		22	146	2.3	20433	20433	20433			
37	STA 574+00 TO STA 586+00	12.0			22	401	6.3	23139	23139	23139			
38	STA 586+00 TO STA 598+00	12.0			11	208	3.3	23859	23859	23859			
39	STA 598+00 TO STA 610+00	12.0						20881	20881	20881			
40	STA 610+00 TO END PROJ	1.0						2616	2616	2616			
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00										175		2166
2	STA 178+00 TO STA 190+00				14	310	4.9				1410		2210
3	STA 190+00 TO STA 202+00				5	118	1.9						2808
4	STA 202+00 TO STA 214+00				3	81	1.3				1849		3312
5	STA 214+00 TO STA 226+00		152		20	163	2.6				2800		2311
6	STA 226+00 TO STA 238+00				7	137	2.2				1358		778
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10				55	1070	16.7						7750
2	STA 95+10 TO END PROJ		52.0		74	1374	21.5						14171
	PROJECT TOTALS:	465.0	2022	273	899	12778	201.6	681287	681287	681287	7592	16540	48689

* EMBANKMENT ASSOCIATED WITH THE PLACEMENT OF MBGF MOW STRIP

** REFER TO BASIS OF ESTIMATE FOR BID ITEM QUANTITIES

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Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY SUMMARY

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	16
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0354 6045 PLANE ASPH CONC PAV (2")	0354 6023 PLANE ASPH CONC PAV (0" TO 4")	0420 6066 CL C CONC (RAIL FOUNDATION)	0432 6001 RIPRAP (CONC)(4 IN)	0432 6045 RIPRAP (MOW STRIP) (4 IN)	0450 6023 RAIL (TY SSTR)	0506 6035 SANDBAGS FOR EROSION CONTROL	0506 6041 BIODEG EROSN CONT LOGS (INSTL)(12")	0506 6043 BIODEG EROSN CONT LOGS (REMOVE)	0540 6001 MTL W-BEAM GD FEN (TIM POST)	0540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	0540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION
		SY	SY	CY	CY	CY	LF	EA	LF	LF	LF	EA	EA
	MAINLANES												
1	BEGIN PROJ TO STA 154+00	7476											
2	STA 154+00 TO STA 166+00	11209											
3	STA 166+00 TO STA 178+00	19070	2847										
4	STA 178+00 TO STA 190+00	10304				20			468	468	372.8		2
5	STA 190+00 TO STA 202+00	13028				50			1085	1085	814.7		3
6	STA 202+00 TO STA 214+00	13286				33			770	770	675		2
7	STA 214+00 TO STA 226+00	15681			6	46			1065	1065	850		3
8	STA 226+00 TO STA 238+00	13383			11	86			1987	1987	1901.3		1
9	STA 238+00 TO STA 250+00	11163	3737		45	97			2237	2237	2111.9		1
10	STA 250+00 TO STA 262+00	14704			23	21			547	547	461.8		1
11	STA 262+00 TO STA 274+00	13638				30			675	675	525.0		2
12	STA 274+00 TO STA 286+00	14637				21			498	498	412.5		1
13	STA 286+00 TO STA 298+00	13614				23			503	503	353		2
14	STA 298+00 TO STA 310+00	13322	811		17	74			1790	1790	1600	2	2
15	STA 310+00 TO STA 322+00	8437	4822			51			1260	1260	1079.5	2	1
16	STA 322+00 TO STA 334+00	16517				61			1376	1376	1280.1		2
17	STA 334+00 TO STA 346+00	10950	3664			50			1066	1066	940.4		1
18	STA 346+00 TO STA 358+00	16733				2			54	54	23.3		
19	STA 358+00 TO STA 370+00	15560				8			177	177	101.7		
20	STA 370+00 TO STA 382+00	16246				26			560	560	400		2
21	STA 382+00 TO STA 394+00	16636			7	3			75	75	44.7		1
22	STA 394+00 TO STA 406+00	18449			27	26			583	583	442.8		1
23	STA 406+00 TO STA 418+00	14162				9			216	216	185.3		1
24	STA 418+00 TO STA 430+00	27391				59			1288	1288	952.2		4
25	STA 430+00 TO STA 442+00	21909				20			455	455	314.3		1
26	STA 442+00 TO STA 454+00	21029				17			422	422	216.5		2
27	STA 454+00 TO STA 466+00	24988				16			387	387	356.7		1
28	STA 466+00 TO STA 478+00	16171	6627			34			773	773	637.5	3	
29	STA 478+00 TO STA 490+00	24203				23			513	513	362.5		2
30	STA 490+00 TO STA 502+00	15619	5225			30			1166	1166	870.7	5	1
31	STA 502+00 TO STA 514+00	21154			15	22			520	520	404.3	2	
32	STA 514+00 TO STA 526+00	20399				13			290	290	150		1
33	STA 526+00 TO STA 538+00	14772	5316			8			258	258	162.5	1	
34	STA 538+00 TO STA 550+00	17469	2226			87			2018	2018	1732.5	4	2
35	STA 550+00 TO STA 562+00	14761	8494		31	52			1203	1203	1142.5	1	2
36	STA 562+00 TO STA 574+00	7331	13102		13	22			437	437	396.3	1	
37	STA 574+00 TO STA 586+00	23139				66			1203	1203	1182.6		
38	STA 586+00 TO STA 598+00	23859				34			622	622	546.1		
39	STA 598+00 TO STA 610+00	15191	5690										
40	STA 610+00 TO END PROJ	1272	1344										
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00	3645	1873										
2	STA 178+00 TO STA 190+00	9126				45			928	928	637.5		5
3	STA 190+00 TO STA 202+00	9807				16			353	353	212.5		1
4	STA 202+00 TO STA 214+00	9175		38		11	260		243	243	62.5	2	1
5	STA 214+00 TO STA 226+00	9239			16	22			488	488	412.5		
6	STA 226+00 TO STA 238+00	4632				19			410	410	325		1
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10	20755	355			145		6	3210	3210	2650	4	10
2	STA 95+10 TO END PROJ	21760	1195		6	181			4120	4120	3225	8	11
	PROJECT TOTALS:	717001	67328	38	217	1679	260	6	38299	38299	31528.0	35	74

* EMBANKMENT ASSOCIATED WITH THE PLACEMENT OF MBGF MOW STRIP

** REFER TO BASIS OF ESTIMATE FOR BID ITEM QUANTITIES

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Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY SUMMARY

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	17
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0540 6037 MTL BEAM GD FEN TRANS (ANCHOR PLATE)	0542 6001 REMOVE METAL BEAM GUARD FENCE	0542 6002 REMOVE TERMINAL ANCHOR SECTION	0542 6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	0544 6001 GUARDRAIL END TREATMENT (INSTALL)	0544 6003 GUARDRAIL END TREATMENT (REMOVE)	ITEM 3077 SP MIXES SP-C SAC-B PG 70-22 **	3085 6001 UNDERSEAL COURSE	4171 6001 INSTALL BRIDGE IDENTIFICATION NUMBERS	6305 6007 LCS SIGNAL UNIT (REMOVE)
		EA	LF	EA	EA	EA	EA	SY	GAL	EA	EA
	MAINLANES										
1	BEGIN PROJ TO STA 154+00										
2	STA 154+00 TO STA 166+00										
3	STA 166+00 TO STA 178+00							11480	2296	4	2
4	STA 178+00 TO STA 190+00		322.8	2		1	1				
5	STA 190+00 TO STA 202+00		702.2	4		4	3			4	3
6	STA 202+00 TO STA 214+00		675	2		1	1				
7	STA 214+00 TO STA 226+00		391.5	6		3	2				3
8	STA 226+00 TO STA 238+00		1901.3	1		1	1				
9	STA 238+00 TO STA 250+00	4	2111.9	2		1				4	3
10	STA 250+00 TO STA 262+00		461.8	2		1					
11	STA 262+00 TO STA 274+00		500	2		2	2				
12	STA 274+00 TO STA 286+00		412.5	2		1					
13	STA 286+00 TO STA 298+00		315.5	3		2	1				
14	STA 298+00 TO STA 310+00		1525	2		2	2				
15	STA 310+00 TO STA 322+00		1004.5	1		2	2			4	
16	STA 322+00 TO STA 334+00		1197.1	2		1	1				
17	STA 334+00 TO STA 346+00	4	940.4	1		1	1			4	
18	STA 346+00 TO STA 358+00	1	23.3		1						4
19	STA 358+00 TO STA 370+00		26.7	1		1					
20	STA 370+00 TO STA 382+00	1	400	3		2	1				
21	STA 382+00 TO STA 394+00		44.7	1							
22	STA 394+00 TO STA 406+00		442.8	1		2	2				4
23	STA 406+00 TO STA 418+00		185.3	1							
24	STA 418+00 TO STA 430+00		802.2	4		5	5				
25	STA 430+00 TO STA 442+00		314.3	1		2	2				
26	STA 442+00 TO STA 454+00		166.5	2		3	3				
27	STA 454+00 TO STA 466+00		356.7	1							4
28	STA 466+00 TO STA 478+00		637.5		3	1	1			6	
29	STA 478+00 TO STA 490+00		337.5	2		2	2				
30	STA 490+00 TO STA 502+00		920.7	2	5	3	1			4	
31	STA 502+00 TO STA 514+00		404.3		2	1	1				
32	STA 514+00 TO STA 526+00		150	1		2	2				
33	STA 526+00 TO STA 538+00		162.5		1	1	1			4	8
34	STA 538+00 TO STA 550+00		1732.5	2	4	3	3				
35	STA 550+00 TO STA 562+00		1142.5	2	1					4	
36	STA 562+00 TO STA 574+00		396.3		1						
37	STA 574+00 TO STA 586+00		291.2				1				6
38	STA 586+00 TO STA 598+00					1					6
39	STA 598+00 TO STA 610+00									4	4
40	STA 610+00 TO END PROJ										5
	FRONTAGE ROADS										
1	STA 166+00 TO STA 178+00							5518	1103	4	
2	STA 178+00 TO STA 190+00		500	6		4	3	9126	1825		
3	STA 190+00 TO STA 202+00		225	2		2	2	9807	1961		
4	STA 202+00 TO STA 214+00					2		9175	1835		
5	STA 214+00 TO STA 226+00		200	1		1	1	9239	1848		
6	STA 226+00 TO STA 238+00		300	1		1	1	4632	927		
	GENERAL MCMULLEN										
1	BEGIN PROJ TO STA 95+10		2475	13	2	6	3	21110	4222	2	
2	STA 95+10 TO END PROJ		2250	18	8	11	4	22955	4591	2	
	PROJECT TOTALS:	10	27349.0	97	28	79	56	103042	20608	50	52

* EMBANKMENT ASSOCIATED WITH THE PLACEMENT OF MBGF MOW STRIP

** REFER TO BASIS OF ESTIMATE FOR BID ITEM QUANTITIES

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Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY SUMMARY

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	18
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0354 6045 PLANE ASPH CONC PAV (2")	0354 6023 PLANE ASPH CONC PAV (0" TO 4")	0420 6066 CL C CONC (RAIL FOUNDATION)	0429 6005 CONC STR REPAIR (DECK REP) (FULL DEPTH)	0432 6001 RIPRAP (CONC) (4 IN)	0432 6045 RIPRAP (MOW STRIP) (4 IN)	0438 6009 CLEANING EXISTING JOINTS	0450 6023 RAIL (TY SSTR)	0451 6005 RETROFIT RAIL (TY T221)	0454 6008 HEADER TYPE EXPANSION JOINT	0454 6009 JOINT SEALANT	0496 6099 REMOV STR (RAIL)
		SY	SY	CY	SF	CY	CY	LF	LF	LF	CF	LF	LF
	MAINLANES												
1	BEGIN PROJ TO STA 154+00	7476											
2	STA 154+00 TO STA 166+00	11209											
3	STA 166+00 TO STA 178+00	19070	2847					156			44	156	
4	STA 178+00 TO STA 190+00	10304					20						
5	STA 190+00 TO STA 202+00	13028					50						
6	STA 202+00 TO STA 214+00	13286					33						
7	STA 214+00 TO STA 226+00	15681				6	46						
8	STA 226+00 TO STA 238+00	13383				11	86						
9	STA 238+00 TO STA 250+00	11163	3737			45	97	212			48	212	
10	STA 250+00 TO STA 262+00	14704				23	21						
11	STA 262+00 TO STA 274+00	13638					30						
12	STA 274+00 TO STA 286+00	14637					21						
13	STA 286+00 TO STA 298+00	13614					23						
14	STA 298+00 TO STA 310+00	13322	811			17	74						
15	STA 310+00 TO STA 322+00	8437	4822		156		51	416		1694	79	416	1694
16	STA 322+00 TO STA 334+00	16517					61						
17	STA 334+00 TO STA 346+00	10950	3664				50	208			36	208	
18	STA 346+00 TO STA 358+00	16733					2						
19	STA 358+00 TO STA 370+00	15560					8						
20	STA 370+00 TO STA 382+00	16246					26						
21	STA 382+00 TO STA 394+00	16636				7	3						
22	STA 394+00 TO STA 406+00	18449				27	26						
23	STA 406+00 TO STA 418+00	14162					9	416			79	416	
24	STA 418+00 TO STA 430+00	27391					59						
25	STA 430+00 TO STA 442+00	21909					20						
26	STA 442+00 TO STA 454+00	21029					17						
27	STA 454+00 TO STA 466+00	24988					16						
28	STA 466+00 TO STA 478+00	16171	6627				34	366			58	366	
29	STA 478+00 TO STA 490+00	24203					23						
30	STA 490+00 TO STA 502+00	15619	5225				30	313			52	313	
31	STA 502+00 TO STA 514+00	21154				15	22						
32	STA 514+00 TO STA 526+00	20399					13						
33	STA 526+00 TO STA 538+00	14772	5316				8	432			64	432	
34	STA 538+00 TO STA 550+00	17469	2226				87						
35	STA 550+00 TO STA 562+00	14761	8494			31	52	1295			189	1295	
36	STA 562+00 TO STA 574+00	7331	13102			13	22						
37	STA 574+00 TO STA 586+00	23139					66						
38	STA 586+00 TO STA 598+00	23859					34						
39	STA 598+00 TO STA 610+00	15191	5690					580			101	580	
40	STA 610+00 TO END PROJ	1272	1344										
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00	3645	1873					100			28	100	
2	STA 178+00 TO STA 190+00	9126					45						
3	STA 190+00 TO STA 202+00	9807					16						
4	STA 202+00 TO STA 214+00	9175		38			11		260				
5	STA 214+00 TO STA 226+00	9239				16	22						
6	STA 226+00 TO STA 238+00	4632					19						
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10	20755	355				145	30			4	30	
2	STA 95+10 TO END PROJ	21760	1195			6	181	90			12	90	
	PROJECT TOTALS:	717001	67328	38	156	217	1679	4614	260	1694	794	4614	1694

* EMBANKMENT ASSOCIATED WITH THE PLACEMENT OF MBGF MOW STRIP

** REFER TO BASIS OF ESTIMATE FOR BID ITEM QUANTITIES

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Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY SUMMARY

SHEET 2 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	17
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0506 6035 SANDBAGS FOR EROSION CONTROL	0506 6041 BIODEG EROSN CONT LOGS (INSTL)(12")	0506 6043 BIODEG EROSN CONT LOGS (REMOVE)	0540 6001 MTL W-BEAM GD FEN (TIM POST)	0540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	0540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION	0540 6037 MTL BEAM GD FEN TRANS (ANCHOR PLATE)	0542 6001 REMOVE METAL BEAM GUARD FENCE	0542 6002 REMOVE TERMINAL ANCHOR SECTION	0542 6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	0544 6001 GUARDRAIL END TREATMENT (INSTALL)	0544 6003 GUARDRAIL END TREATMENT (REMOVE)
		EA	LF	LF	LF	EA	EA	EA	LF	EA	EA	EA	EA
	MAINLANES												
1	BEGIN PROJ TO STA 154+00												
2	STA 154+00 TO STA 166+00												
3	STA 166+00 TO STA 178+00												
4	STA 178+00 TO STA 190+00		468	468	372.8		2		322.8	2		1	1
5	STA 190+00 TO STA 202+00		1085	1085	814.7		3		702.2	4		4	3
6	STA 202+00 TO STA 214+00		770	770	675		2		675	2		1	1
7	STA 214+00 TO STA 226+00		1065	1065	850		3		391.5	6		3	2
8	STA 226+00 TO STA 238+00		1987	1987	1901.3		1		1901.3	1		1	1
9	STA 238+00 TO STA 250+00		2237	2237	2111.9		1	4	2111.9	2		1	
10	STA 250+00 TO STA 262+00		547	547	461.8		1		461.8	2		1	
11	STA 262+00 TO STA 274+00		675	675	525.0		2		500	2		2	2
12	STA 274+00 TO STA 286+00		498	498	412.5		1		412.5	2		1	
13	STA 286+00 TO STA 298+00		503	503	353		2		315.5	3		2	1
14	STA 298+00 TO STA 310+00		1790	1790	1600	2	2		1525	2		2	2
15	STA 310+00 TO STA 322+00		1260	1260	1079.5	2	1		1004.5	1		2	2
16	STA 322+00 TO STA 334+00		1376	1376	1280.1		2		1197.1	2		1	1
17	STA 334+00 TO STA 346+00		1066	1066	940.4		1	4	940.4	1		1	1
18	STA 346+00 TO STA 358+00		54	54	23.3			1	23.3		1		
19	STA 358+00 TO STA 370+00		177	177	101.7				26.7	1		1	
20	STA 370+00 TO STA 382+00		560	560	400		2	1	400	3		2	1
21	STA 382+00 TO STA 394+00		75	75	44.7		1		44.7	1			
22	STA 394+00 TO STA 406+00		583	583	442.8		1		442.8	1		2	2
23	STA 406+00 TO STA 418+00		216	216	185.3		1		185.3	1			
24	STA 418+00 TO STA 430+00		1288	1288	952.2		4		802.2	4		5	5
25	STA 430+00 TO STA 442+00		455	455	314.3		1		314.3	1		2	2
26	STA 442+00 TO STA 454+00		422	422	216.5		2		166.5	2		3	3
27	STA 454+00 TO STA 466+00		387	387	356.7		1		356.7	1			
28	STA 466+00 TO STA 478+00		773	773	637.5	3			637.5		3	1	1
29	STA 478+00 TO STA 490+00		513	513	362.5		2		337.5	2		2	2
30	STA 490+00 TO STA 502+00		1166	1166	870.7	5	1		920.7	2	5	3	1
31	STA 502+00 TO STA 514+00		520	520	404.3	2			404.3		2	1	1
32	STA 514+00 TO STA 526+00		290	290	150		1		150	1		2	2
33	STA 526+00 TO STA 538+00		258	258	162.5	1			162.5		1	1	1
34	STA 538+00 TO STA 550+00		2018	2018	1732.5	4	2		1732.5	2	4	3	3
35	STA 550+00 TO STA 562+00		1203	1203	1142.5	1	2		1142.5	2	1		
36	STA 562+00 TO STA 574+00		437	437	396.3	1			396.3		1		
37	STA 574+00 TO STA 586+00		1203	1203	1182.6				291.2				1
38	STA 586+00 TO STA 598+00		622	622	546.1							1	
39	STA 598+00 TO STA 610+00												
40	STA 610+00 TO END PROJ												
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00												
2	STA 178+00 TO STA 190+00		928	928	637.5		5		500	6		4	3
3	STA 190+00 TO STA 202+00		353	353	212.5		1		225	2		2	2
4	STA 202+00 TO STA 214+00		243	243	62.5	2	1					2	
5	STA 214+00 TO STA 226+00		488	488	412.5				200	1		1	1
6	STA 226+00 TO STA 238+00		410	410	325		1		300	1		1	1
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10	6	3210	3210	2650	4	10		2475	13	2	6	3
2	STA 95+10 TO END PROJ		4120	4120	3225	8	11		2250	18	8	11	4
	PROJECT TOTALS:	6	38299	38299	31528.0	35	74	10	27349.0	97	28	79	56

* EMBANKMENT ASSOCIATED WITH THE PLACEMENT OF MBGF MOW STRIP

** REFER TO BASIS OF ESTIMATE FOR BID ITEM QUANTITIES

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Texas Department of Transportation

US 90

ROADWAY SUMMARY

SHEET 3 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	18
CONT.	SECT.	JOB	
0024	08	141	

ROADWAY SHEET NO.	LOCATION	STRUCTURE NUMBER	0429 6005 CONC STR REPAIR (DECK REP) (FULL DEPTH)	0438 6009 CLEANING EXISTING JOINTS	0451 6005 RETROFIT RAIL (TY T221)	0454 6008 HEADER TYPE EXPANSION JOINT	0454 6009 JOINT SEALANT	0496 6099 REMOV STR (RAIL)	4171 6001 INSTALL BRIDGE IDENTIFICATION NUMBERS
			SF	LF	LF	CF	LF	LF	EA
3	US 90 WBML OVERPASS AT IH 410	NBI# 15-015-0-0521-05-208		78		22	78		2
3	US 90 EBML OVERPASS AT IH 410	NBI# 15-015-0-0521-05-207		78		22	78		2
9	US 90 WBML OVERPASS AT MILITARY DR	NBI# 15-015-0-0024-08-210		106		29	106		2
9	US 90 EBML OVERPASS AT MILITARY DR	NBI# 15-015-0-0024-08-211		106		19	106		2
15	US 90 WBML AT LEON CREEK	NBI# 15-015-0-0024-08-129	36	208	847	42	208	847	2
15	US 90 EBML AT LEON CREEK	NBI# 15-015-0-0024-08-130	120	208	847	37	208	847	2
17	US 90 WBML OVERPASS AT CALLAGHAN RD	NBI# 15-015-0-0024-08-132		104		17	104		2
17	US 90 EBML OVERPASS AT CALLAGHAN RD	NBI# 15-015-0-0024-08-133		104		19	104		2
23	US 90 WB OVERPASS AT SW 36TH STREET	NBI# 15-015-0-0024-08-213		208		42	208		2
23	US 90 EB OVERPASS AT SW 36TH STREET	NBI# 15-015-0-0024-08-212		208		37	208		2
28	US 90 WBML OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-142		138		22	138		2
28	US 90 EBML OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-143		120		19	120		2
28	US 90 EBFR OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-144		108		17	108		2
30	US 90 WBML OVERPASS AT CUPPLES RD	NBI# 15-015-0-0024-08-146		143		18	143		2
30	US 90 EBML OVERPASS AT CUPPLES RD	NBI# 15-015-0-0024-08-147		170		34	170		2
33	US 90 WBML OVERPASS AT SPUR 371	NBI# 15-015-0-0024-08-114		216		32	216		2
33	US 90 EBML OVERPASS AT SPUR 371	NBI# 15-015-0-0024-08-115		216		32	216		2
35	US 90 WBML OVERPASS AT S ZARZAMORA ST	NBI# 15-015-0-0024-08-116		603		92	603		2
35	US 90 EBML OVERPASS AT S ZARZAMORA ST	NBI# 15-015-0-0024-08-117		692		97	692		2
39	US 90 WBML OVERPASS AT LP 353	NBI# 15-015-0-0024-08-312		325		55	325		2
39	US 90 EBML OVERPASS AT LP 353	NBI# 15-015-0-0024-08-313		255		46	255		2
FR 1	US 90 WBFR OVERPASS AT IH 410	NBI# 15-015-0-0521-05-206		50		14	50		2
FR 1	US 90 EBFR OVERPASS AT IH 410	NBI# 15-015-0-0521-05-209		50		14	50		2
GENERAL MCMULLEN									
1	BEGIN PROJ TO STA 95+10	NBI# 15-015-0-0024-08-137		30		4	30		2
2	STA 95+10 TO END PROJ	NBI# 15-015-0-0024-08-141		60		8	60		2
		PROJECT TOTALS:	156	4584	1694	790	4584	1694	50

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®Texas Department of Transportation

US 90

BRIDGE SUMMARY

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	19
CONT.	SECT.	JOB	
0024	08	141	

SIGNING AND PAVEMENT MARKING SUMMARY

SHEET NO.	LOCATION	0644 6001 IN SM RD SN SUP& &AM TY10BWG (1)SA(P)	0644 6002 IN SM RD SN SUP& &AM TY10BWG (1)SA(P-BM)	0644 6067 IN SM RD SN SUP &AM (INST SIGN ONLY)	0644 6076 REMOVE SM RD SN SUP&AM	0658 6061 INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2	0658 6064 INSTL DEL ASSM (D-SY)SZ 1 (BRF)GF2	0658 6080 INSTL DEL ASSM (D-SW)SZ 1 (WFLX)GND	0658 6092 INSTL DEL ASSM (D-DW)SZ 1 (WFLX)GND	0666 6009 REFL PAV MRK TY I (W)4"(LNDP) (100MIL)	0666 6036 REFL PAV MRK TY I (W)8"(SLD) (100MIL)	0666 6039 REFL PAV MRK TY I (W)12"(LNDP) (100MIL)	0666 6042 REFL PAV MRK TY I (W)12"(SLD) (100MIL)
		EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF
	MAINLANES												
1	BEGIN PROJ TO STA 154+00												
2	STA 154+00 TO STA 166+00										243		44
3	STA 166+00 TO STA 178+00										450		123
4	STA 178+00 TO STA 190+00					6							
5	STA 190+00 TO STA 202+00					15		4			753	9	935
6	STA 202+00 TO STA 214+00					8						300	
7	STA 214+00 TO STA 226+00					13		6			677		722
8	STA 226+00 TO STA 238+00					21							
9	STA 238+00 TO STA 250+00					24					314		315
10	STA 250+00 TO STA 262+00			1		6		2					294
11	STA 262+00 TO STA 274+00					8							
12	STA 274+00 TO STA 286+00					5		2					130
13	STA 286+00 TO STA 298+00					6							
14	STA 298+00 TO STA 310+00					18					444		204
15	STA 310+00 TO STA 322+00					11			1				60
16	STA 322+00 TO STA 334+00					15		6	5		367		411
17	STA 334+00 TO STA 346+00					16		4	1		150		119
18	STA 346+00 TO STA 358+00							4	5		293	189	618
19	STA 358+00 TO STA 370+00					3		2	4			153	300
20	STA 370+00 TO STA 382+00					7		1					
21	STA 382+00 TO STA 394+00										826		545
22	STA 394+00 TO STA 406+00					7					1993	168	1836
23	STA 406+00 TO STA 418+00					3					932	50	277
24	STA 418+00 TO STA 430+00					9	7	3	2		834		419
25	STA 430+00 TO STA 442+00					6						108	54
26	STA 442+00 TO STA 454+00					6						231	281
27	STA 454+00 TO STA 466+00	1			1	4			6		962		905
28	STA 466+00 TO STA 478+00					8							300
29	STA 478+00 TO STA 490+00					7		3	7		481	60	315
30	STA 490+00 TO STA 502+00					14					272	33	729
31	STA 502+00 TO STA 514+00					4		2			423	150	440
32	STA 514+00 TO STA 526+00					3		1			200		78
33	STA 526+00 TO STA 538+00					3						300	
34	STA 538+00 TO STA 550+00					18	5				481	21	407
35	STA 550+00 TO STA 562+00					12					602	147	791
36	STA 562+00 TO STA 574+00					4							
37	STA 574+00 TO STA 586+00					12						306	
38	STA 586+00 TO STA 598+00					5					542	141	1151
39	STA 598+00 TO STA 610+00											192	1922
40	STA 610+00 TO END PROJ										318		226
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00												
2	STA 178+00 TO STA 190+00					3	12						
3	STA 190+00 TO STA 202+00	1	1		2		6						
4	STA 202+00 TO STA 214+00	1			1		6						
5	STA 214+00 TO STA 226+00	1			1		5						
6	STA 226+00 TO STA 238+00						4						
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10					30	7			83			
2	STA 95+10 TO END PROJ	3			3	30	21			99	242		111
	PROJECT TOTALS:	7	1	1	8	370	73	40	31	182	12799	2558	15062

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US 90

SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 1 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	20
CONT.	SECT.	JOB	
0024	08	141	

SIGNING AND PAVEMENT MARKING SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0666 6048 REFL PAV MRK TY I (W)24"(SLD) (100MIL)	0666 6054 REFL PAV MRK TY I (W)(ARROW) (100MIL)	0666 6057 REFL PAV MRK TY I (W)(DBL ARROW) (100MIL)	0666 6072 REFL PAV MRK TY I (W)(LNDP ARW)(100MIL)	0666 6078 REFL PAV MRK TY I (W)(WORD) (100MIL)	0666 6081 REFL PAV MRK TY I (W)(ENTR GORE) (100MIL)	0666 6084 REFL PAV MRK TY I (W)(EXIT GORE) (100MIL)	0666 6102 REFL PAV MRK TY I (W)36" (YLD TRI) (100MIL)	0666 6147 REFL PAV MRK TY I (Y)24"(SLD) (100MIL)	0666 6162 RE PV MRK TY I (BLACK)6" (SHADOW) (100 MIL)	0666 6224 PAVEMENT SEALER 4"	0666 6225 PAVEMENT SEALER 6"
		LF	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF
	MAINLANES												
1	BEGIN PROJ TO STA 154+00												3804
2	STA 154+00 TO STA 166+00							1					5696
3	STA 166+00 TO STA 178+00	400					2	2	14				5400
4	STA 178+00 TO STA 190+00												5404
5	STA 190+00 TO STA 202+00		1				1	1					6279
6	STA 202+00 TO STA 214+00		1		2	2							5700
7	STA 214+00 TO STA 226+00						1	1					5988
8	STA 226+00 TO STA 238+00												6002
9	STA 238+00 TO STA 250+00							1					6364
10	STA 250+00 TO STA 262+00						2						6383
11	STA 262+00 TO STA 274+00												6001
12	STA 274+00 TO STA 286+00						1						6424
13	STA 286+00 TO STA 298+00												6001
14	STA 298+00 TO STA 310+00							1					6000
15	STA 310+00 TO STA 322+00												6002
16	STA 322+00 TO STA 334+00						1	1					7891
17	STA 334+00 TO STA 346+00							1					6731
18	STA 346+00 TO STA 358+00		2		1	1	1						6043
19	STA 358+00 TO STA 370+00		1		1	2	1						6260
20	STA 370+00 TO STA 382+00												6558
21	STA 382+00 TO STA 394+00							1					6277
22	STA 394+00 TO STA 406+00		2		2	2		1					4650
23	STA 406+00 TO STA 418+00		2		2	2		1			320		6639
24	STA 418+00 TO STA 430+00						1	1					9239
25	STA 430+00 TO STA 442+00		1	1	1	1							7101
26	STA 442+00 TO STA 454+00		2	2	2	2							6901
27	STA 454+00 TO STA 466+00						1	2					7832
28	STA 466+00 TO STA 478+00						2	1					9367
29	STA 478+00 TO STA 490+00		1			1	3	1					8253
30	STA 490+00 TO STA 502+00							1					7393
31	STA 502+00 TO STA 514+00						1	1					6952
32	STA 514+00 TO STA 526+00												7233
33	STA 526+00 TO STA 538+00		1		2	2							6902
34	STA 538+00 TO STA 550+00		1					1					6883
35	STA 550+00 TO STA 562+00		2	2	2	2	1	1					7383
36	STA 562+00 TO STA 574+00												7516
37	STA 574+00 TO STA 586+00		2		1	3							7205
38	STA 586+00 TO STA 598+00		3		2	3	1	1					6962
39	STA 598+00 TO STA 610+00		2		2	2	1						6429
40	STA 610+00 TO END PROJ							1					820
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00	188					2	2	10			3239	
2	STA 178+00 TO STA 190+00	444	3			3	1					4787	
3	STA 190+00 TO STA 202+00				1		1	1	6	90		3318	
4	STA 202+00 TO STA 214+00	28	1		1	1						3545	
5	STA 214+00 TO STA 226+00						1		7	71		3379	
6	STA 226+00 TO STA 238+00							1				1744	
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10		1			1	3	2				13806	
2	STA 95+10 TO END PROJ		1			1	1	2				14406	
	PROJECT TOTALS:	1060	30	5	22	31	30	31	37	161	320	48224	258868

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US 90

SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 2 OF 4

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	21
CONT.	SECT.	JOB	
0024	08	141	

SIGNING AND PAVEMENT MARKING SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0666 6226 PAVEMENT SEALER 8"	0666 6228 PAVEMENT SEALER 12"	0666 6230 PAVEMENT SEALER 24"	0666 6231 PAVEMENT SEALER (ARROW)	0666 6232 PAVEMENT SEALER (WORD)	0666 6234 PAVEMENT SEALER (DBL ARROW)	0666 6237 PAVEMENT SEALER (LNDP ARROW)	0666 6239 PAVEMENT SEALER (ENTR GORE)	0666 6240 PAVEMENT SEALER (EXIT GORE)	0666 6243 PAVEMENT SEALER (YLD TRI)	0666 6300 RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)	0666 6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
		LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	LF	LF
	MAINLANES												
1	BEGIN PROJ TO STA 154+00												
2	STA 154+00 TO STA 166+00	243	44							1			
3	STA 166+00 TO STA 178+00	450	123	400					2	2	14	230	3317
4	STA 178+00 TO STA 190+00												
5	STA 190+00 TO STA 202+00	753	944		1				1	1			
6	STA 202+00 TO STA 214+00		300		1	2		2					
7	STA 214+00 TO STA 226+00	677	722						1	1			
8	STA 226+00 TO STA 238+00												
9	STA 238+00 TO STA 250+00	314	315							1			
10	STA 250+00 TO STA 262+00		294						2				
11	STA 262+00 TO STA 274+00												
12	STA 274+00 TO STA 286+00		130						1				
13	STA 286+00 TO STA 298+00												
14	STA 298+00 TO STA 310+00	444	204							1			
15	STA 310+00 TO STA 322+00		60										
16	STA 322+00 TO STA 334+00	367	411						1	1			
17	STA 334+00 TO STA 346+00	150	119							1			
18	STA 346+00 TO STA 358+00	293	807		2	1		1	1				
19	STA 358+00 TO STA 370+00		453		1	2		1	1				
20	STA 370+00 TO STA 382+00												
21	STA 382+00 TO STA 394+00	826	545							1			
22	STA 394+00 TO STA 406+00	1993	2004		2	2		2		1			
23	STA 406+00 TO STA 418+00	932	327		2	2		2		1			
24	STA 418+00 TO STA 430+00	834	419						1	1			
25	STA 430+00 TO STA 442+00		162		1	1	1	1					
26	STA 442+00 TO STA 454+00		512		2	2	2	2					
27	STA 454+00 TO STA 466+00	962	905						1	2			
28	STA 466+00 TO STA 478+00		300						2	1			
29	STA 478+00 TO STA 490+00	481	375		1	1			3	1			
30	STA 490+00 TO STA 502+00	272	762							1			
31	STA 502+00 TO STA 514+00	423	590						1	1			
32	STA 514+00 TO STA 526+00	200	78										
33	STA 526+00 TO STA 538+00		300		1	2		2					
34	STA 538+00 TO STA 550+00	481	428		1					1			
35	STA 550+00 TO STA 562+00	602	938		2	2	2	2	1	1			
36	STA 562+00 TO STA 574+00												
37	STA 574+00 TO STA 586+00		306		2	3		1					
38	STA 586+00 TO STA 598+00	542	1292		3	3		2	1	1			
39	STA 598+00 TO STA 610+00		2114		2	2		2	1				
40	STA 610+00 TO END PROJ	318	226							1			
	FRONTAGE ROADS												
1	STA 166+00 TO STA 178+00			188					2	2	10	310	1200
2	STA 178+00 TO STA 190+00			444	3	3			1			720	1647
3	STA 190+00 TO STA 202+00			90				1	1	1	6	700	160
4	STA 202+00 TO STA 214+00			28	1	1		1				900	245
5	STA 214+00 TO STA 226+00			71					1		7	900	84
6	STA 226+00 TO STA 238+00									1		380	160
	GENERAL MCMULLEN												
1	BEGIN PROJ TO STA 95+10				1	1			3	2		720	6684
2	STA 95+10 TO END PROJ	242	111		1	1			1	2		1160	6836
	PROJECT TOTALS:	12799	17620	1221	30	31	5	22	30	31	37	6020	20333

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Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 3 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	22
CONT.	SECT.	JOB	
0024	08	141	

SIGNING AND PAVEMENT MARKING SUMMARY (CONTINUED)

SHEET NO.	LOCATION	0666 6306 RE PM W/RET REQ TY I (W) 6"(BRK) (100MIL)	0666 6315 RE PM W/RET REQ TY I (Y) 4"(SLD) (100MIL)	0666 6343 REF PROF PAV MRK TY I (W) 6"(SLD) (100MIL)	0666 6347 REF PROF PAV MRK TY I (Y) 6"(SLD) (100MIL)	0672 6007 REFL PAV MRKR TY I-C	0672 6008 REFL PAV MRKR TY I-R	0672 6009 REFL PAV MRKR TY II-A-A	0672 6010 REFL PAV MRKR TY II-C-R
		LF	LF	LF	LF	EA	EA	EA	EA
	MAINLANES								
1	BEGIN PROJ TO STA 154+00	420		1691	1693				22
2	STA 154+00 TO STA 166+00	600		2547	2549				36
3	STA 166+00 TO STA 178+00	600	3474	2400	2400				78
4	STA 178+00 TO STA 190+00	600		2402	2402				30
5	STA 190+00 TO STA 202+00	650		3059	2570		14		125
6	STA 202+00 TO STA 214+00	900		2400	2400				95
7	STA 214+00 TO STA 226+00	1230		2199	2559		14		140
8	STA 226+00 TO STA 238+00	1200		2401	2401				61
9	STA 238+00 TO STA 250+00	1220		2575	2569		14		82
10	STA 250+00 TO STA 262+00	1200		2561	2622		14		97
11	STA 262+00 TO STA 274+00	1200		2401	2400				60
12	STA 274+00 TO STA 286+00	1200		2614	2610				102
13	STA 286+00 TO STA 298+00	1200		2401	2400				60
14	STA 298+00 TO STA 310+00	1200		2399	2401		14		76
15	STA 310+00 TO STA 322+00	1200		2401	2401				63
16	STA 322+00 TO STA 334+00	1210		3340	3341		28		114
17	STA 334+00 TO STA 346+00	1200		2764	2767		28		66
18	STA 346+00 TO STA 358+00	1200		2424	2419				170
19	STA 358+00 TO STA 370+00	1200		2531	2529				119
20	STA 370+00 TO STA 382+00	1200		2678	2680				60
21	STA 382+00 TO STA 394+00	1200		2400	2677	13	56		98
22	STA 394+00 TO STA 406+00	1200		2146	1304	55			201
23	STA 406+00 TO STA 418+00	2020		2514	1785	24	28		132
24	STA 418+00 TO STA 430+00	2480		3550	3209		28		181
25	STA 430+00 TO STA 442+00	2300		2401	2400				136
26	STA 442+00 TO STA 454+00	2100		2401	2400				158
27	STA 454+00 TO STA 466+00	2310		2297	3225		42		235
28	STA 466+00 TO STA 478+00	2220		3547	3600				162
29	STA 478+00 TO STA 490+00	2100		2850	3303		14		250
30	STA 490+00 TO STA 502+00	2390		2501	2502		28		166
31	STA 502+00 TO STA 514+00	2250		2301	2401		14		194
32	STA 514+00 TO STA 526+00	2430		2402	2401				133
33	STA 526+00 TO STA 538+00	2100		2401	2401				156
34	STA 538+00 TO STA 550+00	2110		2373	2400		42		142
35	STA 550+00 TO STA 562+00	2580		2403	2400				223
36	STA 562+00 TO STA 574+00	2710		2405	2401				136
37	STA 574+00 TO STA 586+00	2400		2404	2401				172
38	STA 586+00 TO STA 598+00	2165		2397	2400		14		227
39	STA 598+00 TO STA 610+00	1630		2399	2400				232
40	STA 610+00 TO END PROJ	160		331	329		28		24
	FRONTAGE ROADS								
1	STA 166+00 TO STA 178+00		1729						65
2	STA 178+00 TO STA 190+00		2420						110
3	STA 190+00 TO STA 202+00		2458					23	83
4	STA 202+00 TO STA 214+00		2400						57
5	STA 214+00 TO STA 226+00		2395					30	62
6	STA 226+00 TO STA 238+00		1204						50
	GENERAL MCMULLEN								
1	BEGIN PROJ TO STA 95+10		6402						120
2	STA 95+10 TO END PROJ		6410						115
	PROJECT TOTALS:	61485	28892	98611	98452	92	420	53	5676

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Kimley»Horn F-928

US 90

SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 4 OF 4

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	23
CONT.	SECT.	JOB	
0024	08	141	

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:

DAYTIME: ALLOWED SUNDAY THROUGH WEDNESDAY BETWEEN THE HOURS OF 9:00 AM TO 3:00 PM.

NIGHTTIME: ALLOWED SUNDAY THROUGH THURSDAY BETWEEN THE HOURS OF 8:30 PM TO 5:00 AM (WITH UNIFORMED OFF DUTY LAW ENFORCEMENT OFFICERS). NO NIGHT TIME CLOSURES ARE PERMITTED ON FRIDAY AND SATURDAY. AT LEAST ONE LANE MUST REMAIN OPEN AT ALL TIMES.

NO LANE CLOSURES OR ROADWAY CLOSURES WILL BE PERMITTED FOR THE FOLLOWING KEY DATES AND/OR SPECIAL EVENTS:

BETWEEN DECEMBER 15 AND JANUARY 1.

FIESTA WEEK AND TAX FREE WEEKEND.

WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING

SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.

SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.

ELECTION DAYS

DURING MAJOR EVENTS AT THE AT&T CENTER (SPURS HOME GAMES, RODEO, CONCERTS, ETC.), ALAMODOME AND OR CONVENTION CENTER

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 CPS ENERGY POLE WILL REQUIRE POLE BRACING. CONTACT CPS ENERGYUTILTY COORDINATION TO REQUEST POLE BRACING (JOHN OFFER, JEOFFER@CPSENERGY.COM). THE ESTIMATED DURATION FOR THE POLE BRACING PROCESS IS APPROXIMATELY 6 TO 8 WEEKS.

(14) COORDINATE WITH THE CITY OF SAN ANTONIO OR TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

(15) IF THERE IS A LANE CLOSURE NEAR OR ADJACENT TO A VIA BUS STOP, CONTACT VIA DISPATCH AT (210) 362-0829 AT LEAST 48 HOURS PRIOR TO THE SCHEDULED CLOSURE.

2. SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN (6) 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 IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING, 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) COMPLETE ALL PAVING OPERATIONS FOR EACH ROADBED PRIOR TO BEGINNING WORK ON THE NEXT ROADBED (THE ROADBEDS IN THIS PROJECT ARE THE EASTBOUND MAINLANES, WESTBOUND MAINLANES, EASTBOUND FRONTAGE ROAD, WESTBOUND FRONTAGE ROAD, AND GENERAL MCMULLEN INTERCHANGE).

(5) LIMIT NIGHTLY PAVING OPERATIONS TO AN AREA THAT CAN BE COMPLETED IN A SINGLE NIGHTTIME CLOSURE

(6) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

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JOSHUA A. RODRIGUEZ 127267 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	24
CONT.	SECT.	JOB	
0024	08	141	

PHASE 1A

THE INTENT OF THIS PHASE IS TO ABANDON EXISTING LOOP DETECTORS, REMOVE EXISTING LANE CONTROL SIGNAL UNITS, AND PERFORM FLEXIBLE PAVEMENT STRUCTURE REPAIR OPERATIONS. THIS PHASE IS INTENDED TO BE PERFORMED CONCURRENTLY WITH PHASE 1B AND 2. ONLY NIGHTIME LANE CLOSURES WILL BE ALLOWED FOR THIS PHASE; NO DAYTIME LANE CLOSURES WILL BE ALLOWED THIS PHASE.

STEP 1:

(1) INSTALL THE NECESSARY SW3P DEVICES. SW3P DEVICES ARE TO BE INSTALLED AS NEEDED TO SERVE THE AREAS OF IMMINENT/CURRENT SOIL DISTURBING ACTIVITIES.

(2) DISCONNECT EXISTING LOOP CABLES AND BACKFILL ABANDONED GROUNDBOXES AS SHOWN IN PLANS.

(3) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(4) REMOVE EXISTING LANE CONTROL SIGNAL (LCS) UNITS.

STEP 2:

(1) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(2) PERFORM FLEXIBLE PAVEMENT STRUCTURE REPAIR AS SHOWN IN THE PLANS.

(3) REMOVE TRAFFIC CONTROL WARNING DEVICES, TO OPEN ALL LANES TO TRAFFIC, AT THE END OF EACH NIGHT.

PHASE 1B

THE INTENT OF THIS PHASE IS TO PERFORM CONCRETE STRUCTURE REPAIR AND BRIDGE RAIL RETROFIT OPERATIONS ON THE BRIDGES AT LEON CREEK. THIS PHASE IS INTENDED TO BE PERFORMED CONCURRENTLY WITH PHASE 1A AND 2. DAYTIME AND NIGHTIME CLOSURES WILL BE ALLOWED THIS PHASE.

STEP 1:

(1) UTILIZING TCP (6-1)-12, PLANE THE SHOULDERS OF THE LEON CREEK BRIDGES TO THE LIMITS NECESSARY TO PERFORM CONCRETE STRUCTURE REPAIR AND RAIL RETROFIT AND AS DIRECTED BY THE ENGINEER.

STEP 2:

(1) REMOVE CONFLICTING SIGNING AND MARKING. PLACE WORK ZONE SIGNING, PAVEMENT MARKINGS, AND CHANNELIZING DEVICES PER TXDOT AND TCP STANDARDS, THE LATEST EDITION OF THE TEXAS MUTCD, AND AS DIRECTED BY THE ENGINEER.

(2) SHIFT EASTBOUND TRAFFIC AS SHOWN IN THE PHASE 1B - STEP 2A TYPICAL SECTIONS AND TCP.

a. PERFORM BRIDGE DECK CONCRETE STRUCTURE REPAIR AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

b. PERFORM RAIL RETROFIT AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

(3) SHIFT EASTBOUND TRAFFIC AS SHOWN IN THE PHASE 1B - STEP 2B TYPICAL SECTIONS AND TCP.

a. PERFORM BRIDGE DECK CONCRETE STRUCTURE REPAIR AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

b. PERFORM RAIL RETROFIT AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

(4) RESTRIPE EASTBOUND LANES AS SHOWN IN THE PHASE 1B - STEP 2C TCP TO RESTORE THE EXISTING LANE ASSIGNMENTS.

STEP 3:

(1) REMOVE CONFLICTING SIGNING AND MARKING. PLACE WORK ZONE SIGNING, PAVEMENT MARKINGS, AND CHANNELIZING DEVICES PER TXDOT AND TCP STANDARDS, THE LATEST EDITION OF THE TEXAS MUTCD, AND AS DIRECTED BY THE ENGINEER.

(2) SHIFT WESTBOUND TRAFFIC AS SHOWN IN THE PHASE 1B - STEP 3A TYPICAL SECTIONS AND TCP.

a. PERFORM BRIDGE DECK CONCRETE STRUCTURE REPAIR AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

b. PERFORM RAIL RETROFIT AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

(3) SHIFT WESTBOUND TRAFFIC AS SHOWN IN THE PHASE 1B - STEP 3B TYPICAL SECTIONS AND TCP.

a. PERFORM BRIDGE DECK CONCRETE STRUCTURE REPAIR AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

b. PERFORM RAIL RETROFIT AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

(4) RESTRIPE WESTBOUND LANES AS SHOWN IN THE PHASE 1B - STEP 3C TCP TO RESTORE THE EXISTING LANE ASSIGNMENTS.

PHASE 2

THE INTENT OF THIS PHASE IS TO PERFORM METAL BEAM GUARD FENCE (MBGF) REPLACEMENT OPERATIONS. THIS PHASE IS INTENDED TO BE PERFORMED CONCURRENTLY WITH ALL OTHER PHASES BUT WORK SHOULD BE SCHEDULED SO AS TO NOT INTERFERE WITH OTHER OPERATIONS. DAYTIME AND NIGHTIME CLOSURES WILL BE ALLOWED THIS PHASE. CLOSE ONLY LANES IMMEDIATELY ADJACENT TO MBGF REPLACEMENT OPERATIONS.

(1) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(2) INSTALL THE NECESSARY SW3P DEVICES. SW3P DEVICES ARE TO BE INSTALLED AS NEEDED TO SERVE THE AREAS OF IMMINENT/CURRENT SOIL DISTURBING ACTIVITIES.

(3) REMOVE EXISTING MBGF AND END TREATMENTS.

(4) INSTALL MBGF AND END TREATMENTS AS SHOWN IN THE PLANS.

(5) INSTALL MOW STRIP AS SHOWN IN THE PLANS.

(6) INSTALL SOD AS SHOWN IN THE PLANS.

(7) REMOVE TRAFFIC CONTROL WARNING DEVICES, TO OPEN ALL LANES TO TRAFFIC, AT THE END OF EACH DAY / NIGHT.

PHASE 3

THE INTENT OF THIS PHASE IS TO PERFORM MAINLANE PLANE AND INLAY OPERATIONS. THIS PHASE CAN BE PERFORMED CONCURRENTLY WITH PREVIOUS PHASES, WITH PRIOR APPROVAL FROM THE ENGINEER. ONLY NIGHTIME LANE CLOSURES WILL BE ALLOWED FOR THIS PHASE; NO DAYTIME LANE CLOSURES WILL BE ALLOWED THIS PHASE.

(1) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(2) PERFORM PLANE AND INLAY OPERATIONS AS SHOWN IN THE PLANS.

a. PLANE SURFACE

b. APPLY SEAL COAT

c. CONSTRUCT STONE MATRIX ASPHALT INLAY

(3) CLEAN AND SEAL BRIDGE EXPANSION JOINTS AS SHOWN IN THE PLANS.

(4) INSTALL WORK ZONE PAVEMENT MARKINGS.

(5) REMOVE TRAFFIC CONTROL WARNING DEVICES, TO OPEN ALL LANES TO TRAFFIC, AT THE END OF EACH NIGHT.

4/1/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	25
CONT.	SECT.	JOB	
0024	08	141	

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PHASE 4

THE INTENT OF THIS PHASE IS TO PERFORM FRONTAGE ROAD PLANE AND INLAY OPERATIONS. ONLY NIGHTIME LANE CLOSURES WILL BE ALLOWED FOR THIS PHASE; NO DAYTIME LANE CLOSURES WILL BE ALLOWED THIS PHASE.

(1) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(2) PERFORM PLANE AND INLAY OPERATIONS AS SHOWN IN THE PLANS.

a. PLANE SURFACE

b. APPLY UNDERSEAL COURSE

c. CONSTRUCT SUPERPAVE INLAY

(3) INSTALL WORK ZONE PAVEMENT MARKINGS.

(4) REMOVE TRAFFIC CONTROL WARNING DEVICES, TO OPEN ALL LANES TO TRAFFIC, AT THE END OF EACH NIGHT.

PHASE 5

THE INTENT OF THIS PHASE IS TO PERFORM GENERAL MCMULLEN INTERCHANGE PLANE AND INLAY OPERATIONS ONLY NIGHTIME LANE CLOSURES WILL BE ALLOWED FOR THIS PHASE; NO DAYTIME LANE CLOSURES WILL BE ALLOWED THIS PHASE.

(1) INSTALL TRAFFIC CONTROL DEVICES FOR THE NECESSARY LANE CLOSURES, IN ACCORDANCE WITH THE APPLICABLE TXDOT STANDARD AND THE LATEST TEXAS MUTCD.

(2) PERFORM PLANE AND INLAY OPERATIONS AS SHOWN IN THE PLANS.

a. PLANE SURFACE

b. APPLY UNDERSEAL COURSE

c. CONSTRUCT SUPERPAVE INLAY

(3) CLEAN AND SEAL BRIDGE EXPANSION JOINTS AS SHOWN IN THE PLANS.

(4) INSTALL WORK ZONE PAVEMENT MARKINGS.

(5) REMOVE TRAFFIC CONTROL WARNING DEVICES, TO OPEN ALL LANES TO TRAFFIC, AT THE END OF EACH NIGHT.

PHASE 6

THE INTENT OF THIS PHASE IS TO INSTALL FINAL PAVEMENT MARKINGS AND PERFORM FINAL CLEAN-UP.

(1) INSTALL FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH THE TXDOT STANDARDS FOR MOBILE OPERATIONS.

(2) REMOVE PREVIOUSLY INSTALLED SW3P DEVICES ONCE SOIL DISTURBING ACTIVITES IN THE AREA ARE COMPLETED, AND THE PROPER VEGETATIVE COVER IS ESTABLISHED.

(3) PERFORM FINAL CLEAN-UP.

1. SAFETY

(1) THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1 - 12)-21. 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.

2. 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.

3. 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.

4. 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.

10/28/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	26
CONT.	SECT.	JOB	
0024	08	141	

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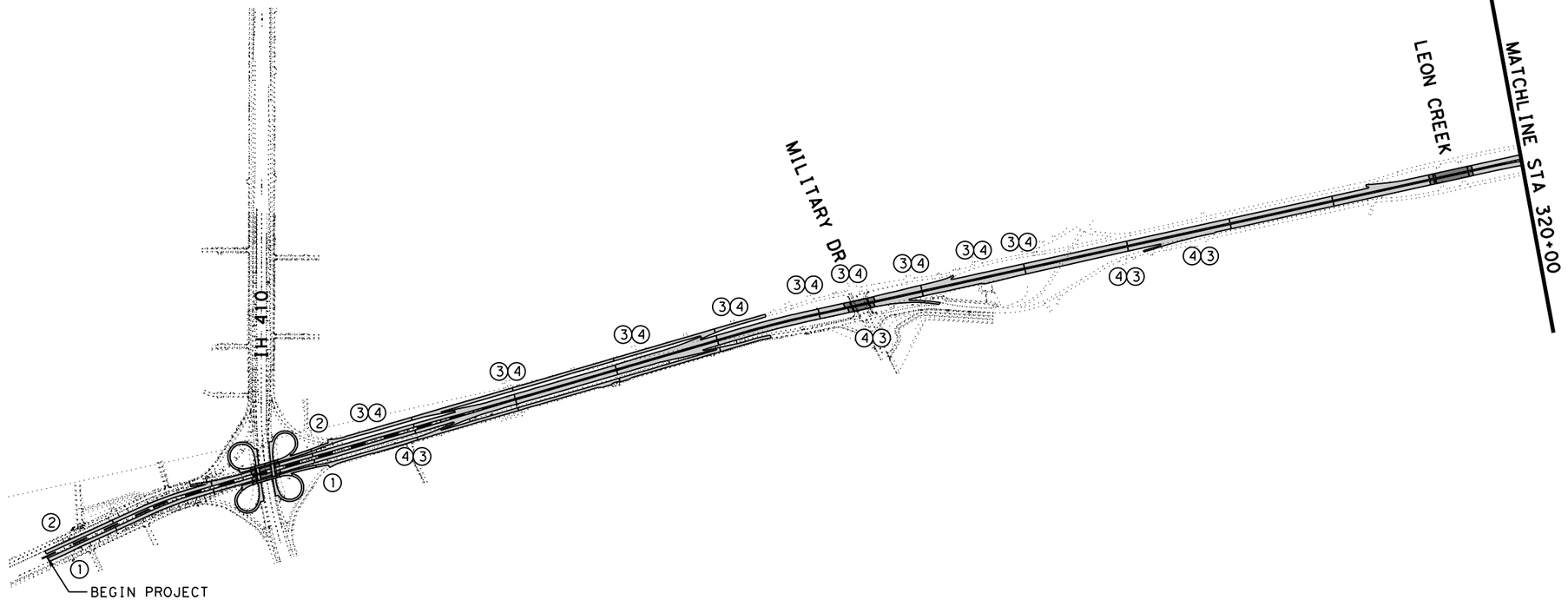
SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	R20-3T	G20-10T	G20-9TP	R20-5T R20-5aTP	R2-1	CW20-1D	G20-5T	G20-6T	G20-2bT	G20-2a	G20-1aT	CW20-1A	CW20-1B	CW20-1C	CW9-1R	R11-2	CW9-2TL	CW20-5R	CW8-11	CW8-8	CW3-4	CW9-3T	CW8-4	VERT PANEL	R3-5hTP	CW4-3L	CW13-1P	ARROW BOARD	PCMB	W1-9TR	R6-1R
1	X	X	X	X	X	X	X	X																							
2					X				X	X																					
3						X					X																				
4										X																					
*						X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	CW20RP-3D	R11-2bT	CW25-1T	CW21-1T	CW21-5aR	CW26-1T	R3-9cP	E5-2a	R11-4	CW7-3aP	M4-8	M4-8a	M4-9L	M4-9TL	M4-10R	PCTB/ LPCTB	TY III	CW8-7	R1-2	CHEVRONS	R5-1	CW20-8T	BARRELS	CW1-6aT	CW1-4L	CW8-1	CW4-1L	CW20-5R	CW20-2D	CW20-2F	CW20-2E
1																															
2																															
3																															
4																															
*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



SCALE: N.T.S.

LOCATION NO. 1 APPROACHES TO PROJECT
LOCATION NO. 2 DEPARTURES FROM PROJECT
LOCATION NO. 3 SIDE STREET APPROACHES
LOCATION NO. 4 SIDE STREET DEPARTURES
LOCATION NO. * AS DIRECTED BY THE ENGINEER

NOTE:
1. CERTAIN SIGNS MUST BE USED IN CONJUNCTION WITH OTHER SIGNS. EXAMPLE: "FLAGGER AHEAD" MUST HAVE A "BE PREPARED TO STOP".
2. BARRICADES AND WARNING SIGNS ON THIS SHEET ARE THE MINIMUM CONSTRUCTION ZONE, SIGNING ADDITIONAL BARRICADES, WARNING SIGNS, ARROW PANELS, CONES, ETC. REQUIRED IN ACCORDANCE WITH CURRENT BC STANDARDS AND THE TEXAS MUTCD MAY BE REQUIRED IN AREAS OF ACTUAL CONSTRUCTION.
3. A DISTANCE PLAQUE IN FEET OR MILES MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
4. IMPLEMENT DETOURS IN ACCORDANCE WITH THE TEXAS MUTCD. USE CHANGEABLE MESSAGE BOARDS TO GUIDE MOTORISTS THROUGH THE DETOUR.

4/1/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90
SCHEDULE OF BARRICADES & ADVANCED WARNING

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	27
CONT.	SECT.	JOB	
0024	08	141	

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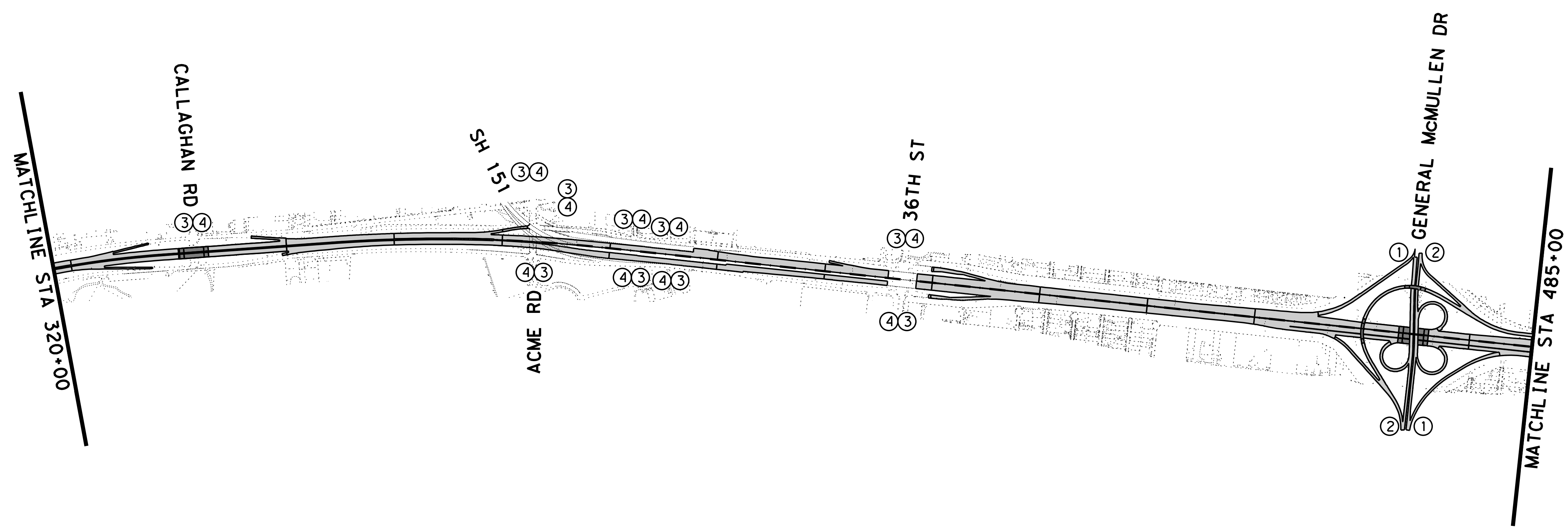
SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	R20-3T	G20-10T	G20-9TP	R20-5T R20-5aTP	R2-1	CW20-1D	G20-5T	G20-6T	G20-2bT	G20-2a	G20-1aT	CW20-1A	CW20-1B	CW20-1C	CW9-1R	R11-2	CW9-2TL	CW20-5R	CW8-11	CW8-8	CW3-4	CW9-3T	CW8-4	VERT PANEL	R3-5hTP	CW4-3L	CW13-1P	ARROW BOARD	PCMB	W1-9TR	R6-1R
1	X	X	X	X	X	X	X	X																							
2					X				X	X																					
3						X					X																				
4										X																					
*						X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	CW20RP-3D	R11-2bT	CW25-1T	CW21-1T	CW21-5aR	CW26-1T	R3-9cP	E5-2a	R11-4	CW7-3aP	M4-8	M4-8a	M4-9L	M4-9TL	M4-10R	PCTB/ LPCTB	TY III	CW8-7	R1-2	CHEVRONS	R5-1	CW20-8T	BARRELS	CW1-6aT	CW1-4L	CW8-1	CW4-1L	CW20-5R	CW20-2D	CW20-2F	CW20-2E
1																															
2																															
3																															
4																															
*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



SCALE: N.T.S.

4/1/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

LOCATION NO. 1 APPROACHES TO PROJECT
LOCATION NO. 2 DEPARTURES FROM PROJECT
LOCATION NO. 3 SIDE STREET APPROACHES
LOCATION NO. 4 SIDE STREET DEPARTURES
LOCATION NO. * AS DIRECTED BY THE ENGINEER

NOTE:
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3. A DISTANCE PLAQUE IN FEET OR MILES MAY BE REQUIRED FOR USE IN CONJUNCTION WITH WARNING SIGNS.
4. IMPLEMENT DETOURS IN ACCORDANCE WITH THE TEXAS MUTCD. USE CHANGEABLE MESSAGE BOARDS TO GUIDE MOTORISTS THROUGH THE DETOUR.

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Kimley»Horn F-928

®Texas Department of Transportation

US 90
SCHEDULE OF BARRICADES & ADVANCED WARNING

SHEET 2 OF 3

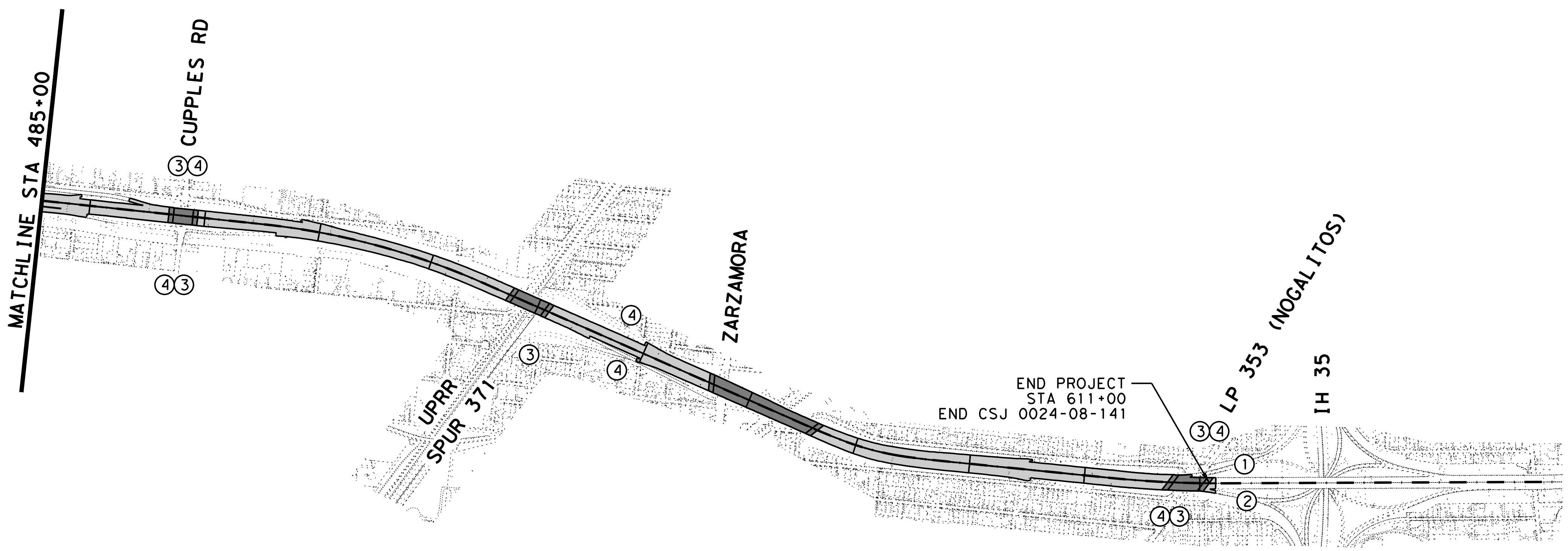
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.	
6			US 90	
STATE	DIST.	COUNTY		SHEET NO.
TEXAS	SAT	BEXAR		28
CONT.	SECT.	JOB		
0024	08	141		

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	R20-3T	G20-10T	G20-9TP	R20-5T R20-5aTP	R2-1	CW20-1D	G20-5T	G20-6T	G20-2bT	G20-2a	G20-1aT	CW20-1A	CW20-1B	CW20-1C	CW9-1R	R11-2	CW9-2TL	CW20-5R	CW8-11	CW8-8	CW3-4	CW9-3T	CW8-4	VERT PANEL	R3-5hTP	CW4-3L	CW13-1P	ARROW BOARD	PCMB	W1-9TR	R6-1R
1	X	X	X	X	X	X	X	X																							
2					X				X	X																					
3						X					X																				
4										X																					
*						X						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	CW20RP-3D	R11-2bT	CW25-1T	CW21-1T	CW21-5aR	CW26-1T	R3-9cP	E5-2a	R11-4	CW7-3aP	M4-8	M4-8a	M4-9L	M4-9TL	M4-10R	PCTB/ LPCTB	TY III	CW8-7	R1-2	CHEVRONS	R5-1	CW20-8T	BARRELS	CW1-6aT	CW1-4L	CW8-1	CW4-1L	CW20-5R	CW20-2D	CW20-2F	CW20-2E
1																															
2																															
3																															
4																															
*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



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4/1/2021

LOCATION NO. 1 APPROACHES TO PROJECT
LOCATION NO. 2 DEPARTURES FROM PROJECT
LOCATION NO. 3 SIDE STREET APPROACHES
LOCATION NO. 4 SIDE STREET DEPARTURES
LOCATION NO. * AS DIRECTED BY THE ENGINEER

NOTE:
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4. IMPLEMENT DETOURS IN ACCORDANCE WITH THE TEXAS MUTCD. USE CHANGEABLE MESSAGE BOARDS TO GUIDE MOTORISTS THROUGH THE DETOUR.

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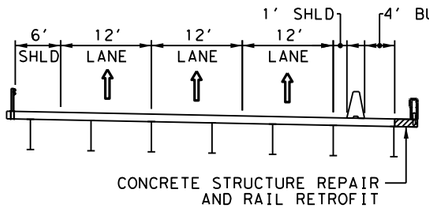
STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928

US 90
SCHEDULE OF BARRICADES & ADVANCED WARNING

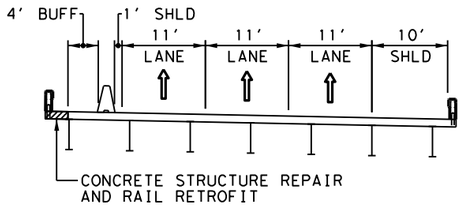
SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.	
6			US 90	
STATE	DIST.	COUNTY		SHEET NO.
TEXAS	SAT	BEXAR		29
CONT.	SECT.	JOB		
0024	08	141		



PHASE 1B STEP 2A - EBML

STA 297+70 TO STA 316+00

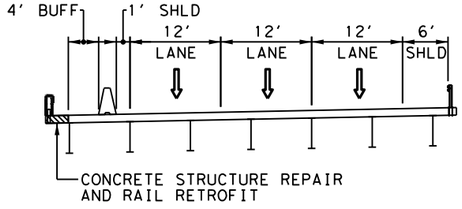


PHASE 1B STEP 2B - EBML

STA 300+00 TO STA 316+00

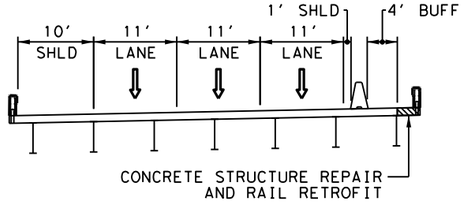
NOTES

1. REFER TO BRIDGE STRUCTURAL LAYOUTS FOR ACTUAL CONCRETE STRUCTURE REPAIR LOCATIONS.



PHASE 1B STEP 3A - WBML

STA 307+55 TO STA 322+50



PHASE 1B STEP 3B - WBML

STA 307+55 TO STA 323+40

5/5/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928

US 90

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	30
CONT.	SECT.	JOB	
0024	08	141	

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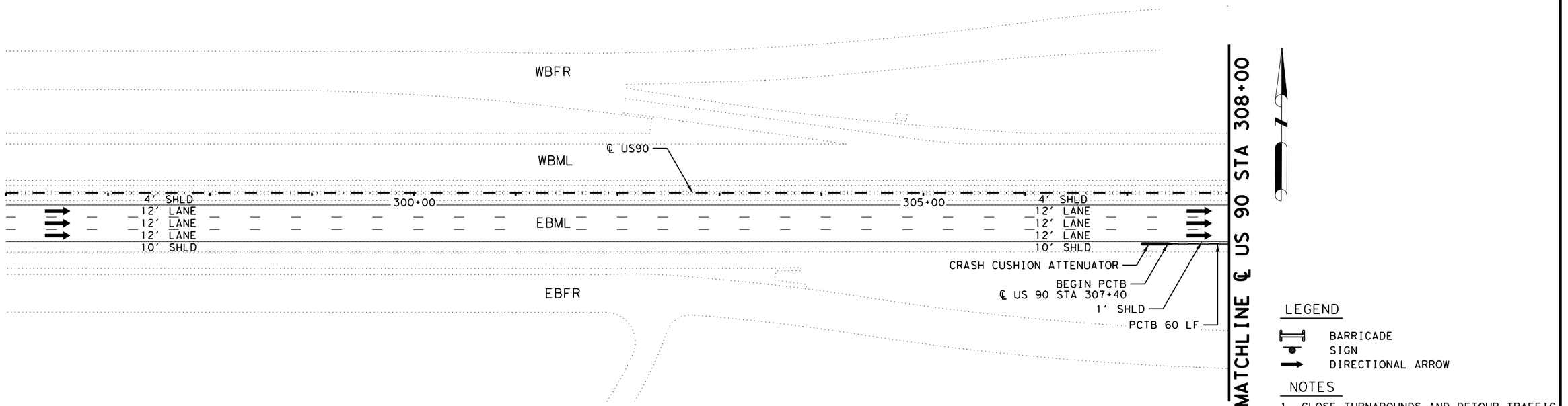
0545 6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	1

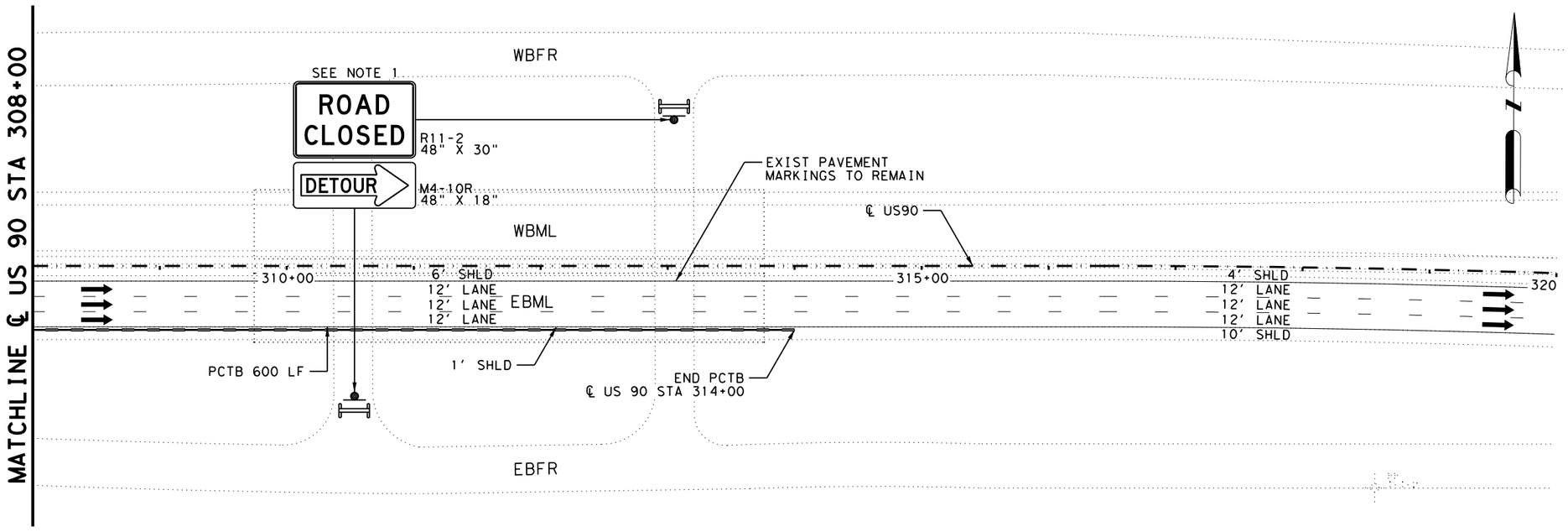


LEGEND

BARRICADE
SIGN
DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.



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5/5/2021

JOSHUA A. RODRIGUEZ
127267
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PROFESSIONAL ENGINEER
STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

TRAFFIC CONTROL PLAN PHASE 1B - STEP 2A

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	31
CONT.	SECT.	JOB	
0024	08	141	

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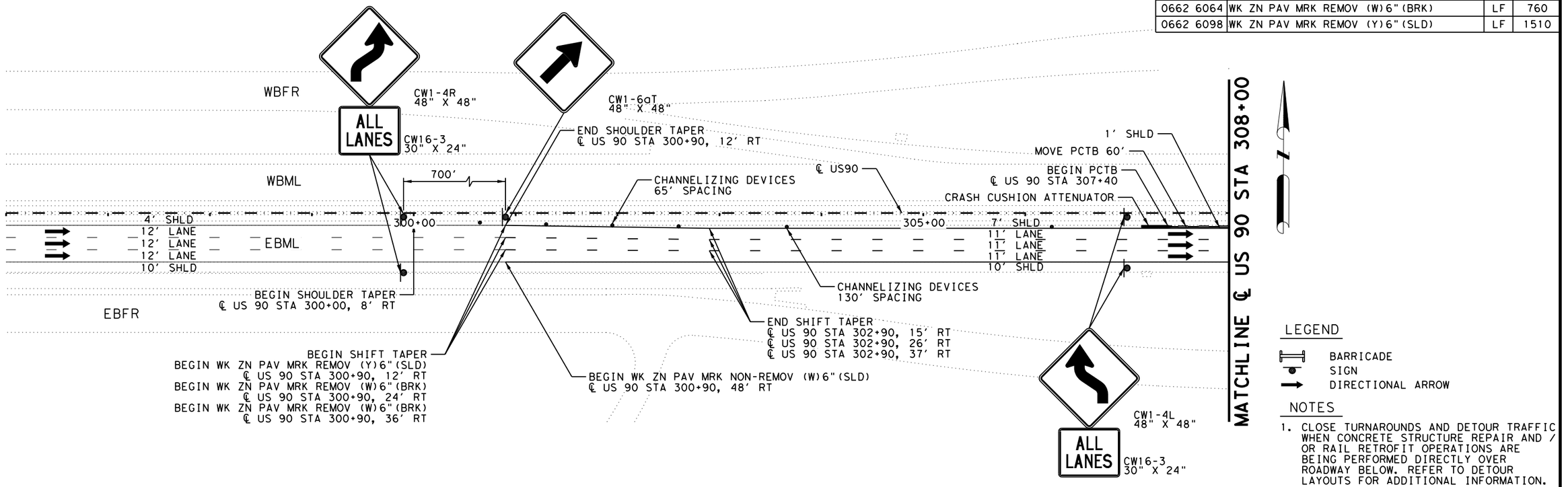
0512 6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	660
0545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
0662 6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	1510
0662 6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	760
0662 6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	1510

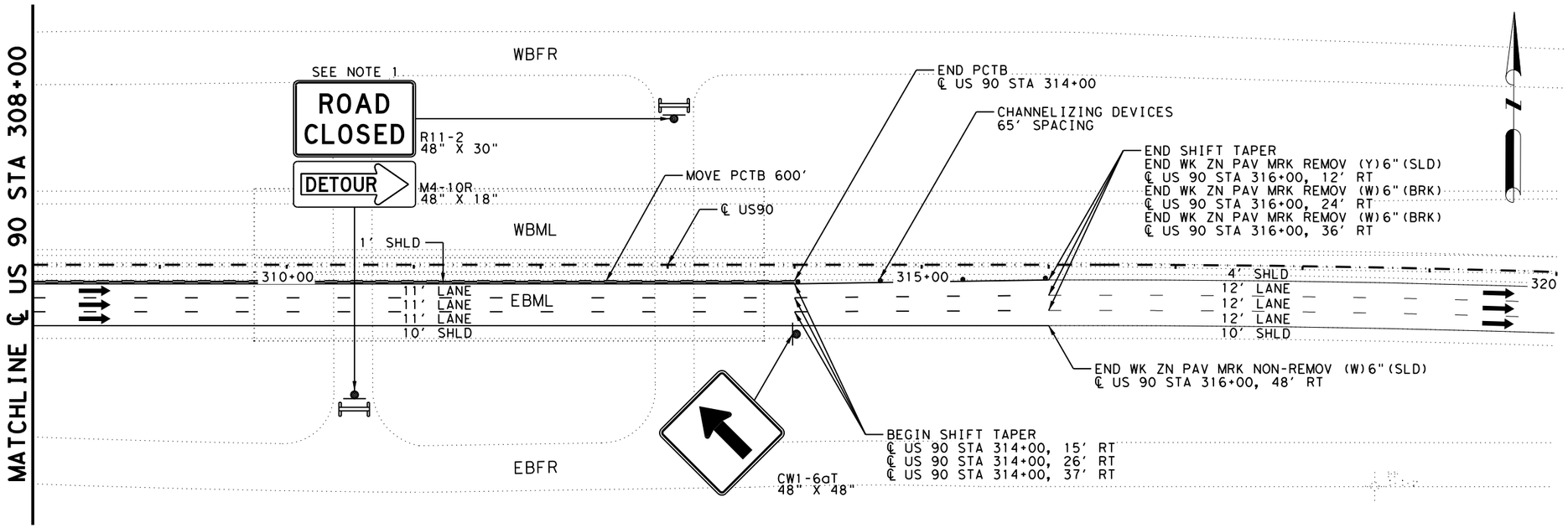


LEGEND

BARRICADE
SIGN
DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.



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4/1/2021

JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Kimley»Horn F-928

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US 90

TRAFFIC CONTROL PLAN PHASE 1B - STEP 2B

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	32
CONT.	SECT.	JOB	
0024	08	141	

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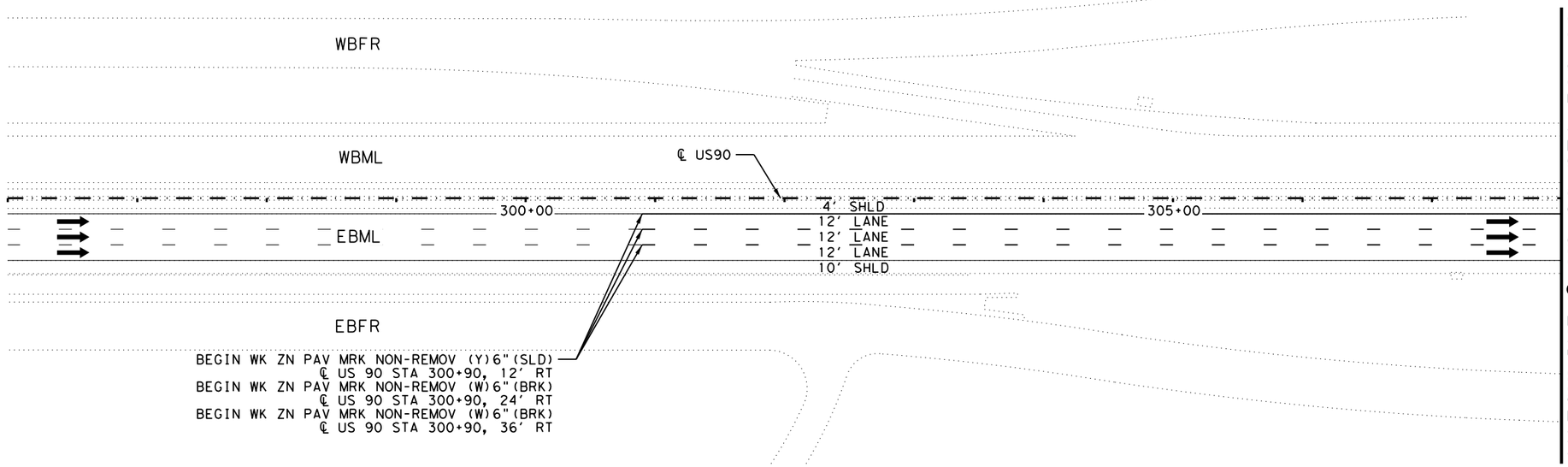
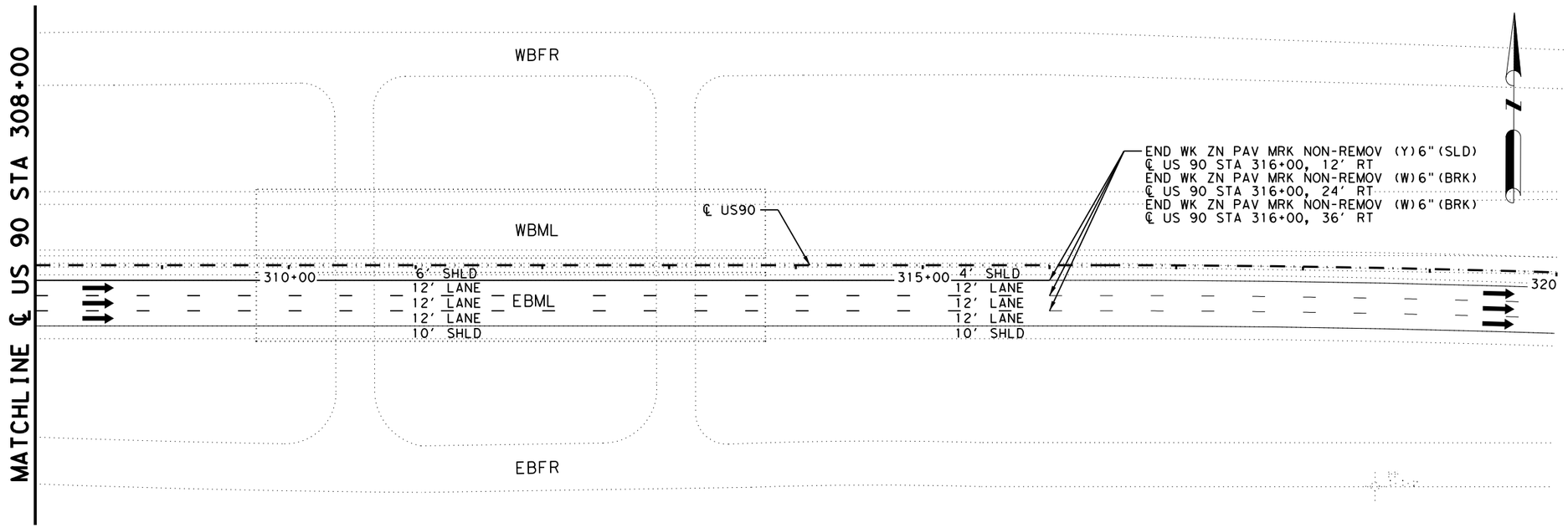
0545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
0662 6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	760
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	1510





MATCHLINE ℄ US 90 STA 308+00

LEGEND

BARRICADE
SIGN
DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.

0 50 100

4/1/2021

STATE OF TEXAS
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TRAFFIC CONTROL PLAN PHASE 1B - STEP 2C

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.	
6		US 90	
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	33
CONT.	SECT.	JOB	
0024	08	141	

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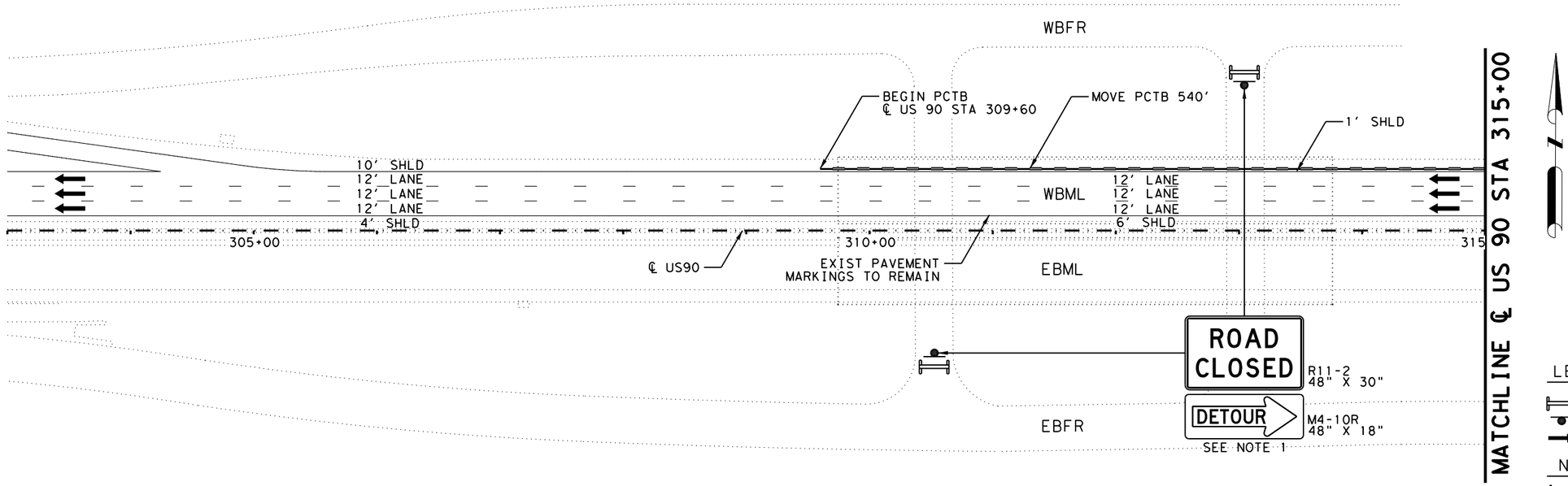
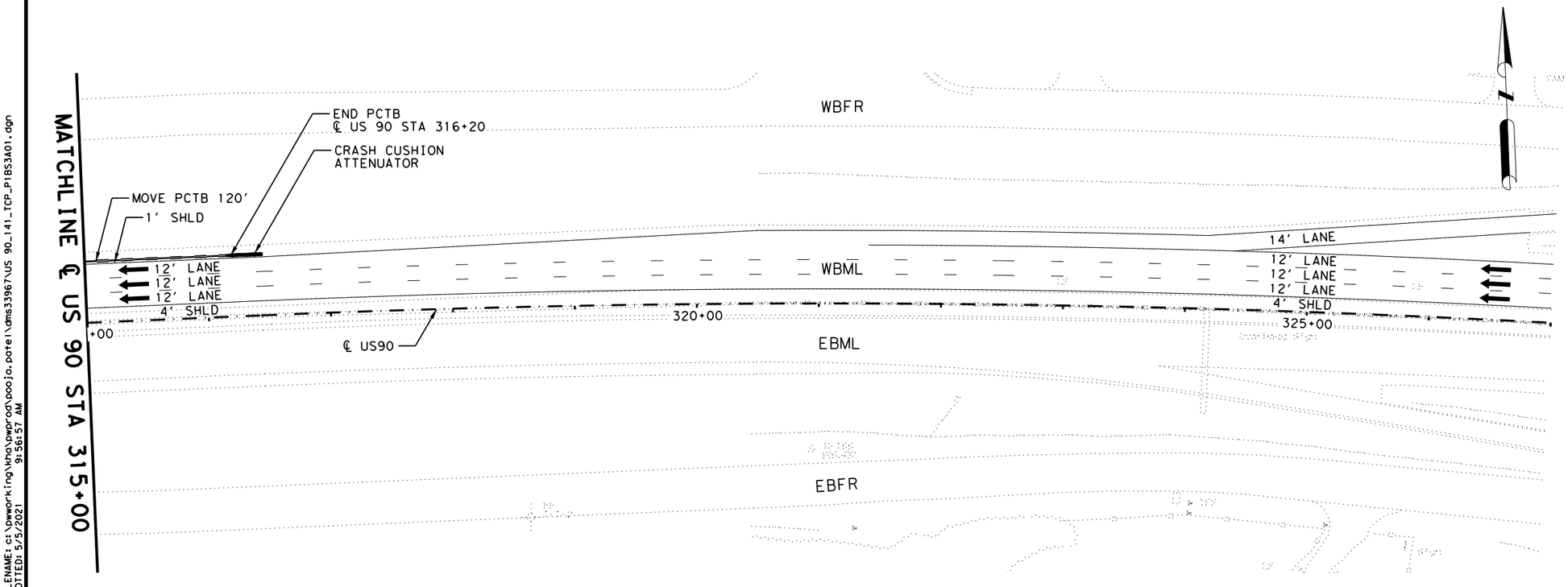
0545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1





LEGEND

- BARRICADE
- SIGN
- DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.

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TRAFFIC CONTROL PLAN PHASE 1B - STEP 3A

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	34
CONT.	SECT.	JOB	
0024	08	141	

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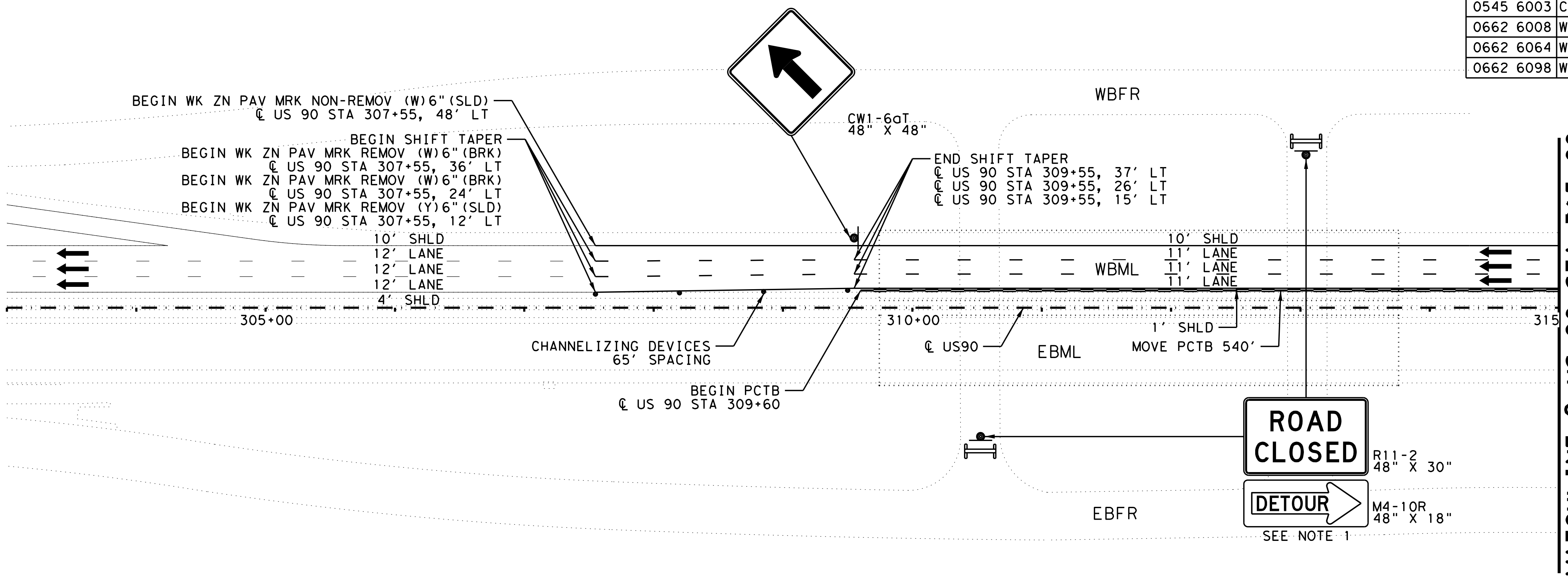
0545 6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1
0662 6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	1298
0662 6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	750
0662 6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	1496



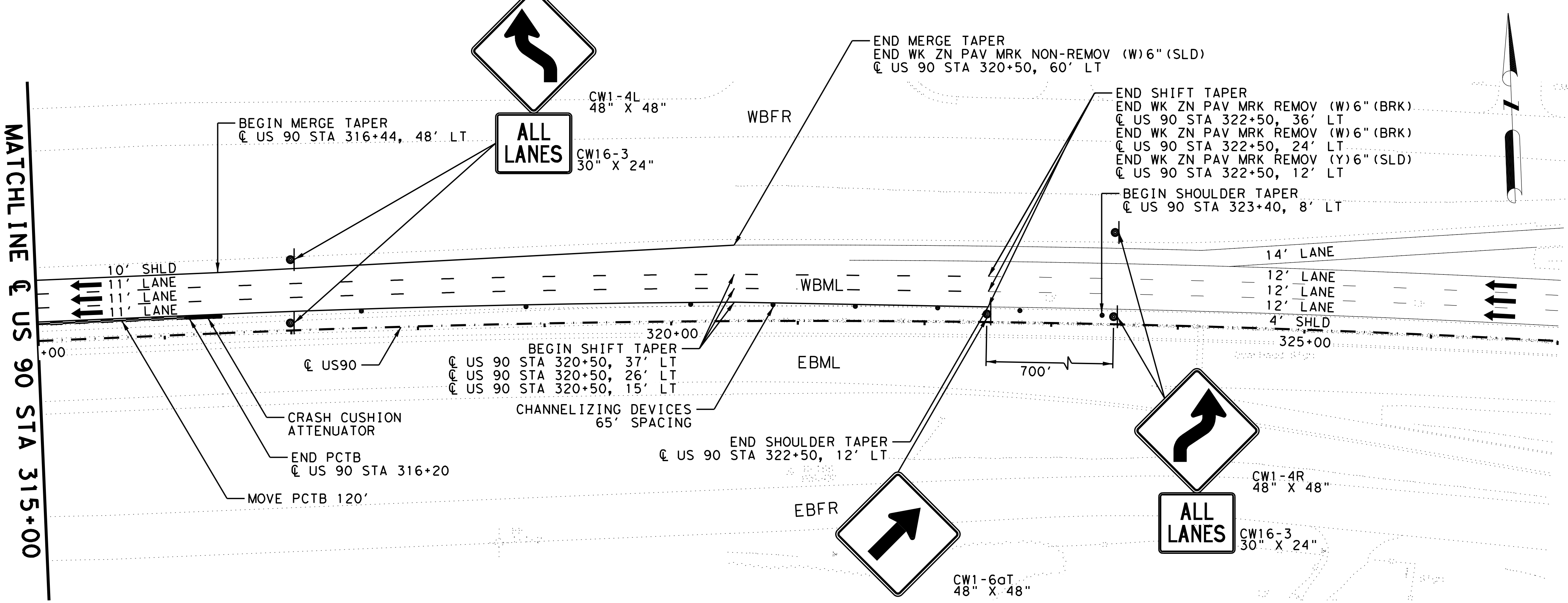
LEGEND

- BARRICADE
- SIGN
- DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.

0 50 100



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TRAFFIC CONTROL PLAN
PHASE 1B - STEP 3B

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.	
6		US 90	
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	35
CONT.	SECT.	JOB	
0024	08	141	

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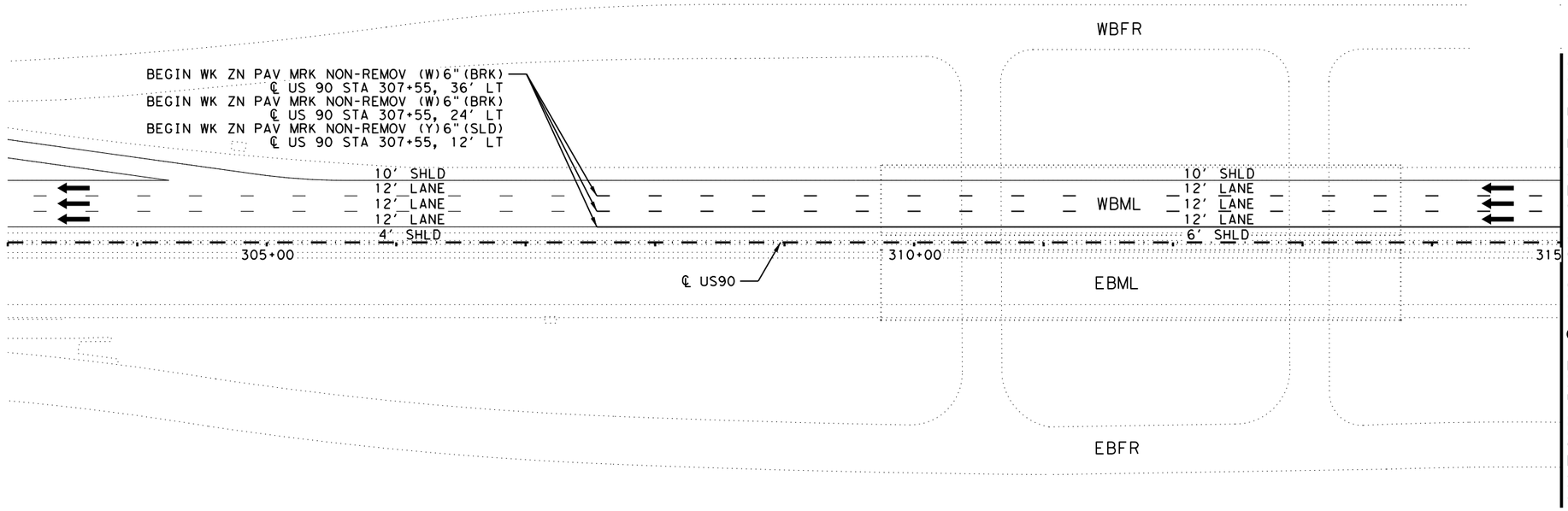
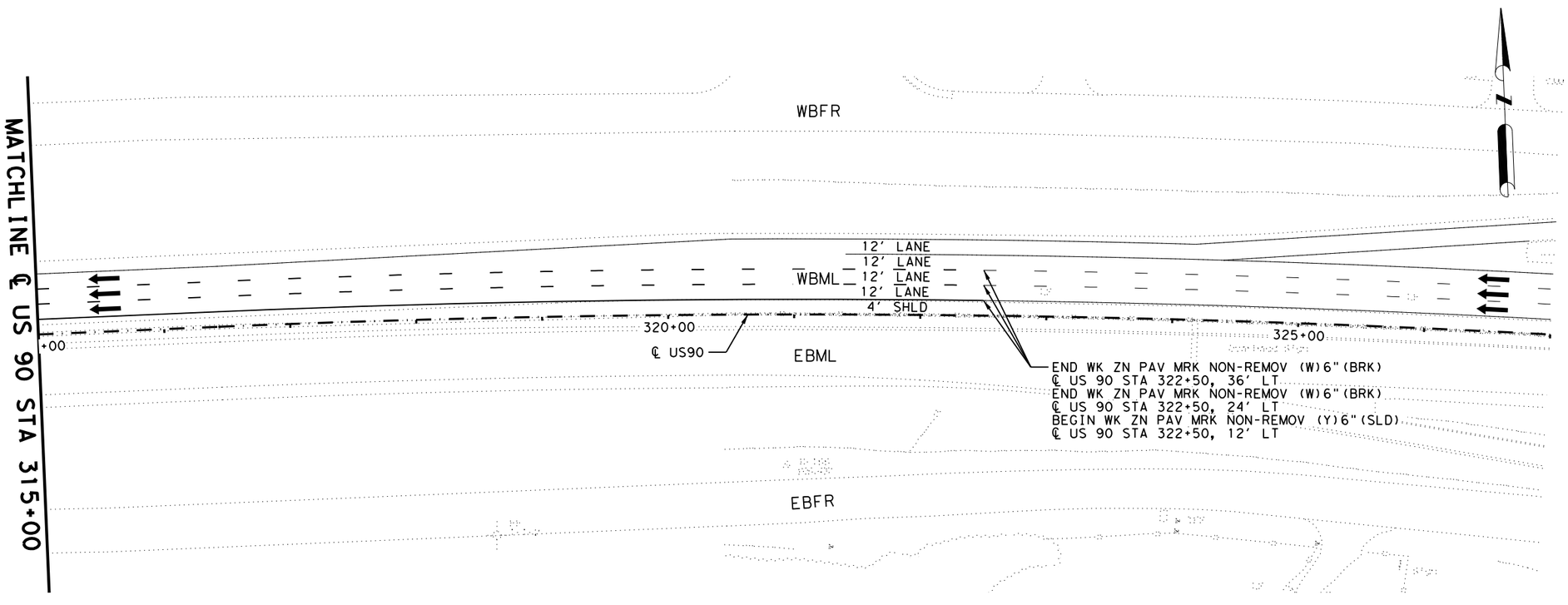
0545 6005	CRASH CUSH ATTEN (REMOVE)	EA	1
0662 6005	WK ZN PAV MRK NON-REMOV (W)6"(BRK)	LF	750
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	1496





LEGEND

- BARRICADE
- SIGN
- DIRECTIONAL ARROW

NOTES

1. CLOSE TURNAROUNDS AND DETOUR TRAFFIC WHEN CONCRETE STRUCTURE REPAIR AND / OR RAIL RETROFIT OPERATIONS ARE BEING PERFORMED DIRECTLY OVER ROADWAY BELOW. REFER TO DETOUR LAYOUTS FOR ADDITIONAL INFORMATION.

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TRAFFIC CONTROL PLAN PHASE 1B - STEP 3C

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.	
6		US 90	
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	36
CONT.	SECT.	JOB	
0024	08	141	

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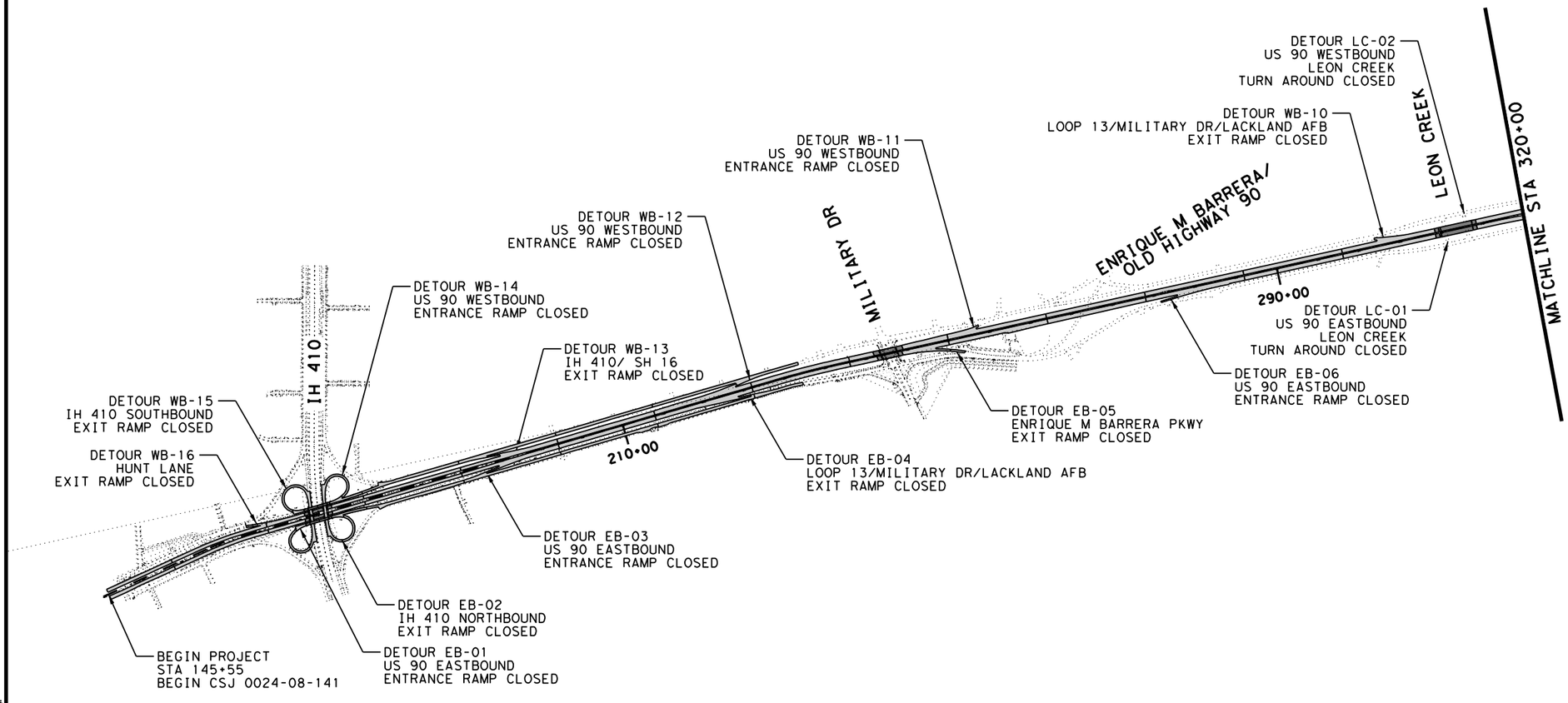

NOTES:

1. DETOURS ARE TO BE IMPLEMENTED ON AN AS NEEDED BASIS.
2. NO TWO DETOURS SHALL BE IMPLEMENTED AT ONE TIME, WITHOUT APPROVAL OF THE FIELD ENGINEER.

SCALE: N.T.S.

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DETOURS OVERALL LAYOUT

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	37
CONT.	SECT.	JOB	
0024	08	141	

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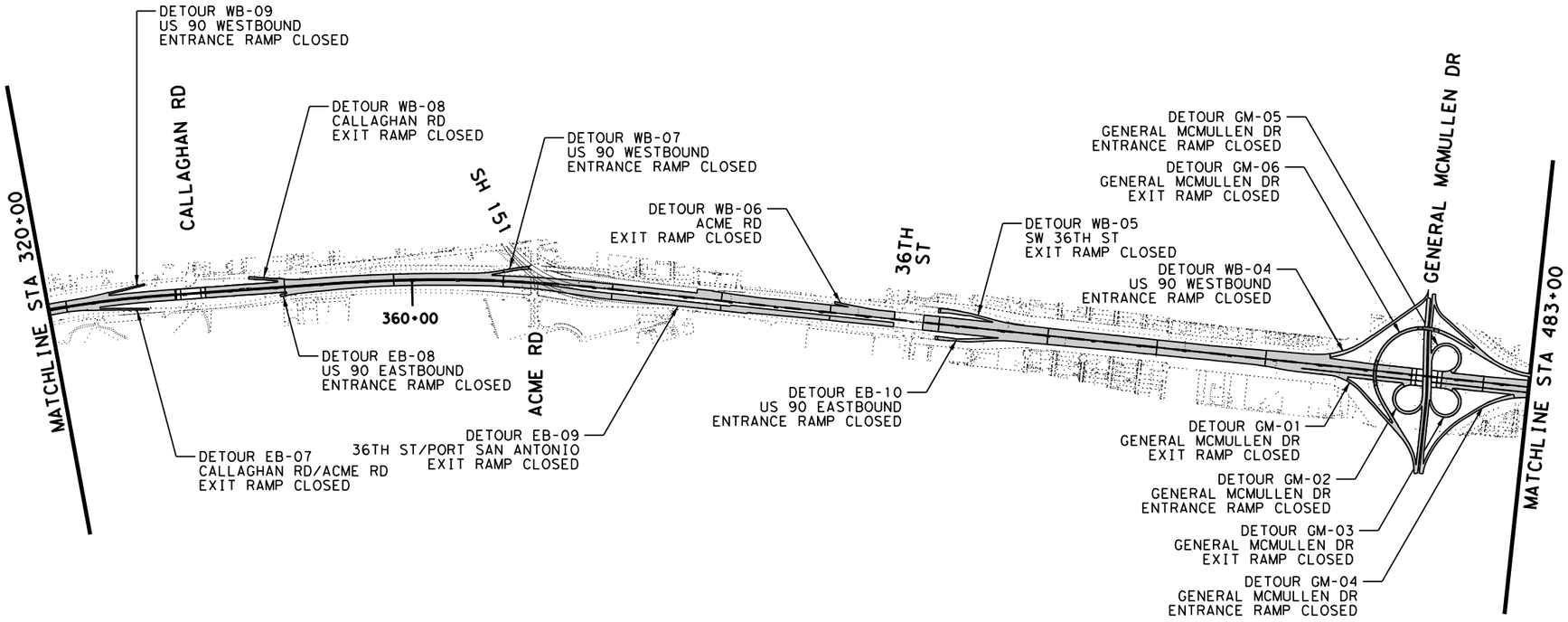

NOTES:

1. DETOURS ARE TO BE IMPLEMENTED ON AN AS NEEDED BASIS.
2. NO TWO DETOURS SHALL BE IMPLEMENTED AT ONE TIME, WITHOUT APPROVAL OF THE FIELD ENGINEER.

SCALE: N.T.S.

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DETOURS OVERALL LAYOUT

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	38
CONT.	SECT.	JOB	
0024	08	141	

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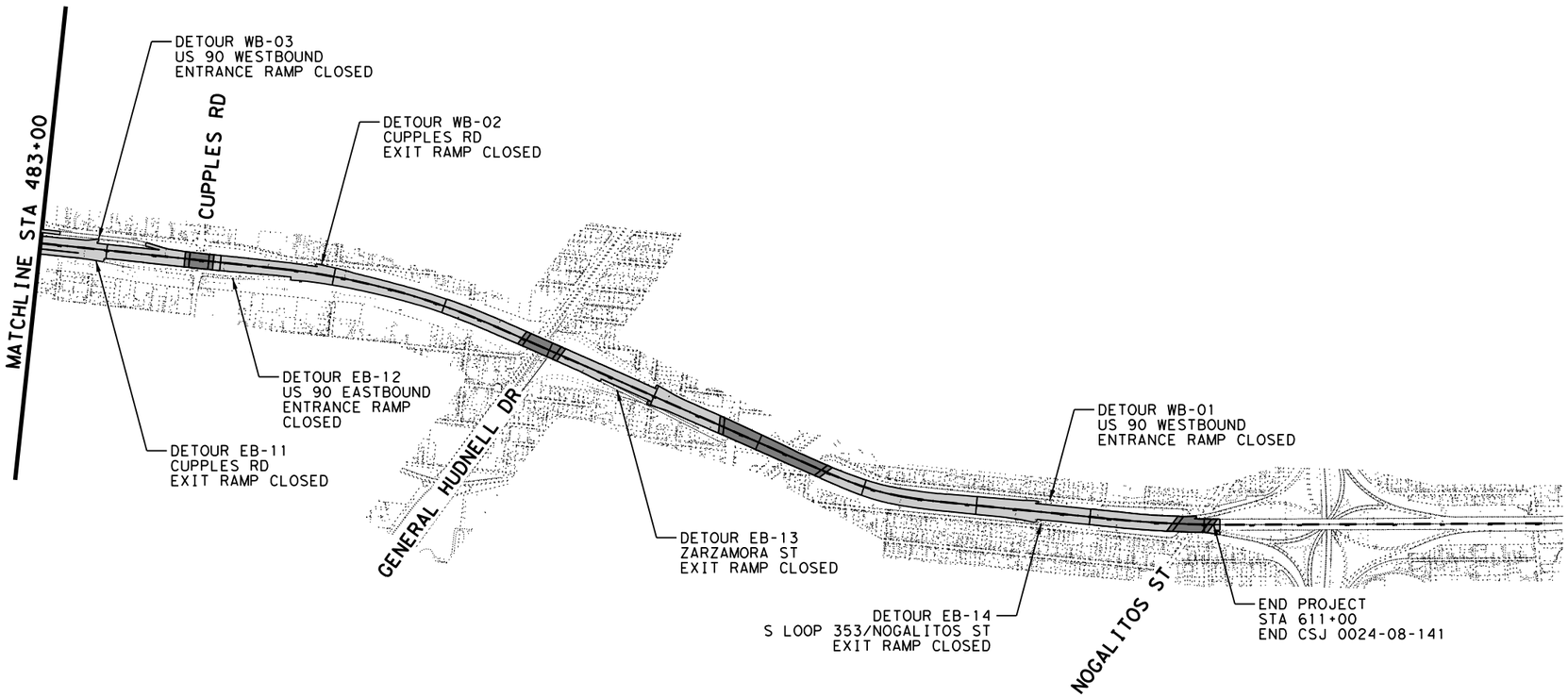

NOTES:

1. DETOURS ARE TO BE IMPLEMENTED ON AN AS NEEDED BASIS.
2. NO TWO DETOURS SHALL BE IMPLEMENTED AT ONE TIME, WITHOUT APPROVAL OF THE FIELD ENGINEER.

N

SCALE: N.T.S.

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DETOURS OVERALL LAYOUT

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	39
CONT.	SECT.	JOB	
0024	08	141	

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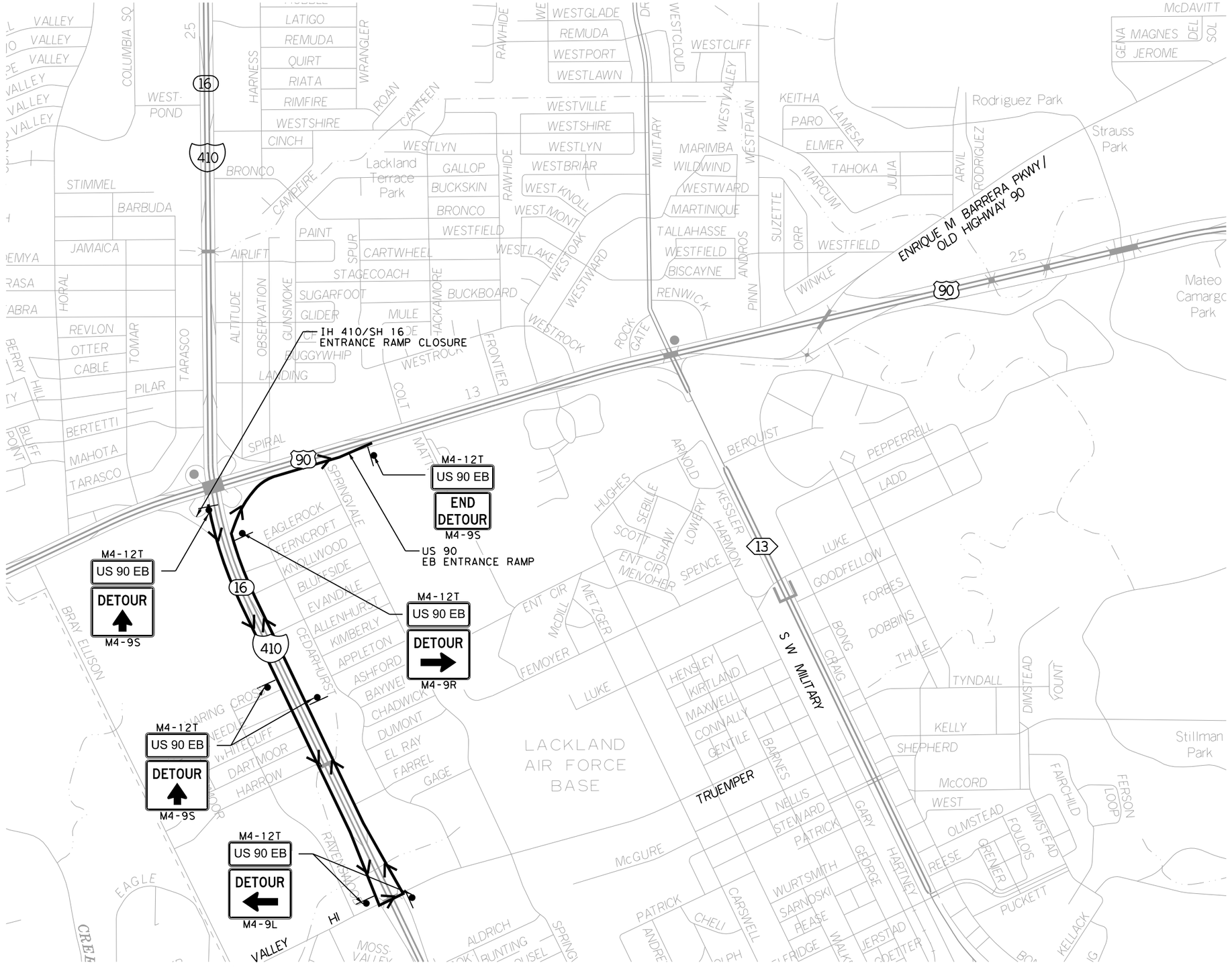

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-01
IH 410/SH 16
ENTRANCE RAMP DETOUR

SHEET 1 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	40
CONT.	SECT.	JOB	
0024	08	141	

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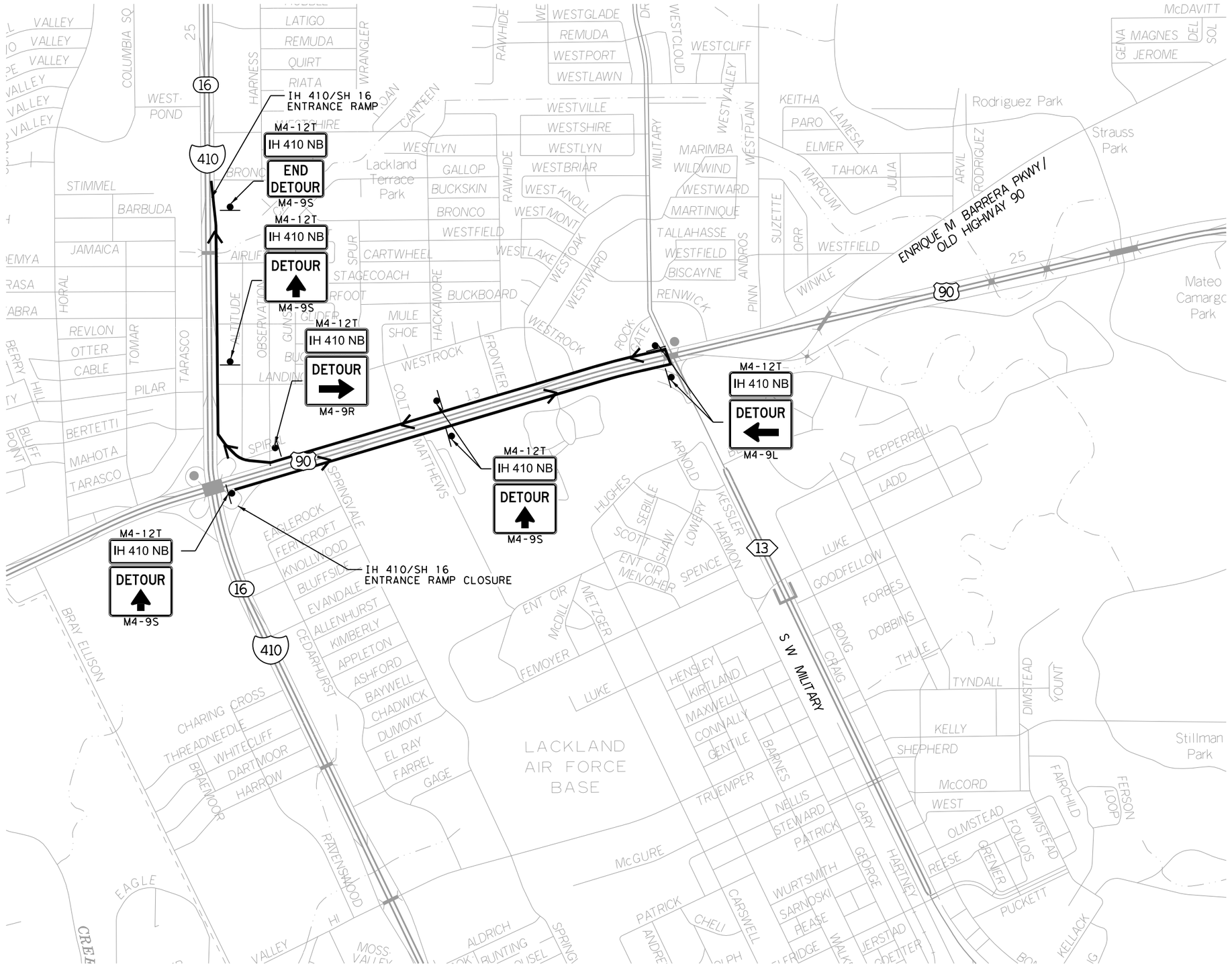

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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US 90

DETOUR LAYOUT

DETOUR EB-02
IH 410/SH 16 NORTHBOUND
ENTRANCE RAMP DETOUR

SHEET 2 OF 38

FED. RD. DIV. NO:	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	41
CONT.	SECT.	JOB	
0024	08	141	

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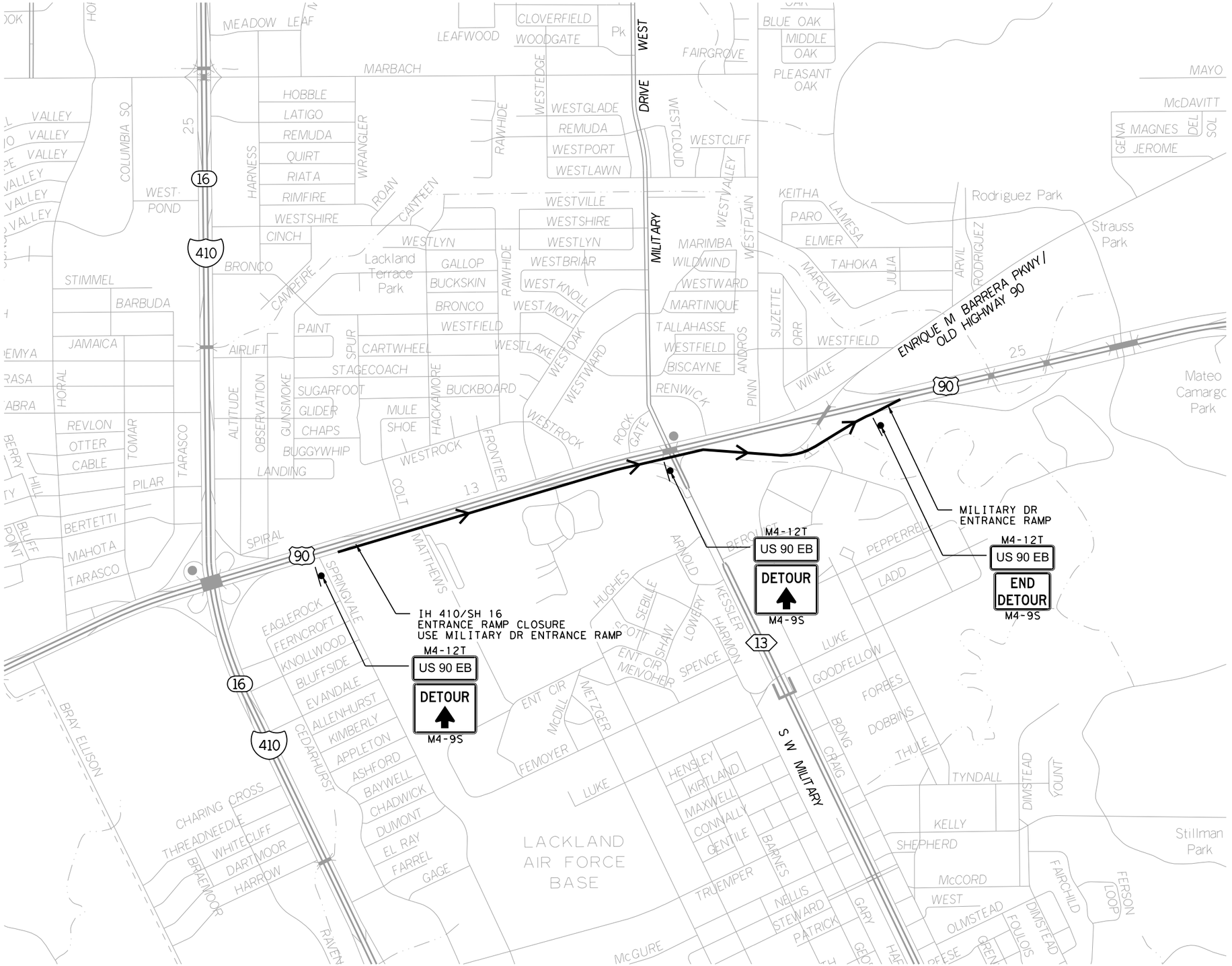

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-03
US 90 EASTBOUND
ENTRANCE RAMP DETOUR

SHEET 3 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	42
CONT.	SECT.	JOB	
0024	08	141	

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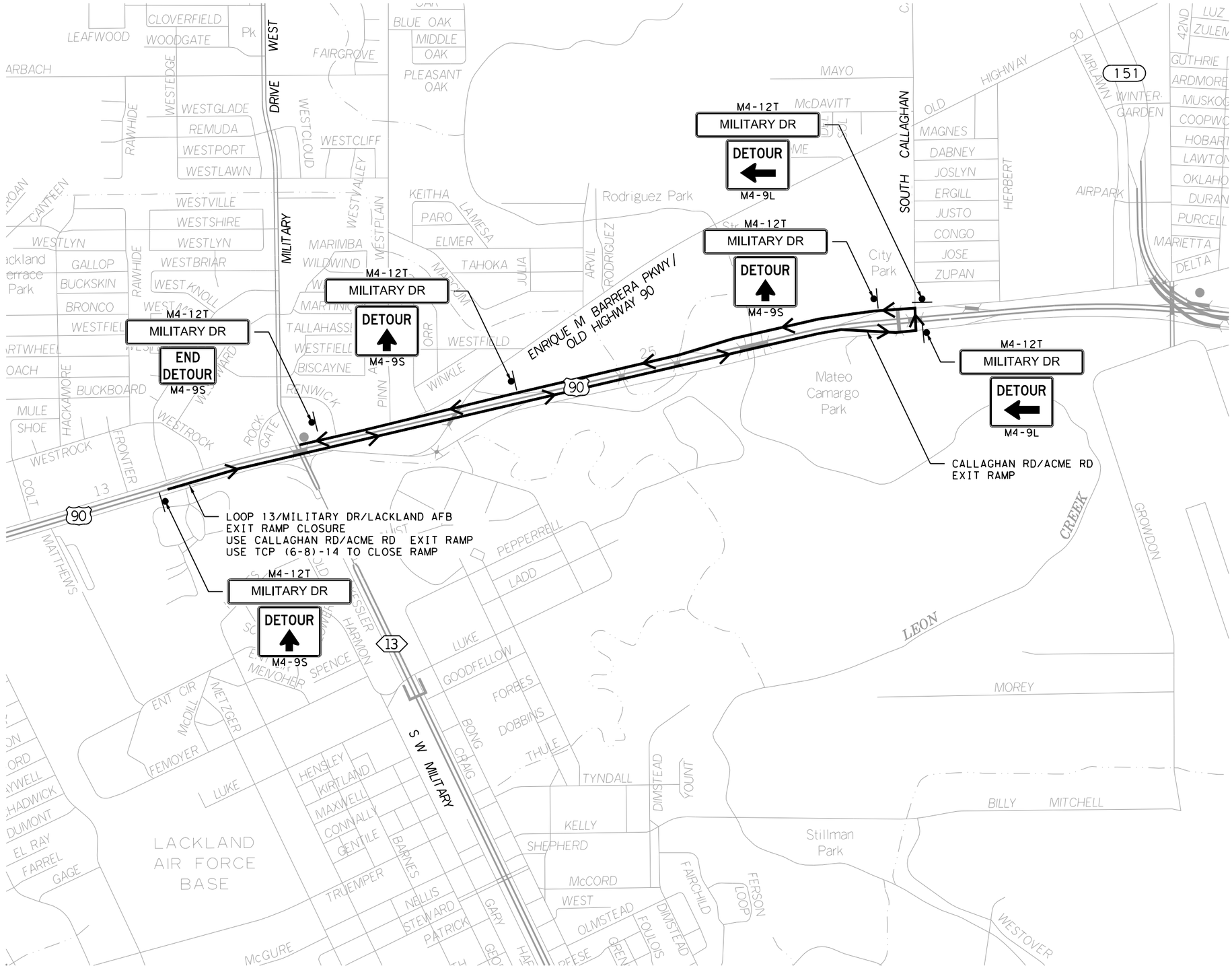

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

N

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-04
LOOP 13/MILITARY DR/LACKLAND AFB
EXIT RAMP DETOUR

SHEET 4 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	43
CONT.	SECT.	JOB	
0024	08	141	

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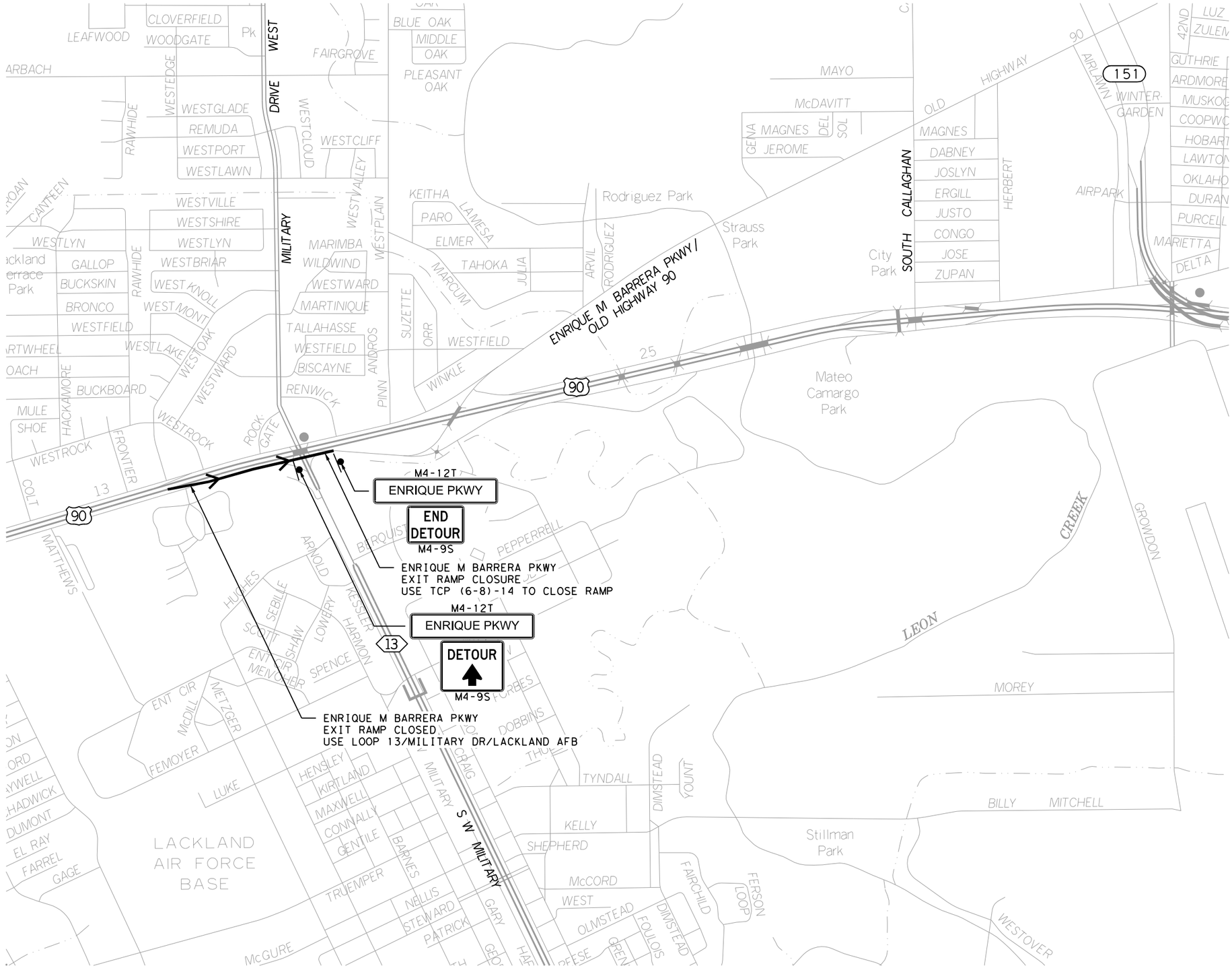

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-05
ENRIQUE M BARRERA PKWY
EXIT RAMP DETOUR

SHEET 5 OF 38

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	44
CONT.	SECT.	JOB	
0024	08	141	

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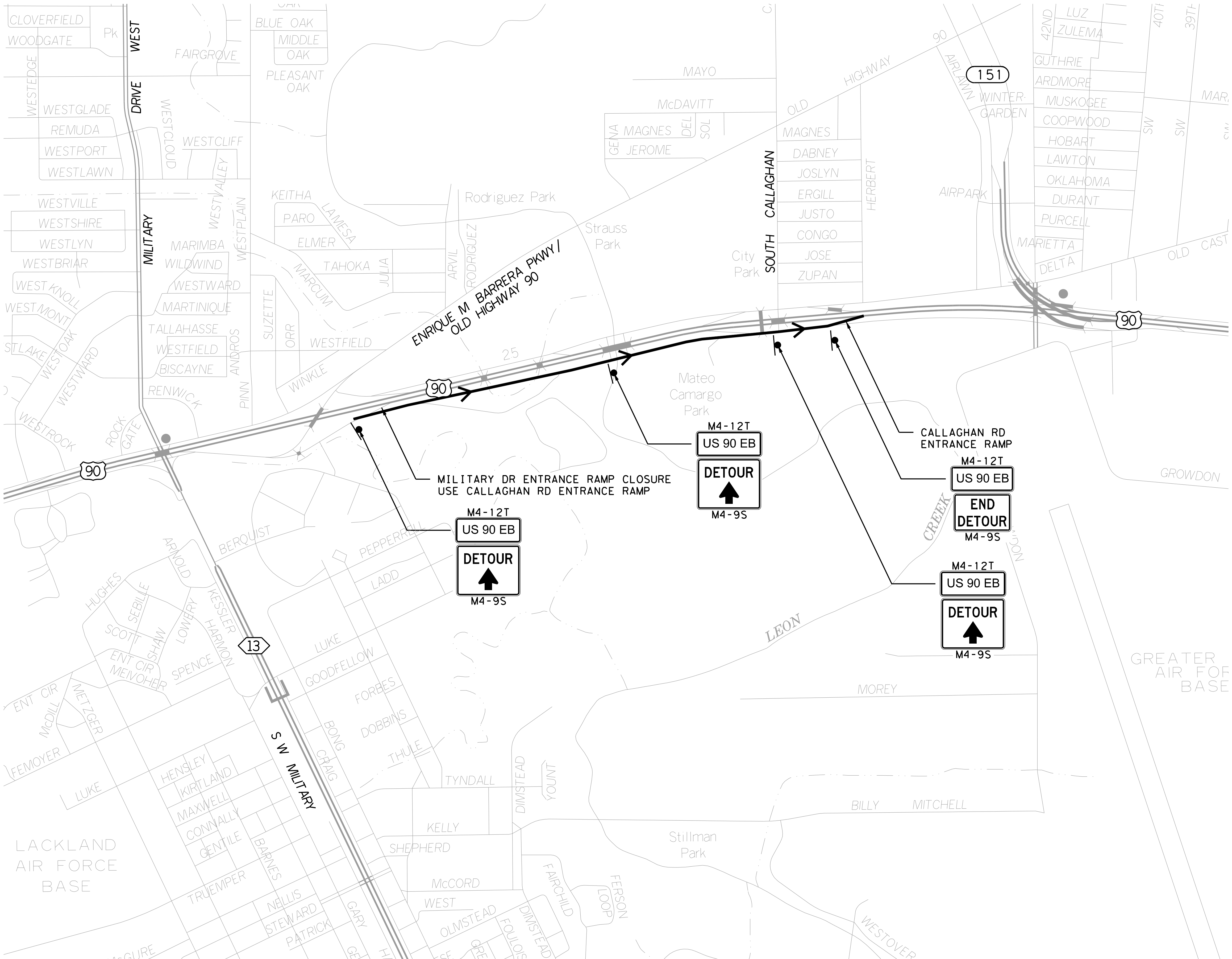

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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US 90

DETOUR LAYOUT

DETOUR EB-06
US 90 EASTBOUND
ENTRANCE RAMP DETOUR

SHEET 6 OF 38

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.	
6			US 90	
STATE	DIST.	COUNTY		SHEET NO.
TEXAS	SAT	BEXAR		45
CONT.	SECT.	JOB		
0024	08	141		

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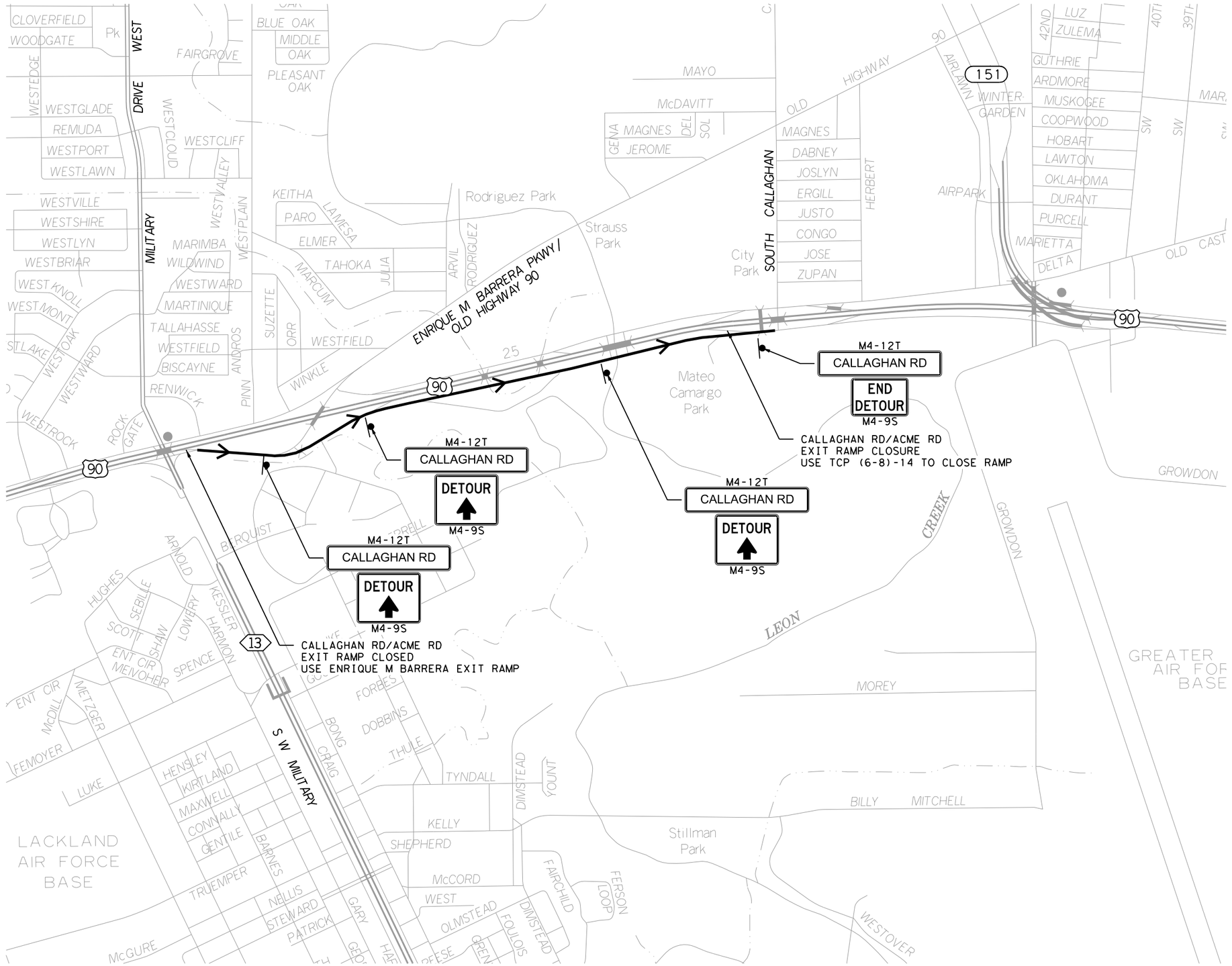

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

4/1/2021

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Kimley»Horn F-928

US 90

DETOUR LAYOUT

DETOUR EB-07
CALLAGHAN RD/ACME RD
EXIT RAMP DETOUR

SHEET 7 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	46
CONT.	SECT.	JOB	
0024	08	141	

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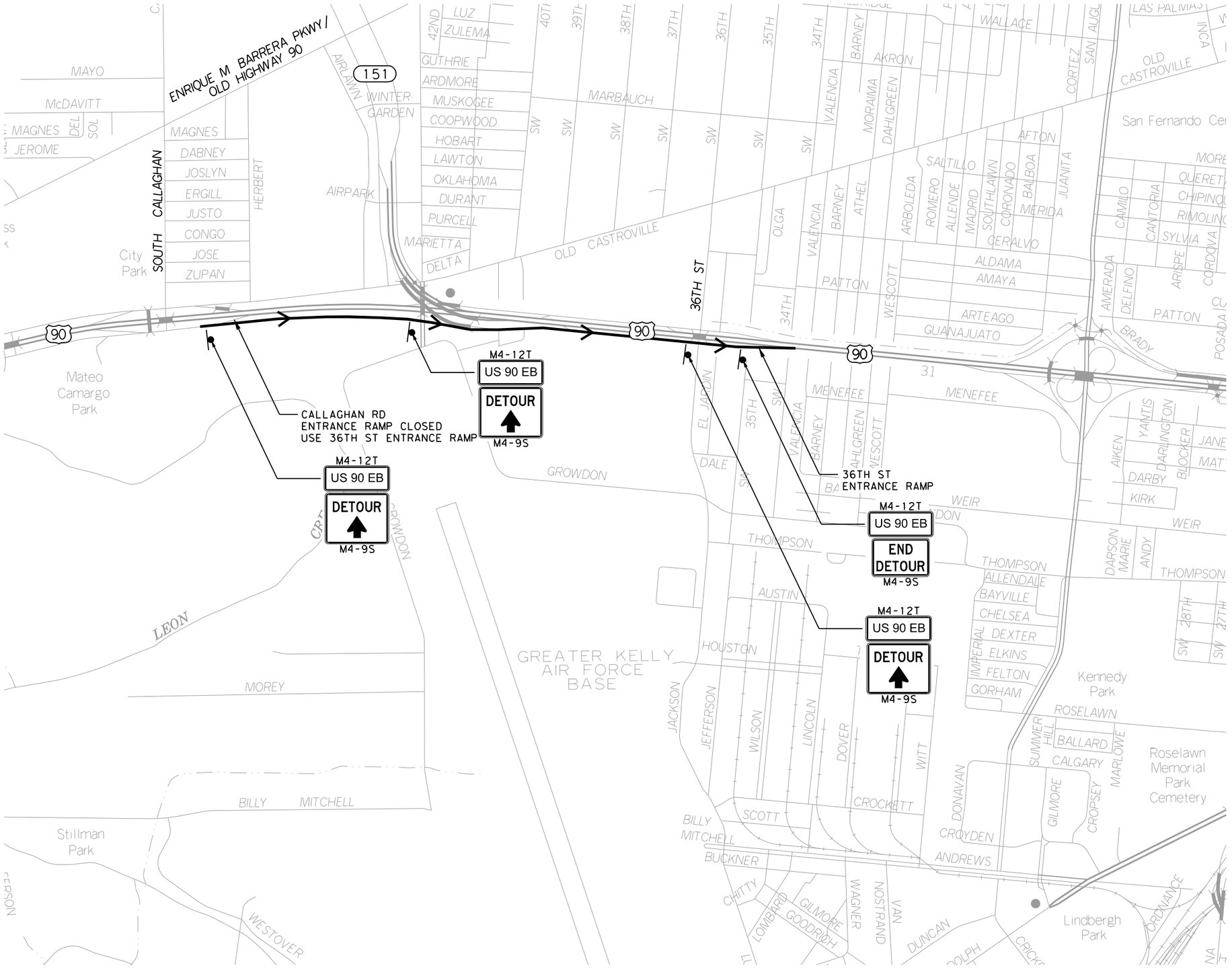

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-08
US 90 EASTBOUND
ENTRANCE RAMP DETOUR

SHEET 8 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	47
CONT.	SECT.	JOB	
0024	08	141	

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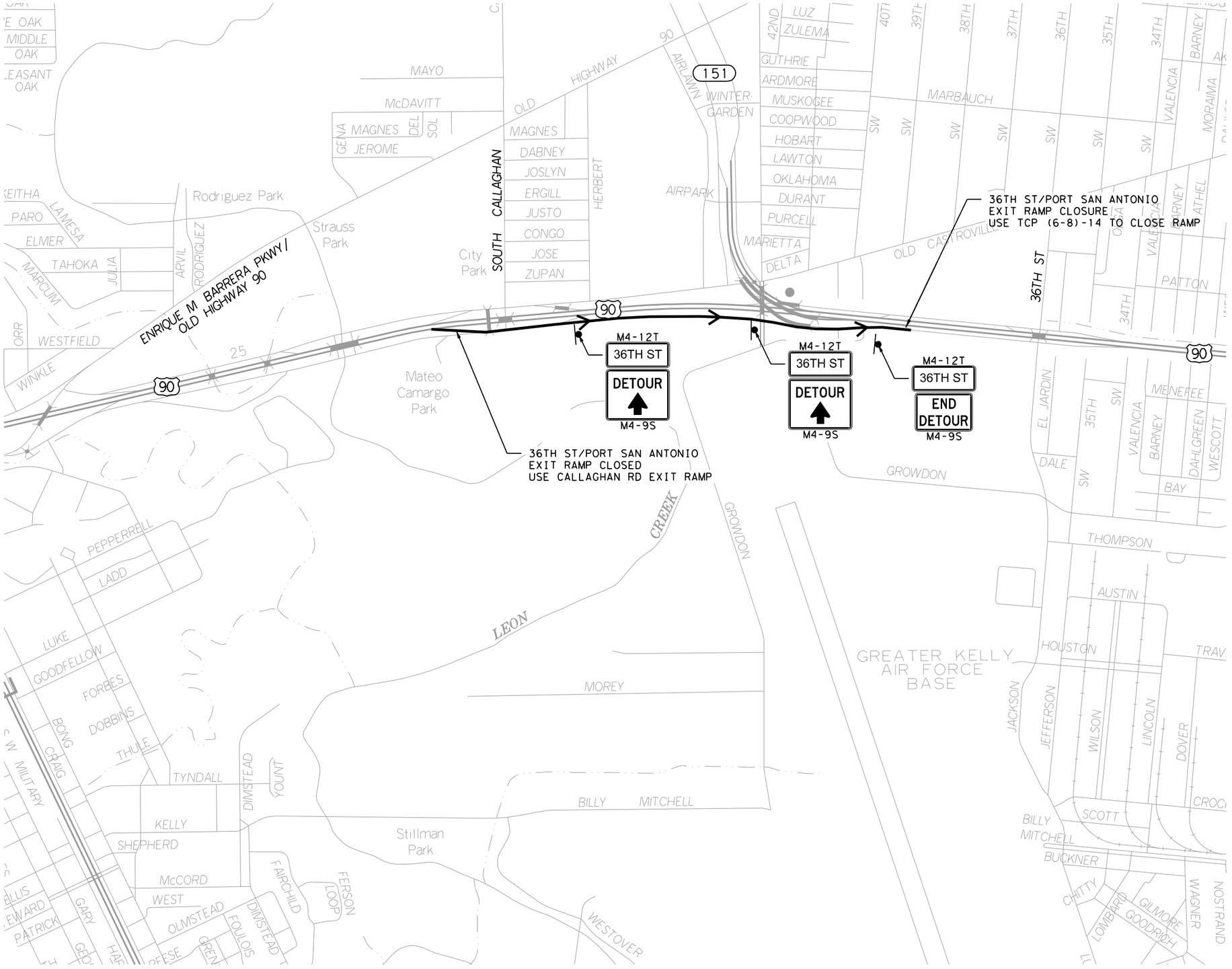

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-09
36TH ST/PORT SAN ANTONIO
EXIT RAMP DETOUR

SHEET 9 OF 38

FED. RD. DIV. NO:	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	48
CONT.	SECT.	JOB	
0024	08	141	

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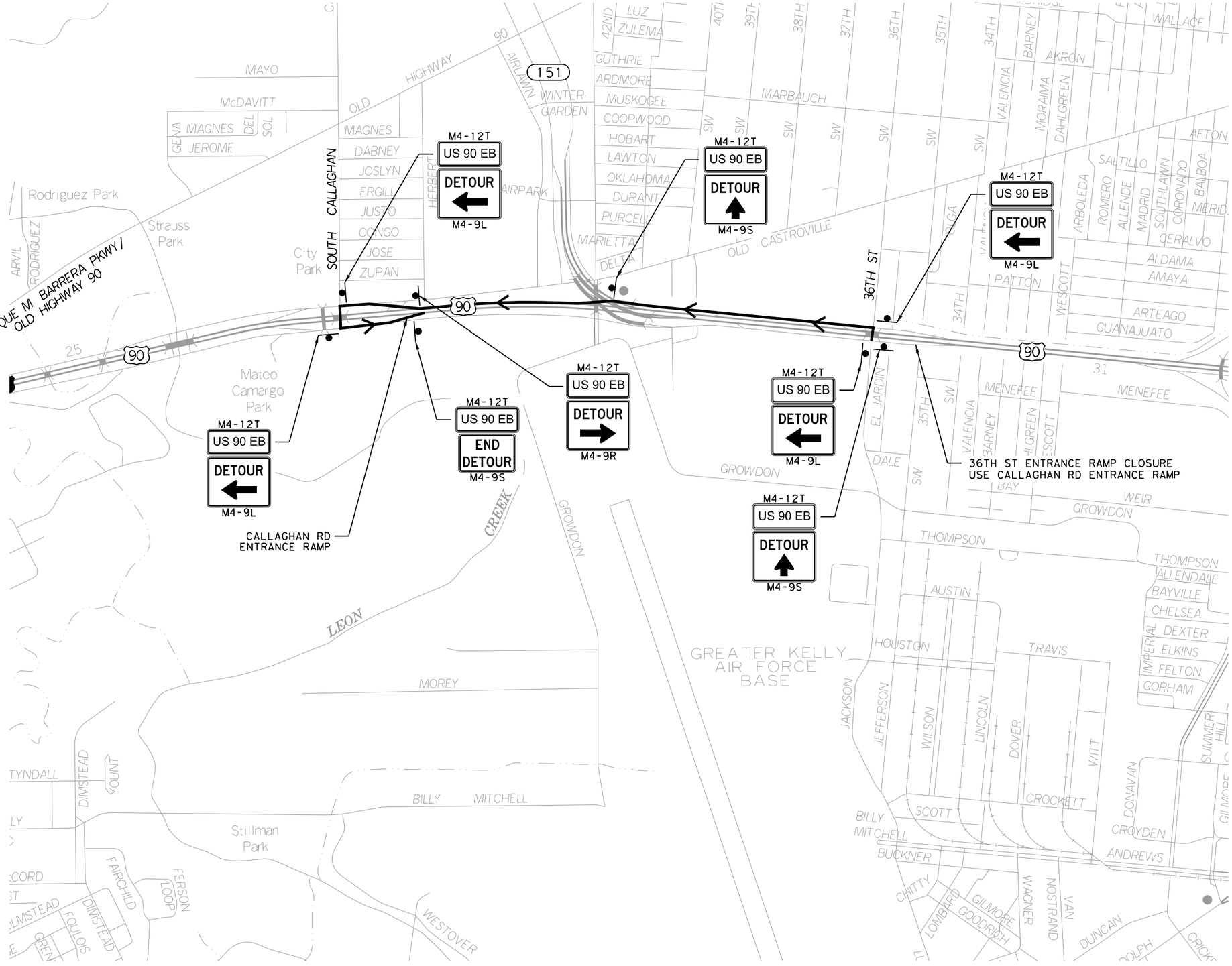

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR EB-10
36TH ST
ENTRANCE RAMP DETOUR

SHEET 10 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	49
CONT.	SECT.	JOB	
0024	08	141	

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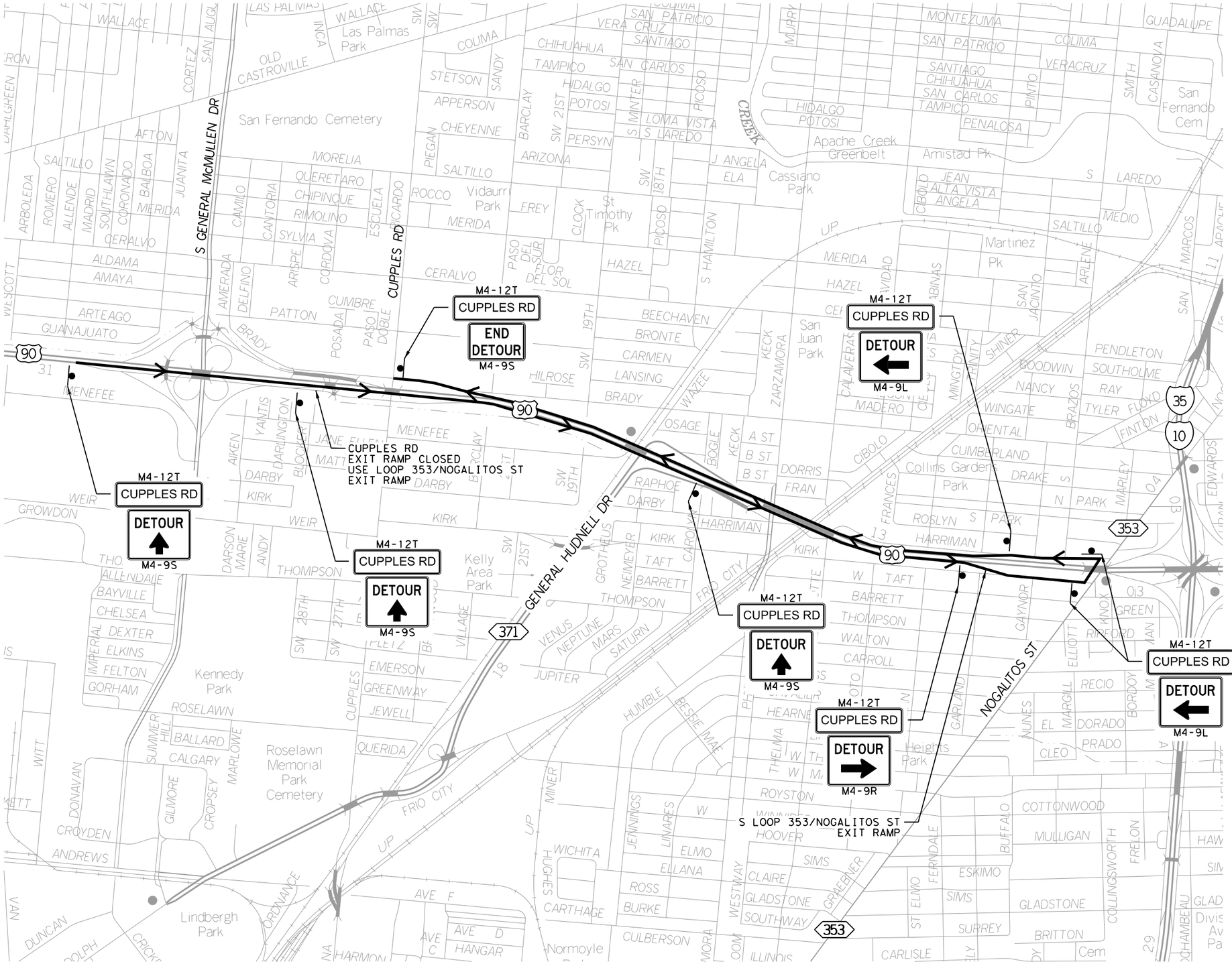

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR EB-11
CUPPLES ROAD
EXIT RAMP DETOUR

SHEET 11 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	50
CONT.	SECT.	JOB	
0024	08	141	

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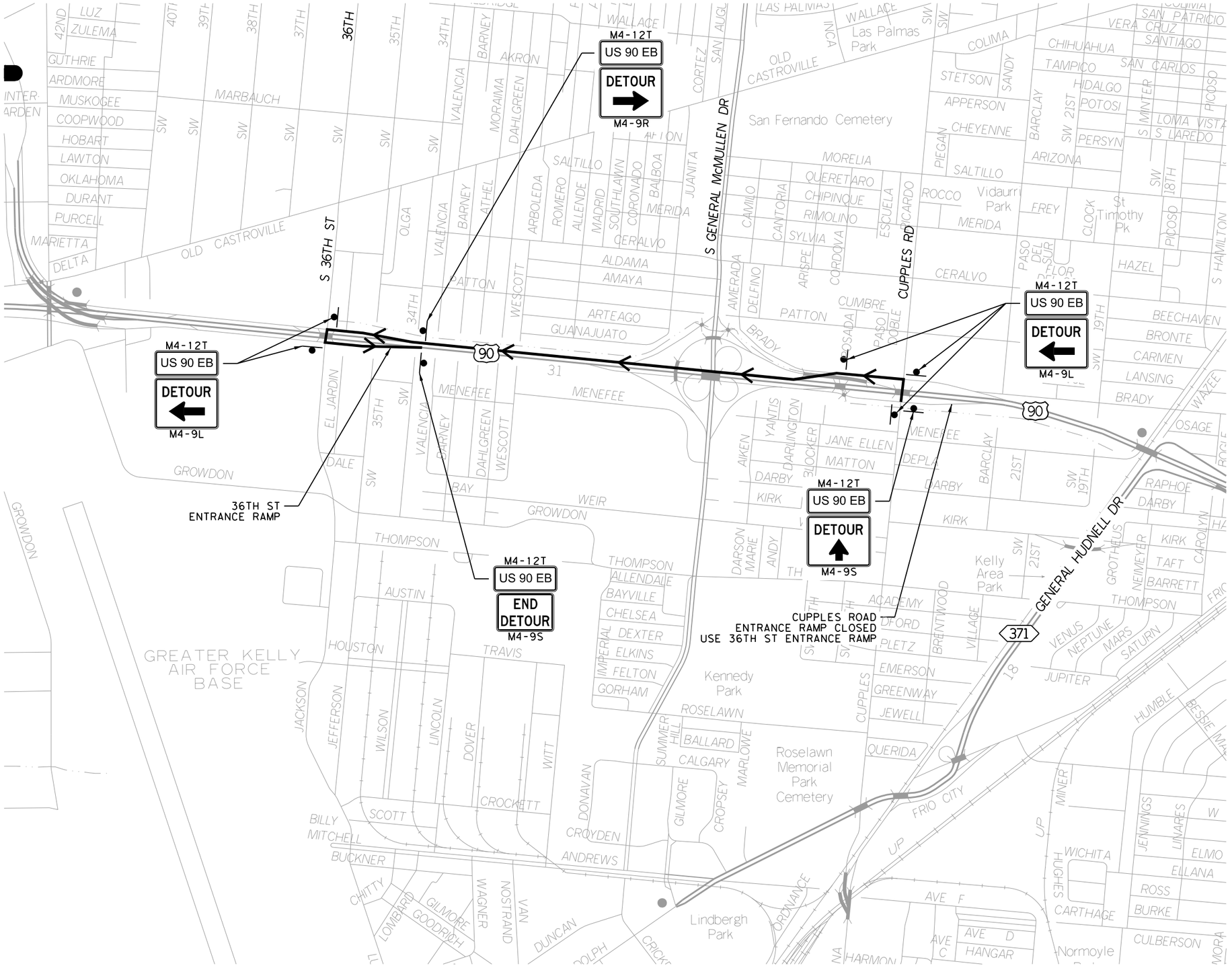

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR EB-12
CUPPLES ROAD
ENTRANCE RAMP DETOUR

SHEET 12 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	51
CONT.	SECT.	JOB	
0024	08	141	

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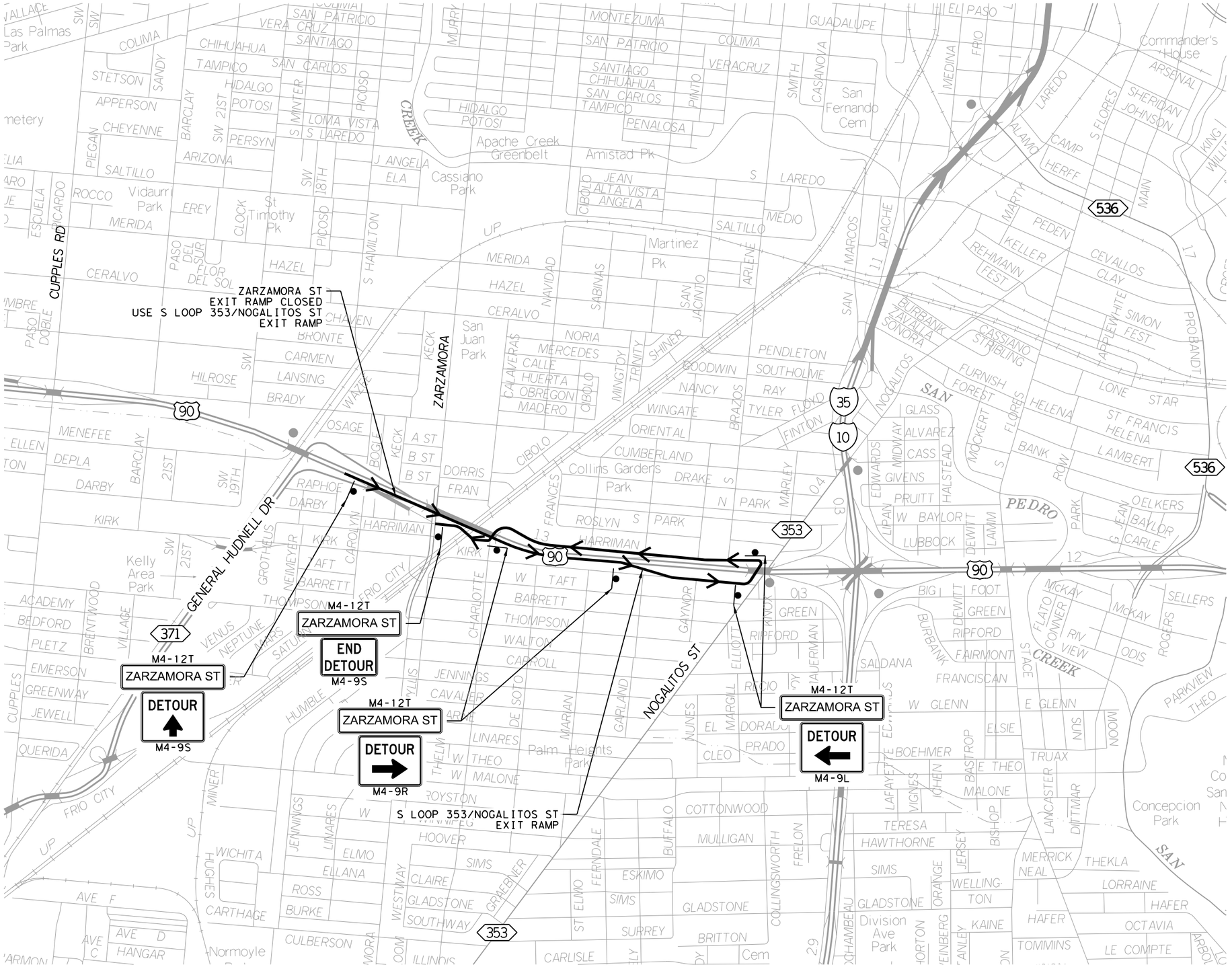

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR EB-13
ZARZAMORA ST ROAD
EXIT RAMP DETOUR

SHEET 13 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	52
CONT.	SECT.	JOB	
0024	08	141	

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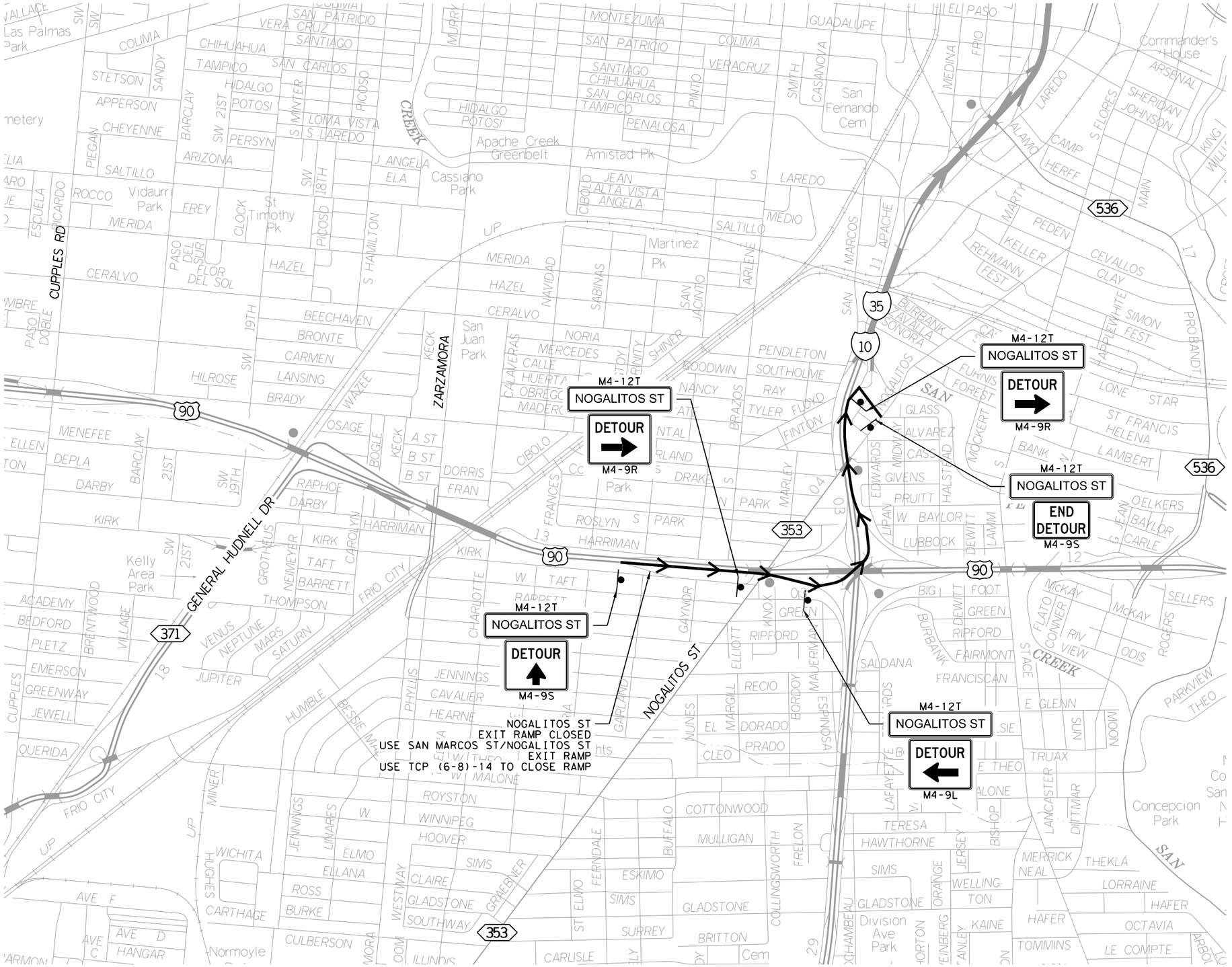

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR EB-14
S LOOP 353/NOGALITOS ST
EXIT RAMP DETOUR

SHEET 14 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	53
CONT.	SECT.	JOB	
0024	08	141	

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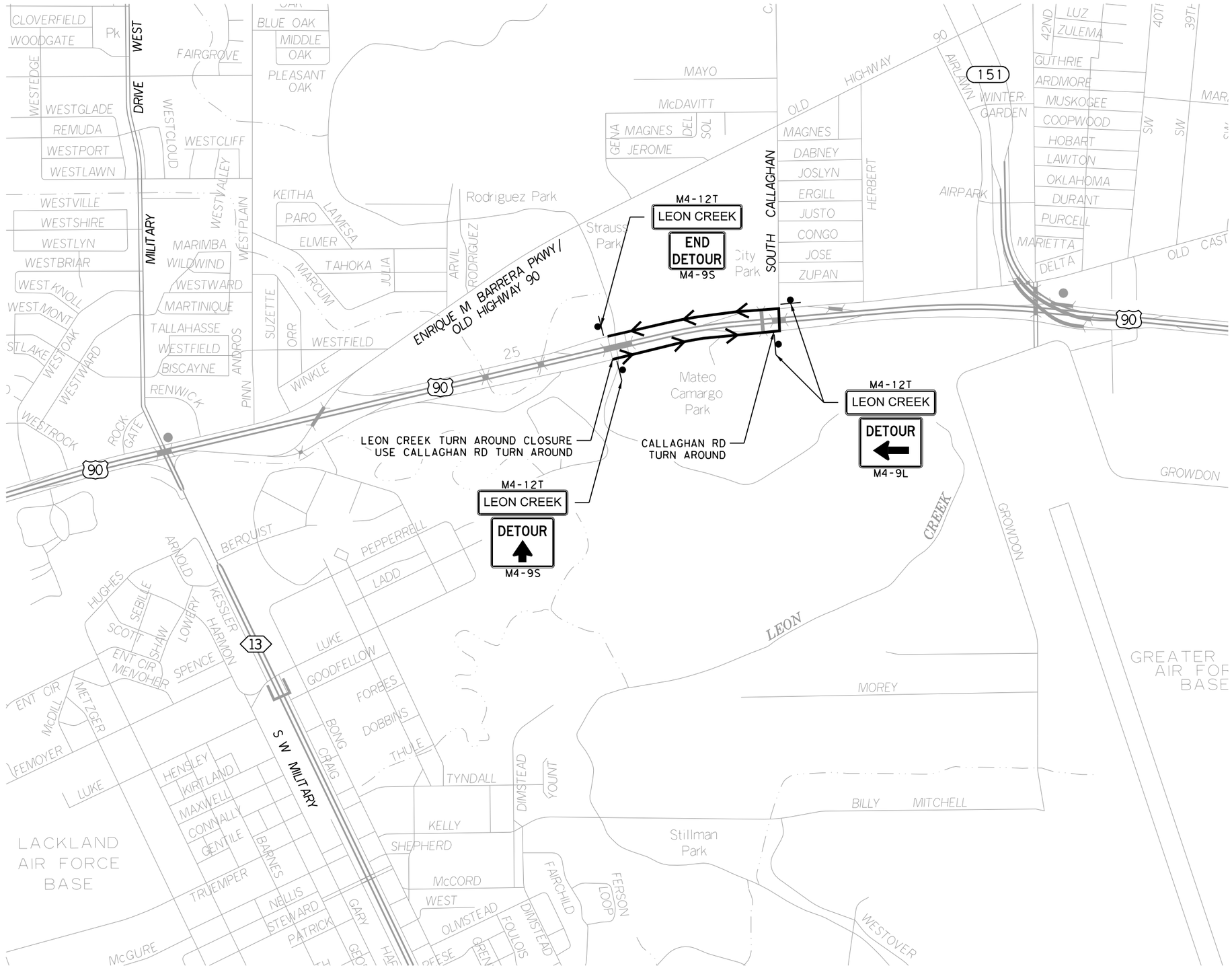

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1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR LC-01
US 90 EASTBOUND
LEON CREEK TURN AROUND DETOUR

SHEET 15 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	54
CONT.	SECT.	JOB	
0024	08	141	

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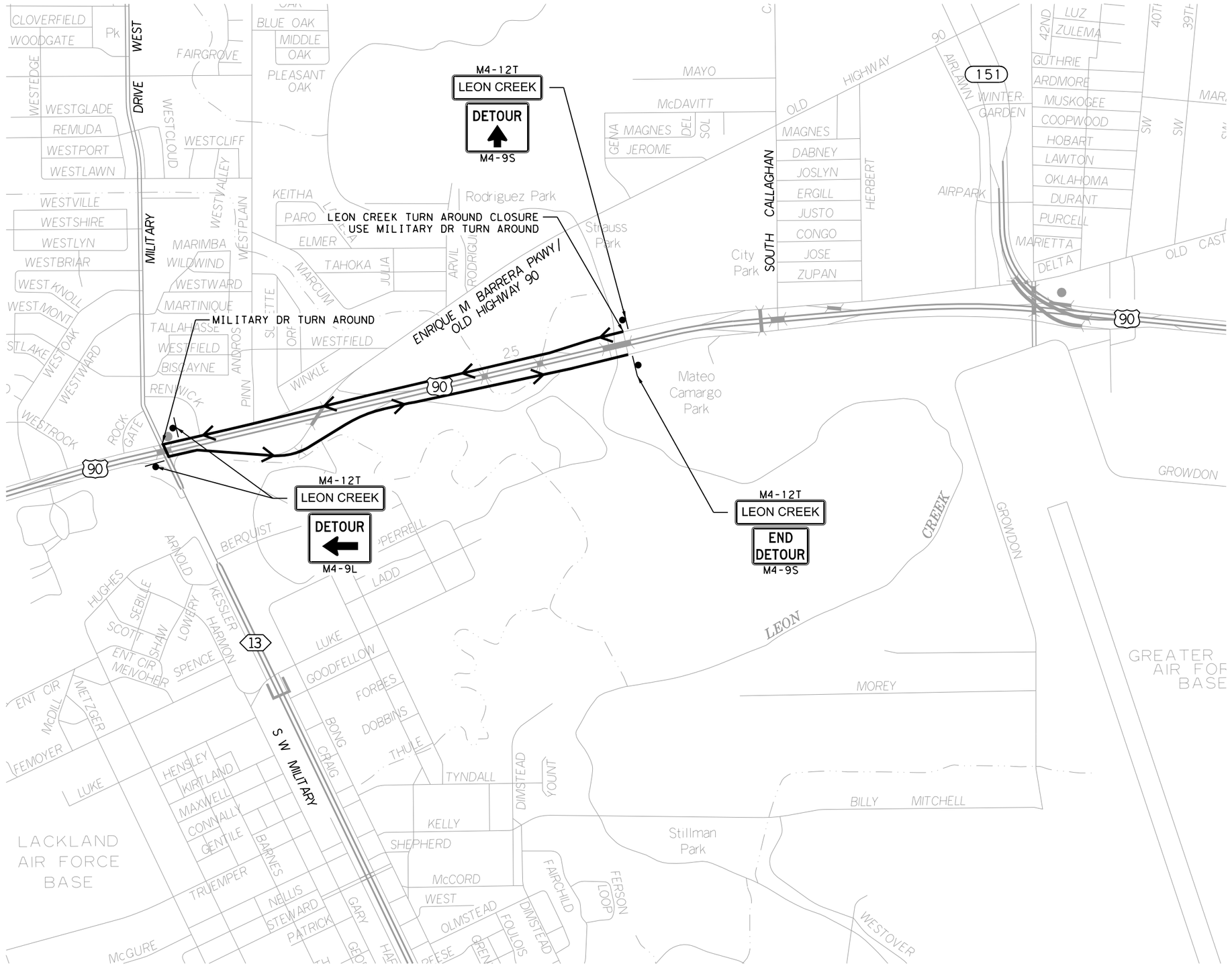

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR LC-02
US 90 WESTBOUND
LEON CREEK TURN AROUND DETOUR

SHEET 16 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	55
CONT.	SECT.	JOB	
0024	08	141	

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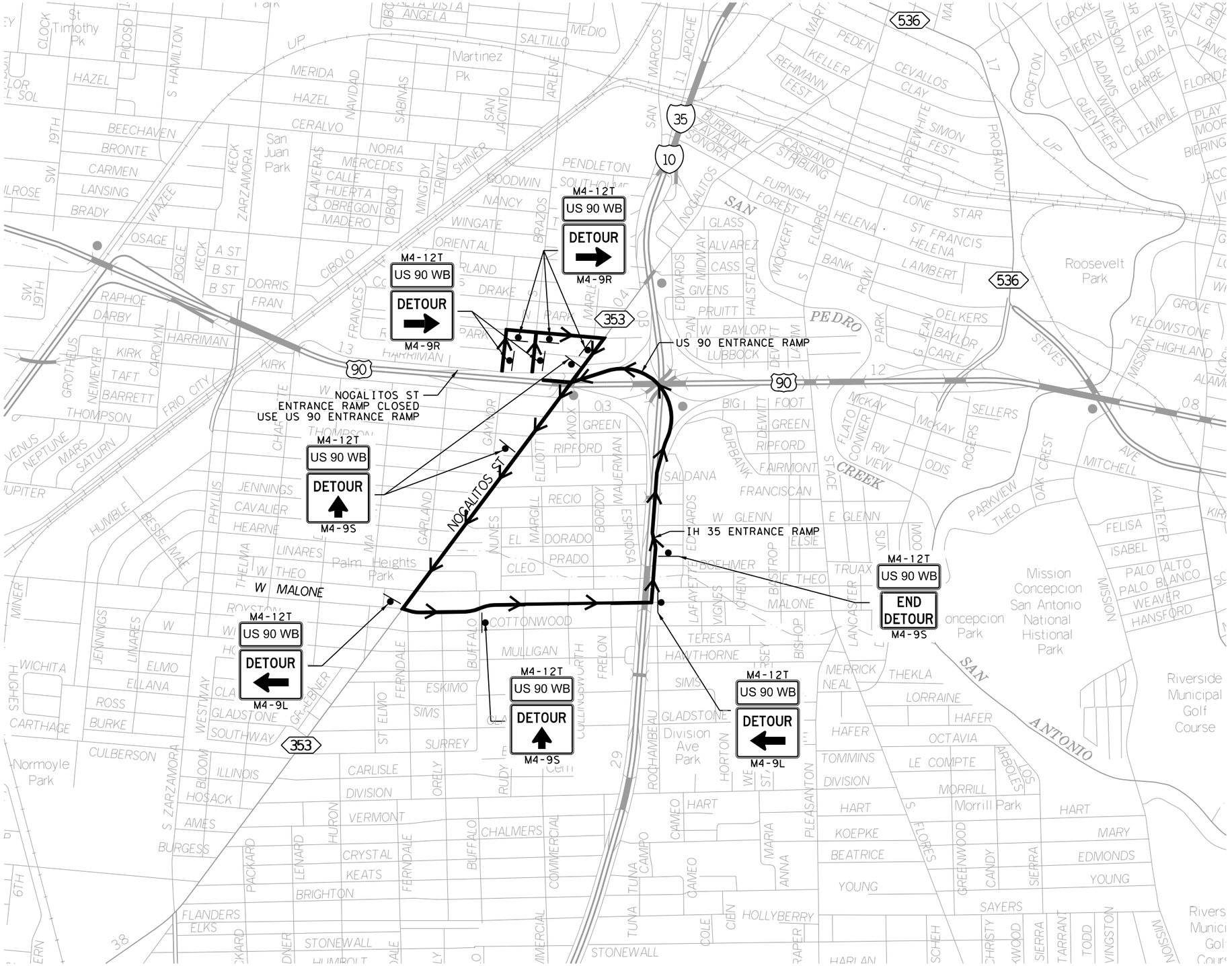

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1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-01
NOGALITOS ST
ENTRANCE RAMP DETOUR

SHEET 17 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	56
CONT.	SECT.	JOB	
0024	08	141	

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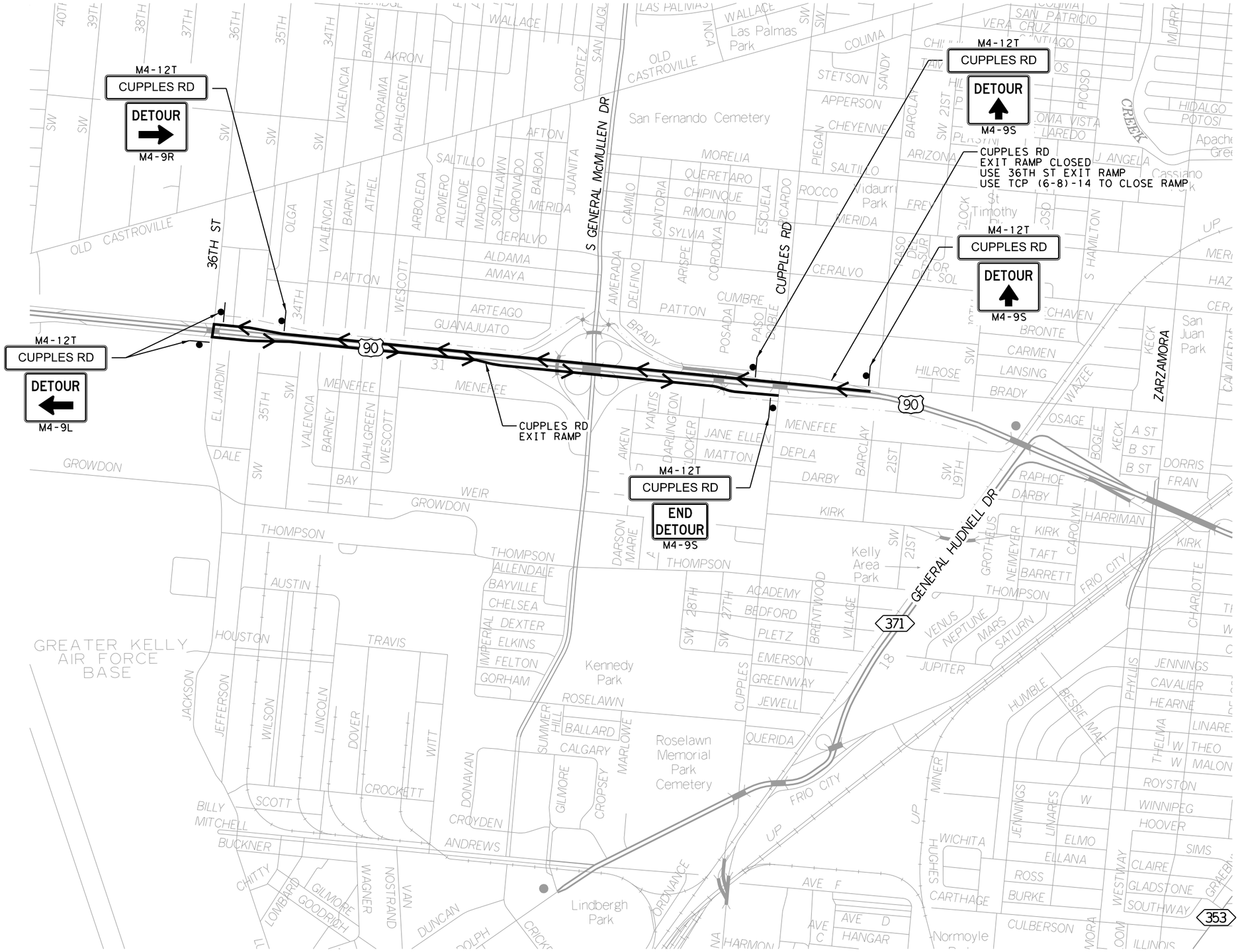

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1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-02
CUPPLES RD
EXIT RAMP DETOUR

SHEET 18 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	57
CONT.	SECT.	JOB	
0024	08	141	

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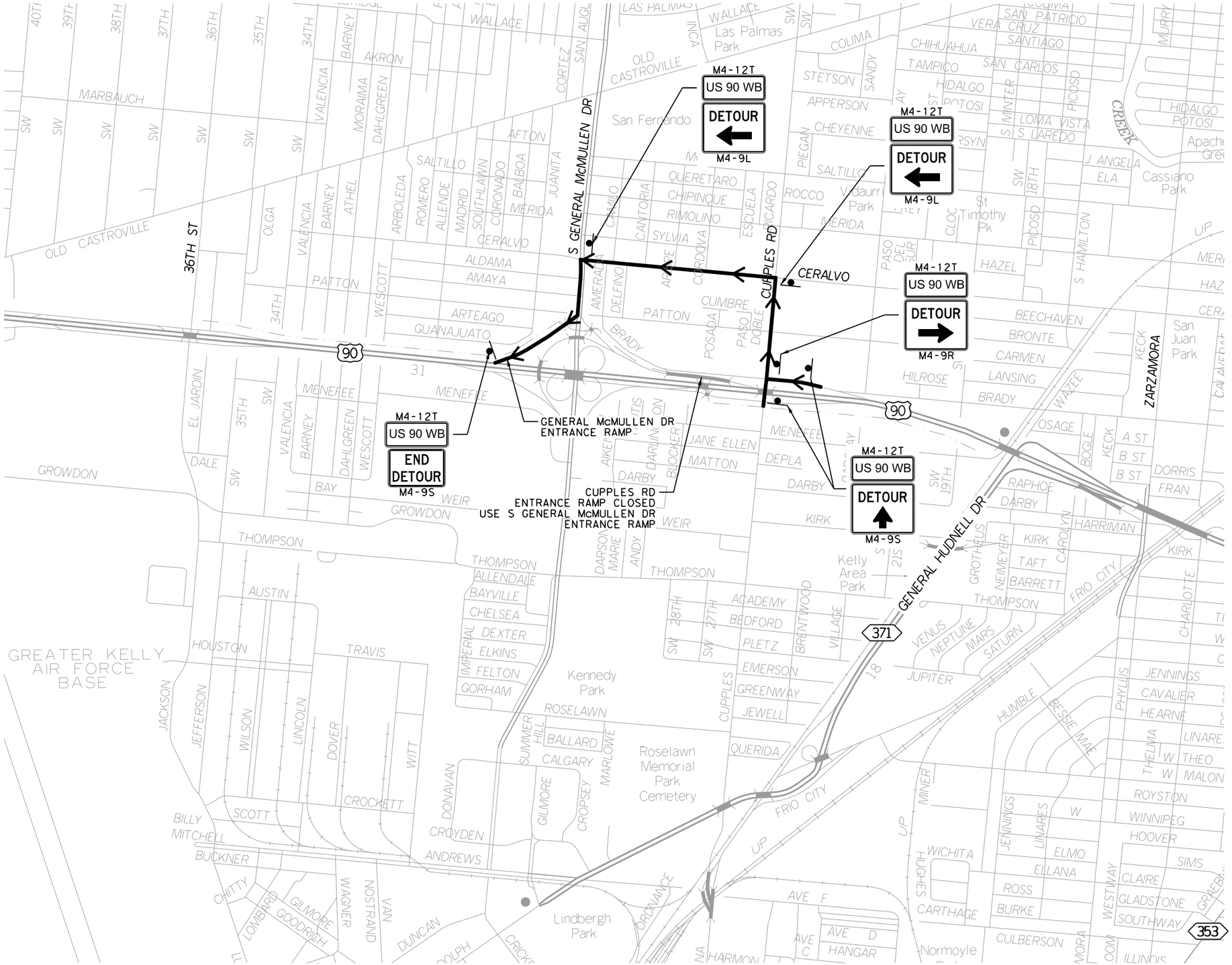

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1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-03
CUPPLES RD
ENTRANCE RAMP DETOUR

SHEET 19 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	58
CONT.	SECT.	JOB	
0024	08	141	

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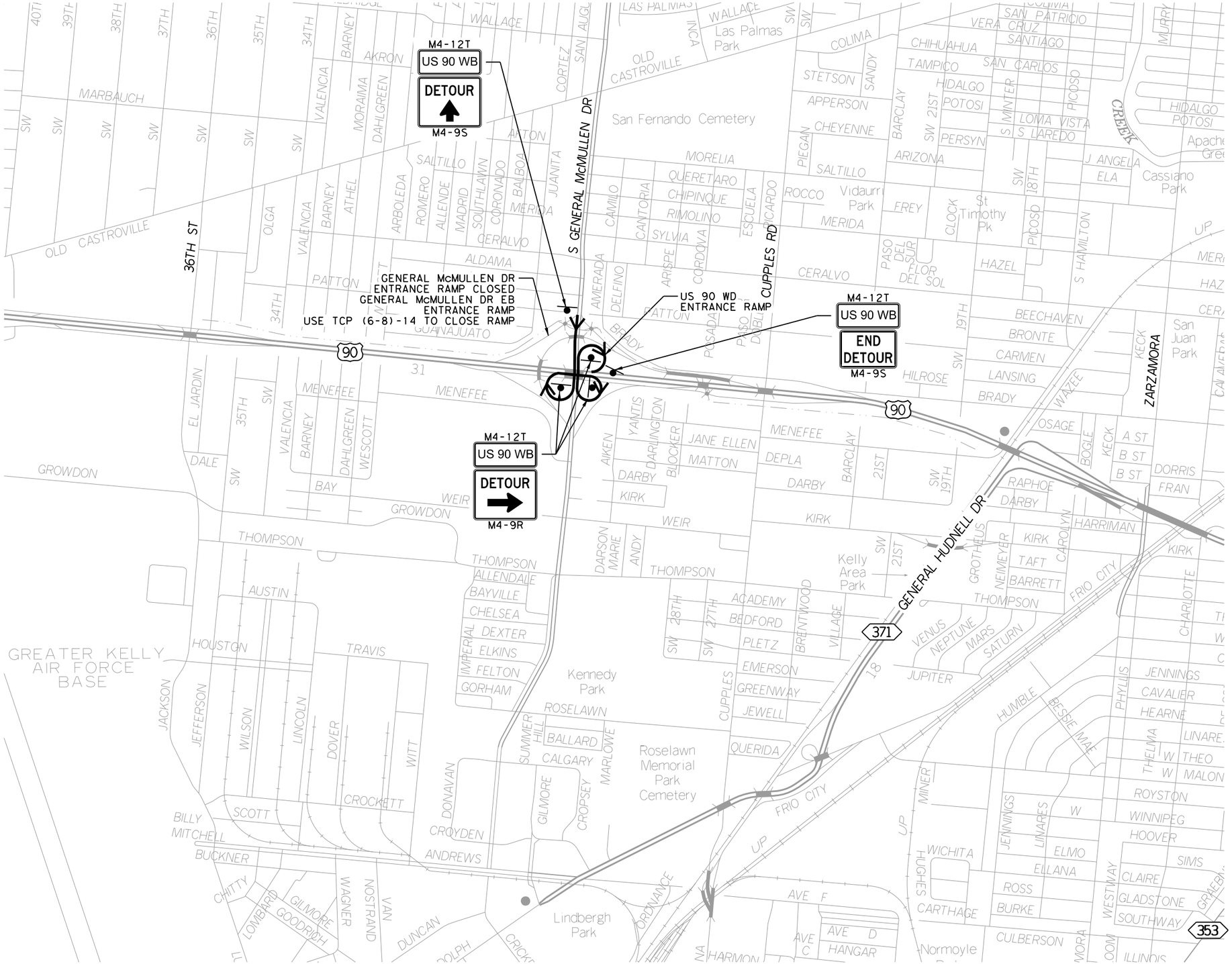

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-04
GENERAL McMULLEN DR
ENTRANCE RAMP DETOUR

SHEET 20 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	59
CONT.	SECT.	JOB	
0024	08	141	

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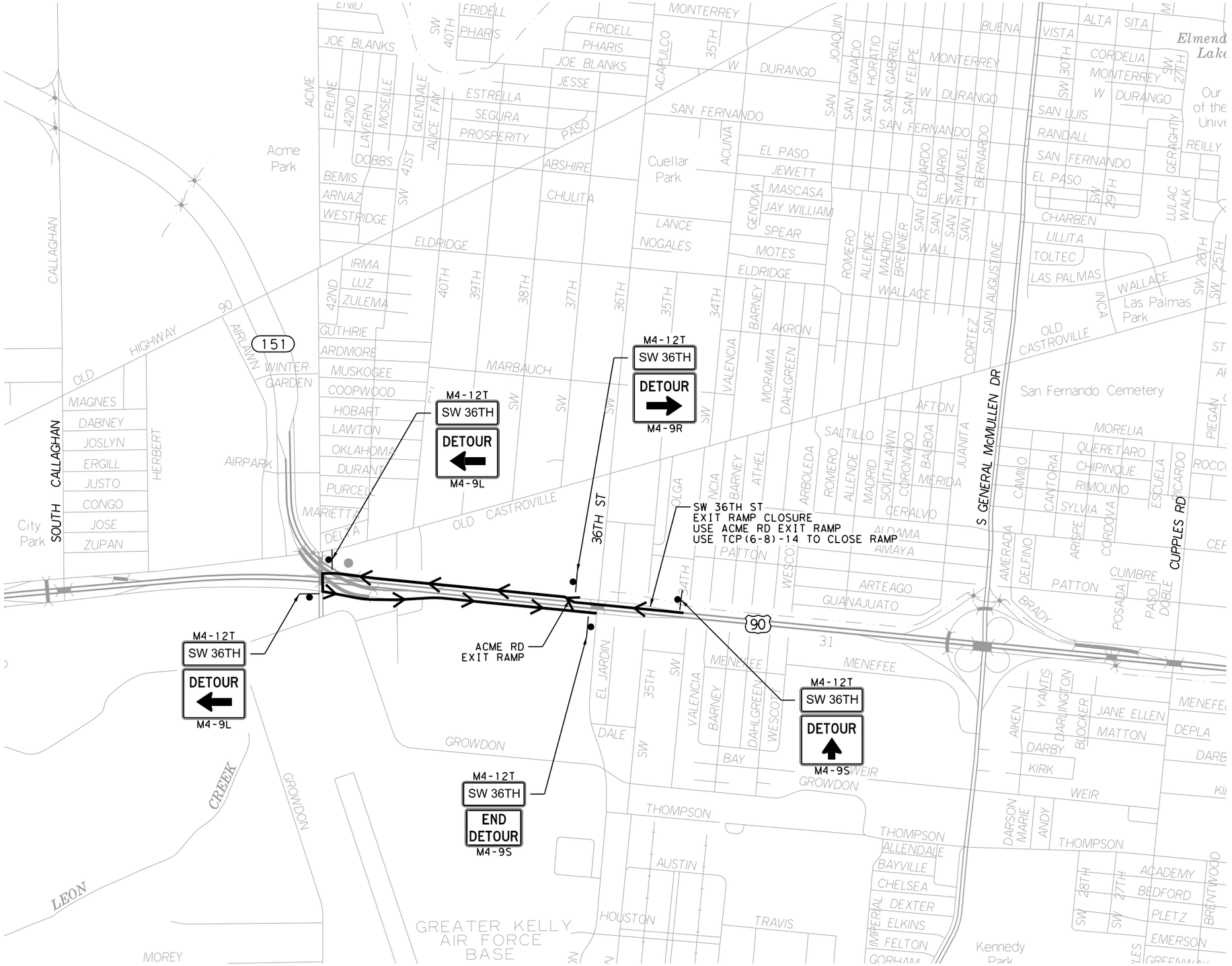

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-05
SW 36TH ST
EXIT RAMP DETOUR

SHEET 21 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	60
CONT.	SECT.	JOB	
0024	08	141	

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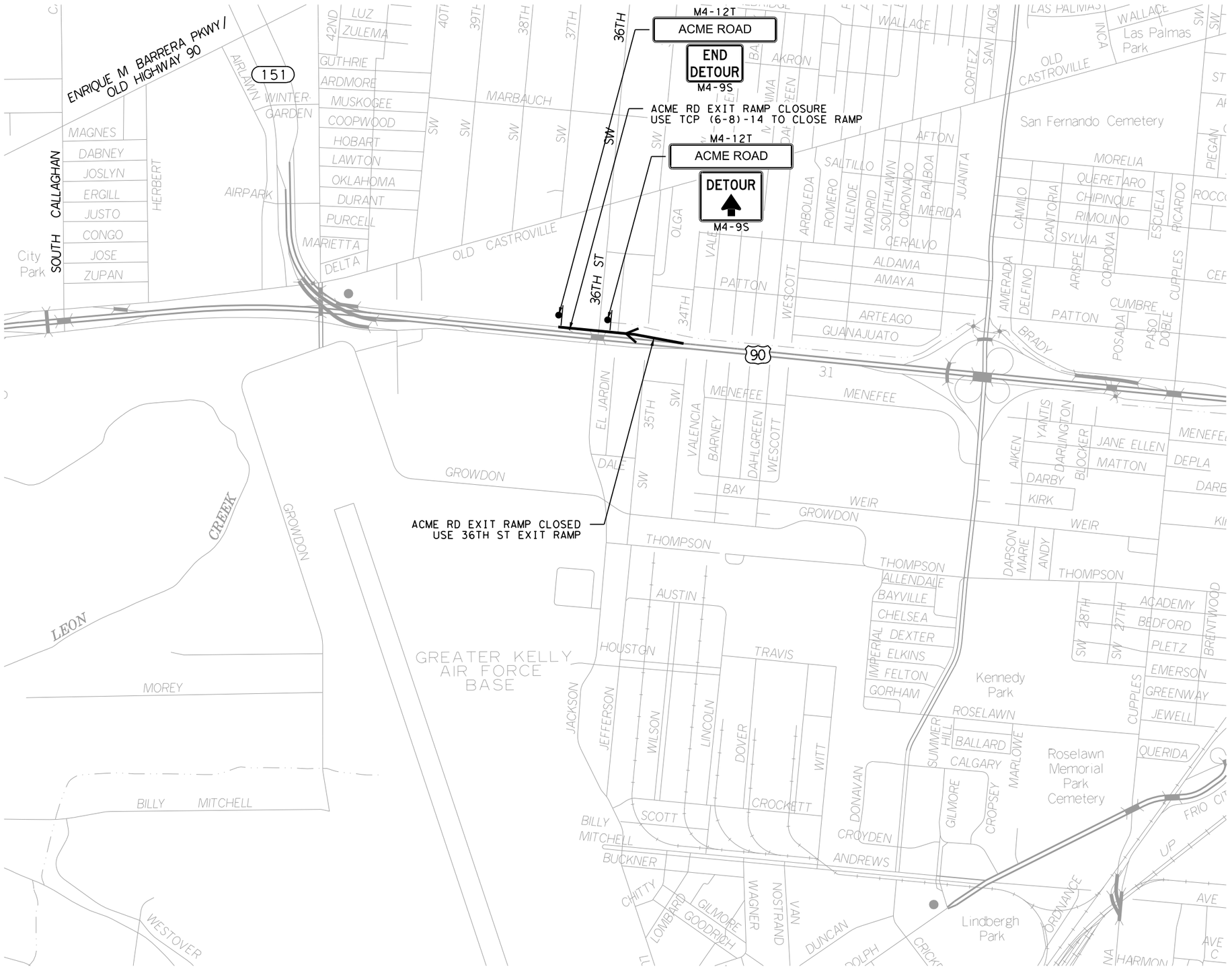

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR #8
ACME RD
EXIT RAMP DETOUR

SHEET 22 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	61
CONT.	SECT.	JOB	
0024	08	141	

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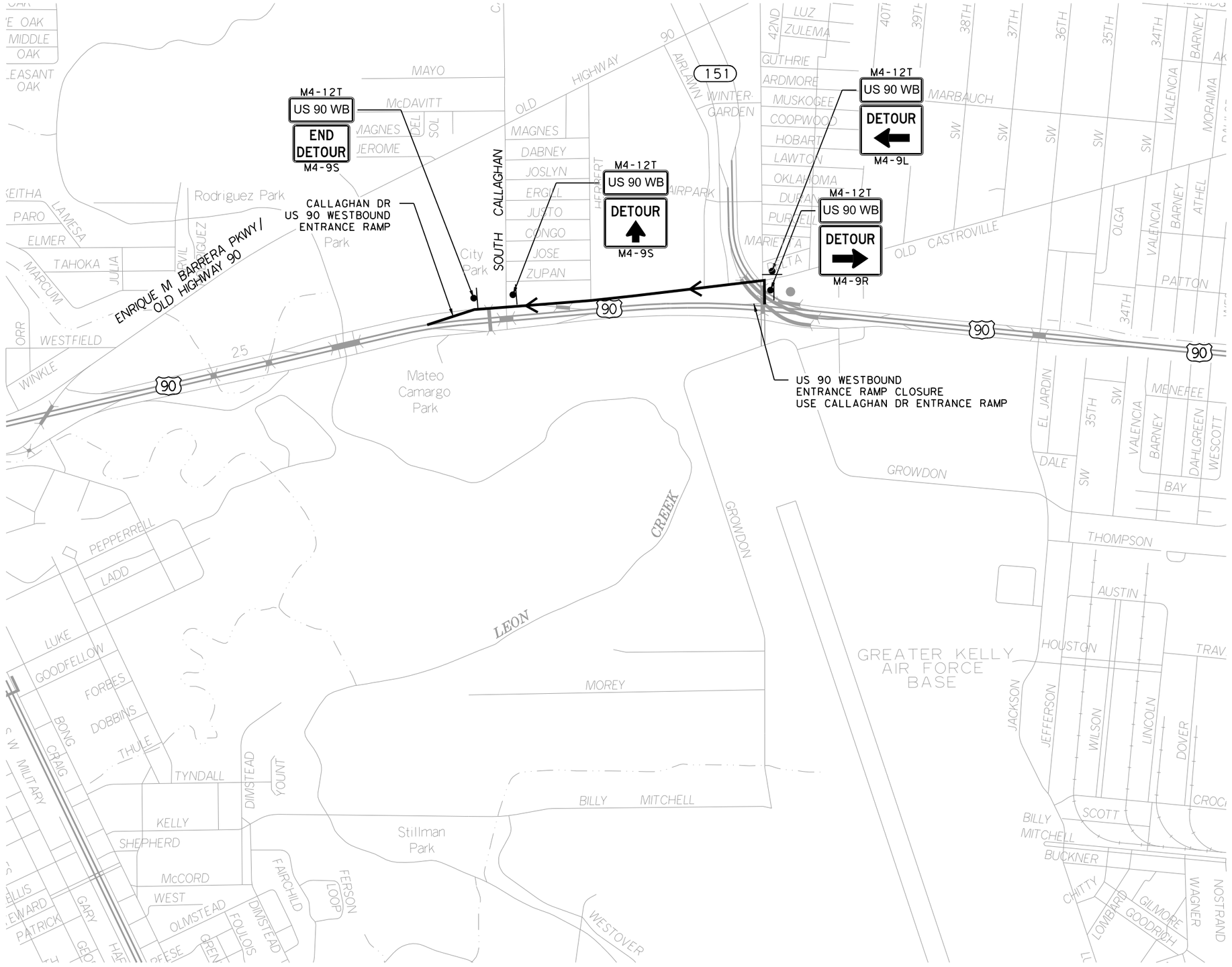

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-07
US 90 WESTBOUND
ENTRANCE RAMP DETOUR

SHEET 23 OF 38

FED. RD. DIV. NO:	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	62
CONT.	SECT.	JOB	
0024	08	141	

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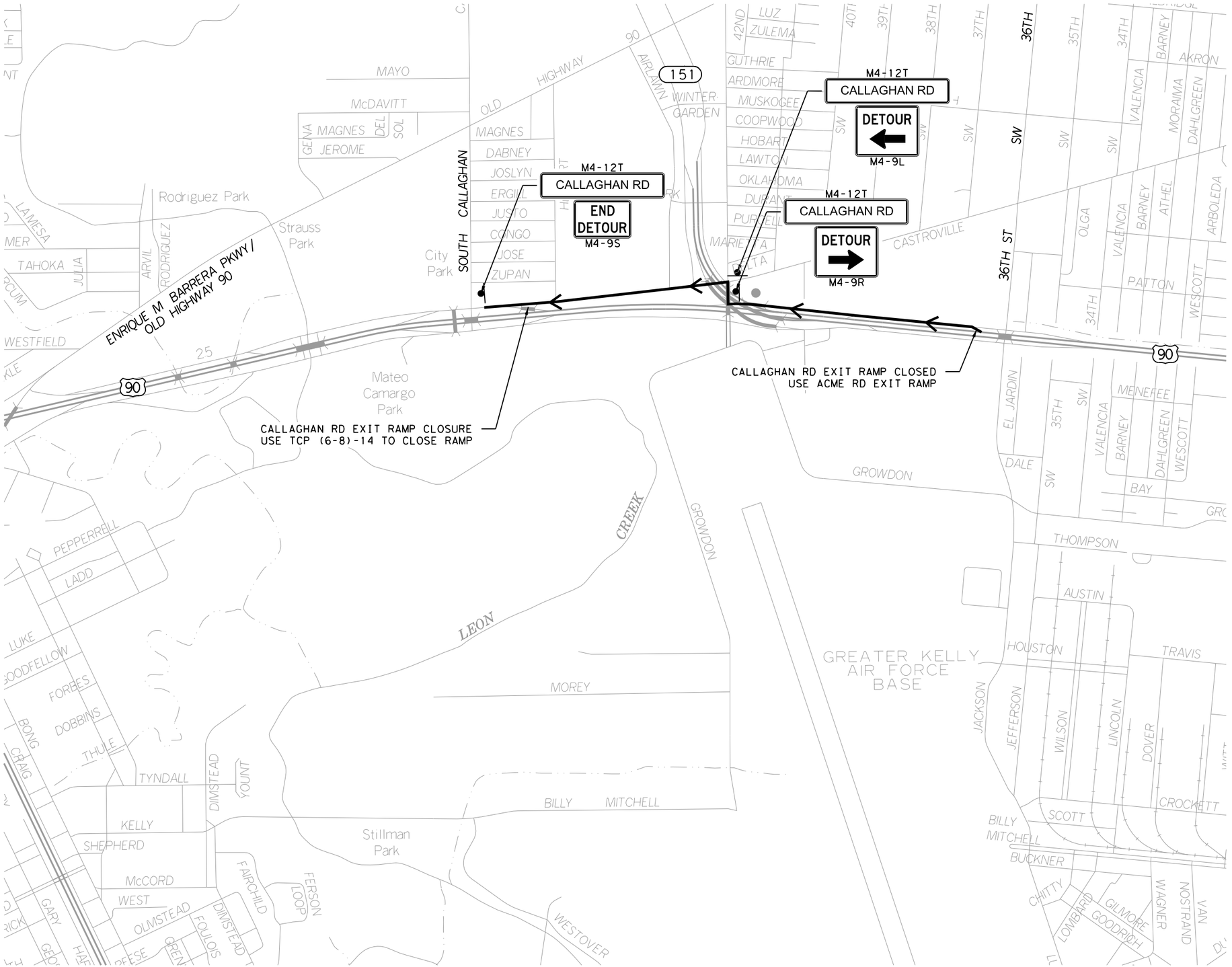

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-08
CALLAGHAN RD
EXIT RAMP DETOUR

SHEET 24 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	63
CONT.	SECT.	JOB	
0024	08	141	

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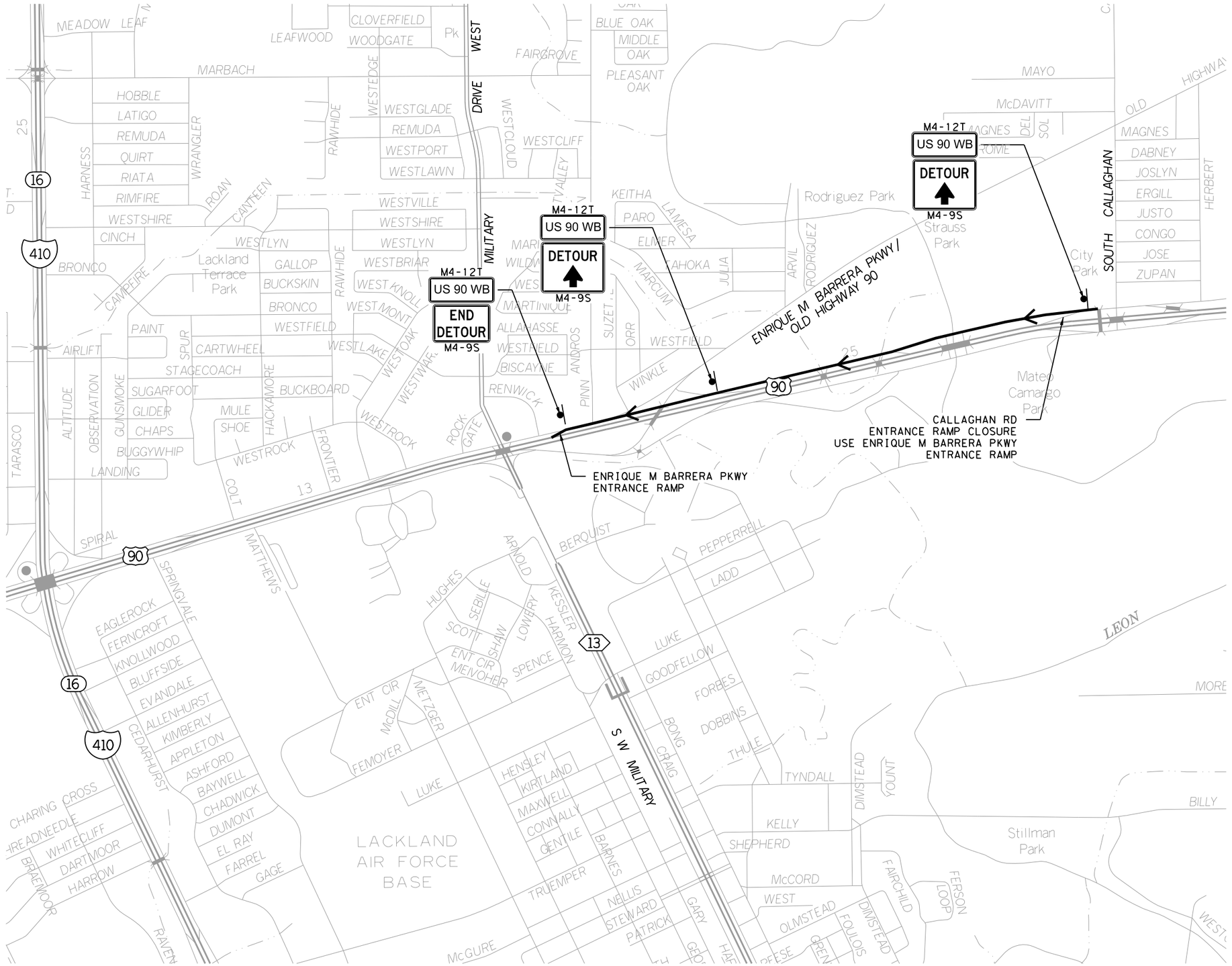

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-09
US 90 WESTBOUND
ENTRANCE RAMP DETOUR

SHEET 25 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	64
CONT.	SECT.	JOB	
0024	08	141	

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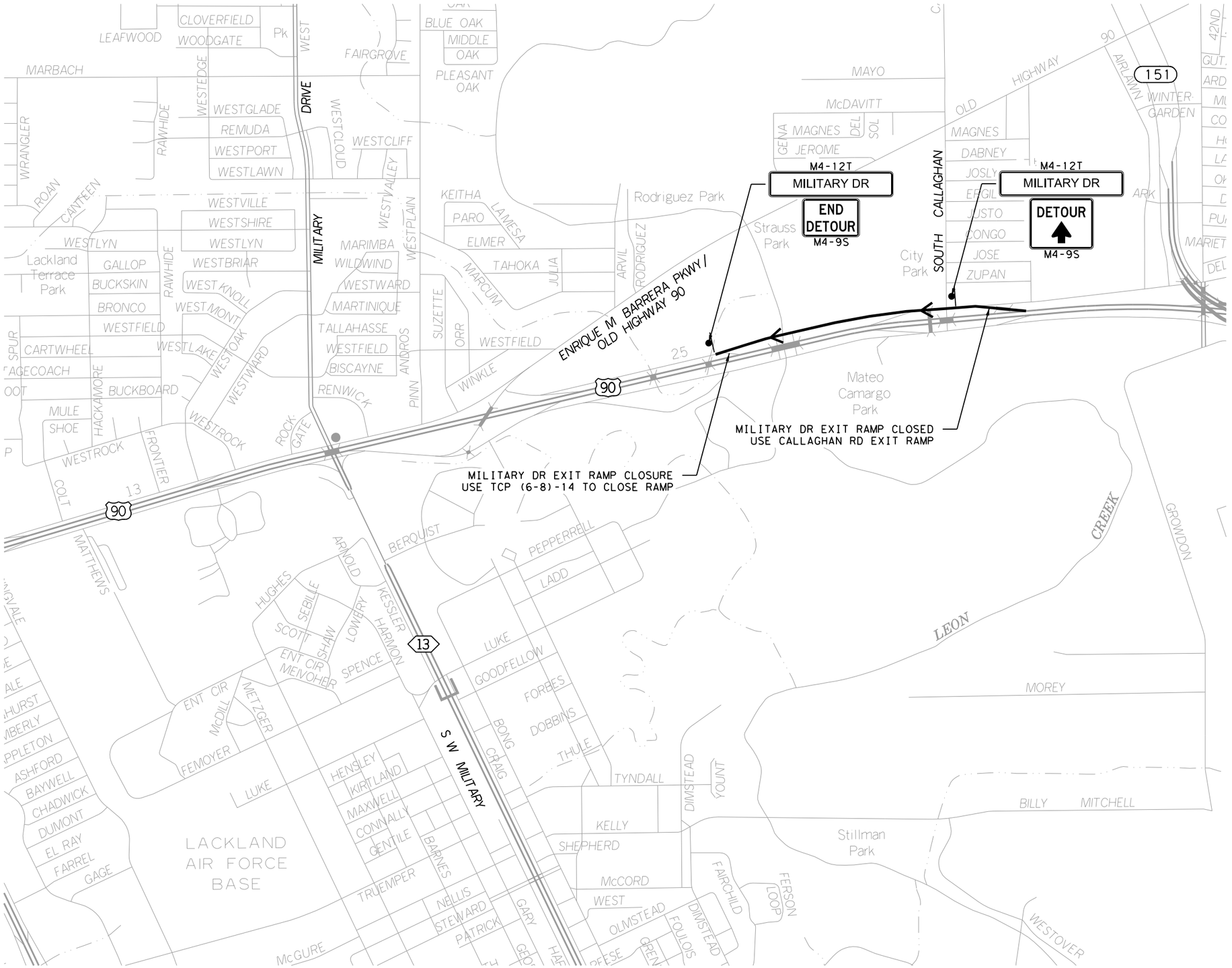

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-10
LOOP 13/MILITARY DR/LACKLAND AFB
EXIT RAMP DETOUR

SHEET 26 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	65
CONT.	SECT.	JOB	
0024	08	141	

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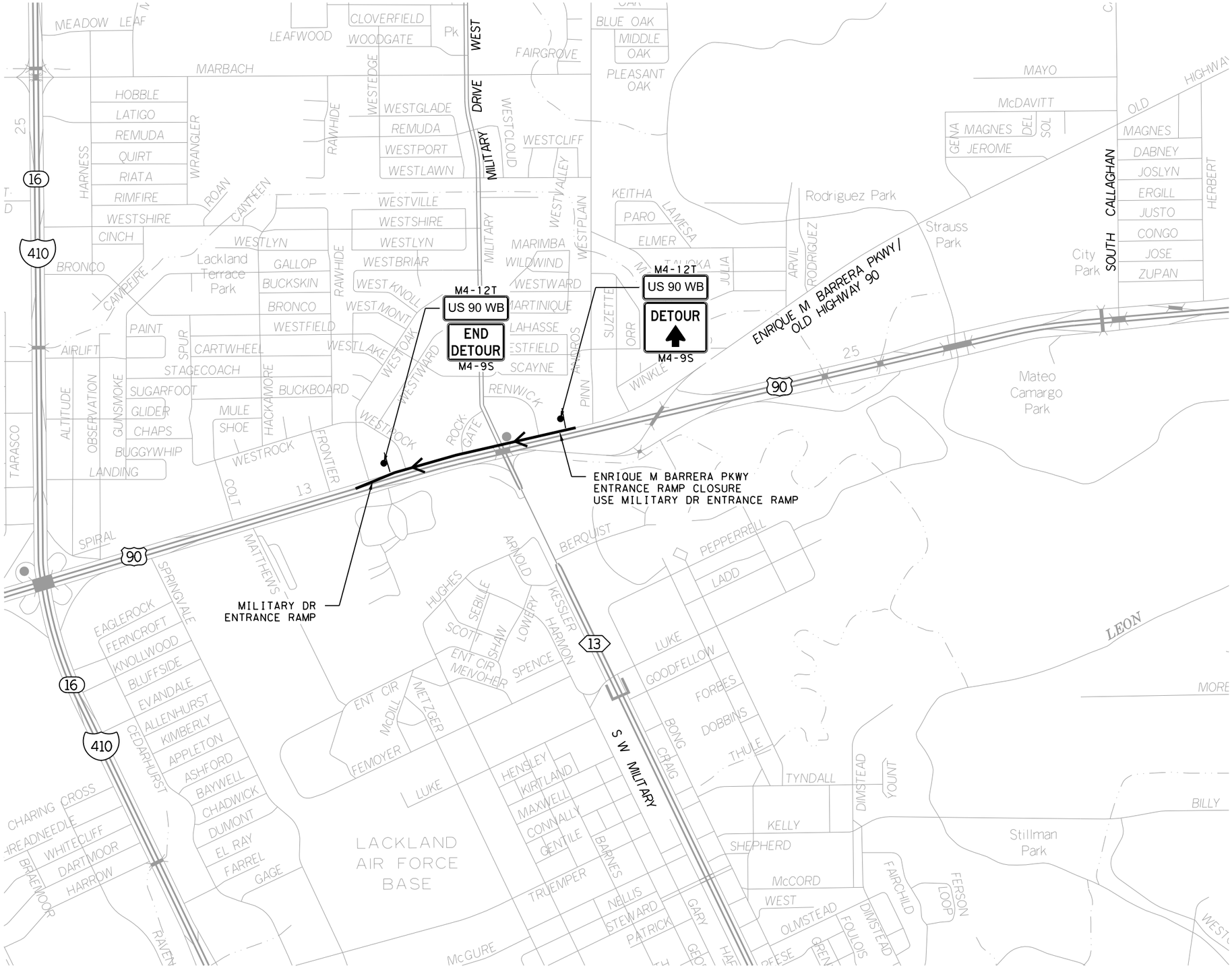

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-11
US 90 WESTBOUND
ENTRANCE RAMP DETOUR

SHEET 27 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	66
CONT.	SECT.	JOB	
0024	08	141	

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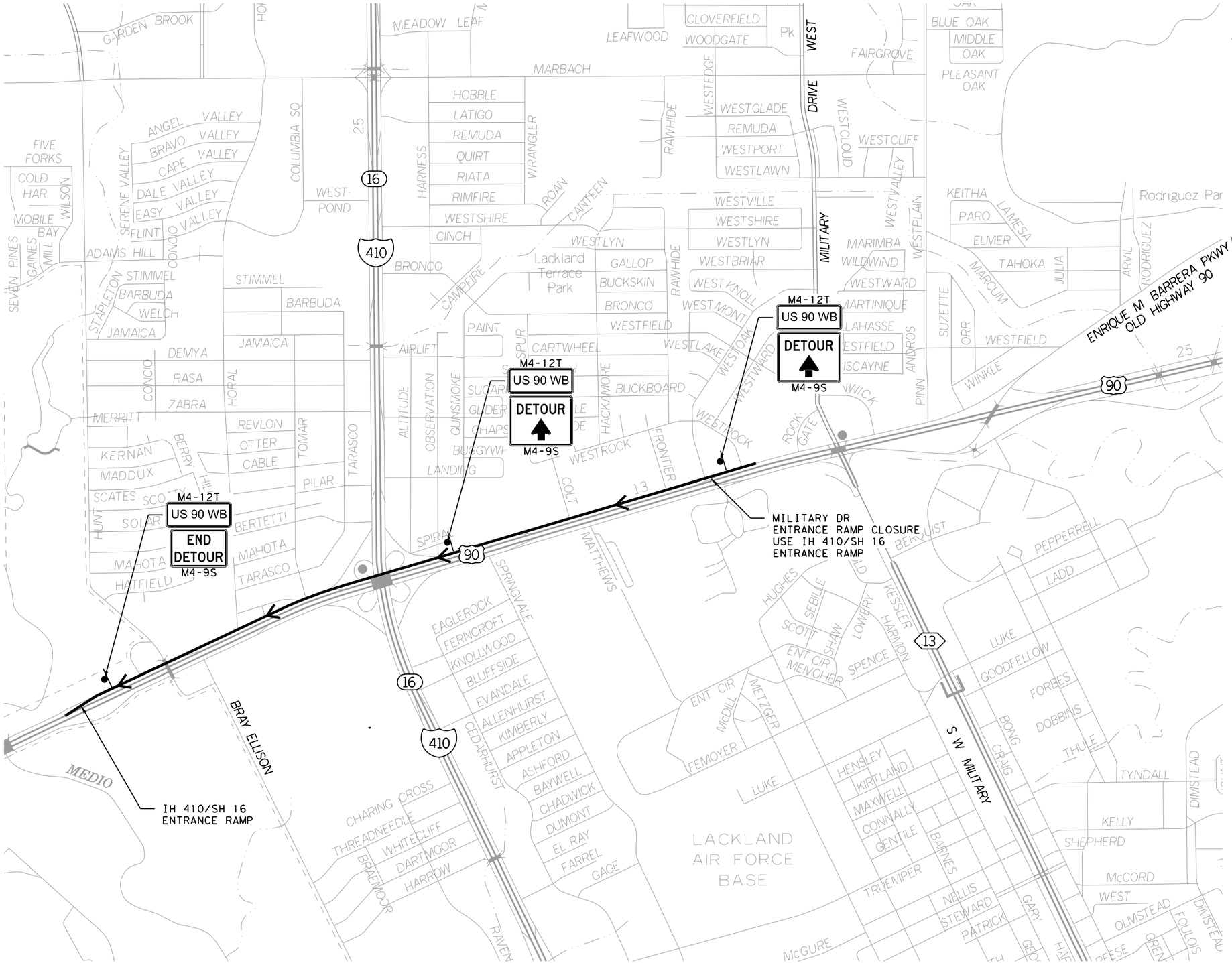

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1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-12
US 90 WESTBOUND
ENTRANCE RAMP DETOUR

SHEET 28 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	67
CONT.	SECT.	JOB	
0024	08	141	

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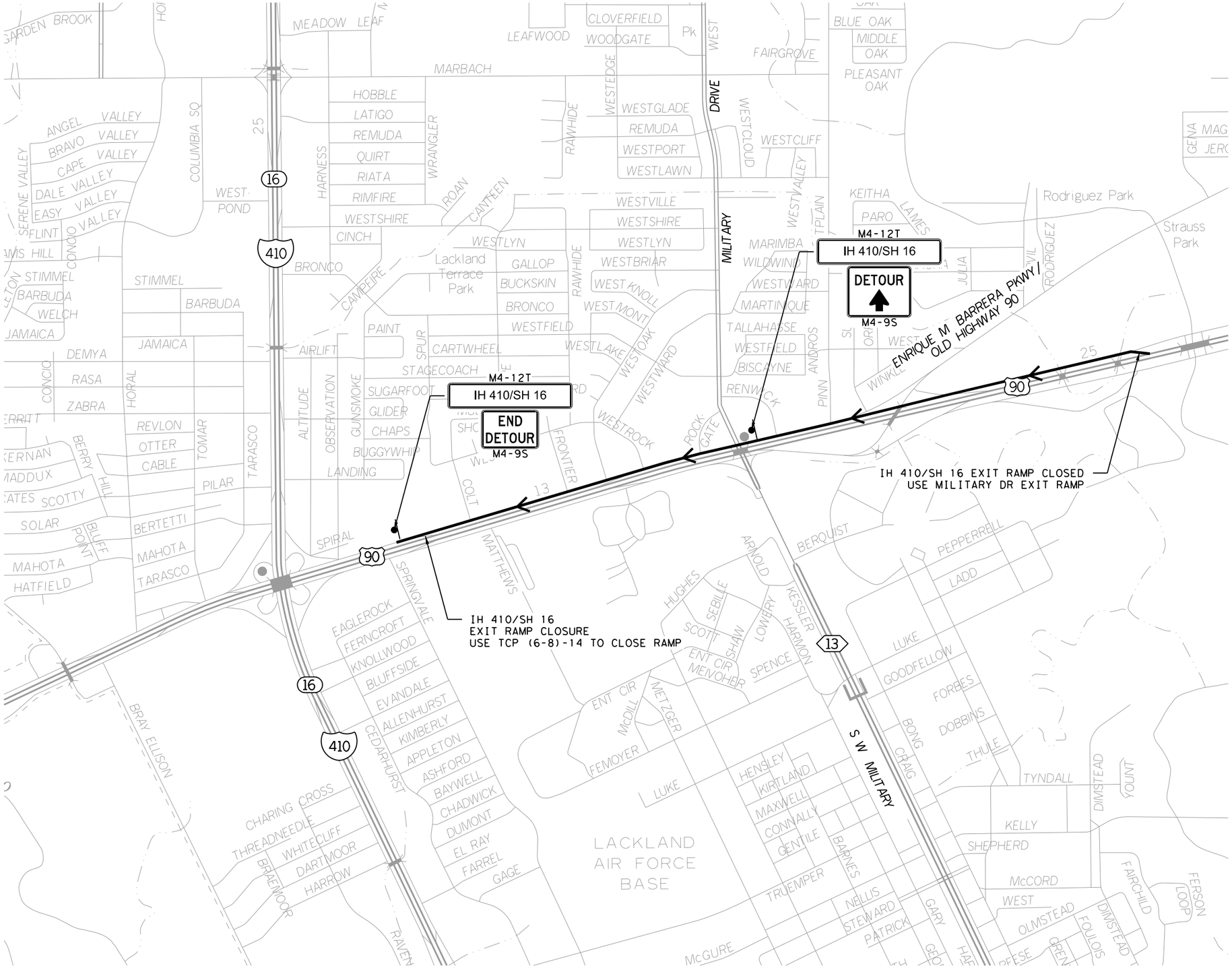

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

4/1/2021

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LICENSED PROFESSIONAL ENGINEER
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DETOUR LAYOUT

DETOUR WB-13
IH 410/SH 16
EXIT RAMP DETOUR

SHEET 29 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	68
CONT.	SECT.	JOB	
0024	08	141	

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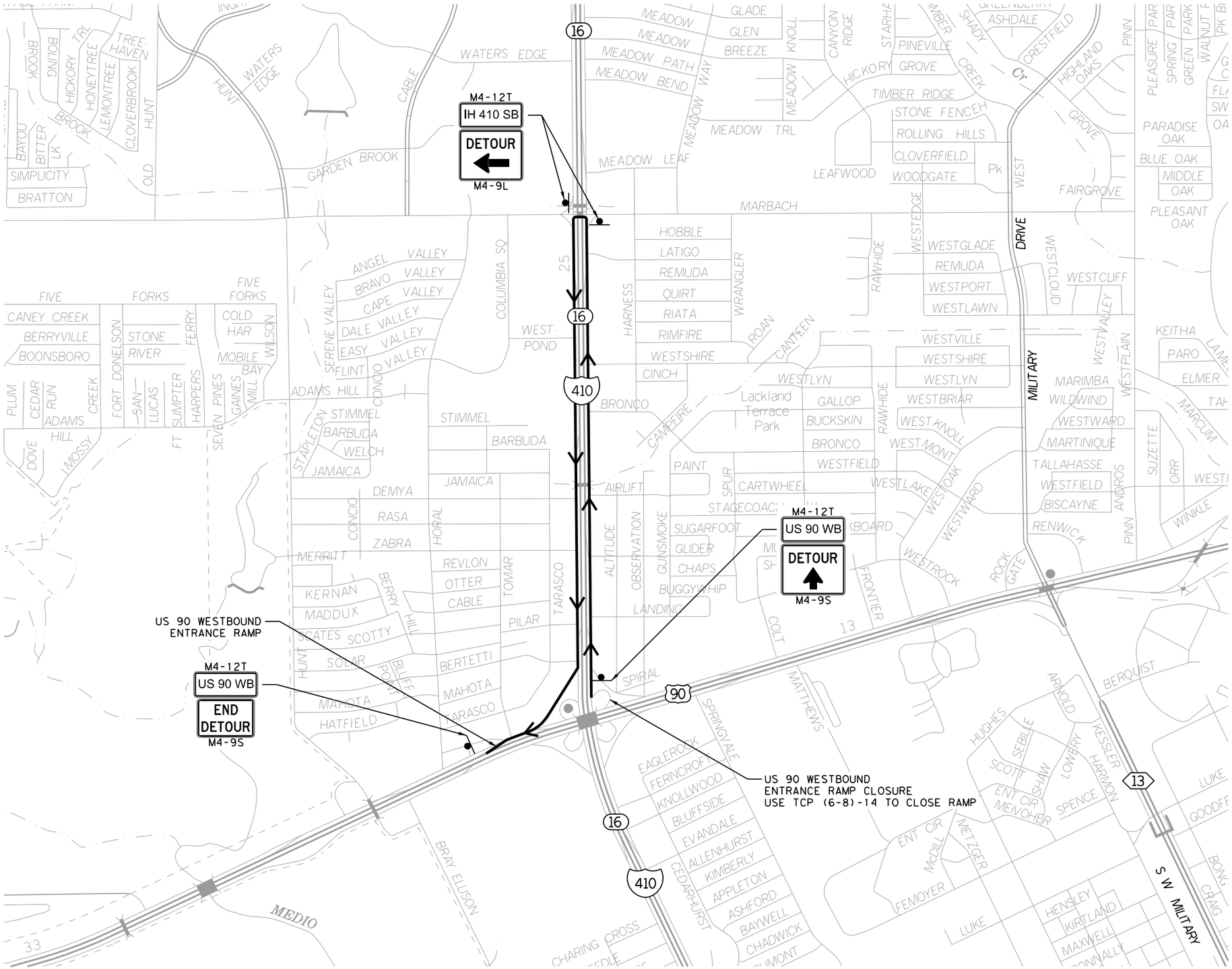

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

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DETOUR LAYOUT

DETOUR WB-14
US 90 WB
ENTRANCE RAMP DETOUR

SHEET 30 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	69
CONT.	SECT.	JOB	
0024	08	141	

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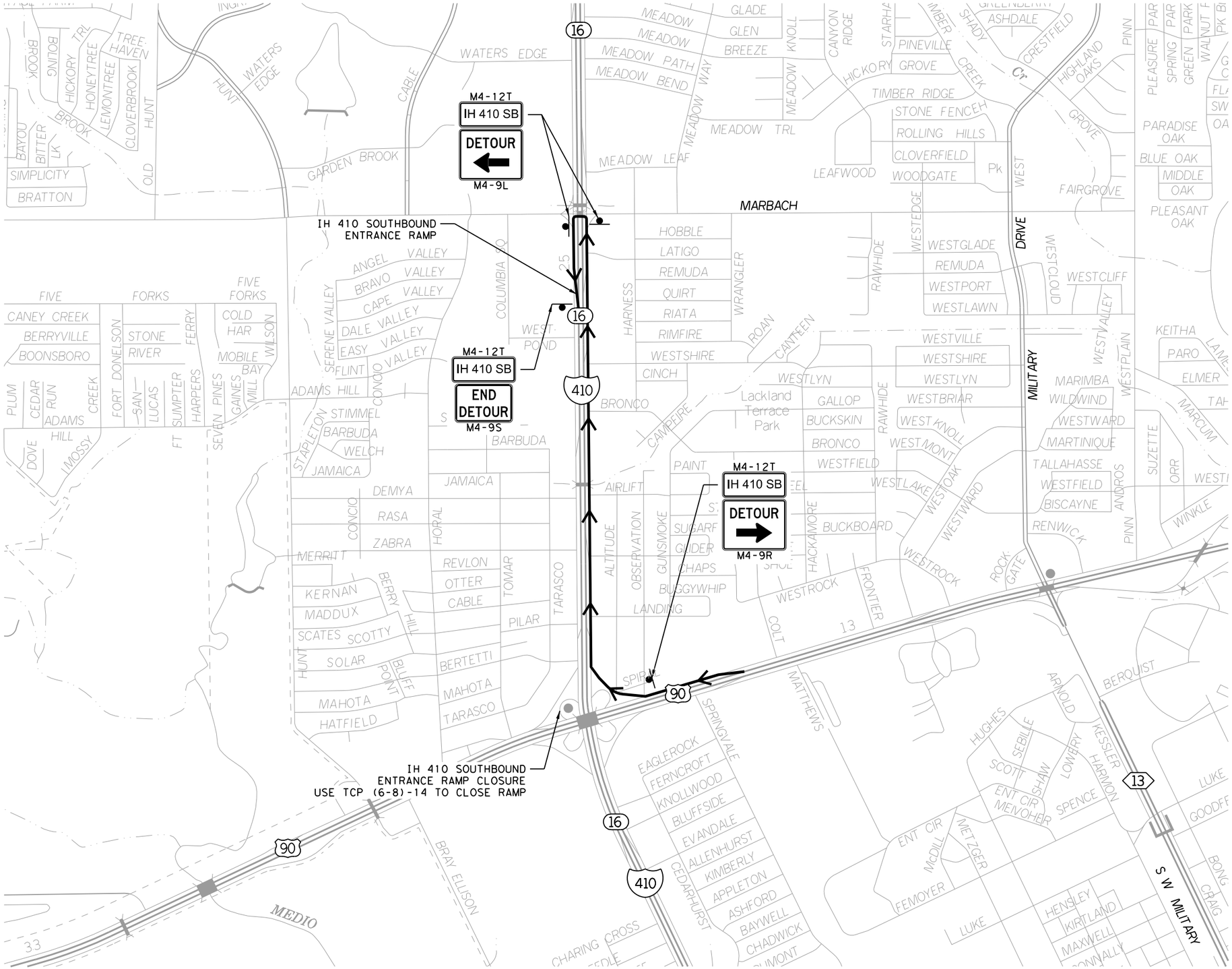

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR WB-15
IH 410 SOUTHBOUND
EXIT RAMP DETOUR

SHEET 31 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	70
CONT.	SECT.	JOB	
0024	08	141	

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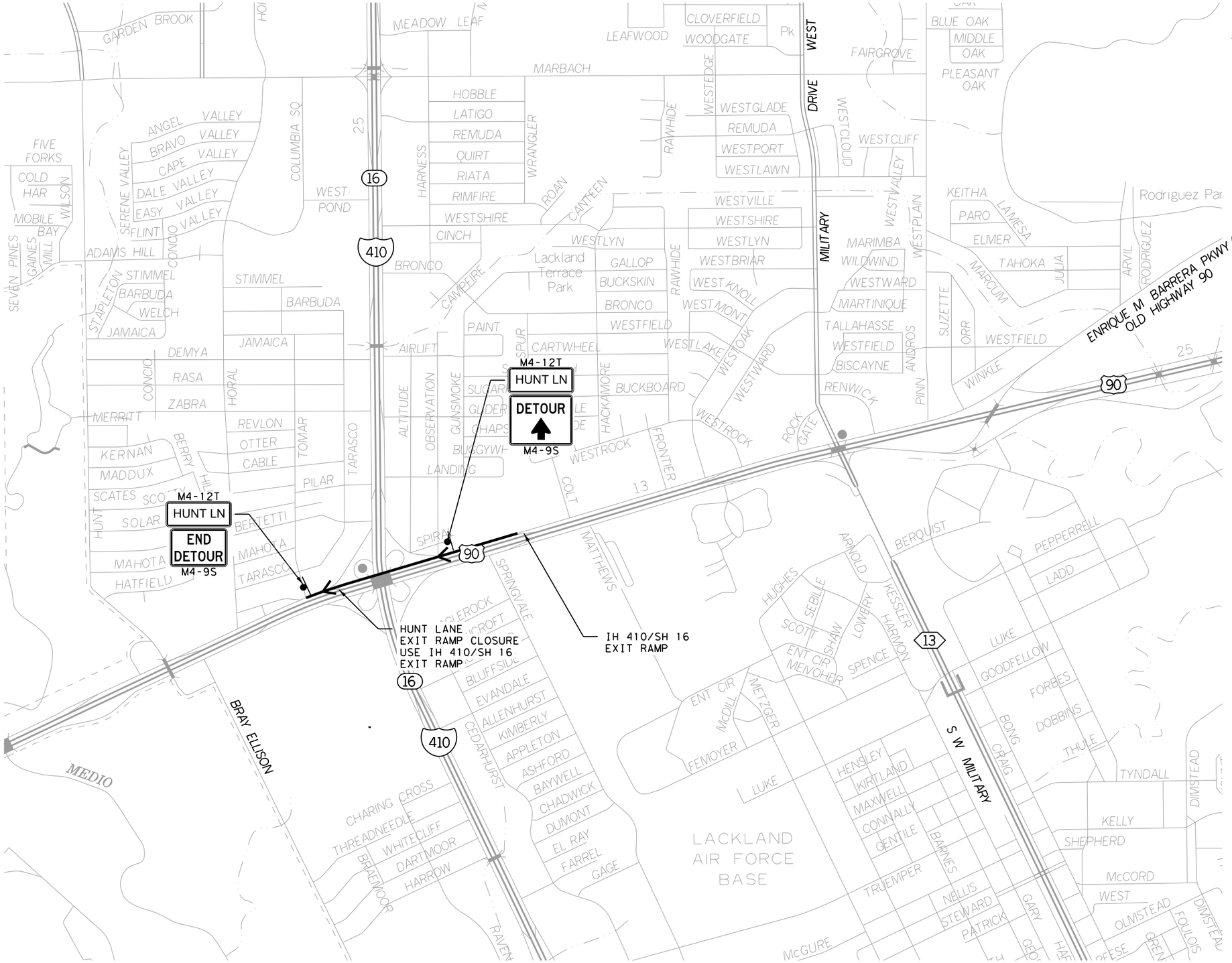

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR WB-16
HUNT LANE
EXIT RAMP DETOUR

SHEET 32 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	71
CONT.	SECT.	JOB	
0024	08	141	

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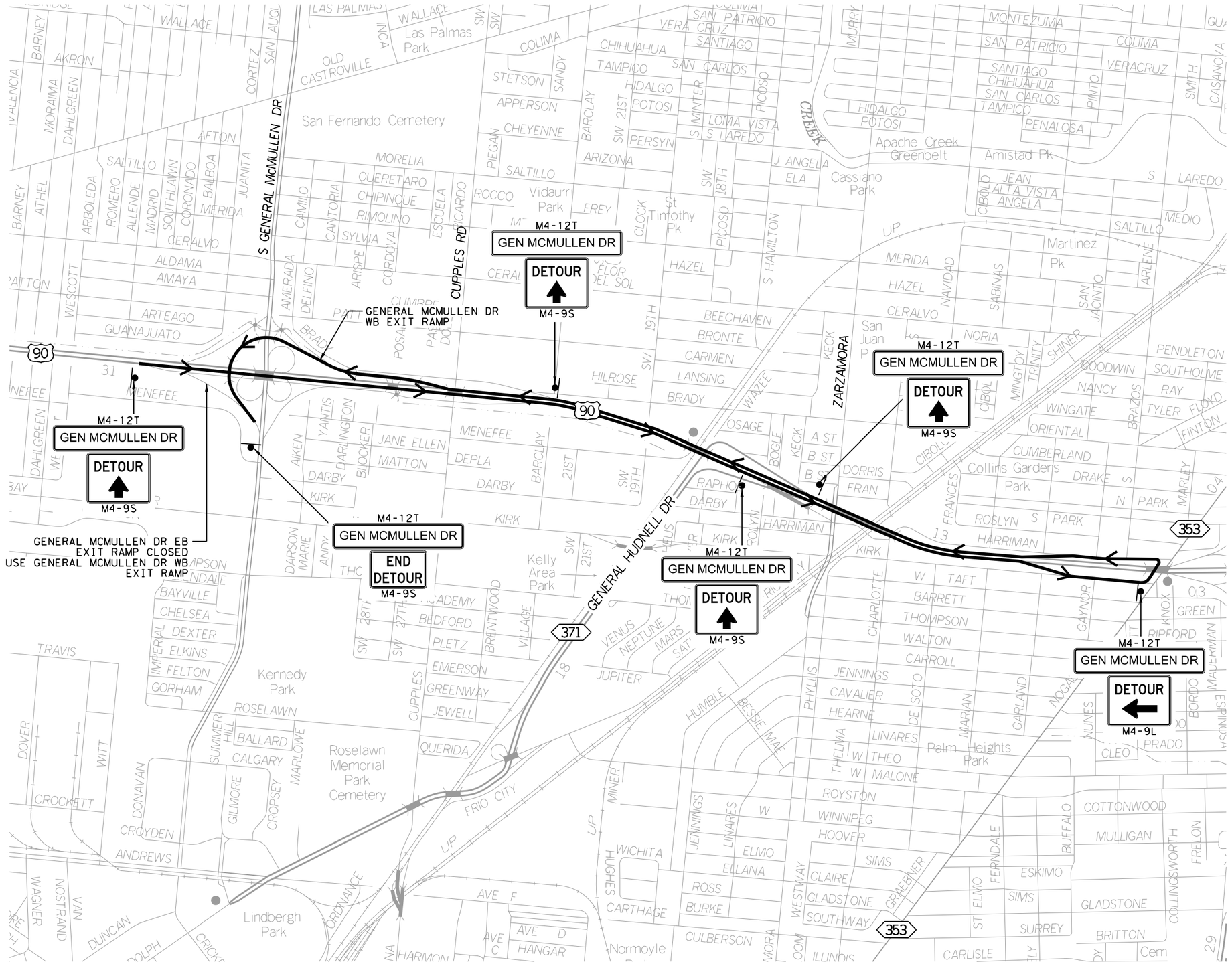

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR GM-01
GENERAL MCMULLEN DR
EXIT RAMP DETOUR

SHEET 33 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	72
CONT.	SECT.	JOB	
0024	08	141	

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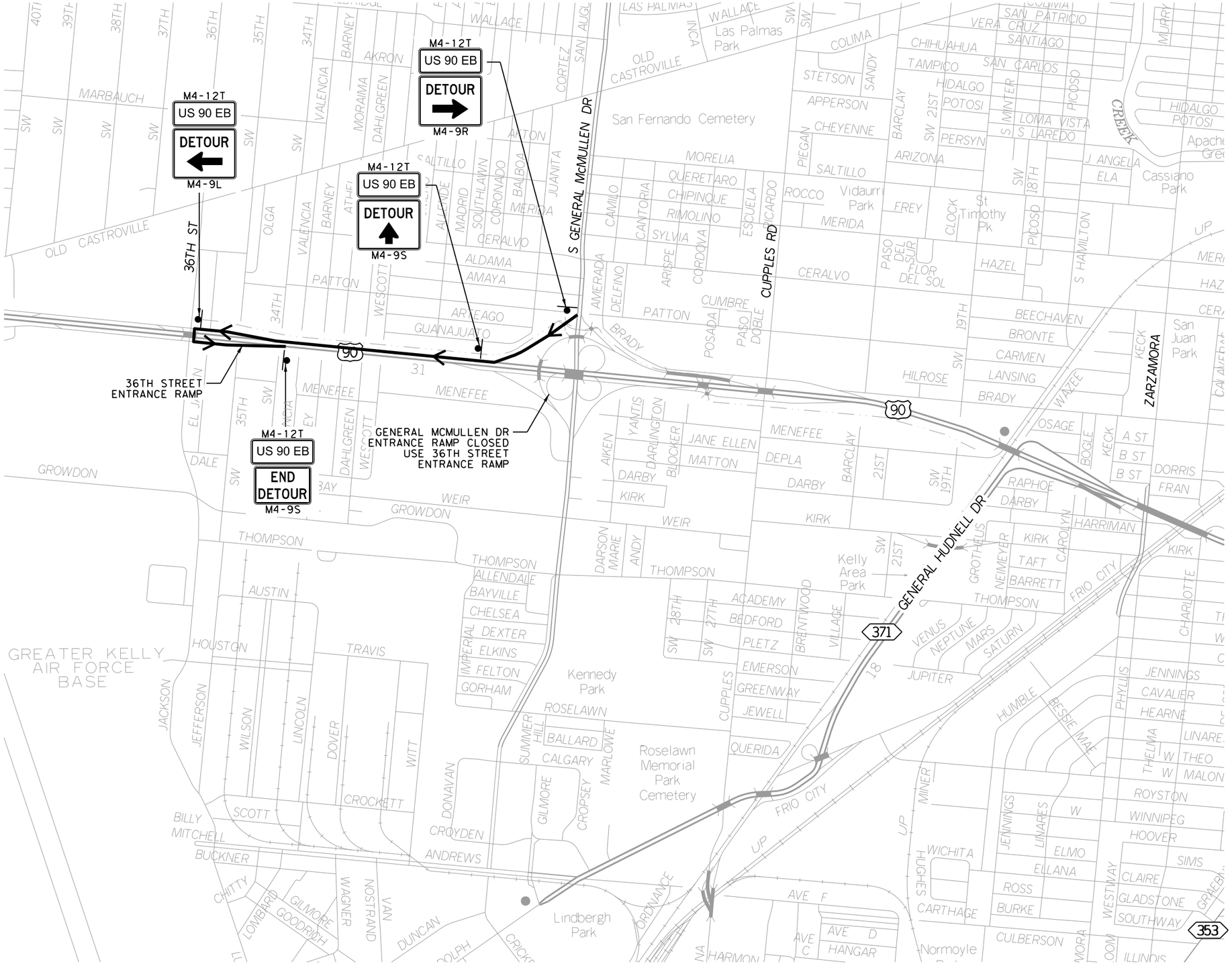

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR GM-02
GENERAL MCMULLEN DR
ENTRANCE RAMP DETOUR

SHEET 34 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	73
CONT.	SECT.	JOB	
0024	08	141	

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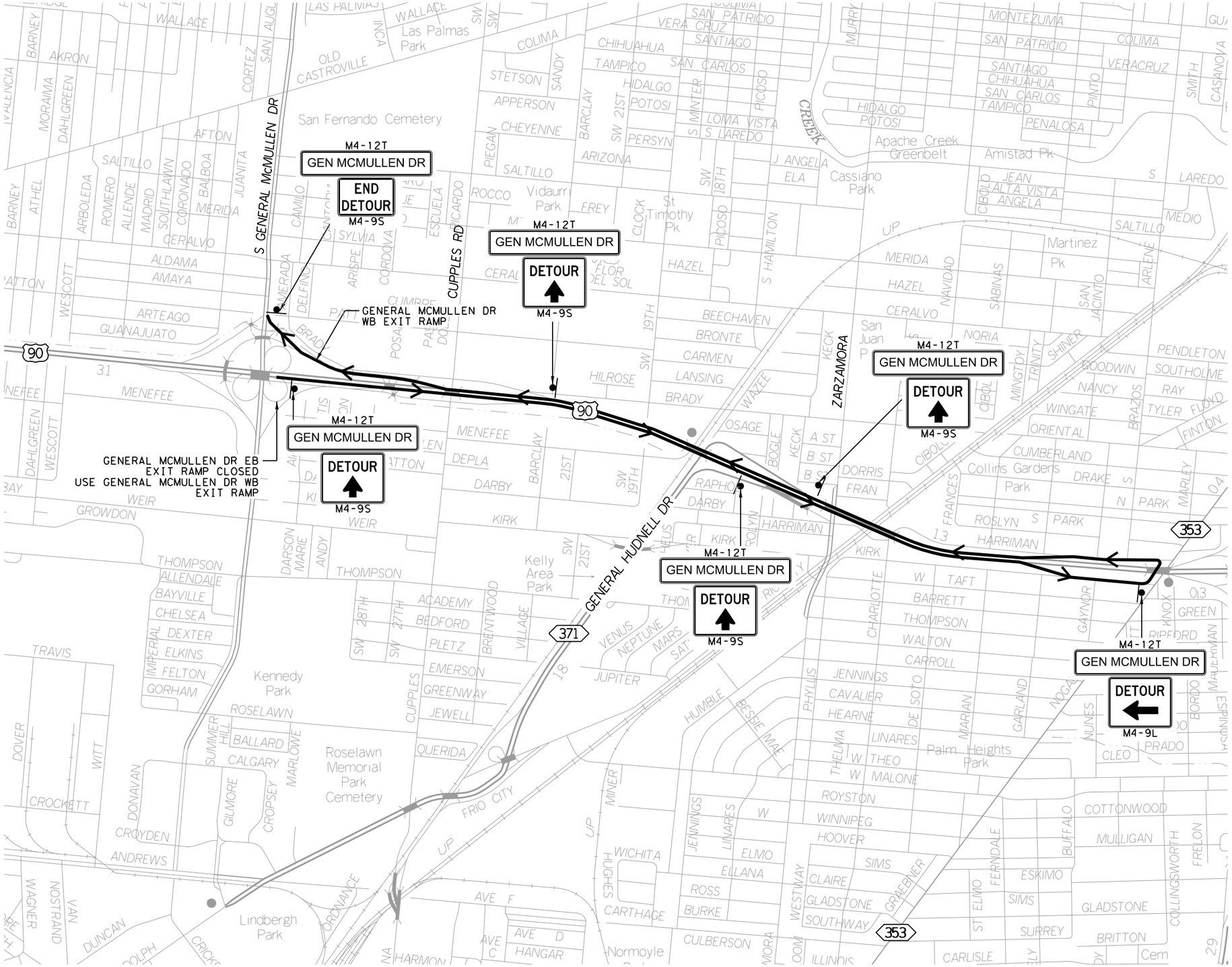

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR GM-03
GENERAL MCMULLEN DR
EXIT RAMP DETOUR

SHEET 35 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	74
CONT.	SECT.	JOB	
0024	08	141	

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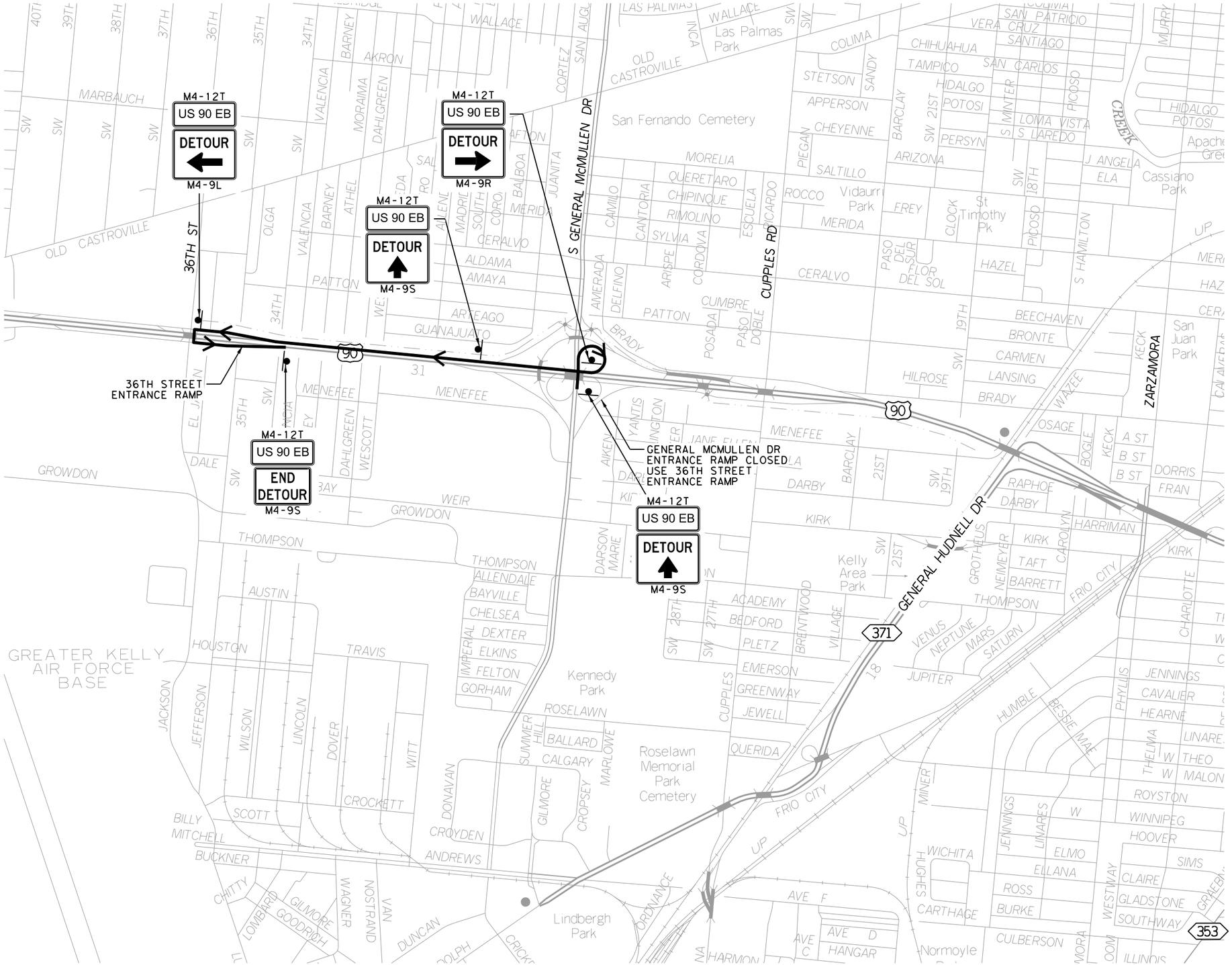

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR GM-04
GENERAL MCMULLEN DR
ENTRANCE RAMP DETOUR

SHEET 36 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	75
CONT.	SECT.	JOB	
0024	08	141	

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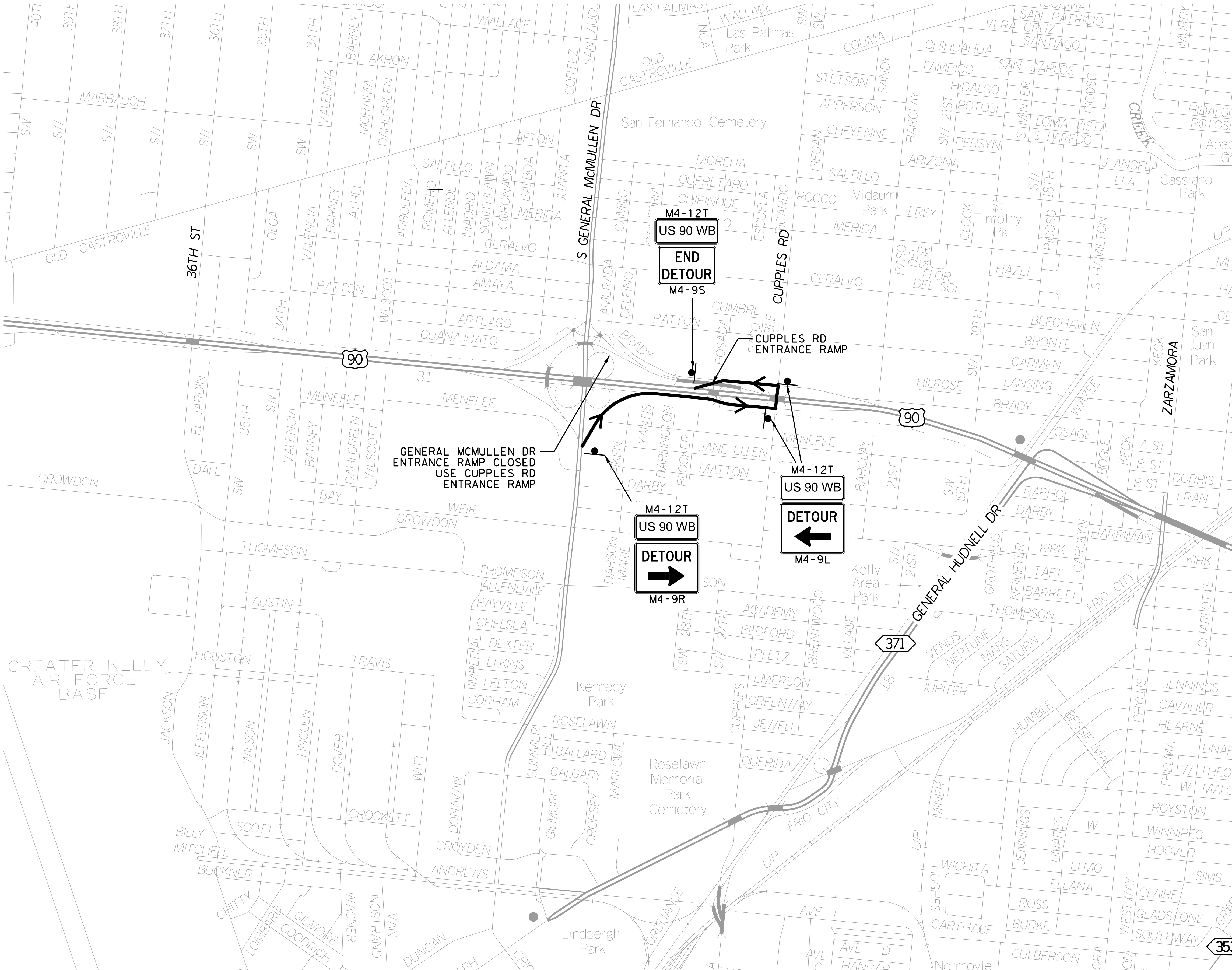

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

SCALE: N.T.S.

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DETOUR LAYOUT

DETOUR GM-05
GENERAL MCMULLEN DR
ENTRANCE RAMP DETOUR

SHEET 37 OF 38

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	76
CONT.	SECT.	JOB	
0024	08	141	

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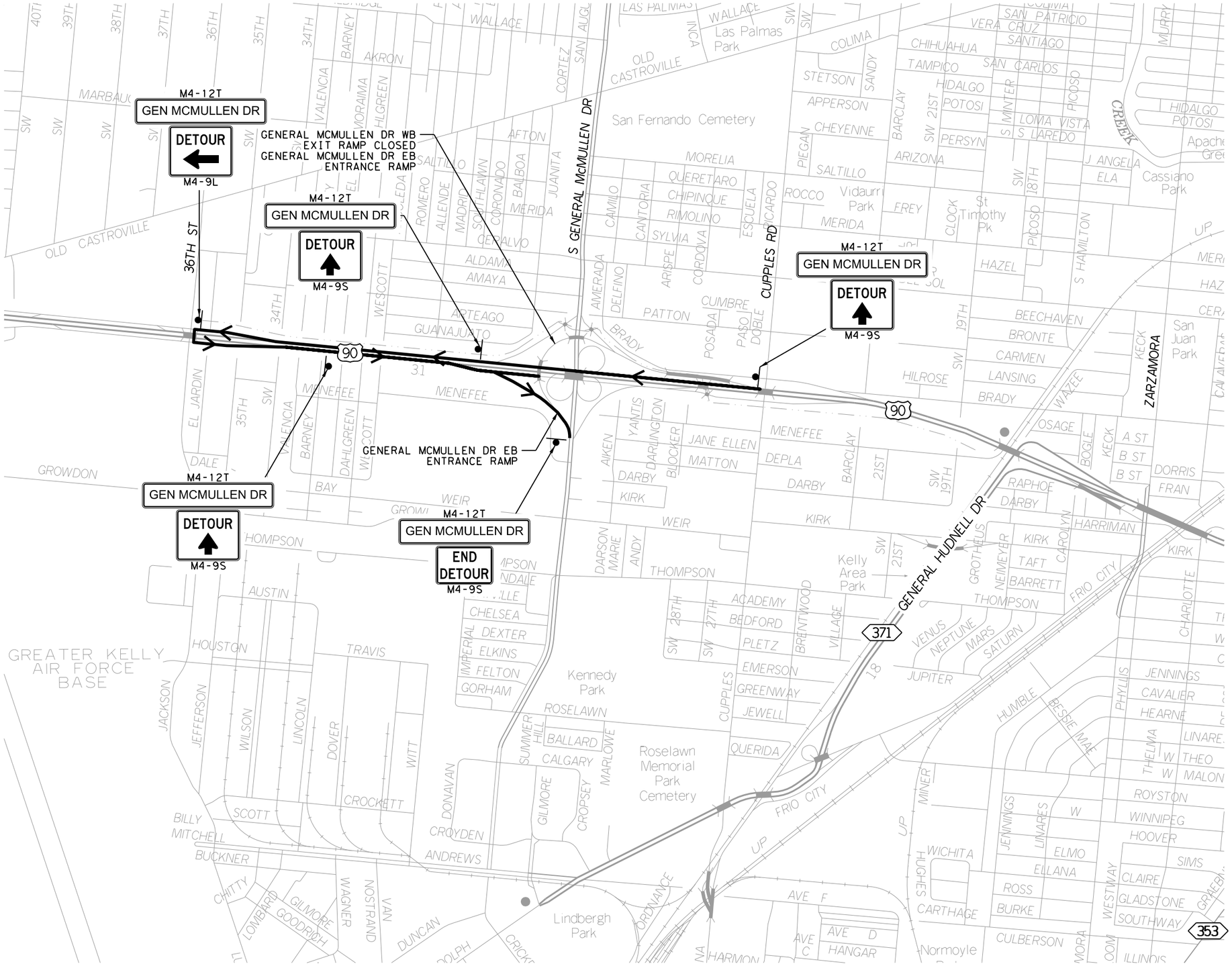

NOTES

1. REFER TO TCP(6)SERIES STANDARDS FOR ADDITIONAL RAMP CLOSURE SIGNAGE NOT SHOWN.

4/1/2021

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DETOUR LAYOUT

DETOUR GM-06
GENERAL MCMULLEN DR
EXIT RAMP DETOUR

SHEET 38 OF 38

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	77
CONT.	SECT.	JOB	
0024	08	141	

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LANE CLOSURES AND ASSESSMENT FEE TABLE

ONE-LANE CLOSURE PER 0.5 MI

HIGHWAY	SEGMENT LOCATION	DIRECTION	12 AM • 4 AM	4 AM • 6 AM	6 AM • 9 AM	9AM • 12 PM	12 PM• 3 PM	3 PM • 6 PM	6 PM • 9 PM	9PM • 12 AM	LANE CLOSURE ASSESSMENT FEE
US 90	SL 1604 to IH 410	EB									$3,200.00
		WB									
	IH 410 to SH 151	EB									$2,700.00
		WB									
	SH 151 to IH 35	EB									$4,700.00
		WB									
				5 AM	9 AM			3 PM	8:30 PM		

LANE CLOSURES AND ASSESSMENT FEE TABLE

TWO AND THREE-LANE CLOSURE PER 0.5 MI

HIGHWAY	SEGMENT LOCATION	DIRECTION	12 AM • 4 AM	4 AM • 6 AM	6 AM • 9 AM	9AM • 12 PM	12 PM• 3 PM	3 PM • 6 PM	6 PM • 9 PM	9PM • 12 AM	LANE CLOSURE ASSESSMENT FEE
US 90	IH 410 to SH 151	EB									$3,800.00
		WB									
	SH 151 to IH 35	EB									$7,900.00
		WB									
				5 AM	9 AM			3 PM	8:30 PM		

LEGEND		ALLOWABLE LANE CLOSURE
		NO LANE CLOSURE

NOTE: PRICING ABOVE IS EXPRESSED IN DOLLARS PER LANE PER HALF MILE. LENGTH MEASUREMENT OF THE LANE CLOSURE IS MEASURED FROM THE BEGINNING OF TAPER TO THE POINT WHERE THE LANE IS IN FULL OPEN CONFIGURATION.

10/29/2021

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US 90

LANE CLOSURE AND ASSESSMENT FEE TABLE

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	78
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\khl\dms33967\US 90_141_LCAFT01.dgn
PLOTTED: 10/29/2021 9:08:49 AM

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET	FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	6185 6002 TMA (STATIONARY)	6185 6005 TMA (MOBILE OPERATION)
		SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
-	1A	TCP(6-1) THRU TCP(6-5) (PAVEMENT REPAIR LANE CLOSURES)	1	73	74	1	74	0
-	1B	TCP(6-1) (LEON CREEK BRIDGE SHOULDER PLANE LANE CLOSURES)	0	1	1	1	2	0
-	2	TCP(6-1) THRU TCP(6-3) (MBGF REPLACEMENT LANE CLOSURES)	0	145	145	1	145	0
-	3	TCP(6-1) THRU TCP(6-5) (MAINLANE-PLANE/INLAY SINGLE LANE CLOSURE)	0	181	181	1	181	0
-	3	TCP(6-1) (MAINLANE-PLANE/INLAY TWO LANE CLOSURE)	1	289	290	1	290	0
-	3	TCP(6-1) (MAINLANE-PLANE/INLAY THREE LANE CLOSURE)	1	108	109	1	109	0
-	3	TCP(6-2) THRU TCP(6-4) AND TCP(6-8) (PLANE/INLAY RAMP CLOSURES)	0	38	38	1	38	0
-	3	TCP(6-1) (FRONTAGE RD-PLANE/INLAY SINGLE LANE CLOSURE)	0	21	21	1	21	0
-	3	TCP(6-1) (FRONTAGE RD-PLANE/INLAY TWO LANE CLOSURE)	0	11	11	1	11	0
-	3	TCP(6-1) THRU TCP(6-5) (GEN MCMULLEN-PLANE/INLAY SINGLE LANE CLOSURE)	0	20	20	1	20	0
-	3	TCP(3-2) AND TCP(3-3) (PAVEMENT MARKING OPERATIONS)	0	60	60	1	0	60
		TOTALS	3				891	60

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 ATTENTUATORS 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	HIGHWAY
REVISIONS 3/2018	0024	08	141	US 90
	DIST	COUNTY	
	SAT	BEXAR	
	FEDERAL AID PROJECT		SHEET NO.
			79

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC.#	N	W	N	W	N	W
1	1B-2A	31	EBML AT LEON CREEK	307+40	TL-3	UNI	ACP/ FLEX BASE	2"/ 14"	PCTB	24"	42"	30'+	1								X	
2	1B-2B	32	EBML AT LEON CREEK	307+40	TL-3	UNI	ACP/ FLEX BASE	2"/ 14"	PCTB	24"	42"	30'+			1	1					X	
3	1B-2C	33	TEMP STORAGE LOCATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			1	2					X	
4	1B-3A	34	WBML AT LEON CREEK	316+20	TL-3	UNI	ACP/ FLEX BASE	2"/ 14"	PCTB	24"	42"	30'+			1	3					X	
5	1B-3B	35	WBML AT LEON CREEK	316+20	TL-3	UNI	ACP/ FLEX BASE	2"/ 14"	PCTB	24"	42"	30'+		1	1	4					X	
												TOTALS	1	1	4							

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

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyise.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		
	SAT	BEXAR		
	FEDERAL AID PROJECT			SHEET NO.
				80

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	SAT	BEXAR		81
5-10 5-21				

DATE: 10/27/2021 5:22:39 PM
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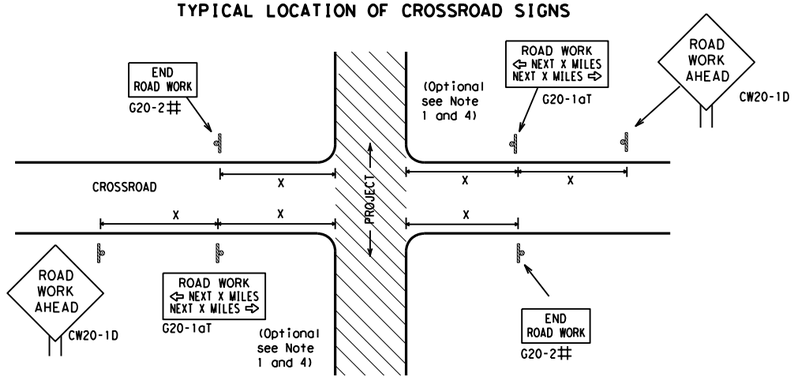
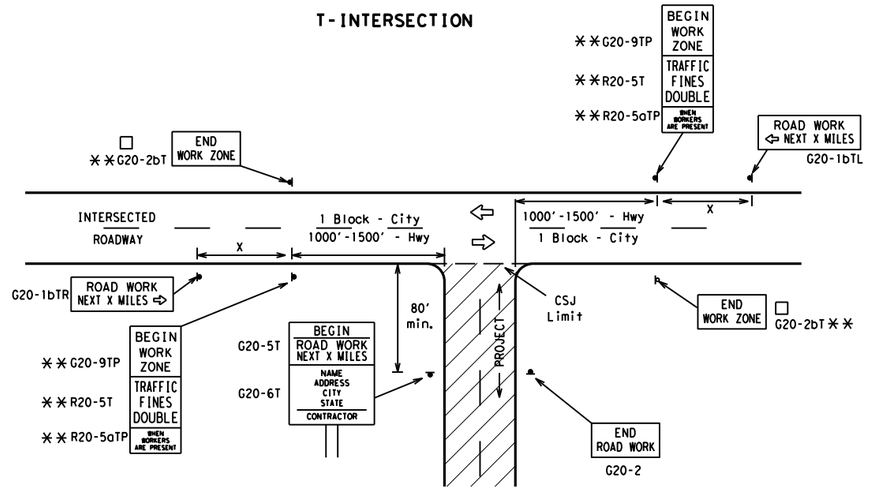
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

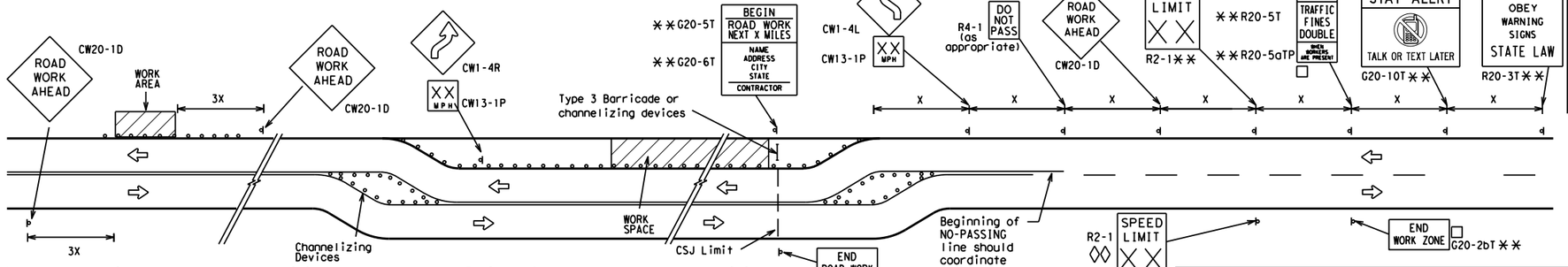
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

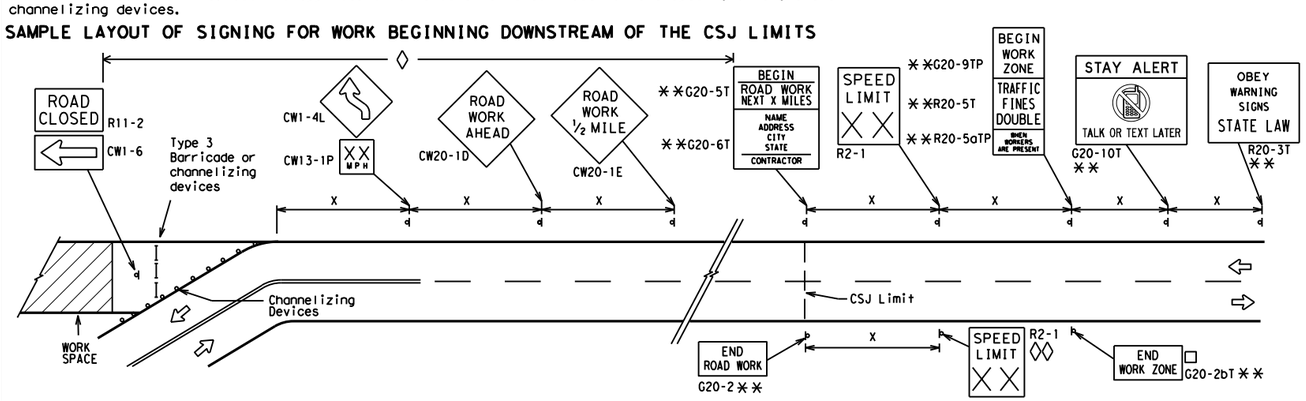
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		82

DATE: 10/27/2021 5:22:40 PM
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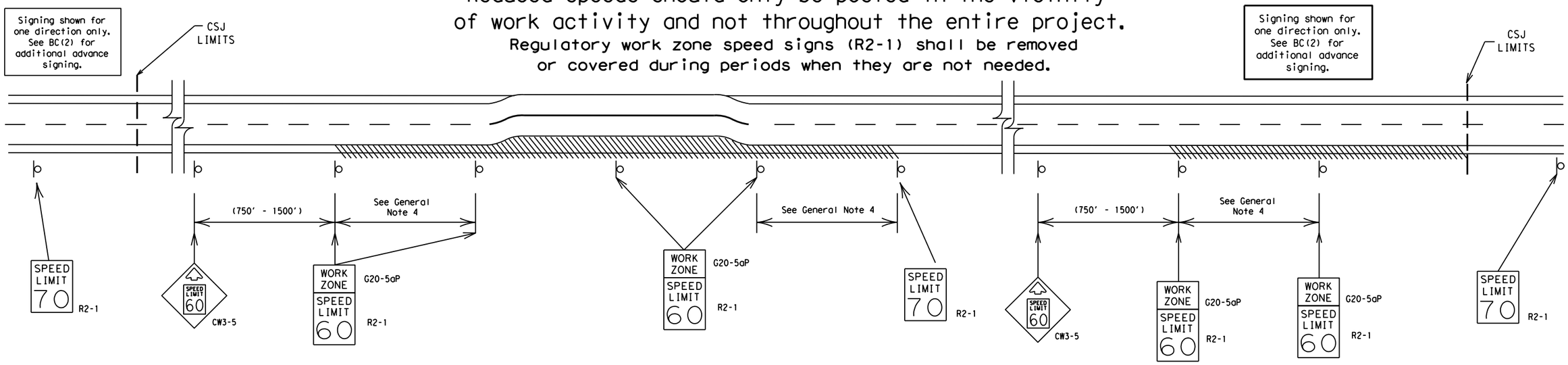
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		83

DATE: 10/27/2021 5:22:40 PM
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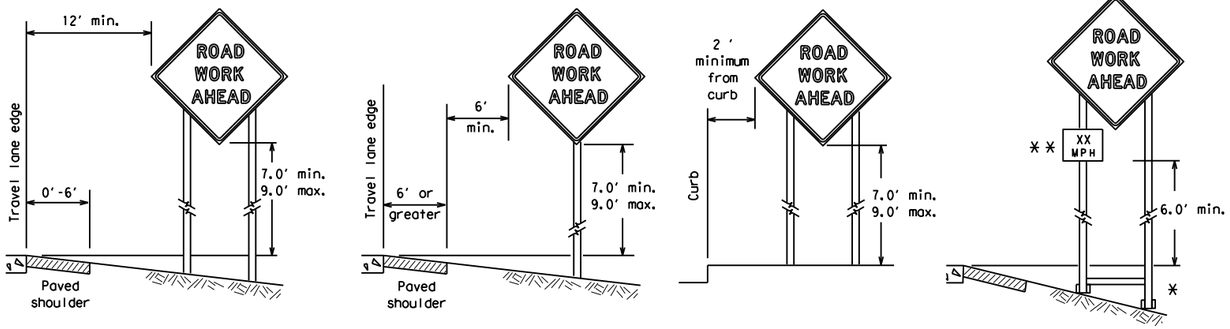
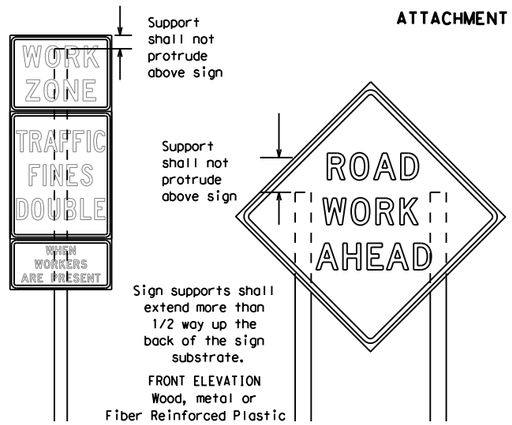
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

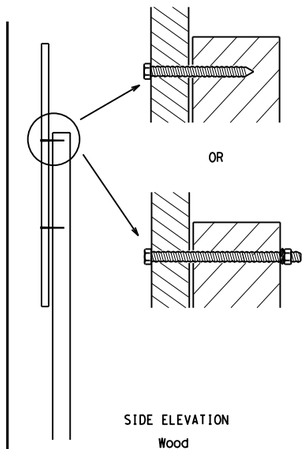


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





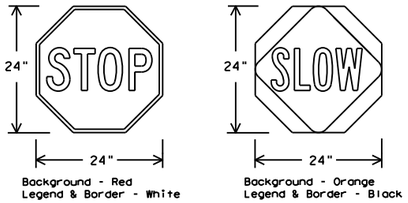
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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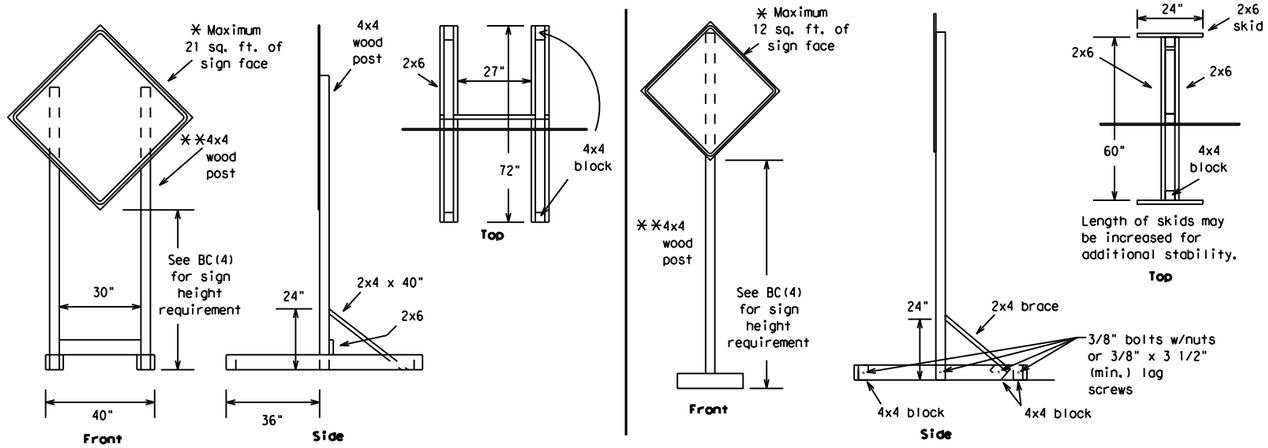
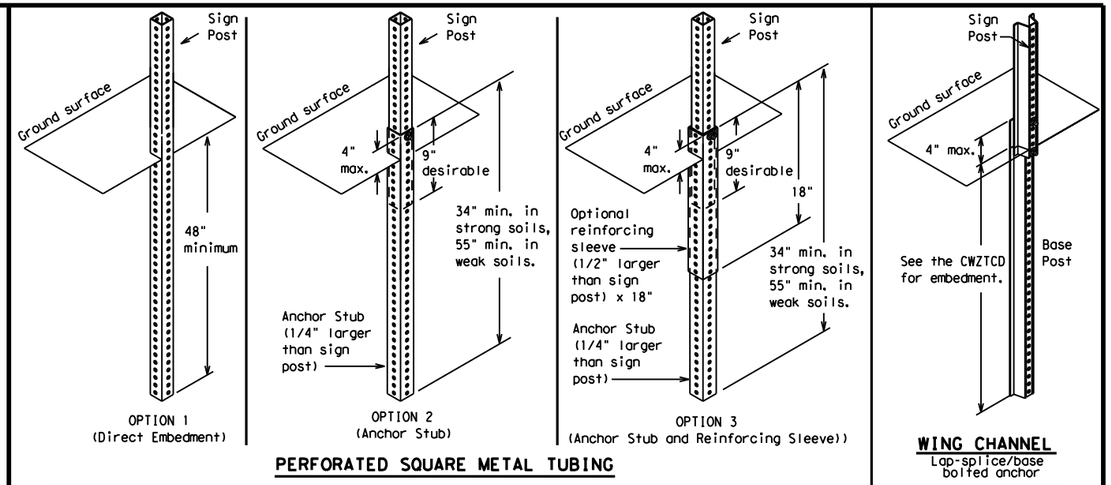


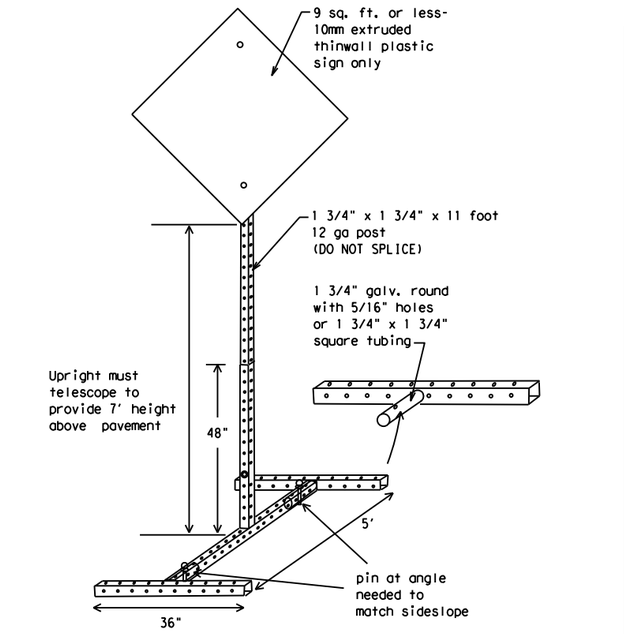
SKID MOUNTED WOOD SIGN SUPPORTS

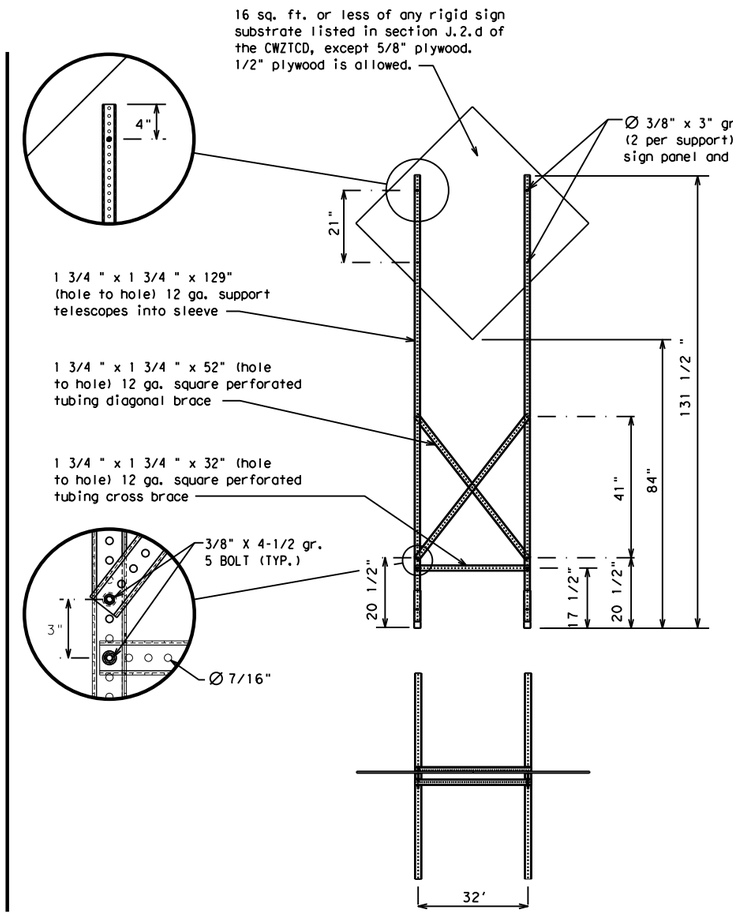
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

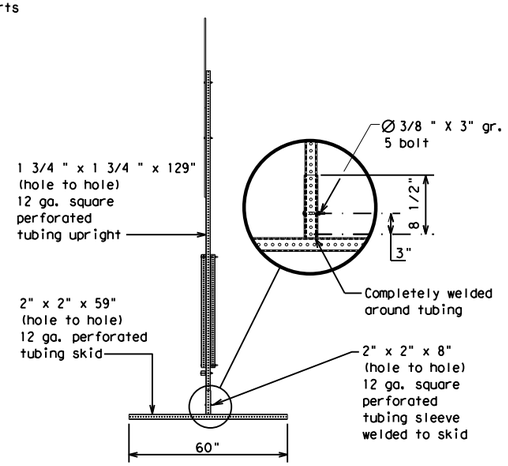


GROUND MOUNTED SIGN SUPPORTS

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

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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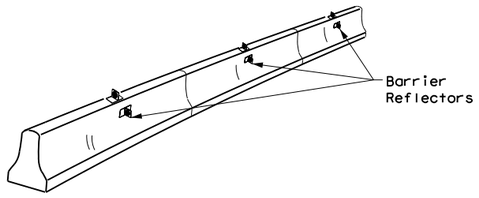
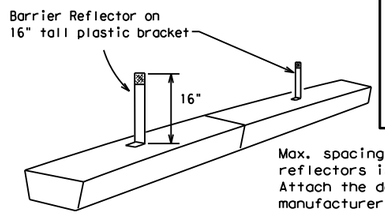
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



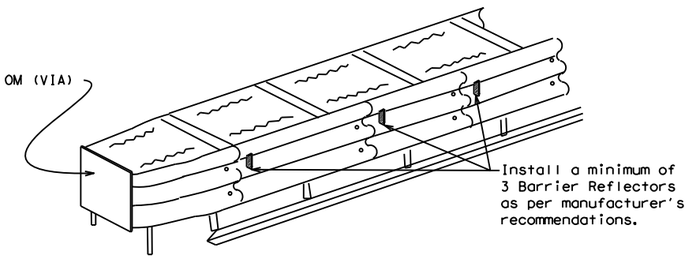
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

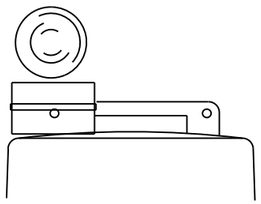
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

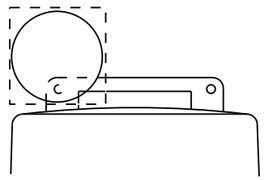


Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

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



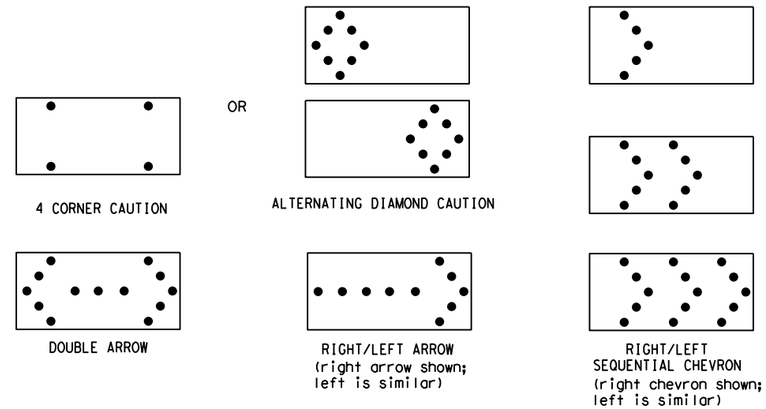
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

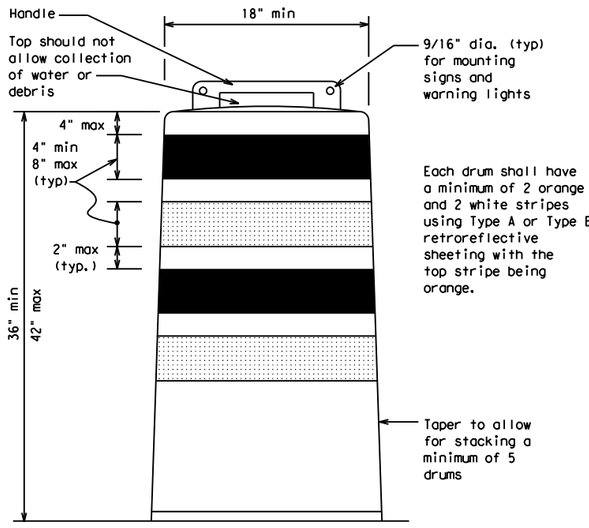
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

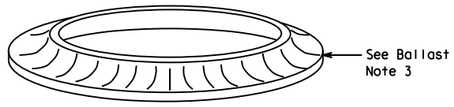
RETROREFLECTIVE SHEETING

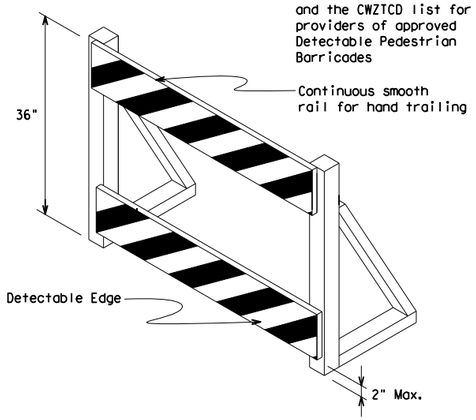
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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



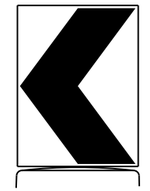




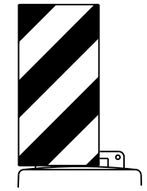
This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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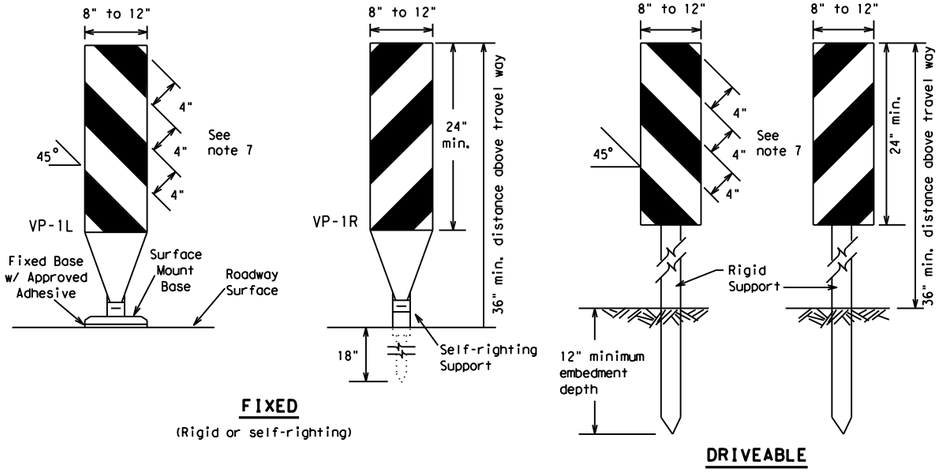
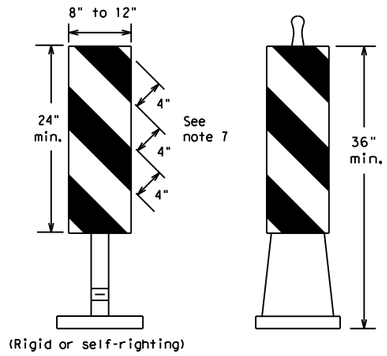


FIXED
(Rigid or self-righting)

DRIVEABLE

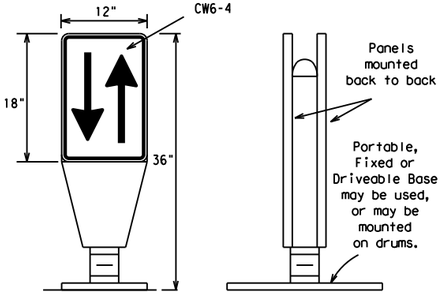


(Rigid or self-righting)

PORTABLE

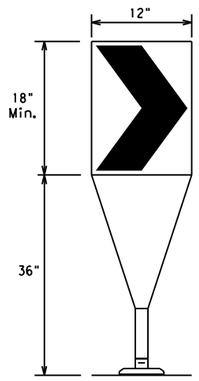
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



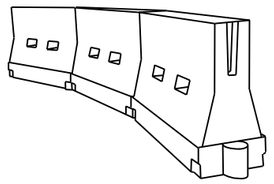
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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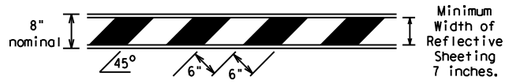
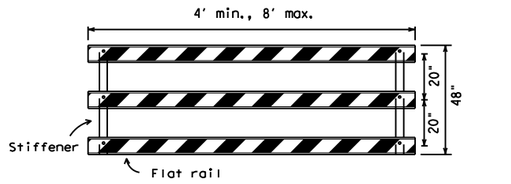
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



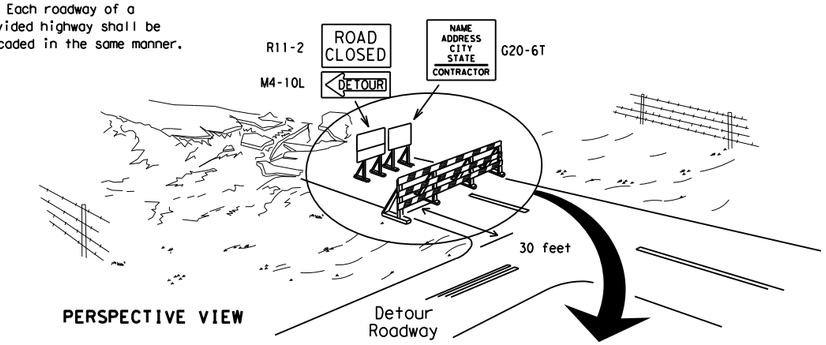
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

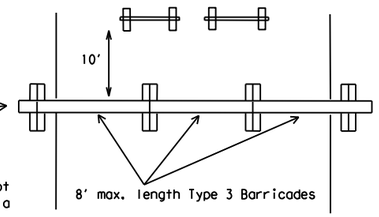
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

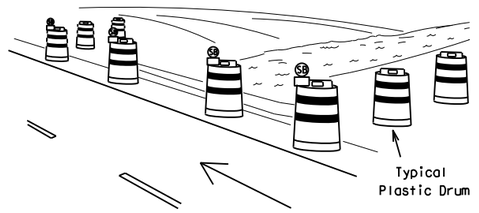
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

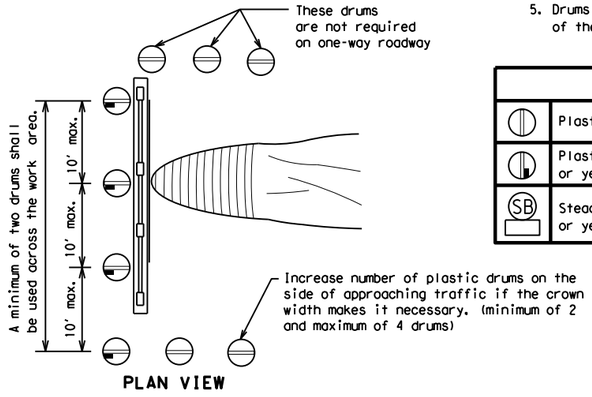
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

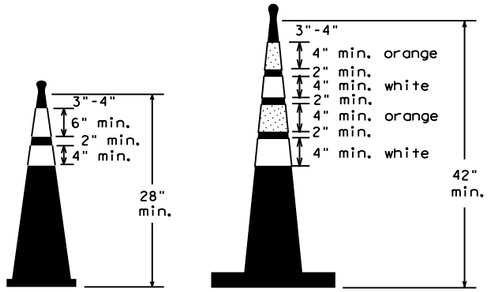
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

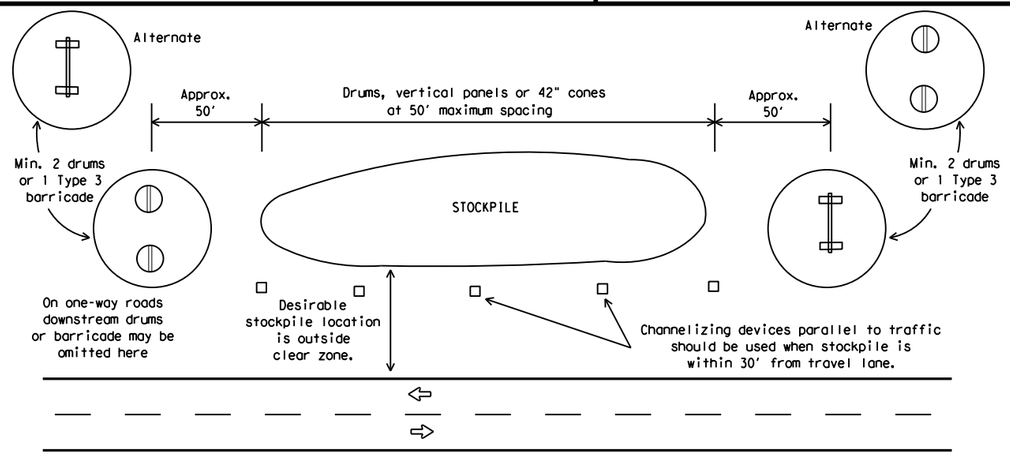
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

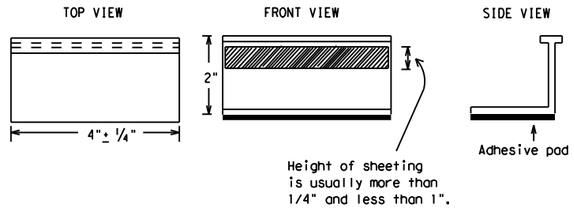
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

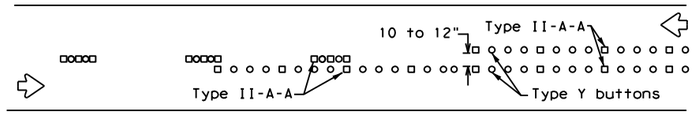
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	SAT	BEXAR		91
11-02 8-14				

105

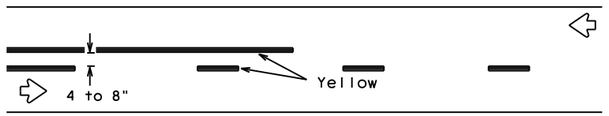
DATE: 10/27/2021 5:22:45 PM
FILE: c:\pw\kn1\dms4616\bc-21 (6).dgn

PAVEMENT MARKING PATTERNS

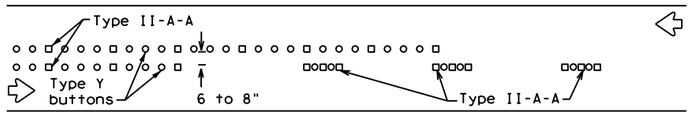
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



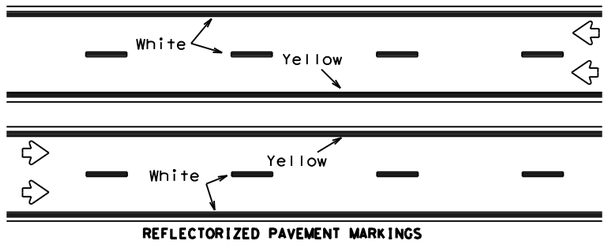
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



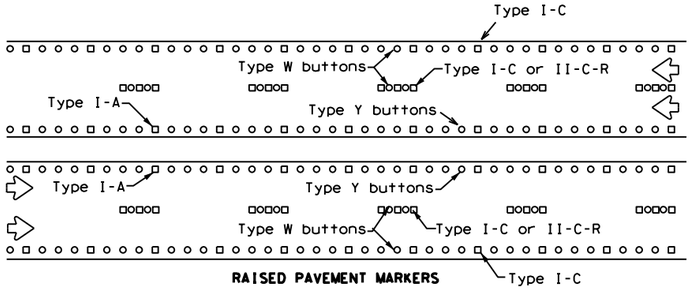
RAISED PAVEMENT MARKERS - PATTERN B

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

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



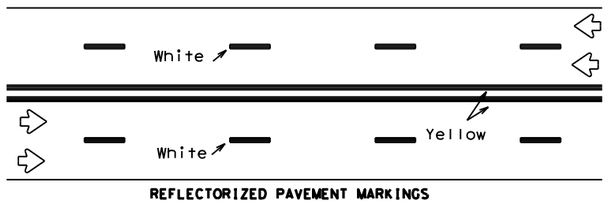
REFLECTORIZED PAVEMENT MARKINGS



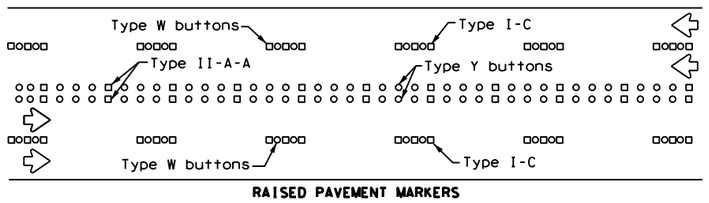
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



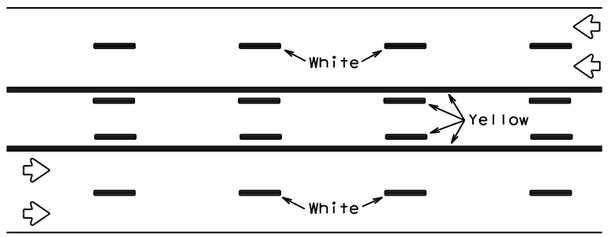
REFLECTORIZED PAVEMENT MARKINGS



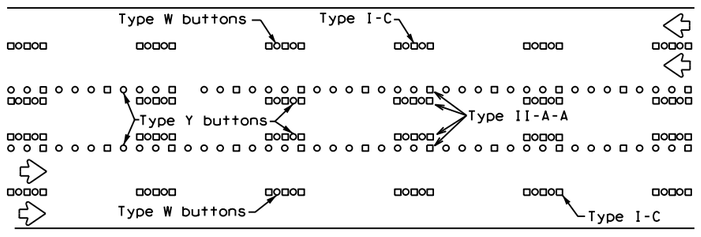
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

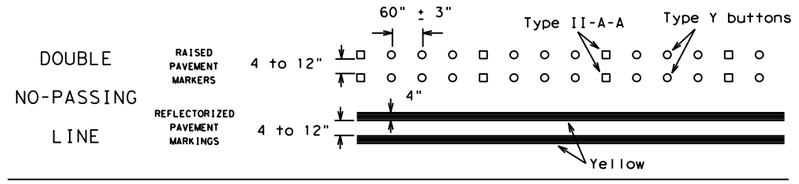
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

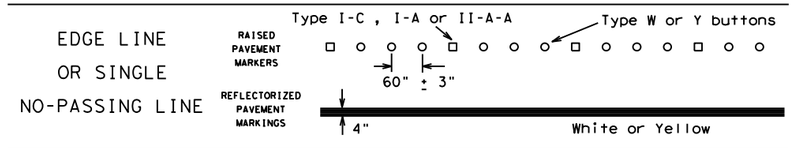
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

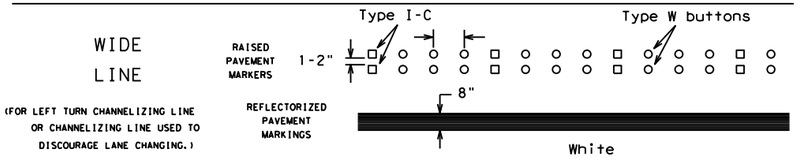


EDGE LINE OR SINGLE NO-PASSING LINE



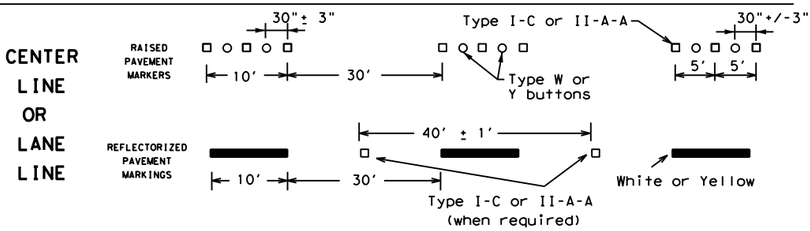
WIDE LINE

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

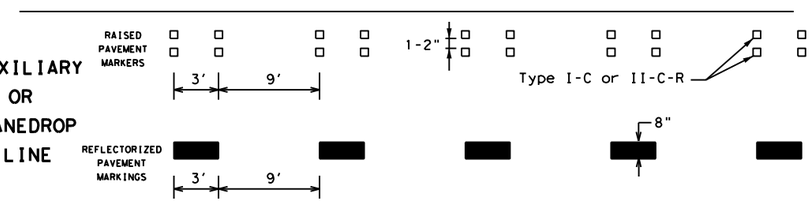


BROKEN LINES

CENTER LINE OR LANE LINE

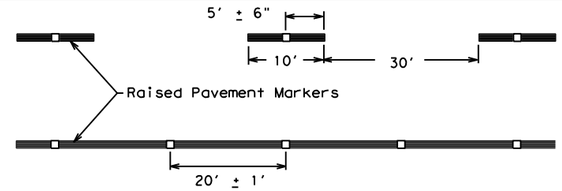


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21	0024	08	141	US 90
2-98 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	SAT	BEXAR		92

106

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DATE: 4/1/2021
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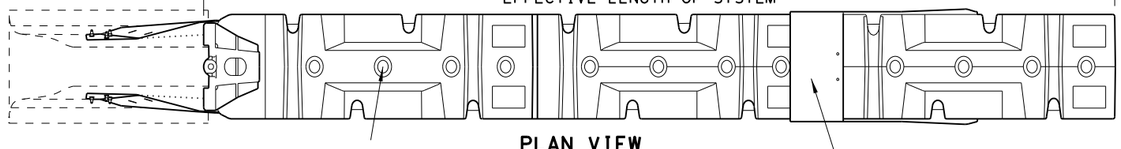
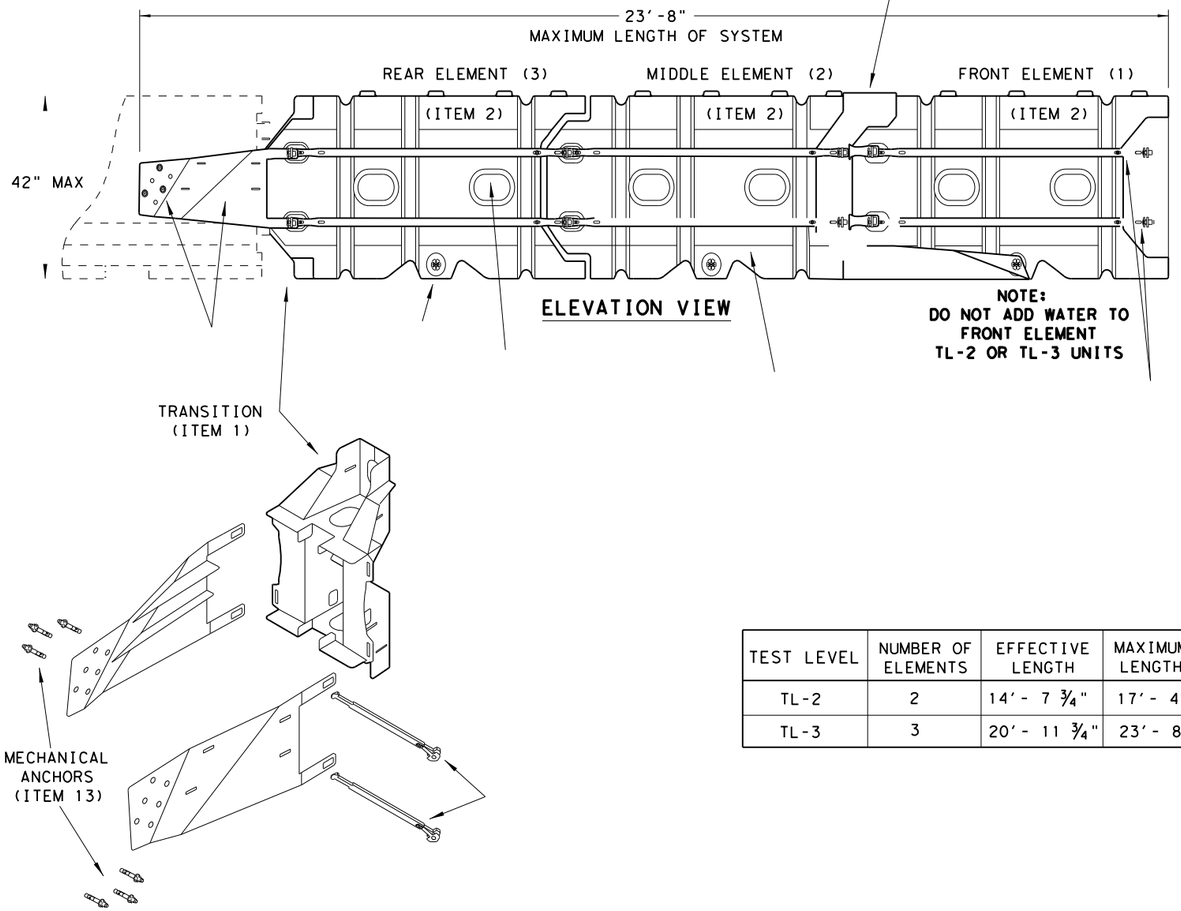
SYSTEM SHOWN - ABSORB-M TL-3



PLAN VIEW

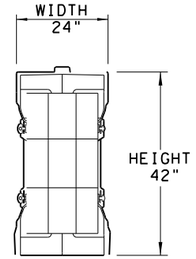
TRAFFIC FLOW



ELEVATION VIEW

NOTE:
DO NOT ADD WATER TO
FRONT ELEMENT
TL-2 OR TL-3 UNITS

TRAFFIC FLOW



SECTION A-A

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

GENERAL NOTES

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

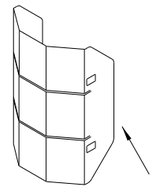
BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
3	BSI-4004598	FILL CAPS	8	12
4	BSI-4004599	DRAIN PLUGS	2	3
5	BSI-1809053-00	TENSION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

* COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE

TRAFFIC FLOW LEFT-SIDE BARRIER | TRAFFIC FLOW BOTH-SIDE BARRIER | TRAFFIC FLOW RIGHT-SIDE BARRIER

** APPLY DECAL



NOSE PLATE

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

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

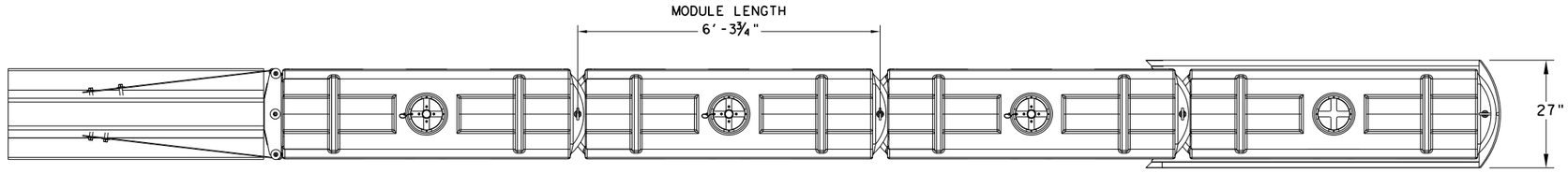
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

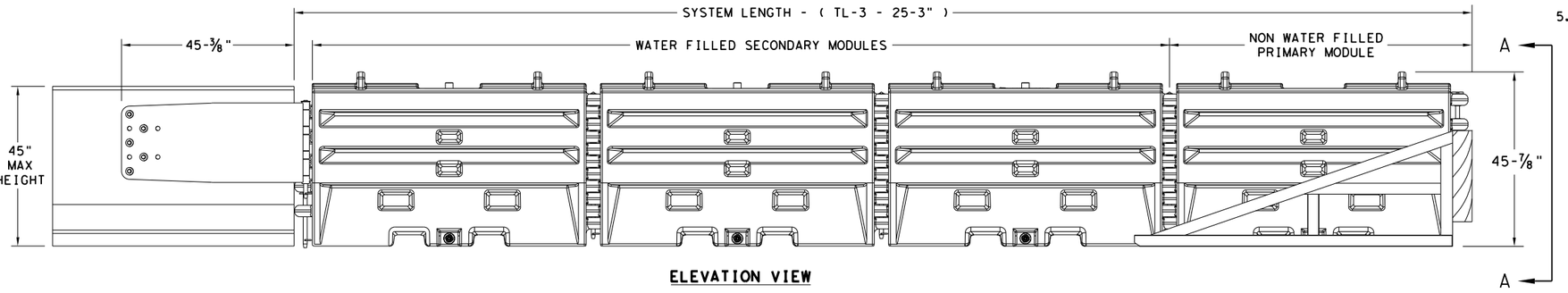
Texas Department of Transportation — Design Division Standard

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

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		93



PLAN VIEW



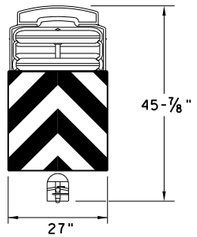
ELEVATION VIEW

GENERAL NOTES

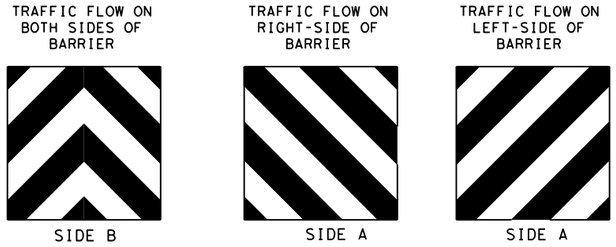
1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE,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

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

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



SECTION A-A

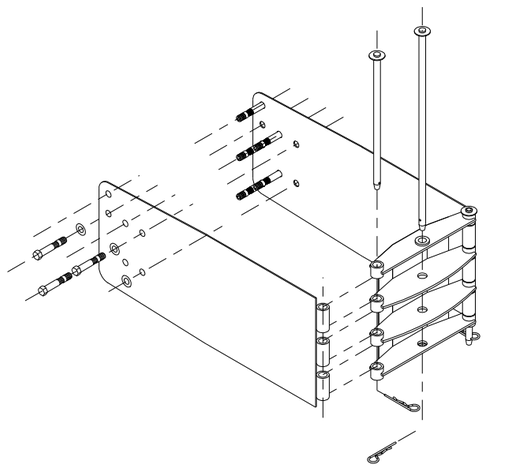


NOSE SHEETING PANEL DELINEATION

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

BILL OF MATERIAL

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



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

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

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

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

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

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

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		94

DATE: 4/1/2021
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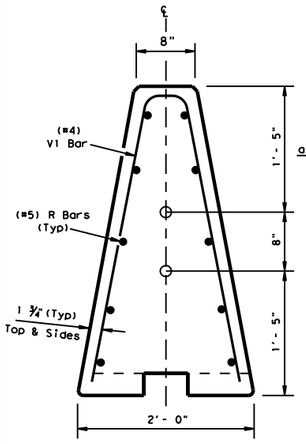
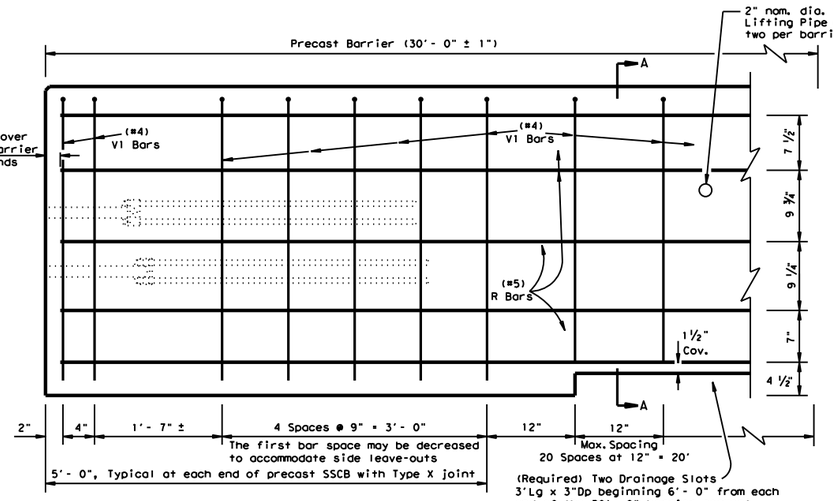


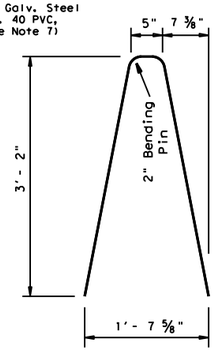
End View
Precast Barrier

Pipe locations for Joint Type X connection



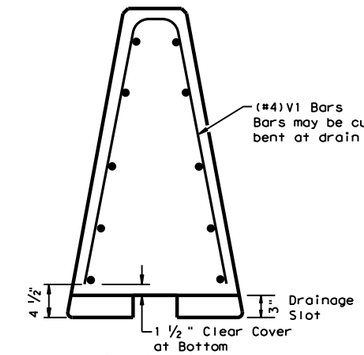
Reinforcement for Precast (SSCB)
Single Slope Concrete Barrier (Type 1)

Showing reinforcement for Joint Connection (Type X)



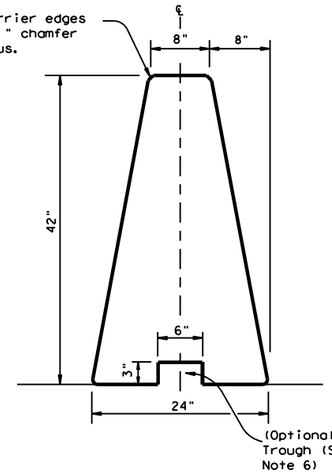
V1 Bar
#4 Rebar

Note:
V1 Bars above the drainage slots may bent to accomadate 1 ½" clear cover as directed by the Engineer.



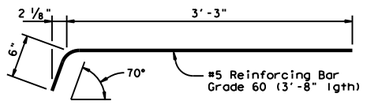
Section A-A
Steel Placement at (Required) Drainage Slots

All precast barrier edges shall have a ¾" chamfer or tooled radius.



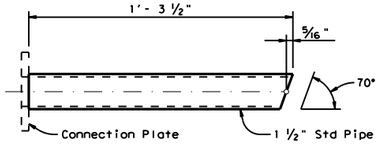
Single Slope Concrete Traffic Barrier

Precast SSCB barrier may be connected to cast-in-place SSBC. The joint connection "Types" may be used in the cast-in-place barrier, to match the precast barrier connection.



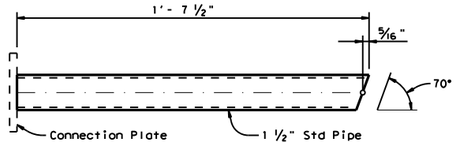
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



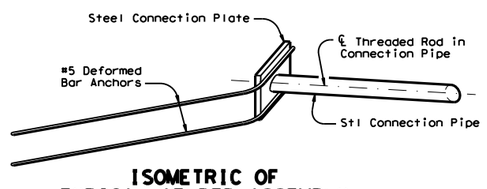
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.



LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.

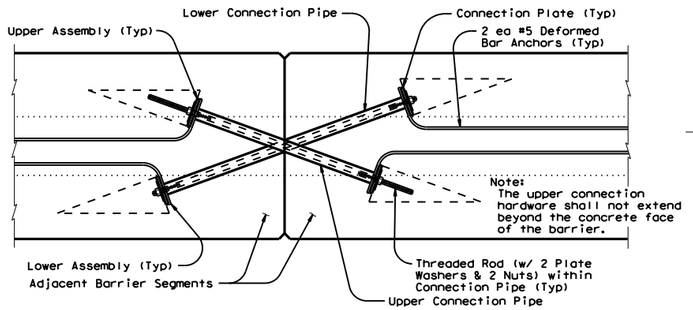


ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.

General Notes

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or a tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items.
9. All steel assemblies shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

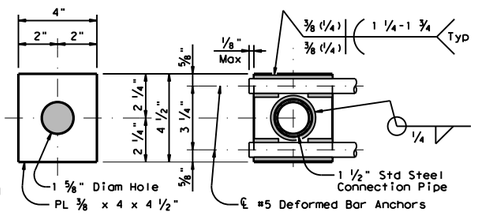
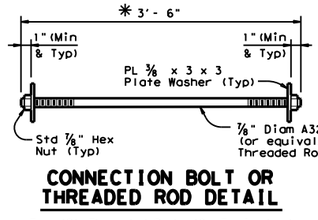


PLATE DIMENSIONS **WELDING DETAILS**

CONNECTION PLATE DETAILS

One (1) Plate required per assembly.
Four (4) required per Joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.

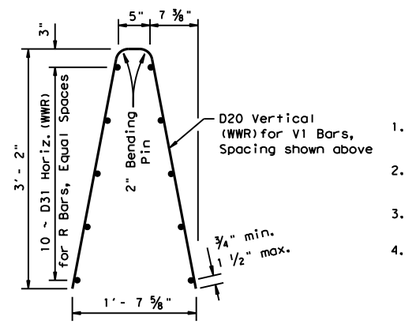


✱ The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.

CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts) (w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per Joint.

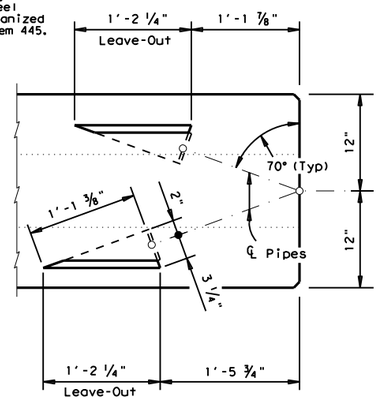
Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.



Welded Wire Reinforcement (WWR) Option for Bars R and V1

(WWR) General Notes

1. Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
2. Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
3. All reinforcement shall comply with Item 440, "Reinforcing Steel."
4. Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



BARRIER PLAN AT JOINT

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1)

SSCB(2)-10

FILE: sscb210.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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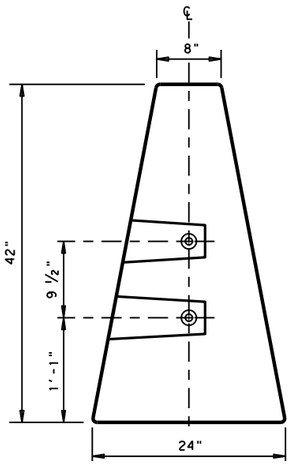
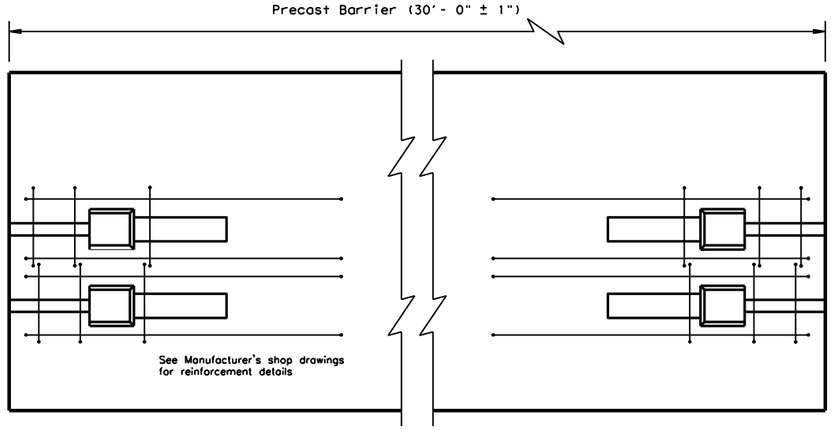
	SAT	BEXAR		95

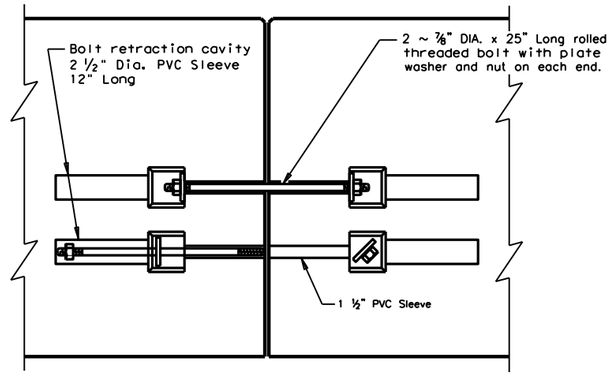
DATE: 4/1/2021
FILE: c:\pwworking\kha\pwprod\nicole.smale\dms46116\sscb210.dgn



END VIEW
"QUICK-BOLT" POCKET LOCATIONS



ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details



ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

TOP VIEW
PRECAST (SSCB) WITH J-J HOOKS
See Manufacturer's shop drawing for additional details

VIEW FROM ABOVE
J-J HOOK CONNECTION

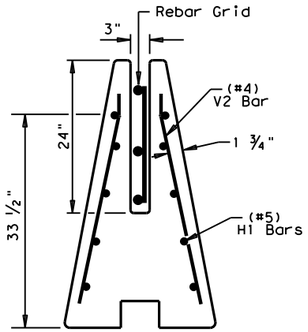
END VIEW

Proprietary Joint Connections (SSCB)

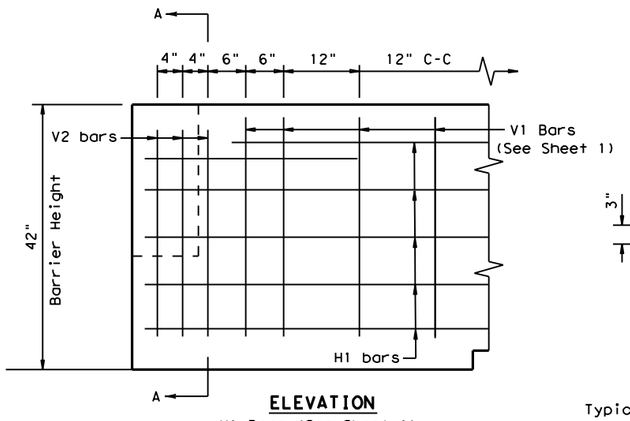
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
Quick-Bolt by Bexar Concrete, (210)497-3773

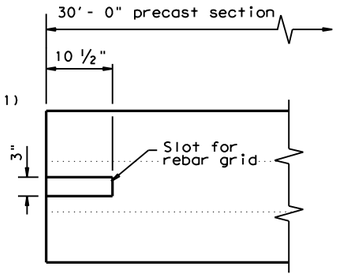
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



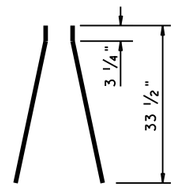
SECTION A-A
Showing (Type R) Rebar Grid



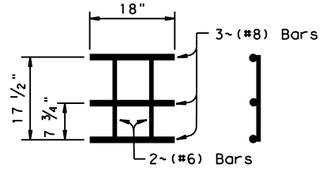
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



(#4) V2 BARS
6 ~ two piece bars per barrier segment



WELDED REBAR GRID

Joint Connection (Type R)

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER
(TYPE 1)

SSCB(2)-10

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©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		96

DATE: 4/1/2021
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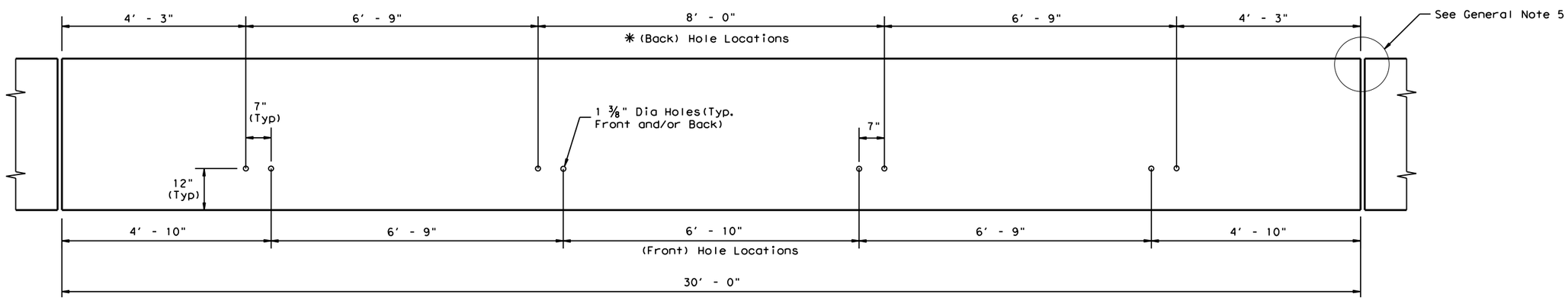
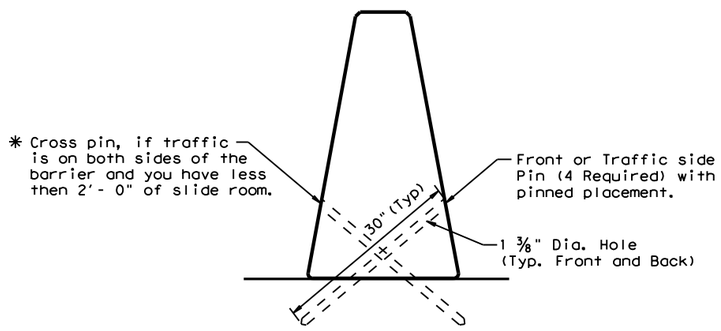


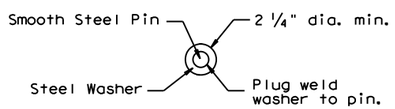
DETAIL 1

Precast SSCB(42")
Showing hole locations

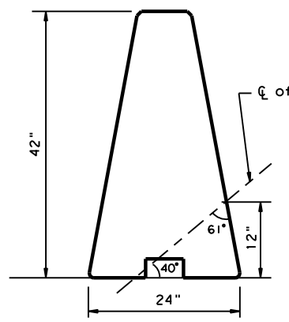


DETAIL 2

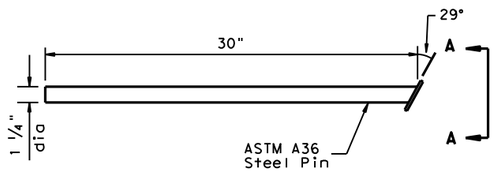
Placement on (ACP)
Asphalt Conc. Pavement
or Treated Base Material
(30" Pin required)



VIEW A-A

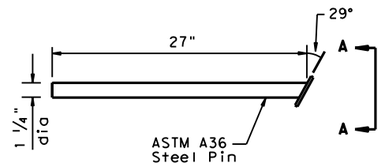


HOLE LOCATION DETAIL



(30") PIN DETAIL

See Detail 2



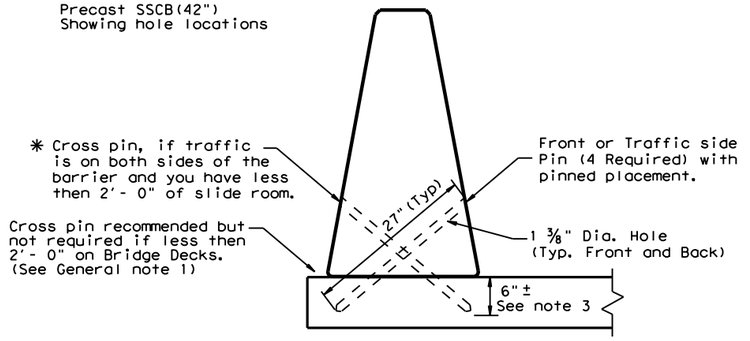
(27") PIN DETAIL

See Detail 3

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

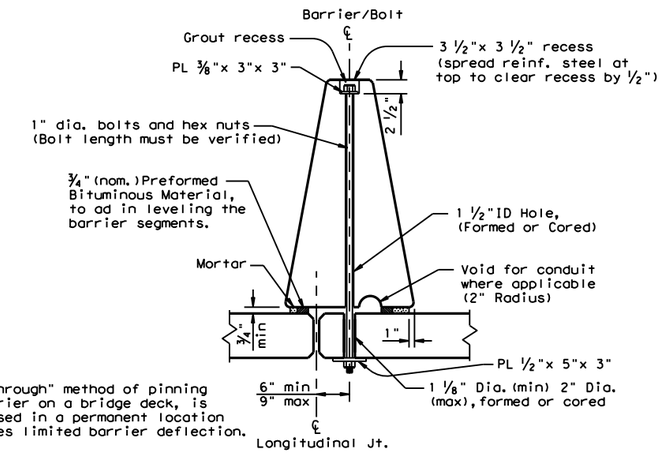
DETAIL 3

Bridge Deck or CRCP
(27" Pin required).



CORE DRILLING EXISTING BARRIER

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



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

PRECAST SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1) PINNED PLACEMENT

SSCB(5)-10

FILE: sscb510.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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DATE:
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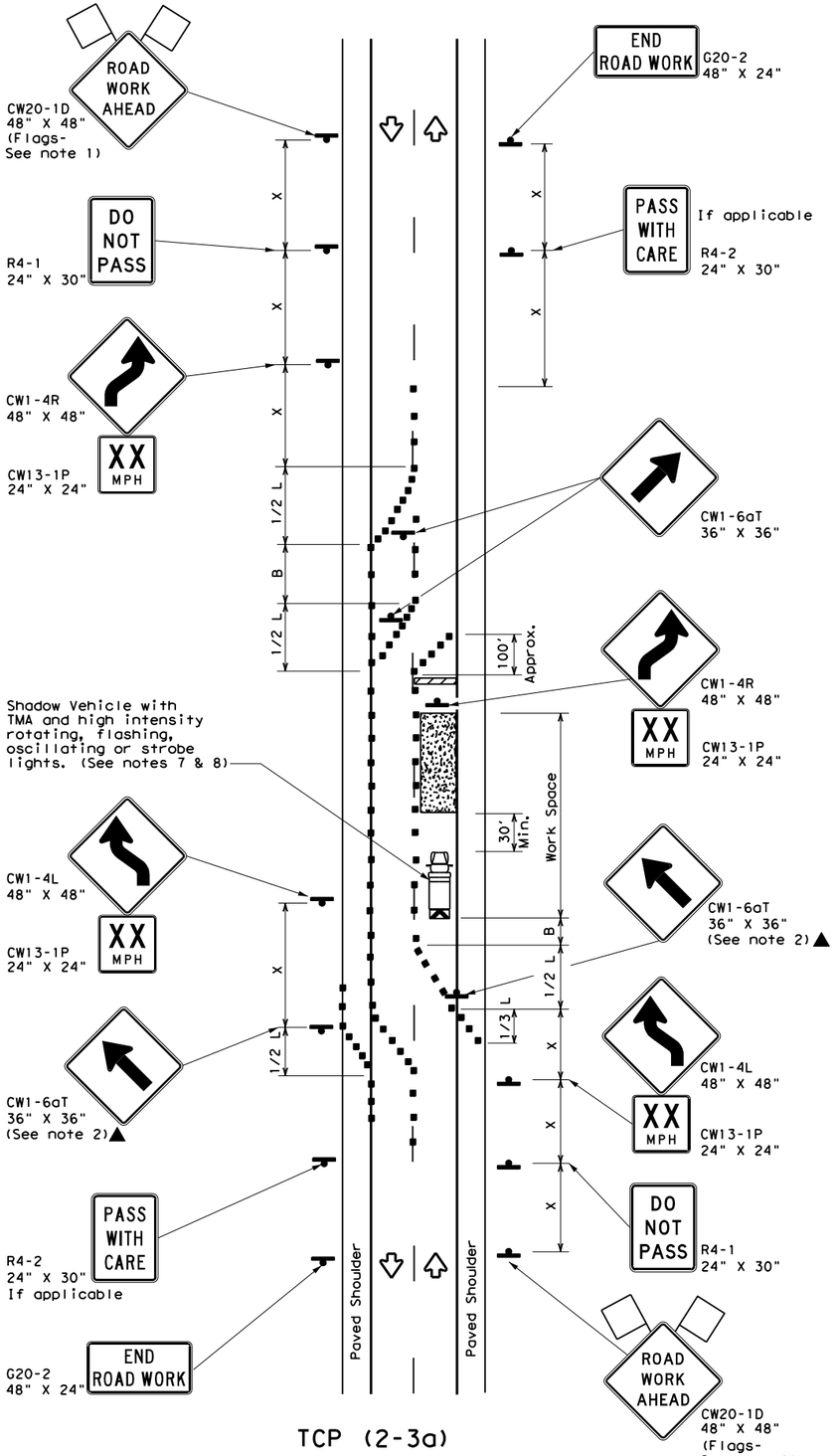
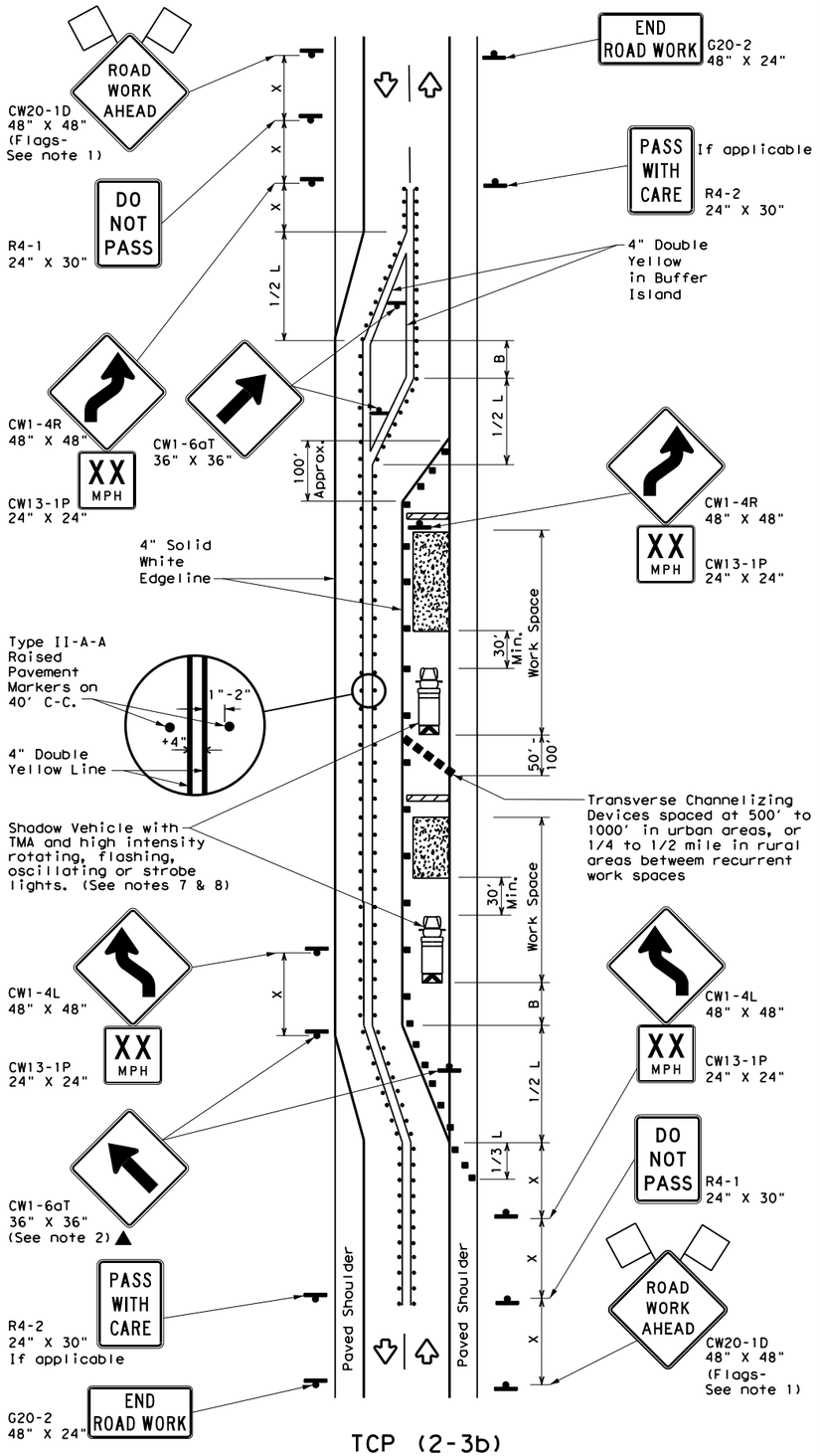


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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

* Conventional Roads Only

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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.
4. 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.
5. 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.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. 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)

9. 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

TCP(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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1-97 2-12	SAT	BEXAR		98
4-98 2-18				

DATE:
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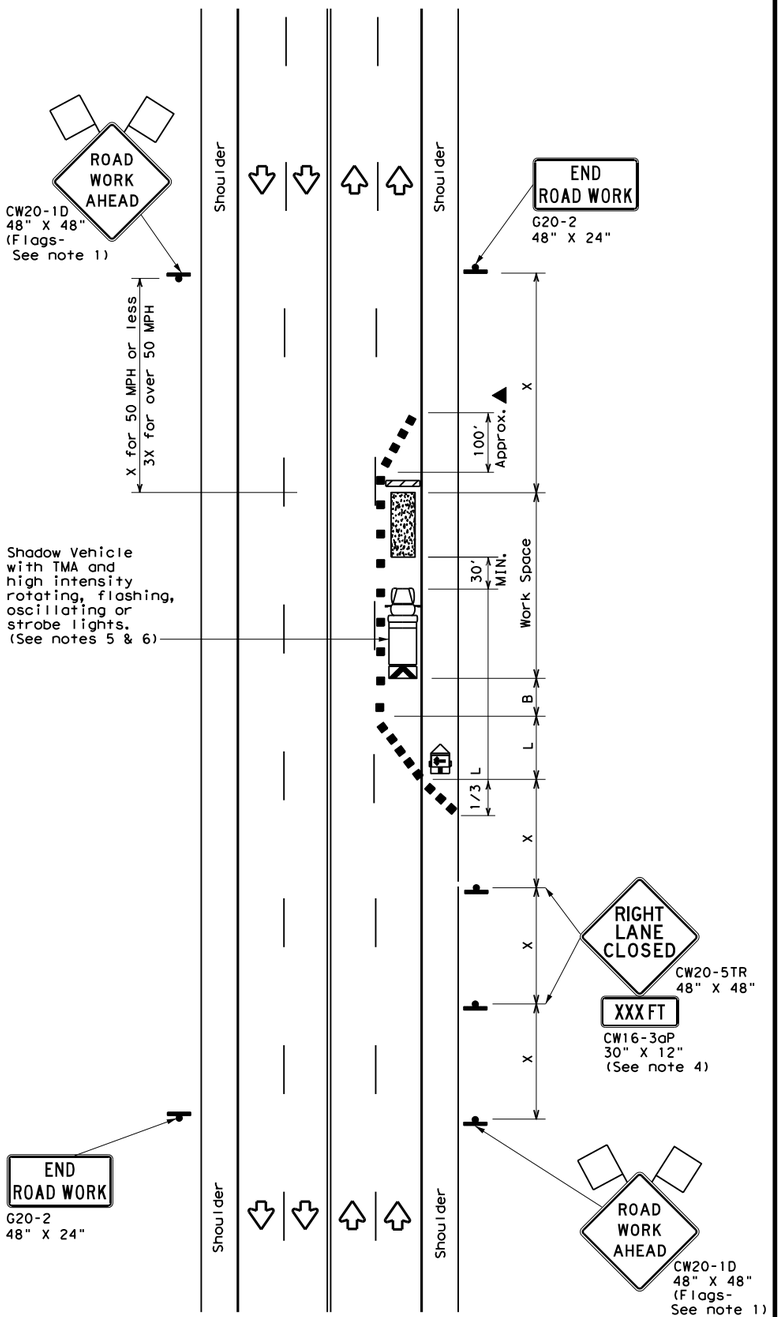
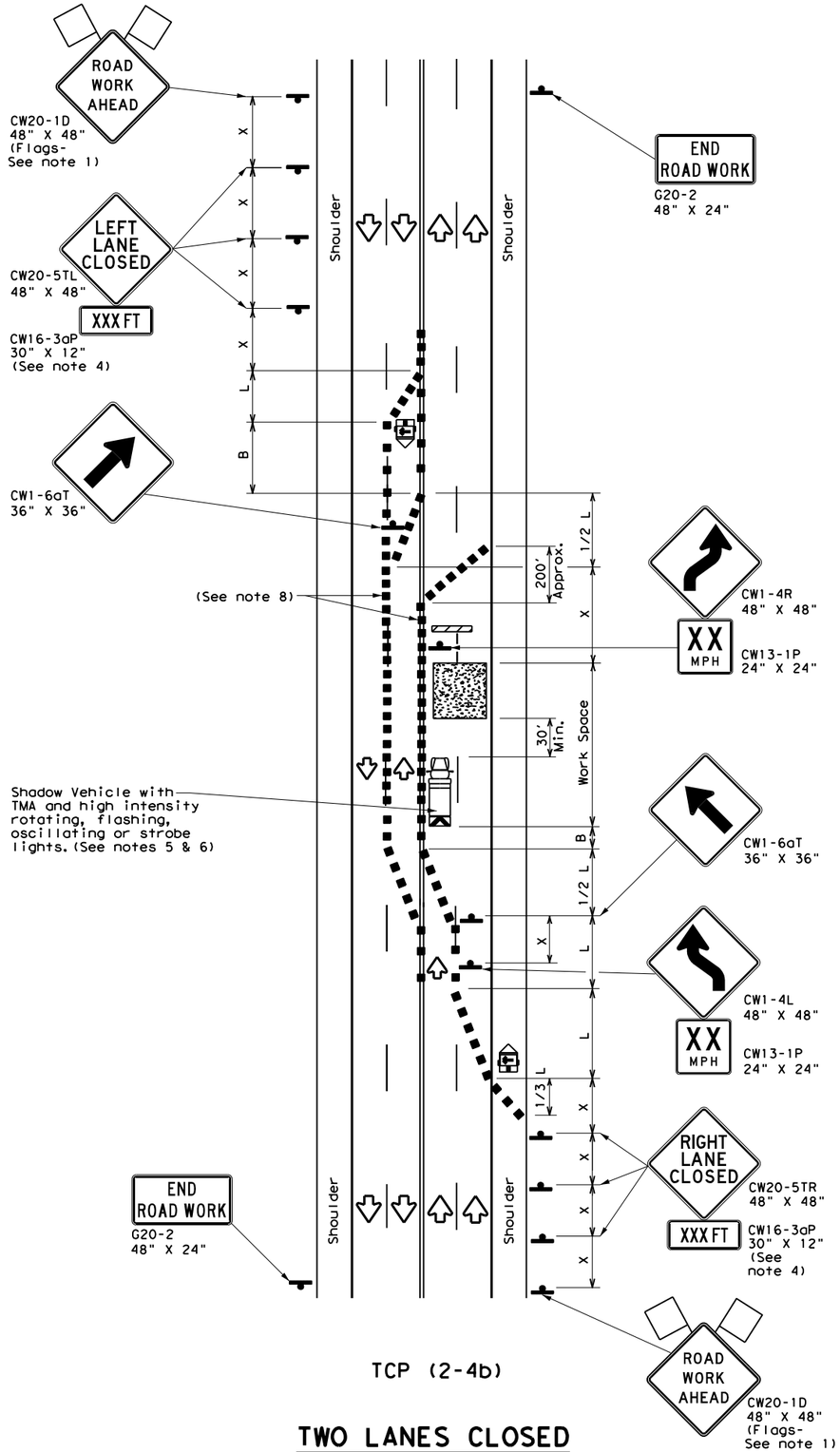


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

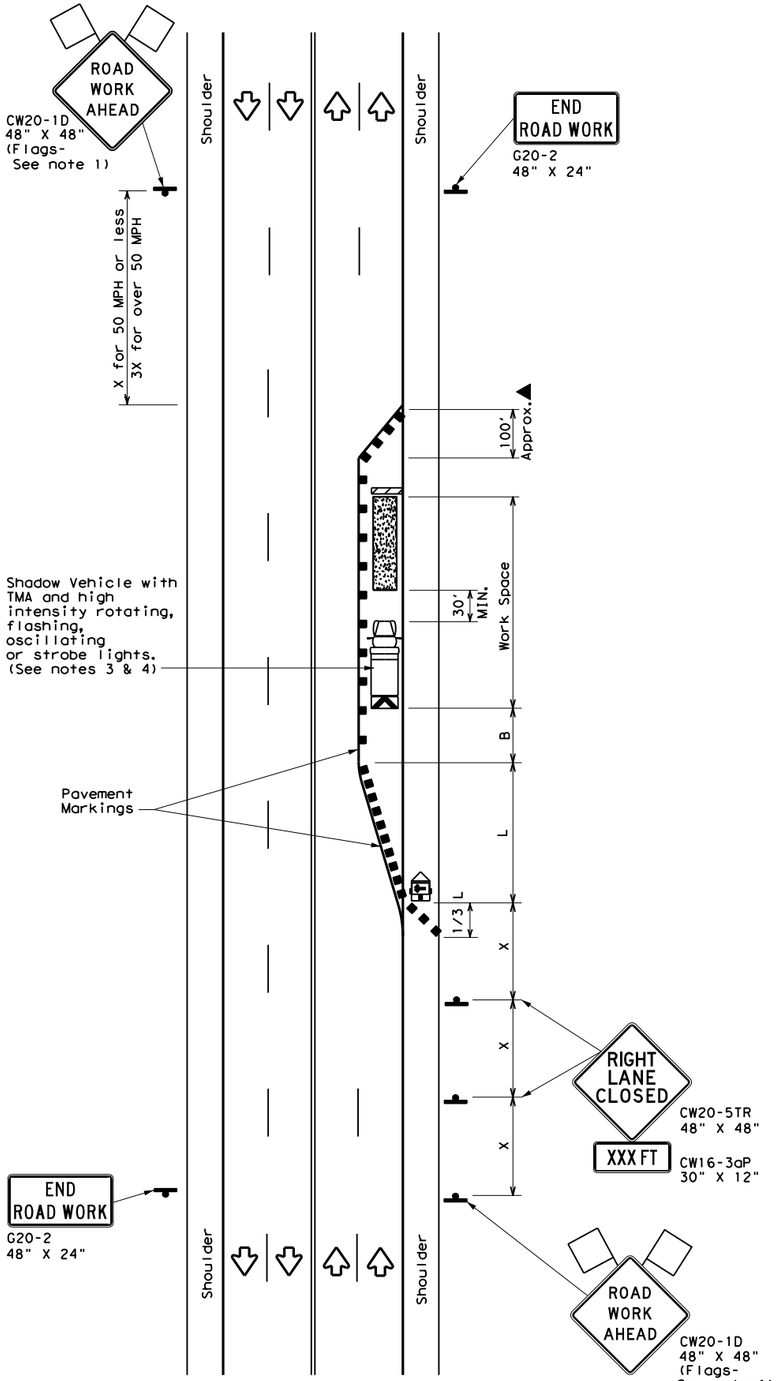
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

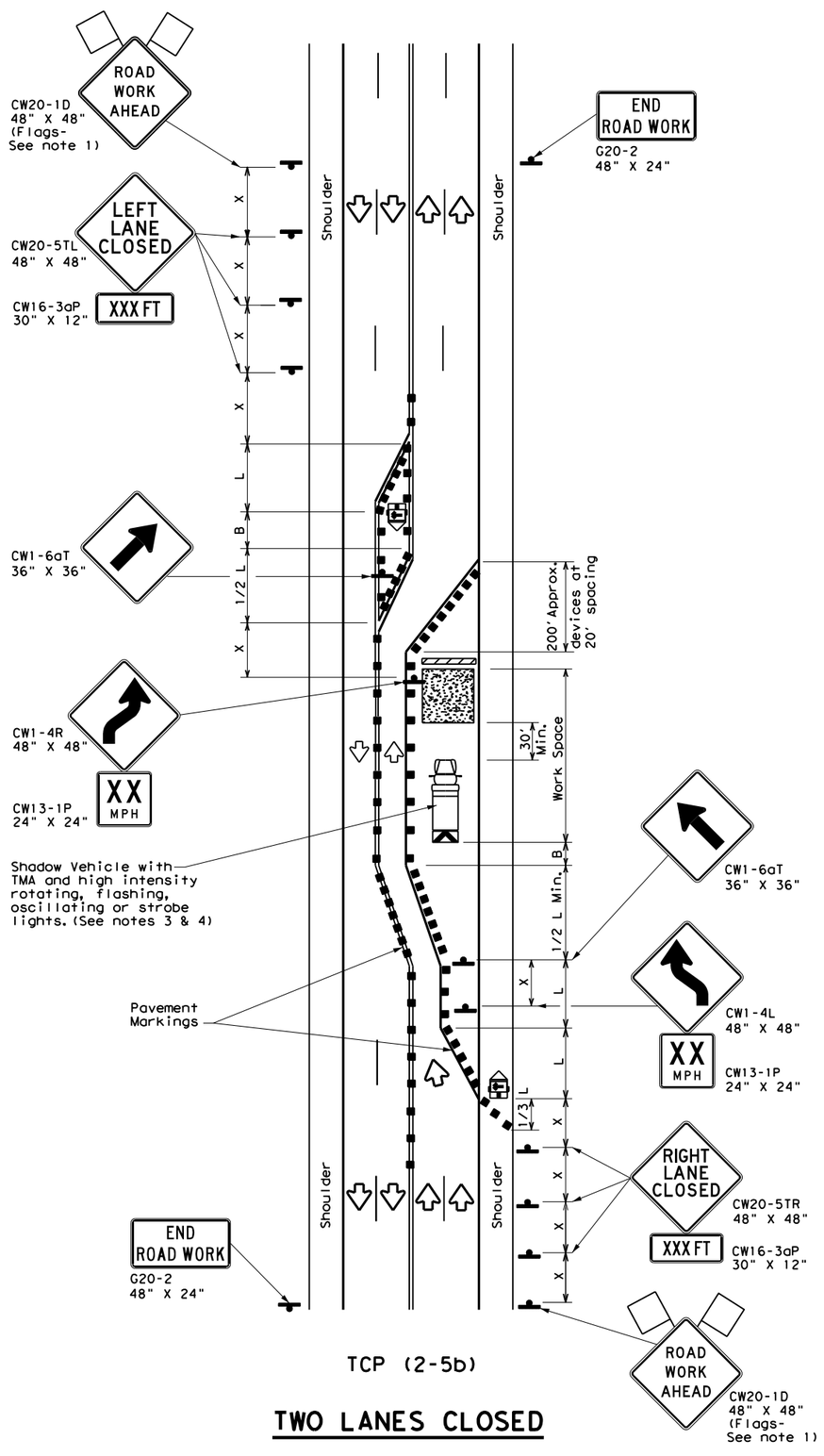
FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0024	08	141	US 90
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		99

DATE:
FILE:



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. 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 epoxure 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 substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

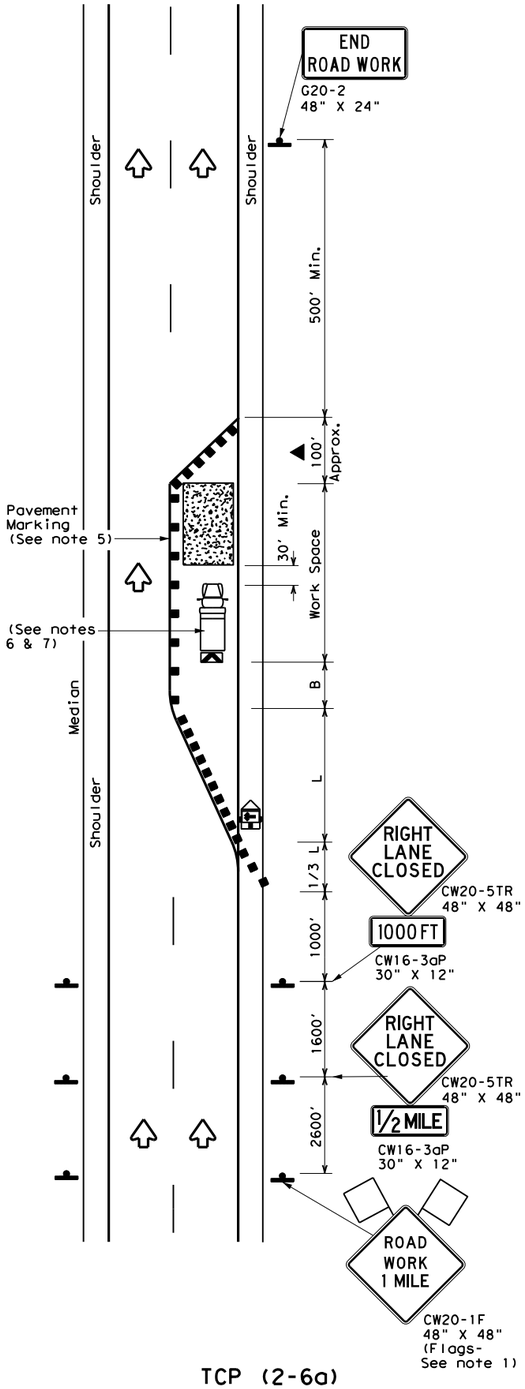
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

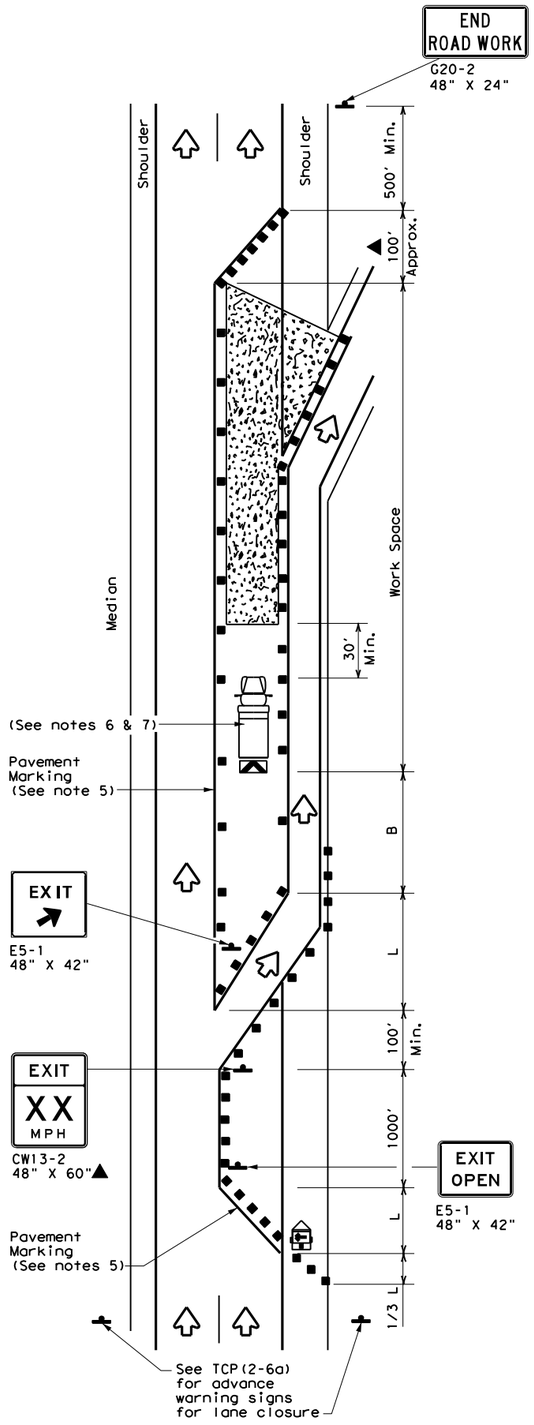
FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0024	08	141	US 90
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		100

DATE:
FILE:



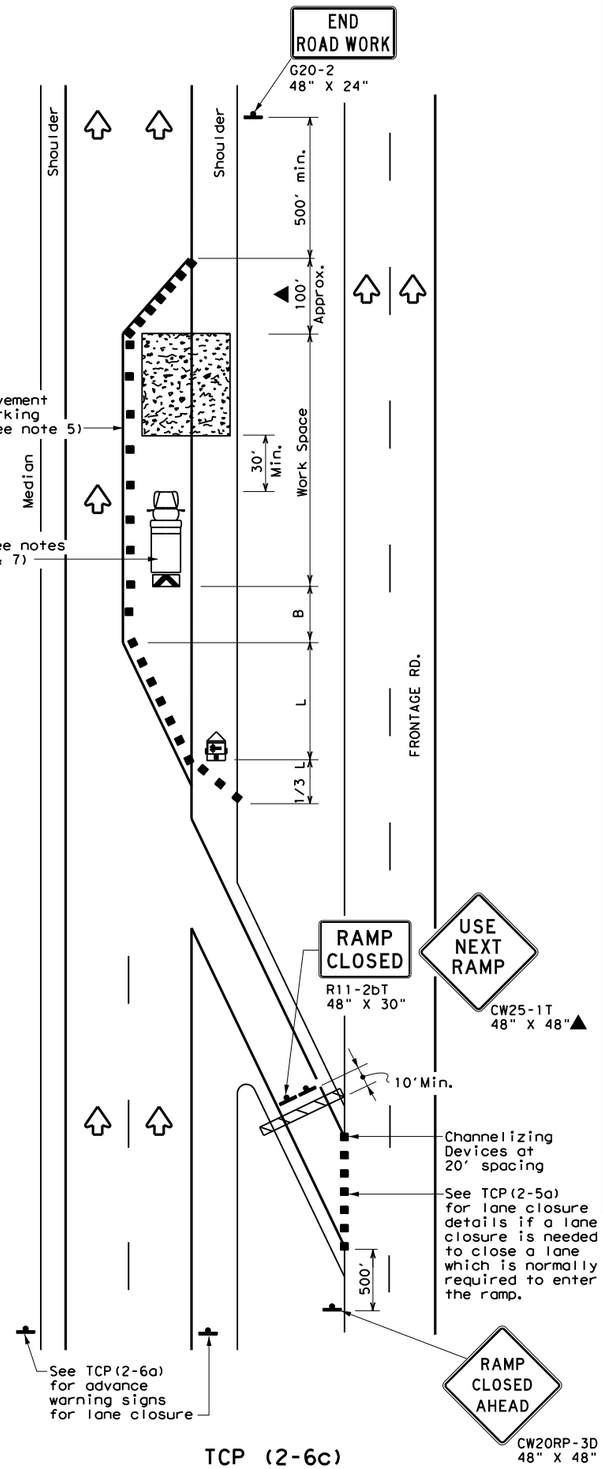
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing,oscillating or strobe lights. 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.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

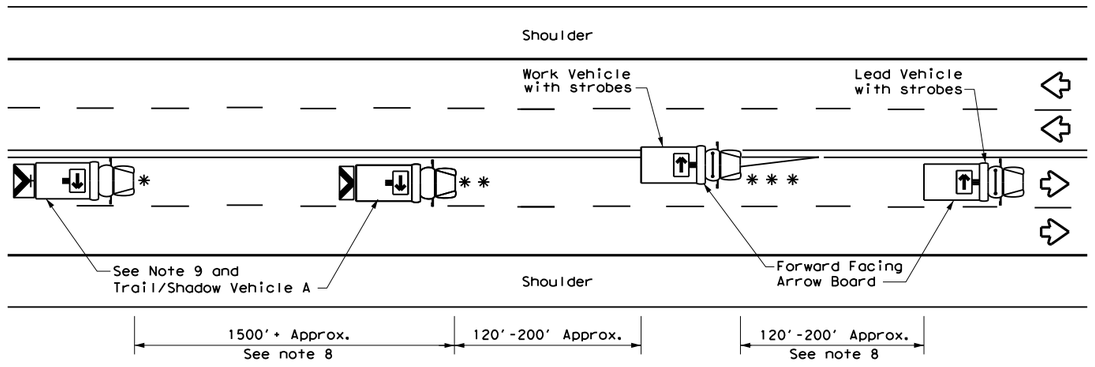
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

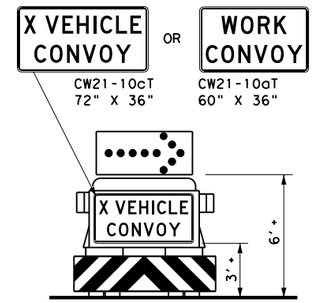
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		101



TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

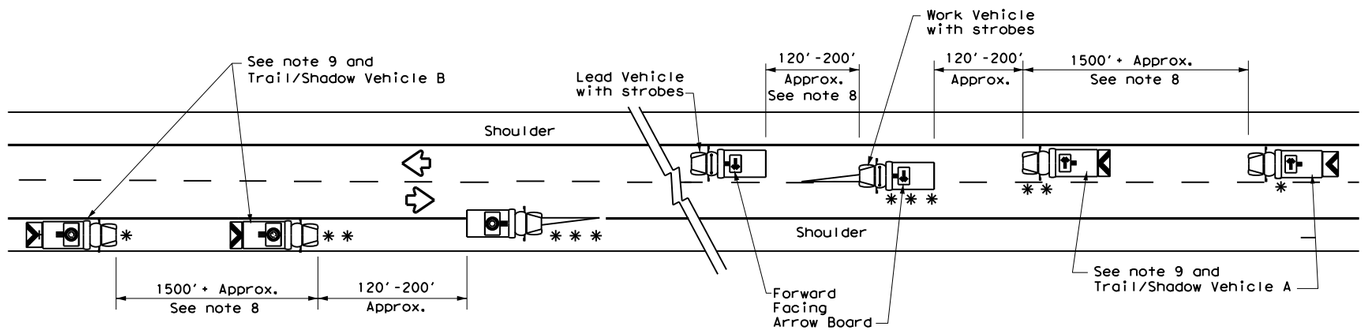
with RIGHT Directional display Flashing Arrow Board

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

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

GENERAL NOTES

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

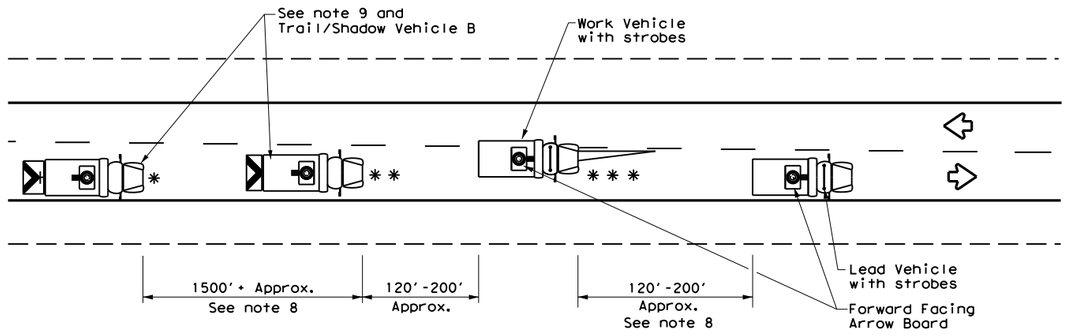


WORK ON SHOULDER

WORK ON TRAVEL LANE

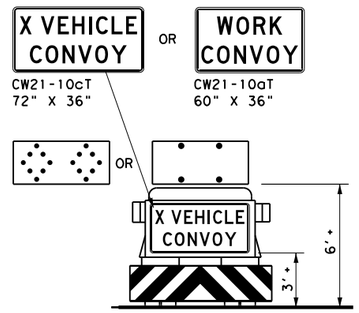
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



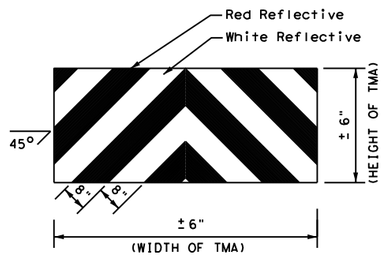
TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		102

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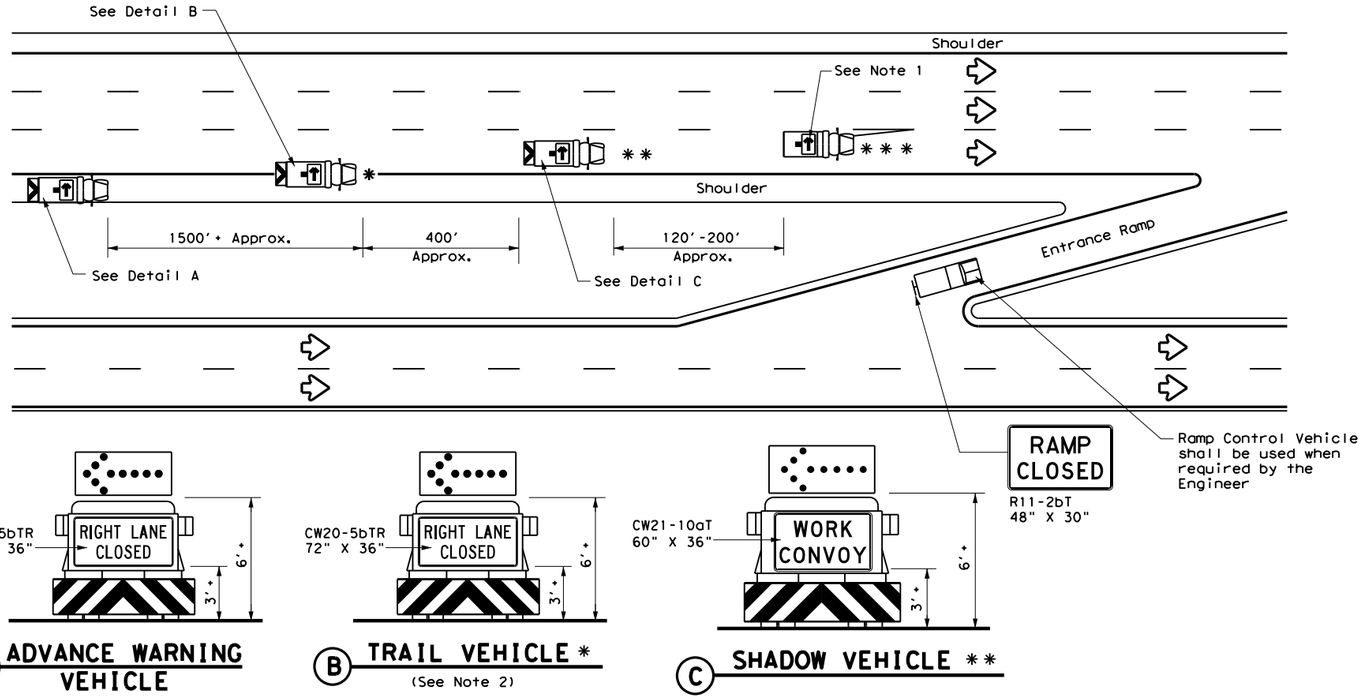
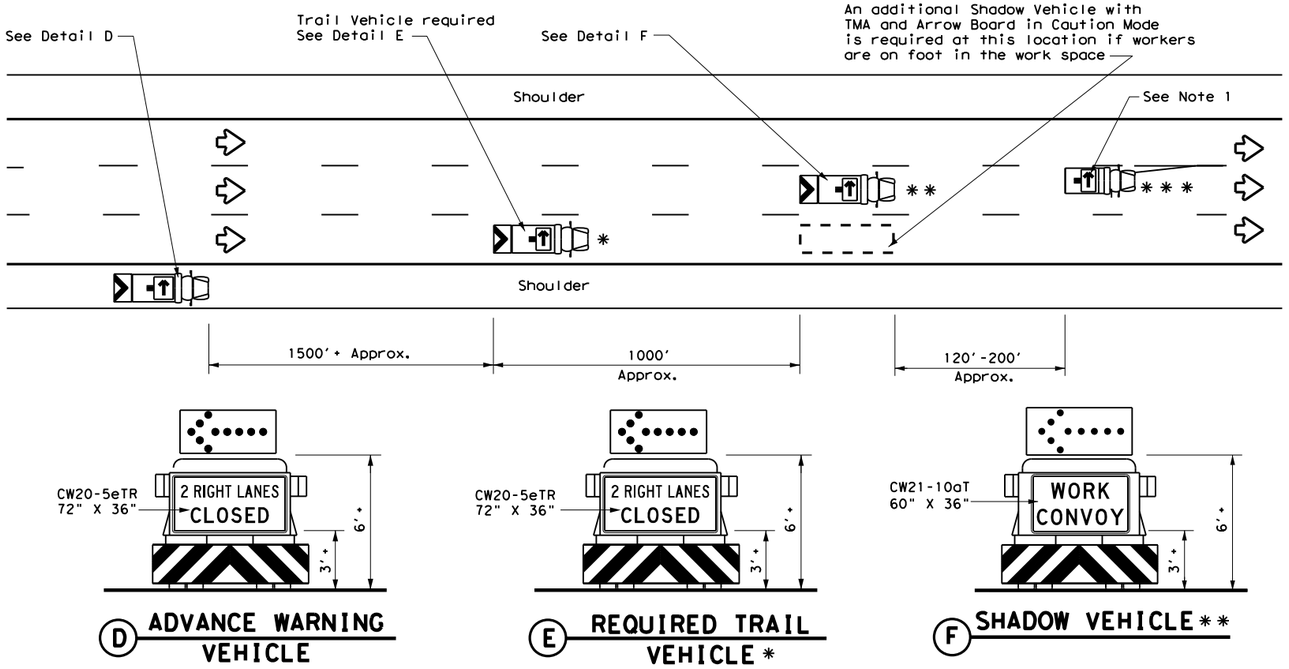


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



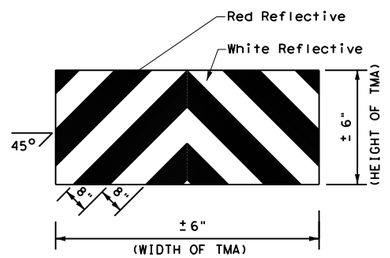
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		103

176

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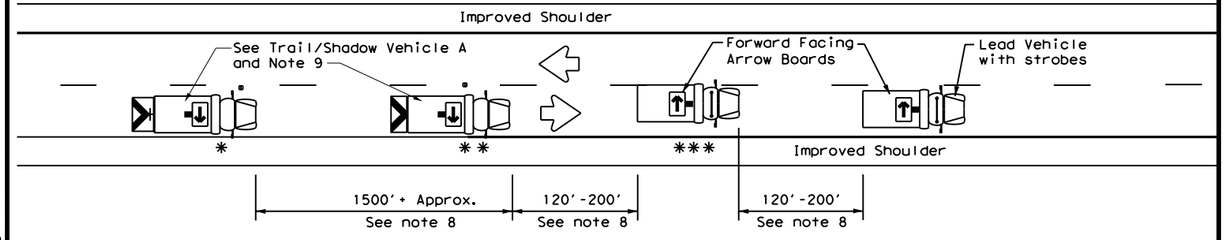
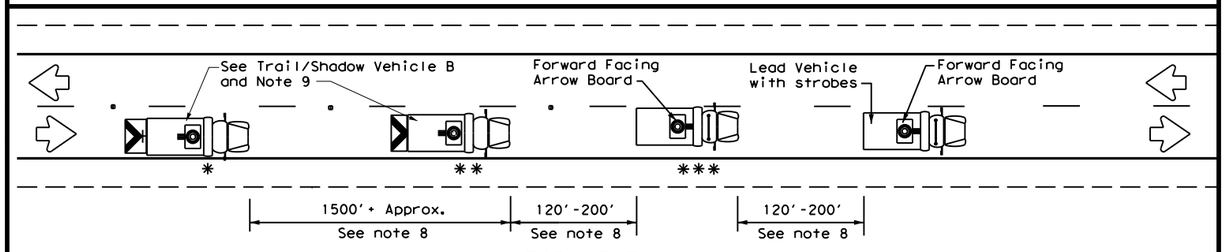


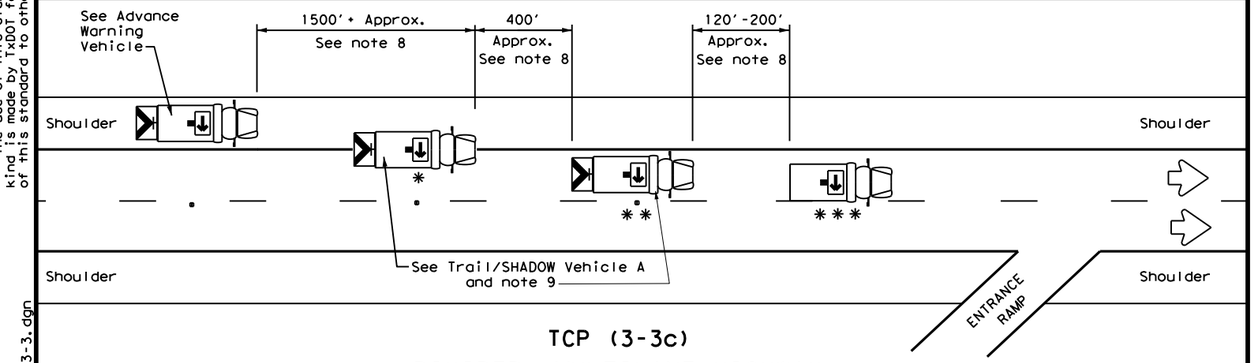
TCP (3-3a)

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



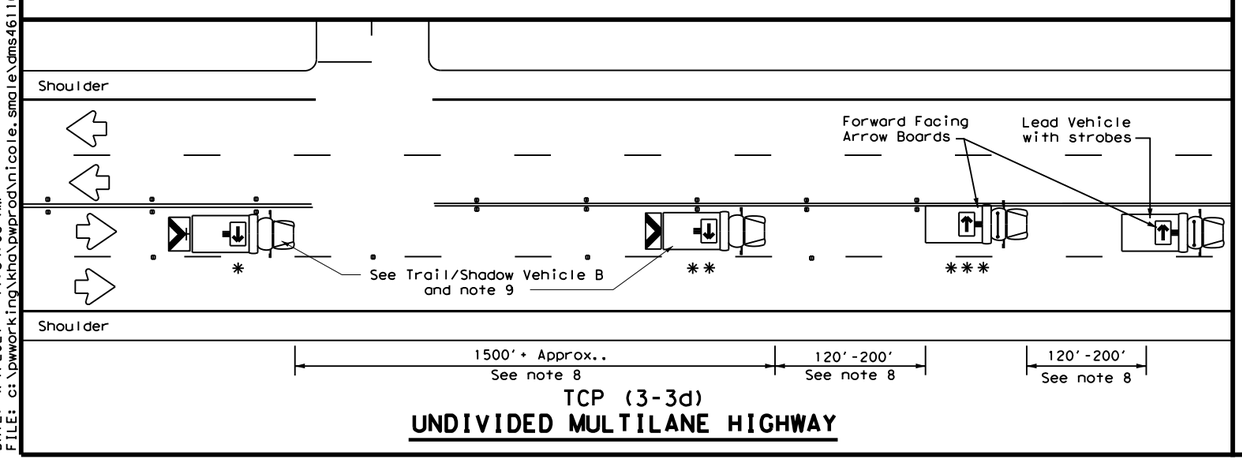
TCP (3-3b)

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



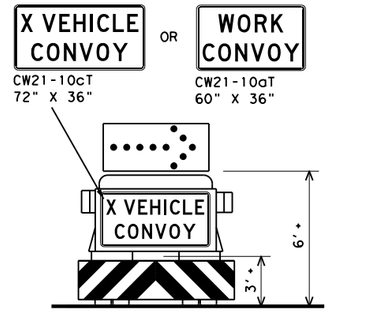
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



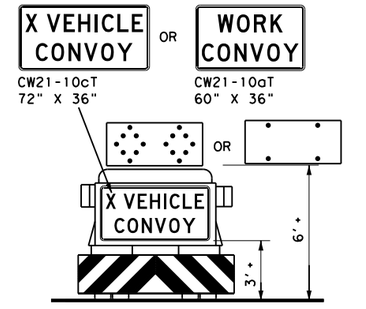
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



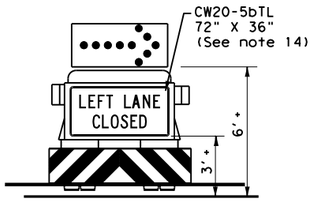
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

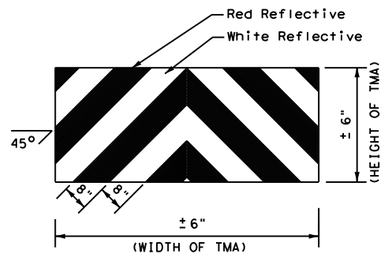


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SAT	BEXAR		104
1-97 7-14				

DATE: 4/1/2021 11:34:08 AM
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DATE: 4/1/2021 11:34:11 AM
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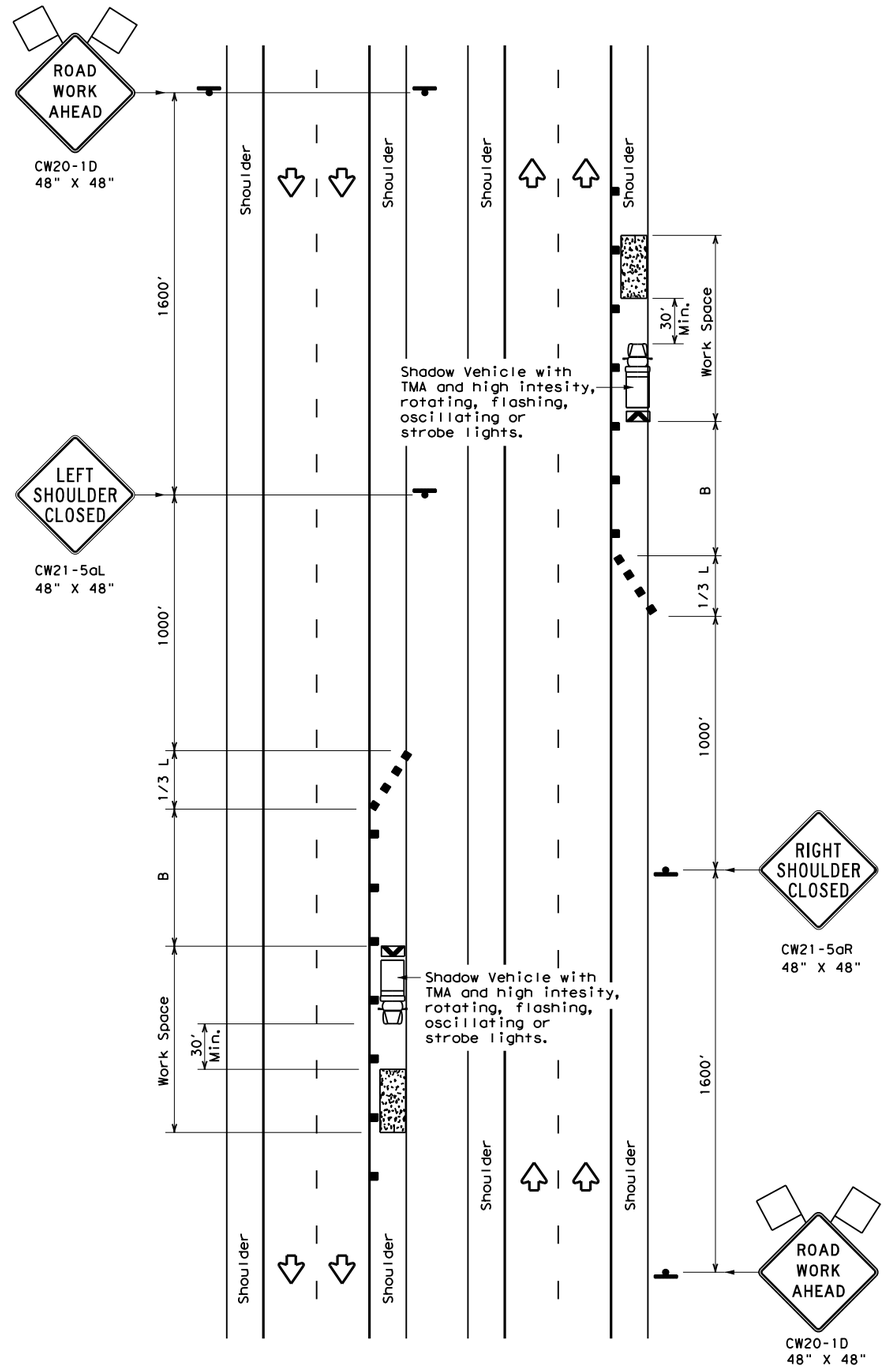
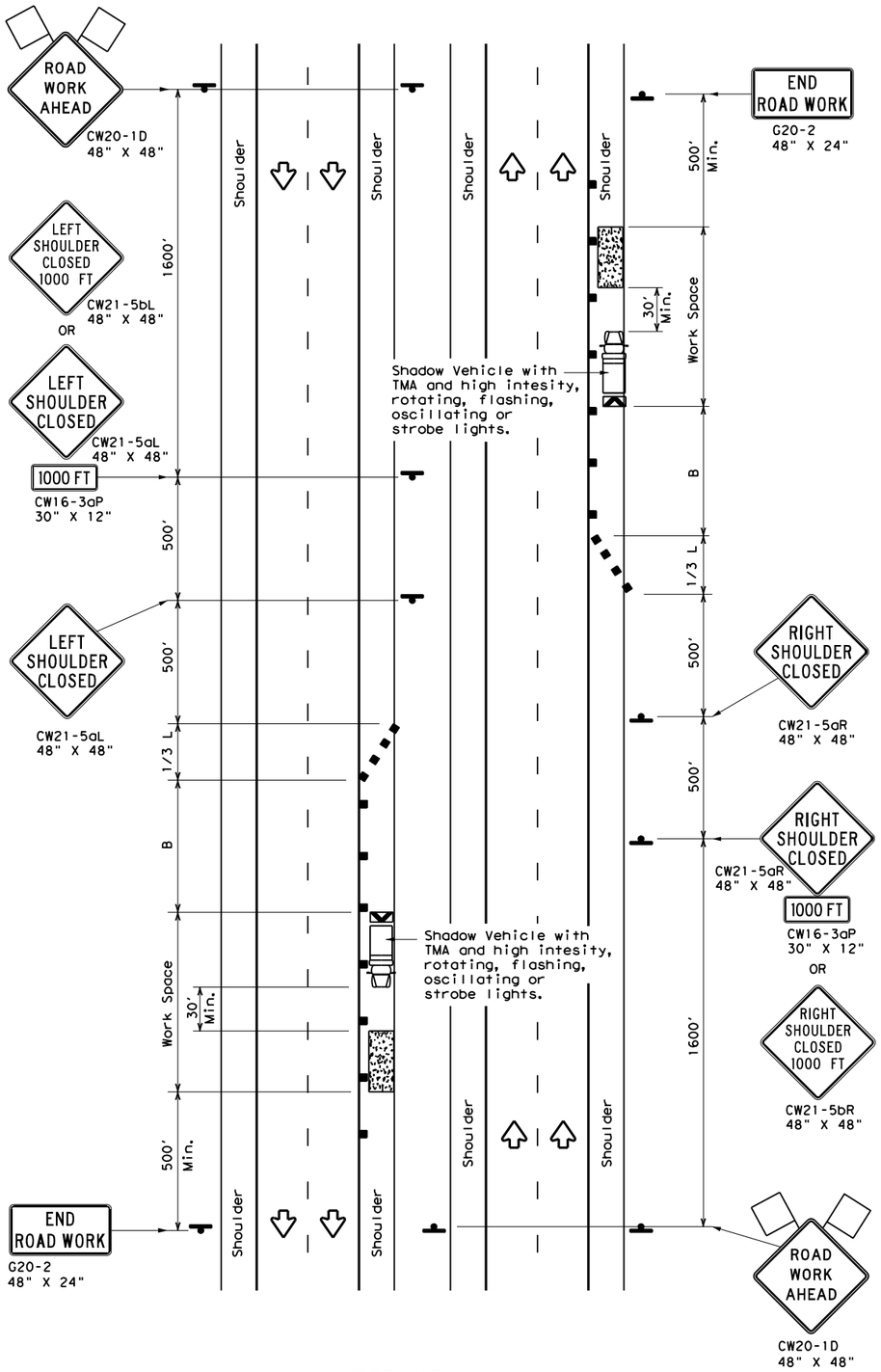


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

* 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
	TCP(5-1a)	TCP(5-1b)	TCP(5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely effecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.

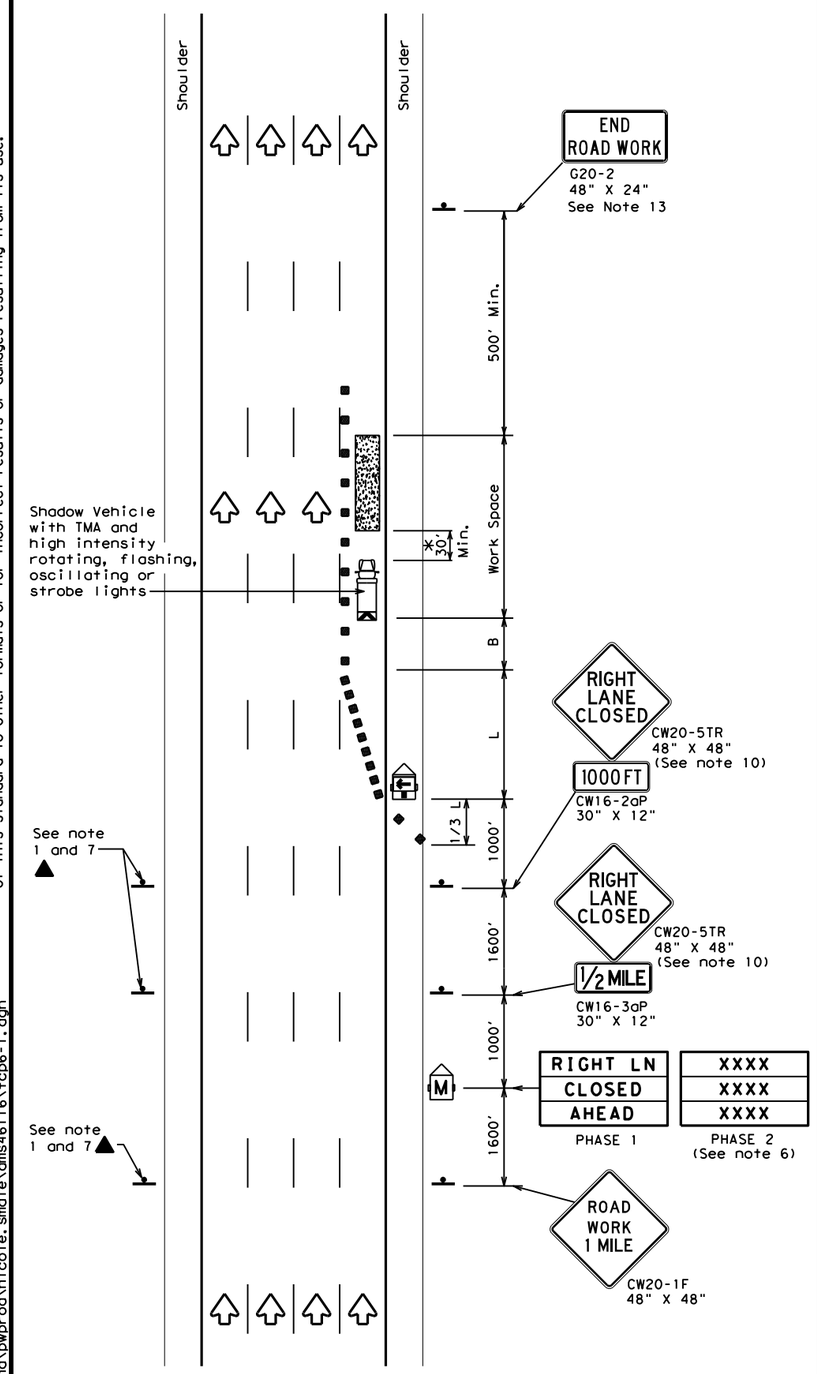
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

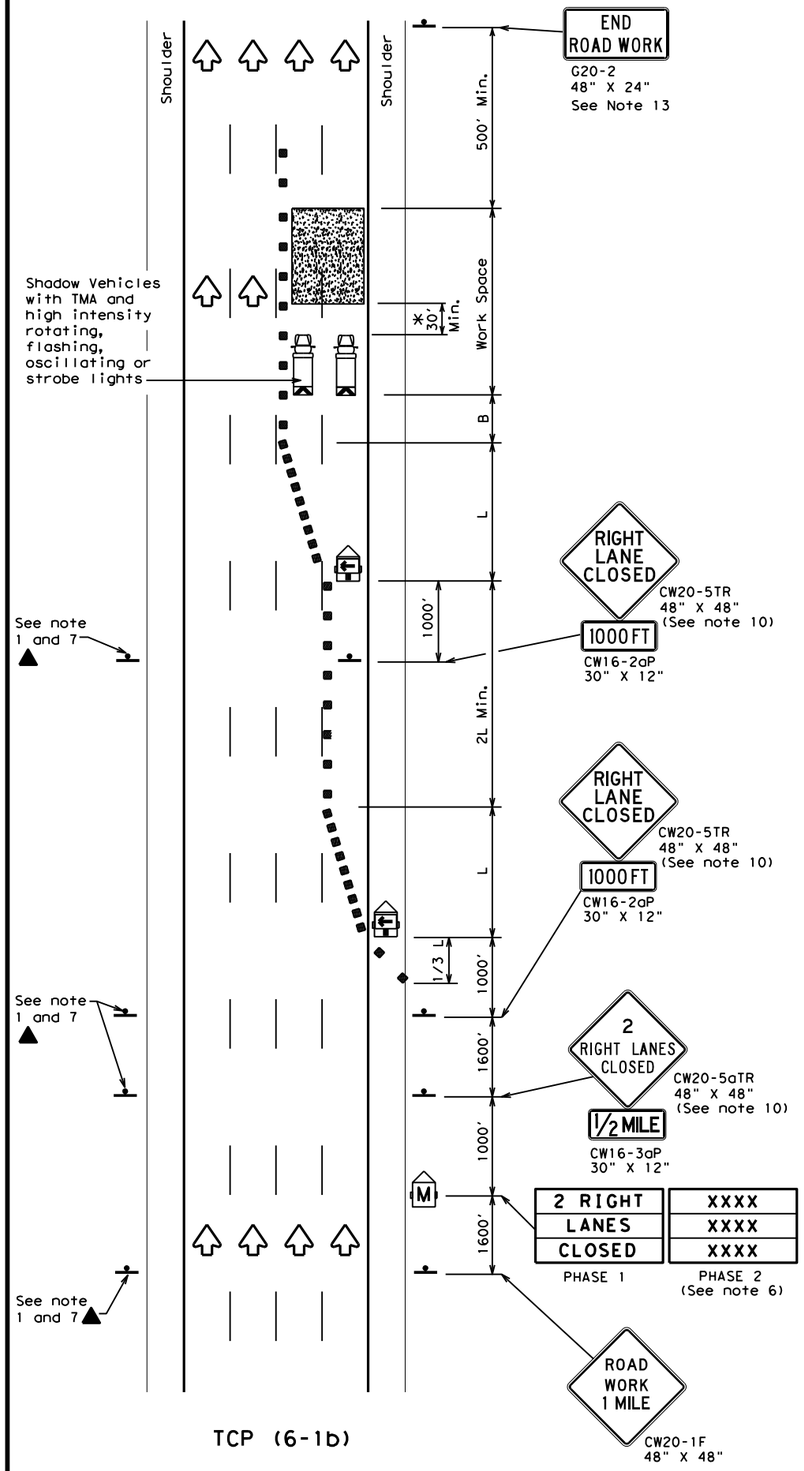
TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
2-18	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		105



TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		106

DATE: 4/1/2021 11:34:14 AM
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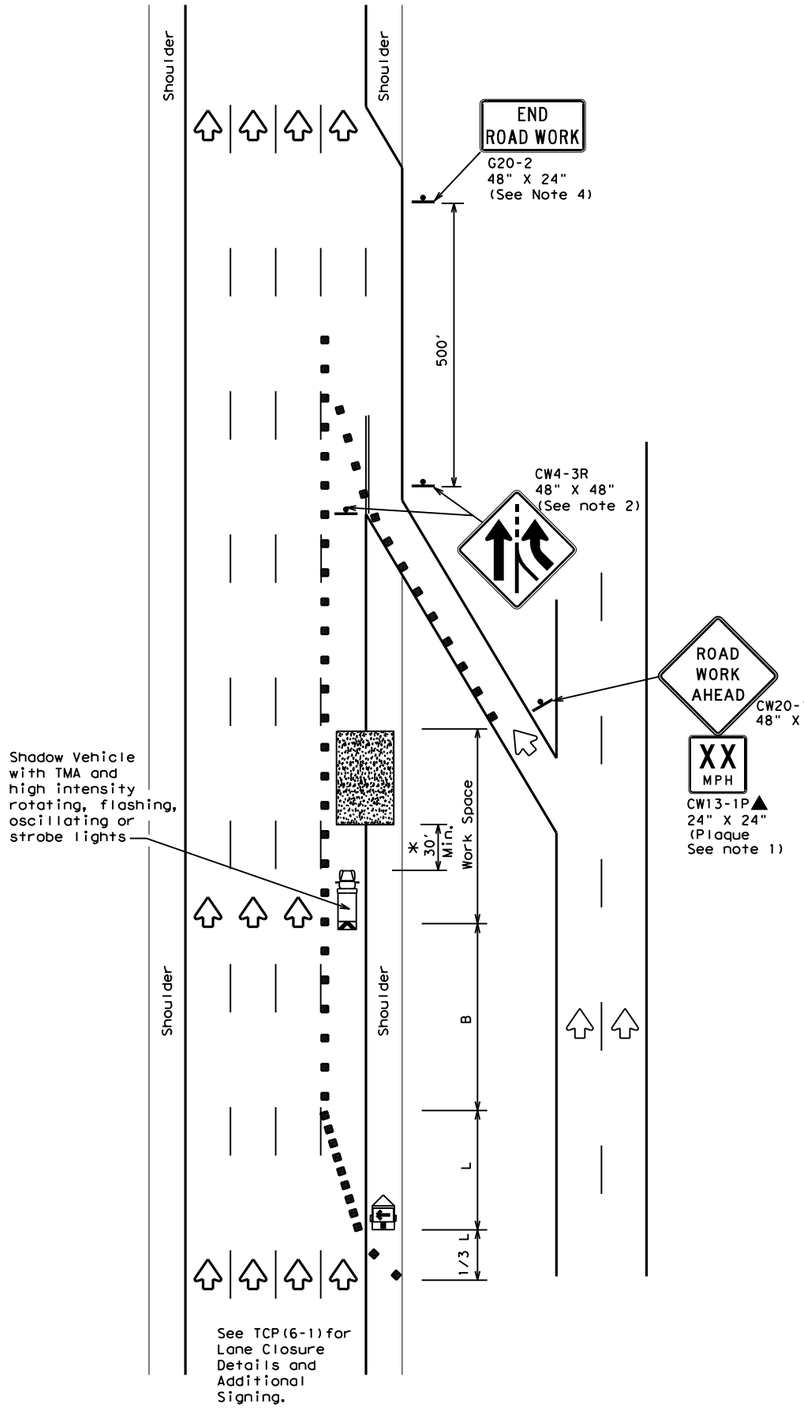
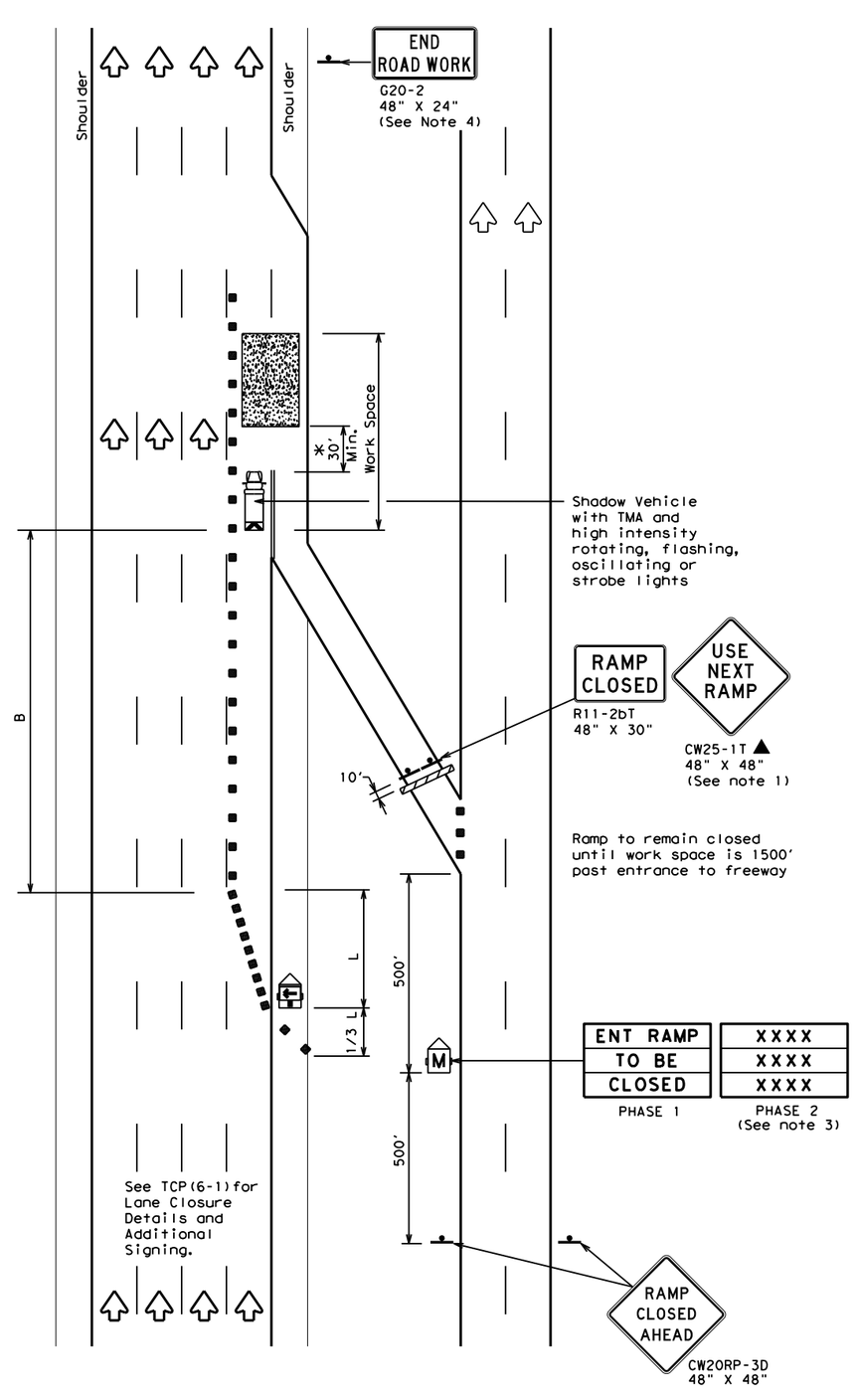


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		107

202

DATE: 4/1/2021 11:34:17 AM
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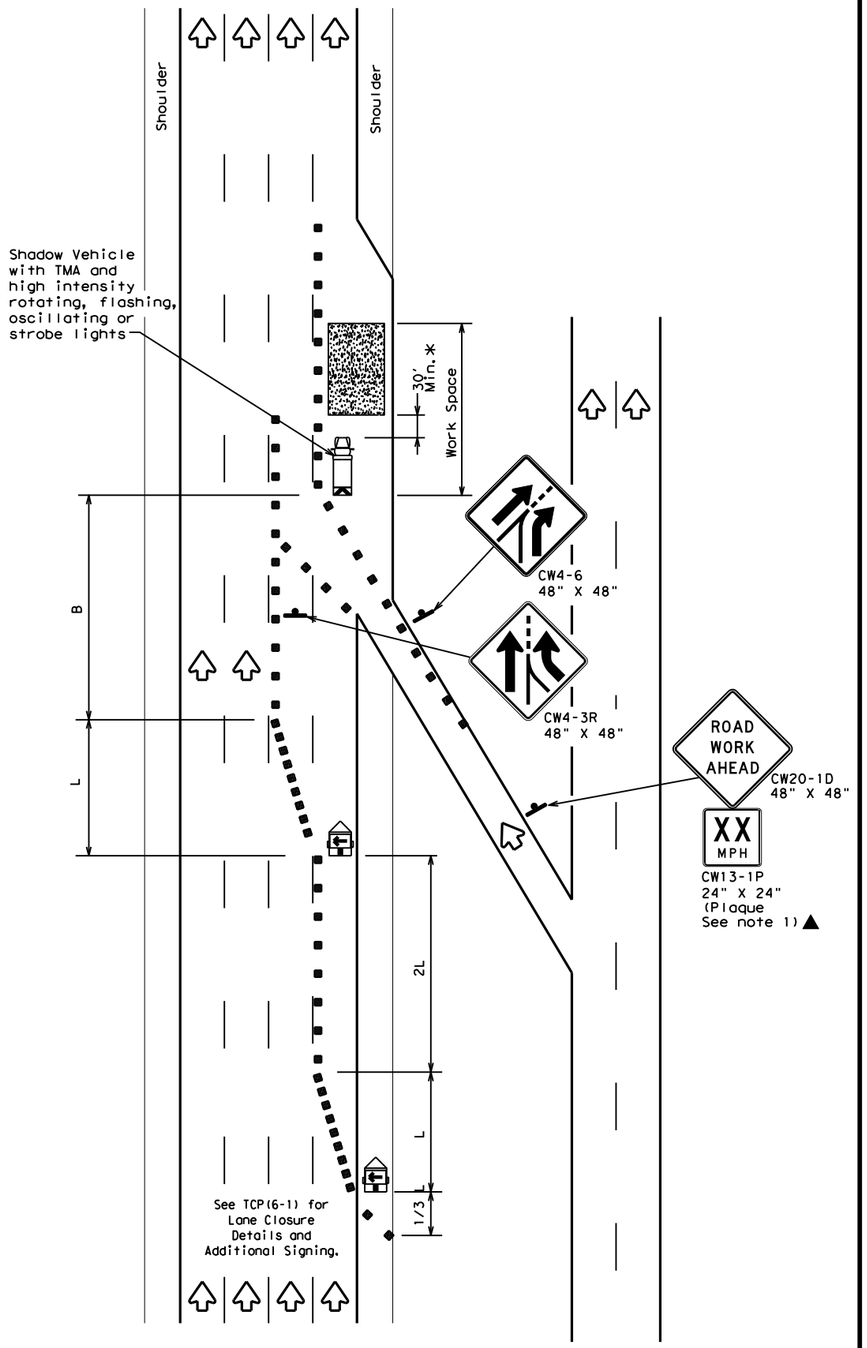
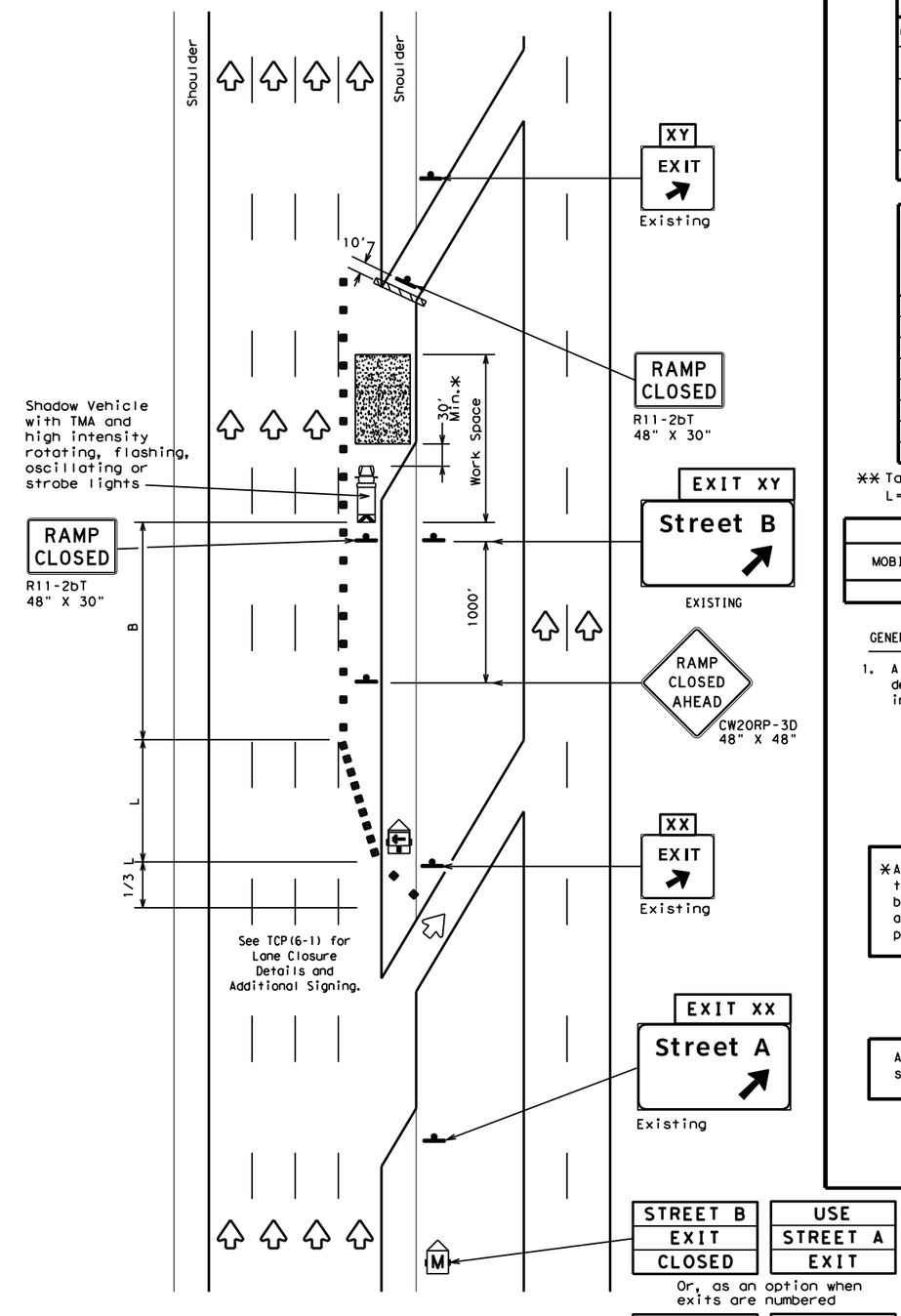


TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES:

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		108

DATE: 4/1/2021 11:34:20 AM
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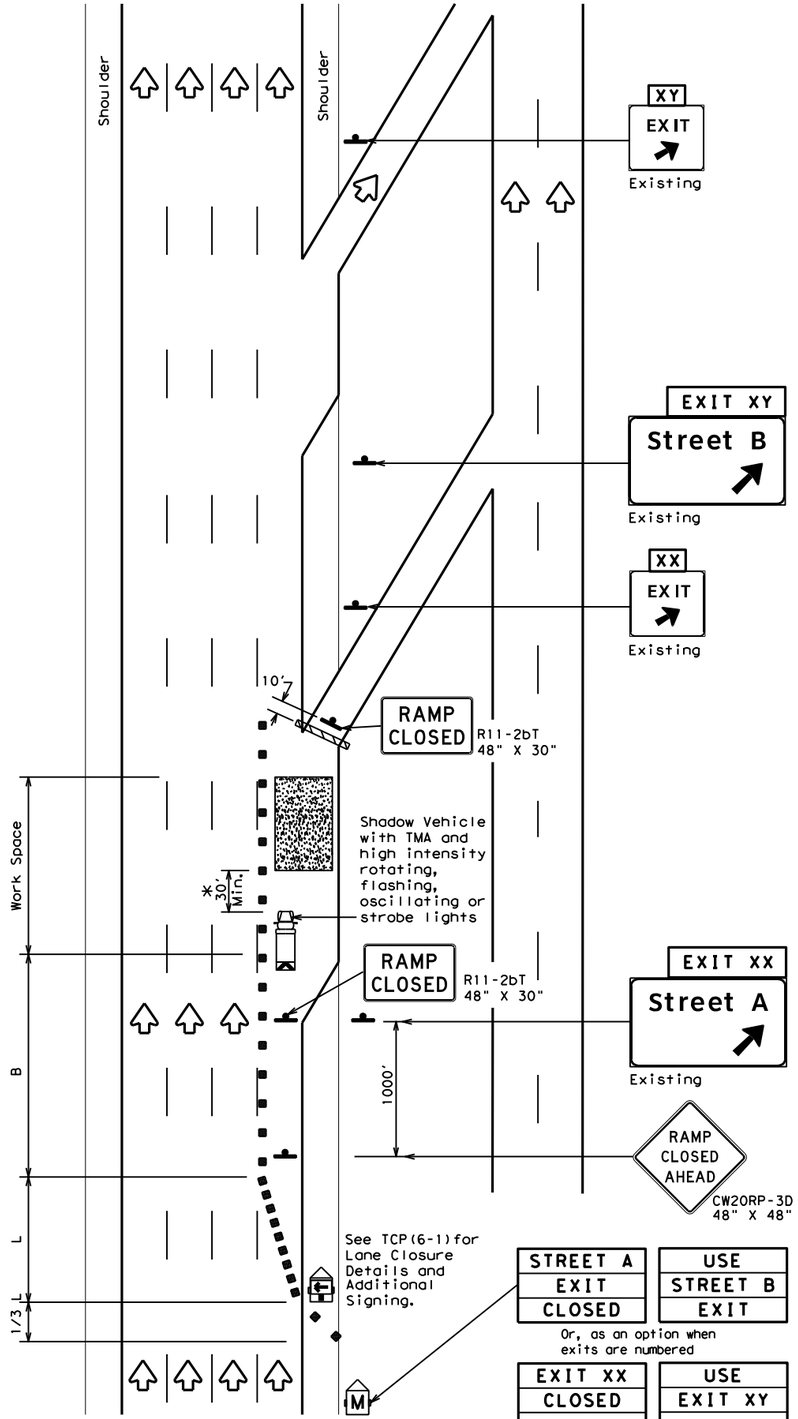
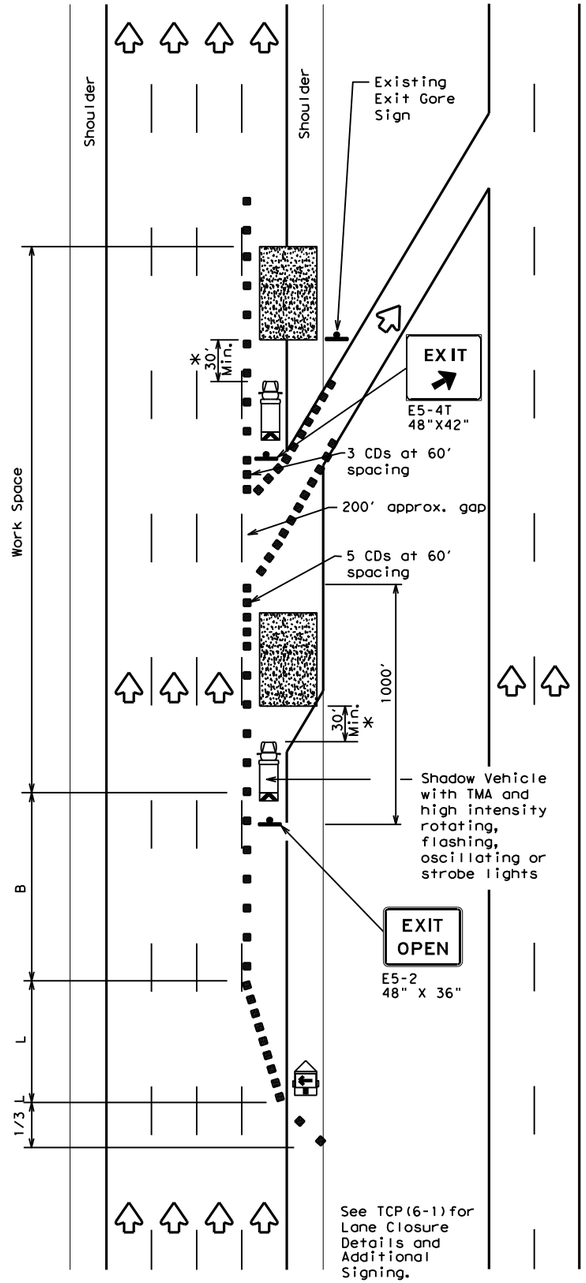


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		109

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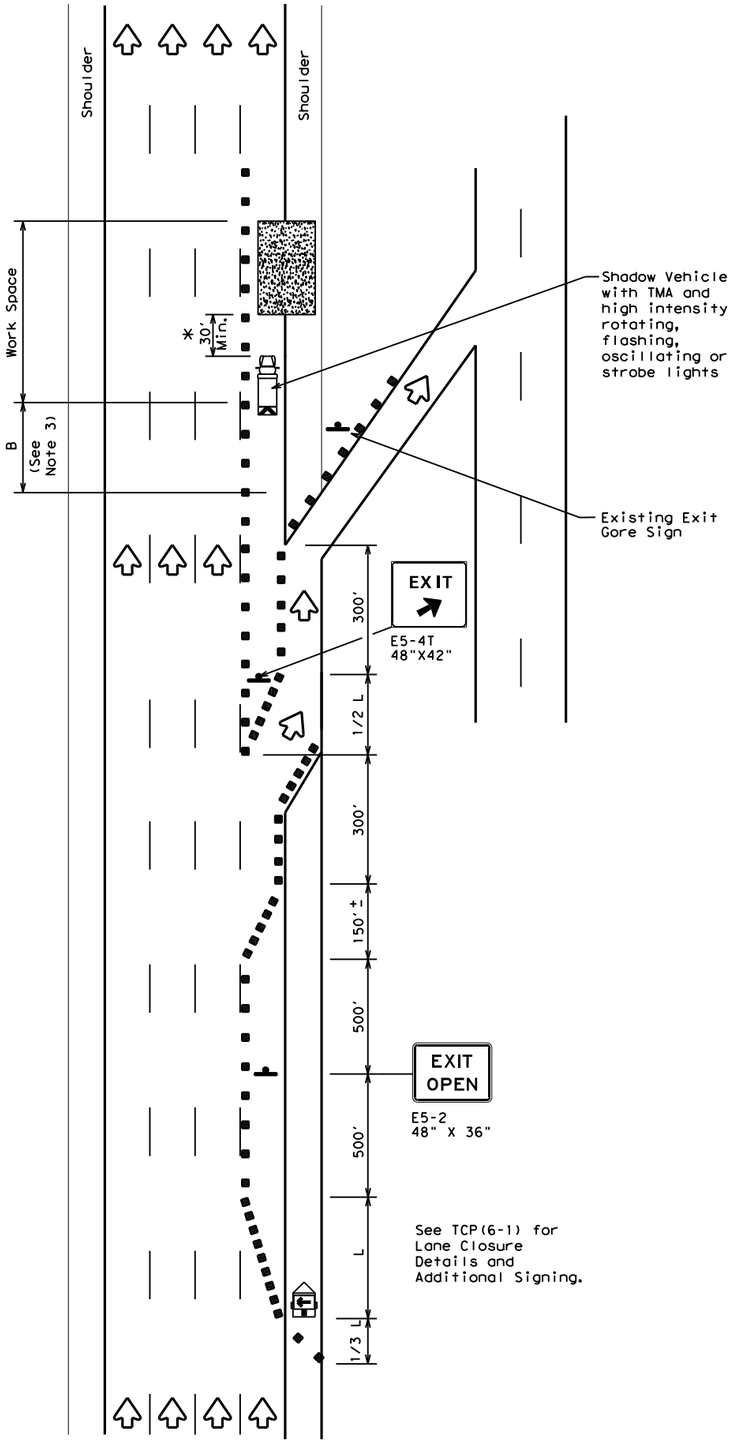
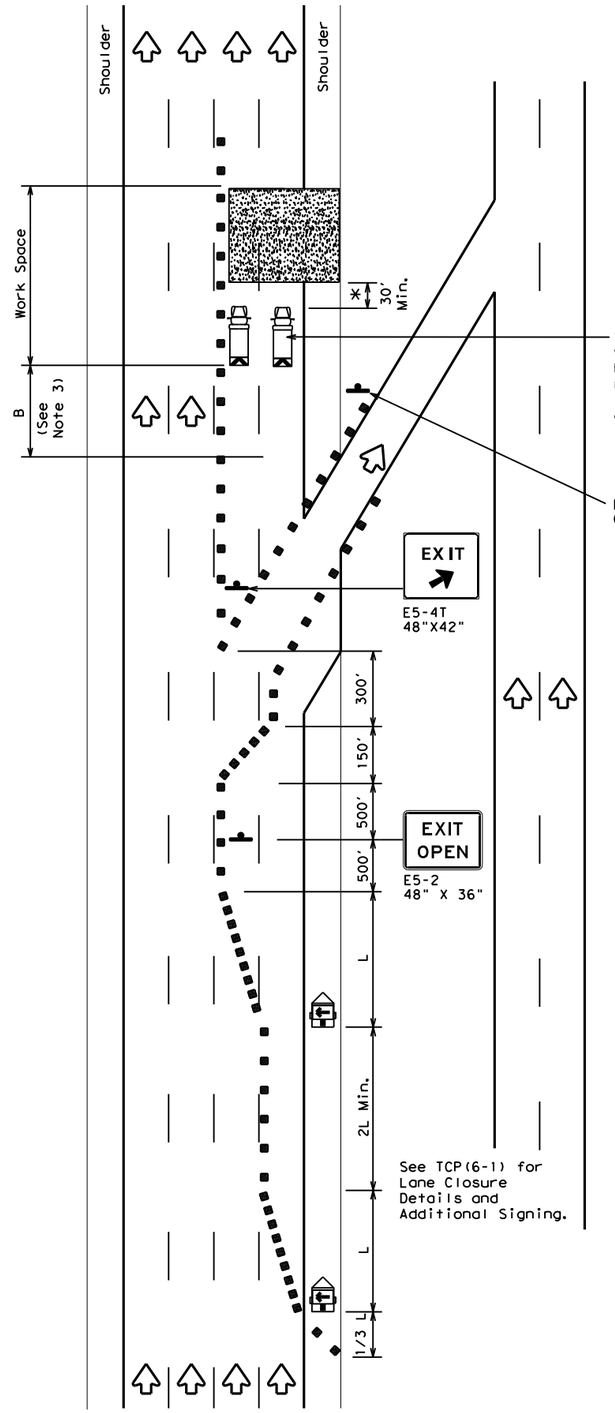


TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

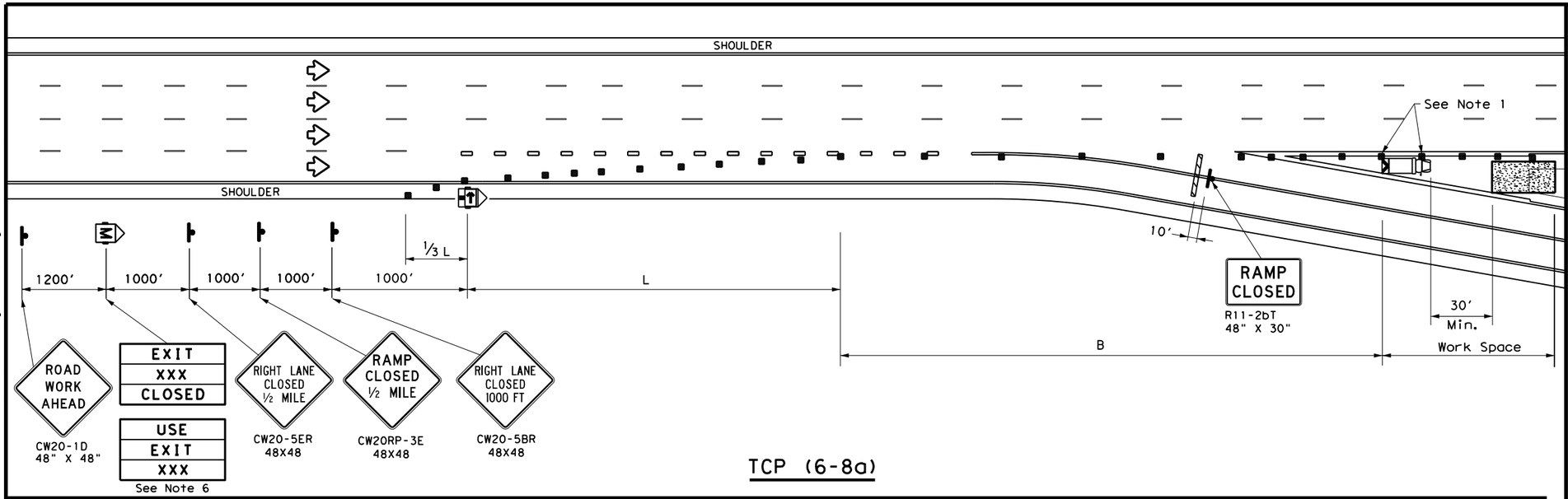
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

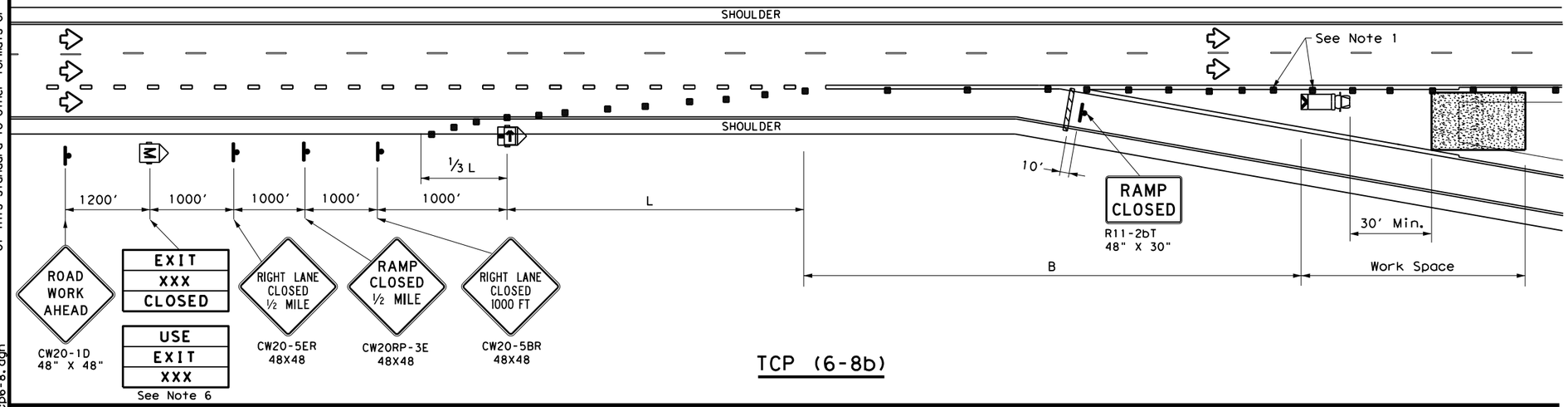
TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

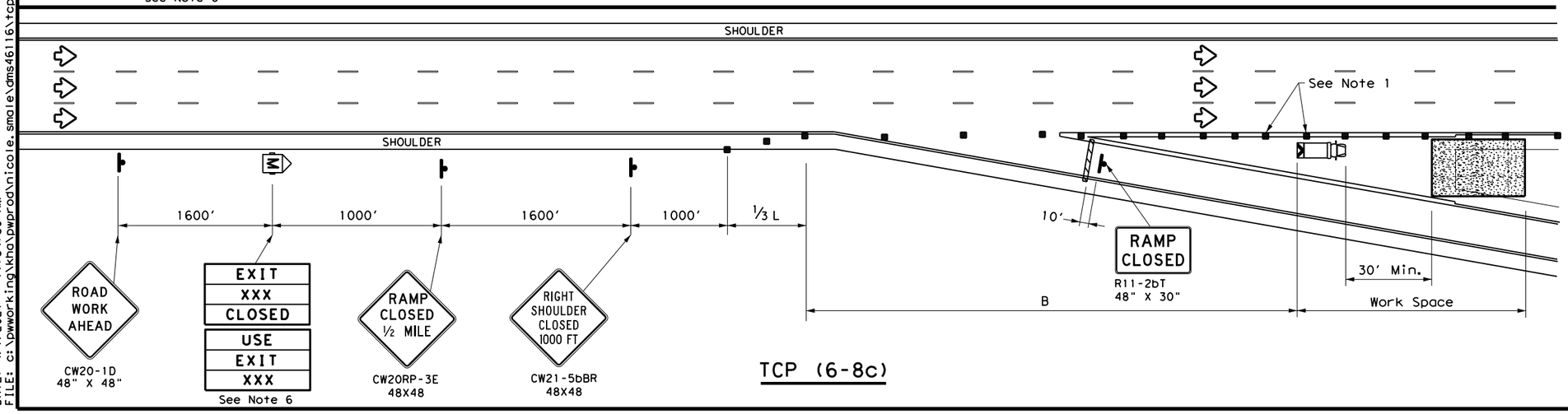
FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		110



TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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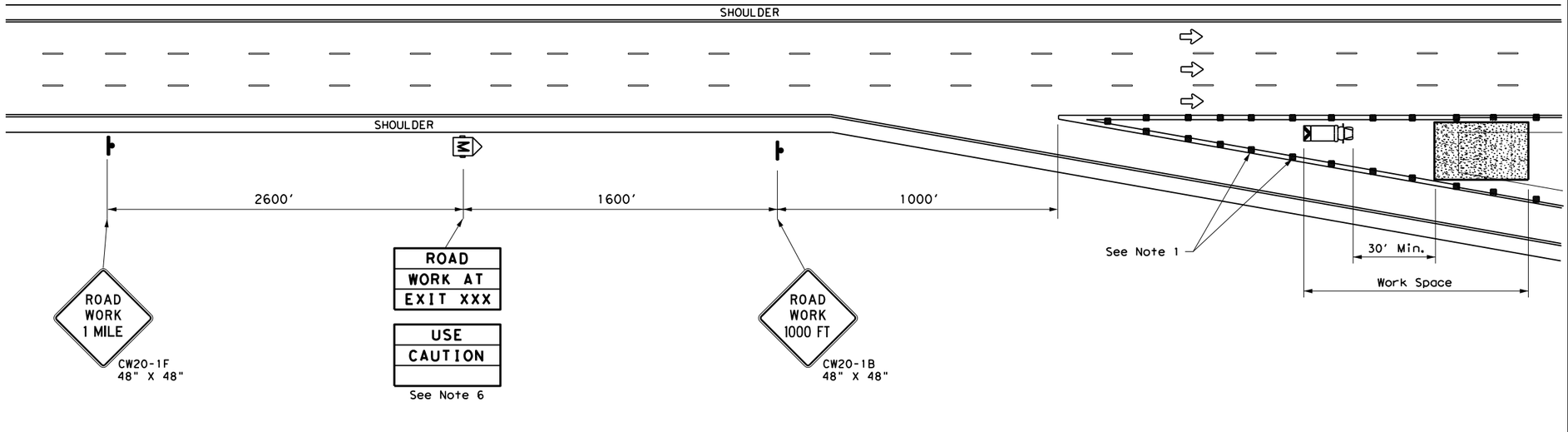
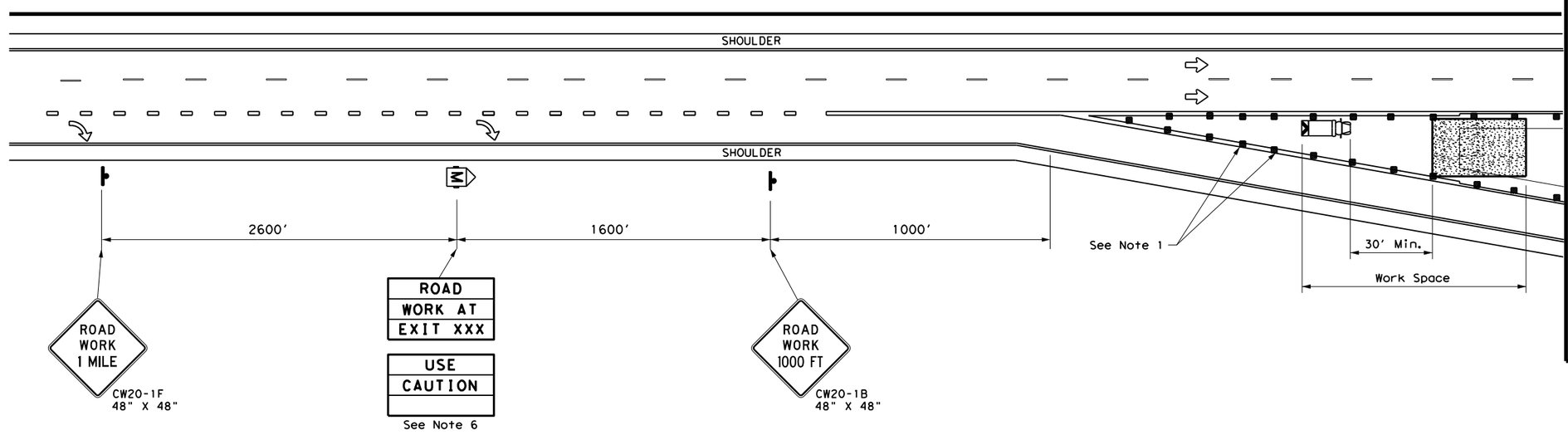


TCP (6-9a)



TCP (6-9b)

LEGEND			
	Type 3 Barricade		Channelizing Devices (CDs)
	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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) and TCP(6-8)for traffic control details.
5. Truck mounted attenuators are required.
6. The PCMS may be omitted if replaced with a "ROAD WORK ½ MILE" (CW20-1E).
7. Roadway ADT should be less than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP(6-9)-14

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©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
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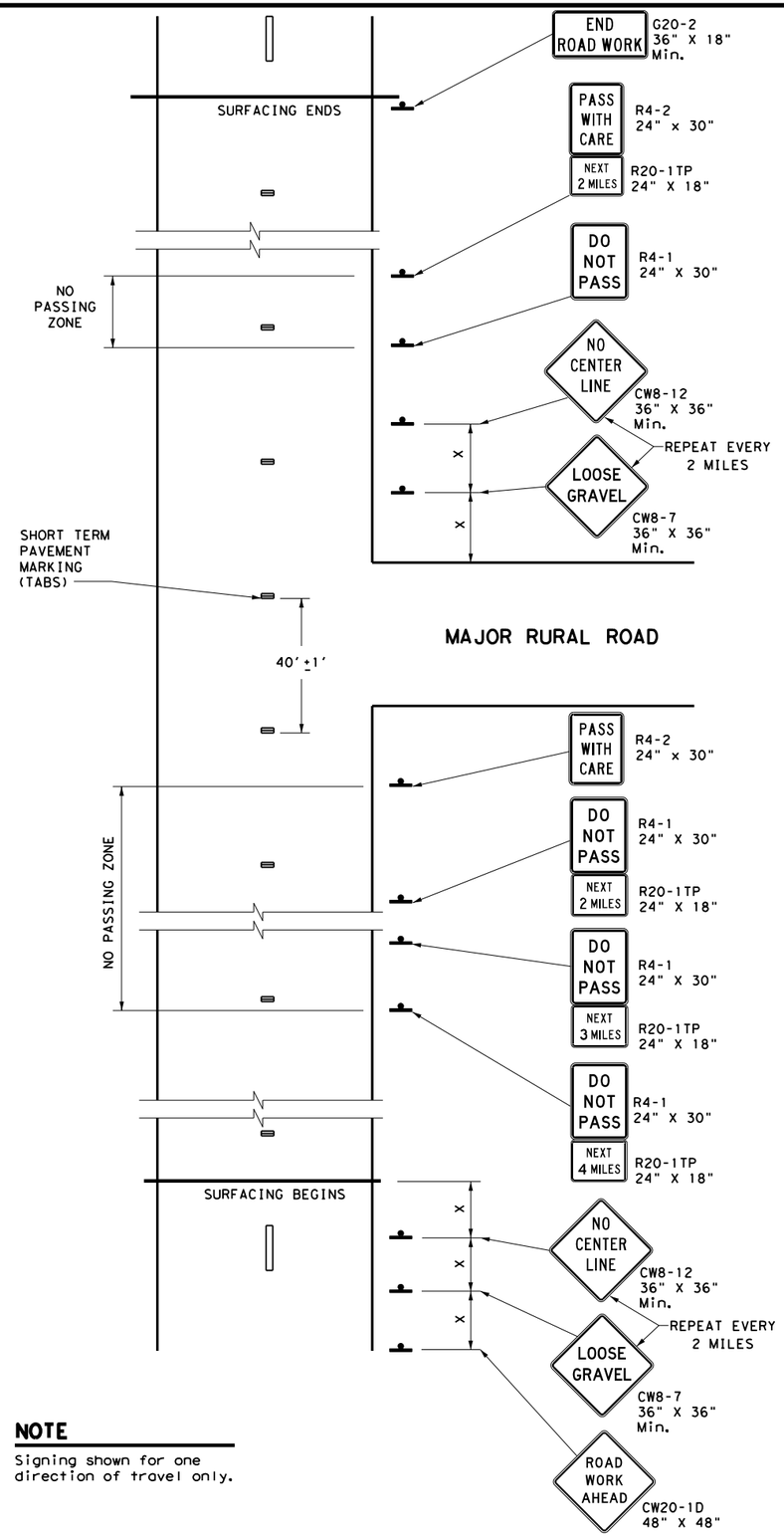
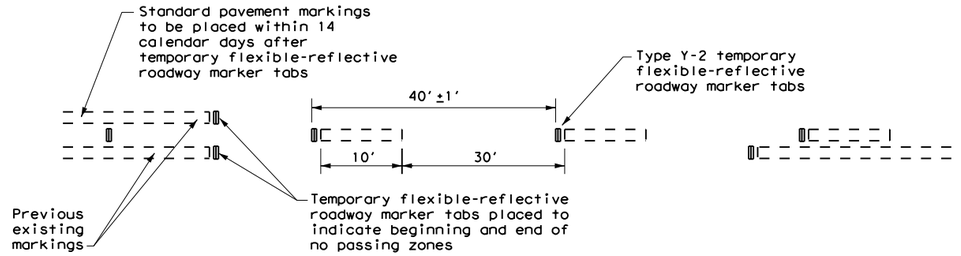


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
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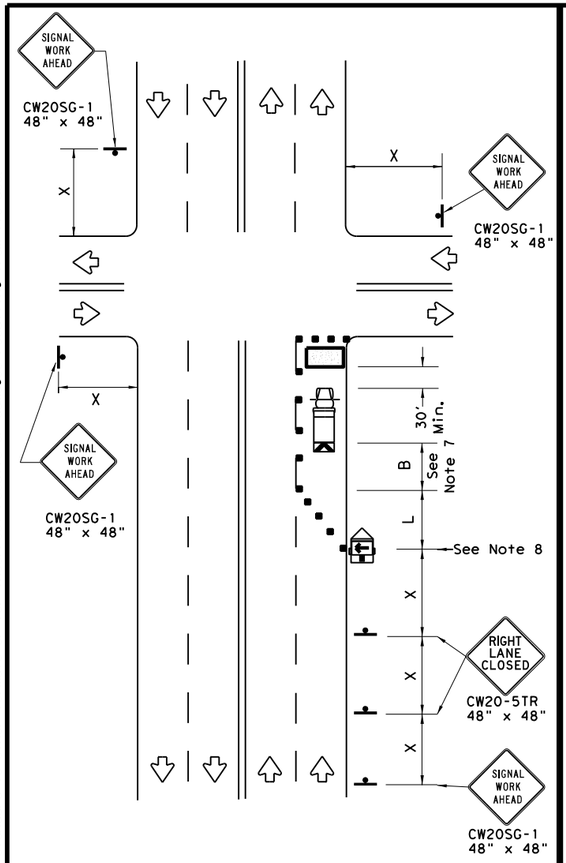
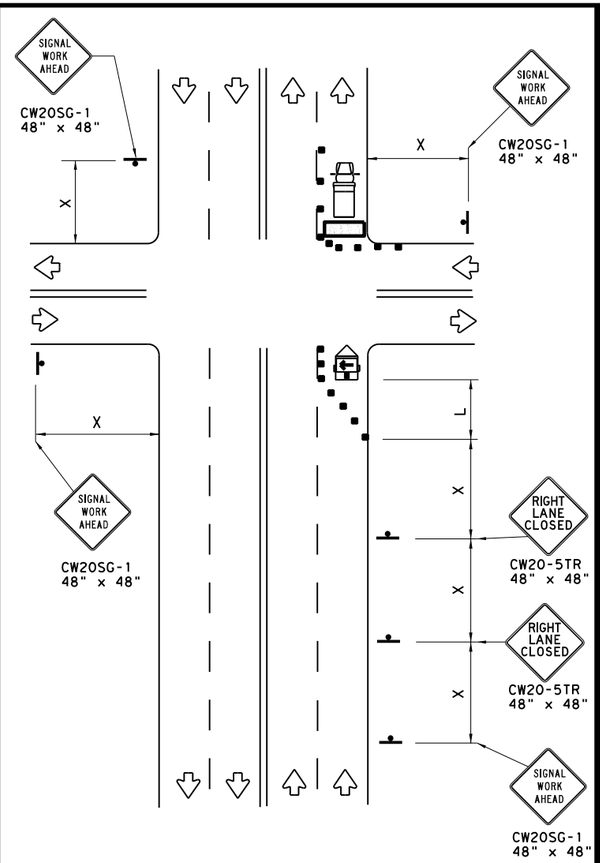
1-97 7-13	SAT	BEXAR		113

210



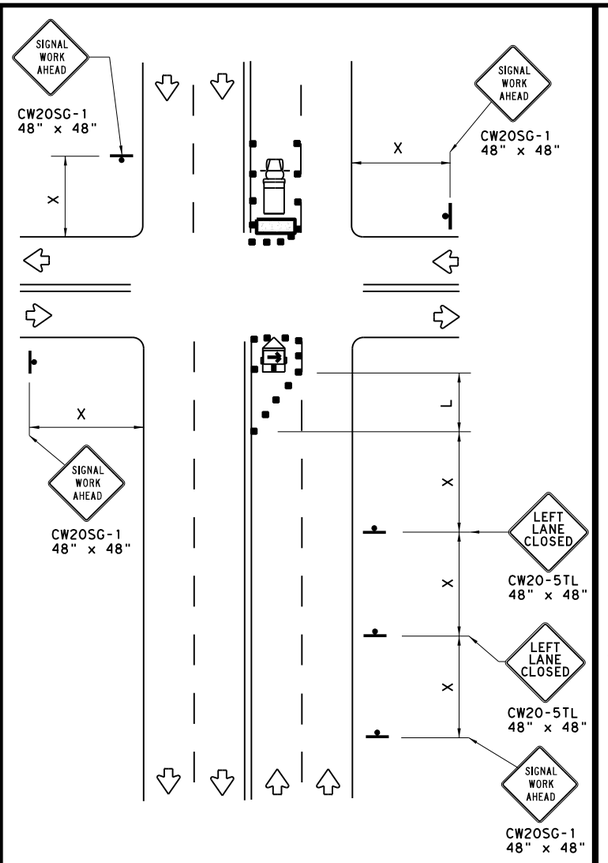
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



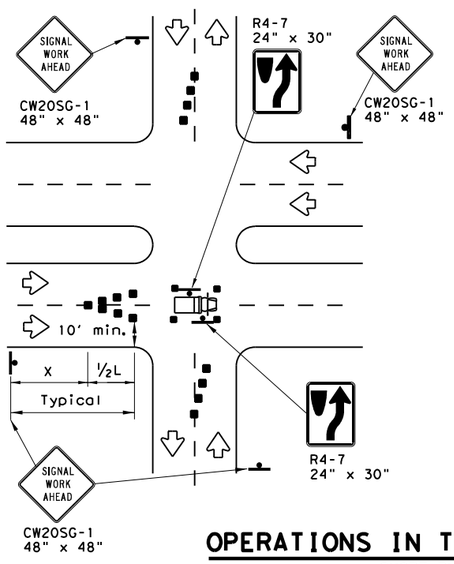
FAR SIDE RIGHT LANE CLOSURE

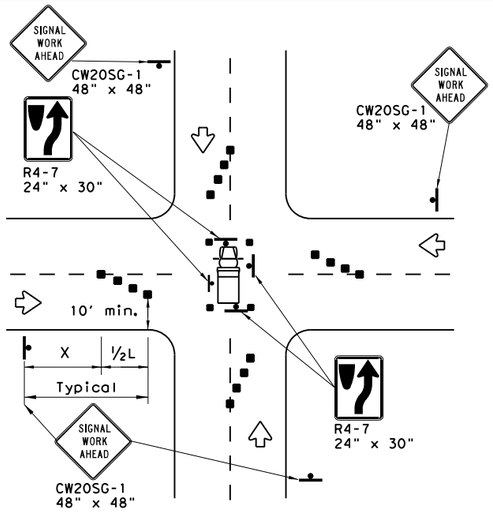
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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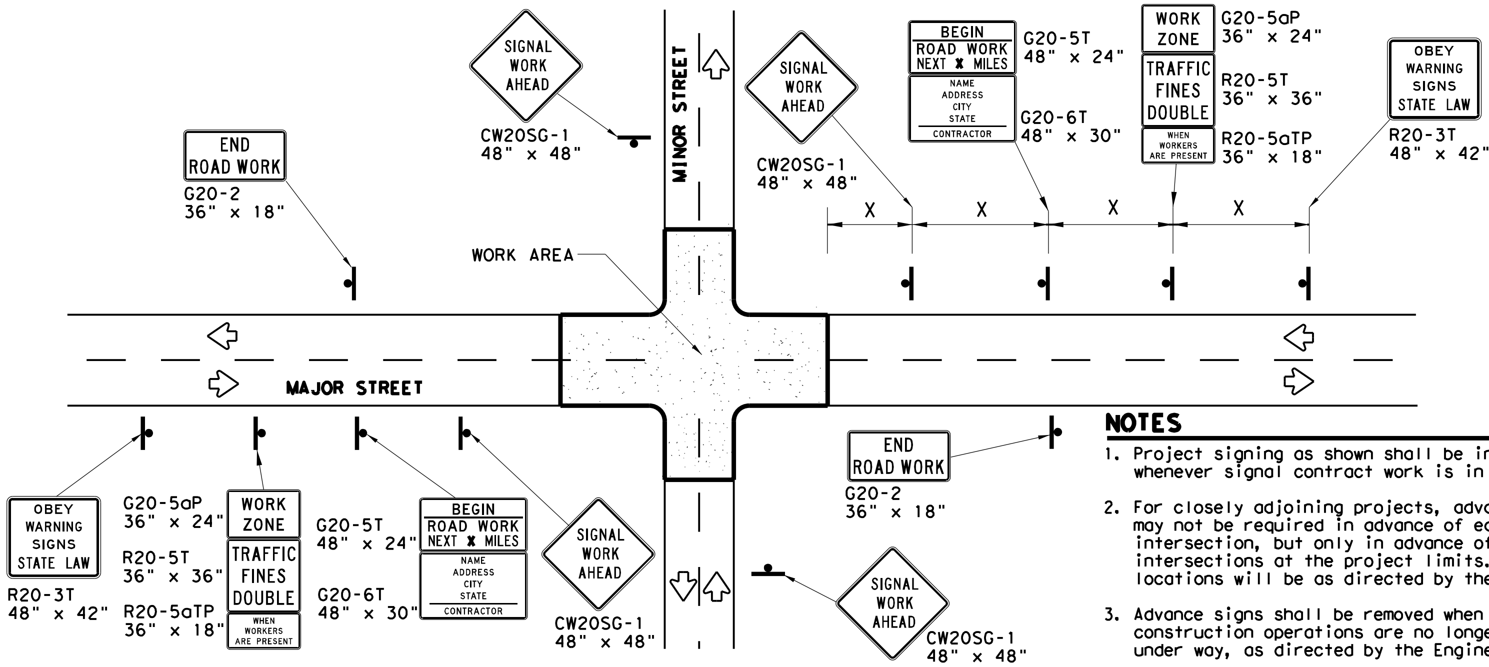


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. 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, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

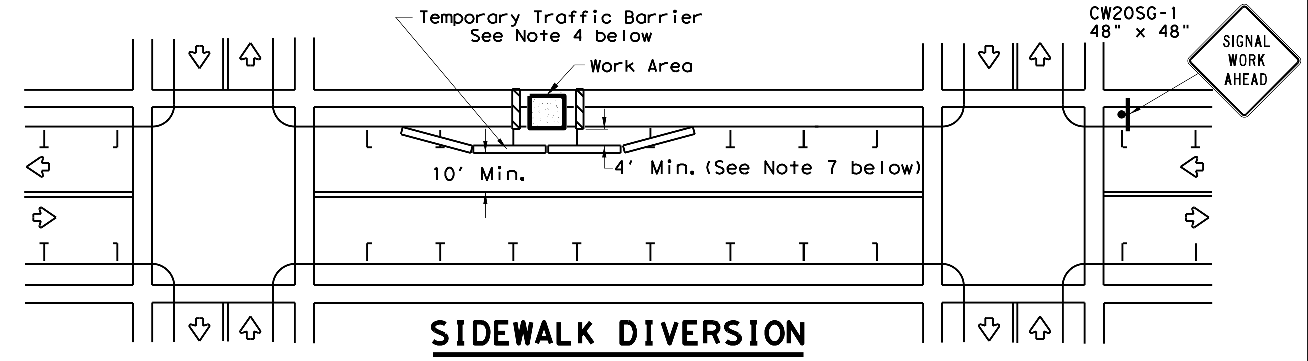
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
(symbol)	Sign
(symbol)	Channelizing Devices
(symbol)	Type 3 Barricade

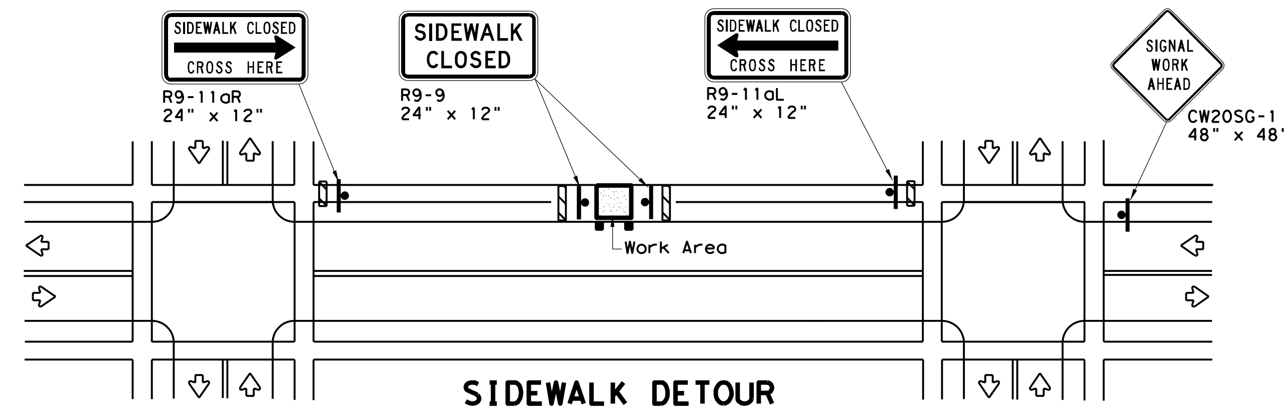
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

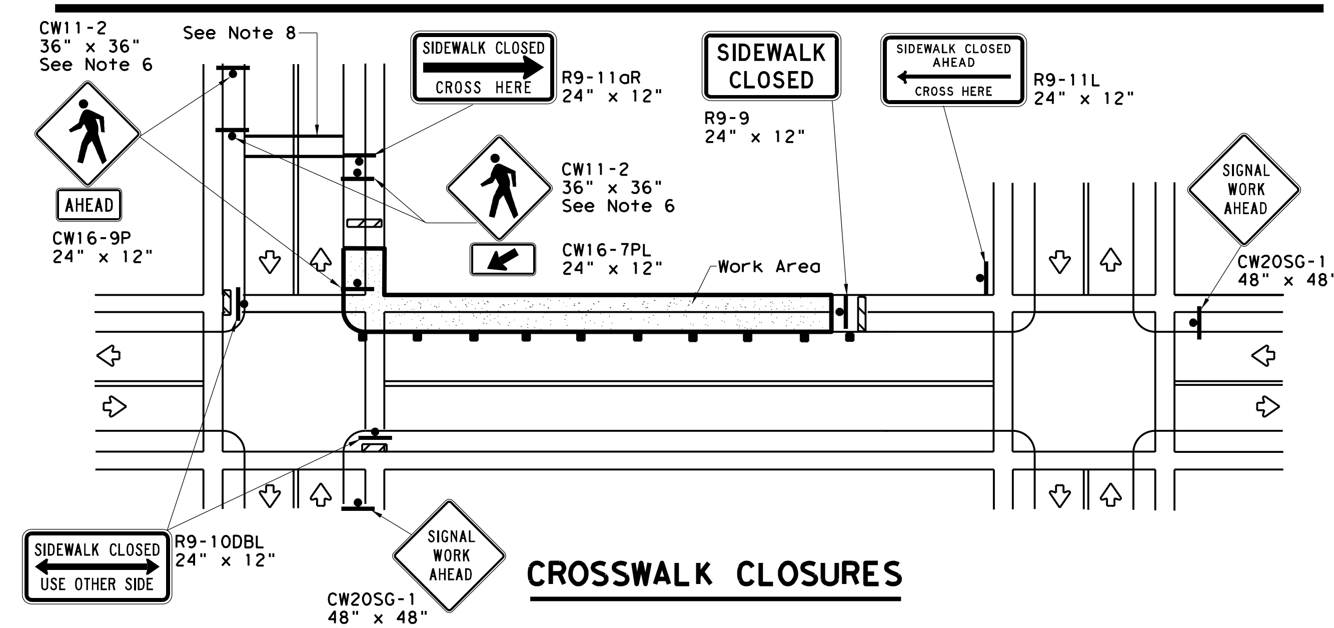
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

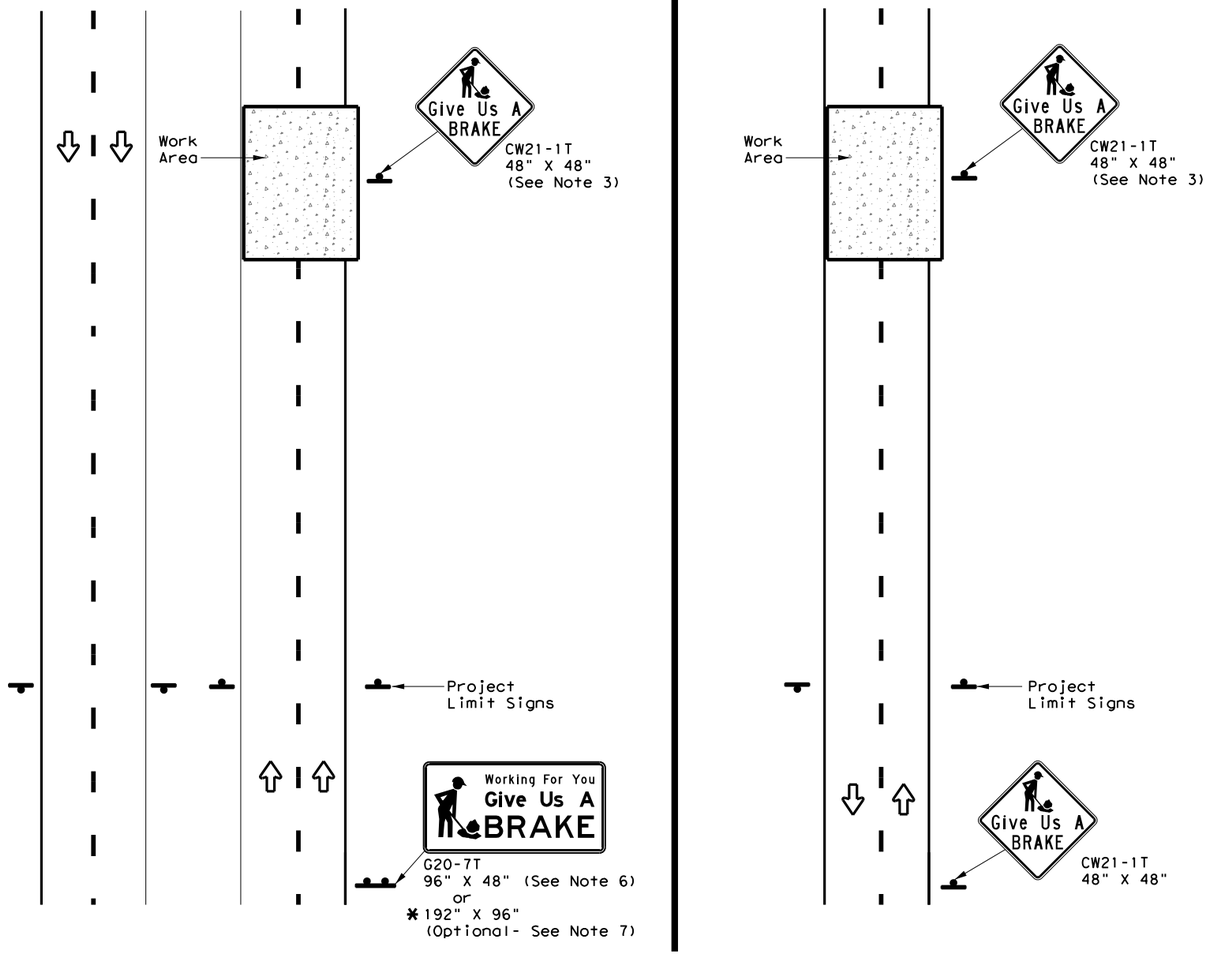
SHEET 2 OF 2

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	SAT	BEXAR		115



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

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

SUMMARY OF LARGE SIGNS

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

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	SAT	BEXAR		116

116

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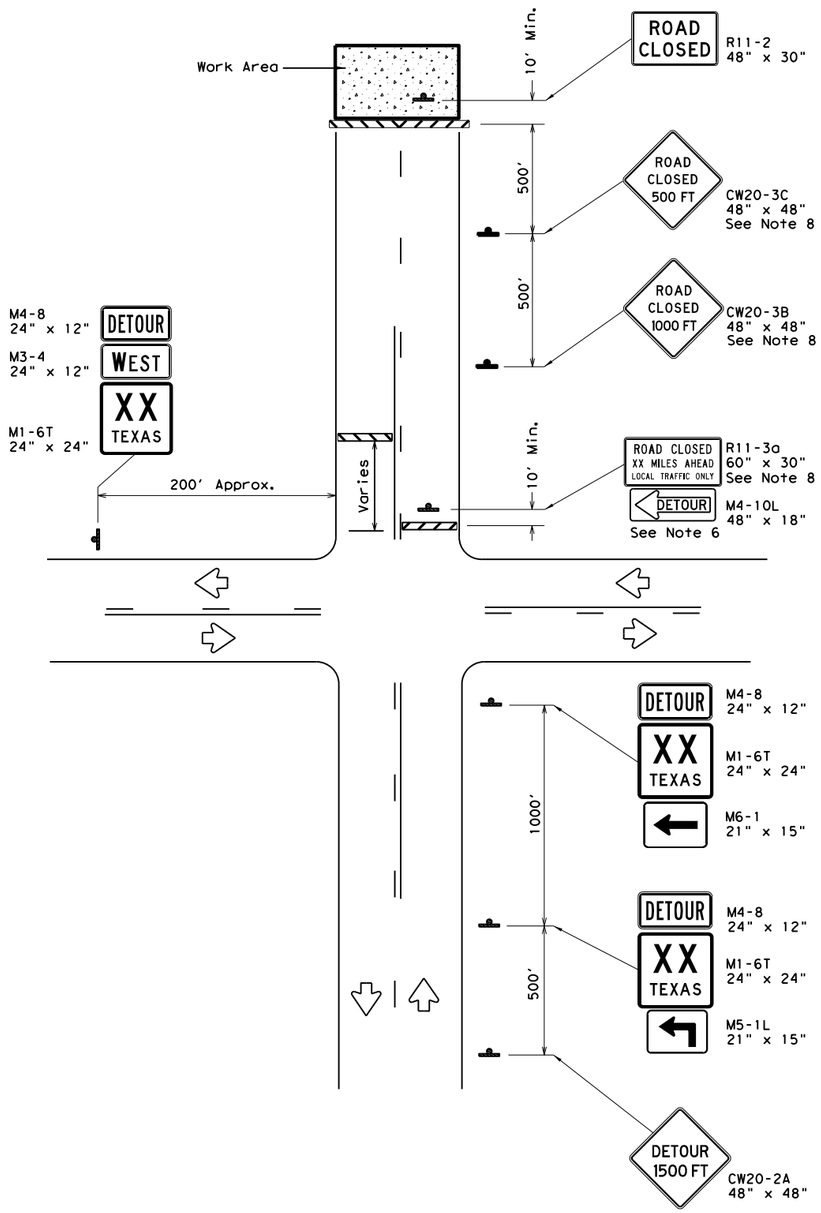
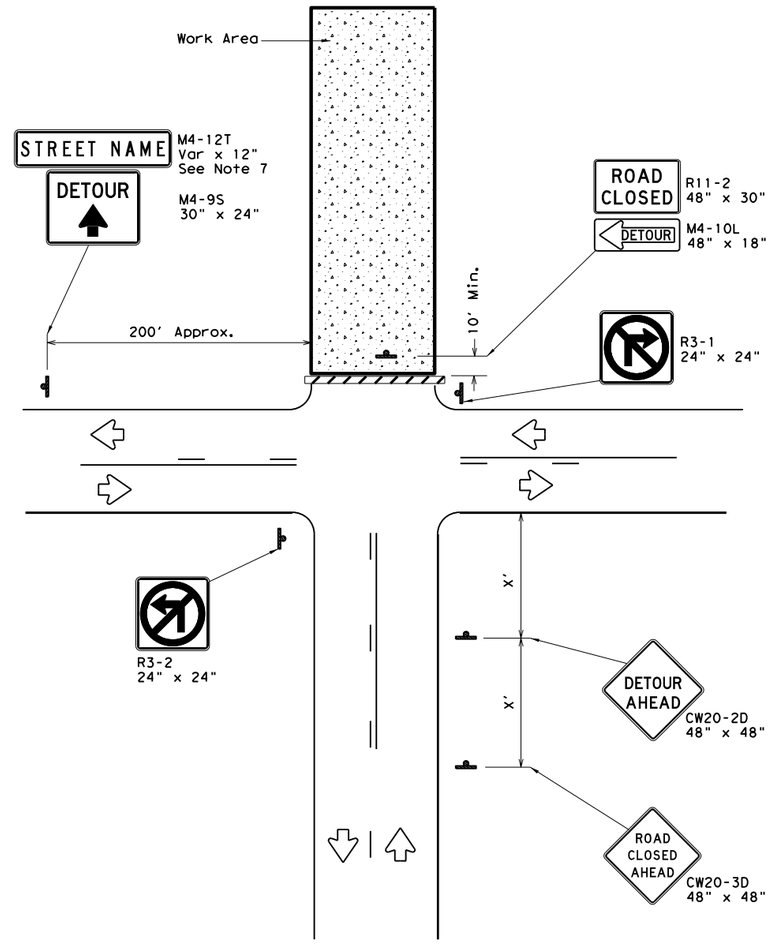


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	SAT	BEXAR		117

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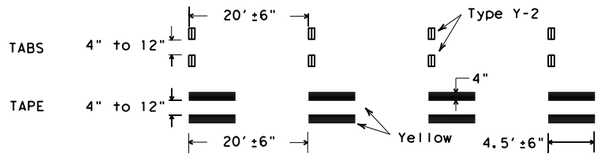
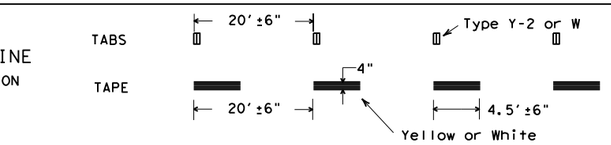
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

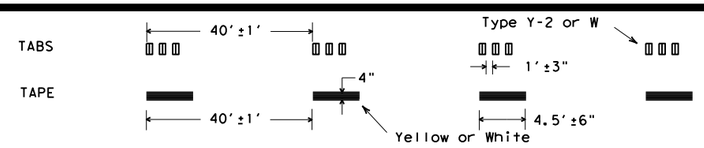


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



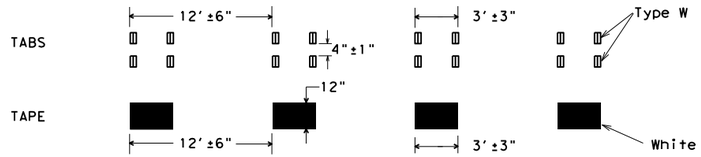
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

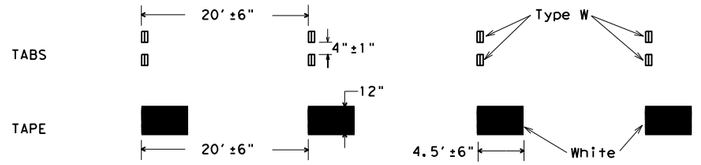


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



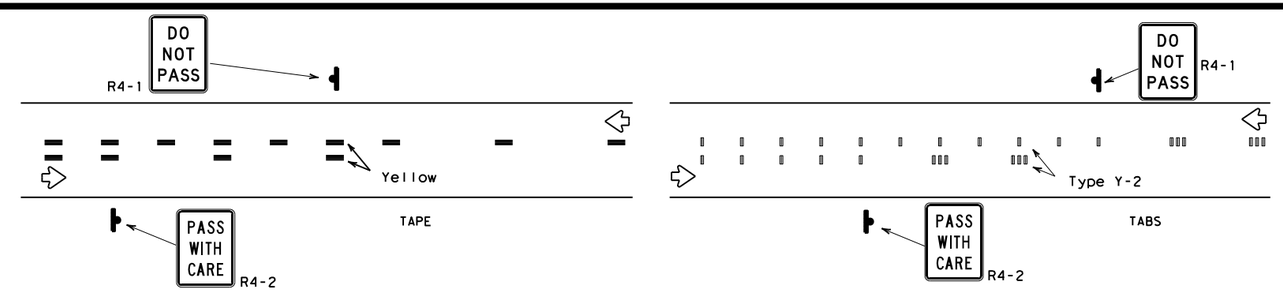
NOTES:

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

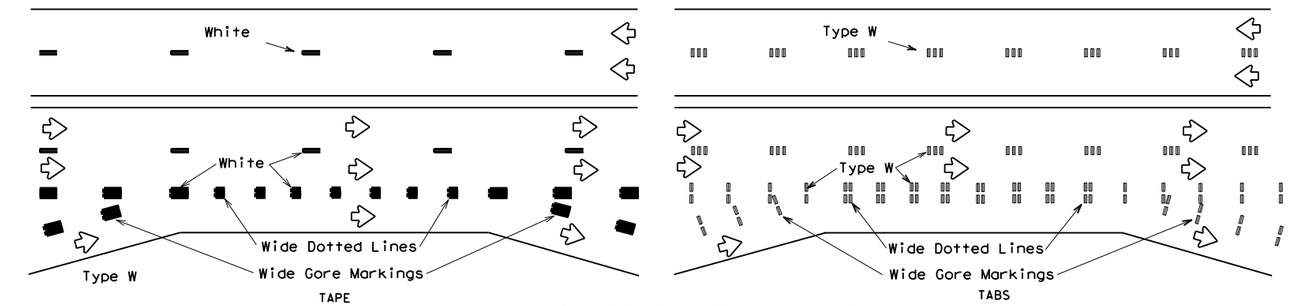
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

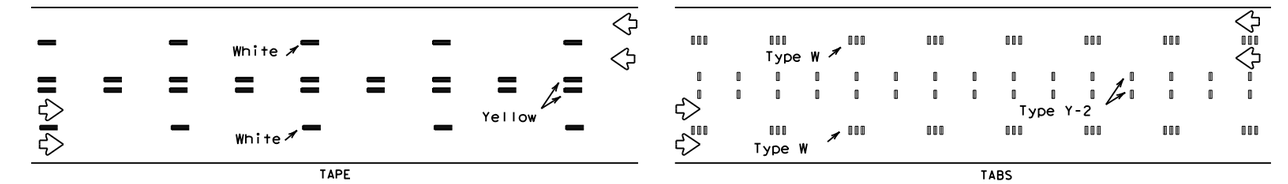
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



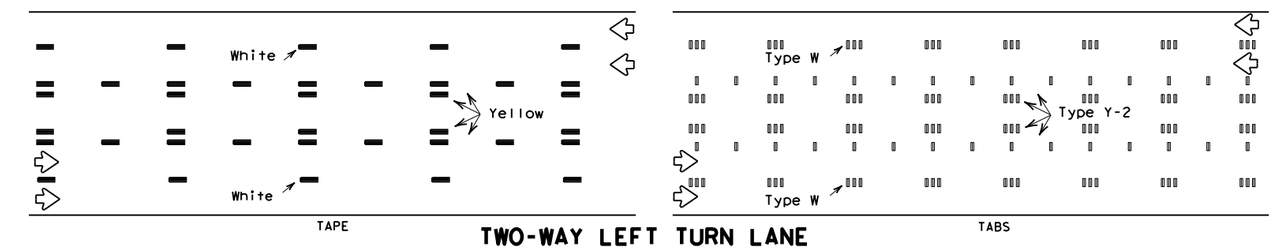
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



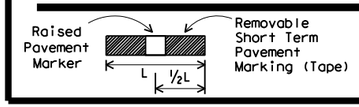
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

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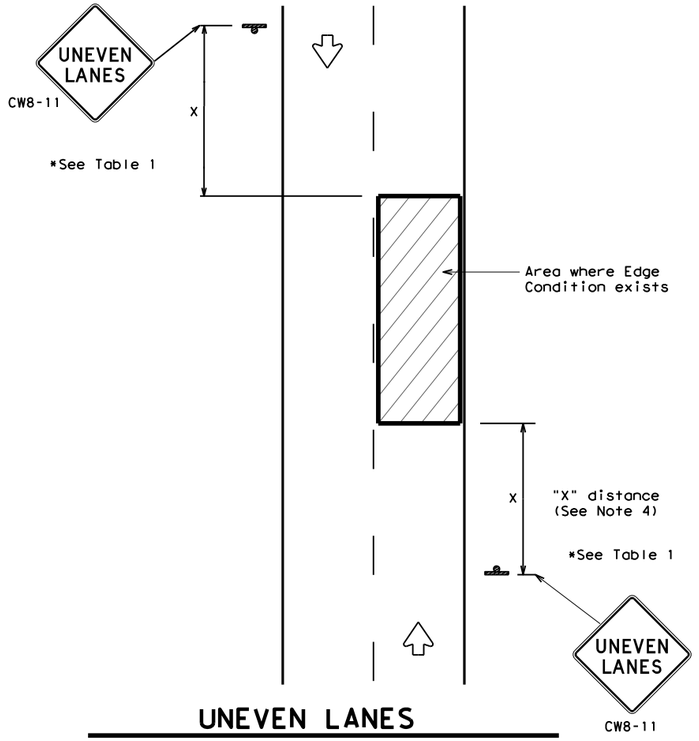
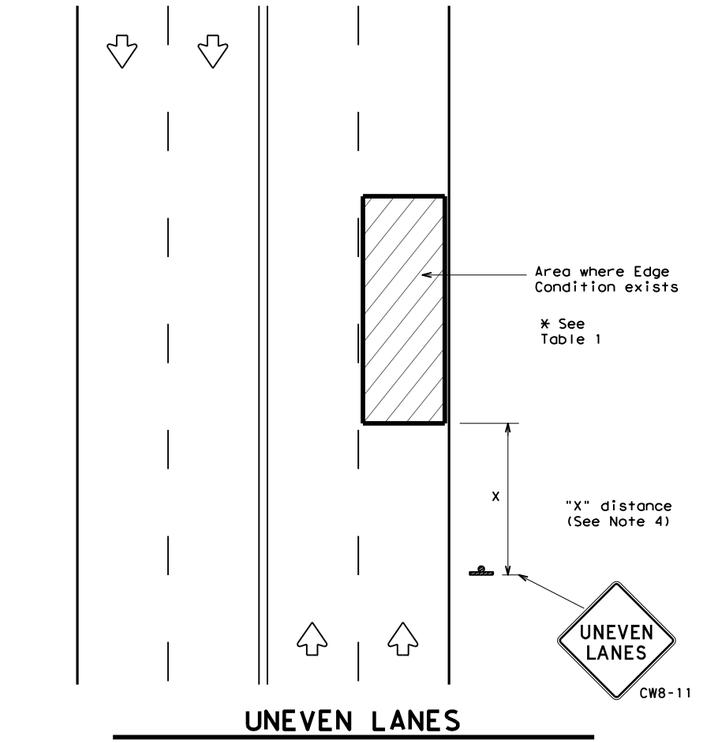
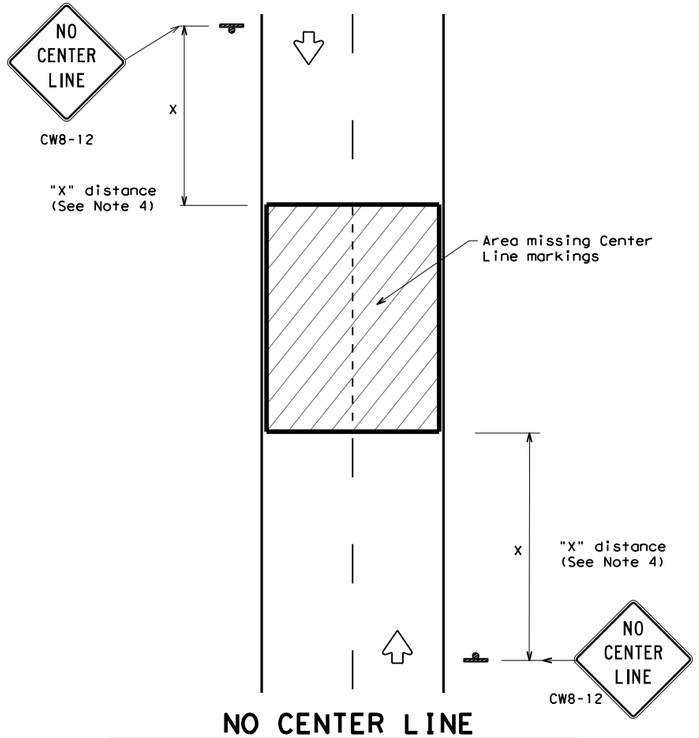
3-03		SAT	BEXAR		118
7-13					



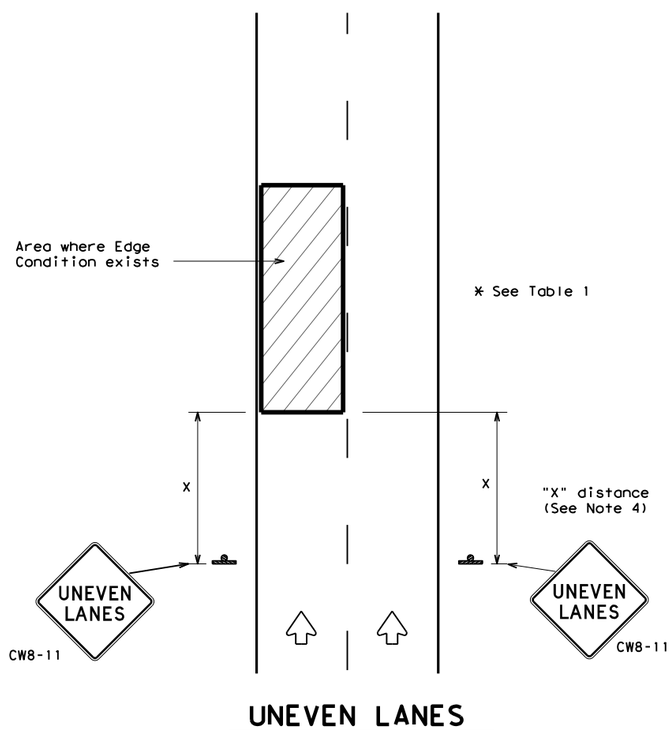
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

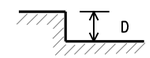
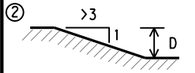
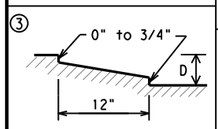
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	SAT	BEXAR		119

DATE: 4/1/2021 11:34:56 AM
FILE: c:\pwworking\khd\pwprod\nicole.smale\dms4611\6\wzul-13.dgn

℄ US90

Chain US90 contains:
US9001 CUR US90-1 CUR US90-2 CUR US90-3 CUR US90-4 CUR US90-5 CUR US90-6 CUR US90-7 CUR US90-8 CUR US90-9 US9002

Beginning chain US90 description

Point US9001 N 13,693,491.850 E 2,077,882.863 Sta 144+85.00

Course from US9001 to PC US90-1 N 65° 23′ 02.20" E Dist 1,396.166

Curve Data					
Curve US90-1					
P.I. Station	160+86.01	N	13,694,158.726	E	2,079,338.369
Delta =	8° 22′ 05.86"	(RT)			
Degree =	2° 02′ 46.60"				
Tangent =	204.840				
Length =	408.952				
Radius =	2,800.000				
External =	7.483				
Long Chord =	408.589				
Mid. Ord. =	7.463				
P.C. Station	158+81.17	N	13,694,073.403	E	2,079,152.145
P.T. Station	162+90.12	N	13,694,216.039	E	2,079,535.028
C.C.		N	13,691,527.869	E	2,080,318.444
Back = N	65° 23′ 02.20" E				
Ahead = N	73° 45′ 08.06" E				
Chord Bear = N	69° 34′ 05.13" E				

Course from PT US90-1 to PC US90-2 N 73° 45′ 08.06" E Dist 6,613.473

Curve Data					
Curve US90-2					
P.I. Station	232+92.59	N	13,696,175.271	E	2,086,257.829
Delta =	3° 52′ 28.97"	(RT)			
Degree =	0° 29′ 53.61"				
Tangent =	389.001				
Length =	777.705				
Radius =	11,500.000				
External =	6.577				
Long Chord =	777.557				
Mid. Ord. =	6.574				
P.C. Station	229+03.59	N	13,696,066.432	E	2,085,884.364
P.T. Station	236+81.30	N	13,696,258.625	E	2,086,637.794
C.C.		N	13,685,025.733	E	2,089,101.966
Back = N	73° 45′ 08.06" E				
Ahead = N	77° 37′ 37.03" E				
Chord Bear = N	75° 41′ 22.54" E				

Course from PT US90-2 to PC US90-3 N 77° 37′ 37.03" E Dist 7,962.544

Curve Data					
Curve US90-3					
P.I. Station	324+43.02	N	13,698,136.051	E	2,095,196.013
Delta =	8° 18′ 38.91"	(RT)			
Degree =	0° 31′ 15.13"				
Tangent =	799.182				
Length =	1,595.561				
Radius =	11,000.000				
External =	28.993				
Long Chord =	1,594.162				
Mid. Ord. =	28.917				
P.C. Station	316+43.84	N	13,697,964.806	E	2,094,415.394
P.T. Station	332+39.40	N	13,698,192.665	E	2,095,993.188
C.C.		N	13,687,220.301	E	2,096,772.428
Back = N	77° 37′ 37.03" E				
Ahead = N	85° 56′ 15.94" E				
Chord Bear = N	81° 46′ 56.49" E				

Course from PT US90-3 to PC US90-4 N 85° 56′ 15.94" E Dist 1,857.528

Curve Data					
Curve US90-4					
P.I. Station	366+25.82	N	13,698,432.559	E	2,099,371.094
Delta =	10° 09′ 33.12"	(RT)			
Degree =	0° 19′ 59.21"				
Tangent =	1,528.886				
Length =	3,049.758				
Radius =	17,200.000				
External =	67.817				
Long Chord =	3,045.764				
Mid. Ord. =	67.550				
P.C. Station	350+96.93	N	13,698,324.253	E	2,097,846.049
P.T. Station	381+46.69	N	13,698,270.174	E	2,100,891.333
C.C.		N	13,681,167.465	E	2,099,064.498
Back = N	85° 56′ 15.94" E				
Ahead = S	83° 54′ 10.94" E				
Chord Bear = S	88° 58′ 57.50" E				

Course from PT US90-4 to PC US90-5 S 83° 54′ 10.94" E Dist 12,671.141

℄ US90 (CONTINUED)

Curve Data					
Curve US90-5					
P.I. Station	520+06.72	N	13,696,798.082	E	2,114,672.968
Delta =	17° 41′ 24.73"	(RT)			
Degree =	0° 44′ 59.80"				
Tangent =	1,188.893				
Length =	2,358.867				
Radius =	7,640.000				
External =	91.951				
Long Chord =	2,349.509				
Mid. Ord. =	90.858				
P.C. Station	508+17.83	N	13,696,924.355	E	2,113,490.800
P.T. Station	531+76.69	N	13,696,318.553	E	2,115,760.865
C.C.		N	13,689,327.571	E	2,112,679.345
Back = S	83° 54′ 10.94" E				
Ahead = S	66° 12′ 46.21" E				
Chord Bear = S	75° 03′ 28.58" E				

Course from PT US90-5 to PC US90-6 S 66° 12′ 46.21" E Dist 3,766.989

Curve Data					
Curve US90-6					
P.I. Station	571+18.74	N	13,694,728.568	E	2,119,368.032
Delta =	3° 29′ 59.07"	(LT)			
Degree =	0° 59′ 59.73"				
Tangent =	175.054				
Length =	350.000				
Radius =	5,730.000				
External =	2.673				
Long Chord =	349.946				
Mid. Ord. =	2.672				
P.C. Station	569+43.68	N	13,694,799.174	E	2,119,207.849
P.T. Station	572+93.68	N	13,694,667.871	E	2,119,532.227
C.C.		N	13,700,042.411	E	2,121,518.989
Back = S	66° 12′ 46.21" E				
Ahead = S	69° 42′ 45.28" E				
Chord Bear = S	67° 57′ 45.75" E				

Curve Data					
Curve US90-7					
P.I. Station	575+76.78	N	13,694,569.715	E	2,119,797.759
Delta =	10° 57′ 47.02"	(LT)			
Degree =	1° 56′ 32.03"				
Tangent =	283.093				
Length =	564.458				
Radius =	2,950.000				
External =	13.552				
Long Chord =	563.597				
Mid. Ord. =	13.490				
P.C. Station	572+93.68	N	13,694,667.871	E	2,119,532.227
P.T. Station	578+58.14	N	13,694,523.847	E	2,120,077.111
C.C.		N	13,697,434.868	E	2,120,555.080
Back = S	69° 42′ 45.28" E				
Ahead = S	80° 40′ 32.31" E				
Chord Bear = S	75° 11′ 38.79" E				

Curve Data					
Curve US90-8					
P.I. Station	580+36.53	N	13,694,494.944	E	2,120,253.144
Delta =	3° 33′ 58.96"	(LT)			
Degree =	0° 59′ 59.73"				
Tangent =	178.390				
Length =	356.664				
Radius =	5,730.000				
External =	2.776				
Long Chord =	356.607				
Mid. Ord. =	2.775				
P.C. Station	578+58.14	N	13,694,523.847	E	2,120,077.111
P.T. Station	582+14.80	N	13,694,477.046	E	2,120,430.633
C.C.		N	13,700,178.136	E	2,121,005.505
Back = S	80° 40′ 32.31" E				
Ahead = S	84° 14′ 31.27" E				
Chord Bear = S	82° 27′ 31.79" E				

Course from PT US90-8 to PC US90-9 S 84° 14′ 31.27" E Dist 1,830.990

Curve Data					
Curve US90-9					
P.I. Station	606+47.66	N	13,694,232.966	E	2,122,851.213
Delta =	5° 59′ 30.52"	(LT)			
Degree =	0° 29′ 53.61"				
Tangent =	601.865				
Length =	1,202.633				
Radius =	11,500.000				
External =	15.739				
Long Chord =	1,202.085				
Mid. Ord. =	15.717				
P.C. Station	600+45.79	N	13,694,293.349	E	2,122,252.385
P.T. Station	612+48.43	N	13,694,235.422	E	2,123,453.074
C.C.		N	13,705,735.327	E	2,123,406.141
Back = S	84° 14′ 31.27" E				
Ahead = N	89° 45′ 58.21" E				
Chord Bear = S	87° 14′ 16.53" E				

Course from PT US90-9 to US9002 N 89° 45′ 58.21" E Dist 3,482.338

Point US9002 N 13,694,249.634 E 2,126,935.382 Sta 647+30.77

Ending chain US90 description

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	120
CONT.	SECT.	JOB	
0024	08	141	

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℄ WBFR1

Chain WBFR1 contains:
WBFR1 WBFR2 WBFR3 CUR WBFR11 CUR WBFR12 CUR WBFR13 CUR WBFR14 CUR WBFR15 WBFR4

Beginning chain WBFR1 description

Point WBFR1 N 13,693,610.235 E 2,077,828.005 Sta 144+85.00

Course from WBFR1 to WBFR2 N 65° 34′ 57.26" E Dist 498.734

Point WBFR2 N 13,693,816.402 E 2,078,282.131 Sta 149+83.73

Course from WBFR2 to WBFR3 N 64° 18′ 13.65" E Dist 518.561

Point WBFR3 N 13,694,041.250 E 2,078,749.409 Sta 155+02.29

Course from WBFR3 to PC WBFR11 N 63° 41′ 47.37" E Dist 163.676

Curve Data					
Curve WBFR11	(Chord Definition)				
P.I. Station	161+34.62	N	13,694,321.451	E	2,079,316.265
Delta =	15° 47′ 16.60"	(RT)			
Degree =	1° 41′ 42.73"				
Tangent =	468.651				
Length =	931.331				
Radius =	3,380.000				
External =	32.336				
Long Chord =	928.421				
Mid. Ord. =	32.029				
P.C. Station	156+65.97	N	13,694,113.779	E	2,078,896.138
P.T. Station	165+97.30	N	13,694,406.981	E	2,079,777.045
C.C.		N	13,691,083.747	E	2,080,393.904
Back = N	63° 41′ 47.37" E				
Ahead = N	79° 29′ 03.97" E				
Chord Bear = N	71° 35′ 25.67" E				

Curve Data					
Curve WBFR12	(Chord Definition)				
P.I. Station	167+90.62	N	13,694,442.263	E	2,079,967.121
Delta =	5° 44′ 03.68"	(LT)			
Degree =	1° 29′ 03.80"				
Tangent =	193.322				
Length =	386.311				
Radius =	3,860.000				
External =	4.838				
Long Chord =	386.161				
Mid. Ord. =	4.832				
P.C. Station	165+97.30	N	13,694,406.981	E	2,079,777.045
P.T. Station	169+83.61	N	13,694,496.359	E	2,080,152.720
C.C.		N	13,698,202.153	E	2,079,072.585
Back = N	79° 29′ 03.97" E				
Ahead = N	73° 45′ 00.30" E				
Chord Bear = N	76° 37′ 02.13" E				

Course from PT WBFR12 to PC WBFR13 N 73° 45′ 00.30" E Dist 468.555

Curve Data					
Curve WBFR13	(Chord Definition)				
P.I. Station	177+06.71	N	13,694,698.702	E	2,080,846.930
Delta =	4° 21′ 51.90"	(LT)			
Degree =	0° 51′ 27.83"				
Tangent =	254.542				
Length =	508.834				
Radius =	6,680.000				
External =	4.848				
Long Chord =	508.716				
Mid. Ord. =	4.844				
P.C. Station	174+52.17	N	13,694,627.474	E	2,080,602.556
P.T. Station	179+61.00	N	13,694,788.320	E	2,081,085.174
C.C.		N	13,701,040.610	E	2,078,733.308
Back = N	73° 45′ 00.30" E				
Ahead = N	69° 23′ 08.40" E				
Chord Bear = N	71° 34′ 04.35" E				

Course from PT WBFR13 to PC WBFR14 N 70° 09′ 54.45" E Dist 80.750

Curve Data					
Curve WBFR14	(Chord Definition)				
P.I. Station	180+57.79	N	13,694,821.161	E	2,081,176.218
Delta =	0° 38′ 41.23"	(RT)			
Degree =	2° 00′ 37.73"				
Tangent =	16.037				
Length =	32.071				
Radius =	2,850.000				
External =	0.045				
Long Chord =	32.073				
Mid. Ord. =	0.045				
P.C. Station	180+41.75	N	13,694,815.719	E	2,081,161.133
P.T. Station	180+73.82	N	13,694,826.432	E	2,081,191.364
C.C.		N	13,692,134.797	E	2,082,128.168
Back = N	70° 09′ 54.45" E				
Ahead = N	70° 48′ 35.67" E				
Chord Bear = N	70° 29′ 15.06" E				

℄ WBFR1 (CONTINUED)

Curve Data					
Curve WBFR15	(Chord Definition)				
P.I. Station	181+66.24	N	13,694,855.104	E	2,081,279.225
Delta =	1° 19′ 00.19"	(RT)			
Degree =	0° 42′ 44.57"				
Tangent =	92.422				
Length =	184.834				
Radius =	8,042.924				
External =	0.531				
Long Chord =	184.831				
Mid. Ord. =	0.531				
P.C. Station	180+73.82	N	13,694,826.432	E	2,081,191.364
P.T. Station	182+58.66	N	13,694,881.750	E	2,081,367.723
C.C.		N	13,687,180.345	E	2,083,686.557
Back = N	71° 55′ 35.89" E				
Ahead = N	73° 14′ 36.08" E				
Chord Bear = N	72° 35′ 05.98" E				

Course from PT WBFR15 to WBFR4 N 73° 44′ 25.36" E Dist 88.949

Point WBFR4 N 13,694,906.655 E 2,081,453.114 Sta 183+47.60

Ending chain WBFR1 description

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	121
CONT.	SECT.	JOB	
0024	08	141	

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℄ WBFR2

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Chain WBFR2 contains:
 WBFR33 WBFR34 CUR WBFR21 WBFR35 CUR WBFR22 WBFR36 WBFR37 CUR WBFR23 WBFR38 WBF-
R39 CUR WBFR24 WBFR40 CUR WBFR25 WBFR41 CUR WBFR26 CUR WBFR27 WBFR42 CUR WBFR28-
 CUR WBFR29 CUR WBFR210 WBFR43 CUR WBFR211 WBFR44 WBFR45

Beginning chain WBFR2 description
=================================================================================

Point WBFR33              N   13,694,914.335 E    2,081,450.874 Sta     183+47.60

Course from WBFR33 to WBFR34 N 73° 44' 25.36" E Dist 4,448.937

Point WBFR34              N   13,696,159.994 E    2,085,721.866 Sta     227+96.54

Course from WBFR34 to PC WBFR21 N 73° 51' 35.77" E Dist 414.739

                                   Curve Data
                                  *----------*
Curve WBFR21                (Chord Definition)
P.I.  Station               232+41.26  N      13,696,283.696  E         2,086,149.039
Delta         =        1° 11' 49.76"  (LT)
Degree        =        1° 59' 47.29"
Tangent       =              29.984
Length        =              59.964
Radius        =           2,870.000
External      =               0.157
Long Chord    =              59.966
Mid. Ord.     =               0.157
P.C.  Station               232+11.28  N      13,696,275.286  E         2,086,120.258
P.T.  Station               232+71.24  N      13,696,292.705  E         2,086,177.638
C.C.                                   N      13,699,030.093  E         2,085,315.313
Back          = N  73° 42' 42.58" E
Ahead         = N  72° 30' 52.82" E
Chord Bear    = N  73° 06' 47.70" E

Course from PT WBFR21 to WBFR35 N 72° 30' 52.82" E Dist 257.042

Point WBFR35              N   13,696,369.936 E    2,086,422.803 Sta     235+28.28

Course from WBFR35 to PC WBFR22 N 71° 07' 47.58" E Dist 129.838

                                   Curve Data
                                  *----------*
Curve WBFR22                (Chord Definition)
P.I.  Station               237+65.06  N      13,696,446.515  E         2,086,646.854
Delta         =        6° 24' 32.96"  (RT)
Degree        =        3° 00' 00.44"
Tangent       =             106.939
Length        =             213.630
Radius        =           1,910.000
External      =               2.991
Long Chord    =             213.543
Mid. Ord.     =               2.987
P.C.  Station               236+58.12  N      13,696,411.929  E         2,086,545.662
P.T.  Station               238+71.75  N      13,696,469.590  E         2,086,751.273
C.C.                                   N      13,694,604.583  E         2,087,163.402
Back          = N  71° 07' 47.58" E
Ahead         = N  77° 32' 20.54" E
Chord Bear    = N  74° 20' 04.06" E

Course from PT WBFR22 to WBFR36 N 77° 32' 20.54" E Dist 203.098

Point WBFR36              N   13,696,513.413 E    2,086,949.586 Sta     240+74.85

Course from WBFR36 to WBFR37 N 76° 28' 36.51" E Dist 103.411

Point WBFR37              N   13,696,537.595 E    2,087,050.131 Sta     241+78.26

Course from WBFR37 to PC WBFR23 N 75° 34' 36.21" E Dist 133.426

                                   Curve Data
                                  *----------*
Curve WBFR23                (Chord Definition)
P.I.  Station               243+82.49  N      13,696,588.466  E         2,087,247.928
Delta         =        3° 08' 39.07"  (RT)
Degree        =        2° 13' 15.26"
Tangent       =              70.808
Length        =             141.572
Radius        =           2,580.000
External      =               0.971
Long Chord    =             141.563
Mid. Ord.     =               0.971
P.C.  Station               243+11.68  N      13,696,570.829  E         2,087,179.352
P.T.  Station               244+53.26  N      13,696,602.315  E         2,087,317.369
C.C.                                   N      13,694,072.145  E         2,087,821.987
Back          = N  75° 34' 36.21" E
Ahead         = N  78° 43' 15.28" E
Chord Bear    = N  77° 08' 55.75" E

Course from PT WBFR23 to WBFR38 N 78° 43' 15.28" E Dist 77.725

Point WBFR38              N   13,696,617.517 E    2,087,393.593 Sta     245+30.98

Course from WBFR38 to WBFR39 N 79° 31' 42.23" E Dist 270.051

Point WBFR39              N   13,696,666.599 E    2,087,659.146 Sta     248+01.03

Course from WBFR39 to PC WBFR24 N 80° 52' 01.47" E Dist 124.045
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℄ WBFR2 (CONTINUED)

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                                   Curve Data
                                  *----------*
Curve WBFR24                (Chord Definition)
P.I.  Station               249+66.49  N      13,696,692.862  E         2,087,822.510
Delta         =        3° 09' 47.74"  (RT)
Degree        =        3° 49' 13.53"
Tangent       =              41.418
Length        =              82.799
Radius        =           1,500.000
External      =               0.572
Long Chord    =              82.803
Mid. Ord.     =               0.571
P.C.  Station               249+25.08  N      13,696,686.288  E         2,087,781.618
P.T.  Station               250+07.88  N      13,696,697.169  E         2,087,863.703
C.C.                                   N      13,695,205.304  E         2,088,019.706
Back          = N  80° 52' 01.47" E
Ahead         = N  84° 01' 49.20" E
Chord Bear    = N  82° 26' 55.33" E

Course from PT WBFR24 to WBFR40 N 84° 01' 49.20" E Dist 226.964

Point WBFR40              N   13,696,720.774 E    2,088,089.437 Sta     252+34.84

Course from WBFR40 to PC WBFR25 N 78° 46' 37.68" E Dist 55.785

                                   Curve Data
                                  *----------*
Curve WBFR25                (Chord Definition)
P.I.  Station               253+36.46  N      13,696,740.551  E         2,088,189.110
Delta         =        4° 33' 52.04"  (LT)
Degree        =        4° 59' 01.73"
Tangent       =              45.831
Length        =              91.586
Radius        =           1,150.000
External      =               0.913
Long Chord    =              91.590
Mid. Ord.     =               0.912
P.C.  Station               252+90.62  N      13,696,731.631  E         2,088,144.155
P.T.  Station               253+82.21  N      13,696,753.020  E         2,088,233.213
C.C.                                   N      13,697,859.640  E         2,087,920.335
Back          = N  78° 46' 37.68" E
Ahead         = N  74° 12' 45.64" E
Chord Bear    = N  76° 29' 41.66" E

Course from PT WBFR25 to WBFR41 N 74° 12' 45.64" E Dist 144.392

Point WBFR41              N   13,696,792.305 E    2,088,372.158 Sta     255+26.60

Course from WBFR41 to PC WBFR26 N 73° 46' 09.77" E Dist 136.684

                                   Curve Data
                                  *----------*
Curve WBFR26                (Chord Definition)
P.I.  Station               260+21.93  N      13,696,930.750  E         2,088,847.741
Delta         =        7° 59' 53.29"  (RT)
Degree        =        1° 07' 00.82"
Tangent       =             358.641
Length        =             716.105
Radius        =           5,130.000
External      =              12.521
Long Chord    =             715.535
Mid. Ord.     =              12.491
P.C.  Station               256+63.29  N      13,696,830.508  E         2,088,503.394
P.T.  Station               263+79.39  N      13,696,982.104  E         2,089,202.686
C.C.                                   N      13,691,904.967  E         2,089,937.251
Back          = N  73° 46' 09.77" E
Ahead         = N  81° 46' 03.06" E
Chord Bear    = N  77° 46' 06.42" E

Course from PT WBFR26 to PC WBFR27 N 81° 46' 03.06" E Dist 122.641

                                   Curve Data
                                  *----------*
Curve WBFR27                (Chord Definition)
P.I.  Station               266+08.92  N      13,697,014.970  E         2,089,429.850
Delta         =        4° 15' 56.96"  (LT)
Degree        =        1° 59' 47.29"
Tangent       =             106.889
Length        =             213.668
Radius        =           2,870.000
External      =               1.990
Long Chord    =             213.630
Mid. Ord.     =               1.988
P.C.  Station               265+02.03  N      13,696,999.665  E         2,089,324.063
P.T.  Station               267+15.70  N      13,697,038.102  E         2,089,534.206
C.C.                                   N      13,699,840.090  E         2,088,913.108
Back          = N  81° 46' 03.06" E
Ahead         = N  77° 30' 06.10" E
Chord Bear    = N  79° 38' 04.58" E

Course from PT WBFR27 to WBFR42 N 77° 30' 06.10" E Dist 782.317

Point WBFR42              N   13,697,207.404 E    2,090,297.984 Sta     274+98.02

Course from WBFR42 to PC WBFR28 N 77° 44' 15.28" E Dist 2,649.195
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Kimley»Horn F-928

US 90

HORIZONTAL ALIGNMENT DATA

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	122
CONT.	SECT.	JOB	
0024	08	141	

℄ EBFR1

Chain EBFR1 contains:
EBFR1 EBFR2 CUR EBFR11 CUR EBFR12 CUR EBFR13 CUR EBFR14 CUR EBFR15 EBFR3

Beginning chain EBFR1 description

Point EBFR1 N 13,693,356.609 E 2,077,945.532 Sta 144+85.00

Course from EBFR1 to EBFR2 N 64° 59′ 55.89" E Dist 1,200.100

Point EBFR2 N 13,693,863.815 E 2,079,033.182 Sta 156+85.10

Course from EBFR2 to PC EBFR11 N 64° 51′ 37.06" E Dist 328.689

Curve Data					
Curve EBFR11	(Chord Definition)				
P.I. Station	160+74.39	N	13,694,029.198	E	2,079,385.601
Delta =	8° 09′ 24.01"	(RT)			
Degree =	6° 44′ 40.46"				
Tangent =	60.606				
Length =	120.937				
Radius =	850.000				
External =	2.158				
Long Chord =	120.904				
Mid. Ord. =	2.152				
P.C. Station	160+13.79	N	13,694,003.451	E	2,079,330.736
P.T. Station	161+34.73	N	13,694,046.900	E	2,079,443.564
C.C.		N	13,693,233.968	E	2,079,691.839
Back = N	64° 51′ 37.06" E				
Ahead = N	73° 01′ 01.08" E				
Chord Bear = N	68° 56′ 19.07" E				

Curve Data					
Curve EBFR12	(Chord Definition)				
P.I. Station	162+87.08	N	13,694,091.401	E	2,079,589.274
Delta =	3° 29′ 26.22"	(LT)			
Degree =	1° 08′ 45.36"				
Tangent =	152.354				
Length =	304.609				
Radius =	5,000.000				
External =	2.321				
Long Chord =	304.567				
Mid. Ord. =	2.320				
P.C. Station	161+34.73	N	13,694,046.900	E	2,079,443.564
P.T. Station	164+39.33	N	13,694,144.691	E	2,079,732.004
C.C.		N	13,698,828.857	E	2,077,983.121
Back = N	73° 01′ 01.08" E				
Ahead = N	69° 31′ 34.86" E				
Chord Bear = N	71° 16′ 17.97" E				

Course from PT EBFR12 to PC EBFR13 N 69° 31′ 34.86" E Dist 239.375

Curve Data					
Curve EBFR13	(Chord Definition)				
P.I. Station	168+07.17	N	13,694,273.350	E	2,080,076.600
Delta =	4° 14′ 24.48"	(RT)			
Degree =	1° 39′ 04.44"				
Tangent =	128.456				
Length =	256.786				
Radius =	3,470.000				
External =	2.377				
Long Chord =	256.736				
Mid. Ord. =	2.375				
P.C. Station	166+78.71	N	13,694,228.419	E	2,079,956.258
P.T. Station	169+35.50	N	13,694,309.260	E	2,080,199.935
C.C.		N	13,690,977.608	E	2,081,169.983
Back = N	69° 31′ 34.86" E				
Ahead = N	73° 45′ 59.34" E				
Chord Bear = N	71° 38′ 47.10" E				

Course from PT EBFR13 to PC EBFR14 N 73° 45′ 59.34" E Dist 625.895

Curve Data					
Curve EBFR14	(Chord Definition)				
P.I. Station	176+46.30	N	13,694,507.969	E	2,080,882.404
Delta =	5° 24′ 06.27"	(RT)			
Degree =	3° 11′ 00.63"				
Tangent =	84.913				
Length =	169.679				
Radius =	1,800.000				
External =	2.002				
Long Chord =	169.638				
Mid. Ord. =	2.000				
P.C. Station	175+61.39	N	13,694,484.231	E	2,080,800.876
P.T. Station	177+31.07	N	13,694,523.926	E	2,080,965.804
C.C.		N	13,692,755.996	E	2,081,304.071
Back = N	73° 45′ 59.34" E				
Ahead = N	79° 10′ 05.60" E				
Chord Bear = N	76° 28′ 02.47" E				

Course from PT EBFR14 to PC EBFR15 N 79° 10′ 05.60" E Dist 70.795

℄ EBFR1 (CONTINUED)

Curve Data					
Curve EBFR15	(Chord Definition)				
P.I. Station	179+24.21	N	13,694,560.222	E	2,081,155.501
Delta =	5° 25′ 47.41"	(LT)			
Degree =	2° 13′ 15.26"				
Tangent =	122.343				
Length =	244.487				
Radius =	2,580.000				
External =	2.899				
Long Chord =	244.411				
Mid. Ord. =	2.896				
P.C. Station	178+01.87	N	13,694,537.230	E	2,081,035.338
P.T. Station	180+46.35	N	13,694,594.481	E	2,081,272.950
C.C.		N	13,697,071.263	E	2,080,550.489
Back = N	79° 10′ 05.60" E				
Ahead = N	73° 44′ 18.19" E				
Chord Bear = N	76° 27′ 11.90" E				

Course from PT EBFR15 to EBFR3 N 73° 44′ 18.23" E Dist 3.902

Point EBFR3 N 13,694,595.573 E 2,081,276.696 Sta 180+50.25

Ending chain EBFR1 description

4/1/2021

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HORIZONTAL ALIGNMENT DATA

SHEET 4 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	123
CONT.	SECT.	JOB	
0024	08	141	

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℄ EBFR2

Beginning chain EBFR2 description

Point EBFR21 N 13,694,584.053 E 2,081,280.056 Sta 180+50.25

Course from EBFR21 to PC EBFR21 N 73° 44′ 18.19" E Dist 4,949.997

Curve Data					
Curve EBFR21	(Chord Definition)				
P.I. Station	230+59.21	N	13,695,986.680	E	2,086,088.623
Delta =	5° 18′ 59.09"	(RT)			
Degree =	4° 30′ 45.52"				
Tangent =	58.963				
Length =	117.811				
Radius =	1,270.000				
External =	1.368				
Long Chord =	117.800				
Mid. Ord. =	1.367				
P.C. Station	230+00.25	N	13,695,970.169	E	2,086,032.019
P.T. Station	231+18.06	N	13,695,997.876	E	2,086,146.514
C.C.		N	13,694,750.978	E	2,086,387.649
Back = N	73° 44′ 18.19" E				
Ahead = N	79° 03′ 17.29" E				
Chord Bear = N	76° 23′ 47.74" E				

Course from PT EBFR21 to EBFR22 N 79° 03′ 17.29" E Dist 38.610

Point EBFR22 N 13,696,005.207 E 2,086,184.422 Sta 231+56.67

Course from EBFR22 to PC EBFR22 N 81° 00′ 29.67" E Dist 422.385

Curve Data					
Curve EBFR22	(Chord Definition)				
P.I. Station	236+84.91	N	13,696,087.767	E	2,086,706.172
Delta =	2° 41′ 42.47"	(LT)			
Degree =	1° 16′ 23.76"				
Tangent =	105.857				
Length =	211.671				
Radius =	4,500.000				
External =	1.245				
Long Chord =	211.655				
Mid. Ord. =	1.245				
P.C. Station	235+79.05	N	13,696,071.222	E	2,086,601.616
P.T. Station	237+90.72	N	13,696,109.210	E	2,086,809.835
C.C.		N	13,700,515.921	E	2,085,898.300
Back = N	81° 00′ 29.67" E				
Ahead = N	78° 18′ 47.21" E				
Chord Bear = N	79° 39′ 38.44" E				

Course from PT EBFR22 to PC EBFR23 N 78° 18′ 47.21" E Dist 43.718

Curve Data					
Curve EBFR23	(Chord Definition)				
P.I. Station	239+10.93	N	13,696,133.559	E	2,086,927.548
Delta =	4° 22′ 48.86"	(LT)			
Degree =	2° 51′ 54.31"				
Tangent =	76.487				
Length =	152.883				
Radius =	2,000.000				
External =	1.462				
Long Chord =	152.862				
Mid. Ord. =	1.461				
P.C. Station	238+34.44	N	13,696,118.065	E	2,086,852.647
P.T. Station	239+87.33	N	13,696,154.728	E	2,087,001.047
C.C.		N	13,698,076.604	E	2,086,447.520
Back = N	78° 18′ 47.21" E				
Ahead = N	73° 55′ 58.35" E				
Chord Bear = N	76° 07′ 22.78" E				

Course from PT EBFR23 to EBFR23 N 73° 55′ 58.35" E Dist 17.904

Point EBFR23 N 13,696,159.683 E 2,087,018.252 Sta 240+05.23

Course from EBFR23 to PC EBFR24 N 77° 36′ 29.33" E Dist 594.144

Curve Data					
Curve EBFR24	(Chord Definition)				
P.I. Station	249+06.09	N	13,696,363.145	E	2,087,895.715
Delta =	20° 02′ 45.05"	(RT)			
Degree =	3° 18′ 07.30"				
Tangent =	306.716				
Length =	607.077				
Radius =	1,735.410				
External =	26.896				
Long Chord =	604.069				
Mid. Ord. =	26.485				
P.C. Station	245+99.37	N	13,696,287.184	E	2,087,598.554
P.T. Station	252+06.45	N	13,696,332.646	E	2,088,200.910
C.C.		N	13,694,605.837	E	2,088,028.346
Back = N	75° 39′ 39.29" E				
Ahead = S	84° 17′ 35.66" E				
Chord Bear = N	85° 41′ 01.81" E				

Course from PT EBFR24 to EBFR24 S 86° 14′ 25.70" E Dist 538.707

Point EBFR24 N 13,696,297.324 E 2,088,738.458 Sta 257+45.16

Course from EBFR24 to PC EBFR25 N 89° 26′ 31.19" E Dist 135.201

℄ EBFR2 (CONTINUED)

Curve Data					
Curve EBFR25	(Chord Definition)				
P.I. Station	261+99.23	N	13,696,301.746	E	2,089,192.506
Delta =	30° 44′ 25.42"	(LT)			
Degree =	4° 56′ 26.96"				
Tangent =	318.868				
Length =	622.172				
Radius =	1,160.000				
External =	43.028				
Long Chord =	614.927				
Mid. Ord. =	41.489				
P.C. Station	258+80.36	N	13,696,298.641	E	2,088,873.653
P.T. Station	265+02.53	N	13,696,467.396	E	2,089,464.970
C.C.		N	13,697,458.586	E	2,088,862.356
Back = N	89° 26′ 31.19" E				
Ahead = N	58° 42′ 05.77" E				
Chord Bear = N	74° 04′ 18.48" E				

Course from PT EBFR25 to PC EBFR26 N 58° 42′ 05.77" E Dist 635.177

Curve Data					
Curve EBFR26	(Chord Definition)				
P.I. Station	273+29.55	N	13,696,897.030	E	2,090,171.638
Delta =	18° 56′ 30.62"	(RT)			
Degree =	4° 59′ 01.73"				
Tangent =	191.844				
Length =	380.067				
Radius =	1,150.000				
External =	15.892				
Long Chord =	378.458				
Mid. Ord. =	15.675				
P.C. Station	271+37.71	N	13,696,797.368	E	2,090,007.712
P.T. Station	275+17.78	N	13,696,938.084	E	2,090,359.037
C.C.		N	13,695,814.724	E	2,090,605.131
Back = N	58° 42′ 05.77" E				
Ahead = N	77° 38′ 36.38" E				
Chord Bear = N	68° 10′ 21.08" E				

Course from PT EBFR26 to EBFR25 N 77° 38′ 36.38" E Dist 213.962

Point EBFR25 N 13,696,983.870 E 2,090,568.043 Sta 277+31.74

Course from EBFR25 to PC EBFR27 N 79° 20′ 08.37" E Dist 92.643

Curve Data					
Curve EBFR27	(Chord Definition)				
P.I. Station	279+22.96	N	13,697,019.257	E	2,090,755.963
Delta =	3° 45′ 50.79"	(LT)			
Degree =	1° 54′ 35.81"				
Tangent =	98.580				
Length =	197.079				
Radius =	3,000.000				
External =	1.619				
Long Chord =	197.053				
Mid. Ord. =	1.618				
P.C. Station	278+24.38	N	13,697,001.015	E	2,090,659.086
P.T. Station	280+21.46	N	13,697,043.820	E	2,090,851.434
C.C.		N	13,699,949.199	E	2,090,103.921
Back = N	79° 20′ 08.37" E				
Ahead = N	75° 34′ 17.57" E				
Chord Bear = N	77° 27′ 12.97" E				

Course from PT EBFR27 to PC EBFR28 N 75° 34′ 17.58" E Dist 473.475

Curve Data					
Curve EBFR28	(Chord Definition)				
P.I. Station	285+48.97	N	13,697,175.262	E	2,091,362.310
Delta =	2° 03′ 50.18"	(RT)			
Degree =	1° 54′ 35.81"				
Tangent =	54.040				
Length =	108.063				
Radius =	3,000.000				
External =	0.487				
Long Chord =	108.062				
Mid. Ord. =	0.487				
P.C. Station	284+94.93	N	13,697,161.796	E	2,091,309.975
P.T. Station	286+03.00	N	13,697,186.833	E	2,091,415.096
C.C.		N	13,694,256.418	E	2,092,057.487
Back = N	75° 34′ 17.57" E				
Ahead = N	77° 38′ 07.76" E				
Chord Bear = N	76° 36′ 12.67" E				

Course from PT EBFR28 to PC EBFR29 N 77° 38′ 07.76" E Dist 1,617.286

Curve Data					
Curve EBFR29	(Chord Definition)				
P.I. Station	303+38.70	N	13,697,558.500	E	2,093,110.542
Delta =	8° 15′ 36.02"	(RT)			
Degree =	3° 29′ 39.07"				
Tangent =	118.420				
Length =	236.393				
Radius =	1,640.000				
External =	4.270				
Long Chord =	236.225				
Mid. Ord. =	4.259				
P.C. Station	302+20.28	N	13,697,533.143	E	2,092,994.869
P.T. Station	304+56.68	N	13,697,566.976	E	2,093,228.659
C.C.		N	13,695,931.183	E	2,093,346.043
Back = N	77° 38′ 07.76" E				
Ahead = N	85° 53′ 43.78" E				
Chord Bear = N	81° 45′ 55.77" E				

4/1/2021

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HORIZONTAL ALIGNMENT DATA

SHEET 5 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	124
CONT.	SECT.	JOB	
0024	08	141	

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℄ GENERAL MCMULLEN

Beginning chain GEN MCM description

Point GM1 N 13,696,089.7944 E 2,109,760.3718 Sta 82+83.75

Course from GM1 to GM2 N 6° 14′ 15.18" E Dist 610.8190

Point GM2 N 13,696,696.9973 E 2,109,826.7378 Sta 88+94.57

Course from GM2 to PC GEN MCM1 N 6° 00′ 34.31" E Dist 322.7377

Curve Data					
Curve GEN MCM1					
P.I. Station	92+96.12	N	13,697,096.3430	E	2,109,868.7779
Delta =	4° 43′ 34.31"	(LT)			
Degree =	3° 00′ 00.00"				
Tangent =	78.8147				
Length =	157.5400				
Radius =	1,909.8600				
External =	1.6255				
Long Chord =	157.4953				
Mid. Ord. =	1.6242				
P.C. Station	92+17.30	N	13,697,017.9614	E	2,109,860.5264
P.T. Station	93+74.84	N	13,697,175.1379	E	2,109,870.5430
C.C.		N	13,697,217.9121	E	2,107,961.1621
Back = N	6° 00′ 34.31" E				
Ahead = N	1° 17′ 00.00" E				
Chord Bear = N	3° 38′ 47.16" E				

Course from PT GEN MCM1 to PC GEN MCM2 N 1° 17′ 00.00" E Dist 542.3867

Curve Data					
Curve GEN MCM2					
P.I. Station	99+98.25	N	13,697,798.3940	E	2,109,884.1450
Delta =	4° 51′ 29.51"	(RT)			
Degree =	3° 00′ 00.00"				
Tangent =	81.0185				
Length =	161.9400				
Radius =	1,909.8600				
External =	1.7177				
Long Chord =	161.8915				
Mid. Ord. =	1.7161				
P.C. Station	99+17.23	N	13,697,717.3885	E	2,109,882.6906
P.T. Station	100+79.17	N	13,697,878.9853	E	2,109,892.4546
C.C.		N	13,697,683.1034	E	2,111,792.2428
Back = N	1° 01′ 42.99" E				
Ahead = N	5° 53′ 12.50" E				
Chord Bear = N	3° 27′ 27.75" E				

Course from PT GEN MCM2 to GM3 N 5° 05′ 24.09" E Dist 404.2630

Point GM3 N 13,698,281.6541 E 2,109,928.3211 Sta 104+83.43

Ending chain GEN MCM description

4/1/2021

STATE OF TEXAS
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HORIZONTAL ALIGNMENT DATA

SHEET 6 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	125
CONT.	SECT.	JOB	
0024	08	141	

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NOTES:

1. INSTALL SANDBAGS AND EROSION LOGS TO PROTECT CURB INLETS AND WHERE MBGF/ MOWSTRIP WORK WILL BE PERFORMED AND AT OTHER LOCATIONS AS NEEDED OR AS DIRECTED BY THE ENGINEER. REFER TO MISCELLANEOUS ROADWAY DETAILS SHEET AND STANDARD EC(9)-16 FOR PLACEMENT AND INSTALLATION DETAILS.

2. LOCATION OF EXISTING UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.

3. REFER TO SUMMARY OF METAL BEAM GUARD FENCE FOR ADDITIONAL INFORMATION.

4. DISCONNECT EXISTING LOOP CABLES (2/C #14)FOR LOOPS BEING ABANDONED. (DISCONNECT FROM LOOP LEAD-INS AND FROM LOCAL CONTROL UNITS AND MARK DISCONNECTED CABLES IN ALL GROUND BOXES THEY PASS THRU AND AT EACH END AS "ABANDONED", SUBSIDIARY TO THE VARIOUS BID ITEMS.) CONTACT TRANSGUIDE MAINTENANCE PRIOR TO ANY DISCONNECTIONS. SEE "SURVEILLANCE LOOP DETECTOR INSTALLATION DETAILS" SHEET FOR REFERENCE.

5. AFTER GROUND BOXES HAVE BEEN ABANDONED REMOVE AND DELIVER ALL GROUND BOX LIDS LABELED "FTM" TO TRANSGUIDE. BACKFILL ABANDONED GROUNDBOXES IN ACCORDANCE WITH ITEM 624 GROUND BOX REMOVAL. THIS WORK WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.

6. EXISTING TMS EQUIPMENT AND CONDUIT LOCATIONS SHOWN ON LAYOUTS IS NOT GUARANTEED TO BE 100% ACCURATE OR ALL-INCLUSIVE AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY.

7. DURING ASPHALT PLACEMENT ON BRIDGE DECKS CONTRACTOR SHALL TAKE PRECAUTIONS TO ENSURE THAT ASPHALT DOES NOT FALL THROUGH THE BRIDGE JOINTS. SHOULD ASPHALT FALL THROUGH THE BRIDGE JOINTS, CONTRACTOR WILL BE REQUIRED TO REMOVE ASPHALT SPOILS FROM BENT CAPS. THIS NOTE SUPPLEMENTS CONTRACTOR REQUIREMENTS TO MAINTAIN OVERALL PROJECT CLEANINESS, AND WILL NOT BE PAID FOR DIRECTLY.

8. REFER TO BRIDGE PLANS FOR DETAILS OF WORK TO BE PERFORMED FOR EACH STRUCTURE.

9. REFER TO MISCELLANEOUS ROADWAY DETAILS FOR INFORMATION ON PLANE AND INLAY AT BRIDGES.

4/1/2021

STATE OF TEXAS
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US 90

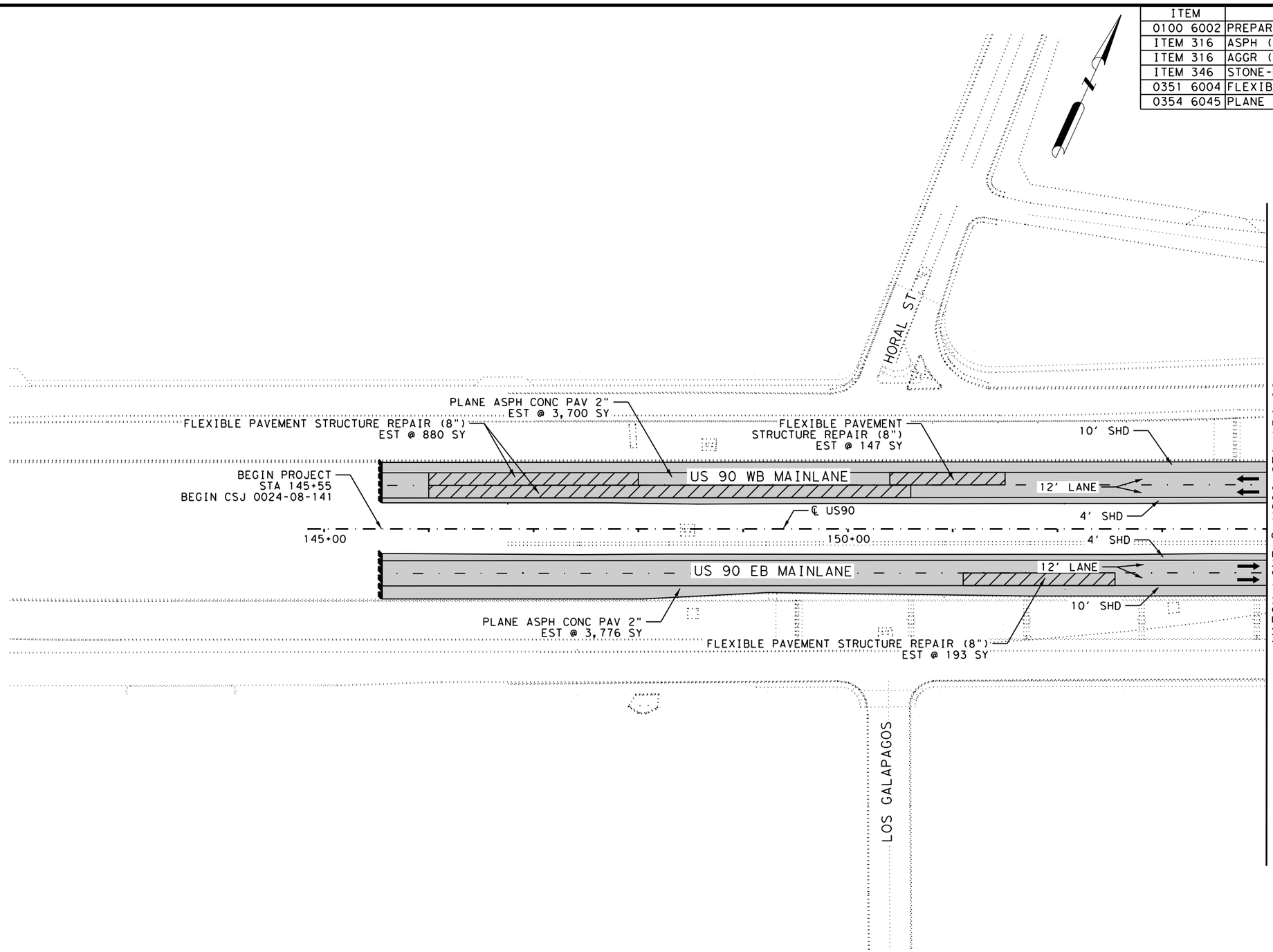
ROADWAY GENERAL NOTES

SHEET 1 OF 1

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	126
CONT.	SECT.	JOB	
0024	08	141	

ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	7.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	7476
ITEM 316	AGGR (TY-PB GR-4)	SY	7476
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	7576
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	1220
0354 6045	PLANE ASPH CONC PAV (2")	SY	7476



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
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ROADWAY PLAN MAINLANE

BEGIN PROJECT TO
℄ US90 STA 154+00

SHEET 1 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	127
CONT.	SECT.	JOB	
0024	08	141	

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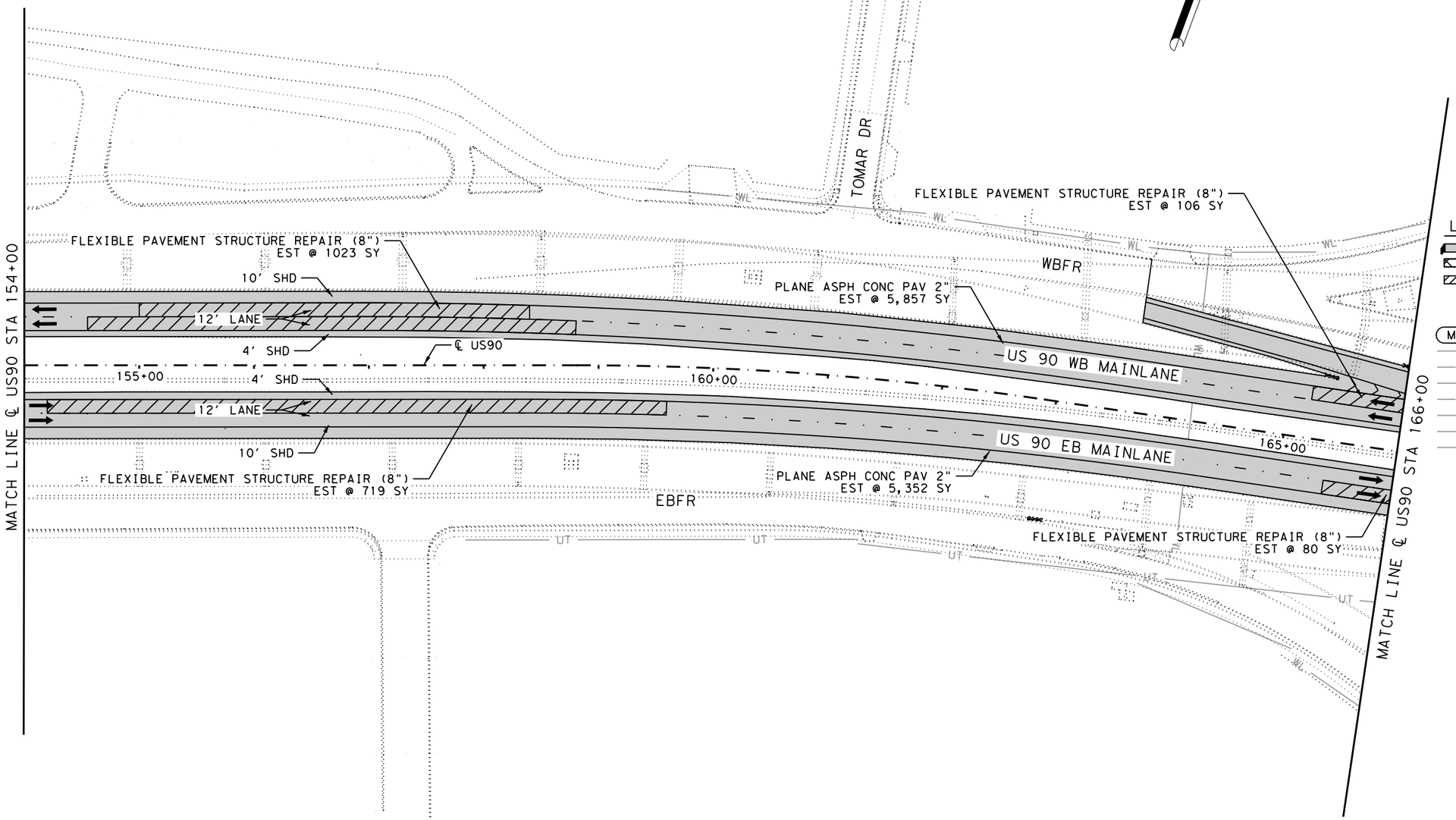
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
ITEM 316	ASPH (A-R TYPE II OR III)	SY	11209
ITEM 316	AGGR (TY-PB GR-4)	SY	11209
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	11209
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	1928
0354 6045	PLANE ASPH CONC PAV (2")	SY	11209



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 154+00 TO
℄ US90 STA 166+00

SHEET 2 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	128
CONT.	SECT.	JOB	
0024	08	141	

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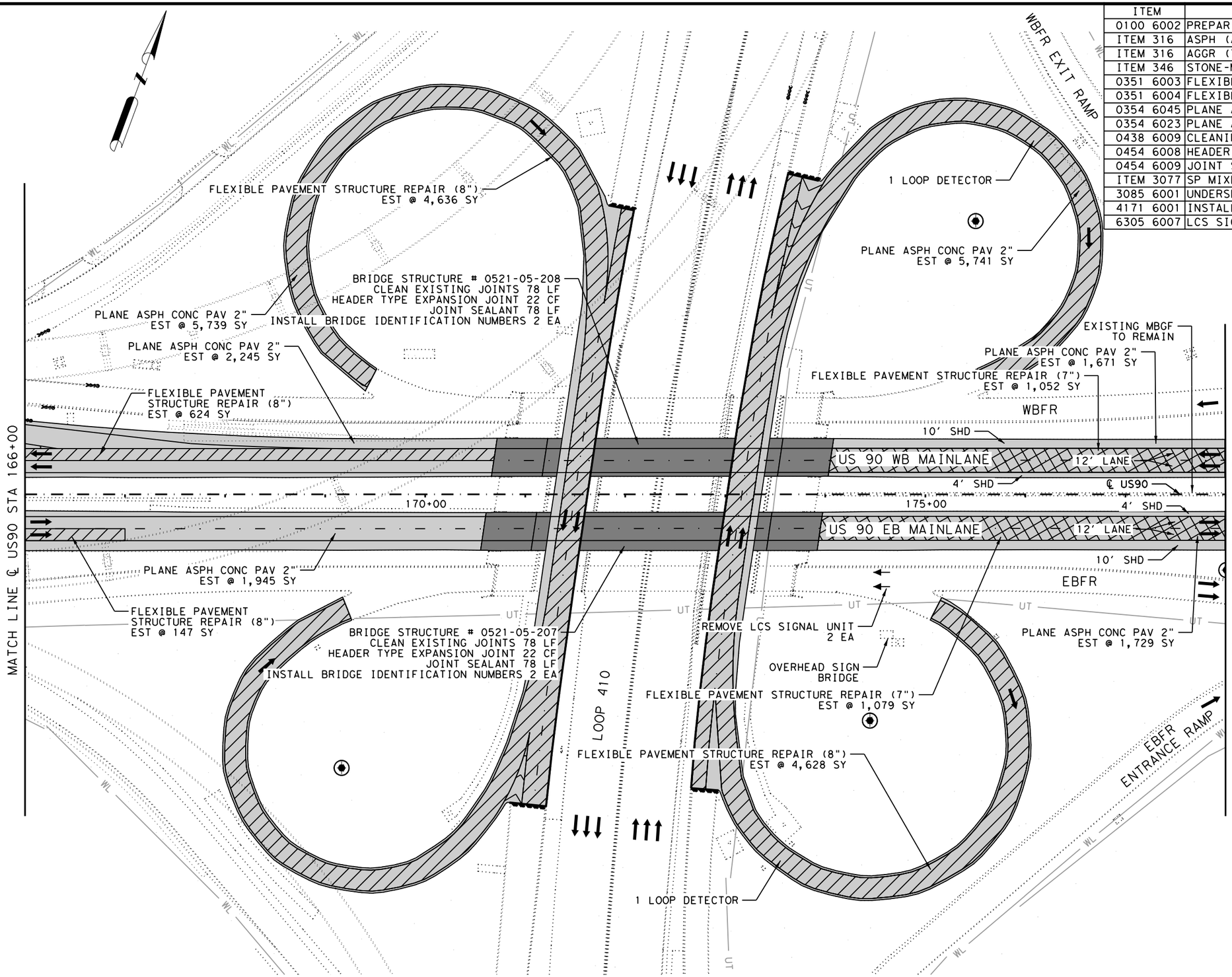
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
ITEM 316	ASPH (A-R TYPE II OR III)	SY	10437
ITEM 316	AGGR (TY-PB GR-4)	SY	10437
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	10437
0351 6003	FLEXIBLE PAVEMENT STRUCTURE REPAIR(7")	SY	2131
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	10035
0354 6045	PLANE ASPH CONC PAV (2")	SY	19070
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	2847
0438 6009	CLEANING EXISTING JOINTS	LF	156
0454 6008	HEADER TYPE EXPANSION JOINT	CF	44
0454 6009	JOINT SEALANT	LF	156
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	11480
3085 6001	UNDERSEAL COURSE	GAL	2296
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 166+00 TO
℄ US90 STA 178+00

SHEET 3 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	129
CONT.	SECT.	JOB	
0024	08	141	

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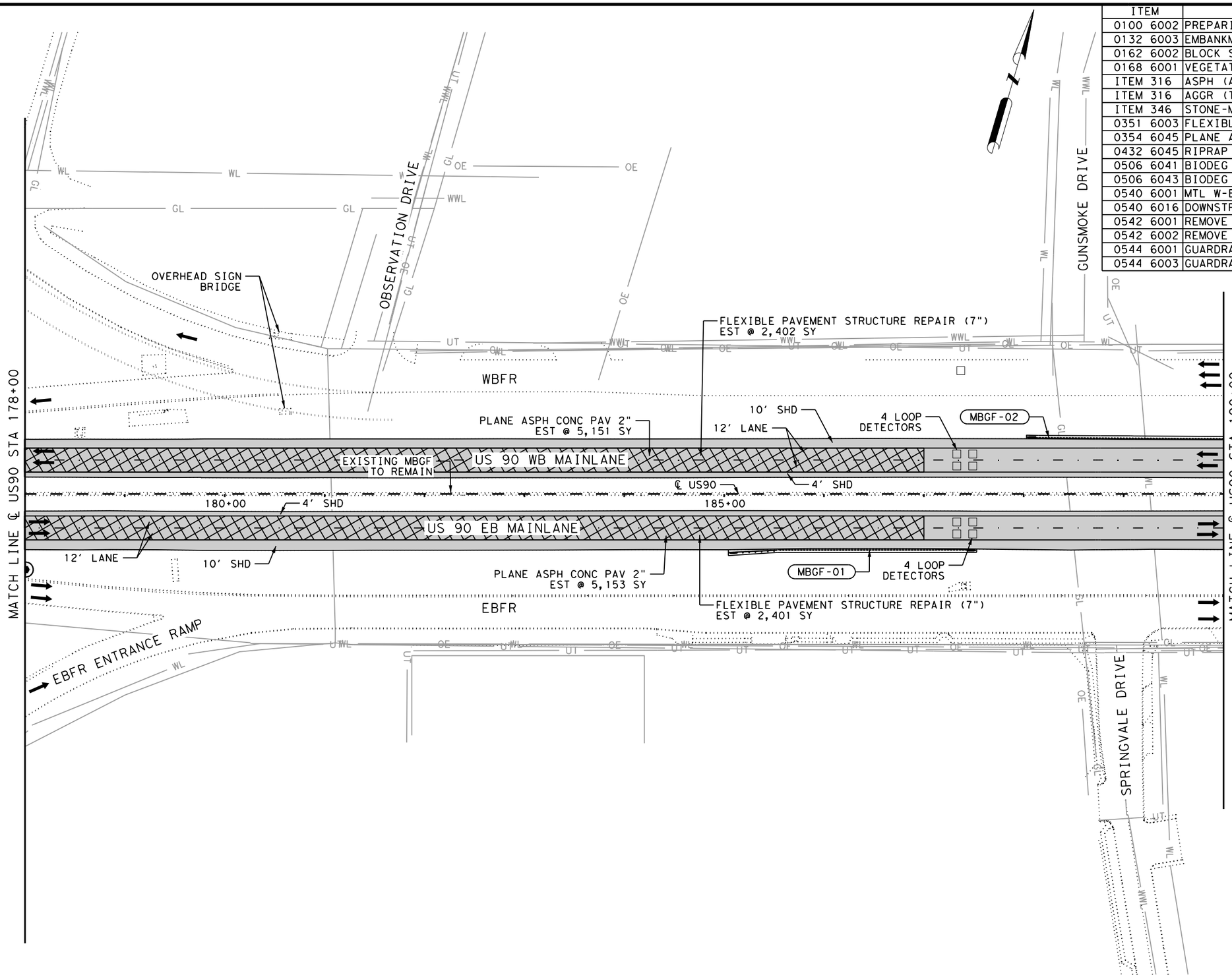
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	8
0162 6002	BLOCK SODDING	SY	156
0168 6001	VEGETATIVE WATERING	MG	2.5
ITEM 316	ASPH (A-R TYPE II OR III)	SY	10304
ITEM 316	AGGR (TY-PB GR-4)	SY	10304
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	10304
0351 6003	FLEXIBLE PAVEMENT STRUCTURE REPAIR(7")	SY	4803
0354 6045	PLANE ASPH CONC PAV (2")	SY	10304
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	20
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	468
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	468
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	372.8
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	322.8
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC
- □ EXIST INDUCTIVE LOOP TO BE ABANDONED
- ← EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 178+00 TO
℄ US90 STA 190+00

SHEET 4 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	130
CONT.	SECT.	JOB	
0024	08	141	

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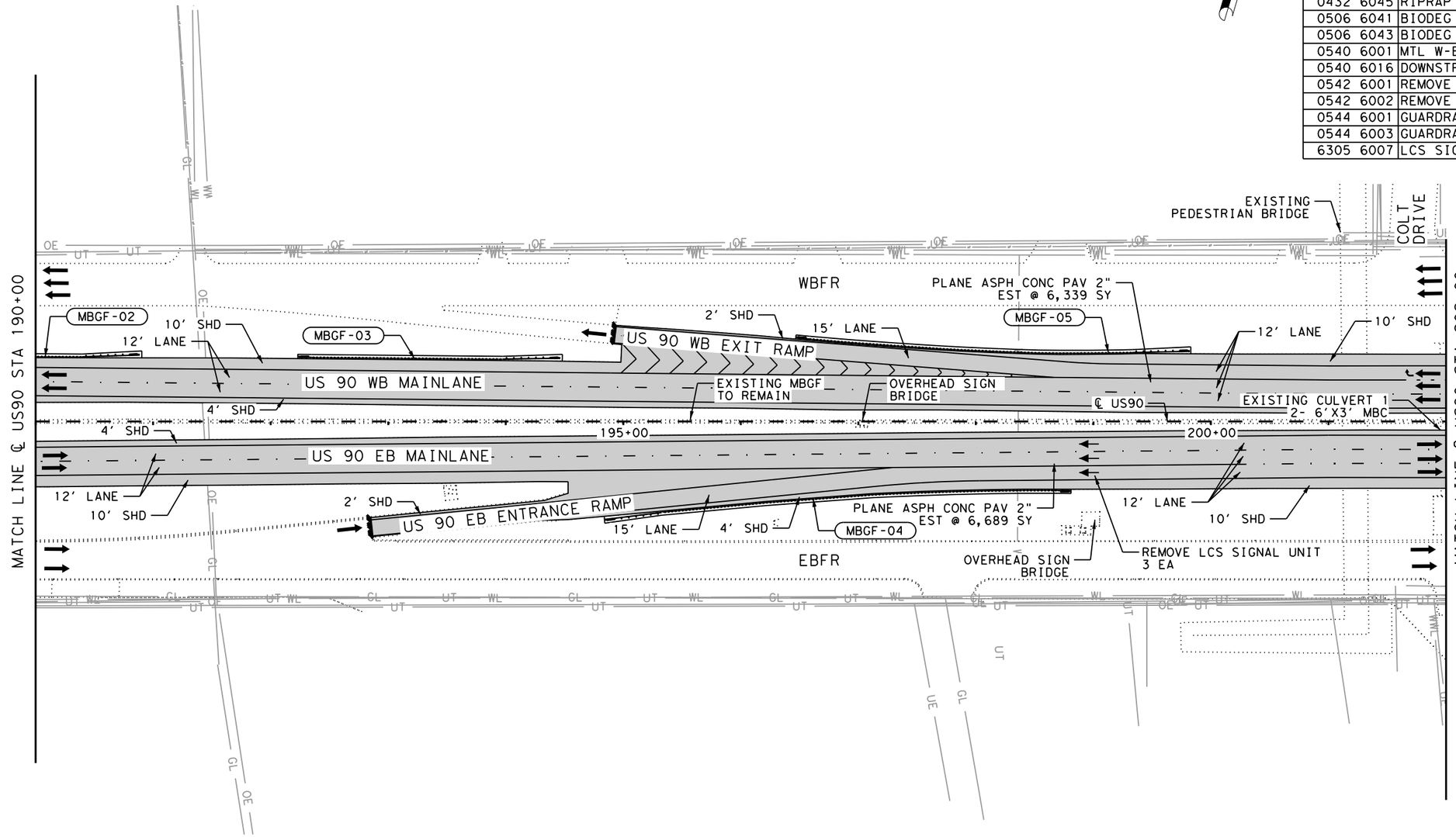
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	18
0162 6002	BLOCK SODDING	SY	362
0168 6001	VEGETATIVE WATERING	MG	5.7
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13028
ITEM 316	AGGR (TY-PB GR-4)	SY	13028
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13028
0354 6045	PLANE ASPH CONC PAV (2")	SY	13028
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	50
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1085
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1085
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	814.7
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	3
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	702.2
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	4
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	3



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 190+00 TO
℄ US90 STA 202+00

SHEET 5 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	131
CONT.	SECT.	JOB	
0024	08	141	

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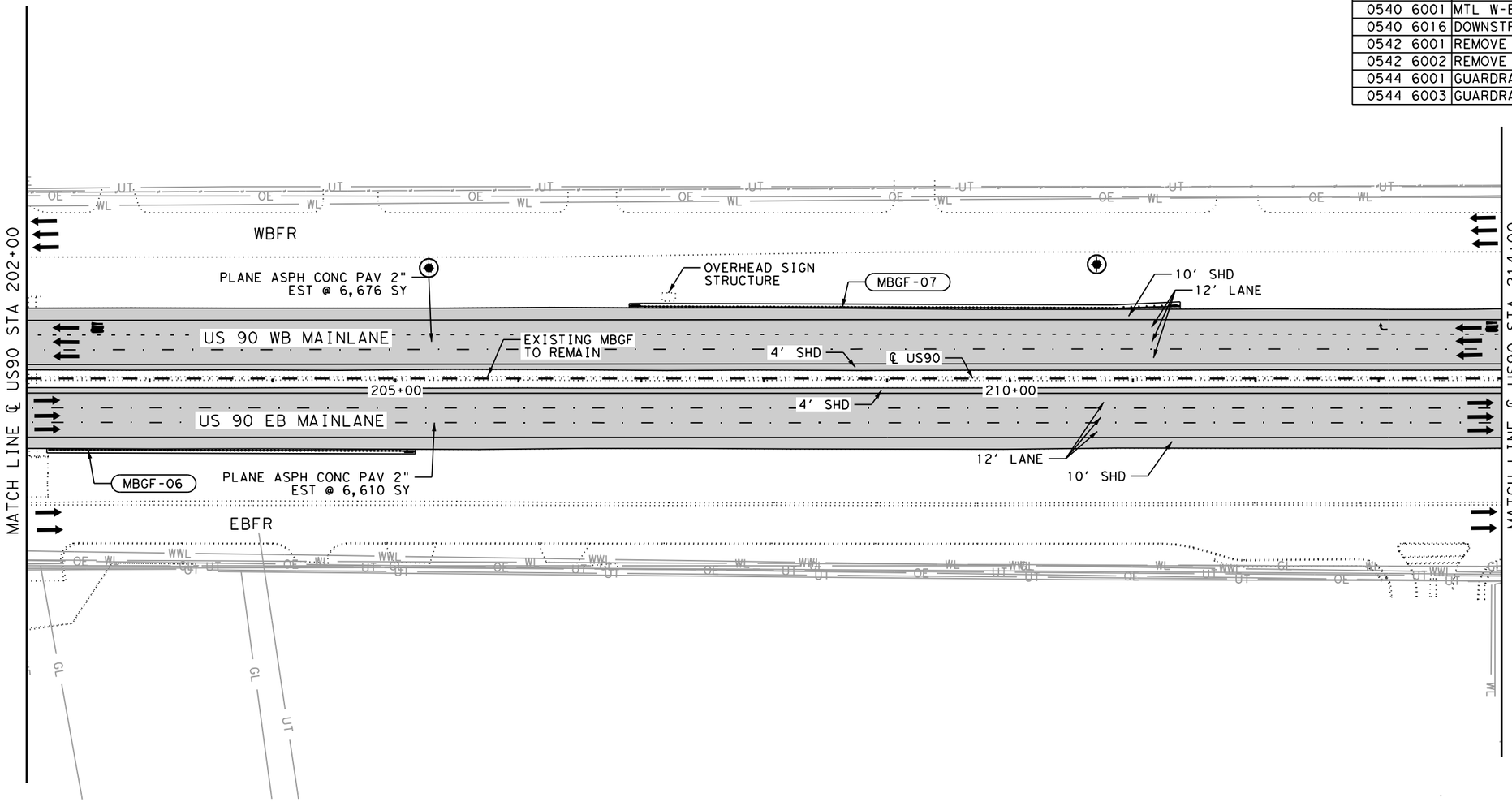
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6054	REMOVING CONCRETE(MOW STRIP)	LF	50
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	14
0162 6002	BLOCK SODDING	SY	257
0168 6001	VEGETATIVE WATERING	MG	4.1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13286
ITEM 316	AGGR (TY-PB GR-4)	SY	13286
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13286
0354 6045	PLANE ASPH CONC PAV (2")	SY	13286
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	33
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	770
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	770
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	675
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	675
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 202+00 TO
℄ US90 STA 214+00

SHEET 6 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	132
CONT.	SECT.	JOB	
0024	08	141	

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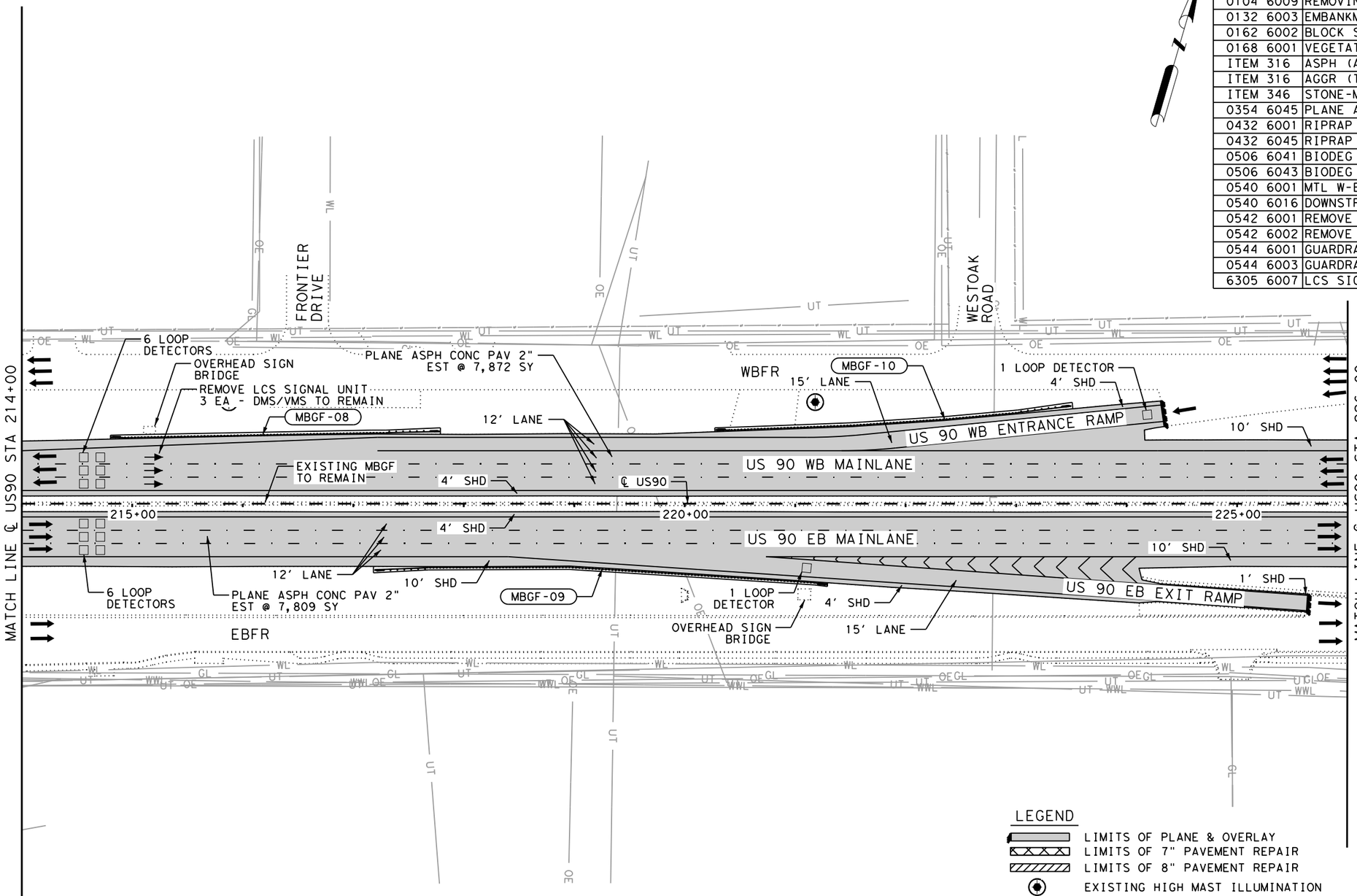
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	56
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	24
0162 6002	BLOCK SODDING	SY	355
0168 6001	VEGETATIVE WATERING	MG	5.6
ITEM 316	ASPH (A-R TYPE II OR III)	SY	15681
ITEM 316	AGGR (TY-PB GR-4)	SY	15681
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	15681
0354 6045	PLANE ASPH CONC PAV (2")	SY	15681
0432 6001	RIPRAP (CONC)(4 IN)	SY	6
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	46
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1065
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1065
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	850
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	3
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	391.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	6
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	3



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LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 214+00 TO
℄ US90 STA 226+00

SHEET 7 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	133
CONT.	SECT.	JOB	
0024	08	141	

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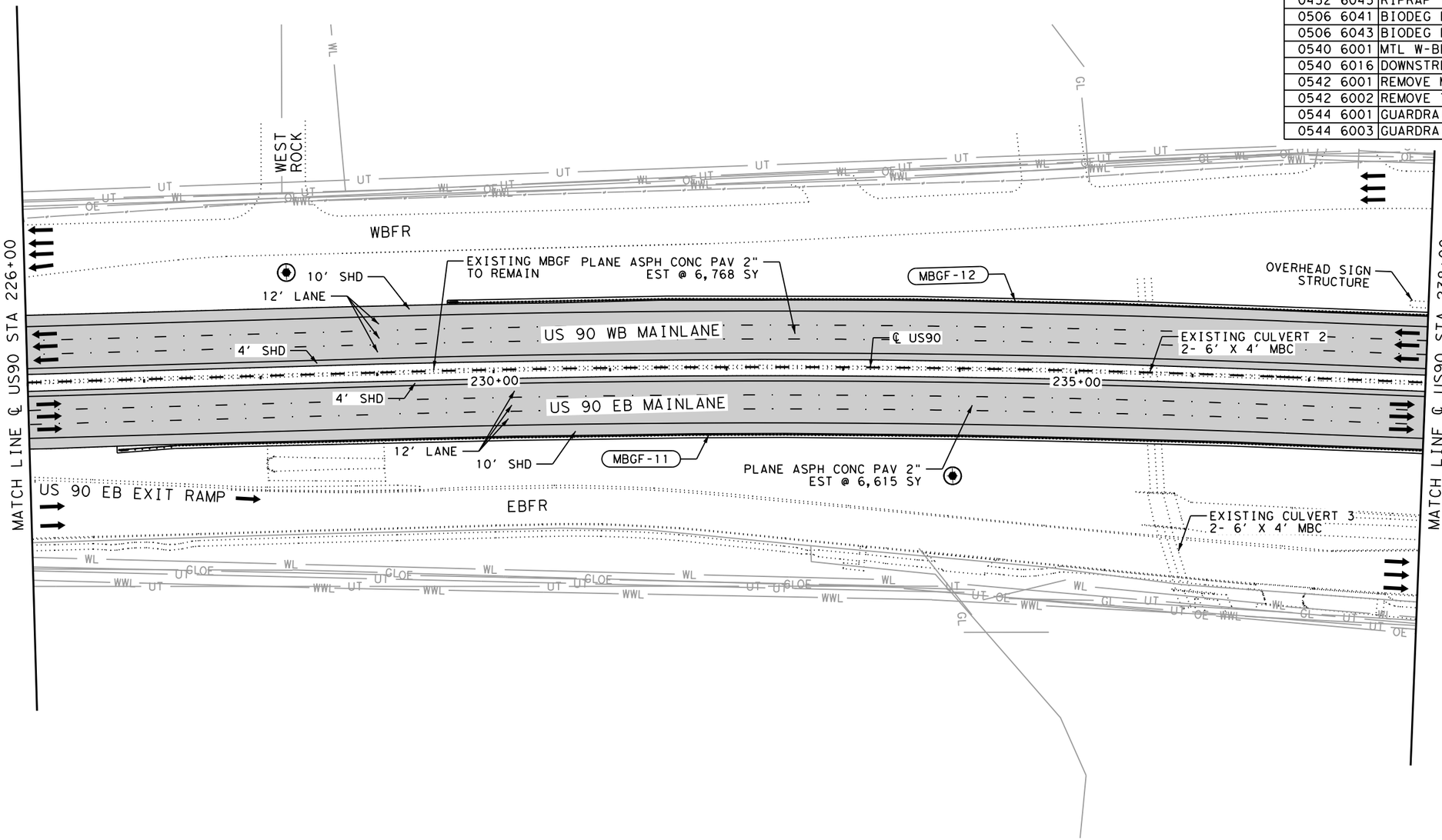
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	94
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	47
0162 6002	BLOCK SODDING	SY	663
0168 6001	VEGETATIVE WATERING	MG	10.4
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13383
ITEM 316	AGGR (TY-PB GR-4)	SY	13383
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13383
0354 6045	PLANE ASPH CONC PAV (2")	SY	13383
0432 6001	RIPRAP (CONC)(4 IN)	SY	11
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	86
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1987
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1987
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1901
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1901
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 226+00 TO
℄ US90 STA 238+00

SHEET 8 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	134
CONT.	SECT.	JOB	
0024	08	141	

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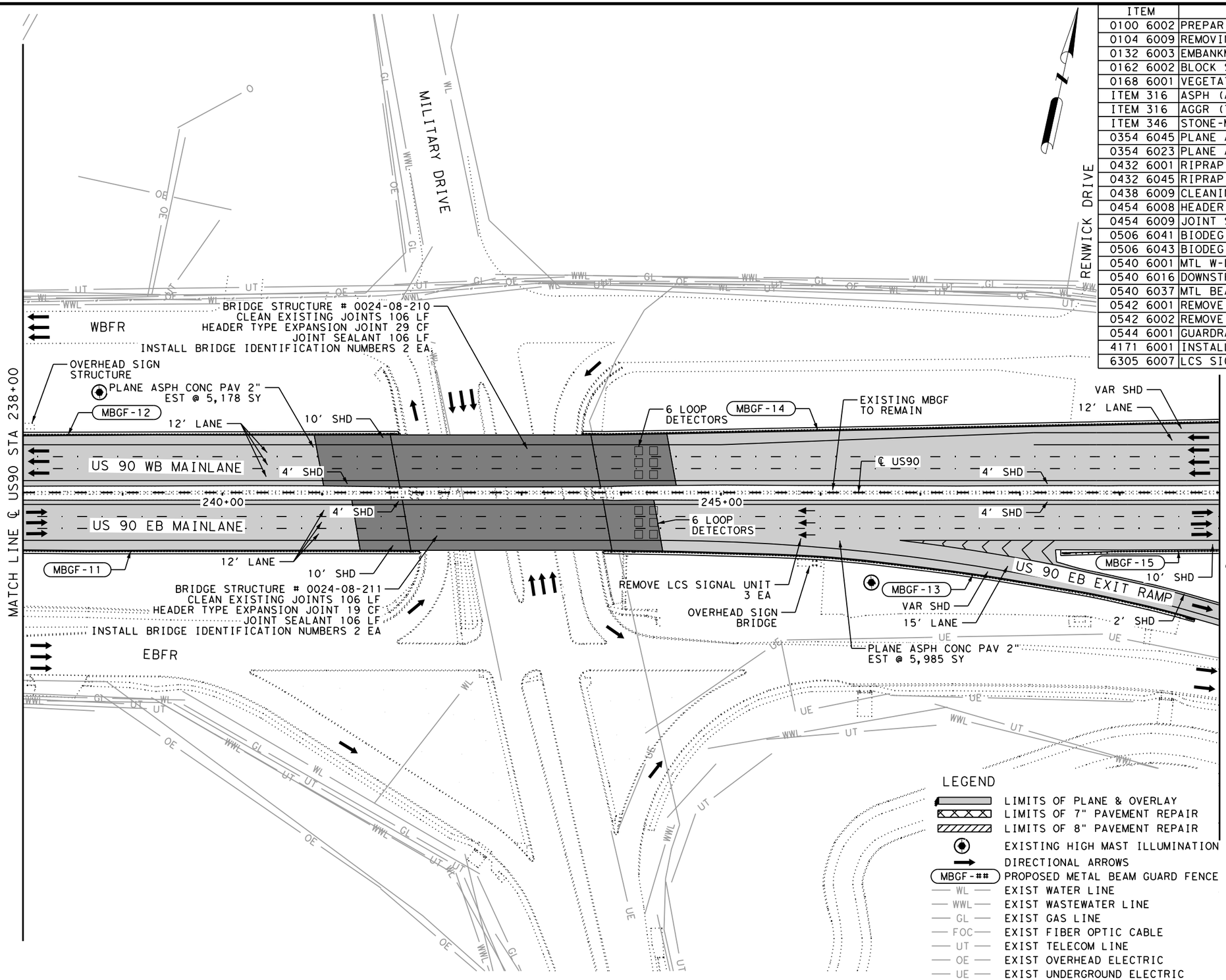
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	427
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	108
0162 6002	BLOCK SODDING	SY	746
0168 6001	VEGETATIVE WATERING	MG	11.7
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14900
ITEM 316	AGGR (TY-PB GR-4)	SY	14900
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14900
0354 6045	PLANE ASPH CONC PAV (2")	SY	11163
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	3737
0432 6001	RIPRAP (CONC)(4 IN)	SY	45
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	97
0438 6009	CLEANING EXISTING JOINTS	LF	212
0454 6008	HEADER TYPE EXPANSION JOINT	CF	48
0454 6009	JOINT SEALANT	LF	212
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	2237
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2237
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	2112
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0540 6037	MTL BEAM GD FEN TRANS (ANCHOR PLATE)	SY	4
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	2112
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	3



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10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 238+00 TO
℄ US90 STA 250+00

SHEET 9 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	135
CONT.	SECT.	JOB	
0024	08	141	

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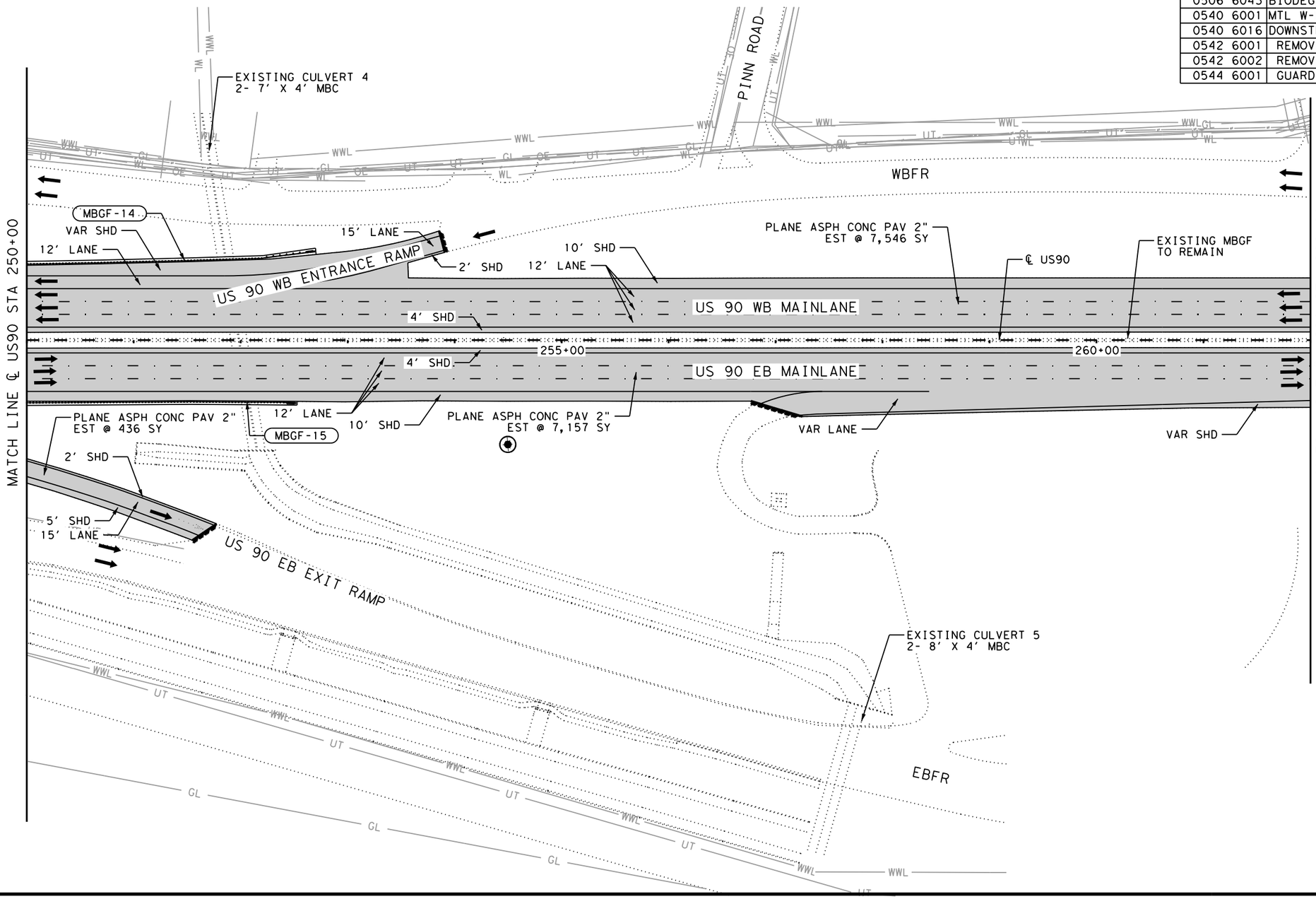
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	225
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	43
0162 6002	BLOCK SODDING	SY	183
0168 6001	VEGETATIVE WATERING	MG	2.9
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14704
ITEM 316	AGGR (TY-PB GR-4)	SY	14704
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14704
0354 6045	PLANE ASPH CONC PAV (2")	SY	14704
0432 6001	RIPRAP (CONC)(4 IN)	SY	23
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	21
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	547
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	547
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	461.8
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	461.8
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
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- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
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- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 250+00 TO
℄ US90 STA 262+00

SHEET 10 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	136
CONT.	SECT.	JOB	
0024	08	141	

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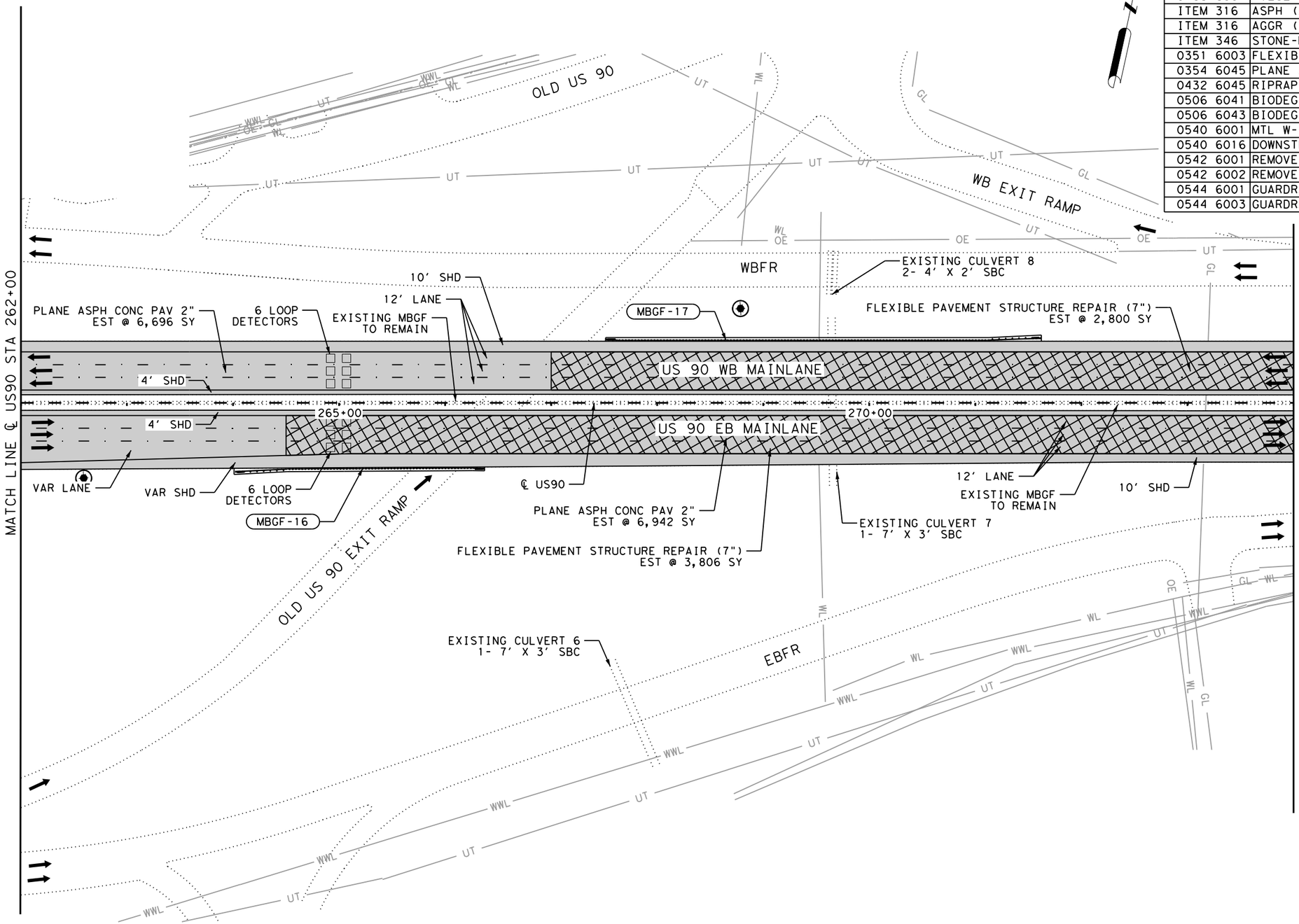
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	11
0162 6002	BLOCK SODDING	SY	225
0168 6001	VEGETATIVE WATERING	MG	3.6
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13638
ITEM 316	AGGR (TY-PB GR-4)	SY	13638
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13638
0351 6003	FLEXIBLE PAVEMENT STRUCTURE REPAIR(7")	SY	6606
0354 6045	PLANE ASPH CONC PAV (2")	SY	13638
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	30
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	675
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	675
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	525
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	500
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
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- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 262+00 TO
℄ US90 STA 274+00

SHEET 11 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	137
CONT.	SECT.	JOB	
0024	08	141	

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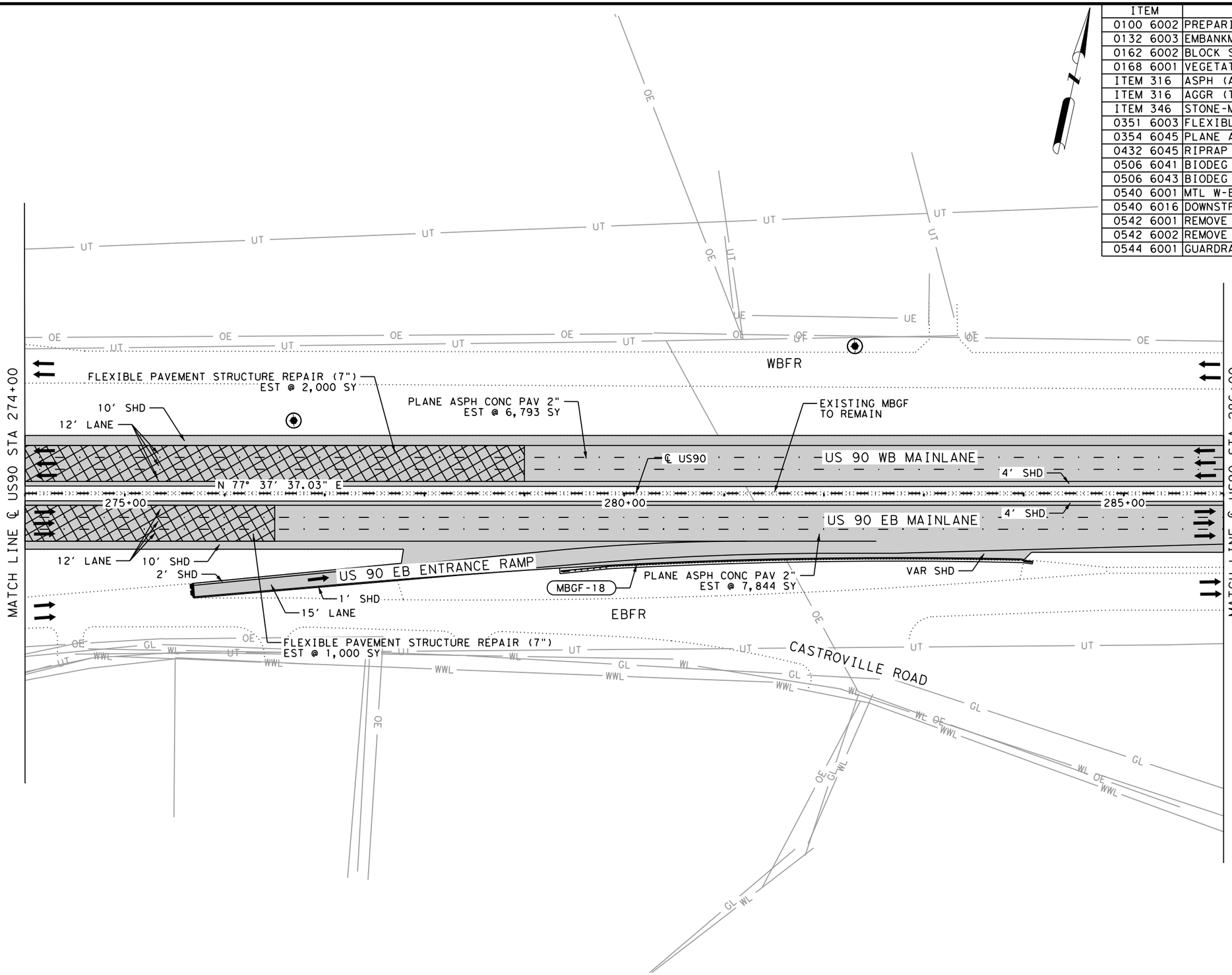
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	8
0162 6002	BLOCK SODDING	SY	166
0168 6001	VEGETATIVE WATERING	MG	2.6
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14637
ITEM 316	AGGR (TY-PB GR-4)	SY	14637
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14637
0351 6003	FLEXIBLE PAVEMENT STRUCTURE REPAIR(7")	SY	3000
0354 6045	PLANE ASPH CONC PAV (2")	SY	14637
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	21
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	498
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	498
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	412.5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	412.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 274+00 TO
℄ US90 STA 286+00

SHEET 12 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	138
CONT.	SECT.	JOB	
0024	08	141	

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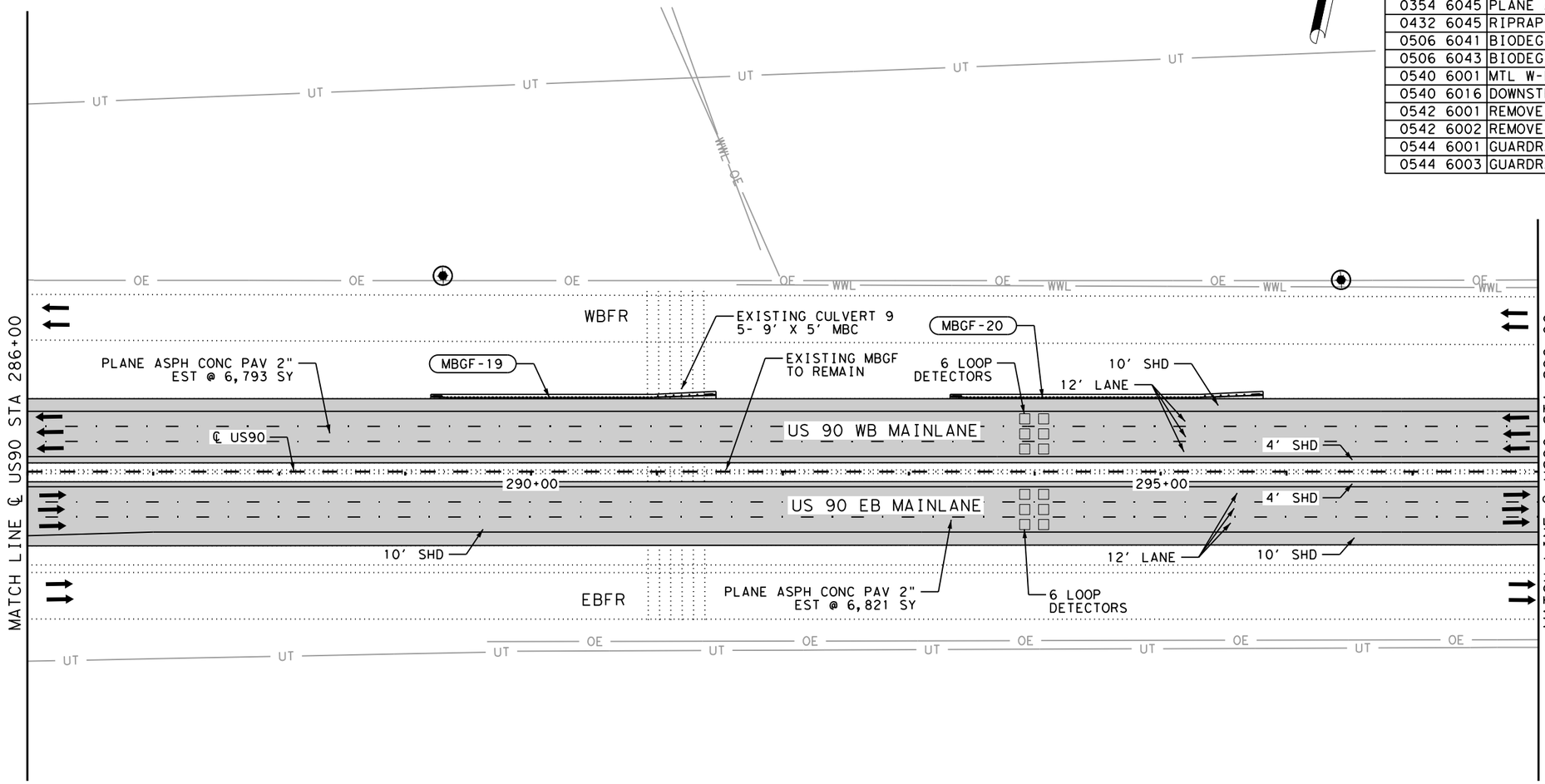
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	8
0162 6002	BLOCK SODDING	SY	168
0168 6001	VEGETATIVE WATERING	MG	2.7
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13614
ITEM 316	AGGR (TY-PB GR-4)	SY	13614
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13614
0354 6045	PLANE ASPH CONC PAV (2")	SY	13614
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	23
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	503
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	503
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	353
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	315.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	3
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 286+00 TO
℄ US90 STA 298+00

SHEET 13 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	139
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\khi\dms33968\US90_141_RDWY_11.dgn
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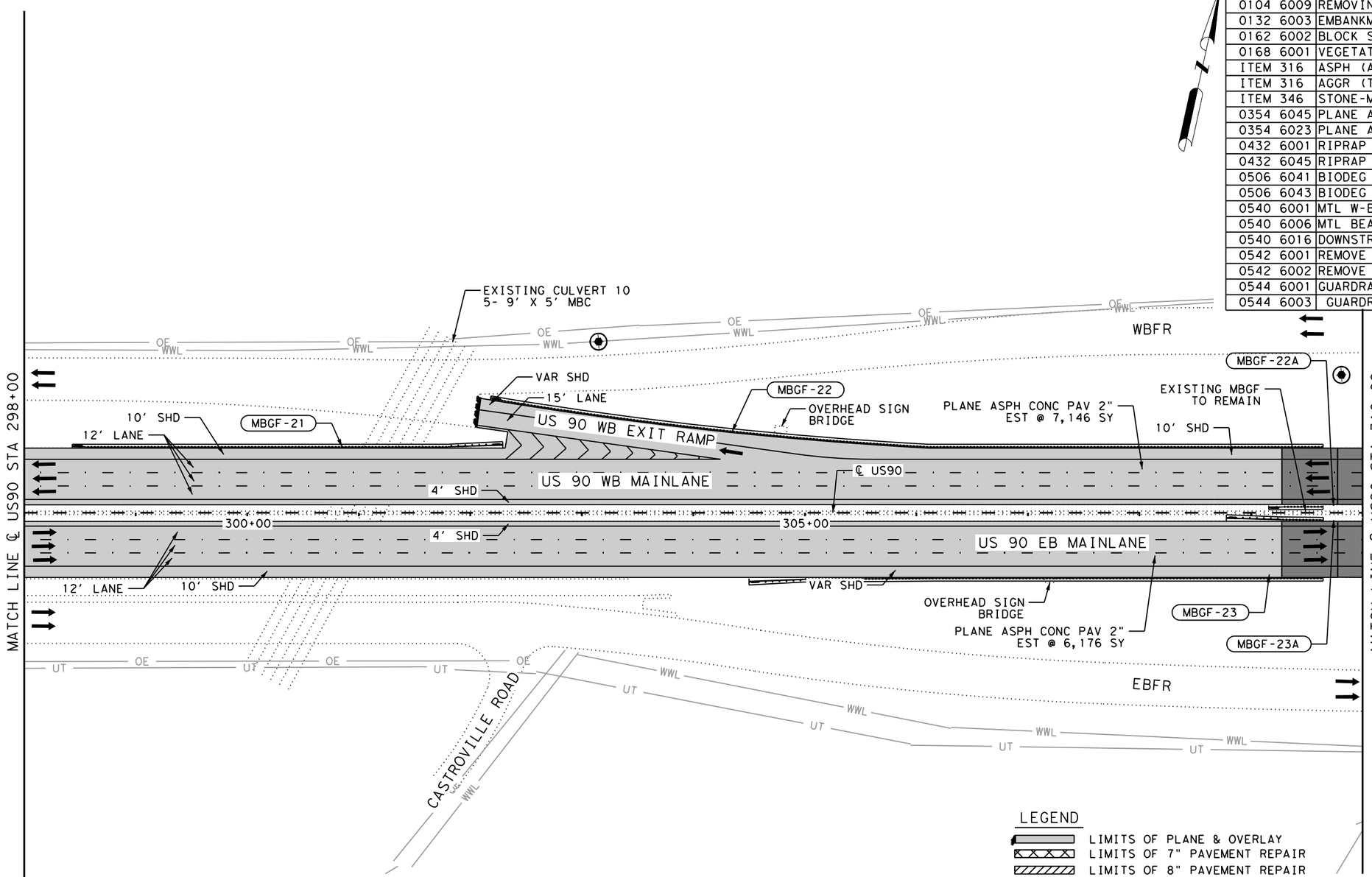
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	167
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	56
0162 6002	BLOCK SODDING	SY	572
0168 6001	VEGETATIVE WATERING	MG	9
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14133
ITEM 316	AGGR (TY-PB GR-4)	SY	14133
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14133
0354 6045	PLANE ASPH CONC PAV (2")	SY	13322
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	811
0432 6001	RIPRAP (CONC)(4 IN)	SY	17
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	74
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1715
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1715
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1525
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1525
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 298+00 TO
℄ US90 STA 310+00

SHEET 14 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	140
CONT.	SECT.	JOB	
0024	08	141	

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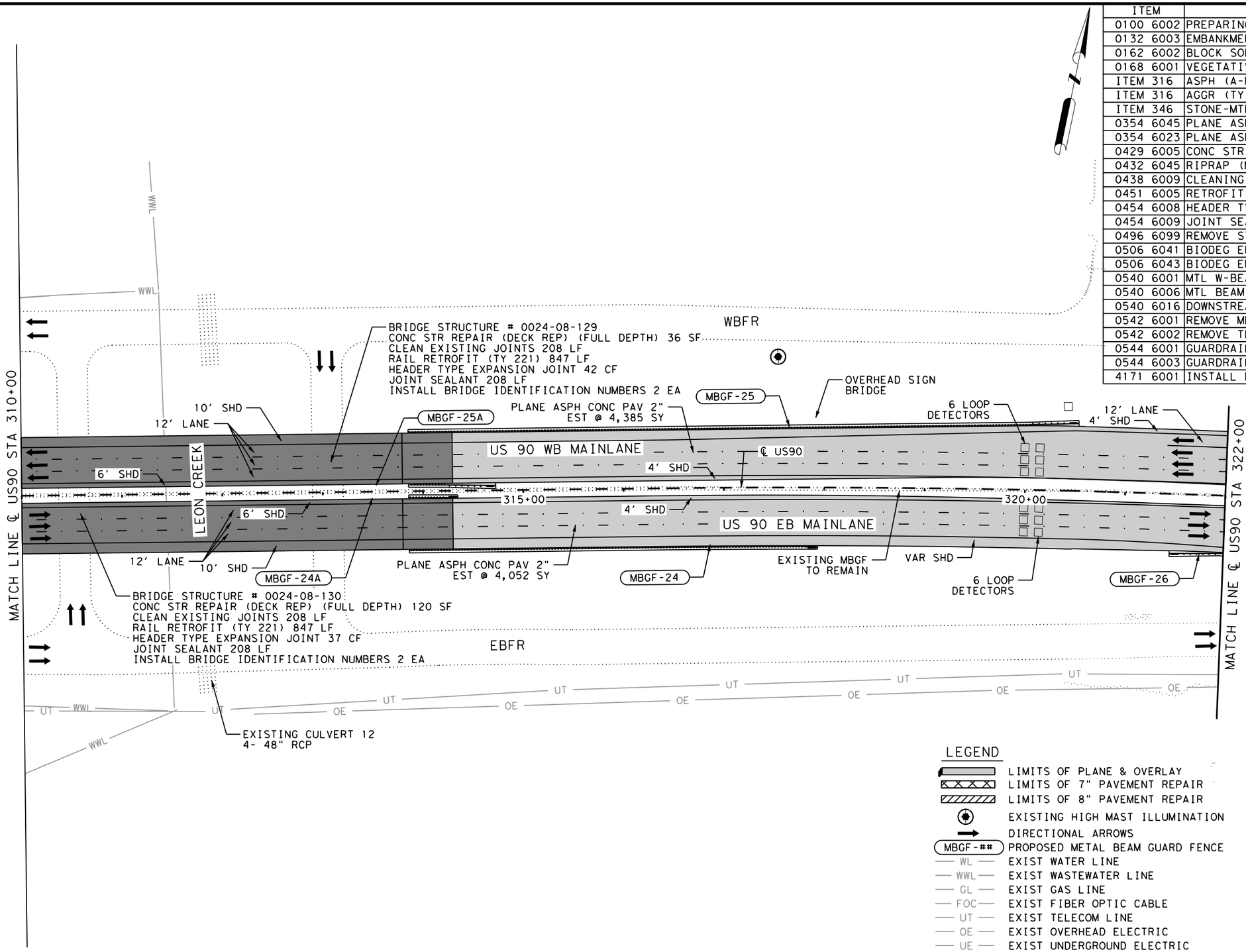
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	21
0162 6002	BLOCK SODDING	SY	395
0168 6001	VEGETATIVE WATERING	MG	6.2
ITEM 316	ASPH (A-R TYPE II OR III)	SY	13259
ITEM 316	AGGR (TY-PB GR-4)	SY	13259
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	13259
0354 6045	PLANE ASPH CONC PAV (2")	SY	8437
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	4822
0429 6005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SY	156
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	51
0438 6009	CLEANING EXISTING JOINTS	LF	416
0451 6005	RETROFIT RAIL (TY T221)	LF	1694
0454 6008	HEADER TYPE EXPANSION JOINT	CF	79
0454 6009	JOINT SEALANT	LF	416
0496 6099	REMOVE STR (RAIL)	LF	1694
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1185
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1185
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1005
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1005
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 310+00 TO
℄ US90 STA 322+00

SHEET 15 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	141
CONT.	SECT.	JOB	
0024	08	141	

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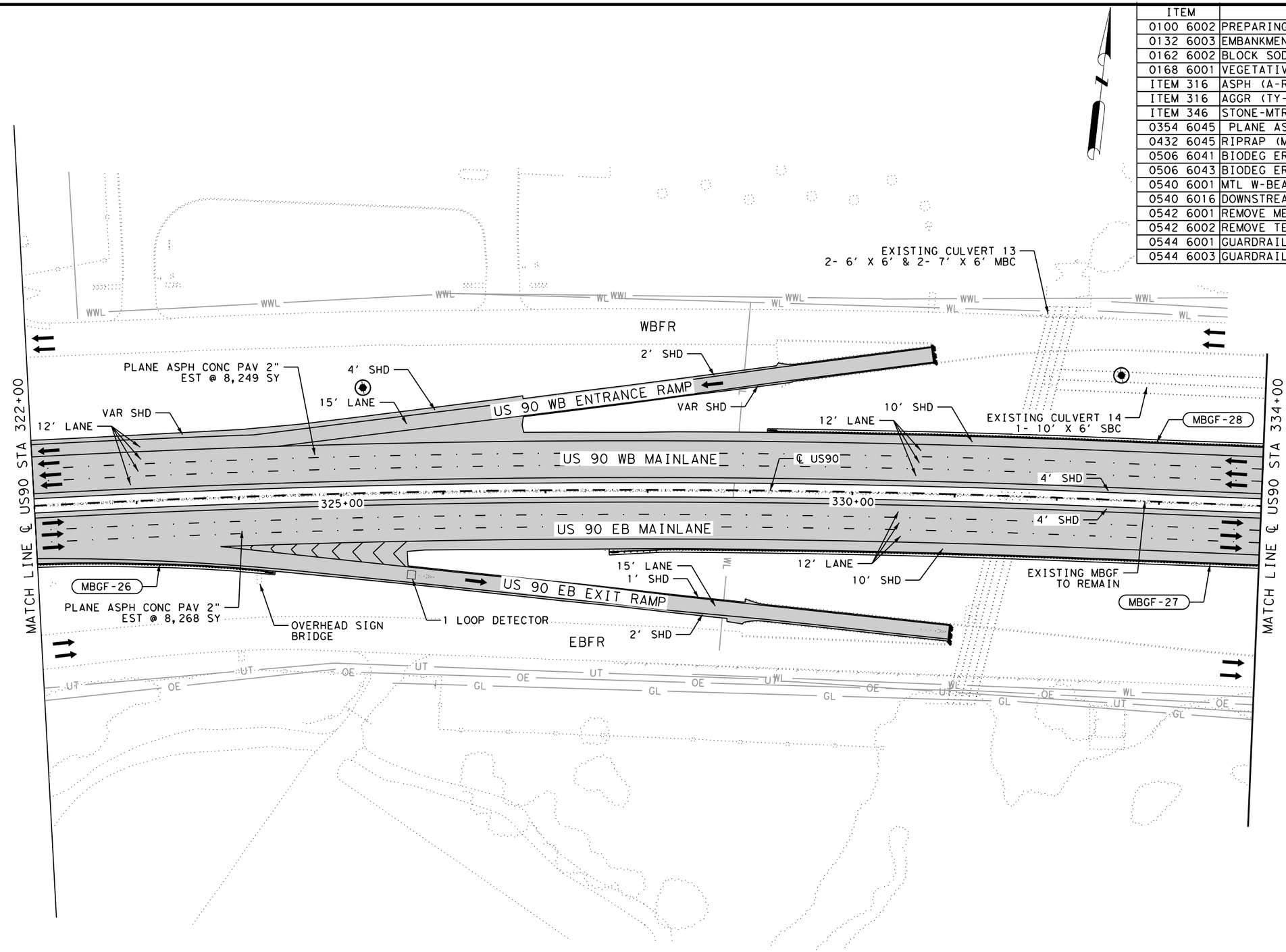
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	25
0162 6002	BLOCK SODDING	SY	459
0168 6001	VEGETATIVE WATERING	MG	7.2
ITEM 316	ASPH (A-R TYPE II OR III)	SY	16517
ITEM 316	AGGR (TY-PB GR-4)	SY	16517
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	16517
0354 6045	PLANE ASPH CONC PAV (2")	SY	16517
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	61
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1376
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1376
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1280
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1197
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 322+00 TO
℄ US90 STA 334+00

SHEET 16 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	142
CONT.	SECT.	JOB	
0024	08	141	

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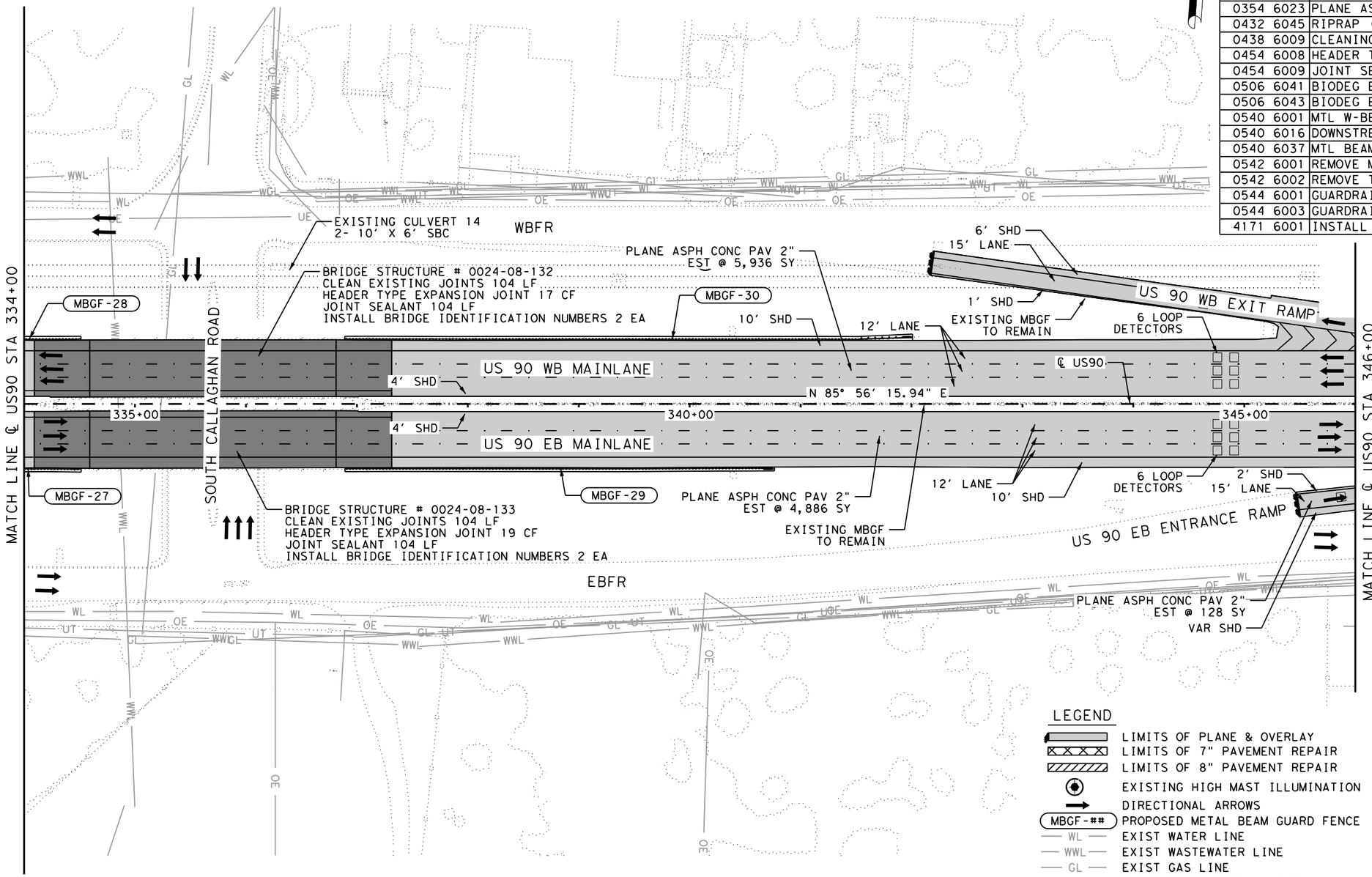
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	18
0162 6002	BLOCK SODDING	SY	356
0168 6001	VEGETATIVE WATERING	MG	5.6
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14614
ITEM 316	AGGR (TY-PB GR-4)	SY	14614
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14614
0354 6045	PLANE ASPH CONC PAV (2")	SY	10950
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	3664
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	50
0438 6009	CLEANING EXISTING JOINTS	LF	208
0454 6008	HEADER TYPE EXPANSION JOINT	CF	36
0454 6009	JOINT SEALANT	LF	208
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1066
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1066
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	940.4
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0540 6037	MTL BEAM GD FEN TRANS (ANCHOR PLATE)	SY	4
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	940.4
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 334+00 TO
℄ US90 STA 346+00

SHEET 17 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	143
CONT.	SECT.	JOB	
0024	08	141	

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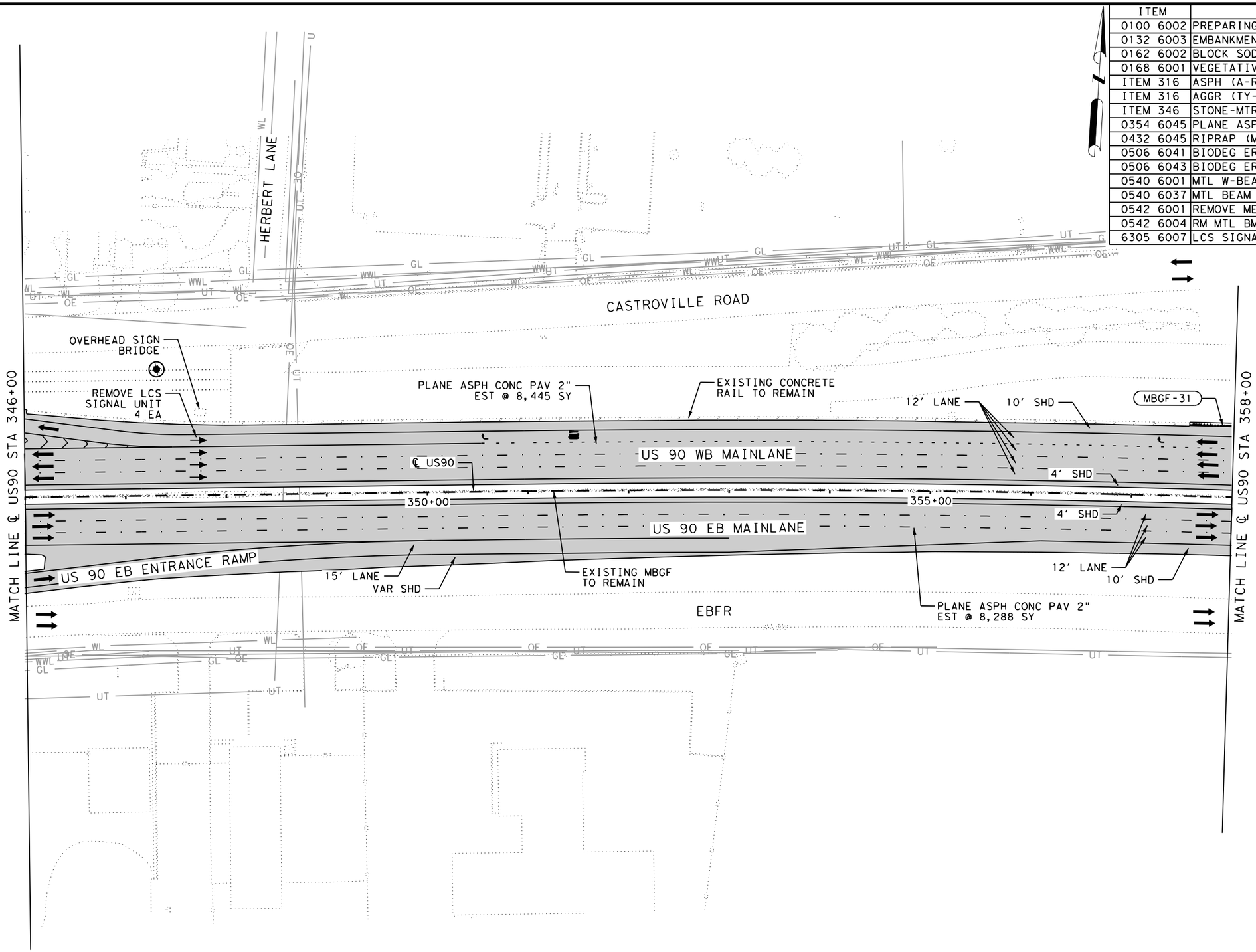
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	1
0162 6002	BLOCK SODDING	SY	18
0168 6001	VEGETATIVE WATERING	MG	0.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	16733
ITEM 316	AGGR (TY-PB GR-4)	SY	16733
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	16733
0354 6045	PLANE ASPH CONC PAV (2")	SY	16733
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	2
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	54
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	54
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	23.3
0540 6037	MTL BEAM GD FEN TRANS (ANCHOR PLATE)	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	23.3
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
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- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 346+00 TO
℄ US90 STA 358+00

SHEET 18 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	144
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\khi\dms33968\US90_141_RDWY_16.dgn
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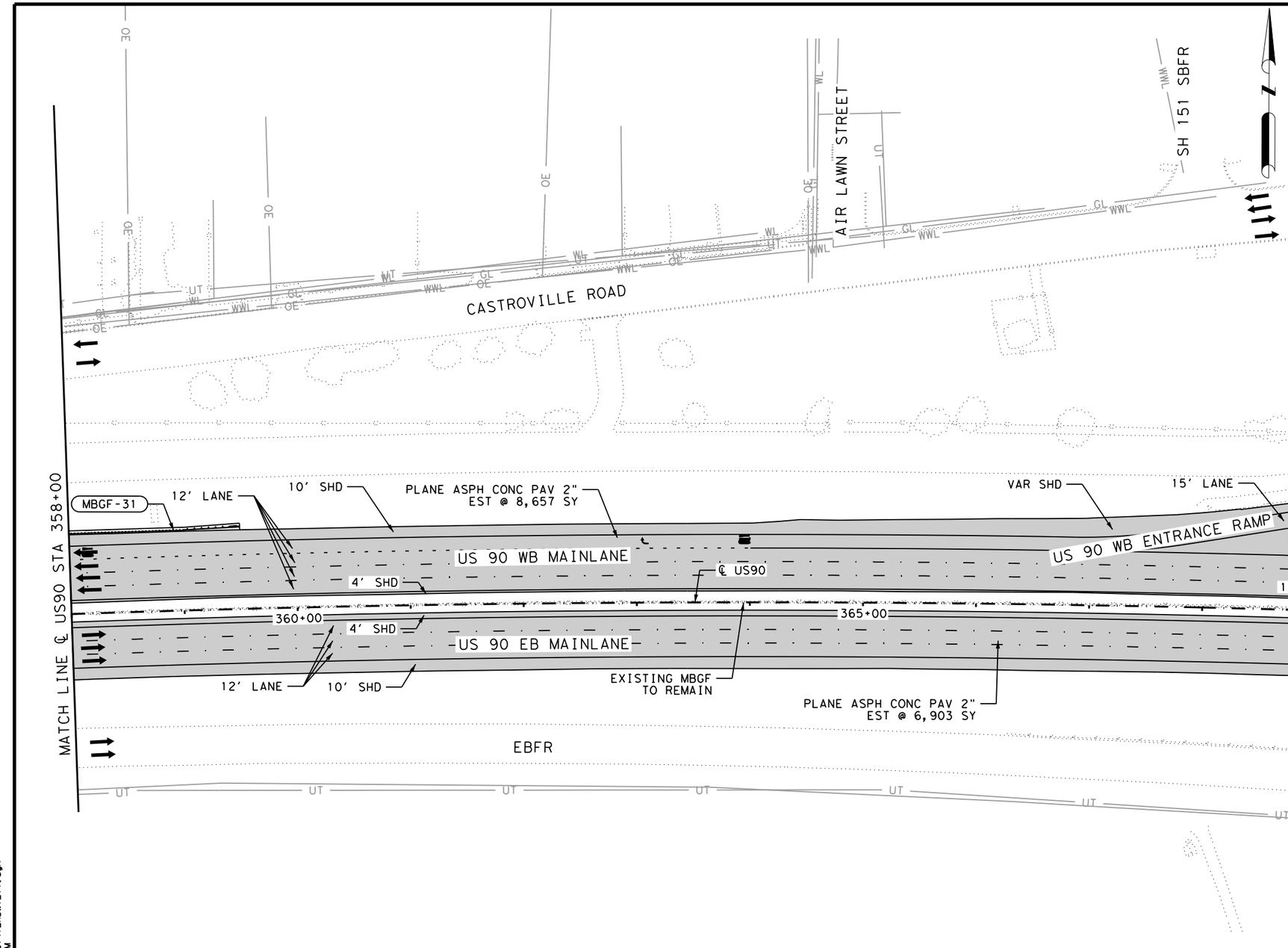
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	2
0162 6002	BLOCK SODDING	SY	59
0168 6001	VEGETATIVE WATERING	MG	1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	15560
ITEM 316	AGGR (TY-PB GR-4)	SY	15560
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	15560
0354 6045	PLANE ASPH CONC PAV (2")	SY	15560
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	8
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	177
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	177
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	101.7
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	26.7
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 358+00 TO
℄ US90 STA 370+00

SHEET 19 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	145
0024	08	141	

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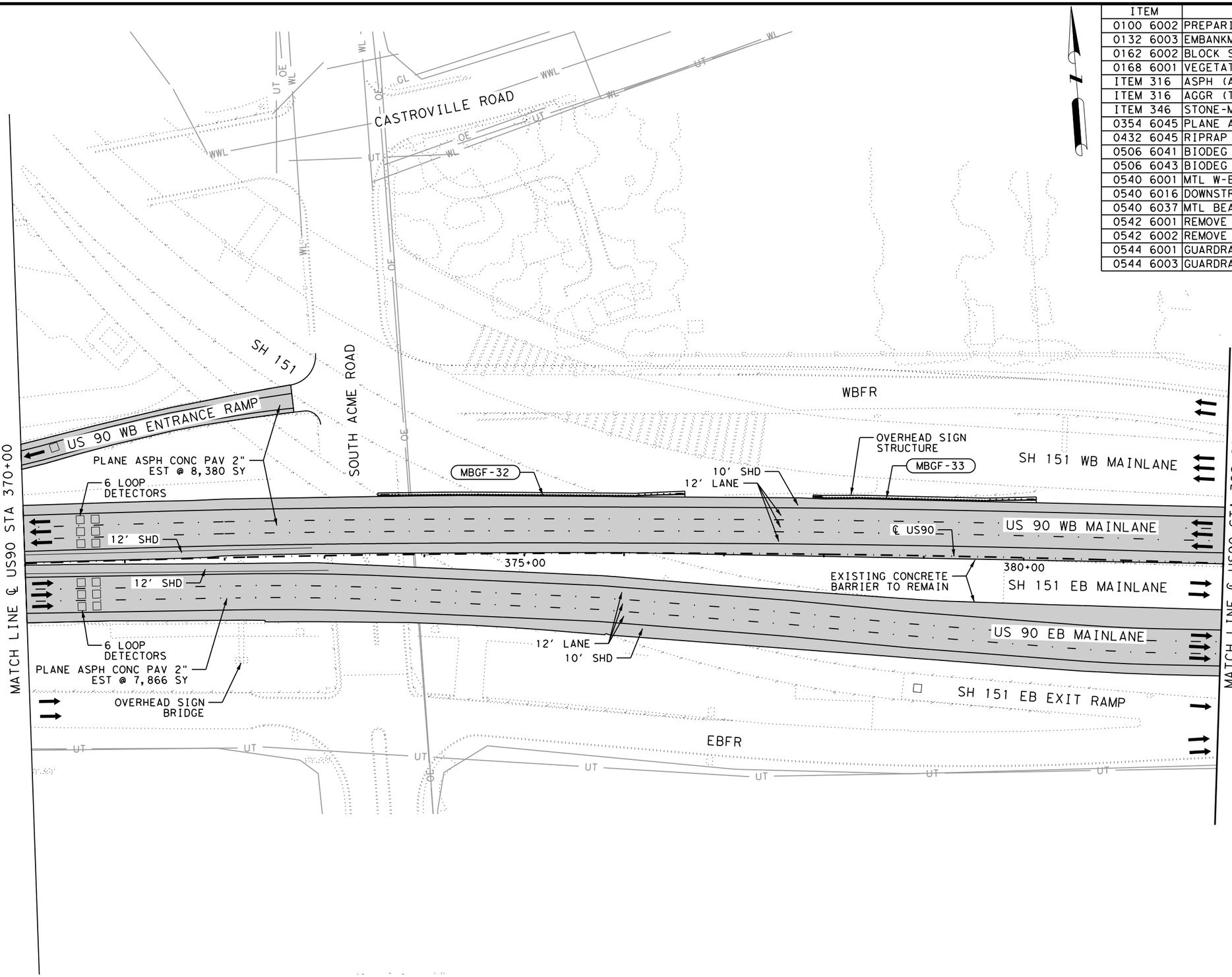
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	9
0162 6002	BLOCK SODDING	SY	187
0168 6001	VEGETATIVE WATERING	MG	3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	16246
ITEM 316	AGGR (TY-PB GR-4)	SY	16246
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	16246
0354 6045	PLANE ASPH CONC PAV (2")	SY	16246
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	26
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	560
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	560
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	400
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0540 6037	MTL BEAM GD FEN TRANS (ANCHOR PLATE)	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	400
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	3
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 370+00 TO
℄ US90 STA 382+00

SHEET 20 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	146
CONT.	SECT.	JOB	
0024	08	141	

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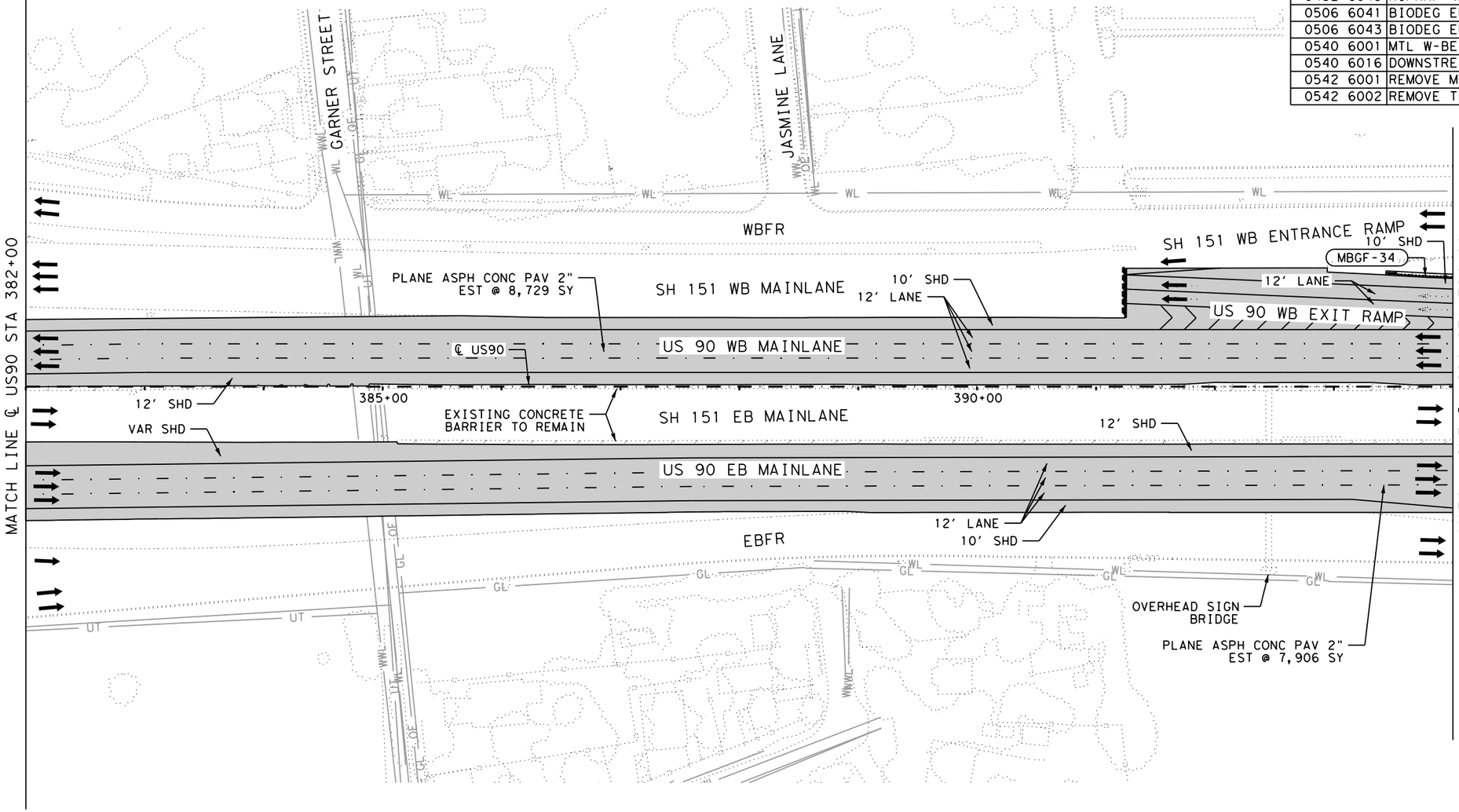
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	63
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	10
0162 6002	BLOCK SODDING	SY	25
0168 6001	VEGETATIVE WATERING	MG	0.4
ITEM 316	ASPH (A-R TYPE II OR III)	SY	16636
ITEM 316	AGGR (TY-PB GR-4)	SY	16636
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	16636
0354 6045	PLANE ASPH CONC PAV (2")	SY	16636
0432 6001	RIPRAP (CONC)(4 IN)	SY	7
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	3
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	75
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	75
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	44.7
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	44.7
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 382+00 TO
℄ US90 STA 394+00

SHEET 21 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	147
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\kh1\dms33968\US90_141_RDWY_19.dgn
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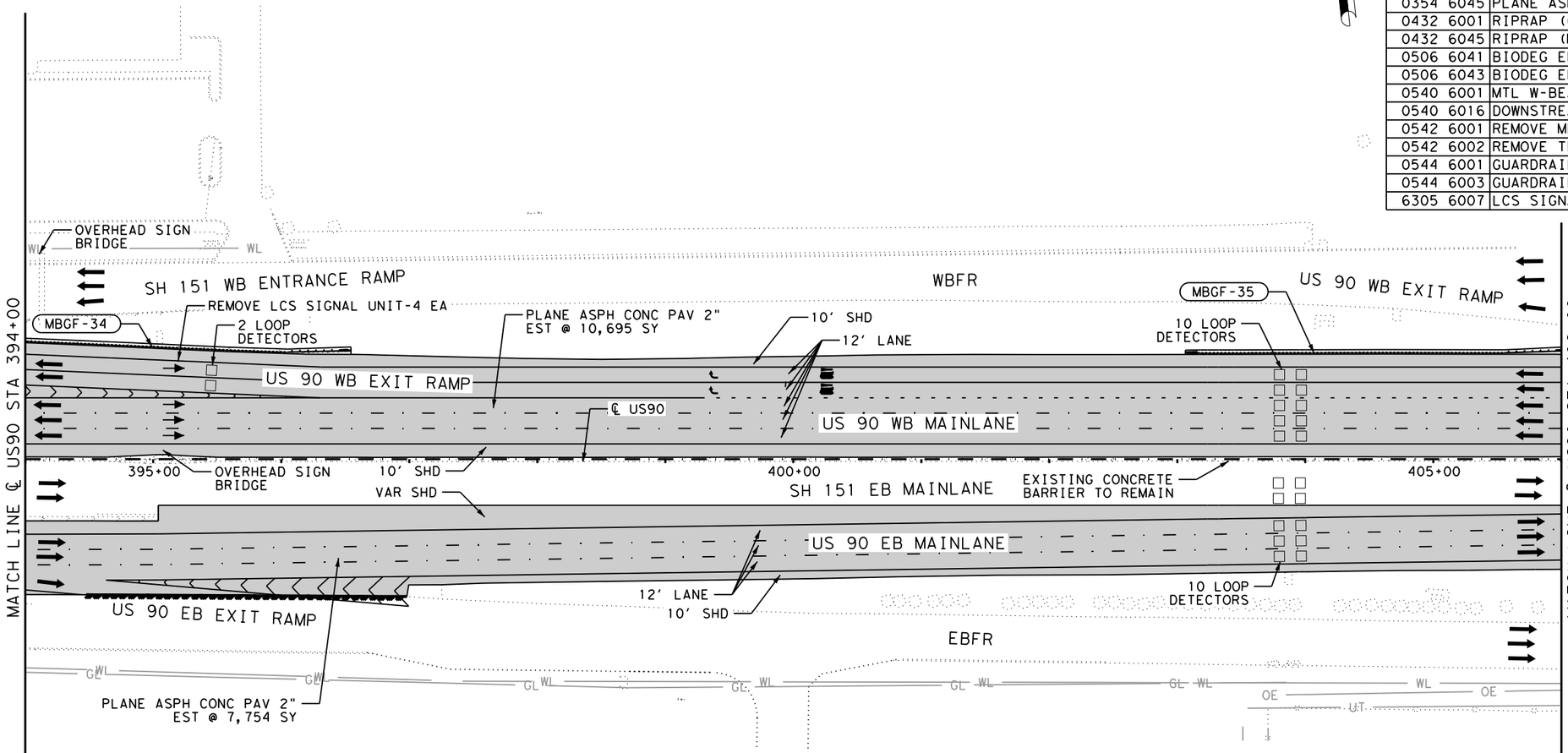
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	245
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	27
0162 6002	BLOCK SODDING	SY	195
0168 6001	VEGETATIVE WATERING	MG	3.1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	18449
ITEM 316	AGGR (TY-PB GR-4)	SY	18449
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	18449
0354 6045	PLANE ASPH CONC PAV (2")	SY	18449
0432 6001	RIPRAP (CONC)(4 IN)	SY	27
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	26
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	583
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	583
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	442.8
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	442.8
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	4



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10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 394+00 TO
℄ US90 STA 406+00

SHEET 22 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	148
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\kh1\dms33968\US90_141_RDWY_20.dgn
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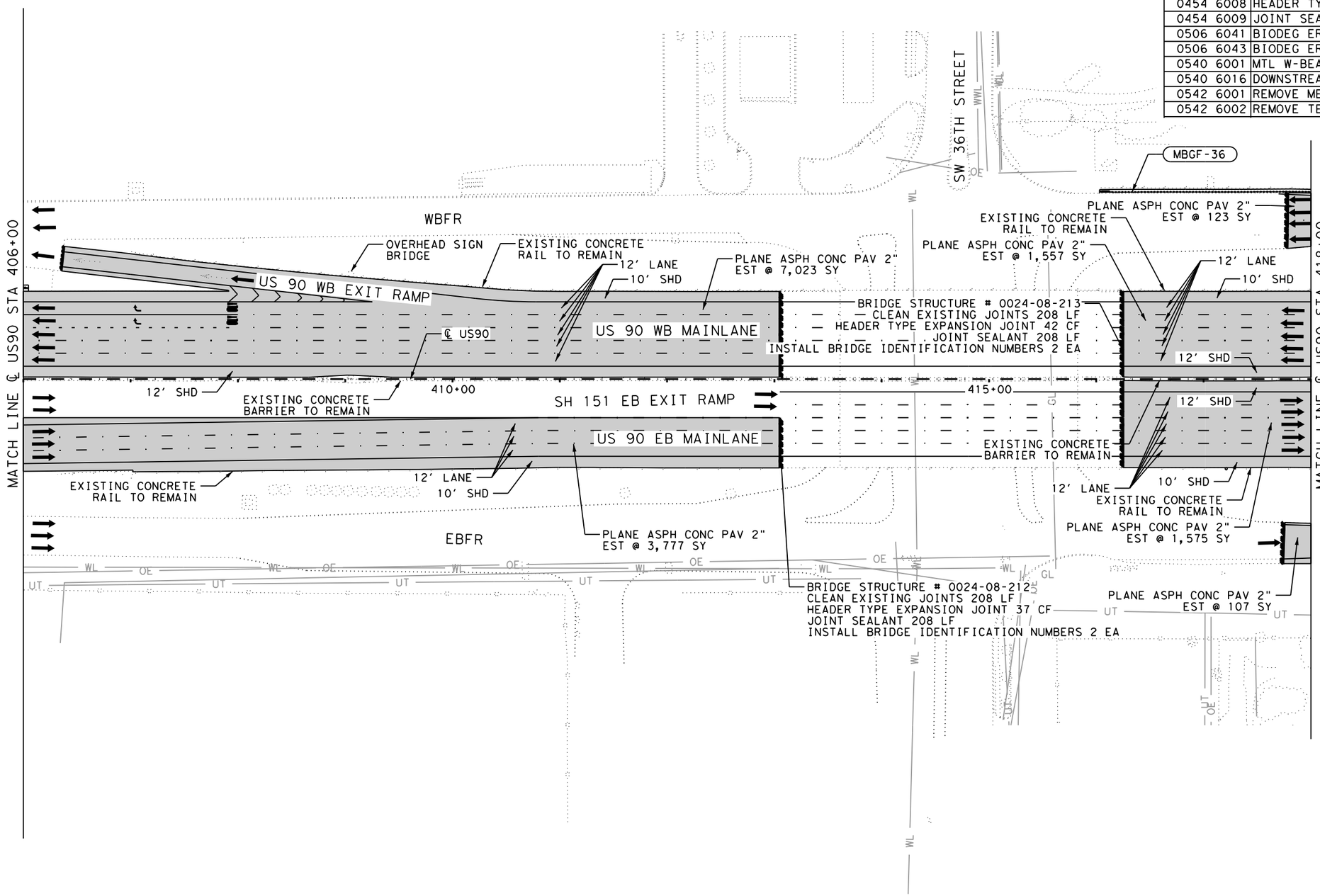
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	4
0162 6002	BLOCK SODDING	SY	72
0168 6001	VEGETATIVE WATERING	MG	1.2
ITEM 316	ASPH (A-R TYPE II OR III)	SY	14162
ITEM 316	AGGR (TY-PB GR-4)	SY	14162
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	14162
0354 6045	PLANE ASPH CONC PAV (2")	SY	14162
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	9
0438 6009	CLEANING EXISTING JOINTS	SY	416
0454 6008	HEADER TYPE EXPANSION JOINT	CF	79
0454 6009	JOINT SEALANT	LF	416
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	216
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	216
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	185.3
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	185.3
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/29/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 406+00 TO
℄ US90 STA 418+00

SHEET 23 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	149
CONT.	SECT.	JOB	
0024	08	141	

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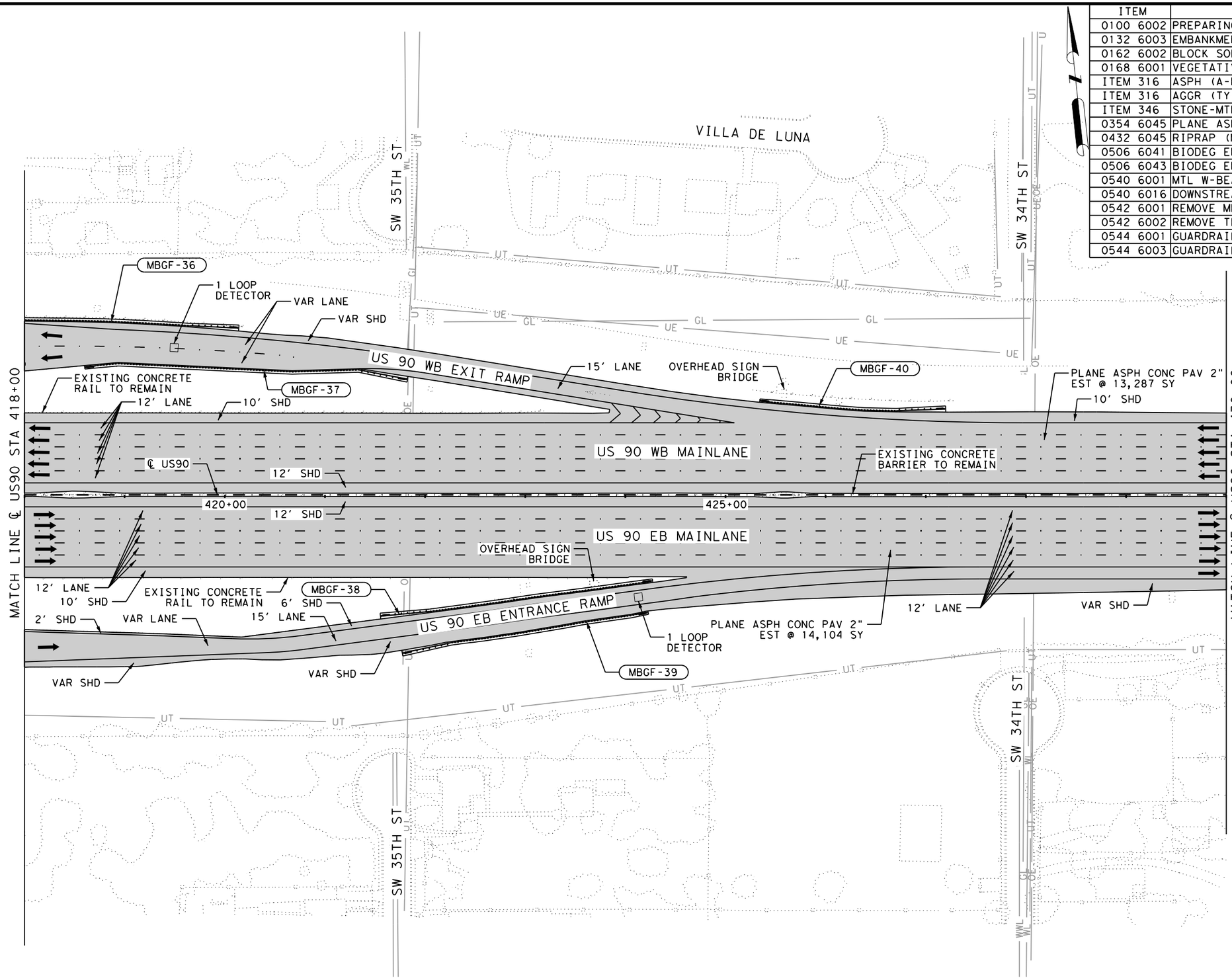
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	20
0162 6002	BLOCK SODDING	SY	430
0168 6001	VEGETATIVE WATERING	MG	6.8
ITEM 316	ASPH (A-R TYPE II OR III)	SY	27391
ITEM 316	AGGR (TY-PB GR-4)	SY	27391
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	27391
0354 6045	PLANE ASPH CONC PAV (2")	SY	27391
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	59
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1288
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1288
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	952.2
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	4
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	802.2
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	4
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	5
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	5



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 418+00 TO
℄ US90 STA 430+00

SHEET 24 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	150
CONT.	SECT.	JOB	
0024	08	141	

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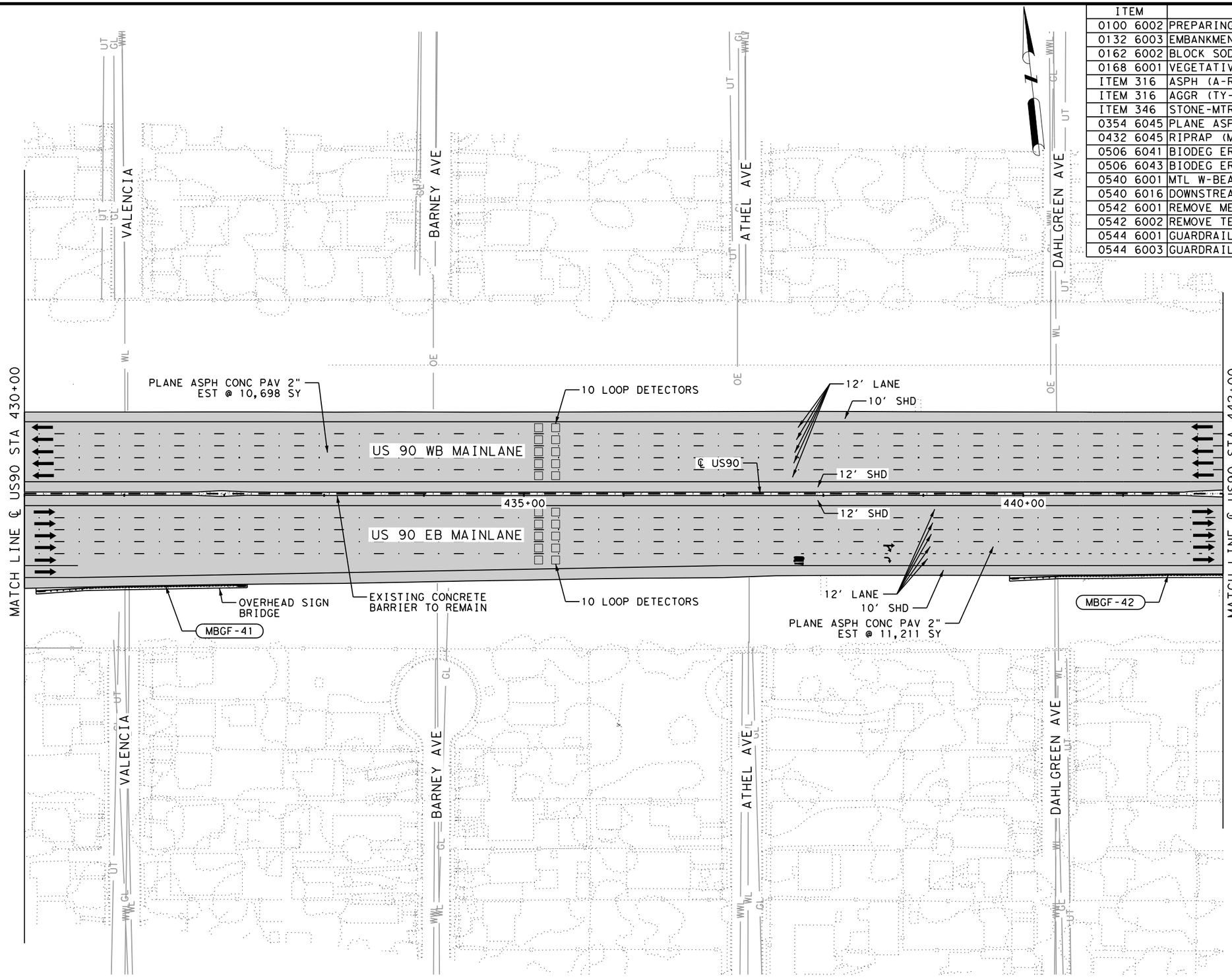
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	7
0162 6002	BLOCK SODDING	SY	152
0168 6001	VEGETATIVE WATERING	MG	2.4
ITEM 316	ASPH (A-R TYPE II OR III)	SY	21909
ITEM 316	AGGR (TY-PB GR-4)	SY	21909
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	21909
0354 6045	PLANE ASPH CONC PAV (2")	SY	21909
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	20
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	455
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	455
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	314.3
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	314.3
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 430+00 TO
℄ US90 STA 442+00

SHEET 25 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	151
CONT.	SECT.	JOB	
0024	08	141	

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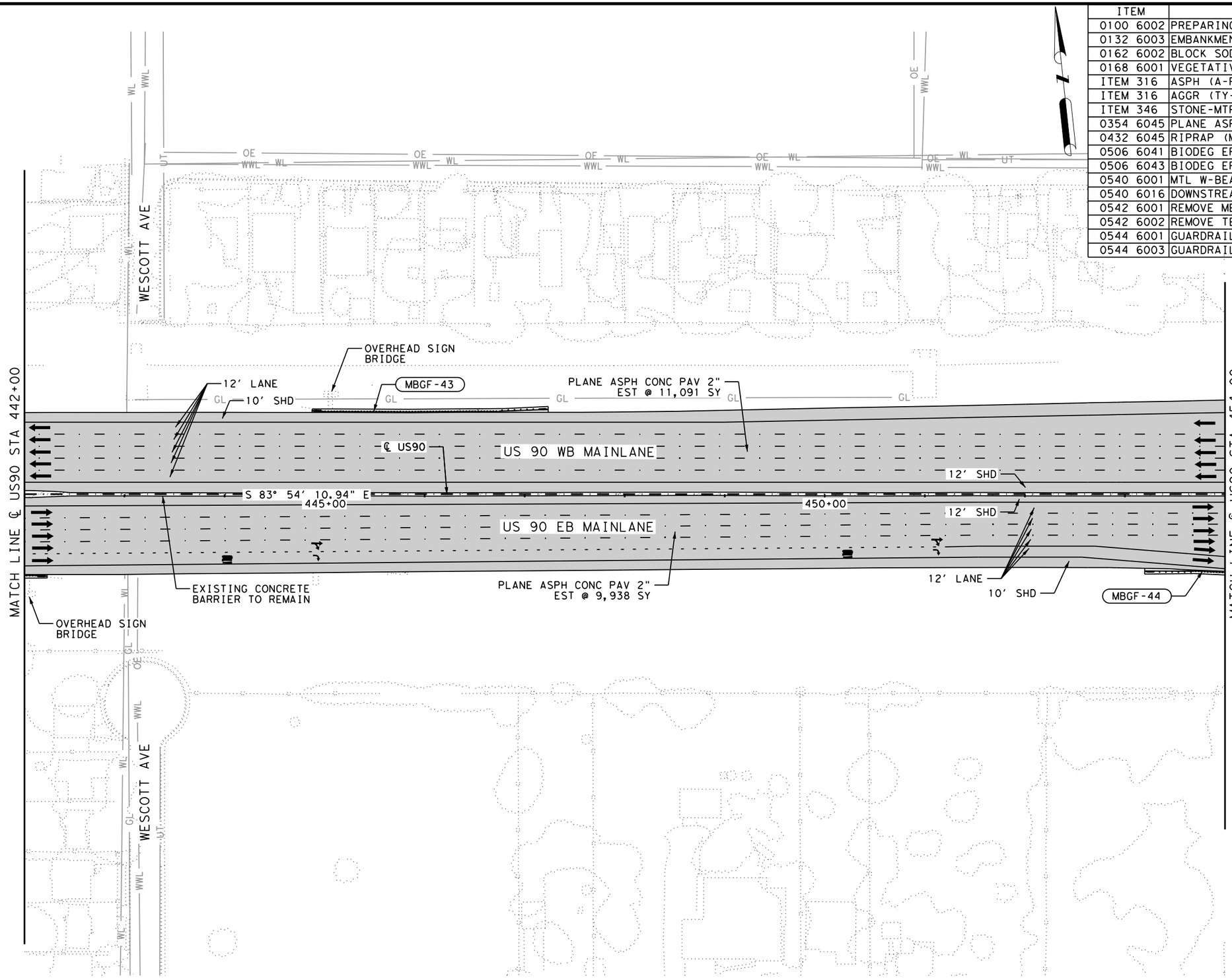
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	6
0162 6002	BLOCK SODDING	SY	141
0168 6001	VEGETATIVE WATERING	MG	2.2
ITEM 316	ASPH (A-R TYPE II OR III)	SY	21029
ITEM 316	AGGR (TY-PB GR-4)	SY	21029
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	21029
0354 6045	PLANE ASPH CONC PAV (2")	SY	21029
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	17
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	422
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	422
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	216.5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	166.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
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- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 442+00 TO
℄ US90 STA 454+00

SHEET 26 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	152
CONT.	SECT.	JOB	
0024	08	141	

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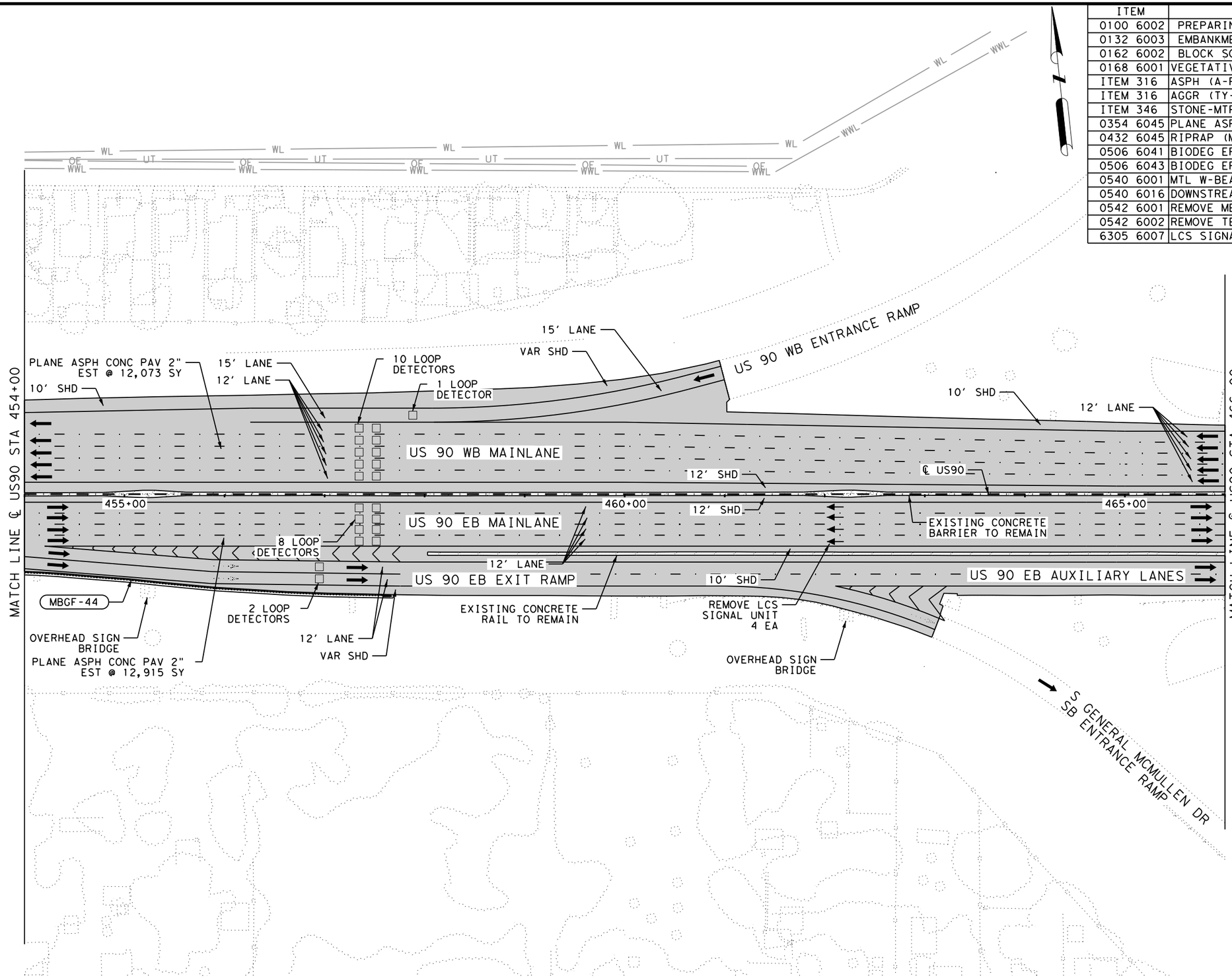
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	7
0162 6002	BLOCK SODDING	SY	129
0168 6001	VEGETATIVE WATERING	MG	2.1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	24988
ITEM 316	AGGR (TY-PB GR-4)	SY	24988
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	24988
0354 6045	PLANE ASPH CONC PAV (2")	SY	24988
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	16
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	387
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	387
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	356.7
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	356.7
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TROY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 454+00 TO
℄ US90 STA 466+00

SHEET 27 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	153
CONT.	SECT.	JOB	
0024	08	141	

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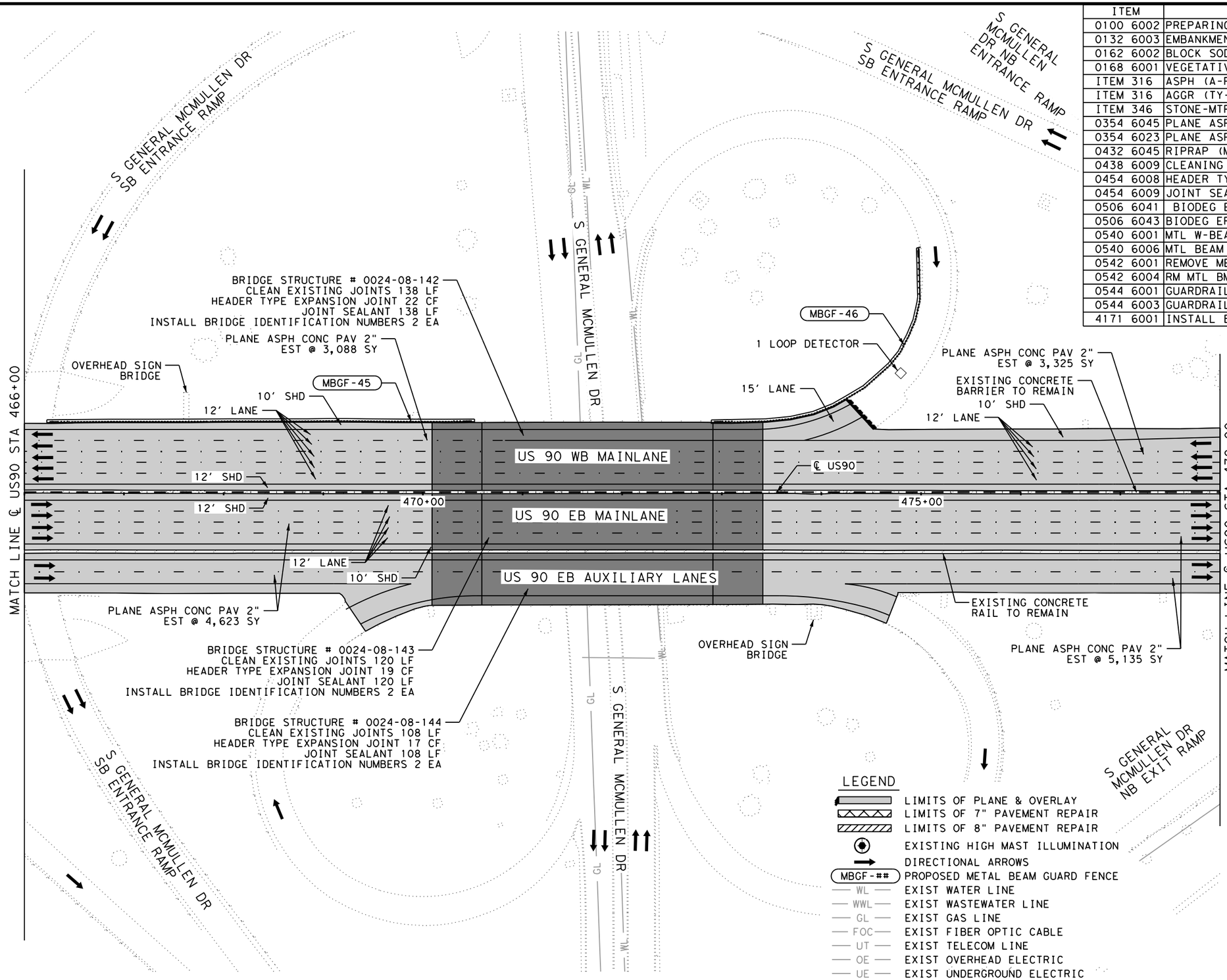
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	13
0162 6002	BLOCK SODDING	SY	258
0168 6001	VEGETATIVE WATERING	MG	4.1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	22798
ITEM 316	AGGR (TY-PB GR-4)	SY	22798
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	22798
0354 6045	PLANE ASPH CONC PAV (2")	SY	16171
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	6627
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	34
0438 6009	CLEANING EXISTING JOINTS	LF	366
0454 6008	HEADER TYPE EXPANSION JOINT	CF	58
0454 6009	JOINT SEALANT	LF	366
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	773
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	773
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	637.5
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	3
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	637.5
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	3
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	6



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10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 466+00 TO
℄ US90 STA 478+00

SHEET 28 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	154
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\kh1\dms33968\US90_141_RDWY_26.dgn
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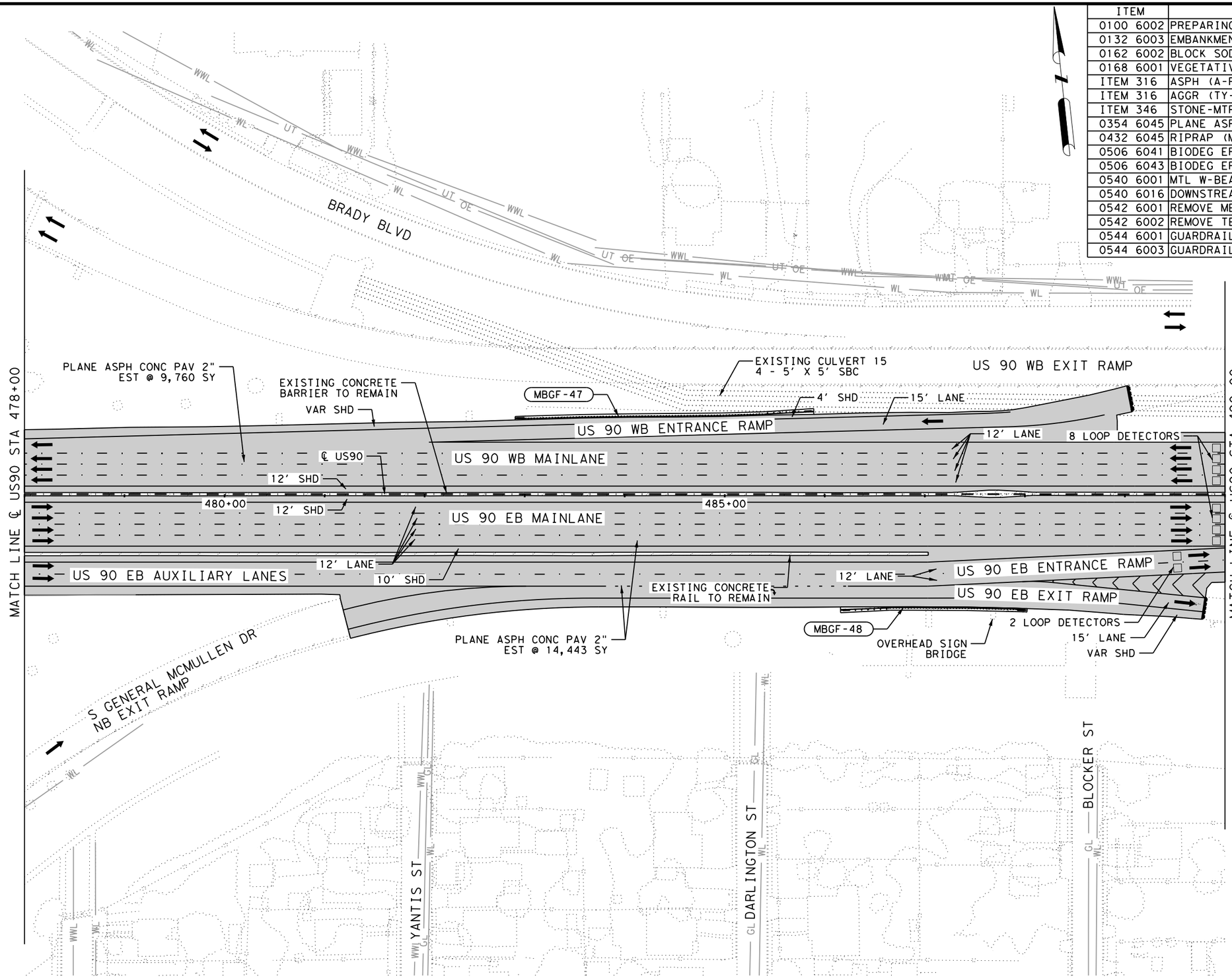
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	8
0162 6002	BLOCK SODDING	SY	171
0168 6001	VEGETATIVE WATERING	MG	2.7
ITEM 316	ASPH (A-R TYPE II OR III)	SY	24203
ITEM 316	AGGR (TY-PB GR-4)	SY	24203
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	24203
0354 6045	PLANE ASPH CONC PAV (2")	SY	24203
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	23
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	513
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	513
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	362.5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	337.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

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10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 478+00 TO
℄ US90 STA 490+00

SHEET 29 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	155
CONT.	SECT.	JOB	
0024	08	141	

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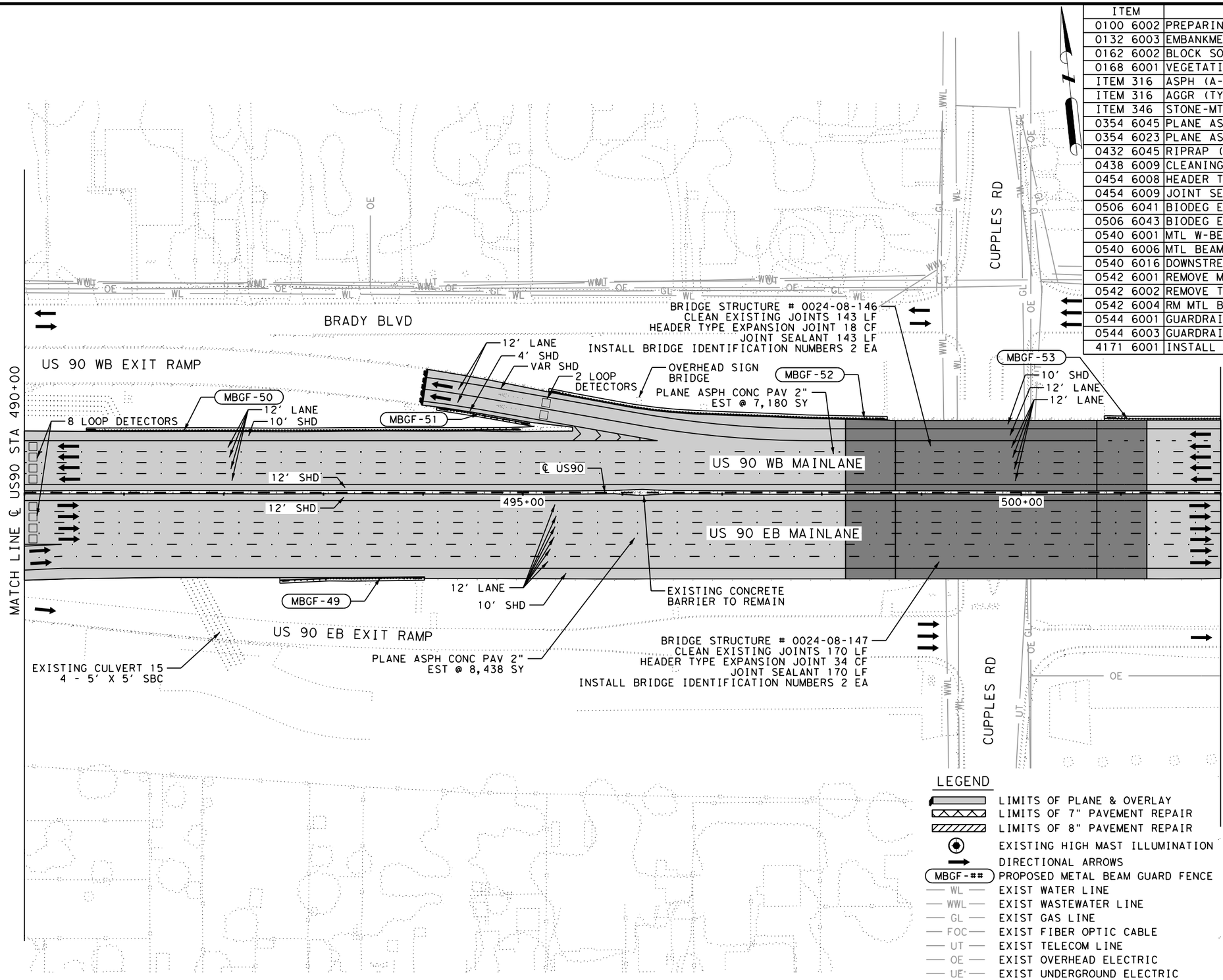
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	19
0162 6002	BLOCK SODDING	SY	406
0168 6001	VEGETATIVE WATERING	MG	6.4
ITEM 316	ASPH (A-R TYPE II OR III)	SY	20844
ITEM 316	AGGR (TY-PB GR-4)	SY	20844
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	20844
0354 6045	PLANE ASPH CONC PAV (2")	SY	15619
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	5525
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	30
0438 6009	CLEANING EXISTING JOINTS	LF	313
0454 6008	HEADER TYPE EXPANSION JOINT	CF	52
0454 6009	JOINT SEALANT	LF	313
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1216
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1216
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	920.7
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	920.7
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	5
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

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Kimley»Horn F-928

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 490+00 TO
℄ US90 STA 502+00

SHEET 30 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	156
CONT.	SECT.	JOB	
0024	08	141	

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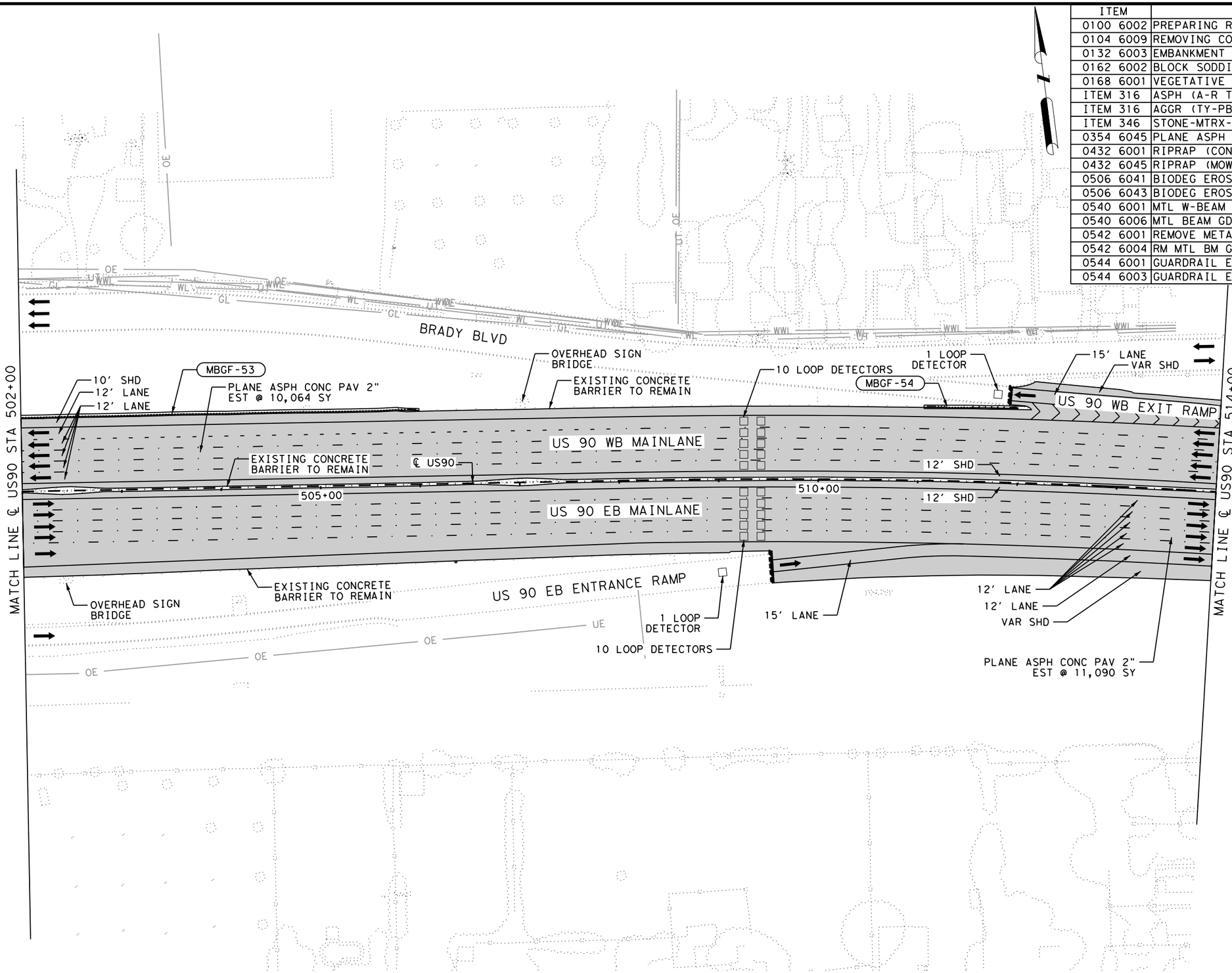
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	138
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	40
0162 6002	BLOCK SODDING	SY	174
0168 6001	VEGETATIVE WATERING	MG	2.8
ITEM 316	ASPH (A-R TYPE II OR III)	SY	21154
ITEM 316	AGGR (TY-PB GR-4)	SY	21154
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	21154
0354 6045	PLANE ASPH CONC PAV (2")	SY	21154
0432 6001	RIPRAP (CONC)(4 IN)	SY	15
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	22
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	520
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	520
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	404.3
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	404.3
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

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10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 502+00 TO
℄ US90 STA 514+00

SHEET 31 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	157
CONT.	SECT.	JOB	
0024	08	141	

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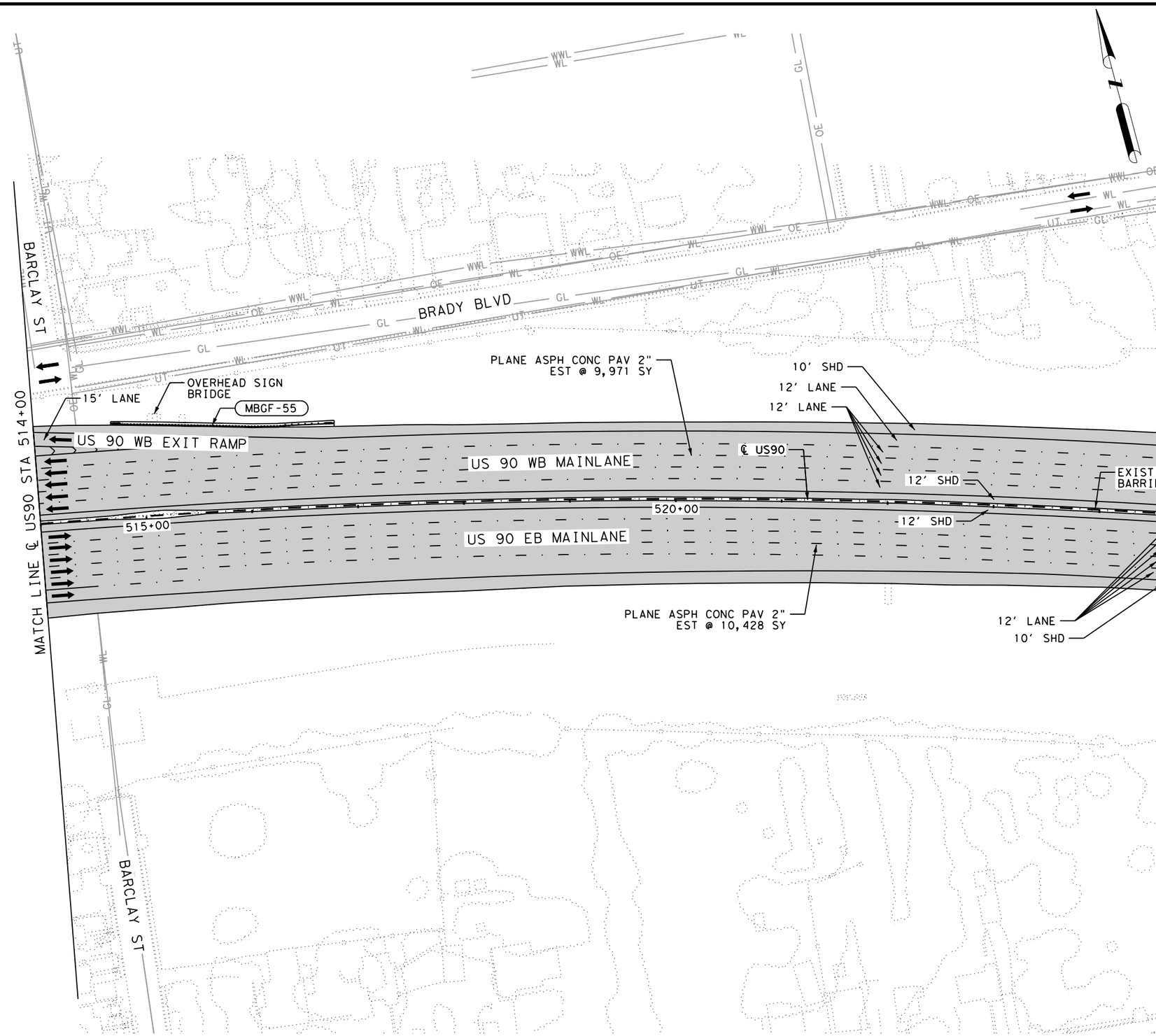
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	3
0162 6002	BLOCK SODDING	SY	97
0168 6001	VEGETATIVE WATERING	MG	1.6
ITEM 316	ASPH (A-R TYPE II OR III)	SY	20399
ITEM 316	AGGR (TY-PB GR-4)	SY	20399
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	20399
0354 6045	PLANE ASPH CONC PAV (2")	SY	20399
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	13
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	290
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	290
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	150
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	150
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

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10/28/2021

STATE OF TEXAS
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 514+00 TO
℄ US90 STA 526+00

SHEET 32 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	158
CONT.	SECT.	JOB	
0024	08	141	

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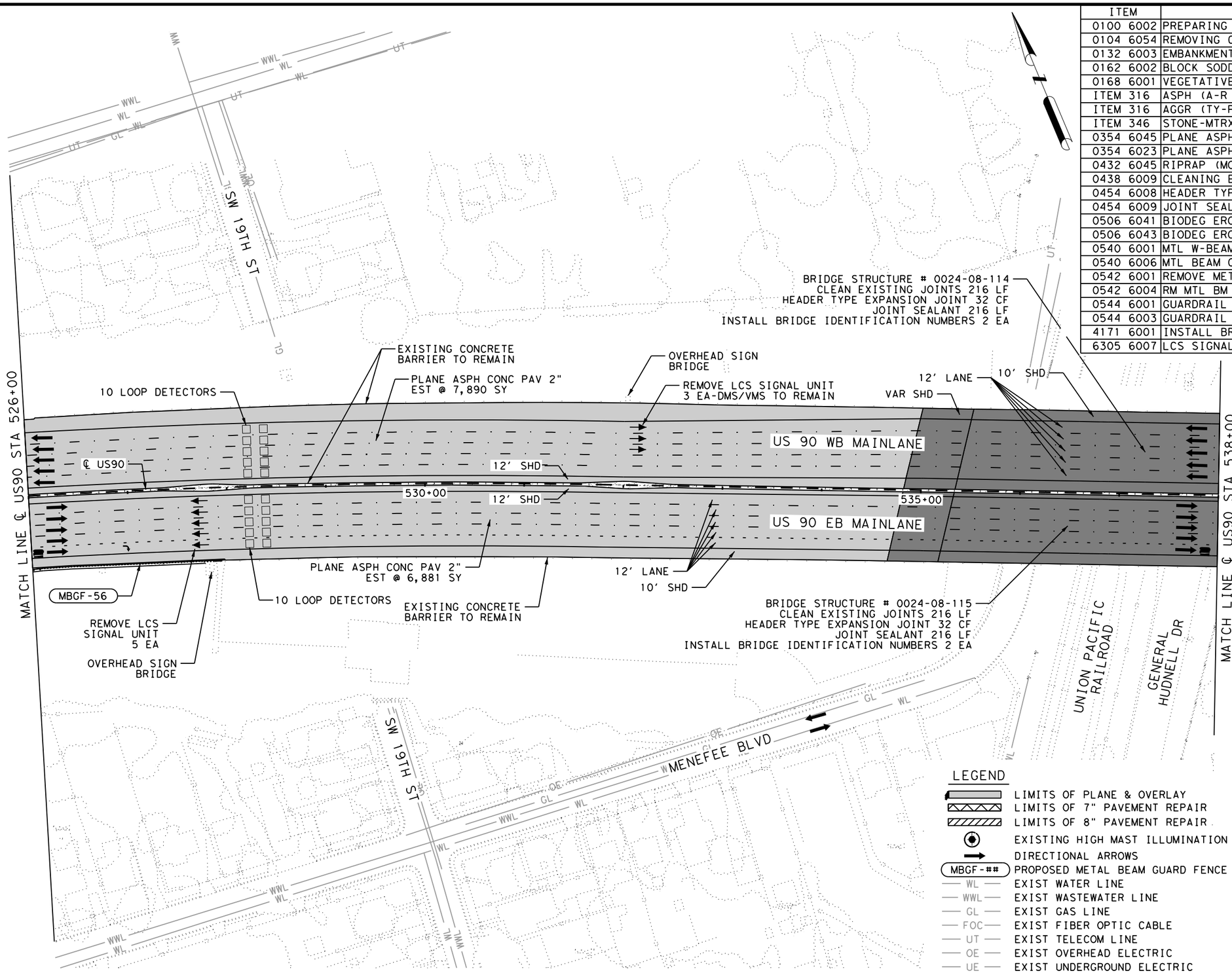
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6054	REMOVING CONCRETE(MOW STRIP)	LF	223
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	4
0162 6002	BLOCK SODDING	SY	86
0168 6001	VEGETATIVE WATERING	MG	1.4
ITEM 316	ASPH (A-R TYPE II OR III)	SY	20088
ITEM 316	AGGR (TY-PB GR-4)	SY	20088
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	20088
0354 6045	PLANE ASPH CONC PAV (2")	SY	14772
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	5316
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	8
0438 6009	CLEANING EXISTING JOINTS	LF	432
0454 6008	HEADER TYPE EXPANSION JOINT	CF	64
0454 6009	JOINT SEALANT	LF	432
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	258
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	258
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	162.5
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	162.5
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	8



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10/28/2021

STATE OF TEXAS
TROY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 526+00 TO
℄ US90 STA 538+00

SHEET 33 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	159
CONT.	SECT.	JOB	
0024	08	141	

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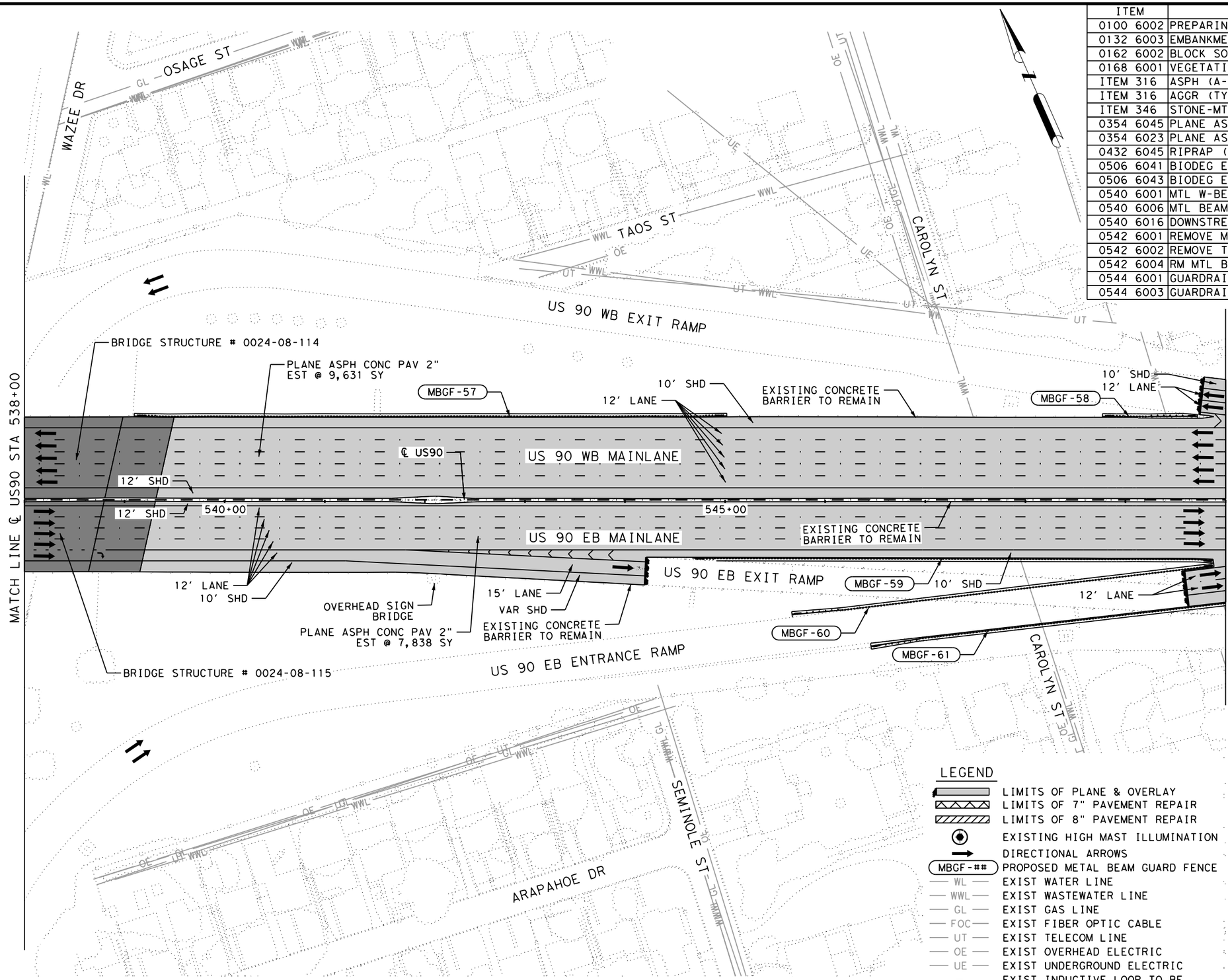
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	35
0162 6002	BLOCK SODDING	SY	673
0168 6001	VEGETATIVE WATERING	MG	10.5
ITEM 316	ASPH (A-R TYPE II OR III)	SY	19695
ITEM 316	AGGR (TY-PB GR-4)	SY	19695
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	19695
0354 6045	PLANE ASPH CONC PAV (2")	SY	17469
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	2226
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	87
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	2018
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2018
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1732.5
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1732.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	4
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3



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10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 538+00 TO
℄ US90 STA 550+00

SHEET 34 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	160
CONT.	SECT.	JOB	
0024	08	141	

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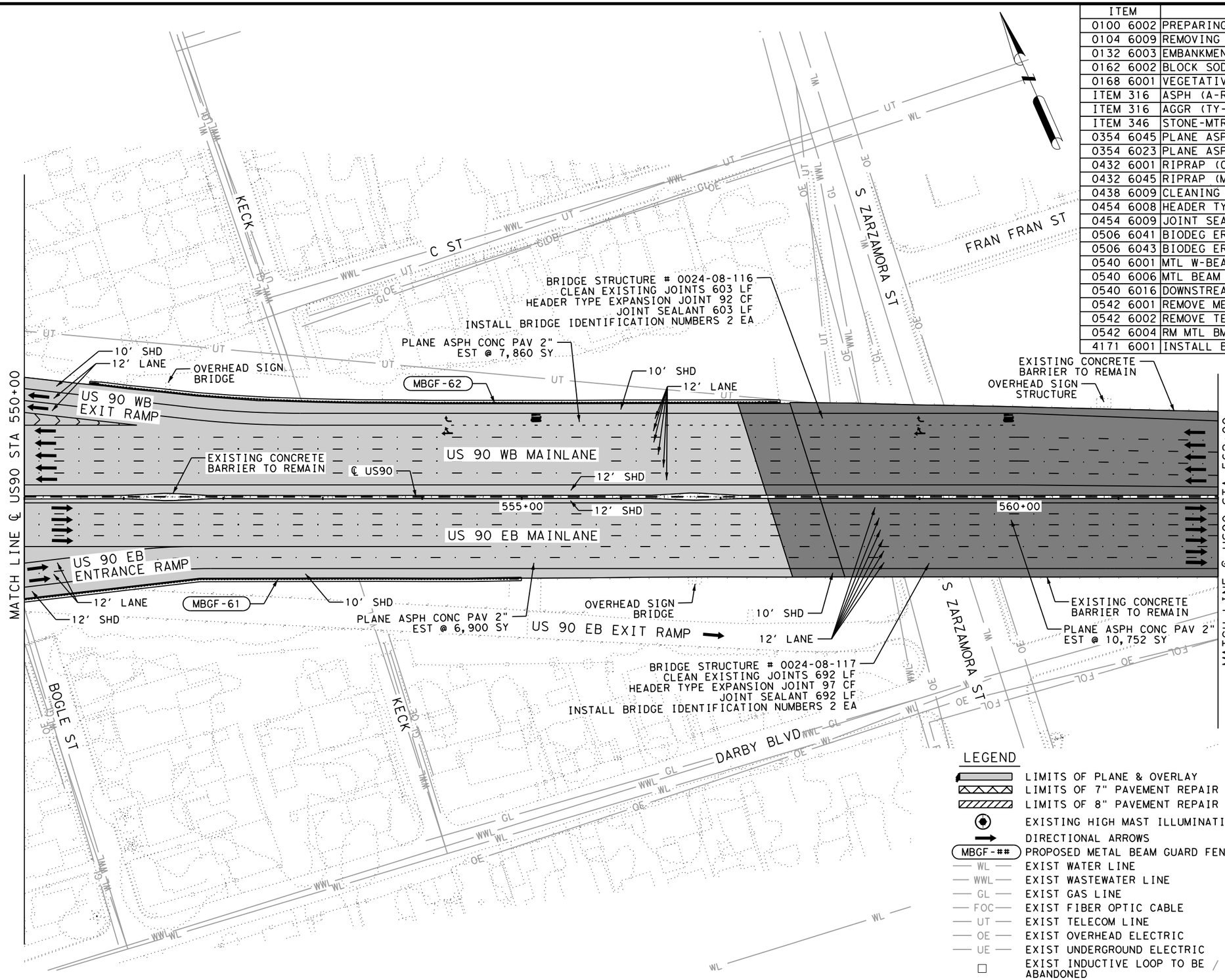
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	281
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	42
0162 6002	BLOCK SODDING	SY	401
0168 6001	VEGETATIVE WATERING	MG	6.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	23255
ITEM 316	AGGR (TY-PB GR-4)	SY	23255
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	23255
0354 6045	PLANE ASPH CONC PAV (2")	SY	14761
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	8494
0432 6001	RIPRAP (CONC)(4 IN)	SY	31
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	52
0438 6009	CLEANING EXISTING JOINTS	LF	1295
0454 6008	HEADER TYPE EXPANSION JOINT	CF	189
0454 6009	JOINT SEALANT	LF	1295
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1203
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1203
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1142.5
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	2
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	1142.5
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE / ABANDONED
- EXIST LCS SIGNAL UNIT

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10/28/2021

STATE OF TEXAS
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106194
PROFESSIONAL ENGINEER

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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 550+00 TO
℄ US90 STA 562+00

SHEET 35 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	161
CONT.	SECT.	JOB	
0024	08	141	

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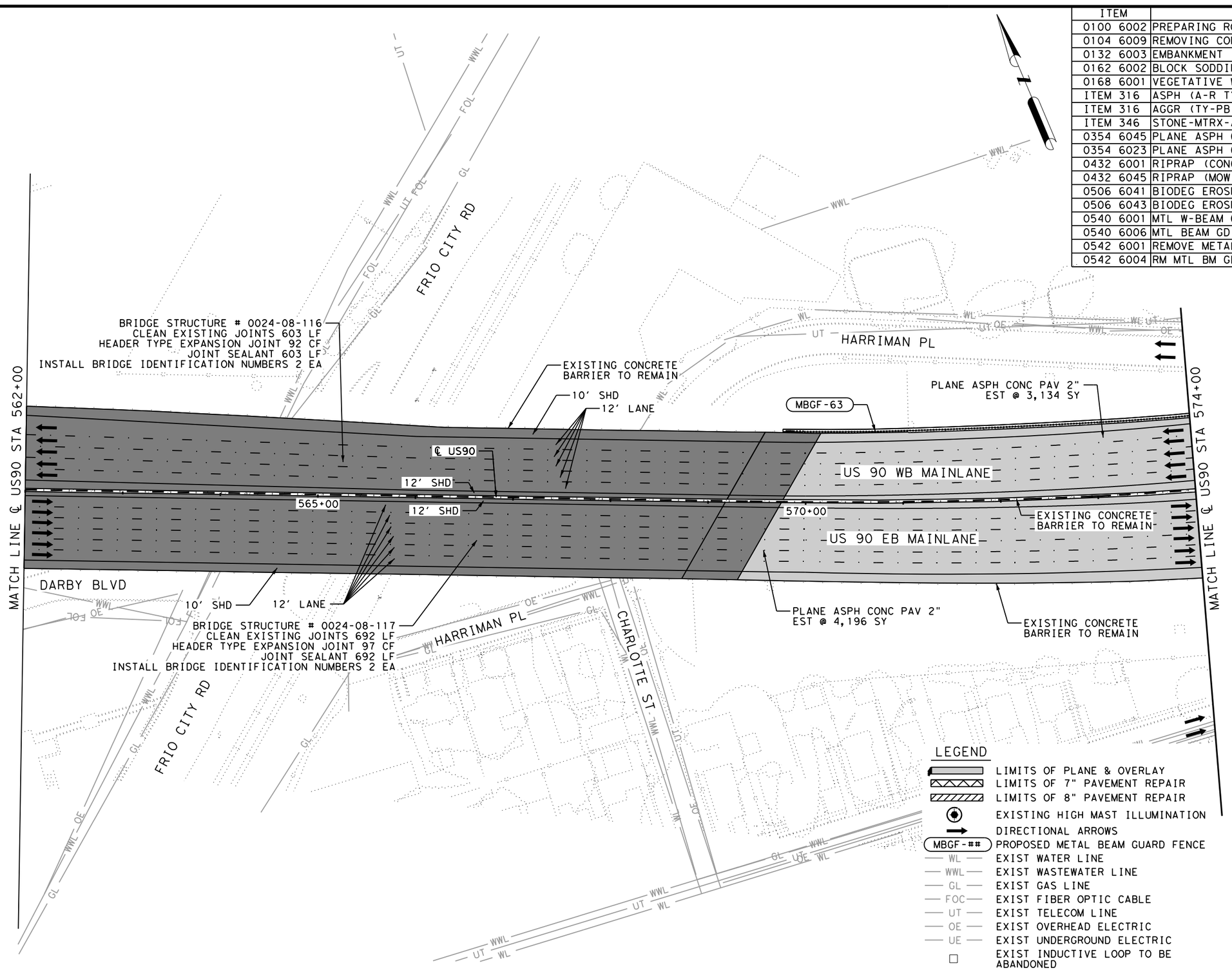
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	122
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	22
0162 6002	BLOCK SODDING	SY	146
0168 6001	VEGETATIVE WATERING	MG	2.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	20433
ITEM 316	AGGR (TY-PB GR-4)	SY	20433
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	20433
0354 6045	PLANE ASPH CONC PAV (2")	SY	7331
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	13102
0432 6001	RIPRAP (CONC)(4 IN)	SY	13
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	22
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	437
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	437
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	396.3
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	396.3
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	1



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10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 562+00 TO ℄ US90 STA 574+00

SHEET 36 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	162
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\kn1\cms33968\US90_141_RDWY_34.dgn
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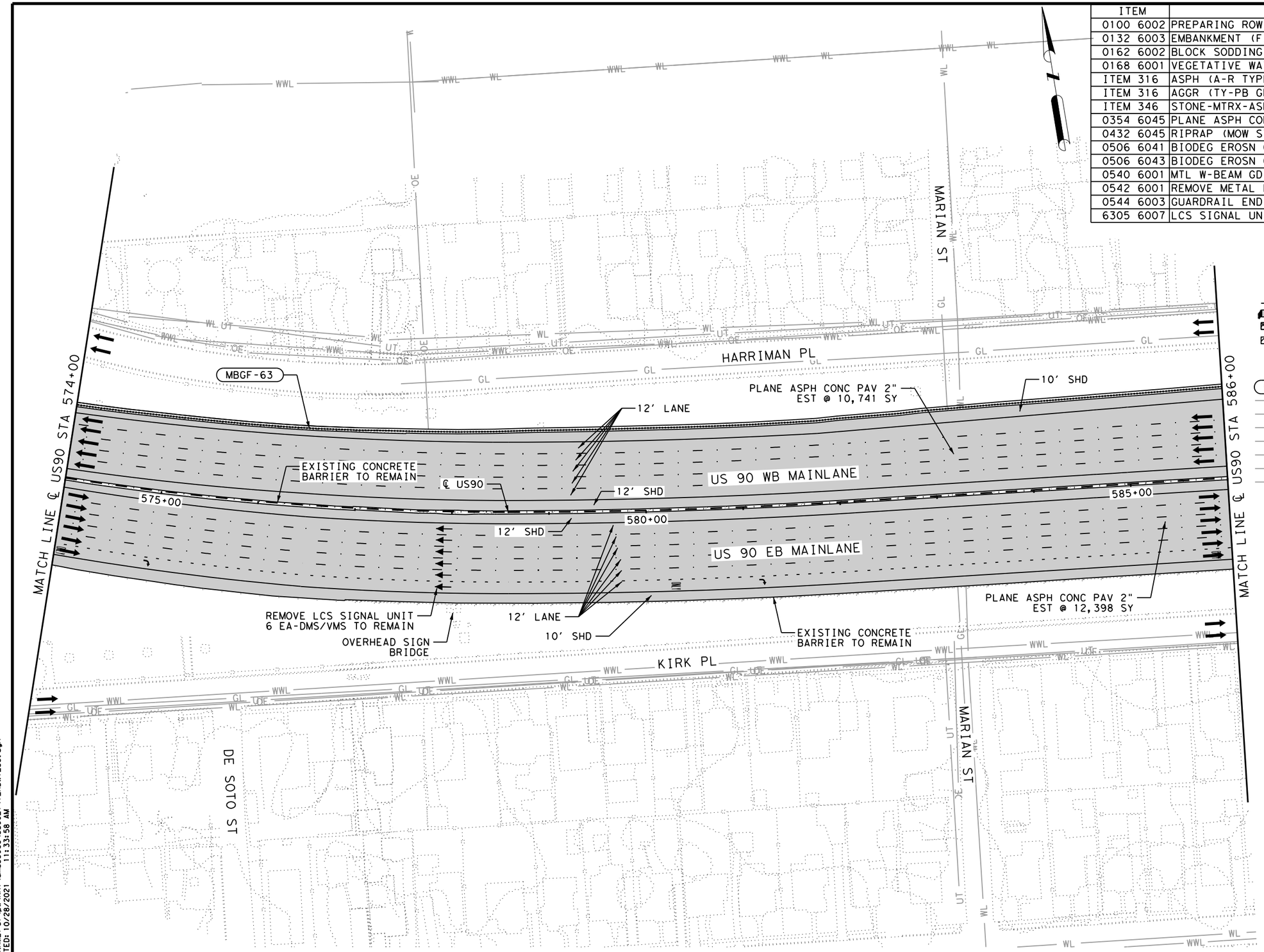
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	22
0162 6002	BLOCK SODDING	SY	401
0168 6001	VEGETATIVE WATERING	MG	6.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	23139
ITEM 316	AGGR (TY-PB GR-4)	SY	23139
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	23139
0354 6045	PLANE ASPH CONC PAV (2")	SY	23139
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	66
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	1203
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1203
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	1182.6
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	291.2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	6



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 574+00 TO
℄ US90 STA 586+00

SHEET 37 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	163
CONT.	SECT.	JOB	
0024	08	141	

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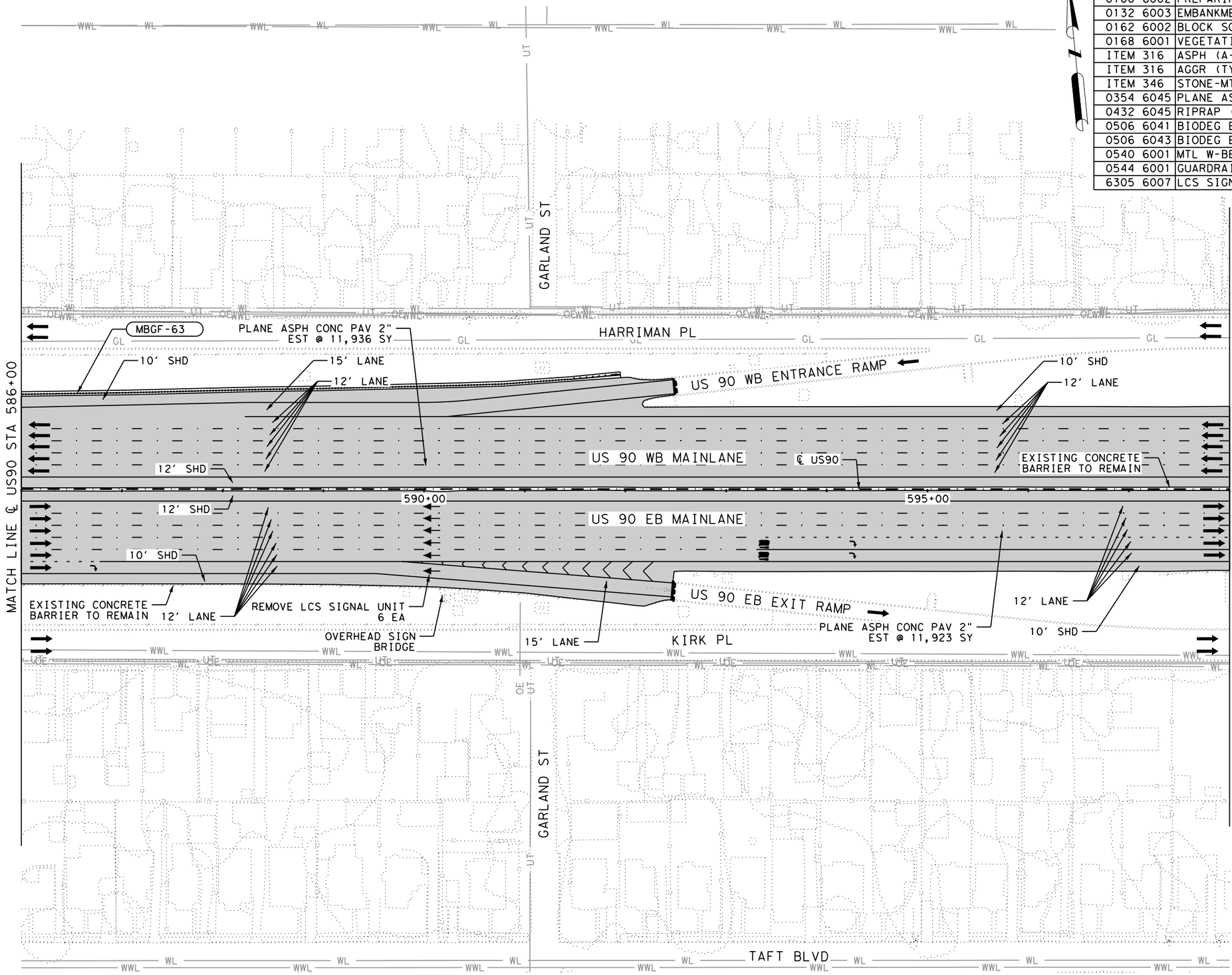
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	11
0162 6002	BLOCK SODDING	SY	208
0168 6001	VEGETATIVE WATERING	MG	3.3
ITEM 316	ASPH (A-R TYPE II OR III)	SY	23859
ITEM 316	AGGR (TY-PB GR-4)	SY	23859
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	23859
0354 6045	PLANE ASPH CONC PAV (2")	SY	23859
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	34
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	622
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	622
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	546.1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	6



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 586+00 TO
℄ US90 STA 598+00

SHEET 38 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	164
CONT.	SECT.	JOB	
0024	08	141	

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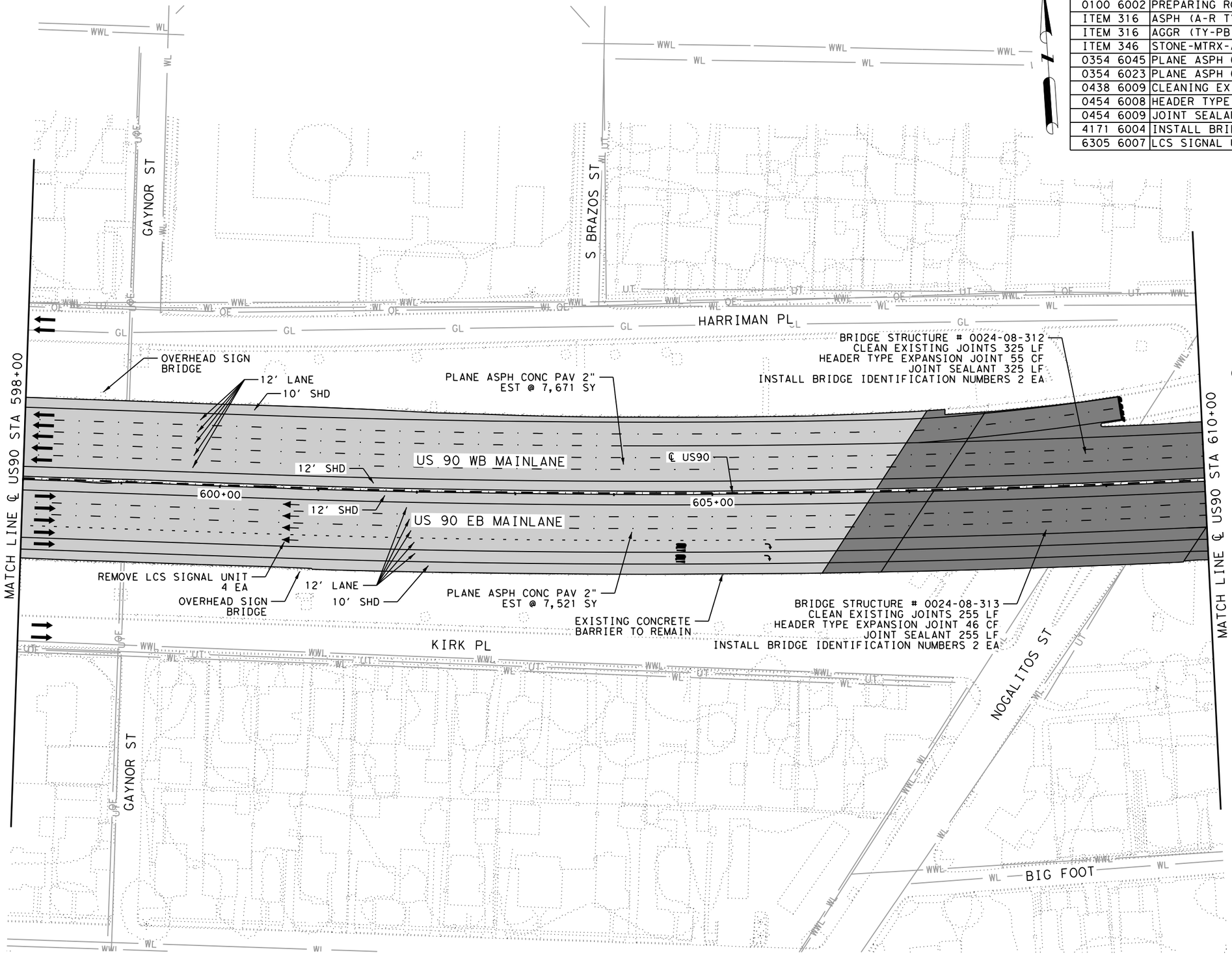
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
ITEM 316	ASPH (A-R TYPE II OR III)	SY	20881
ITEM 316	AGGR (TY-PB GR-4)	SY	20881
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	20881
0354 6045	PLANE ASPH CONC PAV (2")	SY	15191
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	5690
0438 6009	CLEANING EXISTING JOINTS	LF	580
0454 6008	HEADER TYPE EXPANSION JOINT	CF	101
0454 6009	JOINT SEALANT	LF	580
4171 6004	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

STATE OF TEXAS
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106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 598+00 TO
℄ US90 STA 610+00

SHEET 39 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	165
0024	08	141	

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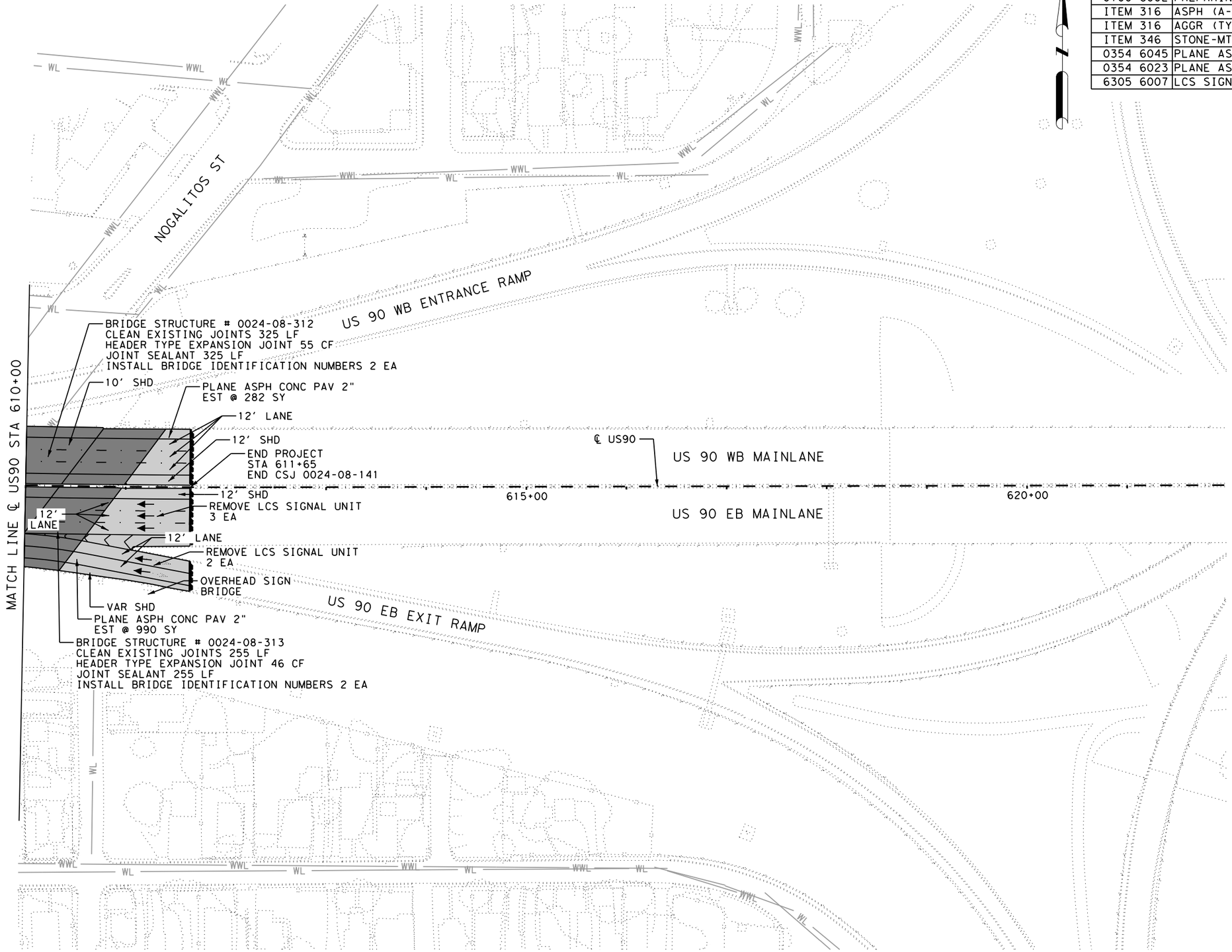
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	1
ITEM 316	ASPH (A-R TYPE II OR III)	SY	2616
ITEM 316	AGGR (TY-PB GR-4)	SY	2616
ITEM 346	STONE-MTRX-ASPH SMA-D SAC-A PG76-22	SY	2616
0354 6045	PLANE ASPH CONC PAV (2")	SY	1272
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	1344
6305 6007	LCS SIGNAL UNIT (REMOVE)	EA	5



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN MAINLANE

℄ US90 STA 598+00 TO
℄ US90 STA 610+00

SHEET 40 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	166
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\khi\dms33968\US90_141_RDWY_38.dgn
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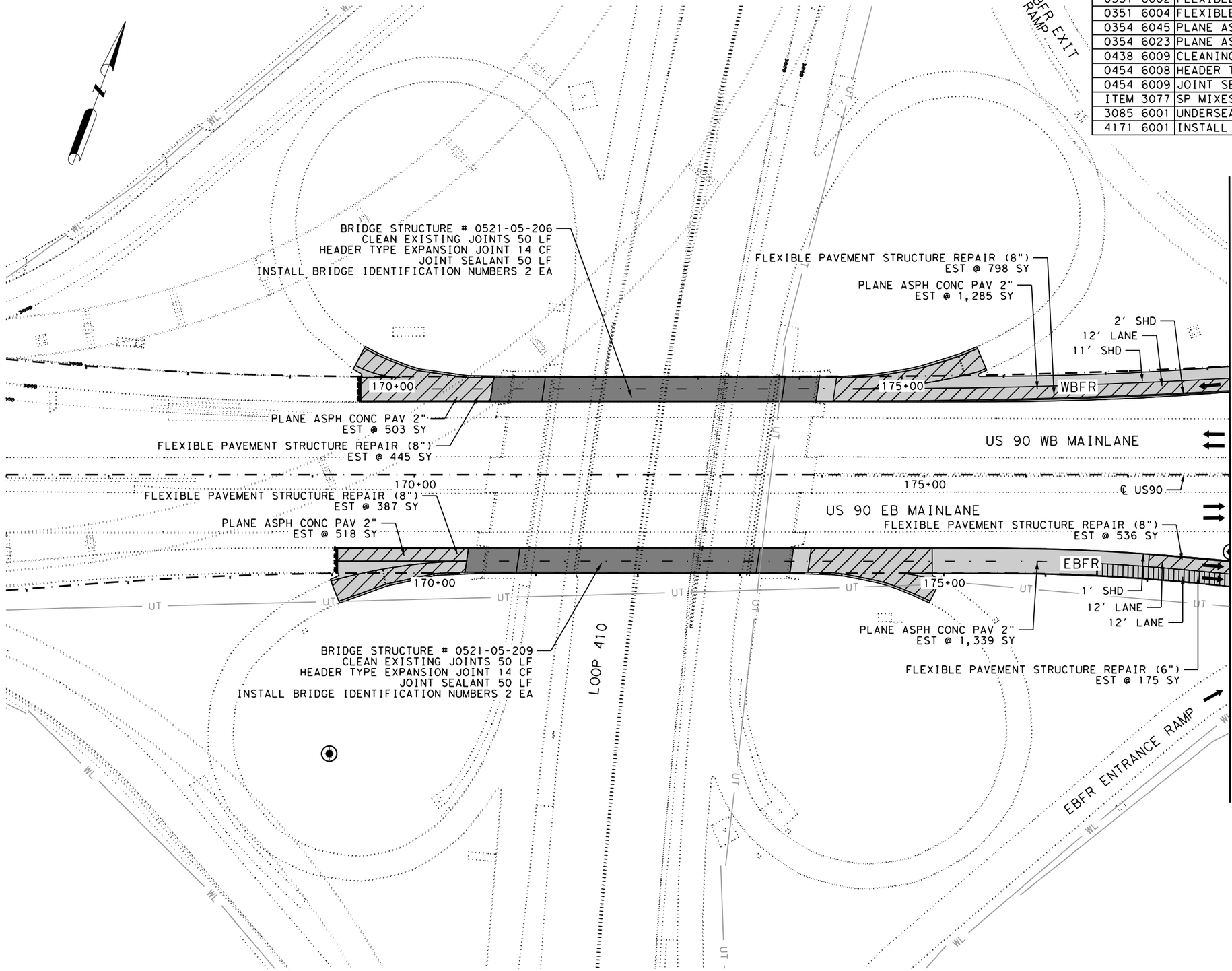
ITEM	DESCRIPTION	UNIT	QTY
0351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	175
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2166
0354 6045	PLANE ASPH CONC PAV (2")	SY	3645
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	1873
0438 6009	CLEANING EXISTING JOINTS	LF	100
0454 6008	HEADER TYPE EXPANSION JOINT	CF	28
0454 6009	JOINT SEALANT	LF	100
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	5518
3085 6001	UNDERSEAL COURSE	GAL	1103
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	4



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
- LIMITS OF 6" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN FRONTAGE ROAD

BEGIN PROJECT TO
℄ US90 STA 178+00

SHEET 1 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	167
CONT.	SECT.	JOB	
0024	08	141	

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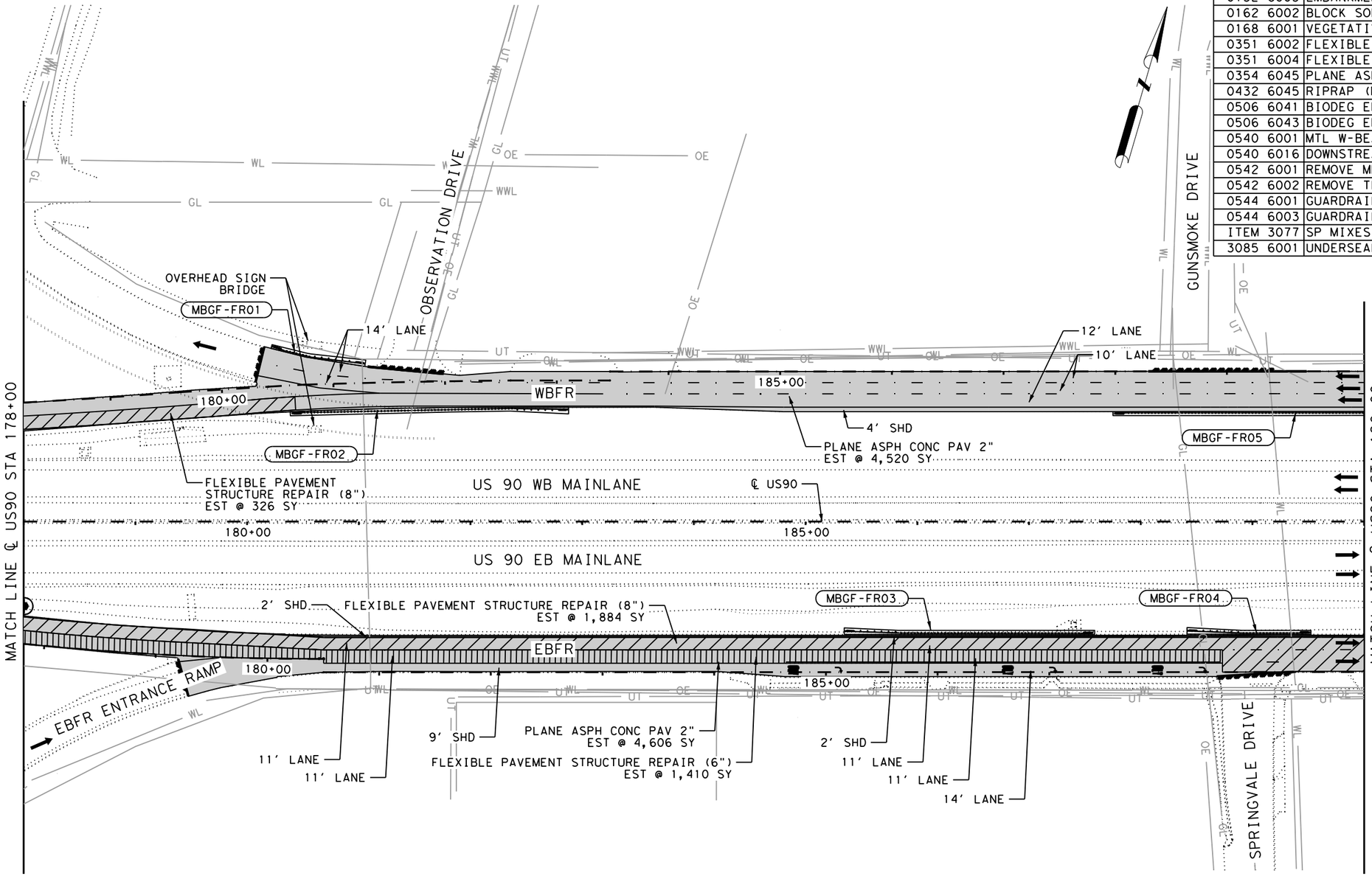
ITEM	DESCRIPTION	UNIT	QTY
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	14
0162 6002	BLOCK SODDING	SY	310
0168 6001	VEGETATIVE WATERING	MG	4.9
0351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	1410
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2210
0354 6045	PLANE ASPH CONC PAV (2")	SY	9126
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	45
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	928
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	928
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	637.5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	5
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	500
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	6
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	9126
3085 6001	UNDERSEAL COURSE	GAL	1826



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
- LIMITS OF 6" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN FRONTAGE ROAD

℄ US90 STA 178+00 TO
℄ US90 STA 190+00

SHEET 2 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	168
CONT.	SECT.	JOB	
0024	08	141	

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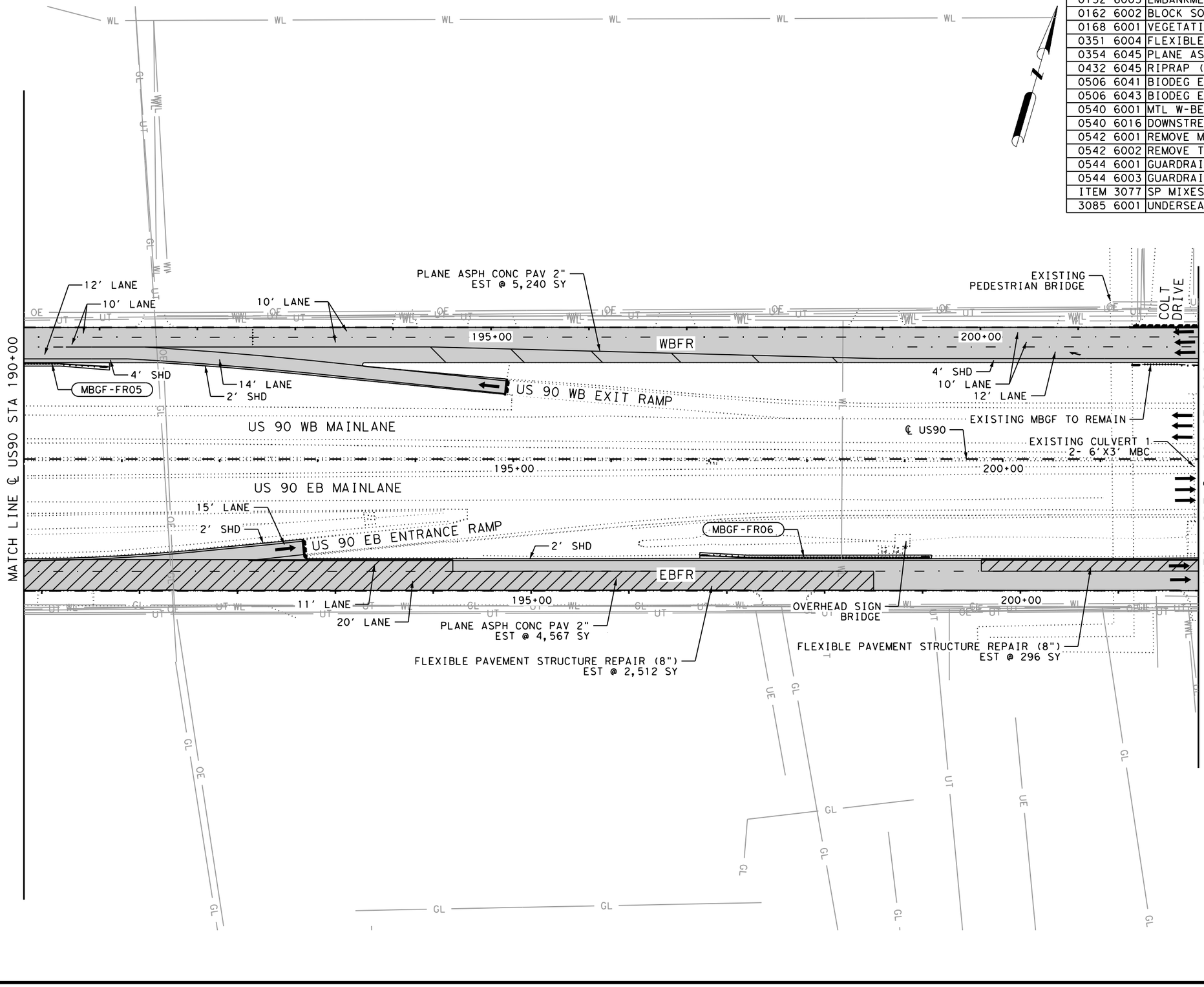
ITEM	DESCRIPTION	UNIT	QTY
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	5
0162 6002	BLOCK SODDING	SY	118
0168 6001	VEGETATIVE WATERING	MG	1.9
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2808
0354 6045	PLANE ASPH CONC PAV (2")	SY	9807
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	16
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	353
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	353
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	212.5
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	225
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	9807
3085 6001	UNDERSEAL COURSE	GAL	1962



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
- LIMITS OF 6" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
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0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN FRONTAGE ROAD

℄ US90 STA 190+00 TO
℄ US90 STA 202+00

SHEET 3 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	169
CONT.	SECT.	JOB	
0024	08	141	

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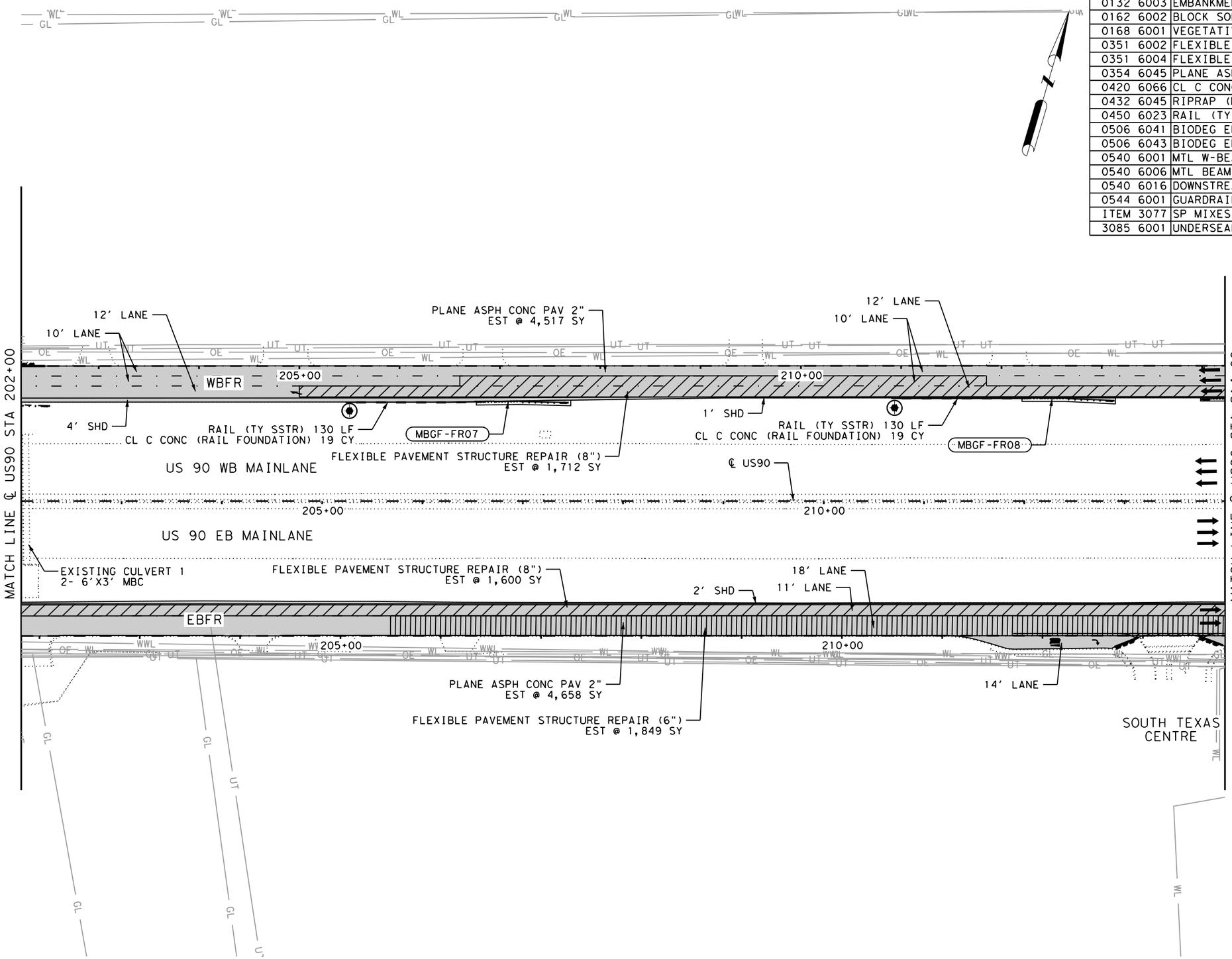
ITEM	DESCRIPTION	UNIT	QTY
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	3
0162 6002	BLOCK SODDING	SY	81
0168 6001	VEGETATIVE WATERING	MG	1.3
0351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	1849
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	3312
0354 6045	PLANE ASPH CONC PAV (2")	SY	9175
0420 6066	CL C CONC (RAIL FOUNDATION)	CY	38
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	11
0450 6023	RAIL (TY SSTR)	SY	260
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	243
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	243
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	62.5
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	2
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	9175
3085 6001	UNDERSEAL COURSE	GAL	1835



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
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- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC

0 50 100

10/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN FRONTAGE ROAD

℄ US90 STA 202+00 TO
℄ US90 STA 214+00

SHEET 4 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	170
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pw\xhn1\dms33968\US90_141FR_RDWY_04.dgn
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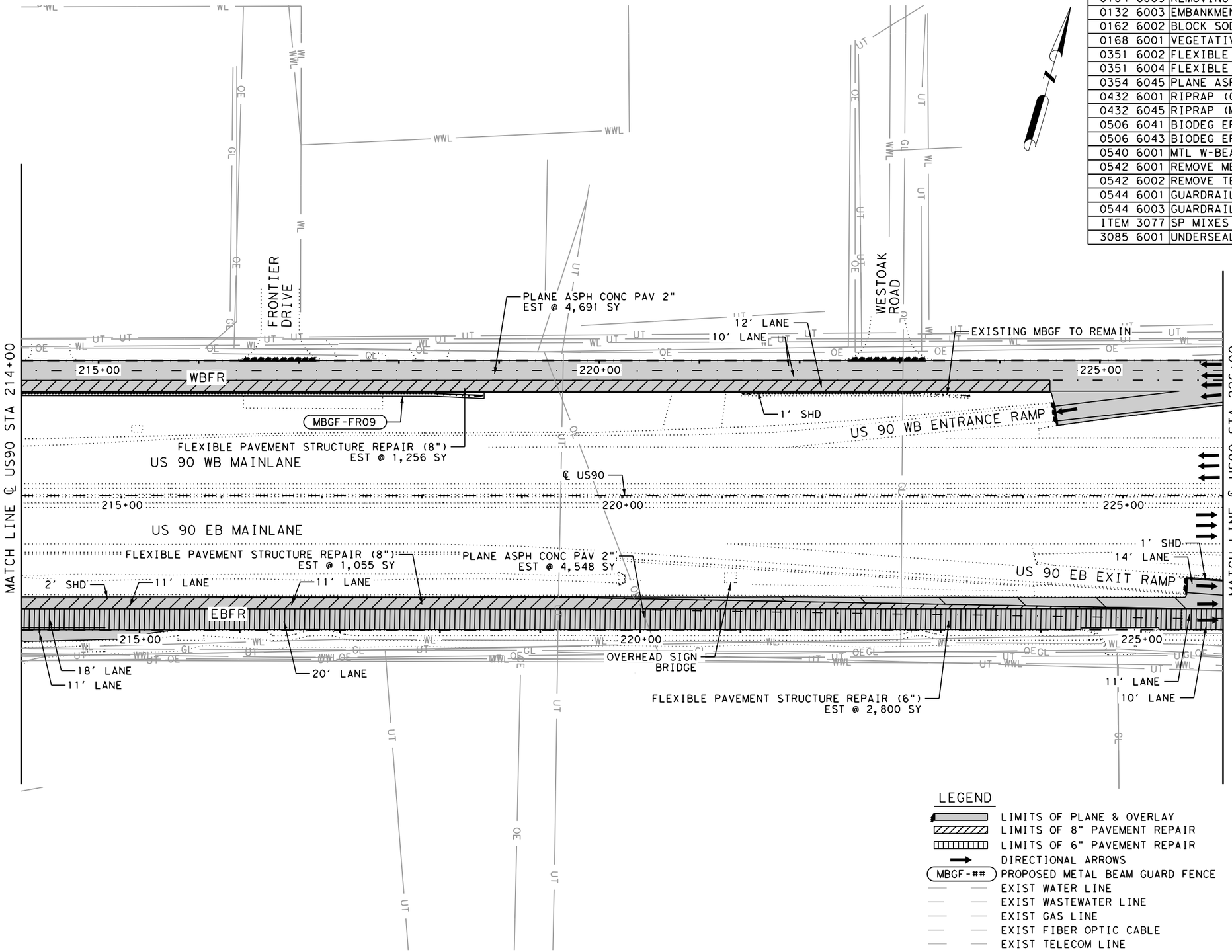
ITEM	DESCRIPTION	UNIT	QTY
0104 6009	REMOVING CONC (RIPRAP)	SY	152
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	20
0162 6002	BLOCK SODDING	SY	163
0168 6001	VEGETATIVE WATERING	MG	2.6
0351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	2800
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	2311
0354 6045	PLANE ASPH CONC PAV (2")	SY	9239
0432 6001	RIPRAP (CONC)(4 IN)	SY	16
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	22
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	488
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	488
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	412.5
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	200
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	9239
3085 6001	UNDERSEAL COURSE	GAL	1848



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
- LIMITS OF 6" PAVEMENT REPAIR
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- EXIST WATER LINE
- EXIST WASTEWATER LINE
- EXIST GAS LINE
- EXIST FIBER OPTIC CABLE
- EXIST TELECOM LINE
- EXIST OVERHEAD ELECTRIC
- EXIST UNDERGROUND ELECTRIC

0 50 100

10/28/2021

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN FRONTAGE ROAD

℄ US90 STA 214+00 TO
℄ US90 STA 226+00

SHEET 5 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	171
CONT.	SECT.	JOB	
0024	08	141	

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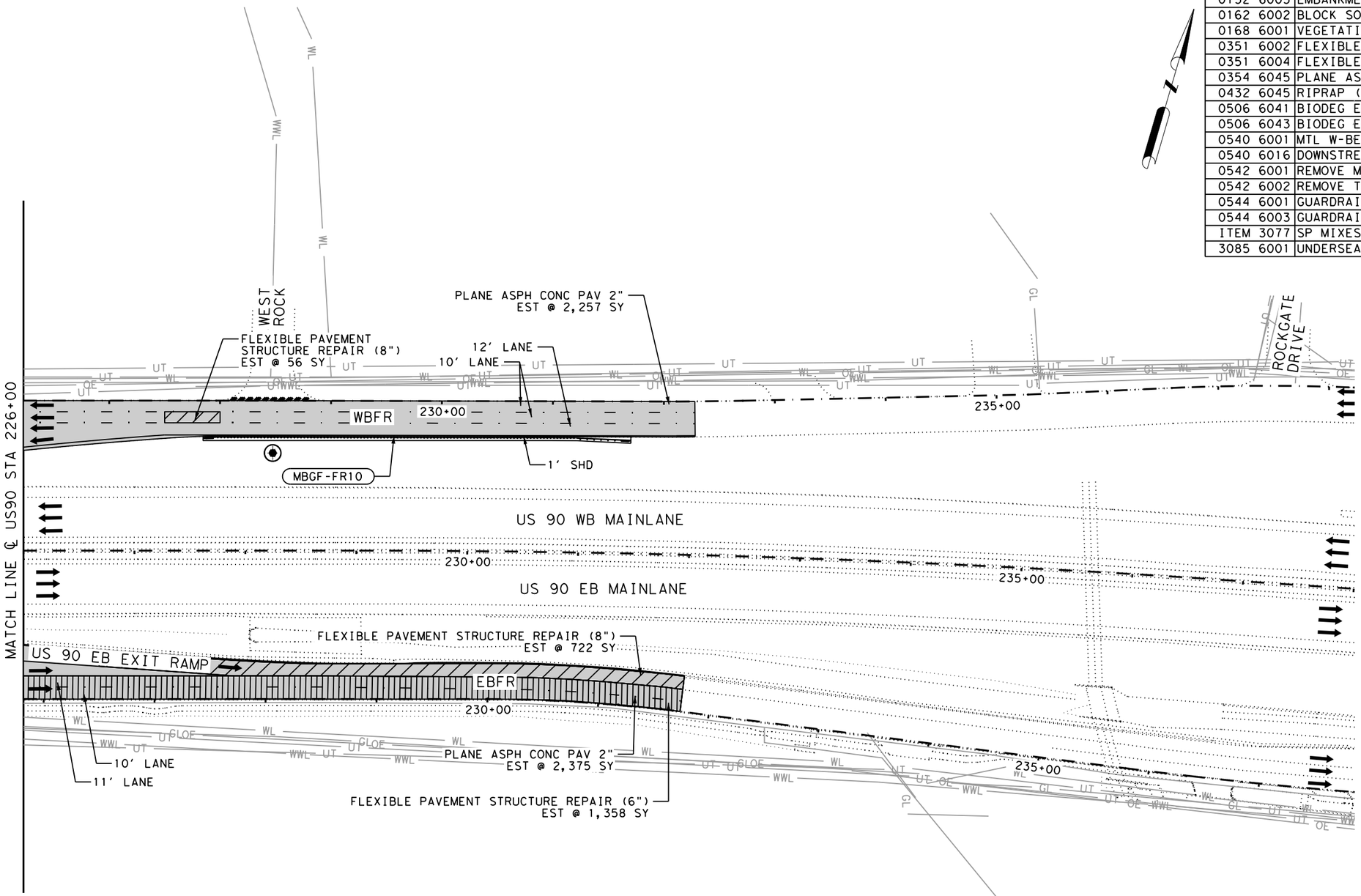
ITEM	DESCRIPTION	UNIT	QTY
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	7
0162 6002	BLOCK SODDING	SY	137
0168 6001	VEGETATIVE WATERING	MG	2.2
0351 6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	1358
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	778
0354 6045	PLANE ASPH CONC PAV (2")	SY	4632
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	19
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	410
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	410
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	325
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	1
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	300
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	1
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	4632
3085 6001	UNDERSEAL COURSE	GAL	927



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 8" PAVEMENT REPAIR
- LIMITS OF 6" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL — EXIST WATER LINE
- WWL — EXIST WASTEWATER LINE
- GL — EXIST GAS LINE
- FOC — EXIST FIBER OPTIC CABLE
- UT — EXIST TELECOM LINE
- OE — EXIST OVERHEAD ELECTRIC
- UE — EXIST UNDERGROUND ELECTRIC

0 50 100

10/28/2021

TROY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

ROADWAY PLAN FRONTAGE ROAD

℄ US90 STA 226+00 TO
END PROJECT

SHEET 6 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	172
CONT.	SECT.	JOB	
0024	08	141	

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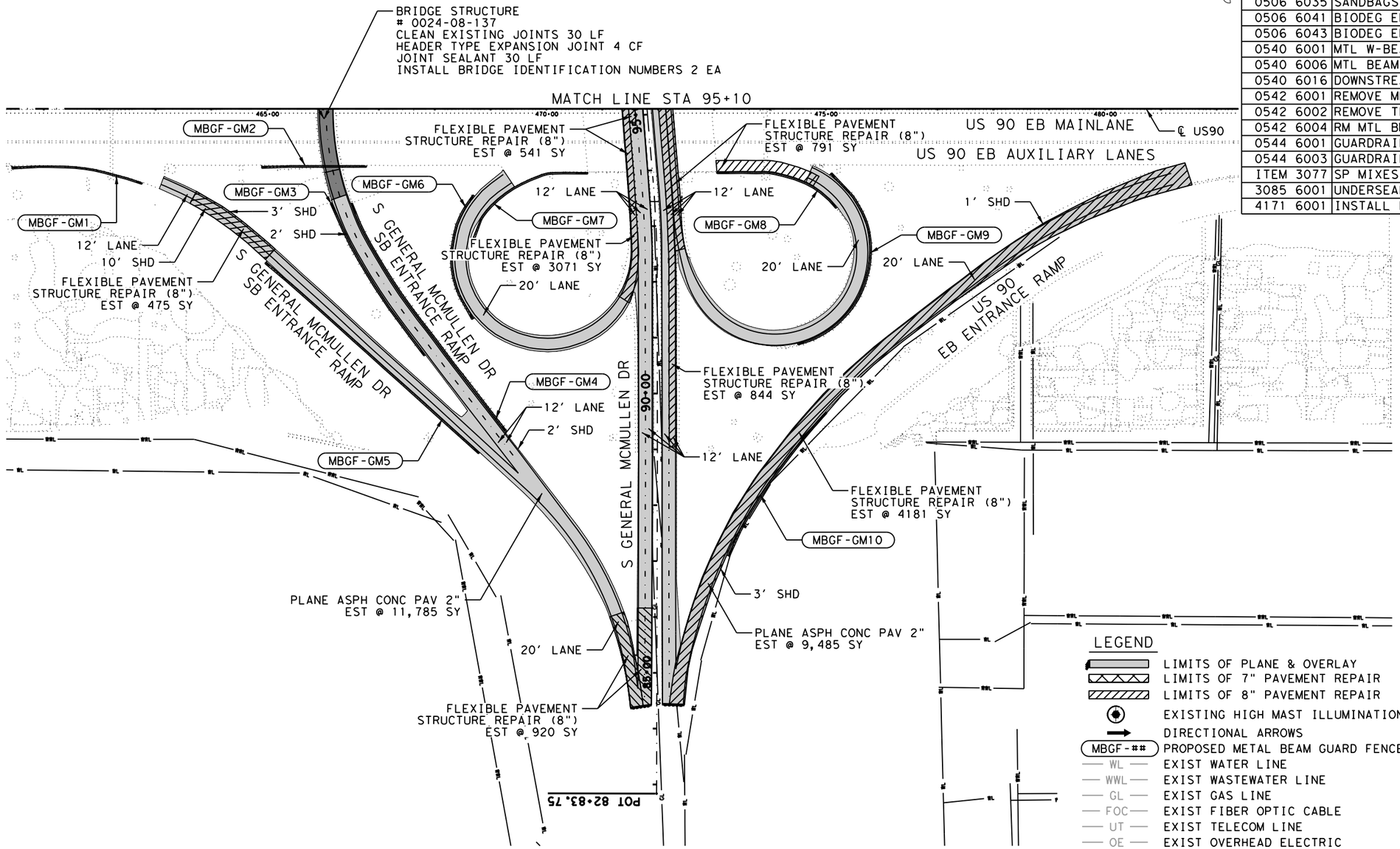
ITEM	DESCRIPTION	UNIT	QTY
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	55
0162 6002	BLOCK SODDING	SY	1070
0168 6001	VEGETATIVE WATERING	MG	16.7
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	7750
0354 6045	PLANE ASPH CONC PAV (2")	SY	20755
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	514
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	145
0438 6009	CLEANING EXISTING JOINTS	LF	30
0454 6008	HEADER TYPE EXPANSION JOINT	CF	4
0454 6009	JOINT SEALANT	LF	30
0506 6035	SANDBAGS FOR EROSION CONTROL	EA	6
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	3210
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	3210
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	2650
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	10
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	2475
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	13
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	6
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	3
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	21110
3085 6001	UNDERSEAL COURSE	GAL	4222
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	2



LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

10/28/2021

TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation
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US 90

ROADWAY PLAN
GENERAL MCMULLEN DR

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	173
CONT.	SECT.	JOB	
0024	08	141	

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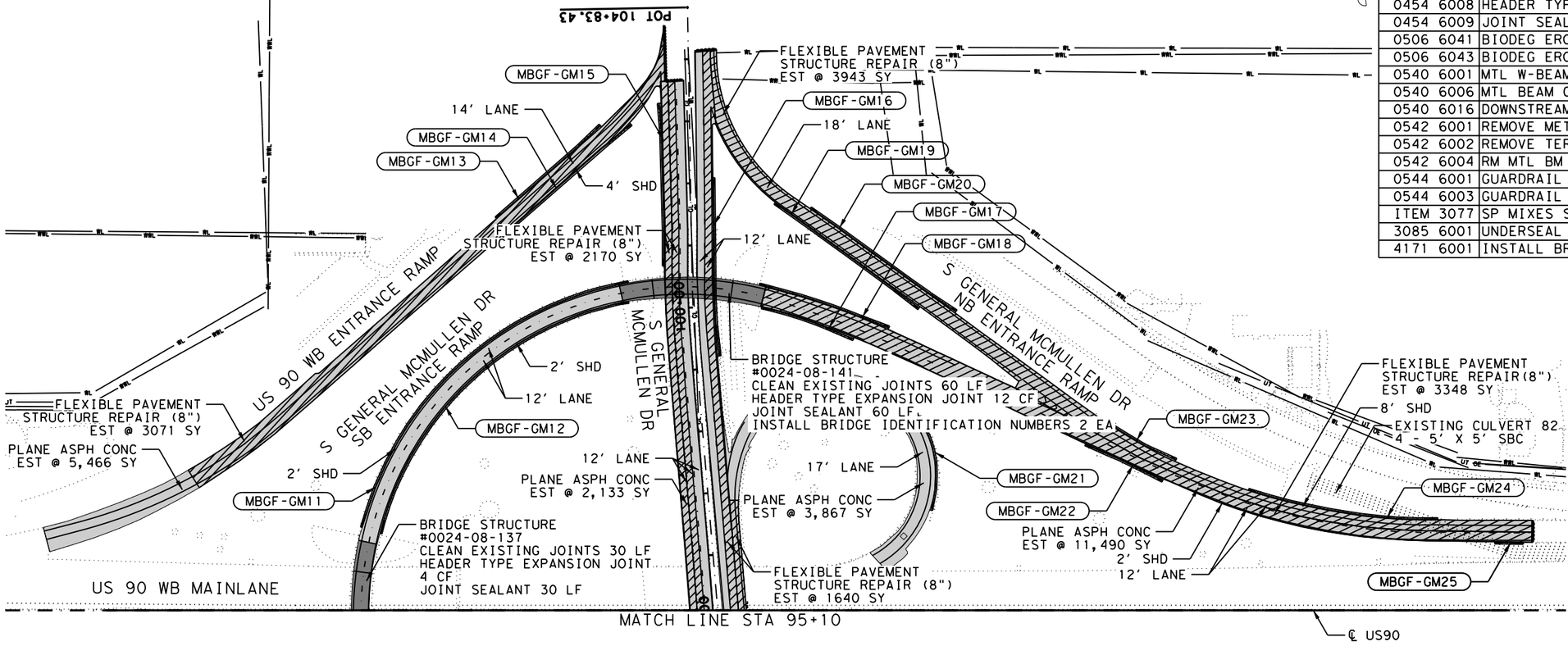
ITEM	DESCRIPTION	UNIT	QTY
0104 6009	REMOVING CONC (RIPRAP)	SY	52
0132 6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	74
0162 6002	BLOCK SODDING	SY	1374
0168 6001	VEGETATIVE WATERING	MG	21.5
0351 6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	14171
0354 6045	PLANE ASPH CONC PAV (2")	SY	21760
0354 6023	PLANE ASPH CONC PAV (0" TO 4")	SY	1195
0432 6001	RIPRAP (CONC)(4 IN)	SY	6
0432 6045	RIPRAP (MOW STRIP)(4 IN)	SY	181
0438 6009	CLEANING EXISTING JOINTS	LF	90
0454 6008	HEADER TYPE EXPANSION JOINT	CF	12
0454 6009	JOINT SEALANT	LF	90
0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	4120
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	4120
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	3225
0540 6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	8
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	SY	11
0542 6001	REMOVE METAL BEAM GUARD FENCE	SY	2250
0542 6002	REMOVE TERMINAL ANCHOR SECTION	SY	18
0542 6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	8
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	11
0544 6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4
ITEM 3077	SP MIXES SP-C SAC-B PG 70-22	SY	22955
3085 6001	UNDERSEAL COURSE	GAL	4591
4171 6001	INSTALL BRIDGE IDENTIFICATION NUMBERS	EA	2



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10/28/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

LEGEND

- LIMITS OF PLANE & OVERLAY
- LIMITS OF 7" PAVEMENT REPAIR
- LIMITS OF 8" PAVEMENT REPAIR
- EXISTING HIGH MAST ILLUMINATION
- DIRECTIONAL ARROWS
- MBGF-## PROPOSED METAL BEAM GUARD FENCE
- WL EXIST WATER LINE
- WWL EXIST WASTEWATER LINE
- GL EXIST GAS LINE
- FOC EXIST FIBER OPTIC CABLE
- UT EXIST TELECOM LINE
- OE EXIST OVERHEAD ELECTRIC
- UE EXIST UNDERGROUND ELECTRIC
- EXIST INDUCTIVE LOOP TO BE ABANDONED
- EXIST LCS SIGNAL UNIT

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US 90

ROADWAY PLAN GENERAL MCMULLEN DR

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	174
CONT.	SECT.	JOB	
0024	08	141	

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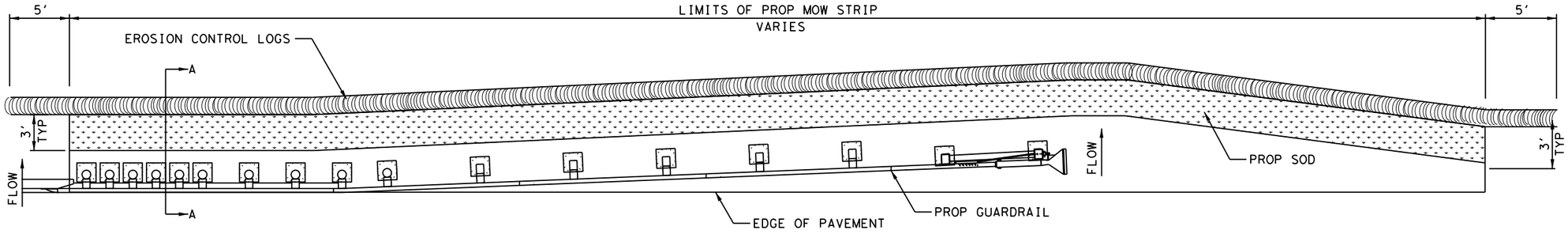
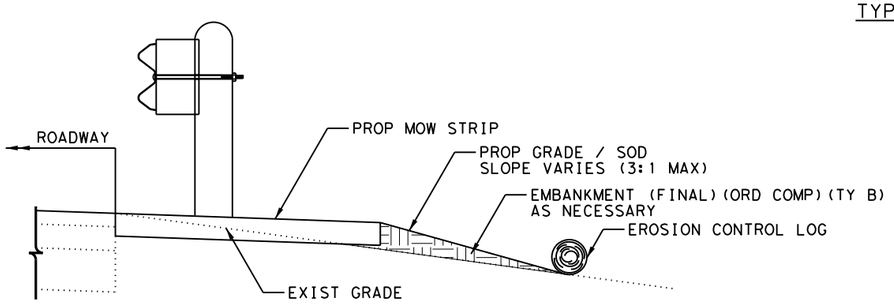
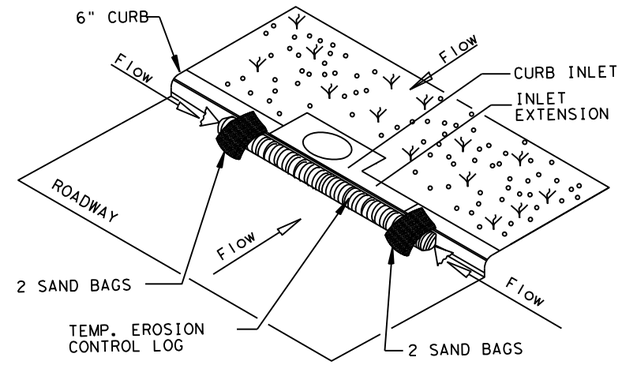


TYPICAL EROSION CONTROL AT MBGF

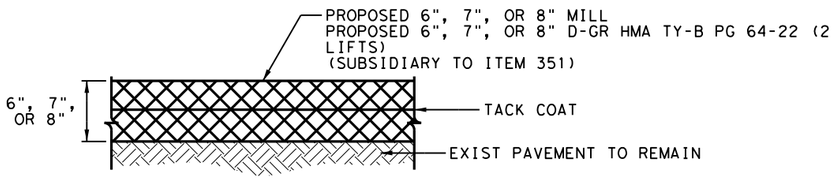


SECTION A-A

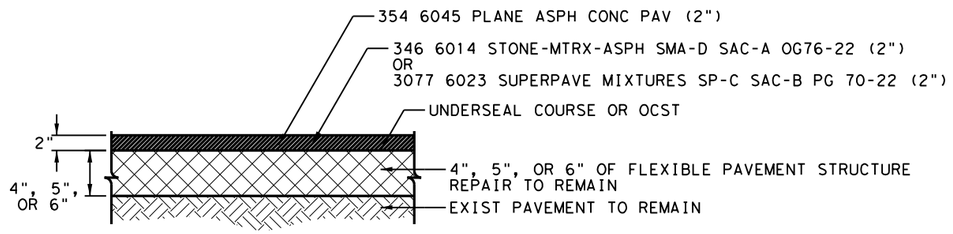
NOTE: PAY ITEM QUANTITIES ESTIMATED BASED ON FIELD OBSERVATIONS. PRIOR TO COMMENCING WORK, CONTRACTOR TO VERIFY FIELD CONDITIONS AND NOTIFY THE ENGINEER IF THE QUANTITIES SHOWN IN THE PLANS DIFFER FROM THOSE REQUIRED TO COMPLETE THE WORK.



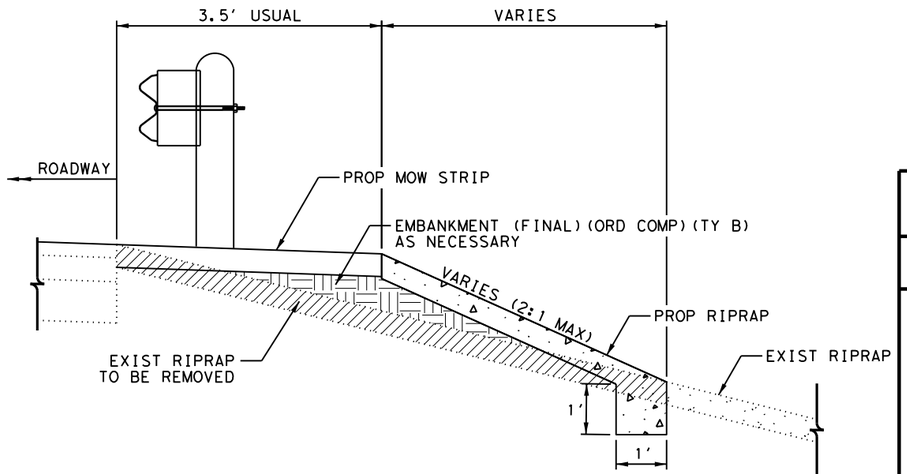
TYPICAL EROSION CONTROL AT CURB



FLEXIBLE PAVEMENT STRUCTURE REPAIR SECTION



PROPOSED FINAL PAVEMENT SECTION



TYPICAL MOWSTRIP AT EXISTING RIPRAP

NOTE: PAY ITEM QUANTITIES ESTIMATED BASED ON FIELD OBSERVATIONS. PRIOR TO COMMENCING WORK, CONTRACTOR TO VERIFY FIELD CONDITIONS AND NOTIFY THE ENGINEER IF THE QUANTITIES SHOWN IN THE PLANS DIFFER FROM THOSE REQUIRED TO COMPLETE THE WORK.

10/28/2021

STATE OF TEXAS
JOSHUA L. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

MISCELLANEOUS ROADWAY DETAILS

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	175
CONT.	SECT.	JOB	
0024	08	141	

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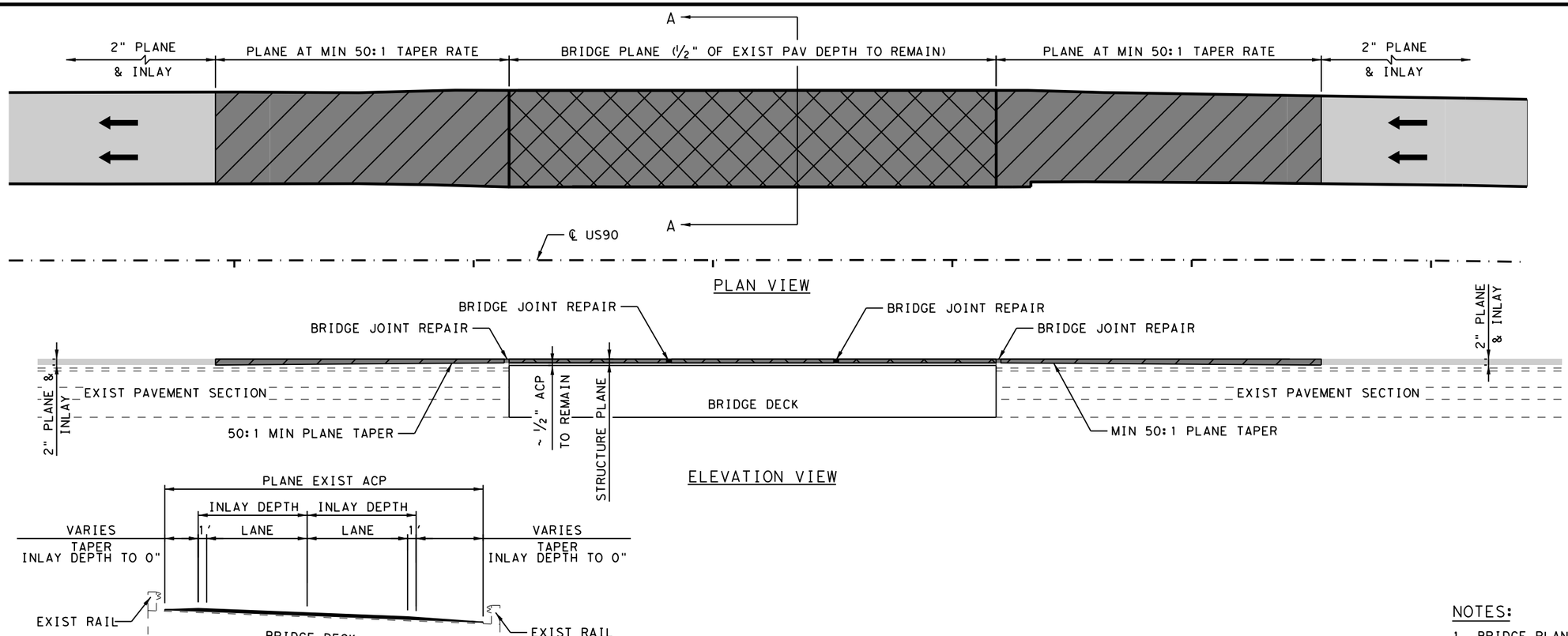

PLAN VIEW

ELEVATION VIEW

TYPICAL BRIDGE CROSS SECTION
SECTION A-A

NOTES:

1. BRIDGE PLANING TABLE IS FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY FOR PAY ITEM QUANTITIES.

BRIDGE PLANING

ROADWAY SHEET NO.	LOCATION	STRUCTURE NUMBER	APPROX. EXIST ACP DEPTH	APPROX. STRUCTURE PLANE / INLAY DEPTH	PLANE VARIES	PLANE TAPER LENGTH @ BEGIN/END BRIDGE
5	US 90 WBML OVERPASS AT IH 410	NBI# 15-015-0-0521-05-208	2.25"	1.75"	2"-1.75"	50.00
5	US 90 EBML OVERPASS AT IH 410	NBI# 15-015-0-0521-05-209	2.5"	2"	2"-2"	50.00
9	US 90 WBML OVERPASS AT MILITARY DR	NBI# 15-015-0-0024-08-210	3.75"	3.25"	2"-3.25"	75.00
9	US 90 EBML OVERPASS AT MILITARY DR	NBI# 15-015-0-0024-08-211	2.63"	2.13"	2"-2.13"	50.00
14 & 15	US 90 WBML AT LEON CREEK	NBI# 15-015-0-0024-08-129	2.88"	2.38"	2"-2.38"	50.00
14 & 15	US 90 EBML AT LEON CREEK	NBI# 15-015-0-0024-08-130	2.63"	2.13"	2"-2.13"	50.00
17	US 90 WBML OVERPASS AT CALLAGHAN RD	NBI# 15-015-0-0024-08-132	2.38"	1.88"	2"-1.88"	50.00
17	US 90 EBML OVERPASS AT CALLAGHAN RD	NBI# 15-015-0-0024-08-133	2.63"	2.13"	2"-2.13"	50.00
28	US 90 WBML OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-142	2.38"	1.88"	2"-1.88"	50.00
28	US 90 EBML OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-143	2.38"	1.88"	2"-1.88"	50.00
28	US 90 EBFR OVERPASS AT S GENERAL MCMULLEN DR	NBI# 15-015-0-0024-08-144	2"	1.5"	2"-1.5"	50.00
30	US 90 WBML OVERPASS AT CUPPLES RD	NBI# 15-015-0-0024-08-146	2"	1.5"	2"-1.5"	50.00
30	US 90 EBML OVERPASS AT CUPPLES RD	NBI# 15-015-0-0024-08-147	2.88"	2.38"	2"-2.38"	50.00
33 & 34	US 90 WBML OVERPASS AT SPUR 371	NBI# 15-015-0-0024-08-114	2.25"	1.75"	2"-1.75"	50.00
33 & 34	US 90 EBML OVERPASS AT SPUR 371	NBI# 15-015-0-0024-08-115	2.38"	1.88"	2"-1.88"	50.00
35 & 36	US 90 WBML OVERPASS AT S ZARZAMORA ST	NBI# 15-015-0-0024-08-116	2.33"	1.83"	2"-1.83"	50.00
35 & 36	US 90 EBML OVERPASS AT S ZARZAMORA ST	NBI# 15-015-0-0024-08-117	2.17"	1.67"	2"-1.67"	50.00
39 & 40	US 90 WBML OVERPASS AT LP 353	NBI# 15-015-0-0024-08-312	2.5"	2"	2"-2"	50.00
39 & 40	US 90 EBML OVERPASS AT LP 353	NBI# 15-015-0-0024-08-313	2.63"	2.13"	2"-2.13"	50.00
FR 1	US 90 WBFR OVERPASS AT IH 410	NBI# 15-015-0-0024-08-206	2.75"	2.25"	2"-2.25"	50.00
FR 1	US 90 EBFR OVERPASS AT IH 410	NBI# 15-015-0-0024-08-209	2.5"	2"	2"-2"	50.00
GM 1 & 2	GENERAL MCMULLEN DR - CONNECTION R OVERPASS	NBI# 15-015-0024-08-137	1.25"	0.75"	2"-0.75"	50.00
GM 2	GENERAL MCMULLEN DR - CONNECTION R OVERPASS	NBI# 15-015-0024-08-141	1.25"	0.75"	2"-0.75"	50.00

4/1/2021

STATE OF TEXAS
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US 90

MISCELLANEOUS ROADWAY DETAILS

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	176
CONT.	SECT.	JOB	
0024	08	141	

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SUMMARY OF METAL BEAM GUARD FENCE

SHEET	PLAN SHEET	104 6009 REMOVING CONC (RIPRAP)	104 6054 REMOVING CONCRETE (MOW STRIP)	132 6003 EMBANKMENT (FINAL) (ORD COMP) (TY B)	432 6001 RIPRAP (CONC) (4IN)	432 6045 RIPRAP (MOW STRIP) (4IN)	540 6001 MTL W-BEAM GD FEN (TIM POST)	540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION	540 6037 MTL BEAM GD FEN TRANS (ANCHOR PLATE)	542 6001 REMOVE METAL BEAM GUARD FENCE	542 6002 REMOVE TERMINAL ANCHOR SECTION	542 6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	544 6001 GUARDRAIL END TREATMENT (INSTALL)
		SY	LF	CY	CY	CY	LF	EA	EA	EA	LF	EA	EA	EA
MAINLANES														
MBGF-1	4 OF 38			4		12	187.5		1		137.5	1		1
MBGF-2	4 OF 38			4		8	185.3		1		185.3	1		
	5 OF 38			1		5	39.7				39.7			1
MBGF-3	5 OF 38			4		11	162.5		1		50.0	2		1
MBGF-4	5 OF 38			7		18	337.5		1		337.5	1		1
MBGF-5	5 OF 38			6		16	275.0		1		275.0	1		1
MBGF-6	6 OF 38		50	6		13	287.5		1		287.5	1		
MBGF-7	6 OF 38			8		20	387.5		1		387.5	1		1
MBGF-8	7 OF 38			5		14	237.5		1		237.5	1		1
MBGF-9	7 OF 38			7		17	350.0		1		87.5	4		1
MBGF-10	7 OF 38	56		12	4	15	262.5		1		66.5	1		1
MBGF-11	8 OF 38	94		31	7	50	1071.0				1071.0			1
	9 OF 38			8		18	399.0			1	399.0			
MBGF-12	8 OF 38			16		36	830.3		1		830.3	1		
	9 OF 38			7		17	377.2			1	377.2			
MBGF-13	9 OF 38	302		58	18	26	587.5		1	1	587.5	1		
MBGF-14	9 OF 38	125		32	8	28	638.8			1	638.8			
	10 OF 38	225		38	13	10	221.2				221.2	1		1
MBGF-15	9 OF 38			3		8	109.4				109.4	1		1
	10 OF 38			5		11	240.6		1		240.6	1		
MBGF-16	11 OF 38			4		11	175.0		1		150.0	1		1
MBGF-17	11 OF 38			7		19	350.0		1		350.0	1		1
MBGF-18	12 OF 38			8		21	412.5		1		412.5	2		1
MBGF-19	13 OF 38			4		11	165.5		1		165.5	2		1
MBGF-20	13 OF 38			4		12	187.5		1		150.0	1		1
MBGF-21	14 OF 38			7		18	325.0		1		325.0	1		1
MBGF-22	14 OF 38	167		40	10	33	750.0		1		750.0	1	1	
MBGF-22A	14 OF 38						37.5	1	1				1	
MBGF-23	14 OF 38			9		23	450.0				450.0		1	1
MBGF-23A	14 OF 38						37.5	1					1	1
MBGF-24	15 OF 38			8		18	387.5		1		387.5	1		
MBGF-24A	15 OF 38						37.5	1	1				1	
MBGF-25	15 OF 38			12		30	612.5				612.5			1
MBGF-25A	15 OF 38						37.5	1					1	1
MBGF-26	15 OF 38			1		3	4.5				4.5			1
	16 OF 38			5		11	220.5		1		137.5	1		
MBGF-27	16 OF 38			11		29	586.0				586.0			1
	17 OF 38			1		4	51.5			1	51.5			
MBGF-28	16 OF 38			9		21	473.6		1		473.6	1		
	17 OF 38			1		4	51.4			1	51.4			
MBGF-29	17 OF 38			7		18	375.0		1	1	375.0	1		
MBGF-30	17 OF 38			9		24	462.5			1	462.5			1
MBGF-31	18 OF 38			1		2	23.3			1	23.3		1	
	19 OF 38			2		8	101.7				26.7	1		1
MBGF-32	20 OF 38			5		15	237.5		1	1	237.5	1		1

NOTES:

1. FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY SHEET FOR QUANTITIES.

4/1/2021

STATE OF TEXAS
JOSHUA L. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

US 90

SUMMARY OF METAL BEAM GUARD FENCE

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	177
CONT.	SECT.	JOB	
0024	08	141	

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SUMMARY OF METAL BEAM GUARD FENCE

SHEET	PLAN SHEET	104 6009 REMOVING CONC (RIPRAP) SY	104 6054 REMOVING CONCRETE (MOW STRIP) LF	132 6003 EMBANKMENT (FINAL) (ORD COMP) (TY B) CY	432 6001 RIPRAP (CONC) (4IN) CY	432 6045 RIPRAP (MOW STRIP) (4IN) CY	540 6001 MTL W-BEAM GD FEN (TIM POST) LF	540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM) EA	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION EA	540 6037 MTL BEAM GD FEN TRANS (ANCHOR PLATE) EA	542 6001 REMOVE METAL BEAM GUARD FENCE LF	542 6002 REMOVE TERMINAL ANCHOR SECTION EA	542 6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM) EA	544 6001 GUARDRAIL END TREATMENT (INSTALL) EA	544 6003 GUARDRAIL END TREATMENT (REMOVE) EA
MBGF-33	20 OF 38		223	4		11	162.5		1		162.5	2		1	
MBGF-34	21 OF 38	63		10	7	3	44.7		1		44.7	1			
	22 OF 38	245		22	27	12	205.3				205.3			1	1
MBGF-35	22 OF 38			5		14	237.5		1		237.5	1		1	1
MBGF-36	23 OF 38			4		9	185.3		1		185.3	1			
	24 OF 38			4		10	164.7				164.7			1	1
MBGF-37	24 OF 38			5		15	262.5		1		112.5	1		1	1
MBGF-38	24 OF 38			4		13	212.5		1		212.5	1		1	1
MBGF-39	24 OF 38			4		12	187.5		1		187.5	1		1	1
MBGF-40	24 OF 38			3		9	125.0		1		125.0	1		1	1
MBGF-41	25 OF 38			3		10	150.0		1		150.0	1		1	1
MBGF-42	25 OF 38			4		10	164.3				164.3			1	1
	26 OF 38			1		1	10.7		1		10.7	1		1	1
MBGF-43	26 OF 38			4		11	175.0		1		125.0	1		1	1
MBGF-44	26 OF 38			1		5	30.8				30.8			1	1
	27 OF 38			7		16	356.7		1		356.7	1			
MBGF-45	28 OF 38			8		19	387.5	2			387.5		2		
MBGF-46	28 OF 38			5		15	250.0	1			250.0		1	1	1
MBGF-47	29 OF 38			5		14	237.5		1		237.5	1		1	1
MBGF-48	29 OF 38			3		9	125.0		1		100.0	1		1	1
MBGF-49	30 OF 38			2		8	75.0	1			75.0		1	1	1
MBGF-50	30 OF 38			7		0	375.0		1		425.0	2		1	
MBGF-51	30 OF 38			1		0	25.0	1			25.0		1	1	
MBGF-52	30 OF 38			6		15	300.0	2			300.0		2		
MBGF-53	30 OF 38			2		7	95.7	1			95.7		1		
	31 OF 38			8		17	379.3	1			379.3		1		
MBGF-54	31 OF 38	138		32	15	5	25.0	1			25.0		1	1	1
MBGF-55	32 OF 38			3		10	150.0		1		150.0	1		1	1
MBGF-56	32 OF 38			0		3								1	1
	33 OF 38			4		8	162.5	1			162.5		1	1	1
MBGF-57	34 OF 38			11		24	550.0	2			550.0		2		
MBGF-58	34 OF 38			1		5	25.0	1			25.0		1	1	1
MBGF-59	34 OF 38			10		22	487.5	1	1		487.5	1	1		
MBGF-60	34 OF 38			7		19	362.5		1		362.5	1		1	1
MBGF-61	34 OF 38			6		17	307.5				307.5			1	1
	35 OF 38			9		22	480.0		1		480.0	1			
MBGF-62	35 OF 38	281		33	31	30	662.5	1	1		662.5	1	1		
MBGF-63	36 OF 38	122		22	13	22	396.3	1			396.3		1		
	37 OF 38			22		66	1182.6				291.2				1
	38 OF 38			11		34	546.1							1	
MAINLANES TOTAL		**1,818**	**273**	**709**	**195**	**1,206**	**24,003.0**	**21**	**47**	**10**	**21,399**	**56**	**24**	**53**	**42**

NOTES:

1. FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY SHEET FOR QUANTITIES.

7/28/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SUMMARY OF METAL BEAM GUARD FENCE

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	178
CONT.	SECT.	JOB	
0024	08	141	

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SUMMARY OF METAL BEAM GUARD FENCE

SHEET	PLAN SHEET	104 6009 REMOVING CONC (RIPRAP)	104 6054 REMOVING CONCRETE (MOW STRIP)	132 6003 EMBANKMENT (FINAL) (ORD COMP) (TY B)	432 6001 RIPRAP (CONC) (4IN)	432 6045 RIPRAP (MOW STRIP) (4IN)	540 6001 MTL W-BEAM GD FEN (TIM POST)	540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION	540 6037 MTL BEAM GD FEN TRANS (ANCHOR PLATE)	542 6001 REMOVE METAL BEAM GUARD FENCE	542 6002 REMOVE TERMINAL ANCHOR SECTION	542 6004 RM MTL BM GD FENCE TRANS (THRIE-BEAM)	544 6001 GUARDRAIL END TREATMENT (INSTALL)
		SY	LF	CY	CY	CY	LF	EA	EA	EA	LF	EA	EA	EA
FRONTAGE ROADS					0.0	0.0								
MBGF-FR1	2 OF 6			1		5	25.0		1		25.0	2		1
MBGF-FR2	2 OF 6			4		13	187.5		1		125.0	1		1
MBGF-FR3	2 OF 6			4		11	162.5		1		125.0	1		1
MBGF-FR4	2 OF 6			1		6	50.0		1		50.0	1		1
MBGF-FR5	2 OF 6			4		10	212.5		1		175.0	1		
	3 OF 6			1		5	37.5				75.0	1		1
MBGF-FR6	3 OF 6			4		11	175.0		1		150.0	1		1
MBGF-FR7	4 OF 6			1		5	25.0	1						1
MBGF-FR8	4 OF 6			1		5	25.0	1						1
MBGF-FR9	4 OF 6			1		1	12.5		1					
	5 OF 6	152		20	11	22	412.5				200.0	1		1
MBGF-FR10	6 OF 6			7		19	325.0		1		300.0	1		1
FRONTAGE ROADS TOTAL		**152**	**0**	**49**	**11**	**113**	**1,650.0**	**2**	**8**	**0**	**1,225**	**10**	**0**	**10**
GENERAL MCMULLEN					0	0								
MBGF-GM1	1 OF 2			4		11	175.0		1		175.0	1		1
MBGF-GM2	1 OF 2			3		9	125.0		1		125.0	2		1
MBGF-GM3	1 OF 2			6		14	287.5	1	1		287.5	1		
MBGF-GM4	1 OF 2			9		22	462.5	1	1		462.5	1		
MBGF-GM5	1 OF 2			9		23	450.0		1		450.0	1		1
MBGF-GM6	1 OF 2			4		11	175.0		1		175.0	2		1
MBGF-GM7	1 OF 2			4		12	200.0	1	1		200.0	1	1	
MBGF-GM8	1 OF 2			4		11	200.0	1	1		200.0	1	1	
MBGF-GM9	1 OF 2			7		18	325.0		1		325.0	1		1
MBGF-GM10	1 OF 2			5		14	250.0		1		75.0	2		1
MBGF-GM11	2 OF 2			10		27	537.5	2			537.5		2	
MBGF-GM12	2 OF 2			11		25	575.0	2			575.0		2	
MBGF-GM13	2 OF 2			4		10	162.5		1		75.0	1		1
MBGF-GM14	2 OF 2			4		12	212.5		1		50.0	1		1
MBGF-GM15	2 OF 2			4		12	200.0		1		25.0	2		1
MBGF-GM16	2 OF 2			5		13	225.0		1		25.0	2		1
MBGF-GM17	2 OF 2			3		7	150.0	1			150.0	1	1	1
MBGF-GM18	2 OF 2			2		10	87.5	1			87.5	1	1	1
MBGF-GM19	2 OF 2			5		13	225.0		1		50.0	2		1
MBGF-GM20	2 OF 2			5		13	225.0		1		50.0	2		1
MBGF-GM21	2 OF 2			4		11	187.5		1		187.5	2		1
MBGF-GM22	2 OF 2			2		6	75.0		1		75.0	1		1
MBGF-GM23	2 OF 2			2		6	75.0		1		75.0	1		1
MBGF-GM24	2 OF 2	52		12	4	14	275.0	1	1		275.0	1	1	
MBGF-GM25	2 OF 2			1		2	12.5	1	1		12.5	1	1	
GENERAL MCMULLEN TOTAL		**52**	**0**	**129**	**4**	**326**	**5,875.0**	**12**	**21**	**0**	**4,725.0**	**31**	**10**	**17**
PROJECT TOTAL		**2,022**	**273**	**871**	**138**	**1,599**	**30,090.5**	**35**	**76**	**10**	**27,349.0**	**97**	**34**	**81**

NOTES:

1. FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY SHEET FOR QUANTITIES.

4/1/2021

JOSHUA A. RODRIGUEZ 127267 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SUMMARY OF METAL BEAM GUARD FENCE

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	179
CONT.	SECT.	JOB	
0024	08	141	

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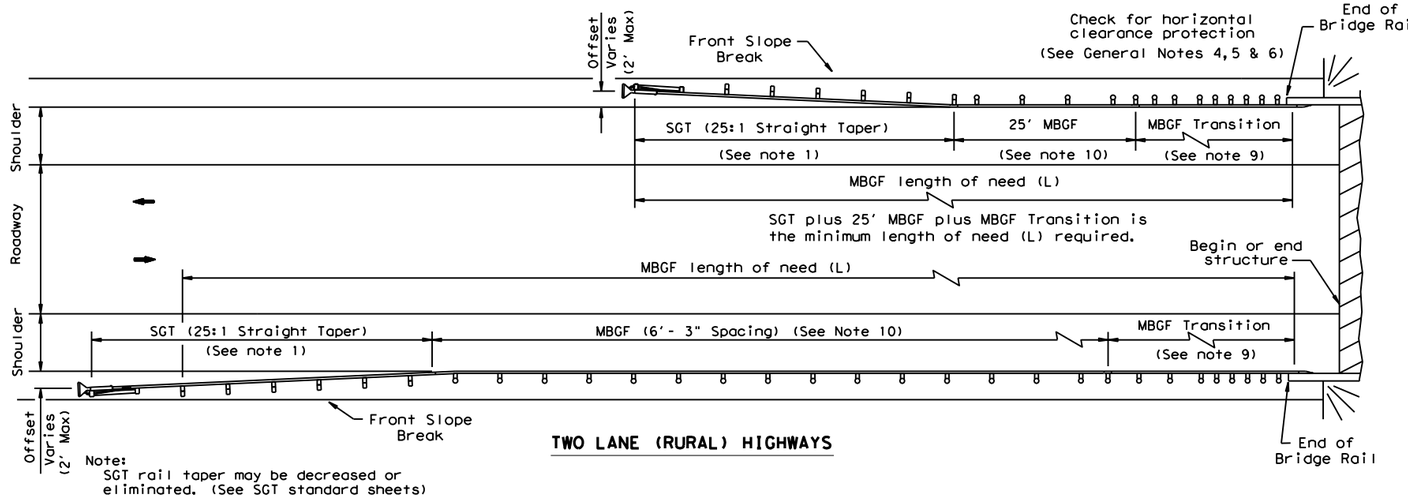
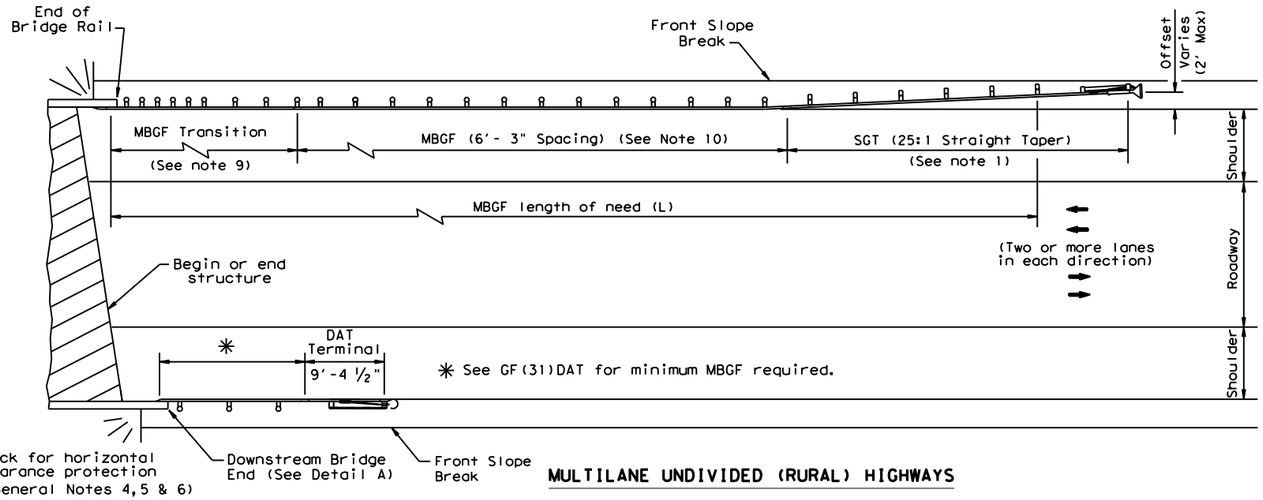
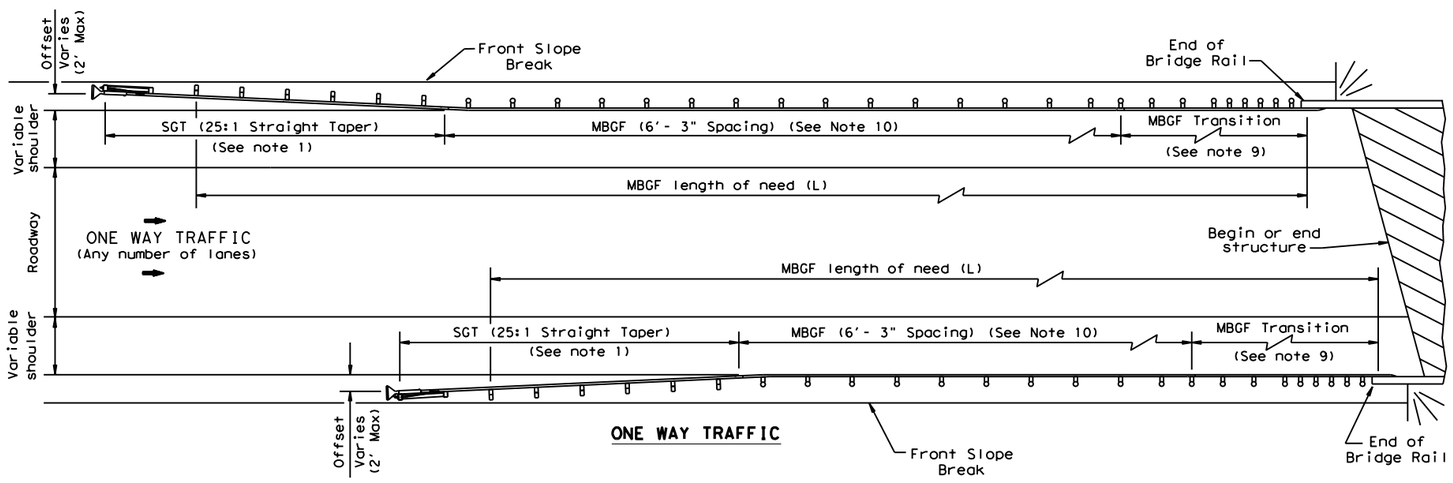


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



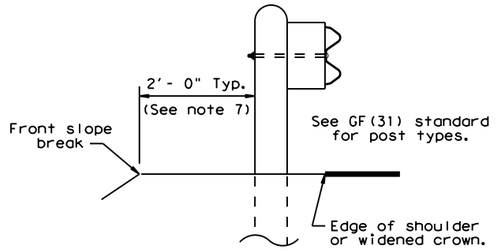
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. <u>For restrictive bridge widths:</u> The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF

Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation — Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
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REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		180

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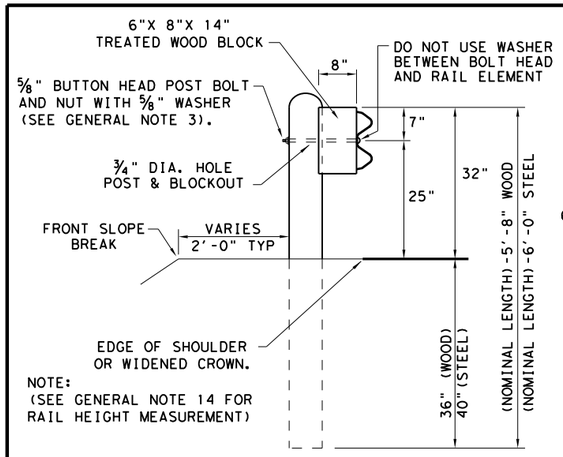
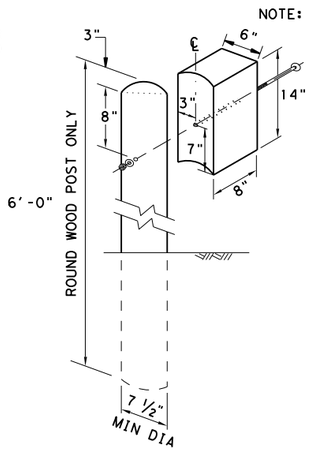
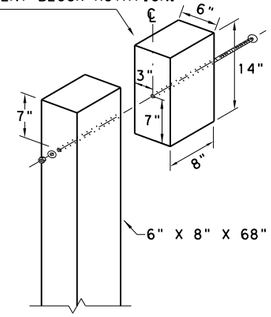


TYPICAL POST PLACEMENT

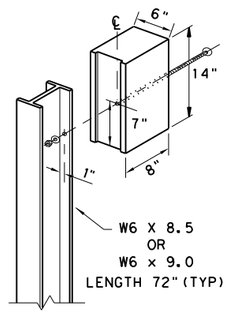


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

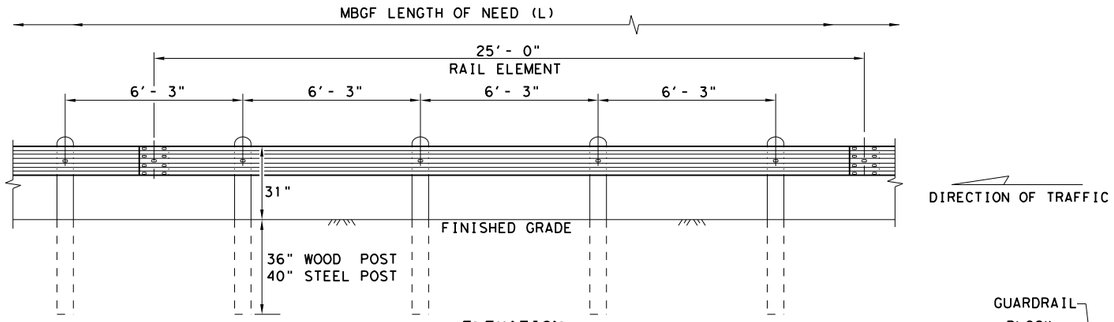


WOOD BLOCK TO RECTANGULAR WOOD POST



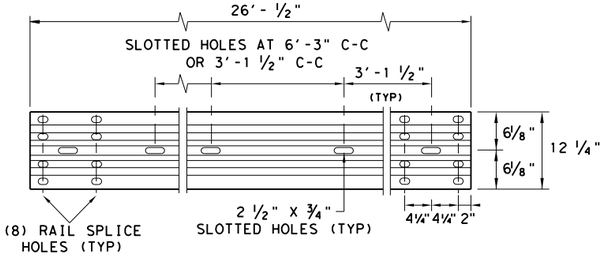
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

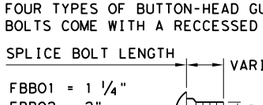
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

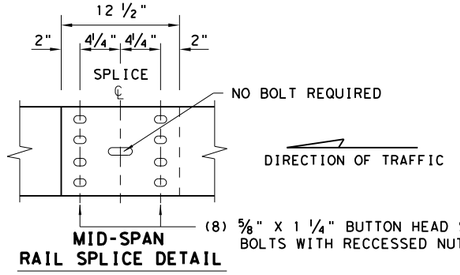
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



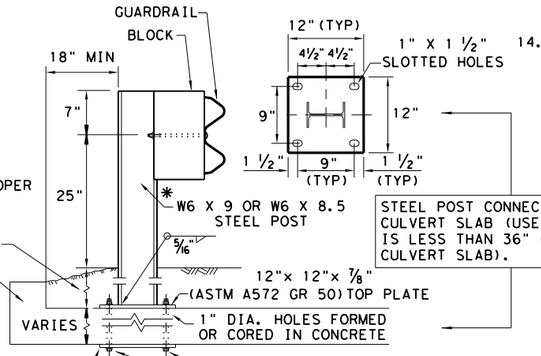
BUTTON HEAD BOLT

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.



12" X 12" X ¼"(ASTM A36) STEEL BOTTOM PLATE WITH 1" DIA. HOLES REQUIRED WITH BOLT-THROUGH INSTALLATION.

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. ⅞" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 ¼" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE ⅞" 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 ¼" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

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 ½" 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 ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. 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.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		181

DATE: 4/1/2021
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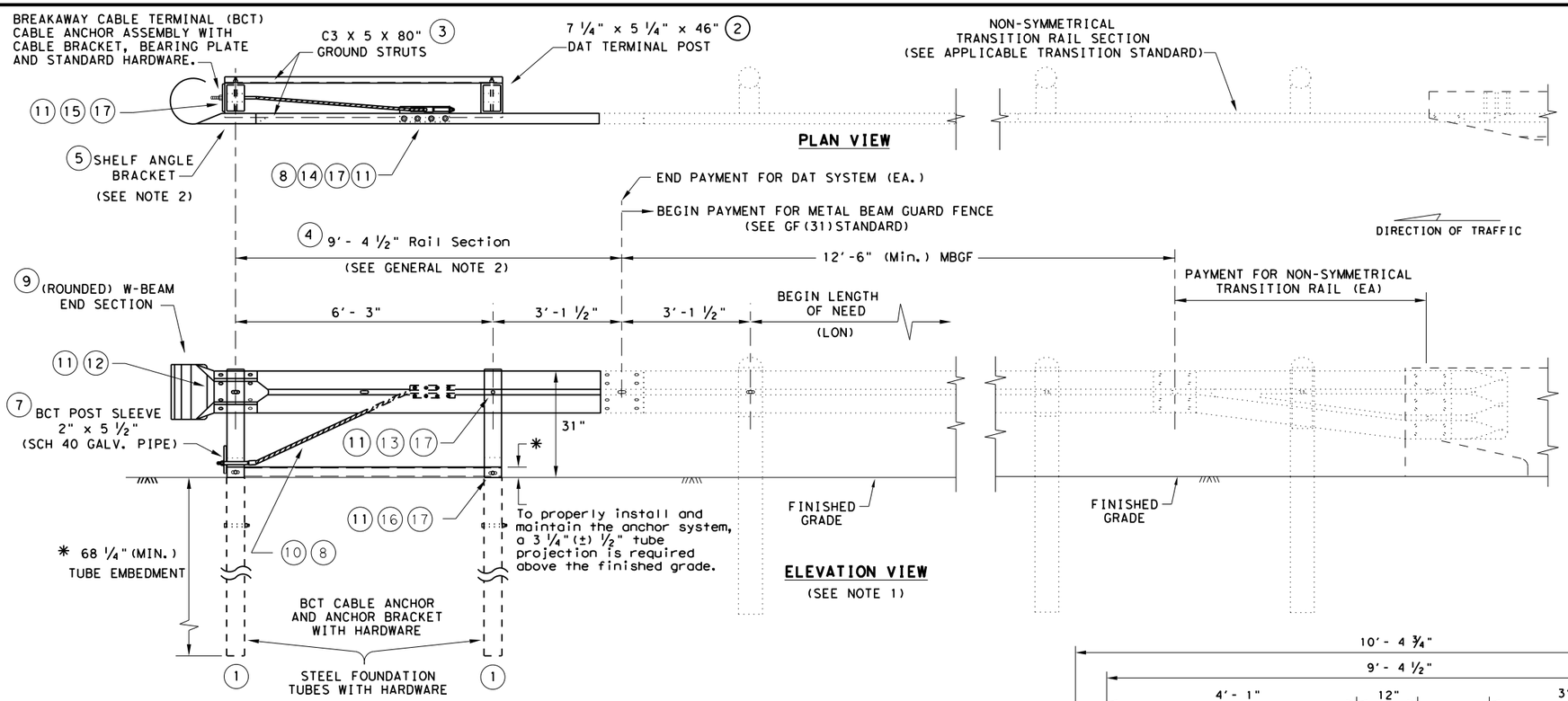


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

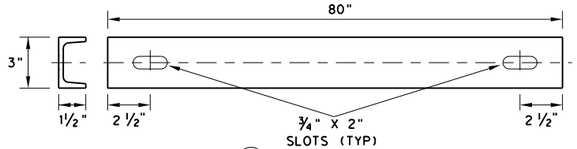
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

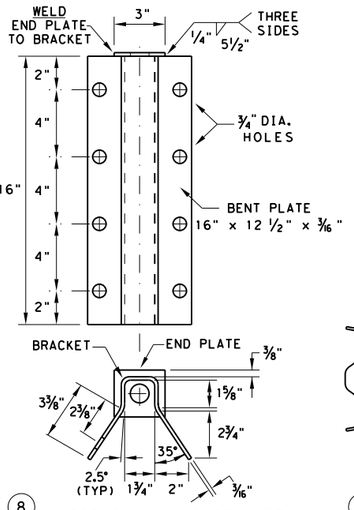
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

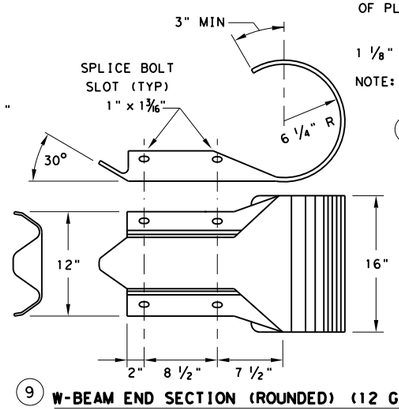
(4) TERMINAL RAIL ELEMENT FOR DAT



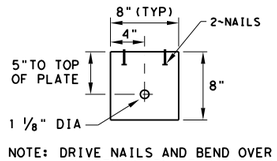
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

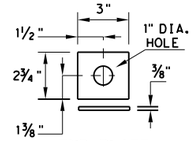


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

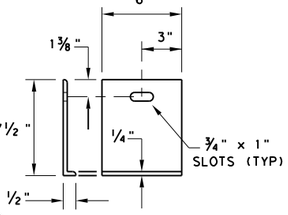


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

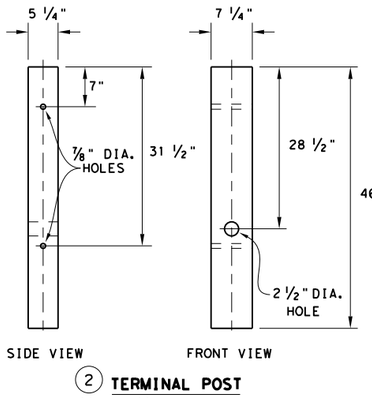
(6) BEARING PLATE
8"x 8"x 5/8" R



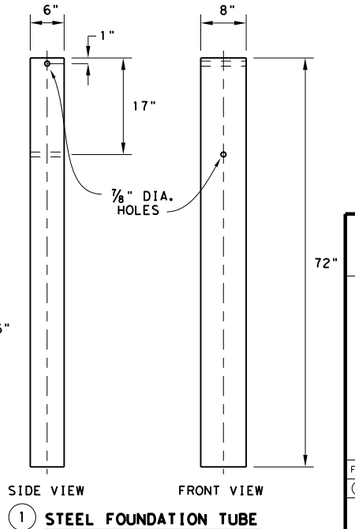
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

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©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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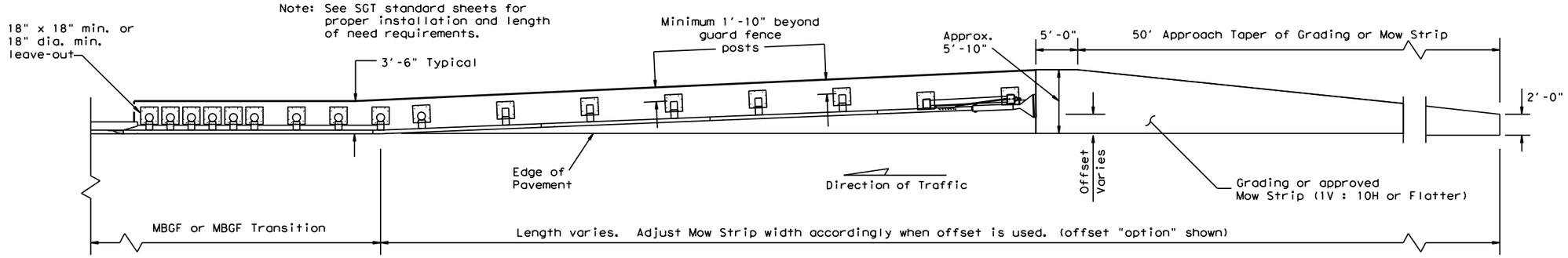
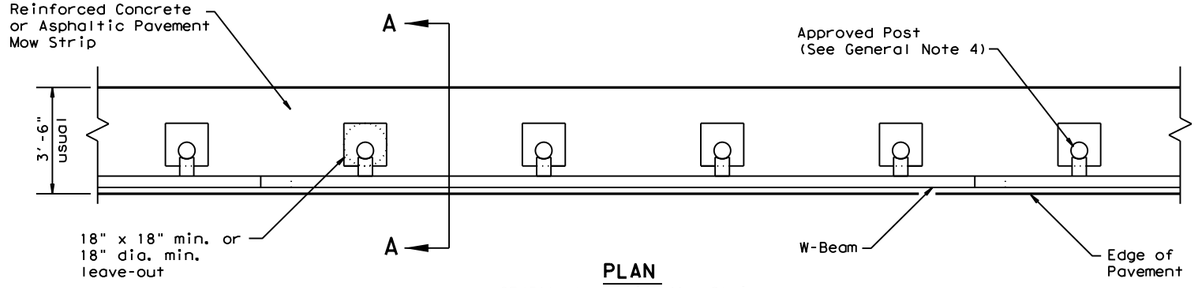
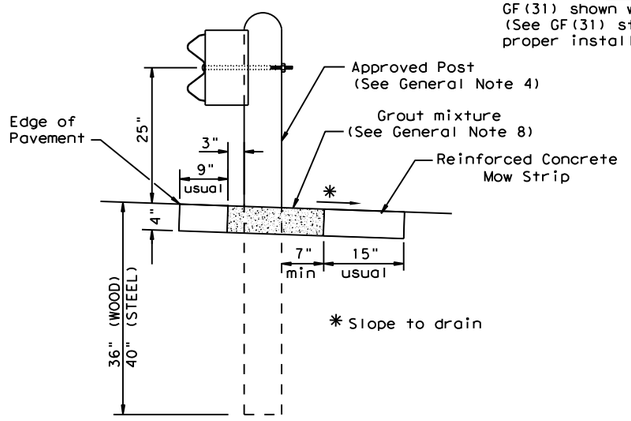


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



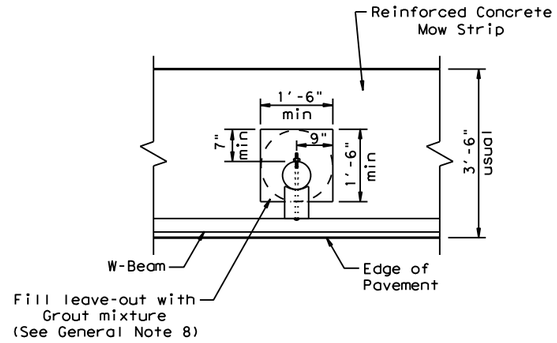
PLAN

GF(31) shown with Mow Strip
(See GF(31) standard sheet for proper installation)



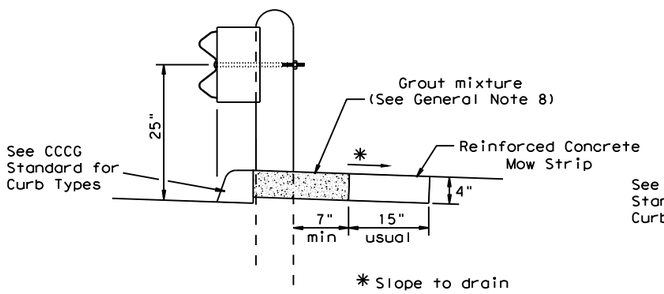
SECTION A-A

Typical



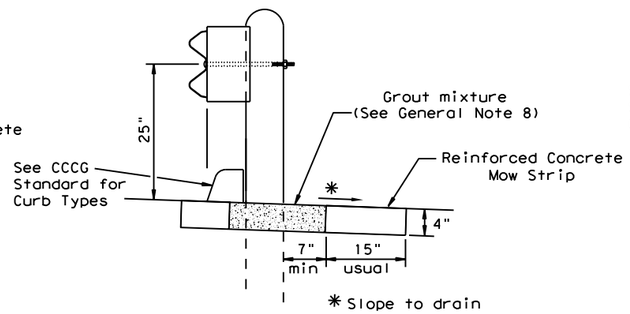
MOW STRIP DETAIL

Reinforced Concrete Mow Strip
with 18" x 18" Square or
18" Dia. minimum leave-out.



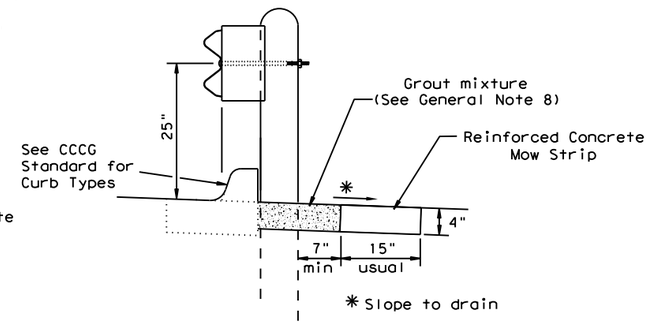
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

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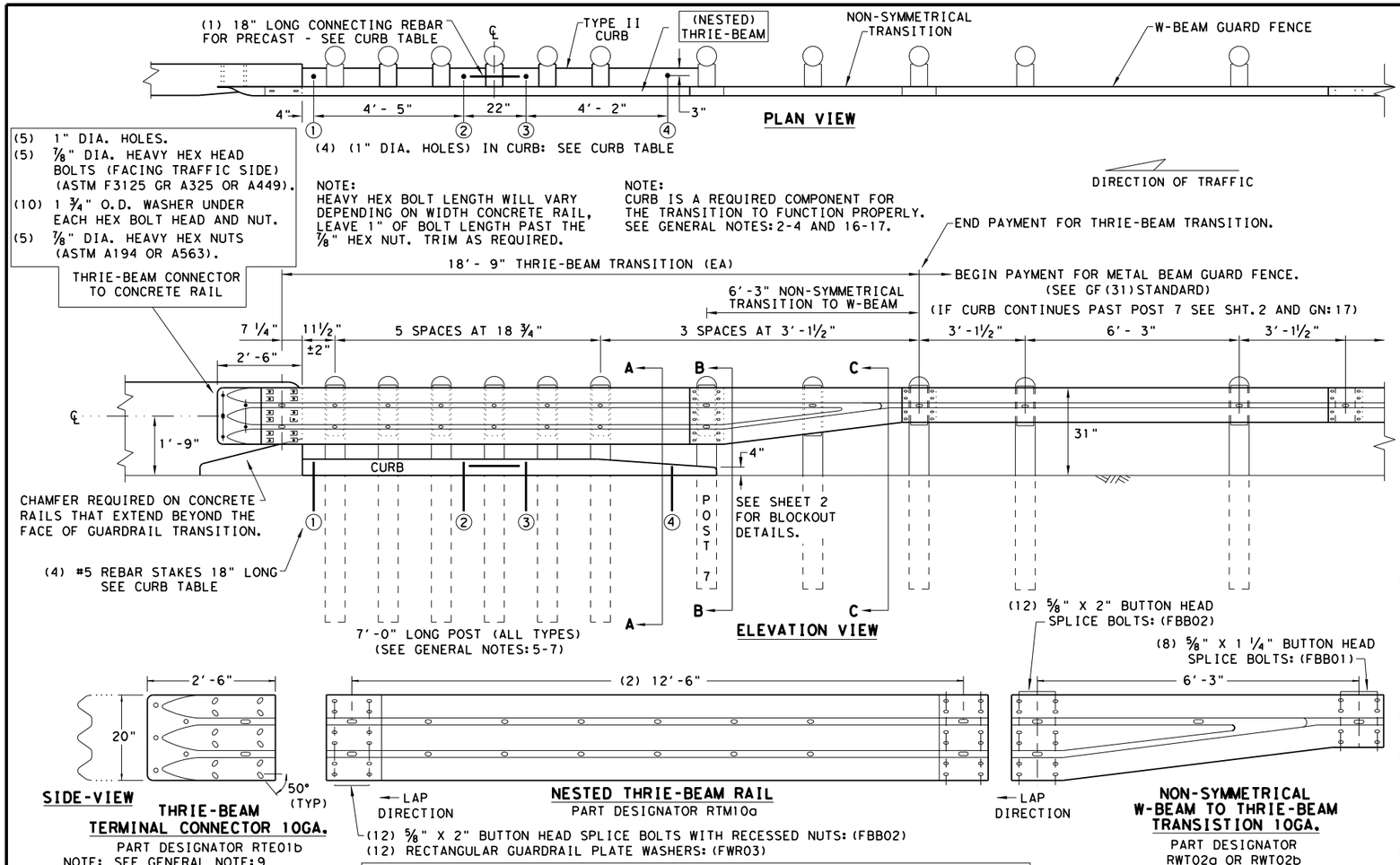
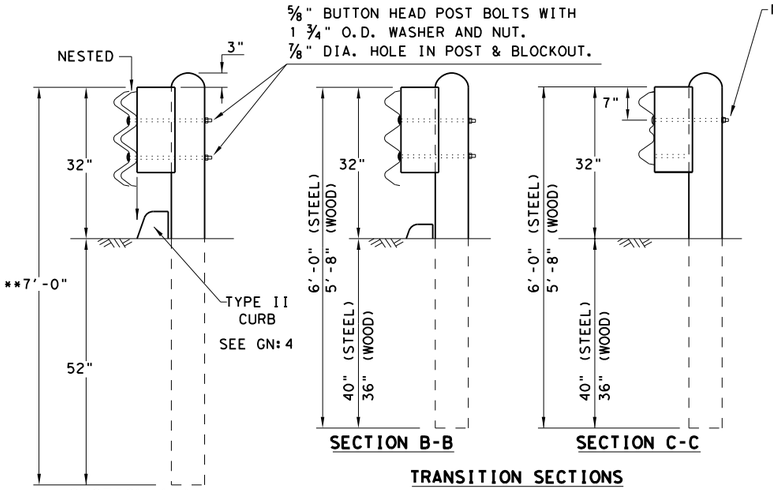
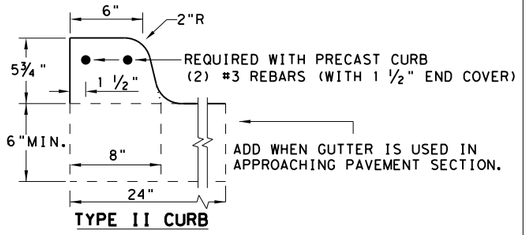




THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB 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 ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

* 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.

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. 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- ¾" HEIGHT); SEE CURRENT CCCG 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.
3. 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.
4. 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.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. 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.
7. 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 ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. 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.
10. 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 ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. 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.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. 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.
17. 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

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

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	SAT	BEXAR		184

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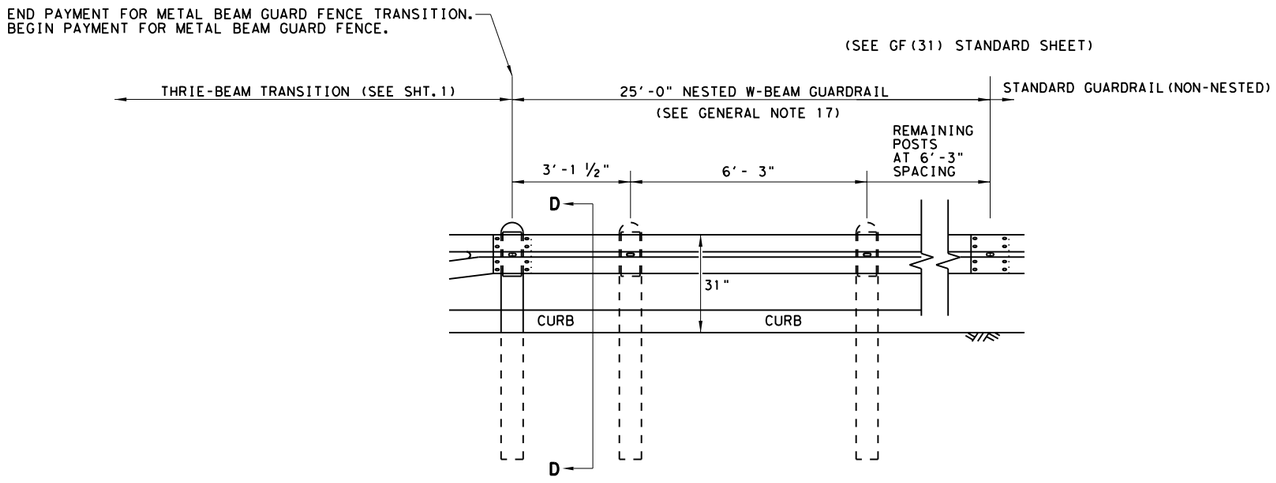
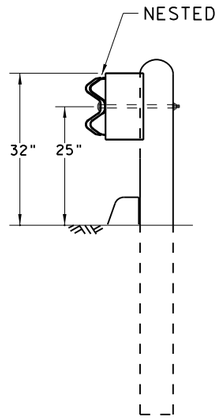
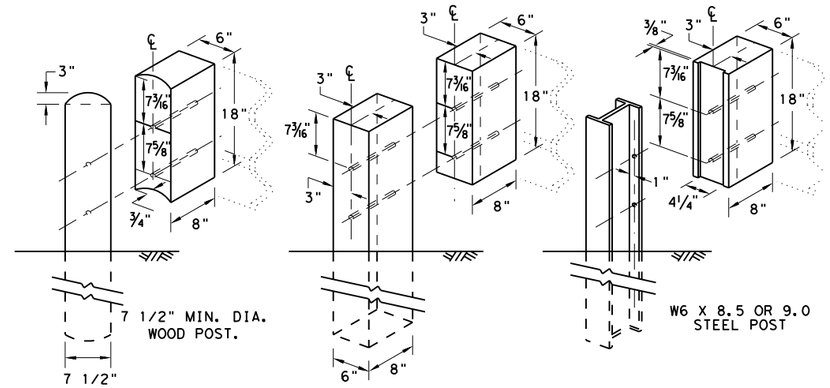
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT

GF(31)TR TL3-20

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	SAT	BEXAR		185

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NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANCHOR PADDLE PN: 15204A

ANGLE STRUT PN: 15202G

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(1) POST(0)

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

BEGIN LENGTH OF NEED

PLAN VIEW

TRAFFIC FLOW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT (1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT (2) 1½" X 6'-9 ⅝"

SoftStop FACE SEE GN(3) & NOTE: B

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

SEE NOTE: C

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE: A

POST 32" HEIGHT

31" RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

31" RAIL HEIGHT

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

SEE DETAIL 3

6'-1 3/8"

(8) ⅝"x 1-¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

(8) ⅝"x 1-¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(2) 6'-0" (SYTP) PN: 15000G POST(1) 4'-9 ½" SYTP PN: 15203G POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"x 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

B B A A

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

NOTE: DO NOT BOLT ANCHOR RAIL TO POST(2)

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

(1) ⅝" X 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" X 1-½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" X 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR. DH PN: 3245G

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE: A

(2) ¾" X 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

6'-1 3/8" POST DEPTH

(2) ANCHOR POST ANGLE PN: 15201G

DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15) I-BEAM POST PN: 15205A

TRAFFIC FLOW

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

LINE POST (3, 4, 5, 6, 7 & 8)

SECTION VIEW B-B

6'-0" (W6 X 8.5) I-BEAM POST PN: 533G

6" X 8" X 14" BLOCKOUT WOOD

W-BEAM RAIL 25'-0"

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

POST(2)

SECTION VIEW A-A

6'-0" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

POST 17"- ½" HEIGHT

4'-9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5) (SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

2'-0"

STANDARD MBGF

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" 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 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
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 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" 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	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR. DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR. DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP	
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0024	08	141	US 90	
	DIST	COUNTY		SHEET NO.	
	SAT	BEXAR		186	

DATE: 4/1/2021
FILE: c:\pwworking\khd\pwprod\nicole.smale\dms46104\sgt11s3118.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

INSTALLATION LENGTH 55'- ½"

49'-8 ⅝"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 ⅞"

RAIL HEIGHT 31"

ARROWS

DETAIL (D)

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

RAIL HEIGHT 31"

HEAD HEIGHT

DETAIL (B)

32-¼"

68-⅛"

FINISHED GRADE

CABLES

FINISHED GRADE

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1

ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

SOIL
ANCHOR POST
ITEM (1)

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

HEAD HEIGHT 32-¼"

TOP OF POST

31-⅞"

FINISHED GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 ⅝"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)

ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. 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.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. 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.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. 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	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	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

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

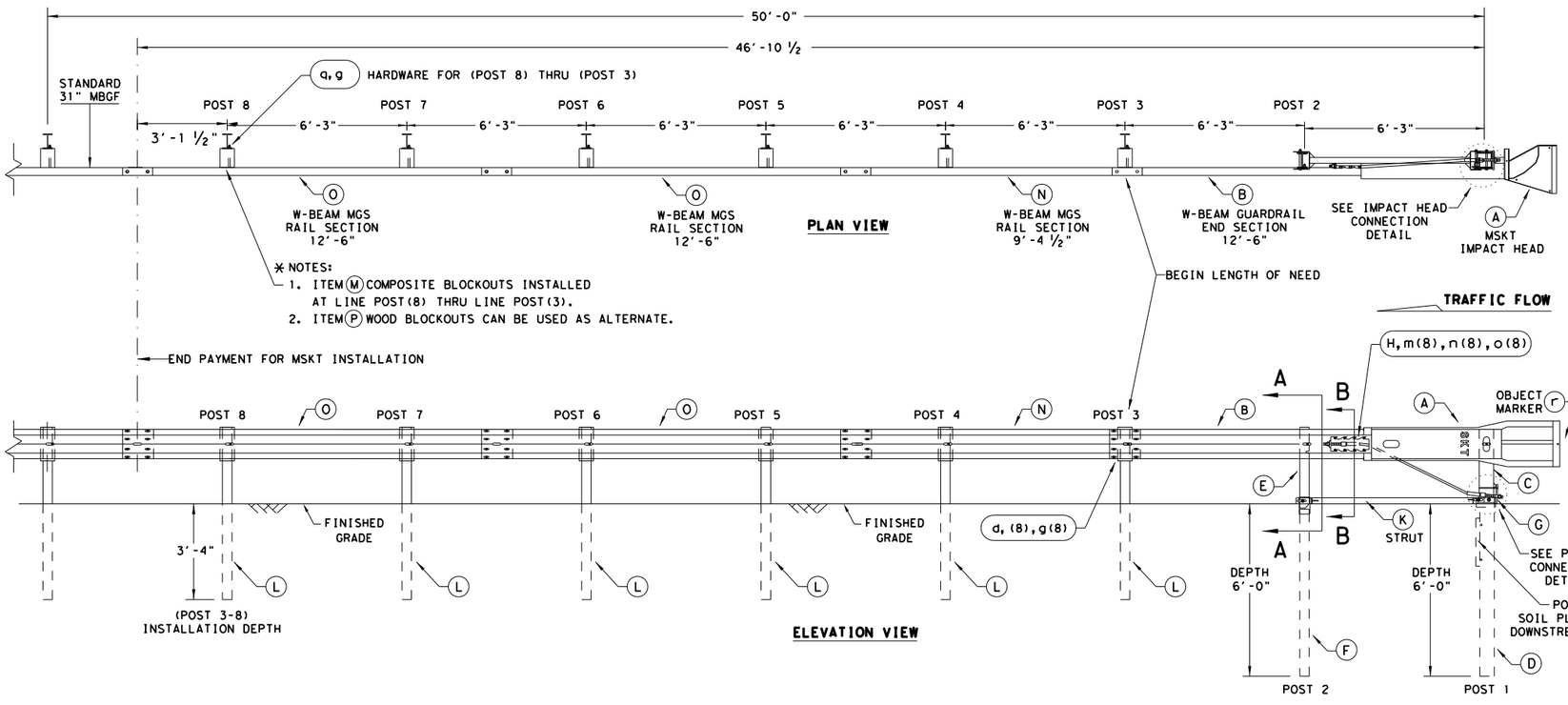
Texas Department of Transportation

Design Division Standard

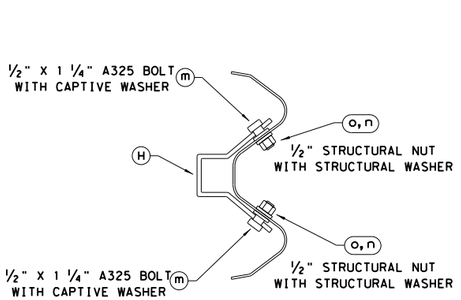
MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

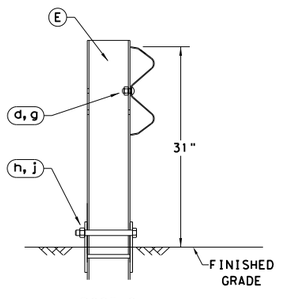
FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		187

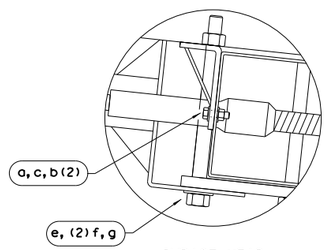
DATE: 4/1/2021
FILE: c:\pwworking\kha\pwprod\nicole.smale\dms46104\sgt12s3118.dgn

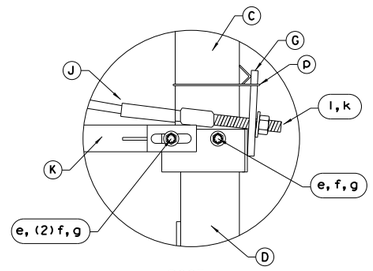


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.









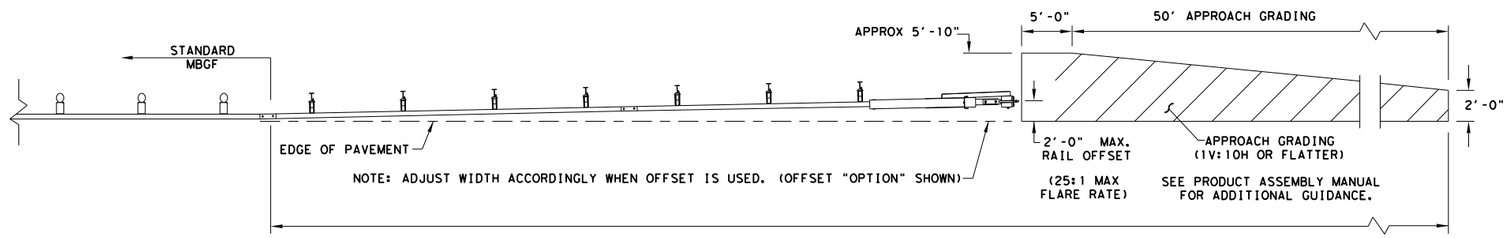
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" 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 ½")	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	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x ⅜" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL



NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		188

DATE: 4/1/2021
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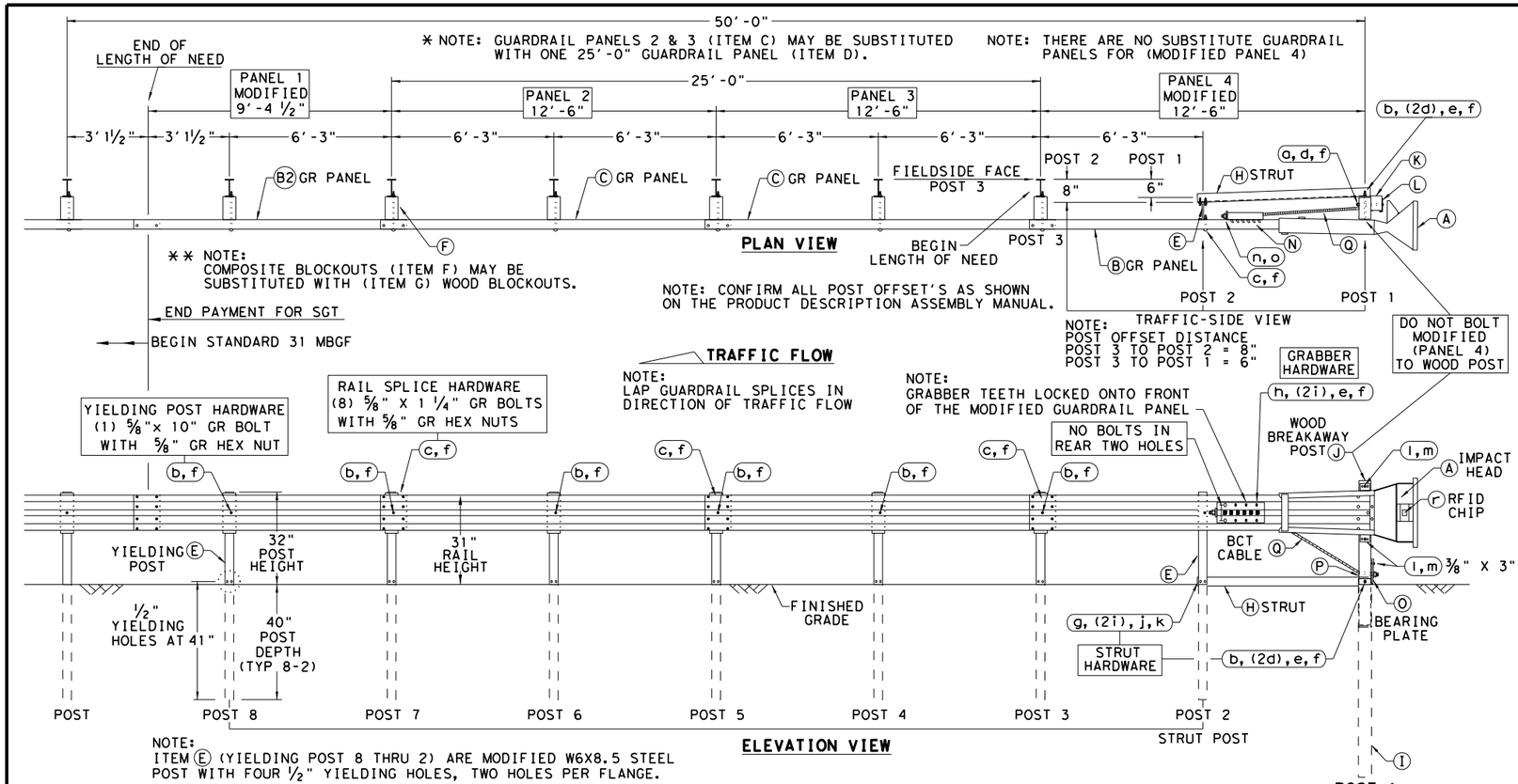
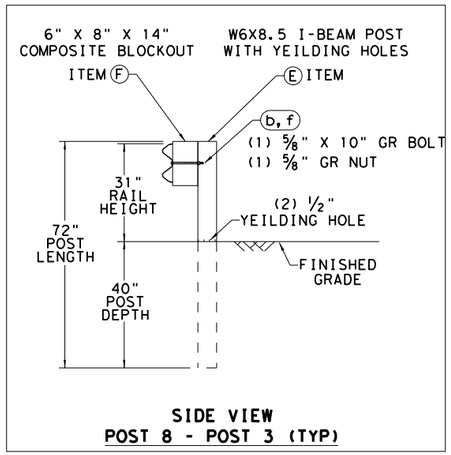


GENERAL NOTES

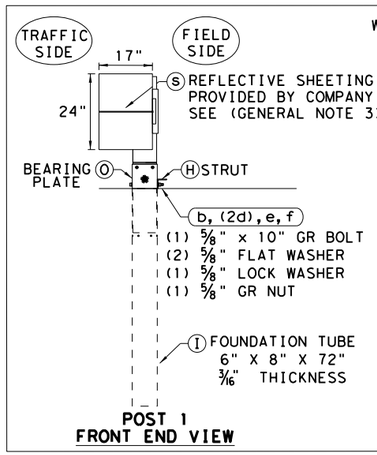
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. 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.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. 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.
11. 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"	WBO8
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 A563DH HDG	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

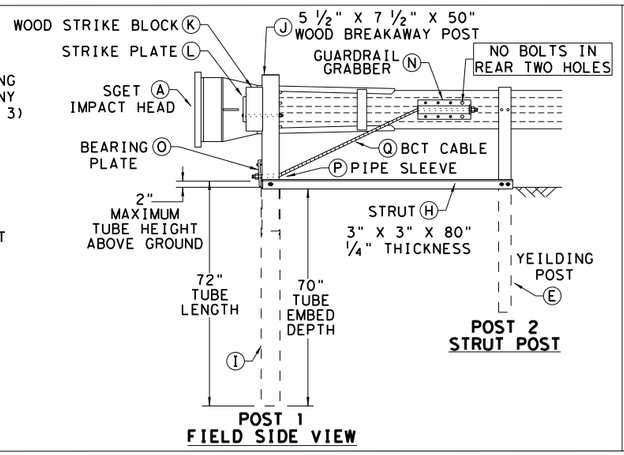
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



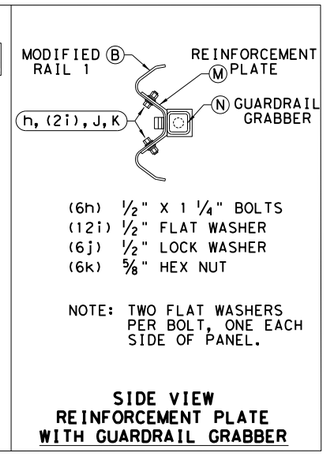
SIDE VIEW
POST 8 - POST 3 (TYP)



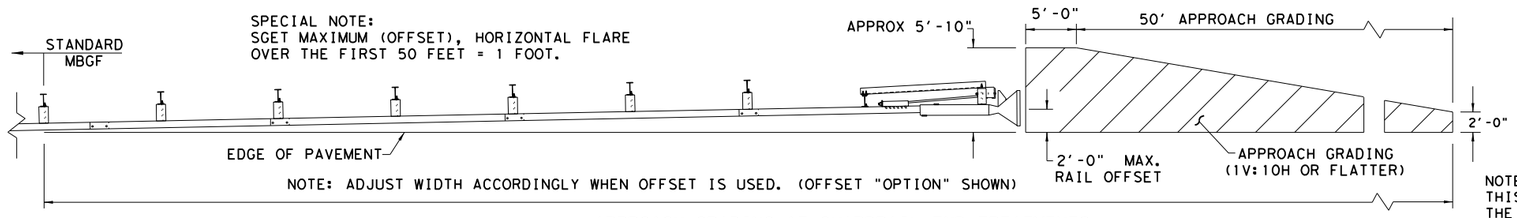
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation
Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

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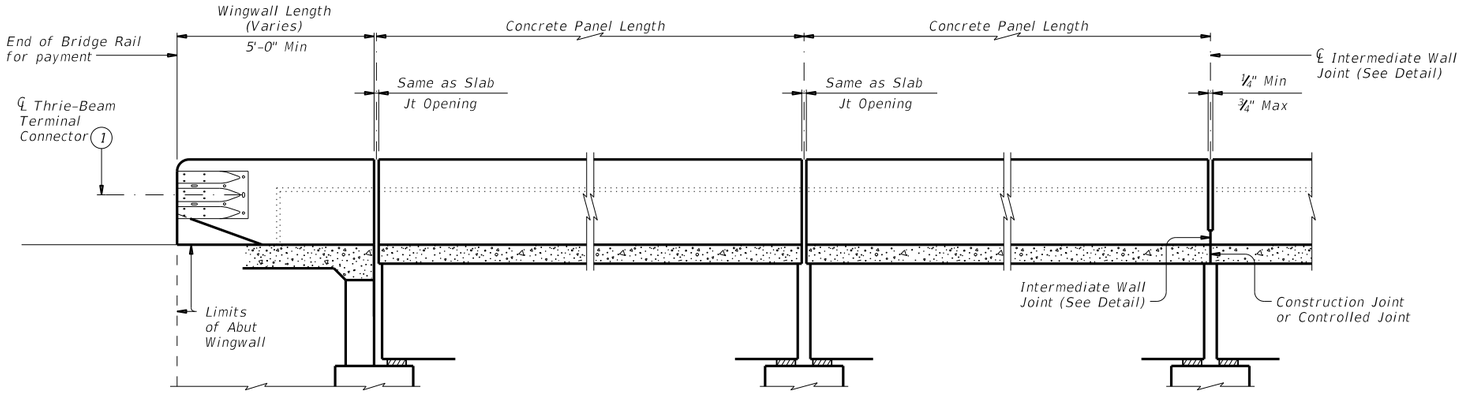
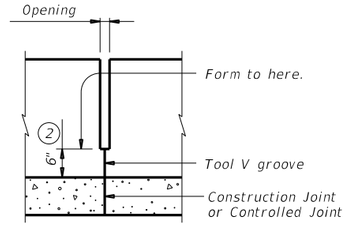


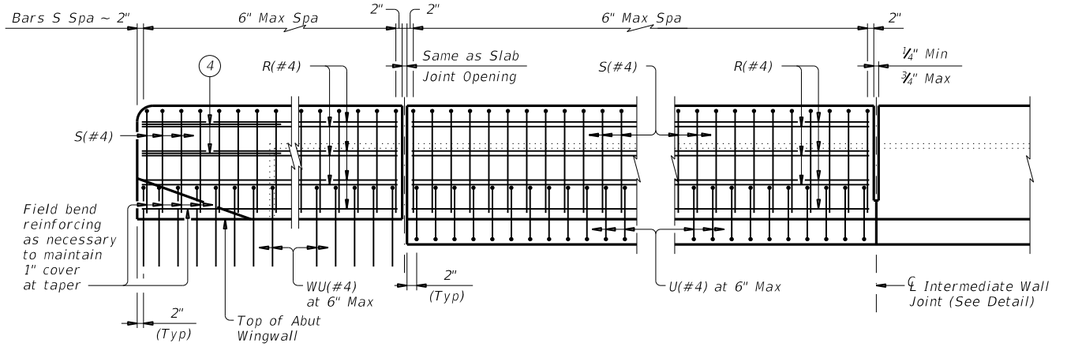
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

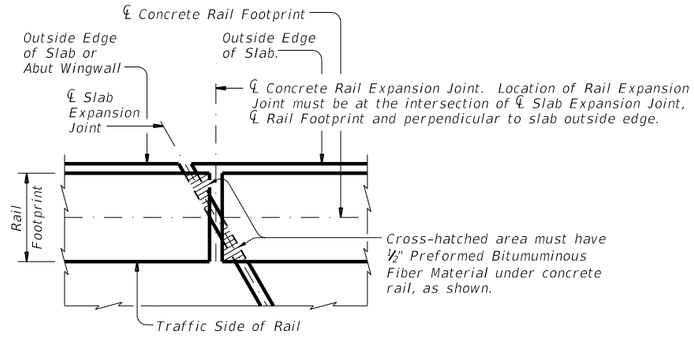


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



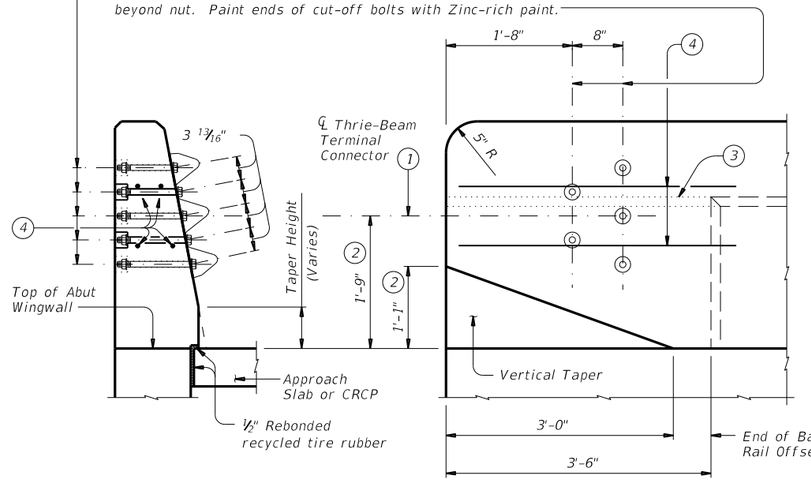
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Increase 2" for structures with Overlay.
3. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR

FILE: rlstd014-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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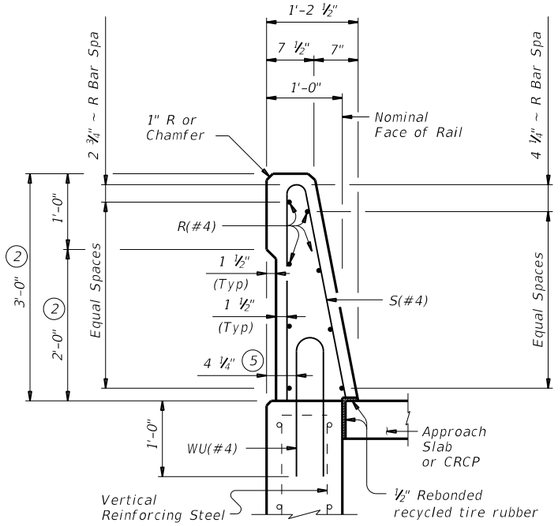
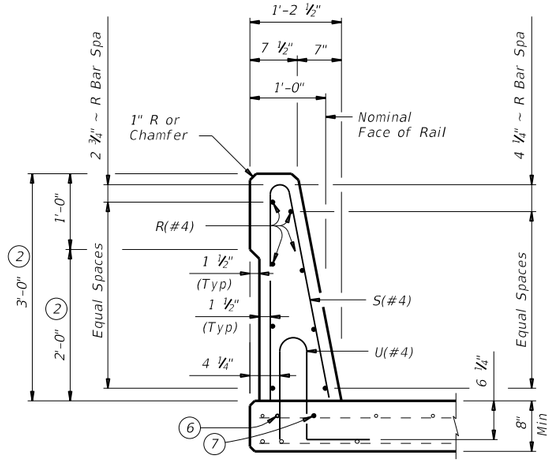
	SAT	BEXAR		190



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL

(2) Increase 2" for structures with Overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) No longitudinal wires may be within upper bend.

(9) Bend or cut as required to clear drain slots.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greator to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #4 = 1'-7"

Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

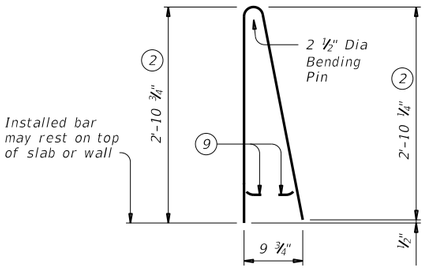
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

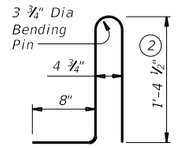
Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

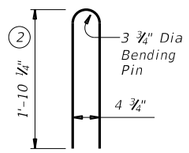
Reinforcing bar dimensions shown are out-to-out of bar.



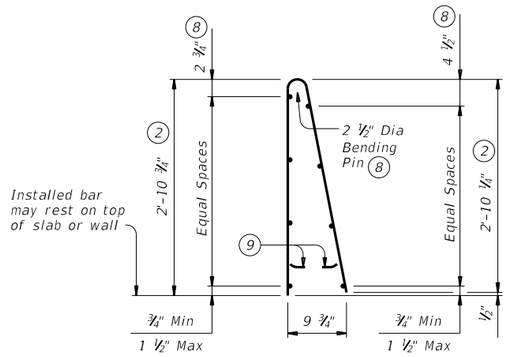
BARS S (#4)



BARS U (#4)

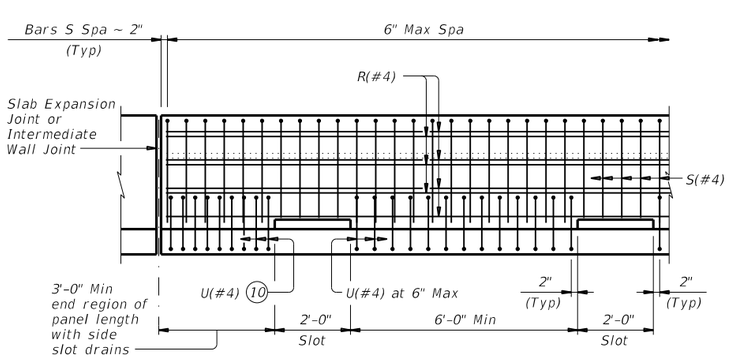


BARS WU (#4)



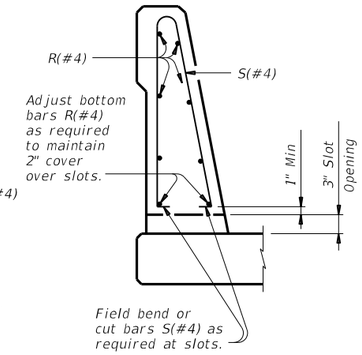
OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU OPTIONAL SIDE SLOT DRAIN

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR

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		DIST	COUNTY		SHEET NO.
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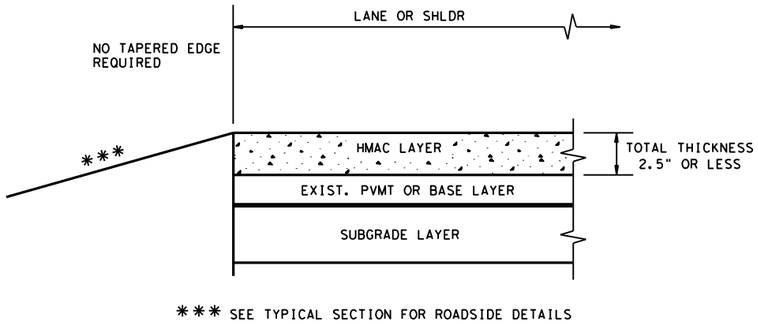
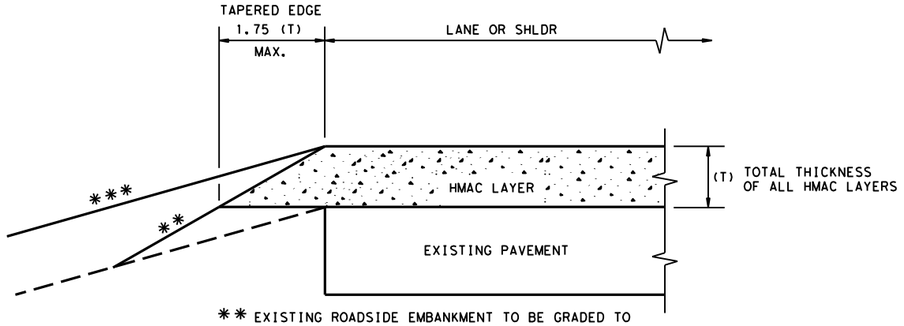


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

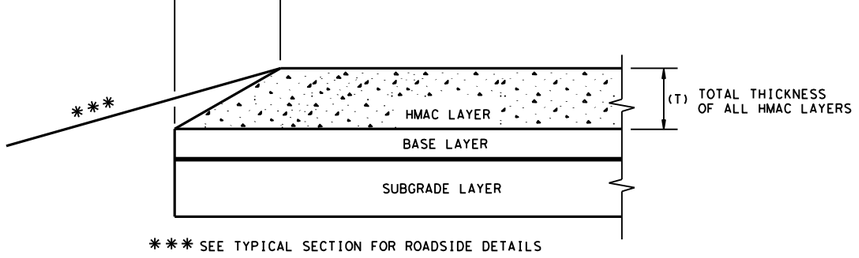
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

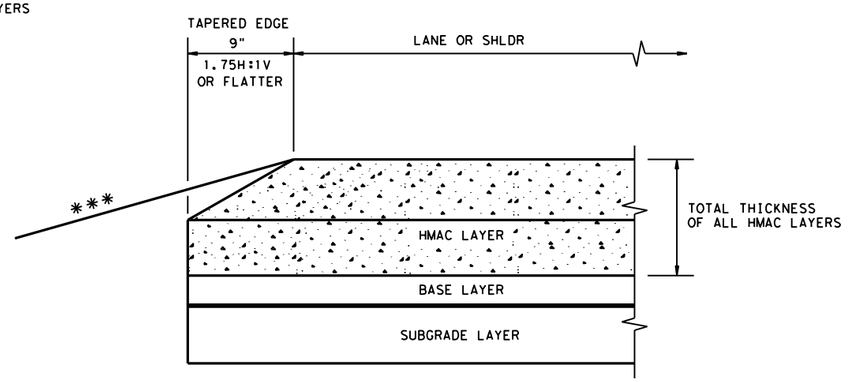
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		192

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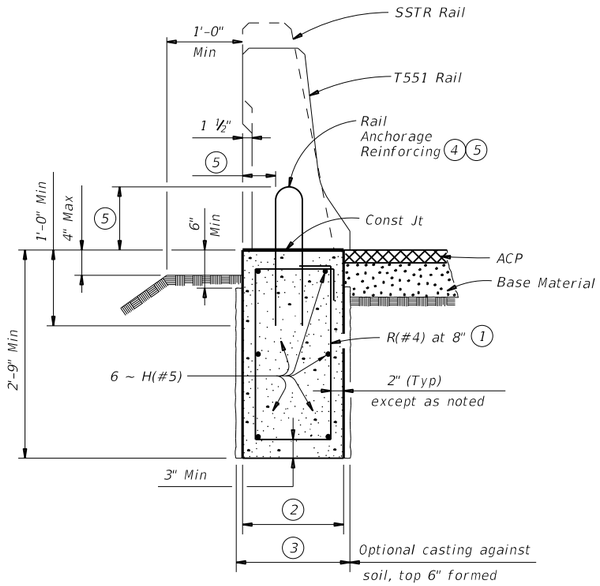
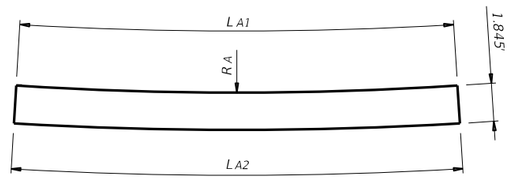


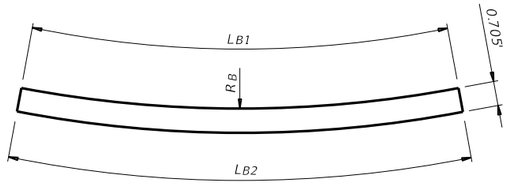
TRAFFIC RAIL FOUNDATION

(Showing T551 & SSTR Rails, other Bridge Rails similar)



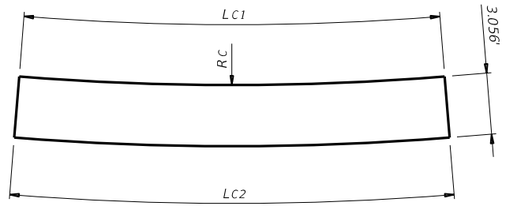
DEVELOPED SURFACE-A

(T551 Type Rail)



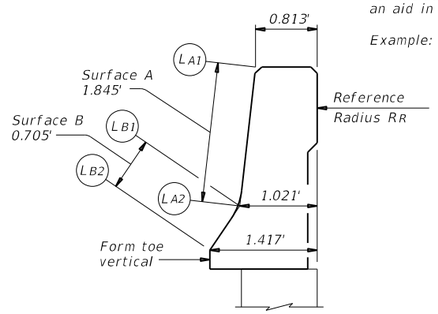
DEVELOPED SURFACE-B

(T551 Type Rail)



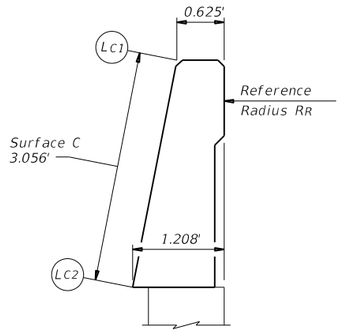
DEVELOPED SURFACE-C

(SSTR Rail)



SECTION A-A

(T551 Type Rails)



SECTION A-A

(SSTR Rail)

(1) Stirrup hook length is 5". (Typ)

(2) 1'-4" for Bridge Rail Types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
Approximate Footing Concrete = 0.14 CY/LF and Reinforcement = 11.5 LB/LF.

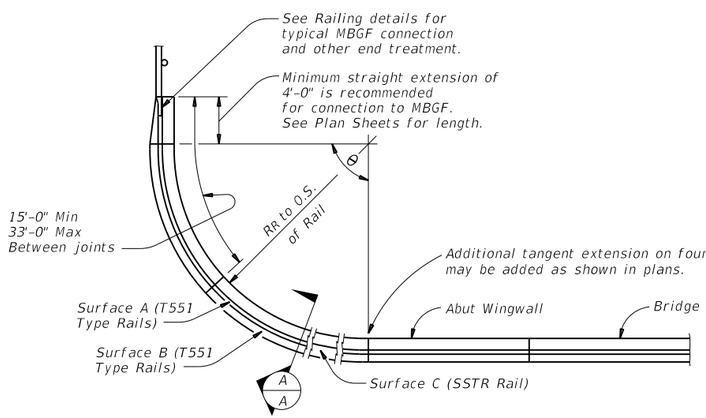
1'-7" for Bridge Rail Types: T224, C412, T66, C66, T80HT and T80SS.
Approximate Footing Concrete = 0.16 CY/LF and Reinforcement = 12.0 LB/LF.

(3) 1'-6" for Bridge Rail Types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

1'-9" for Bridge Rail Types: T224, C412, T66, C66, T80HT and T80SS.

(4) Modify reinforcement on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically, into traffic rail foundation.

(5) See applicable bridge rail standard.



CURVED T551 & SSTR TYPE RAILING AT BRIDGE ENDS

TABLE OF DEVELOPED SURFACES

DIMENSIONS FOR θ = 90°

Reference Radius RR (ft) to back of Rail	T551 TYPE RAILS						SSTR RAIL		
	Radius	Arc Length		Radius	Arc Length		Radius	Arc Length	
	RA ft	LA1 ft	LA2 ft	RB ft	LB1 ft	LB2 ft	RC ft	LC1 ft	LC2 ft
10	95.76	16.99	17.31	19.63	17.31	17.93	55.66	16.69	17.61
15	140.04	24.84	25.17	28.54	25.17	25.79	81.86	24.54	25.46
20	184.32	32.69	33.02	37.44	33.02	33.64	108.05	32.40	33.31
25	228.60	40.55	40.87	46.35	40.87	41.50	134.25	40.25	41.17
30	272.88	48.40	48.73	55.25	48.73	49.35	160.44	48.11	49.02

$R_A = 8.8560(R_R + 0.813')$ $R_B = 1.7811(R_R + 1.021')$ $R_C = 5.2389(R_R + 0.625')$

$L_{A1} = 1.5708(R_R + 0.813')$ $L_{B1} = 1.5708(R_R + 1.021')$ $L_{C1} = 1.5708(R_R + 0.625')$

$L_{A2} = 1.5708(R_R + 1.021')$ $L_{B2} = 1.5708(R_R + 1.417')$ $L_{C2} = 1.5708(R_R + 1.208')$

The linear ratio may be used to obtain the above arc length dimensions for included θ angles other than 90°. The dimensions are intended as an aid in constructing forms for curved SSTR & Type T551 Railing.

Example: For R_R = 10' & 80° ~ L_{A1} = 16.99($^8/_9$)

DESIGN GUIDANCE:
The use of curved rail sections at bridge ends must be appropriate for the speed and site conditions.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars H and R unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

The foundations indicated are suitable for mounting typical concrete bridge barrier type railings. The design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper foundations.

See Railing standards for details not shown.

The primary use of the curved railing detail is to avoid the necessity of curved MBGF at the ends of bridges adjacent to grade intersections.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for railing foundations will be by CY of Class "C" or Class "C" (HPC) concrete.

Reinforcing steel quantities shown are for contractor's information only.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATION AND MISCELLANEOUS DETAILS

TRF

FILE: rlstd027-19.dgn	DN: TxDOT	CK: MPM	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
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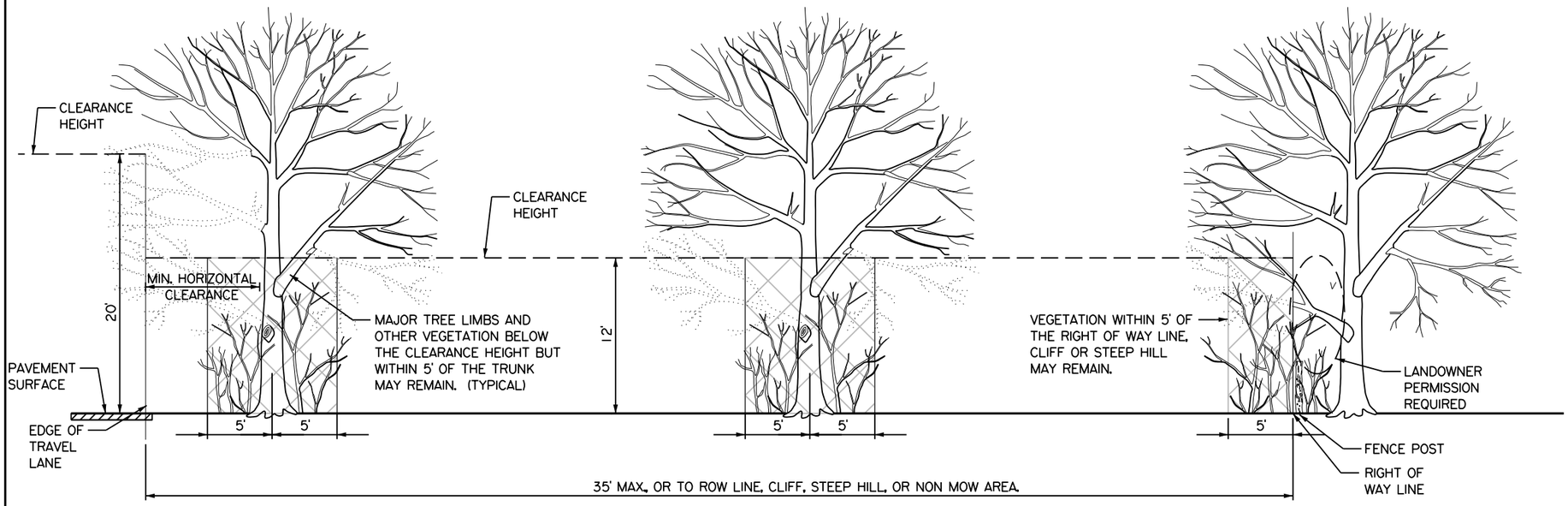
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		193

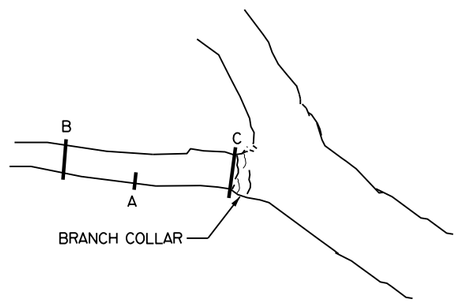


TREE PRUNING

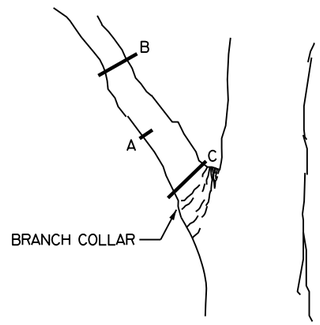
A - STEP 1
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8-12" ABOVE MAIN STEM OR TRUNK

B - STEP 2
REMOVE LIMB 4-6" BEYOND THE FIRST CUT

C - STEP 3
REMOVE STUB WITH A SMOOTH CUT JUST BEYOND THE BRANCH COLLAR OF THE REMOVED LIMB.



TREE LIMB



MAIN BRANCH

PRUNING CUTS - LIMBS 2" IN DIAMETER AND GREATER

TREE REMOVAL:

REMOVE ALL DEAD WOODY VEGETATION WITHIN THE ROW. CUT STUMPS FLUSH WITH THE GROUND.

TREE PRUNING:

THE OBJECTIVE OF TREE PRUNING IS FOR CROWN RAISING TO ALLOW CLEARANCE FOR MAINTENANCE VEHICLES.

WITH THE EXCEPTION OF WORK WITHIN OR ALONG A CHANNEL OR UNLESS OTHERWISE SHOWN ON THE PLANS, LIMIT WIDTH OF WORK TO 35' FROM THE EDGE OF THE TRAVEL LANE, OR TO ROW LINE, CLIFF, STEEP HILL, OR NON-MOW AREA, WHICHEVER IS LESS. THE ENGINEER WILL DEFINE CLIFFS, STEEP HILLS AND NON-MOW AREAS BASED ON FIELD CONDITIONS. THE ENGINEER MAY DEFINE AREAS TO RESTRICT OR INCREASE TREE PRUNING.

IF ANY TREES IN THE ROW ARE MARKED IN ANY WAY, VERIFY THE MEANING OF THE MARKINGS BEFORE BEGINNING PRUNING OPERATIONS.

WHEN PRUNING OAK TREES, DISINFECT TOOLS BEFORE MOVING FROM ONE TREE TO ANOTHER. USE 70% METHYL ALCOHOL, CHLORINE SOLUTION, OR OTHER APPROVED MATERIAL AS A DISINFECTANT.

TREAT ALL WOUNDS AND CUTS ON ALL OAK SPECIES WITH A COMMERCIAL TREE WOUND DRESSING WITHIN 20 MINUTES OF CREATING THE WOUND.

FLAILING EQUIPMENT IS NOT ALLOWED FOR THIS WORK.

REPAIR DAMAGE TO A PRIVATE FENCE OR OTHER PRIVATE PROPERTY AT CONTRACTOR EXPENSE.

PERFORM TREE PRUNING WITHIN ROW LIMITS. IF POSSIBLE, OBTAIN LANDOWNER PERMISSION AND MAKE PROPER PRUNING CUTS NECESSARY TO MAINTAIN THE HEALTH OF THE TREE.

CUT LIMBS AT A MAJOR FORK IN THE BRANCH OR, IF THE ENTIRE BRANCH IS ENCROACHING INTO THE AREA TO BE CLEARED, REMOVE THE BRANCH AT THE TRUNK.

DO NOT LEAVE A STUB BEYOND THE BRANCH COLLAR OR CUT THROUGH THE BRANCH COLLAR WHEN MAKING PRUNING CUTS. THE BRANCH COLLAR IS GENERALLY VISIBLE, BUT IF IT IS NOT, MAKE THE FINAL CUT APPROXIMATELY 1/2" FROM THE PARENT BRANCH OR TRUNK, PERPENDICULAR TO THE BRANCH OR LIMB BEING REMOVED.

THIS WORK AND ALL ASSOCIATED MATERIALS WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO ITEM 100 - PREPARING RIGHT OF WAY.

NOT TO SCALE

San Antonio District

TREE PRUNING AND REMOVAL

San Antonio District Standard

T:\Engdata\Standards\SATreePruning&Removal.dgn	PREPARED BY AND FOR USE OF TxDoT.						
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REVISIONS	SAT	6					194
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY	
	BEXAR		0024	08	141	US 90	

4/1/2021

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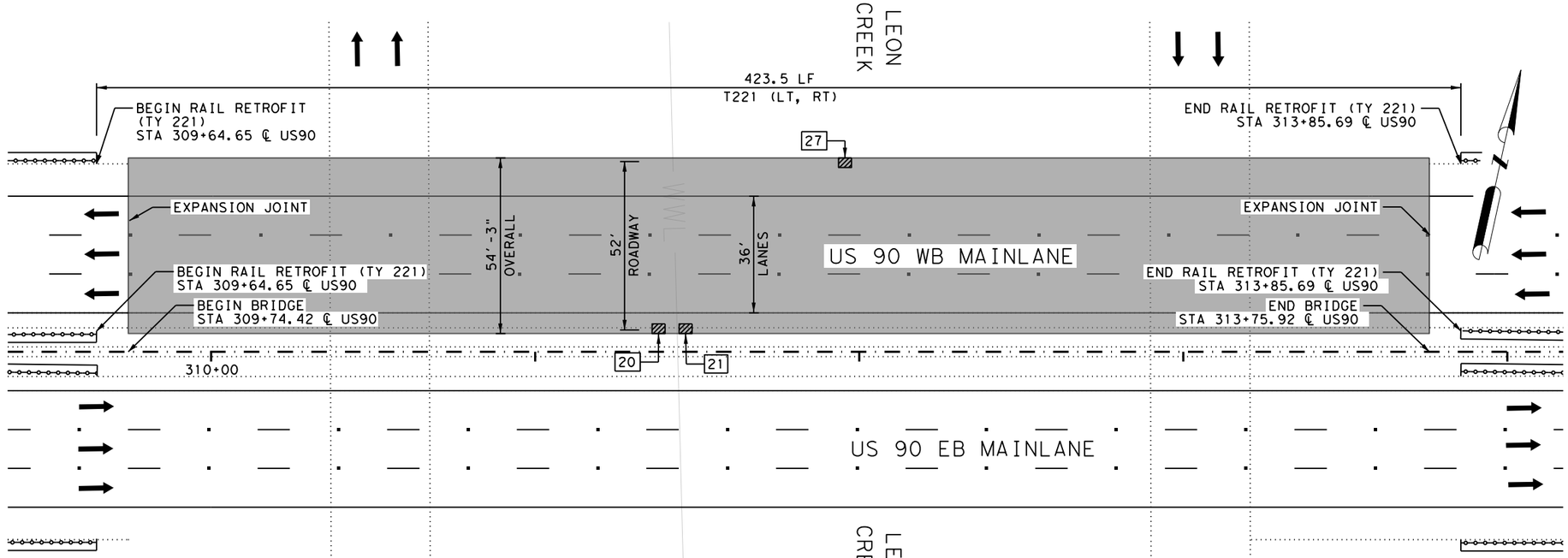

PLAN

SCALE AS SHOWN

NOTES

1. ALL DIMENSIONS AND OTHER INFORMATION PERTAINING TO EXISTING CONSTRUCTION ARE BASED ON AS-BUILT PLANS. AS-BUILT PLANS FOR EXISTING ROADWAY, BRIDGE, AND CROSSING ROADWAYS BELOW THE BRIDGE ARE AVAILABLE AT TXDOT UPON REQUEST.
2. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK OR ORDERING MATERIALS.
3. REFER TO T221 TRAFFIC RAIL STANDARD AND C-RAIL-R (MOD) FOR ADDITIONAL INFORMATION REGARDING RETROFIT.
4. REFER TO "LEON CREEK RAIL REMOVAL AND CONCRETE REPAIR DETAILS" SHEET FOR ADDITIONAL INFORMATION REGARDING THE REPAIR OF EXISTING CONCRETE BRIDGE ELEMENTS.
5. LIMITS OF RAIL RETROFIT ARE AT END OF WINGWALL. CONTRACTOR TO FIELD VERIFY LOCATIONS.
6. REMOVE EXISTING SEAL AND PROVIDE NEW SEALED HEADER JOINT. REFER TO SAN ANTONIO DISTRICT EXPANSION JOINT HEADER REPAIR STANDARD.

LEGEND

- BRIDGE DECK REPAIR
- XX BRIDGE POST NUMBER

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DESIGN SPEED:	70 MPH
FUNCTIONAL CLASS:	URBAN FREEWAY

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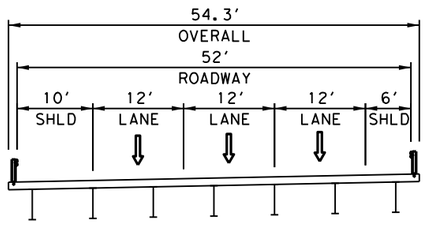
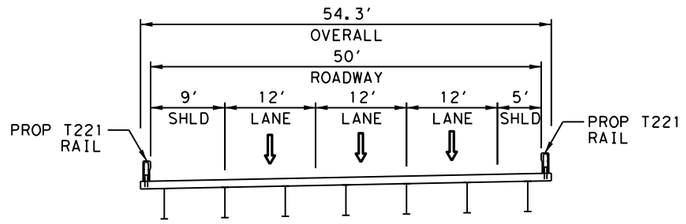
SCALE: 1" = 40'



US 90 WBML EXISTING TYPICAL SECTION

NOT TO SCALE



US 90 WBML PROPOSED TYPICAL SECTION

NOT TO SCALE

Item	Description	Unit	Qty
0429 6005	CONC STR REPAIR(DECK REP (FULL DEPTH)	SF	36
0438 6009	CLEANING EXISTING JOINTS	LF	208
0451 6005	RAIL RETROFIT (TY 221)	LF	842
0454 6008	HEADER TYPE EXPANSION JOINT	CF	42
0454 6009	JOINT SEALANT	LF	208
4161 6001	STENCILING PERMANENT STRUCTURE NUMBERS	EA	2

FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY FOR PAY ITEM QUANTITIES.

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90
STRUCTURE LAYOUT US 90 WBML OVER LEON CREEK

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	195
CONT.	SECT.	JOB	
0024	08	141	

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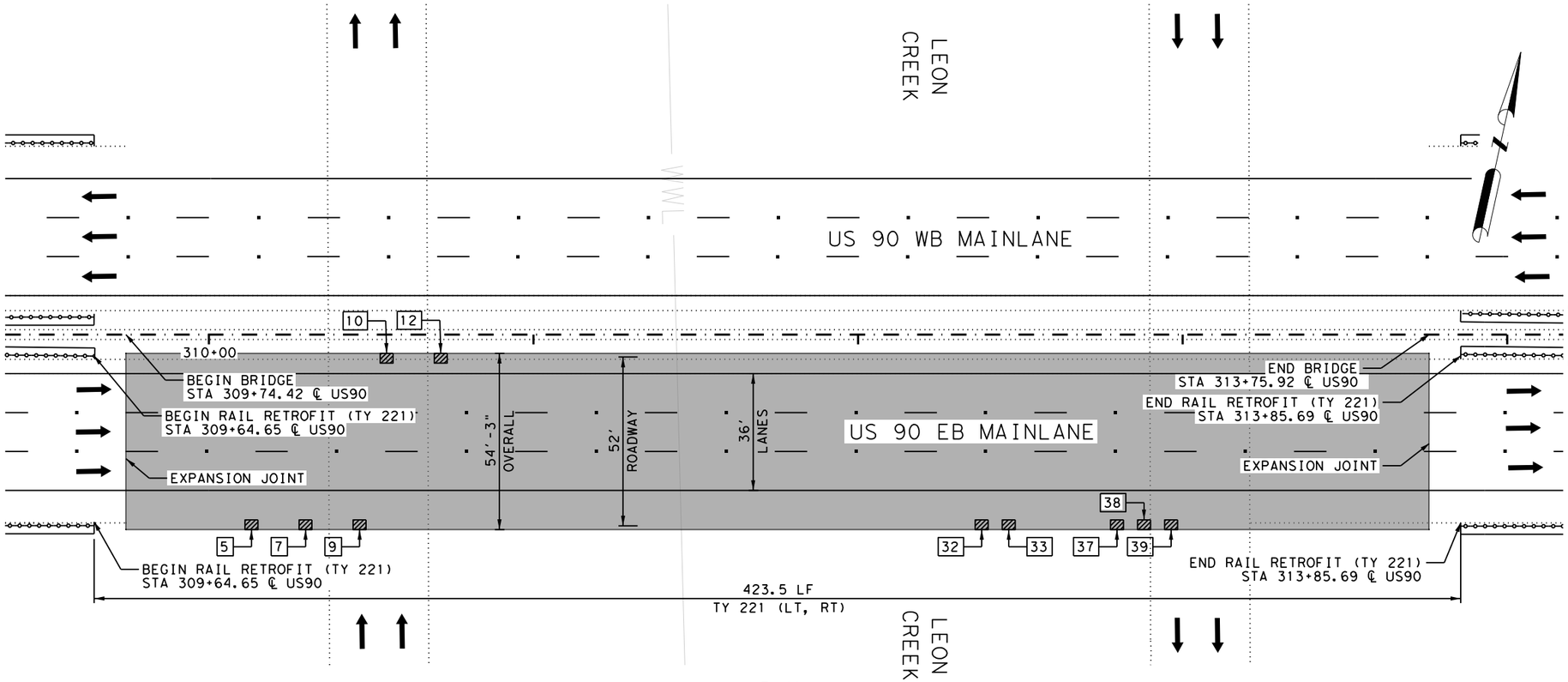
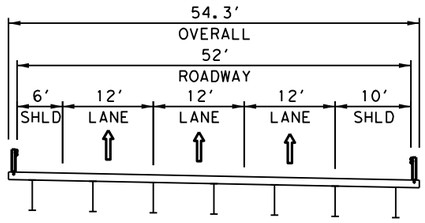


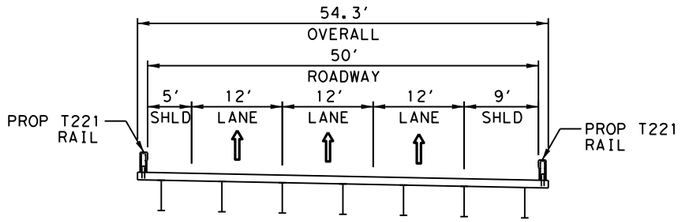
PLAN

SCALE AS SHOWN



US 90 EBML EXISTING TYPICAL SECTION

NOT TO SCALE



US 90 EBML PROPOSED TYPICAL SECTION

NOT TO SCALE

NOTES

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2. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK OR ORDERING MATERIALS.
3. REFER TO T221 TRAFFIC RAIL STANDARD AND C-RAIL-R (MOD) FOR ADDITIONAL INFORMATION REGARDING RETROFIT.
4. REFER TO "LEON CREEK RAIL REMOVAL AND CONCRETE REPAIR DETAILS" SHEET FOR ADDITIONAL INFORMATION REGARDING THE REPAIR OF EXISTING CONCRETE BRIDGE ELEMENTS.
5. LIMITS OF RAIL RETROFIT ARE AT END OF WINGWALL. CONTRACTOR TO FIELD VERIFY LOCATIONS.
6. REMOVE EXISTING SEAL AND PROVIDE NEW SEALED HEADER JOINT. REFER TO SAN ANTONIO DISTRICT EXPANSION JOINT HEADER REPAIR STANDARD.

LEGEND

▨ BRIDGE DECK REPAIR

[XX] BRIDGE POST NUMBER

EXIST NBI NO:	15-015-0-0024-08-130
DESIGN SPEED:	70 MPH
FUNCTIONAL CLASS:	URBAN FREEWAY

0 20 40

SCALE: 1" = 40'

Item	Description	Unit	Qty
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0438 6009	CLEANING EXISTING JOINTS	LF	208
0451 6005	RAIL (TY T221)	LF	842
0454 6008	HEADER TYPE EXPANSION JOINT	CF	37
0454 6009	JOINT SEALANT	LF	208
4161 6001	STENCILING PERMANENT STRUCTURE NUMBERS	EA	2

FOR CONTRACTOR'S INFORMATION ONLY. REFER TO ROADWAY SUMMARY FOR PAY ITEM QUANTITIES.

4/1/2021

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LICENSED PROFESSIONAL ENGINEER

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US 90
STRUCTURE LAYOUT
US 90 EBML OVER LEON CREEK

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	196
CONT.	SECT.	JOB	
0024	08	141	

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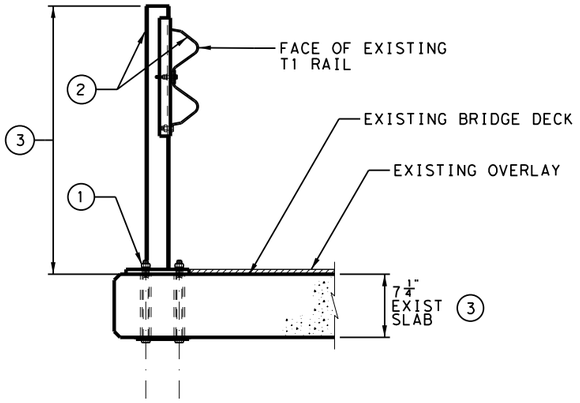
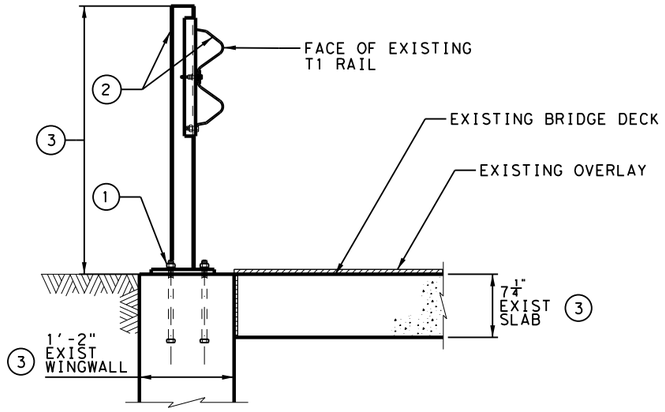


EXISTING RAIL REMOVAL AT BRIDGE

N.T.S

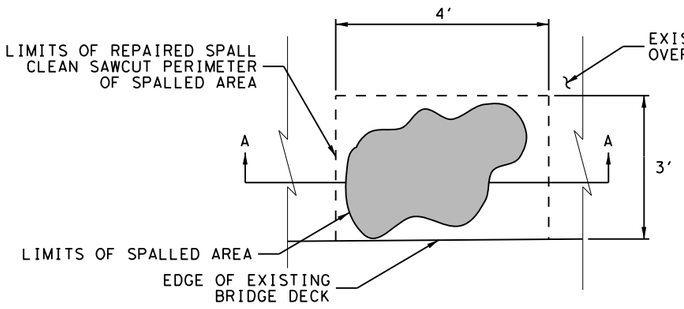


EXISTING RAIL REMOVAL AT WINGWALL

N.T.S

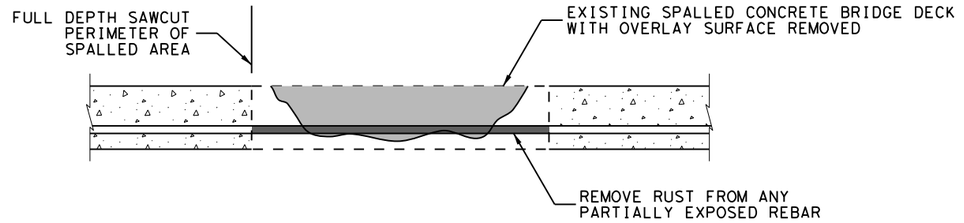
KEY NOTES:

1. UNSCREW HEX NUTS AND REMOVE EXISTING POST AND RAIL. CUT EXISTING BOLTS FLUSH WITH BRIDGE SLAB. CLEAN ALL VISIBLE CORROSION ON REMAINING ENDS OF BOLTS AND PAINT WITH RUST-INHIBITING PAINT. PAINT SHALL MATCH COLOR OF CONCRETE TO THE EXTENT POSSIBLE.
2. ALL RAILING DEEMED SALVAGEABLE SHALL BE CAREFULLY REMOVED AND STOCKPILED FOR REUSE. PORTIONS OF RAILING NOT DEEMED SALVAGEABLE SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
3. DIMENSIONS OF EXISTING ELEMENTS ARE SHOWN IN AS-BUILT CONSTRUCTION DOCUMENTS AND SHALL BE FIELD VERIFIED PRIOR TO RAIL RETROFIT.



TYPICAL CONCRETE REPAIR PLAN

N.T.S



SECTION A-A

N.T.S

CONCRETE REPAIR NOTES:

1. CONTRACTOR SHALL REPAIR DAMAGED CONCRETE AT THE LOCATIONS NOTED ON THE PLANS. LOCATIONS FOR REPAIR ARE BASED ON FIELD OBSERVATIONS. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IF THE NUMBER OF LOCATIONS REQUIRING REPAIR OR THE EXTENT OF DAMAGE SHOWN ON THE PLANS DIFFER FROM ACTUAL CONDITIONS.
2. CONTRACTOR SHALL INCLUDE UNIT COSTS FOR ALL REPAIR METHODS WITH BID IN THE EVENT QUANTITIES CHANGE DURING CONSTRUCTION.
3. CONCRETE STRUCTURE REPAIR SHALL COMPLY WITH TXDOT SPECIFICATIONS ITEM 429 "CONCRETE STRUCTURE REPAIR."
4. CONTRACTORS SHALL FOLLOW THE PROCEDURES OUTLINED IN THE TXDOT "CONCRETE REPAIR MANUAL" FOR ALL CONCRETE REPAIR WORK.
5. ONLY FULL DEPTH BRIDGE DECK REPAIRS WILL BE ALLOWED. FOLLOW ONLY FULL DEPTH BRIDGE DECK REPAIR PROCEDURES AS OUTLINED IN THE TXDOT "CONCRETE REPAIR MANUAL."
6. IN ADDITION TO THE REQUIREMENTS IN THE TXDOT "CONCRETE REPAIR MANUAL," FOLLOW ALL RECOMMENDATIONS PROVIDED BY THE REPAIR MATERIALS MANUFACTURERS.
7. FOR REPAIR MATERIAL, PROVIDE CLASS S CONCRETE MIXES MEETING THE REQUIREMENTS OF ITEM 421 "HYDRAULIC CEMENT CONCRETE."
8. ALL PROPOSED REPAIR PRODUCTS AND PROCEDURES SHALL BE SUBMITTED TO TXDOT FOR APPROVAL PRIOR TO APPLICATION. IT SHALL BE CLEARLY NOTED WHERE EACH REPAIR PRODUCT IS INTENDED TO BE USED.
9. COLOR OF EPOXY COMPOUND AND ANY ADDED AGGREGATES SHALL MATCH COLOR OF EXISTING CONCRETE TO THE EXTENT POSSIBLE.
10. CONTRACTOR SHALL REPAIR OR REPLACE DEFECTIVE AREAS AND PATCH AREAS THAT LOSE BOND AFTER CURING, AT THE CONTRACTOR'S EXPENSE, IN ACCORDANCE WITH TXDOT SPECIFICATIONS ITEM 429 "CONCRETE STRUCTURE REPAIR."

4/1/2021

STATE OF TEXAS
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Texas Department of Transportation

US 90
LEON CREEK
RAIL REMOVAL AND CONCRETE REPAIR DETAILS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	197
CONT.	SECT.	JOB	
0024	08	141	

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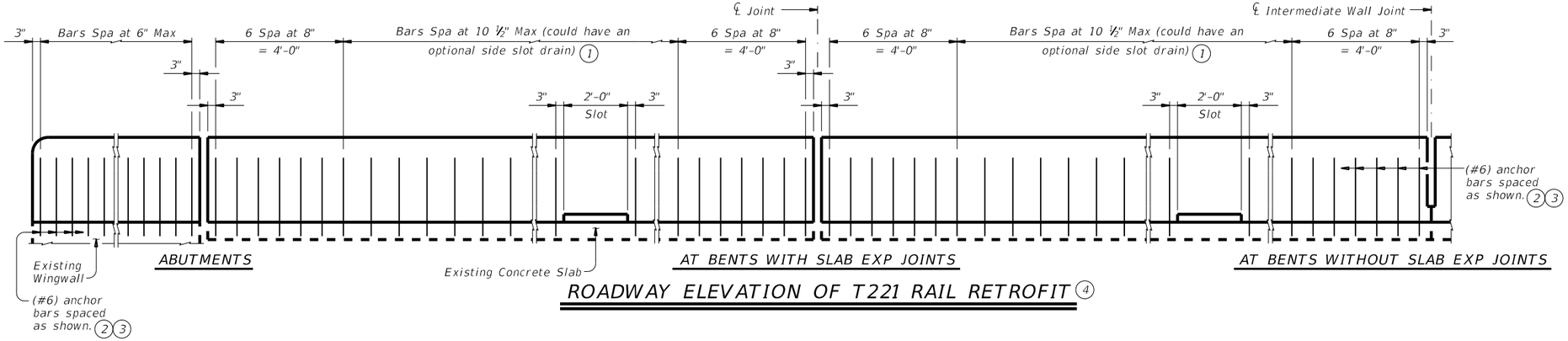
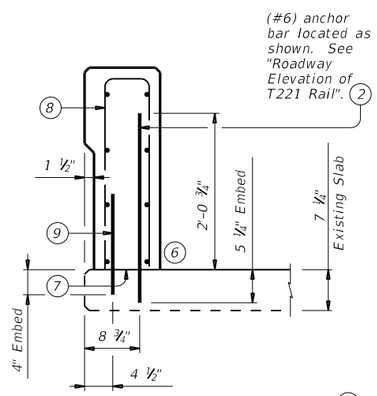
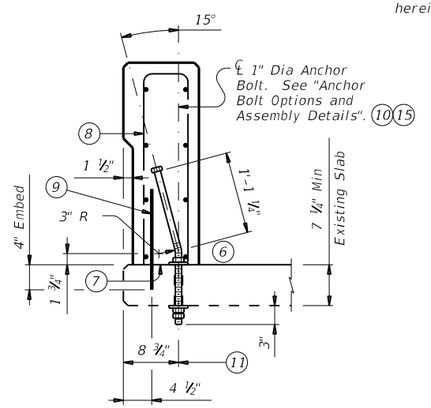


ROADWAY ELEVATION OF T221 RAIL RETROFIT 4

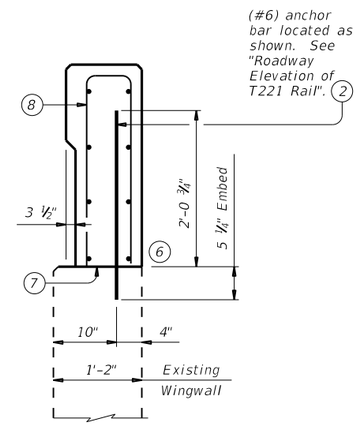
1. When side slot drains are used, provide 8'-0" Min clear spacing between drain slots.
2. Embed (#6) anchor bars with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 5 ¼". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 20 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".
3. See T221 Rail Sections in "Rail Retrofit Section on Wingwalls using Adhesive Anchors" and/or "Rail Retrofit Section on Concrete Slabs using Adhesive Anchors".
4. Showing spacing of (#6) adhesive anchor in a rail retrofit condition. Secondary (#4) adhesive anchor in a rail retrofit not shown for clarity. Reinforcing steel and terminal connections not shown for clarity. See rail standard for details and notes not shown
5. Showing location or locations of anchor bars in a rail retrofit condition. See appropriate rail standard for details and notes not shown.
6. Overlay depth to be tapered over shoulder width to 0" at toe of rail. Refer to Miscellaneous Roadway Details for more information.
7. Do not cast rails or parapet walls on top of overlays/seal coats.
8. See appropriate rail standard for reinforcing steel. Modify length of vertical reinforcing bars as required to fit existing structure. Longitudinal reinforcing bars may be removed only if their position puts them in conflict with un-removed portions of existing structure.
9. Embed secondary (#4) anchor bars 1'-4" in length with a Type III Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 10 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". (#4) anchor bars spaced longitudinally along rail at 4 ft Max (Spaced 3" longitudinally from outside edge and edge of side slot drains).
10. ℄ 1" Dia Anchor Bolt Spaced longitudinally along rail at 18" Max (Spaced 6" longitudinally from outside edge and edge of optional side slot drains, if required).
11. ℄ 1 1⁄16" to 1 ¼" Dia holes. Core drill holes through existing deck (percussion drilling not permitted). Concrete spalls in the bottom of the deck exceeding ½" from edge of holes will be patched in accordance with Item 429, "Concrete Structure Repair" at the Contractor's expense.
12. Showing location of anchor bars and anchor bolts in a rail retrofit condition. See appropriate rail standard for details and notes not shown.
13. ℄ 1" Dia ASTM F1554 Gr 55 Anchor Bolt or Threaded Rod. Nuts must conform to ASTM A563 requirements.
14. Plate Washer ⅜ x 3 x 3 ASTM A36 with 1 1⁄16" Dia Hole centered.
15. Galvanize anchor bolts, nuts and plate washers.



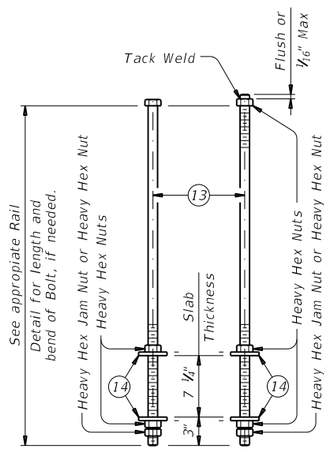
RAIL RETROFIT SECTIONS ON CONCRETE SLABS USING ADHESIVE ANCHORS 5



RAIL RETROFIT SECTIONS ON SLABS USING ANCHOR BOLTS



RAIL RETROFIT SECTIONS ON WINGWALLS USING ADHESIVE ANCHORS 5



ANCHOR BOLT OPTIONS AND ASSEMBLY DETAILS 15

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

By adding additional anchorage, welding can be performed at a minimum spacing of 3 ft between the cage and additional anchorage. By satisfying additional anchorage requirements slip forming is allowed. Do not weld to the required anchorage.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

(#6) and (#4) anchor bars used for the adhesive anchorage system must not be epoxy coated within the required embedment.

GENERAL NOTES:

Use of these retrofit details will result in a railing acceptable for the MASH Test Level indicated on the applicable rail standard.

Rail anchorage details shown on this guide may require modification for select structure types. See appropriate details elsewhere in plans for these modifications. Not all possible combinations of existing railing, curbs, parapets etc. have been shown on this sheet. Other combinations and reinforcement arrangements are permissible if they meet the same strength requirements as indicated on this guide.

Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the retrofit railing.

Payment for a rail retrofit will be as per Item 451, "Retrofit Railing", by the type of the rail retrofit. All details shown herein are subsidiary to rail retrofit.

4/1/2021

STATE OF TEXAS
JOSHUA A. RODRIGUEZ
127267
LICENSED PROFESSIONAL ENGINEER

Texas Department of Transportation

Bridge Division Standard

RETROFIT GUIDE FOR CONCRETE RAILS

T221

C-RAIL-R (MOD)

FILE: r1std022-20.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
07-20: Text change from epoxy to adhesive and changed MASH Test Level note.	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		198

DATE: 4/1/2021 1:03:40 PM
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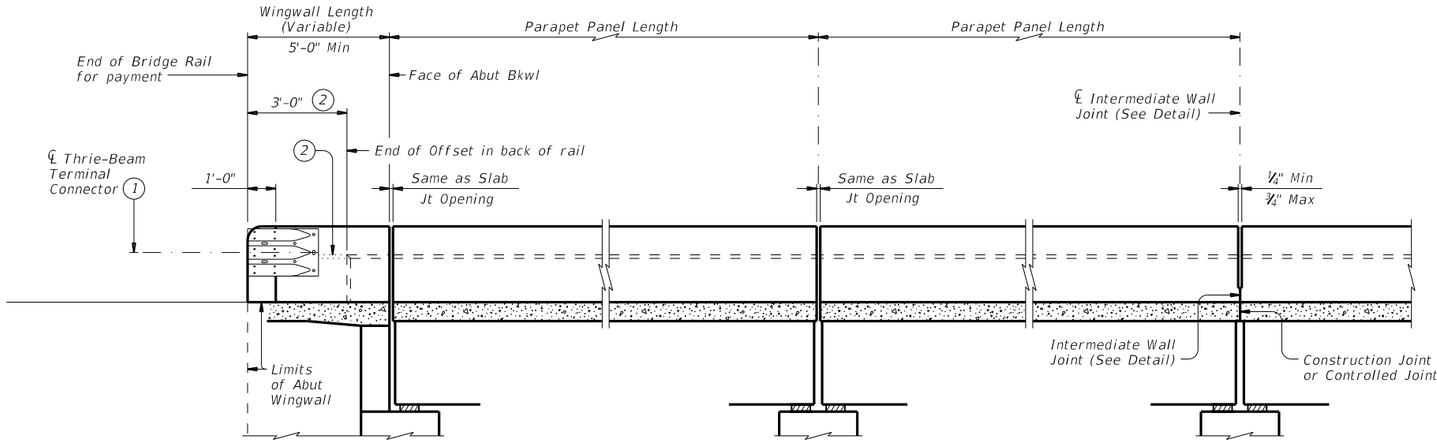
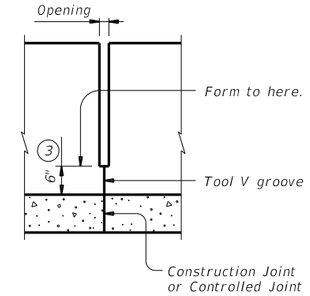
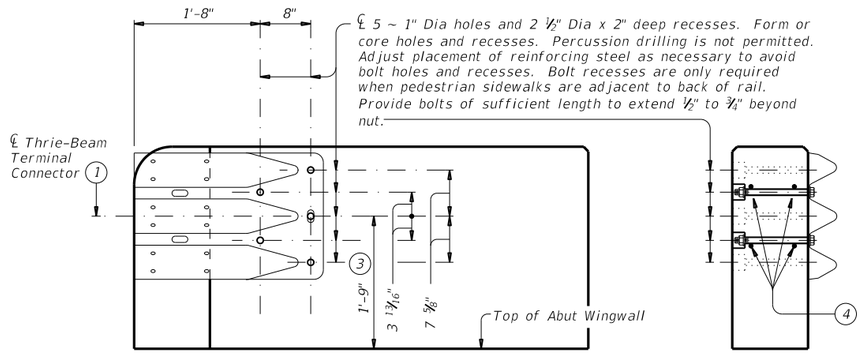


ROADWAY ELEVATION OF RAIL



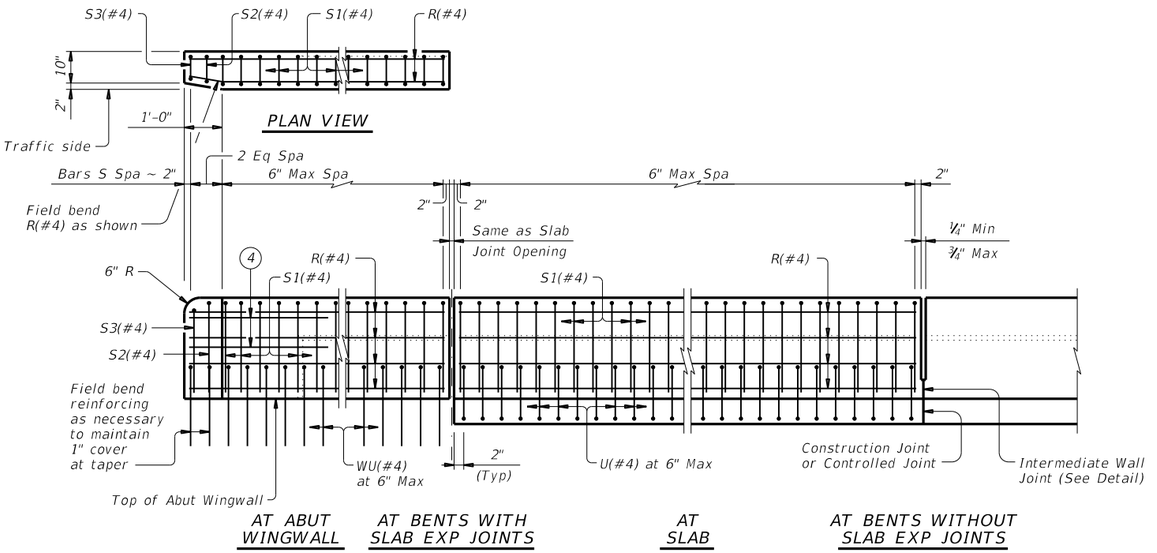
INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.

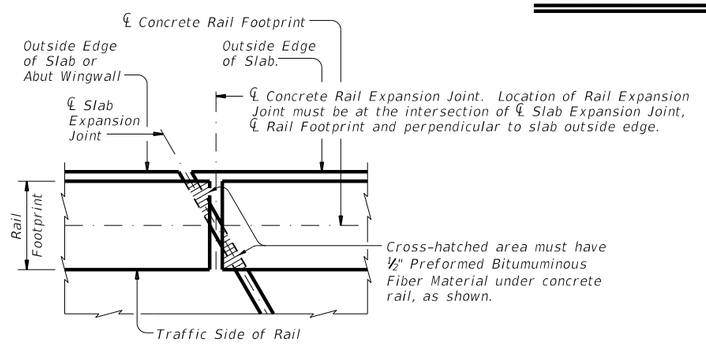


TERMINAL CONNECTION DETAILS

1. Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
2. Back of rail offset may, with Engineer's approval, be continued to the end of the railing.
3. Increase 2" for structures with overlay.
4. Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T221

FILE: r1std004-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		199

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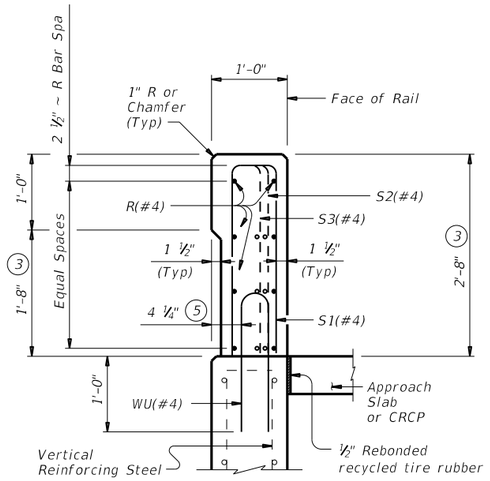
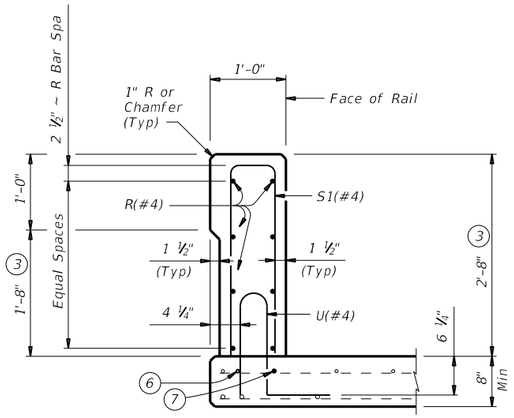


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON BRIDGE SLAB

SECTIONS THRU RAIL

(3) Increase 2" for structures with overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars will be furnished at the Contractors expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) Bend or cut as required to clear drain slots.

(9) No longitudinal wires may be in top center of cage.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greater to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ½" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.

Chamfer all exposed concrete corners.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM 1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other that shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #4 = 1'-7"
Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been evaluated and accepted to be of equal strength to railings with like geometry, which have been crash tested to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

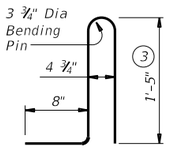
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

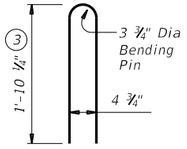
Shop drawings are not required for this rail.

Average weight of railing with no overlay is 370 plf.

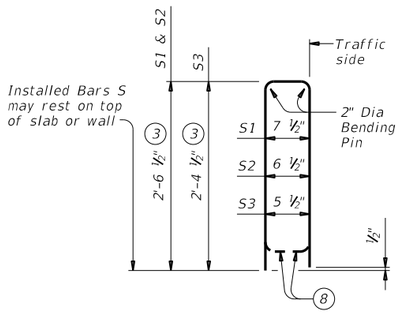
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



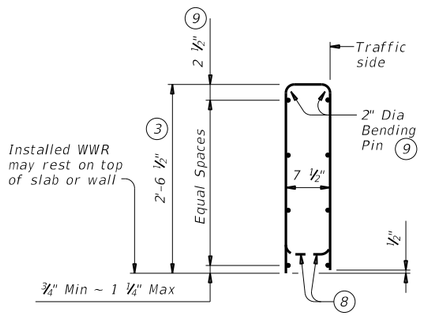
BARS U (#4)



BARS WU (#4)

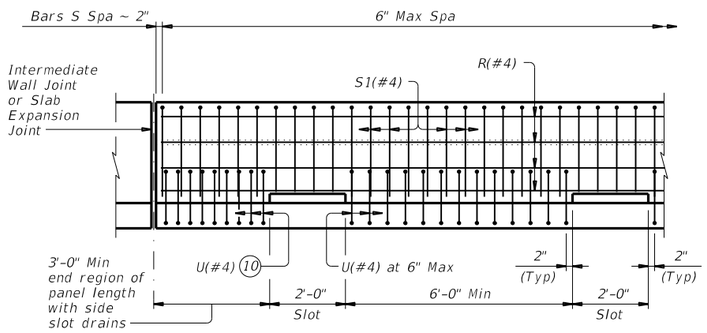


BARS S (#4)



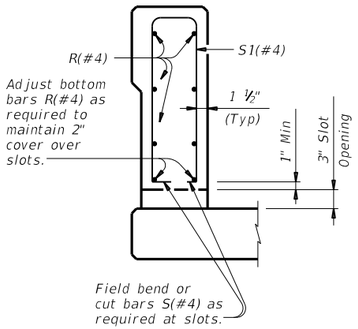
OPTIONAL WELDED WIRE REINFORCEMENT (WWR)

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	



OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.



SECTION THRU OPTIONAL SIDE SLOT DRAIN

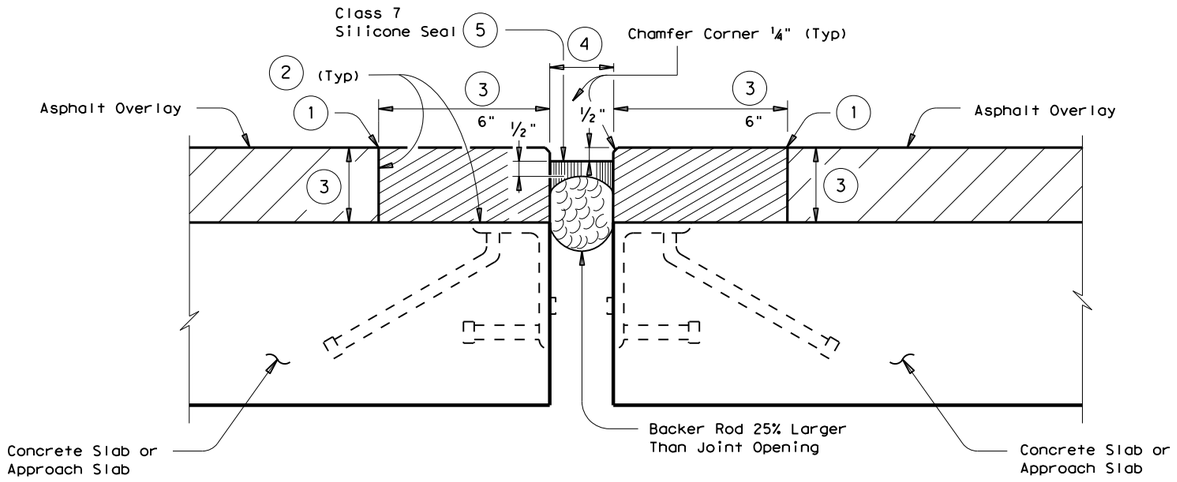
SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

TRAFFIC RAIL

TYPE T221

FILE: rlstd004-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		200



SECTION

Angle type armor shown. Detail is identical for plate type armor or unarmored joint.

GENERAL NOTES:

Header Type Joint must be in accordance with Item 454, "Bridge Expansion Joints".

Unless shown otherwise on the plans, header material will be paid for by the cubic foot and sealant by the linear foot in accordance with Item 454, "Bridge Expansion Joints".

Removal and replacement of loose existing steel and repair of deck must be in accordance with Item 785, "Bridge Joint Repair or Replacement". This work is subsidiary to Item 454, "Bridge Expansion Joints - Armor Joints", or "Bridge Expansion Joints - SEJ".

Work performed and materials furnished for cleaning existing joints will be paid for by the linear foot under Item 438, "Cleaning and Sealing Joints".

Any asphaltic material deposited on bent or abutment caps must be removed.

AFTER EXISTING OVERLAY IS REMOVED:

Clean joint of any bituminous material, dirt, grease, or other deleterious material. Joint opening must be cleaned of old expansion material or devices in accordance with Item 438, "Cleaning and Sealing Joints".

The entire length of the joint must be checked. If any steel is present, remove and replace any portion determined to be unsound. Repair the deck. An approved concrete repair material must be used to repair any deep spall in the deck that leaves less than 6 inches of the original concrete below the spall. Spalls in the deck that are not so deep may be filled with header material. Removal and repair of deck must be accordance with Item 785, "Bridge Joint Repair or Replacement". Repair of damage caused by the Contractor must be repaired at the Contractor's expense in accordance with Item 429, "Concrete Structure Repair".

Place surface treatment according to the plans.

AFTER NEW OVERLAY IS PLACED:

(1) Saw cut overlay to the top of deck and remove material to expose the joint.

(2) Surfaces where header material is to be placed must be clean and dry in accordance with the manufacturer's specifications. Remove all asphaltic materials from the deck where the header material is placed.

(3) Place header material in accordance with Item 454, "Bridge Expansion Joints - Header Type Expansion Joint". Match the thickness of the header material with the thickness of the overlay as shown in the plans. Do not cantilever header material over the joint opening.

(4) Match existing joint opening or set at the minimum:

a. 1 inch at 70 degrees F when the distance between joints is 150 feet or less
b. 2 inches at 70 degrees F when the distance between joints is greater than 150 feet
c. or as directed by the Engineer

(5) After placing header material, install backer rod and sealant in accordance with Item 438, "Cleaning and Sealing Joints".
Extend sealant up into rail or curb 6 inches on low side or sides of deck. If the Class 7 sealant cannot be effectively placed in the vertical position, a Class 4 sealant is allowed for the extention of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

SAN ANTONIO DISTRICT STANDARD

Texas Department of Transportation

EXPANSION JOINT HEADER REPAIR

FED. RD. DIV. NO.	FEDERAL AID PROJECT		SHEET NO.
6			201
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0024	08	141	US 90

15 015 XXXX XX XXX

15	015	XXXX	XX	XXX
San Antonio District designation	County designation	Control number	Section nunber	Structure number

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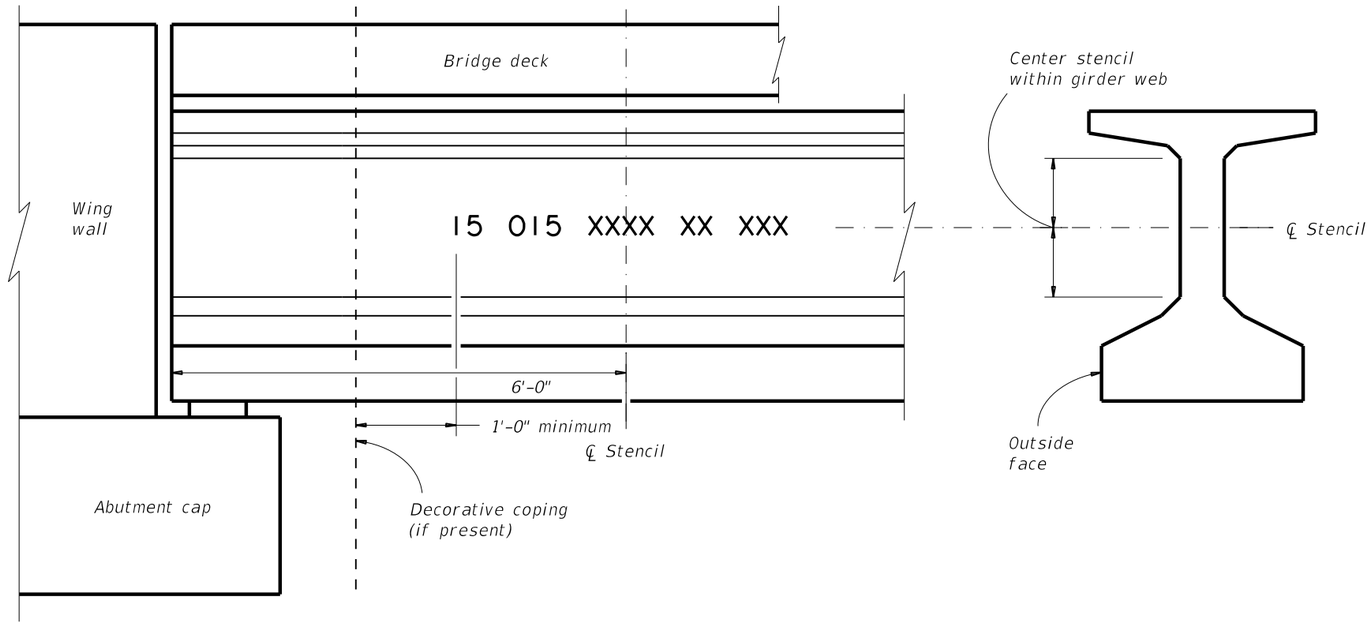


TYPICAL BRIDGE CORNER (ELEVATION)

SAN ANTONIO DISTRICT COUNTY DESIGNATIONS

Atascosa 007
Bandera 010
Bexar 015
Comal 046
Frio 083
Guadalupe 095
Kendall 131
Kerr 133
McMullen 162
Medina 163
Uvalde 232
Wilson 247

GENERAL NOTES:
Apply stucture number in accordance with Special Specification 4171 Install Bridge Identification.

SAN ANTONIO DISTRICT STANDARD

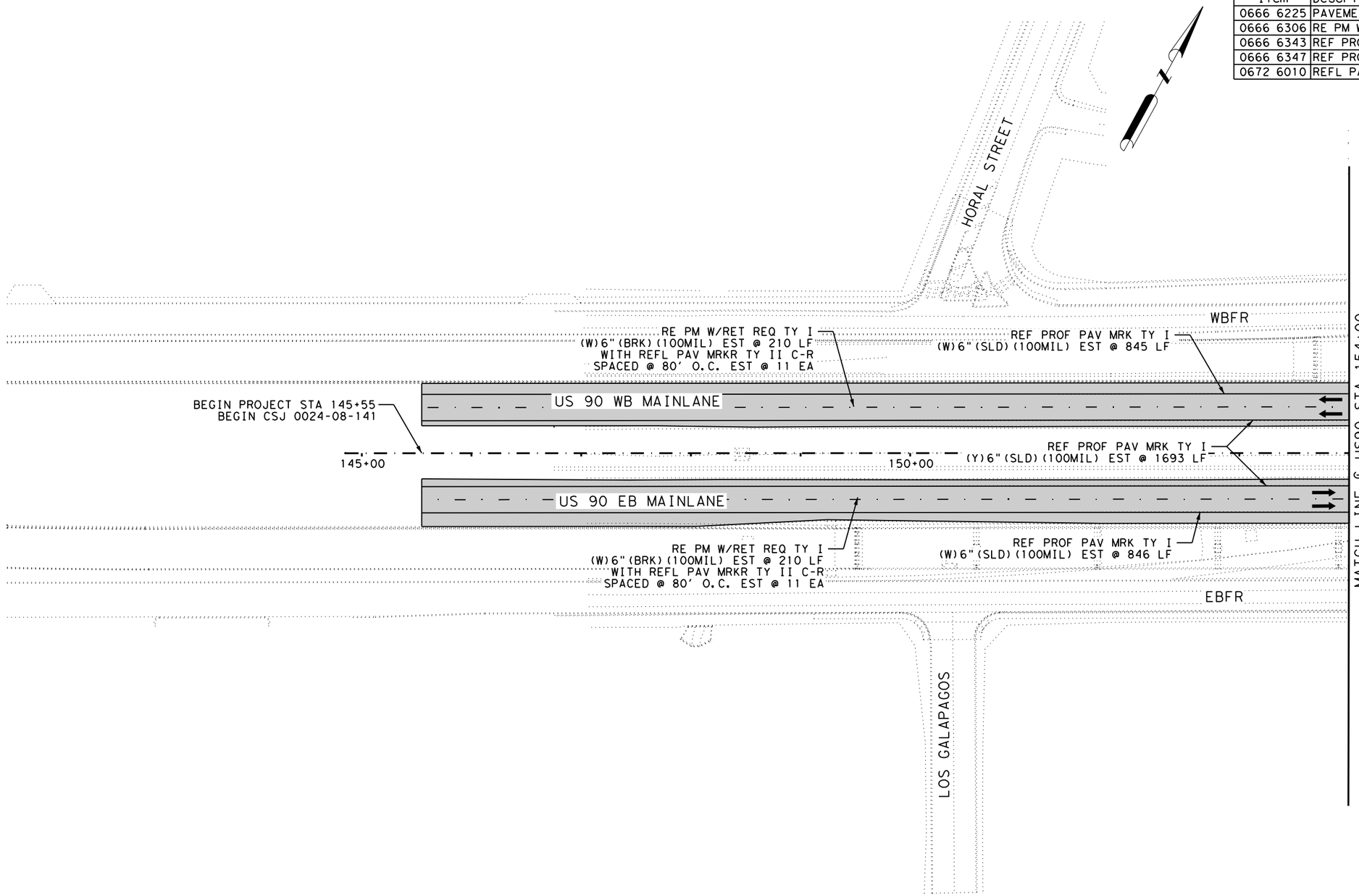
Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

BRIDGE NBI NUMBER STENCIL

DN: BCL	CK: KHA	FILENAME: 000000000 SA District Stencil.dgn	
DW: SRF	CK: KHA	ORIGINAL DRAWING DATE: August 2019	
DIST.	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	COUNTY
SAT	6		BEXAR
CONTROL	SECTION	JOB / SHEET NO.	ROUTE
0024	08	135 / 202	US 90

REVISIONS:

Item	Description	Unit	Qty
0666 6225	PAVEMENT SEALER 6"	LF	3804
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	420
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	1691
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	1693
0672 6010	REFL PAV MRKR TY II-C-R	EA	22



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

BEGIN PROJECT TO
℄ US90 STA 154+00

SHEET 1 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	203
CONT.	SECT.	JOB	
0024	08	141	

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Item	Description	Unit	Qty
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0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	44
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	5696
0666 6226	PAVEMENT SEALER 8"	LF	243
0666 6226	PAVEMENT SEALER 12"	LF	44
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	600
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2547
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2549
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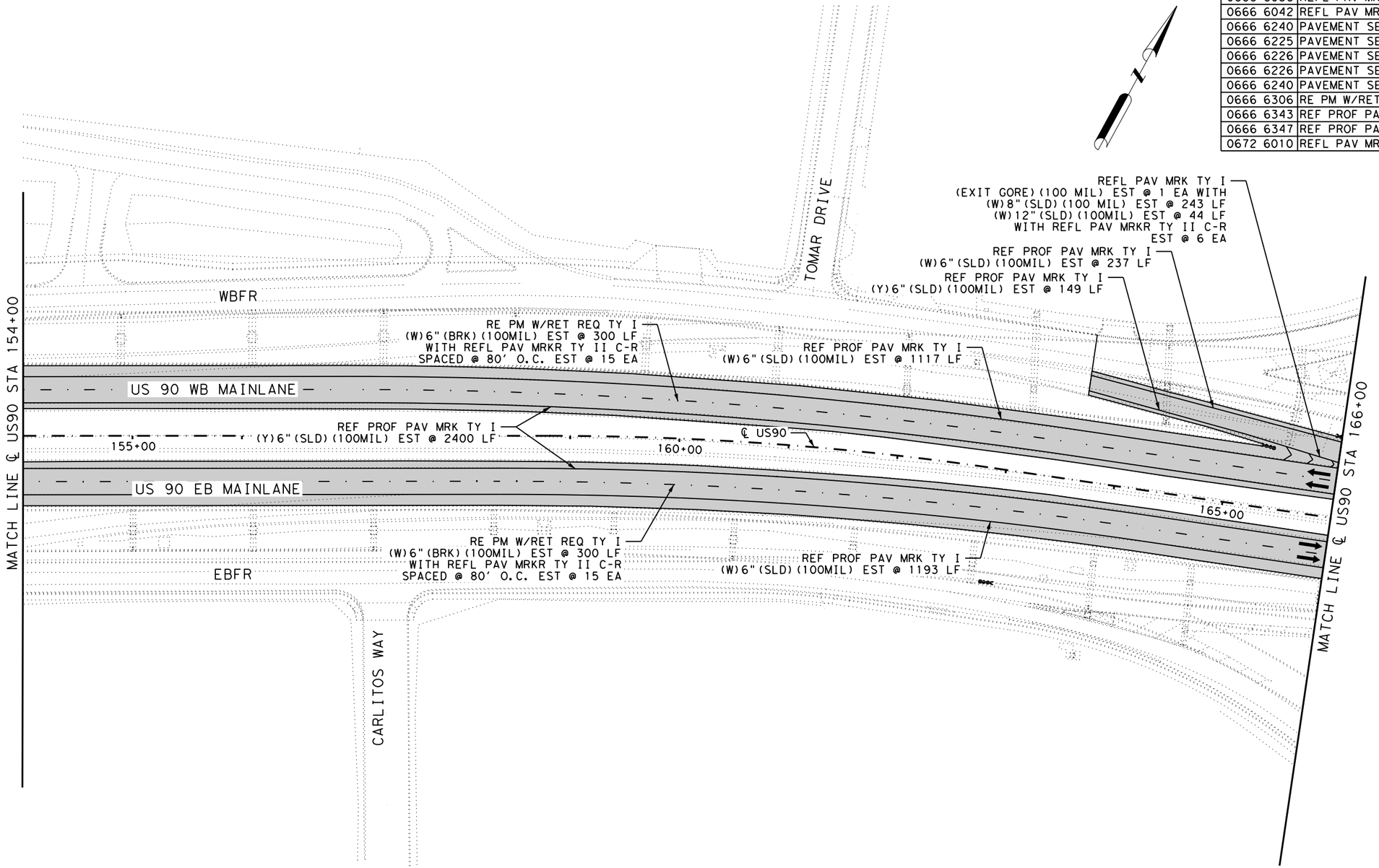

LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

10/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 154+00 TO
℄ US90 STA 166+00

SHEET 2 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	204
CONT.	SECT.	JOB	
0024	08	141	

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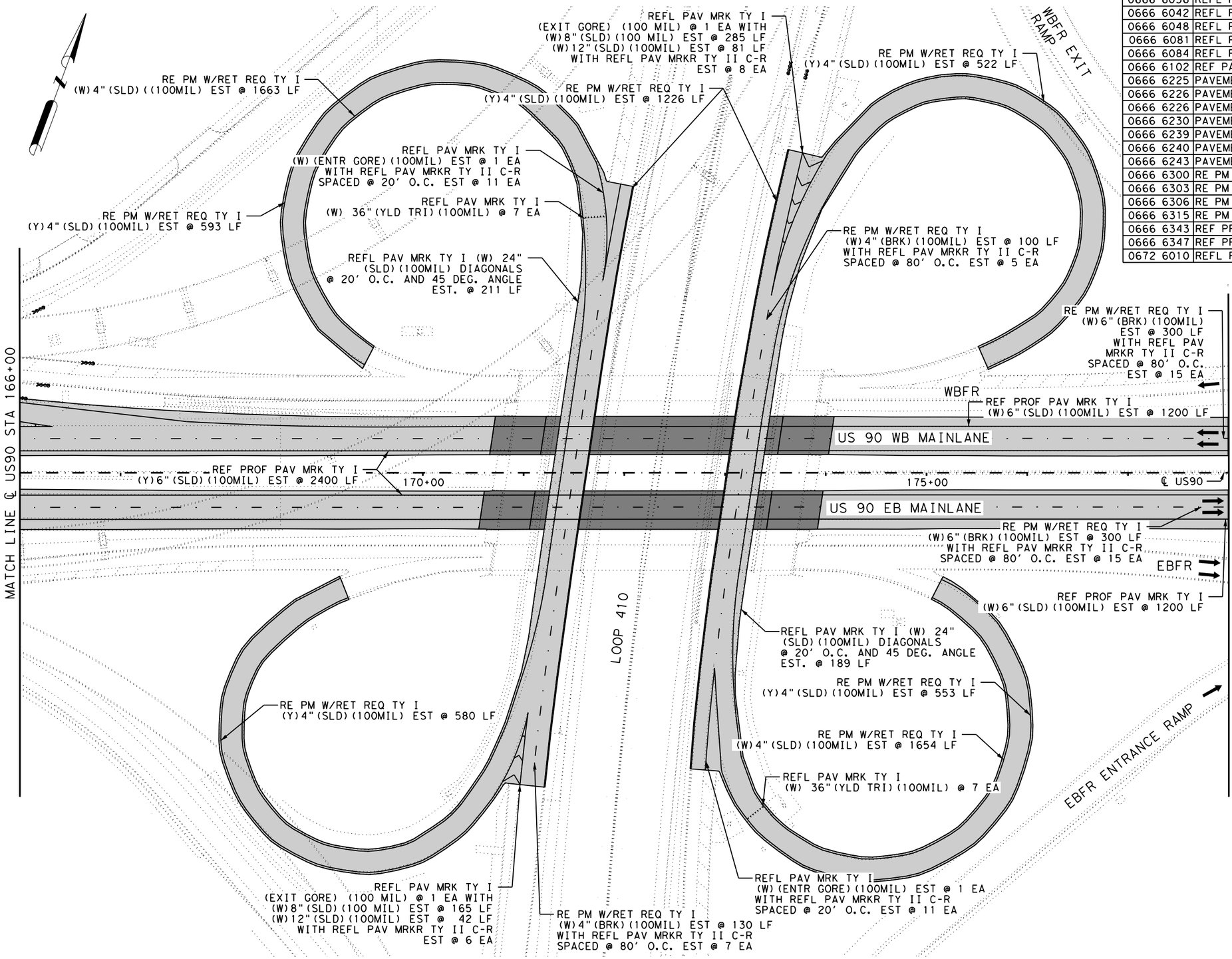
Item	Description	Unit	Qty
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	450
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	123
0666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	400
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	2
0666 6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	14
0666 6225	PAVEMENT SEALER 6"	LF	5400
0666 6226	PAVEMENT SEALER 8"	LF	450
0666 6226	PAVEMENT SEALER 12"	LF	123
0666 6230	PAVEMENT SEALER 24"	LF	400
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	2
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	2
0666 6243	PAVEMENT SEALER (YLD TRI)	EA	14
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	230
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	3317
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	600
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	3474
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2400
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	78



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS · TREY NEAL · 106194 · LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 166+00 TO
℄ US90 STA 178+00

SHEET 3 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	205
CONT.	SECT.	JOB	
0024	08	141	

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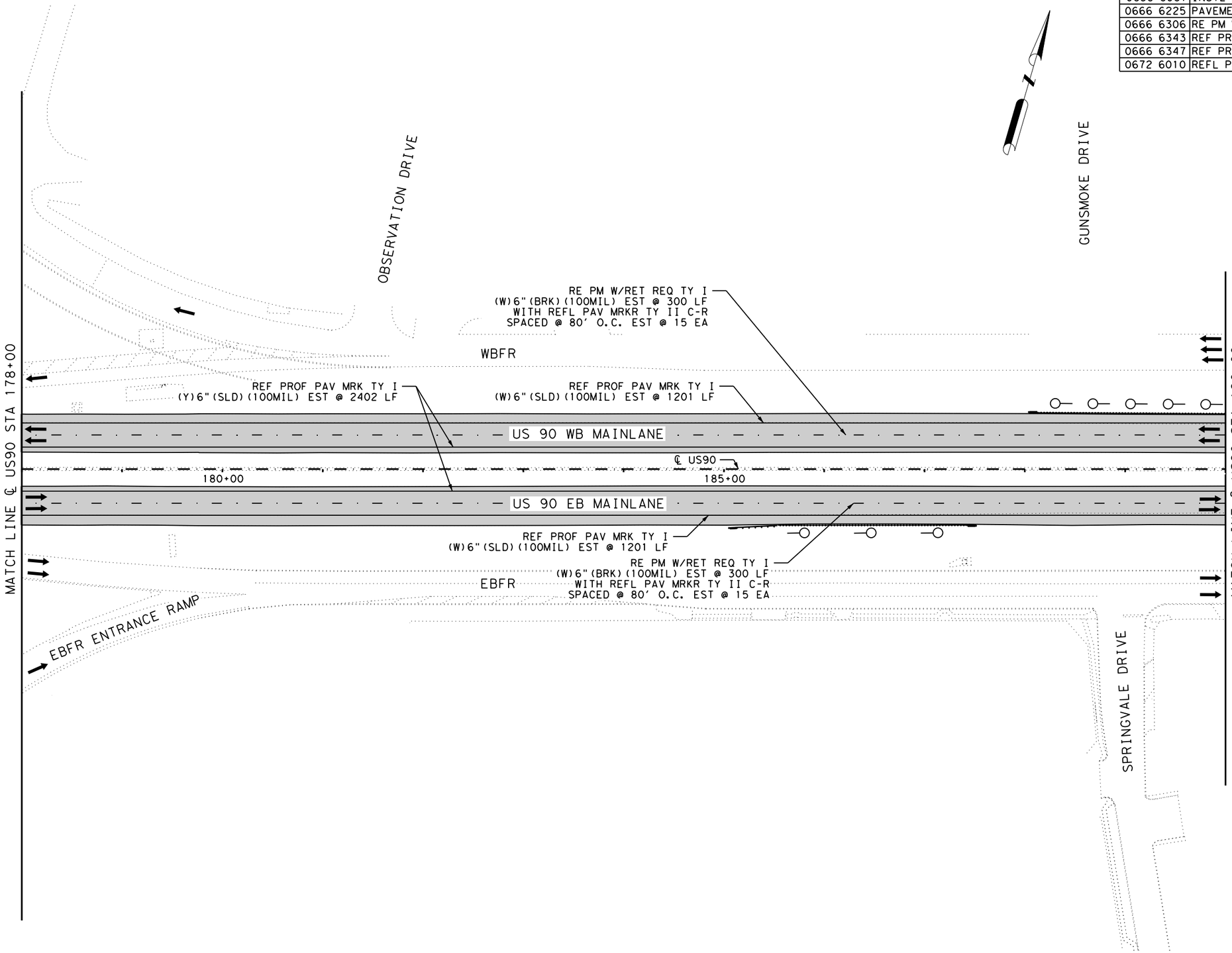
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6
0666 6225	PAVEMENT SEALER 6"	LF	5404
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	600
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2402
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2402
0672 6010	REFL PAV MRKR TY II-C-R	EA	30



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 178+00 TO
℄ US90 STA 190+00

SHEET 4 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	206
CONT.	SECT.	JOB	
0024	08	141	

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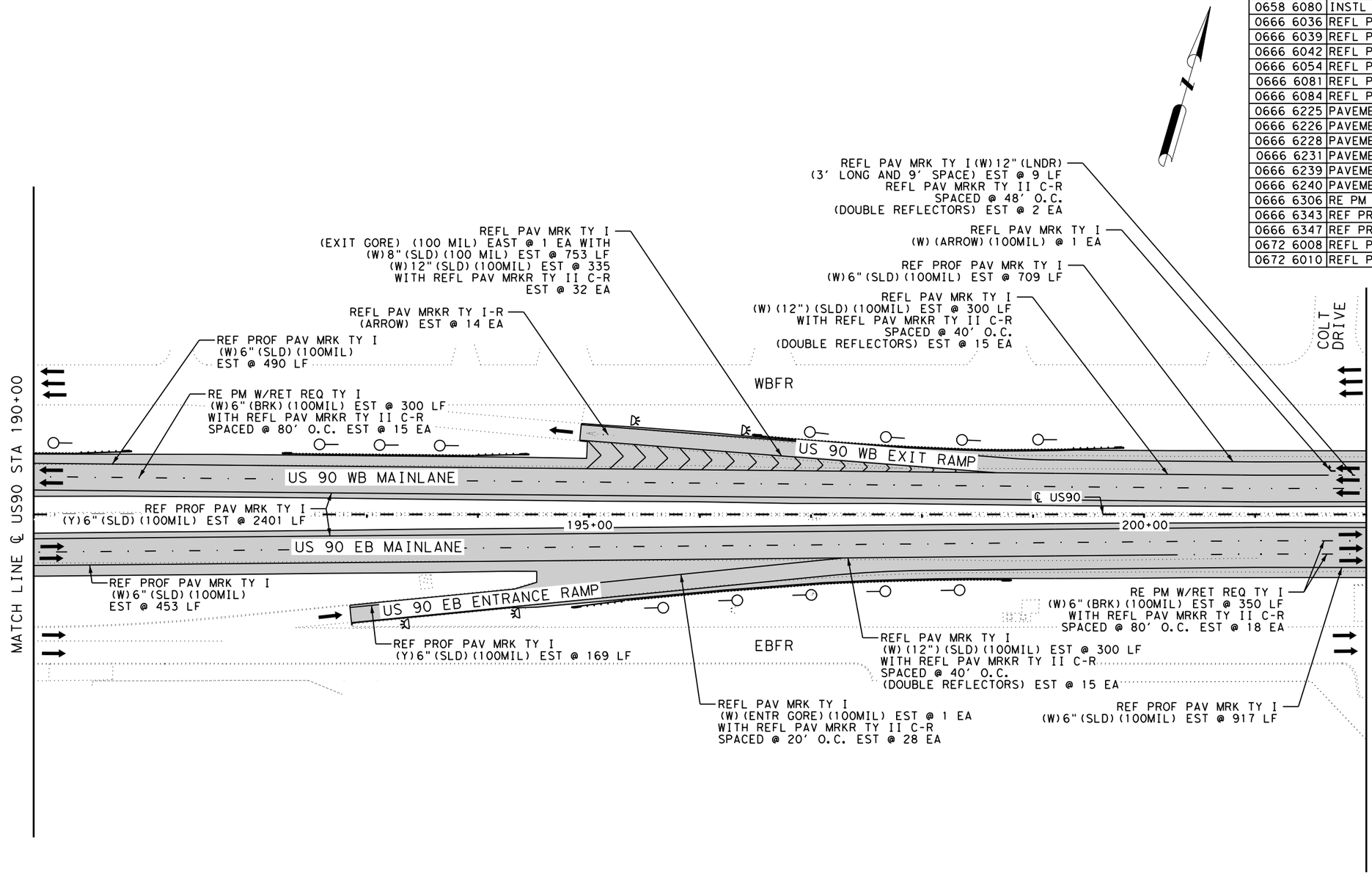
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	15
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	4
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	753
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	9
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	935
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6279
0666 6226	PAVEMENT SEALER 8"	LF	753
0666 6228	PAVEMENT SEALER 12"	LF	944
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	650
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	3059
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2570
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	125



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL LICENSED ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 190+00 TO
℄ US90 STA 202+00

SHEET 5 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	207
CONT.	SECT.	JOB	
0024	08	141	

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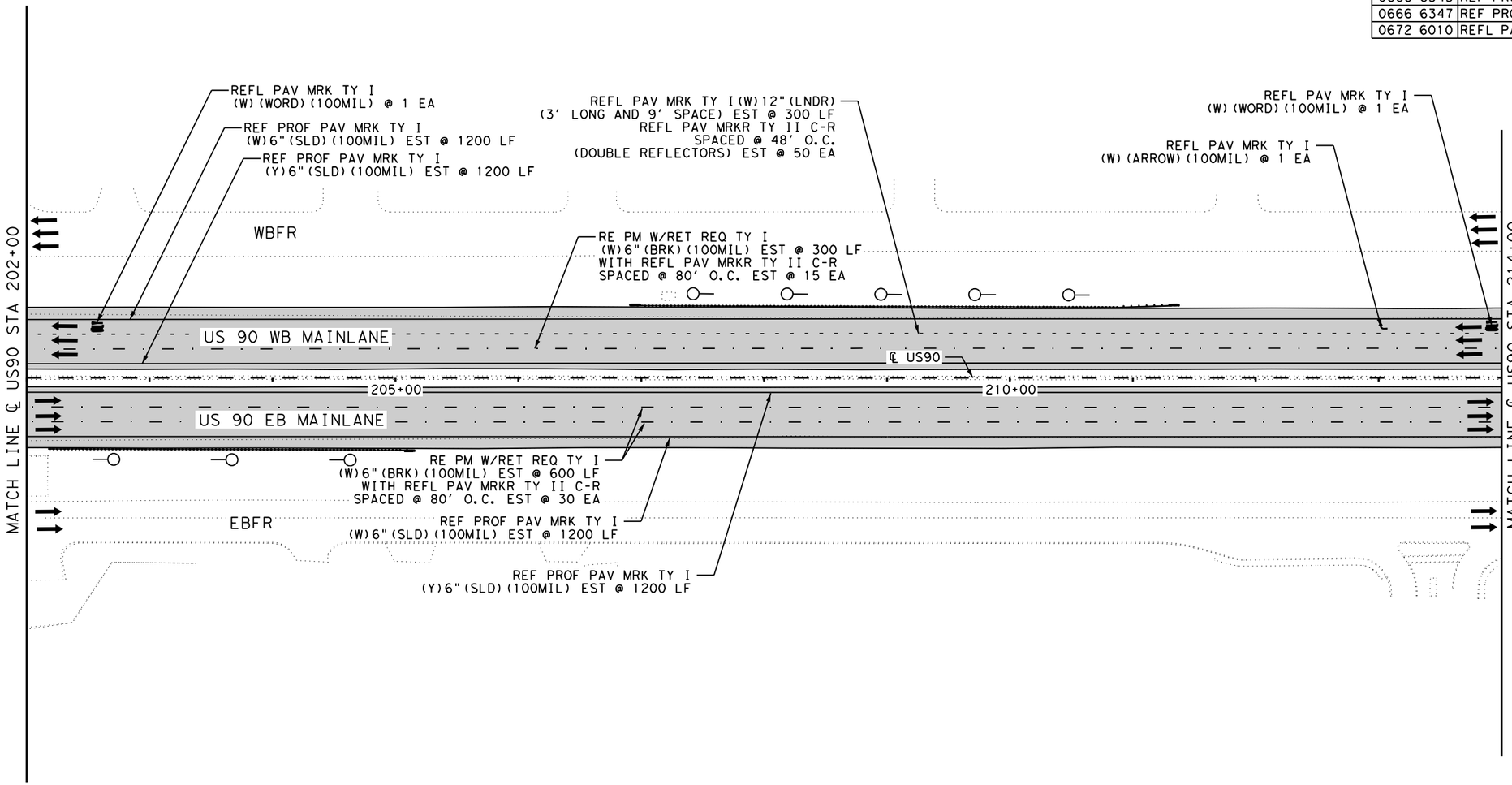
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	8
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	300
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	5700
0666 6228	PAVEMENT SEALER 12"	LF	300
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	900
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2400
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	95



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 202+00 TO
℄ US90 STA 214+00

SHEET 6 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	208
CONT.	SECT.	JOB	
0024	08	141	

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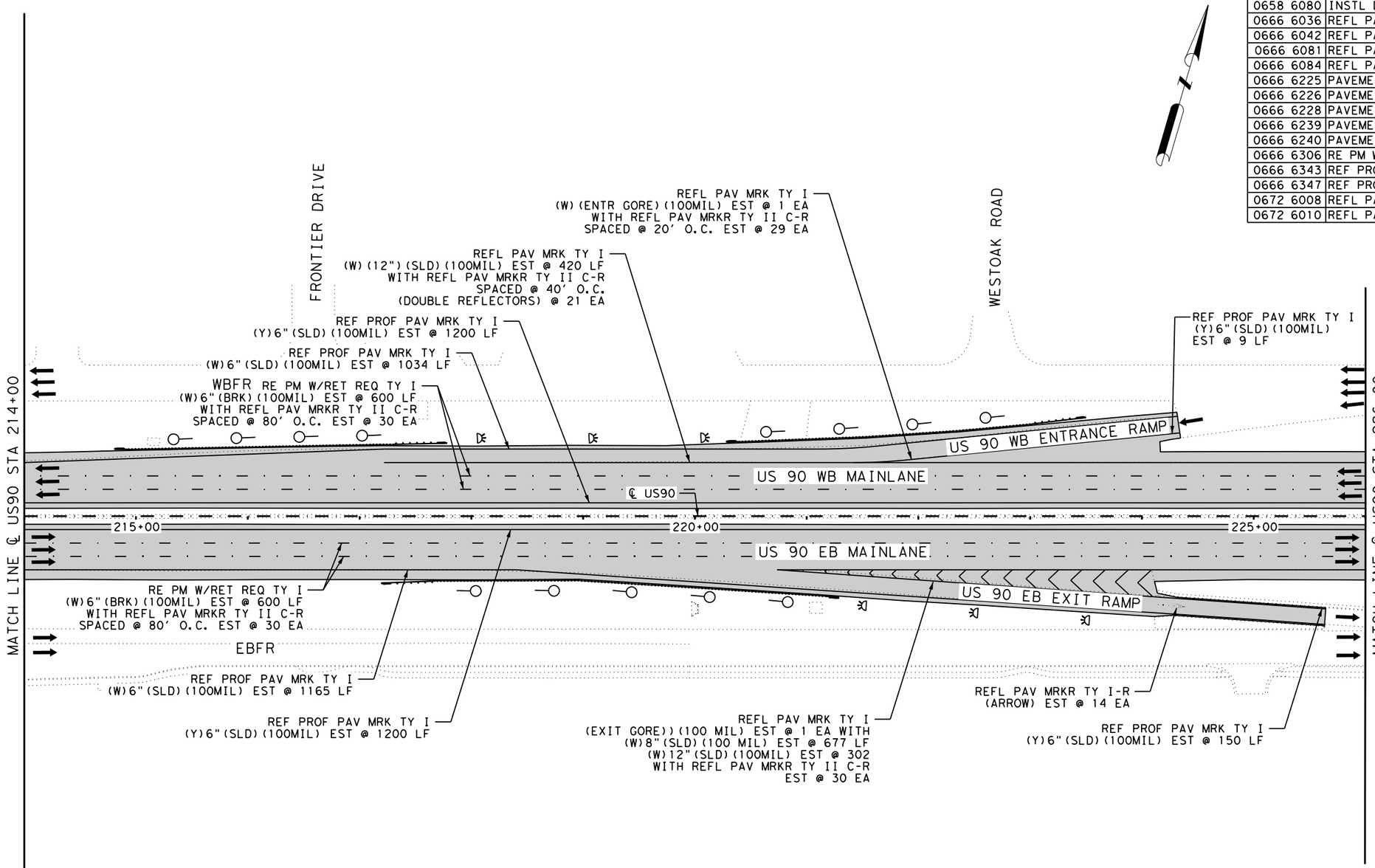
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	13
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	6
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	677
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	722
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	5988
0666 6226	PAVEMENT SEALER 8"	LF	677
0666 6228	PAVEMENT SEALER 12"	LF	722
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1230
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2199
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2559
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	140



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 214+00 TO
℄ US90 STA 226+00

SHEET 7 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	209
CONT.	SECT.	JOB	
0024	08	141	

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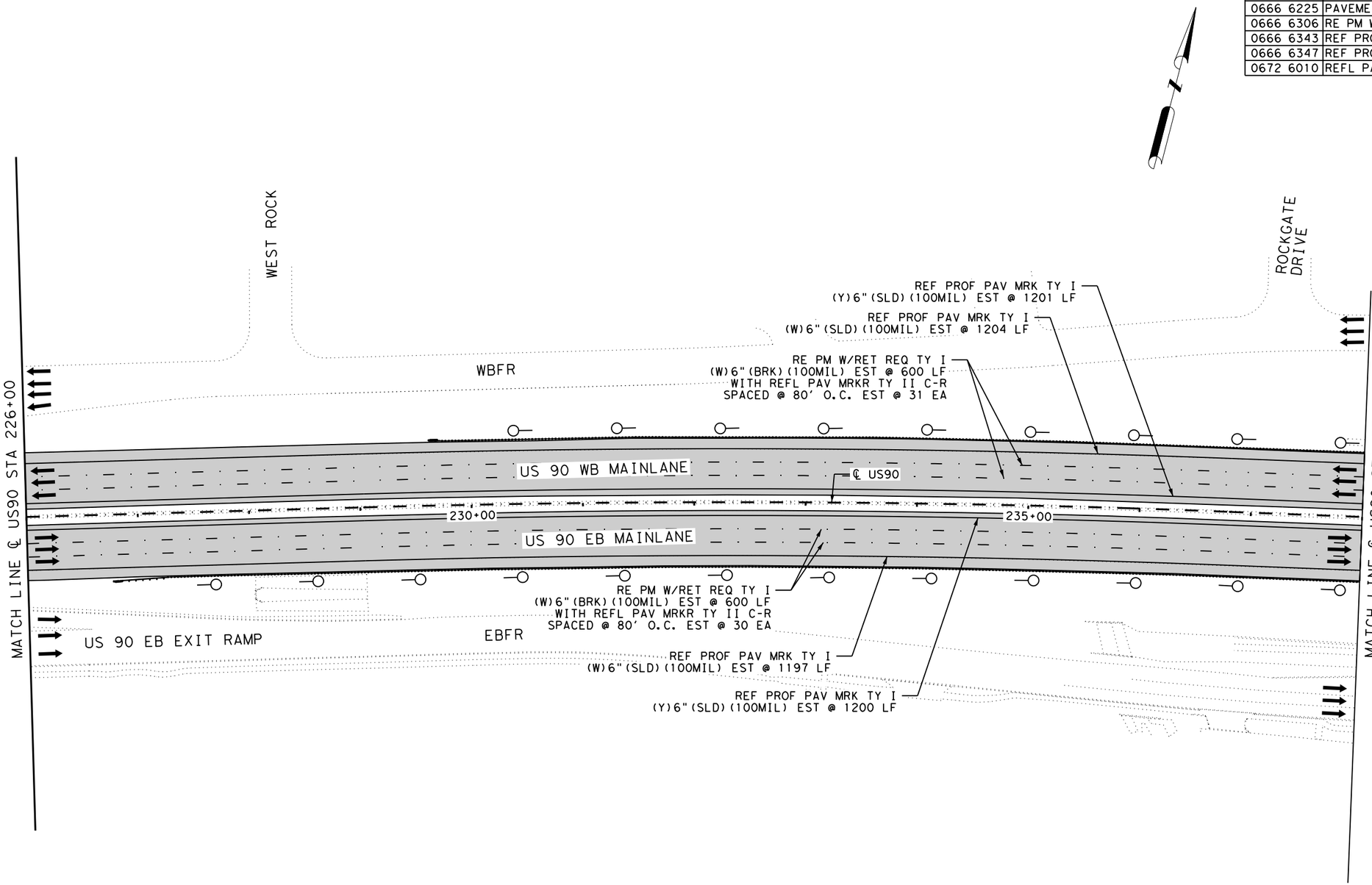
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	21
0666 6225	PAVEMENT SEALER 6"	LF	6002
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	61



LEGEND

PROPOSED SIGN
DIRECTIONAL ARROWS
(DW-SW/SY)SZ1(BRF)GF2
(D-SW)SZ1(WFLX)GND
(D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 226+00 TO
℄ US90 STA 238+00

SHEET 8 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	210
CONT.	SECT.	JOB	
0024	08	141	

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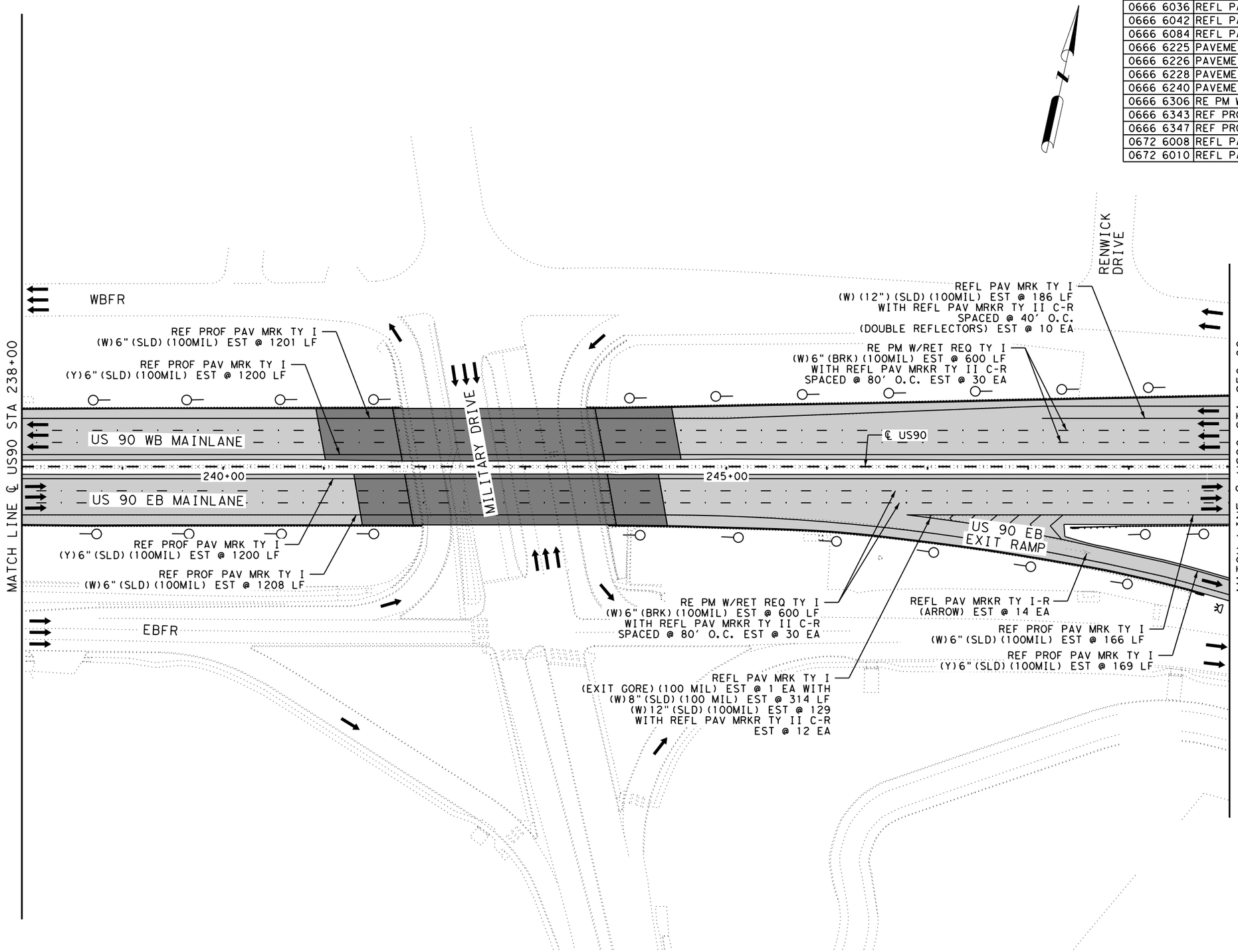
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	24
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	314
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	315
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6364
0666 6226	PAVEMENT SEALER 8"	LF	314
0666 6228	PAVEMENT SEALER 12"	LF	315
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1220
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2575
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2569
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	82



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 238+00 TO
℄ US90 STA 250+00

SHEET 9 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	211
0024	08	141	

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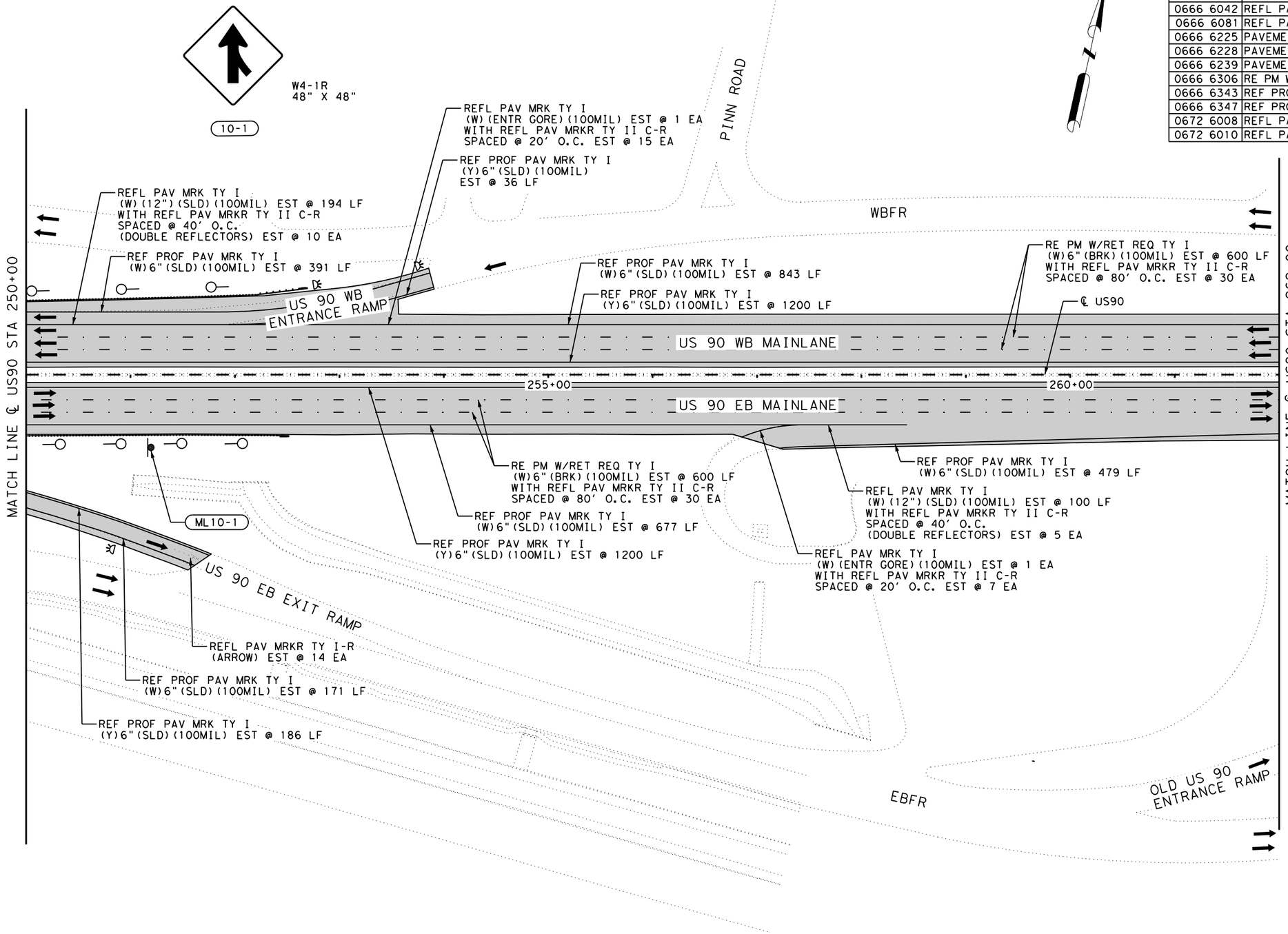
Item	Description	Unit	Qty
0644 6067	INSTL SM RD SN SUP & AM (INST SIGN ONLY)	EA	1
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	2
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	294
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	2
0666 6225	PAVEMENT SEALER 6"	LF	6383
0666 6228	PAVEMENT SEALER 12"	LF	294
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	2
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2561
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2622
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	97



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 250+00 TO
℄ US90 STA 262+00

SHEET 10 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	212
CONT.	SECT.	JOB	
0024	08	141	

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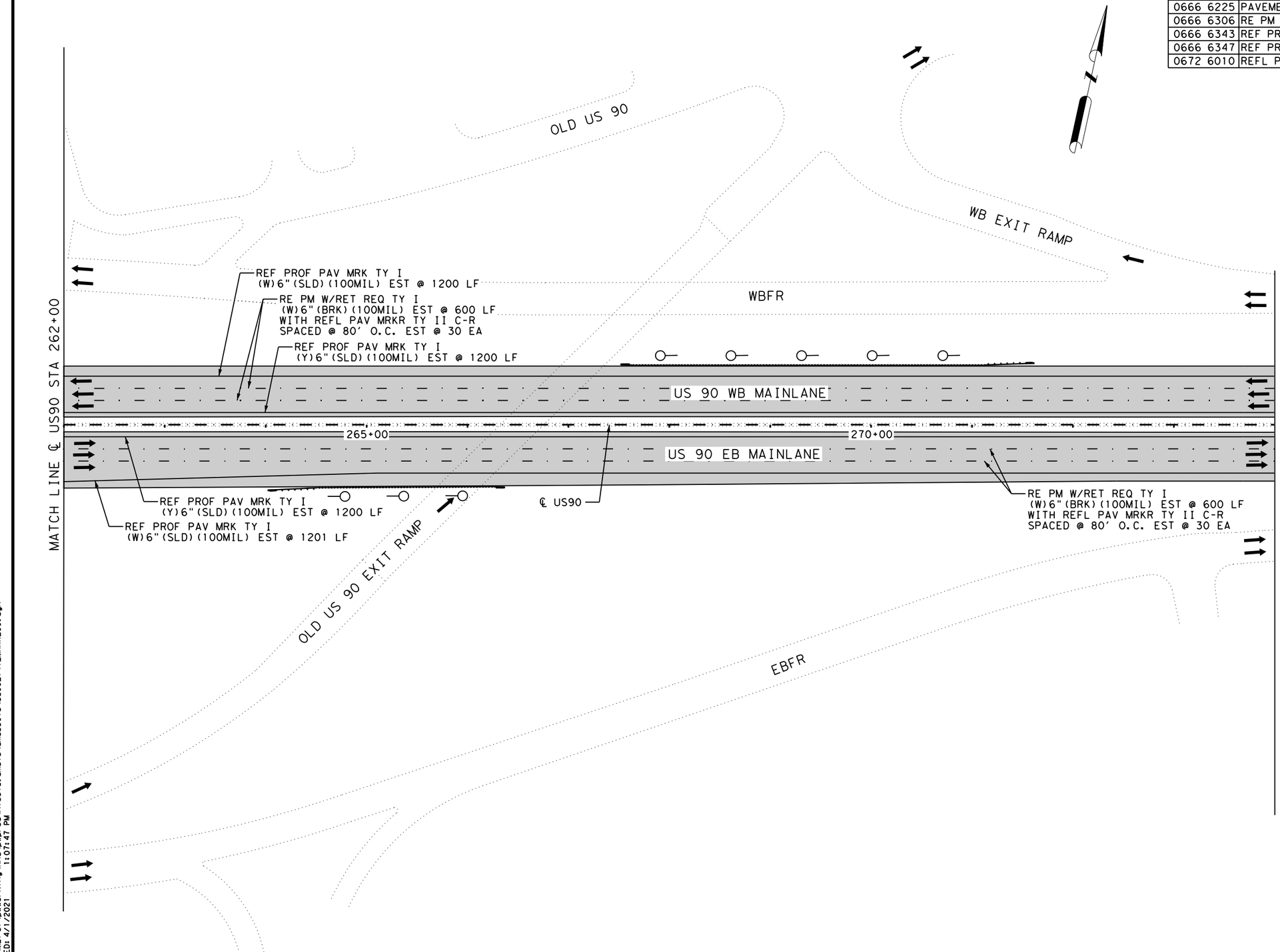
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	8
0666 6225	PAVEMENT SEALER 6"	LF	6001
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	60



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 262+00 TO
℄ US90 STA 274+00

SHEET 11 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	213
CONT.	SECT.	JOB	
0024	08	141	

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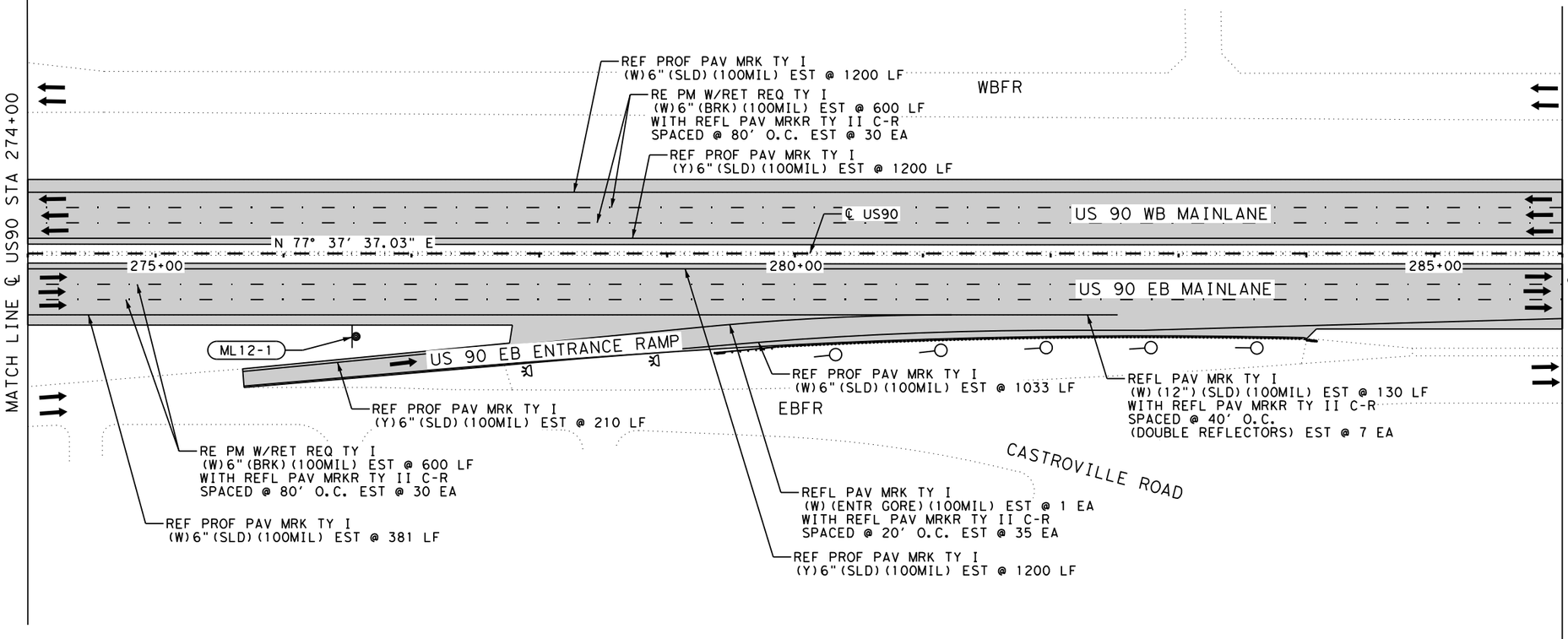
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	5
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	2
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	130
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6424
0666 6228	PAVEMENT SEALER 12"	LF	130
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2614
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2610
0672 6010	REFL PAV MRKR TY II-C-R	EA	102



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 274+00 TO
℄ US90 STA 286+00

SHEET 12 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	214
CONT.	SECT.	JOB	
0024	08	141	

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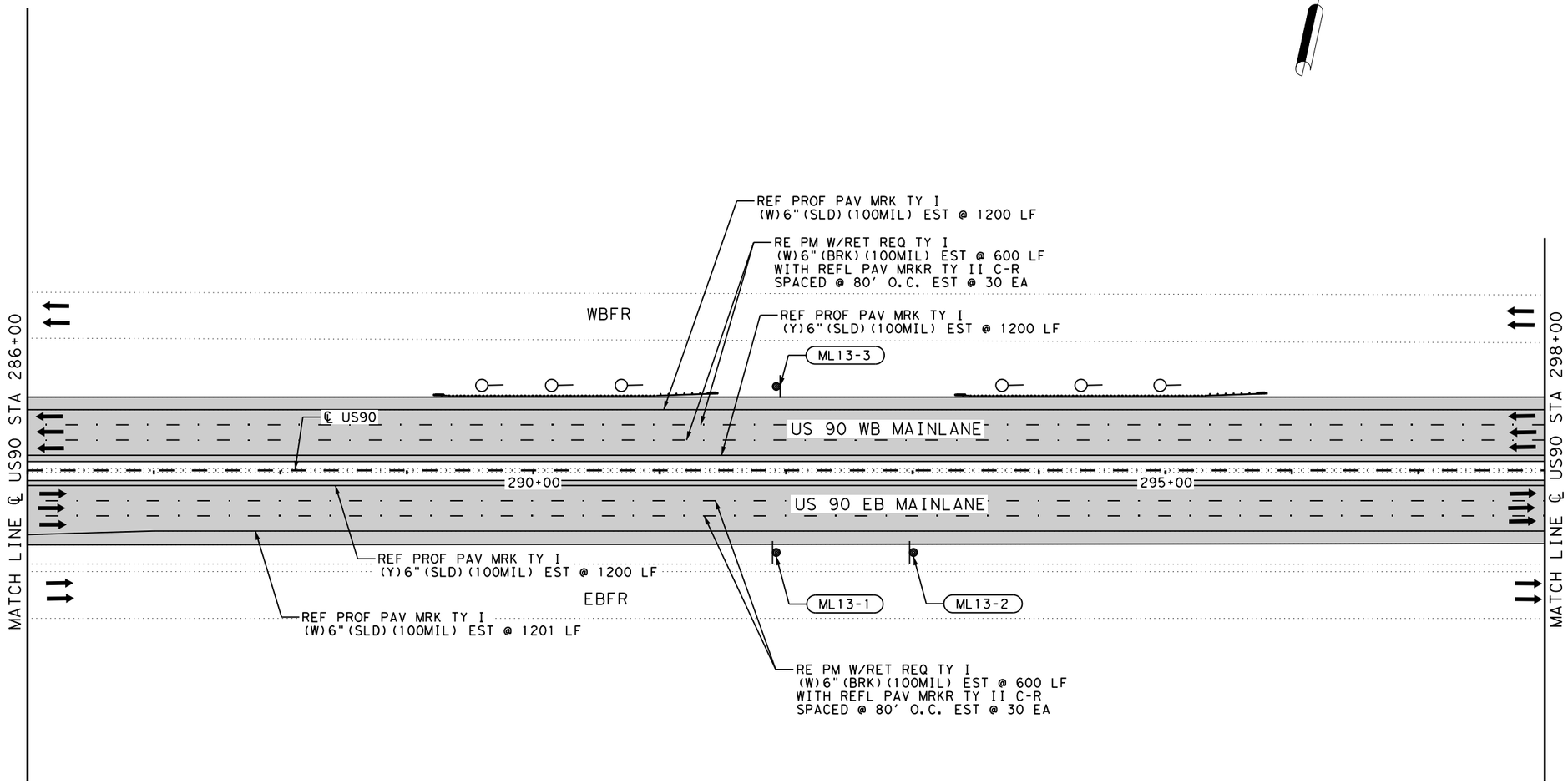
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6
0666 6225	PAVEMENT SEALER 6"	LF	6001
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	60



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 286+00 TO
℄ US90 STA 298+00

SHEET 13 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	215
CONT.	SECT.	JOB	
0024	08	141	

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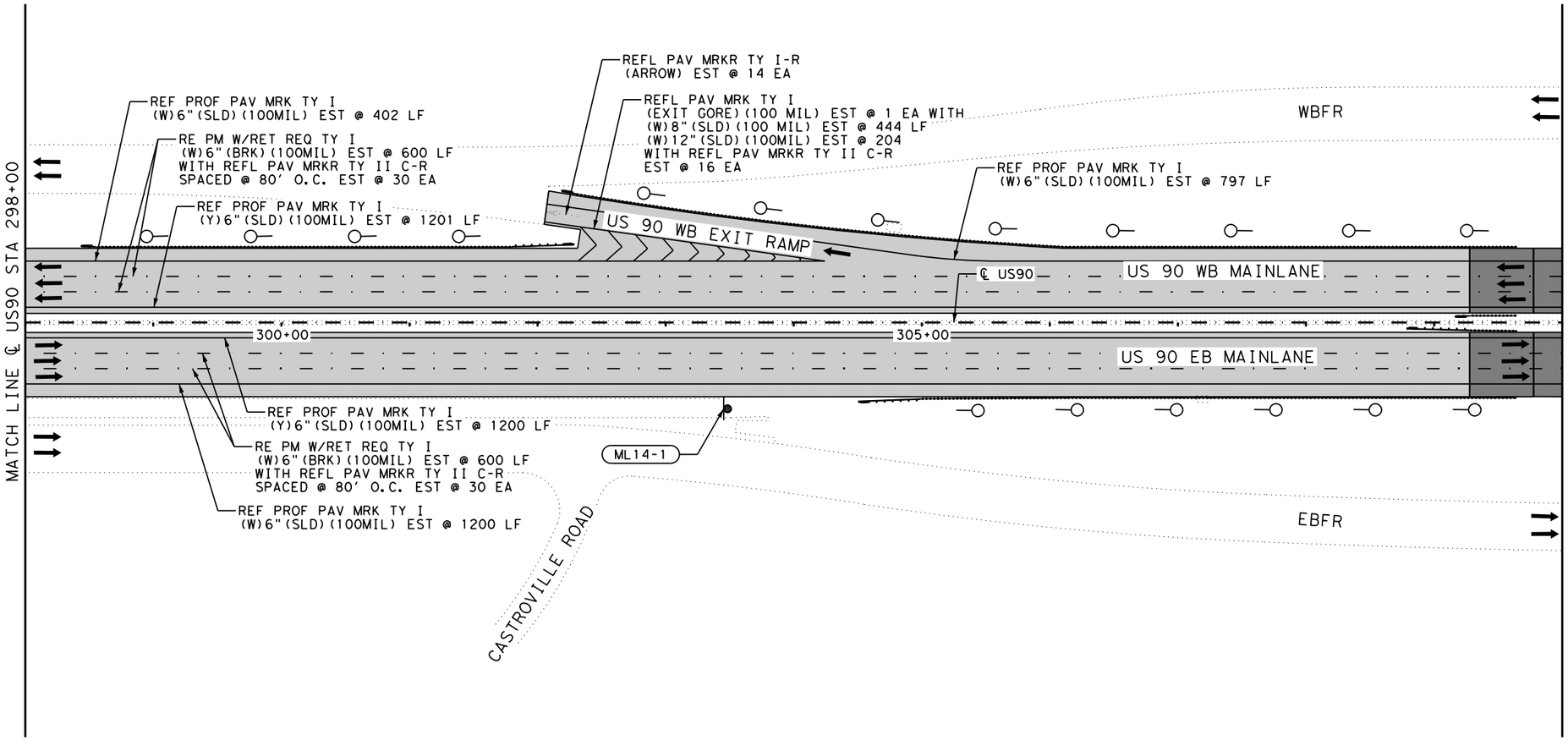
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	18
0666 6036	REF PROF PAV MRK TY I(W)8"(SLD)(100MIL)	LF	444
0666 6042	REF PROF PAV MRK TY I(W)12"(SLD)(100MIL)	LF	204
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6000
0666 6226	PAVEMENT SEALER 8"	LF	444
0666 6228	PAVEMENT SEALER 12"	LF	204
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2399
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	76



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 298+00 TO
℄ US90 STA 310+00

SHEET 14 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	216
CONT.	SECT.	JOB	
0024	08	141	

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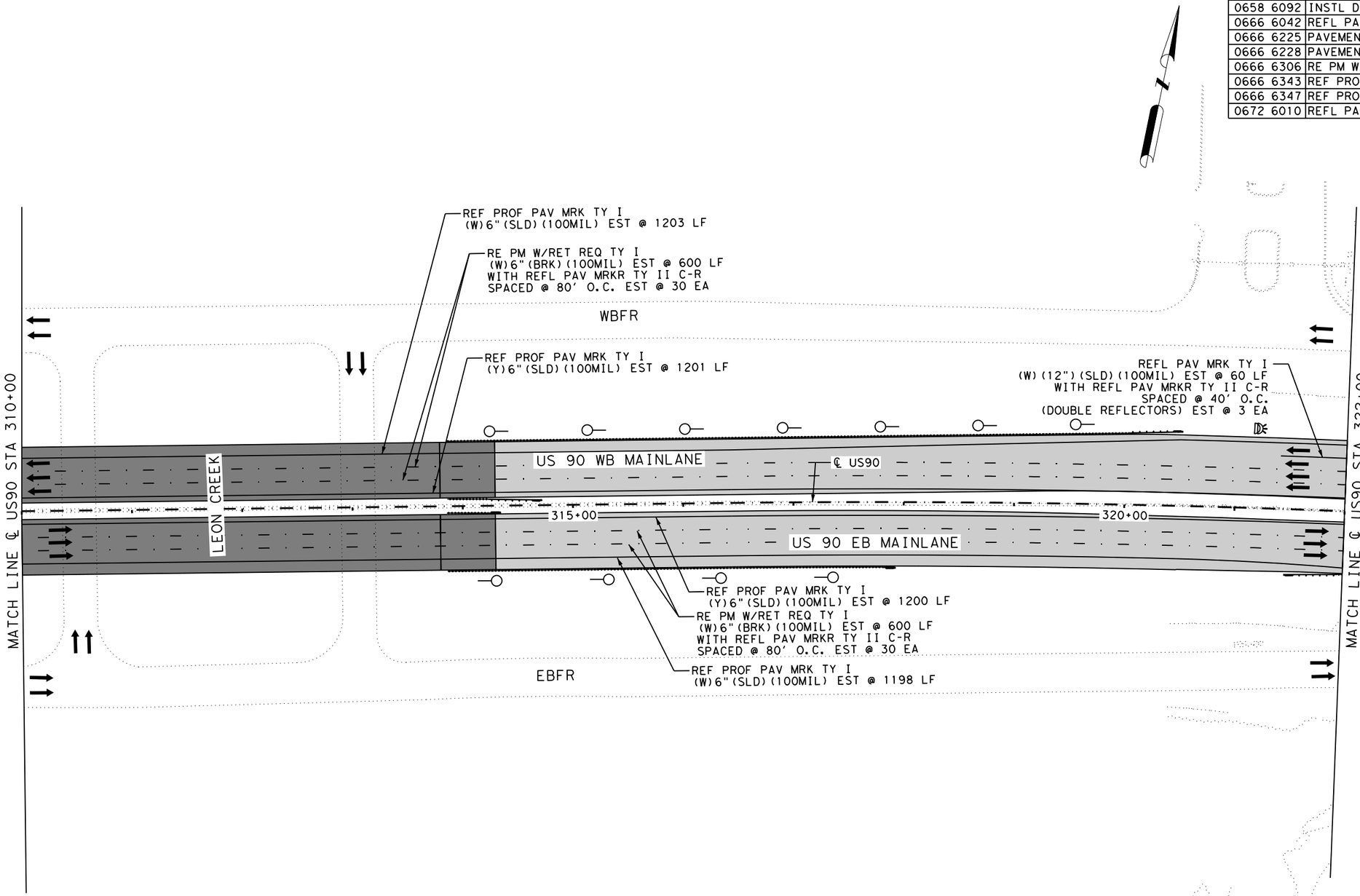
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	11
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	1
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	60
0666 6225	PAVEMENT SEALER 6"	LF	6002
0666 6228	PAVEMENT SEALER 12"	LF	60
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	63



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 310+00 TO
℄ US90 STA 322+00

SHEET 15 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	217
CONT.	SECT.	JOB	
0024	08	141	

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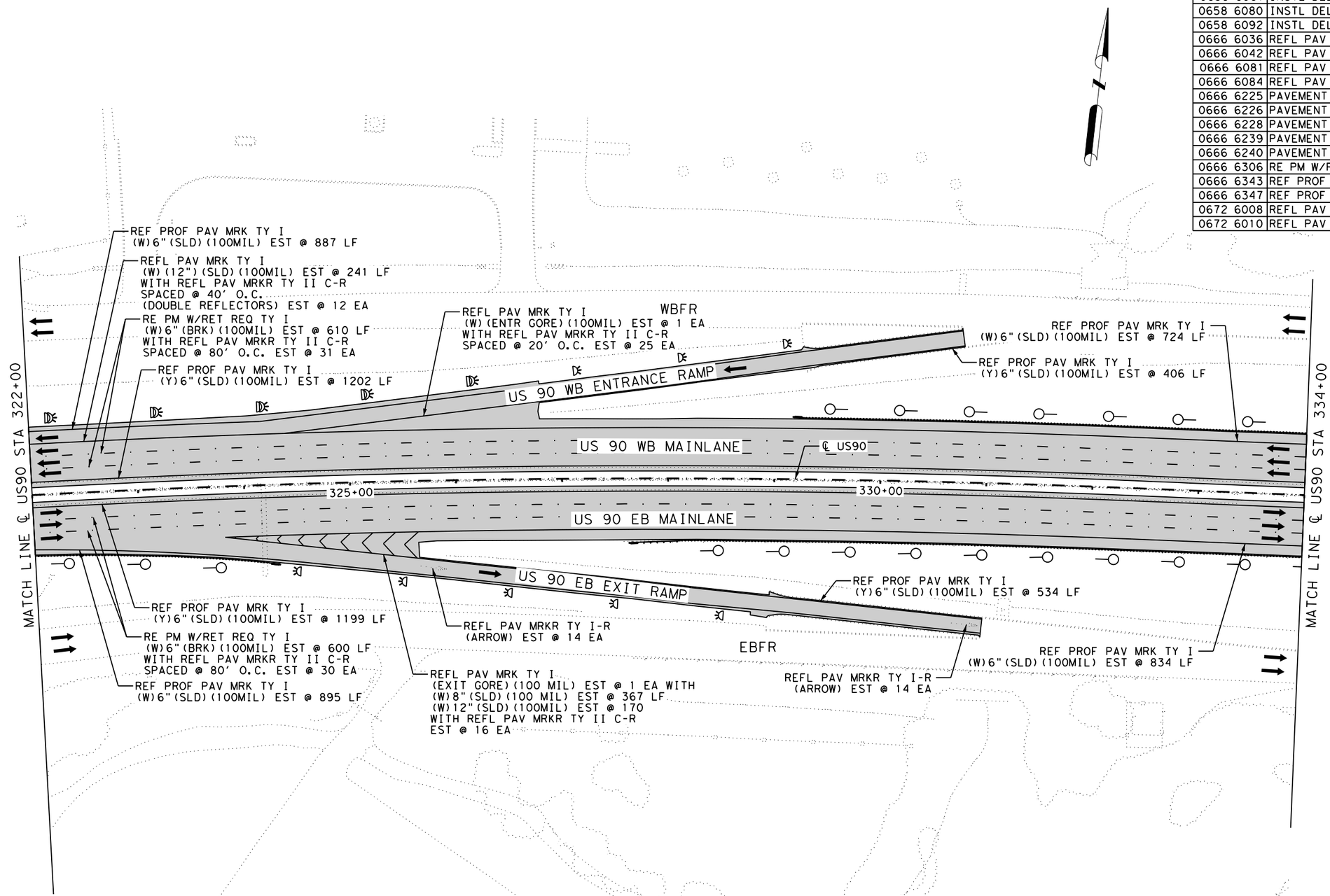
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	15
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	6
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	5
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	367
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	411
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	7891
0666 6226	PAVEMENT SEALER 8"	LF	367
0666 6228	PAVEMENT SEALER 12"	LF	411
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1210
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	3340
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	3341
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	114



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 322+00 TO
℄ US90 STA 334+00

SHEET 16 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	218
CONT.	SECT.	JOB	
0024	08	141	

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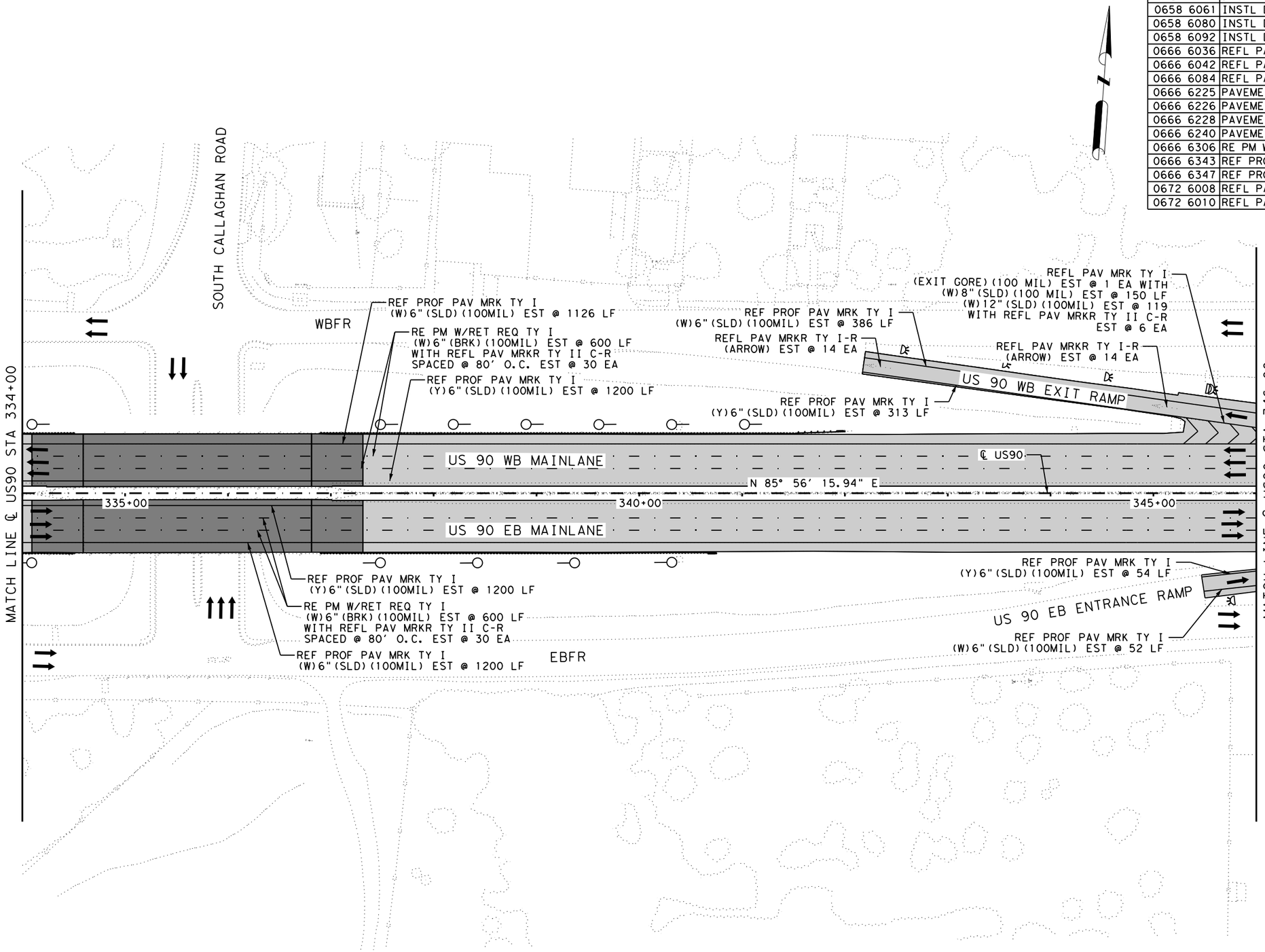
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	16
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	4
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	1
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	150
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	119
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6731
0666 6226	PAVEMENT SEALER 8"	LF	150
0666 6228	PAVEMENT SEALER 12"	LF	119
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2764
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2767
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	66



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

TREY NEAL
106194
STATE OF TEXAS
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 334+00 TO
℄ US90 STA 346+00

SHEET 17 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	219
CONT.	SECT.	JOB	
0024	08	141	

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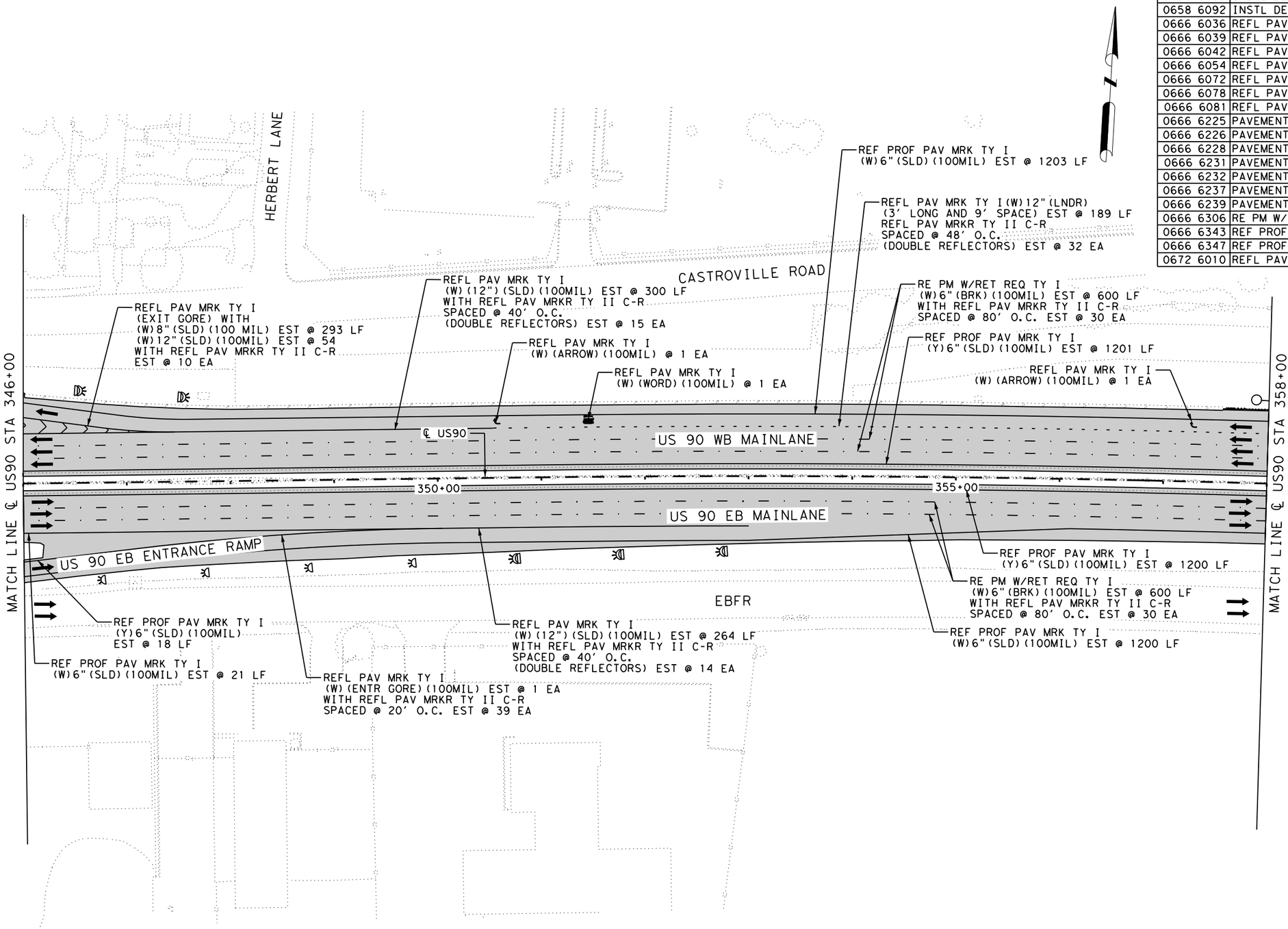
Item	Description	Unit	Qty
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	4
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	5
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	293
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	189
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	618
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6043
0666 6226	PAVEMENT SEALER 8"	LF	293
0666 6228	PAVEMENT SEALER 12"	LF	807
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2424
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2419
0672 6010	REFL PAV MRKR TY II-C-R	EA	170



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 346+00 TO
℄ US90 STA 358+00

SHEET 18 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	220
CONT.	SECT.	JOB	
0024	08	141	

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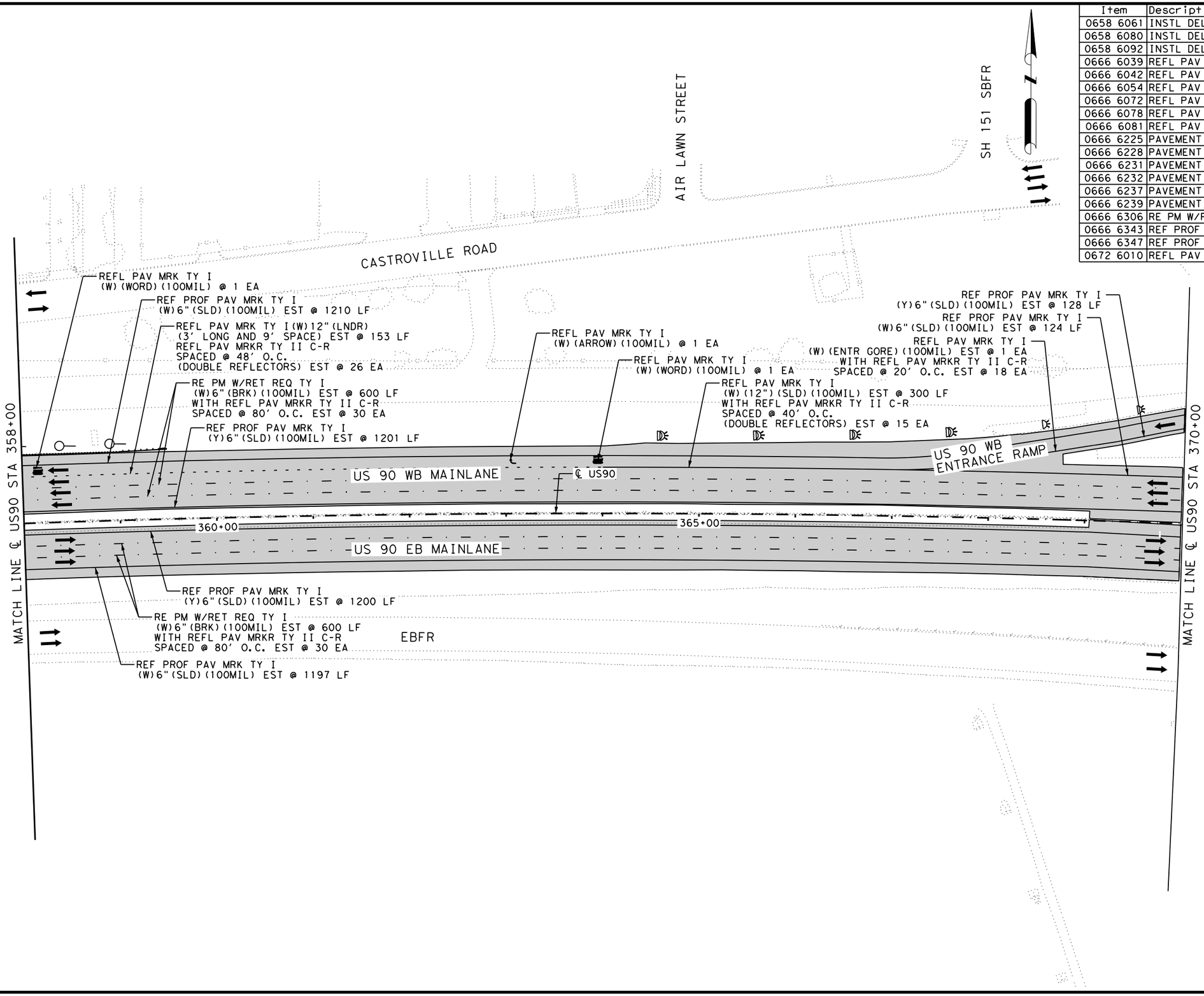
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	2
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	4
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	153
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	300
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6260
0666 6228	PAVEMENT SEALER 12"	LF	453
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2531
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2529
0672 6010	REFL PAV MRKR TY II-C-R	EA	119



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 358+00 TO
℄ US90 STA 370+00

SHEET 19 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	221
CONT.	SECT.	JOB	
0024	08	141	

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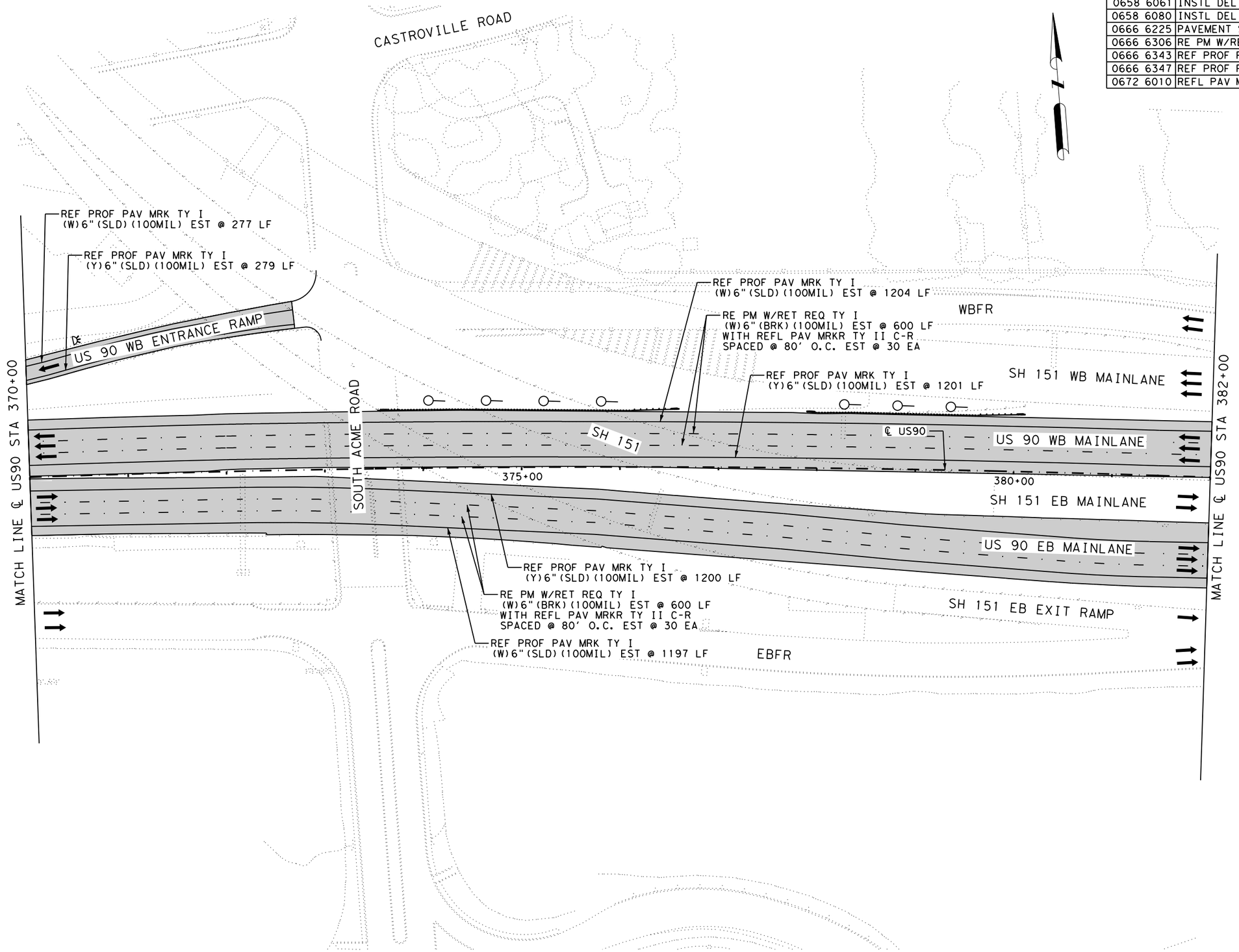
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	7
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6558
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2678
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2680
0672 6010	REFL PAV MRKR TY II-C-R	EA	60



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 370+00 TO
℄ US90 STA 382+00

SHEET 20 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	222
CONT.	SECT.	JOB	
0024	08	141	

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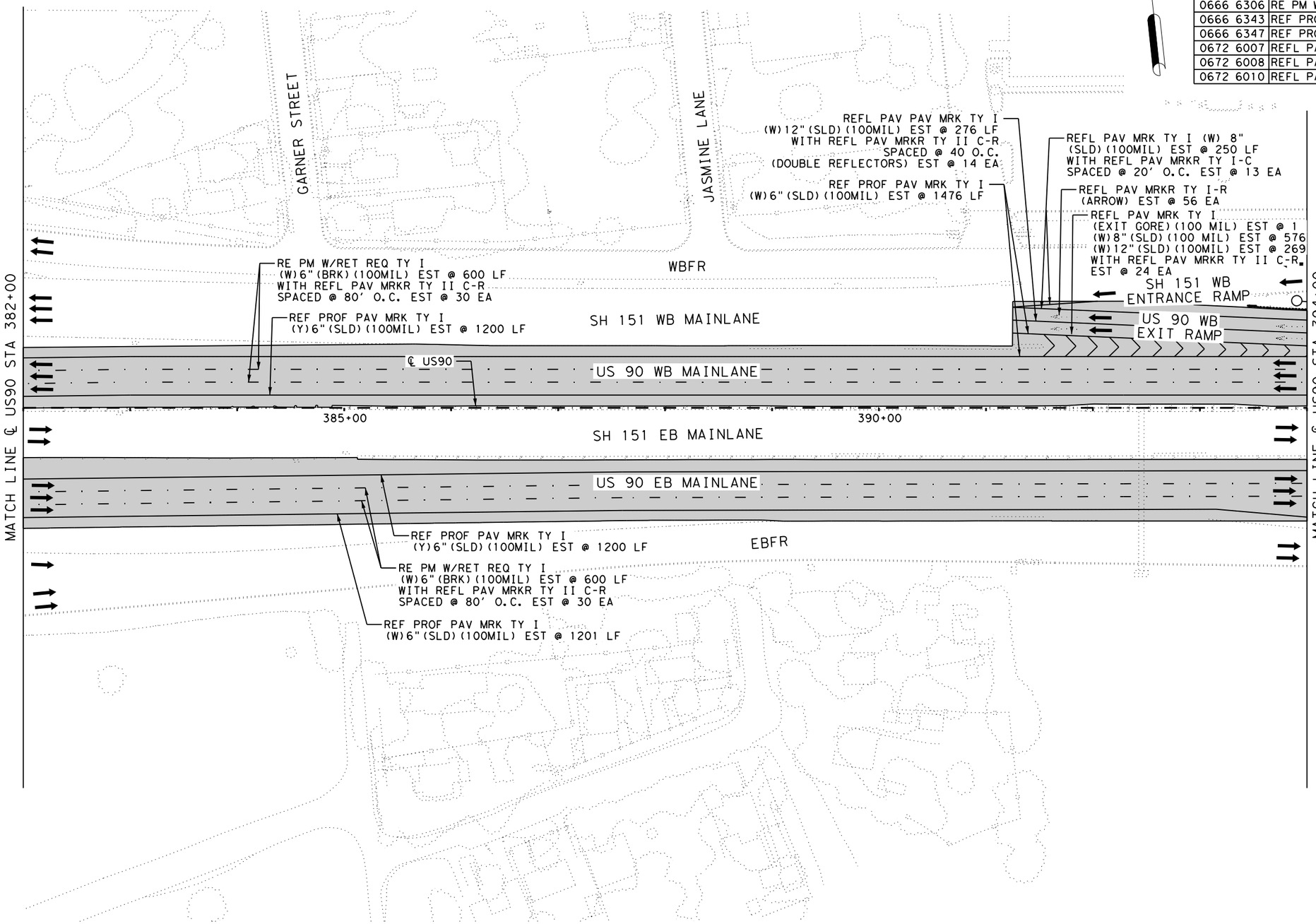
Item	Description	Unit	Qty
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	826
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	545
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6277
0666 6226	PAVEMENT SEALER 8"	LF	826
0666 6228	PAVEMENT SEALER 12"	LF	545
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2400
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2677
0672 6007	REFL PAV MRKR TY I-C	EA	13
0672 6008	REFL PAV MRKR TY I-R	EA	56
0672 6010	REFL PAV MRKR TY II-C-R	EA	98



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 382+00 TO
℄ US90 STA 394+00

SHEET 21 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	223
CONT.	SECT.	JOB	
0024	08	141	

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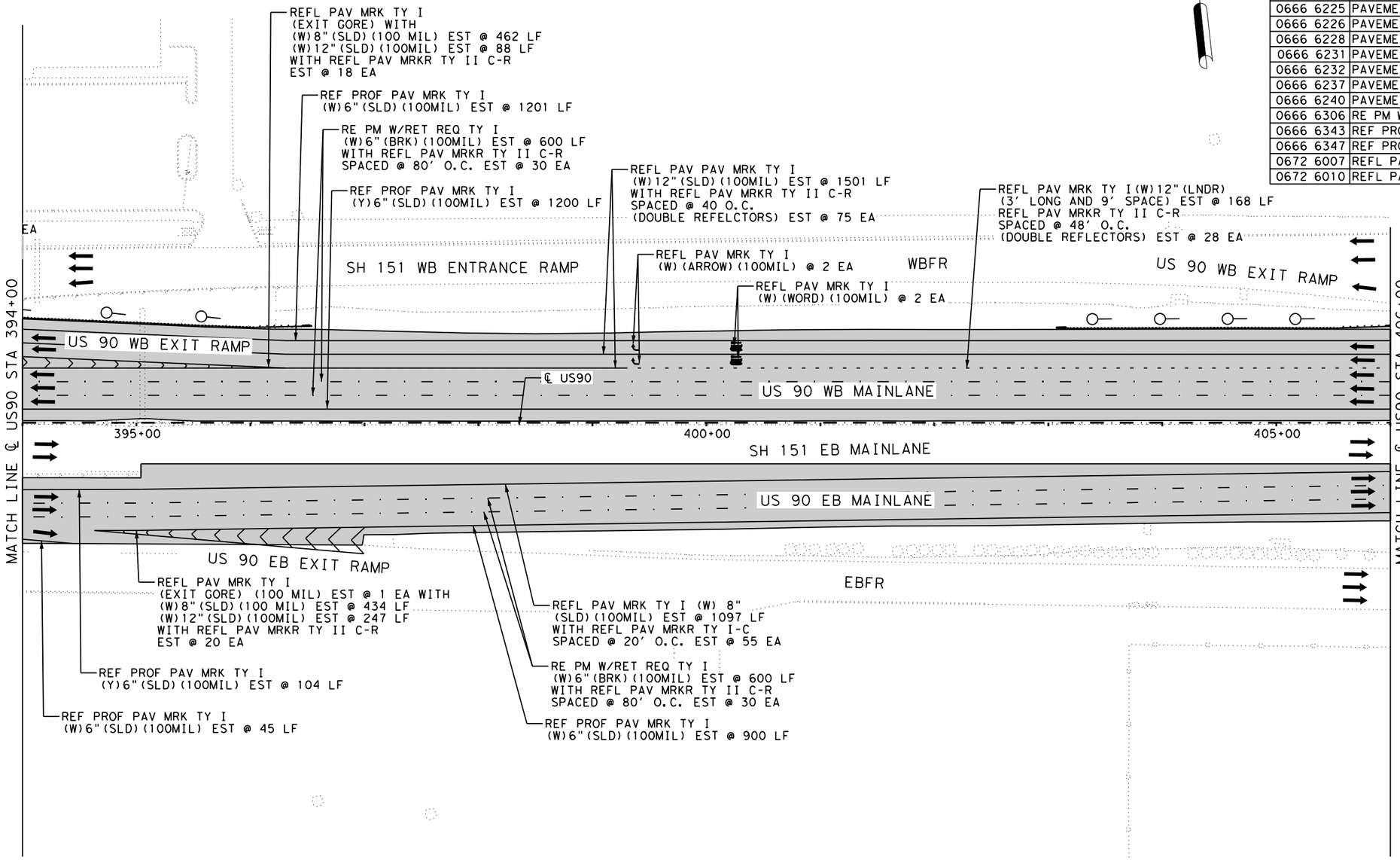
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	7
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1993
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	168
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	1836
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	4650
0666 6226	PAVEMENT SEALER 8"	LF	1993
0666 6228	PAVEMENT SEALER 12"	LF	2004
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1200
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2146
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	1304
0672 6007	REFL PAV MRKR TY I-C	EA	55
0672 6010	REFL PAV MRKR TY II-C-R	EA	201



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 394+00 TO
℄ US90 STA 406+00

SHEET 22 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	224
CONT.	SECT.	JOB	
0024	08	141	

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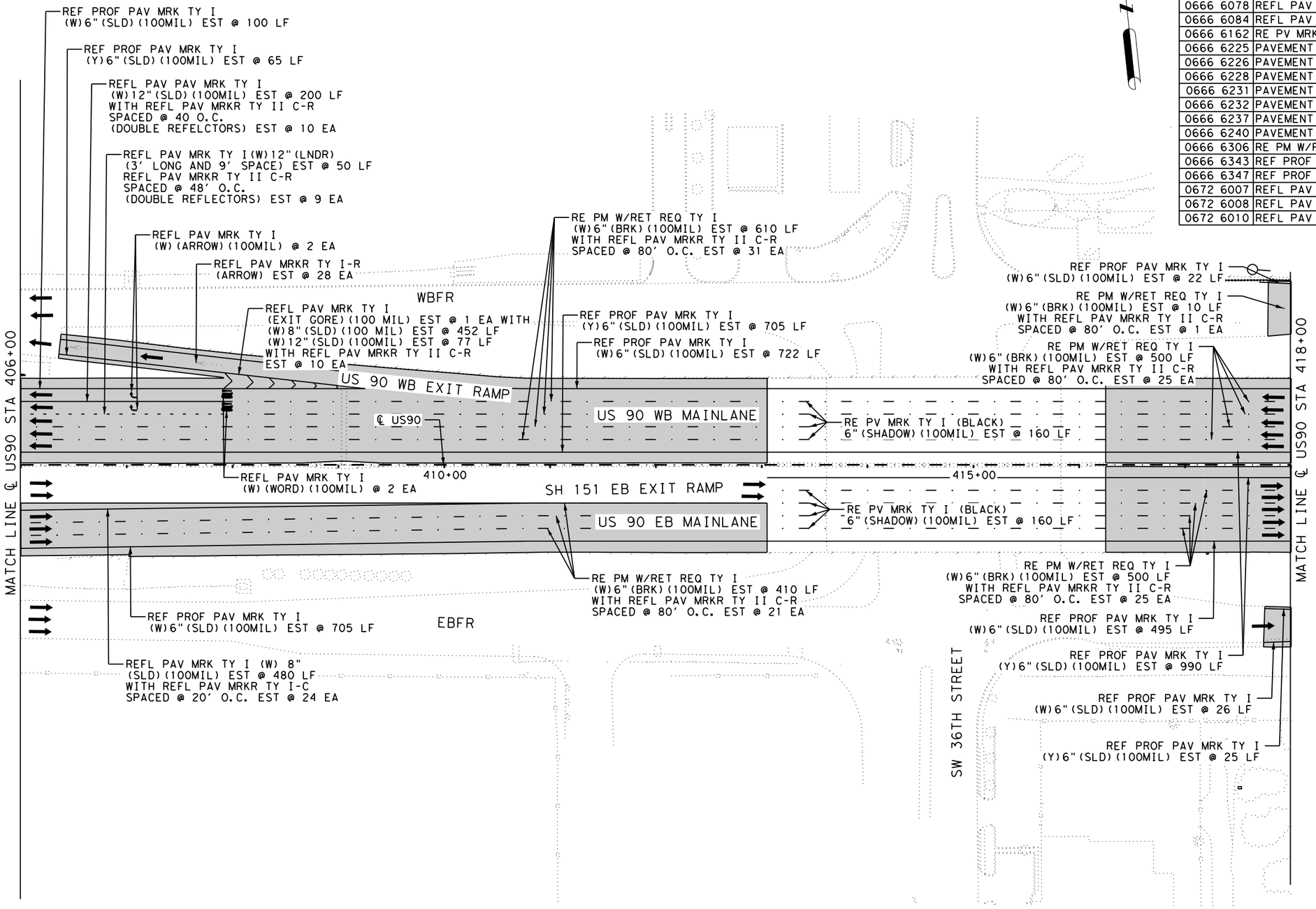
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	932
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	50
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	277
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6162	RE PV MRK TY I (BLACK)6"(SHADOW)(100 MIL)	EA	320
0666 6225	PAVEMENT SEALER 6"	LF	6639
0666 6226	PAVEMENT SEALER 8"	LF	932
0666 6228	PAVEMENT SEALER 12"	LF	327
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2020
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2514
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	1785
0672 6007	REFL PAV MRKR TY I-C	EA	24
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	132



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS · TREY NEAL · 106194 · LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 406+00 TO
℄ US90 STA 418+00

SHEET 23 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	225
CONT.	SECT.	JOB	
0024	08	141	

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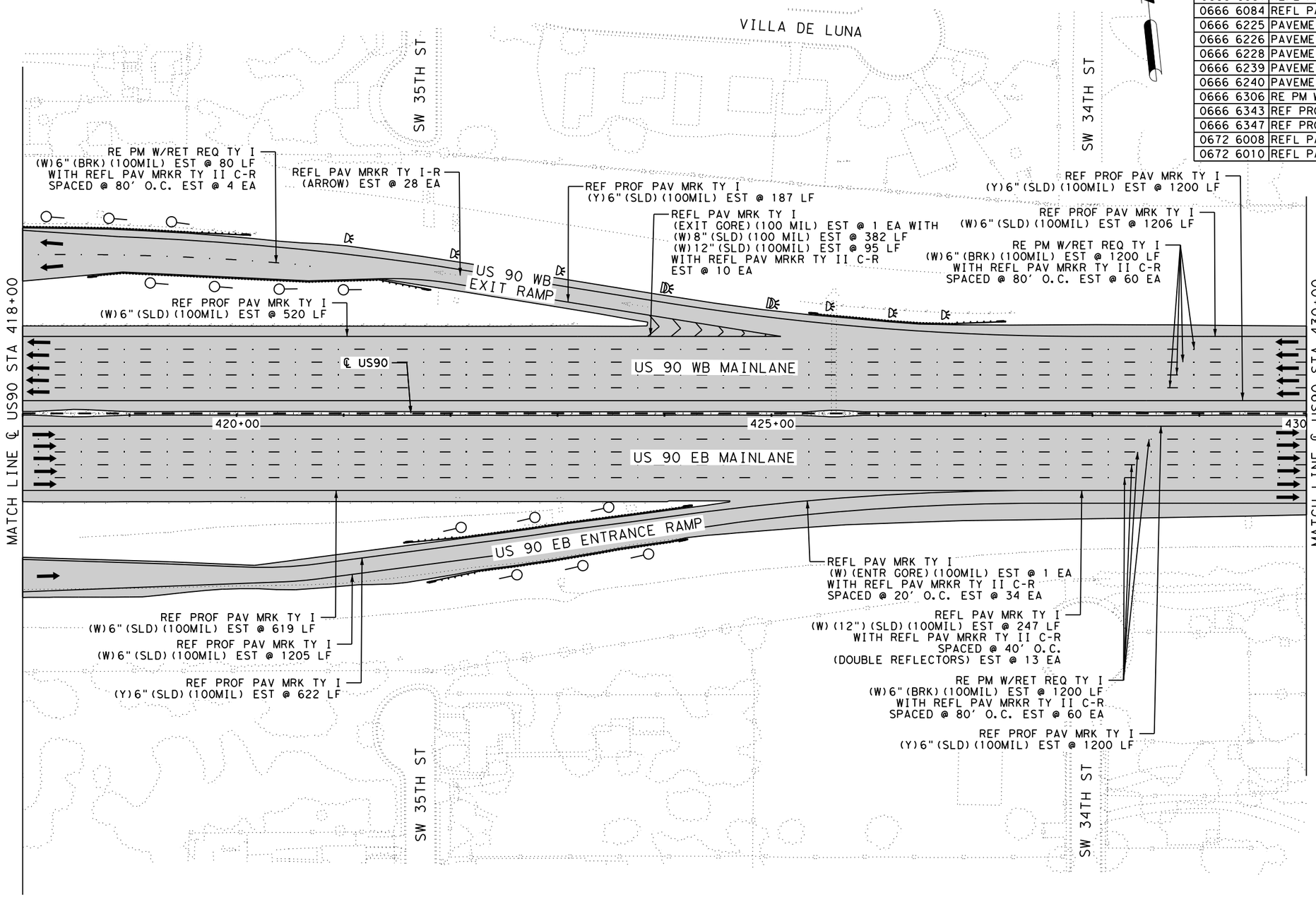
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	9
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	7
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	3
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	2
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	834
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	419
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	9239
0666 6226	PAVEMENT SEALER 8"	LF	834
0666 6228	PAVEMENT SEALER 12"	LF	419
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2480
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	3550
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	3209
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	181



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 418+00 TO
℄ US90 STA 430+00

SHEET 24 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	226
CONT.	SECT.	JOB	
0024	08	141	

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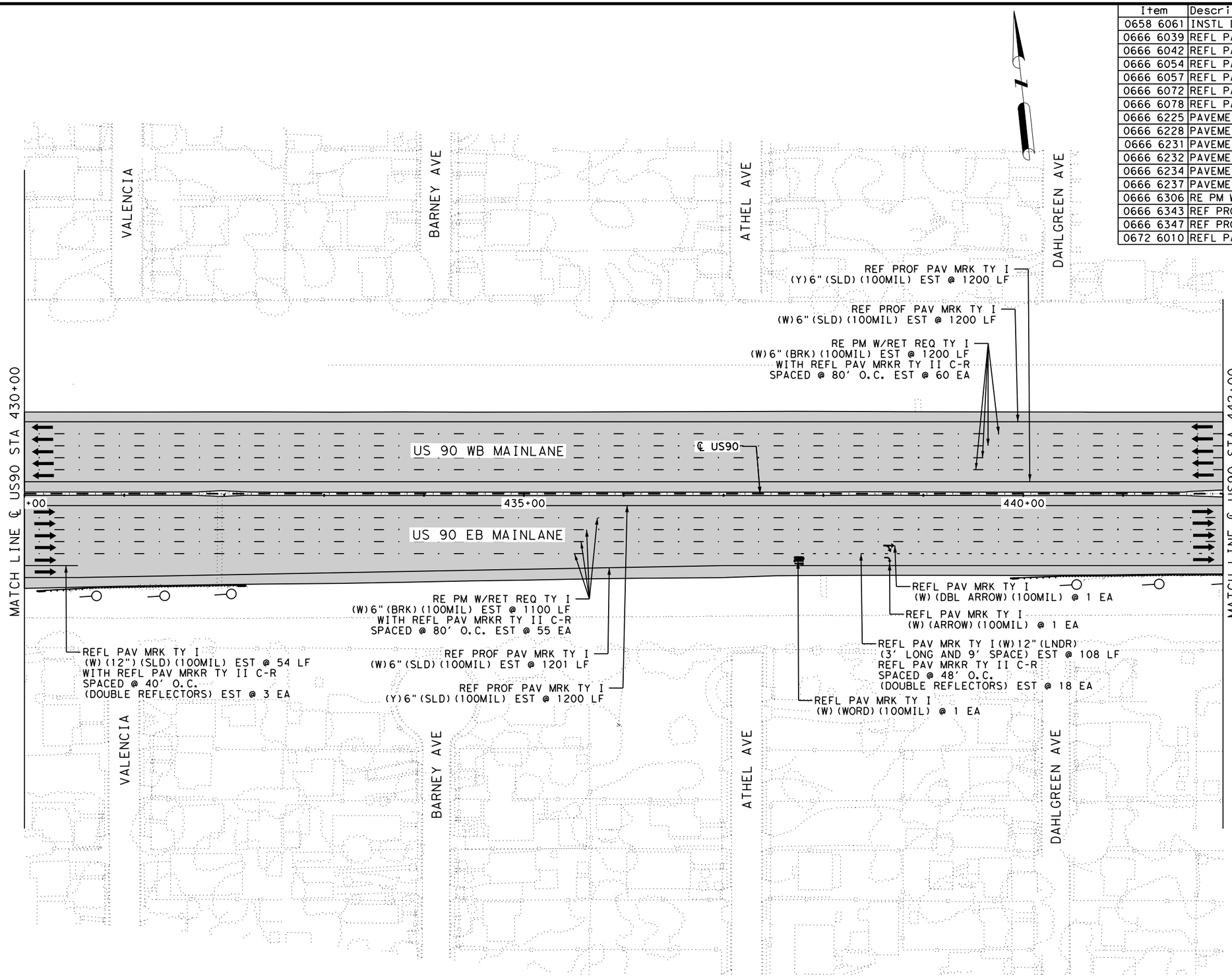
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	108
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	54
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	1
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	7101
0666 6228	PAVEMENT SEALER 12"	LF	162
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6234	PAVEMENT SEALER (DBL ARROW)	EA	1
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2300
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	136



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 430+00 TO
℄ US90 STA 442+00

SHEET 25 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	227
CONT.	SECT.	JOB	
0024	08	141	

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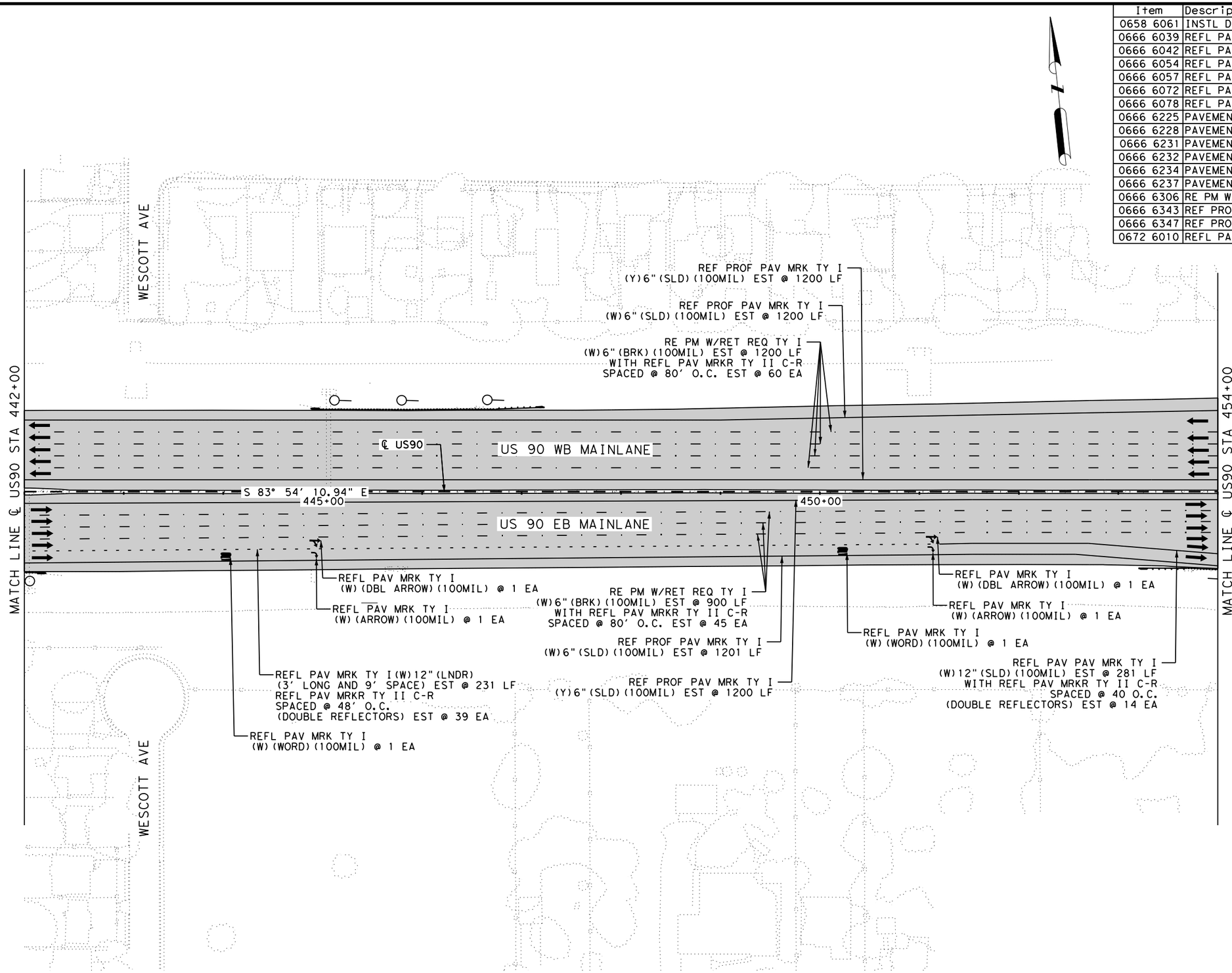
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	6
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	231
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	281
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6225	PAVEMENT SEALER 6"	LF	6901
0666 6228	PAVEMENT SEALER 12"	LF	512
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6234	PAVEMENT SEALER (DBL ARROW)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2100
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	158



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 442+00 TO
℄ US90 STA 454+00

SHEET 26 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	228
CONT.	SECT.	JOB	
0024	08	141	

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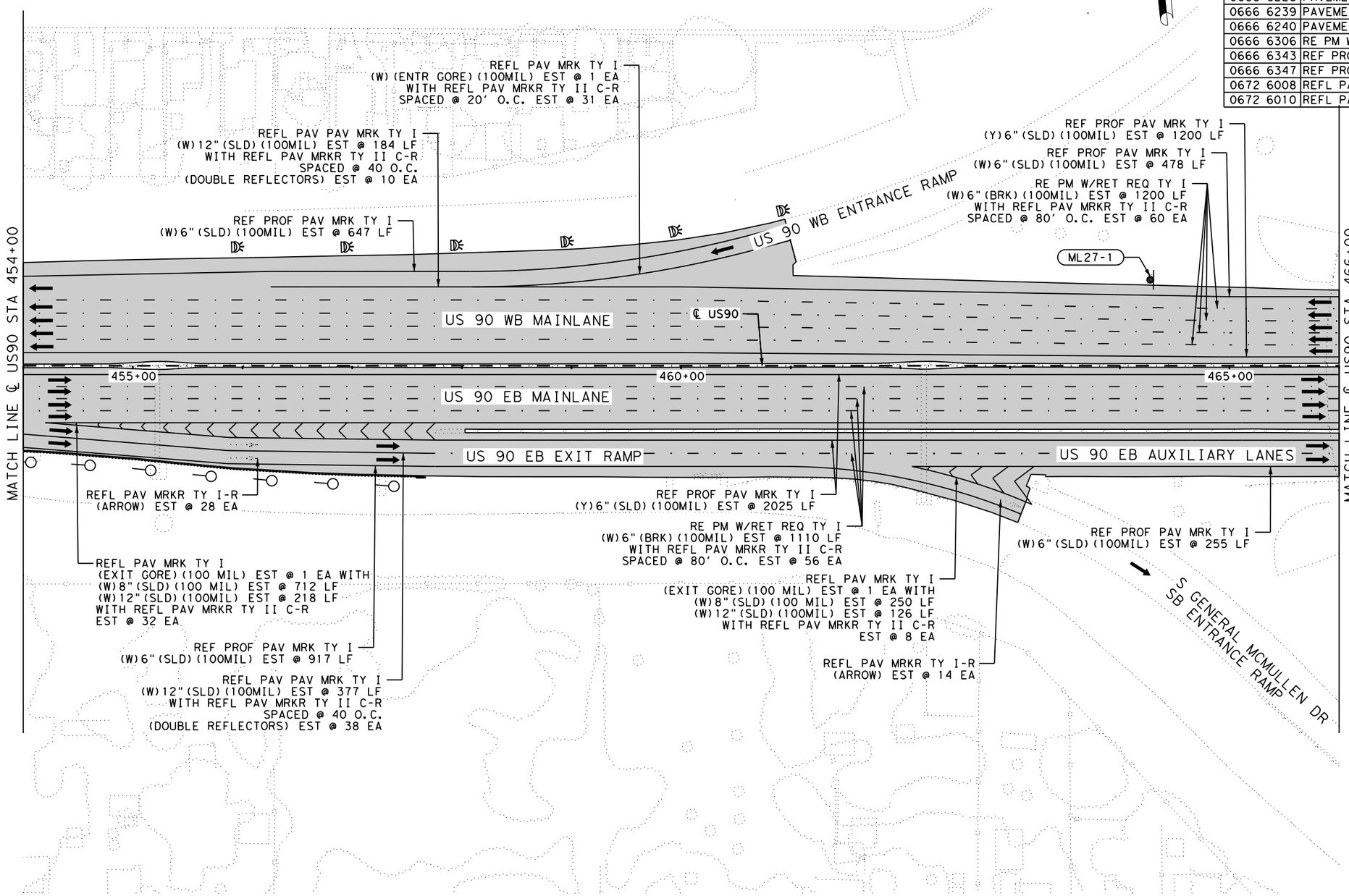
Item	Description	Unit	Qty
0644 6001	IN SM RD SN SUP & AM TY10BWG(1)SA(P)	EA	1
0644 6076	REMOVE SM RD SN SUP & AM	EA	1
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	4
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	6
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	962
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	905
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	2
0666 6225	PAVEMENT SEALER 6"	LF	7832
0666 6226	PAVEMENT SEALER 8"	LF	962
0666 6228	PAVEMENT SEALER 12"	LF	905
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	2
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2310
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2297
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	3225
0672 6008	REFL PAV MRKR TY I-R	EA	42
0672 6010	REFL PAV MRKR TY II-C-R	EA	235



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 454+00 TO
℄ US90 STA 466+00

SHEET 27 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	229
CONT.	SECT.	JOB	
0024	08	141	

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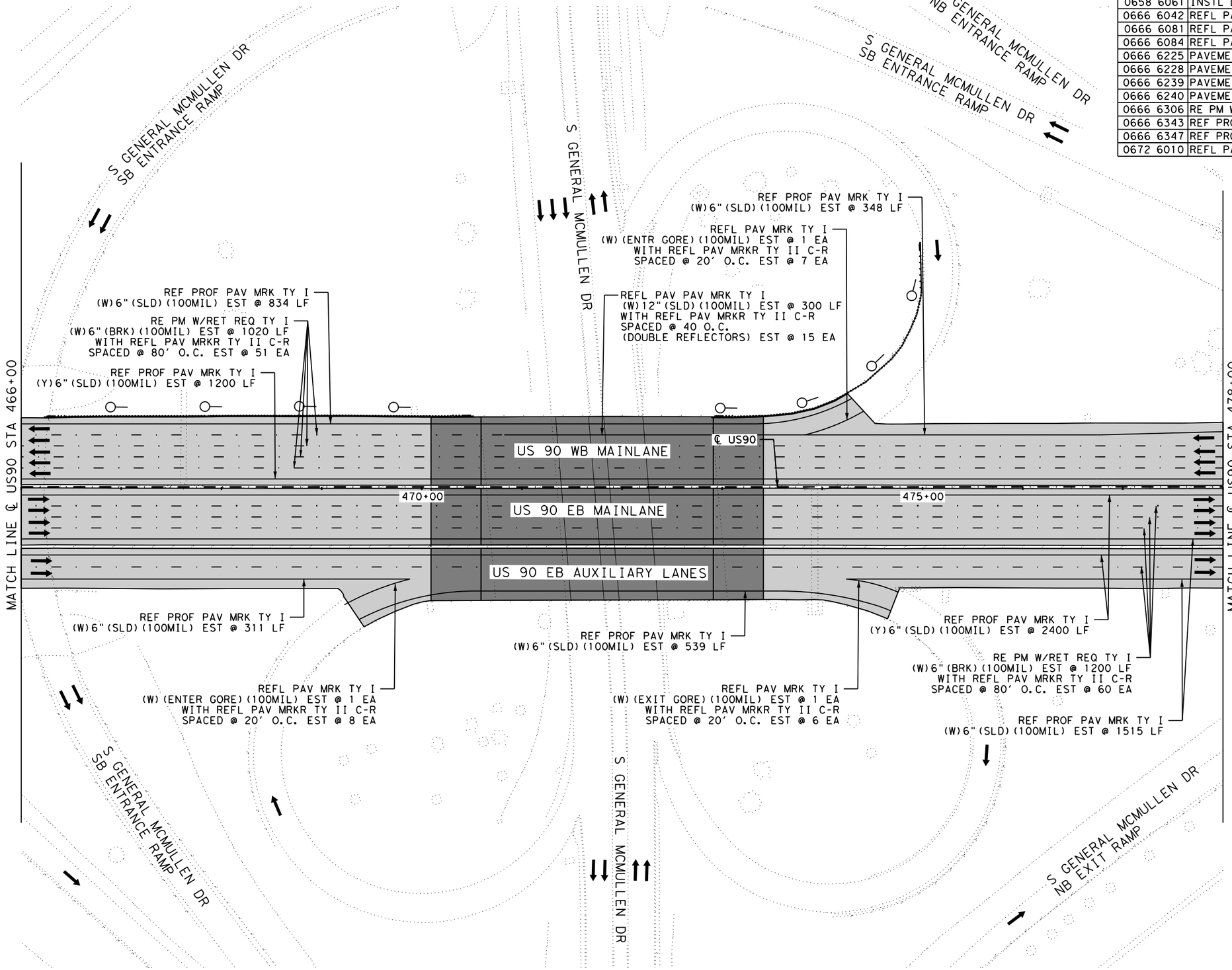
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	8
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	300
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	9367
0666 6228	PAVEMENT SEALER 12"	LF	300
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	2
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2220
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	3547
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	3600
0672 6010	REFL PAV MRKR TY II-C-R	EA	162



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 466+00 TO
℄ US90 STA 478+00

SHEET 28 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	230
CONT.	SECT.	JOB	
0024	08	141	

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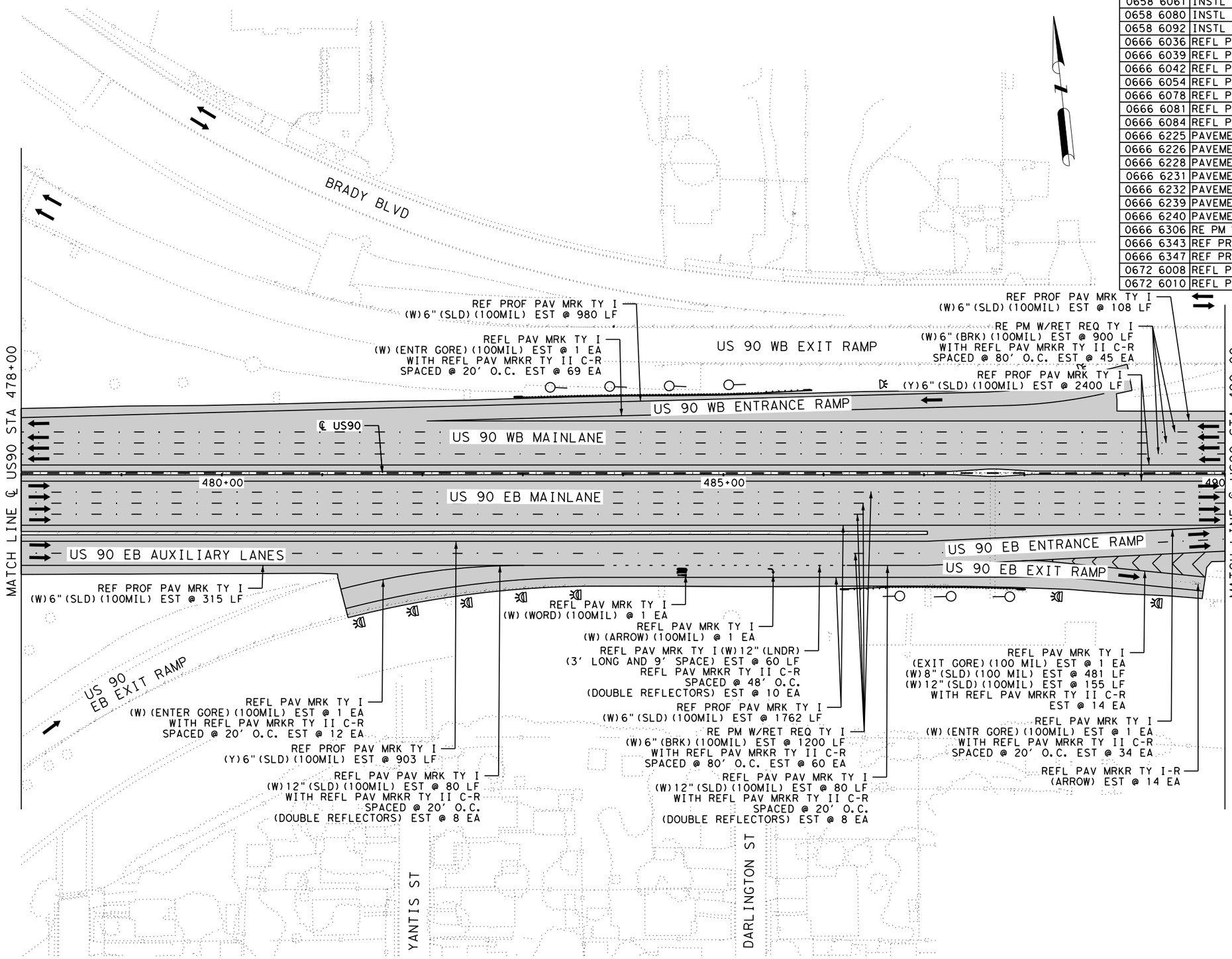
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	7
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	3
0658 6092	INSTL DEL ASSM (D-DW)SZ 1(WFLX)GND	EA	7
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	481
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	60
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	315
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	3
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	8253
0666 6226	PAVEMENT SEALER 8"	LF	481
0666 6228	PAVEMENT SEALER 12"	LF	375
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	3
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2100
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2850
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	3303
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	250



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
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PROFESSIONAL ENGINEER

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 478+00 TO
℄ US90 STA 490+00

SHEET 29 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	231
CONT.	SECT.	JOB	
0024	08	141	

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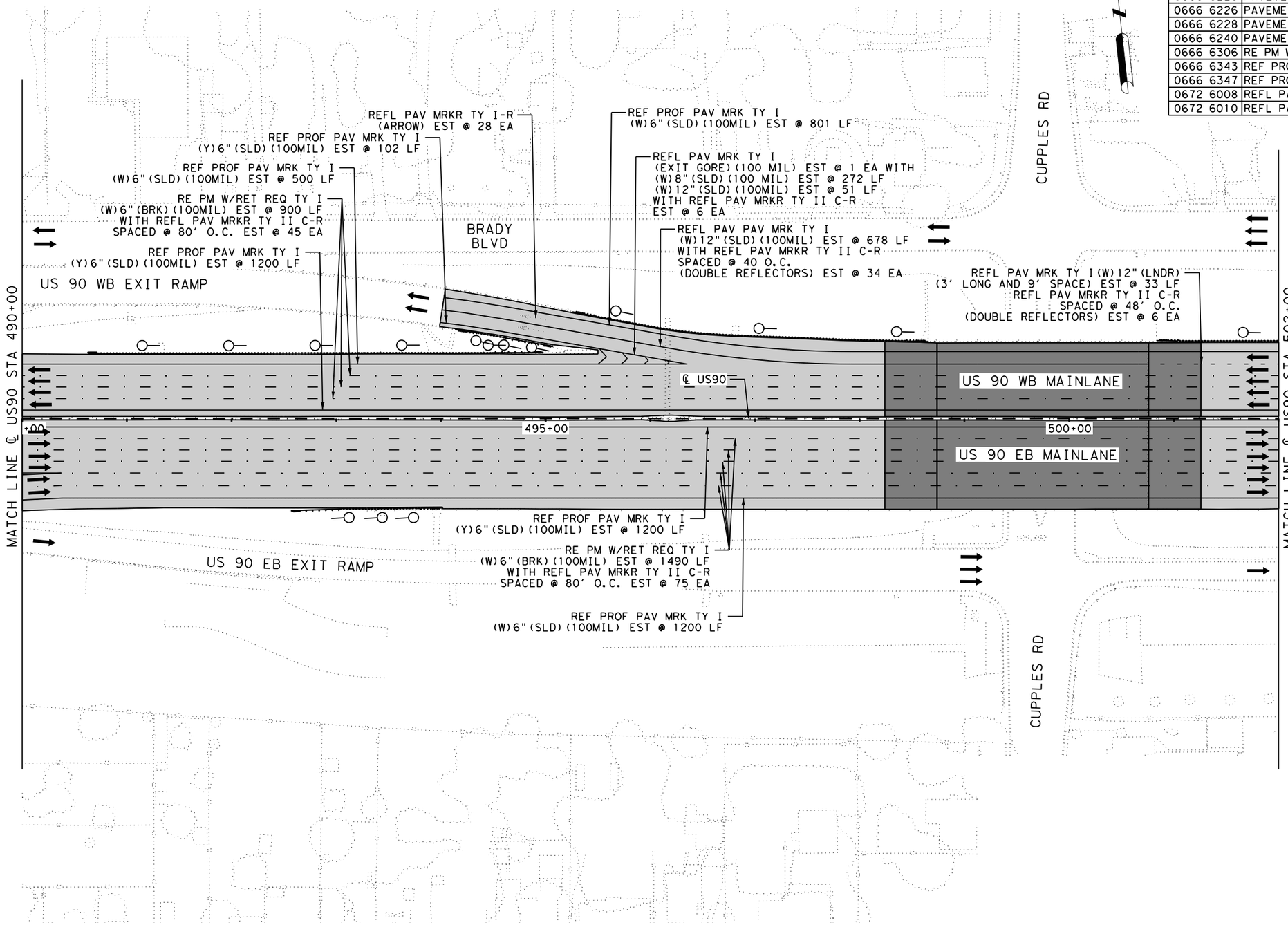
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	14
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	272
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	33
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	729
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	7393
0666 6226	PAVEMENT SEALER 8"	LF	272
0666 6228	PAVEMENT SEALER 12"	LF	762
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2390
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2501
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2502
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	166



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 490+00 TO
℄ US90 STA 502+00

SHEET 30 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	232
CONT.	SECT.	JOB	
0024	08	141	

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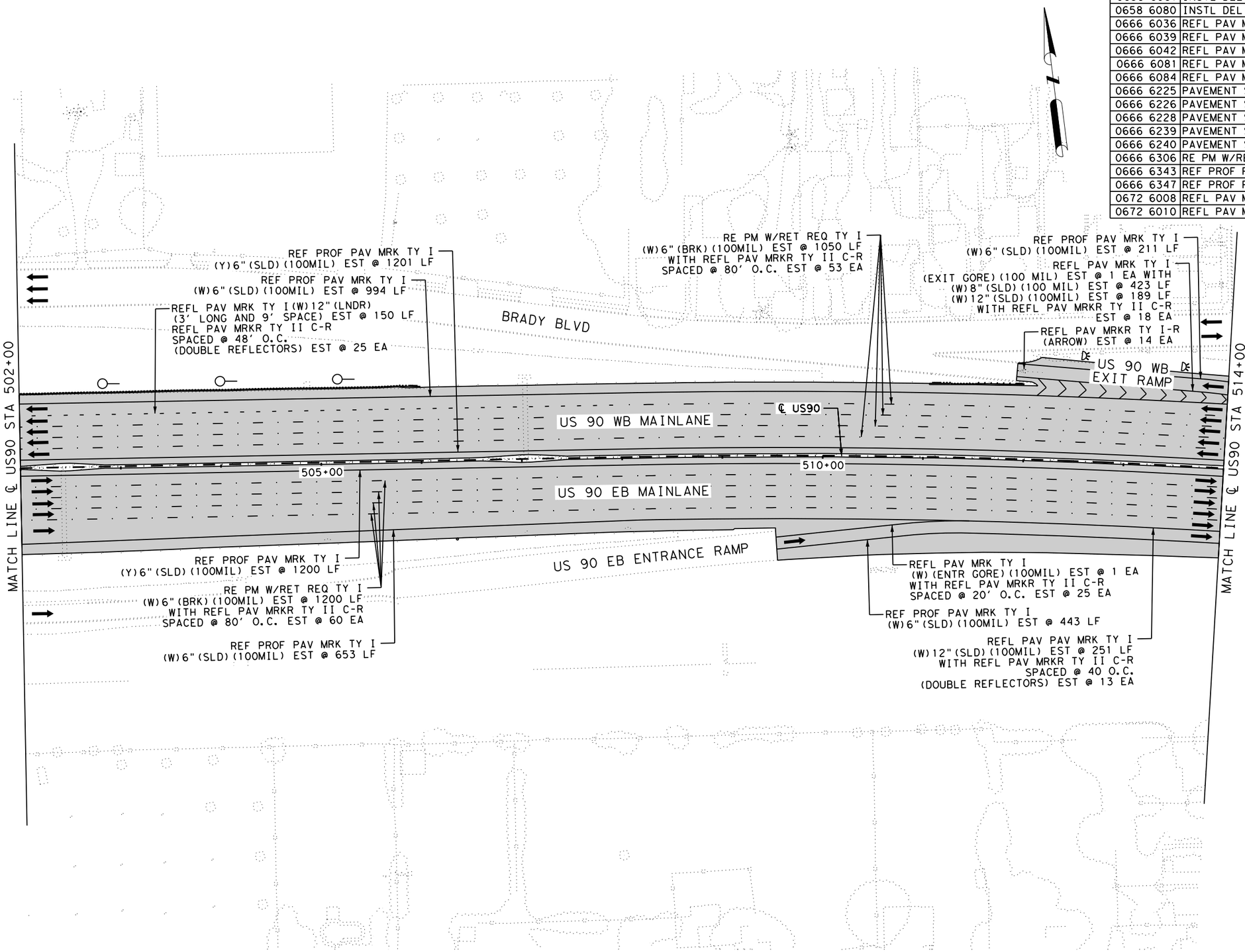
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	7
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	2
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	423
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	150
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	440
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6952
0666 6226	PAVEMENT SEALER 8"	LF	423
0666 6228	PAVEMENT SEALER 12"	LF	590
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2250
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2301
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	194



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 502+00 TO
℄ US90 STA 514+00

SHEET 31 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	233
0024	08	141	

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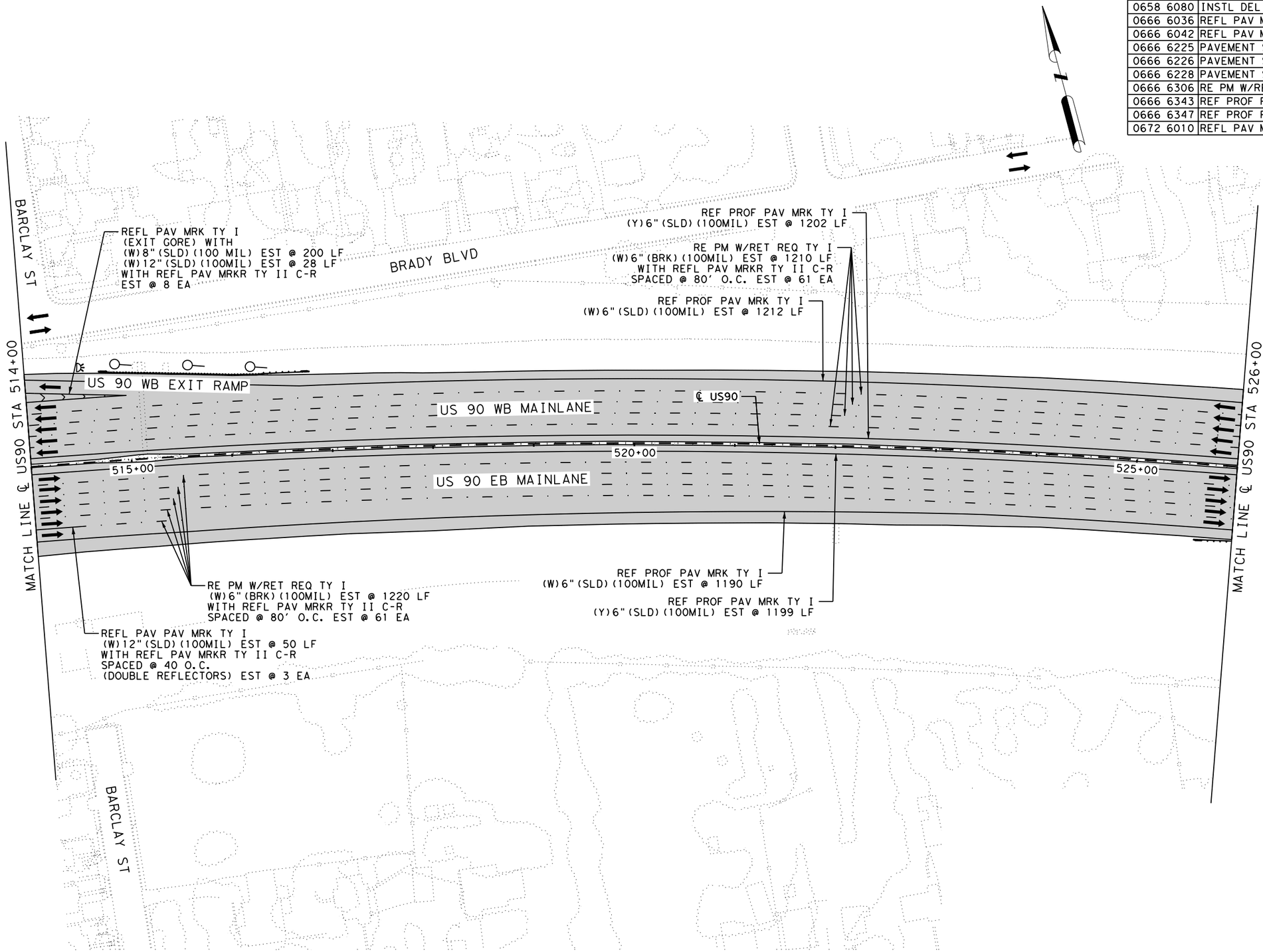
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	1
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	200
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	50
0666 6225	PAVEMENT SEALER 6"	LF	7233
0666 6226	PAVEMENT SEALER 8"	LF	200
0666 6228	PAVEMENT SEALER 12"	LF	78
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2430
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2402
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	133



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 514+00 TO
℄ US90 STA 526+00

SHEET 32 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	234
CONT.	SECT.	JOB	
0024	08	141	

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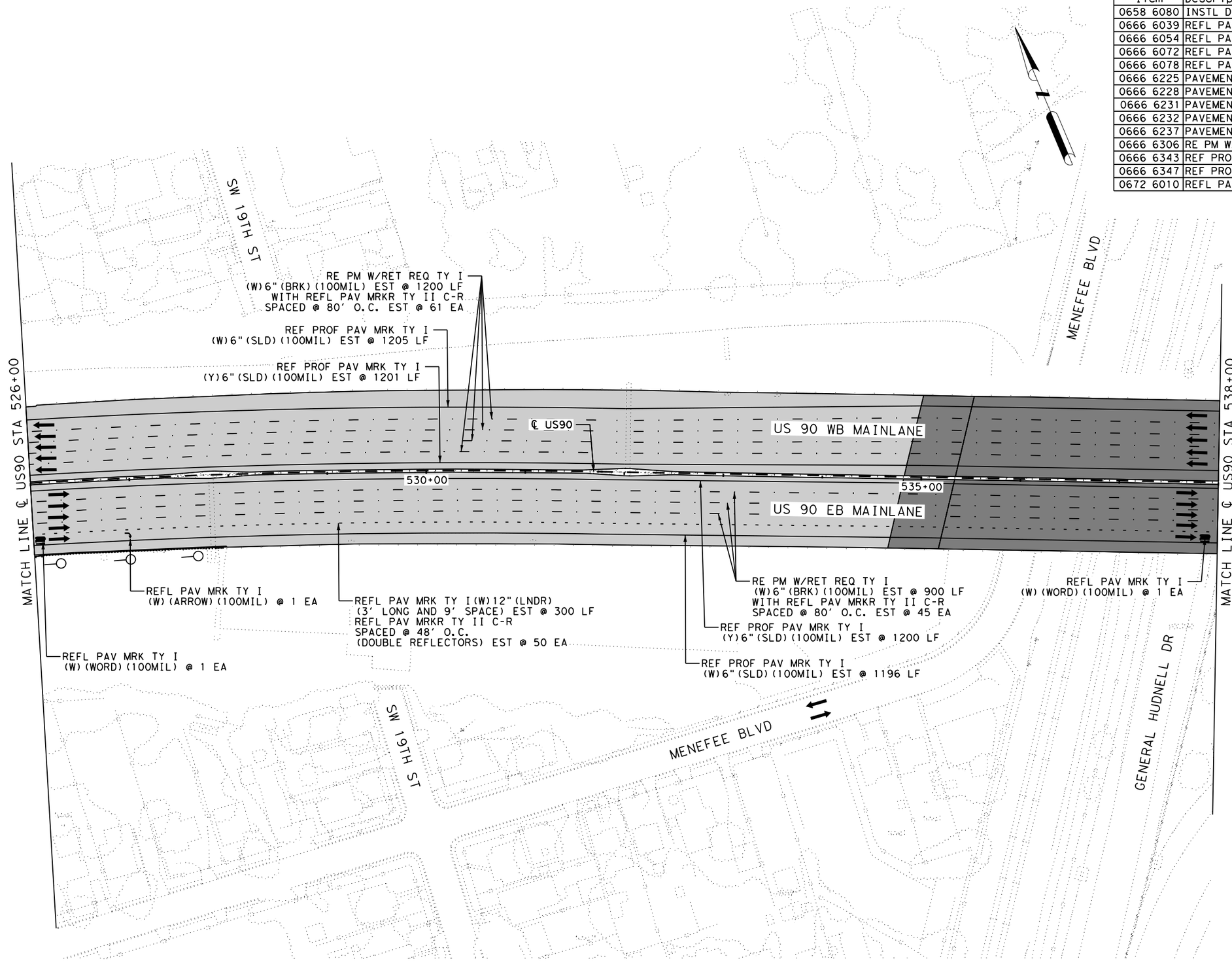
Item	Description	Unit	Qty
0658 6080	INSTL DEL ASSM (D-SW)SZ 1(WFLX)GND	EA	3
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	300
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6072	REFL PAV MRK TY I (W)(LNDP ARW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6225	PAVEMENT SEALER 6"	LF	6902
0666 6228	PAVEMENT SEALER 12"	LF	300
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARW)	EA	2
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2100
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2401
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	156



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 526+00 TO
℄ US90 STA 538+00

SHEET 33 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	235
0024	08	141	

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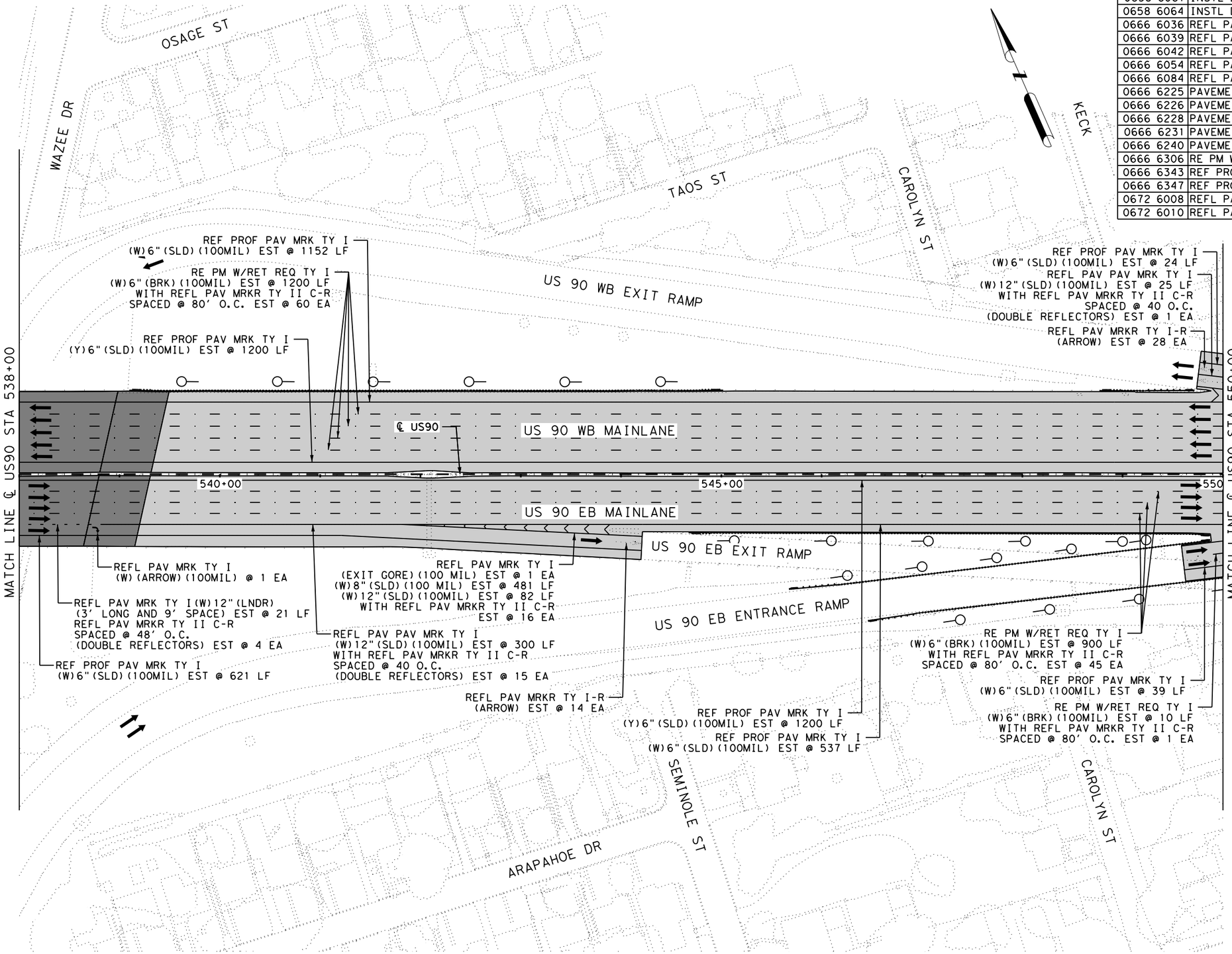
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	18
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	5
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	481
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	21
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	407
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6883
0666 6226	PAVEMENT SEALER 8"	LF	481
0666 6228	PAVEMENT SEALER 12"	LF	428
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2110
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2373
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6008	REFL PAV MRKR TY I-R	EA	42
0672 6010	REFL PAV MRKR TY II-C-R	EA	142



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS · TROY NEAL · 106194 · LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 538+00 TO
℄ US90 STA 550+00

SHEET 34 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	236
CONT.	SECT.	JOB	
0024	08	141	

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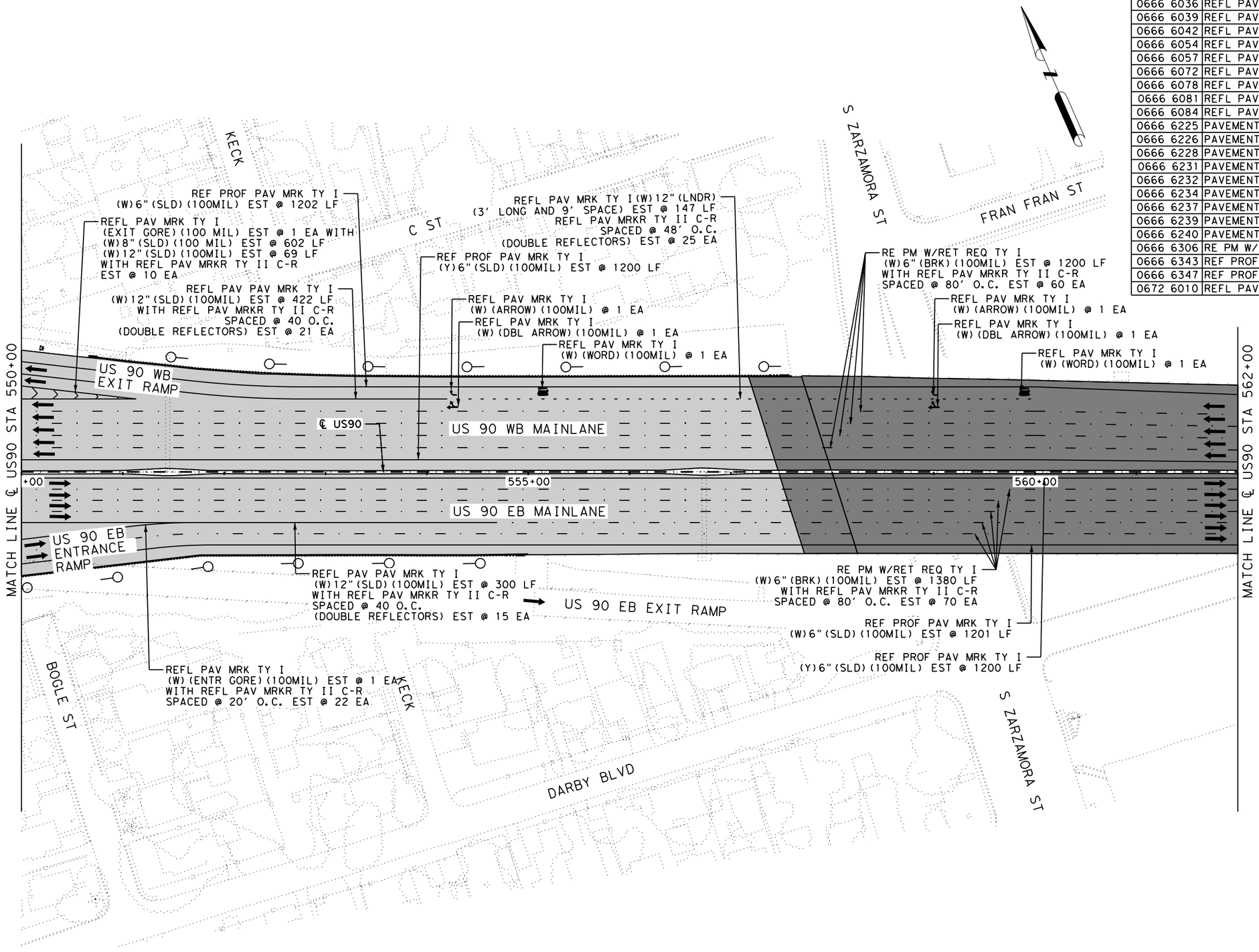
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	12
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	602
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	147
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	791
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I(W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	7383
0666 6226	PAVEMENT SEALER 8"	LF	602
0666 6228	PAVEMENT SEALER 12"	LF	938
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6234	PAVEMENT SEALER (DBL ARROW)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2580
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2403
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	223



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
PROFESSIONAL ENGINEER
LICENSED

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 550+00 TO
℄ US90 STA 562+00

SHEET 35 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	237
CONT.	SECT.	JOB	
0024	08	141	

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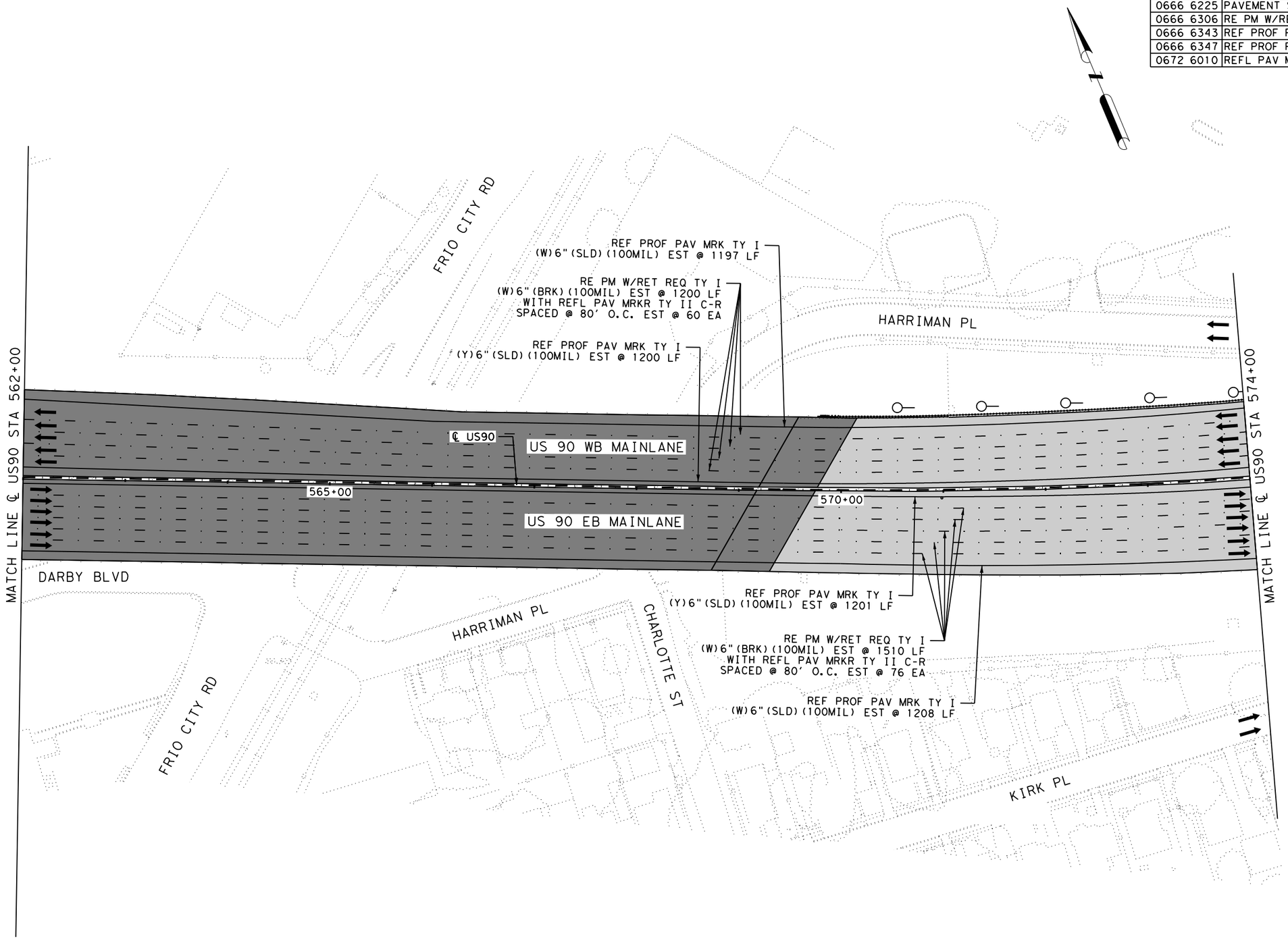
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	4
0666 6225	PAVEMENT SEALER 6"	LF	7516
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2710
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2405
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	136



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 562+00 TO
℄ US90 STA 574+00

SHEET 36 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	238
CONT.	SECT.	JOB	
0024	08	141	

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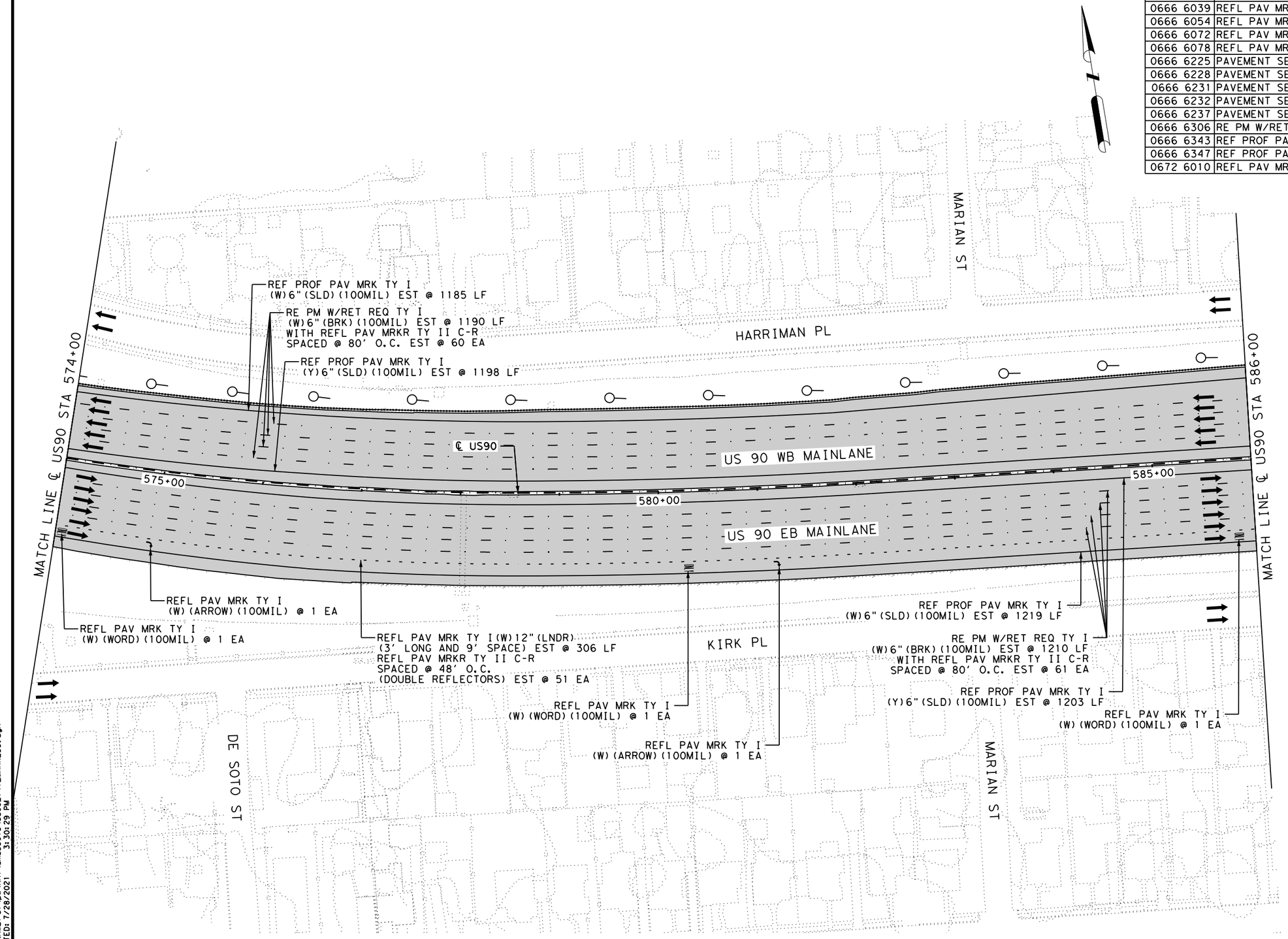
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	12
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	306
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3
0666 6225	PAVEMENT SEALER 6"	LF	7205
0666 6228	PAVEMENT SEALER 12"	LF	306
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	3
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2400
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2404
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2401
0672 6010	REFL PAV MRKR TY II-C-R	EA	172



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

7/28/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 574+00 TO
℄ US90 STA 586+00

SHEET 37 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	239
0024	08	141	

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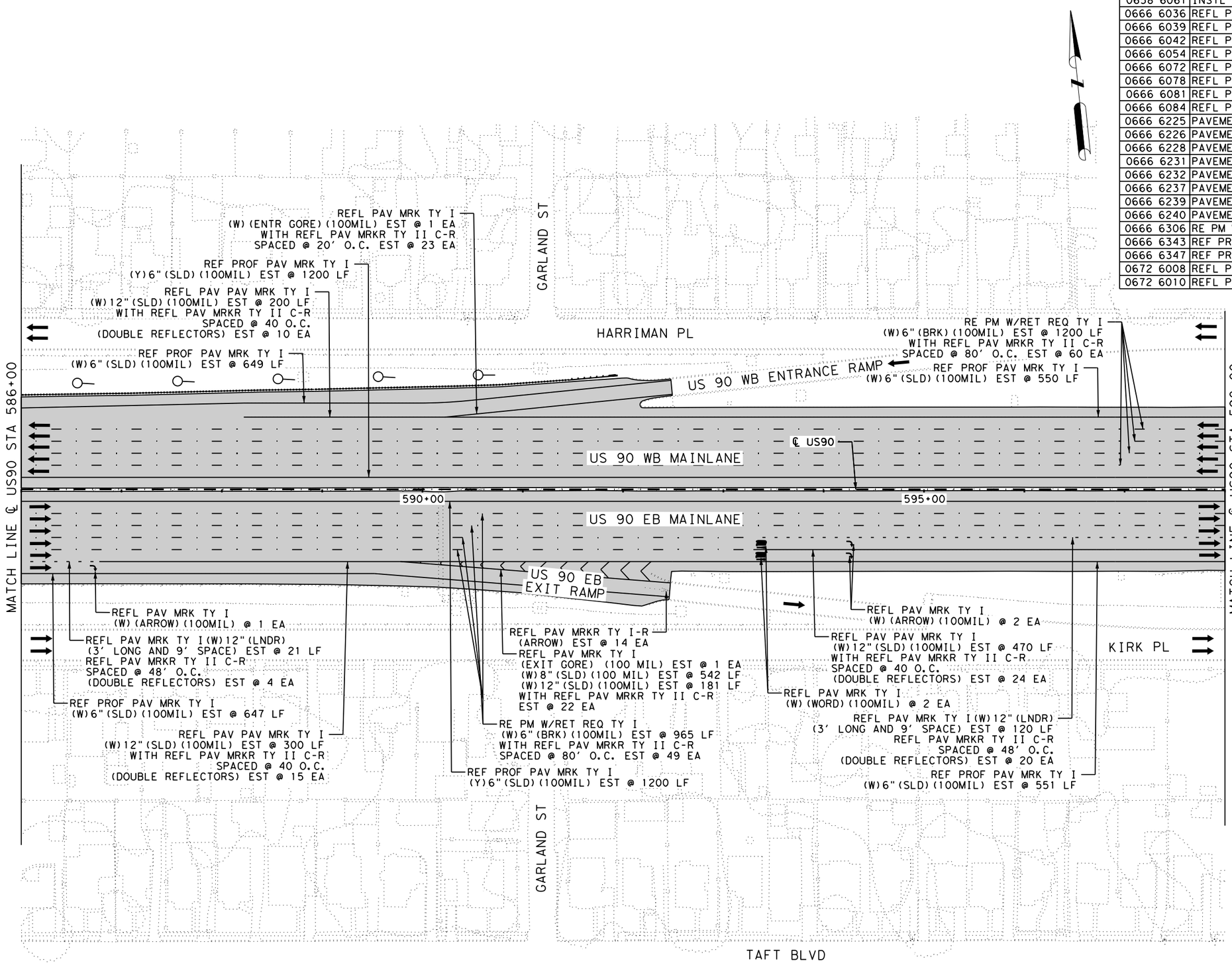
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	5
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	542
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	141
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	1151
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3
0666 6072	REFL PAV MRK TY I (W)(LNDP ARROW)(100MIL)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6962
0666 6226	PAVEMENT SEALER 8"	LF	542
0666 6228	PAVEMENT SEALER 12"	LF	1292
0666 6231	PAVEMENT SEALER (ARROW)	EA	3
0666 6232	PAVEMENT SEALER (WORD)	EA	3
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2165
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2397
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6008	REFL PAV MRKR TY I-R	EA	14
0672 6010	REFL PAV MRKR TY II-C-R	EA	227



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

7/28/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 586+00 TO
℄ US90 STA 598+00

SHEET 38 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	240
CONT.	SECT.	JOB	
0024	08	141	

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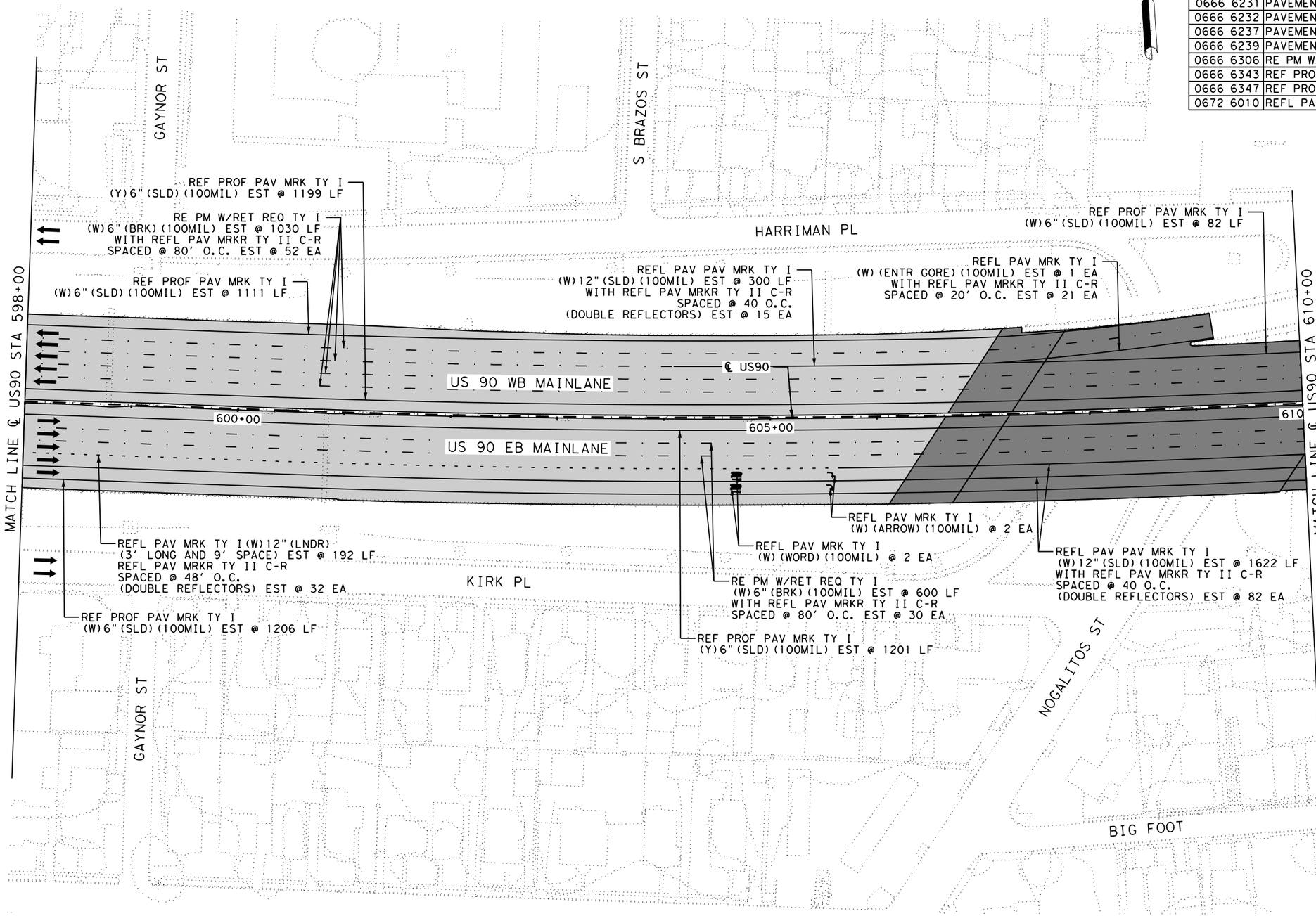
Item	Description	Unit	Qty
0666 6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	192
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	1922
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	6429
0666 6228	PAVEMENT SEALER 12"	LF	2114
0666 6231	PAVEMENT SEALER (ARROW)	EA	2
0666 6232	PAVEMENT SEALER (WORD)	EA	2
0666 6237	PAVEMENT SEALER (LNDP ARROW)	EA	2
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1630
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	2399
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	232



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 598+00 TO
℄ US90 STA 610+00

SHEET 39 OF 40

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	241
CONT.	SECT.	JOB	
0024	08	141	

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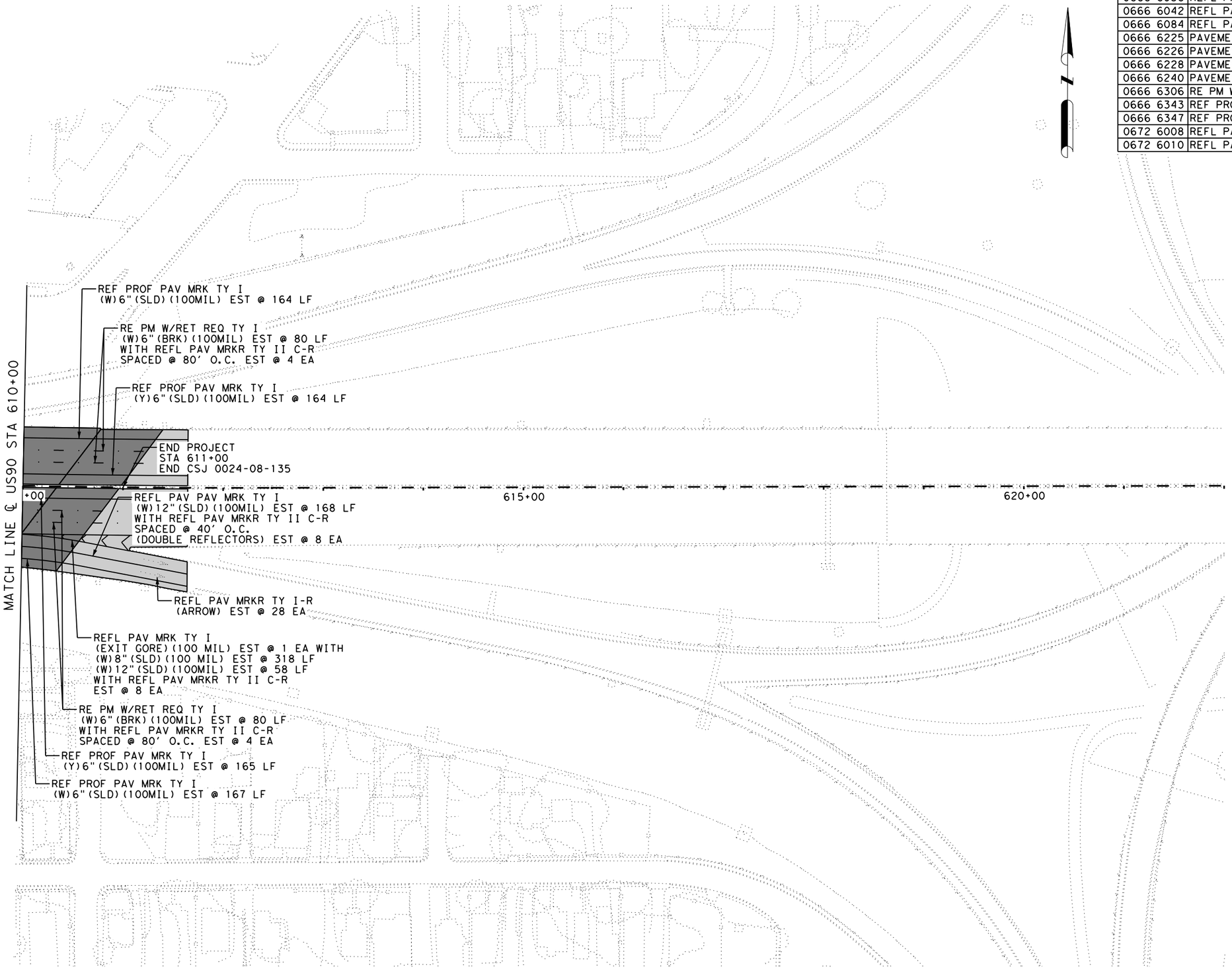
Item	Description	Unit	Qty
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	318
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	226
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6225	PAVEMENT SEALER 6"	LF	820
0666 6226	PAVEMENT SEALER 8"	LF	318
0666 6228	PAVEMENT SEALER 12"	LF	226
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	160
0666 6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	331
0666 6347	REF PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	329
0672 6008	REFL PAV MRKR TY I-R	EA	28
0672 6010	REFL PAV MRKR TY II-C-R	EA	24



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT MAINLANE

℄ US90 STA 598+00 TO
℄ US90 STA 610+00

SHEET 40 OF 40

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	242
CONT.	SECT.	JOB	
0024	08	141	

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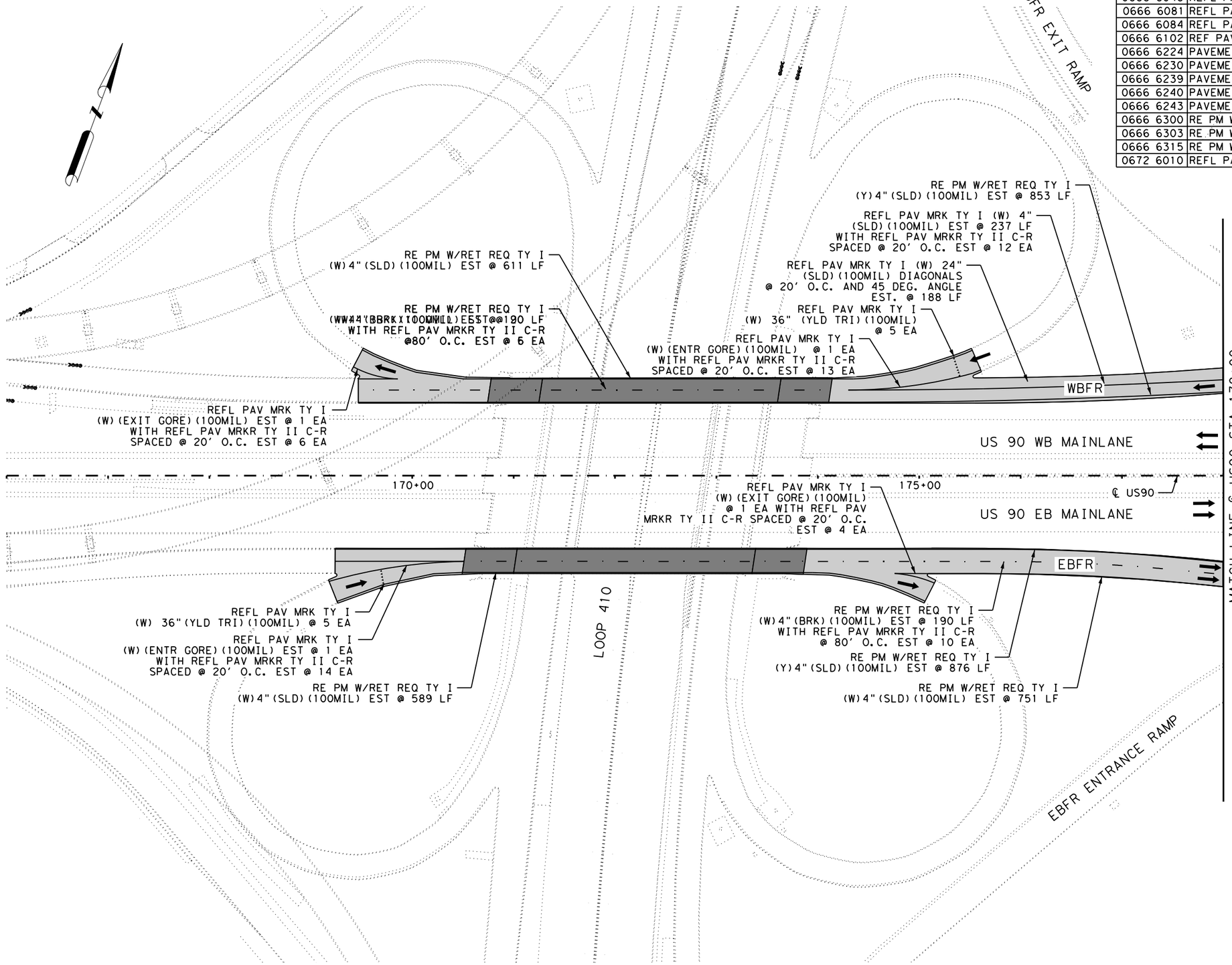
Item	Description	Unit	Qty
0666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	188
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	2
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	2
0666 6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	10
0666 6224	PAVEMENT SEALER 4"	LF	3239
0666 6230	PAVEMENT SEALER 24"	LF	188
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	2
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	2
0666 6243	PAVEMENT SEALER (YLD TRI)	EA	10
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	310
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	1200
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1729
0672 6010	REFL PAV MRKR TY II-C-R	EA	65



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

BEGIN PROJECT TO
℄ US90 STA 178+00

SHEET 1 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	243
0024	08	141	

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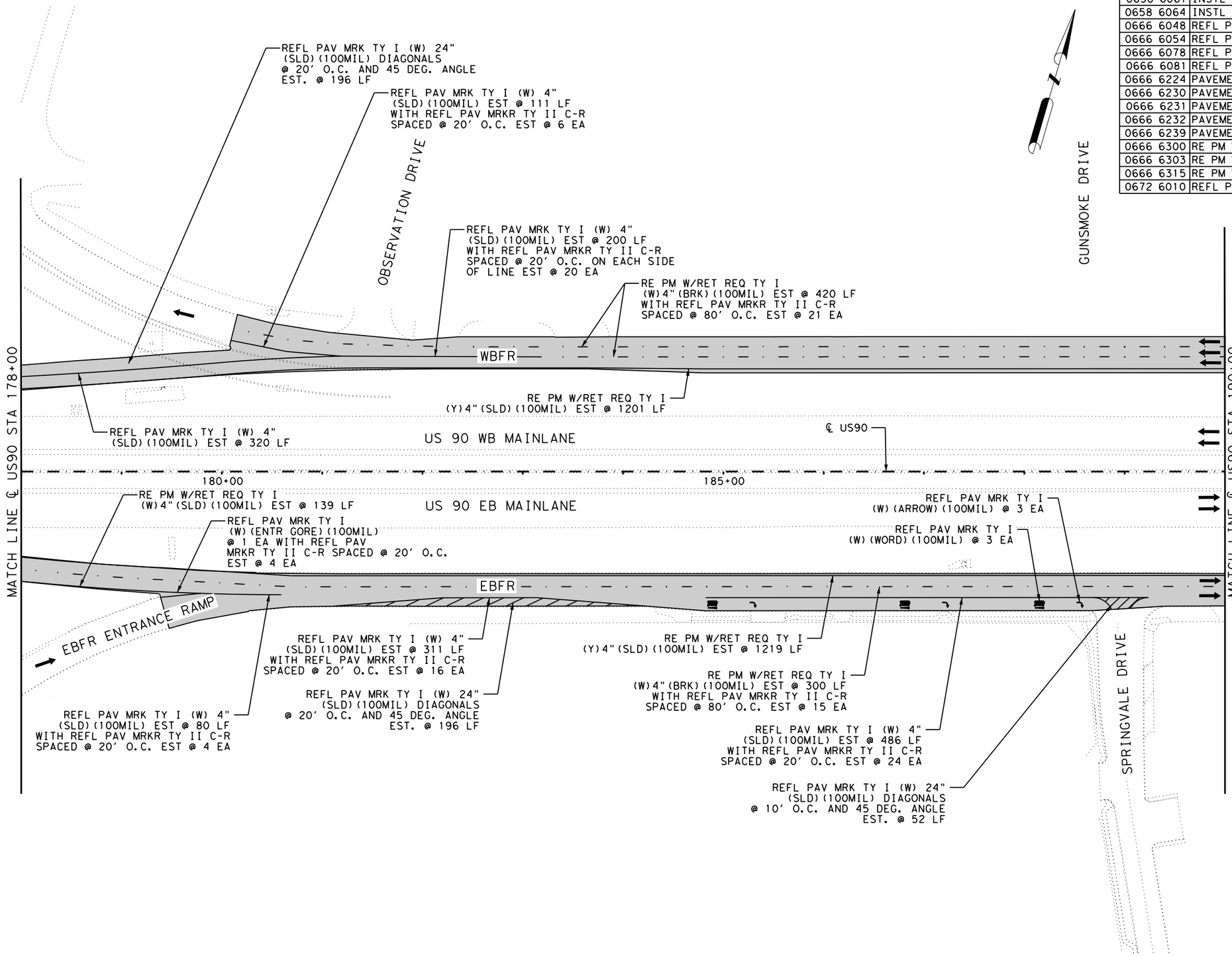
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	12
0666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	444
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6224	PAVEMENT SEALER 4"	LF	4787
0666 6230	PAVEMENT SEALER 24"	LF	444
0666 6231	PAVEMENT SEALER (ARROW)	EA	3
0666 6232	PAVEMENT SEALER (WORD)	EA	3
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	720
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	1647
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2420
0672 6010	REFL PAV MRKR TY II-C-R	EA	110



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

℄ US90 STA 178+00 TO
℄ US90 STA 190+00

SHEET 2 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	244
CONT.	SECT.	JOB	
0024	08	141	

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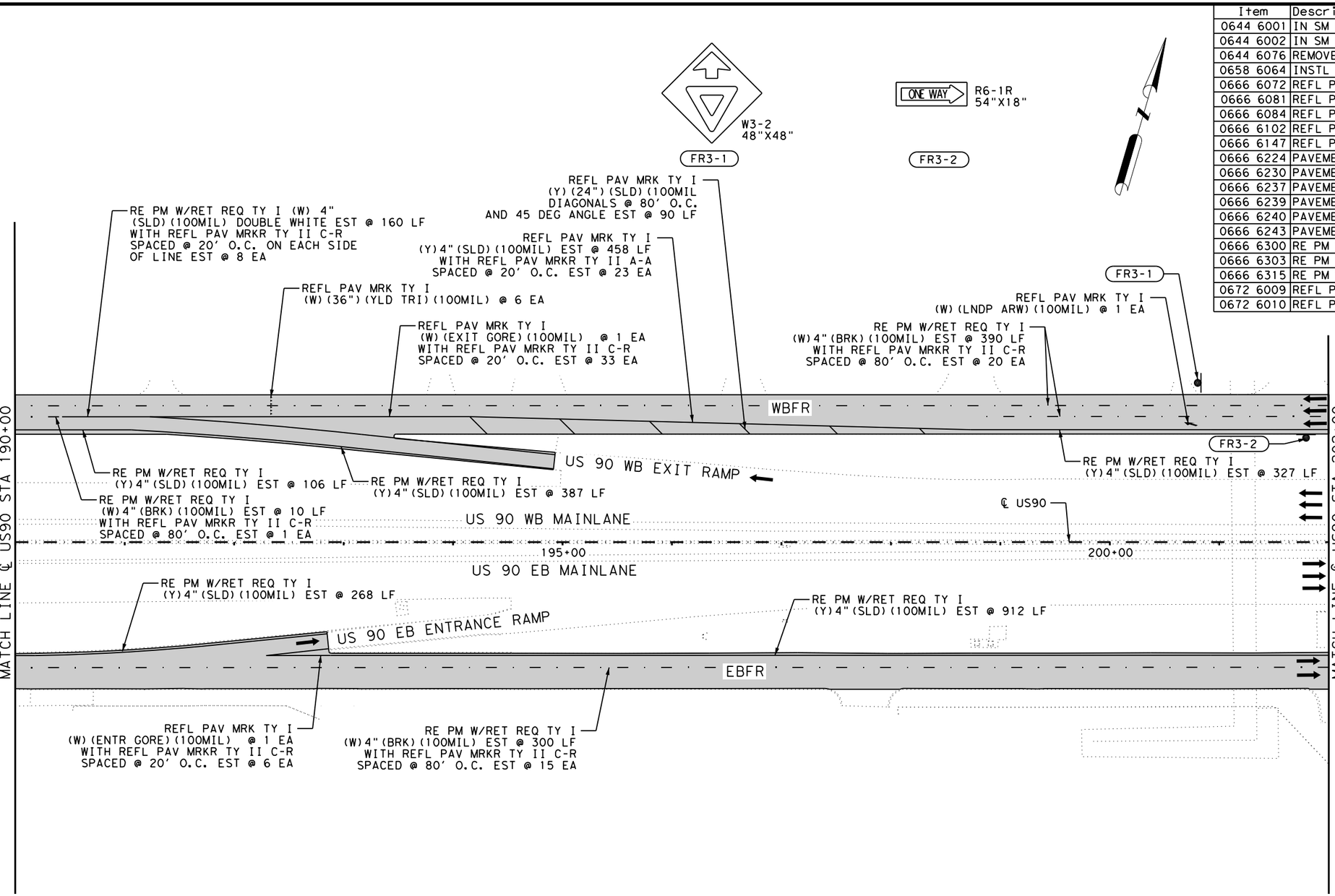
Item	Description	Unit	Qty
0644 6001	IN SM RD SN SUP & AM TY10BWG(1)SA(P)	EA	1
0644 6002	IN SM RD SN SUP & AM TY10BWG(1)SA(P-BM)	EA	1
0644 6076	REMOVE SM RD SN SUP & AM	EA	2
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	6
0666 6072	REFL PAV MRK TY I (W)(LNDP ARW)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6102	REFL PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	6
0666 6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	90
0666 6224	PAVEMENT SEALER 4"	LF	3318
0666 6230	PAVEMENT SEALER 24"	LF	90
0666 6237	PAVEMENT SEALER (LNDRP ARW)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6243	PAVEMENT SEALER (YLD TRI)	EA	6
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	700
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	160
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2458
0672 6009	REFL PAV MRKR TY II-A-A	EA	23
0672 6010	REFL PAV MRKR TY II-C-R	EA	83



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

TREY NEAL 106194 STATE OF TEXAS LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

℄ US90 STA 190+00 TO
℄ US90 STA 202+00

SHEET 3 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	245
CONT.	SECT.	JOB	
0024	08	141	

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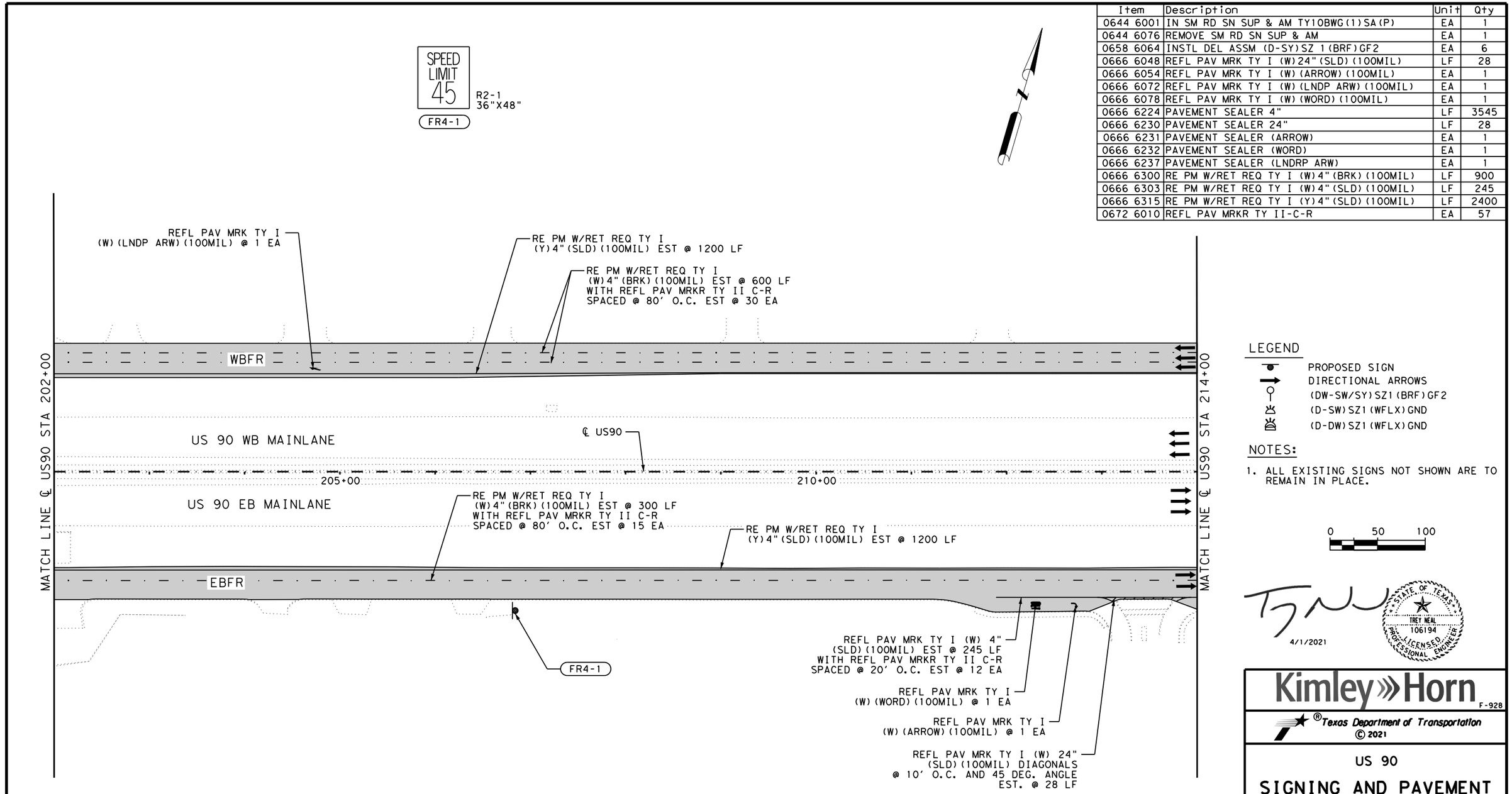
Item	Description	Unit	Qty
0644 6001	IN SM RD SN SUP & AM TY10BWG(1)SA(P)	EA	1
0644 6076	REMOVE SM RD SN SUP & AM	EA	1
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	6
0666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	28
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6072	REFL PAV MRK TY I (W)(LNDP ARW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6224	PAVEMENT SEALER 4"	LF	3545
0666 6230	PAVEMENT SEALER 24"	LF	28
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6237	PAVEMENT SEALER (LNDRP ARW)	EA	1
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	900
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	245
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2400
0672 6010	REFL PAV MRKR TY II-C-R	EA	57



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

℄ US90 STA 202+00 TO
℄ US90 STA 214+00

SHEET 4 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	246
CONT.	SECT.	JOB	
0024	08	141	

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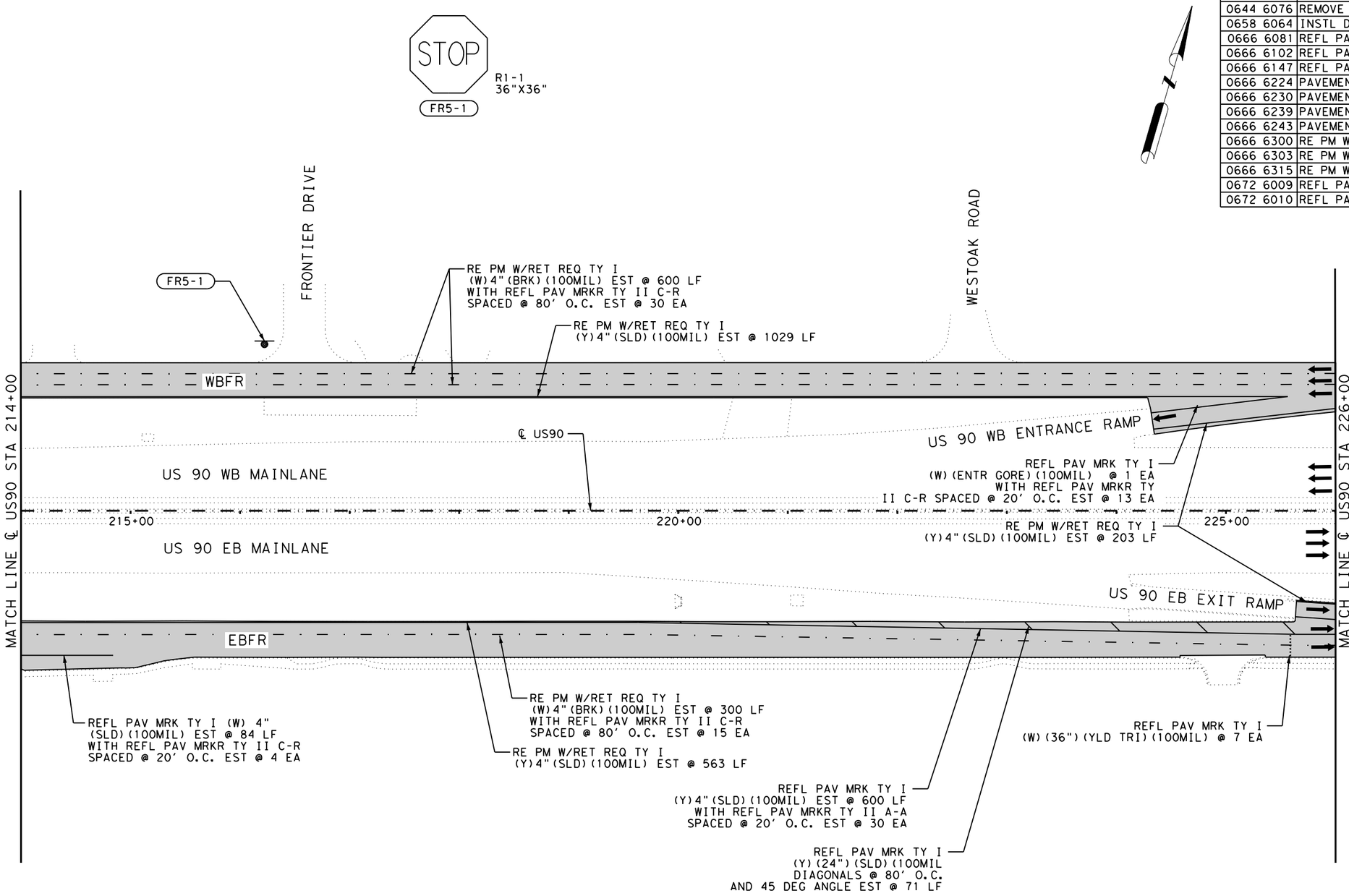
Item	Description	Unit	Qty
0644 6001	IN SM RD SN SUP & AM TY10BWG(1)SA(P)	EA	1
0644 6076	REMOVE SM RD SN SUP & AM	EA	1
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	5
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6102	REFL PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	7
0666 6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	71
0666 6224	PAVEMENT SEALER 4"	LF	3379
0666 6230	PAVEMENT SEALER 24"	LF	71
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6243	PAVEMENT SEALER (YLD TRI)	EA	7
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	900
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	84
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2395
0672 6009	REFL PAV MRKR TY II-A-A	EA	30
0672 6010	REFL PAV MRKR TY II-C-R	EA	62



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

TREY NEAL
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STATE OF TEXAS

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US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

℄ US90 STA 214+00 TO
℄ US90 STA 226+00

SHEET 5 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	247
CONT.	SECT.	JOB	
0024	08	141	

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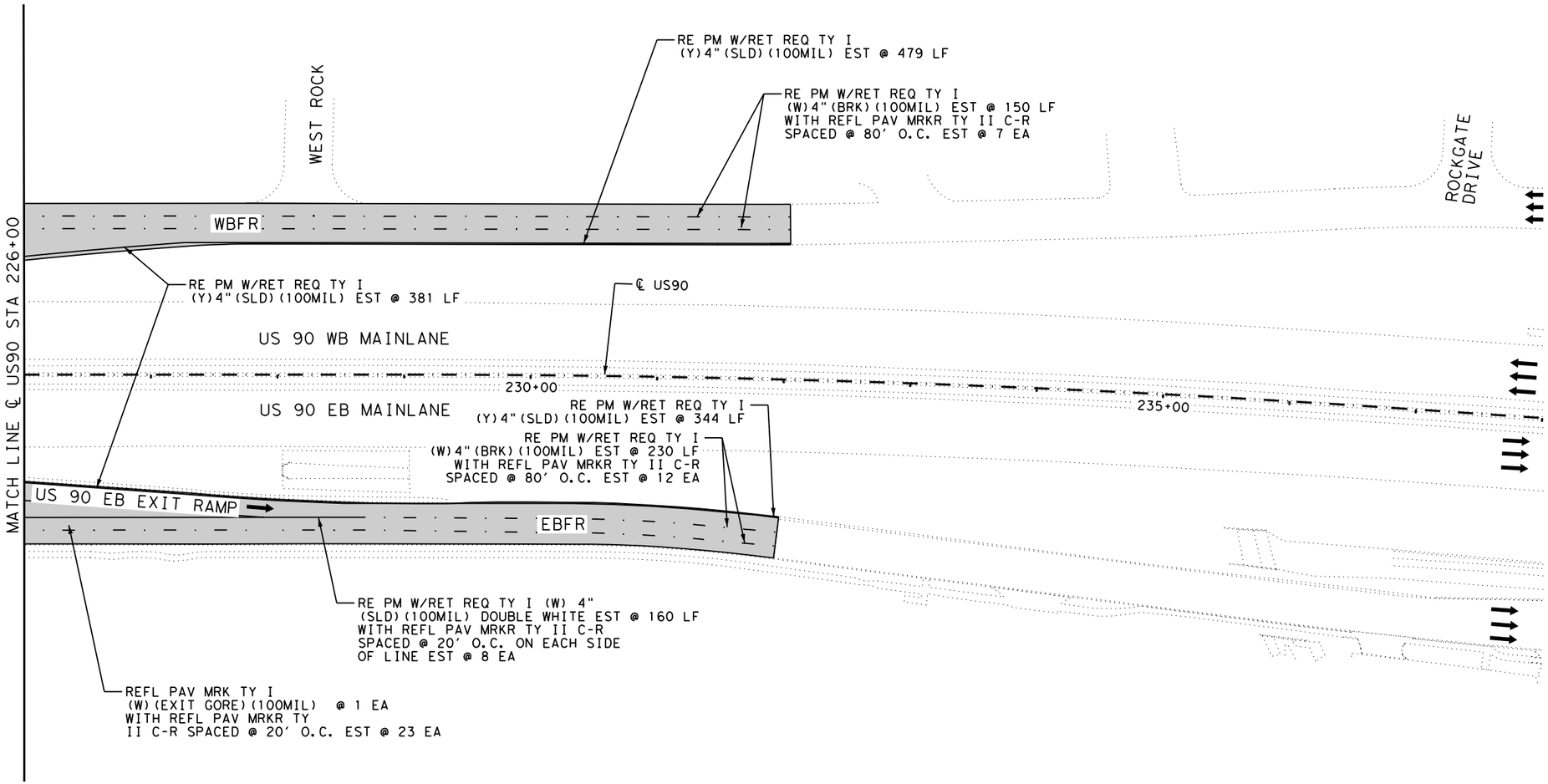
Item	Description	Unit	Qty
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	4
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	1
0666 6224	PAVEMENT SEALER 4"	LF	1744
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	1
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	380
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	160
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1204
0672 6010	REFL PAV MRKR TY II-C-R	EA	50



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 50 100

4/1/2021

STATE OF TEXAS
TREY NEAL
106194
LICENSED PROFESSIONAL ENGINEER

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT FRONTAGE ROAD

℄ US90 STA 214+00 TO
END PROJECT

SHEET 6 OF 6

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	248
CONT.	SECT.	JOB	
0024	08	141	

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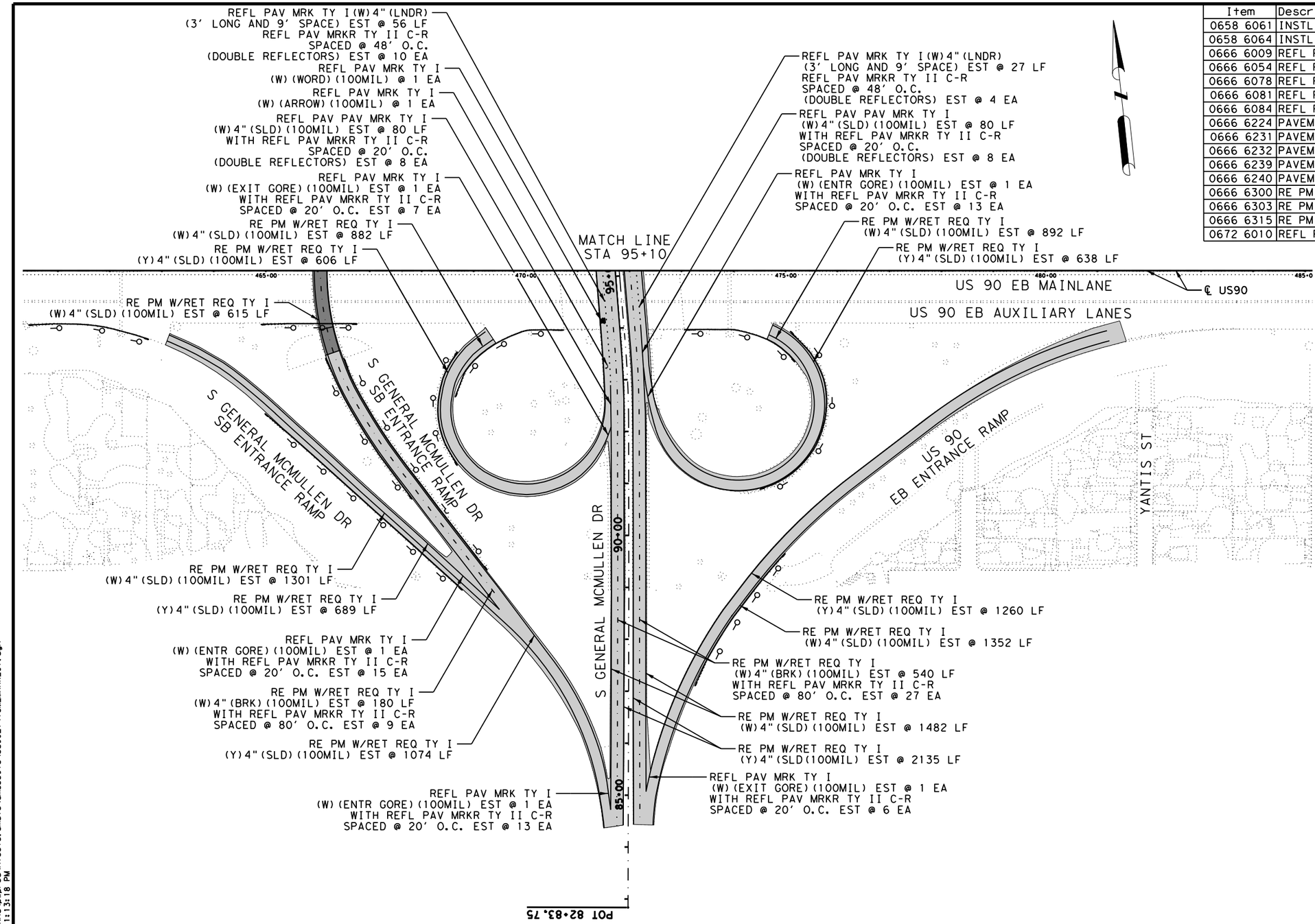

Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	30
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	7
0666 6009	REFL PAV MRK TY I (W)4"(LNDP)(100MIL)	LF	83
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	3
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	2
0666 6224	PAVEMENT SEALER 4"	LF	13806
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	3
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	2
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	720
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	6684
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	6402
0672 6010	REFL PAV MRKR TY II-C-R	EA	120

LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

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4/1/2021

STATE OF TEXAS
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US 90

SIGNING AND PAVEMENT MARKING LAYOUT GENERAL MCMULLEN DR

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6		US 90

STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	249
CONT.	SECT.	JOB	
0024	08	141	

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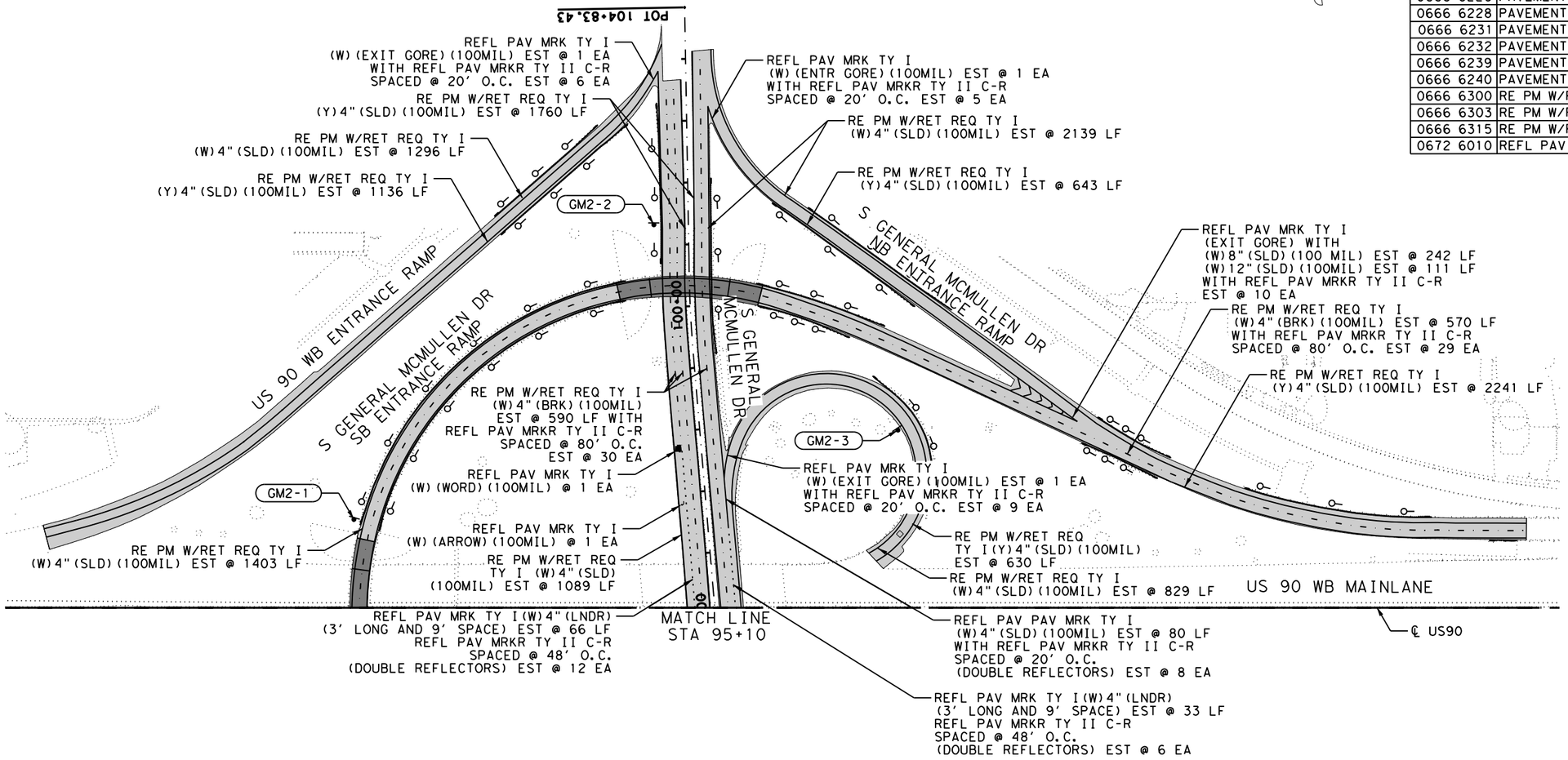
Item	Description	Unit	Qty
0658 6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	30
0658 6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	24
0666 6009	REFL PAV MRK TY I (W)4"(LNDP)(100MIL)	LF	99
0666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	242
0666 6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	111
0666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	1
0666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	1
0666 6081	REFL PAV MRK TY I(W)(ENTR GORE)(100MIL)	EA	1
0666 6084	REFL PAV MRK TY I(W)(EXIT GORE)(100MIL)	EA	2
0666 6224	PAVEMENT SEALER 4"	LF	14406
0666 6226	PAVEMENT SEALER 8"	LF	242
0666 6228	PAVEMENT SEALER 12"	LF	111
0666 6231	PAVEMENT SEALER (ARROW)	EA	1
0666 6232	PAVEMENT SEALER (WORD)	EA	1
0666 6239	PAVEMENT SEALER (ENTR GORE)	EA	1
0666 6240	PAVEMENT SEALER (EXIT GORE)	EA	2
0666 6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1160
0666 6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	6836
0666 6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	6410
0672 6010	REFL PAV MRKR TY II-C-R	EA	115



LEGEND

- PROPOSED SIGN
- DIRECTIONAL ARROWS
- (DW-SW/SY)SZ1(BRF)GF2
- (D-SW)SZ1(WFLX)GND
- (D-DW)SZ1(WFLX)GND

NOTES:

1. ALL EXISTING SIGNS NOT SHOWN ARE TO REMAIN IN PLACE.

0 100 200

W4-1aR
36" X 36"

GM2-1

W8-13aT
36" X 36"

GM2-2

W1-8R
18" X 24"

GM2-3

4/1/2021

TREY NEAL 106194 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Kimley»Horn F-928

Texas Department of Transportation

US 90

SIGNING AND PAVEMENT MARKING LAYOUT GENERAL MCMULLEN DR

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	SAT	BEXAR	250
CONT.	SECT.	JOB	
0024	08	141	

FILENAME: c:\pwworking\khd\pwprodv\nicole.smale\d0ms33973\US90_141GM_MARK_02.dgn
PLOTTED: 4/1/2021 1:13:22 PM

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
10 (ML)	1	W4-1R	(SIGN ONLY)	48 x 48	X							
27 (ML)	1	W4-1R		48 x 48	X		10BWG	1	SA	P		
3 (FR)	1	W3-2		48 x 48	X		10BWG	1	SA	P		
3 (FR)	2	R6-1R	ONE WAY	54 x 18	X		10BWG	1	SA	P	BM	
4 (FR)	1	R2-1	SPEED LIMIT 45	36 x 48	X		10BWG	1	SA	P		
5 (FR)	1	R1-1	STOP	36 x 36	X		10BWG	1	SA	P		
2 (GM)	1	W4-1aR	THRU TRAFFIC MERGE RIGHT	36 x 36	X		10BWG	1	SA	P		
2 (GM)	2	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 x 36	X		10BWG	1	SA	P		
2 (GM)	3	W1-8R		18 x 24	X		10BWG	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0024	08	141	US 90
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		251

18

DATE: 4/1/2021 1:13:26 PM
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DATE: 4/1/2021 1:13:41 PM
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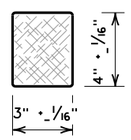
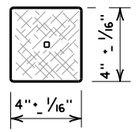
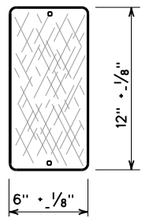
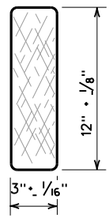
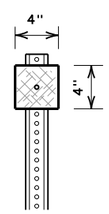
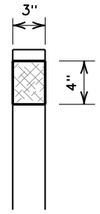
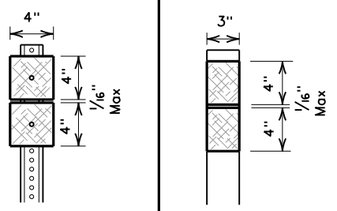
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			

NOTE
1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx).
2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

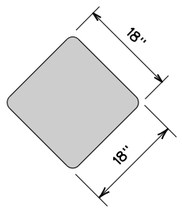
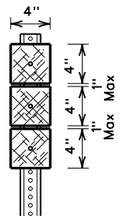
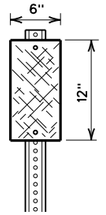
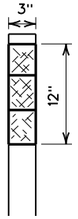
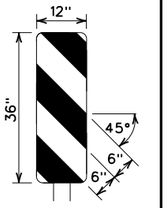
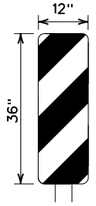
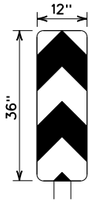
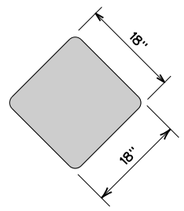
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

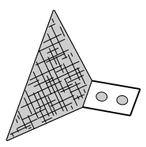
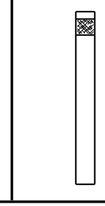
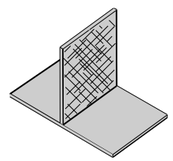
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B or C Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B or C Sheeting			Red -Type B or C Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

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

BARRIER REFLECTORS (BRF)

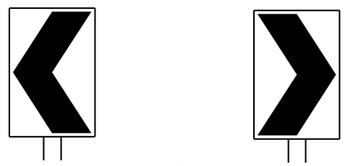
	GF1	GF2	CTB
DEVICE			

1. Barrier reflectors shall meet the requirements of DMS 8600.
2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.

SHEETING: Yellow, White, Red

NOTE
1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

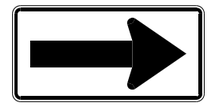
CHEVRONS

DEVICE:  W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:
Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

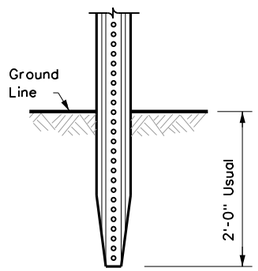
FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		252

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

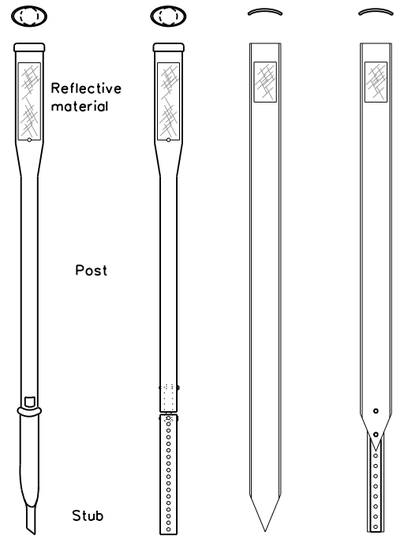


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

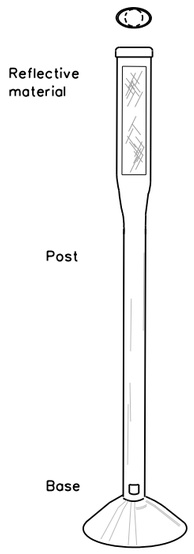
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



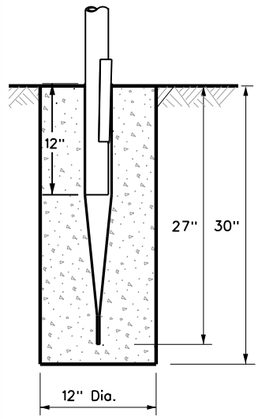
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

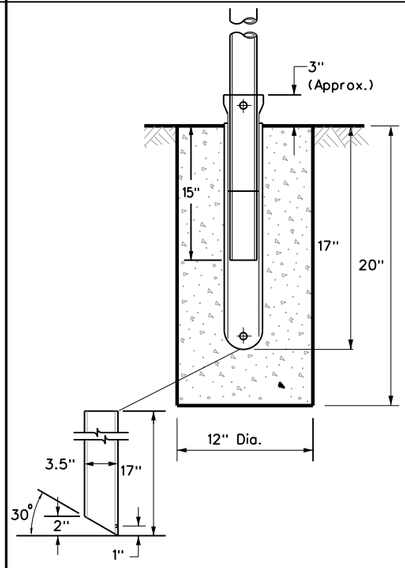
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

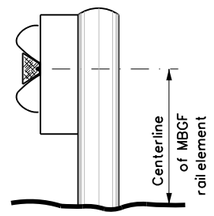
NOTE

1. Install per manufacturer's recommendations.

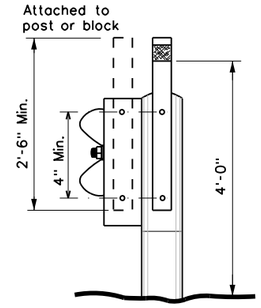
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

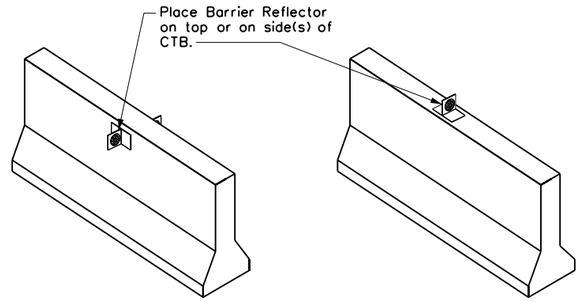
GF1



GF2



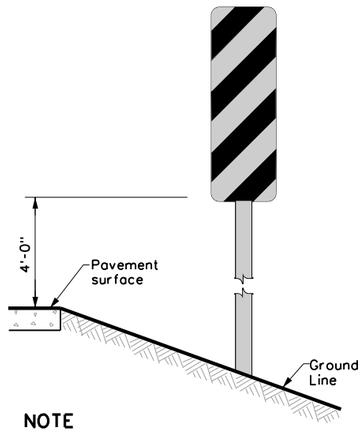
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

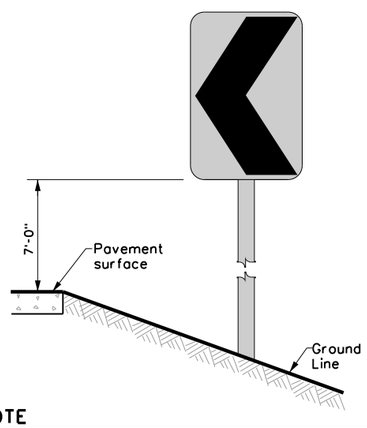
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

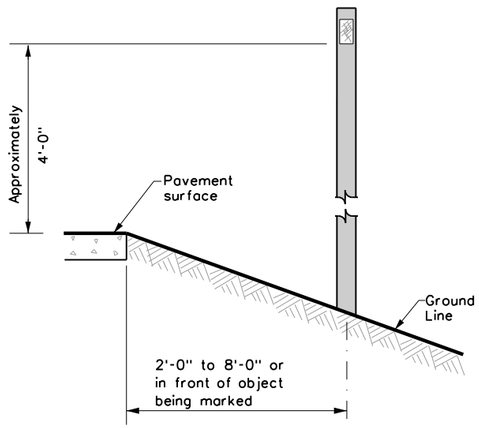
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		253

20B

DATE: 4/1/2021 1:13:42 PM
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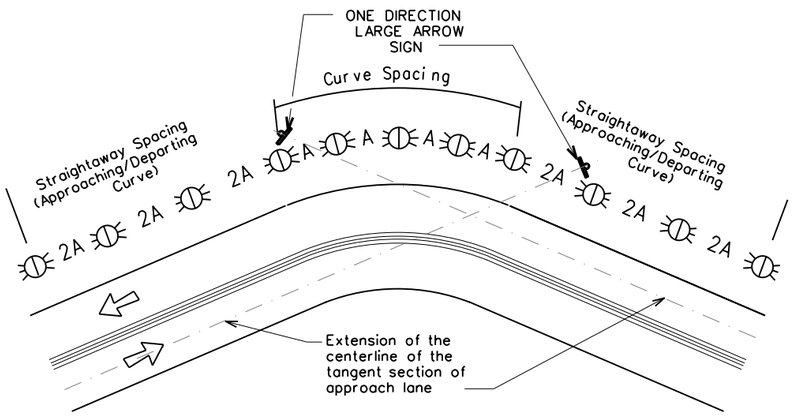
MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

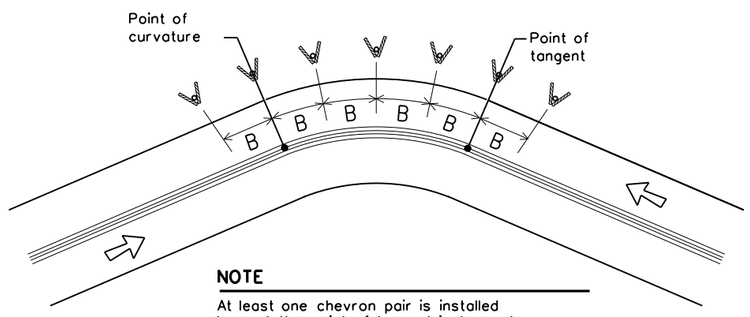
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	SAT	BEXAR		254

20C

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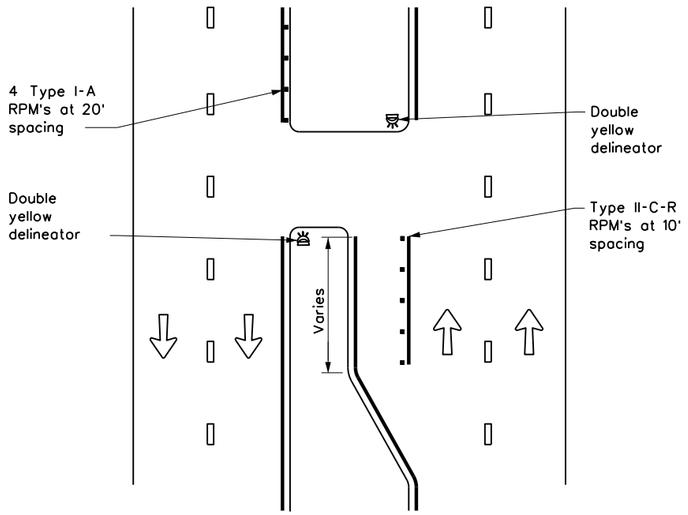
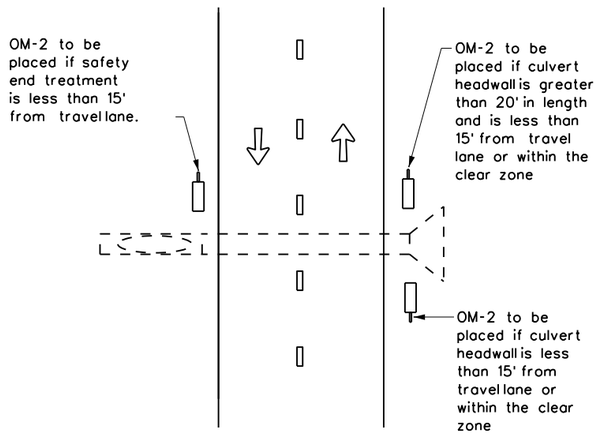
CROSSOVERS



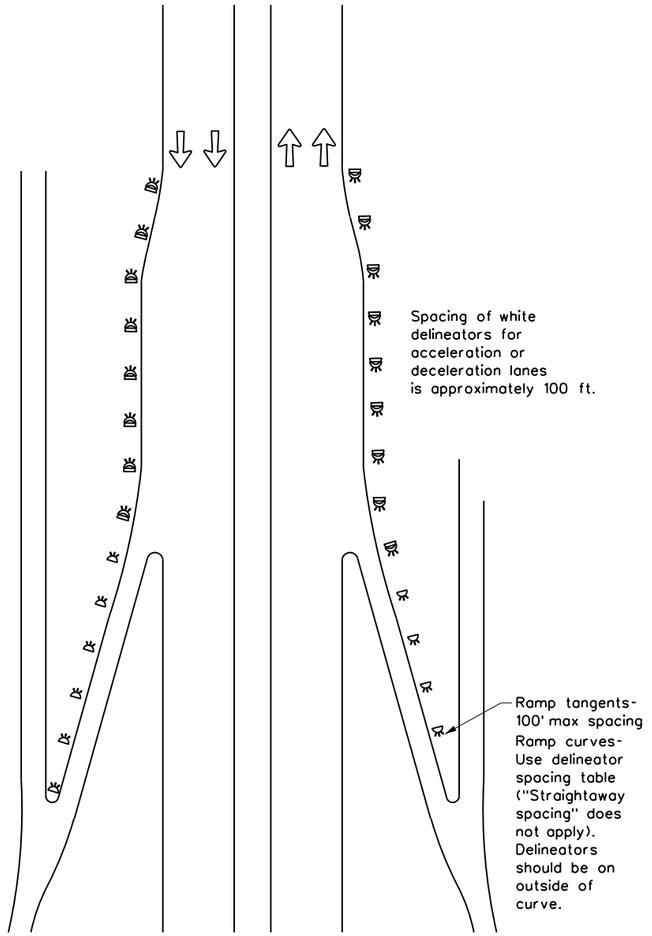
DETAIL 1

FOR CULVERTS WITHOUT MBGF



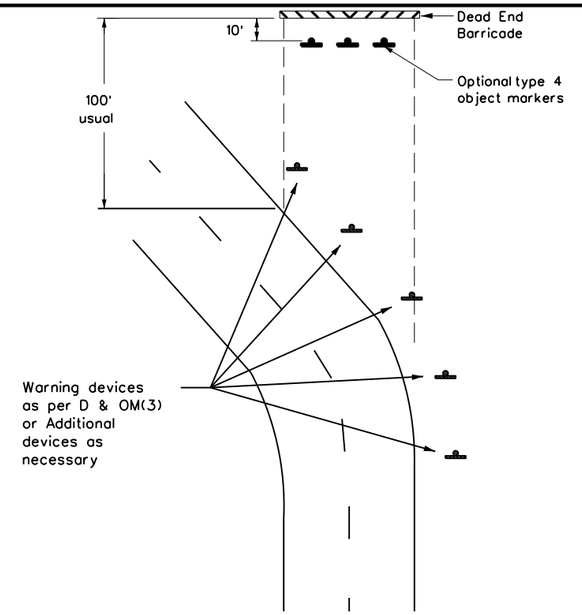
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



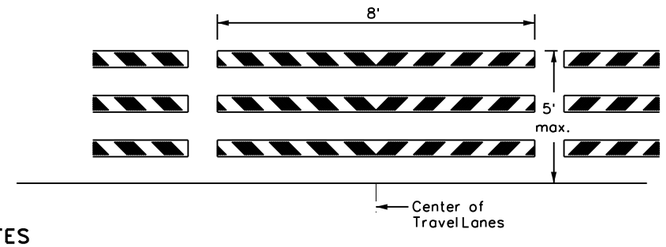
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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3-15	DIST	COUNTY		SHEET NO.
7-20	SAT	BEXAR		255

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DATE: 4/1/2021 1:13:45 PM
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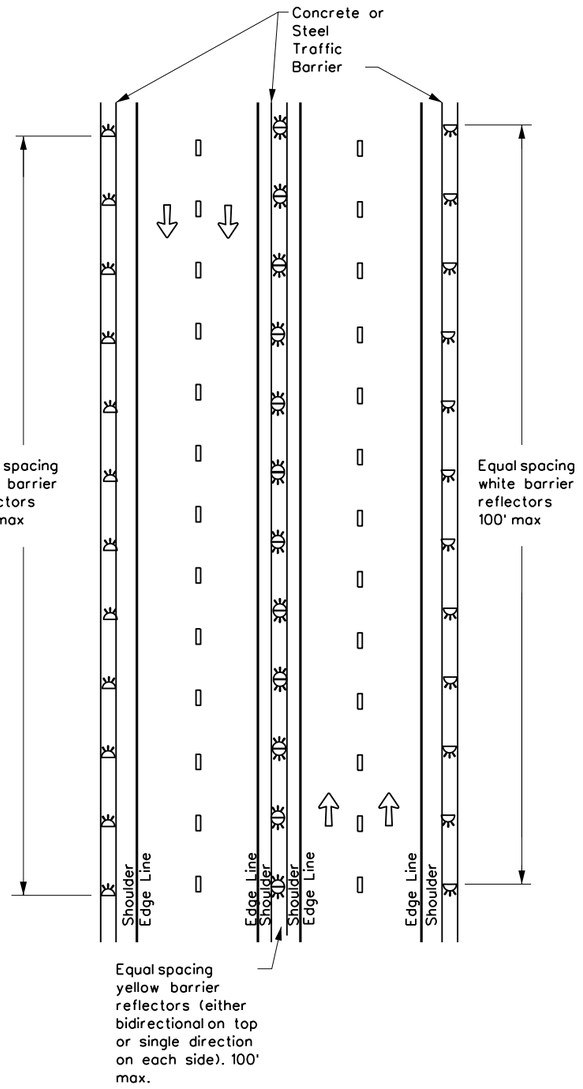
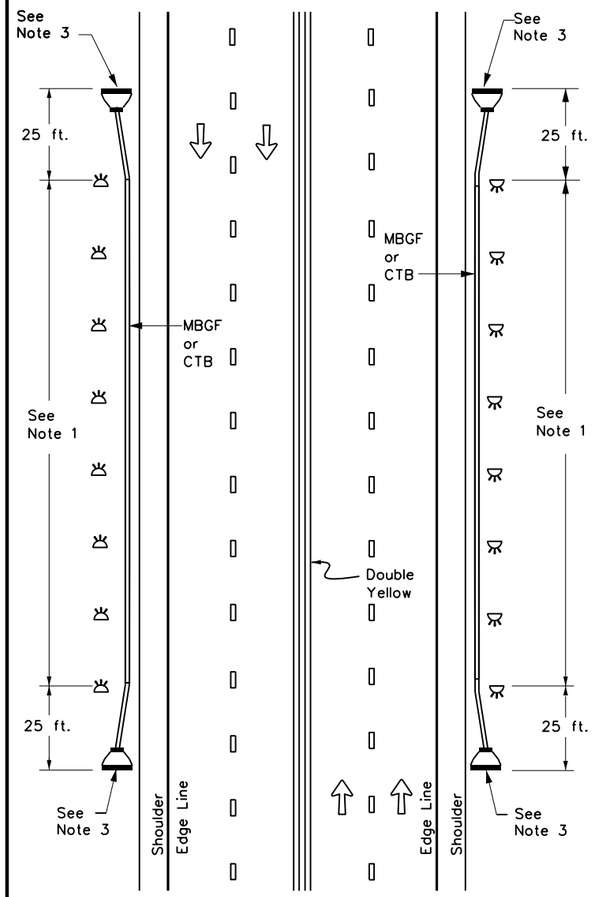
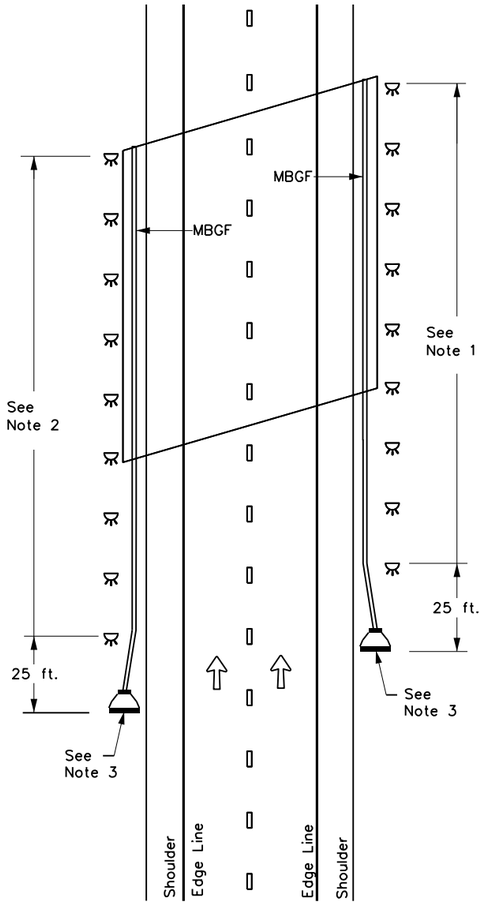
CONTINUOUS CONCRETE OR STEEL BARRIER



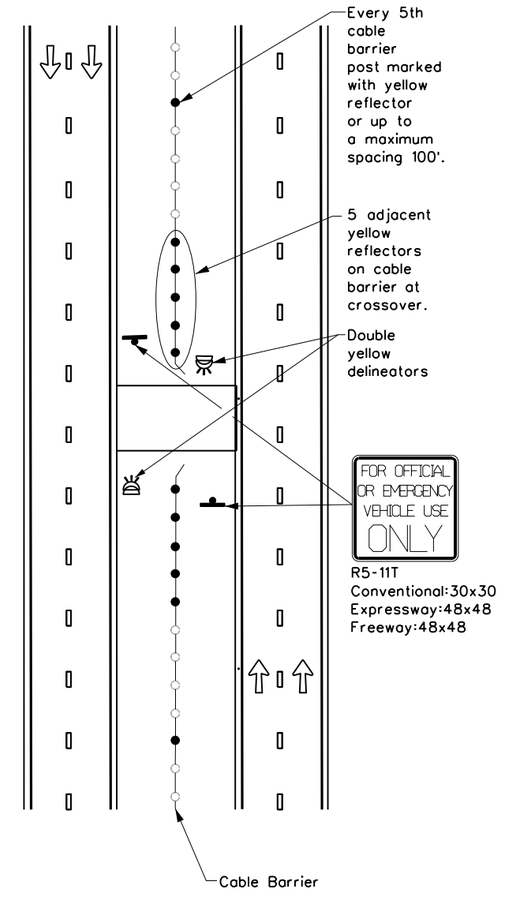
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3)in front of the terminal end.

LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

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©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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7-20	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		256

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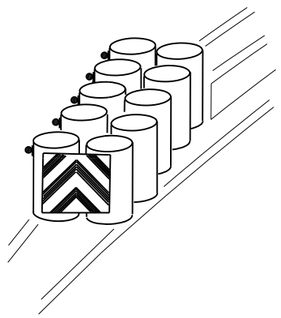
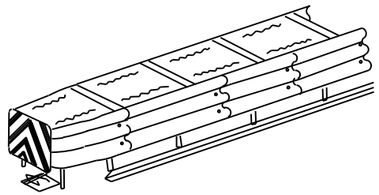
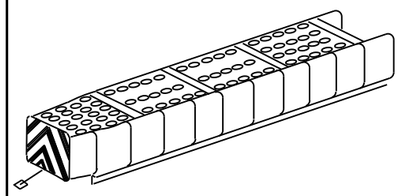
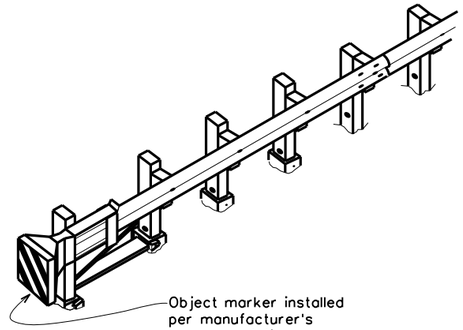
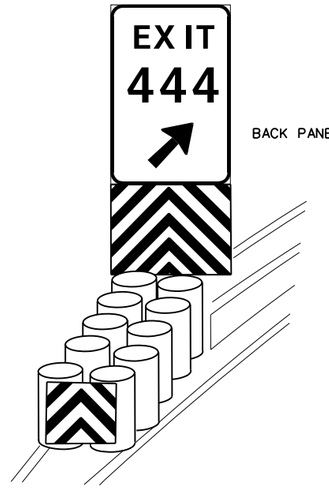
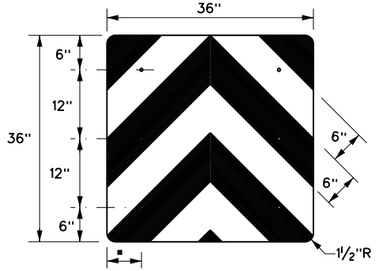


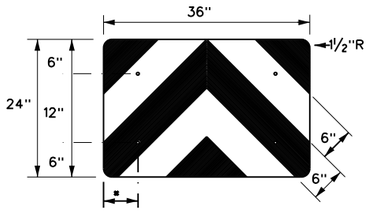




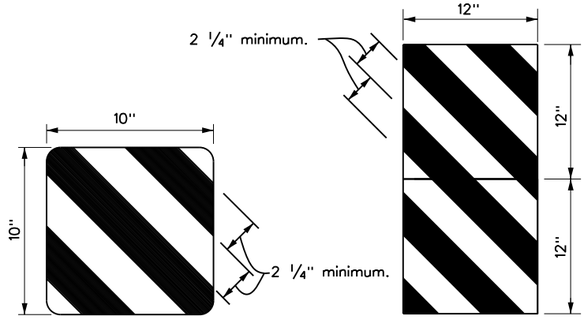




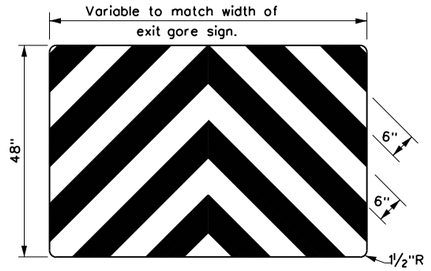


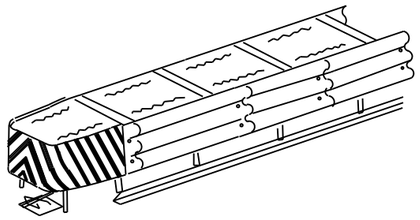


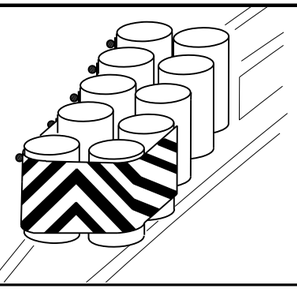
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

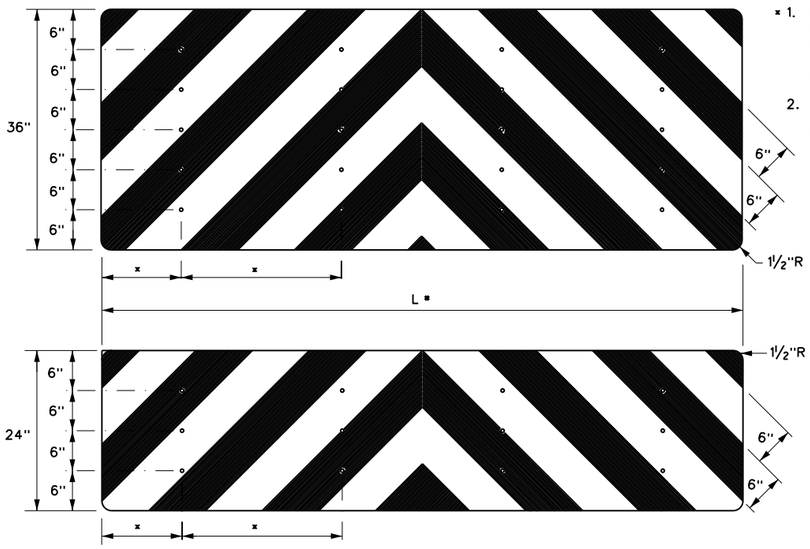


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

* 1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. 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.

2. 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.

3. 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 ¼".

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.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
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4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	SAT	BEXAR		257
4-98 7-20				

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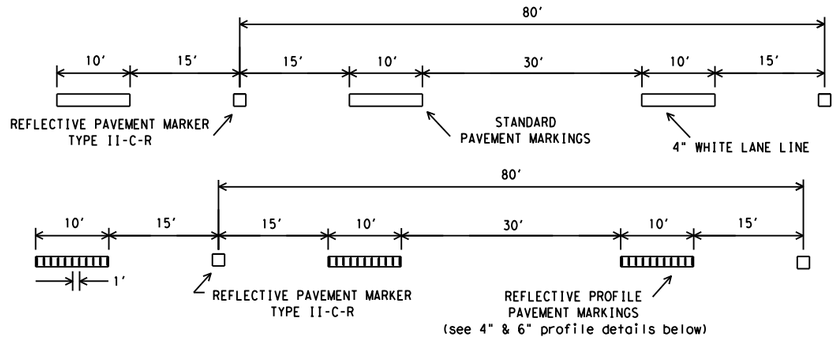
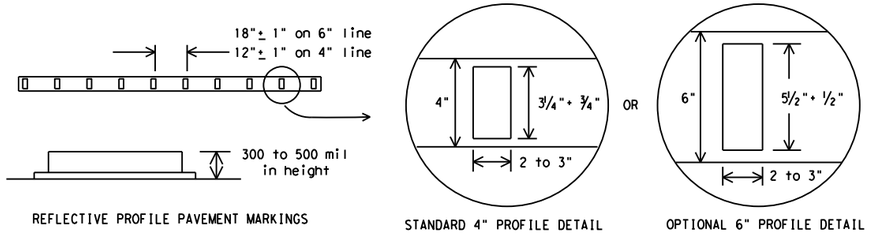


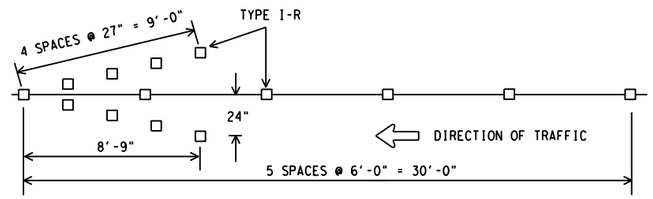
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

EDGELINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS.
IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.



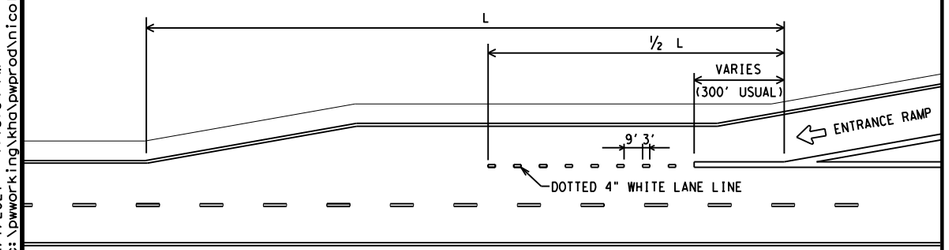
EDGELINE PAVEMENT MARKINGS



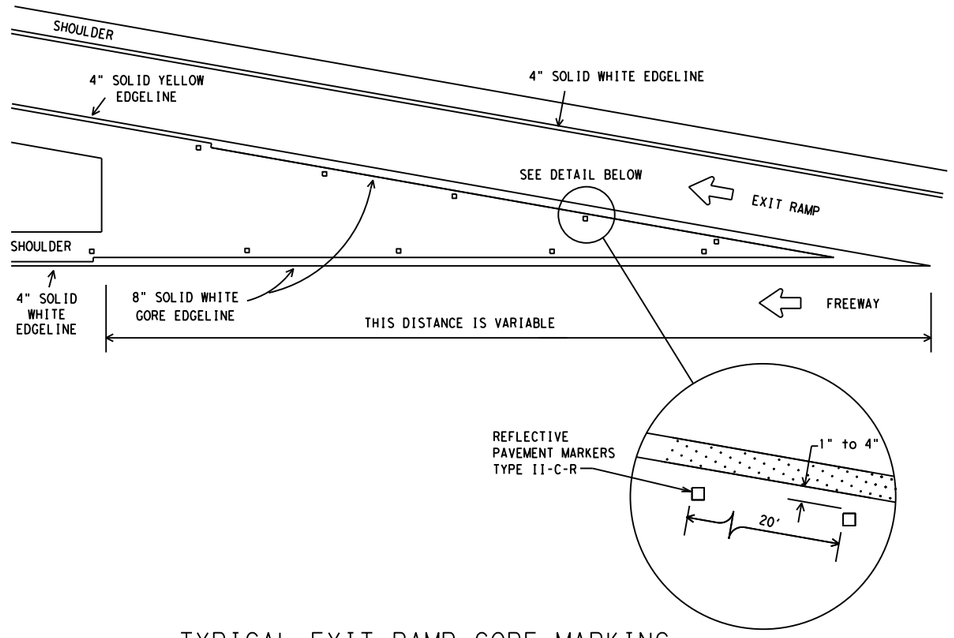
ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS.
LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

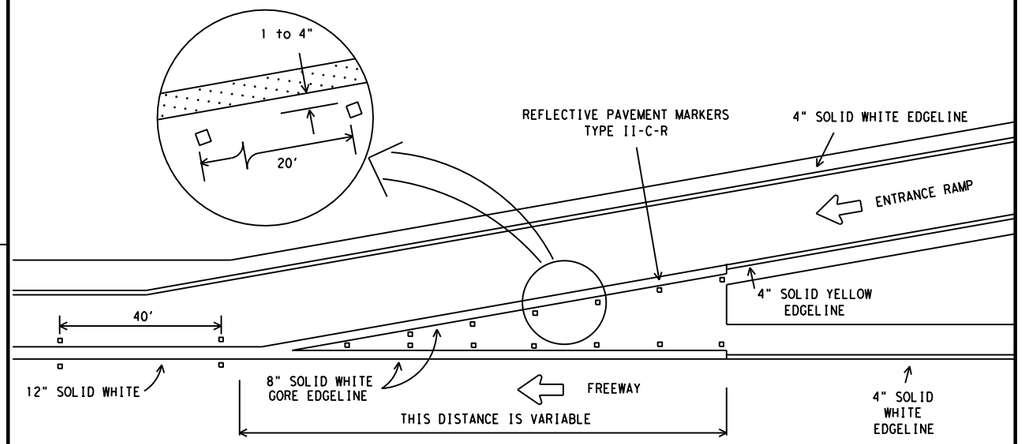
WRONG WAY ARROW DETAIL



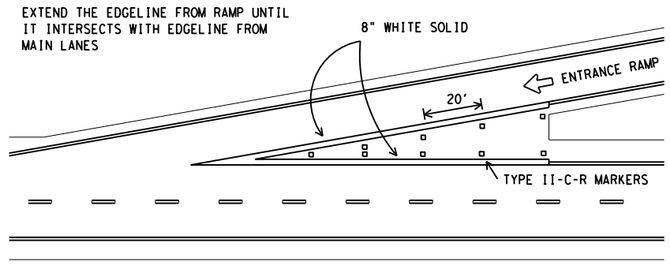
PARALLEL ACCELERATION LANE



TYPICAL EXIT RAMP GORE MARKING



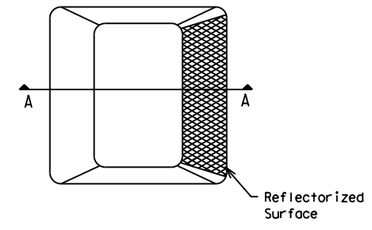
TYPICAL ENTRANCE RAMP GORE MARKING



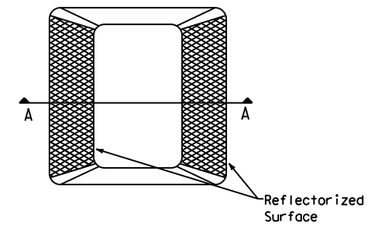
TAPERED ACCELERATION LANE

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

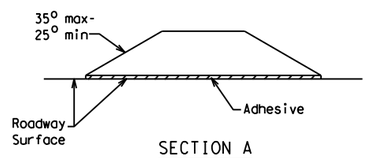
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0024	08	141	US 90
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00		SAT	BEXAR		258
2-08					

23A

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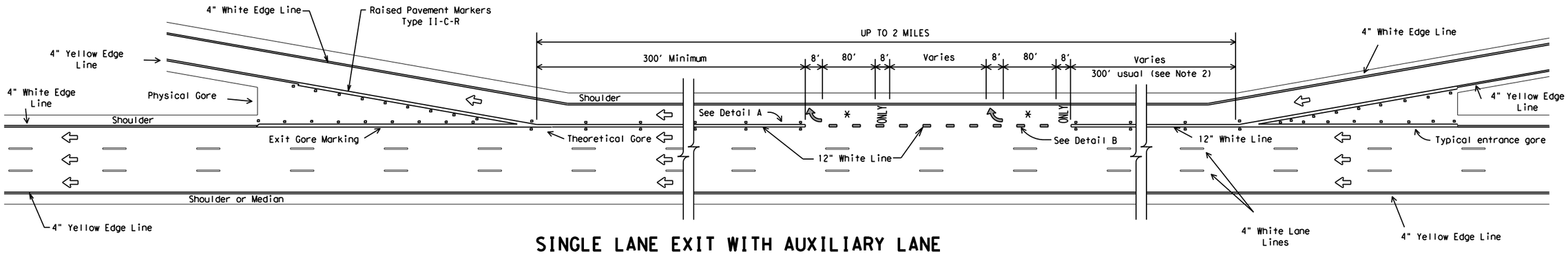
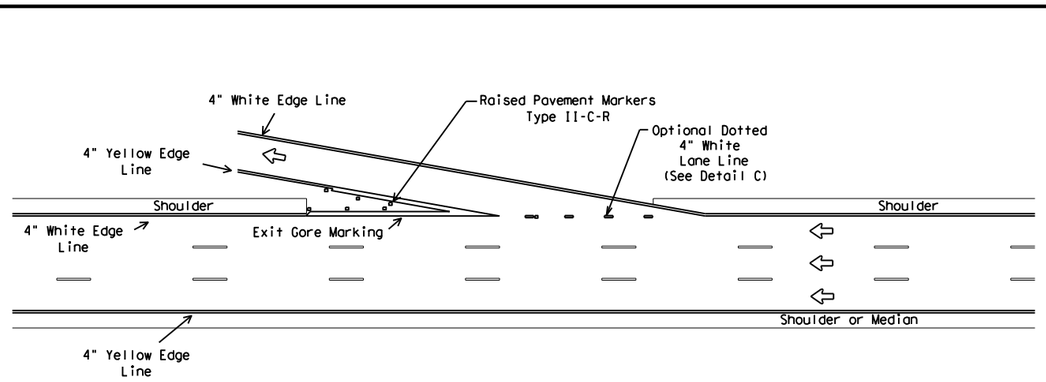
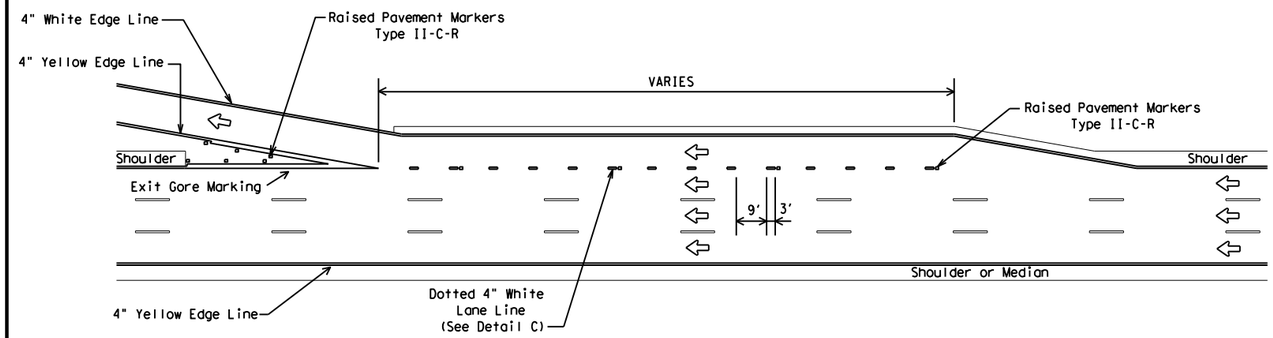


SINGLE LANE EXIT WITH AUXILIARY LANE

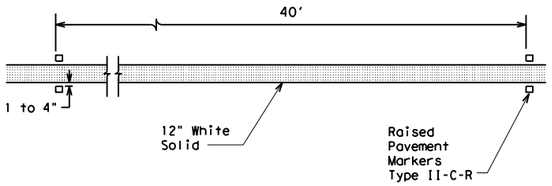
(See Note 2)



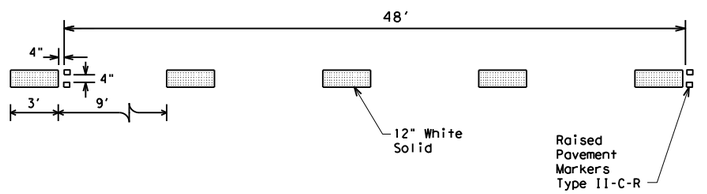
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

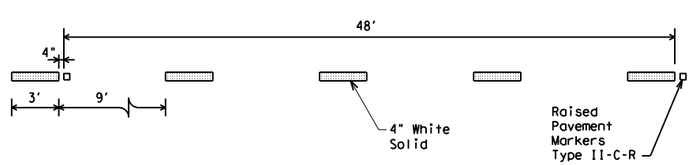


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
4-92 2-10
8-95 2-12
5-00
8-00

CONT	SECT	JOB	HIGHWAY
0024	08	141	US 90
DIST	COUNTY		SHEET NO.
SAT	BEXAR		259

23B

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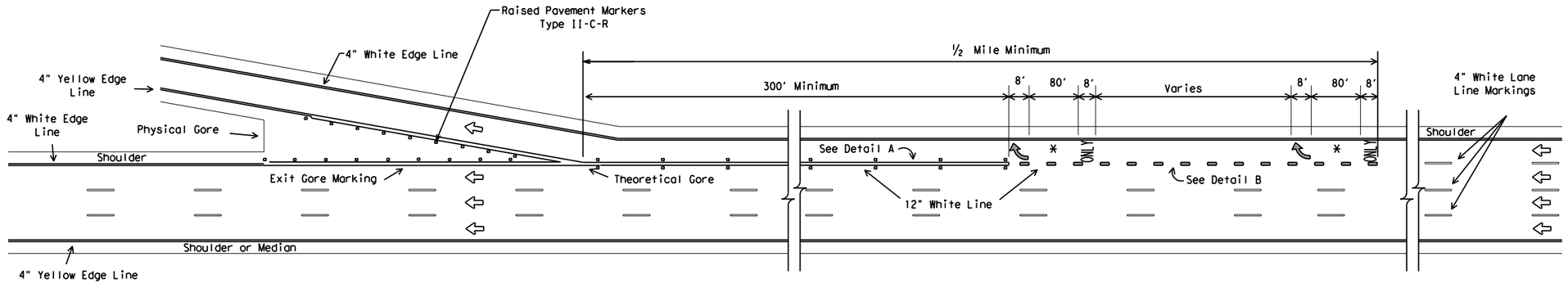
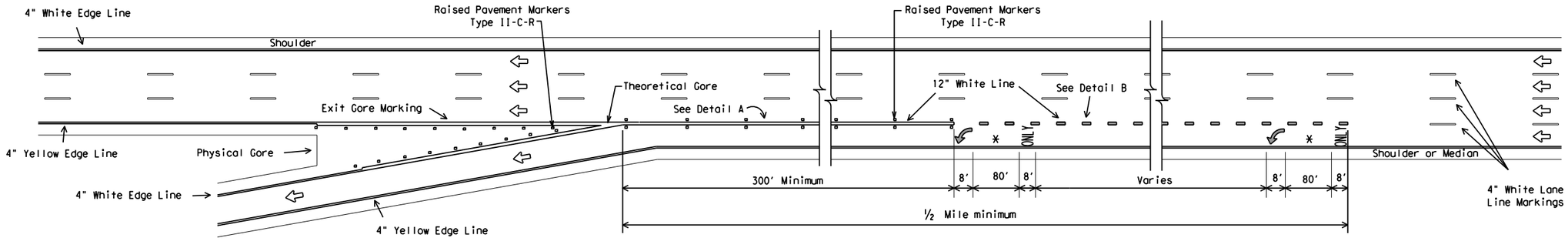


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY

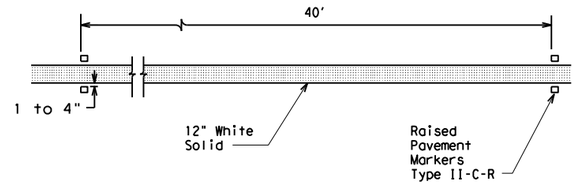


SINGLE LANE EXIT - LANE DROP OR EXIT ONLY (LEFTHAND)

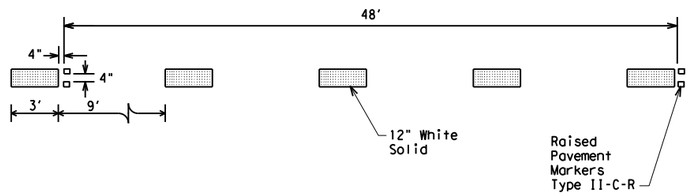
LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) EXIT RAMPS

FPM(3)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-00
8-00
2-10
2-12

CONT	SECT	JOB	HIGHWAY
0024	08	141	US 90

DIST	COUNTY	SHEET NO.
SAT	BEXAR	260

23C

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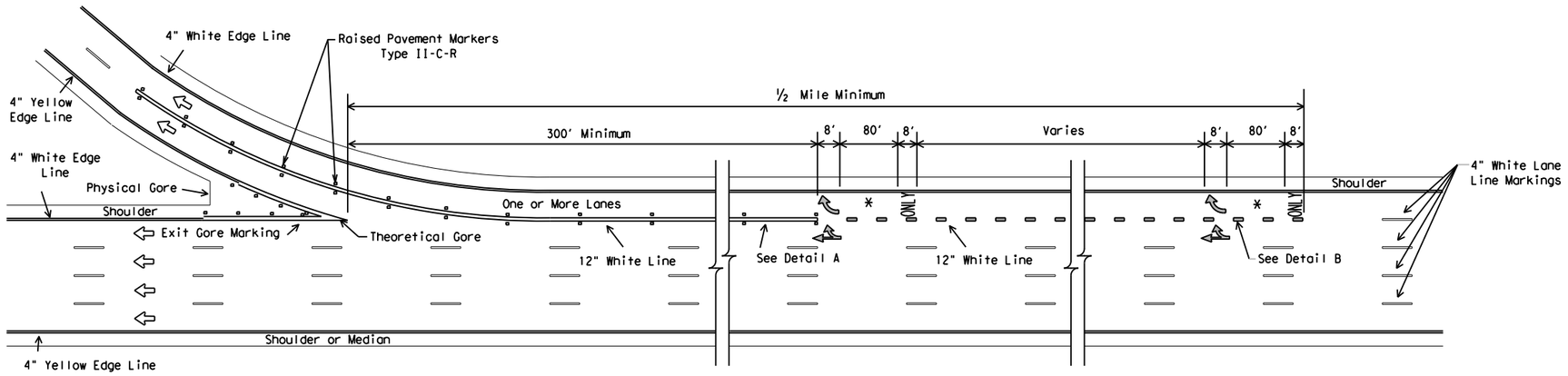
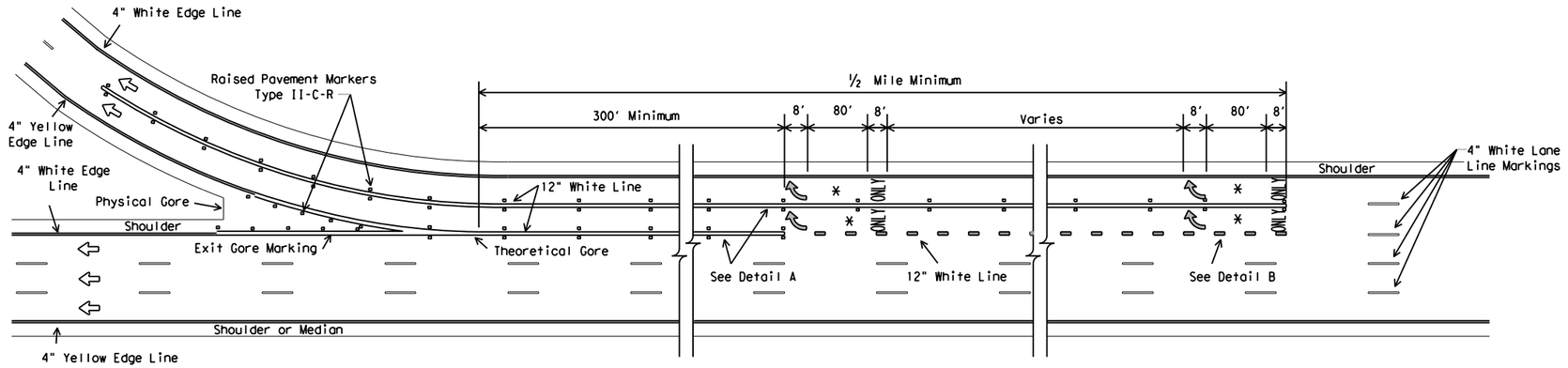


MULTIPLE LANE EXIT - EXIT ONLY WITH OPTION LANE

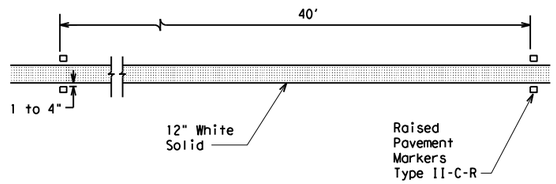


MULTIPLE LANE EXIT ONLY

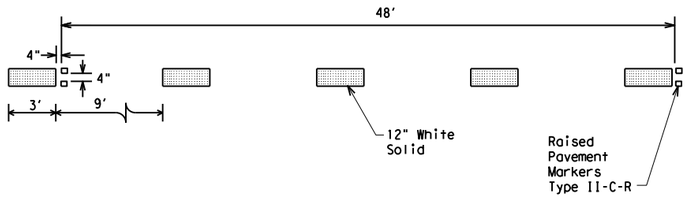
LEGEND	
⇦	Denotes direction of traffic
	Pavement marking arrow (white)
	Optional Pavement Marking Arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.



DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS LANE DROP (EXIT ONLY) DETAILS

FPM(4)-12

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-00
8-00
2-10
2-12

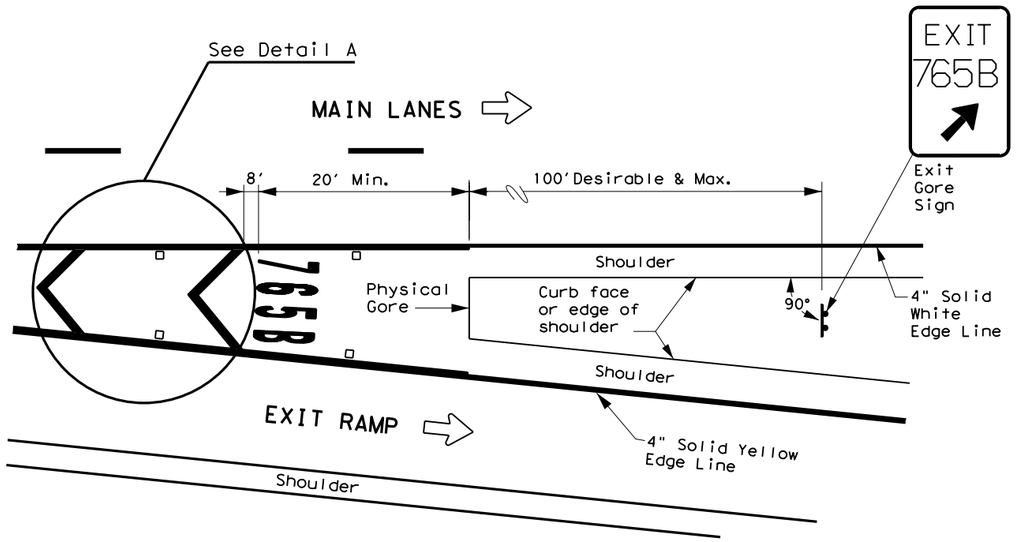
CONT	SECT	JOB	HIGHWAY
0024	08	141	US 90
DIST	COUNTY		SHEET NO.
SAT	BEXAR		261

23D

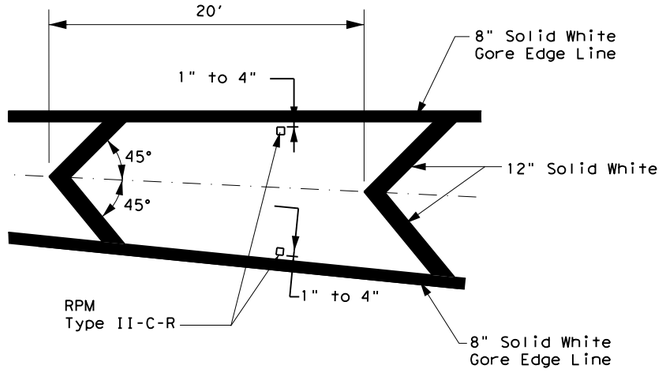
DATE: 4/1/2021 1:14:03 PM
FILE: c:\pwworking\kha\pwprod\nicole.smale\dms4615\fpm4-12.dgn

EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at http://www.txdot.gov



MARKINGS WITH EXIT NUMBER



NOTES

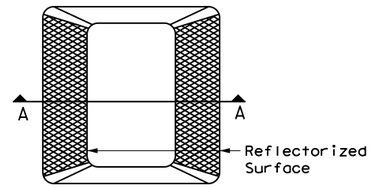
1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

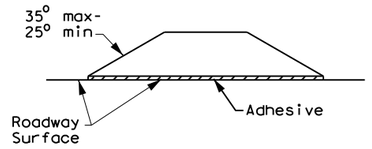
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

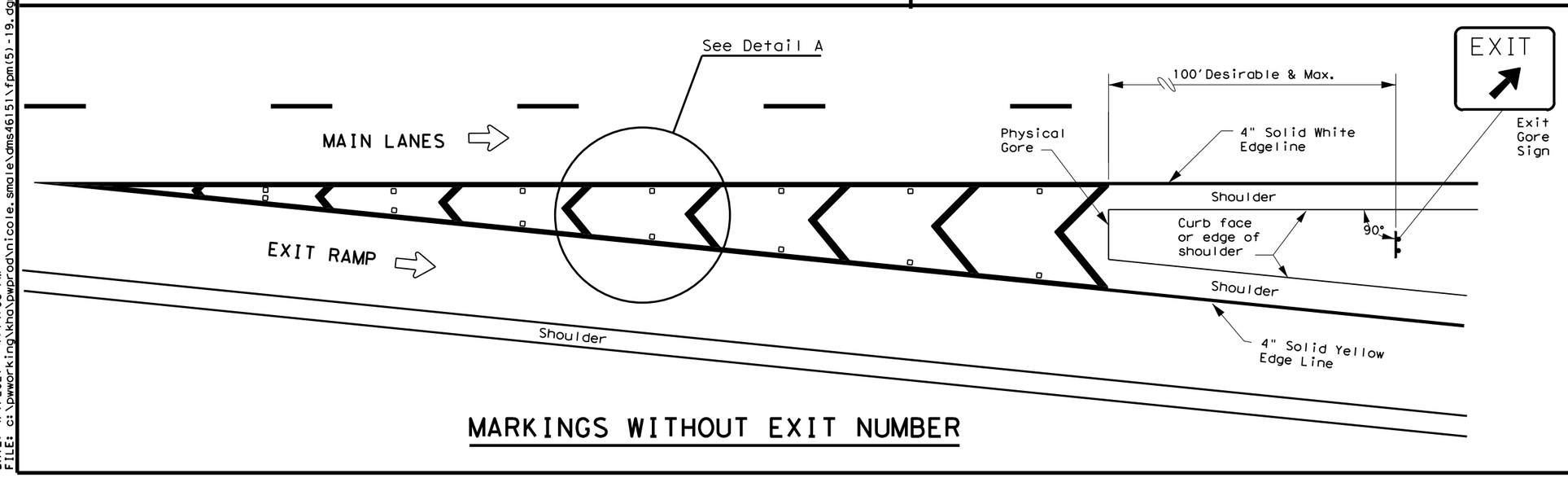
LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A



MARKINGS WITHOUT EXIT NUMBER

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-19

FILE: fpm(5)-19.dgn	DN:	CK:	DW:	CK:
© TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		262

23F

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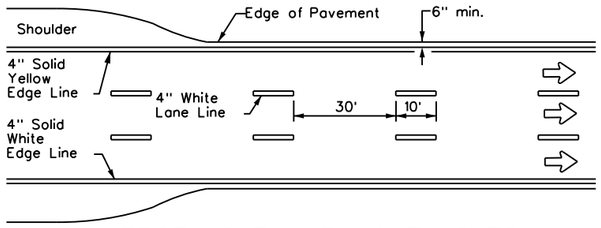
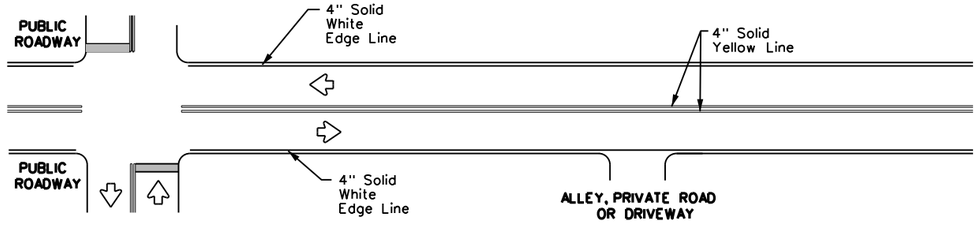
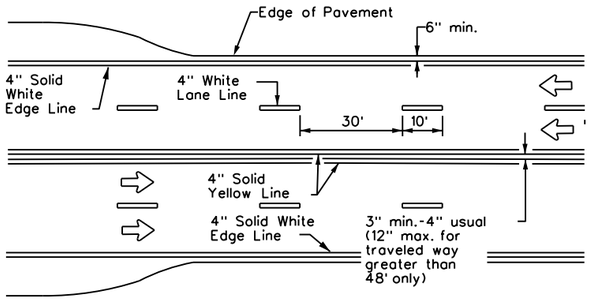


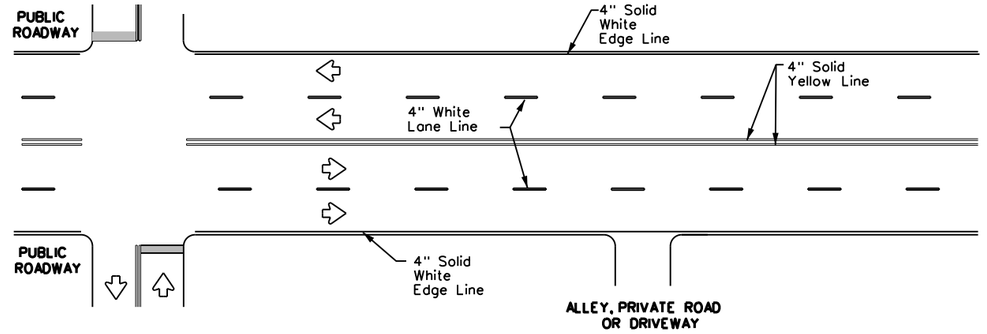
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



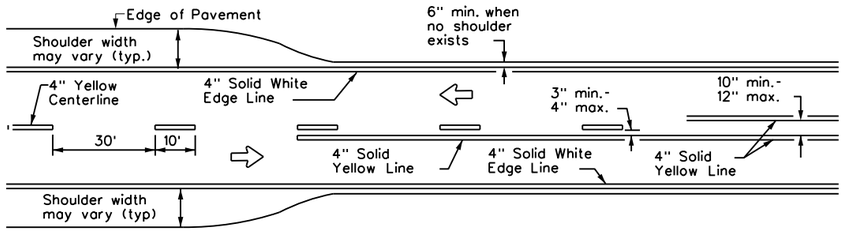
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



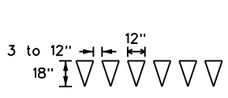
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



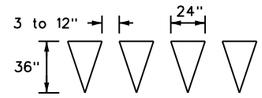
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

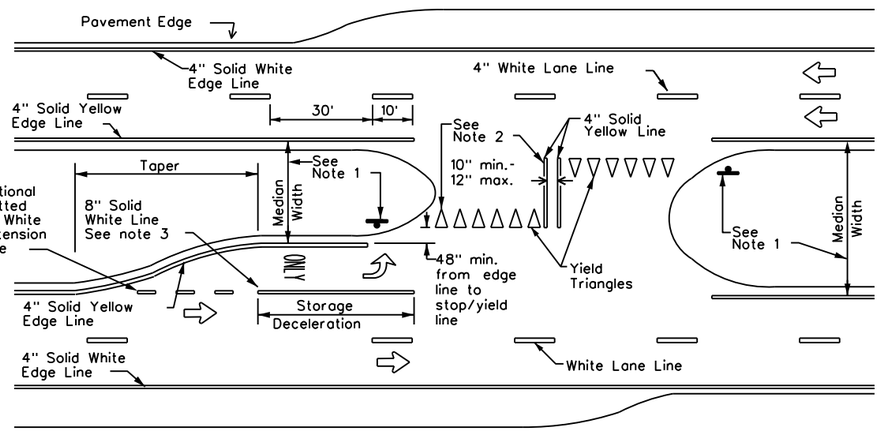


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

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

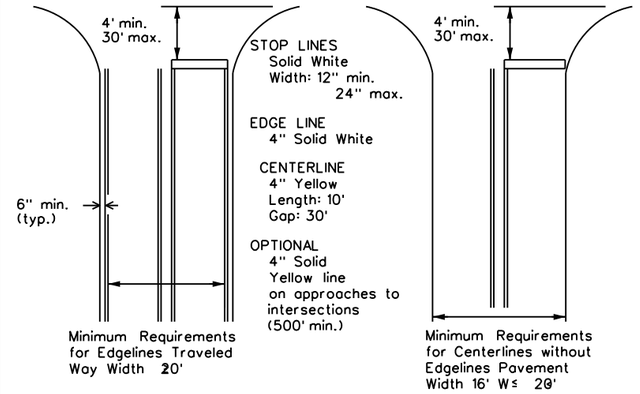
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0024	08	141	US 90
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	BEXAR		263

22B

DATE: 4/1/2021 1:14:21 PM
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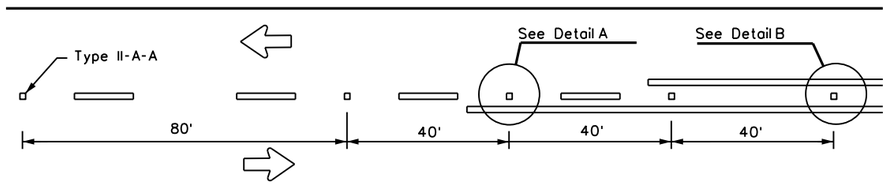
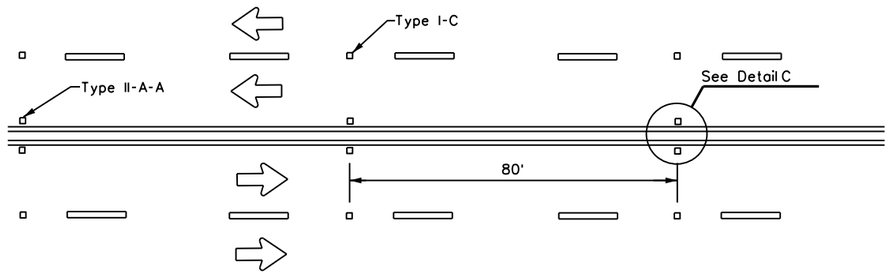
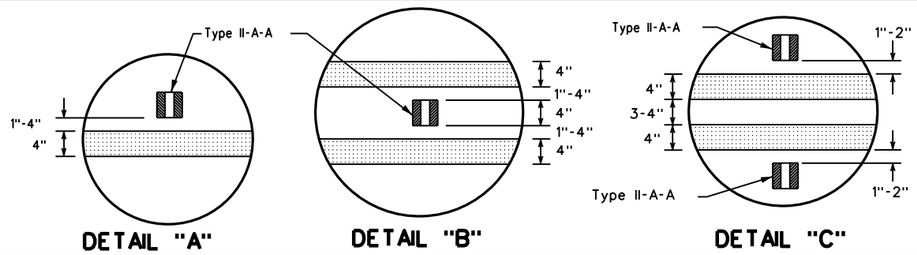
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

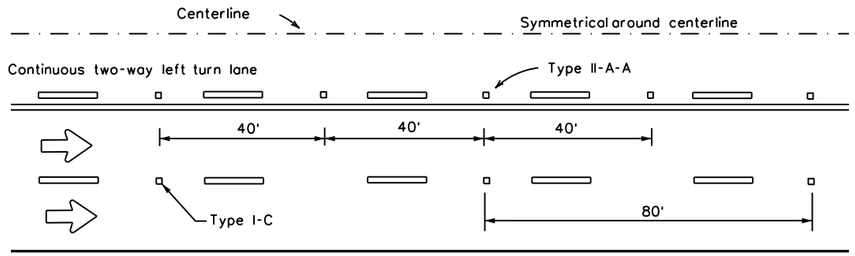


CENTERLINE FOR ALL TWO LANE ROADWAYS

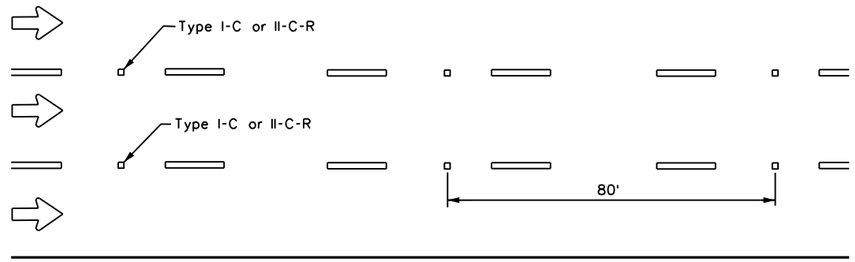


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

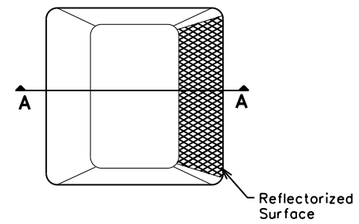


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

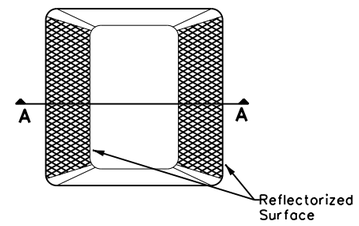
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

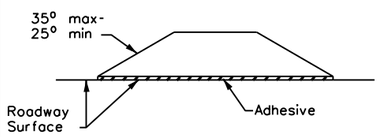
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

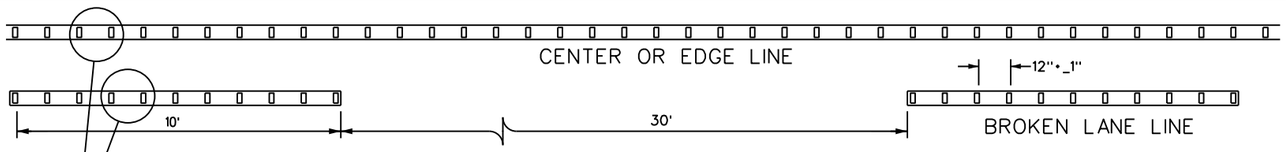


Type II (Top View)



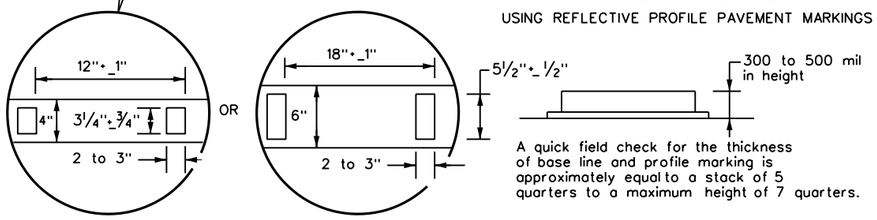
SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

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

GENERAL NOTES

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

Texas Department of Transportation

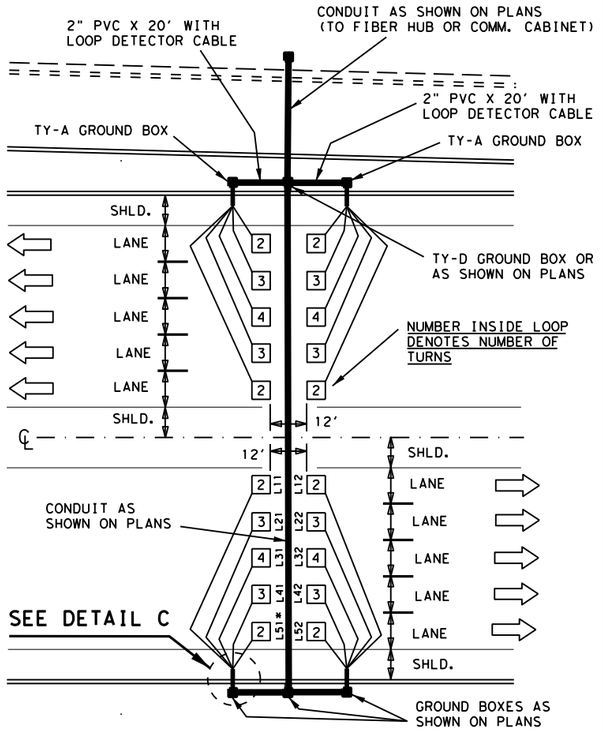
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0024	08	141	US 90
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	BEXAR		264

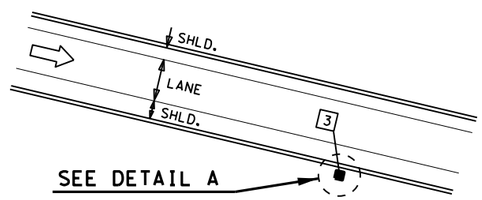
22B

DATE: 4/1/2021 1:14:22 PM
FILE: c:\pwworking\khb\pwprod\nicole.smale\dms46151\pm2-20.dgn

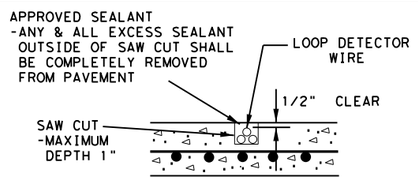


TYPICAL MAINLANE DETAIL
(3 OR MORE LANES)

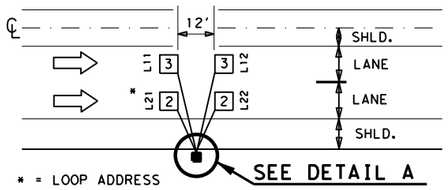
* = LOOP ADDRESS



TYPICAL RAMP DETAIL
(1 LANE)

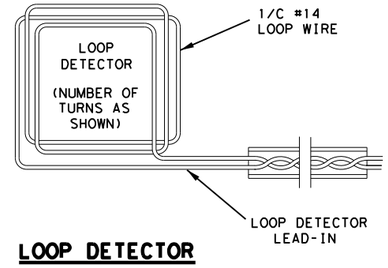


LOOP DETECTOR IN CONC. PAVEMENT

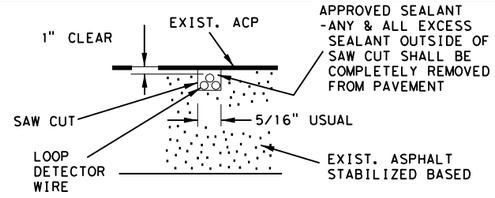


* = LOOP ADDRESS

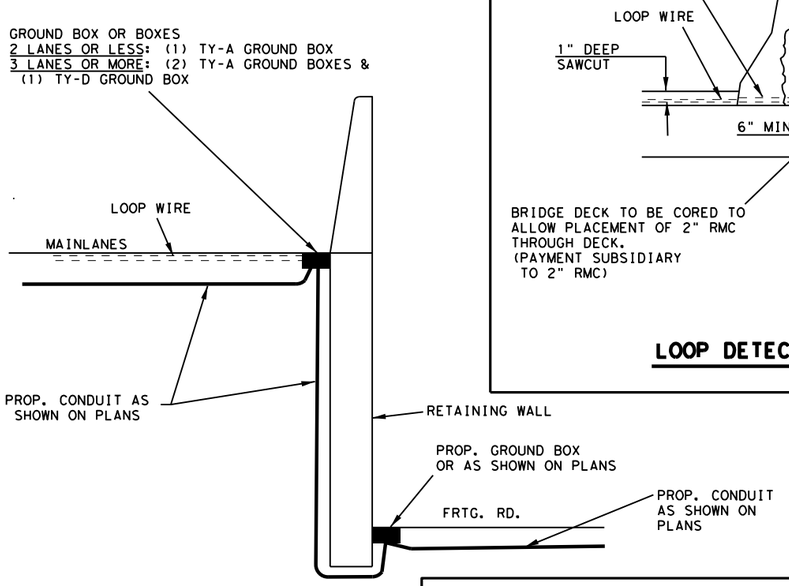
TYPICAL MAINLANE OR CONNECTOR DETAIL
(2 LANES OR LESS)



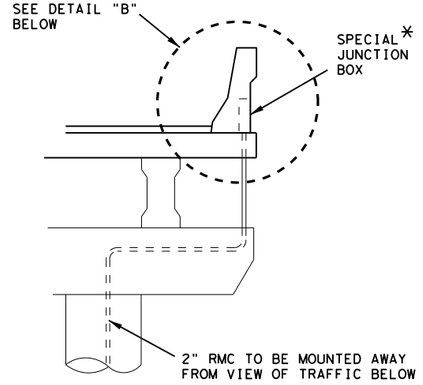
LOOP DETECTOR TURNS



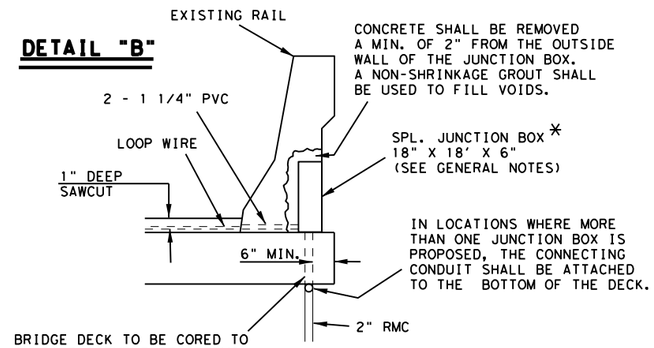
LOOP DETECTOR IN ASPHALT



LOOP DETECTOR NEAR RETAINING WALL

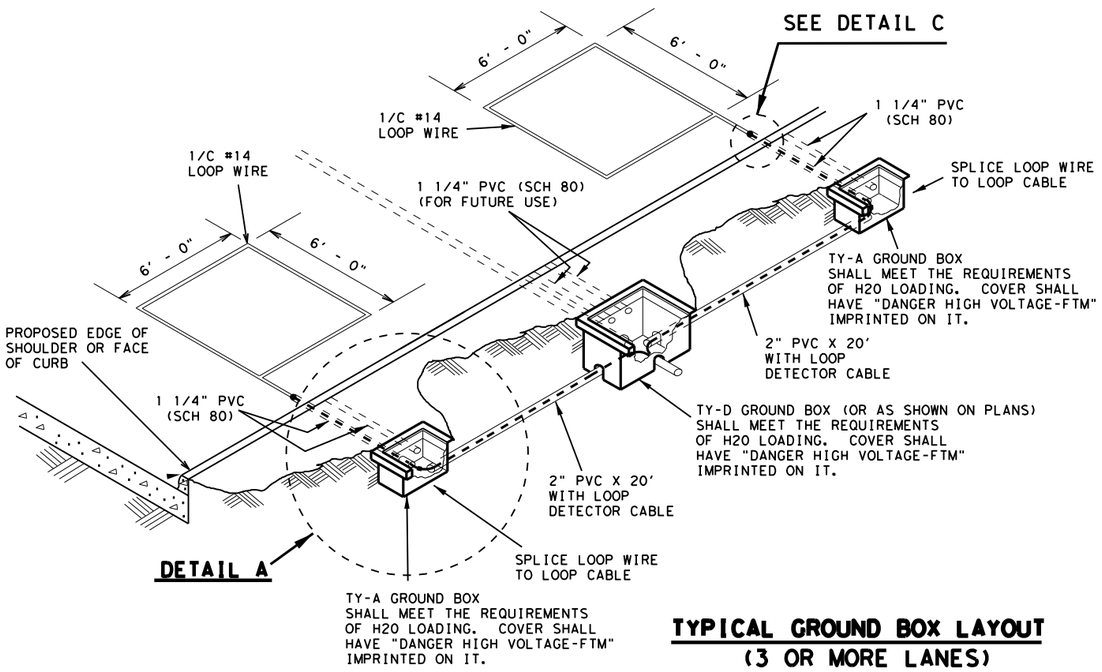


DETAIL "B"

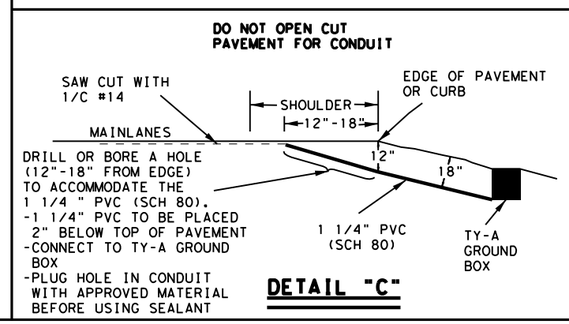


* SPECIAL JUNCTION BOX AND 1 1/4" PVC SHALL BE PLACED IN EXIST. RAIL. ALL VOIDS SHALL BE SEALED WITH CONCRETE GROUT. ALL LABOR AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.

LOOP DETECTOR IN BRIDGE DECK



TYPICAL GROUND BOX LAYOUT
(3 OR MORE LANES)



DETAIL "C"

THIS SHEET IS FOR INFORMATION PURPOSES ONLY.
NO LOOP DETECTORS WILL BE INSTALLED IN THIS PROJECT.

SURVEILLANCE LOOP DETECTOR INSTALLATION DETAILS

 Texas Department of Transportation

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			265
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0024	08	135	US 90

1:14:31 PM
4/1/2021
c:\pwworking\khg\pwprod\nicole.smale\dms46151\loopsengl.dgn

PLAN

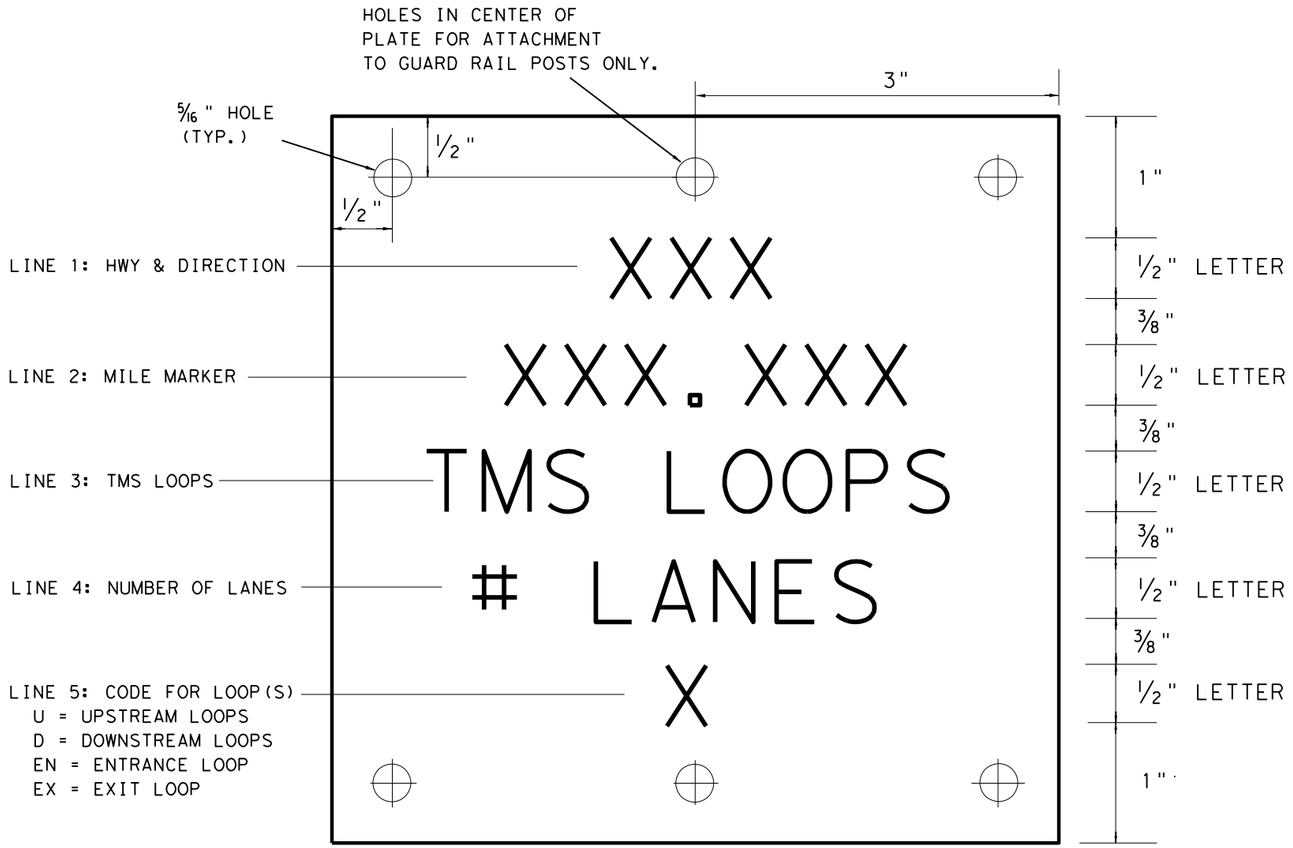
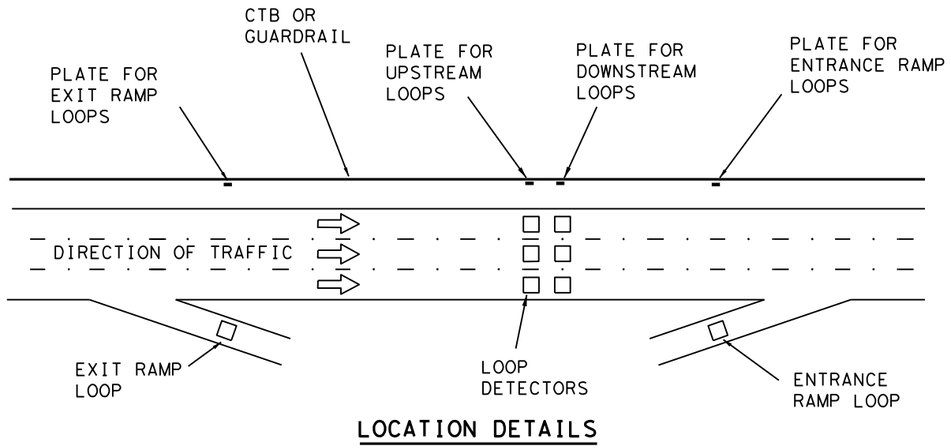


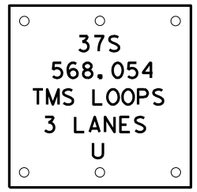
PLATE DETAILS

6" X 6" X 1/8" THICK UNPAINTED POLISHED ALUMINUM PLATE WITH LETTERS AND NUMBERS STAMPED INTO PLATE. FINISH SHALL BE SMOOTH AND FREE OF FLAWS, BURRS, OR SHARP EDGES.

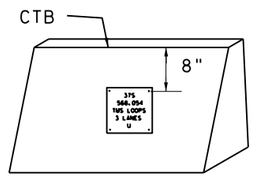


LOCATION DETAILS

EXAMPLE:

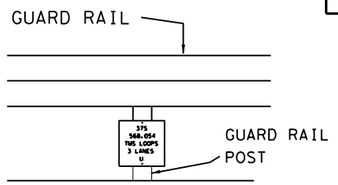


EXPLANATION:
UPSTREAM TMS LOOPS
ON IH 37 SBND
WITH 3 LANES
AT MILE MARKER
568.054



ATTACH USING 4
OUTSIDE HOLES

PLATE MOUNTED TO CTB



ATTACH USING 2
INSIDE HOLES

PLATE MOUNTED TO GUARD RAIL

LOOP INSTALLATION NOTES:

1. THE PAVEMENT CUT IS TO BE MADE WITH AN APPROVED SAW TO NEAT LINES AND LOOSE MATERIAL REMOVED. THE CUT SHALL BE CLEAN AND DRY WHEN THE WIRE AND LOOP SEALANT IS PLACED.
2. WHERE MORE THAN ONE LOOP IS PLACED, THE LOOP DETECTOR WIRE FROM LOOP TO GROUND BOX SHALL NOT BE PLACED IN A SAW CUT WITH WIRE FROM OTHER LOOPS UNLESS OTHERWISE SHOWN IN THE PLANS.
3. THE LOOP WIRE SHALL BE TWISTED A MINIMUM OF FIVE TURNS PER FOOT FROM THE EDGE OF THE ROAD TO THE GROUND BOX AND NO SPLICES SHALL BE PERMITTED IN THE LOOP OR IN THE RUN TO THE GROUND BOX.
4. THE 1/C #14 LOOP WIRE SHALL BE SINGLE CONDUCTOR CROSSLINKED POLYETHYLENE (0.045) INSULATED WIRE, TYPE: RHH, RHW, USE, 14 AWG STRANDED COPPER RATED AT 600 VOLTS.
5. THE 2/C #14 LOOP CABLE SHALL BE TWO CONDUCTOR SHIELDED CABLE, 14 AWG, 19 X 27 STRANDED, 600 VOLT TINNED COPPER, POLYETHYLENE INSULATED, TWISTED PAIR, TWISTED A MINIMUM OF THREE TWISTS PER FOOT, ALUMINUM - POLYESTER SHIELD, 16 AWG STRANDED TINNED COPPER DRAIN WIRE, 100% SHIELD COVERAGE. THE LOOP CABLE SHALL BE CONTINUOUS WITHOUT SPLICES.
6. THE LOOP WIRE SHALL BE SPLICED TO THE LOOP CABLE BY SOLDERING CONDUCTORS, SECURING WITH A WIRE NUT AND FULLY ENCAPSULATING INTO A WATERTIGHT COMMERCIAL SPLICING KIT.
7. ALL LOOP WIRE PLACED IN A SAWCUT SHALL BE SEALED BY FULLY ENCAP-SULATING IT WITH LOOP WIRE SEALANT AS APPROVED BY THE ENGINEER.
8. ALL LOOP DETECTORS SHALL BE 6' X 6' CENTERED BETWEEN THE ULTIMATE LANE LINES.
9. LOOP DETECTOR WIRE AND LOOP DETECTOR CABLE SHALL BE LABELLED IN THE FIRST GROUND BOX AND CABINET TO IDENTIFY IN WHICH LANE THE LOOP IS LOCATED IN ACCORDANCE WITH THE EQUIPMENT ADDRESS INDEX SHEET.
10. LOOP DETECTOR WIRE AND LOOP DETECTOR CABLE SHALL BE TESTED IN THE PRESENCE OF THE ENGINEER USING A MEGOHMETER AND CONTINUITY TESTER. THE RESISTANCE BETWEEN GROUND AND EACH SIDE OF THE LOOP DETECTOR WIRE OR LOOP DETECTOR CABLE SHALL BE TESTED. ANY LOOP HAVING LESS THAN 50 MEG-OHMS TO GROUND SHALL BE REPLACED BY THE CONTRACTOR. THE TEST SHALL BE PERFORMED BEFORE, AFTER THE RUBBER SEAL, AND AFTER THE ACP OVERLAY.
11. ANY JUNCTION BOXES PLACED IN RAIL SHALL BE 18" X 18" X 6" CAST IRON, HOT DIP GALV. WATERTIGHT(NEMA - 4) SIMILAR TO OZ/GEDNEY CAT.YU-181806. ALL CONDUIT ENTERING THE BOX SHALL ENTER THROUGH DRILLED AND SEALED HOLES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH THE FABRICATOR THE HOLE LOCATIONS. THE CONTRACTOR SHALL FURNISH A CATALOG SUBMITTAL TO THE ENGINEER FOR APPROVAL.
12. SURVEILLANCE LOOP DETECTORS SHALL BE PAID FOR AS EACH LOOP DETECTOR WHICH SHALL BE PAYMENT FOR ALL MATERIAL AND LABOR FROM THE LOOP DETECTOR TO BUT NOT INCLUDING THE GROUND BOXES OR 2/C #14 LOOP CABLE.
13. LOOPS SHALL BE INSTALLED PRIOR TO FINAL ACP MAT.

PLATE INSTALLATION NOTES:

1. PLATE SHALL BE ATTACHED TO CTB WITH 1/4 " X 3/4 " LONG GALVANIZED LAG BOLTS & FLAT WASHERS WITH LEAD ANCHORS DRILLED INTO CTB.
2. PLATE SHALL BE ATTACHED TO METAL GUARD RAIL POSTS USING HILTI GUN WITH APPROPRIATE ANCHORS.
3. PLATE SHALL BE ATTACHED TO WOOD GUARD RAIL POSTS WITH 1/4 " GALVANIZED LAG BOLTS AND WASHERS.
4. CONTACT TXDOT AT (210)731-5140 TO REQUEST INFORMATION TO BE STAMPED ON PLATE AT EACH LOOP LOCATION(MILE MARKER, ETC). 48 HRS NOTICE REQUIRED.
5. ALL MATERIALS AND LABOR SHALL BE CONSIDERED SUBSIDIARY TO THE ITEM "SURVEILLANCE LOOP DETECTOR" AND NO DIRECT PAYMENT SHALL BE MADE.
6. IN LOCATIONS WITHOUT CTB OR GUARDRAIL, PLATE SHALL BE ATTACHED TO CONCRETE APRON SURROUNDING GROUND BOX AT LOOP(S).

THIS SHEET IS FOR INFORMATION PURPOSES ONLY.
NO LOOP DETECTORS WILL BE INSTALLED IN THIS PROJECT.

SURVEILLANCE LOOP DETECTOR INSTALLATION DETAILS

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
			266
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0024	08	135	US 90

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4/1/2021
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PLAN

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

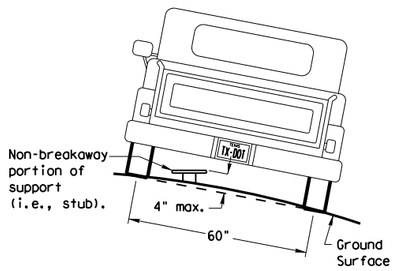
Anchor Type

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

Sign Mounting Designation

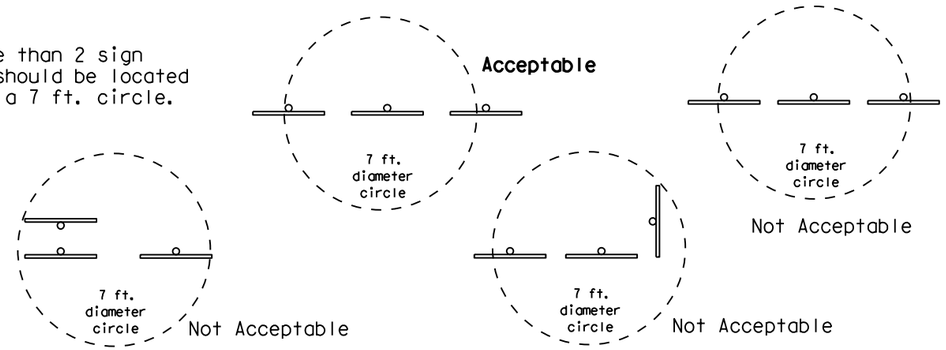
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



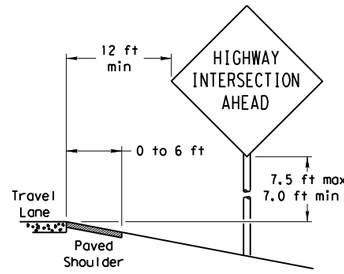
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



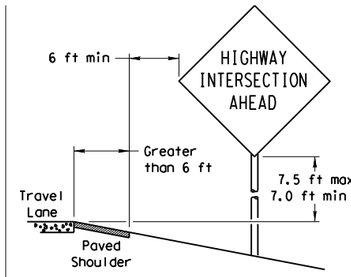
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

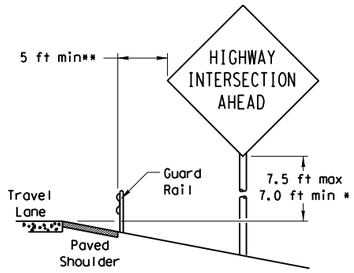
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



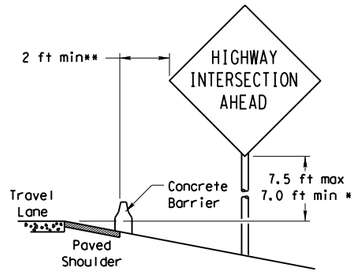
GREATER THAN 6 FT. WIDE

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.

BEHIND BARRIER



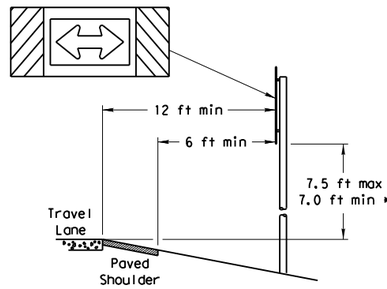
BEHIND GUARDRAIL



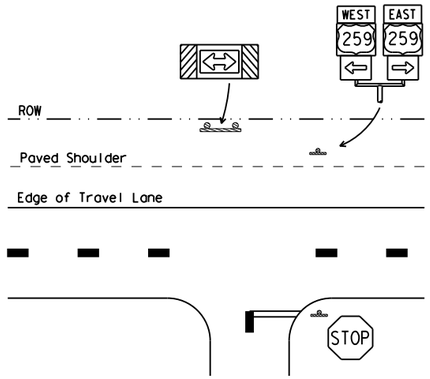
BEHIND CONCRETE BARRIER

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

T-INTERSECTION



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



* 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.

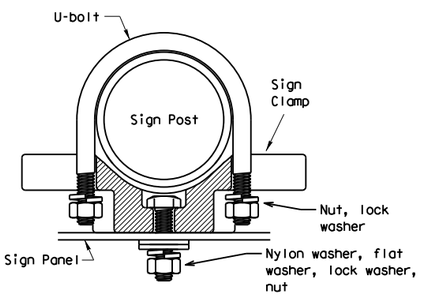
The maximum values may be increased when directed by the Engineer.

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

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

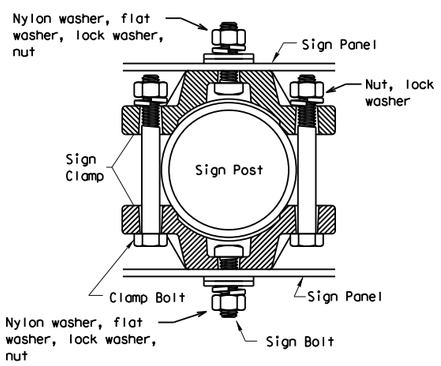


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

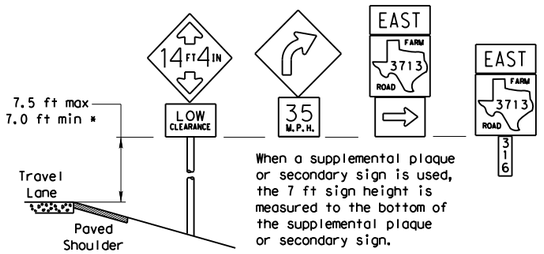
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



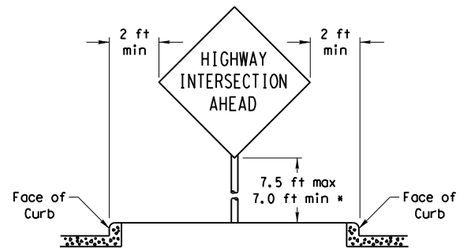
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



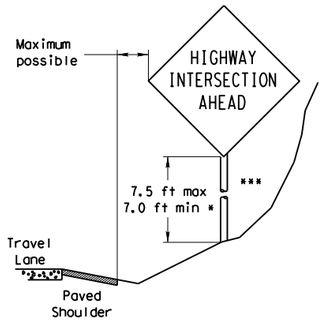
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		267

DATE: 4/1/2021 1:14:36 PM
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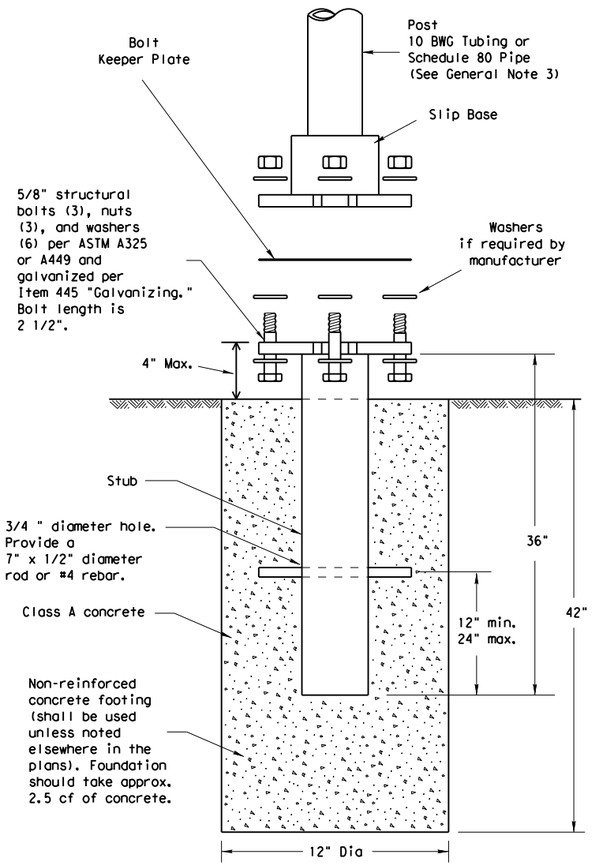
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

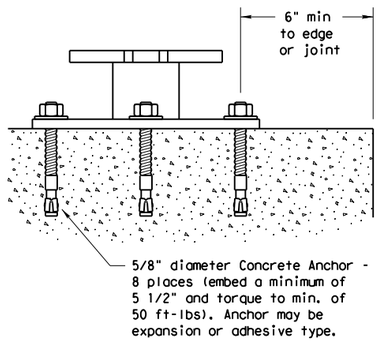
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS 9-08			

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DIST	COUNTY		SHEET NO.
SAT	BEXAR		268

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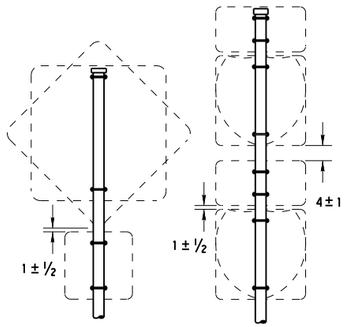
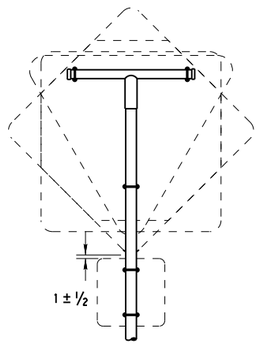
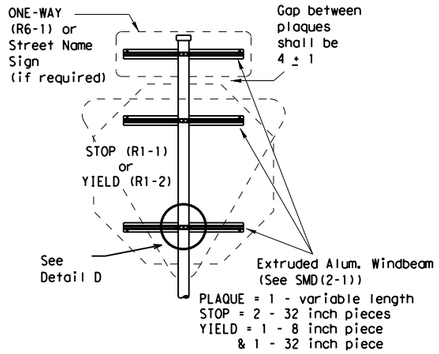


SM RD SGN ASSM TY XXXXX(1)XX(P)



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



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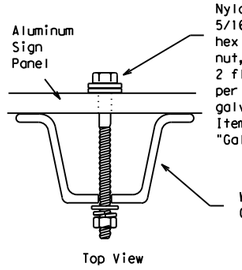
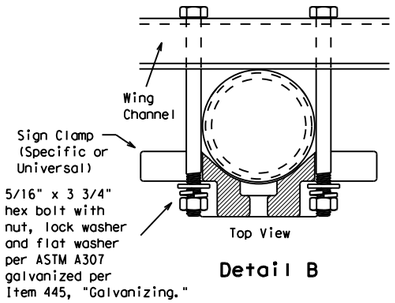
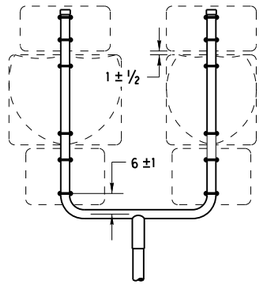


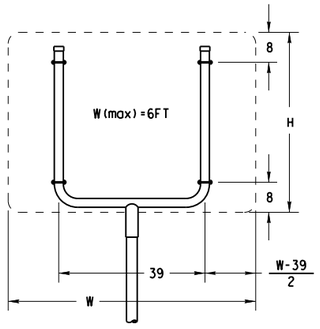
Detail A



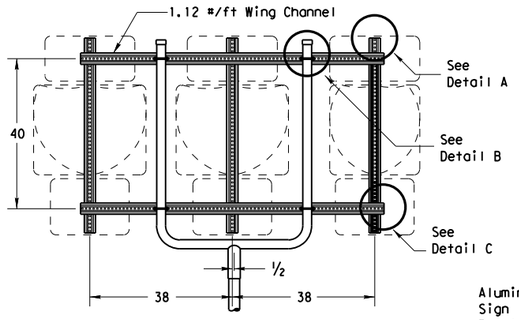
Detail B



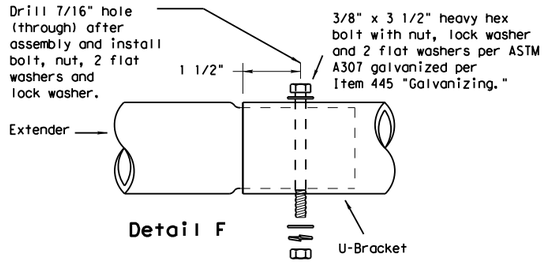
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

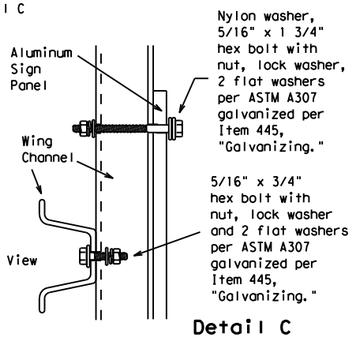


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

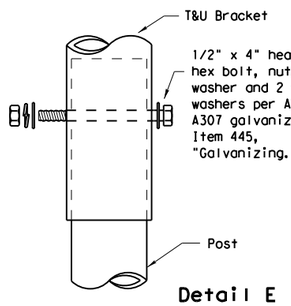


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



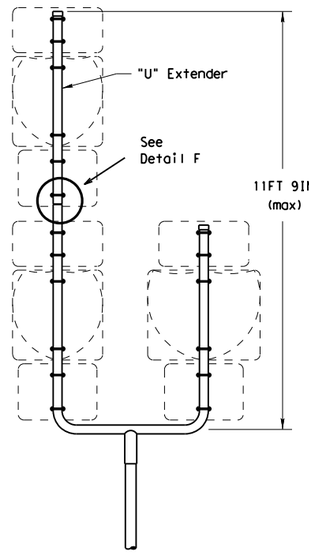
Detail E

GENERAL NOTES:

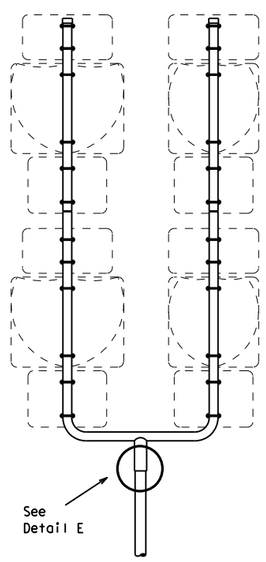
1.

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.



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



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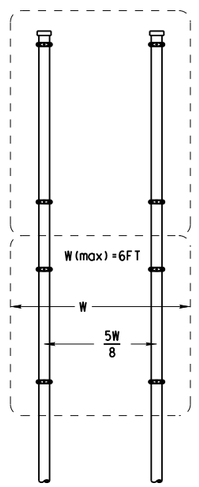
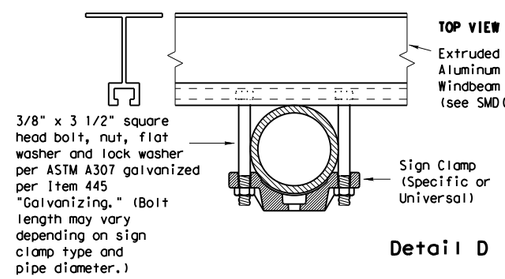
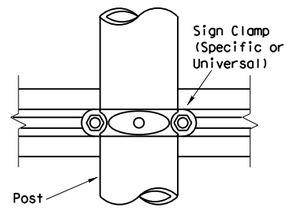


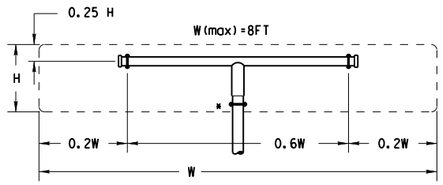
SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D



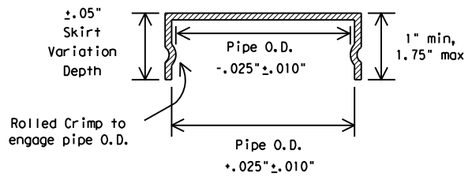
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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)



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

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0024	08	141	US 90
DIST	COUNTY		SHEET NO.
SAT	BEXAR		269

9-08 REVISIONS

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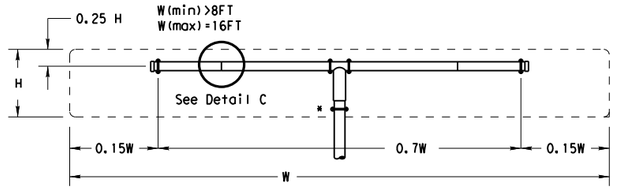
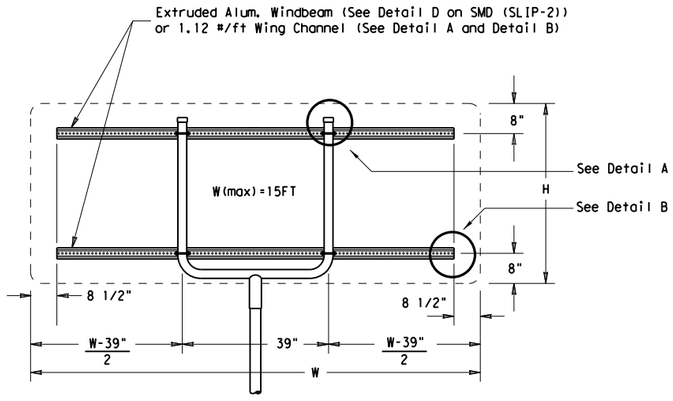
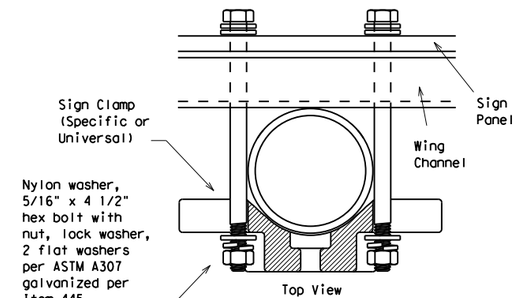


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

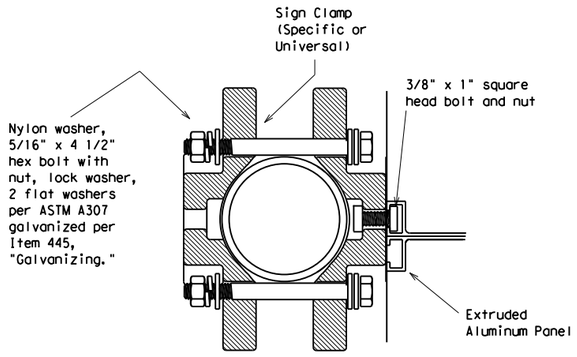
(* - See Note 12)



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

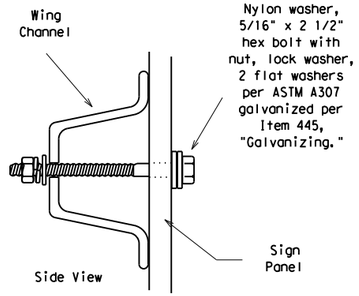


Detail A

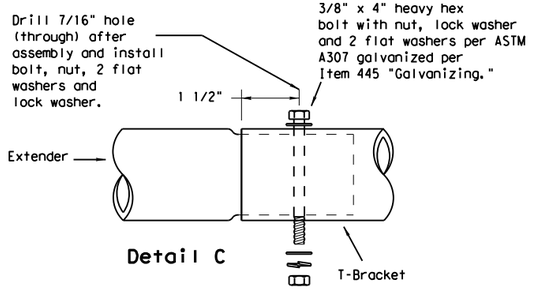


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

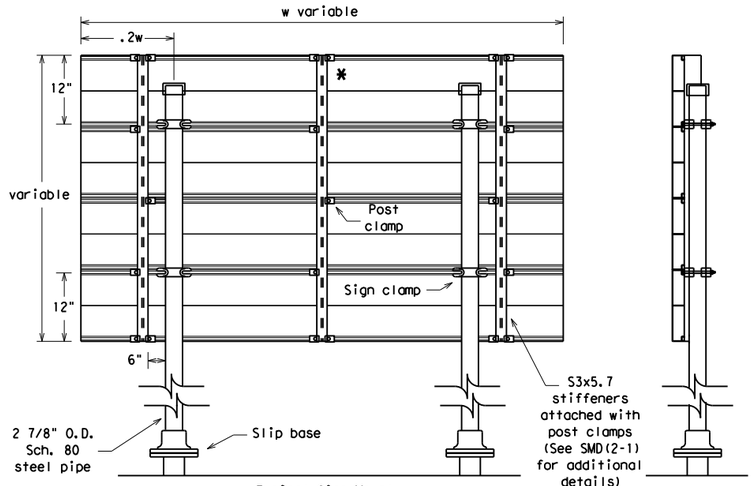


Detail B



Detail C

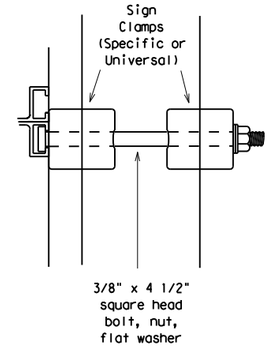
Splices shall only be allowed behind the sign substrate.



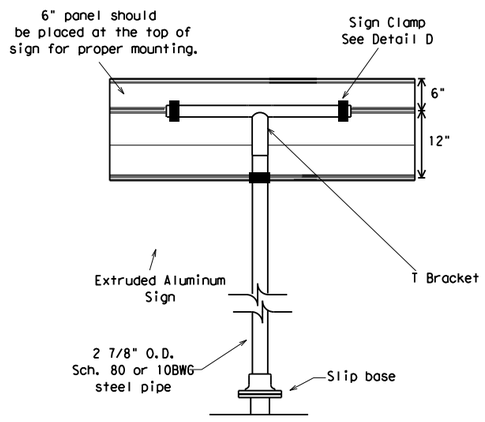
Typical Sign Mount

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

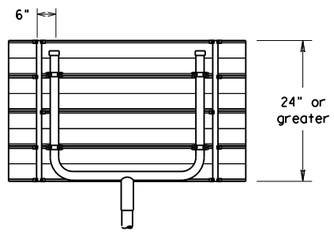
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Detail E



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

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

1. 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.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. 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.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. 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.
6. 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.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. 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."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. 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.
11. 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)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0024	08	141	US 90

DIST	COUNTY	SHEET NO.
SAT	BEXAR	270

DATE: 4/1/2021 1:14:45 PM
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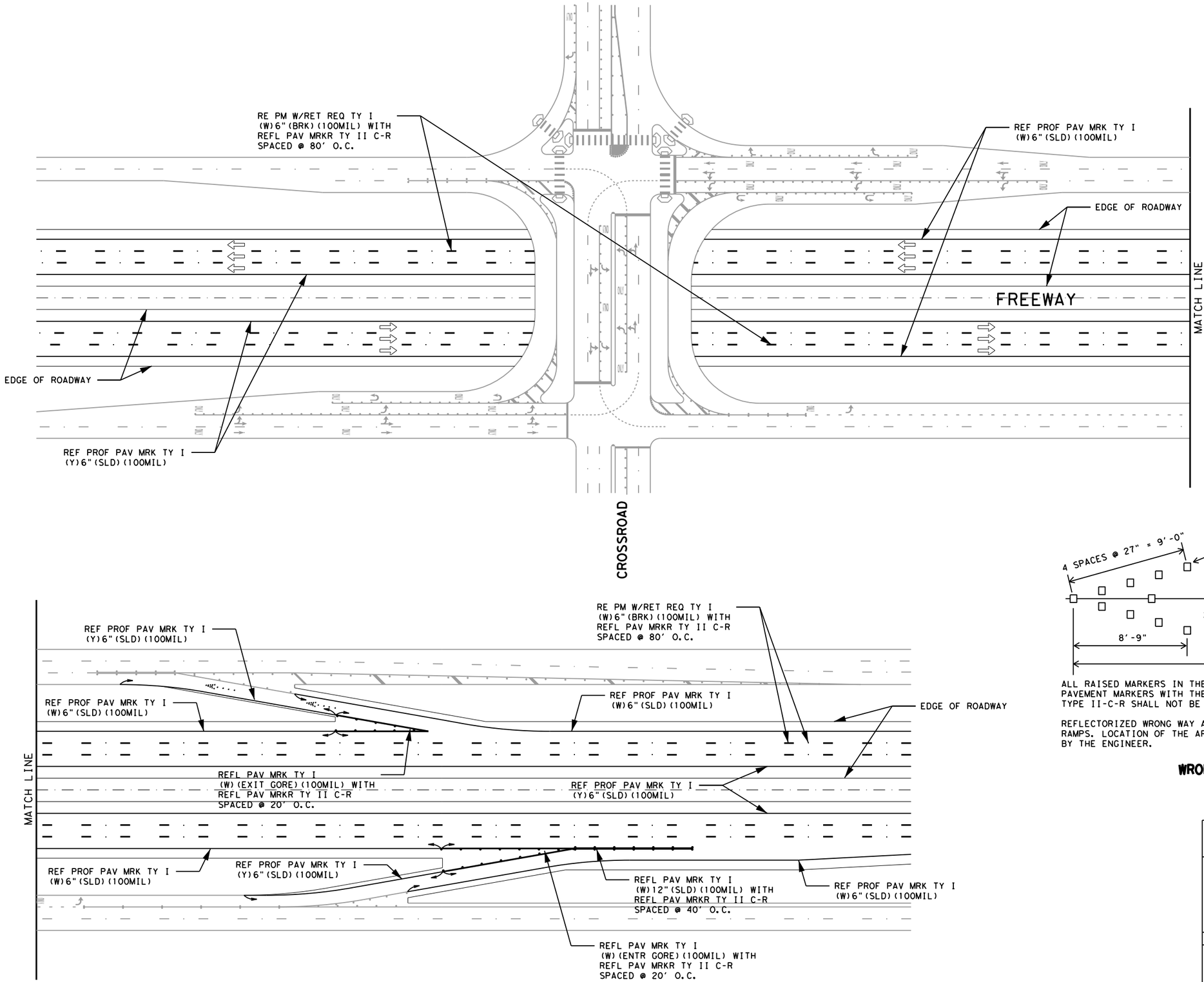

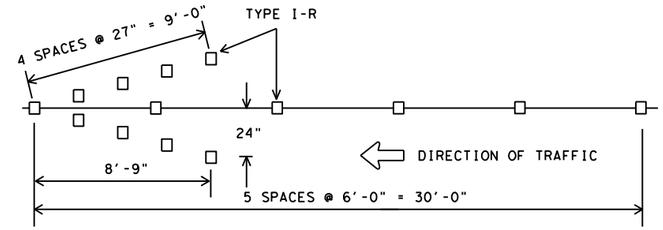

ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS. LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

WRONG WAY ARROW DETAIL

Texas Department of Transportation

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(1)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.			SHEET NO.
MAY 2018		$FAP-NUM$			271
	STATE	DIST.	COUNTY		
	TEXAS	SAT	BEXAR		
	CONT.	SECT.	JOB	HIGHWAY NO.	
	0024	08	141	US 90	

REVISED ON: 5-18 | CHECKED By: GG / CMG | REVISED By: JCO3 | DRAWN By: TED

4/1/2021 1:14:48 PM

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REFL PAV MRK TY I (W) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY I-C SPACED @ 20' O.C.

REFL PAV MRK TY I (Y) (MED NOSE) (100MIL) WITH REFL PAV MRKR TY II-A-A SPACED @ 2' O.C.

REFL PAV MRK TY I (W) 4" (DOT) (100MIL) (3' LONG AND 3' SPACE)

RE PM W/RET REQ TY I (Y) 4" (SLD)(100MIL) DOUBLE YELLOW WITH REFL PAV MRKR TY II-A-A SPACED AT 20' O.C.

REFER TO SAN ANTONIO DISTRICT STANDARD TCD-05 - TYPICAL CROSSWALK DETAILS

REFL PAV MRK TY I (W) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY I-C SPACED @ 20' O.C.

75'

50'

32' VARIES VARIES 48'

TANG. 48' VARIES 48'

8' 32' 8'

SEE DETAIL ON SHT TPMD(3)-18

REFL PAV MRK TY I (W) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY I-C SPACED @ 20' O.C.

48'

VARIES 49'

* WHITE PAVEMENT LEGENDS

SEE DETAIL ON SHT TPMD(3)-18

* WHITE PAVEMENT LEGENDS

FOR LEGEND PLACEMENT SEE PM(3)-12

REFL PAV MRK TY I (W) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY I-C SPACED @ 20' O.C.

32'

49' 8' 32' 9' VARIES

8' 32' 8' 48' VARIES VARIES 32'

WHITE PAVEMENT LEGENDS

REFL PAV MRK TY I (W) 4" (DOT) (100MIL) (3' LONG AND 3' SPACE)

CROSSROAD

SEE DETAIL ON SHT TPMD(3)-18

REFL PAV MRK TY I (W) 8"(LNDR)(100MIL) (3' LONG AND 9' SPACE) WITH REFL PAV MRKR TY II C-R SPACED @ 48' O.C.(DOUBLE REFLECTORS)

80' DESIRABLE 8' 32' 8' VARIES 48'

* WHITE PAVEMENT LEGENDS

RE PM W/RET REQ TY I (W) 4" (SLD)(100MIL) DOUBLE WHITE WITH REFL PAV MRKR TY II C-R SPACED @ 20' O.C.

REFL PAV MRK TY I (W)(EXIT GORE)(100MIL) WITH REFL PAV MRKR TY II C-R SPACED @ 20' O.C.

RE PM W/RET REQ TY I (W) 4" (BRK)(100MIL) WITH REFL PAV MRKR TY II C-R SPACED @ 80' O.C.

80' DESIRABLE VARIABLE 600'

REFL PAV MRK TY I (Y) 24" (SLD)(100MIL) DIAGONALS AT 80' O.C. AND 45 DEG. ANGLE

REFL PAV MRK TY I (Y) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY II A-A SPACED @ 20' O.C.

FREEWAY

MATCH LINE

REFL PAV MRK TY I (W) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY II C-R SPACED @ 20' O.C. ON EACH SIDE OF LINE

200' (VARIABLE)

REFL PAV MRK TY I (W)(ENTR GORE)(100MIL) WITH REFL PAV MRKR TY II C-R SPACED @ 20' O.C.

600' 200' 400'

REFL PAV MRK TY I (Y) 24" (SLD) (100MIL) DIAGONALS AT 80'o.c. AND 45 DEG. ANGLE

REFL PAV MRK TY I (Y) 8" (SLD) (100MIL) WITH REFL PAV MRKR TY II A-A SPACED @ 20' O.C.

LANE REDUCTION ARROWS (REFER TO MUTCD)

MATCH LINE

RE PM W/RET REQ TY I (W) 4" (BRK)(100MIL) WITH REFL PAV MRKR TY II C-R SPACED @ 80' O.C.

* PROPOSED WHITE LEGENDS TEXT AND ARROW SIZE TO BE IN ACCORDANCE WITH THE TEXAS MUTCD

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(2)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.			SHEET NO.
MAY 2018		$FAP-NUM$			272
	STATE	DIST.	COUNTY		
	TEXAS	SAT	BEXAR		
	CONT.	SECT.	JOB	HIGHWAY NO.	
	0024	08	141	US 90	

DRAWN BY: TED
REVISED BY: JCO3
CHECKED BY: GG / OMG
REVISED ON: 5-18
1:14:49 PM
4/1/2021

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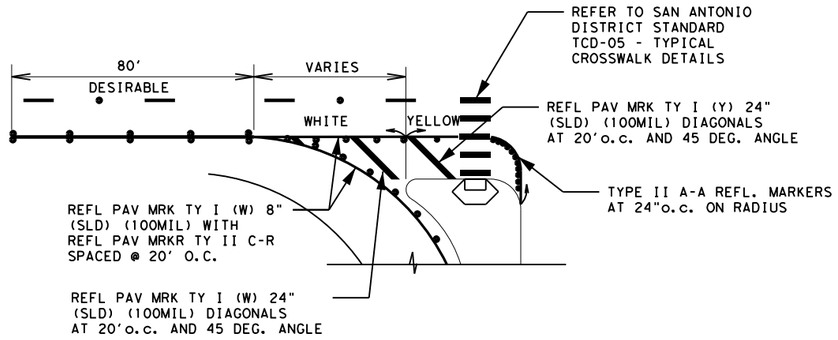
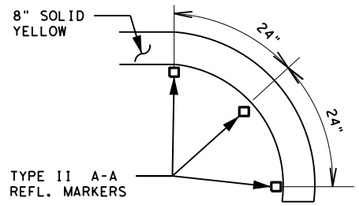
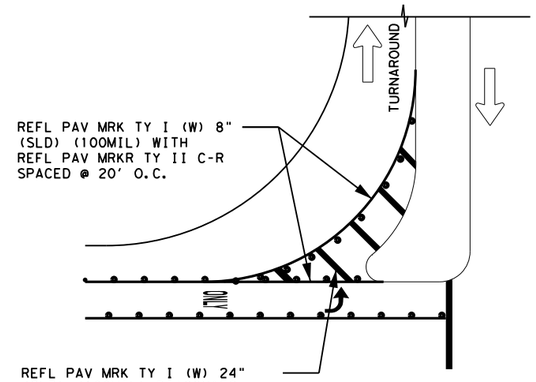




RADIUS DETAIL



TYPICAL TURNAROUND PAVEMENT MARKING DETAILS

San Antonio District Standard

TYPICAL PAVEMENT MARKING DETAILS

SCALE: NS

TPMD(3)-18

REVISIONS	FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.			SHEET NO.
MAY 2018		$FAP-NUM$			273
	STATE	DIST.	COUNTY		
	TEXAS	SAT	BEXAR		
	CONT.	SECT.	JOB	HIGHWAY NO.	
	0024	08	141	US 90	

REVISED ON: 5-18 | CHECKED By: GG / CMG | REVISED By: JCO3 | DRAWN By: TED
4/1/2021 1:14:49 PM
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DATE: 4/1/2021 1:14:52 PM
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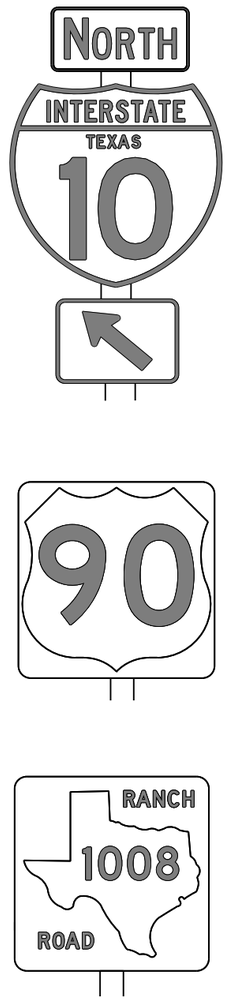
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

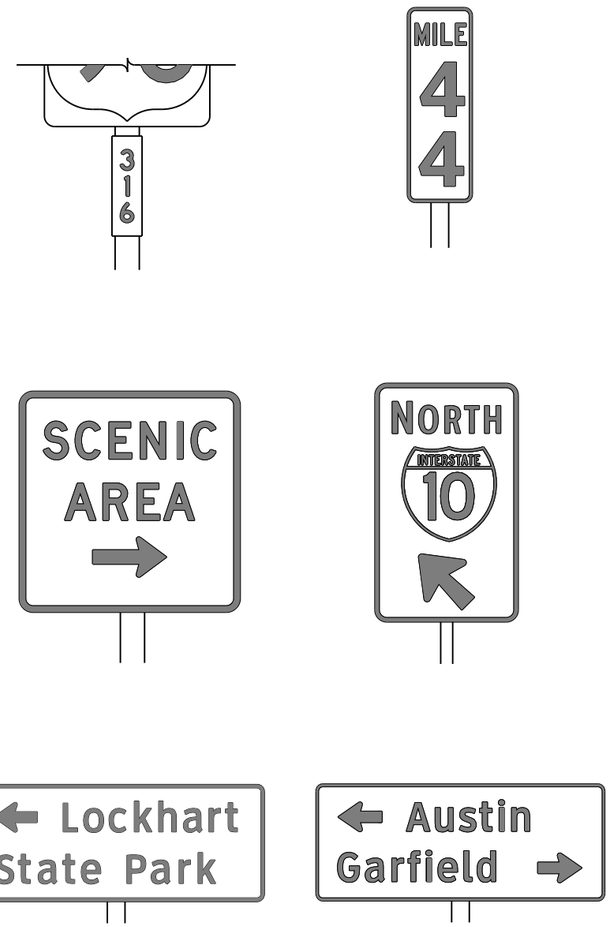
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

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

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

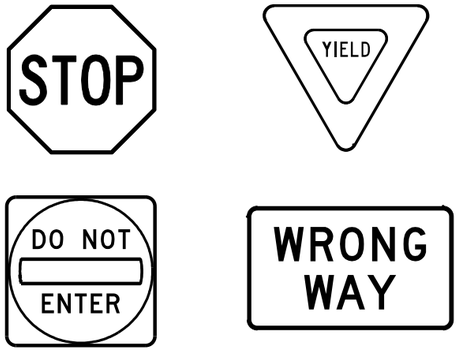
TSR(3)-13

FILE:	tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0024	08	141	US 90
12-03 7-13		DIST	COUNTY		SHEET NO.
9-08		SAT	BEXAR		274

DATE: 4/1/2021 1:14:55 PM
FILE: c:\pwworking\txkd\pwprod\nicole.smale\dms4615l\tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

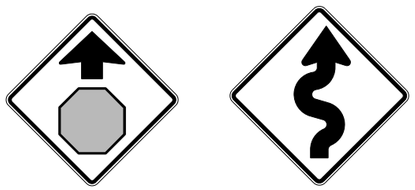
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

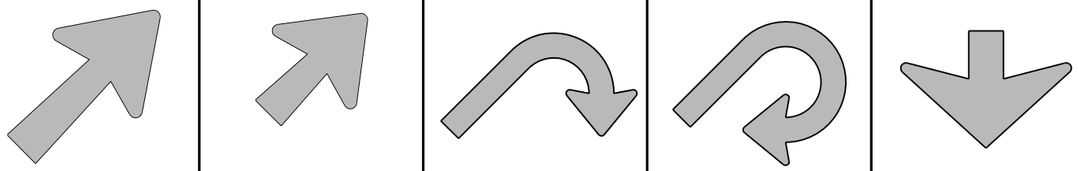
TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		275

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

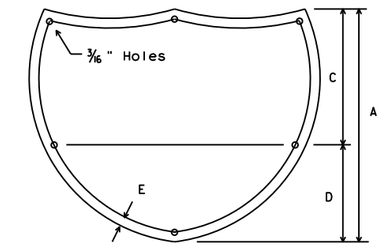
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

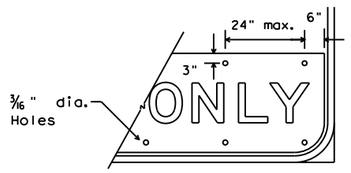
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

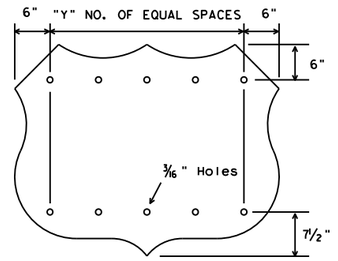


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

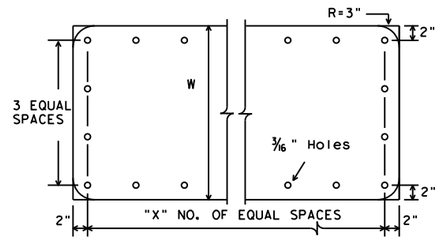


EXIT ONLY PANEL



U.S. ROUTE MARKERS

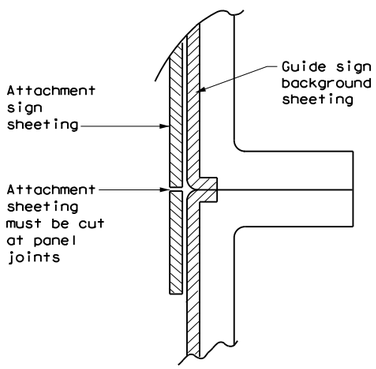
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

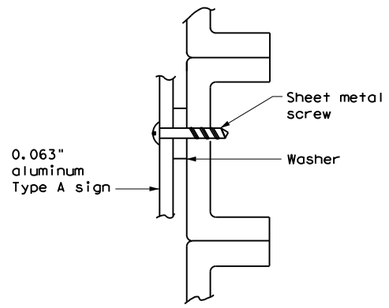
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



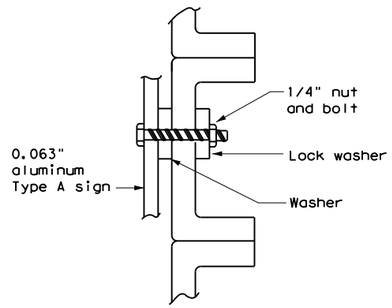
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



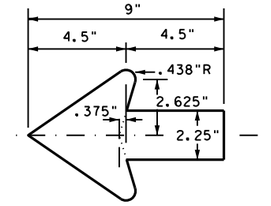
NUT/BOLT ATTACHMENT

NOTE:

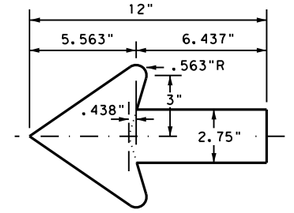
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		276

DATE: 4/1/2021 1:14:57 PM
FILE: c:\pw working\kha\pwprod\nicole.smale\dms46151\tsr5-13.dgn

DATE:
FILE:

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

DOT #: 764309K
Crossing Type: ** Highway Overpass
RR Company Owning Track at Crossing: UPRR
Operating RR Company at Track: UPRR
RR MP: 214.410
RR Subdivision: DEL RIO
City: SAN ANTONIO
County: BEXAR
CSJ at this Crossing: 0024-08-141
Highway/Roadway name crossing the railroad: US 90
# of regularly scheduled trains per day at this crossing: 40
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: <1%

DOT #: 432571M
Crossing Type: ** Highway Overpass
RR Company Owning Track at Crossing: UPRR
Operating RR Company at Track: UPRR
RR MP: 261.550
RR Subdivision: LAREDO
City: SAN ANTONIO
County: BEXAR
CSJ at this Crossing: 0024-08-141
Highway/Roadway name crossing the railroad: US 90
# of regularly scheduled trains per day at this crossing: 21
# 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:
RESURFACE ROADWAY (MILL AND OVERLAY)

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: 0 DAYS

On this project, night or weekend flagging is:

- [ ] Expected
- [X] Not Expected

Flagging services will be provided by:

- [ ] Railroad Company: TxDOT will pay flagging invoices
- [X] 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:

- [X] UPRR - UP.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - UP.request@nrssinc.net
  Call Center 877-984-6777
- [ ] 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
  bottomline076@aol.com, 903-767-7630
- [ ] OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- [X] 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
- [X] 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		
[X]	Not Required	
[ ]	Non - Bridge Projects	$2,000,000 / $6,000,000
[ ]	Bridge Projects	$5,000,000 / $10,000,000
[ ]	Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

- [X] Not Required
- [ ] Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
- [ ] Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.
- [ ] 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:

- [X] 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 UPRR Railroad Emergency Line
at 800-877-7267
Location: DOT 764309K
RR Milepost 214.410 DEL RIO Subdivision**

**In Case of Railroad Emergency
Call UPRR Railroad Emergency Line
at 800-877-7267
Location: DOT 432571M
RR Milepost 261.550 LAREDO Subdivision**

Texas Department of Transportation — 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	0024	08	141	US 90
9/2021	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		277

A. GENERAL SITE DATA

1. PROJECT LIMITS: *Same as stated on the Title Sheet*

2. PROJECT SITE MAPS:

- *Project Latitude 29°25'27.6564" N Project Longitude 98°29'28.1112" W*
- *Project Location Map: Shown on Title Sheet*
- *Drainage Patterns: NO CHANGE*
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: NO CHANGE*
- *Major Controls and Locations of Stabilization Practices: NO CHANGE*
- *Project Specific Locations: TO BE DETERMINED BY THE PROJECT CONSTRUCTION PERSONNEL.*
- *Surface Waters and Discharge Locations: NO CHANGE*

3. PROJECT DESCRIPTION: *Same description as stated on Title Sheet*

4. FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:

1. *Install controls down-slope of work area and initiate inspection and maintenance activities.*
2. *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.*
3. *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*
___ *Exstensive ditch grading*
___ *Upgrading or replacing culverts or bridges*
___ *Temporary detour road(s)*
_X_ *Other: REMOVING AND REPLACING GUARDFENCE AND MOW STRIP*

5. EXISTING AND PROPOSED CONDITIONS:

Description of existing vegetative cover: NATIVE GRASS
Percentage of existing vegetative cover: 80%-90%
Existing vegetative cover: (mark one)
_X_ *Thick or uniformly established*
___ *Thin and Patchy*
___ *None or minimal cover*
Description of soils: N/A
Site Acreage: 465 *Acreage disturbed: 5.76*
Site runoff coefficient (pre-construction): NO CHANGE *Site runoff coefficient (post-construction): NO CHANGE*

6. RECEIVING WATERS:

___ *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): N/A

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)

___ SEEDING
___ MULCHING (Hay or Straw)
___ BUFFER ZONES
___ PLANTING
___ COMPOST/MULCH FILTER BERM
P SODDING
___ PRESERVATION OF NATURAL RESOURCES
___ FLEXIBLE CHANNEL LINER
___ RIGID CHANNEL LINER
___ SOIL RETENTION BLANKET
___ COMPOST MANUFACTURED TOPSOIL
___ OTHER:

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

___ SILT FENCES
___ HAY BALES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES
T OTHER: *EROSION CONTROL 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)

_X_ *Existing or new vegetation provides natural filtration.*
___ *The design includes provisions for permanent erosion controls provided by strategically placed pervious and impervious surfaces.*
___ *Project includes permanent sedimentation controls (other than grass).*
___ *Velocities do not require dissipation devices.*
___ *Velocity-dissipation devices included in the design.*
___ *Other : _____*

4. NON-STORM WATER DISCHARGES:

Off-site discharges are prohibited except as follows:

1. *Discharges from fire fighting activities and/or fire hydrant flushings.*
2. *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).*
3. *Plain water used to control dust.*
4. *Plain water originating from potable water sources.*
5. *Uncontaminated groundwater, spring water or accumulated stormwater.*
6. *Foundation or footing drains where flows are not contaminated with process materials such as solvents.*
7. *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.

Kimley»Horn F-928

 Texas Department of Transportation

STATE OF TEXAS
TREY NEAL
106194
LICENSED
PROFESSIONAL ENGINEER

TREY NEAL, P.E. 10/29/2021
Signature of Registrant & Date

REVISION DATE: 10/12

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6			US 90
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	SHEET NO.
0024	08	141	278

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 distrubed 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.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. 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.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the 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 appropiate 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 follwing 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. All non-galvanized metal rail and its components is assumed to contain lead-based paint. The torching, grinding or mechanical cutting of the rail or its components is not recommended without the use of the proper personal protective equipment (e.g. respirators). If the rail or its components is bolted to the structure, it must be removed by unbolting the rail supports from the structure. If a bolt is rusted in place and cannot be removed by unbolting, or if the rail and its components are not bolted and need to be cut, the Contractor shall notify the engineer ten working days before the rail needs to be removed. TxDOT will make arrangements with a specialty contactor to perform the cutting or torching of the lead containing components.

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.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
©TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		279

DATE: 4/1/2021
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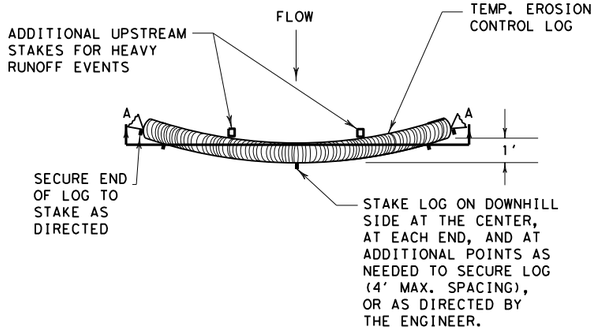
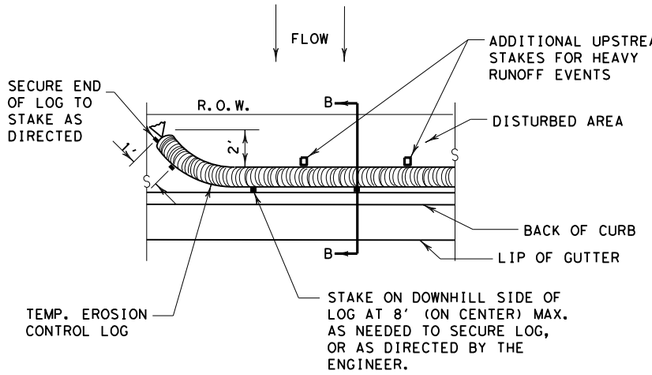
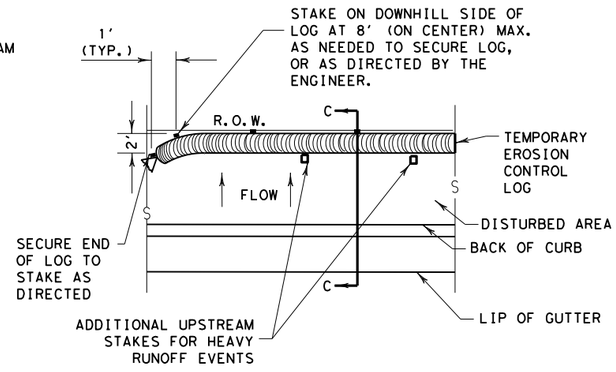


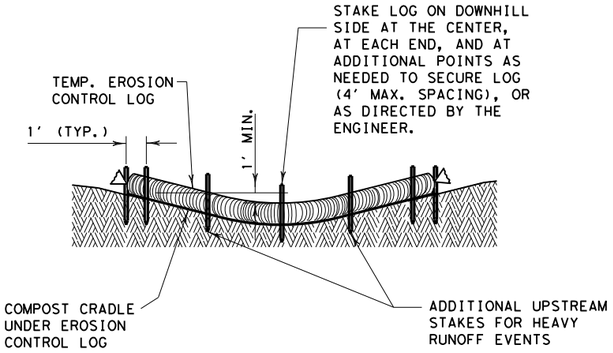
PLAN VIEW



PLAN VIEW



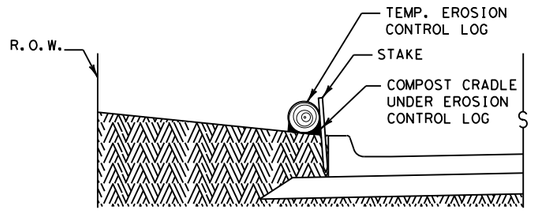
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

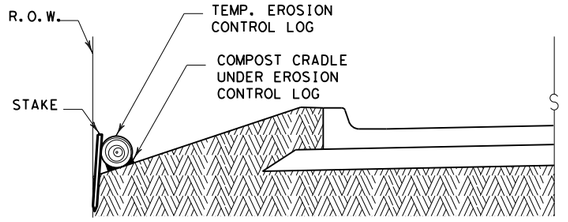
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

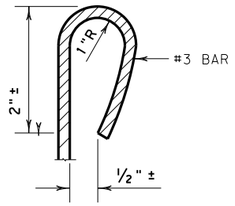
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



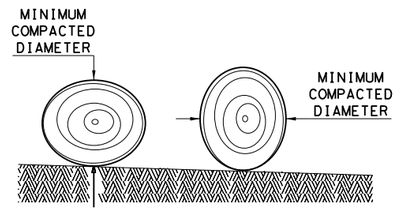
REBAR STAKE DETAIL

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

GENERAL NOTES:

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



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

Texas Department of Transportation

Design Division Standard

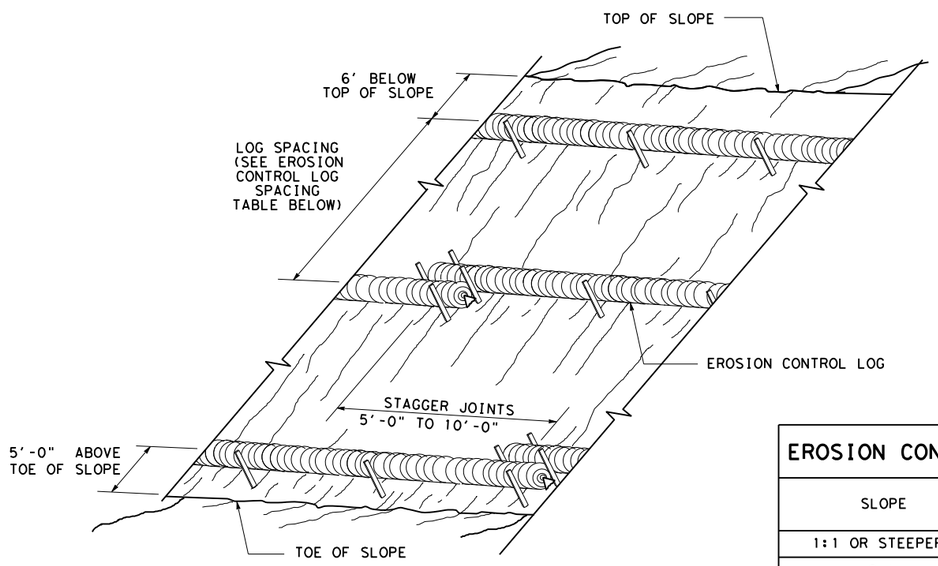
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

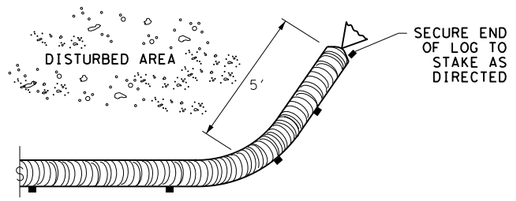
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	08	141	US 90
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		280

DATE: 4/1/2021
FILE: c:\pwworking\kha\pwprod\nicole.smale\dms46167\ec916.dgn



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

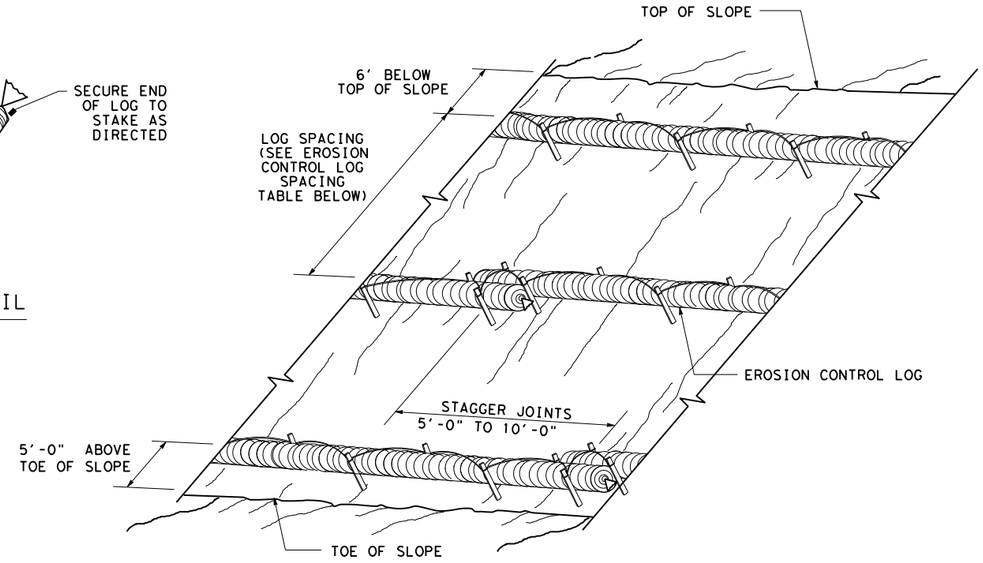
CL-SST



END SECTION RAP DETAIL

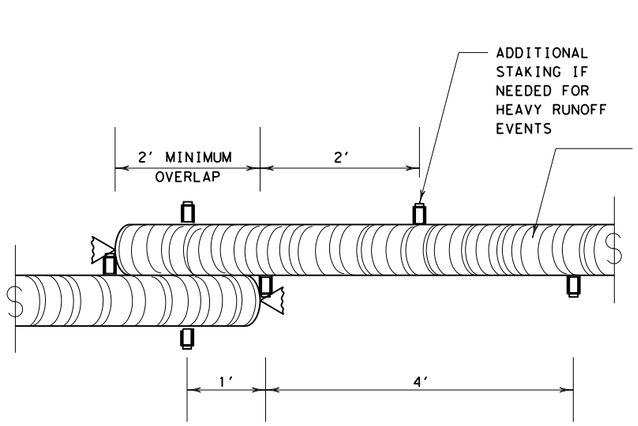
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

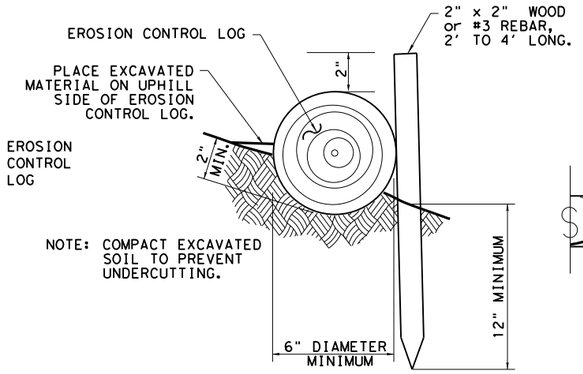
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

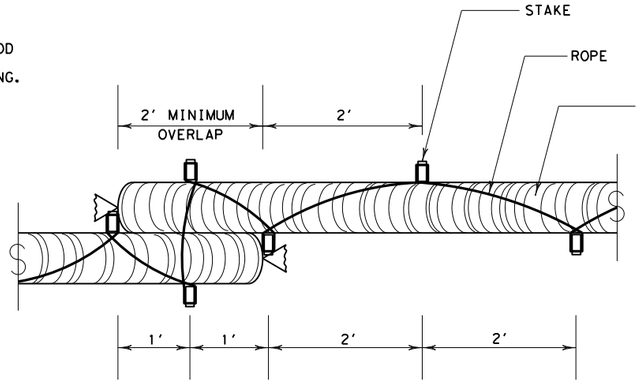


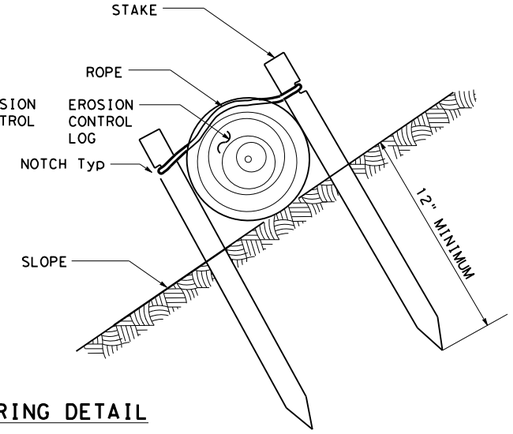


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

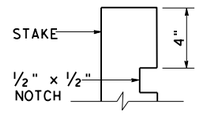
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

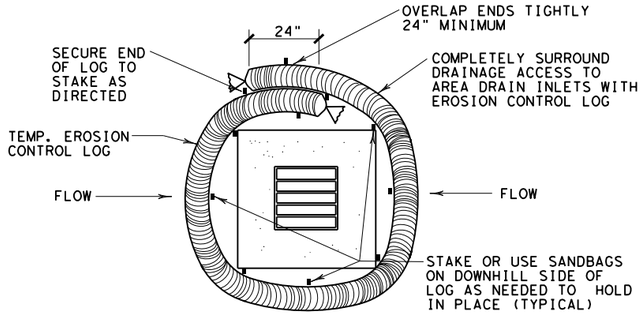
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

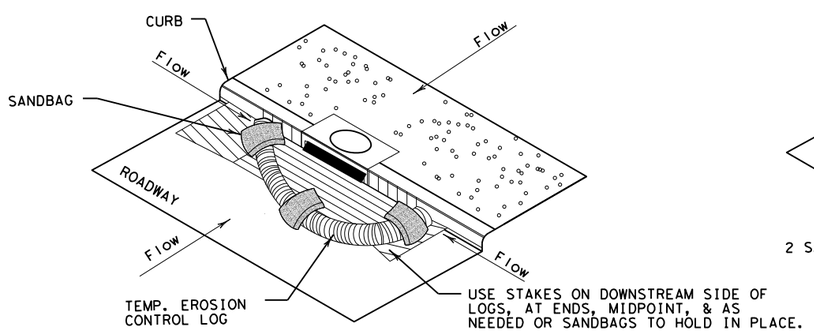
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0024	08	141		US 90	
	DIST	COUNTY			SHEET NO.	
	SAT	BEXAR			281	

DATE: 4/1/2021
FILE: c:\pwworking\khq\pwprod\nicole.smale\dms46167\ec916.dgn



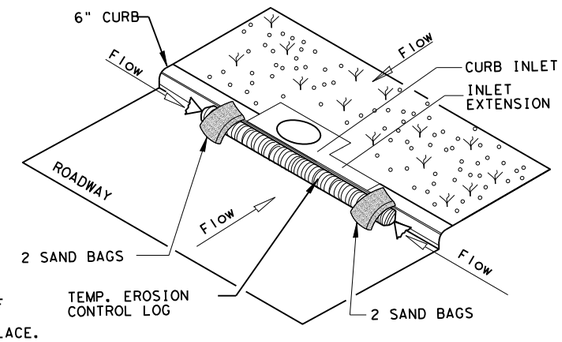
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

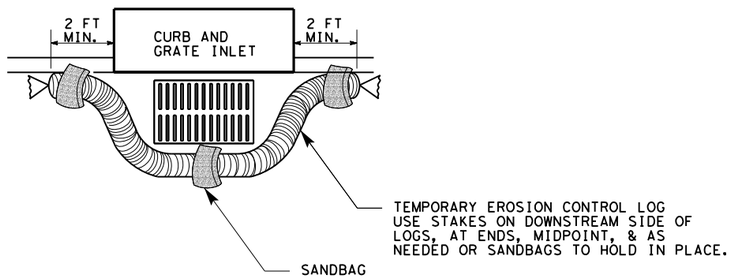
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

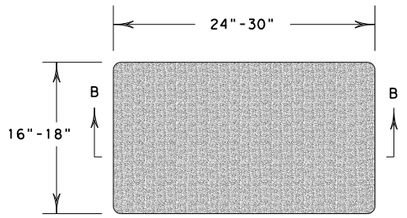
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0024	08	141		US 90	
	DIST	COUNTY			SHEET NO.	
	SAT	BEXAR			282	