FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	C 73- 12-15, etc		1
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

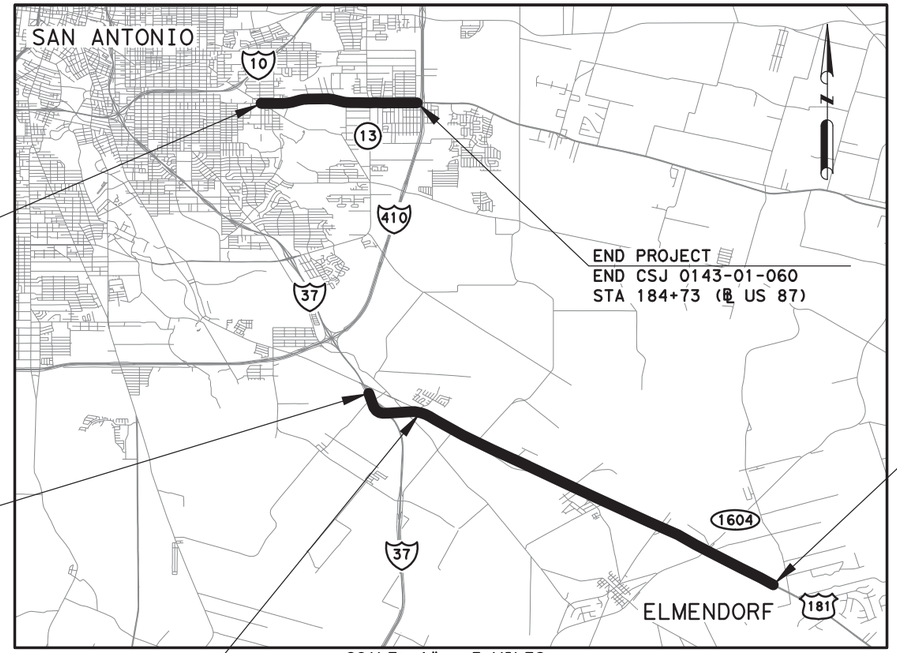
STATE PROJECT
PROJECT NO. C 73-12-15
CCSJ: 0073-12-015, ETC

BEXAR COUNTY
US 181

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

LIMITS FROM: IH 37
TO: SS 122

ROADWAY LENGTH	= 56,958.00 FT	= 10.787	MI
BRIDGE LENGTH	= 1,414.00 FT	= 0.267	MI
NET LENGTH OF PROJECT	= 58,372.00 FT	= 11.054	MI



SCALE: 1" = 3 MILES

EQUATIONS : NONE
EXCEPTIONS : NONE
RR CROSSINGS : UPRR OVER US 181 (STA 267+50 ℄ US 181)

DESIGN SPEEDS
US 181 : (N/A)
US 87 : (N/A)

AREAS OF DISTURBED SOIL
US 181 : 13.65 AC
US 87 : 1.08 AC

ADT
US 181(FROM IH 37 TO SS 122): 29,900 (2020) / 41,400 (2040)
US 181(FROM SS 122 TO BEXAR/WILSON COUNTY LINE): 27,700 (2020) / 38,400 (2040)
US 87(FROM AMANDA ST TO IH 410): 20,000 (2020) / 27,800 (2040)

ACCESSIBILITY STANDARDS: PROWAG

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

CSJ: 0073-12-015

LIMITS FROM: IH 37
TO: SPUR 122

ROADWAY LENGTH	= 5,517.00 FT	= 1.044	MI
BRIDGE LENGTH	= 290.00 FT	= 0.055	MI
NET LENGTH OF PROJECT	= 5,807.00 FT	= 1.099	MI

CSJ: 0100-02-067

LIMITS FROM: SPUR 122
TO: BEXAR/WILSON CO LINE

ROADWAY LENGTH	= 37,032.00 FT	= 7.014	MI
BRIDGE LENGTH	= 710.00 FT	= 0.134	MI
NET LENGTH OF PROJECT	= 37,742.00 FT	= 7.148	MI

CSJ: 0143-01-060

LIMITS FROM: AMANDA ST
TO: IH 410

ROADWAY LENGTH	= 14,409.00 FT	= 2.729	MI
BRIDGE LENGTH	= 414.00 FT	= 0.078	MI
NET LENGTH OF PROJECT	= 14,823.00 FT	= 2.807	MI

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

RECOMMENDED FOR LETTING: 3/2/2021
DocuSigned by: Lizette J. Colbert, P.E.
DF7D9915513A45A...

RECOMMENDED FOR LETTING: 3/1/2021
DocuSigned by: Clayton Ripps
74F59ACB883D4EB... ATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING: 3/1/2021
DocuSigned by: Gina Gallegos
124372CCDF604F5...

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND THE SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000--008)

PREPARED BY:

PGAL

TBPE REG. NO. F-2742

COUNTY BEXAR PROJ. NO.
HWY. NO. US 181 LETTING DATE
DATE ACCEPTED

MODEL NAME: Default
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THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

LUIS A. GONZALEZ , PE

2/25/2021
DATE

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

INDEX OF SHEETS

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			2
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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0 250 500

SCALE: 1" = 500'

STATE OF TEXAS
Luis A. González
104983
LICENSED PROFESSIONAL ENGINEER

2/25/2021

Luis A. González

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 PROJECT LAYOUT

SHEET 1 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			3
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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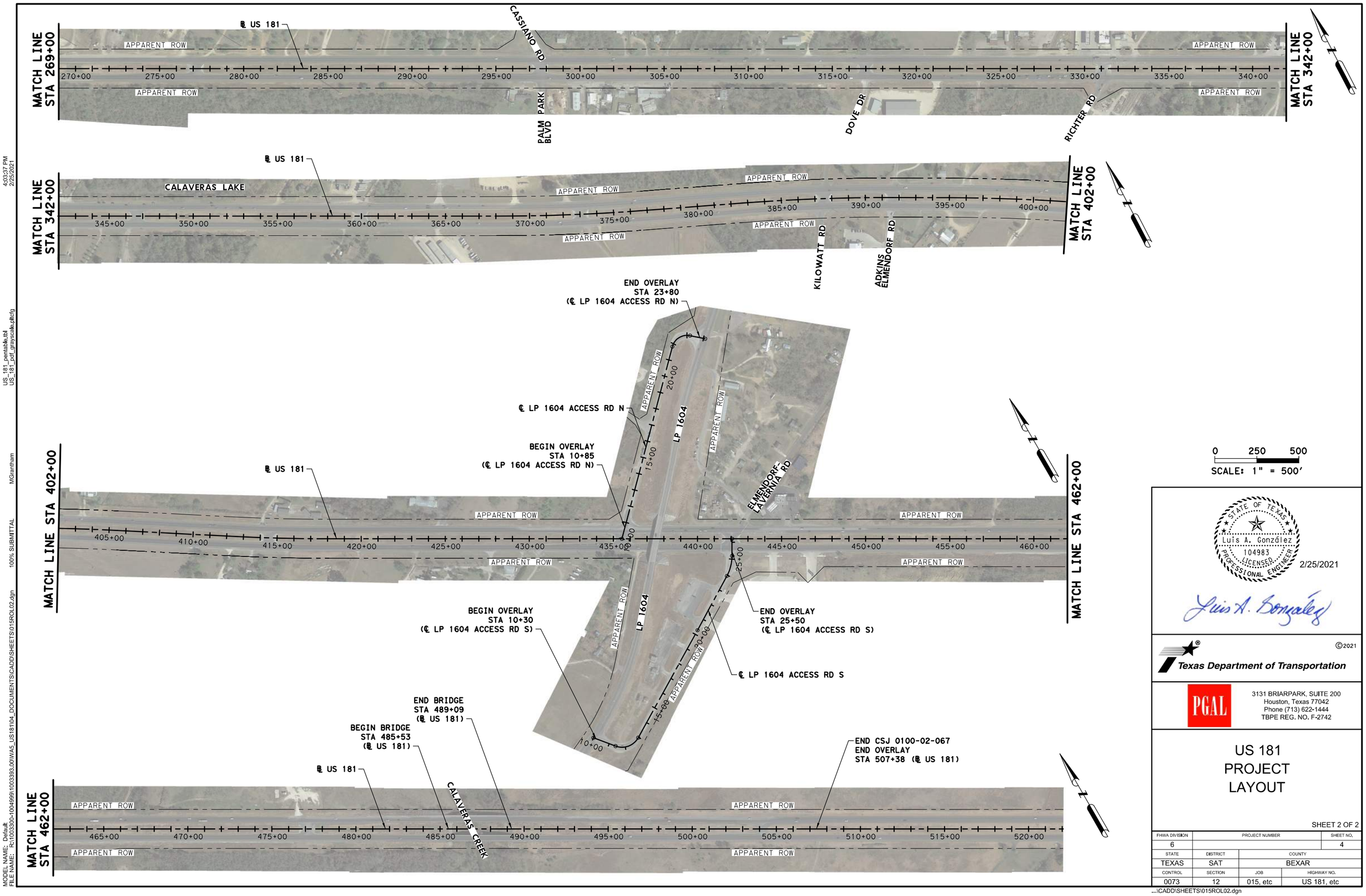

STATE OF TEXAS
Luis A. González
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2/25/2021

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US 181 PROJECT LAYOUT

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			4
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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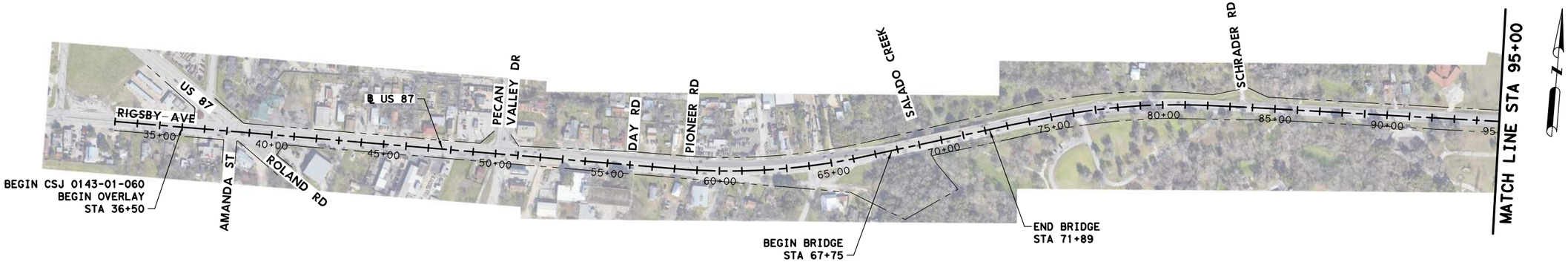

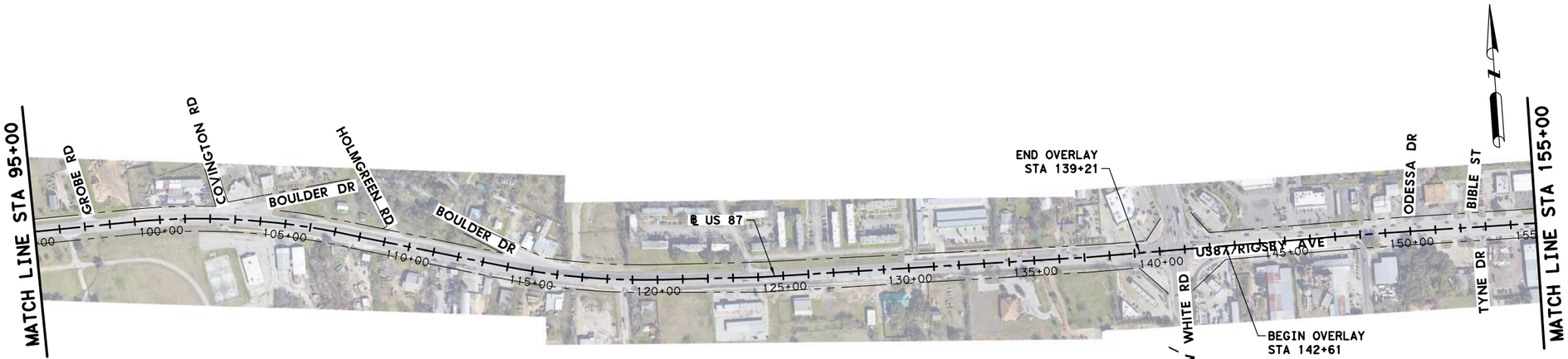

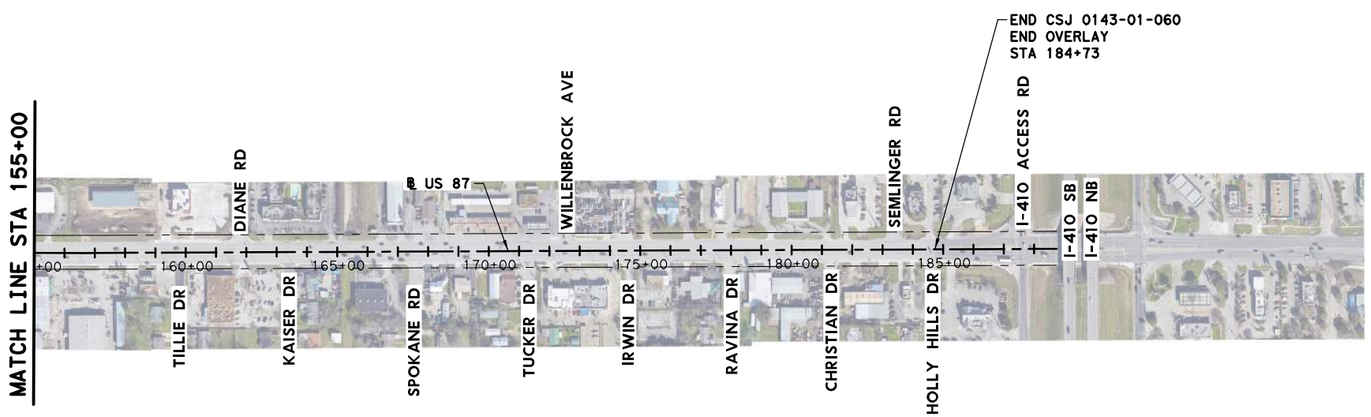

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SCALE: 1" = 500'

STATE OF TEXAS
Brian Legaspi
113039
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PROFESSIONAL ENGINEER
2/25/2021

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TBPE REG. NO. F-2742

US 87 PROJECT LAYOUT

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			5
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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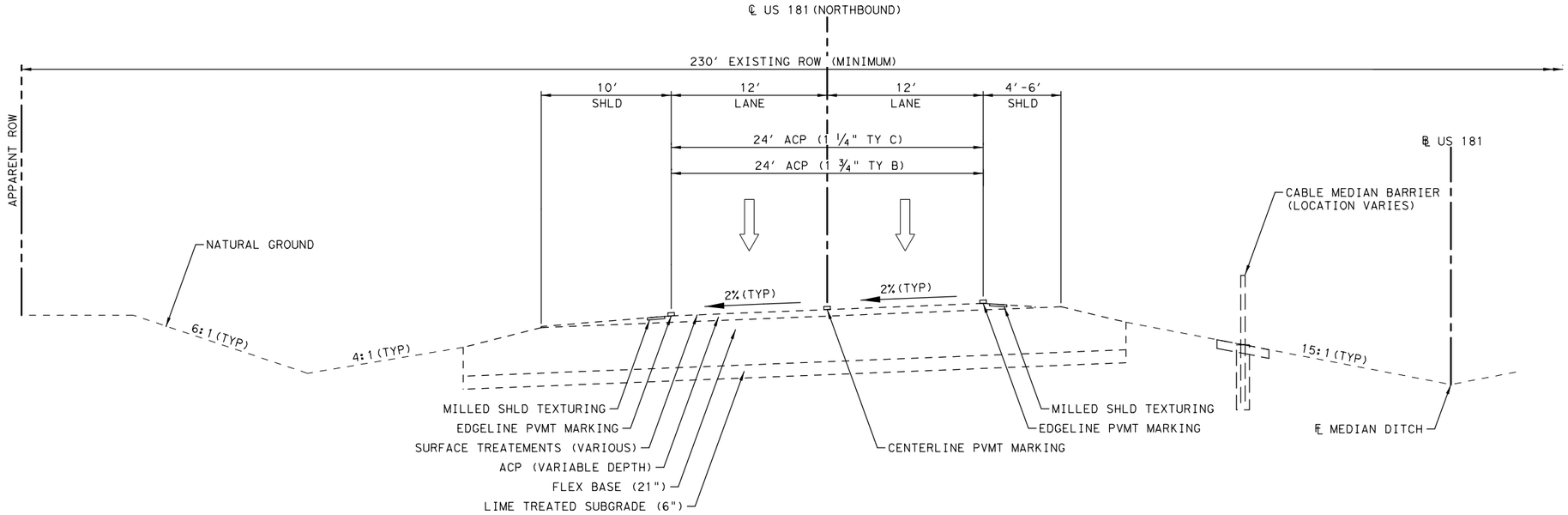
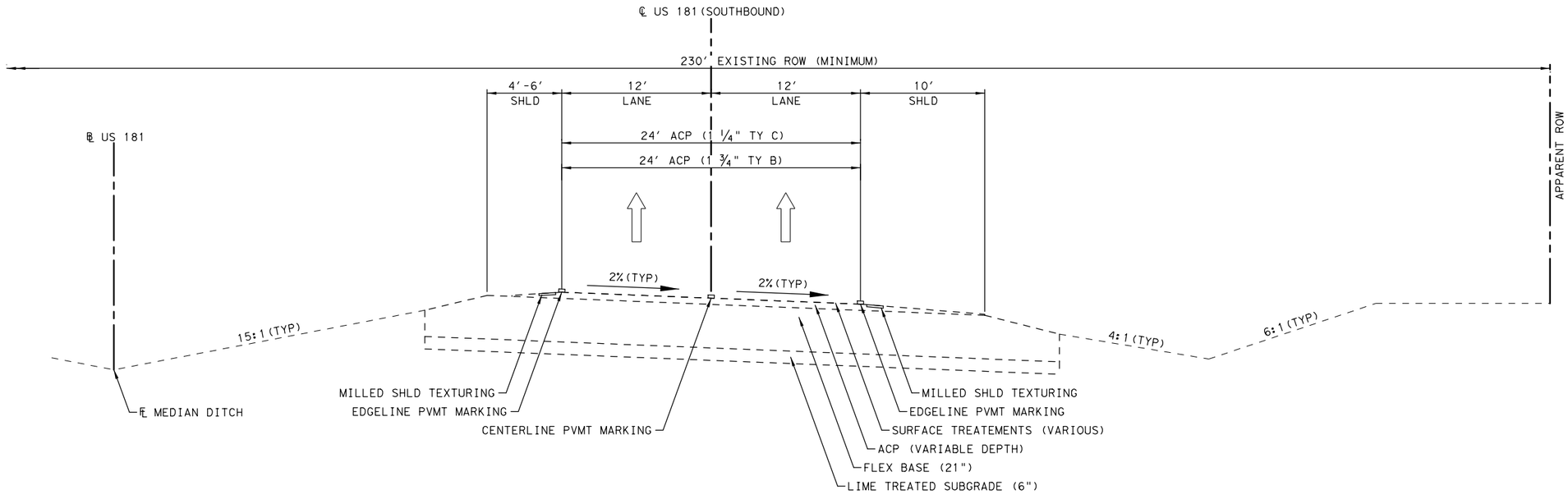


EXISTING TYPICAL SECTION (US 181 NORTHBOUND)

STA 119+00 TO STA 140+00 (℄ US 181)



EXISTING TYPICAL SECTION (US 181 SOUTHBOUND)

STA 119+00 TO STA 140+00 (℄ US 181)

NOT TO SCALE

2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 EXISTING TYPICAL SECTIONS

SHEET 1 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			6
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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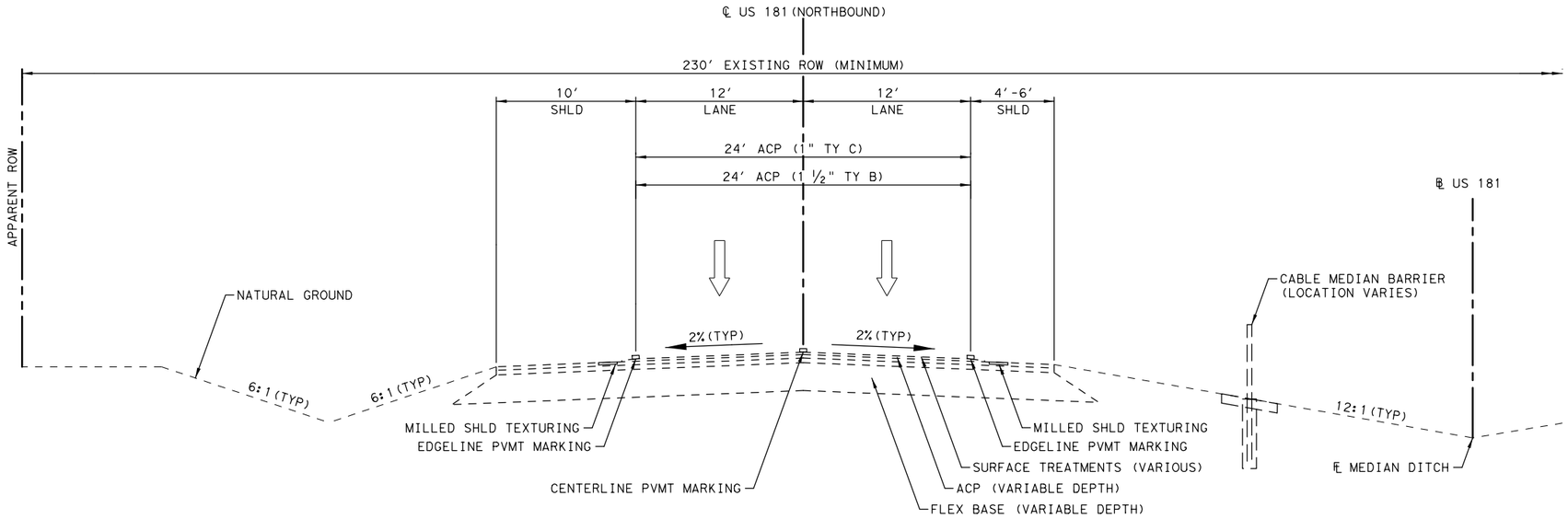
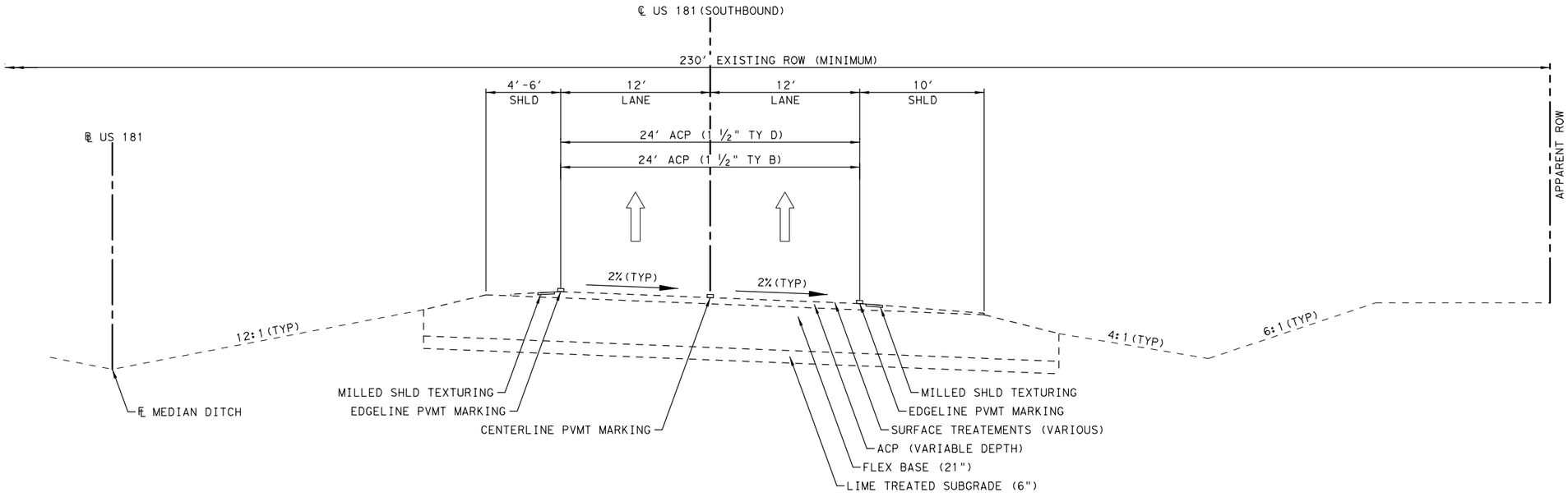


EXISTING TYPICAL SECTION (US 181 NORTHBOUND)

STA 140+00 TO STA 480+00 (℄ US 181)



EXISTING TYPICAL SECTION (US 181 SOUTHBOUND)

STA 140+00 TO STA 480+00 (℄ US 181)

NOT TO SCALE

2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 EXISTING TYPICAL SECTIONS

SHEET 2 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			7
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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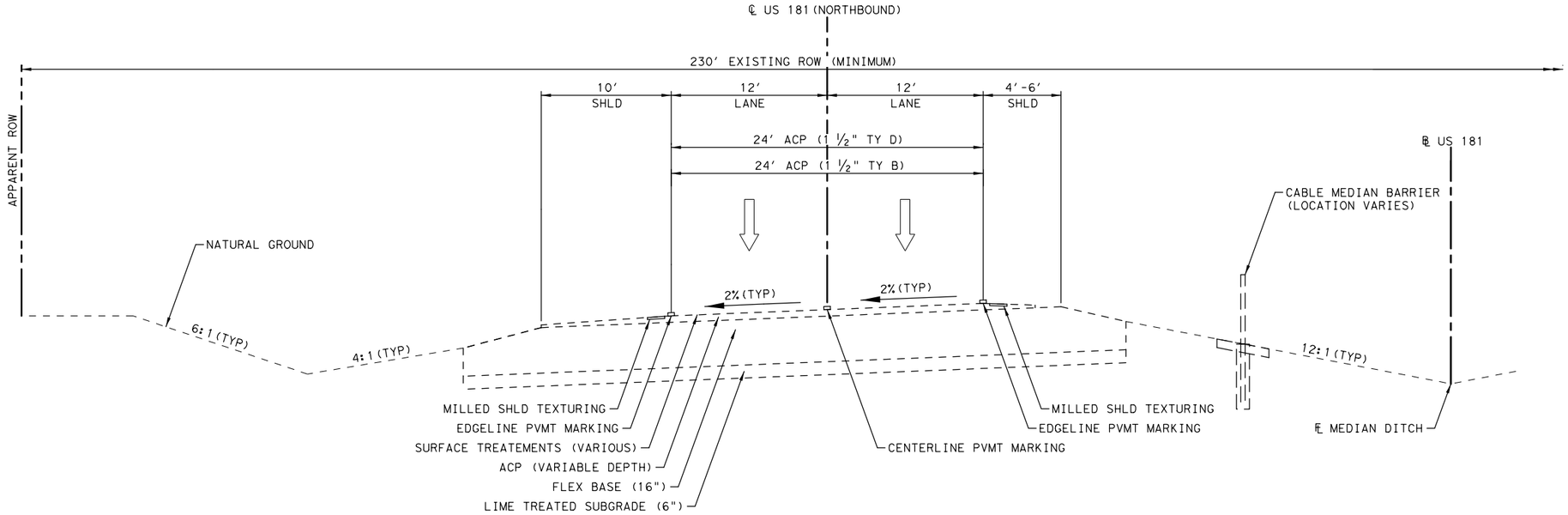
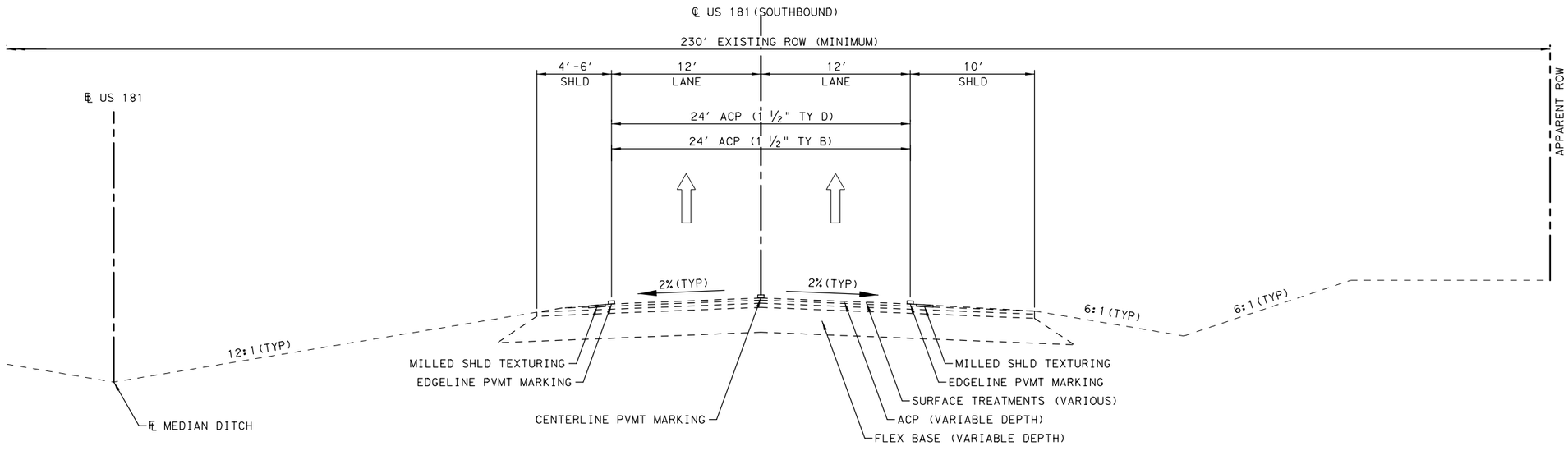


EXISTING TYPICAL SECTION (US 181 NORTHBOUND)

STA 480+00 TO STA 507+38 (℄ US 181)



EXISTING TYPICAL SECTION (US 181 SOUTHBOUND)

STA 480+00 TO STA 507+38 (℄ US 181)

NOT TO SCALE

STATE OF TEXAS
Luis A. González
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2/25/2021

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US 181 EXISTING TYPICAL SECTIONS

SHEET 3 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			8
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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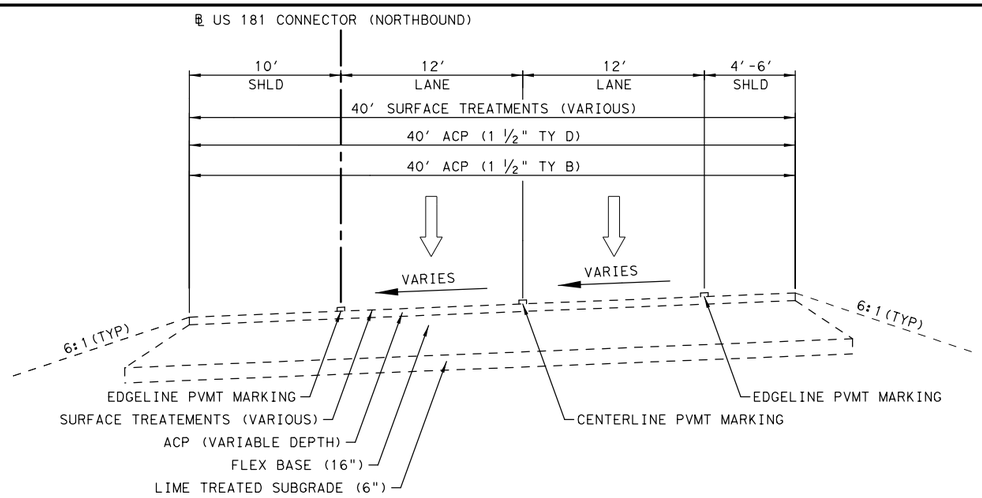
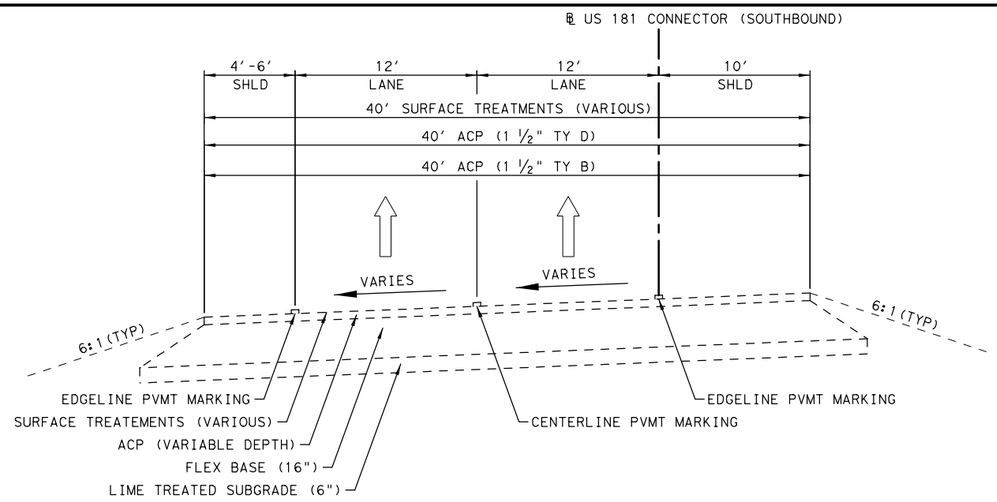


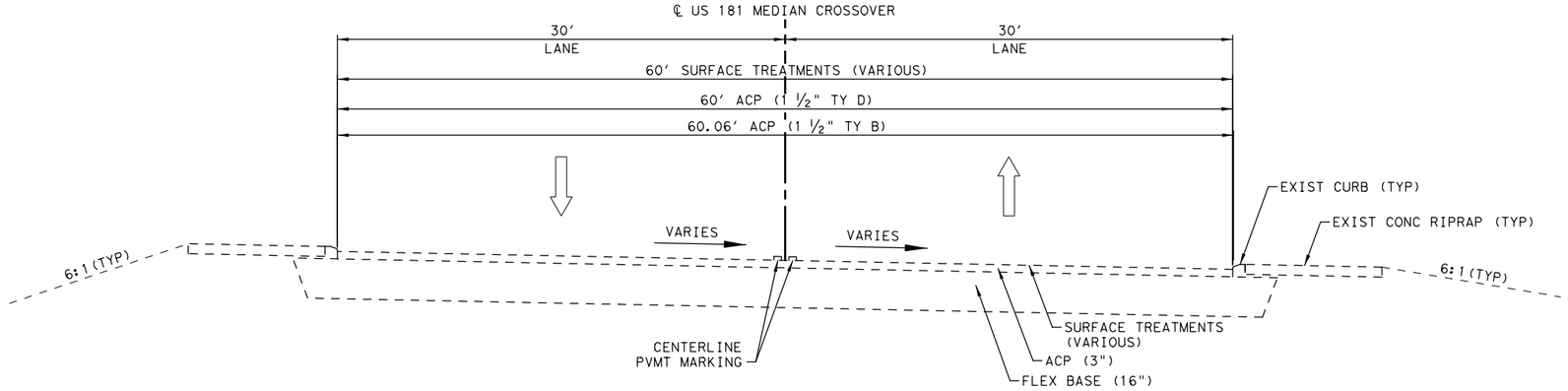
EXISTING TYPICAL SECTION (US 181 CONNECTOR NORTHBOUND)

STA 193+45 TO STA 215+00 (℄ US 181 CONNECTOR NORTHBOUND)



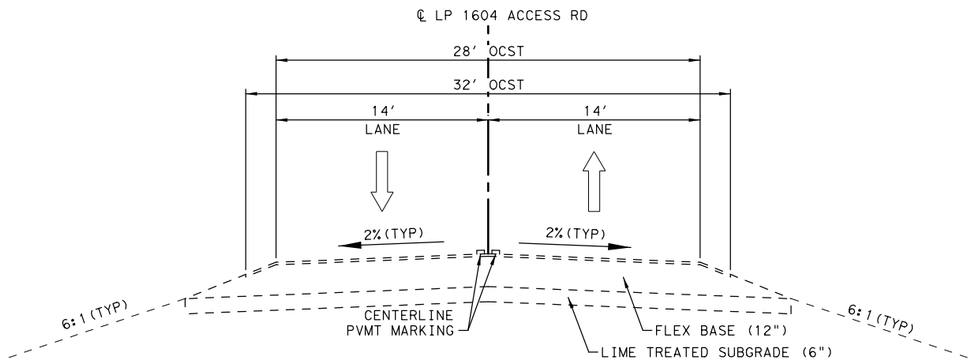
EXISTING TYPICAL SECTION (US 181 CONNECTOR SOUTHBOUND)

STA 273+04 TO STA 315+00 (℄ US 181 CONNECTOR SOUTHBOUND)



EXISTING TYPICAL SECTION (US 181 MEDIAN CROSSOVER)

VARIOUS LOCATIONS



EXISTING TYPICAL SECTION (LP 1604 ACCESS RD)

STA 10+30 TO STA 25+49 (℄ LP 1604 ACCESS RD SOUTH)
STA 10+68 TO STA 23+80 (℄ LP 1604 ACCESS RD NORTH)

NOT TO SCALE

STATE OF TEXAS
Luis A. González
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LICENSED
PROFESSIONAL ENGINEER

2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 EXISTING TYPICAL SECTIONS

SHEET 4 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			9
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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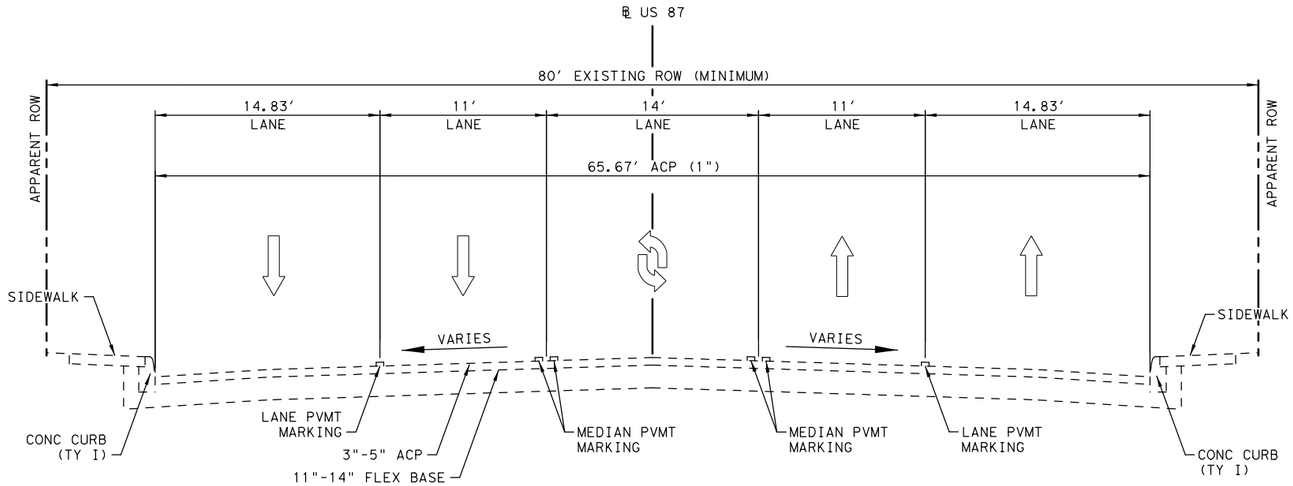
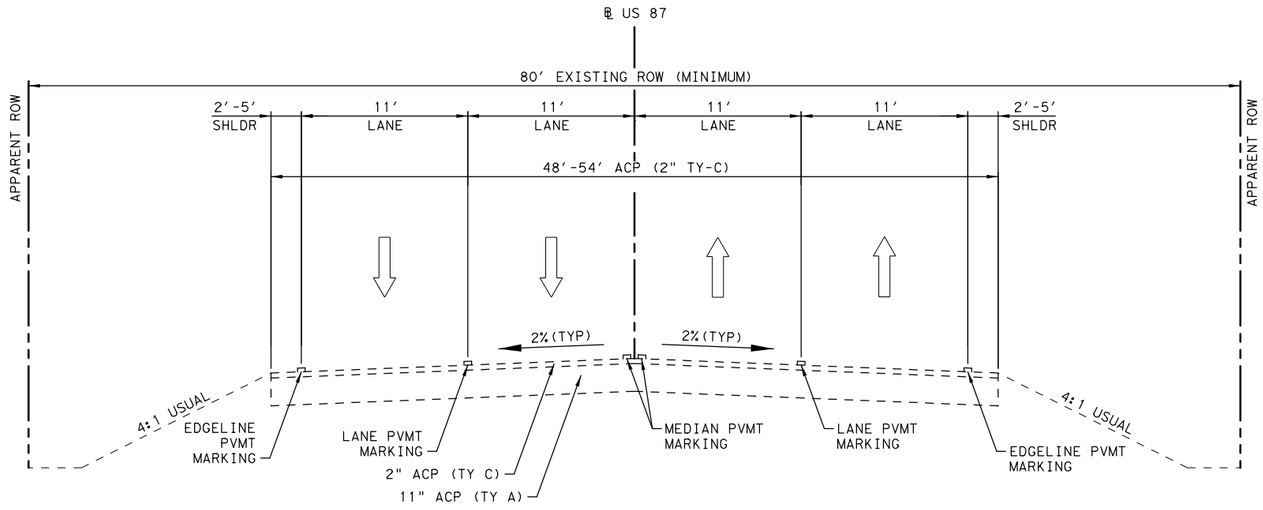


EXISTING TYPICAL SECTION (US 87)

STA 33+00 TO STA 67+75 (℄ US 87)



EXISTING TYPICAL SECTION (US 87)

STA 71+89 TO STA 139+00 (℄ US 87)

NOT TO SCALE

STATE OF TEXAS
Brian Legaspi
113039
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 87 EXISTING TYPICAL SECTIONS

SHEET 1 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			10
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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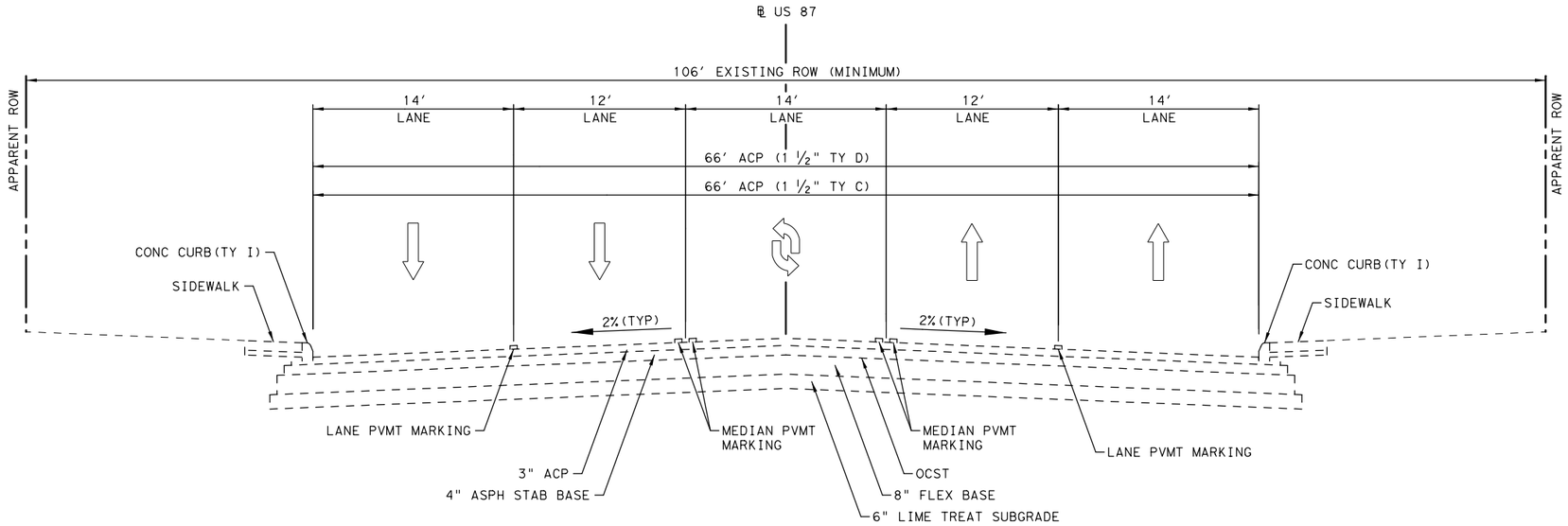

EXISTING TYPICAL SECTION (US 87)

STA 139+00 TO STA 184+73 (℄ US 87)

NOT TO SCALE

STATE OF TEXAS
Brian Legaspi
113039
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2/25/2021

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US 87
EXISTING
TYPICAL SECTIONS

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			11
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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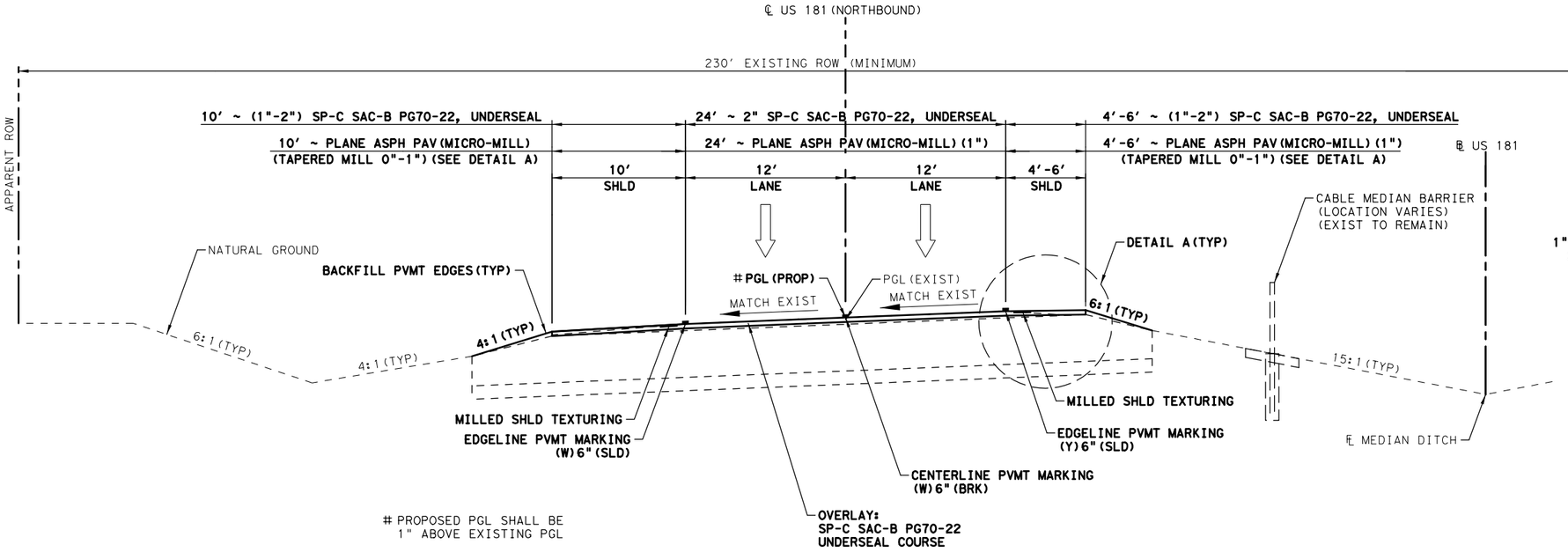
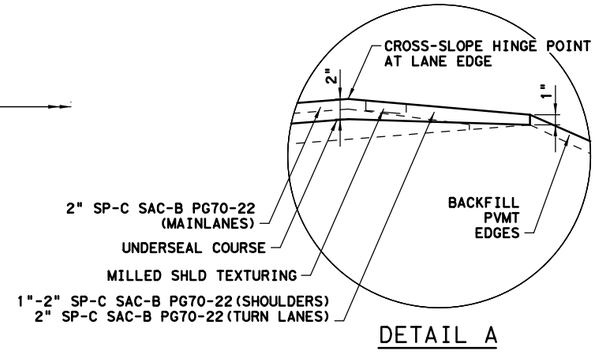


PROPOSED TYPICAL SECTION (US 181 NORTHBOUND)

STA 119+00 TO STA 140+00 (℄ US 181)



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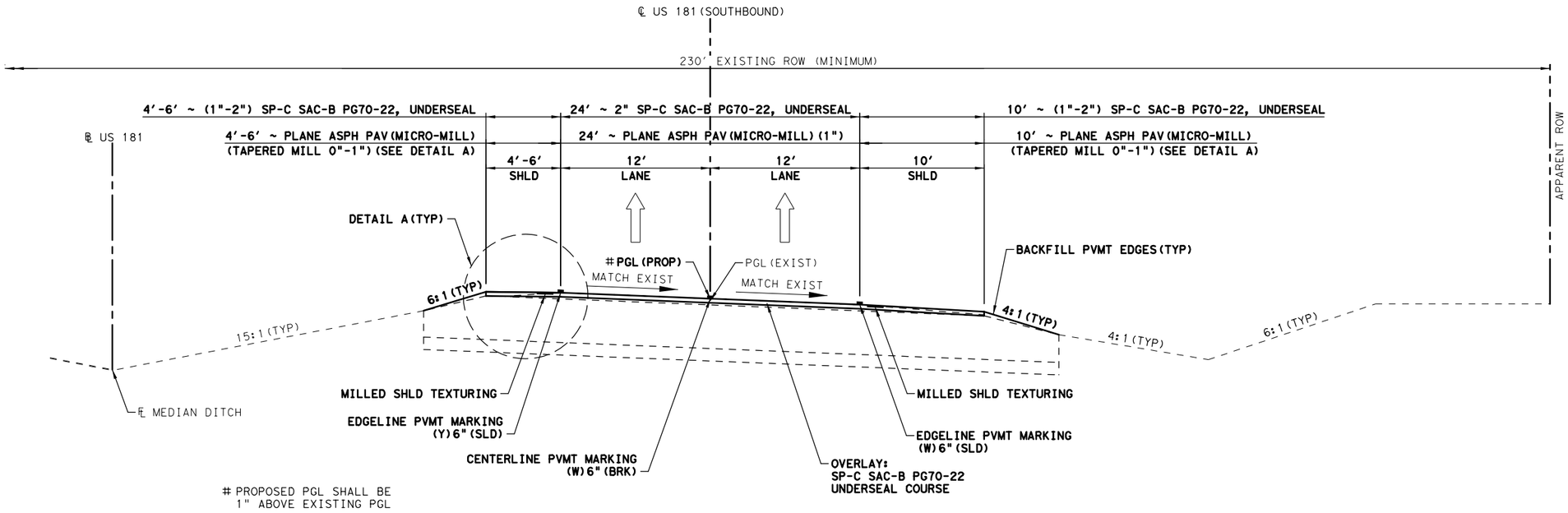


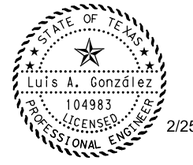
PROPOSED TYPICAL SECTION (US 181 SOUTHBOUND)

STA 119+00 TO STA 140+00 (℄ US 181)

NOTES

1. SHOULDERS SHALL RECEIVE A TAPERED DEPTH OVERLAY THICKNESS (1"-2"). TURN LANES SHALL RECEIVE A CONSTANT OVERLAY THICKNESS (2").
2. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. TAPERED MILLING 0"-1" TO BE PAID FOR WITH ITEM 354-6188 PLANE ASPH CONC PAV (MICRO-MLLING) (1").
4. TAPERED MILLING 0"-2" TO BE PAID FOR WITH ITEM 354-6208 PLANE ASPH CONC PAV (MICRO-MLLING) (2").

NOT TO SCALE



2/25/2021

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 1 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			12
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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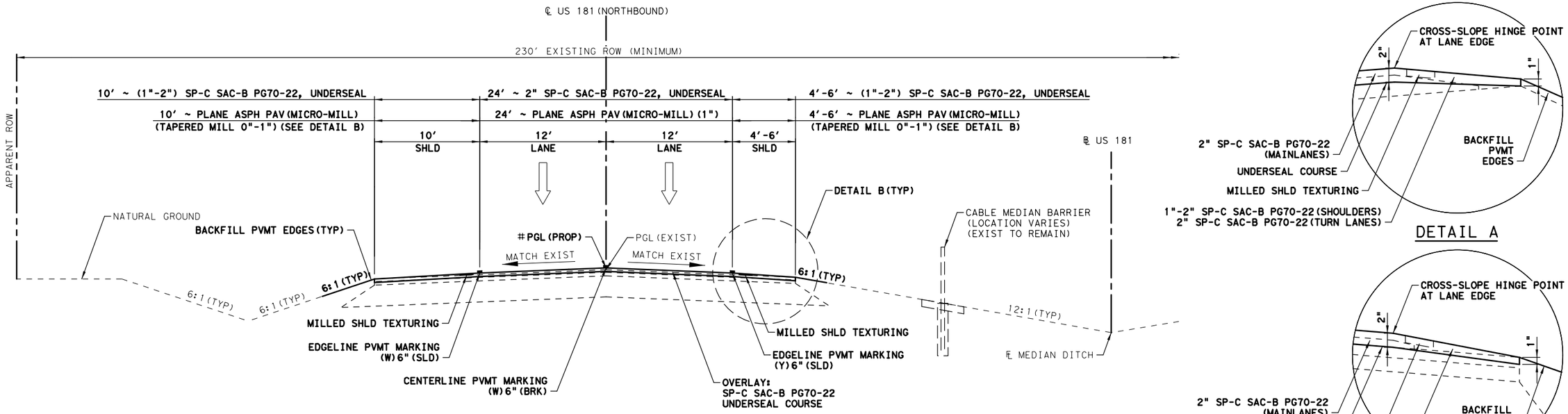
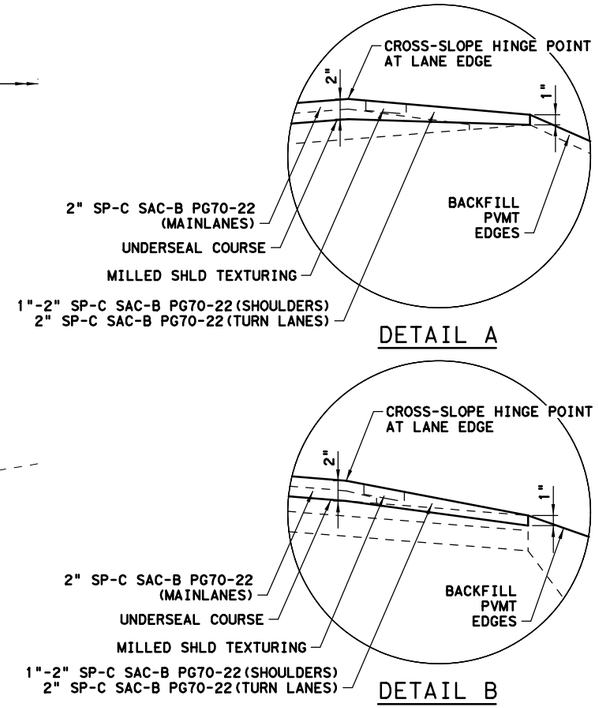


PROPOSED PGL SHALL BE 1" ABOVE EXISTING PGL

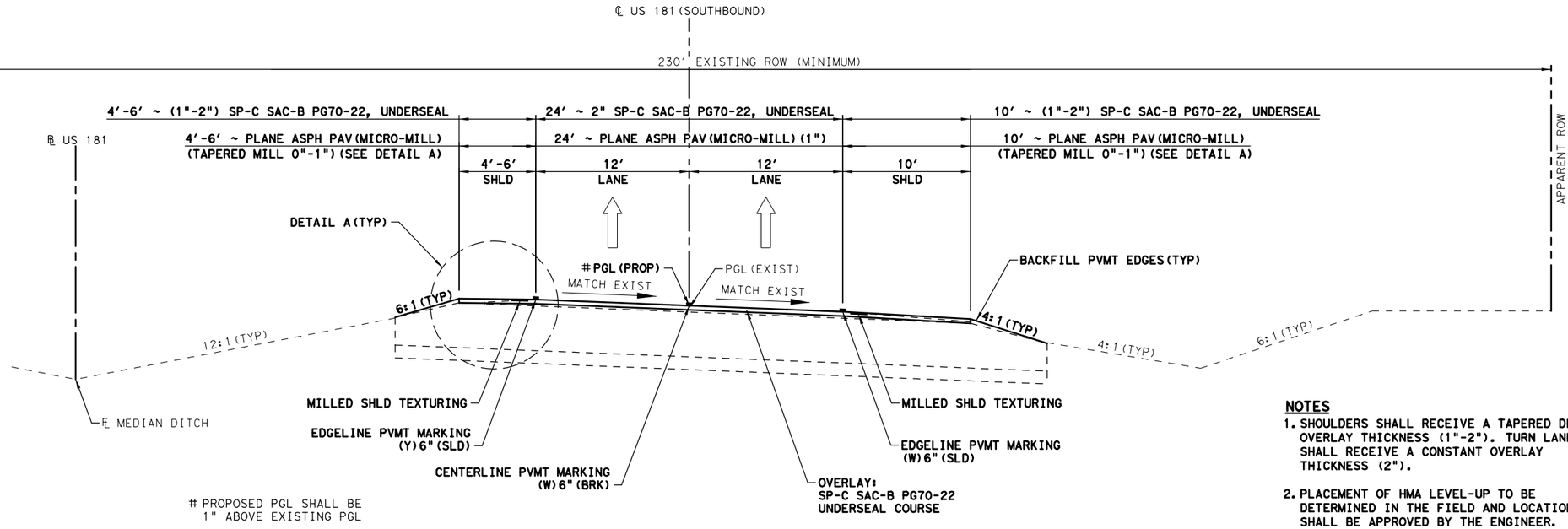
PROPOSED TYPICAL SECTION (US 181 NORTHBOUND)

STA 140+00 TO STA 344+00 (℄ US 181)



DETAIL A

DETAIL B



PROPOSED PGL SHALL BE 1" ABOVE EXISTING PGL

PROPOSED TYPICAL SECTION (US 181 SOUTHBOUND)

STA 140+00 TO STA 344+00 (℄ US 181)

NOTES

1. SHOULDERS SHALL RECEIVE A TAPERED DEPTH OVERLAY THICKNESS (1"-2"). TURN LANES SHALL RECEIVE A CONSTANT OVERLAY THICKNESS (2").
2. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. TAPERED MILLING 0"-1" TO BE PAID FOR WITH ITEM 354-6188 PLANE ASPH CONC PAV (MICRO-MLLING) (1").
4. TAPERED MILLING 0"-2" TO BE PAID FOR WITH ITEM 354-6208 PLANE ASPH CONC PAV (MICRO-MLLING) (2").

NOT TO SCALE

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 2 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			13
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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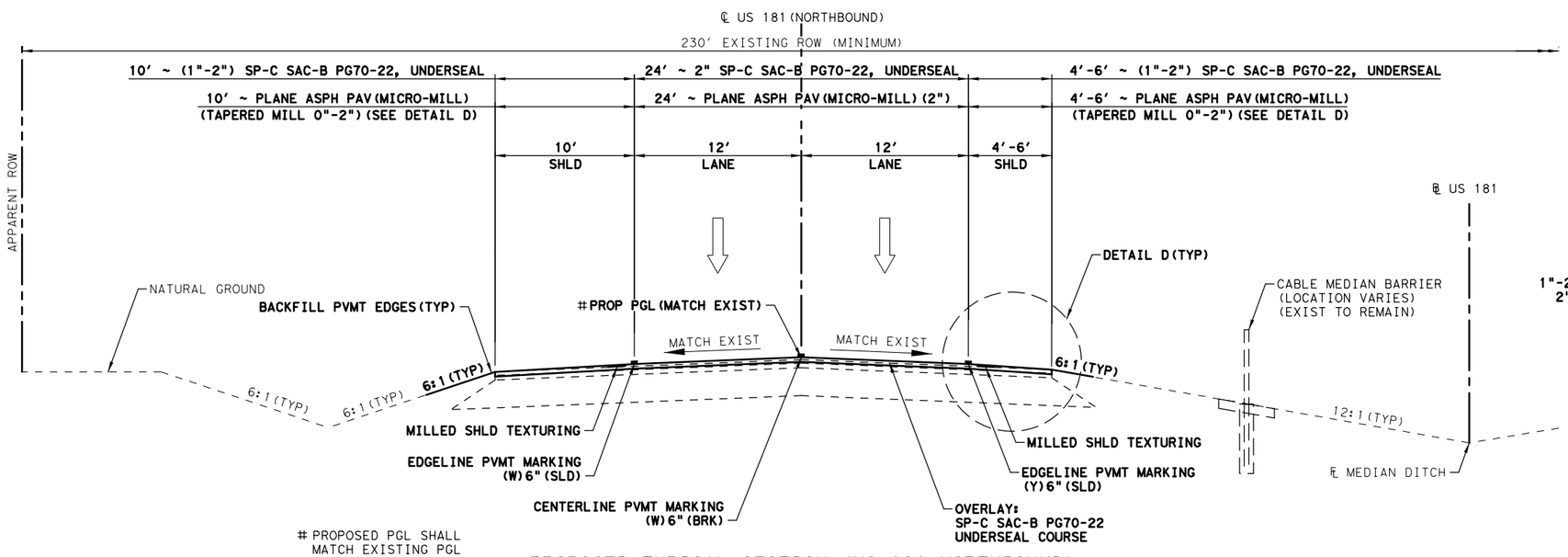
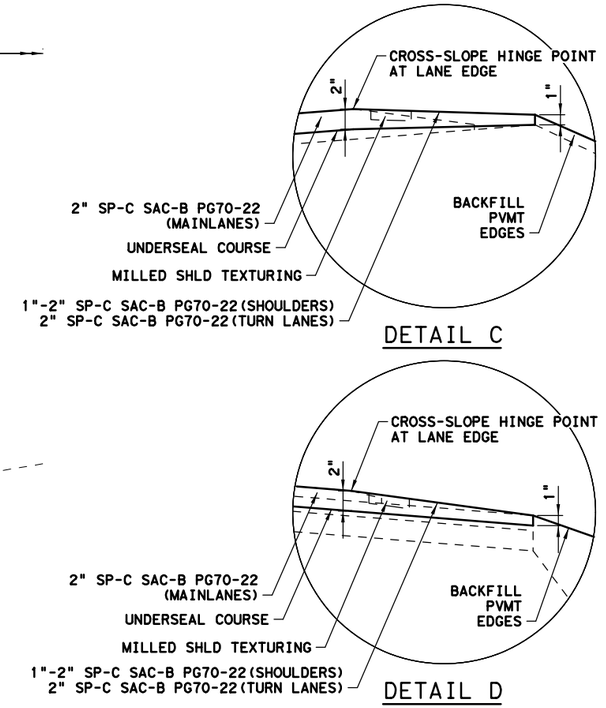


PROPOSED TYPICAL SECTION (US 181 NORTHBOUND)

STA 344+00 TO STA 480+00 (℄ US 181)



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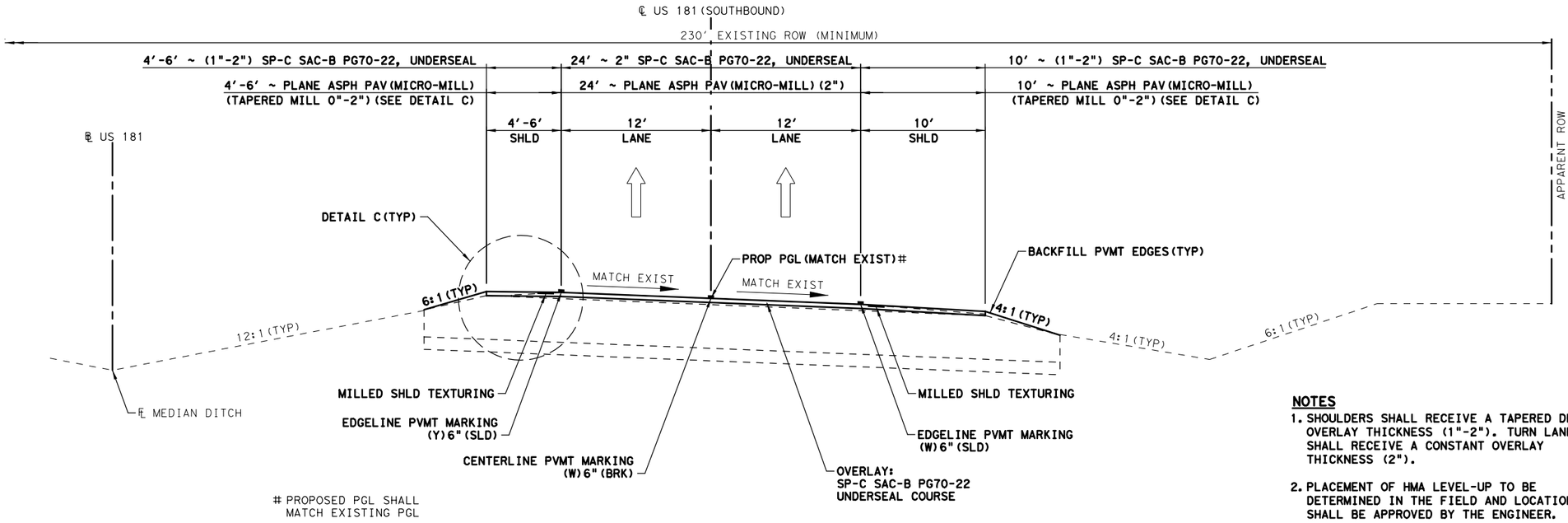

PROPOSED TYPICAL SECTION (US 181 SOUTHBOUND)

STA 344+00 TO STA 480+00 (℄ US 181)

NOTES

1. SHOULDERS SHALL RECEIVE A TAPERED DEPTH OVERLAY THICKNESS (1"-2"). TURN LANES SHALL RECEIVE A CONSTANT OVERLAY THICKNESS (2").
2. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.
3. TAPERED MILLING 0"-1" TO BE PAID FOR WITH ITEM 354-6188 PLANE ASPH CONC PAV (MICRO-MLLING) (1").
4. TAPERED MILLING 0"-2" TO BE PAID FOR WITH ITEM 354-6208 PLANE ASPH CONC PAV (MICRO-MLLING) (2").

NOT TO SCALE

2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 3 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			14
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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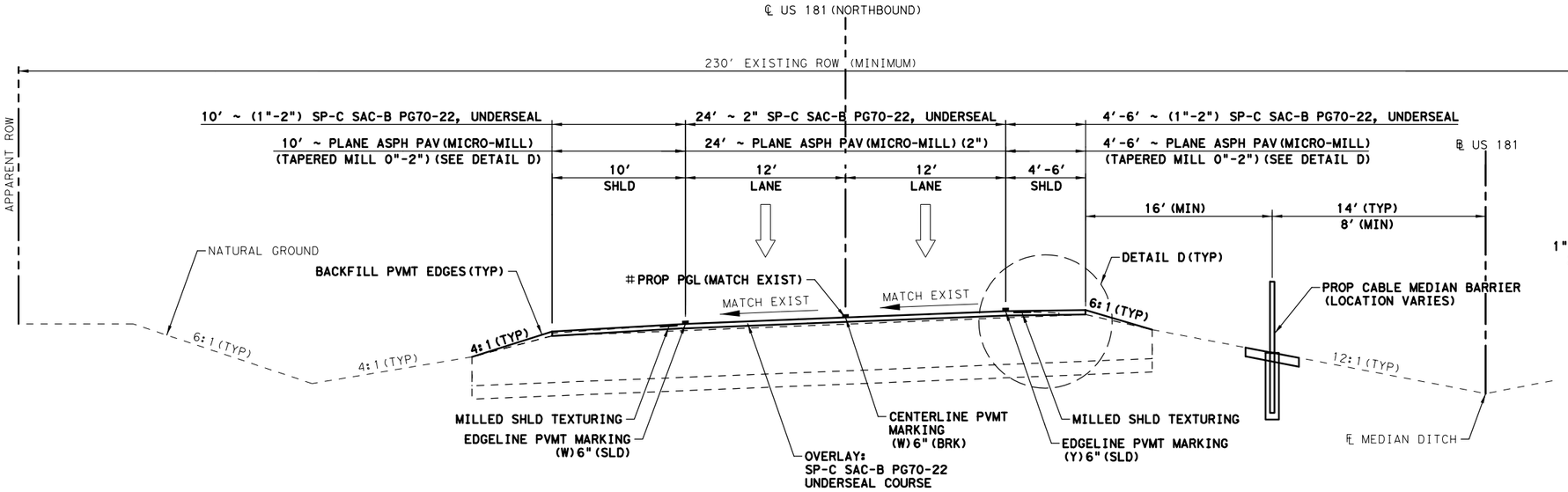


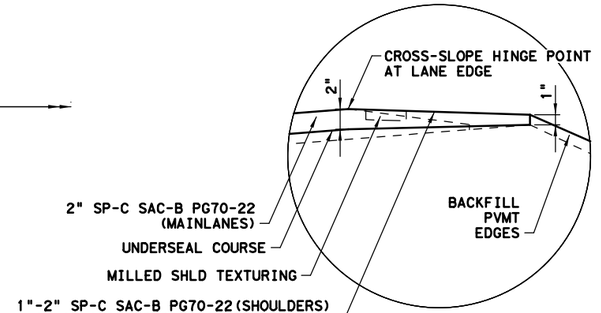
PROPOSED PGL SHALL MATCH EXISTING PGL

PROPOSED TYPICAL SECTION (US 181 NORTHBOUND)

STA 480+00 TO STA 507+38 (℄ US 181)

US 181 BRIDGE (NORTHBOUND) OVER CALAVERAS CREEK: STA 485+53 TO STA 489+09

PLANE ASPH PAV DOWN TO BRIDGE DECK. PLACE OVERLAY ON BRIDGE DECK (SEE "MISCELLANEOUS ROADWAY DETAILS" SHEET)



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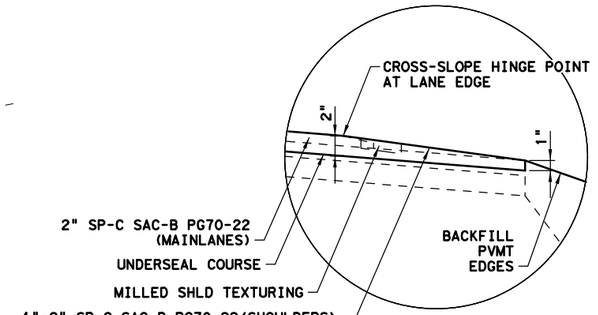
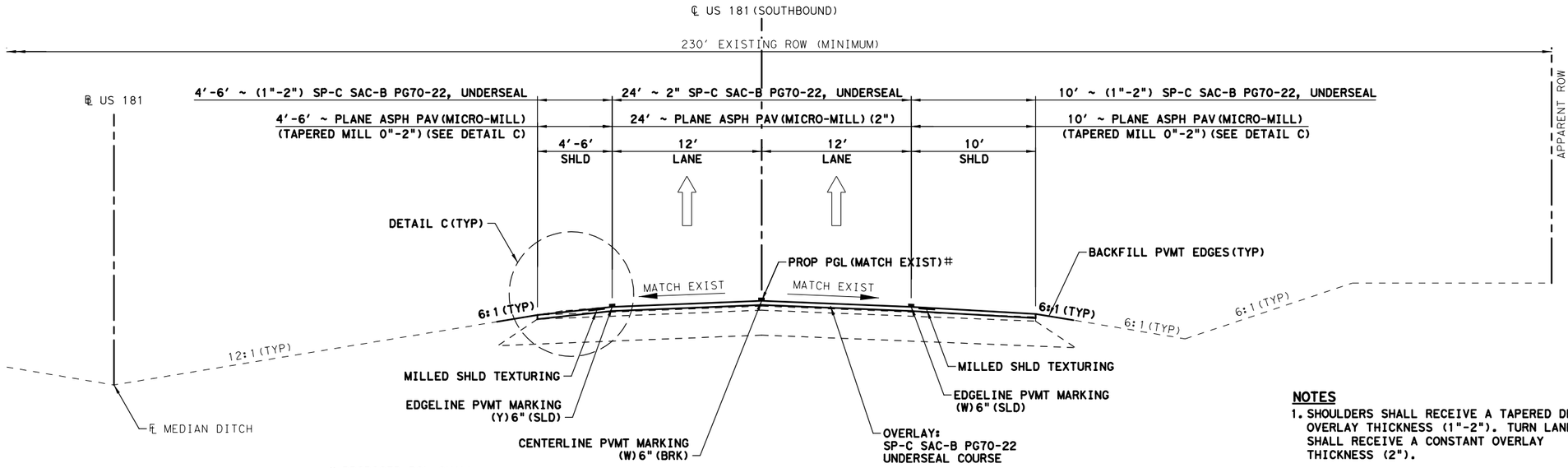


DETAIL D



PROPOSED PGL SHALL MATCH EXISTING PGL

PROPOSED TYPICAL SECTION (US 181 SOUTHBOUND)

STA 480+00 TO STA 507+38 (℄ US 181)

US 181 BRIDGE (SOUTHBOUND) OVER CALAVERAS CREEK: STA 485+53 TO STA 489+09

PLANE ASPH PAV DOWN TO BRIDGE DECK. PLACE OVERLAY ON BRIDGE DECK (SEE "MISCELLANEOUS ROADWAY DETAILS" SHEET)

NOT TO SCALE

NOTES

1. SHOULDERS SHALL RECEIVE A TAPERED DEPTH OVERLAY THICKNESS (1"-2"). TURN LANES SHALL RECEIVE A CONSTANT OVERLAY THICKNESS (2").
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4. TAPERED MILLING 0"-2" TO BE PAID FOR WITH ITEM 354-6208 PLANE ASPH CONC PAV (MICRO-MLLING) (2").

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TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 4 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			15
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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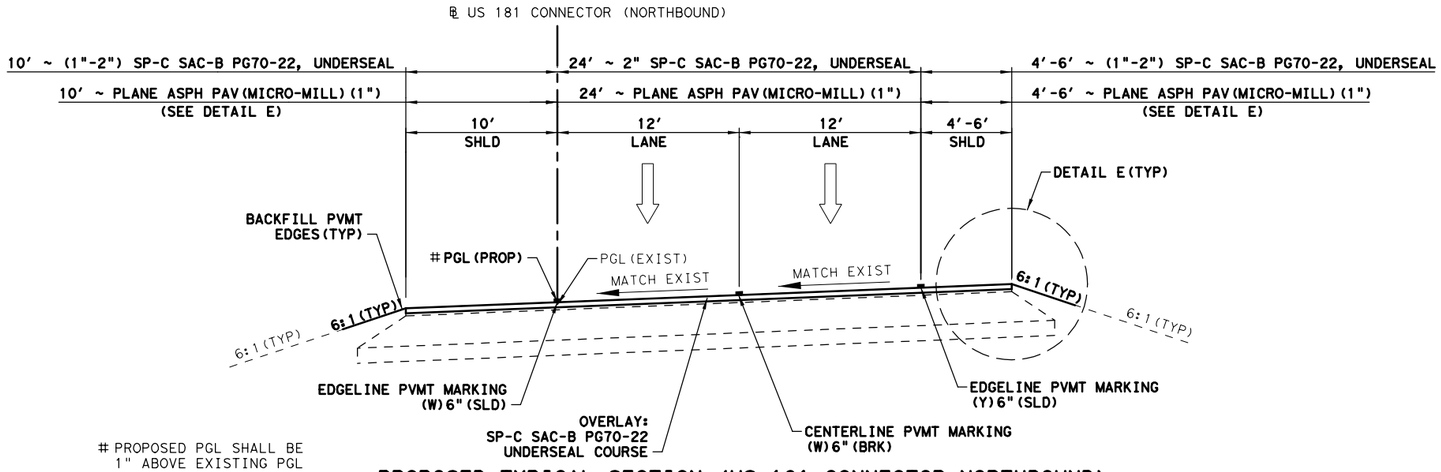
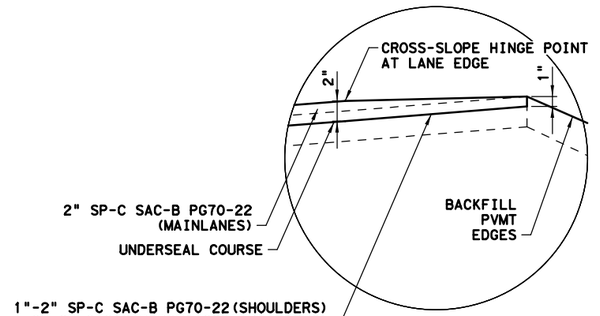


PROPOSED PGL SHALL BE 1" ABOVE EXISTING PGL

PROPOSED TYPICAL SECTION (US 181 CONNECTOR NORTHBOUND)

STA 195+41 TO STA 219+00 (℄ US 181 CONNECTOR NORTHBOUND)



DETAIL E

NOTES

1. SHOULDERS SHALL RECEIVE A TAPERED DEPTH OVERLAY THICKNESS (1"-2"). TURN LANES SHALL RECEIVE A CONSTANT OVERLAY THICKNESS (2").
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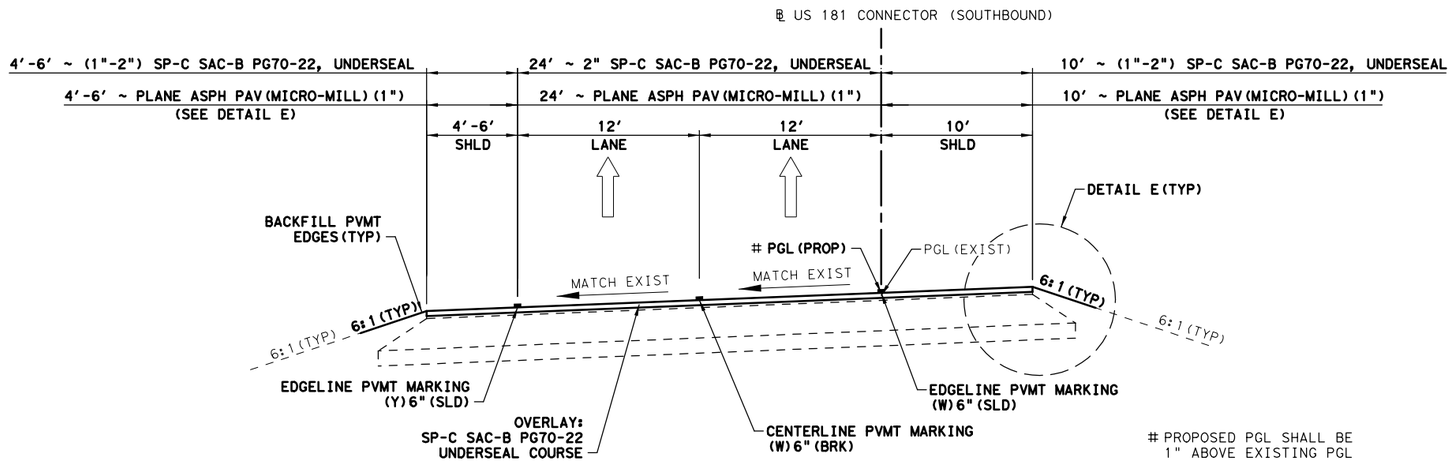

PROPOSED PGL SHALL BE 1" ABOVE EXISTING PGL

PROPOSED TYPICAL SECTION (US 181 CONNECTOR SOUTHBOUND)

STA 275+43 TO STA 319+00 (℄ US 181 CONNECTOR SOUTHBOUND)

US 181 BRIDGE OVER IH 37: STA 301+70 TO STA 304+60

PLANE ASPH PAV DOWN TO BRIDGE DECK. DO NOT PLACE OVERLAY ON BRIDGE DECK, PLACE TWO COURSE SURFACE TREATMENT CONSISTING OF
FIRST COURSE: AGGR(TY-PB GR-3 SAC-B) @ 1CY/120SY, ASPH(AC-15P,AC-20-5TR OR AC-20XP) @ 0.30 GAL/SY
SECOND COURSE: AGGR(TY-PD GR-4 SAC-B) @ 1CY/120SY, ASPH(AC-15P,AC-20-5TR OR AC-20XP) @ 0.30 GAL/SY

NOT TO SCALE

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 5 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			16
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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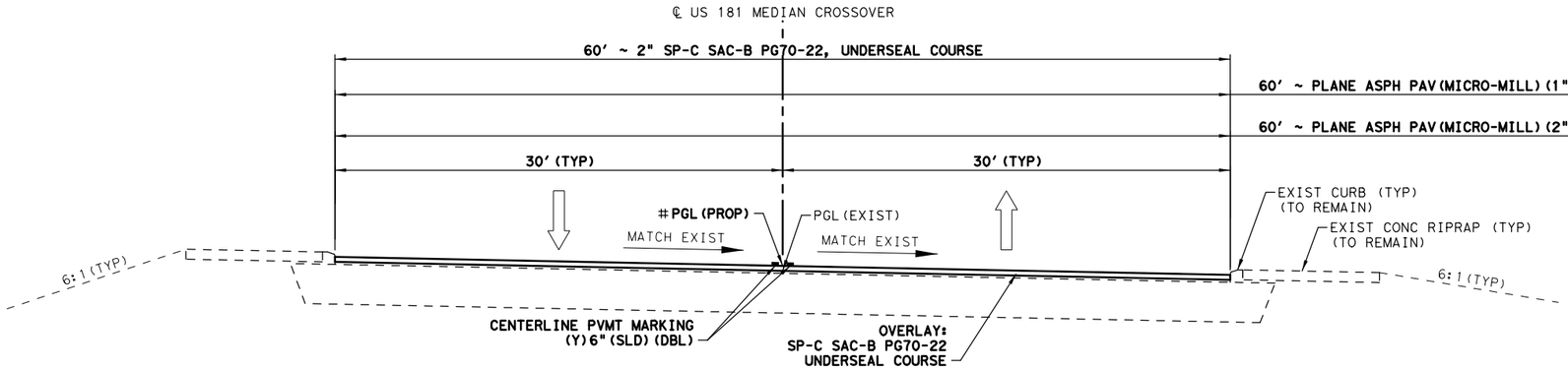


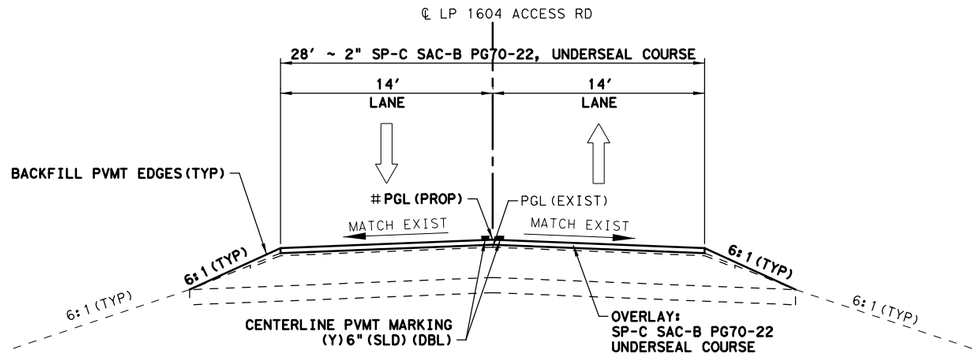
PROPOSED TYPICAL SECTION (US 181 MEDIAN CROSSOVER)

VARIOUS LOCATIONS

PROPOSED PGL SHALL BE 1" ABOVE EXISTING PGL FROM STA 119+00 TO STA 344+00. PROPOSED PGL SHALL MATCH EXISTING PGL FROM STA 345+00 TO STA 507+38.27

NOTES

1. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.



PROPOSED TYPICAL SECTION (LP 1604 ACCESS RD)

STA 10+30 TO STA 25+49 (℄ LP 1604 ACCESS RD SOUTH)
STA 10+68 TO STA 23+80 (℄ LP 1604 ACCESS RD NORTH)

PROPOSED PGL SHALL BE 2" ABOVE EXISTING PGL

NOT TO SCALE

STATE OF TEXAS
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2/25/2021

Texas Department of Transportation

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TBPE REG. NO. F-2742

US 181 PROPOSED TYPICAL SECTIONS

SHEET 6 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			17
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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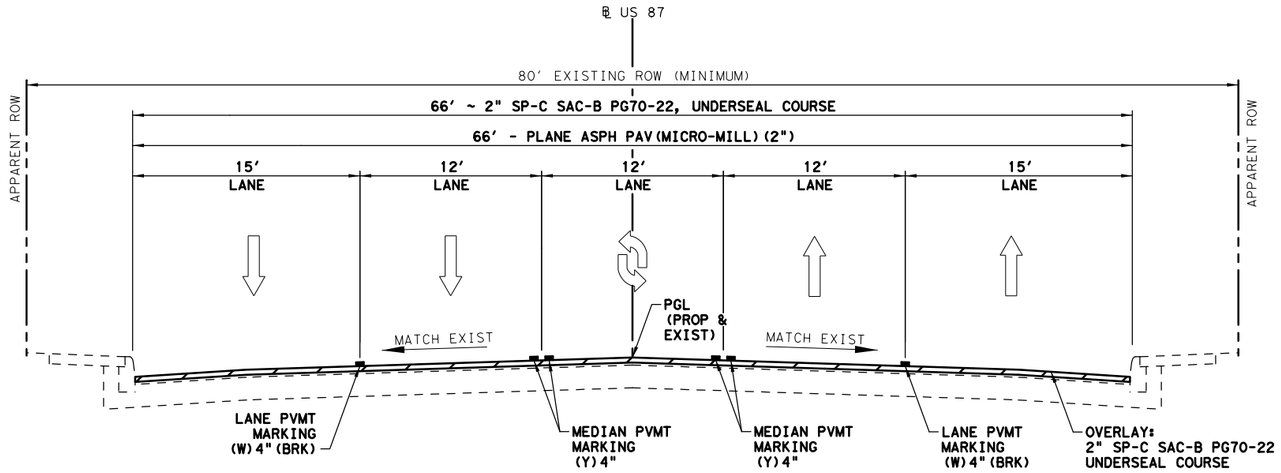
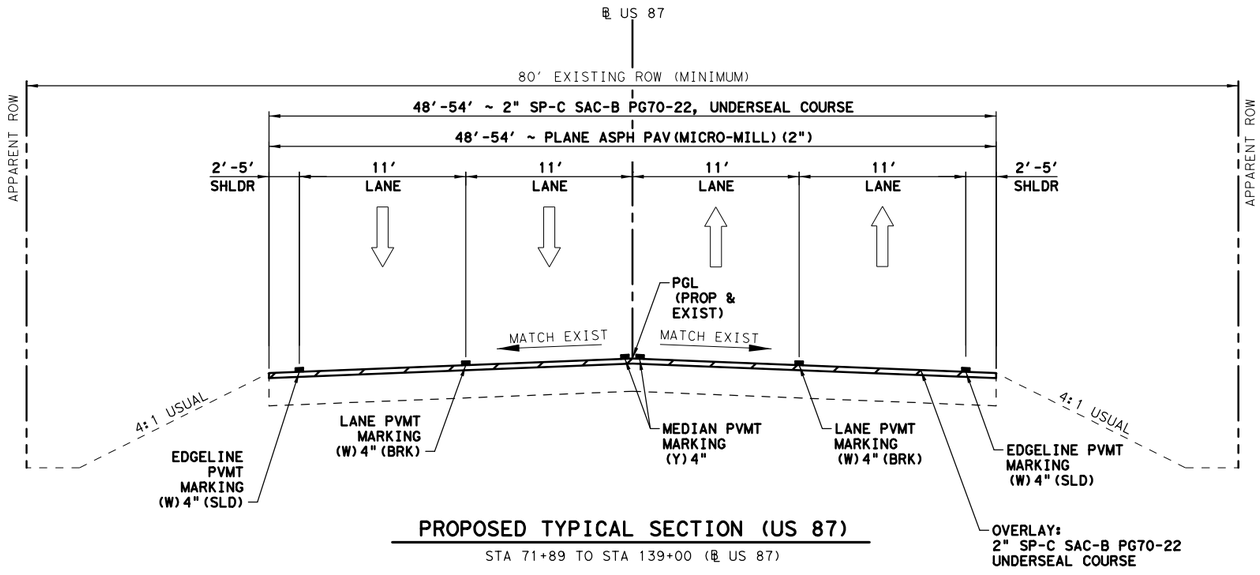


PROPOSED TYPICAL SECTION (US 87)

STA 33+00 TO STA 67+75 (℄ US 87)



PROPOSED TYPICAL SECTION (US 87)

STA 71+89 TO STA 139+00 (℄ US 87)

NOTES

1. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.

NOT TO SCALE

STATE OF TEXAS
Brian Legaspi
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TBPE REG. NO. F-2742

US 87 PROPOSED TYPICAL SECTIONS

SHEET 1 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			18
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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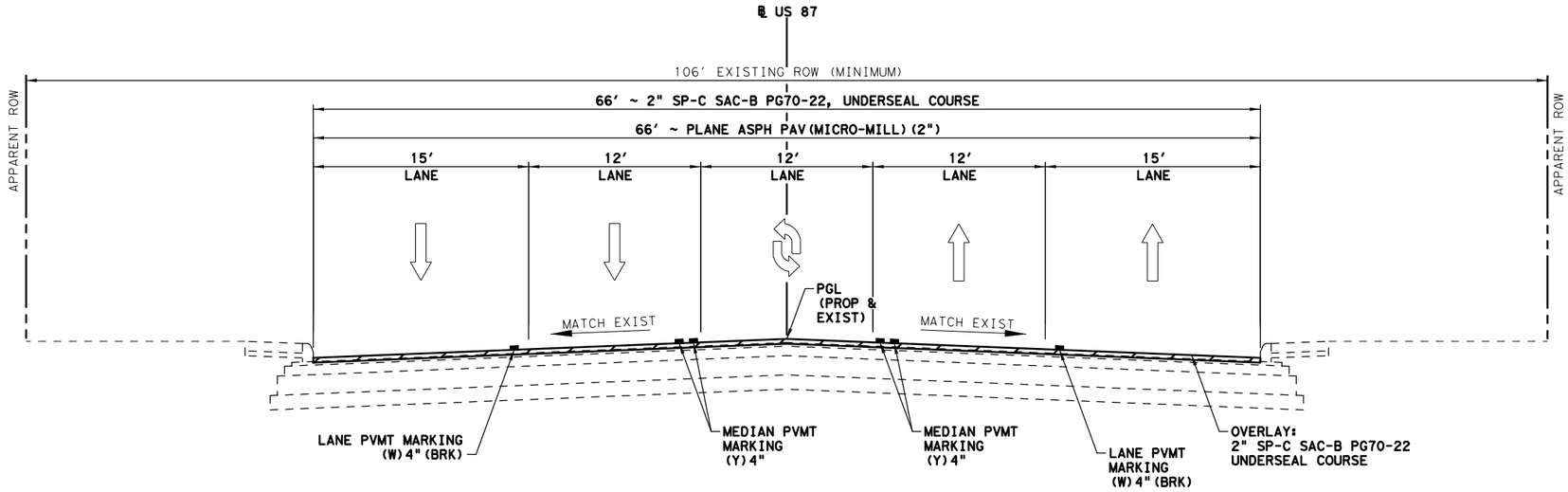

PROPOSED TYPICAL SECTION (US 87)

STA 139+00 TO STA 184+73 (℄ US 87)

NOTES

1. PLACEMENT OF HMA LEVEL-UP TO BE DETERMINED IN THE FIELD AND LOCATIONS SHALL BE APPROVED BY THE ENGINEER.

NOT TO SCALE

STATE OF TEXAS
Brian Legaspi
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2/25/2021

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US 87 PROPOSED TYPICAL SECTIONS

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			19
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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**********GENERAL NOTES**********
2014 Specification Book (Revised October 23, 2020)

US 181 - CSJ 0073-12-015

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

168-6001 VEGETATIVE WATERING

Location	Depth	Rate	Area	Quantity
Various		15.6 gal/sy	1095 sy	17 MG

- The Following Is For Information Only - Non Pay -

D-GR HMA TY-B PG64-22 (for flexible pavement structure repair)

Location	Depth	Rate	Area	Quantity
Various	8.0 inches	110 lbs/sy-inch	7117 sy	3132 tons

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

3077-6023 SP MIXES SP-C SAC-B PG70-22

Location	Depth	Rate	Area	Quantity
Mainlanes	2.0 inches	115 lbs/sy-inch	31328 sy	3603 tons
Shoulders	1.5 inches	115 lbs/sy-inch	11872 sy	1024 tons

3085-6001 UNDERSEAL COURSE

Location	Depth	Rate	Area	Quantity
Main Rdwy		0.20 gal/sy	43200 sy	8640 gal

340-6247 D-GR HMA(SQ) TY-D PG70-22 (LEVEL-UP)

Location	Depth	Rate	Area	Quantity
Various	Varies	110 lbs/sy-inch	Varies	463 tons

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

Description	1st Course	2nd Course
Bridge over IH 37	1063 sy	1063 sy
	-----See Bid Item-----	
Asphalt—rate (gal/sy)	0.30 gal/sy = 319 gal	0.30 gal/sy = 319 gal
Aggregate—type/gr	TY-PB / GR-3 / SAC-B	TY-PD / GR-4 / SAC-B
Aggregate—rate (cy/sy)	1 cy/120 sy = 9 cy	1 cy/120 sy = 9 cy

US 181 - CSJ 0100-02-067

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

168-6001 VEGETATIVE WATERING

Location	Depth	Rate	Area	Quantity
Various		15.6 gal/sy	16872 sy	263 MG

- The Following Is For Information Only - Non Pay -

D-GR HMA TY-B PG64-22 (for flexible pavement structure repair)

Location	Depth	Rate	Area	Quantity
Main Rdwy	8.0 inches	110 lbs/sy-inch	22077 sy	9714 tons
Richter Rd	8.0 inches	110 lbs/sy-inch	361 sy	159 tons

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

3077-6023 SP MIXES SP-C SAC-B PG70-22

Location	Depth	Rate	Area	Quantity
Mainlanes	2.0 inches	115 lbs/sy-inch	264083 sy	30370 tons
Shoulders	1.5 inches	115 lbs/sy-inch	106793 sy	9211 tons
Richter Rd	2.0 inches	115 lbs/sy-inch	410 sy	47 tons

3085-6001 UNDERSEAL COURSE

Location	Depth	Rate	Area	Quantity
Main Rdwy		0.20 gal/sy	370876 sy	74175 gal
Richter Rd		0.20 gal/sy	459 sy	92 gal

340-6011 D-GR HMA(SQ) TY-B PG64-22

Location	Depth	Rate	Area	Quantity
Richter Rd	8.0 inches	110 lbs/sy-inch	49 sy	22 tons

340-6247 D-GR HMA(SQ) TY-D PG70-22 (LEVEL-UP)

Location	Depth	Rate	Area	Quantity
Various	Varies	110 lbs/sy-inch	Varies	3958 tons

US 87 - CSJ 0143-01-060

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

168-6001 VEGETATIVE WATERING

Location	Depth	Rate	Area	Quantity
Various		15.6 gal/sy	207 sy	3 MG

- The Following Is For Information Only - Non Pay -

D-GR HMA TY-B PG64-22 (for flexible pavement structure repair)

Location	Depth	Rate	Area	Quantity
Various	8.0 inches	110 lbs/sy-inch	24677 sy	10858 tons
Various	4.0 inches	110 lbs/sy-inch	1601 sy	353 tons

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

3077-6023 SP MIXES SP-C SAC-B PG70-22

Location	Depth	Rate	Area	Quantity
Main Rdwy	2.0 inches	115 lbs/sy-inch	89108 sy	10247 tons

3085-6001 UNDERSEAL COURSE

Location	Depth	Rate	Area	Quantity
Main Rdwy		0.20 gal/sy	89108 sy	17822 gal

340-6011 D-GR HMA(SQ) TY-B PG64-22

Location	Depth	Rate	Area	Quantity
Various	Varies	110 lbs/sy-inch	Varies	240 tons

340-6247 D-GR HMA(SQ) TY-D PG70-22 (LEVEL-UP)

Location	Depth	Rate	Area	Quantity
Various	Varies	110 lbs/sy-inch	Varies	1016 tons

--General--
The following State, District, Local and/or Utility Standards have been modified: T2 TR (MOD).

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

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

To better fit field conditions, the cross sections may be varied when approved.

If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

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

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

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

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

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

Hurricane Evacuation

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

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

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

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

If a sanitary sewer overflow (SSO) occurs:

1. Attempt to eliminate the source of the SSO.
2. Contain sewage from the SSO to the extent possible to prevent contamination of waterways.
3. Call SAWS at (210) 233-2015.

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

Contractor questions on this project are to be addressed to the following individual(s):
Mike.Coward@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--
Reference all existing striping and other pavement markings to allow these markings to be re-established. Ensure the markings (lane lines, edge lines, ramp gores, etc.) are in line with signs, TMS arrows, etc. located on overhead sign supports.

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

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean all of these features if they weren't properly protected. This work is subsidiary work to applicable bid items.

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

When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. A horizontal boom or equivalent equipment is required for construction in the vicinity of the CPS Energy electric lines in order 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 de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and backfeed requirements. De-energizing may not be possible in all instances or may be restricted during specific periods of time due to load demand. Contractor will be reimbursed for the invoice cost for pole bracing and/or de-energizing or sleeving through force account.

Prevention of Migratory Bird Nesting

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

Structures

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

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

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

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

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 14.73 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

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

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

--Item 8—
Working days will be computed and charged in accordance with Article 8.3.1.4: Standard-Day work week.

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

Create and maintain a Bar Chart schedule.

--Item 9--
When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

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

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

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law

Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

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

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

--Item 100--
Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P.

Trim and remove brush and trees within the stations noted in the plans and as needed for construction operations. Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas to the ROW limits. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 12 ft. vertical clearance under all trees. This work is subsidiary.

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

--Item 110--
Where excavation extends beyond a right of way fence, remove and replace the fence to a comparable condition. This work shall be considered subsidiary to the bid item.

--Item 164--
Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

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

--Item 166--
Use a fertilizer with an analysis of 13-13-13 (50% of the total N must be sulfur coated urea) to apply 60 lbs of actual N per acre. This requires 460 lbs of 13-13-13 per acre or .095 lbs per SY of area.

--Item 168--
Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 316--
When using latex asphalt, avoid drifting of asphalt onto traffic and adjacent properties.

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

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

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

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

--Item 320--
Construct all longitudinal ACP joints adjacent to a travel lane with a joint maker device that will create a 3:1 to 6:1 taper. For placement of 2 inches or more, the device shall provide a maximum ½ inch vertical edge. Taper outside edges (next to the grass) or backfill (shoulder-up) the same day.

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

--Item 342, 347, 348, 3076, & 3077--
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.

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

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

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

Hold a pre-placement meeting one month prior to the placement of the hot mix.

Do not use diesel or solvents as asphalt release agents in production, transportation, or construction. A list of approved asphalt release agents is available from the District Laboratory.

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

--Item340--
Binder substitution is not allowed for surface mixtures.

Reference Table 15A and 15B in Item 3076 for Minimum Surface Temperatures.

--Item 342, 347 & 348--
Aggregate soundness values shall not vary by more than 8 percent between Surface Aggregate Class (SAC) A and B.

--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 432--
In all riprap slopes, provide 3-inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

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

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

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

--Item 502--
Place standard markings no later than 14 days after surface treatment operations are completed.

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

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

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

There are traffic signals at the intersection of:

CSJ 0073-12-015: Old Corpus Christi Hwy, SS 122
CSJ 0100-02-067: S Foster Rd, Richter Rd, E LP 1604 Access Rd, S LP 1604 Access Rd
CSJ 0143-01-060: Rigsby Ave, Pecan Valley Rd, S WW White Rd, Diane Rd

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

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

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

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

For closures not listed in the TCP; the lane closures are limited to between the hours shown below and at least one lane has to remain open at all times.

CSJ 0073-12-015: 9am to 4pm (Monday thru Friday)
CSJ 0100-02-067: 9am to 4pm (Monday thru Friday)
CSJ 0143-01-060: 8 am to 5pm (Monday thru Friday)

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

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

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

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

Use two (2) number of rumble strip arrays.

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

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible

Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

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

--Item 506--
An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

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

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

--Item 510--
The length of the one-way traffic control section is limited to one (1)miles.

--Item 533--
CSJ 0073-120-15 (US 181): Use Option 2 and a width of 8 inches for Edgeline Continuous Milled Rumble Strips as shown on the RS standard sheets for edgelines.

CSJ 0100-02-067 (US 181): Use Option 2 and a width of 8 inches for Edgeline Continuous Milled Rumble Strips as shown on the RS standard sheets for edgelines.

--Item 540--
MBGF posts shall be round with domed tops, and not painted. If 10 or less timber posts are needed, they may be purchased locally and will be accepted by visual inspection.

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

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

County: Bexar

Highway: US 181, etc

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

--Item 585--
CSJ 0073-12-015 (US 181): Use Surface Test Type B, pay adjustment schedule 2 to evaluate ride quality of travel lanes.

CSJ 0100-02-067 (US 181): Use Surface Test Type B, pay adjustment schedule 2 to evaluate ride quality of travel lanes.

CSJ 0143-01-060 (US 87): 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.

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

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

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

--Item 658--
CTB reflectors will not be paid for directly but will be considered subsidiary to the barrier.

--Item 662--
Raised reflective pavement markings are required when using work zone reflective pavement markings for lane lines as shown in the standards. The raised reflective pavement markings must be placed during the same operation for installation of the work zone reflective pavement markings and placed before the roadway is open to traffic. These raised reflective pavement markings will be subsidiary to work zone pavement markings.

--Item 666--
Use TY II material (vs. an acrylic or epoxy) as the sealer for the TY I markings, place the TY II a minimum of 14 calendar days (to provide adequate curing) before placing the TY I markings.

County: Bexar

Highway: US 181, etc

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

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 730--
Mow full-width and hand trim the right of way, including newly seeded or sodded areas, when vegetation reaches a height of 16” or when directed. Removal of brush sprouts growing within guardrail, concrete barriers or at other locations where mowing or hand trimming is done within the limits of construction is required and subsidiary to this item. Mowing may be required more often in newly sodded or seeded areas than in other parts of the project because of the supplemental irrigation these areas receive and the resulting weed growth. Coordinate mowing to avoid rutting or compaction of the soil when mowing where supplemental irrigation is being used. Use mowing equipment that will not adversely affect soil retention blankets or mulches that have been applied. Work performed under this item does not replace the mowing required when placing permanent seeding in an area that has established temporary seeding as described in Article 164.3, Construction.

--Item 734 & 738--
Perform Litter Removal and Cleaning and Sweeping Highways once a month or as directed.

--Item 3085--
The minimum application rates are listed in Table UC. The Engineer may adjust the application rates taking into consideration the existing pavement surface conditions.

Table UC

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

Control: 0073-12-015, etc

County: Bexar

Highway: US 181, etc

--Item 6185--
Two (2)shadow vehicles with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.

QUANTITY SHEET

CONTROLLING PROJECT ID 0073-12-015 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 181, US 87

			CONTROL SECTION JOB	**0073-12-015**		**0100-02-067**		**0143-01-060**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130130**		**A00129895**		**A00129898**			
			COUNTY	**Bexar**		**Bexar**		**Bexar**			
			HIGHWAY	**US 181**		**US 181**		**US 87**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-6001	PREPARING ROW	AC			0.250				0.250	
	104-6009	REMOVING CONC (RIPRAP)	SY			100.000				100.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	3,005.000		3,255.000		230.000		6,490.000	
	105-6002	REMOVING STAB BASE AND ASPH PAV (2")	SY					4,267.000		4,267.000	
	105-6044	REMOVING STAB BASE AND ASPH PAV (10")	SY			14.000				14.000	
	110-6002	EXCAVATION (CHANNEL)	CY			1,001.000				1,001.000	
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	68.000		270.000		11.000		349.000	
	134-6002	BACKFILL (TY B)	STA	96.160		775.910		66.000		938.070	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	365.000		5,624.000		69.000		6,058.000	
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	SY	365.000		5,624.000		69.000		6,058.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	365.000		5,624.000		69.000		6,058.000	
	168-6001	VEGETATIVE WATERING	MG	17.000		263.000		3.000		283.000	
	169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	SY			5,255.000				5,255.000	
	316-6222	AGGR(TY-PB GR-3 SAC-B)	CY	9.000						9.000	
	316-6240	AGGR(TY-PD GR-4 SAC-B)	CY	9.000						9.000	
	316-6419	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	GAL	638.000						638.000	
	340-6011	D-GR HMA(SQ) TY-B PG64-22	TON			22.000		240.000		262.000	
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	TON	463.000		3,958.000		1,016.000		5,437.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	7,117.000		22,429.000		24,645.000		54,191.000	
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY					1,601.000		1,601.000	
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	SY	1,063.000		3,656.000				4,719.000	
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	SY	42,137.000		203,579.000				245,716.000	
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	SY			153,210.000		89,108.000		242,318.000	
	356-6021	PAV JT UNDERSEAL (24")	LF			720.000				720.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY			38.400		4.000		42.400	
	432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	CY			399.500				399.500	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	160.400		379.700		17.000		557.100	
	438-6009	CLEANING EXISTING JOINTS	LF	87.000		586.000		213.000		886.000	
	454-6008	HEADER TYPE EXPANSION JOINT	CF	4.000		98.000				102.000	
	454-6009	JOINT SEALANT	LF	87.000		586.000		213.000		886.000	
	460-6011	CMP AR (GAL STL DES 4)	LF			8.000				8.000	
	467-6547	SET (TY II) (DES 4) (CMP) (4: 1) (C)	EA			1.000				1.000	
	479-6001	ADJUSTING MANHOLES	EA					16.000		16.000	
	480-6001	CLEAN EXIST CULVERTS	EA			3.000				3.000	
	496-6006	REMOV STR (HEADWALL)	EA			1.000				1.000	
	496-6043	REMOV STR (SMALL FENCE)	LF	245.000						245.000	
	500-6001	MOBILIZATION	LS	14.00%		66.00%		20.00%		100.00%	

QUANTITY SHEET

CONTROLLING PROJECT ID 0073-12-015 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 181, US 87

			CONTROL SECTION JOB	**0073-12-015**		**0100-02-067**		**0143-01-060**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130130**		**A00129895**		**A00129898**			
			COUNTY	**Bexar**		**Bexar**		**Bexar**			
			HIGHWAY	**US 181**		**US 181**		**US 87**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		10.000		5.000		18.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF					344.000		344.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	3,139.000		3,654.000				6,793.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	3,139.000		3,654.000		344.000		7,137.000	
	510-6001	ONE-WAY TRAF CONT (FLAGGER CONT)	HR	96.000		384.000		256.000		736.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	18,920.000		151,322.000				170,242.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	3,137.500		2,862.500		162.500		6,162.500	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000		8.000				12.000	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA					2.000		2.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	3.000		9.000		1.000		13.000	
	540-6038	CONNECTOR PLATE FOR THRIE BEAM	EA	4.000						4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	2,937.500		2,582.500		230.000		5,750.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	2.000		4.000		1.000		7.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA			4.000				4.000	
	543-6001	CABLE BARRIER SYSTEM (TL-3)	LF			5,026.000				5,026.000	
	543-6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA			6.000				6.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3.000		9.000		3.000		15.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	2.000		14.000		2.000		18.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	26.000		218.000		3.000		247.000	
	644-6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA			12.000				12.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	13.000		90.000		18.000		121.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA			1.000				1.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	13.000		56.000				69.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA	1.000		1.000				2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	46.000		319.000		9.000		374.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA					22.000		22.000	
	658-6020	INSTL DEL ASSM (D-SY)SZ 1(FLX)SRF	EA			68.000				68.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	45.000		56.000		6.000		107.000	
	662-6060	WK ZN PAV MRK REMOV (W)4"(BRK)	LF					7,340.000		7,340.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF					12,658.000		12,658.000	
	662-6064	WK ZN PAV MRK REMOV (W)6"(BRK)	LF	2,020.000		18,220.000				20,240.000	
	662-6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	10,217.000		79,709.000				89,926.000	
	662-6070	WK ZN PAV MRK REMOV (W)8"(LNDP)	LF	188.000						188.000	
	662-6071	WK ZN PAV MRK REMOV (W)8"(SLD)	LF	2,457.000		12,144.000		2,648.000		17,249.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	407.000		613.000		2,089.000		3,109.000	
	662-6080	WK ZN PAV MRK REMOV (W)(ARROW)	EA	18.000		109.000		60.000		187.000	
	662-6090	WK ZN PAV MRK REMOV (W)(WORD)	EA	16.000		108.000		18.000		142.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0073-12-015 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 181, US 87

			CONTROL SECTION JOB	**0073-12-015**		**0100-02-067**		**0143-01-060**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00130130**		**A00129895**		**A00129898**			
			COUNTY	**Bexar**		**Bexar**		**Bexar**			
			HIGHWAY	**US 181**		**US 181**		**US 87**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	662-6092	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	EA	36.000		284.000		33.000		353.000	
	662-6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF					2,590.000		2,590.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF					29,290.000		29,290.000	
	662-6098	WK ZN PAV MRK REMOV (Y)6"(SLD)	LF	10,290.000		77,946.000				88,236.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	857.000		5,466.000		2,202.000		8,525.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA			548.000		2,242.000		2,790.000	
	666-6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	176.000						176.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,942.000		12,602.000		2,633.000		17,177.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	363.000		627.000		2,089.000		3,079.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	15.000		95.000		60.000		170.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	13.000		95.000		18.000		126.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	18.000		271.000		33.000		322.000	
	666-6224	PAVEMENT SEALER 4"	LF					51,718.000		51,718.000	
	666-6225	PAVEMENT SEALER 6"	LF	20,780.000		175,056.000				195,836.000	
	666-6226	PAVEMENT SEALER 8"	LF	2,118.000		12,602.000		2,633.000		17,353.000	
	666-6230	PAVEMENT SEALER 24"	LF	363.000		627.000		2,089.000		3,079.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	15.000		95.000		60.000		170.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	13.000		95.000		18.000		126.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	18.000		271.000		33.000		322.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF					7,180.000		7,180.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF					12,658.000		12,658.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1,860.000		18,200.000				20,060.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	9,274.000		79,703.000				88,977.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF					2,590.000		2,590.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF					29,290.000		29,290.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	9,646.000		77,153.000				86,799.000	
	672-6007	REFL PAV MRKR TY I-C	EA					476.000		476.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	4.000		417.000		670.000		1,091.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	156.000		1,721.000				1,877.000	
	730-6107	FULL - WIDTH MOWING	CYC	1.000		4.000		1.000		6.000	
	734-6002	LITTER REMOVAL	CYC	3.000		10.000		5.000		18.000	
	738-6003	CLEANING / SWEEPING (OUTSIDE MAIN LANE)	CYC	3.000		10.000		5.000		18.000	
	3077-6023	SP MIXESSP-CSAC-B PG70-22	TON	4,627.000		39,628.000		10,247.000		54,502.000	
	3085-6001	UNDERSEAL COURSE	GAL	8,640.000		74,267.000		17,822.000		100,729.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	42.000		282.000		142.000		466.000	
	6185-6002	TMA (STATIONARY)	DAY	19.000		127.000		57.000		203.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	8.000		44.000		32.000		84.000	

QUANTITY SHEET

CONTROLLING PROJECT ID 0073-12-015 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY US 181, US 87

		CONTROL SECTION JOB		**0073-12-015**		**0100-02-067**		**0143-01-060**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00130130**		**A00129895**		**A00129898**			
		COUNTY		**Bexar**		**Bexar**		**Bexar**			
		HIGHWAY		**US 181**		**US 181**		**US 87**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000		1.000		3.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		3.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		3.000	

SUMMARY OF TRAFFIC CONTROL QUANTITIES (US 181, CSJ 0073-12-015)

		ITEM	510	662	662	662	662	662	662	662	662	662	662	662	6001	6185	6185
		DESCRIPTION	6001	6064	6067	6070	6071	6075	6080	6090	6092	6098	6109	6111	6001	6002	6005
SHEET NUMBER	STATION TO STATION		ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK REMOV (W)6"(BRK)	WK ZN PAV MRK REMOV (W)6"(SLD)	WK ZN PAV MRK REMOV (W)8"(LNDP)	WK ZN PAV MRK REMOV (W)8"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)(WORD)	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	WK ZN PAV MRK REMOV (Y)6"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
			HR	LF	LF	LF	LF	LF	EA	EA	EA	LF	EA	EA	DAY	DAY	DAY
	FROM	TO															
1 OF 23	273+43	293+00	96	410	2210							1900	123		42	19	8
2 OF23	293+00	304+00		250	1970	54					6	1970	147				
3 OF 23	304+00	115+00		400	2102	134	567		4	3	13	2200	299				
4 OF 23	115+00	133+50		960	3935		1890	407	14	13	17	4220	288				
		TOTALS:	**96**	**2020**	**10217**	**188**	**2457**	**407**	**18**	**16**	**36**	**10290**	**857**	**0**	**42**	**19**	**8**

SUMMARY OF TRAFFIC CONTROL QUANTITIES (US 181, CSJ 0100-02-067)

		ITEM	510	662	662	662	662	662	662	662	662	662	662	662	6001	6185	6185
		DESCRIPTION	6001	6064	6067	6070	6071	6075	6080	6090	6092	6098	6109	6111	6001	6002	6005
SHEET NUMBER	STATION TO STATION		ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK REMOV (W)6"(BRK)	WK ZN PAV MRK REMOV (W)6"(SLD)	WK ZN PAV MRK REMOV (W)8"(LNDP)	WK ZN PAV MRK REMOV (W)8"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)(WORD)	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	WK ZN PAV MRK REMOV (Y)6"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
			HR	LF	LF	LF	LF	LF	EA	EA	EA	LF	EA	EA	DAY	DAY	DAY
	FROM	TO															
4 OF 23	133+50	137+00	384	140	590		284	61	14	13	17	633	42		282	127	44
5 OF 23	137+00	159+00		1100	4400		765		6	6	16	4280	330				
6 OF 23	159+00	181+00		1100	4285		400		4	4	6	4280	330				
7 OF 23	181+00	203+00		1050	4660		840	103	4	4	16	4180	315				
8 OF 23	203+00	225+00		1100	4400		400		4	4	16	4270	330				
9 OF 23	225+00	247+00		1000	4295		400		4	4	16	4270	300				
10 OF 23	247+00	269+00		1100	4645		1333	28	8	8	16	4350	330				
11 OF 23	269+00	291+00		1100	4400		750		6	6	16	4260	330				
12 OF 23	291+00	313+00		1000	4322		400	22	4	4	16	4280	300				
13 OF 23	313+00	335+00		1050	4422		800	105	8	8	16	4283	315				
14 OF 23	335+00	357+00		1100	4400		400		4	4	16	4280	330				
15 OF 23	357+00	379+00		1100	4400		800		8	8	32	4090	330				
16 OF 23	379+00	401+00		1100	4000		800		8	8	32	4080	330				
17 OF 23	401+00	423+00		1100	4400		400		4	4	16	4280	330				
18 OF 23	423+00	445+00		990	3940		2315	228	14	14	5	4176	297				
19 OF 23	445+00	467+00		1100	4400		155		1	1		4400	330				
20 OF 23	467+00	489+00		1100	4400		400		4	4	16	4280	330				
21 OF 23	489+00	507+38		890	3870		400		4	4	16	3740	267				
22 OF 23	10+30	25+50			2900			54				2920		290			
23 OF 23	10+85	23+80			2580		102	12				2614		258			
		TOTALS:	**384**	**18220**	**79709**	**0**	**12144**	**613**	**109**	**108**	**284**	**77946**	**5466**	**548**	**282**	**127**	**44**

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181 TRAFFIC CONTROL SUMMARY

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			22
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SUMMARY OF TRAFFIC CONTROL QUANTITIES (US 87, CSJ 0143-01-060)

			ITEM	105	340	510	662	662	662	662	662	662	662	662	662	662	662	6001	6185	6185
			DESCRIPTION	6002	6011	6001	6060	6063	6071	6075	6080	6090	6092	6093	6095	6109	6111	6001	6002	6005
SHEET NUMBER	STATION TO STATION			REMOVING STAB BASE AND ASPH PAV (2")	D-GR HMA(SQ) TY-B PG64-22	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK REMOV (W)4"(BRK)	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (W)8"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)(ARROW)	WK ZN PAV MRK REMOV (W)36"(YLD TRI)	WK ZN PAV MRK REMOV (Y)4"(BRK)	WK ZN PAV MRK REMOV (Y)4"(SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
				SY	TON	HR	LF	LF	LF	LF	EA	EA	EA	LF	LF	EA	EA	DAY	DAY	DAY
	FROM	TO																		
1 OF 8	36+50	50+00		1600	90	256	780		695	746	10	6	9	230	2080	234	173	142	57	32
2 OF 8	50+00	72+00		1867	105		1020		508	411	9	3		500	4492	306	375			
3 OF 8	72+00	94+00					1100	4000							4400	330	220			
4 OF 8	94+00	116+00					1100	4400							4400	330	220			
5 OF 8	116+00	138+00					1090	4158	20	64		1			4840	327	242			
6 OF 8	138+00	160+00					1050	100	1245	616	21	6	24	800	4292	315	455			
7 OF 8	160+00	182+00		800	45		1060		180	184	16	2		920	4240	318	488			
8 OF 8	182+00	184+73					140			68	4			140	546	42	69			
			TOTALS:	**4267**	**240**	**256**	**7340**	**12658**	**2648**	**2089**	**60**	**18**	**33**	**2590**	**29290**	**2202**	**2242**	**142**	**57**	**32**

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 87
TRAFFIC CONTROL
SUMMARY

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			23
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SUMMARY OF ROADWAY QUANTITIES (US 181, CSJ 0073-12-015)

			ITEM	100	105	104	110	132	134	161	164	164	168	169	316	316	316	340	340	3077	351	354	354	354	356	432	438
			DESCRIPTION	6001	6044	6054	6002	6019	6002	6017	6033	6051	6001	6007	6222	6240	6419	6011	6247	6023	6004	6188	6208	6003	6021	6045	6009
SHEET NUMBER	STATION TO STATION			PREPARING ROW	REMOVING STAB BASE AND ASPH PAV (10")	REMOVING CONCRETE(MOW STRIP)	EXCAVATION (CHANNEL)	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	BACKFILL (TY B)	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (SANDY)	DRILL SEED (TEMP)(WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 2) (TY G)	AGGR(TY-PB GR-3 SAC-B)	AGGR(TY-PD GR-4 SAC-B)	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	D-GR HMA(SQ) TY-B PG64-22	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	SP MIXES SP-C SAC-B PG70-22	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	PLAN & TEXT ASPH CONC PAV(0" TO 3")	PAV JT UNDERSEAL (24")	RIPRAP (MOW STRIP)(4 IN)	CLEANING EXISTING JOINTS
				AC	SY	LF	CY	CY	STA	SY	SY	SY	MG	SY	#SY	#SY	#SY	#SY	∗TON	#SY	SY	SY	SY	SY	LF	CY	LF
	FROM	TO																									
1 OF 23	275+43	293+00				552		16	17.57	94	94	94	4						77	7397	200	7397				47.5	
2 OF 23	293+00	304+00				1383		29	19.59	154	154	154	7		843	843	1686		76	7378		6535		843		65.6	87
3 OF 23	304+00	315+00				1070		23	22	117	117	117	6		220	220	440		102	9662	2137	9442		220		47.3	
4 OF 23	115+00	133+50							37										208	18763	4780	18763					
			TOTALS:	**0**	**0**	**3005**	**0**	**68**	**96.16**	**365**	**365**	**365**	**17**	**0**	**1063**	**1063**	**2126**	**0**	**463**	**43200**	**7117**	**42137**	**0**	**1063**	**0**	**160.4**	**87**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

∗ FINAL LOCATIONS OF HMA LEVEL-UP TO BE DETERMINED BY THE ENGINEER.

SUMMARY OF ROADWAY QUANTITIES (US 181, CSJ 0073-12-015)

			ITEM	454	454	460	467	480	496	506	506	543	543	540	540	540	540	542	542	542	544	544	3085
			DESCRIPTION	6008	6009	6011	6547	6001	6043	6042	6043	6001	6019	6001	6006	6016	6038	6001	6002	6004	6001	6003	6001
SHEET NUMBER	STATION TO STATION			HEADER TYPE EXPANSION JOINT	JOINT SEALANT	CMP AR (GAL STL DES 4)	SET (TY II) (DES 4) (CMP) (4:1) (C)	CLEAN EXIST CULVERTS	REMOV STR (SMALL FENCE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)	CABLE BARRIER SYSTEM (TL-3)	CABLE BARRIER TERMINAL SECTION (TL-3)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	CONNECTOR PLATE FOR THRIE BEAM	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	UNDERSEAL COURSE
				CF	LF	LF	EA	EA	LF	LF	LF	LF	EA	LF	EA	EA	EA	LF	EA	EA	EA	EA	# SY
	FROM	TO																					
1 OF 23	275+43	293+00							245	751	751			750		1		500			2	1	7397
2 OF23	293+00	304+00	4	87						1338	1338			1337.5	2		2	1387.5			1	1	7378
3 OF 23	304+00	315+00								1050	1050			1050	2	2	2	1050	2				9662
4 OF 23	115+00	133+50																					18763
			TOTALS:	**4**	**87**	**0**	**0**	**0**	**245**	**3139**	**3139**	**0**	**0**	**3137.5**	**4**	**3**	**4**	**2937.5**	**2**	**0**	**3**	**2**	**43200**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181
ROADWAY SUMMARY

SHEET 1 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			24
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SUMMARY OF ROADWAY QUANTITIES (US 181, CSJ 0100-02-067)

ITEM			100	105	104	110	132	134	161	164	164	168	169	316	316	316	340	340	3077	351	354	354	354	356	432	438
DESCRIPTION			6001	6044	6054	6002	6019	6002	6017	6033	6051	6001	6007	6222	6240	6419	6011	6247	6023	6004	6188	6208	6003	6021	6045	6009
SHEET NUMBER	STATION TO STATION		PREPARING ROW	REMOVING STAB BASE AND ASPH PAV (10")	REMOVING CONCRETE(MOW STRIP)	EXCAVATION (CHANNEL)	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	BACKFILL (TY B)	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (SANDY)	DRILL SEED (TEMP)(WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 2) (TY G)	AGGR(TY-PB GR-3 SAC-B)	AGGR(TY-PD GR-4 SAC-B)	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	D-GR HMA(SQ) TY-B PG64-22	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	SP MIXES SP-C SAC-B PG70-22	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	PLAN & TEXT ASPH CONC PAV(0" TO 3")	PAV JT UNDERSEAL (24")	RIPRAP (MOW STRIP)(4 IN)	CLEANING EXISTING JOINTS
			AC	SY	LF	CY	CY	STA	SY	SY	SY	MG	SY	# SY	# SY	# SY	# SY	* TON	# SY	SY	SY	SY	SY	LF	CY	LF
	FROM	TO																								
4 OF 23	133+50	137+00						7.00										43	3857	1142	3857					
5 OF 23	137+00	159+00						44.00										220	20699		20699					
6 OF 23	159+00	181+00						44.00										219	20676	1258	20676					
7 OF 23	181+00	203+00						44.00										235	21945	1387	21945					
8 OF 23	203+00	225+00						44.00										219	20684	2406	20684					
9 OF 23	225+00	247+00						44.00										219	20706	1295	20706					
10 OF 23	247+00	269+00			1652		53	44.00	181.00	181	181	8						245	23016	1143	23016				86.4	
11 OF 23	269+00	291+00			108		4	44.00	13.00	13	13	1						223	21033	1630	21033				8.1	
12 OF 23	291+00	313+00						44.00										221	20820	935	20820					
13 OF 23	313+00	335+00						44.00										237	21946	1233	21946					
14 OF 23	335+00	357+00						44.00										218	20688	1326	8197	12491				
15 OF 23	357+00	379+00						44.00										232	21700	1694		21700				
16 OF 23	379+00	401+00						44.00										234	21681	1540		21681				
17 OF 23	401+00	423+00						44.00										218	20687			20687				
18 OF 23	423+00	445+00						44.00										243	22249	791		22249			7.2	
19 OF 23	445+00	467+00						44.00										204	19613	672		19613			81.4	
20 OF 23	467+00	489+00			995		33	44.00	104.00	104	104	5						222	20794			17599	3195	698	109.7	586
21 OF 23	489+00	507+38			500		24	36.76	71.00	71	71	3						182	17290			17190	100	22	86.9	
22 OF 23	10+30	25+50						15.20										67	5815	2369						
23 OF 23	10+85	23+80						12.95										57	4977	1247						
		TOTALS:	0	0	3255	0	114	775.91	369	369	369	17	0	0	0	0	0	3958	370876	22068	203579	153210	3295	720	379.7	586

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

* FINAL LOCATIONS OF HMA LEVEL-UP TO BE DETERMINED BY THE ENGINEER.

SUMMARY OF ROADWAY QUANTITIES (US 181, CSJ 0100-02-067)

ITEM			454	454	460	467	480	496	506	506	543	543	540	540	540	540	542	542	542	544	544	3085
DESCRIPTION			6008	6009	6011	6547	6001	6043	6042	6043	6001	6019	6001	6006	6016	6038	6001	6002	6004	6001	6003	6001
SHEET NUMBER	STATION TO STATION		HEADER TYPE EXPANSION JOINT	JOINT SEALANT	CMP AR (GAL STL DES 4)	SET (TY II) (DES 4) (CMP) (4:1) (C)	CLEAN EXIST CULVERTS	REMOV STR (SMALL FENCE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)	CABLE BARRIER SYSTEM (TL-3)	CABLE BARRIER TERMINAL SECTION (TL-3)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	CONNECTOR PLATE FOR THRIE BEAM	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	UNDERSEAL COURSE
			CF	LF	LF	EA	EA	LF	LF	LF	LF	EA	LF	EA	EA	EA	LF	EA	EA	EA	EA	# SY
	FROM	TO																				
4 OF 23	133+50	137+00																				3857
5 OF 23	137+00	159+00																				20699
6 OF 23	159+00	181+00																				20676
7 OF 23	181+00	203+00																				21945
8 OF 23	203+00	225+00																				20684
9 OF 23	225+00	247+00																				20706
10 OF 23	247+00	269+00							1425	1425			1425		5		1225			4	9	23016
11 OF 23	269+00	291+00							63	63			62.5				62.5			1	1	21033
12 OF 23	291+00	313+00																				20820
13 OF 23	313+00	335+00																				21946
14 OF 23	335+00	357+00																				20688
15 OF 23	357+00	379+00																				21700
16 OF 23	379+00	401+00																				21681
17 OF 23	401+00	423+00																				20687
18 OF 23	423+00	445+00							20	20	145	1										22249
19 OF 23	445+00	467+00							180	180	2200											19613
20 OF 23	467+00	489+00	98	586					918	918	1446	3	837.5	4	2		825	2	2	2	2	20794
21 OF 23	489+00	507+38							598	598	1235	2	537.5	4	2		470	2	2	2	2	17290
22 OF 23	10+30	25+50																				5815
23 OF 23	10+85	23+80																				4977
		TOTALS:	98	586	0	0	0	0	3204	3204	5026	6	2862.5	8	9	0	2583	4	4	9	14	370876

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Texas Department of Transportation

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3131 BRIARPARK, SUITE 200
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TBPE REG. NO. F-2742

US 181
ROADWAY SUMMARY

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			25
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SUMMARY OF ROADWAY QUANTITIES (US 87, CSJ 0143-01-060)

			ITEM	104	132	134	161	164	164	168	340	3077	351	351	354	432	432	438	454
			DESCRIPTION	6054	6019	6002	6017	6033	6051	6001	6247	6023	6004	6013	6208	6001	6045	6009	6009
SHEET NUMBER	STATION TO STATION			REMOVING CONCRETE(MOW STRIP)	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	BACKFILL (TY B)	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (SANDY)	DRILL SEED (TEMP)(WARM OR COOL)	VEGETATIVE WATERING	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	SP MIXES SP-C SAC-B PG70-22	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	RIPRAP (CONC)(4 IN)	RIPRAP (MOW STRIP)(4 IN)	CLEANING EXISTING JOINTS	JOINT SEALANT
				LF	CY	STA	SY	SY	SY	MG	∗ TON	# SY	SY	SY	SY	CY	CY	LF	LF
	FROM	TO																	
1 OF 8	36+50	50+00									114	9900	5388		9900				
2 OF 8	50+00	72+00		115	4		25	25	25	1	164	14354	5021	1601	14354		6	213	213
3 OF 8	72+00	94+00		115	4	23	25	25	25	1	116	10892	3155		10892		6		
4 OF 8	94+00	116+00			3	22	19	19	19	1	124	10755	2491		10755	4	5		
5 OF 8	116+00	138+00				21					127	11001	2202		11001				
6 OF 8	138+00	160+00									162	14063	1422		14063				
7 OF 8	160+00	182+00									186	16134	4116		16134				
8 OF 8	182+00	184+73									23	2009	850		2009				
			TOTALS:	**230**	**11**	**66**	**69.0**	**69.0**	**69.0**	**3**	**1016**	**89108**	**24645**	**1601**	**89108**	**4**	**17**	**213.0**	**213.0**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

∗ FINAL LOCATIONS OF HMA LEVEL-UP TO BE DETERMINED BY THE ENGINEER.

SUMMARY OF ROADWAY QUANTITIES (US 87, CSJ 0143-01-060)

			ITEM	479	506	506	540	540	544	544	540	542	542	3085
			DESCRIPTION	6001	6041	6043	6001	6007	6001	6003	6016	6001	6002	6001
SHEET NUMBER	STATION TO STATION			ADJUSTING MANHOLES	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (TL2)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	DOWNSTREAM ANCHOR TERMINAL SECTION	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	UNDERSEAL COURSE
				EA	LF	LF	LF	EA	EA	EA	EA	LF	EA	# SY
	FROM	TO												
1 OF 8	36+50	50+00		6										9900
2 OF 8	50+00	72+00		7	123	123	123	62.5	1	1	1		65		14354
3 OF 8	72+00	94+00			123	123	62.5	1	1	1			65		10892
4 OF 8	94+00	116+00			98	98	37.5		1		1		100	1	10755
5 OF 8	116+00	138+00													11001
6 OF 8	138+00	160+00													14063
7 OF 8	160+00	182+00		3											16134
8 OF 8	182+00	184+73													2009
			TOTALS:	**16**	**344**	**344**	**162.5**	**2**	**3**	**2**	**1**	**230**	**1**	**89108**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

Texas Department of Transportation

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 87
ROADWAY SUMMARY

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			26
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SUMMARY OF GRADING QUANTITIES (US 181, CSJ 0100-02-067)

ITEM			100	104	104	105	110	132	134	161	164	164	168	169	316	316	316	340	340	3077	351	354	432	432	438
DESCRIPTION			6001	6009	6054	6044	6002	6019	6002	6017	6033	6051	6001	6007	6222	6240	6419	6011	6247	6023	6004	6003	6001	6026	6009
SHEET NUMBER	STATION TO STATION		PREPARING ROW	REMOVING CONC (RIPRAP)	REMOVING CONCRETE(MOW STRIP)	REMOVING STAB BASE AND ASPH PAV (10")	EXCAVATION (CHANNEL)	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	BACKFILL (TY B)	COMPOST MANUF TOPSOIL (4")	DRILL SEEDING (PERM) (RURAL) (SANDY)	DRILL SEED (TEMP)(WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 2) (TY G)	AGGR(TY-PB GR-3 SAC-B)	AGGR(TY-PD GR-4 SAC-B)	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	D-GR HMA(SQ) TY-B PG64-22	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	SP MIXES SP-C SAC-B PG70-22	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	PLAN & TEXT ASPH CONC PAV(0" TO 3")	RIPRAP (CONC)(4 IN)	RIPRAP (STONE COMMON)(DRY)(18 IN)	CLEANING EXISTING JOINTS
			AC	SY	LF	SY	CY	CY	STA	SY	SY	SY	MG	SY	# SY	# SY	# SY	# SY	* TON	# SY	SY	SY	CY	CY	LF
	FROM	TO																							
1 OF 1	GRADING AT RICHTER					14	21	11		185	185	185	9	185				49		410	361	361			
1 OF 4	GRADING AT UPRR						129	67		841	841	841	39	841										65	
1 OF 6	GRADING AT LP 1604						197	19		1501	1501	1501	70	1501											
2 OF 6	GRADING AT LP 1604		0.25	100			185	1		657	657	657	31	657									38.4	89	
1 OF 5	GRADING AT CPS PLANT						469	58		2071	2071	2071	97	2071										245.5	
TOTALS:			**0.25**	**100**	**0**	**14**	**1001**	**156**	**0**	**5255**	**5255**	**5255**	**246**	**5255**	**0**	**0**	**0**	**49**	**0**	**410**	**361**	**361**	**38.4**	**399.5**	**0**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

* FINAL LOCATIONS OF HMA LEVEL-UP TO BE DETERMINED BY THE ENGINEER.

SUMMARY OF GRADING QUANTITIES (US 181, CSJ 0100-02-067)

ITEM			460	467	480	496	496	506	506	543	543	540	540	540	540	542	542	542	544	544	3085
DESCRIPTION			6011	6547	6001	6006	6043	6042	6043	6001	6019	6001	6006	6016	6038	6001	6002	6004	6001	6003	6001
SHEET NUMBER	STATION TO STATION		CMP AR (GAL STL DES 4)	SET (TY II) (DES 4) (CMP) (4: 1) (C)	CLEAN EXIST CULVERTS	REMOV STR (HEADWALL)	REMOV STR (SMALL FENCE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)	CABLE BARRIER SYSTEM (TL-3)	CABLE BARRIER TERMINAL SECTION (TL-3)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	DOWNSTREAM ANCHOR TERMINAL SECTION	CONNECTOR PLATE FOR THRIE BEAM	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	UNDERSEAL COURSE
			LF	EA	EA	EA	LF	LF	LF	LF	EA	LF	EA	EA	EA	LF	EA	EA	EA	EA	# SY
	FROM	TO																			
1 OF 1	GRADING AT RICHTER		8	1	1	1															459
1 OF 4	GRADING AT UPRR				1			90	90												
1 OF 6	GRADING AT LP 1604							210	210												
2 OF 6	GRADING AT LP 1604				1																
1 OF 5	GRADING AT CPS PLANT							150	150												
TOTALS:			**8**	**1**	**3**	**1**	**0**	**450**	**450**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**459**

FOR CONTRACTOR'S INFORMATION ONLY, SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY.

Texas Department of Transportation

PGAL

3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181
GRADING SUMMARY

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			27
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0073-12-015

PAVEMENT MARKING LAYOUT SHEET	FROM	TO	533 6003	666 6033	666 6036	666 6048	666 6054	666 6078	666 6102	666 6225	666 6226
			RUMBLE STRIPS (SHOULDER) ASPHALT	REFL PAV MRK TY I (W)8"(LNDP) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"
	STATION	STATION	LF	LF	LF	LF	EA	EA	EA	LF	LF
SHEET 1 OF 23	BEGIN	294+00	4114							4524	
SHEET 2 OF 23	294+00	304+00	3718	42						3968	42
SHEET 3 OF 23	304+00	115+00	4302	134	567		4	3	6	4702	701
SHEET 4 OF 23	115+00	133+50	6786		1375	363	11	10	12	7586	1375
CSJ 0073-12-015 TOTALS			**18920**	**176**	**1942**	**363**	**15**	**13**	**18**	**20780**	**2118**

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0073-12-015

PAVEMENT MARKING LAYOUT SHEET	FROM	TO	666 6230	666 6231	666 6232	666 6243	666 6306	666 6309	666 6321	672 6009	672 6010
			PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (YLD TRI)	RE PM W/RET REQ TY I (W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
	STATION	STATION	LF	EA	EA	EA	LF	LF	LF	EA	EA
SHEET 1 OF 23	BEGIN	294+00					410	2057	2057		21
SHEET 2 OF 23	294+00	304+00					250	1859	1859		14
SHEET 3 OF 23	304+00	115+00		4	3	6	400	2102	2200		25
SHEET 4 OF 23	115+00	133+50	363	11	10	12	800	3256	3530	4	96
CSJ 0073-12-015 TOTALS			**363**	**15**	**13**	**18**	**1860**	**9274**	**9646**	**4**	**156**

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0073-12-015

SIGNING LAYOUT SHEET	FROM	TO	644 6001	644 6002	644 6004	644 6007	644 6030	644 6034	644 6076	658 6014		658 6061
			IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)		INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2
	STATION	STATION	EA	EA	EA	EA	EA	EA	EA	EA		EA
SHEET 1 OF 23	BEGIN	294+00			1		1		2			13
SHEET 2 OF 23	294+00	304+00	1						1			16
SHEET 3 OF 23	304+00	115+00	5				2		6			16
SHEET 4 OF 23	115+00	133+50	20		12		10	1	37			
CSJ 0073-12-015 TOTALS			**26**		**13**		**13**	**1**	**46**			**45**

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 1 OF 3

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			28
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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FILE NAME: $FILE$

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0100-02-067

PAVEMENT MARKING LAYOUT SHEET	FROM	TO	533 6003	666 6033	666 6036	666 6048	666 6054	666 6078	666 6102	666 6225	666 6226
			RUMBLE STRIPS (SHOULDER) ASPHALT	REFL PAV MRK TY I (W)8"(LNDP) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"
	STATION	STATION	LF	LF	LF	LF	EA	EA	EA	LF	LF
SHEET 4 OF 23	133+50	137+00	1369		515	56	3	3		1529	515
SHEET 5 OF 23	137+00	159+00	8600		765		6	6	16	9700	765
SHEET 6 OF 23	159+00	181+00	8470		400		4	4	16	9570	400
SHEET 7 OF 23	181+00	203+00	8840		840	103	4	4	10	9890	840
SHEET 8 OF 23	203+00	225+00	8590		400		4	4	16	9690	400
SHEET 9 OF 23	225+00	247+00	8485		400		4	4	16	9485	400
SHEET 10 OF 23	247+00	269+00	8825		1735	28	8	8	16	9925	1735
SHEET 11 OF 23	269+00	291+00	8660		750		6	6	16	9760	750
SHEET 12 OF 23	291+00	313+00	8602		400	22	4	4	16	9602	400
SHEET 13 OF 23	313+00	335+00	8705		800	105	8	8	16	9755	800
SHEET 14 OF 23	335+00	357+00	8680		400		4	4	16	9780	400
SHEET 15 OF 23	357+00	379+00	8490		800		8	8	32	9590	800
SHEET 16 OF 23	379+00	401+00	8000		800		8	8	32	9000	800
SHEET 17 OF 23	401+00	423+00	8680		450		4	4	16	9780	450
SHEET 18 OF 23	423+00	445+00	8116		2315	228	14	14	5	9106	2315
SHEET 19 OF 23	445+00	467+00	8800		155		1	1		9900	155
SHEET 20 OF 23	467+00	489+00	8600		360		3	3	16	9700	360
SHEET 21 OF 23	489+00	END	7330		215		2	2	16	8280	215
SHEET 22 OF 23	LP 1604 ACCESS RD S		2900			54				5820	
SHEET 23 OF 23	LP 1604 ACCESS RD N		2580		102	31				5194	102
CSJ 0100-02-067 TOTALS			**151322**		**12602**	**627**	**95**	**95**	**271**	**175056**	**12602**

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0100-02-067

PAVEMENT MARKING LAYOUT SHEET	FROM	TO	666 6230	666 6231	666 6232	666 6243	666 6306	666 6309	666 6321	672 6009	672 6010
			PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (YLD TRI)	RE PM W/RET REQ TY I (W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R
	STATION	STATION	LF	EA	EA	EA	LF	LF	LF	EA	EA
SHEET 4 OF 23	133+50	137+00	56	3	3		160	679	690	4	34
SHEET 5 OF 23	137+00	159+00		6	6	16	1100	4400	4200	4	94
SHEET 6 OF 23	159+00	181+00		4	4	16	1100	4290	4180	4	75
SHEET 7 OF 23	181+00	203+00	103	4	4	10	1050	4660	4180	16	400
SHEET 8 OF 23	203+00	225+00		4	4	16	1100	4400	4190	6	75
SHEET 9 OF 23	225+00	247+00		4	4	16	1000	4295	4190	6	75
SHEET 10 OF 23	247+00	269+00	28	8	8	16	1100	4645	4180	12	120
SHEET 11 OF 23	269+00	291+00		6	6	16	1100	4400	4260	6	93
SHEET 12 OF 23	291+00	313+00	22	4	4	16	1000	4322	4280	6	75
SHEET 13 OF 23	313+00	335+00	105	8	8	16	1050	4422	4283	18	73
SHEET 14 OF 23	335+00	357+00		4	4	16	1100	4400	4280	6	75
SHEET 15 OF 23	357+00	379+00		8	8	32	1100	4400	4090	12	40
SHEET 16 OF 23	379+00	401+00		8	8	32	1000	4000	4000	12	40
SHEET 17 OF 23	401+00	423+00		4	4	16	1100	4400	4280	6	75
SHEET 18 OF 23	423+00	445+00	228	14	14	5	990	3940	4176	12	238
SHEET 19 OF 23	445+00	467+00		1	1		1100	4400	4400		8
SHEET 20 OF 23	467+00	489+00		3	3	16	1100	4400	4200	6	18
SHEET 21 OF 23	489+00	END		2	2	16	950	3770	3560	4	11
SHEET 22 OF 23	LP 1604 ACCESS RD S		54					2900	2920	146	
SHEET 23 OF 23	LP 1604 ACCESS RD N		31					2580	2614	131	102
CSJ 0100-02-067 TOTALS			**627**	**95**	**95**	**271**	**18200**	**79703**	**77153**	**417**	**1721**

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING AND PAVEMENT MARKING SUMMARY

SHEET 2 OF 3

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			29
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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FILE NAME: $FILE$

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0100-02-067

SIGNING LAYOUT SHEET	FROM	TO	644 6001	644 6002	644 6004	644 6007	644 6030	644 6034	644 6076	658 6014	658 6061	658 6088
			IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF
	STATION	STATION	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
SHEET 4 OF 23	133+50	137+00	5		4		2	1	11			
SHEET 5 OF 23	137+00	159+00	11		3		2		12			
SHEET 6 OF 23	159+00	181+00	11	2	2				12			
SHEET 7 OF 23	181+00	203+00	8	1	4		7		18			
SHEET 8 OF 23	203+00	225+00	12		3		3		15			
SHEET 9 OF 23	225+00	247+00	8	1	5		2		14			
SHEET 10 OF 23	247+00	269+00	21	1	7		4		31		25	
SHEET 11 OF 23	269+00	291+00	14		2		2		13		2	
SHEET 12 OF 23	291+00	313+00	10	1	5				15			
SHEET 13 OF 23	313+00	335+00	13	3	10		9		28			
SHEET 14 OF 23	335+00	357+00	8		2		3		9			
SHEET 15 OF 23	357+00	379+00	14		4				12			
SHEET 16 OF 23	379+00	401+00	19	2	10		1		30			
SHEET 17 OF 23	401+00	423+00	9		2				7			
SHEET 18 OF 23	423+00	445+00	21	1	10	1	13		39			3
SHEET 19 OF 23	445+00	467+00	4		3		2		8			28
SHEET 20 OF 23	467+00	489+00	7		3		2		10	17	16	21
SHEET 21 OF 23	489+00	END	14		5		2		19		13	16
SHEET 22 OF 23	LP 1604 ACCESS RD S		4		2		1		7			
SHEET 23 OF 23	LP 1604 ACCESS RD N		5		4		1		9			
CSJ 0100-02-067 TOTALS			**218**	**12**	**90**	**1**	**56**	**1**	**319**	**17**	**56**	**68**

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING AND PAVEMENT
MARKING SUMMARY

SHEET 3 OF 3

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			30
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0143-01-060

PAVEMENT MARKING LAYOUT SHEET	FROM	TO	666 6036	666 6048	666 6054	666 6078	666 6102	666 6224	666 6226	666 6230	666 6231	666 6232	666 6243	666 6300	666 6303	666 6312	666 6315	672 6007	672 6009
			REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	PAVEMENT SEALER 4"	PAVEMENT SEALER 8"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (YLD TRI)	RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)4"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (Y)4"(SLD) (100MIL)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
	STATION	STATION	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	EA	EA
SHEET 1 OF 8	BEGIN	50+00	680	746	10	6	9	2930	680	746	10	6	9	620		230	2080	74	42
SHEET 2 OF 8	50+00	72+00	508	411	9	3		6012	508	411	9	3		1020		500	4492	44	145
SHEET 3 OF 8	72+00	94+00						9500						1100	4000		4400	55	55
SHEET 4 OF 8	94+00	116+00						9900						1100	4400		4400	55	55
SHEET 5 OF 8	116+00	138+00	20	64		1		10088	20	64		1		1090	4158		4840	56	97
SHEET 6 OF 8	138+00	160+00	1245	616	21	6	24	6242	1245	616	21	6	24	1050	100	800	4292	115	136
SHEET 7 OF 8	160+00	182+00	180	184	16	2		6220	180	184	16	2		1060		920	4240	63	126
SHEET 8 OF 8	182+00	END		68	4			826		68	4			140		140	546	14	14
CSJ 0143-01-060 TOTALS			**2633**	**2089**	**60**	**18**	**33**	**51718**	**2633**	**2089**	**60**	**18**	**33**	**7180**	**12658**	**2590**	**29290**	**476**	**670**

SIGNING AND PAVEMENT MARKING SUMMARY
CSJ 0143-01-060

SIGNING LAYOUT SHEET	FROM	TO	644 6001	644 6004	644 6076	658 6014	658 6061
			IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW)SZ 1 (BRF)GF2
	STATION	STATION	EA	EA	EA	EA	EA
SHEET 1 OF 8	BEGIN	50+00		6	2		
SHEET 2 OF 8	50+00	72+00		6	2	22	3
SHEET 3 OF 8	72+00	94+00					3
SHEET 4 OF 8	94+00	116+00					
SHEET 5 OF 8	116+00	138+00	1		1		
SHEET 6 OF 8	138+00	160+00		3	1		
SHEET 7 OF 8	160+00	182+00	2	1	3		
SHEET 8 OF 8	182+00	END		2			
CSJ 0143-01-060 TOTALS			**3**	**18**	**9**	**22**	**6**

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING SUMMARY

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			31
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		
1	1	W13-2	EXIT 40 MPH	48X60	✓		S80	1	SA	T		
	2	W1-2L	35 MPH	36X36	✓		10BWG	1	SA	T		
		W13-1P		18X18	✓							
2	1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36X36	✓		10BWG	1	SA	P		
		M3-1	NORTH 181 SOSS SOSS	24X12	✓							
3	1	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							
	2	W9-2TL	LANE ENDS MERGE LEFT	36X36	✓		10BWG	1	SA	P		
		M3-3	SOUTH 181 SOSS SOSS	24X12	✓							
	3	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							
	4	W3-3		48X48	✓		S80	1	SA	T		
	5	R3-5R	ONLY	30X36	✓		10BWG	1	SA	P		
	6	R2-1	SPEED LIMIT 55	48X60	✓		S80	1	SA	T		
	7	R1-1	STOP	36X36	✓		10BWG	1	SA	P		
4	1	D21-1	Old Corpus Christi Rd	120X12	✓		10BWG	1	SA	T		
	2	R3-5R	ONLY	30X36	✓		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

US 181
SUMMARY OF
SMALL SIGNS

SOSS SHEET 1 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		32

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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
		M3-1B	NORTH / INTERSTATE 37	24X12	✓							
4	3	M1-1		24X24	✓		10BWG	1	SA	P		
		M6-3B		21X15	✓							
	4	R5-1a	WRONG WAY	36X24	✓		10BWG	1	SA	P		
	5	R5-1a	WRONG WAY / CELL PHONE USE PROHIBITED UP TO $200 FINE (BACK-BACK)	36X24	✓		10BWG	1	SA	T		
		S7-1T		36X18	✓							
	6	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	7	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	8	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	9	R6-1R	ONE WAY / ONE WAY (BACK-BACK)	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	10	R5-1	DO NOT ENTER / LEFT LANE MUST TURN LEFT (BACK-BACK)	48X48	✓		S80	1	SA	T		
		R3-7L		36X36								
	11	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	12	R5-1	DO NOT ENTER / RIGHT LANE MUST TURN RIGHT (BACK-BACK)	48X48	✓		S80	1	SA	T		
		R3-7R		36X36								
		M3-3	SOUTH / 181	24X12	✓							
	13	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
		M4-5B	TO NORTH / INTERSTATE 37	24X12	✓							
		M3-1B		24X12	✓							
	14	M1-1		24X24	✓		10BWG	1	SA	P		
		M6-3B		21X15	✓							

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

US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 2 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		33

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
4	15	R5-1 R3-7R	DO NOT ENTER / RIGHT LANE MUST TURN RIGHT — BACK-BACK	48X48 36X36	✓		S80	1	SA	T		
	16	R5-1 R3-7L	DO NOT ENTER / LEFT LANE MUST TURN LEFT — BACK-BACK	48X48 36X36	✓		S80	1	SA	T		
	17	R6-1R R6-1L	ONE WAY / ONE WAY — BACK-BACK	54X18 54X18	✓ ✓		10BWG	1	SA	T		
	18	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	19	R19-1T	STOP FOR SCHOOL BUS LOADING OR UNLOADING	48X60	✓		S80	1	SA	T		
	20	D14-4T	ADOPT A HIGHWAY NEXT 2 MILES THIS SECTION AVAILABLE FOR ADOPTION (210) 633-1439	48X48	✓		S80	1	SA	T		
	21	R5-1a	WRONG WAY	36X24	✓		10BWG	1	SA	P		
	22	R5-1a	WRONG WAY	36X24	✓		10BWG	1	SA	P		
	23	D21-1	← Old Corpus Christi Rd	120X12	✓		10BWG	1	SA	T		
	24	W3-3		48X48	✓		S80	1	SA	T		
	25	W2-2L		36X36	✓		10BWG	1	SA	P		
	26	R3-5R	ONLY	30X36	✓		10BWG	1	SA	P		

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

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Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

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SHEET 3 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	SAT	BEXAR		34

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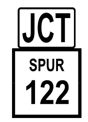
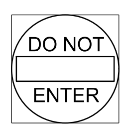
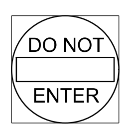
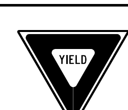
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
4	27	R6-1R		54X18	✓		10BWG	1	SA	T		
	28	M2-1 M1-6Sx		21X15 24X24	✓ ✓		10BWG	1	SA	P		
	29	M3-1 M1-4		24X12 24X24	✓ ✓		10BWG	1	SA	P		
	30	R6-1R		54X18	✓		10BWG	1	SA	T		
	31	D21-1		72X12	✓		10BWG	1	SA	T		
	32	R3-5L		30X36	✓		10BWG	1	SA	P		
	33	R5-1		48X48	✓		S80	1	SA	T		
	34	R5-1		48X48	✓		S80	1	SA	T		
	35	M3-3 M1-4 M6-3 M4-5B M3-1B M1-1 M6-2RB		24X12 24X24 21X15 24X12 24X12 24X24 21X15	✓ ✓ ✓ ✓ ✓ ✓ ✓		S80	1	SA	U	1EXT	
	36	R6-1R		54X18	✓		10BWG	1	SA	T		
	37	R1-2		36X36X36	✓		10BWG	1	SA	P		

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

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Texas Department of Transportation — Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS

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	SAT		BEXAR	35

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
4	38	R5-1	DO NOT ENTER / LEFT LANE MUST TURN LEFT / BACK-BACK	48X48	✓		S80	1	SA	T		
		R3-7L		36X36	✓							
	39	W1-8L		12X18	✓		10BWG	1	SA	P		
	40	W1-8L		12X18	✓		10BWG	1	SA	P		
	41	D1-1	← Floresville	72X12	✓		10BWG	1	SA	T		
		M3-3	SOUTH 181 ←	24X12	✓							
	42	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
	43	R4-7		24X30	✓		10BWG	1	SA	P		
	44	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	45	R8-3D	NO PARKING	24X30	✓		10BWG	1	SA	P		
	46	W2-2R		36X36	✓		10BWG	1	SA	P		
	47	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	48	R5-1	DO NOT ENTER / LEFT LANE MUST TURN LEFT / BACK-BACK	48X48	✓		S80	1	SA	T		
		R3-7L		36X36								
	49	R5-1	DO NOT ENTER / RIGHT LANE MUST TURN RIGHT / BACK-BACK	48X48	✓		S80	1	SA	T		
		R3-7R		36X36								

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4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		36

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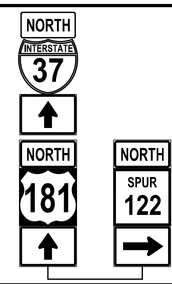
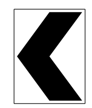
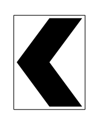
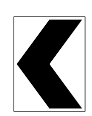
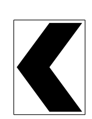
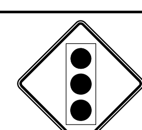
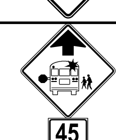
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
4	50	M3-1B M1-1 M6-3B M3-1 M1-4 M6-3 M3-1 M1-6Sx M6-1		24X12 24X24 21X15 24X12 24X24 21X15 24X12 21X15 21X15	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		S80	1	SA	U	1EXT	
	51	W1-8L		12X18	✓		10BWG	1	SA	P		
	52	R3-5R		30X36	✓		10BWG	1	SA	P		
	53	R8-3D		24X30	✓		10BWG	1	SA	P		
	54	D21-1		72X12	✓		10BWG	1	SA	T		
	55	W1-8L		12X18	✓		10BWG	1	SA	P		
5	1	W1-8L		12X18	✓		10BWG	1	SA	P		
	2	R2-1		48X60	✓		S80	1	SA	T		
	3	W1-8L		12X18	✓		10BWG	1	SA	P		
	4	W1-8L		12X18	✓		10BWG	1	SA	P		
	5	W3-3		48X48	✓		S80	1	SA	T		
	6	S3-1 W13-1P		36X36 18X18	✓ ✓		10BWG	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
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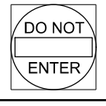
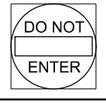
SUMMARY OF SMALL SIGNS

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
5	7	R3-5L		30X36	✓		10BWG	1	SA	P		
	8	R5-1		36X36	✓		10BWG	1	SA	P		
	9	R5-1		36X36	✓		10BWG	1	SA	P		
	10	R1-2		36X36X36	✓		10BWG	1	SA	P		
	11	R6-1L		54X18	✓		10BWG	1	SA	T		
	12	R6-1L		54X18	✓		10BWG	1	SA	T		
	13	R1-2		36X36X36	✓		10BWG	1	SA	P		
	14	R5-1		36X36	✓		10BWG	1	SA	P		
	15	R5-1		36X36	✓		10BWG	1	SA	P		
	16	R3-5L		30X36	✓		10BWG	1	SA	P		
6	1	R4-3		24X30	✓		10BWG	1	SA	P		
	2	R3-5L		30X36	✓		10BWG	1	SA	P		

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Texas Department of Transportation

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
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6	3	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	4	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	5	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	6	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
		D3-1G	DONOP RD US 181 S	32X8	✓							
	7	D3-1G	STOP	24X8	✓		10BWG	1	SA	P	BM	
		R1-1		36x36	✓							
	8	R6-1R	ONE WAY ONE WAY BACK-BACK	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	9	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	10	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	11	D3-1G	DONOP RD	32X8	✓		10BWG	1	SA	P	BM	
	12	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	13	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
		M3-3	SOUTH 181	24X12	✓							
	14	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							

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8-16		SAT	BEXAR		39

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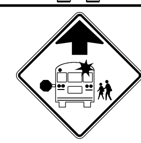
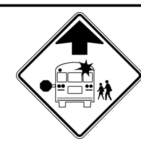
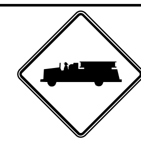
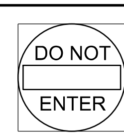
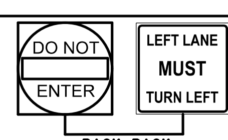
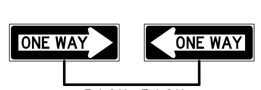
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
6	15	M3-1 M1-4 D10-7aT		24X12 24X24 3X10	✓ ✓ ✓		10BWG	1	SA	P		
7	1	S3-1		36X36	✓		10BWG	1	SA	P		
	2	S3-1		36X36	✓		10BWG	1	SA	P		
	3	W11-8L		36X36	✓		10BWG	1	SA	P		
	4	R3-5L		30X36	✓		10BWG	1	SA	P		
	5	D21-1		54X12	✓		10BWG	1	SA	T		
	6	I-2dT		108X36	✓		S80	1	SA	T		
	7	I-2dT		108X36	✓		S80	1	SA	T		
	8	R5-1		48X48	✓		S80	1	SA	T		
	9	R1-2		36X36X36	✓		10BWG	1	SA	P		
	10	R5-1 R3-7L		48X48 36X36	✓		S80	1	SA	T		
	11	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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

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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 9 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-16 8-16	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		40

18

DATE: 9/23/2020 11:15:46 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\268053\SOSS09.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
7	12	D3-1G	US 181 / FOSTER RD	24X8	✓		10BWG	1	SA	P	BM	
		D3-1G		32X8	✓							
	13	R6-1R	ONE WAY / ONE WAY BACK-BACK	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	14	R5-1	DO NOT ENTER / LEFT LANE MUST TURN LEFT BACK-BACK	48X48	✓		S80	1	SA	T		
		R3-7L		36X36								
	15	R1-2	YIELD / DO NOT ENTER BACK-BACK	36X36X36	✓		S80	1	SA	T		
		R5-1		48X48	✓							
	16	R5-1	DO NOT ENTER	48X48	✓		S80	1	SA	T		
	17	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	18	D21-1	Foster Rd	54X12	✓		10BWG	1	SA	T		
	19	W2-1		30X30	✓		10BWG	1	SA	P		
	20	W11-8L		36X36	✓		10BWG	1	SA	P		
8	1	S3-1		36X36	✓		10BWG	1	SA	P		
	2	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	3	R2-1	SPEED LIMIT 55	48X60	✓		S80	1	SA	T		

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Texas Department of Transportation

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US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 10 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		41

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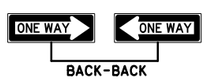
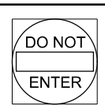
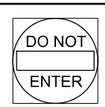
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
8	4	R2-1		48X60	✓		S80	1	SA	T		
	5	R2-1		48X60	✓		S80	1	SA	T		
	6	S3-1		36X36	✓		10BWG	1	SA	P		
	7	R3-5L		30X36	✓		10BWG	1	SA	P		
	8	R5-1		36X36	✓		10BWG	1	SA	P		
	9	R5-1		36X36	✓		10BWG	1	SA	P		
	10	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		
	11	R1-2		36X36X36	✓		10BWG	1	SA	P		
	12	R1-2		36X36X36	✓		10BWG	1	SA	P		
	13	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		
	14	R5-1		36X36	✓		10BWG	1	SA	P		
	15	R5-1		36X36	✓		10BWG	1	SA	P		

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

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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 11 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		42

18

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) 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
8	16	R3-5L		30X36	✓		10BWG	1	SA	P		
	17	W3-5		36X36	✓		10BWG	1	SA	P		
	18	W3-5		36X36	✓		10BWG	1	SA	P		
9	1	R6-1R		54X18	✓		10BWG	1	SA	T		
	2	D14-4T		48X48	✓		S80	1	SA	T		
	3	D14-4T		48X48	✓		S80	1	SA	T		
	4	R3-5L		30X36	✓		10BWG	1	SA	P		
	5	R5-1		36X36	✓		10BWG	1	SA	P		
	6	R5-1		36X36	✓		10BWG	1	SA	P		
	7	R1-2		36X36X36	✓		10BWG	1	SA	P		
	8	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		
	9	D3-1G D3-1G R1-1		24X8 24X8 36X36	✓ ✓ ✓		10BWG	1	SA	P	BM	

ALUMINUM SIGN BLANKS THICKNESS	
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7.5 to 15	0.100"
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Texas Department of Transportation

Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS

SHEET 12 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		43

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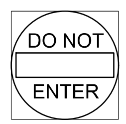
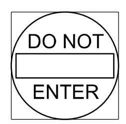
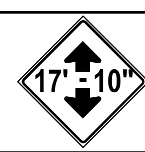
SUMMARY OF SMALL SIGNS

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
9	10	R6-1L		54X18	✓		10BWG	1	SA	T		
	11	R1-2		36X36X36	✓		10BWG	1	SA	P		
	12	R6-1R		54X18	✓		10BWG	1	SA	T		
	13	R5-1		36X36	✓		10BWG	1	SA	P		
	14	R5-1		36X36	✓		10BWG	1	SA	P		
	15	R6-1R		54X18	✓		10BWG	1	SA	T		
	16	R3-5L		30X36	✓		10BWG	1	SA	P		
10	1	M3-1 M1-4		24X12 24X24	✓ ✓		10BWG	1	SA	P		
	2	W12-2		36X36	✓		10BWG	1	SA	P		
	3	R2-1		48X60	✓		S80	1	SA	T		
	4	R3-5L		30X36	✓		10BWG	1	SA	P		
	5	W11-10L		36X36	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
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7.5 to 15	0.100"
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Texas Department of Transportation — Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 13 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	DIST SAT		COUNTY BEXAR	SHEET NO. 44

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
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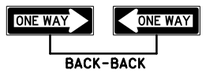
10	6	W11-10L		36X36	✓		10BWG	1	SA	P		
	7	R5-1		36X36	✓		10BWG	1	SA	P		
	8	R5-1		36X36	✓		10BWG	1	SA	P		
	9	R1-2		36X36X36	✓		10BWG	1	SA	P		
	10	R6-1L		54X18	✓		10BWG	1	SA	T		
		M3-1		24X12	✓							
	11	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
		D3-1G		24X8	✓							
	12	D3-1G		42X8	✓		10BWG	1	SA	P	BM	
		R1-1		36X36	✓							
	13	R6-1R		54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	14	R1-2		36X36X36	✓		10BWG	1	SA	P		
	15	R5-1		36X36	✓		10BWG	1	SA	P		
	16	R3-5L		30X36	✓		10BWG	1	SA	P		
	17	W13-2		48X60	✓		S80	1	SA	T		

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Texas Department of Transportation

Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS

SHEET 14 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		45

18

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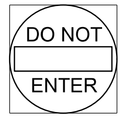
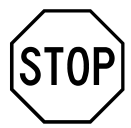
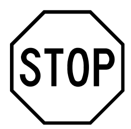
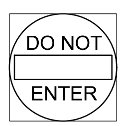
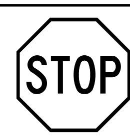
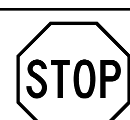
SUMMARY OF SMALL SIGNS

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION: 1EXT or 2EXT / BM / WC / EXAL	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
10	18	R5-1		36X36	✓		10BWG	1	SA	P		
	19	M3-1 M1-4 M6-1		24X12 24X24 21X15	✓ ✓ ✓		10BWG	1	SA	P		
	20	R6-1R		54X18	✓		10BWG	1	SA	T		
	21	R1-1		36X36	✓		10BWG	1	SA	P		
	22	R1-1		36X36	✓		10BWG	1	SA	P		
	23	R5-1		36X36	✓		10BWG	1	SA	P		
	24	W1-1R W13-1P		36X36 18X18	✓ ✓		10BWG	1	SA	P		
	25	E5-1		48X48	✓		S80	1	SA	T		
	26	R1-1		36X36	✓		10BWG	1	SA	T		
	27	E5-1		48X48	✓		S80	1	SA	T		
	28	R6-1R		54X18	✓		10BWG	1	SA	T		
	29	R1-1		36X36	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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Texas Department of Transportation — Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS SHEET 15 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	DIST SAT	COUNTY BEXAR		SHEET NO. 46

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
		M3-3	SOUTH 181	24X12	✓							
10	30	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
	31	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	32	W1-1R	25 MPH	36X36	✓		10BWG	1	SA	T		
		W13-1P		18X18	✓							
	33	W12-2a	18FT 3IN	66X12	✓		10BWG	1	SA	T		
11	1	W11-10L		36X36	✓		10BWG	1	SA	P		
	2	W11-10L		36X36	✓		10BWG	1	SA	P		
	3	W13-2	EXIT 40 MPH	48X60	✓		S80	1	SA	T		
	4	R2-1	SPEED LIMIT 65	48X60	✓		S80	1	SA	T		
	5	R3-5R	ONLY	30X36	✓		10BWG	1	SA	P		
	6	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	7	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	8	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		

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Traffic Operations Division Standard

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SUMMARY OF SMALL SIGNS

SOSS

SHEET 16 OF 36

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4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		47

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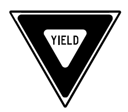
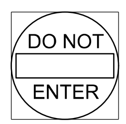
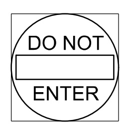
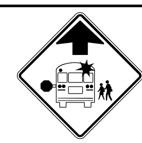
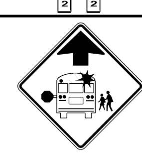
SUMMARY OF SMALL SIGNS

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
11	9	R1-2		36X36X36	✓		10BWG	1	SA	P		
	10	R6-1L		54X18	✓		10BWG	1	SA	T		
	11	R6-1L		54X18	✓		10BWG	1	SA	T		
	12	R1-2		36X36X36	✓		10BWG	1	SA	P		
	13	R5-1		36X36	✓		10BWG	1	SA	P		
	14	R5-1		36X36	✓		10BWG	1	SA	P		
	15	S3-1		36X36	✓		10BWG	1	SA	P		
	16	R3-5L		30X36	✓		10BWG	1	SA	P		
	17	M3-3 M1-4 D10-7aT		24X12 24X24 3X10	✓ ✓ ✓		10BWG	1	SA	P		
	18	M3-1 M1-4 D10-7aT		24X12 24X24 3X10	✓ ✓ ✓		10BWG	1	SA	P		
12	1	S3-1		36X36	✓		10BWG	1	SA	P		
	2	R3-5L		30X36	✓		10BWG	1	SA	P		

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US 181 SUMMARY OF SMALL SIGNS

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FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	DIST SAT	COUNTY BEXAR		SHEET NO. 48

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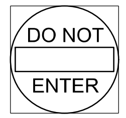
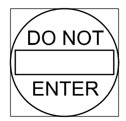
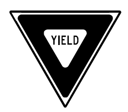
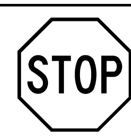
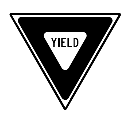
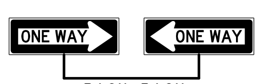
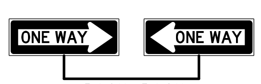
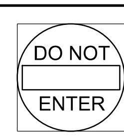
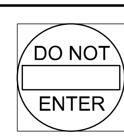
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
12	3	R5-1		36X36	✓		10BWG	1	SA	P		
	4	R6-1R		54X18	✓		10BWG	1	SA	P		
	5	R5-1		36X36	✓		10BWG	1	SA	P		
	6	R1-2		36X36X36	✓		10BWG	1	SA	T		
	7	R1-1		36X36	✓		S80	1	SA	T		
	8	R1-2		36X36X36	✓		10BWG	1	SA	P		
	9	D3-1G D3-1G R1-1		24X8 48X8 36X36	✓ ✓ ✓		10BWG	1	SA	P	BM	
	10	R6-1R R6-1L	 BACK-BACK	54X18 54X18	✓ ✓		10BWG	1	SA	T		
	11	R6-1R R6-1L	 BACK-BACK	54X18 54X18	✓ ✓		10BWG	1	SA	T		
	12	R5-1		36X36	✓		10BWG	1	SA	P		
	13	R5-1		36X36	✓		10BWG	1	SA	P		
	14	R3-5L		30X36	✓		10BWG	1	SA	P		

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Texas Department of Transportation
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SUMMARY OF SMALL SIGNS

SOSS SHEET 18 OF 36

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REVISIONS	0073	12	015,etc	US 181,etc
4-16 8-16	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	49

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		TY = TYPE
										PREFABRICATED	1EXT or 2EXT = # of Ext	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
12	15	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	16	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
13	1	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	2	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	3	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	4	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	5	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
		D3-1G	US 181 DOVE DR	24X8	✓							
	6	D3-1G R1-1	STOP	30X8 36X36	✓ ✓		10BWG	1	SA	P	BM	
	7	R6-1R R6-1L	ONE WAY / ONE WAY BACK-BACK	54X18 54X18	✓ ✓		10BWG	1	SA	T		
	8	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	9	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	10	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		

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SOSS

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REVISIONS 4-16 8-16	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		50

TB

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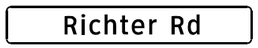
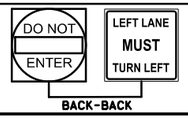
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
13	11	W3-3		48X48	✓		S80	1	SA	T		
	12	R3-5L		30X36	✓		10BWG	1	SA	P		
	13	R6-1R		54X18	✓		10BWG	1	SA	T		
	14	R3-5L		30X36	✓		10BWG	1	SA	P		
	15	D21-1		54X12	✓		10BWG	1	SA	T		
	16	R6-1R		54X18	✓		10BWG	1	SA	T		
	17	R6-1R		54X18	✓		10BWG	1	SA	T		
	18	R5-1		48X48	✓		S80	1	SA	T		
	19	R5-1		48X48	✓		S80	1	SA	T		
	20	R5-1		48X48	✓		S80	1	SA	T		
	21	D3-1B D3-1B		24X8 36X8	✓ ✓		10BWG	1	SA	P	BM	
	22	R5-1 R3-7L		48X48 36X36	✓		S80	1	SA	T		

BACK-BACK

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.
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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 20 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		51

18

DATE: 9/23/2020 11:16:37 AM
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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
13	23	R8-3D	NO PARKING	24X30	✓		10BWG	1	SA	P	
	24	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T	
	25	R8-3D	NO PARKING	24X30	✓		10BWG	1	SA	P	
	26	R6-1R	ONE WAY / ONE WAY (BACK-BACK)	54X18	✓		10BWG	1	SA	T	
		R6-1L		54X18	✓						
	27	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	P	
	28	R5-1	DO NOT ENTER	48X48	✓		10BWG	1	SA	P	
	29	SPECIAL	ACCESS TO CROSSOVER PROHIBITED RIGHT TURN ONLY	36X48	✓		10BWG	1	SA	T	
	30	R5-1	DO NOT ENTER / LEFT LANE MUST TURN LEFT (BACK-BACK)	48X48	✓		S80	1	SA	T	
		R3-7L		36X36							
	31	R5-1	DO NOT ENTER	48X48	✓		S80	1	SA	T	
	32	R5-1	DO NOT ENTER	48X48	✓		S80	1	SA	T	
	33	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T	
	34	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P	

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

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Texas Department of Transportation

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SUMMARY OF SMALL SIGNS

SOSS

SHEET 21 OF 36

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0073	12	015,etc	US 181,etc
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		52

18

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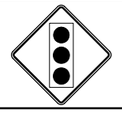
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
13	35	D21-1	Richter Rd	54X12	✓		10BWG	1	SA	T		
14	1	W3-3		48X48	✓		S80	1	SA	T		
	2	R3-5L		30X36	✓		10BWG	1	SA	P		
	3	D14-4T		48X48	✓		S80	1	SA	T		
	4	R5-1		36X36	✓		10BWG	1	SA	P		
	5	R5-1		36X36	✓		10BWG	1	SA	P		
	6	R1-2		36X36X36	✓		10BWG	1	SA	P		
	7	R6-1L		54X18	✓		10BWG	1	SA	T		
	8	R6-1L		54X18	✓		10BWG	1	SA	T		
	9	D14-4T		48X48	✓		S80	1	SA	T		
	10	R1-2		36X36X36	✓		10BWG	1	SA	P		
	11	R5-1		36X36	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
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Texas Department of Transportation

Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS

SHEET 22 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0073	12	015,etc	US 181,etc
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		53

18

DATE: 9/23/2020 11:16:47 AM
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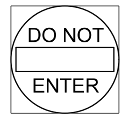
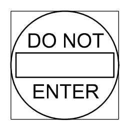
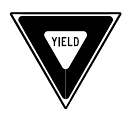
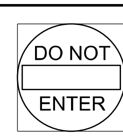
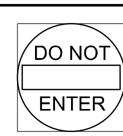
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
14	12	R5-1		36X36	✓		10BWG	1	SA	P		
	13	R3-5L		30X36	✓		10BWG	1	SA	P		
15	1	R3-5L		30X36	✓		10BWG	1	SA	P		
	2	R5-1		36X36	✓		10BWG	1	SA	P		
	3	R1-2		36X36X36	✓		10BWG	1	SA	P		
	4	R6-1L		54X18	✓		10BWG	1	SA	T		
	5	R6-1L		54X18	✓		10BWG	1	SA	T		
	6	R1-2		36X36X36	✓		10BWG	1	SA	P		
	7	R5-1		36X36	✓		10BWG	1	SA	P		
	8	R3-5L		30X36	✓		10BWG	1	SA	P		
	9	R3-5L		30X36	✓		10BWG	1	SA	P		
	10	R5-1		36X36	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 23 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	DIST SAT		COUNTY BEXAR	SHEET NO. 54

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
15	11	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	12	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	13	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	14	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	15	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	16	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	17	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	18	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
16	1	D21-1	Kilowatt Rd	60X12	✓		10BWG	1	SA	T		
	2	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	3	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	4	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		

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

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 24 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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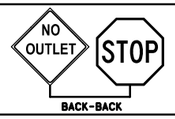
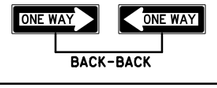
REVISIONS	0073	12	015,etc	US 181,etc
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		55

18

DATE: 9/23/2020 11:16:56 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\2680590\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
16	5	R1-2		36X36X36	✓		10BWG	1	SA	P		
	6	R6-1R		54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	7	W14-2		30X30	✓		S80	1	SA	T		
		R1-1		36X36	✓							
		D3-1G		24X8	✓							
	8	D3-1G		42X8	✓		10BWG	1	SA	P	BM	
		R1-1		36X36	✓							
	9	R6-1R		54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	10	R1-2		36X36X36	✓		10BWG	1	SA	P		
	11	R5-1		36X36	✓		10BWG	1	SA	P		
	12	R3-5L		30X36	✓		10BWG	1	SA	P		
	13	R5-1		36X36	✓		10BWG	1	SA	P		
		M3-3		24X12	✓							
	14	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							
		M3-1		24X12	✓							
	15	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							
	16	D21-1		60X12	✓		10BWG	1	SA	T		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
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Texas Department of Transportation

Traffic Operations Division Standard

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SUMMARY OF
SMALL SIGNS

SOSS

SHEET 25 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		56

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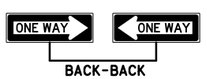
SUMMARY OF SMALL SIGNS

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
16	17	R6-1R		54X18	✓		10BWG	1	SA	T		
	18	D21-1		66X12	✓		10BWG	1	SA	T		
	19	R5-1		36X36	✓		10BWG	1	SA	P		
	20	R5-1		36X36	✓		10BWG	1	SA	P		
	21	R3-5L		30X36	✓		10BWG	1	SA	P		
	22	R1-2		36X36X36	✓		10BWG	1	SA	P		
	23	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		
	24	D3-1G W14-1pR R5-1		24X8 36X8 36X36	✓ ✓ ✓		10BWG	1	SA	P	BM	
	25	R6-1R R6-1L		54X18 54X18	✓ ✓		10BWG	1	SA	T		
	26	R1-2		36X36X36	✓		10BWG	1	SA	P		
	27	R5-1		36X36	✓		10BWG	1	SA	P		
	28	R5-1		36X36	✓		10BWG	1	SA	P		

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US 181 SUMMARY OF SMALL SIGNS

SOSS

SHEET 26 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		57

TB

DATE: 9/23/2020 11:17:04 AM
FILE: c:\pw-cf\pw-cf-prod\bilal.ghandour@aguirre-fields.com\d0118521\26805\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
16	29	D21-1	Cemetery	66X12	✓		10BWG	1	SA	T		
	30	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	31	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	32	S3-1		36X36	✓		10BWG	1	SA	P		
17	1	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	2	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	3	R5-1	DO NOT ENTER	36X36	✓		10BWG	1	SA	P		
	4	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	5	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	6	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
	7	R1-2	YIELD	36X36X36	✓		10BWG	1	SA	P		
	8	R5-1	DO NOT ENTER	36X36	✓		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.
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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 27 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		58

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DATE: 9/23/2020 11:17:08 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\2680590\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
17	9	R5-1		36X36	✓		10BWG	1	SA	P		
	10	R3-5L		30X36	✓		10BWG	1	SA	P		
	11	S3-1		36X36	✓		10BWG	1	SA	P		
18	1	W3-3		30X30	✓		10BWG	1	SA	P		
	2	R19-1T		48X60	✓		S80	1	SA	T		
	3	W2-1		30X30	✓		10BWG	1	SA	P		
	4	R2-1		48X60	✓		S80	1	SA	T		
	5	R8-3D		24X30	✓		10BWG	1	SA	P		
	6	W12-2		36X36	✓		10BWG	1	SA	P		
	7	D2-1		102X18	✓		10BWG	1	SA	T		
	8	M3-1 M1-4		24X12 24X24	✓ ✓		10BWG	1	SA	P		
	9	R3-5L		30X36	✓		10BWG	1	SA	P		

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

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Texas Department of Transportation

Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		59

18

DATE: 9/23/2020 11:17:13 AM
FILE: c:\pw-df\pw-df-prodbi1a1.ghandour@aguirre-fields.com\d0118521\2680505\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
18	10	M2-1	JCT LOOP 1604	21X15	✓		10BWG	1	SA	P		
		M1-6Sx		24X24	✓							
	11	R5-1a	WRONG WAY	36X24	✓		10BWG	1	SA	P		
	12	R5-1a	WRONG WAY	36X24	✓		10BWG	1	SA	P		
	13	R5-1	DO NOT ENTER	48X48	✓		10BWG	1	SA	P		
	14	R5-1	DO NOT ENTER	48X48	✓		10BWG	1	SA	P		
		M3-1	NORTH 181	24X12	✓							
	15	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
	16	R6-1L	ONE WAY	54X18	✓		10BWG	1	SA	T		
		M3-1	NORTH 181	24X12	✓							
	17	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
	18	R6-1R	ONE WAY ONE WAY BACK-BACK	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	19	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	T		
	20	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	21	W14-1	DEAD END	36X36	✓		10BWG	1	SA	P		

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7.5 to 15	0.100"
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Texas Department of Transportation

Traffic Operations Division Standard

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SUMMARY OF SMALL SIGNS

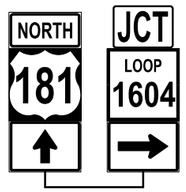
SOSS SHEET 29 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		60

18

DATE: 9/23/2020 11:17:18 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\2680509\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE (FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80)	POSTS (1 or 2)	ANCHOR TYPE (UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic)	MOUNTING DESIGNATION: PREFABRICATED (P = "Plain", T = "T", U = "U")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext (BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels)	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE (TY N, TY S)
18	22	R1-2		36X36X36	✓		10BWG	1	SA	P		
	23	R5-1		48X48	✓		S80	1	SA	T		
	24	R5-1		48X48	✓		S80	1	SA	T		
		M3-1		24X12	✓							
		M1-4		24X24	✓							
		M6-3		21X15	✓							
	25	M2-1		21X15	✓		10BWG	1	SA	U		
		M1-6Sx		24X24	✓							
		M6-1		21X15	✓							
	26	D1-3		72X42			S80	1	SA	T		
	27	R5-1		48X48	✓		S80	1	SA	T		
	28	R5-1a		36X24	✓		10BWG	1	SA	P		
	29	R5-1a		36X24	✓		10BWG	1	SA	P		
	30	R5-1a		36X24	✓		10BWG	1	SA	P		
	31	R5-1a		36X24	✓		10BWG	1	SA	P		
	32	R5-1		48X48	✓		S80	1	SA	T		
	33	R5-1		48X48	✓		S80	1	SA	T		

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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 30 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		61

18

DATE: 9/23/2020 11:17:22 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\268059\sums16.dgn

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
18	34	D1-3	San Antonio Elmendorf → Converse →	78X42			S80	1	SA	T		
	35	R3-5L	ONLY	30X36	✓		10BWG	1	SA	P		
	36	R3-5R	ONLY	30X36	✓		10BWG	1	SA	P		
	37	R6-1R	ONE WAY / ONE WAY BACK-BACK	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
	38	D3-1G	US 181 ELMENDORF-LAVERNIA RD	24X8	✓		10BWG	1	SA	P	BM	
		D3-1G		74X8	✓							
	39	R6-1R	ONE WAY / ONE WAY BACK-BACK	54X18	✓		10BWG	1	SA	T		
		R6-1L		54X18	✓							
		M3-3	SOUTH 181 →	24X12	✓							
	40	M1-4		24X24	✓		10BWG	1	SA	P		
		M6-1		21X15	✓							
	41	R5-1	DO NOT ENTER	48X48	✓		S80	1	SA	T		
	42	R5-1	DO NOT ENTER	48X48	✓		S80	1	SA	T		
	43	M2-1	JCT LOOP 1604	21X15	✓		10BWG	1	SA	P		
		M1-6Sx		24X24	✓							
	44	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	P		
	45	R6-1R	ONE WAY	54X18	✓		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF SMALL SIGNS

SOSS SHEET 31 OF 36

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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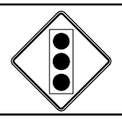
REVISIONS		0073	12	015,etc	US 181,etc
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		62

18

DATE: 9/23/2020 11:17:28 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\268059\US181_SOSS_dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
18	46	R3-5L		30X36	✓		10BWG	1	SA	P		
19	1	R6-1R		54X18	✓		10BWG	1	SA	P		
	2	R3-5L		30X36	✓		10BWG	1	SA	P		
	3	R6-1R		54X18	✓		10BWG	1	SA	P		
	4	W12-2		36X36	✓		10BWG	1	SA	P		
	5	M3-3 M1-4		24X12 24X24	✓ ✓		10BWG	1	SA	P		
	6	R2-1		48X60	✓		S80	1	SA	T		
	7	W2-1aT		48X48	✓		S80	1	SA	T		
	8	D2-2		120X30	✓		S80	1	SA	T		
	9	W3-3		30X30	✓		10BWG	1	SA	P		
20	1	R3-5L		30X36	✓		10BWG	1	SA	P		
	2	R5-1		36X36	✓		10BWG	1	SA	P		

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Texas Department of Transportation

Traffic Operations Division Standard

US 181
SUMMARY OF
SMALL SIGNS

SOSS SHEET 32 OF 36

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0073	12	015,etc	US 181,etc
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		63

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DATE: 9/23/2020 11:17:33 AM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118521\26805\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
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20	3	R1-2		36X36X36	✓		10BWG	1	SA	P		
	4	R6-1L		54X18	✓		10BWG	1	SA	T		
	5	R1-2		36X36X36	✓		10BWG	1	SA	P		
	6	R6-1L		54X18	✓		10BWG	1	SA	T		
	7	R5-1		36X36	✓		10BWG	1	SA	P		
	8	D14-4T		48X48	✓		S80	1	SA	T		
	9	R3-5L		30X36	✓		10BWG	1	SA	P		
	10	W8-13aT		36X36	✓		10BWG	1	SA	P		
	11	I-2aT		96X36	✓		S80	1	SA	T		
	12	I-3		42X18	✓		10BWG	1	SA	T		
21	1	I-3		42X18	✓		10BWG	1	SA	T		
		M3-3		24X12	✓							
	2	M1-4		24X24	✓		10BWG	1	SA	P		
		D10-7aT		3X10	✓							

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

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Texas Department of Transportation

Traffic Operations Division Standard

US 181 SUMMARY OF SMALL SIGNS

SOSS

SHEET 33 OF 36

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0073	12	015,etc	US 181,etc
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		64

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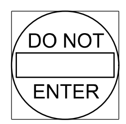
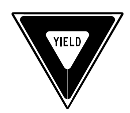
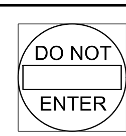
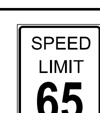
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
21	3	M3-1 M1-4 D10-7aT		24X12 24X24 3X10	✓ ✓ ✓		10BWG	1	SA	P		
	4	W8-13aT		36X36	✓		10BWG	1	SA	P		
	5	R3-5L		30X36	✓		10BWG	1	SA	P		
	6	R5-1		36X36	✓		10BWG	1	SA	P		
	7	R1-2		36X36X36	✓		10BWG	1	SA	P		
	8	R6-1L		54X18	✓		10BWG	1	SA	T		
	9	R6-1L		54X18	✓		10BWG	1	SA	T		
	10	R1-2		36X36X36	✓		10BWG	1	SA	P		
	11	R5-1		36X36	✓		10BWG	1	SA	P		
	12	R19-6T		48X30	✓		10BWG	1	SA	P		
	13	R3-5L		30X36	✓		10BWG	1	SA	P		
	14	R2-1		48X60	✓		S80	1	SA	T		

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:

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Texas Department of Transportation

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US 181
SUMMARY OF SMALL SIGNS

SOSS

SHEET 34 OF 36

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-16 8-16	0073	12	015,etc	US 181,etc
	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	65

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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
21	15	I-2aT	Bexar COUNTY LINE	48X24	✓		10BWG	1	SA	T		
		M3-1	NORTH 181	24X12	✓							
	16	M1-4	NORTH 181	24X24	✓		10BWG	1	SA	P		
		D10-7aT	NORTH 181	3X10	✓							
	17	R2-1	SPEED LIMIT 65	48X60	✓		S80	1	SA	T		
	18	I-2aT	Wilson COUNTY LINE	54X24	✓		10BWG	1	SA	T		
		M3-3	SOUTH 181	24X12	✓							
	19	M1-4	SOUTH 181	24X24	✓		10BWG	1	SA	P		
		D10-7aT	SOUTH 181	3X10	✓							
	20	R19-6T	LITTERING PROHIBITED $10-2000 FINE STATE LAW	48X30	✓		10BWG	1	SA	P		
	21	R4-3	SLOWER TRAFFIC KEEP RIGHT	24X30	✓		10BWG	1	SA	P		
22	1	R1-1	STOP	36X36	✓		10BWG	1	SA	P		
	2	W1-9TR		96X36	✓		S80	1	SA	T		
	3	W2-1aT	HIGHWAY INTERSECTION AHEAD	48X48	✓		S80	1	SA	T		
	4	W3-3		30X30	✓		10BWG	1	SA	P		
	5	W3-1		30X30	✓		10BWG	1	SA	P		

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4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		66

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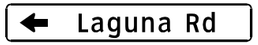
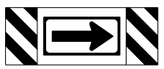
SUMMARY OF SMALL SIGNS

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
22	6	W1-1R W13-1P		36X36 18X18	✓		10BWG	1	SA	T		
	7	D1-2		90X30	✓		S80	1	SA	T		
23	1	D1-1		78X12	✓		10BWG	1	SA	T		
	2	D21-1		72X12	✓		10BWG	1	SA	T		
	3	W3-3		30X30	✓		10BWG	1	SA	T		
	4	W1-1R W13-1P		36X36 18X18	✓		10BWG	1	SA	T		
	5	W3-1		30X30	✓		10BWG	1	SA	P		
	6	D21-1		72X12	✓		10BWG	1	SA	T		
	7	W1-9TR		96X36	✓		S80	1	SA	T		
	8	R1-2		36X36X36	✓		10BWG	1	SA	P		
	9	R5-1		36X36	✓		10BWG	1	SA	P		
	10	R3-5L		36X36	✓		10BWG	1	SA	P		

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Traffic Operations Division Standard

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SUMMARY OF
SMALL SIGNS

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4-16	DIST	COUNTY		SHEET NO.
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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE (FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80)	POSTS (1 or 2)	ANCHOR TYPE (UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic)	MOUNTING DESIGNATION: PREFABRICATED (P = "Plain", T = "T", U = "U")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext; BM = Extruded Wind Beam; WC = 1.12 #/ft Wing Channel; EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE (TY N, TY S)
1	1	R2-1	SPEED LIMIT 40	36X48	✓		10BWG	1	SA	T		
	2	R3-9cP R3-9bPost	BEGIN CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	3	R3-9dP R3-9bPost	END CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	4	R3-9cP R3-9bPost	BEGIN CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	5	R3-9dP R3-9bPost	END CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	6	S5-2aTP R2-1	END SCHOOL ZONE SPEED LIMIT 40	24X10 36X48	✓ ✓		10BWG	1	SA	T		
2	1	R3-9cP R3-9bPost	BEGIN CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	2	R3-9dP R3-9bPost	END CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	3	S5-2aTP R2-1	END SCHOOL ZONE SPEED LIMIT 40	24X10 36X48	✓ ✓		10BWG	1	SA	T		
	4	R3-9cP R3-9bPost	BEGIN CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	5	R3-9dP R3-9bPost	END CENTER LANE ONLY	30x12 30x36	✓ ✓		10BWG	1	SA	T		
	6	R2-1	SPEED LIMIT 40	36X48	✓		10BWG	1	SA	T		

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Texas Department of Transportation

Traffic Operations Division Standard

US 87
SUMMARY OF SMALL SIGNS

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SHEET 1 OF 2

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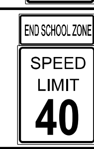
SUMMARY OF SMALL SIGNS

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"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
5	1	W11-2		36X36	✓		10BWG	1	SA	P		
6	1	R3-9cP R3-9bPost		30x12 30x36	✓ ✓		10BWG	1	SA	T		
	2	R3-9dP R3-9bPost		30x12 30x36	✓ ✓		10BWG	1	SA	T		
	3	S5-2aTP R2-1		24X10 36X48	✓ ✓		10BWG	1	UA	T		
7	1	S1-1 SW16-7P		36x36 12X9	✓ ✓		10BWG	1	SA	P		
	2	S1-1		36X36	✓		10BWG	1	SA	P		
	3	R2-1		36X48	✓		10BWG	1	SA	T		
8	1	R3-9cP R3-9bPost		30x12 30x36	✓ ✓		10BWG	1	SA	T		
	2	R3-9dP R3-9bPost		30x12 30x36	✓ ✓		10BWG	1	SA	T		

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Texas Department of Transportation — Traffic Operations Division Standard

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SUMMARY OF SMALL SIGNS

SOSS SHEET 2 OF 2

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 4-16 8-16	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		69

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DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

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

1. GENERAL

(1) TRAFFIC SHALL 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 SHALL 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 OPERATION BASED ON 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, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL 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 SHALL 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) CONTRACTOR SHALL PROVIDE 7 DAYS ADVANCE NOTICE TO PUBLIC FOR ANY AND ALL PROPOSED LANE CLOSURES, NO LANE CLOSURES WILL BE ALLOWED ON THE FOLLOWING DATES:

A) BETWEEN DEC 15TH TO JAN 1ST
B) WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING
C) SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY
D) SATURDAY OR SUNDAY WHEN JULY 4TH FALLS ON A FRIDAY OR MONDAY
E) FRIDAY, SATURDAY, AND SUNDAY OF EASTER WEEKEND

(9) FULL MAINLANE CLOSURES ARE NOT PERMITTED.

(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 OVERAL 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) CONTRACTOR SHALL NOT REMOVE OR ADJUST ANY VIA ASSETS.

(14) CONTRACTOR SHALL CONTACT VIA FORTY-EIGHT (48) HOURS PRIOR TO TEMPORARILY CLOSING LANES NEAR OR ADJACENT TO ANY VIA BUS STOP. CONTACT VIA DISPATCH AT (210)-362-5020.

2. SEQUENCE OF WORK

(1) THIS PROJECT SHALL BE CONSTRUCTED IN 3 PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER. LANE CLOSURES SHALL 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) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

SET UP

THE INTENT OF THIS PHASE IS TO SET UP ADVANCED WARNING SIGNS, BARRICADES, AND SWP3 DEVICES TO BE IN PLACE FOR THE DURATION OF THE PROJECT.

(1) PLACE ADVANCED WARNING SIGNS AND BARRICADES.

(2) PLACE SWP3 DEVICES.

PHASE 1

THE INTENT OF THIS PHASE IS TO PERFORM BASE REPAIRS, GRADING, MBGF REPLACEMENT, MOW STRIP INSTALLATION, AND CABLE MEDIAN BARRIER FOR THE ENTIRE PROJECT.

DAILY: WORK HOURS - 9 AM TO 4 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

NIGHTLY: WORK HOURS - 9 PM TO 6 AM (TO BE USED ONLY FOR RAMP CLOSURES, AS APPROVED BY THE ENGINEER)

(1) INSTALL TRAFFIC CONTROL DEVICES.

(2) PERFORM AND COMPLETE ALL BASE REPAIRS BEFORE PROCEEDING TO PHASE 2. THE LENGTH OF THE BASE REPAIR WORK AREA SHALL BE BASED ON THE CONTRACTOR'S ABILITY, AS DETERMINED BY THE ENGINEER, TO COMPLETE THE BASE REPAIRS AND RETURN TRAFFIC TO NORMAL OPERATIONS AT THE END OF EACH WORK DAY. THE CONTRACTOR SHALL COMPLETE EACH BASE REPAIR LOCATION BEFORE PROCEEDING TO THE NEXT LOCATION.

(3) PERFORM AND COMPLETE ALL GRADING WORK BEFORE PROCEEDING TO PHASE 2. THIS SHALL INCLUDE SEEDING, COMPOST, AND SRB INSTALLATION.

(4) PERFORM AND COMPLETE ALL MBGF REPLACEMENT AND MOW STRIP INSTALLATION BEFORE PROCEEDING TO PHASE 2. CONTRACTOR SHALL COMPLETE EACH MBGF/MOW STRIP LOCATION BEFORE PROCEEDING TO THE NEXT LOCATION.

(5) PERFORM AND COMPLETE ALL MEDIAN CABLE BARRIER AND MOW STRIP INSTALLATION BEFORE PROCEEDING TO PHASE 2. CONTRACTOR SHALL COMPLETE EACH SECTION OF CABLE MEDIAN BARRIER AND MOW STRIP BEFORE PROCEEDING TO THE NEXT LOCATION.

NOTES: CONTRACTOR SHALL COMPLETE ALL PHASE 1 WORK BEFORE PROCEEDING TO PHASE 2. CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION OF 2-MILES BETWEEN WORK ZONES. ALL TRAFFIC LANES SHALL BE OPENED BY THE TIME SPECIFIED. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES. CONTRACTOR SHALL UTILIZE TCP PLAN SHEETS IN CONJUNCTION WITH TMUTCD AND TCP STANDARDS.

PHASE 2

THE INTENT OF THIS PHASE IS TO PERFORM THE MILL AND OVERLAY PAVING OPERATIONS.

DAILY: WORK HOURS - 9 AM TO 4 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

NIGHTLY: WORK HOURS - 9 PM TO 6 AM (TO BE USED ONLY FOR RAMP CLOSURES, AS APPROVED BY THE ENGINEER)

(1) INSTALL TRAFFIC CONTROL DEVICES.

(2) PERFORM PAVING OPERATIONS UTILIZING DAILY LANE CLOSURES, ONE LANE CLOSURE AT A TIME.

NOTES: THE LENGTH OF THE WORK AREA SHALL BE BASED ON THE CONTRACTOR'S ABILITY, AS DETERMINED BY THE ENGINEER, TO COMPLETE THE WORK STEPS 'A' THRU 'E' AND RETURN TRAFFIC TO NORMAL TRAFFIC OPERATIONS AT THE END OF EACH WORK DAY. THE LANES SHALL BE OPENED BY THE TIME SPECIFIED. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES. CONTRACTOR SHALL UTILIZE TCP PLAN SHEETS IN CONJUNCTION WITH TMUTCD AND TCP STANDARDS.

A) PLANE
B) SEAL COAT
C) OVERLAY
D) PLACE WORK ZONE PAVEMENT MARKINGS
E) OPEN LANE TO TRAFFIC

PHASE 3

THE INTENT OF THIS PHASE IS TO INSTALL FINAL SIGNS & STRIPING, AND PROJECT CLEANUP.

DAILY: WORK HOURS - 9 AM TO 4 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

NIGHTLY: WORK HOURS - 9 PM TO 6 AM (TO BE USED ONLY FOR RAMP CLOSURES, AS APPROVED BY THE ENGINEER)

(1) INSTALL FINAL SIGNS & STRIPING.

(2) PERFORM FINAL CLEANUP AND COMPLETE ALL ITEMS ON ENGINEER'S INSPECTION LIST.

(3) REMOVE SWP3 DEVICES, ADVANCE WARNING SIGNS, AND BARRICADES.

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US 181
TRAFFIC CONTROL PLAN NARRATIVE

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			70
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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3. SAFETY

(1) THE CONTRACTOR SHALL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-14. 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 DESIGN 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 NEEDED DUE TO FIELD CONDITIONS, TO PROVIDE FOR THE SAFE PASSAGE OF TRAFFIC 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 TIMES 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, AS DETERMINED BY THE ENGINEER, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS WHEN DIRECTED BY THE ENGINEER AND CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER. THIS SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT BID ITEMS.

4. HAULING EQUIPMENT

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

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

5. FINAL CLEAN UP

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

6. PAYMENT

(1) 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.

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US 181
TRAFFIC CONTROL
PLAN NARRATIVE

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			71
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

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

1. GENERAL

(1) TRAFFIC SHALL 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 SHALL 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 OPERATION BASED ON 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, AS DETERMINED BY THE ENGINEER, THE CONTRACTOR SHALL 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 SHALL 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) CONTRACTOR SHALL PROVIDE 7 DAYS ADVANCE NOTICE TO PUBLIC FOR ANY AND ALL PROPOSED LANE CLOSURES, NO LANE CLOSURES WILL BE ALLOWED ON THE FOLLOWING DATES:

- A) BETWEEN DEC 15TH TO JAN 1ST
- B) WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING
- C) SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY
- D) SATURDAY OR SUNDAY WHEN JULY 4TH FALLS ON A FRIDAY OR MONDAY
- E) FRIDAY, SATURDAY, AND SUNDAY OF EASTER WEEKEND

(9) FULL MAINLANE CLOSURES ARE NOT PERMITTED.

(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 OVERAL 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) CONTRACTOR SHALL NOT REMOVE OR ADJUST ANY VIA ASSETS.

(14) CONTRACTOR SHALL CONTACT VIA FORTY-EIGHT (48) HOURS PRIOR TO TEMPORARILY CLOSING LANES NEAR OR ADJACENT TO ANY VIA BUS STOP. CONTACT VIA DISPATCH AT (210)-362-5020.

(15) RESTRICTED WORK HOURS NEAR STEWART ELEMENTARY SCHOOL SHALL BE 9 AM TO 3PM. WORK HOURS NEAR OTHER TRAFFIC GENERATORS SHALL BE DETERMINED BY THE ENGINEER.

2. SEQUENCE OF WORK

(1) THIS PROJECT SHALL BE CONSTRUCTED IN 3 PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER. LANE CLOSURES SHALL 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) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

SET UP

THE INTENT OF THIS PHASE IS TO SET UP ADVANCED WARNING SIGNS, BARRICADES, AND SWP3 DEVICES TO BE IN PLACE FOR THE DURATION OF THE PROJECT.

(1) PLACE ADVANCED WARNING SIGNS AND BARRICADES.

(2) PLACE SWP3 DEVICES.

PHASE 1

THE INTENT OF THIS PHASE IS TO PERFORM BASE REPAIRS, MBGF REPLACEMENT AND MOW STRIP INSTALLATION.

DAILY: WORK HOURS - 8 AM TO 5 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

(1) INSTALL TRAFFIC CONTROL DEVICES.

(2) PERFORM AND COMPLETE ALL BASE REPAIRS BEFORE PROCEEDING TO PHASE 2. THE LENGTH OF THE BASE REPAIR WORK AREA SHALL BE BASED ON THE CONTRACTOR'S ABIILITY, AS DETERMINED BY THE ENGINEER, TO COMPLETE THE BASE REPAIRS AND RETURN TRAFFIC TO NORMAL OPERATIONS AT THE END OF EACH WORK DAY. THE CONTRACTOR SHALL COMPLETE EACH BASE REPAIR LOCATION BEFORE PROCEEDING TO THE NEXT LOCATION.

(3) PERFORM AND COMPLETE ALL MBGF REPLACEMENT AND MOW STRIP INSTALLATION BEFORE PROCEEDING TO PHASE 2. CONTRACTOR SHALL COMPLETE EACH MBGF/MOW STRIP LOCATION BEFORE PROCEEDING TO THE NEXT LOCATION.

NOTES: CONTRACTOR SHALL COMPLETE ALL PHASE 1 WORK BEFORE PROCEEDING TO PHASE 2. CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION OF 2-MILES BETWEEN WORK ZONES. ALL TRAFFIC LANES SHALL BE OPENED BY THE TIME SPECIFIED. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES. CONTRACTOR SHALL UTILIZE TCP PLAN SHEETS IN CONJUNCTION WITH TMUTCD AND TCP STANDARDS.

PHASE 2

THE INTENT OF THIS PHASE IS TO PERFORM THE MILL AND OVERLAY PAVING OPERATIONS.

DAILY: WORK HOURS - 8 AM TO 5 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

(1) INSTALL TRAFFIC CONTROL DEVICES.

(2) PERFORM PAVING OPERATIONS UTILIZING DAILY LANE CLOSURES, ONE LANE CLOSURE AT A TIME.

NOTES: THE LENGTH OF THE WORK AREA SHALL BE BASED ON THE CONTRACTOR'S ABILITY, AS DETERMINED BY THE ENGINEER, TO COMPLETE THE WORK STEPS 'A' THRU 'E' AND RETURN TRAFFIC TO NORMAL OPERATIONS AT THE END OF EACH WORK DAY. THE LANES SHALL BE OPENED BY THE TIME SPECIFIED. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES. CONTRACTOR SHALL UTILIZE TCP PLAN SHEETS IN CONJUNCTION WITH TMUTCD AND TCP STANDARDS.

- A) PLANE
- B) SEAL COAT
- C) OVERLAY
- D) PLACE WORK ZONE PAVEMENT MARKINGS
- E) OPEN LANE TO TRAFFIC

PHASE 3

THE INTENT OF THIS PHASE IS TO INSTALL FINAL SIGNS & STRIPING, AND PROJECT CLEANUP.

DAILY: WORK HOURS - 8 AM TO 5 PM (WORK HOURS NEAR TRAFFIC GENERATORS AS DETERMINED BY THE ENGINEER)

(1) INSTALL FINAL SIGNS & STRIPING.

(2) PERFORM FINAL CLEANUP AND COMPLETE ALL ITEMS ON ENGINEER'S INSPECTION LIST.

(3) REMOVE SWP3 DEVICES, ADVANCE WARNING SIGNS, AND BARRICADES.

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2/25/2021

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US 87
TRAFFIC CONTROL PLAN NARRATIVE

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			72
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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3. SAFETY

(1) THE CONTRACTOR SHALL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-14. 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 DESIGN 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 NEEDED DUE TO FIELD CONDITIONS, TO PROVIDE FOR THE SAFE PASSAGE OF TRAFFIC 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 TIMES 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, AS DETERMINED BY THE ENGINEER, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS WHEN DIRECTED BY THE ENGINEER AND CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER. THIS SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT BID ITEMS.

4. HAULING EQUIPMENT

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

5. FINAL CLEAN UP

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

6. PAYMENT

(1) 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.

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US 87
TRAFFIC CONTROL PLAN NARRATIVE

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			73
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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LOCATION	ROAD WORK ⇦ NEXT X MILES NEXT X MILES ⇨	ROAD WORK NEXT X MILES ⇨	END ROAD WORK	PILOT CAR FOLLOW ME	WORK ZONE	BEGIN ROAD WORK NEXT X MILES	NAME ADDRESS CITY STATE CONTRACTOR	STAY ALERT TALK OR TEXT LATER	DO NOT PASS	PASS WITH CARE	OBEY WARNING SIGNS STATE LAW	WHEN WORKERS ARE PRESENT	TRAFFIC FINES DOUBLE			BE PREPARED TO STOP	SOFT SHOULDER	LOOSE GRAVEL	ROUGH ROAD	SHOULDER DROP OFF	UNEVEN LANES
	G20-1aT	G20-1bTR	G20-2	G20-4	G20-5aP	G20-5T	G20-6T	G20-10T	R4-1	R4-2	R20-3T	R20-5aTP	R20-5T	CW1-4 R/L	CW1-6aT	CW3-4	CW8-4	CW8-7	CW8-8	CW8-9A	CW8-11
Ⓐ			X		X	X	X	X			X	X	X								
Ⓑ				X					X	X				X	X		X	X	X	X	X
Ⓒ			X													X					
Ⓓ	X	X	X																		

LOCATION	NO CENTER LINE	XX M.P.H.	XXX FEET	RUMBLE STRIPS AHEAD	ROAD WORK AHEAD	ONE LANE ROAD XXX FT	RIGHT LANE CLOSED 1500 FT	RIGHT LANE CLOSED 1000 FT	RIGHT LANE CLOSED ½ MILE		NARROW LANES AHEAD	SHOULDER WORK	RIGHT SHOULDER CLOSED 1000 FT	ROAD MACHINERY AHEAD	FRESH OIL	WORK CONVOY	NEXT XX MILES			
	CW8-12	CW13-1	CW16-2P	CW17-2T	CW20-1D	CW20-4	CW20-5R	CW20-5R	CW20-5R	CW20-7	CW20-8	CW21-5	CW21-5bBR	CW21-3D	CW21-2	CW21-10aT	CW21-16	42" TWO-PIECE CONE	OPPOSING TRAFFIC LANE DIVIDER	PLASTIC DRUM
Ⓐ					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															

LOCATION	PORTABLE CHANGEABLE MESSAGE SIGN	RUMBLE STRIP ARRAY	TRAILER MOUNTED FLASHING ARROW PANEL	TRUCK MOUNTED ATTENUATOR	TY III BARRICADE	VERTICAL PANEL
Ⓐ	X					
Ⓑ	X	X	X	X	X	X
Ⓒ			X	X	X	
Ⓓ						

A - TO BE PLACED AT EACH END OF PROJECT LIMITS, PRIOR TO ANY CONSTRUCTION OPERATIONS, AND SHALL REMAIN FOR THE DURATION OF THE PROJECT

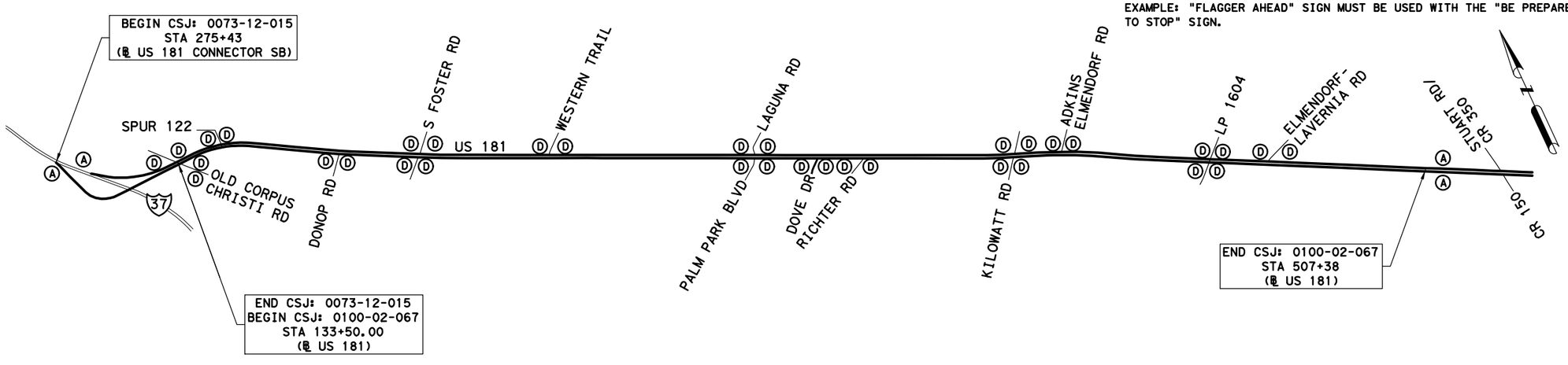
B - AS DIRECTED BY THE ENGINEER, OR AS REQUIRED (SEE NOTE 1)

C - USED DURING LANE CLOSURES

D - USED AT ALL INTERSECTING ROADS

NOTES:

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



NOT TO SCALE

STATE OF TEXAS
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2/25/2021

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US 181
SCHEDULE OF BARRICADES & ADVANCED WARNING

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			74
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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LOCATION	ROAD WORK ⇦ NEXT X MILES NEXT X MILES ⇨	ROAD WORK ⇦ NEXT X MILES	ROAD WORK NEXT X MILES ⇨	END ROAD WORK	PILOT CAR FOLLOW ME	WORK ZONE	BEGIN ROAD WORK NEXT X MILES	NAME ADDRESS CITY STATE CONTRACTOR	STAY ALERT TALK OR TEXT LATER	DO NOT PASS	PASS WITH CARE	OBEY WARNING SIGNS STATE LAW	WHEN WORKERS ARE PRESENT	TRAFFIC FINES DOUBLE			BE PREPARED TO STOP	SOFT SHOULDER	LOOSE GRAVEL	ROUGH ROAD	SHOULDER DROP OFF	UNEVEN LANES
	G20-1aT	G20-1bTL	G20-1bTR	G20-2	G20-4	G20-5aP	G20-5T	G20-6T	G20-10T	R4-1	R4-2	R20-3T	R20-5aTP	R20-5T	CW1-4 R/L	CW1-6aT	CW3-4	CW8-4	CW8-7	CW8-8	CW8-9A	CW8-11
A						X	X	X	X			X	X	X								
B				X																		
C	X	X	X	X	X					X	X				X	X	X	X	X	X	X	X

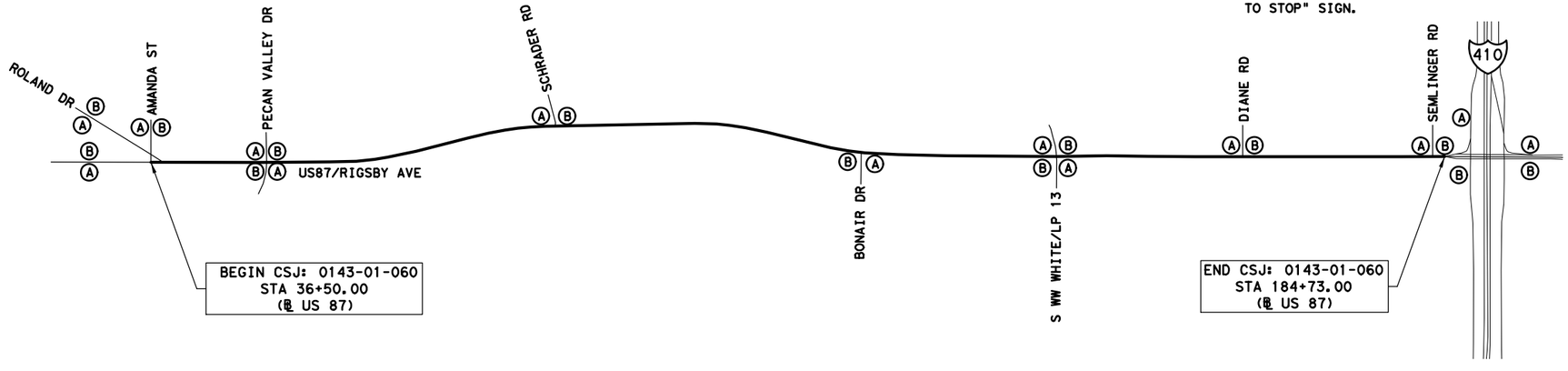
LOCATION	NO CENTER LINE	XX M.P.H.	XXX FEET	RUMBLE STRIPS AHEAD	ROAD WORK AHEAD	ONE LANE ROAD XXX FT	RIGHT LANE CLOSED 1500 FT	RIGHT LANE CLOSED 1000 FT	RIGHT LANE CLOSED ½ MILE		NARROW LANES AHEAD	SHOULDER WORK	RIGHT SHOULDER CLOSED 1000 FT	ROAD MACHINERY AHEAD	FRESH OIL	WORK CONVOY	NEXT XX MILES			
	CW8-12	CW13-1	CW16-2P	CW17-2T	CW20-1D	CW20-4	CW20-5R	CW20-5R	CW20-5R	CW20-7	CW20-8	CW21-5	CW21-5bBR	CW21-3D	CW21-2	CW21-10aT	CW21-16	42" TWO-PIECE CONE	OPPOSING TRAFFIC LANE DIVIDER	PLASTIC DRUM
A					X															
B																				
C	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

LOCATION	PORTABLE CHANGEABLE MESSAGE SIGN	RUMBLE STRIP ARRAY	TRAILER MOUNTED FLASHING ARROW PANEL	TRUCK MOUNTED ATTENUATOR	TY III BARRICADE	VERTICAL PANEL
A	X					
B						
C	X	X	X	X	X	X

A - TO BE PLACED AT BEGINNING OF PROJECT AND ENTERING SIDESTREETS

B - TO BE PLACED AT END OF PROJECT AND EXITING SIDESTREETS

C - TO BE USED THROUGHOUT THE COURSE OF THE PROJECT, OR AS REQUIRED BY ENGINEER (SEE NOTE 1)



NOTES:

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

NOT TO SCALE

STATE OF TEXAS
Brian Legaspi
113039
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

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Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 87
SCHEDULE OF BARRICADES & ADVANCED WARNING

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			75
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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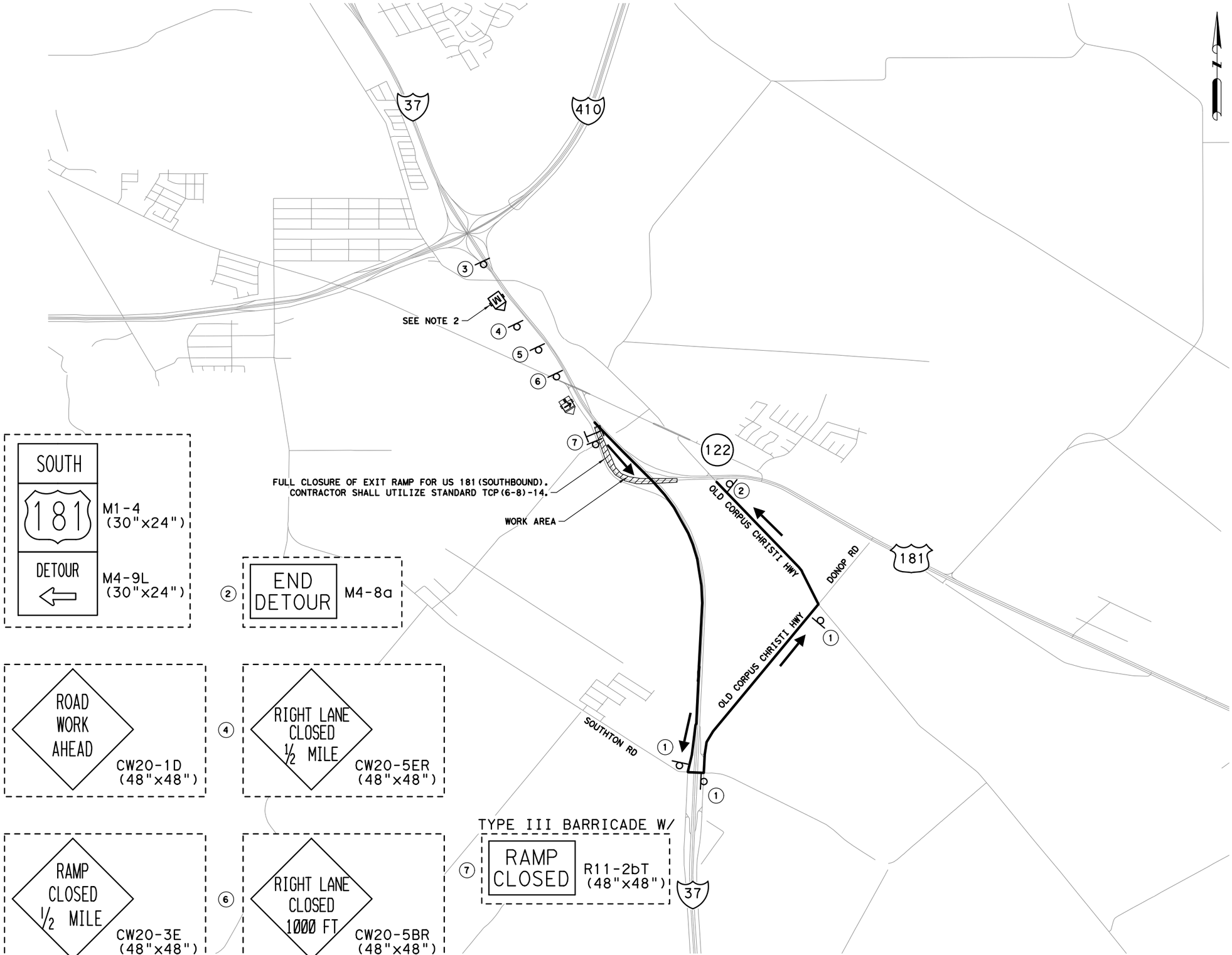

LEGEND

- DETOUR TRAFFIC FLOW
- TYPE III BARRICADE
- PCMS
- TRAILER MOUNTED FLASHING ARROW BOARD
- DETOUR SIGN

NOTES

1. RAMP CLOSURES RESTRICTED TO NIGHTTIME WORK HOURS (9PM - 6AM), UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO PUBLIC FOR RAMP CLOSURES. SEE "ADVANCE NOTICE LIST" ON STANDARD BC(6) FOR RECOMMENDED DATE AND TIME FORMATTING OPTIONS FOR PCMS MESSAGE.
3. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL BY THE ENGINEER PRIOR TO INITIATING RAMP CLOSURES.
4. RAMP CLOSURES SHALL OCCUR ONE AT A TIME. RAMP WORK DURING EACH PHASE SHALL BE COMPLETED PRIOR TO MOVING TO NEXT RAMP CLOSURE AND/OR PHASE.
5. DETOUR SIGNS SHALL BE COVERED WHEN NOT IN USE, AND REMOVED IMMEDIATELY WHEN NO LONGER REQUIRED FOR RAMP CLOSURE.

0 1500 3000
SCALE: 1" = 3000'

① SOUTH 181 M1-4 (30"x24") / DETOUR M4-9L (30"x24")

② END DETOUR M4-8a

③ ROAD WORK AHEAD CW20-1D (48"x48")

④ RIGHT LANE CLOSED ½ MILE CW20-5ER (48"x48")

⑤ RAMP CLOSED ½ MILE CW20-3E (48"x48")

⑥ RIGHT LANE CLOSED 1000 FT CW20-5BR (48"x48")

⑦ TYPE III BARRICADE W/ RAMP CLOSED R11-2bT (48"x48")

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TBPE REG. NO. F-2742

US 181 RAMP CLOSURE & DETOUR FOR US 181 CONNECTOR SB

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			76
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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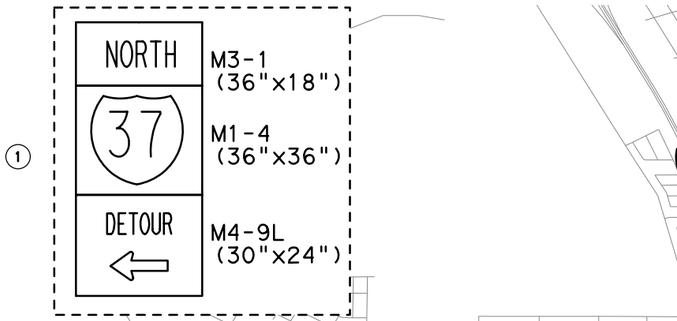

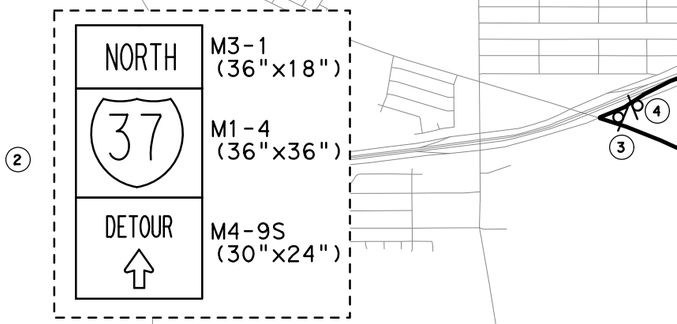

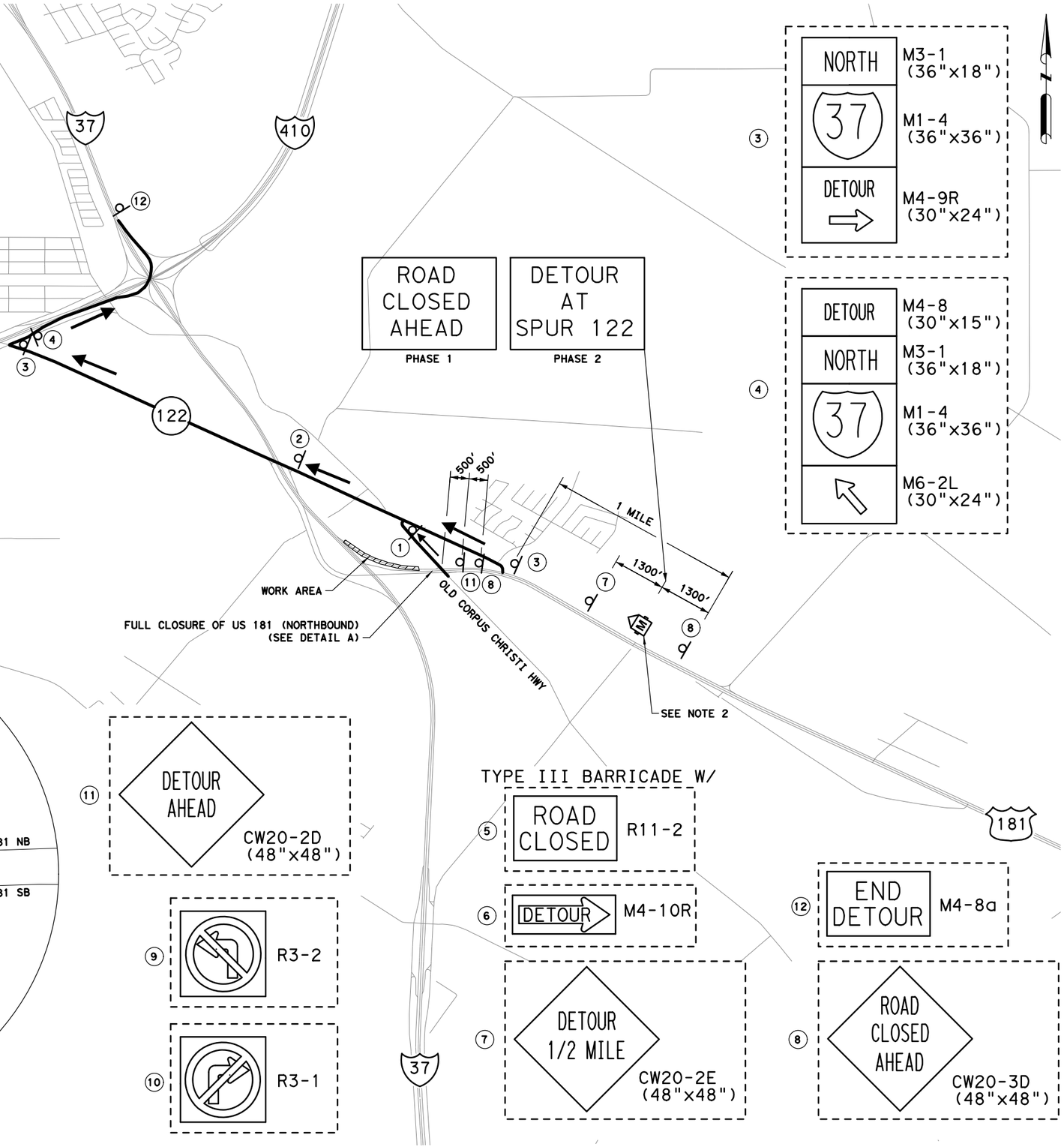

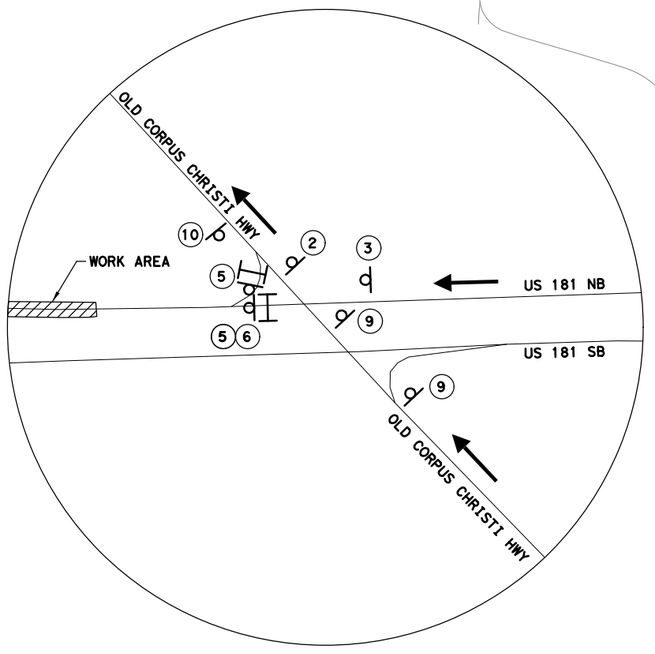

DETAIL A

TYPE III BARRICADE W/

LEGEND

- DETOUR TRAFFIC FLOW
- TYPE III BARRICADE
- PCMS
- TRAILER MOUNTED FLASHING ARROW BOARD
- DETOUR SIGN

NOTES

1. RAMP CLOSURES RESTRICTED TO NIGHTTIME WORK HOURS (9PM - 6AM), UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. CONTRACTOR SHALL PROVIDE ADVANCE NOTICE TO PUBLIC FOR RAMP CLOSURES. SEE "ADVANCE NOTICE LIST" ON STANDARD BC(6) FOR RECOMMENDED DATE AND TIME FORMATTING OPTIONS FOR PCMS MESSAGE.
3. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL BY THE ENGINEER PRIOR TO INITIATING RAMP CLOSURES.
4. RAMP CLOSURES SHALL OCCUR ONE AT A TIME. RAMP WORK DURING EACH PHASE SHALL BE COMPLETED PRIOR TO MOVING TO NEXT RAMP CLOSURE AND/OR PHASE.
5. DETOUR SIGNS SHALL BE COVERED WHEN NOT IN USE, AND REMOVED IMMEDIATELY WHEN NO LONGER REQUIRED FOR RAMP CLOSURE.

0 1500 3000
SCALE: 1" = 3000'

STATE OF TEXAS
Luis A. González
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PROFESSIONAL ENGINEER
2/25/2021

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TBPE REG. NO. F-2742

US 181 RAMP CLOSURE & DETOUR FOR US 181 CONNECTOR NB

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			77
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

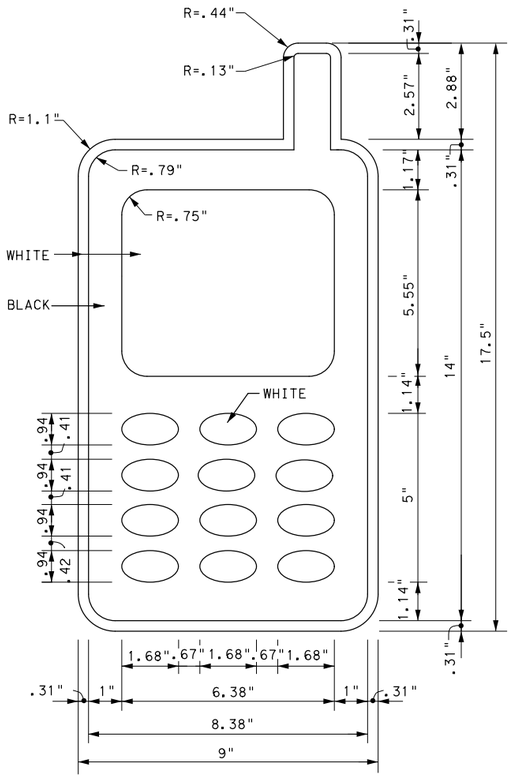
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

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

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

WORKER SAFETY APPAREL NOTES:

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



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

SIGN DETAIL (G20-10T)

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

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

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
4-03 5-10 8-14	DIST	COUNTY		SHEET NO.
9-07 7-13	SAT	BEXAR		78

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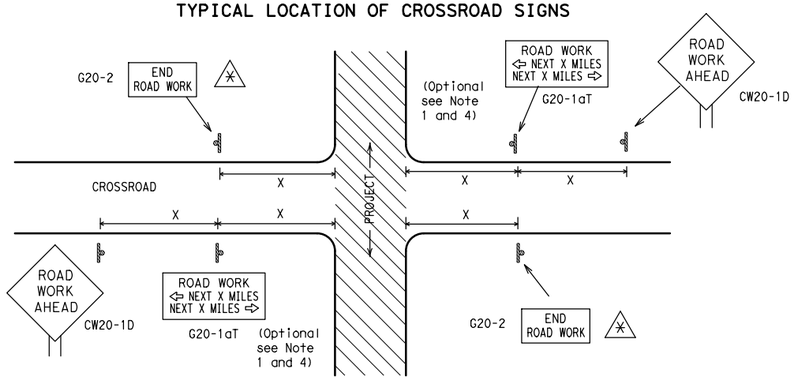
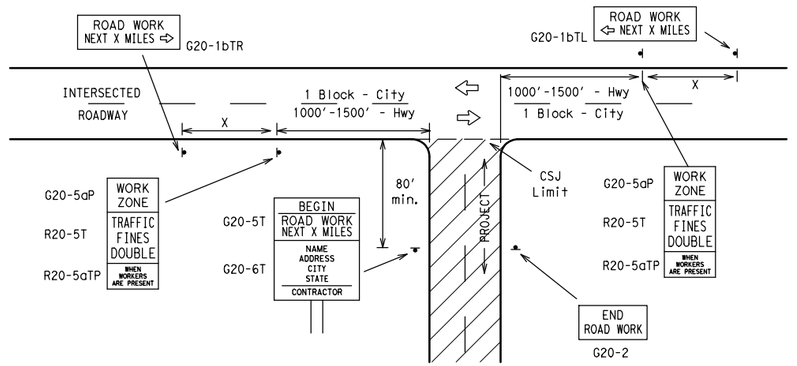
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

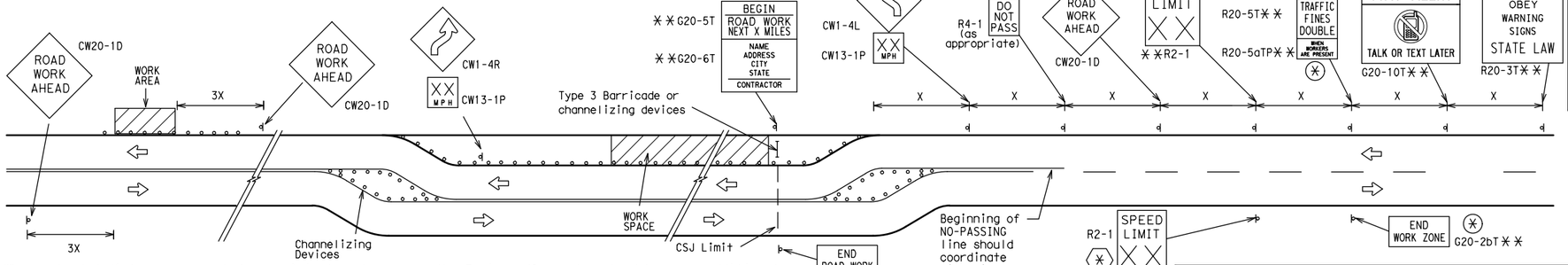
⁂ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

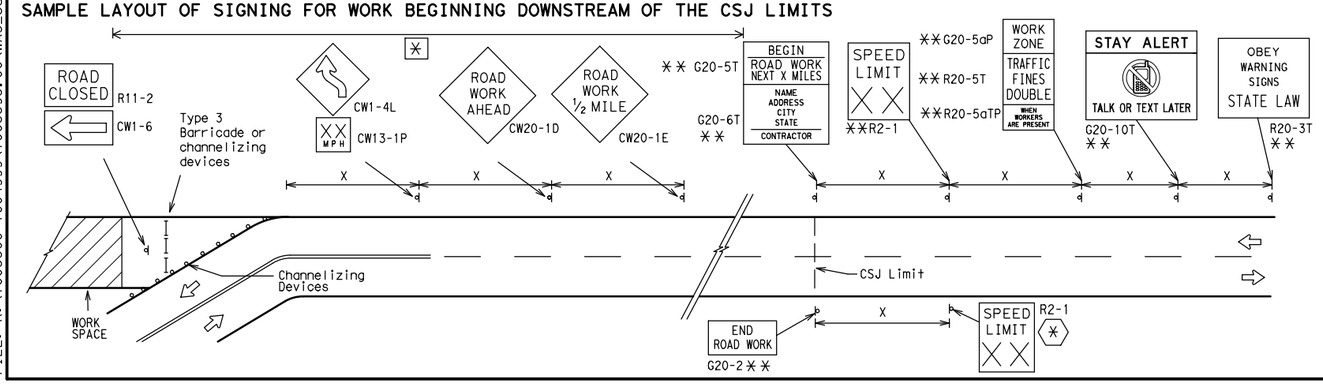
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING 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.

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		79

DATE: 2/25/2021 4:04:47 PM
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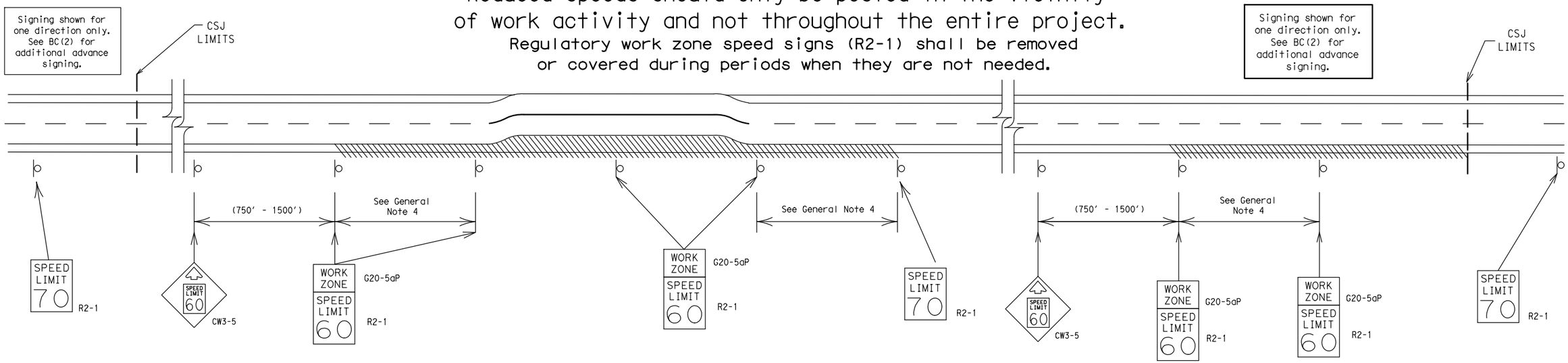
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 travelled way.

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		80

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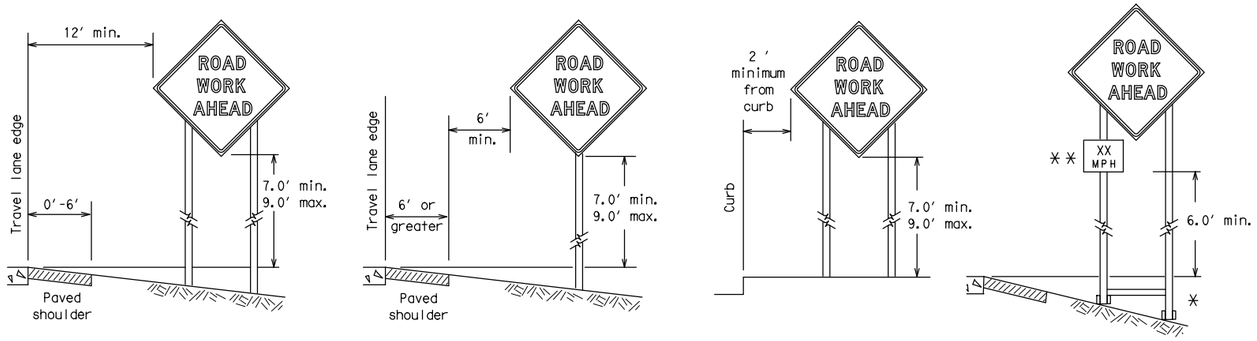
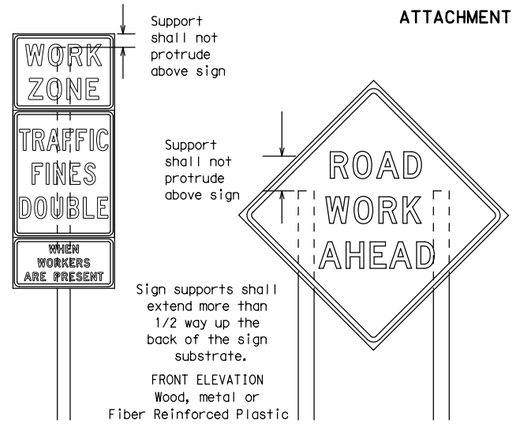
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



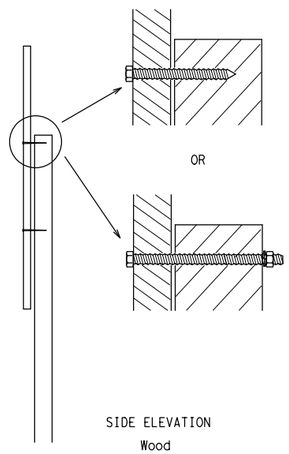
⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the 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.

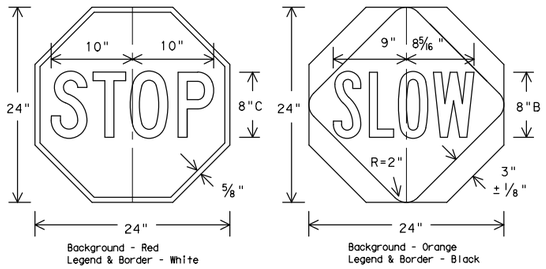


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

STOP/SLOW PADDLES

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



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

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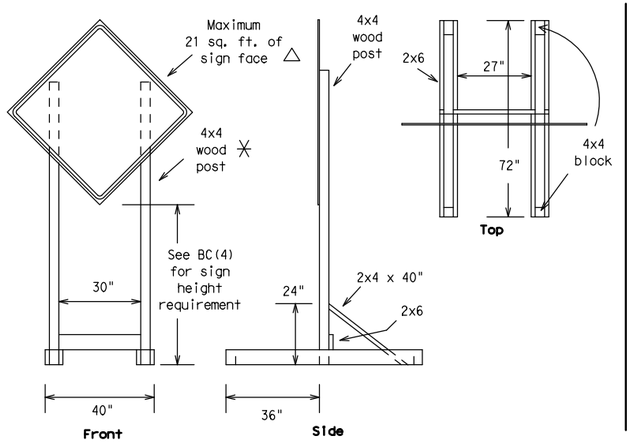
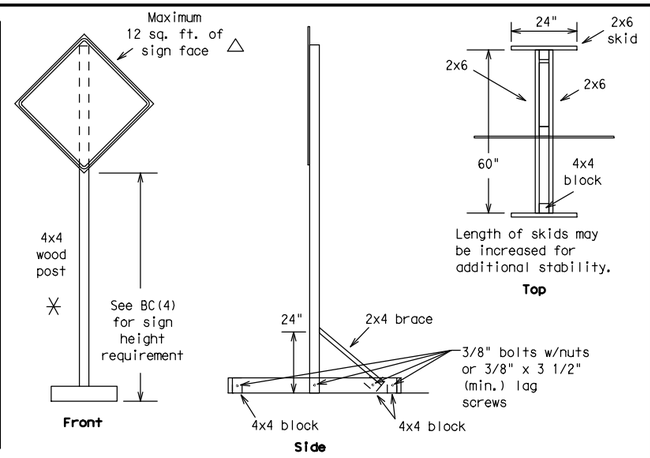
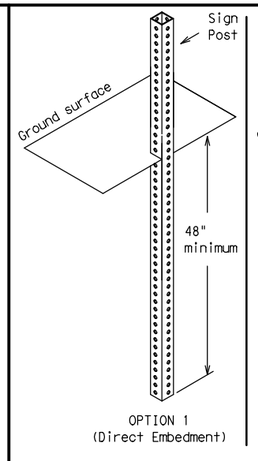
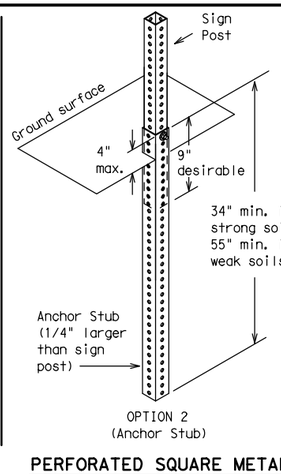


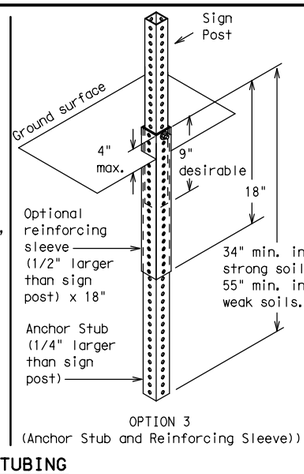


SKID MOUNTED WOOD SIGN SUPPORTS

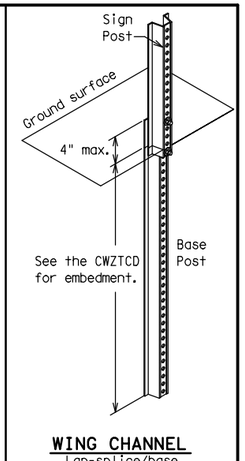
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □







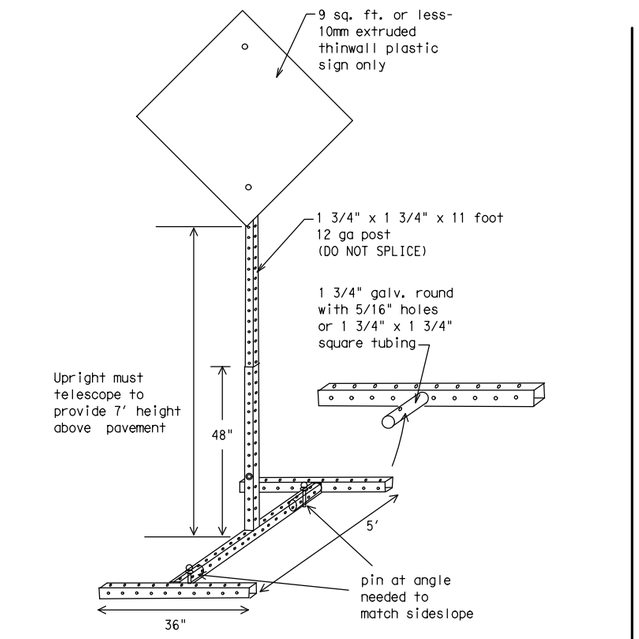
PERFORATED SQUARE METAL TUBING

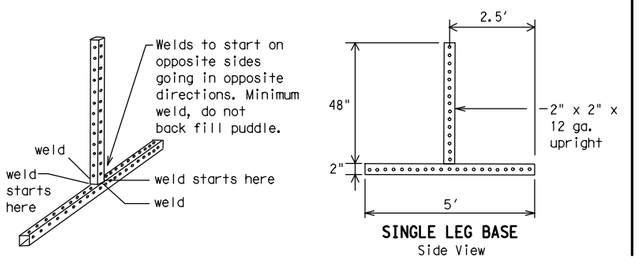


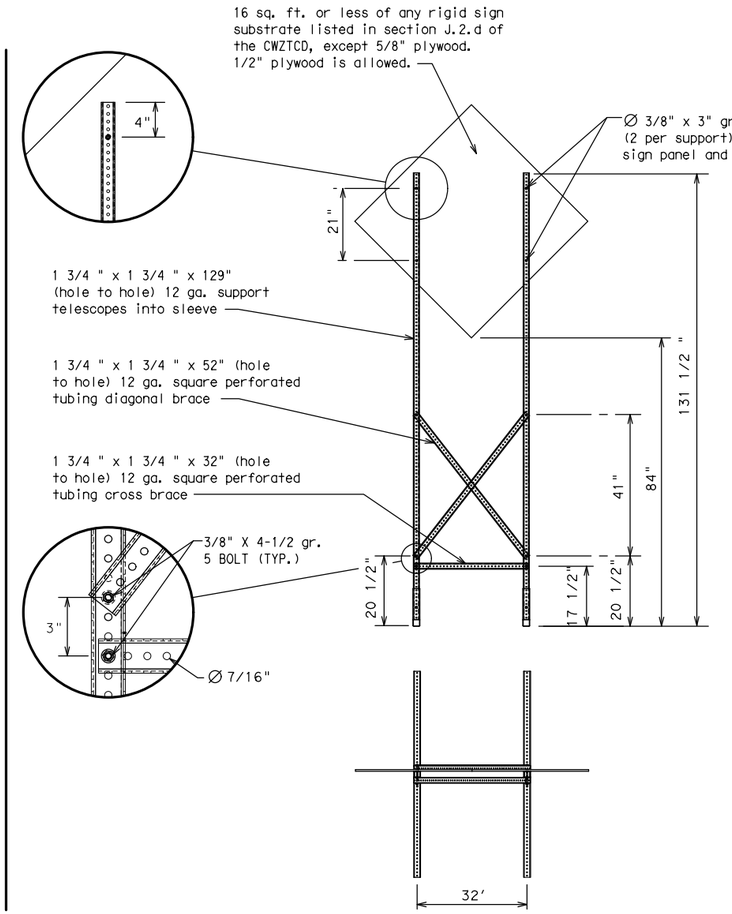
WING CHANNEL
Lap-splice/base bolted anchor

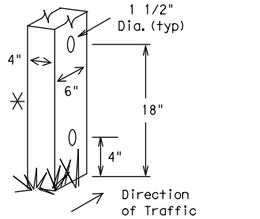
GROUND MOUNTED SIGN SUPPORTS

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



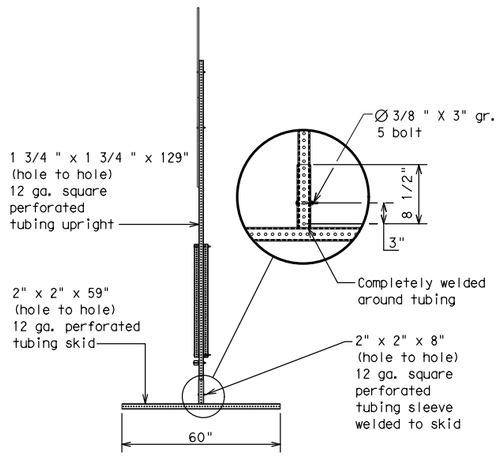






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		82

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		83

DATE: 2/25/2021 4:04:49 PM
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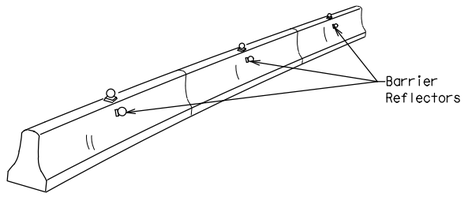
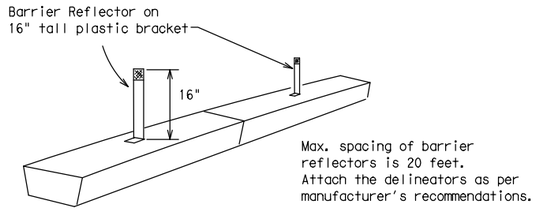
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

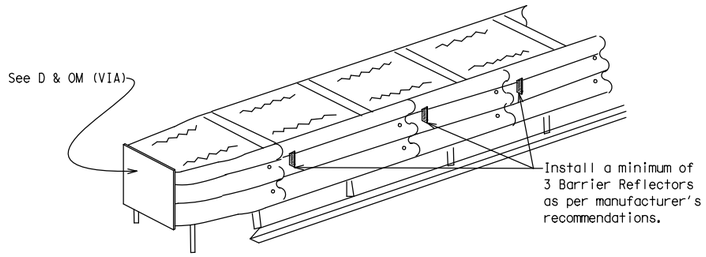


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

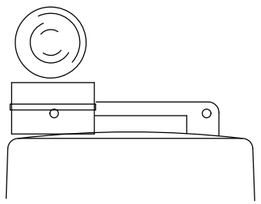


DELINEATION OF END TREATMENTS

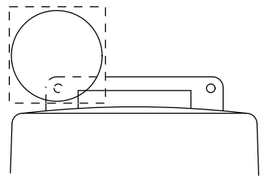
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

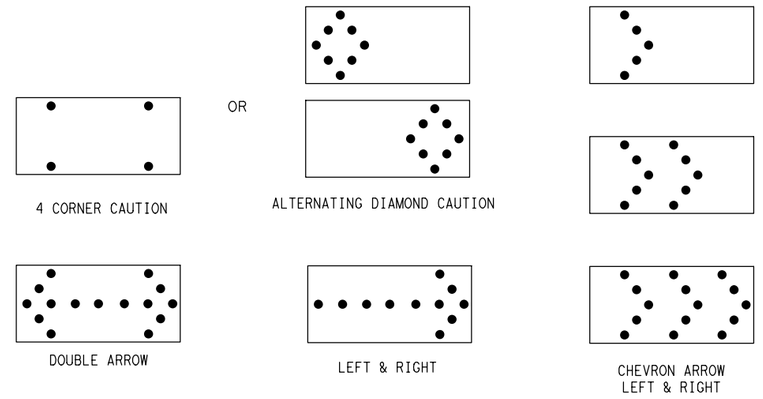
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

BC(7)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	SAT	BEXAR		84

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

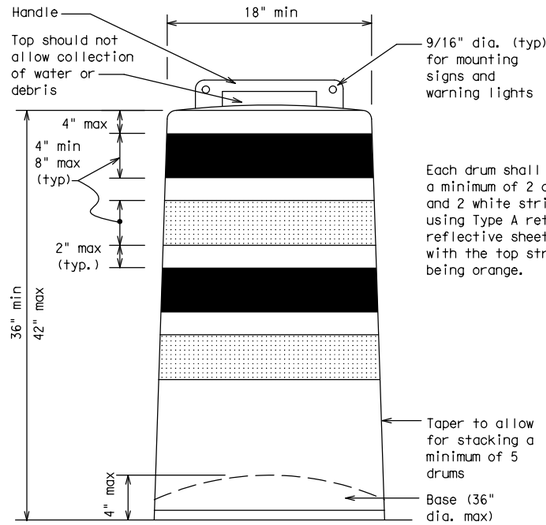
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

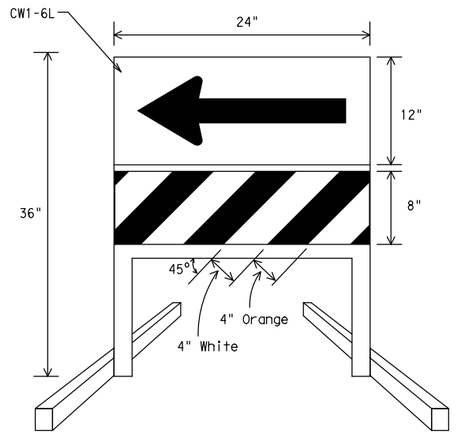
RETROREFLECTIVE SHEETING

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

BALLAST

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





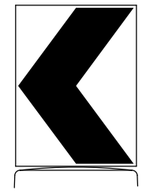
DIRECTION INDICATOR BARRICADE

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

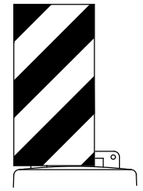
This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	SAT	BEXAR		85

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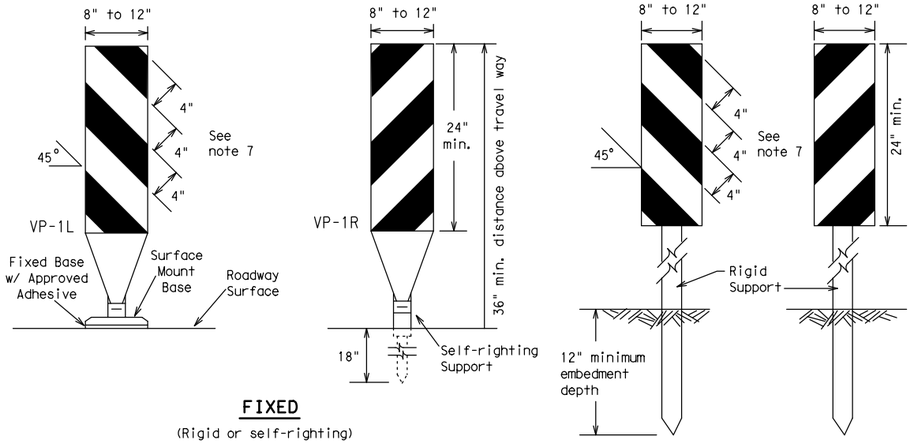
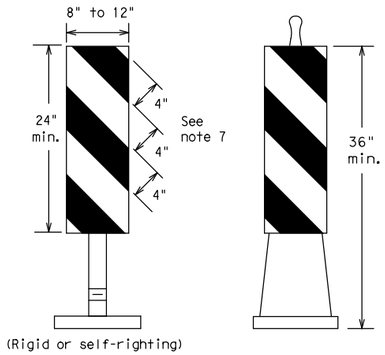


FIXED
(Rigid or self-righting)

DRIVEABLE

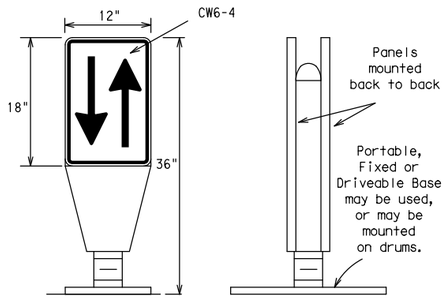


(Rigid or self-righting)

PORTABLE

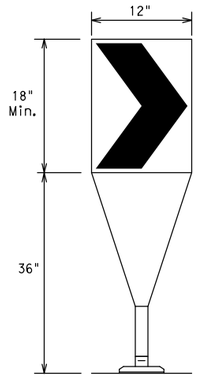
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



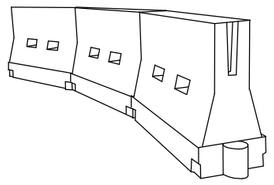
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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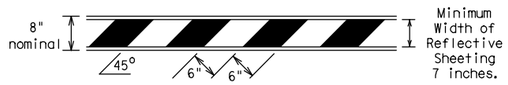
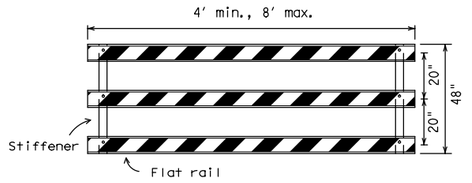
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



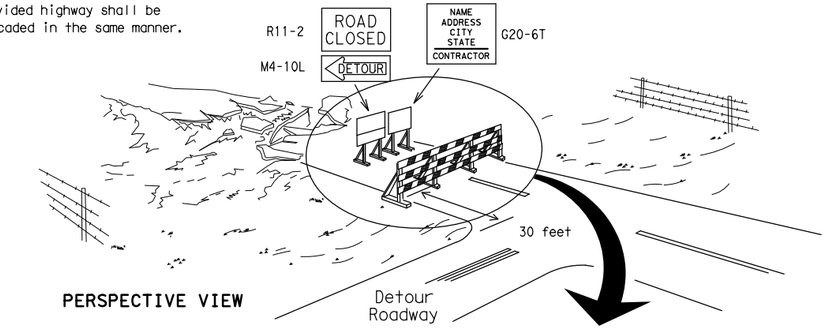
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

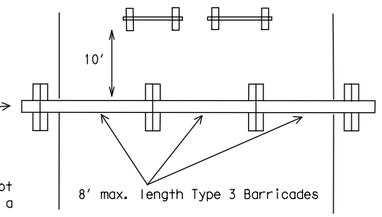
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

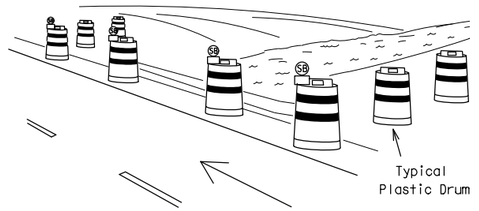
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

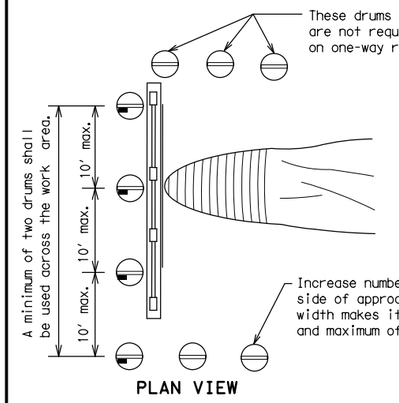
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

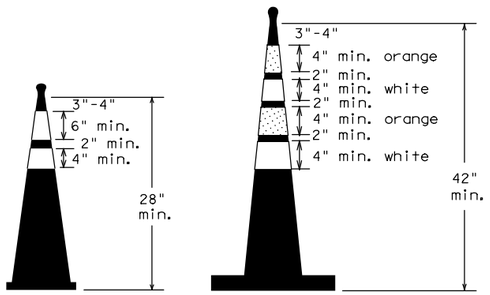
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

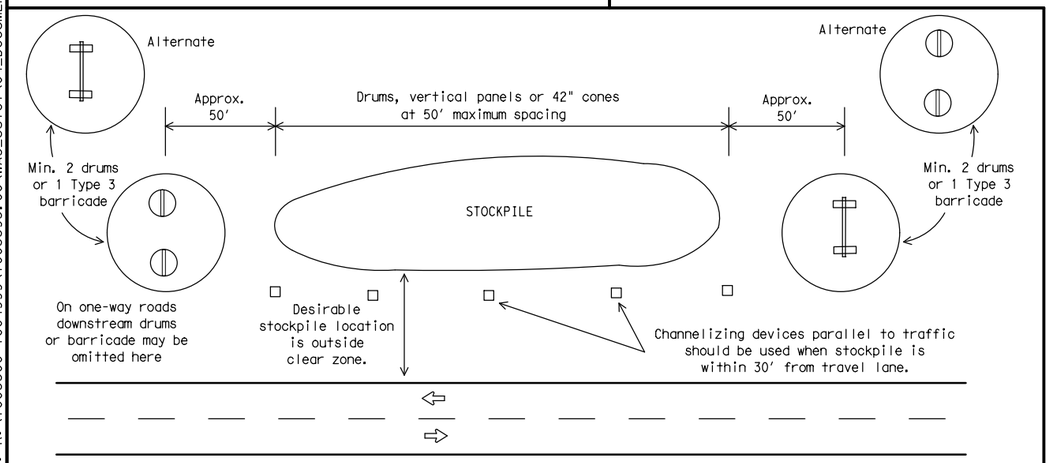
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

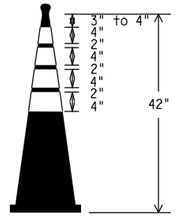
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



EDGELINE CHANNELIZER

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

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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.

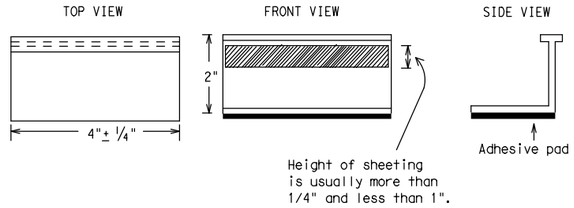
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

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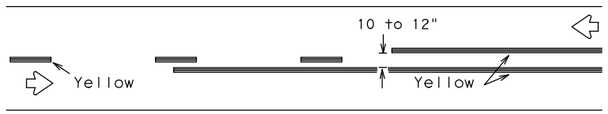
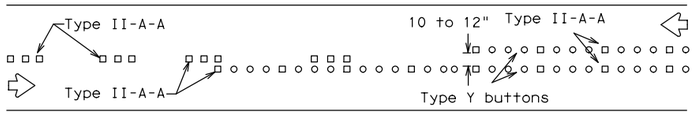
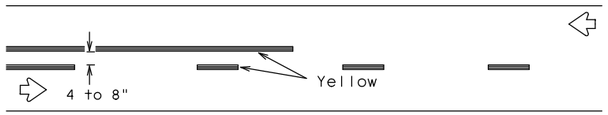
PAVEMENT MARKING PATTERNS



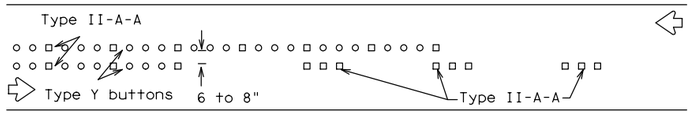
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



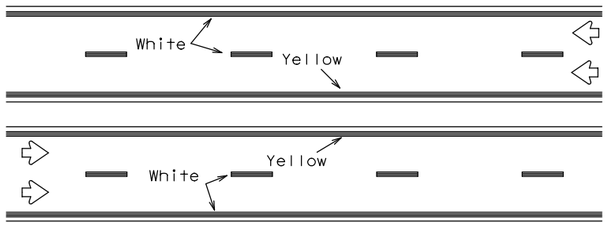
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



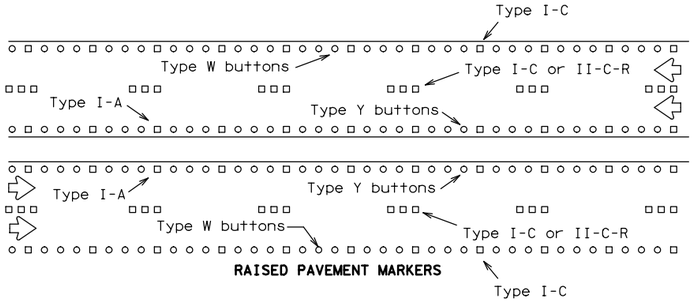
RAISED PAVEMENT MARKERS - PATTERN B

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

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



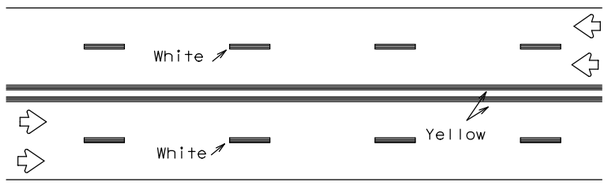
REFLECTORIZED PAVEMENT MARKINGS



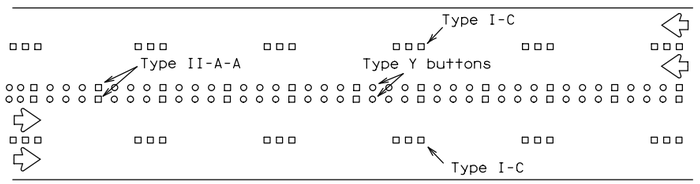
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



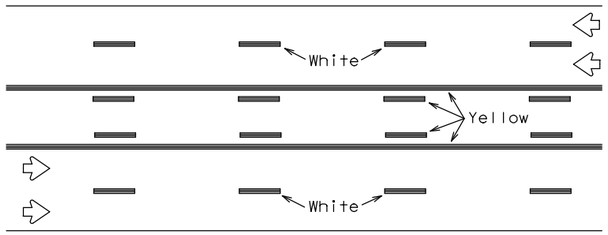
REFLECTORIZED PAVEMENT MARKINGS



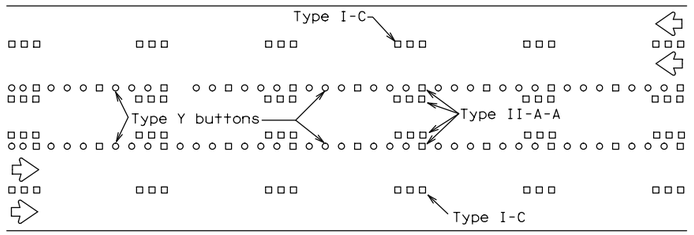
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

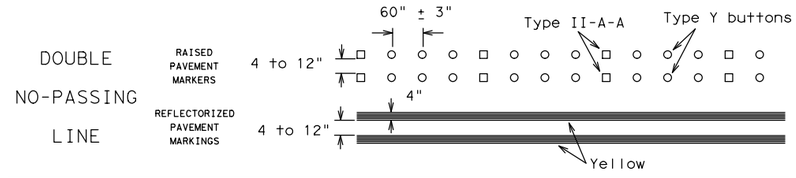
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

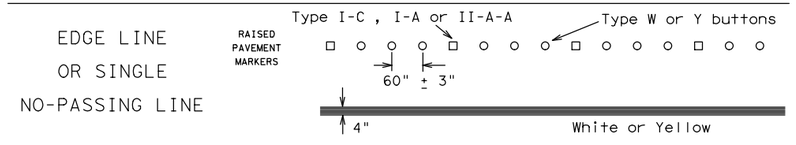
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

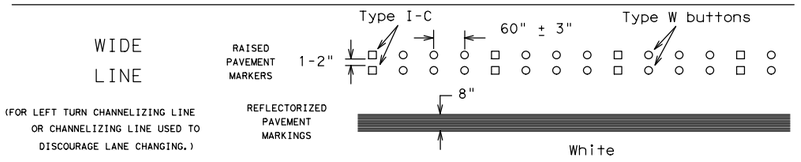


EDGE LINE OR SINGLE NO-PASSING LINE



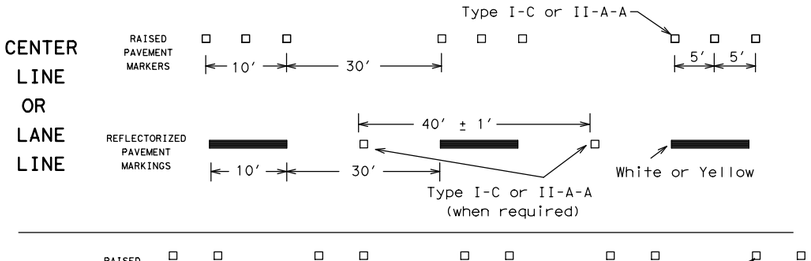
WIDE LINE

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

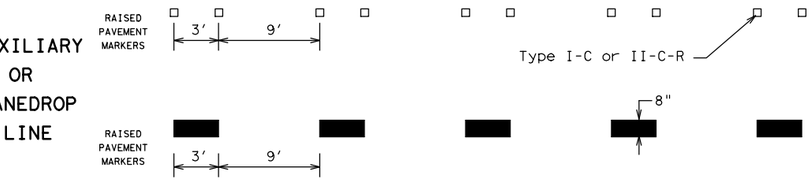


BROKEN LINES

CENTER LINE OR LANE LINE

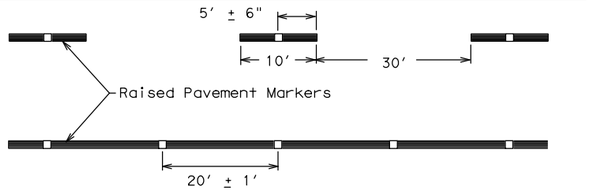


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
1-97 9-07	DIST	COUNTY		SHEET NO.
2-98 7-13	SAT	BEXAR		89
11-02 8-14				

106

DATE: 2/25/2021 4:04:53 PM
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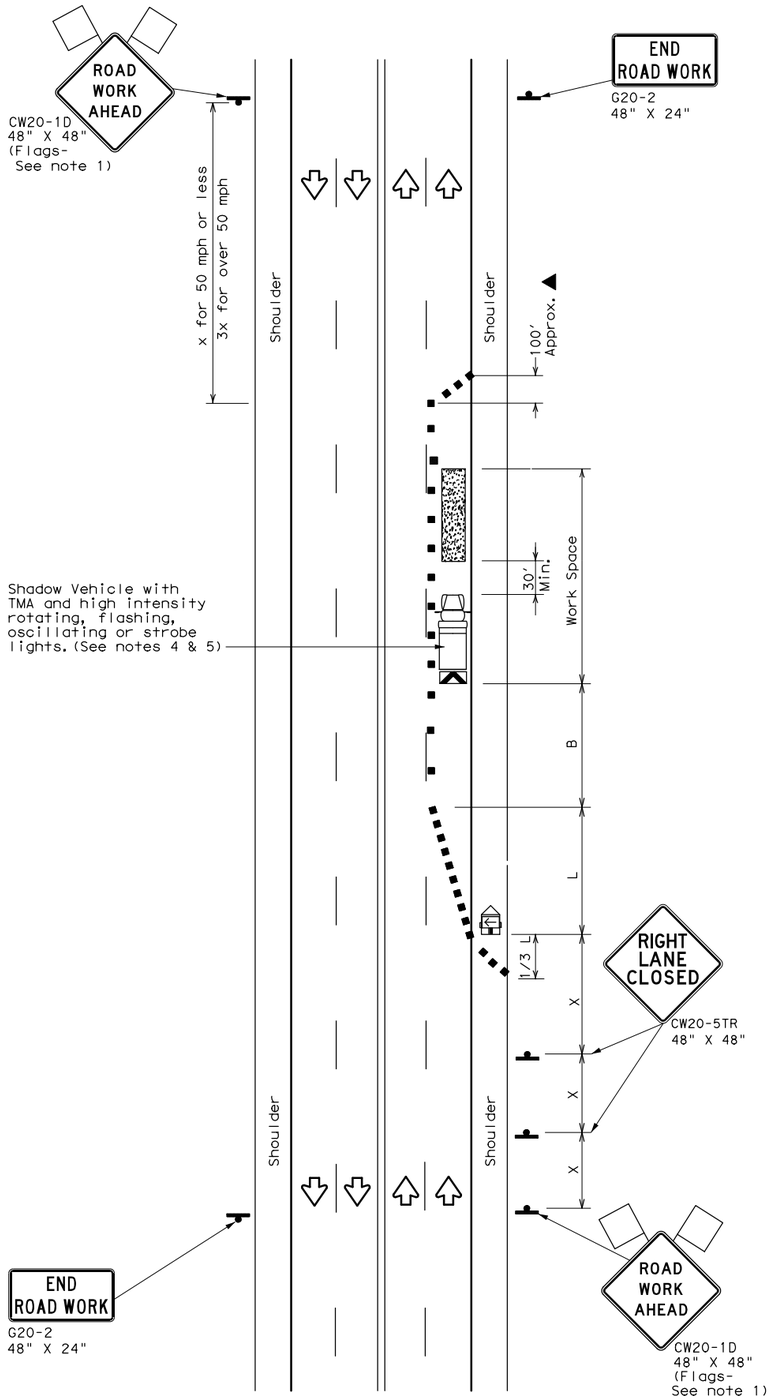
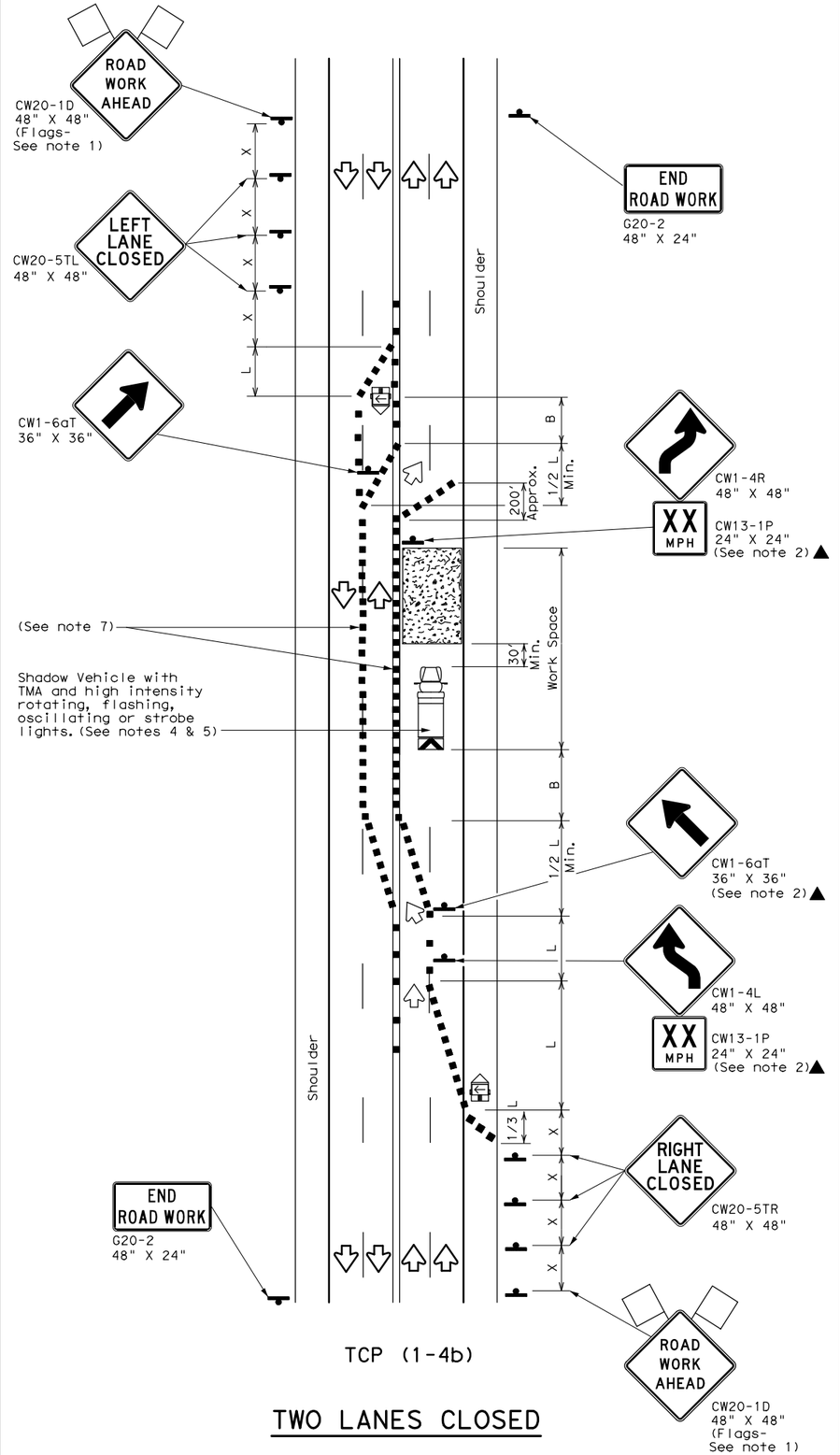


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

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 CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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 where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas 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(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	BEXAR		90
1-97 2-18				

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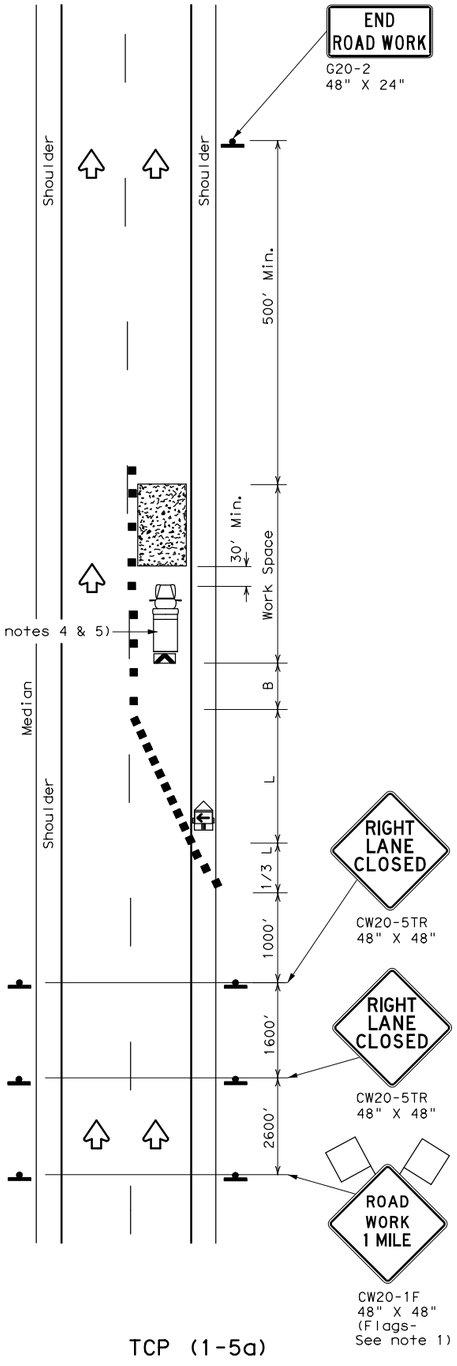
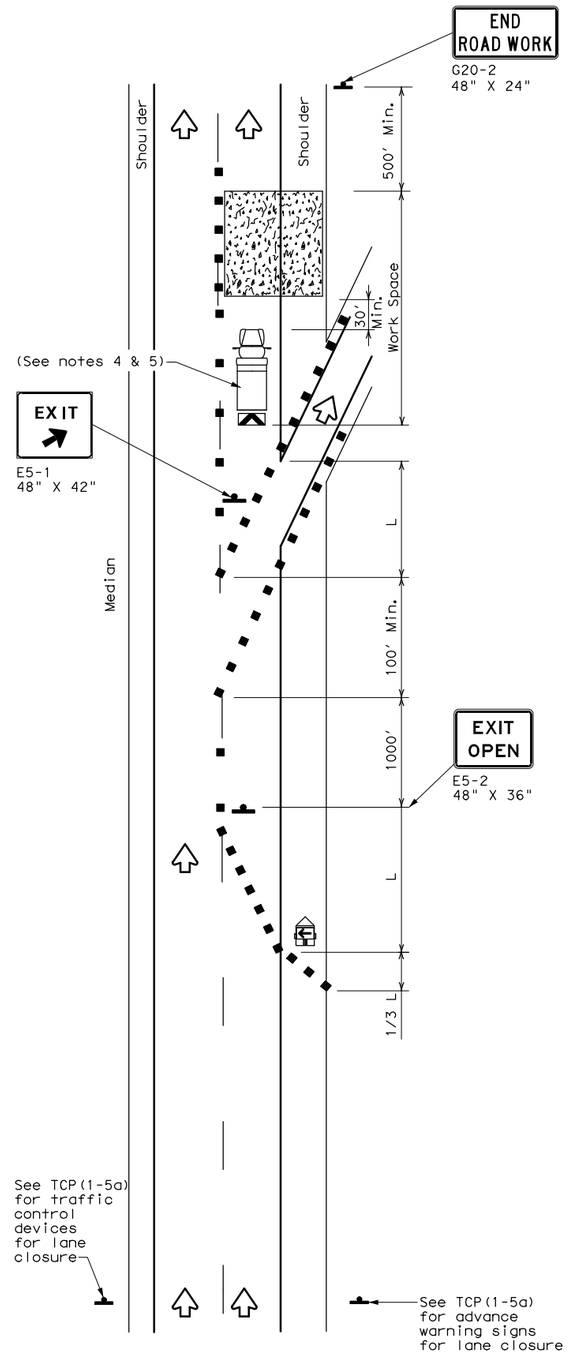


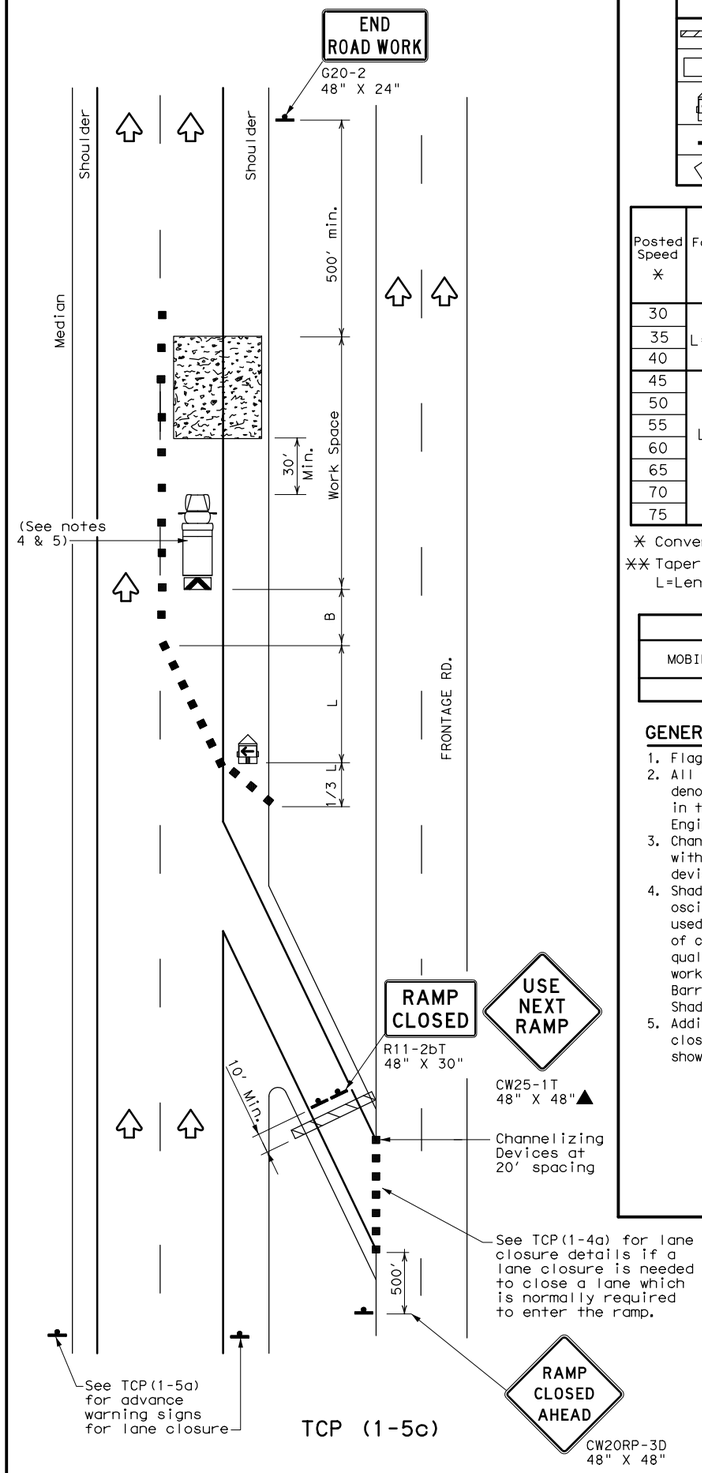
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

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. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned 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 FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		91

DATE: 2/25/2021 4:04:56 PM
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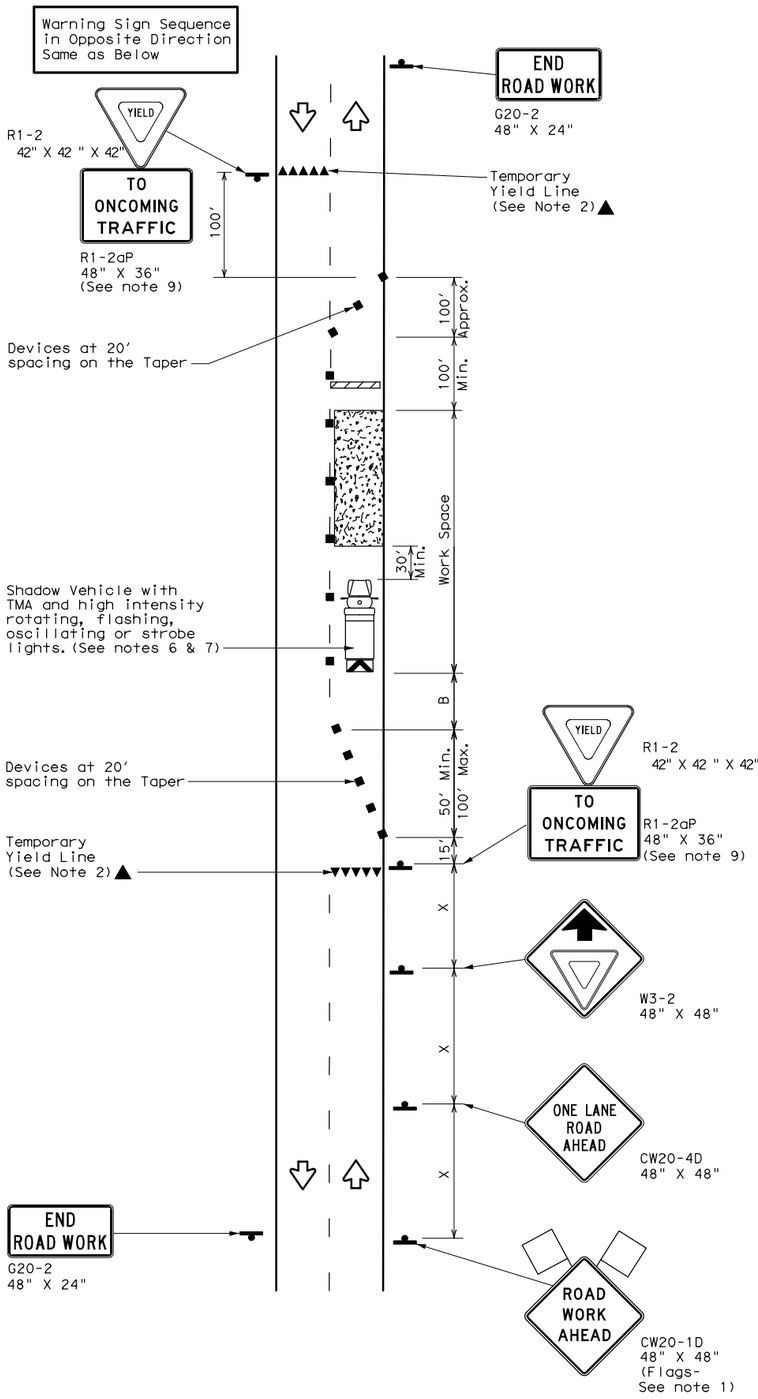
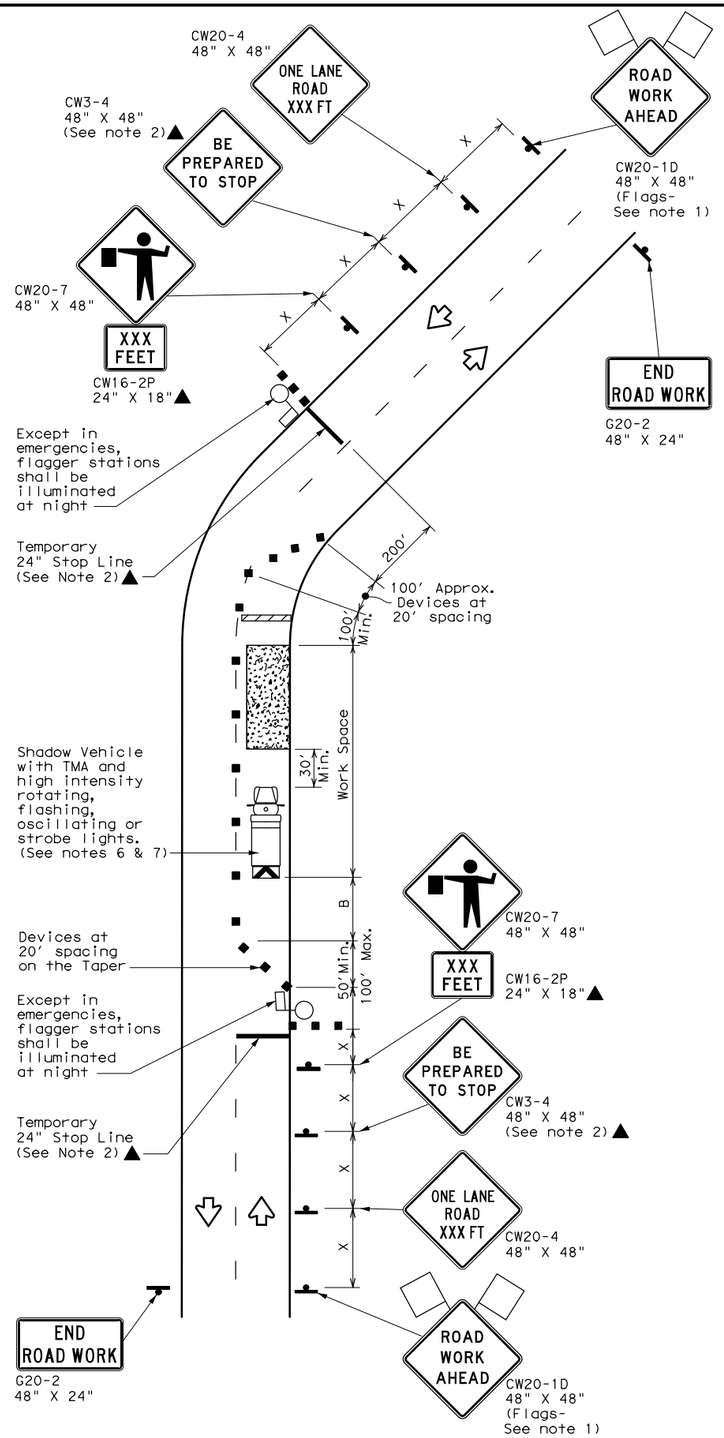


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. 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 CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0073	12	015,etc	US 181,etc
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		92

DATE: 2/25/2021 4:04:57 PM
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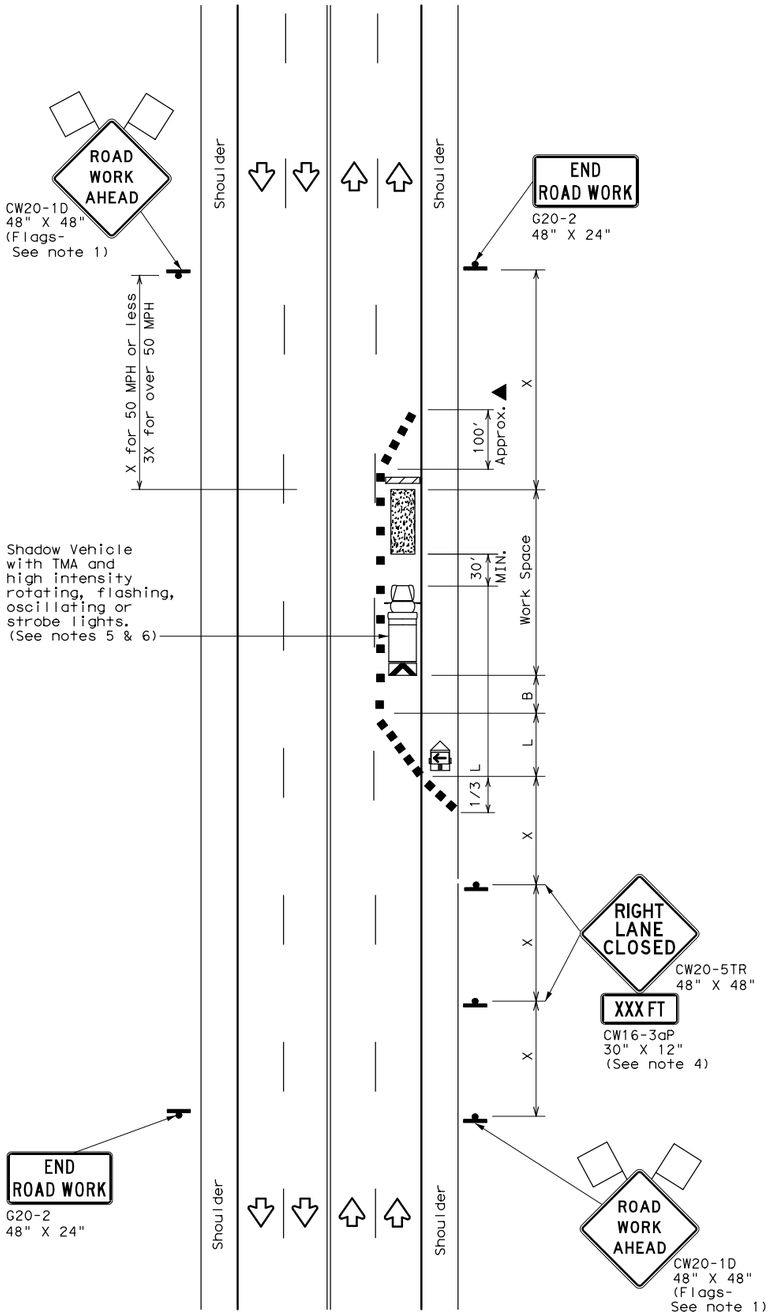
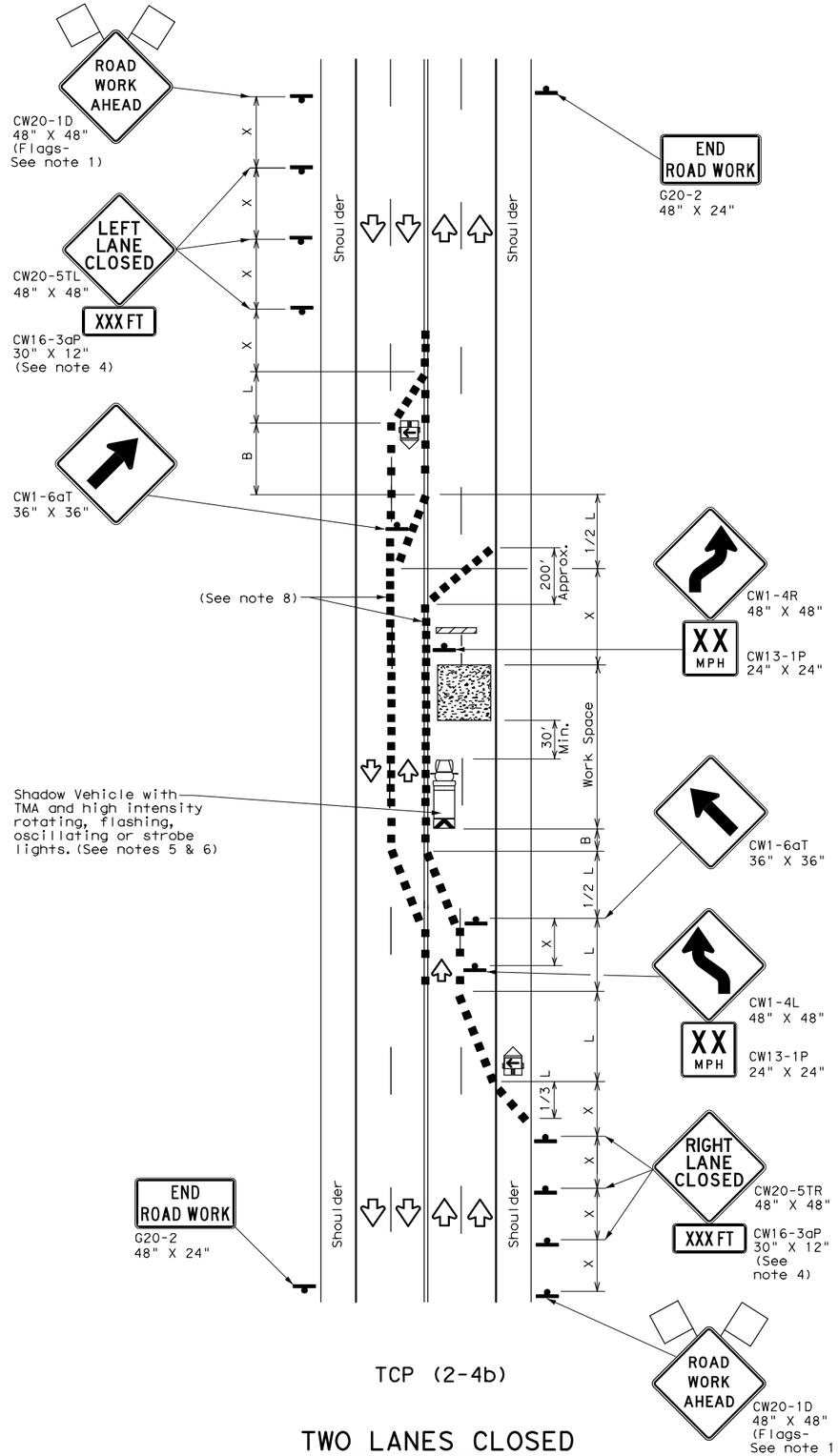


TCP (2-4a)

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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0073	12	015,etc	US 181,etc
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		93

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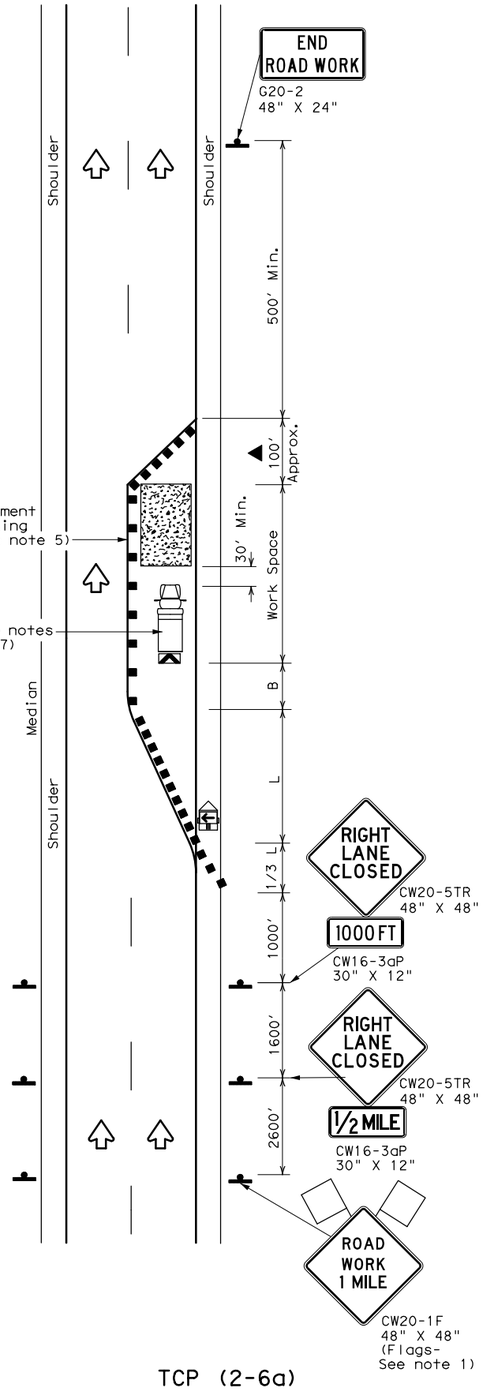
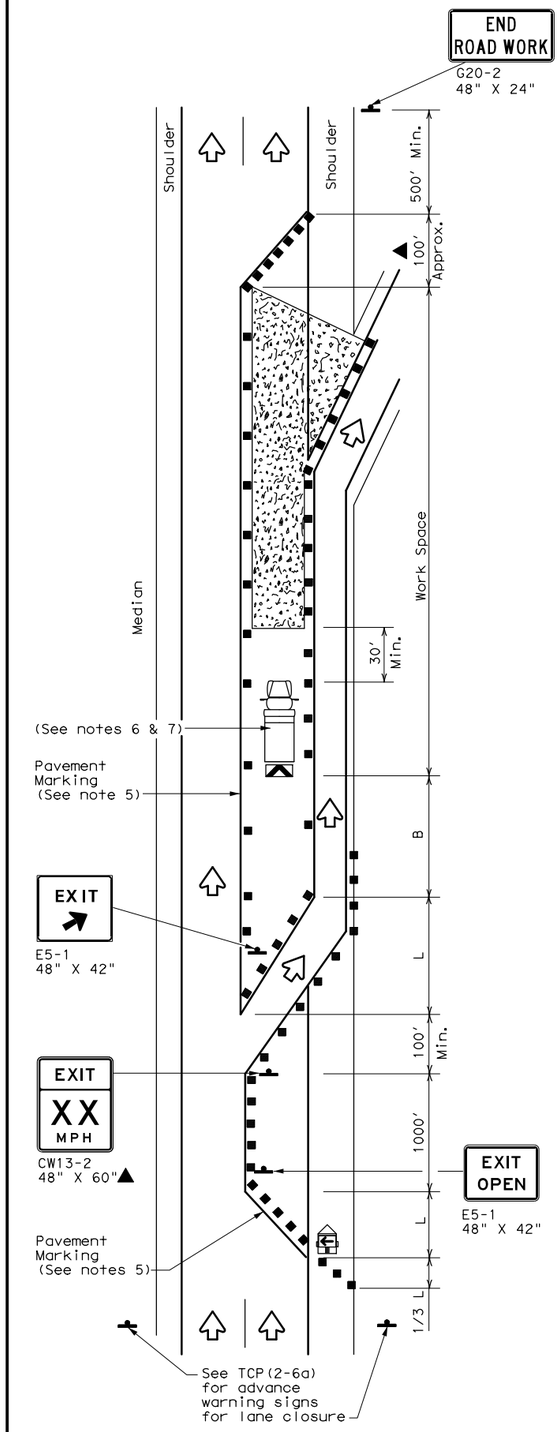


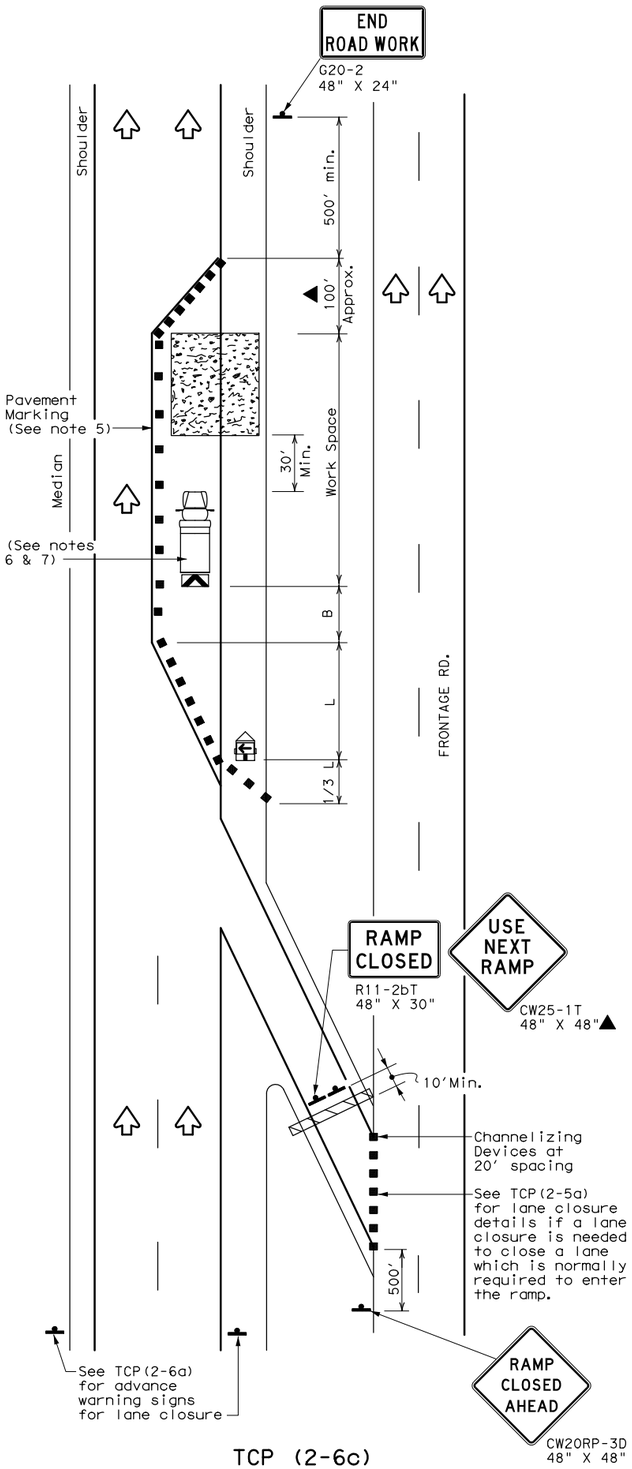
TCP (2-6a)

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	0073	12	015,etc	US 181,etc
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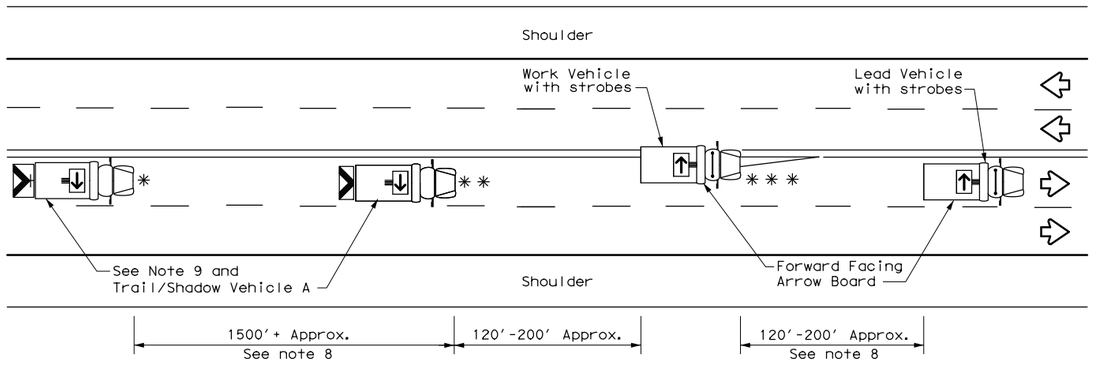
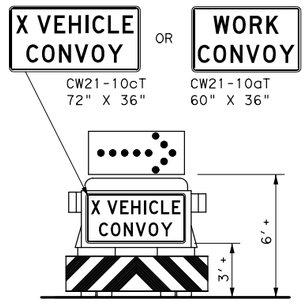


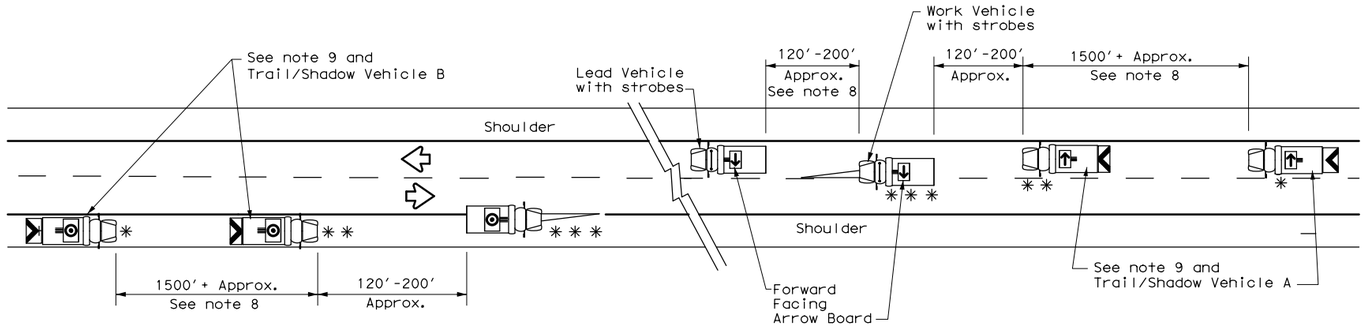
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

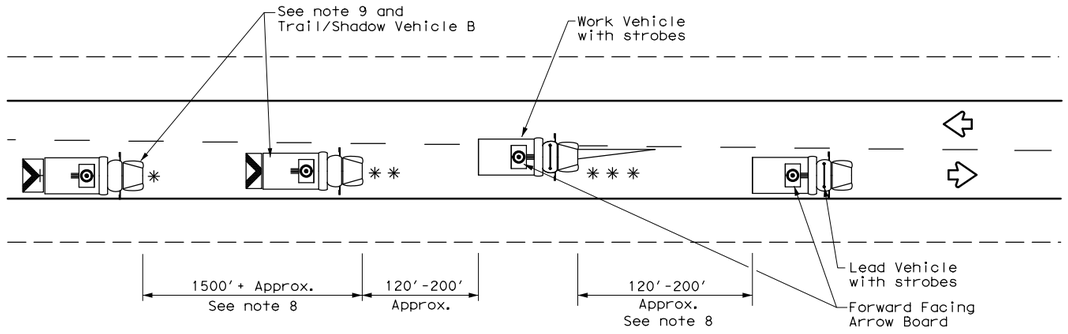


WORK ON SHOULDER

WORK ON TRAVEL LANE

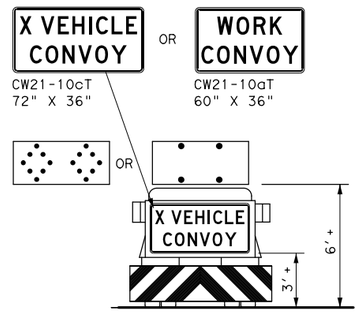
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

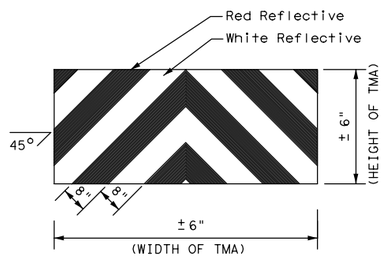
with Flashing Arrow Board in CAUTION display

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.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP (3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0073	12	015,etc	US 181,etc
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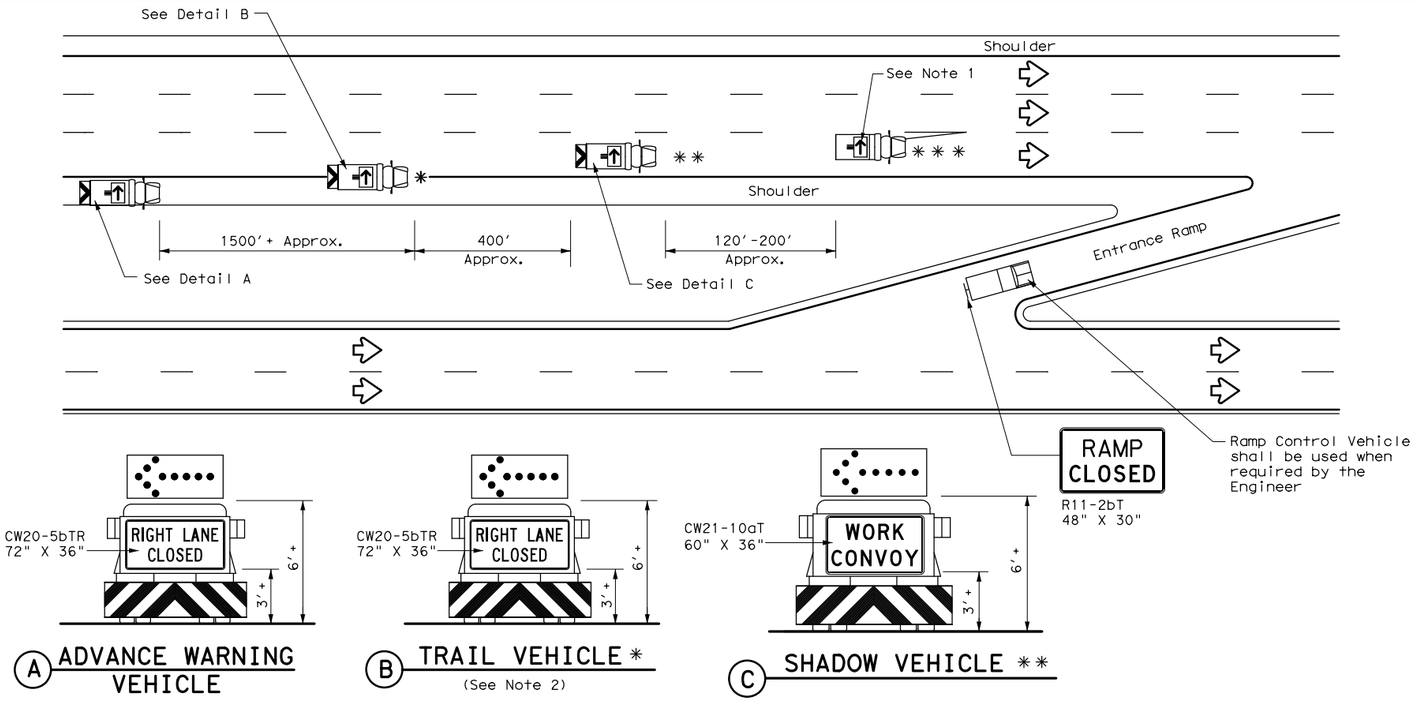
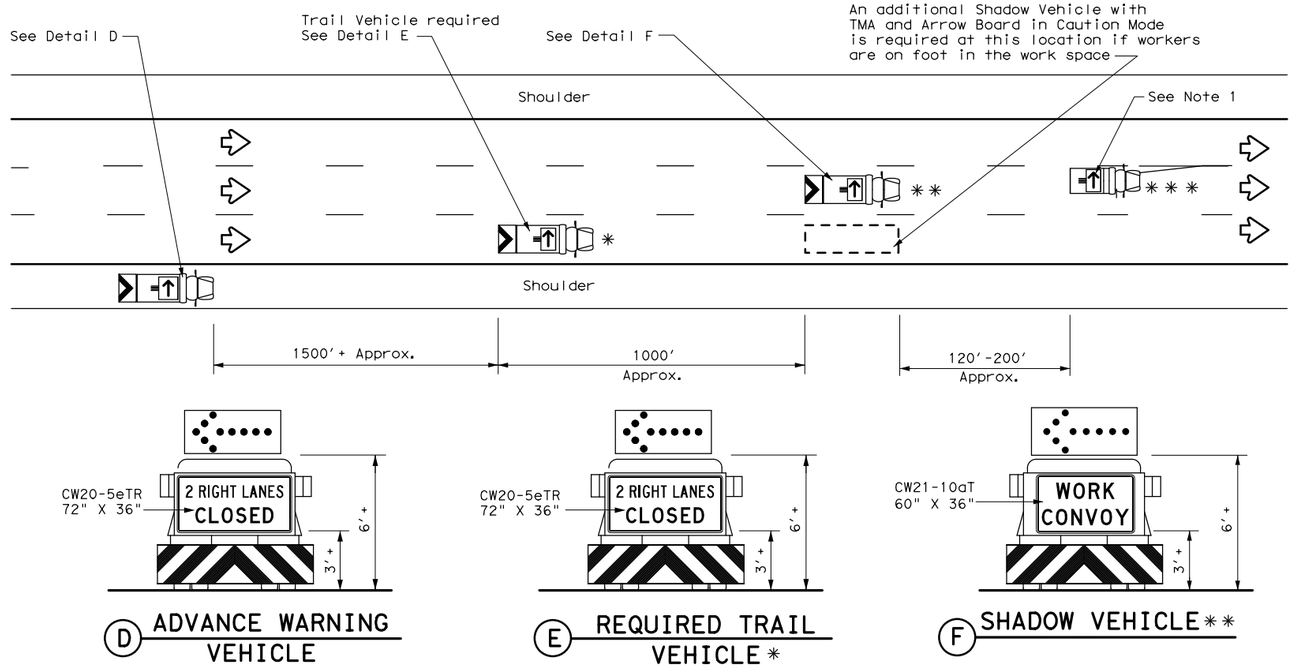


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



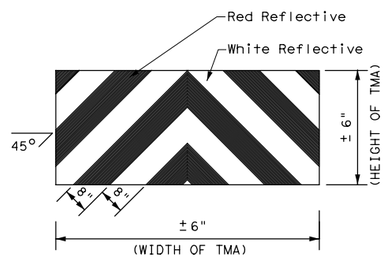
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	SAT	BEXAR		96
1-97				

176

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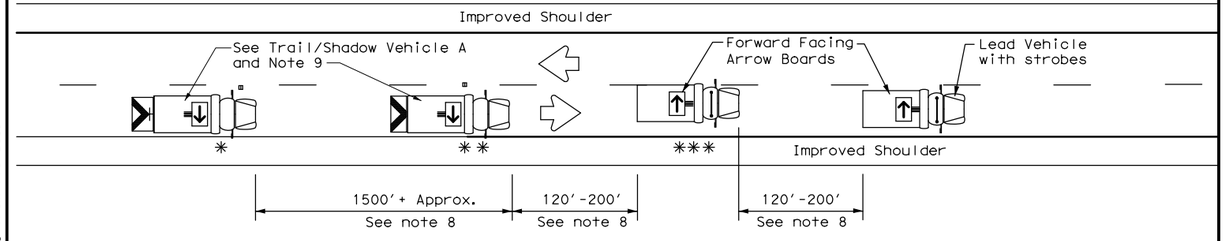
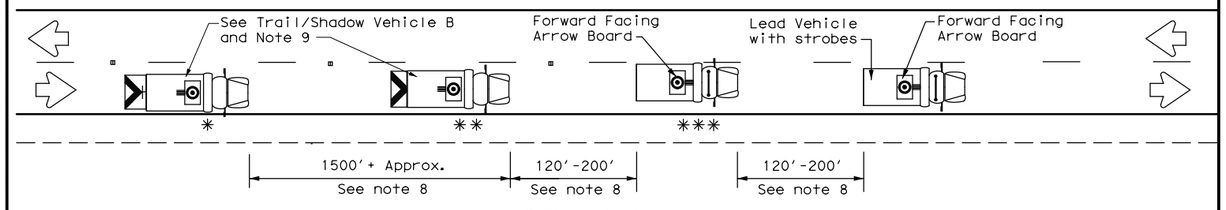


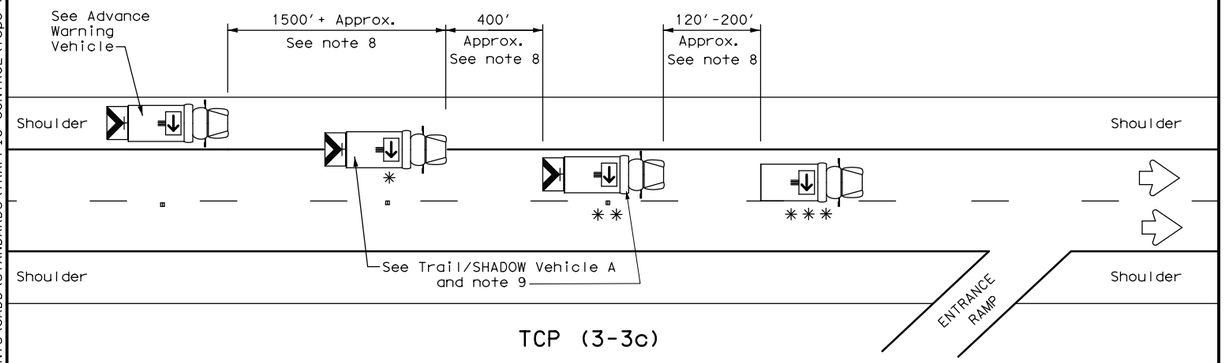
TCP (3-3a)

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



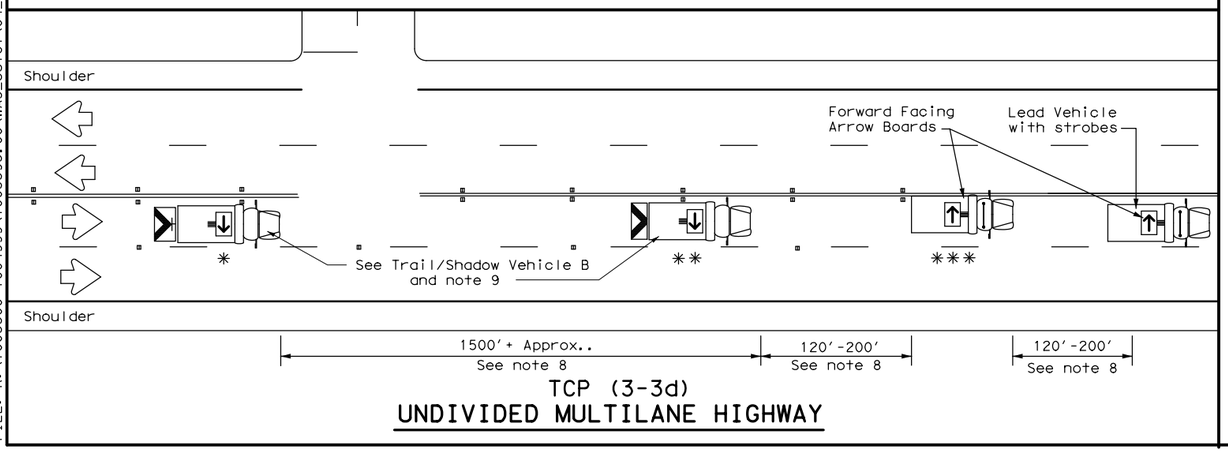
TCP (3-3b)

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



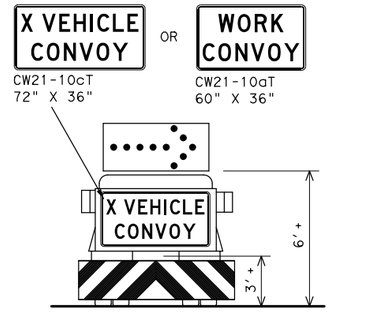
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



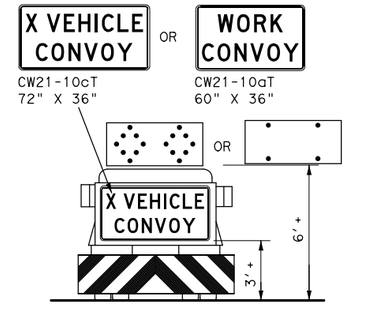
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



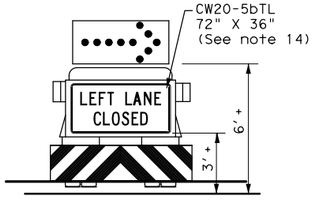
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

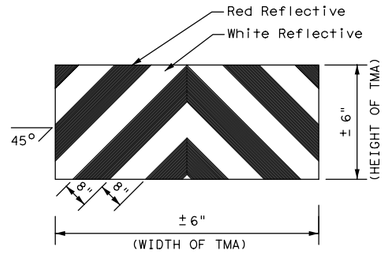


TRAIL/SHADOW VEHICLE B

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

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2-94 4-98	DIST	COUNTY		SHEET NO.
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1-97 7-14				

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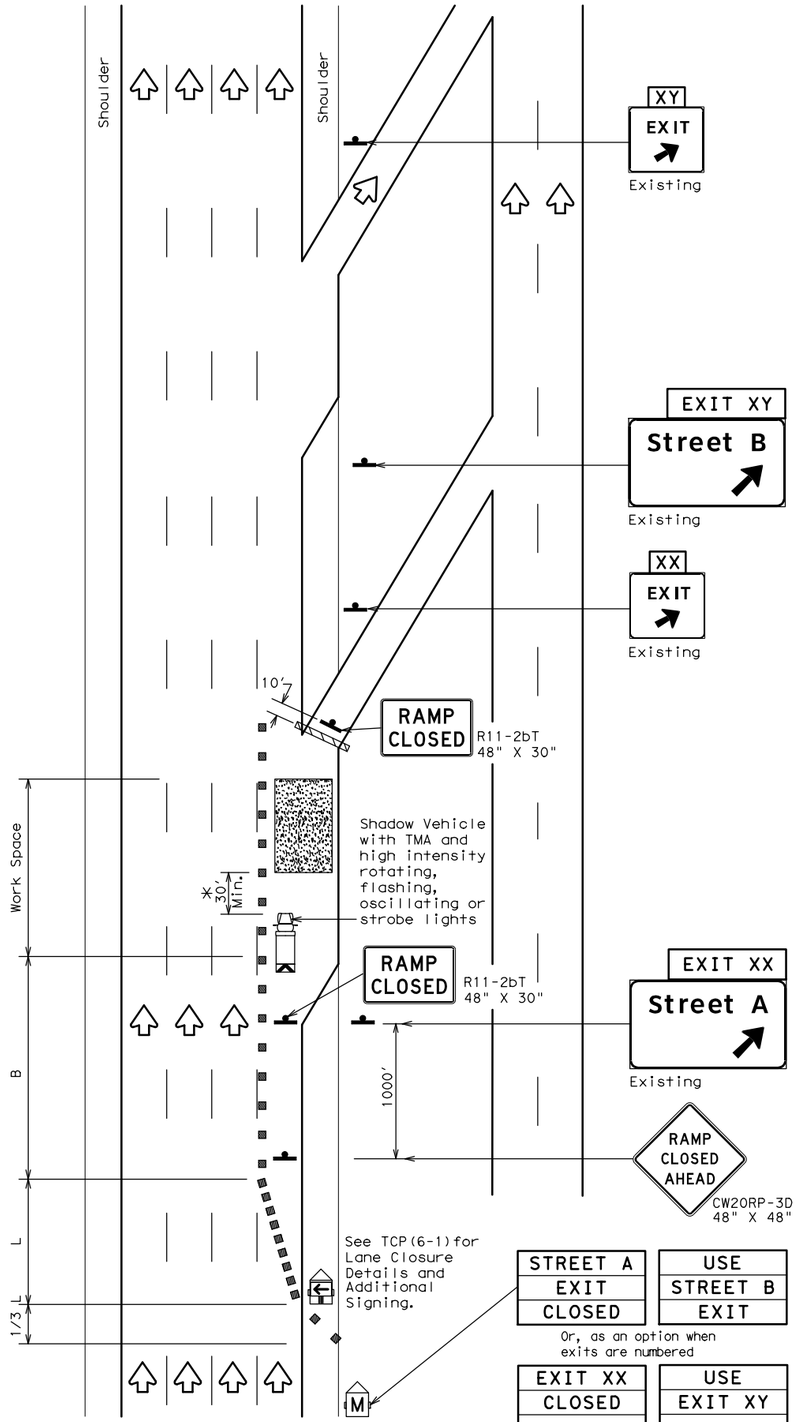
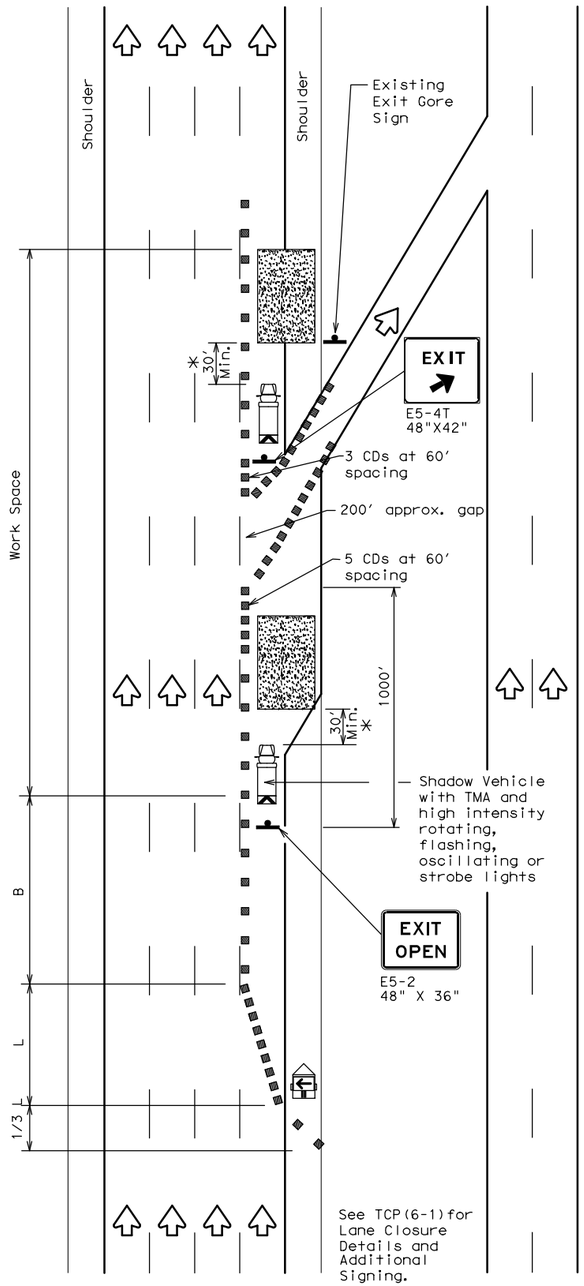


TCP (6-4a)

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" ✳✳			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. 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	0073	12	015,etc	US 181,etc
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		98

DATE: 2/25/2021 4:05:02 PM
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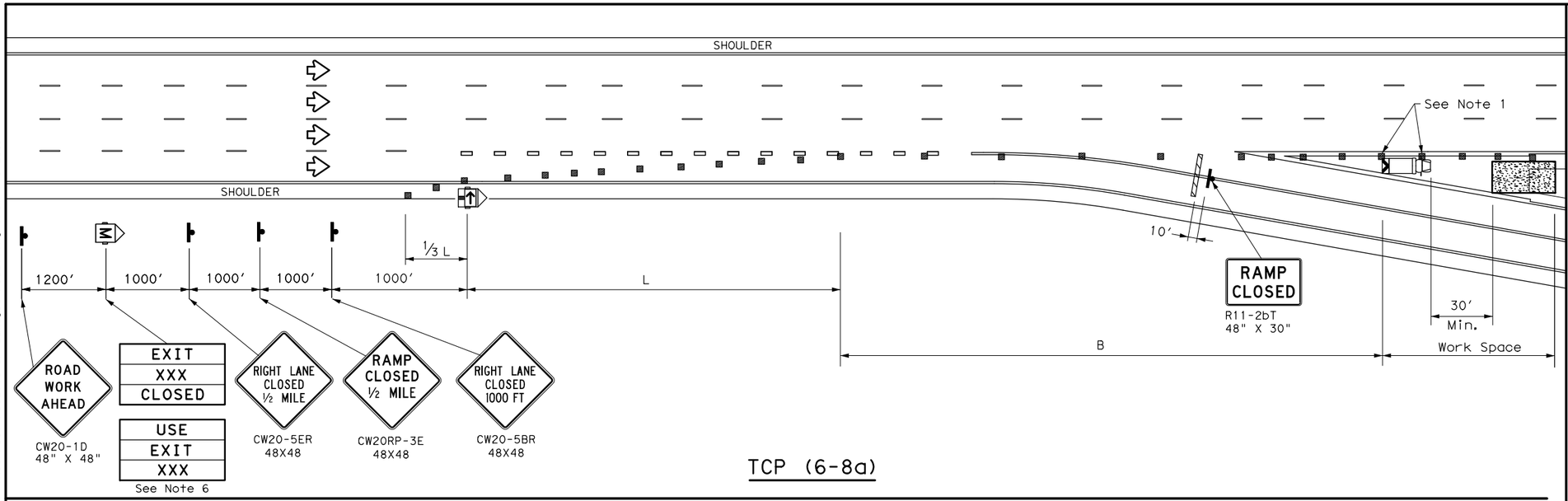
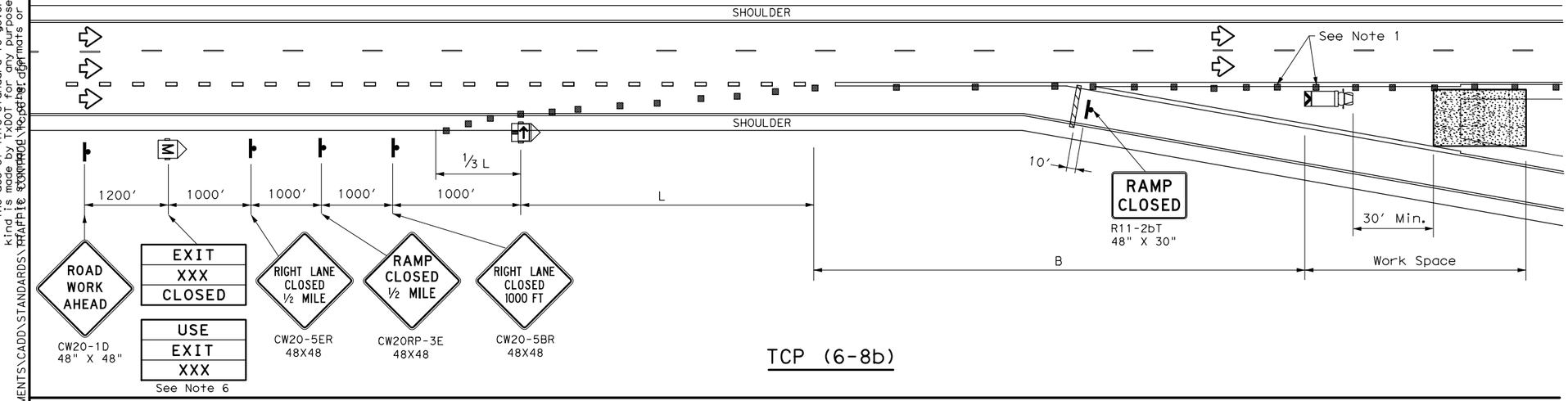
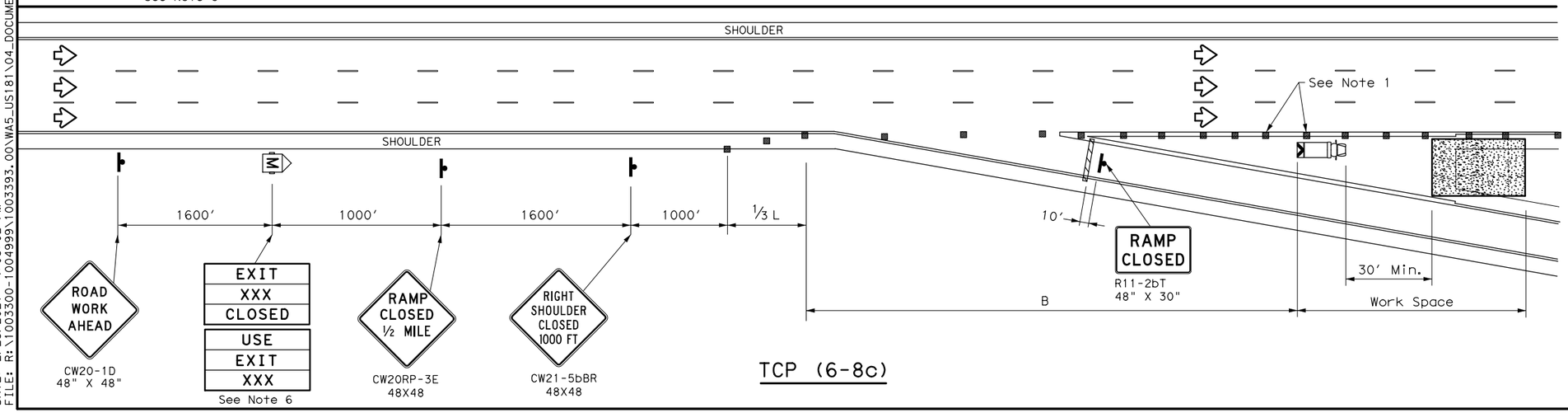


TCP (6-8a)



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

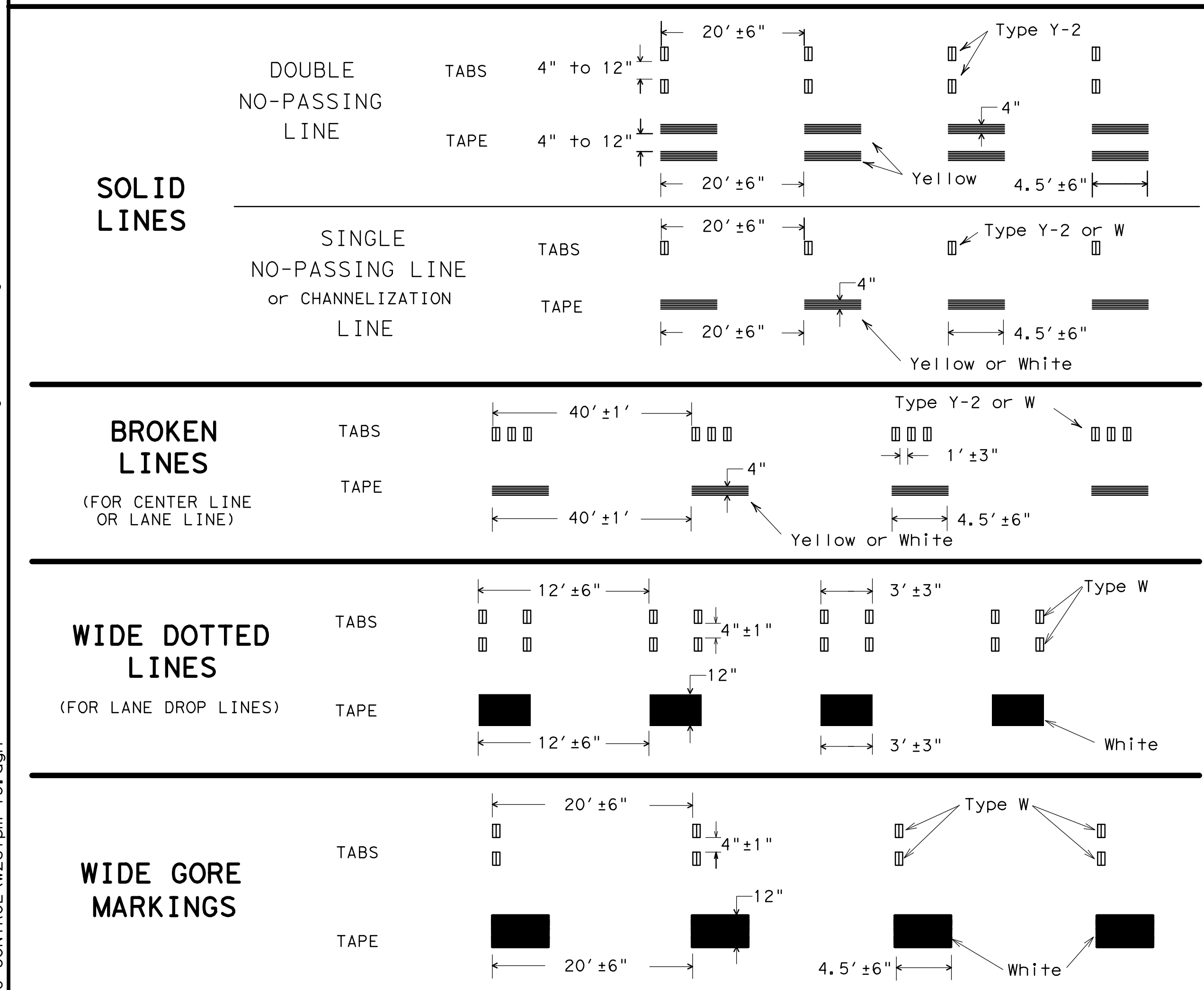
Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

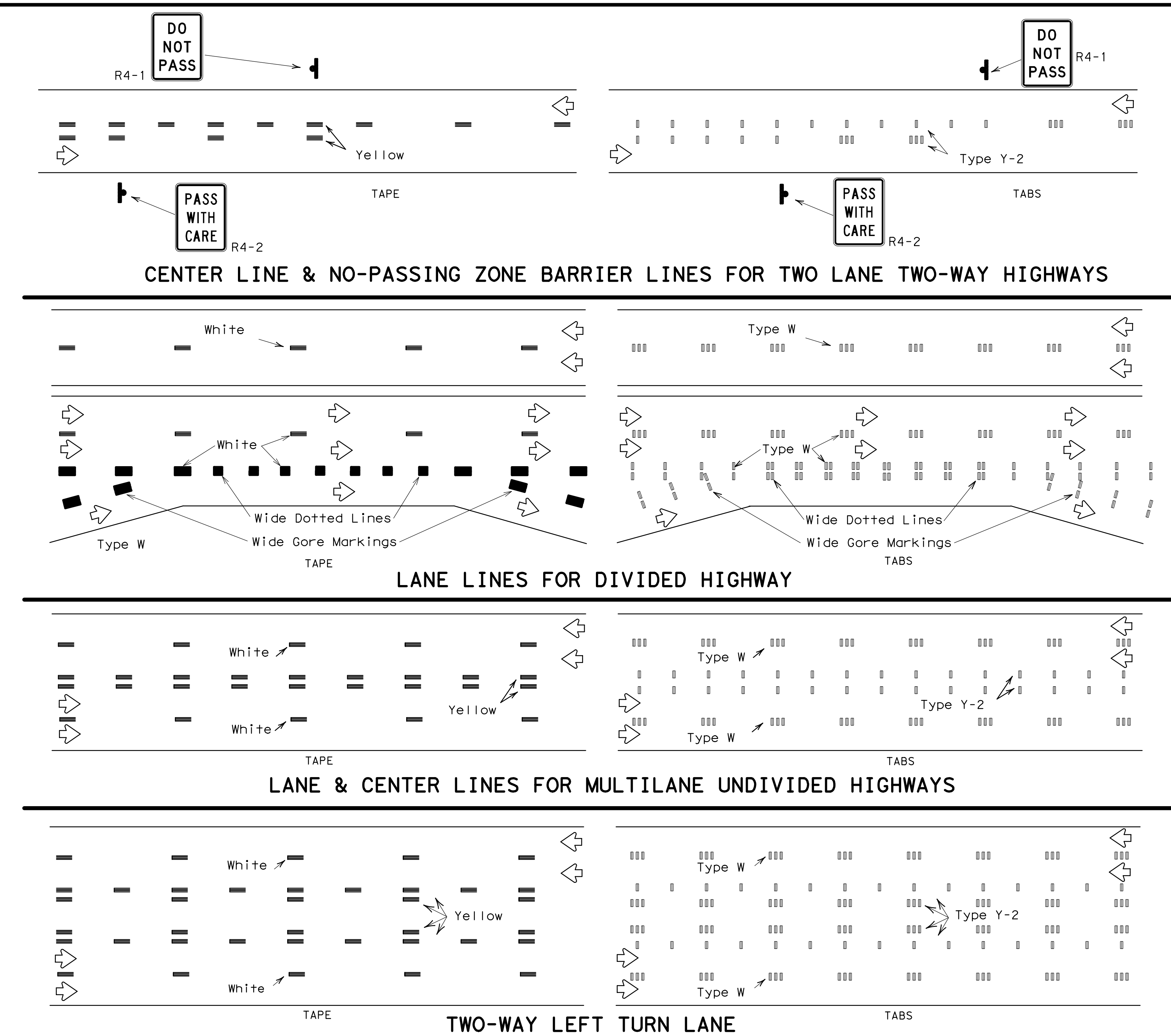
TCP(6-8)-14

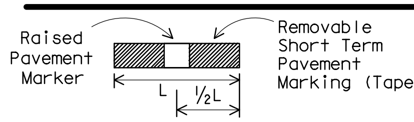
FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		99

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS





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.

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.

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97, 3-03, 7-13		0073	12	015,etc	US 181,etc
		DIST	COUNTY		SHEET NO.
		SAT	BEXAR		100

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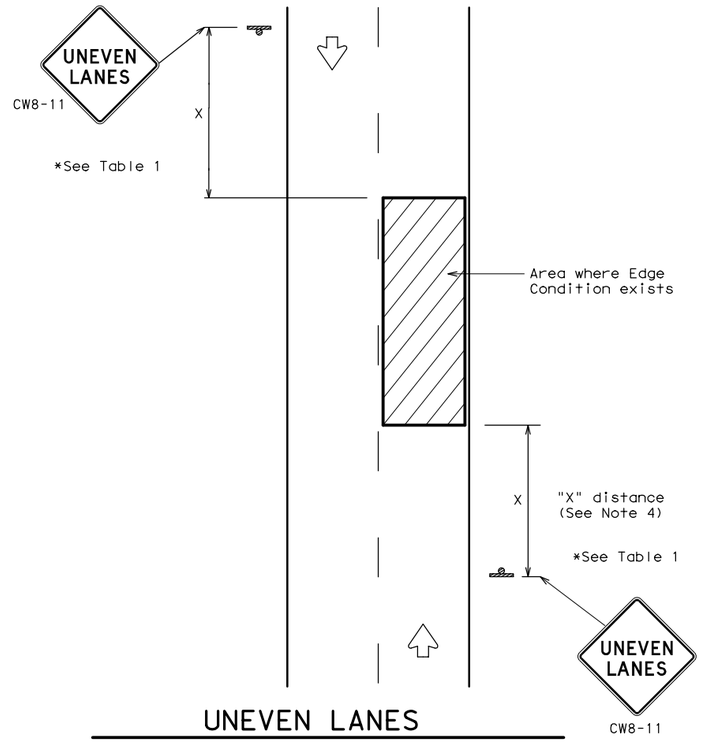
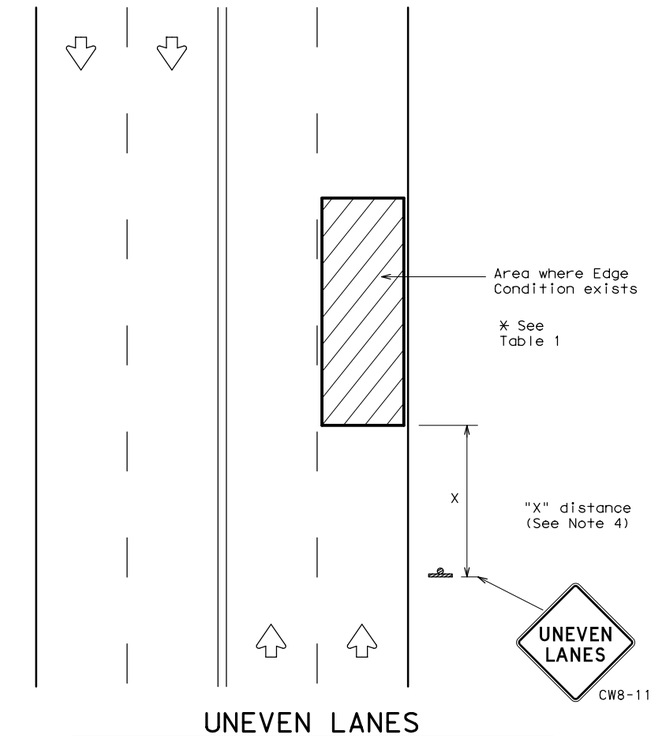
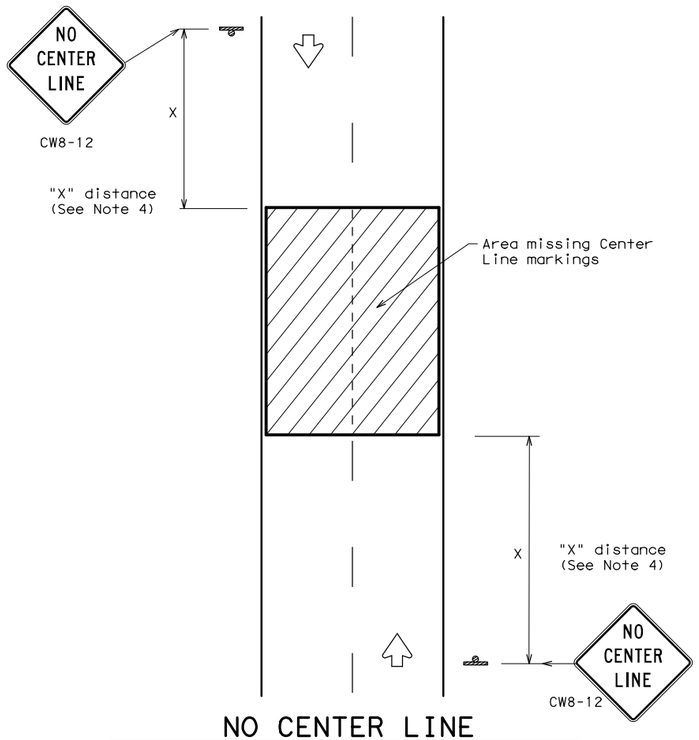


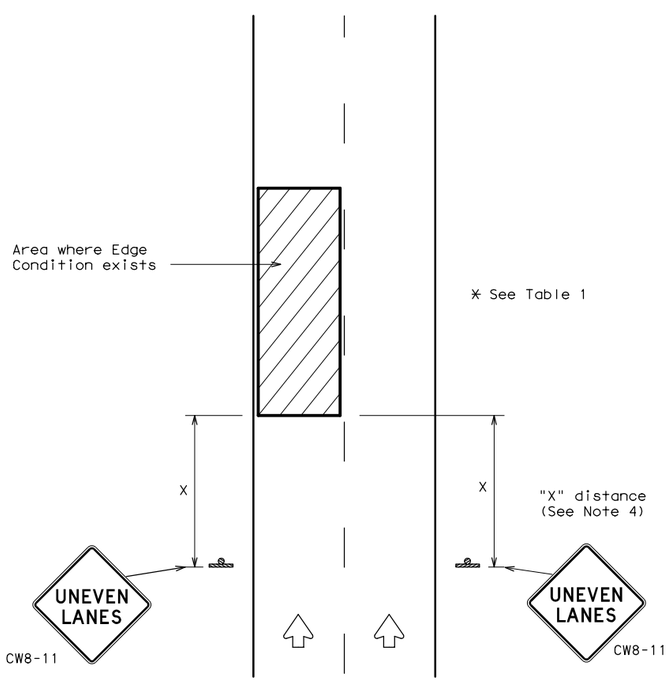
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

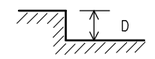
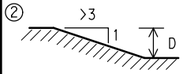
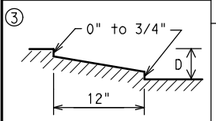
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	SAT	BEXAR		101

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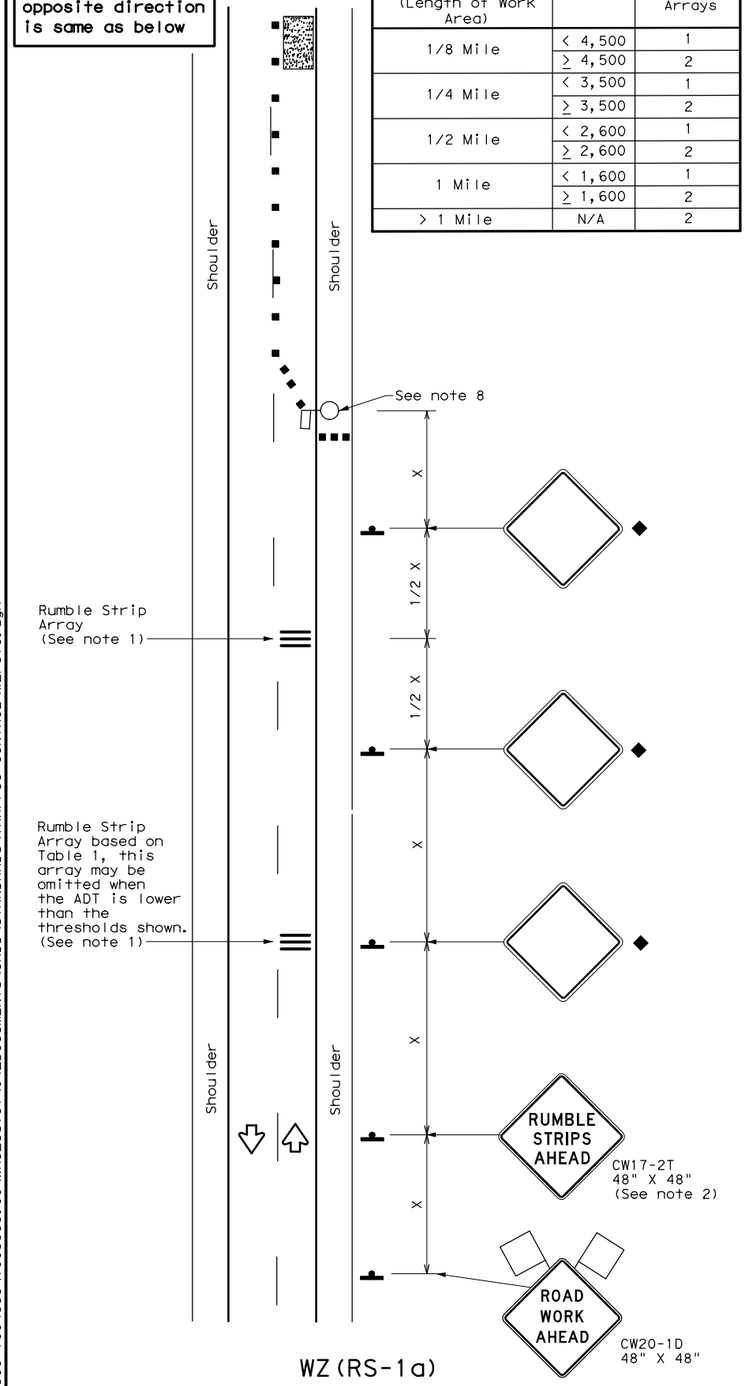
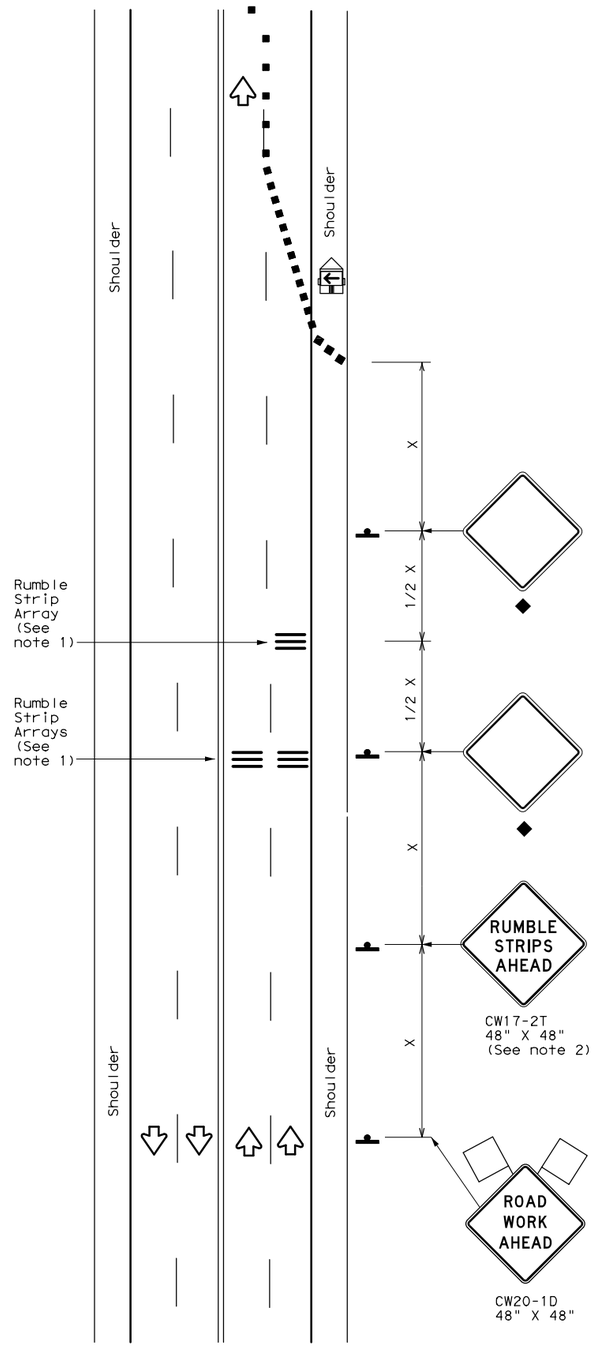
Warning sign and rumble strip sequence in opposite direction is same as below

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



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

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

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

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

* Conventional Roads Only

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
2-14	DIST	COUNTY		SHEET NO.
4-16	SAT	BEXAR		102

	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
#	US181 CSJ 0073-12-015	1-3	TCP(1-5)-18, TCP(2-6)-18, TCP(3-2)-13, TCP(3-3)-14, TCP(6-4)-12	1	19	1		19	8
#	US181 CSJ 0100-02-067	1-3	TCP(1-5)-18, TCP(2-6)-18, TCP(3-2)-13, TCP(3-3)-14, TCP(6-4)-12	1	127	1		127	44
			TOTALS	2	146	2		146	52

LOCATIONS AND LIMITS OF WORKZONES TO BE DETERMINED BY THE ENGINEER IN THE FIELD. THIS SUMMARY SHEET ESTIMATES TMA AND TA BASED ON THE TCP NARRATIVE ,TCP STANDARDS, AND ESTIMATED WORKING DAYS SHOWN ELSEWHERE IN THE PLANS.

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	0073	12	015, etc	US 181, etc
	DIST	COUNTY		
	SAT	BEXAR		
	FEDERAL AID PROJECT			SHEET NO.
				103

	LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET					6185 6002	6185 6005
				FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	TMA (STATIONARY)	TMA (MOBILE OPERATION)
			SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
#	US87 CSJ 0143-01-060	1-3	TCP(1-4)-18, TCP(2-4)-18, TCP(3-3)-14	1	57	1		57	32
	TOTALS			1	57	1		57	32

LOCATIONS AND LIMITS OF WORKZONES TO BE DETERMINED BY THE ENGINEER IN THE FIELD. THIS SUMMARY SHEET ESTIMATES TMA AND TA BASED ON THE TCP NARRATIVE ,TCP STANDARDS, AND ESTIMATED WORKING DAYS SHOWN ELSEWHERE IN THE PLANS.

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	0073	12	015, etc	US 181, etc
	DIST	COUNTY		
	SAT	BEXAR		
	FEDERAL AID PROJECT			SHEET NO.
				104

US 181

Chain US181 contains:
US18100 CUR US1811 CUR US1812 CUR US1813 CUR US1814 CUR US1815 CUR US1816 CUR - US1817 US18101

Beginning chain US181 description

Point US18100 X 2,160,376.89 Y 13,661,672.62 Sta 105+00.00

Course from US18100 to PC US1811 N 87° 15′ 40.57" E Dist 1,922.61

Curve US1811					
P.I. Station	133+49.76	X	2,163,223.39	Y	13,661,808.78
Delta =	35° 52′ 01.34"	(RT)			
Degree =	1° 59′ 59.97"				
Tangent =	927.16				
Length =	1,793.36				
Radius =	2,864.80				
External =	146.30				
Long Chord =	1,764.22				
Mid. Ord. =	139.19				
P.C. Station	124+22.61	X	2,162,297.30	Y	13,661,764.48
P.T. Station	142+15.96	X	2,163,999.84	Y	13,661,302.08
C.C.		X	2,162,434.18	Y	13,658,902.96
Back = N	87° 15′ 40.57" E				
Ahead = S	56° 52′ 18.09" E				
Chord Bear = S	74° 48′ 18.76" E				

Course from PT US1811 to PC US1812 S 56° 52′ 18.09" E Dist 2,308.59

Curve US1812					
P.I. Station	170+15.43	X	2,166,344.25	Y	13,659,772.13
Delta =	3° 15′ 38.53"	(LT)			
Degree =	0° 19′ 56.00"				
Tangent =	490.88				
Length =	981.49				
Radius =	17,246.29				
External =	6.98				
Long Chord =	981.35				
Mid. Ord. =	6.98				
P.C. Station	165+24.56	X	2,165,933.17	Y	13,660,040.40
P.T. Station	175+06.04	X	2,166,769.93	Y	13,659,527.67
C.C.		X	2,175,358.54	Y	13,674,483.28
Back = S	56° 52′ 18.09" E				
Ahead = S	60° 07′ 56.62" E				
Chord Bear = S	58° 30′ 07.36" E				

Course from PT US1812 to PC US1813 S 60° 07′ 56.62" E Dist 2,296.21

Curve US1813					
P.I. Station	201+54.20	X	2,169,066.36	Y	13,658,208.89
Delta =	2° 20′ 17.40"	(LT)			
Degree =	0° 19′ 56.00"				
Tangent =	351.95				
Length =	703.80				
Radius =	17,246.29				
External =	3.59				
Long Chord =	703.75				
Mid. Ord. =	3.59				
P.C. Station	198+02.26	X	2,168,761.15	Y	13,658,384.16
P.T. Station	205+06.05	X	2,169,378.45	Y	13,658,046.22
C.C.		X	2,177,349.76	Y	13,673,339.77
Back = S	60° 07′ 56.62" E				
Ahead = S	62° 28′ 14.02" E				
Chord Bear = S	61° 18′ 05.32" E				

Course from PT US1813 to PC US1814 S 62° 28′ 14.02" E Dist 16,297.27

Curve US1814					
P.I. Station	372+36.08	X	2,184,214.20	Y	13,650,313.53
Delta =	4° 19′ 31.52"	(LT)			
Degree =	0° 29′ 59.99"				
Tangent =	432.75				
Length =	865.09				
Radius =	11,459.20				
External =	8.17				
Long Chord =	864.88				
Mid. Ord. =	8.16				
P.C. Station	368+03.33	X	2,183,830.44	Y	13,650,513.55
P.T. Station	376+68.42	X	2,184,611.94	Y	13,650,143.03
C.C.		X	2,189,126.94	Y	13,660,675.27
Back = S	62° 28′ 14.02" E				
Ahead = S	66° 47′ 45.54" E				
Chord Bear = S	64° 37′ 59.78" E				

Course from PT US1814 to PC US1815 S 66° 47′ 45.54" E Dist 600.92

Curve US1815					
P.I. Station	387+16.99	X	2,185,575.69	Y	13,649,729.88
Delta =	4° 28′ 27.17"	(RT)			
Degree =	0° 29′ 59.99"				
Tangent =	447.65				
Length =	894.85				
Radius =	11,459.20				
External =	8.74				
Long Chord =	894.62				
Mid. Ord. =	8.73				
P.C. Station	382+69.34	X	2,185,164.25	Y	13,649,906.26
P.T. Station	391+64.18	X	2,185,972.11	Y	13,649,521.95
C.C.		X	2,180,649.25	Y	13,639,374.02
Back = S	66° 47′ 45.54" E				
Ahead = S	62° 19′ 18.37" E				
Chord Bear = S	64° 33′ 31.96" E				

Course from PT US1815 to PC US1816 S 62° 19′ 18.37" E Dist 327.02

Curve US1816					
P.I. Station	400+20.76	X	2,186,730.67	Y	13,649,124.06
Delta =	5° 17′ 30.59"	(RT)			
Degree =	0° 29′ 59.99"				
Tangent =	529.56				
Length =	1,058.37				
Radius =	11,459.20				
External =	12.23				
Long Chord =	1,057.99				
Mid. Ord. =	12.22				
P.C. Station	394+91.20	X	2,186,261.71	Y	13,649,370.05
P.T. Station	405+49.57	X	2,187,174.95	Y	13,648,835.87
C.C.		X	2,180,938.85	Y	13,639,222.12
Back = S	62° 19′ 18.37" E				
Ahead = S	57° 01′ 47.79" E				
Chord Bear = S	59° 40′ 33.08" E				

Course from PT US1816 to PC US1817 S 57° 01′ 47.79" E Dist 667.93

Curve US1817					
P.I. Station	415+13.25	X	2,187,983.44	Y	13,648,311.44
Delta =	2° 57′ 24.81"	(LT)			
Degree =	0° 29′ 59.99"				
Tangent =	295.76				
Length =	591.38				
Radius =	11,459.20				
External =	3.82				
Long Chord =	591.31				
Mid. Ord. =	3.81				
P.C. Station	412+17.50	X	2,187,735.31	Y	13,648,472.39
P.T. Station	418+08.88	X	2,188,239.54	Y	13,648,163.50
C.C.		X	2,193,971.42	Y	13,658,086.14
Back = S	57° 01′ 47.79" E				
Ahead = S	59° 59′ 12.59" E				
Chord Bear = S	58° 30′ 30.19" E				

Course from PT US1817 to US18101 S 59° 59′ 12.59" E Dist 11,983.19

Point US18101 X 2,198,615.90 Y 13,642,169.52 Sta 537+92.06

Ending chain US181 description

NOTES

1. **FIELD SURVEY WAS NOT OBTAINED FOR DEVELOPMENT OF THESE PLANS. THE HORIZONTAL ALIGNMENT DATA SHOWN ON THIS SHEET IS BEST-FIT BASED ON AERIAL IMAGERY AND THEN SCALED TO SURFACE COORDINATES USING A SURFACE ADJUSTMENT FACTOR OF 1.00013. THEREFORE, ALL DATA ON THIS SHEET IS APPROXIMATE AND FOR CONTRACTOR'S INFORMATION ONLY.**

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Texas Department of Transportation

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Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			105
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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US 181 CONNECTOR (NORTHBOUND)

Chain RAMPN181 contains:
CUR RAMPN1811 RAMPN18101

Beginning chain RAMPN181 description

				Curve Data			
Curve RAMPN1811							
P.I. Station			205+70.88	X	2,160,307.14	Y	13,661,729.35
Delta	=	46° 47′ 47.89"	(LT)				
Degree	=	2° 01′ 20.23"					
Tangent	=	1,225.94					
Length	=	2,314.05					
Radius	=	2,833.22					
External	=	253.86					
Long Chord	=	2,250.26					
Mid. Ord.	=	232.99					
P.C. Station			193+44.94	X	2,159,426.13	Y	13,662,581.85
P.T. Station			216+58.99	X	2,161,531.68	Y	13,661,787.93
C.C.				X	2,161,396.30	Y	13,664,617.91
Back	= S	45° 56′ 31.55" E					
Ahead	= N	87° 15′ 40.57" E					
Chord Bear	= S	69° 20′ 25.49" E					

Course from PT RAMPN1811 to RAMPN18101 N 87° 15′ 40.57" E Dist 246.94

Point RAMPN18101 X 2,161,778.34 Y 13,661,799.73 Sta 219+05.92

Ending chain RAMPN181 description

US 181 CONNECTOR (SOUTHBOUND)

Chain RAMPN181 contains:
CUR RAMPN1811 RAMPN18101

Beginning chain RAMPN181 description

				Curve Data			
Curve RAMPN1811							
P.I. Station			205+70.88	X	2,160,307.14	Y	13,661,729.35
Delta	=	46° 47′ 47.89"	(LT)				
Degree	=	2° 01′ 20.23"					
Tangent	=	1,225.94					
Length	=	2,314.05					
Radius	=	2,833.22					
External	=	253.86					
Long Chord	=	2,250.26					
Mid. Ord.	=	232.99					
P.C. Station			193+44.94	X	2,159,426.13	Y	13,662,581.85
P.T. Station			216+58.99	X	2,161,531.68	Y	13,661,787.93
C.C.				X	2,161,396.30	Y	13,664,617.91
Back	= S	45° 56′ 31.55" E					
Ahead	= N	87° 15′ 40.57" E					
Chord Bear	= S	69° 20′ 25.49" E					

Course from PT RAMPN1811 to RAMPN18101 N 87° 15′ 40.57" E Dist 246.94

Point RAMPN18101 X 2,161,778.34 Y 13,661,799.73 Sta 219+05.92

Ending chain RAMPN181 description

LP 1604 ACCESS RD NORTH

Chain 1604N contains:
500 CUR 1604N1 501

Beginning chain 1604N description

Point 500 X 2,189,747.93 Y 13,647,292.16 Sta 10+00.00

Course from 500 to PC 1604N1 N 44° 42′ 10.23" E Dist 1,181.81

				Curve Data			
Curve 1604N1							
P.I. Station			22+67.10	X	2,190,639.25	Y	13,648,192.78
Delta	=	86° 55′ 33.54"	(RT)				
Degree	=	63° 39′ 43.12"					
Tangent	=	85.30					
Length	=	136.54					
Radius	=	90.00					
External	=	34.00					
Long Chord	=	123.82					
Mid. Ord.	=	24.68					
P.C. Station			21+81.81	X	2,190,579.25	Y	13,648,132.15
P.T. Station			23+18.35	X	2,190,703.01	Y	13,648,136.12
C.C.				X	2,190,643.22	Y	13,648,068.84
Back	= N	44° 42′ 10.23" E					
Ahead	= S	48° 22′ 16.23" E					
Chord Bear	= N	88° 09′ 57.00" E					

Course from PT 1604N1 to 501 S 48° 22′ 16.23" E Dist 91.65

Point 501 X 2,190,771.51 Y 13,648,075.23 Sta 24+10.00

Ending chain 1604N description

LP 1604 ACCESS RD SOUTH

Chain 1604S contains:
S160400 CUR 1604S1 S160401 CUR 1604S2 S160402

Beginning chain 1604S description

Point S160400 X 2,189,008.85 Y 13,646,352.24 Sta 10+00.00

Course from S160400 to PC 1604S1 S 39° 23′ 04.17" E Dist 140.60

				Curve Data			
Curve 1604S1							
P.I. Station			12+35.75	X	2,189,158.44	Y	13,646,170.03
Delta	=	81° 43′ 08.08"	(LT)				
Degree	=	52° 05′ 13.46"					
Tangent	=	95.15					
Length	=	156.89					
Radius	=	110.00					
External	=	35.44					
Long Chord	=	143.93					
Mid. Ord.	=	26.81					
P.C. Station			11+40.60	X	2,189,098.06	Y	13,646,243.57
P.T. Station			12+97.49	X	2,189,239.90	Y	13,646,219.18
C.C.				X	2,189,183.08	Y	13,646,313.37
Back	= S	39° 23′ 04.17" E					
Ahead	= N	58° 53′ 47.75" E					
Chord Bear	= S	80° 14′ 38.21" E					

Course from PT 1604S1 to S160401 N 58° 53′ 47.75" E Dist 729.71

Point S160401 X 2,189,864.71 Y 13,646,596.14 Sta 20+27.20

Course from S160401 to PC 1604S2 N 58° 25′ 03.87" E Dist 367.73

LP 1604 ACCESS RD SOUTH (CONTINUED)

				Curve Data			
Curve 1604S2							
P.I. Station			24+58.19	X	2,190,231.87	Y	13,646,821.86
Delta	=	28° 24′ 16.46"	(LT)				
Degree	=	22° 55′ 05.92"					
Tangent	=	63.27					
Length	=	123.94					
Radius	=	250.00					
External	=	7.88					
Long Chord	=	122.67					
Mid. Ord.	=	7.64					
P.C. Station			23+94.92	X	2,190,177.97	Y	13,646,788.73
P.T. Station			25+18.86	X	2,190,263.52	Y	13,646,876.65
C.C.				X	2,190,047.04	Y	13,647,001.70
Back	= N	58° 25′ 03.87" E					
Ahead	= N	30° 00′ 47.41" E					
Chord Bear	= N	44° 12′ 55.64" E					

Course from PT 1604S2 to S160402 N 30° 00′ 47.41" E Dist 101.90

Point S160402 X 2,190,314.49 Y 13,646,964.89 Sta 26+20.77

Ending chain 1604S description

NOTES

1. **FIELD SURVEY WAS NOT OBTAINED FOR DEVELOPMENT OF THESE PLANS. THE HORIZONTAL ALIGNMENT DATA SHOWN ON THIS SHEET IS BEST-FIT BASED ON AERIAL IMAGERY AND THEN SCALED TO SURFACE COORDINATES USING A SURFACE ADJUSTMENT FACTOR OF 1.00013. THEREFORE, ALL DATA ON THIS SHEET IS APPROXIMATE AND FOR CONTRACTOR'S INFORMATION ONLY.**

STATE OF TEXAS
Luis A. Gonzalez
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Texas Department of Transportation

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Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181 HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 2

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			106
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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US 87

Chain US87 contains:
100 CUR US871 101 CUR US872 102 CUR US873 CUR US874 103 104 CUR US875 CUR US87-
6 105

Beginning chain US87 description
==========

Point 100 X 2,147,685.08 Y 13,694,488.87 Sta 33+00.00

Course from 100 to PC US871 N 89° 58′ 51.66" E Dist 2,500.21

Curve Data

Curve US871
P.I. Station 62+26.33 X 2,150,611.41 Y 13,694,489.84
Delta = 16° 55′ 14.48" (LT)
Degree = 1° 59′ 59.97"
Tangent = 426.12
Length = 846.04
Radius = 2,864.80
External = 31.52
Long Chord = 842.97
Mid. Ord. = 31.17
P.C. Station 58+00.21 X 2,150,185.29 Y 13,694,489.70
P.T. Station 66+46.25 X 2,151,019.04 Y 13,694,614.00
C.C. X 2,150,184.34 Y 13,697,354.50
Back = N 89° 58′ 51.66" E
Ahead = N 73° 03′ 37.17" E
Chord Bear = N 81° 31′ 14.42" E

Course from PT US871 to 101 N 73° 03′ 37.17" E Dist 665.21

Point 101 X 2,151,655.39 Y 13,694,807.82 Sta 73+11.46

Course from 101 to PC US872 N 74° 01′ 12.07" E Dist 192.41

Curve Data

Curve US872
P.I. Station 78+49.69 X 2,152,172.82 Y 13,694,955.99
Delta = 13° 45′ 56.54" (RT)
Degree = 1° 59′ 59.65"
Tangent = 345.82
Length = 688.32
Radius = 2,864.93
External = 20.80
Long Chord = 686.66
Mid. Ord. = 20.65
P.C. Station 75+03.86 X 2,151,840.36 Y 13,694,860.78
P.T. Station 81+92.18 X 2,152,518.39 Y 13,694,969.35
C.C. X 2,152,629.08 Y 13,692,106.56
Back = N 74° 01′ 12.07" E
Ahead = N 87° 47′ 08.61" E
Chord Bear = N 80° 54′ 10.34" E

Course from PT US872 to 102 N 87° 47′ 08.61" E Dist 203.92

Point 102 X 2,152,722.16 Y 13,694,977.23 Sta 83+96.10

Course from 102 to PC US873 N 88° 23′ 22.21" E Dist 1,437.21

Curve Data

Curve US873
P.I. Station 103+07.12 X 2,154,632.12 Y 13,695,039.23
Delta = 19° 15′ 09.54" (RT)
Degree = 2° 03′ 03.61"
Tangent = 473.81
Length = 938.69
Radius = 2,793.55
External = 39.90
Long Chord = 934.28
Mid. Ord. = 39.34
P.C. Station 98+33.31 X 2,154,158.80 Y 13,695,017.62
P.T. Station 107+72.00 X 2,155,086.09 Y 13,694,903.57
C.C. X 2,154,286.21 Y 13,692,226.98
Back = N 87° 23′ 08.78" E
Ahead = S 73° 21′ 41.67" E
Chord Bear = S 82° 59′ 16.45" E

Course from PT US873 to PC US874 S 74° 25′ 16.37" E Dist 598.09

Curve Data

Curve US874
P.I. Station 116+96.94 X 2,155,977.05 Y 13,694,655.16
Delta = 13° 01′ 03.79" (LT)
Degree = 1° 59′ 59.97"
Tangent = 326.85
Length = 650.89
Radius = 2,864.80
External = 18.59
Long Chord = 649.49
Mid. Ord. = 18.47
P.C. Station 113+70.09 X 2,155,662.21 Y 13,694,742.94
P.T. Station 120+20.98 X 2,156,303.57 Y 13,694,640.56
C.C. X 2,156,431.59 Y 13,697,502.50
Back = S 74° 25′ 16.37" E
Ahead = S 87° 26′ 20.16" E
Chord Bear = S 80° 55′ 48.26" E

Course from PT US874 to 103 S 87° 26′ 20.16" E Dist 392.64

Point 103 X 2,156,695.83 Y 13,694,623.01 Sta 124+13.62

Course from 103 to 104 S 89° 24′ 33.78" E Dist 1,296.01

Point 104 X 2,157,991.77 Y 13,694,609.65 Sta 137+09.63

Course from 104 to PC US875 N 89° 20′ 45.40" E Dist 904.89

Curve Data

Curve US875
P.I. Station 148+01.01 X 2,159,083.07 Y 13,694,622.84
Delta = 1° 14′ 35.78" (RT)
Degree = 0° 20′ 00.00"
Tangent = 186.50
Length = 372.98
Radius = 17,188.73
External = 1.01
Long Chord = 372.97
Mid. Ord. = 1.01
P.C. Station 146+14.52 X 2,158,896.59 Y 13,694,619.98
P.T. Station 149+87.50 X 2,159,269.56 Y 13,694,621.65
C.C. X 2,159,159.78 Y 13,677,433.27
Back = N 89° 07′ 21.62" E
Ahead = S 89° 38′ 02.60" E
Chord Bear = N 89° 44′ 39.51" E

Course from PT US875 to PC US876 S 89° 38′ 02.60" E Dist 478.60

Curve Data

Curve US876
P.I. Station 155+63.66 X 2,159,845.72 Y 13,694,617.97
Delta = 0° 39′ 01.38" (LT)
Degree = 0° 20′ 00.00"
Tangent = 97.56
Length = 195.12
Radius = 17,188.73
External = 0.28
Long Chord = 195.11
Mid. Ord. = 0.28
P.C. Station 154+66.10 X 2,159,748.16 Y 13,694,618.59
P.T. Station 156+61.22 X 2,159,943.27 Y 13,694,618.45
C.C. X 2,159,857.94 Y 13,711,806.97
Back = S 89° 38′ 02.60" E
Ahead = N 89° 42′ 56.02" E
Chord Bear = S 89° 57′ 33.29" E

Course from PT US876 to 105 N 89° 42′ 56.02" E Dist 3,213.78

Point 105 X 2,163,157.02 Y 13,694,634.41 Sta 188+75.00

==========
Ending chain US87 description

NOTES

1. **FIELD SURVEY WAS NOT OBTAINED FOR DEVELOPMENT OF THESE PLANS. THE HORIZONTAL ALIGNMENT DATA SHOWN ON THIS SHEET IS BEST-FIT BASED ON AERIAL IMAGERY AND THEN SCALED TO SURFACE COORDINATES USING A SURFACE ADJUSTMENT FACTOR OF 1.00013. THEREFORE, ALL DATA ON THIS SHEET IS APPROXIMATE AND FOR CONTRACTOR'S INFORMATION ONLY.**

STATE OF TEXAS
Brian Legaspi
113039
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

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TBPE REG. NO. F-2742

US 87
HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			107
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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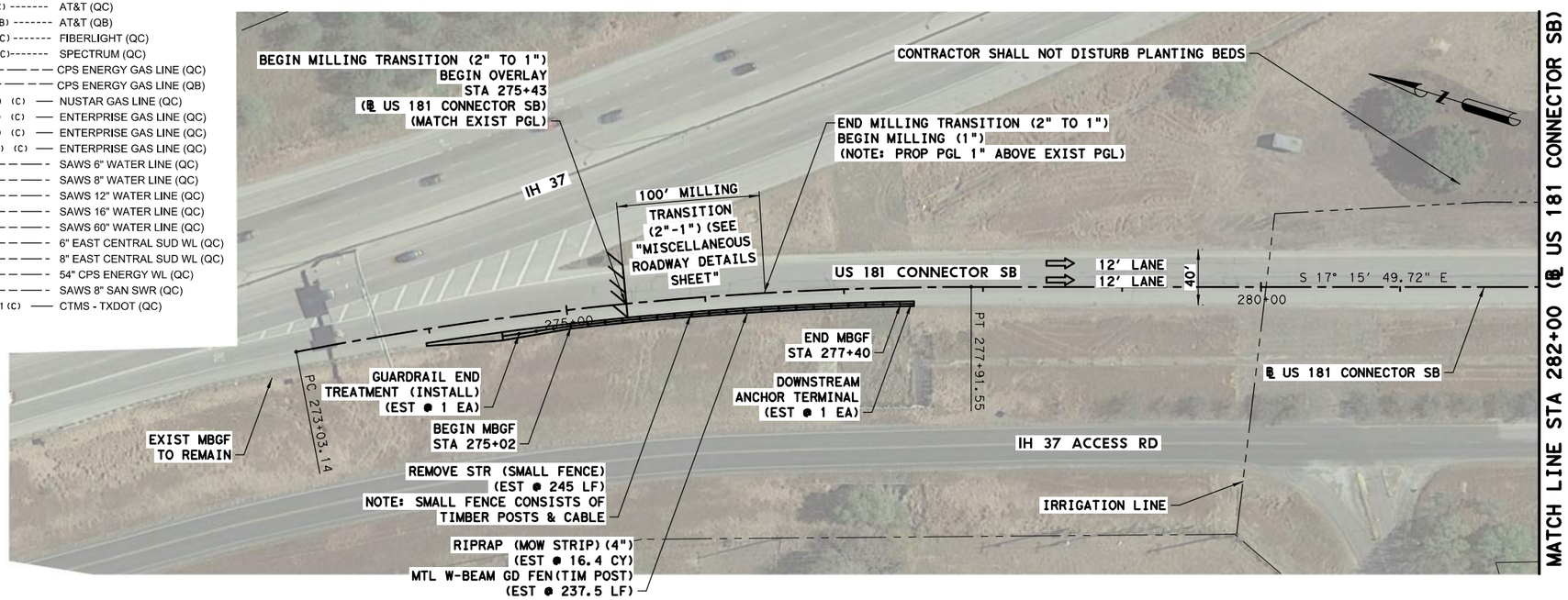
100% SUBMITTAL
MODEL NAME: Default
FILE NAME: R:\1003300-1004999\1003393.00\WA5_US181\04_DOCUMENTS\CADD\SHEETS\060HAD01.dgn

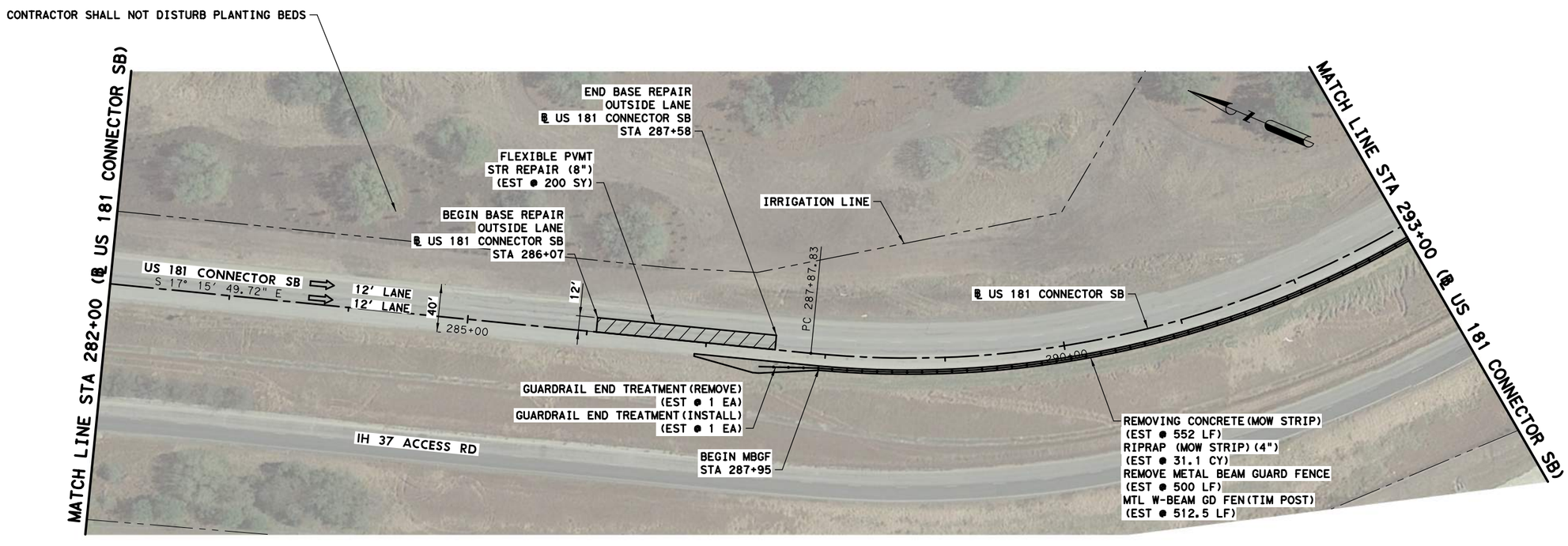
LEGEND

⇦ TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

T1(C) T1(C)	AT&T (QC)
T1(B) T1(B)	AT&T (QB)
FOC2(C) FOC2(C)	FIBERLIGHT (QC)
FOC5(C) FOC5(C)	SPECTRUM (QC)
G1 (C)	CPS ENERGY GAS LINE (QC)
G1 (B)	CPS ENERGY GAS LINE (QB)
PL2 (6") (C)	NUSTAR GAS LINE (QC)
PL3 (4") (C)	ENTERPRISE GAS LINE (QC)
PL3 (6") (C)	ENTERPRISE GAS LINE (QC)
PL3 (24") (C)	ENTERPRISE GAS LINE (QC)
W1(6") (C)	SAWS 6" WATER LINE (QC)
W1(8") (C)	SAWS 8" WATER LINE (QC)
W1(12") (C)	SAWS 12" WATER LINE (QC)
W1(16") (C)	SAWS 16" WATER LINE (QC)
W1(60") (C)	SAWS 60" WATER LINE (QC)
W2(6") (C)	6" EAST CENTRAL SUD WL (QC)
W2(8") (C)	8" EAST CENTRAL SUD WL (QC)
W2(54") (C)	54" CPS ENERGY WL (QC)
SS1(8") (C)	SAWS 8" SAN SWR (QC)
E1(C) E1(C)	CTMS - TXDOT (QC)





ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	552 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	16 CY
	134-6002	BACKFILL (TY B)	17.57 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	94 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	94 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	94 SY
	168-6001	VEGETATIVE WATERING	4 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	77 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	7397 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	200 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	7397 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	47.5 CY
	496-6043	REMOV STR (SMALL FENCE)	245 LF
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	751 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	751 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	750 LF
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	1 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	500 LF
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	2 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	1 EA
#	3085-6001	UNDERSEAL COURSE	7397 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
Luis A. González
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US 181
PLAN LAYOUT

SHEET 1 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			108
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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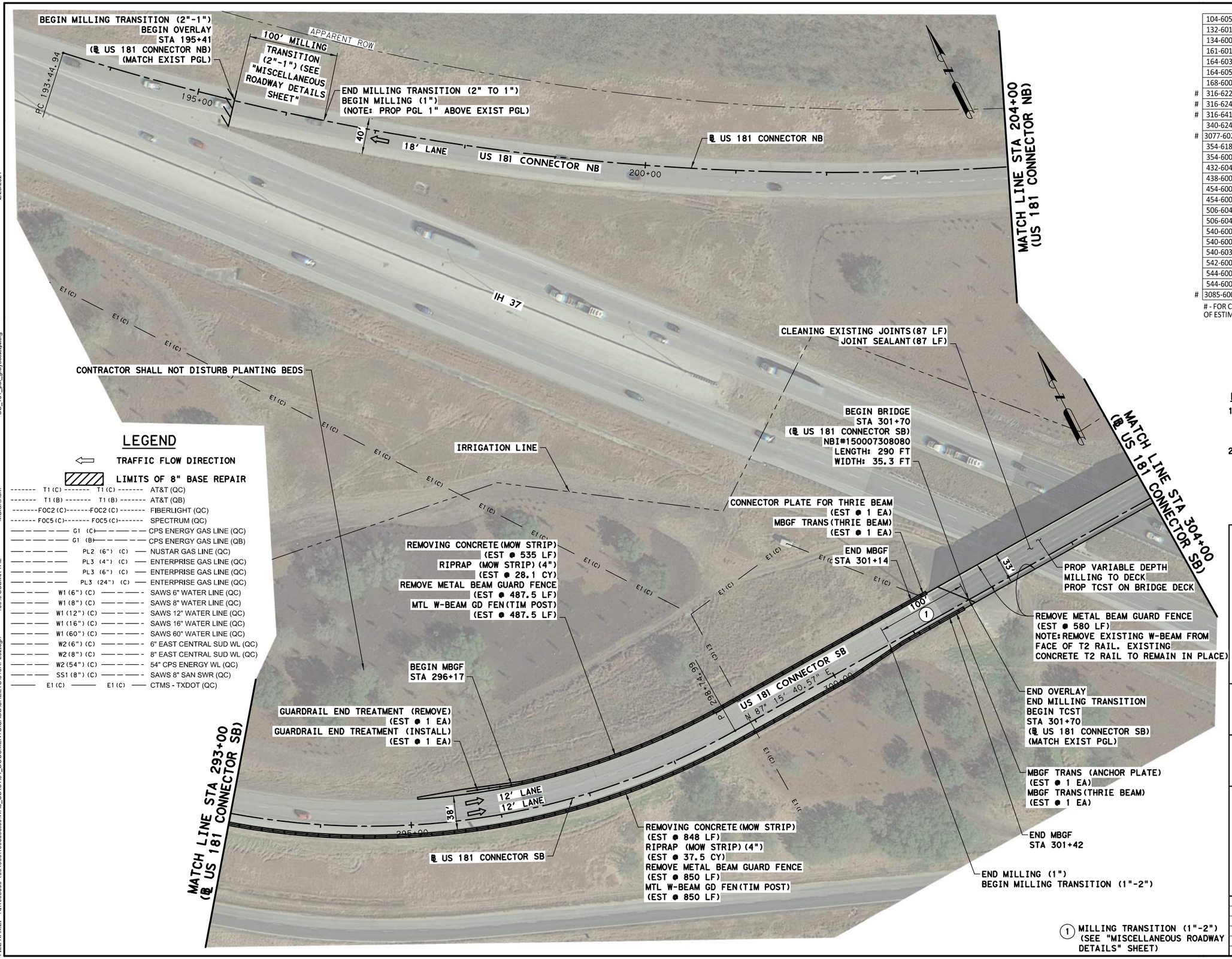

LEGEND

⇦ TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1(C) T1(C) AT&T (QC)
- T1(B) T1(B) AT&T (QB)
- FOC2(C) FOC2(C) FIBERLIGHT (QC)
- FOC5(C) FOC5(C) SPECTRUM (QC)
- G1 (C) CPS ENERGY GAS LINE (QC)
- G1 (B) CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) NUSTAR GAS LINE (QC)
- PL3 (4") (C) ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) ENTERPRISE GAS LINE (QC)
- W1(6") (C) SAWS 6" WATER LINE (QC)
- W1(8") (C) SAWS 8" WATER LINE (QC)
- W1(12") (C) SAWS 12" WATER LINE (QC)
- W1(16") (C) SAWS 16" WATER LINE (QC)
- W1(60") (C) SAWS 60" WATER LINE (QC)
- W2(6") (C) 6" EAST CENTRAL SUD WL (QC)
- W2(8") (C) 8" EAST CENTRAL SUD WL (QC)
- W2(54") (C) 54" CPS ENERGY WL (QC)
- SS1(8") (C) SAWS 8" SAN SWR (QC)
- E1(C) E1(C) CTMS - TXDOT (QC)

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	1383 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	29 CY
	134-6002	BACKFILL (TY B)	19.59 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	154 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	154 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	154 SY
	168-6001	VEGETATIVE WATERING	7 MG
#	316-6222	AGGR(TY-PB GR-3 SAC-B)	843 SY
#	316-6240	AGGR(TY-PD GR-4 SAC-B)	843 SY
#	316-6419	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	1686 SY
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	76 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	7378 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	6535 SY
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	843 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	65.6 CY
	438-6009	CLEANING EXISTING JOINTS	87 LF
	454-6008	HEADER TYPE EXPANSION JOINT	4 CF
	454-6009	JOINT SEALANT	87 LF
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	1338 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	1338 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	1337.5 LF
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	2 EA
	540-6038	CONNECTOR PLATE FOR THRIE BEAM	2 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	1387.5 LF
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	1 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	1 EA
#	3085-6001	UNDERSEAL COURSE	7378 SY

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NOTES

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0 50 100

SCALE: 1" = 100'

(1) MILLING TRANSITION (1"-2") (SEE "MISCELLANEOUS ROADWAY DETAILS" SHEET)

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US 181
PLAN LAYOUT

SHEET 2 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			109
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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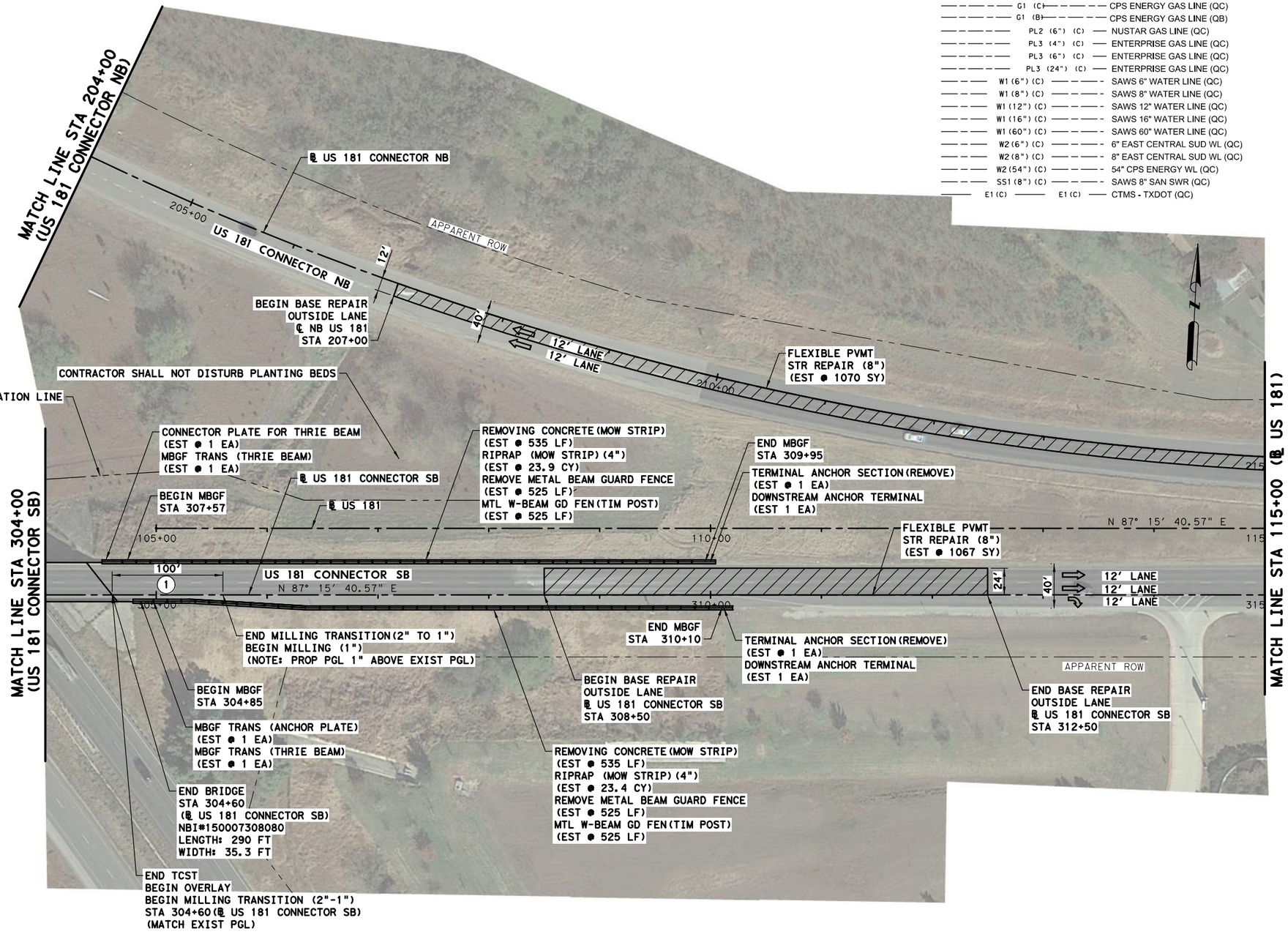

LEGEND

⇦ TRAFFIC FLOW DIRECTION

▨ LIMITS OF 8" BASE REPAIR

T1(C) T1(C) AT&T (QC)
T1(B) T1(B) AT&T (QB)
FOC2(C) FOC2(C) FIBERLIGHT (QC)
FOC5(C) FOC5(C) SPECTRUM (QC)
G1 (C) CPS ENERGY GAS LINE (QC)
G1 (B) CPS ENERGY GAS LINE (QB)
PL2 (6") (C) NUSTAR GAS LINE (QC)
PL3 (4") (C) ENTERPRISE GAS LINE (QC)
PL3 (6") (C) ENTERPRISE GAS LINE (QC)
PL3 (24") (C) ENTERPRISE GAS LINE (QC)
W1 (6") (C) SAWS 6" WATER LINE (QC)
W1 (8") (C) SAWS 8" WATER LINE (QC)
W1 (12") (C) SAWS 12" WATER LINE (QC)
W1 (16") (C) SAWS 16" WATER LINE (QC)
W1 (60") (C) SAWS 60" WATER LINE (QC)
W2 (6") (C) 6" EAST CENTRAL SUD WL (QC)
W2 (8") (C) 8" EAST CENTRAL SUD WL (QC)
W2 (54") (C) 54" CPS ENERGY WL (QC)
SS1 (8") (C) SAWS 8" SAN SWR (QC)
E1 (C) E1 (C) CTMS - TXDOT (QC)

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	1070 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	23 CY
	134-6002	BACKFILL (TY B)	22 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	117 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	117 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	117 SY
	168-6001	VEGETATIVE WATERING	6 MG
#	316-6222	AGGR(TY-PB GR-3 SAC-B)	220 SY
#	316-6240	AGGR(TY-PD GR-4 SAC-B)	220 SY
#	316-6419	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	440 SY
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	102 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	9662 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	2137 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	9442 SY
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	220 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	47.3 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	1050 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	1050 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	1050 LF
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	2 EA
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	2 EA
	540-6038	CONNECTOR PLATE FOR THRIE BEAM	2 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	1050 LF
	542-6002	REMOVE TERMINAL ANCHOR SECTION	2 EA
#	3085-6001	UNDERSEAL COURSE	9662 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

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0 50 100
SCALE: 1" = 100'

(1) MILLING TRANSITION (2"-1") (SEE "MISCELLANEOUS ROADWAY DETAILS" SHEET)

STATE OF TEXAS
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US 181
PLAN LAYOUT

SHEET 3 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			110
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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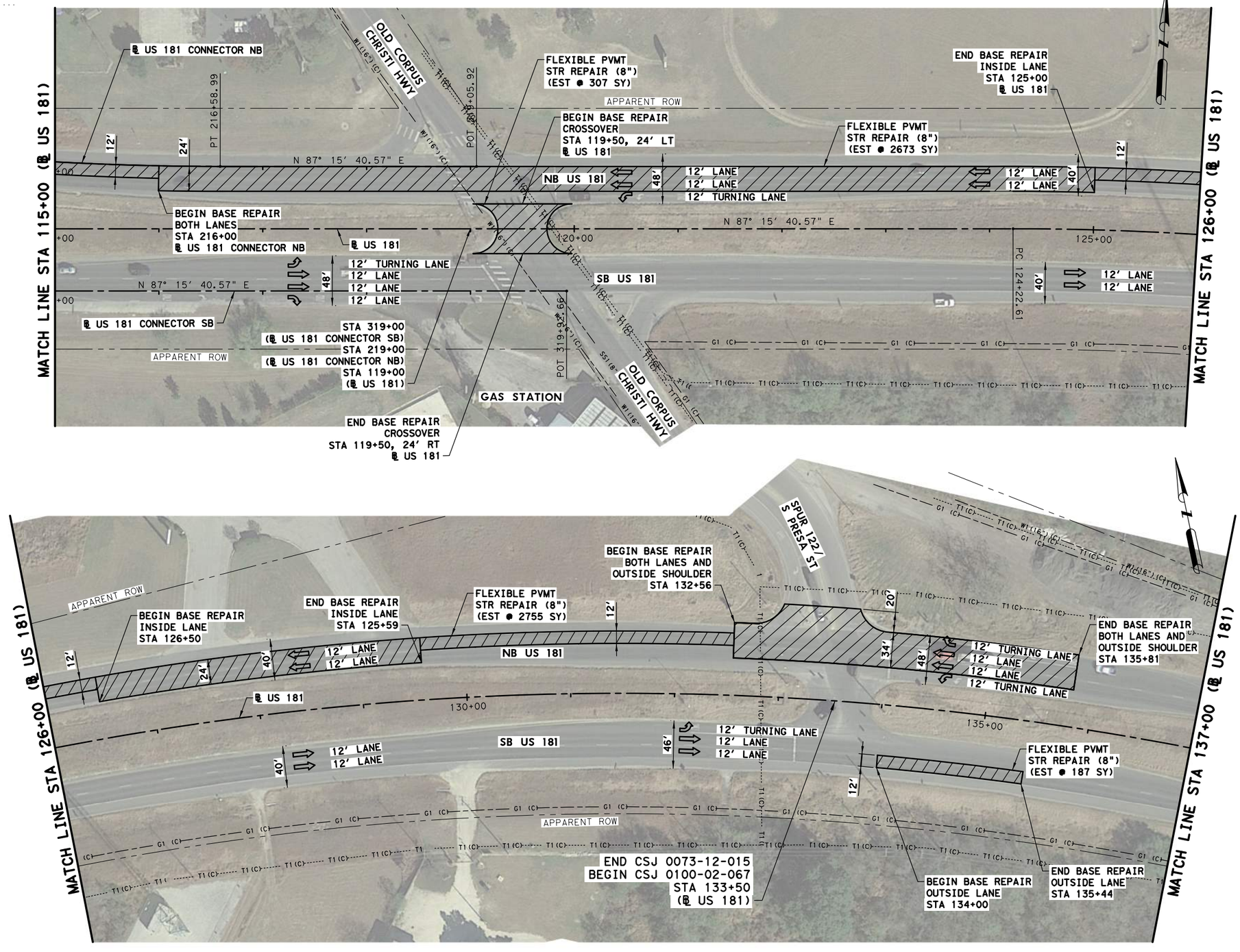

ESTIMATED SHEET QUANTITIES

134-6002	BACKFILL (TY B)	37 STA	7 STA
340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	208 TON	43 TON
# 3077-6023	SP MIXES SP-C SAC-B PG70-22	18763 SY	3857 SY
351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	4780 SY	1142 SY
354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	18763 SY	3857 SY
# 3085-6001	UNDERSEAL COURSE	18763 SY	3857 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

CSJ 0073-12-015
CSJ 0100-02-067

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) / T1 (B) — AT&T (QC) / (QB)
- FOC2 (C), FOC5 (C) — FIBERLIGHT (QC)
- G1 (C) / G1 (B) — CPS ENERGY GAS LINE (QC) / (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C), PL3 (6") (C), PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C), W1 (8") (C), W1 (12") (C), W1 (16") (C), W1 (60") (C) — SAWS WATER LINE (QC)
- W2 (6") (C), W2 (8") (C), W2 (54") (C) — EAST CENTRAL SUD WL (QC)
- SS1 (8") (C) — SAWS SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100
SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 4 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			111
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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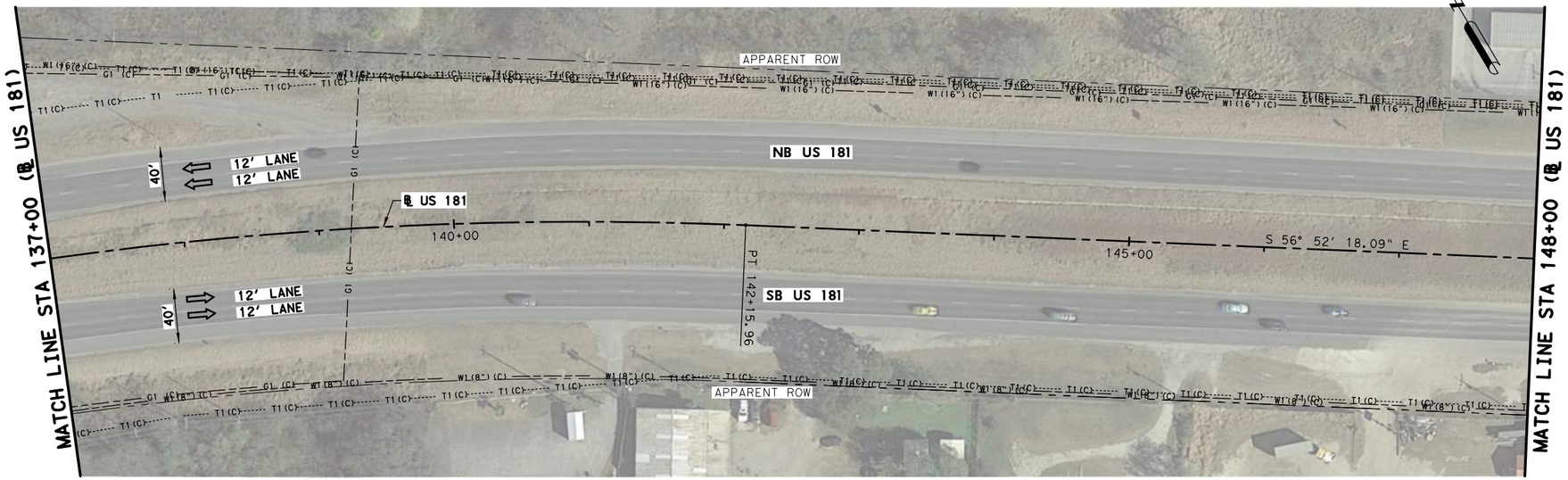

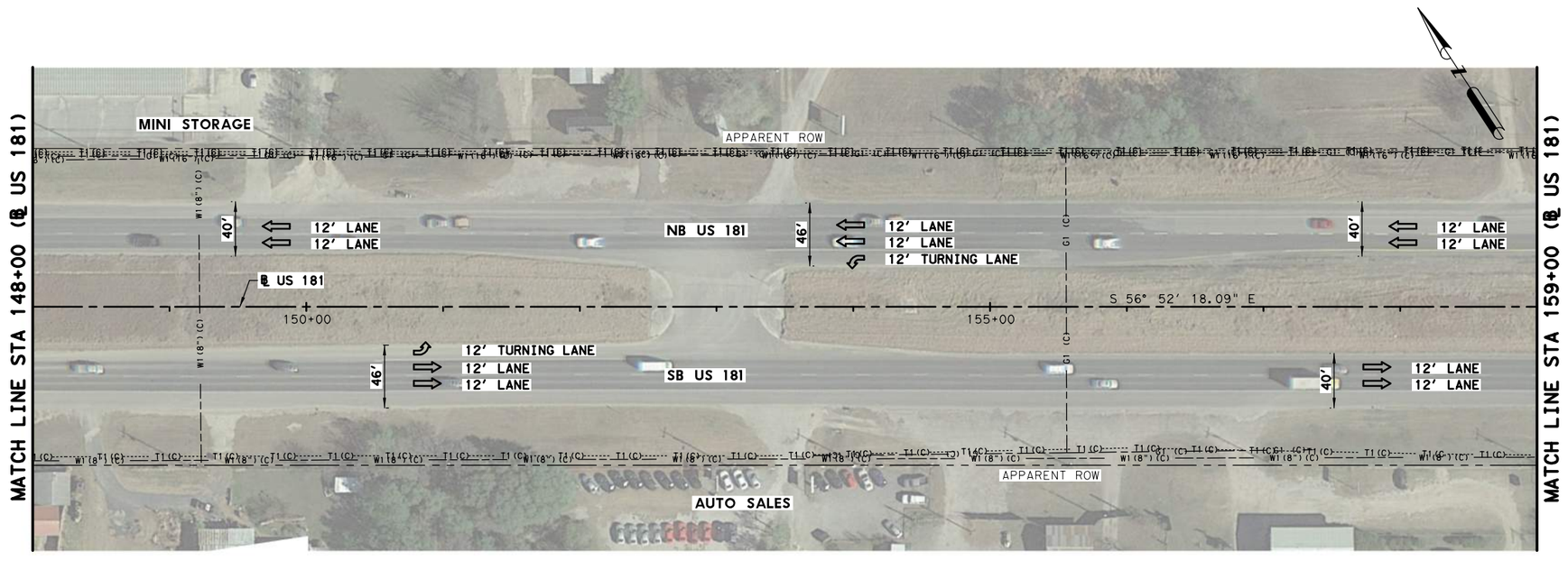

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	220 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20699 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	20699 SY
#	3085-6001	UNDERSEAL COURSE	20699 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100

SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 5 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			112
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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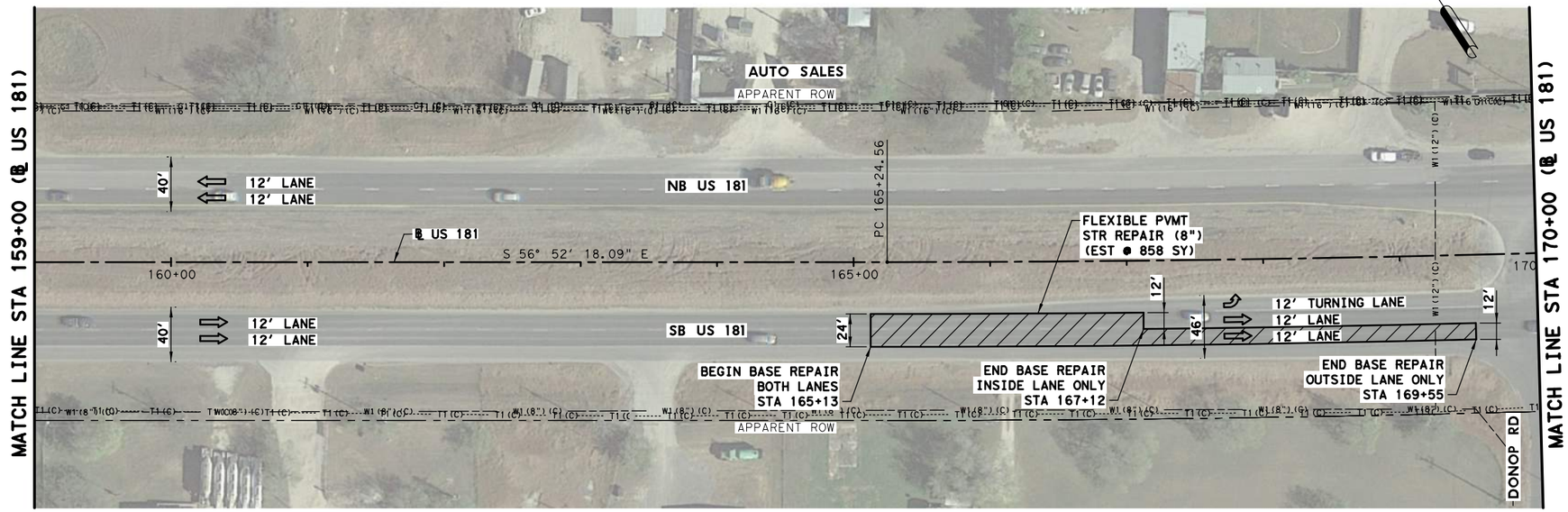

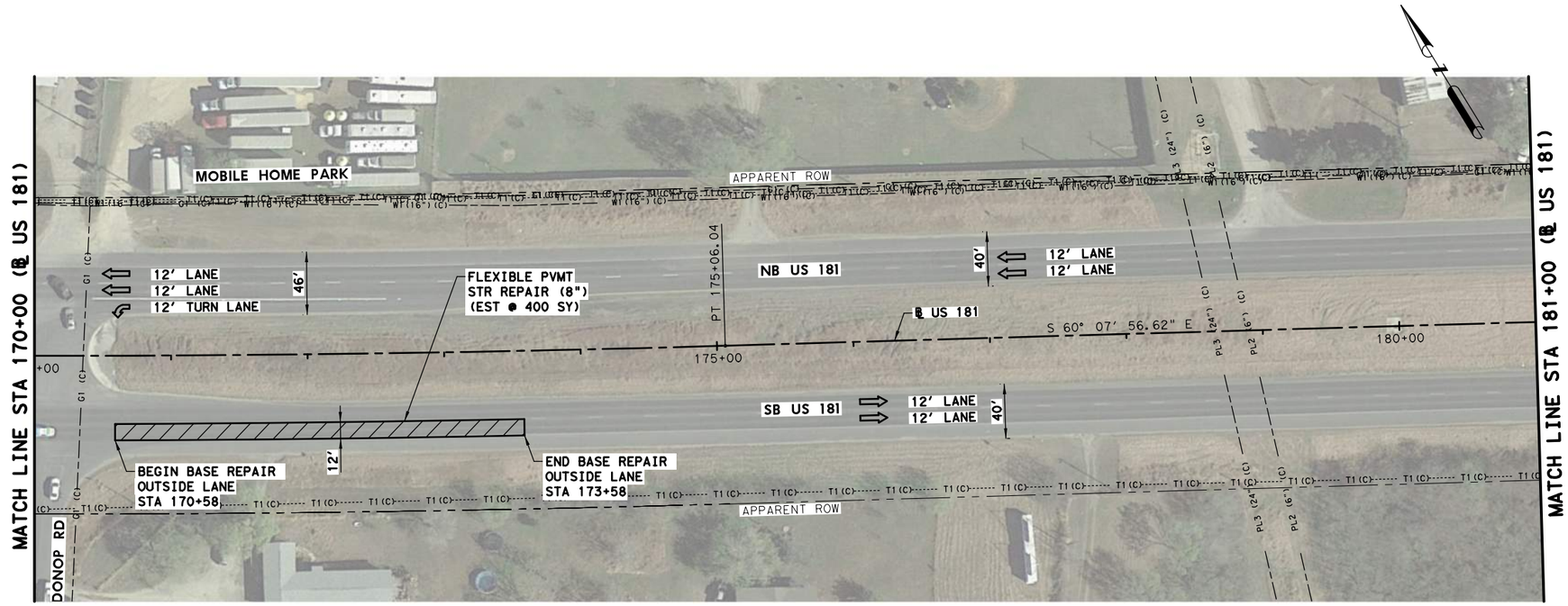

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	219 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20676 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1258 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	20676 SY
#	3085-6001	UNDERSEAL COURSE	20676 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

▨ LIMITS OF 8" BASE REPAIR

- T1(C) T1(C) — AT&T (QC)
- T1(B) T1(B) — AT&T (QB)
- FOC2(C) FOC2(C) — FIBERLIGHT (QC)
- FOC5(C) FOC5(C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100
SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 6 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			113
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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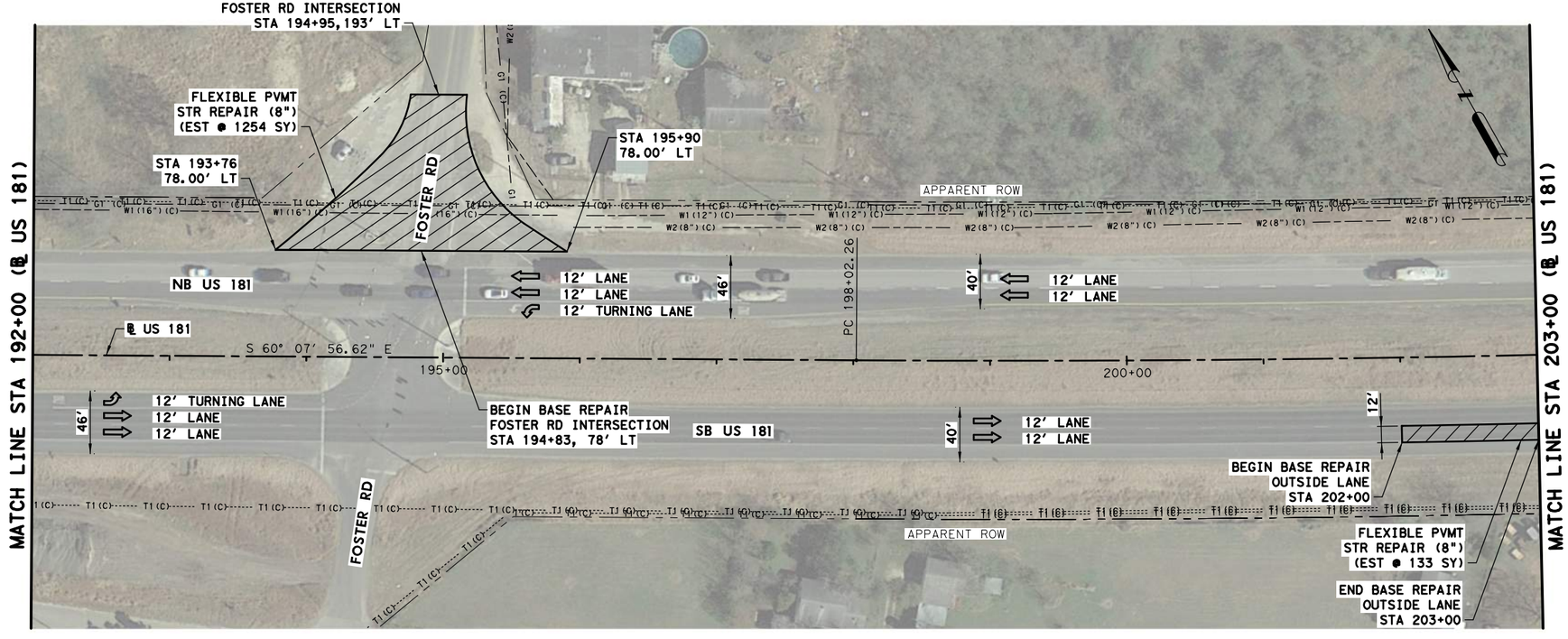

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	235 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	21945 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1387 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	21945 SY
#	3085-6001	UNDERSEAL COURSE	21945 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
Luis A. González
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2/25/2021

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TBPE REG. NO. F-2742

US 181
PLAN LAYOUT

SHEET 7 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			114
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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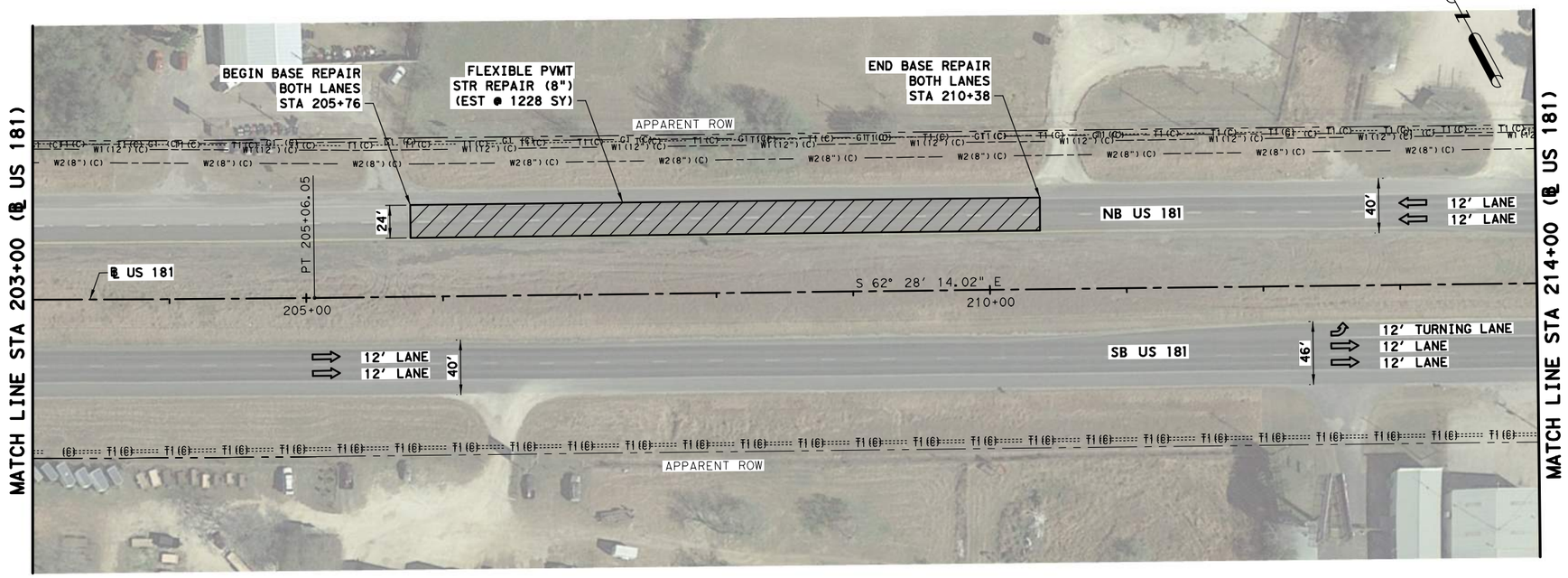

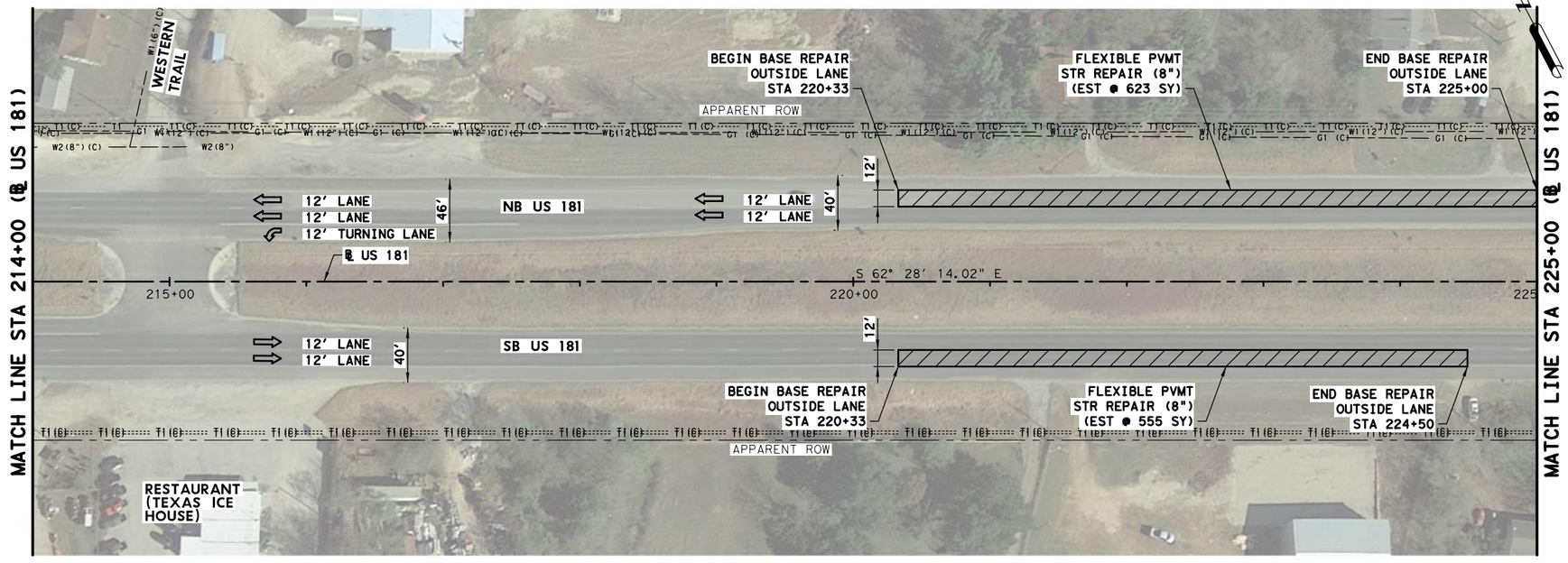

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	219 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20684 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	2406 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	20684 SY
#	3085-6001	UNDERSEAL COURSE	20684 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

▨ LIMITS OF 8" BASE REPAIR

T1(C) AT&T (QC)
T1(B) AT&T (QB)
FOC2(C) FIBERLIGHT (QC)
FOC5(C) SPECTRUM (QC)
G1(C) CPS ENERGY GAS LINE (QC)
G1(B) CPS ENERGY GAS LINE (QB)
PL2(6")(C) NUSTAR GAS LINE (QC)
PL3(4")(C) ENTERPRISE GAS LINE (QC)
PL3(6")(C) ENTERPRISE GAS LINE (QC)
PL3(24")(C) ENTERPRISE GAS LINE (QC)
W1(6")(C) SAWS 6" WATER LINE (QC)
W1(8")(C) SAWS 8" WATER LINE (QC)
W1(12")(C) SAWS 12" WATER LINE (QC)
W1(16")(C) SAWS 16" WATER LINE (QC)
W1(60")(C) SAWS 60" WATER LINE (QC)
W2(6")(C) 6" EAST CENTRAL SUD WL (QC)
W2(8")(C) 8" EAST CENTRAL SUD WL (QC)
W2(54")(C) 54" CPS ENERGY WL (QC)
SS1(8")(C) SAWS 8" SAN SWR (QC)
E1(C) CTMS - TXDOT (QC)

NOTES

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0 50 100
SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 8 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			115
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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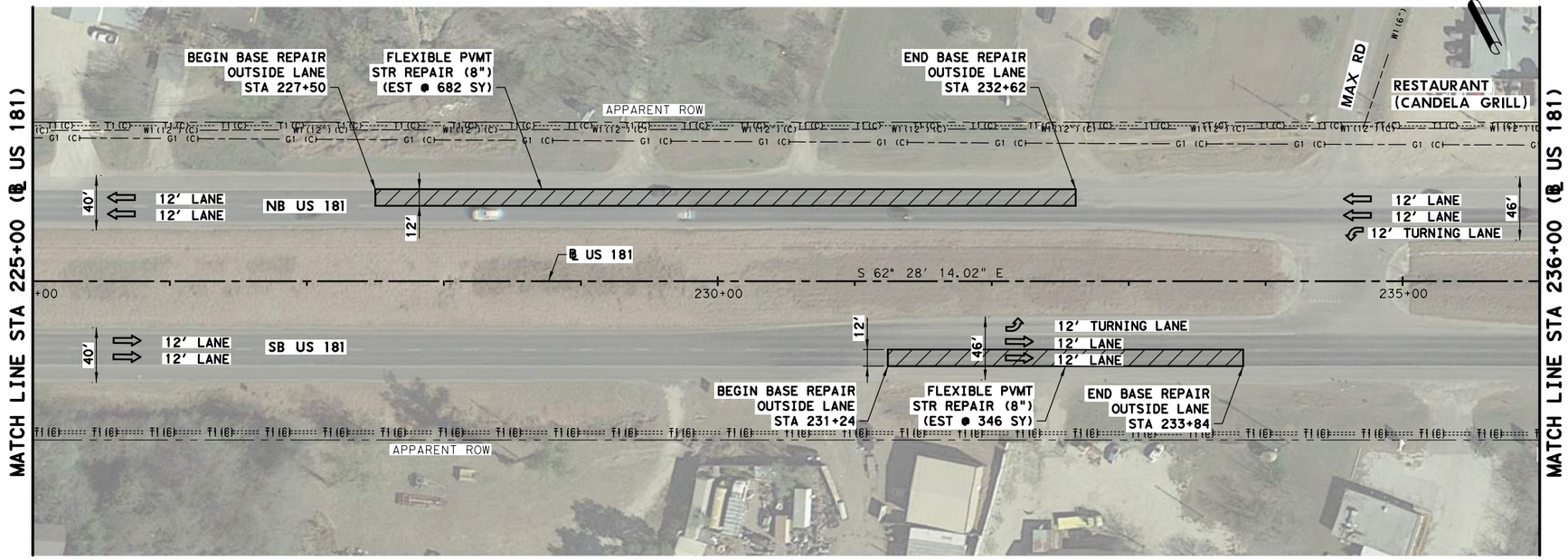

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	219 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20706 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1295 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	20706 SY
#	3085-6001	UNDERSEAL COURSE	20706 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
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- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100

SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 9 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			116
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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NOTES

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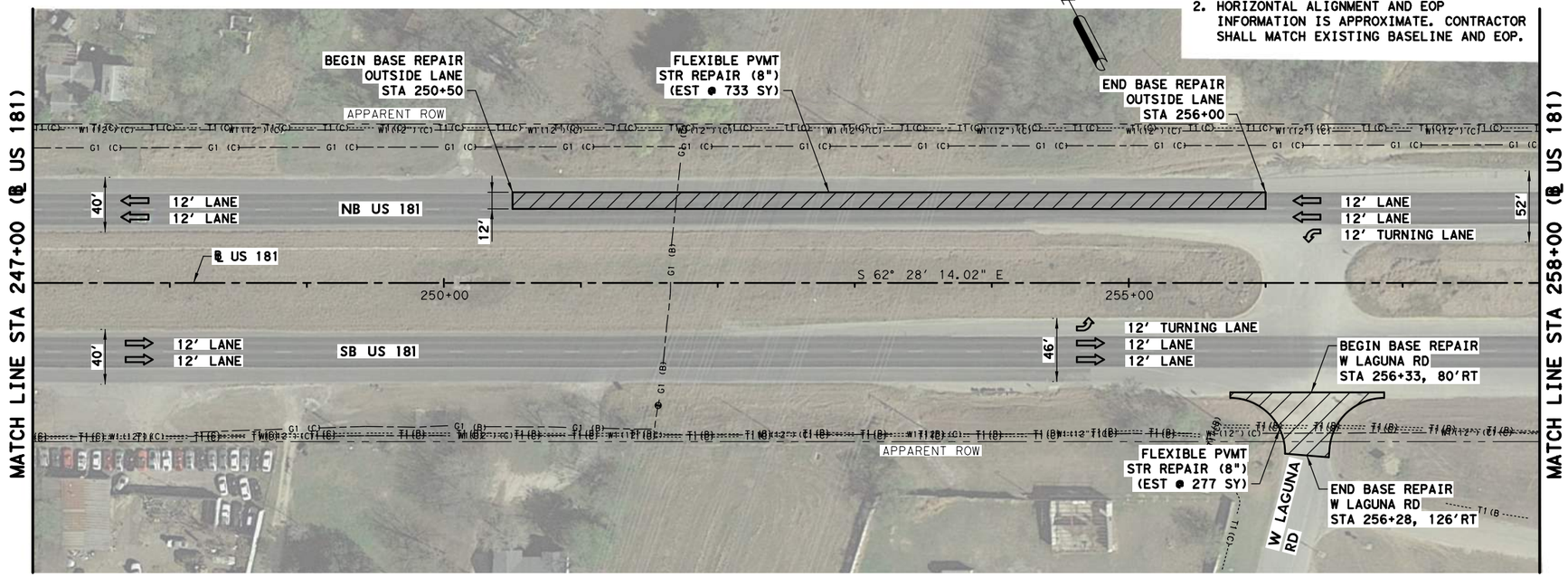

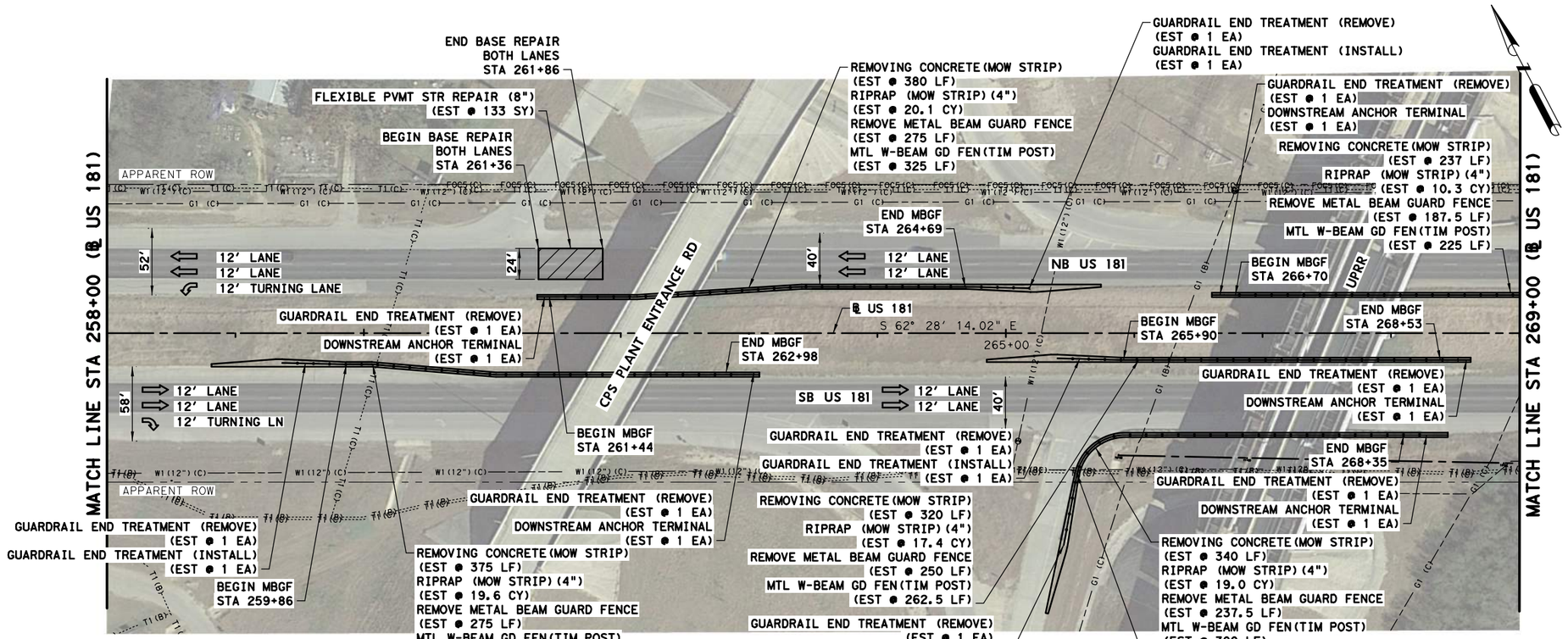

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	1652 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	53 CY
	134-6002	BACKFILL (TY B)	44 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	181 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	181 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	181 SY
	168-6001	VEGETATIVE WATERING	8 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	245 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	23016 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1143 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	23016 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	86.4 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	1425 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	1425 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	1425 LF
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	5 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	1225 LF
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	4 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	9 EA
#	3085-6001	UNDERSEAL COURSE	23016 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1(C) — T1(C) — AT&T (QC)
- T1(B) — T1(B) — AT&T (QB)
- FOC2(C) — FOC2(C) — FIBERLIGHT (QC)
- FOC5(C) — FOC5(C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
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- W2(54") (C) — 54" CPS ENERGY WL (QC)
- SS1(8") (C) — SAWS 8" SAN SWR (QC)
- E1(C) — E1(C) — CTMS - TXDOT (QC)

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 181
PLAN LAYOUT

SHEET 10 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			117
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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NOTES

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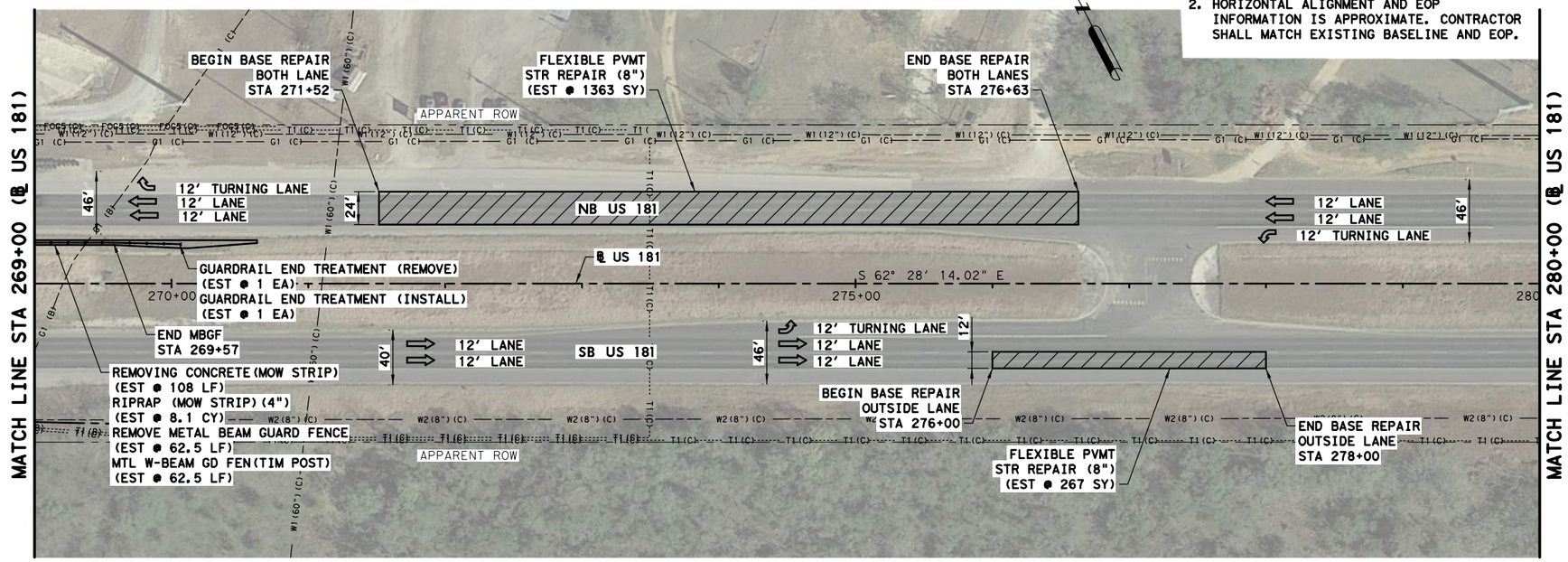

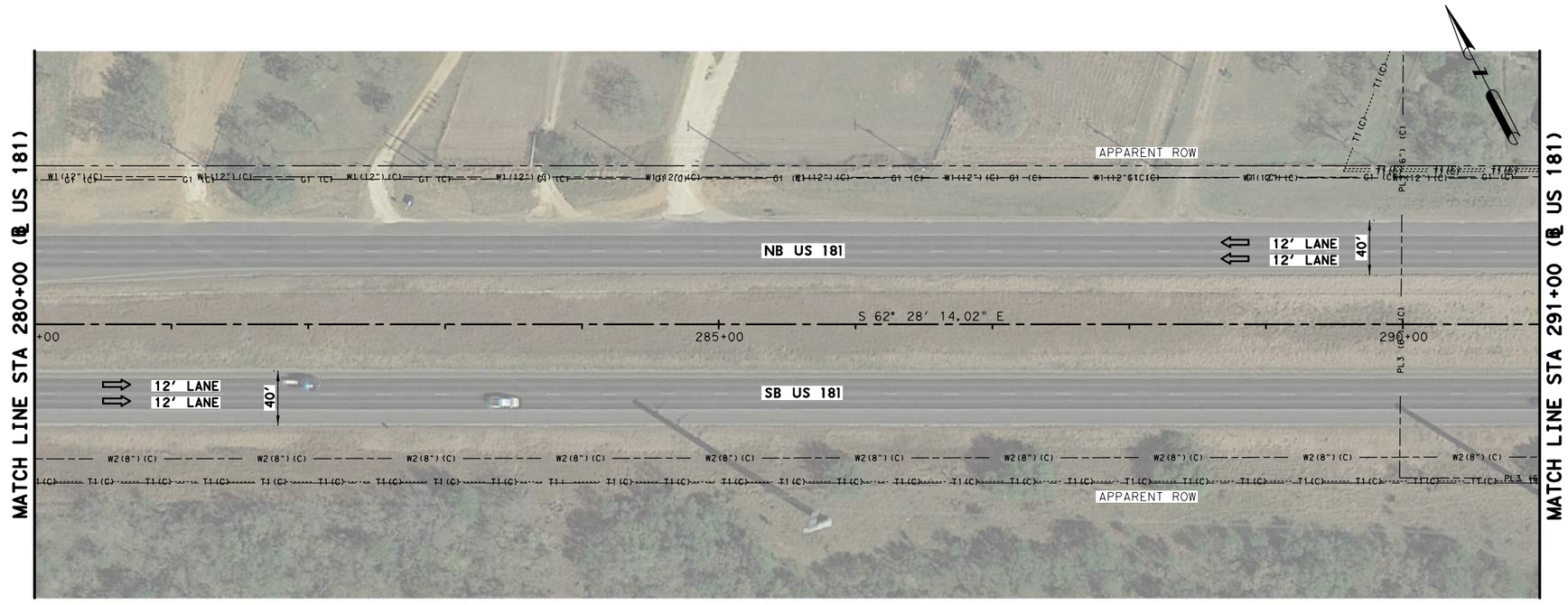

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	108 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	4 CY
	134-6002	BACKFILL (TY B)	44 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	13 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	13 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	13 SY
	168-6001	VEGETATIVE WATERING	1 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	223 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	21033 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1630 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	21033 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	8.1 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	63 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	63 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	62.5 LF
	542-6001	REMOVE METAL BEAM GUARD FENCE	62.5 LF
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	1 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	1 EA
#	3085-6001	UNDERSEAL COURSE	21033 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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US 181
PLAN LAYOUT

SHEET 11 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			118
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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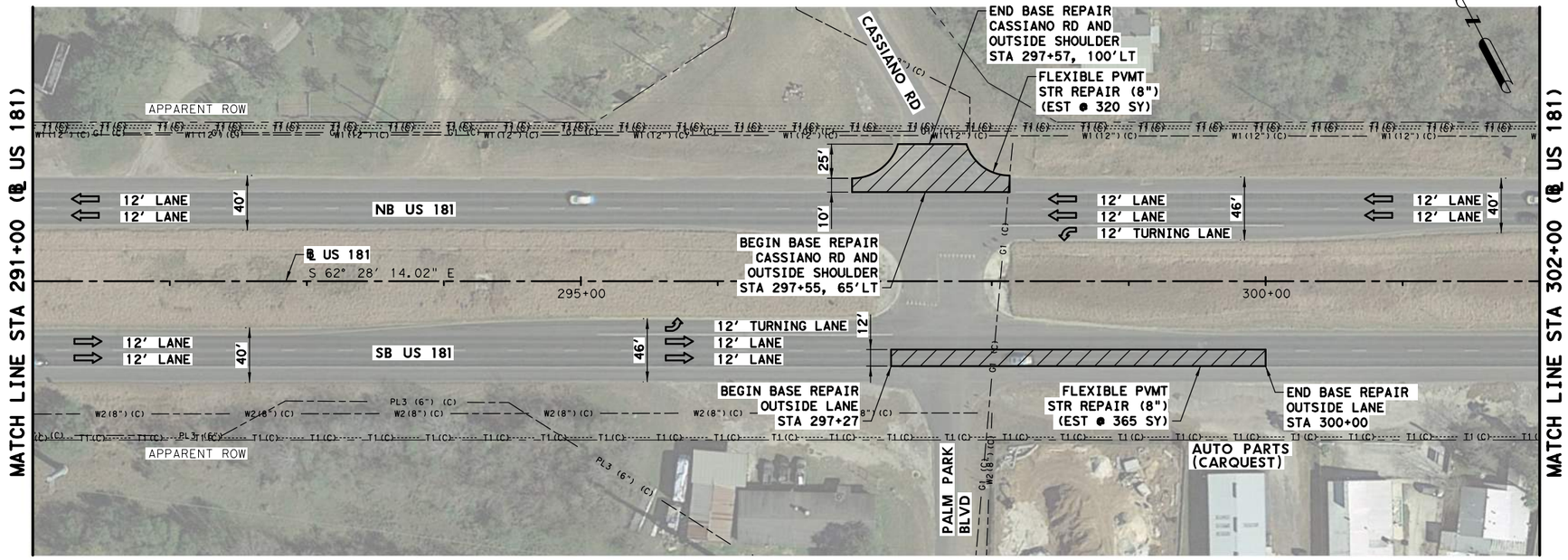

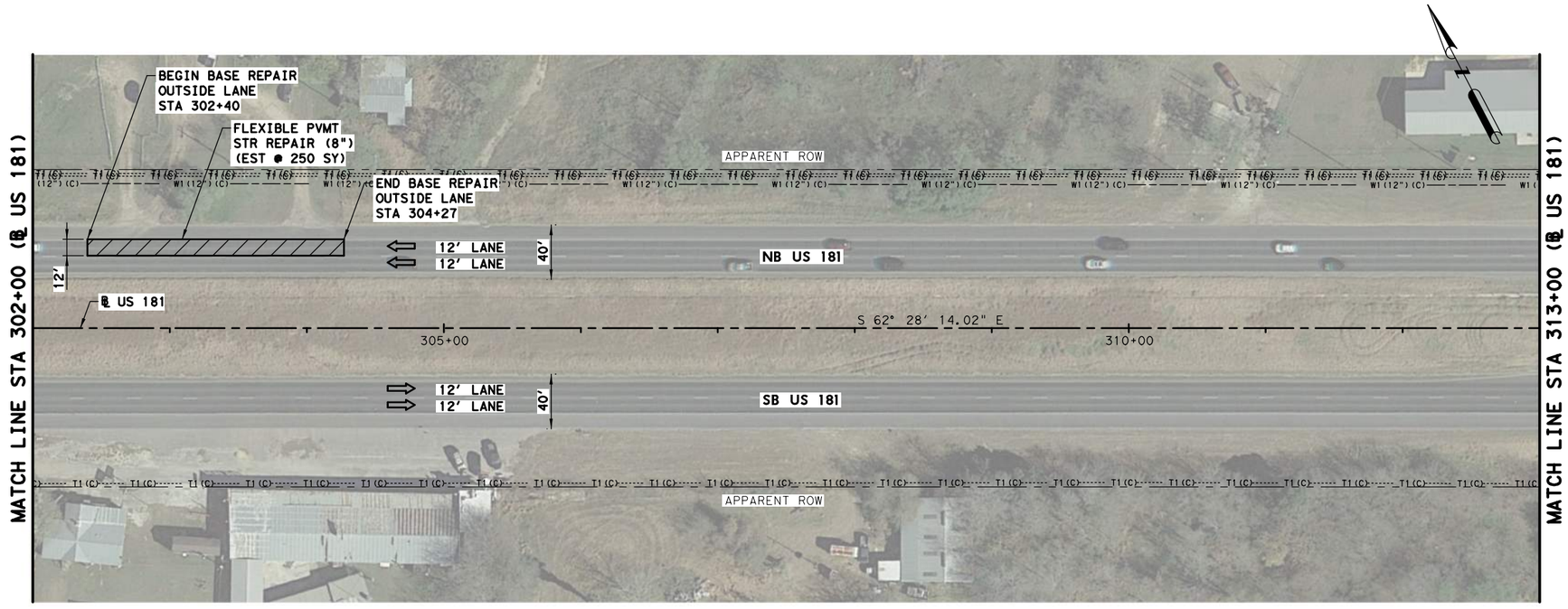

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	221 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20820 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	935 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	20820 SY
#	3085-6001	UNDERSEAL COURSE	20820 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
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- E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100

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US 181
PLAN LAYOUT

SHEET 12 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			119
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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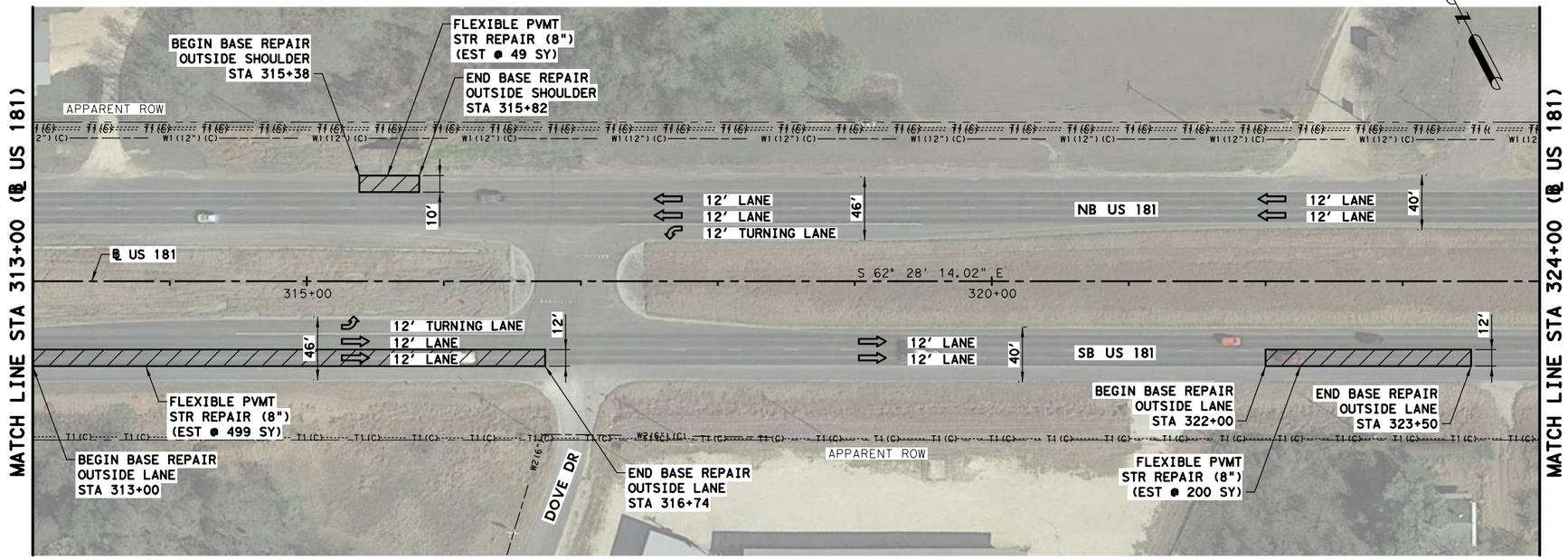

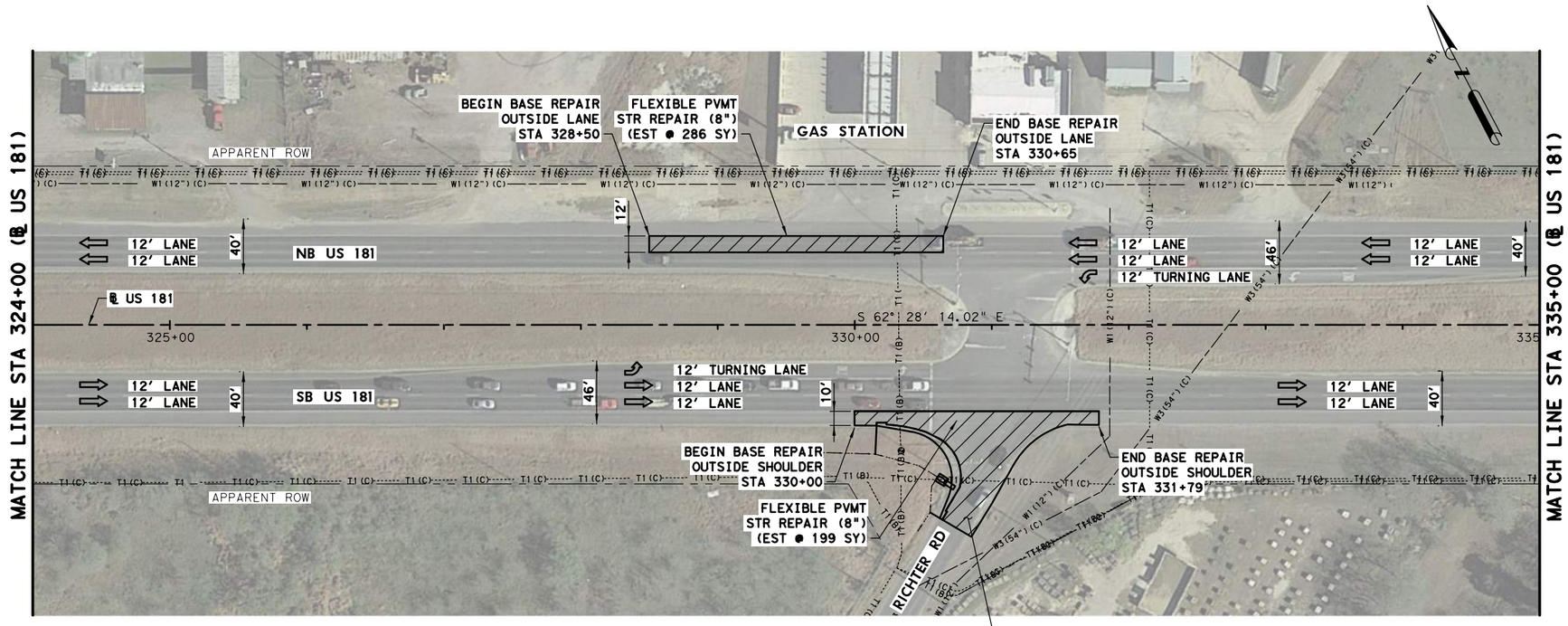

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	237 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	21946 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1233 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	21946 SY
#	3085-6001	UNDERSEAL COURSE	21946 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — T1 (C) — AT&T (QC)
- T1 (B) — T1 (B) — AT&T (QB)
- FOC2 (C) — FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 181
PLAN LAYOUT

SHEET 13 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			120
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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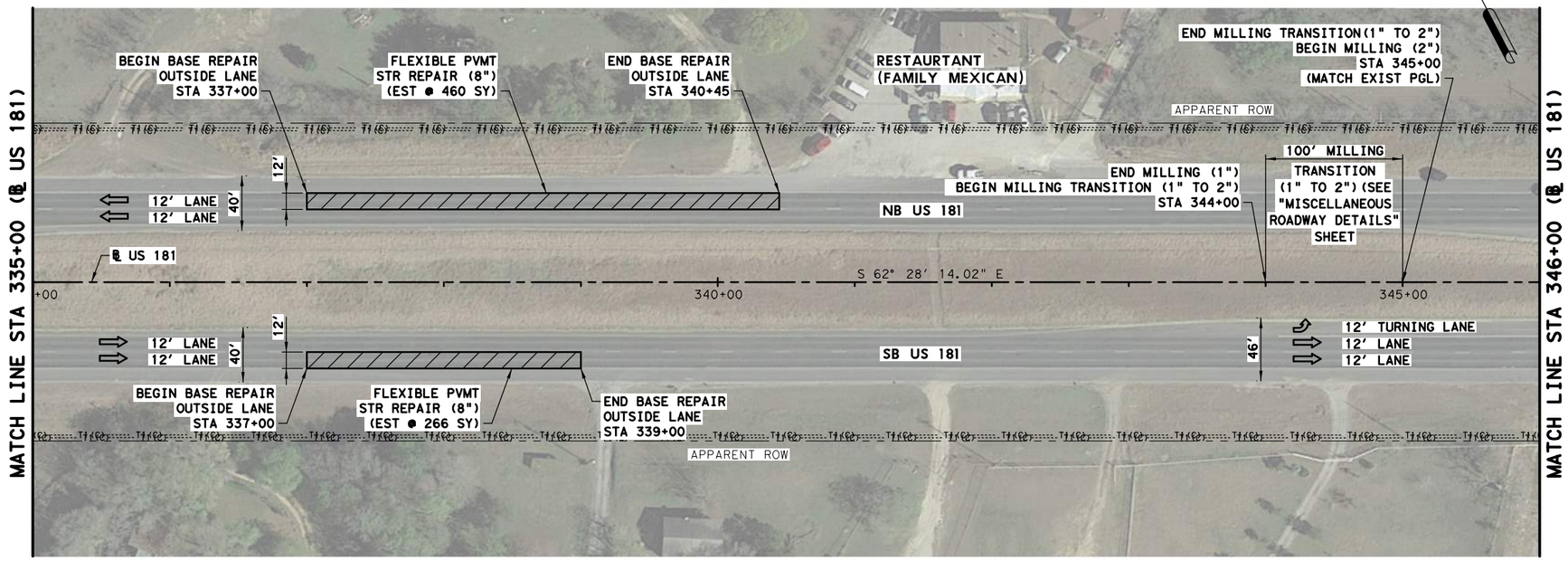

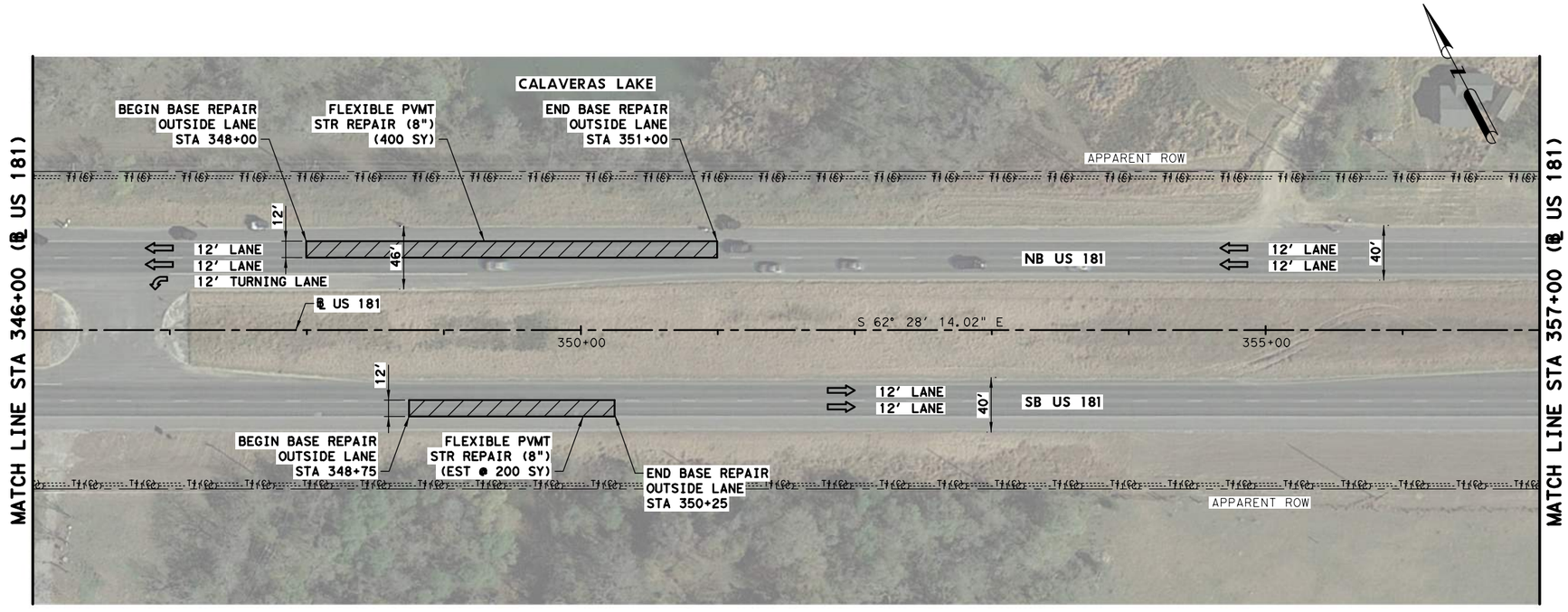

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	218 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20688 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1326 SY
	354-6188	PLANE ASPH CONC PAV(MICRO-MLLING)(1")	8197 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	12491 SY
#	3085-6001	UNDERSEAL COURSE	20688 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

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0 50 100

SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 14 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			121
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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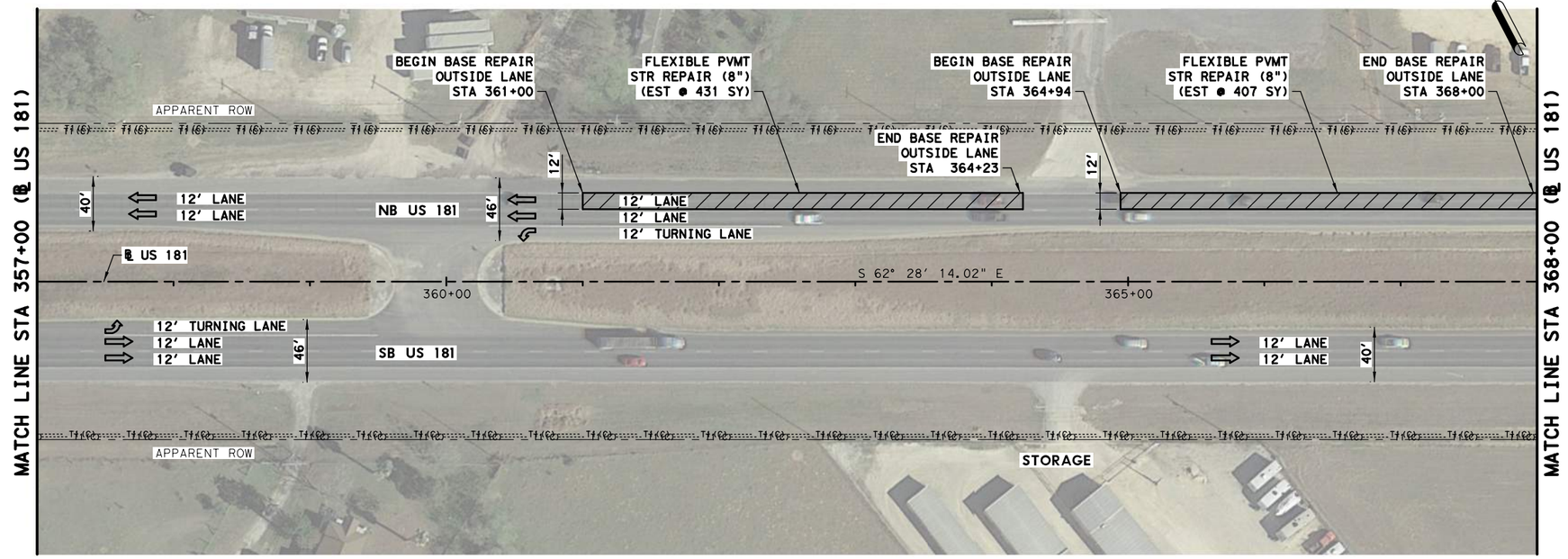

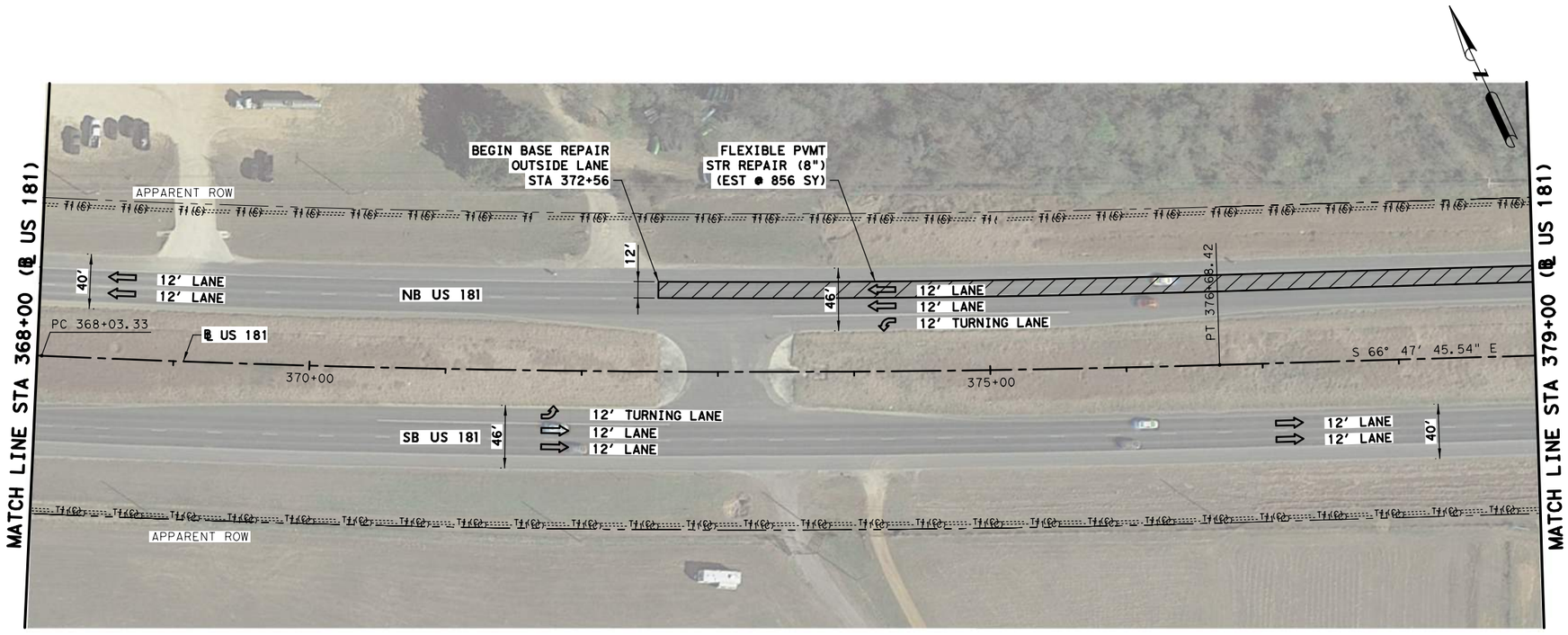

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	232 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	21700 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1694 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	21700 SY
#	3085-6001	UNDERSEAL COURSE	21700 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1(C) T1(C) AT&T (QC)
- T1(B) T1(B) AT&T (QB)
- FOC2(C) FOC2(C) FIBERLIGHT (QC)
- FOC5(C) FOC5(C) SPECTRUM (QC)
- G1(C) CPS ENERGY GAS LINE (QC)
- G1(B) CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) NUSTAR GAS LINE (QC)
- PL3 (4") (C) ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) ENTERPRISE GAS LINE (QC)
- W1(6") (C) SAWS 6" WATER LINE (QC)
- W1(8") (C) SAWS 8" WATER LINE (QC)
- W1(12") (C) SAWS 12" WATER LINE (QC)
- W1(16") (C) SAWS 16" WATER LINE (QC)
- W1(60") (C) SAWS 60" WATER LINE (QC)
- W2(6") (C) 6" EAST CENTRAL SUD WL (QC)
- W2(8") (C) 8" EAST CENTRAL SUD WL (QC)
- W2(54") (C) 54" CPS ENERGY WL (QC)
- SS1(8") (C) SAWS 8" SAN SWR (QC)
- E1(C) E1(C) CTMS - TXDOT (QC)

NOTES

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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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US 181
PLAN LAYOUT

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			122
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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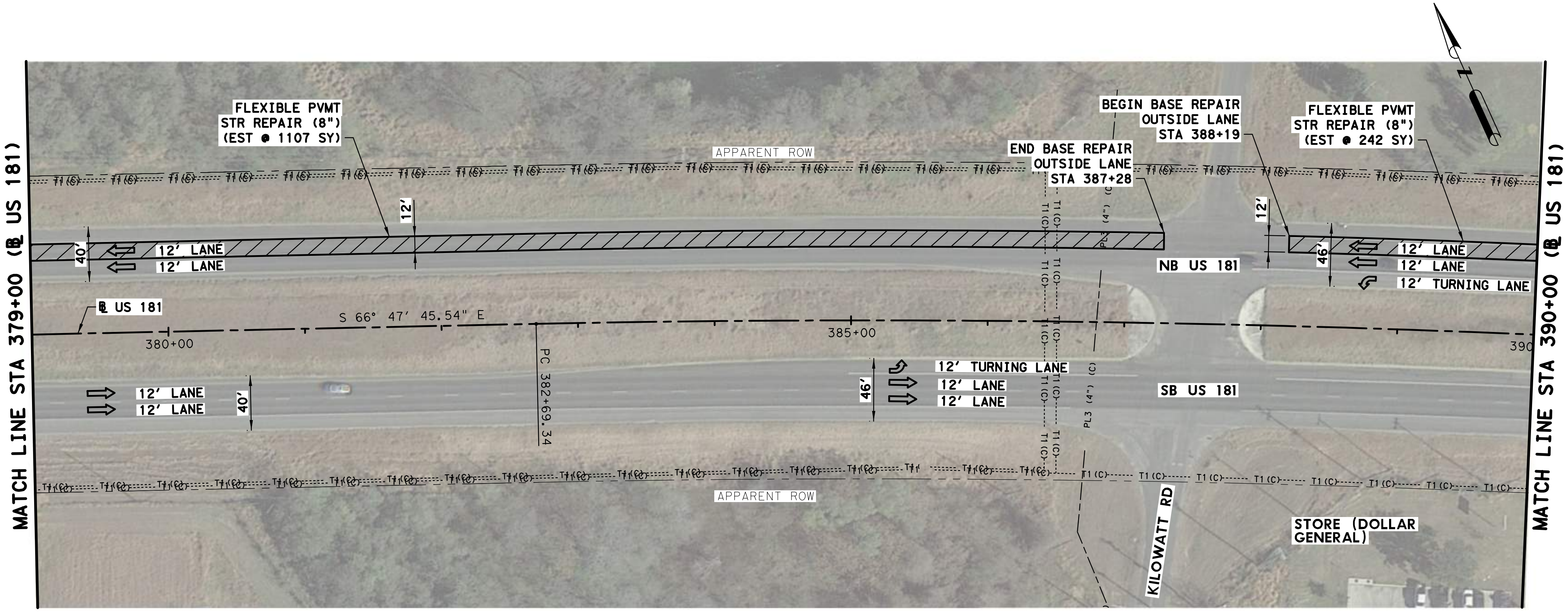
ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44	STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	234	TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	21681	SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1540	SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	21681	SY
#	3085-6001	UNDERSEAL COURSE	21681	SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY



LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

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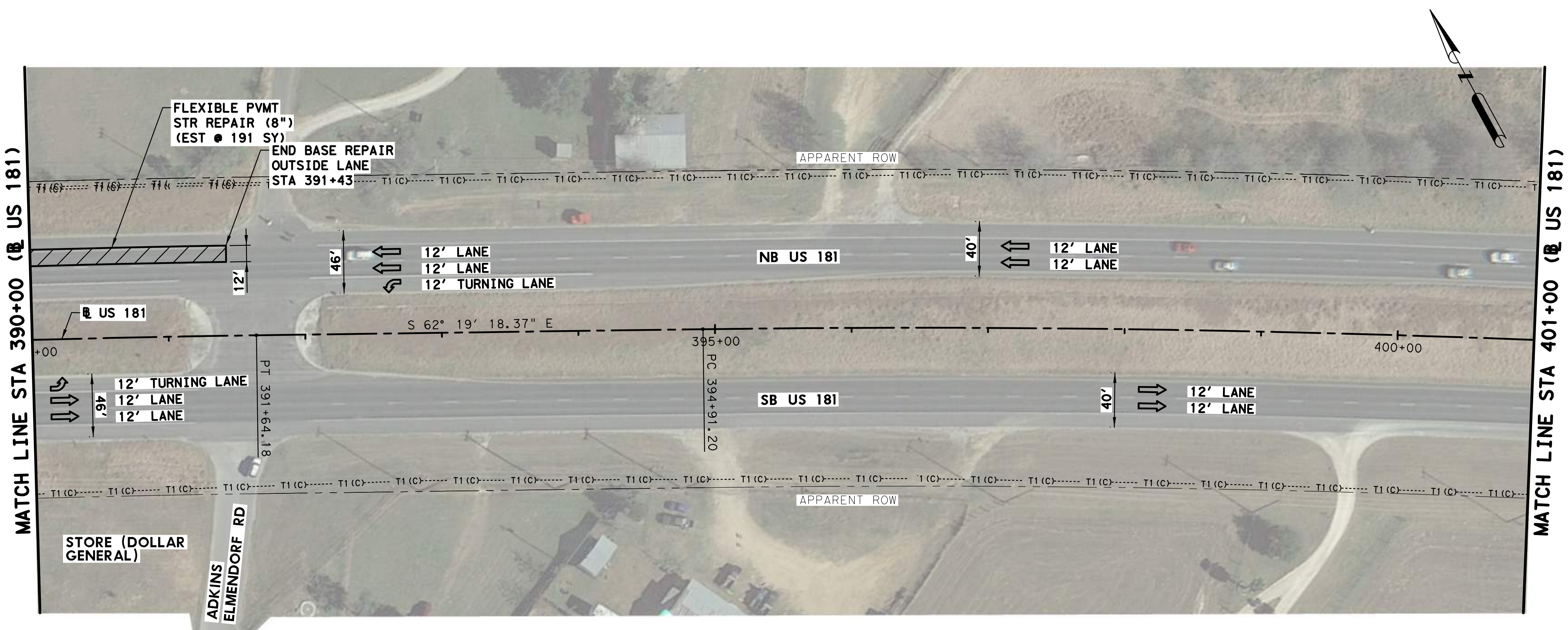
SCALE: 1" = 100'



STATE OF TEXAS
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2/25/2021

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US 181
PLAN LAYOUT

SHEET 16 OF 23

FHWA DIVISION	PROJECT NUMBER	SHEET NO.
6		123

STATE	DISTRICT	COUNTY
TEXAS	SAT	BEXAR

CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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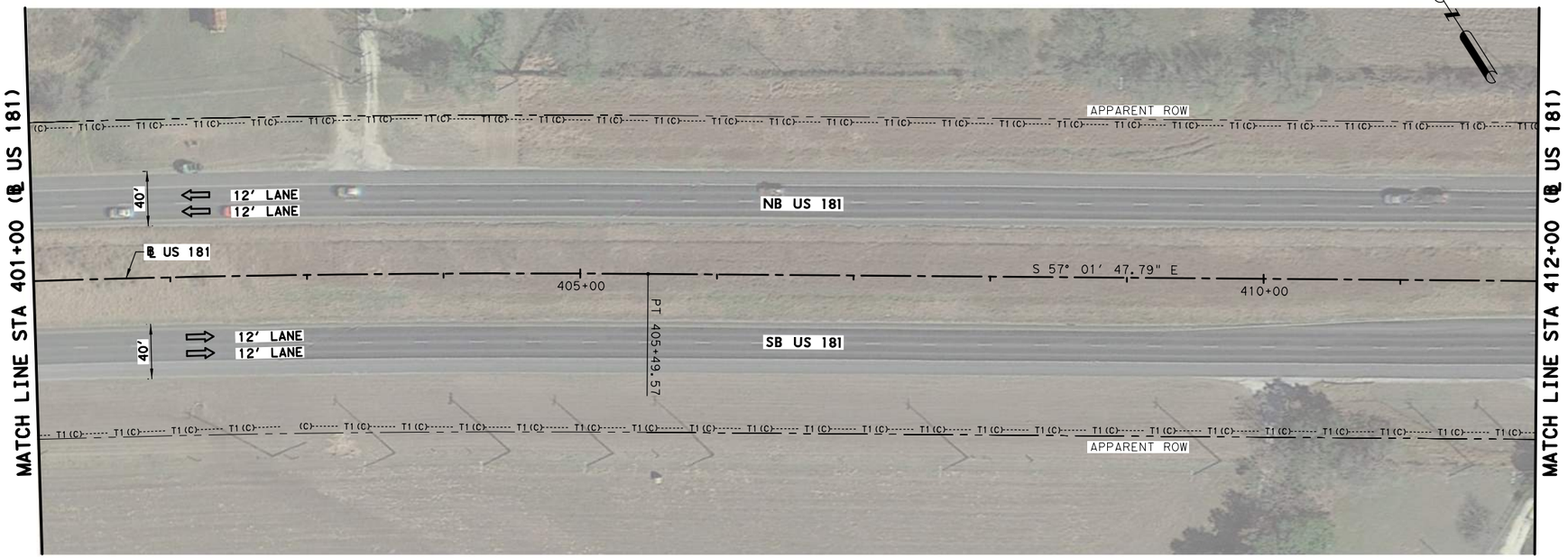

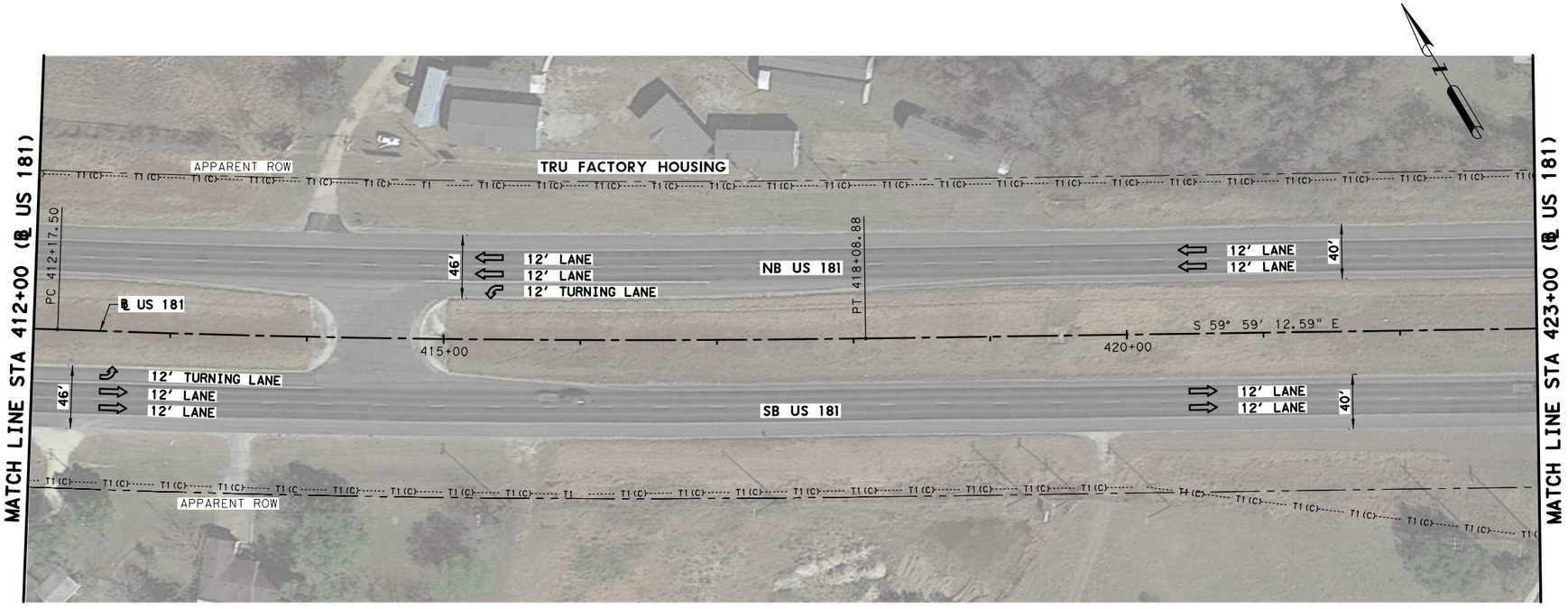

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	218 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20687 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	20687 SY
#	3085-6001	UNDERSEAL COURSE	20687 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
Luis A. González
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2/25/2021

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TBPE REG. NO. F-2742

US 181
PLAN LAYOUT

SHEET 17 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			124
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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NOTES

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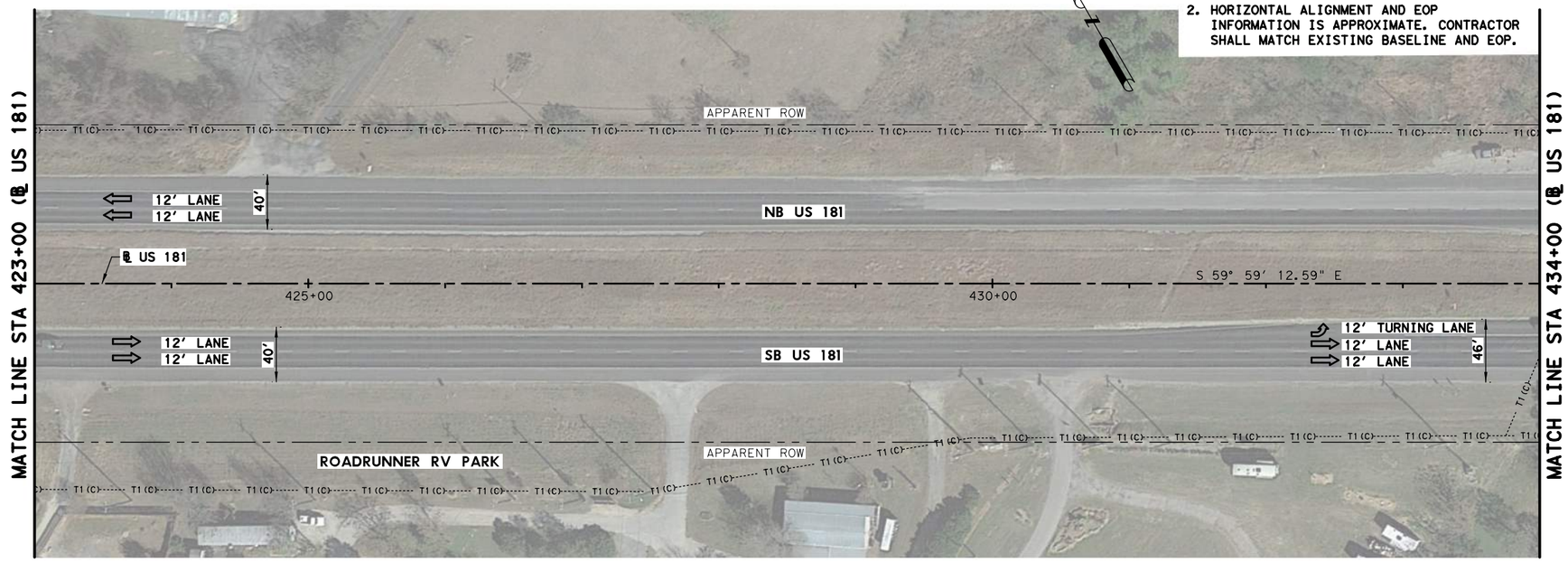
ESTIMATED SHEET QUANTITIES

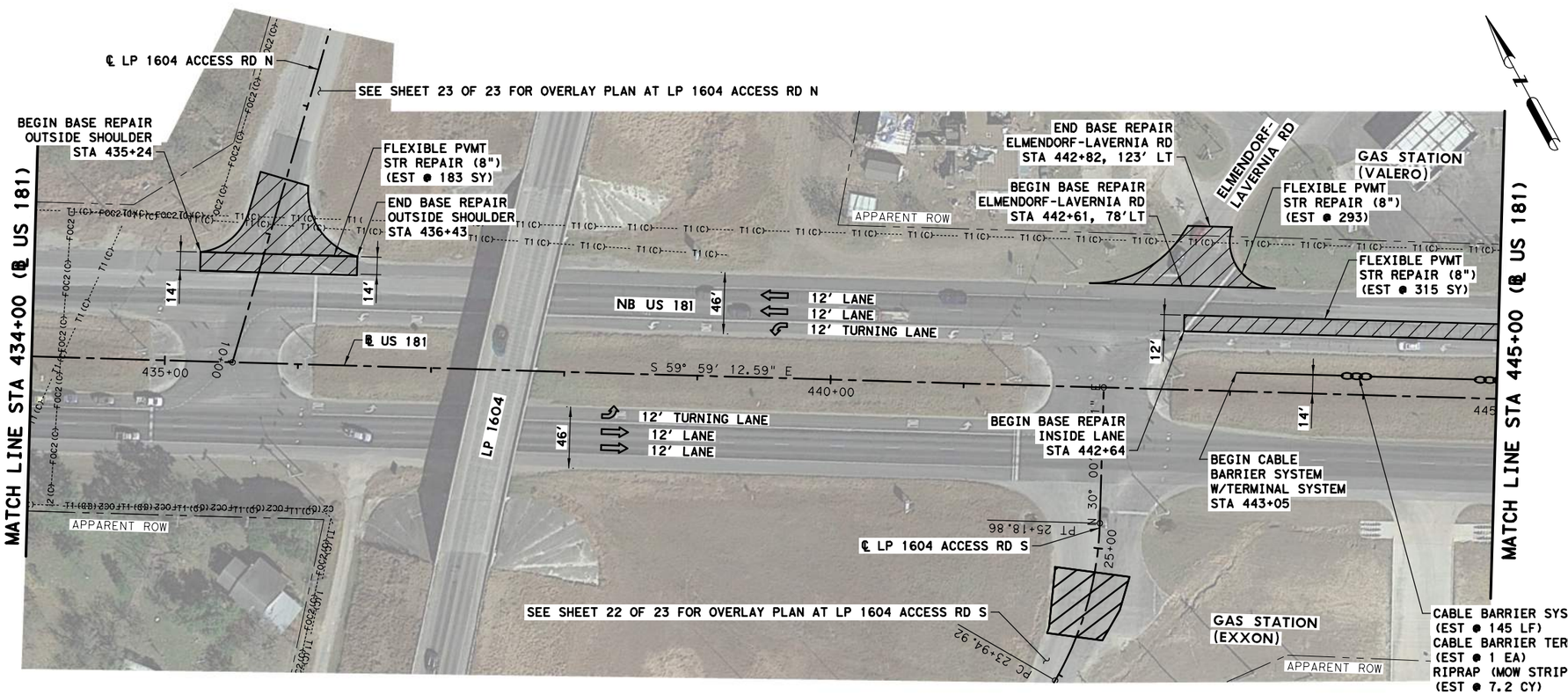
	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	243 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	22249 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	791 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	22249 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	7.2 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	20 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	20 LF
	543-6001	CABLE BARRIER SYSTEM (TL-3)	145 LF
	543-6019	CABLE BARRIER TERMINAL SECTION (TL-3)	1 EA
#	3085-6001	UNDERSEAL COURSE	22249 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY



LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- AT&T (QC)
- AT&T (QB)
- FIBERLIGHT (QC)
- SPECTRUM (QC)
- CPS ENERGY GAS LINE (QC)
- CPS ENERGY GAS LINE (QB)
- NUSTAR GAS LINE (QC)
- ENTERPRISE GAS LINE (QC)
- ENTERPRISE GAS LINE (QC)
- ENTERPRISE GAS LINE (QC)
- SAWS 6" WATER LINE (QC)
- SAWS 8" WATER LINE (QC)
- SAWS 12" WATER LINE (QC)
- SAWS 16" WATER LINE (QC)
- SAWS 60" WATER LINE (QC)
- 6" EAST CENTRAL SUD WL (QC)
- 8" EAST CENTRAL SUD WL (QC)
- 54" CPS ENERGY WL (QC)
- SAWS 8" SAN SWR (QC)
- CTMS - TXDOT (QC)



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SCALE: 1" = 100′

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2/25/2021

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TBPE REG. NO. F-2742

US 181
PLAN LAYOUT

SHEET 18 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			125
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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NOTES

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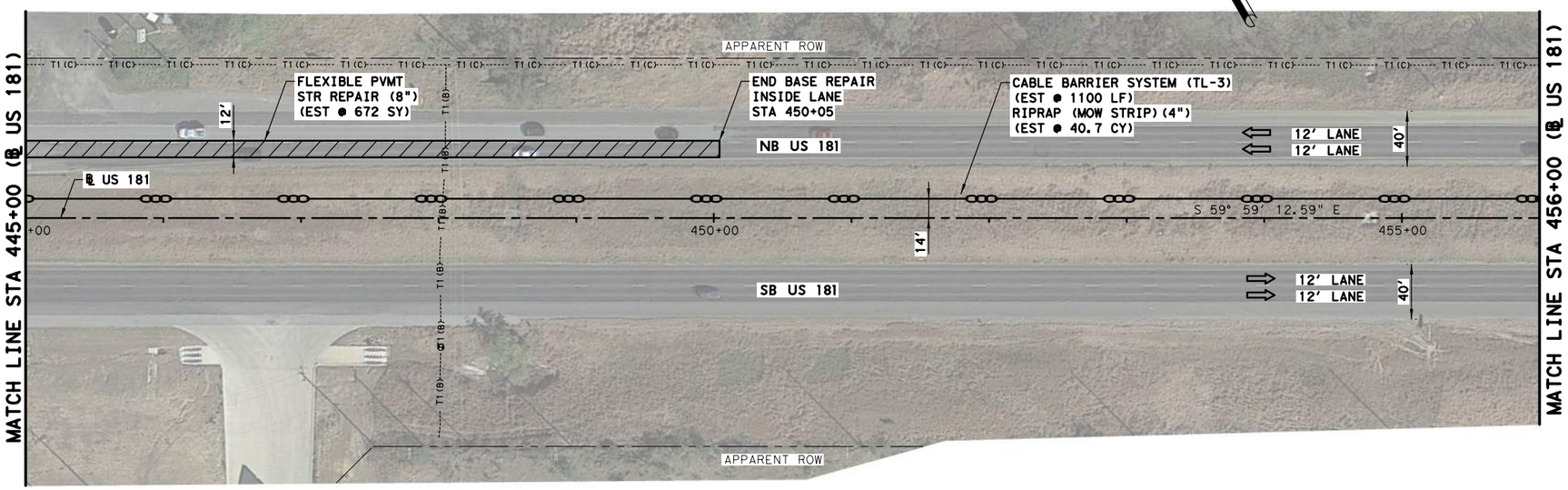

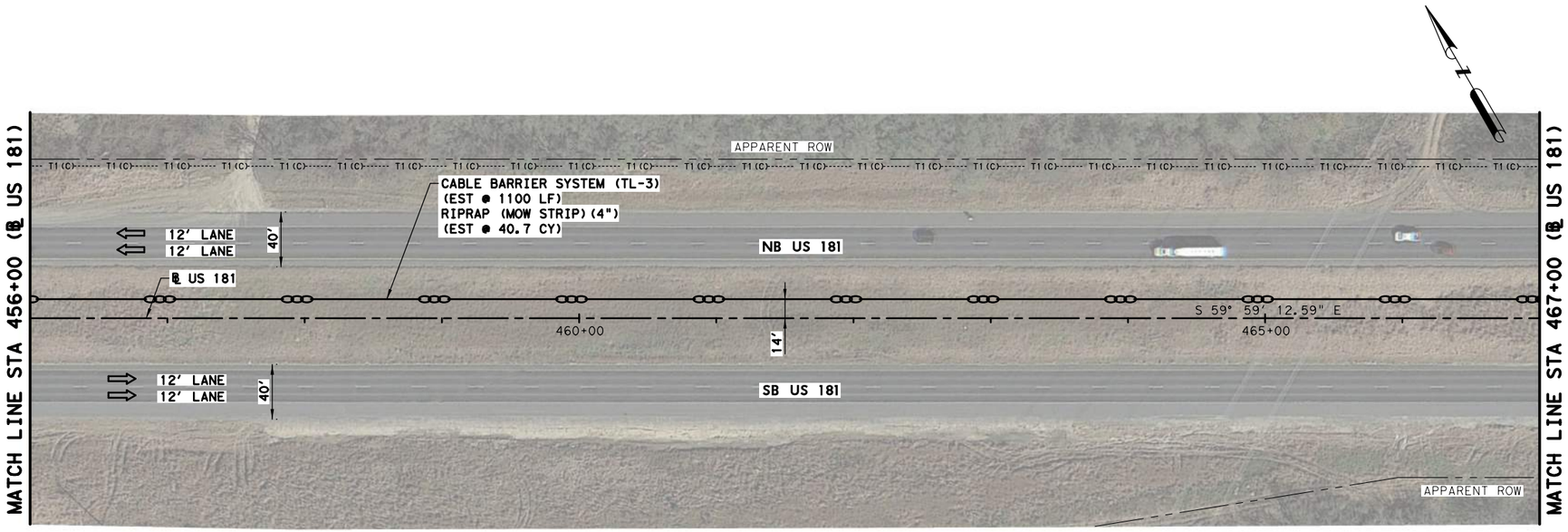

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	44 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	204 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	19613 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	672 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	19613 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	81.4 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	180 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	180 LF
	543-6001	CABLE BARRIER SYSTEM (TL-3)	2200 LF
#	3085-6001	UNDERSEAL COURSE	19613 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
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US 181
PLAN LAYOUT

SHEET 19 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			126
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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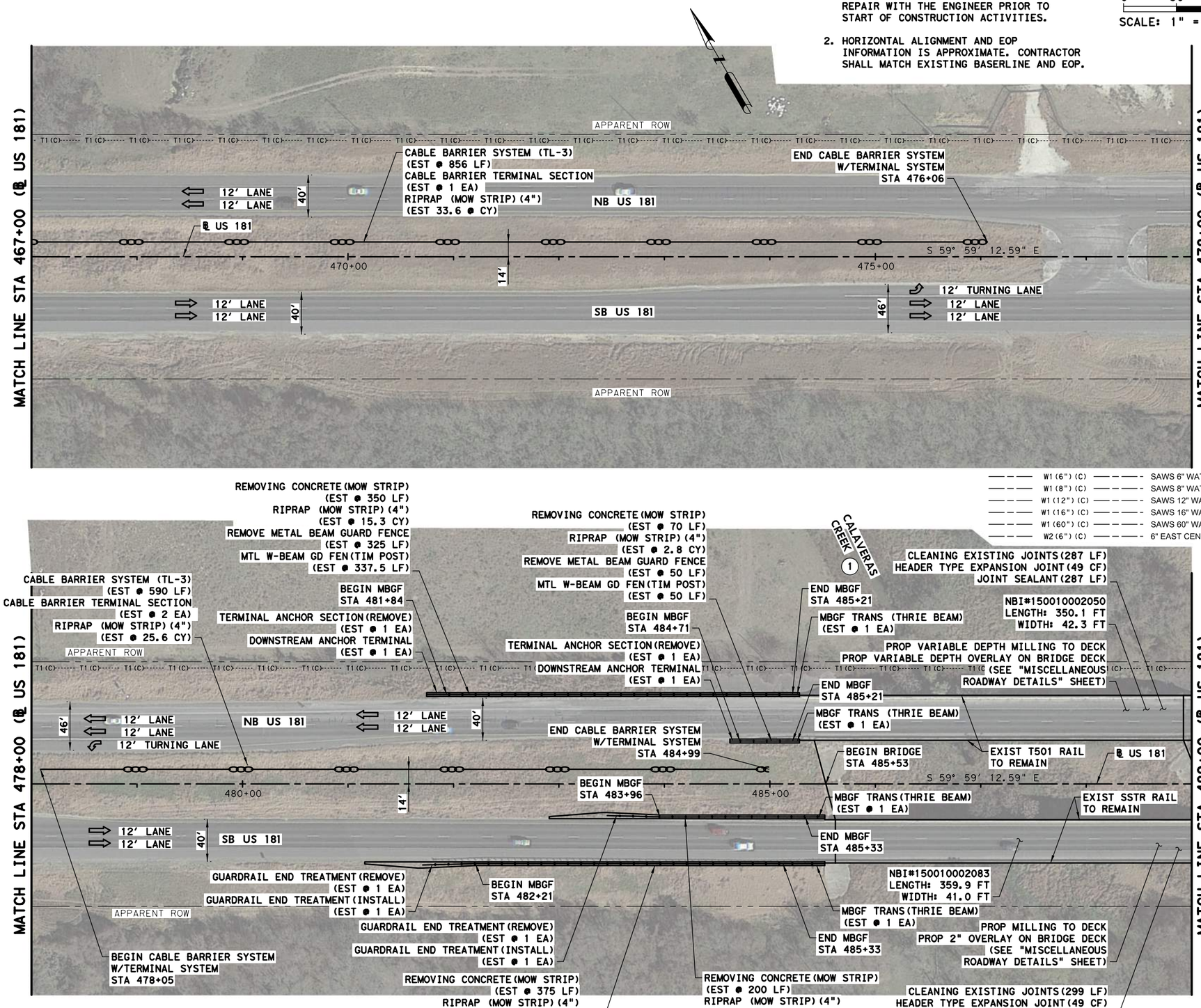
NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASERLINE AND EOP.

SCALE: 1" = 100'



1 THE PROPOSED WORK DOES NOT IMPACT THE HYDRAULICS OF THIS BRIDGE.

W1 (6") (C) — SAWS 6" WATER LINE (QC)
W1 (8") (C) — SAWS 8" WATER LINE (QC)
W1 (12") (C) — SAWS 12" WATER LINE (QC)
W1 (16") (C) — SAWS 16" WATER LINE (QC)
W1 (60") (C) — SAWS 60" WATER LINE (QC)
W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	995 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	33 CY
	134-6002	BACKFILL (TY B)	44 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	104 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	104 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	104 SY
	168-6001	VEGETATIVE WATERING	5 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	222 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	20794 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	17599 SY
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	3195 SY
	356-6021	PAV JT UNDERSEAL (24")	698 LF
	432-6045	RIPRAP (MOW STRIP)(4 IN)	109.7 CY
	438-6009	CLEANING EXISTING JOINTS	586 LF
	454-6008	HEADER TYPE EXPANSION JOINT	98 CF
	454-6009	JOINT SEALANT	586 LF
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	918 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	918 LF
	543-6001	CABLE BARRIER SYSTEM (TL-3)	1446 LF
	543-6019	CABLE BARRIER TERMINAL SECTION (TL-3)	3 EA
	540-6001	MTL W-BEAM GD FEN (TIM POST)	837.5 LF
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	4 EA
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	2 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	825 LF
	542-6002	REMOVE TERMINAL ANCHOR SECTION	2 EA
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	2 EA
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	2 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	2 EA
#	3085-6001	UNDERSEAL COURSE	20794 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

T1 (C) — AT&T (QC)
T1 (B) — AT&T (QB)
FOC2 (C) — FIBERLIGHT (QC)
FOC5 (C) — SPECTRUM (QC)
G1 (C) — CPS ENERGY GAS LINE (QC)
G1 (B) — CPS ENERGY GAS LINE (QB)
PL2 (6") (C) — NUSTAR GAS LINE (QC)
PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
PL3 (24") (C) — ENTERPRISE GAS LINE (QC)

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US 181
PLAN LAYOUT

SHEET 20 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			127
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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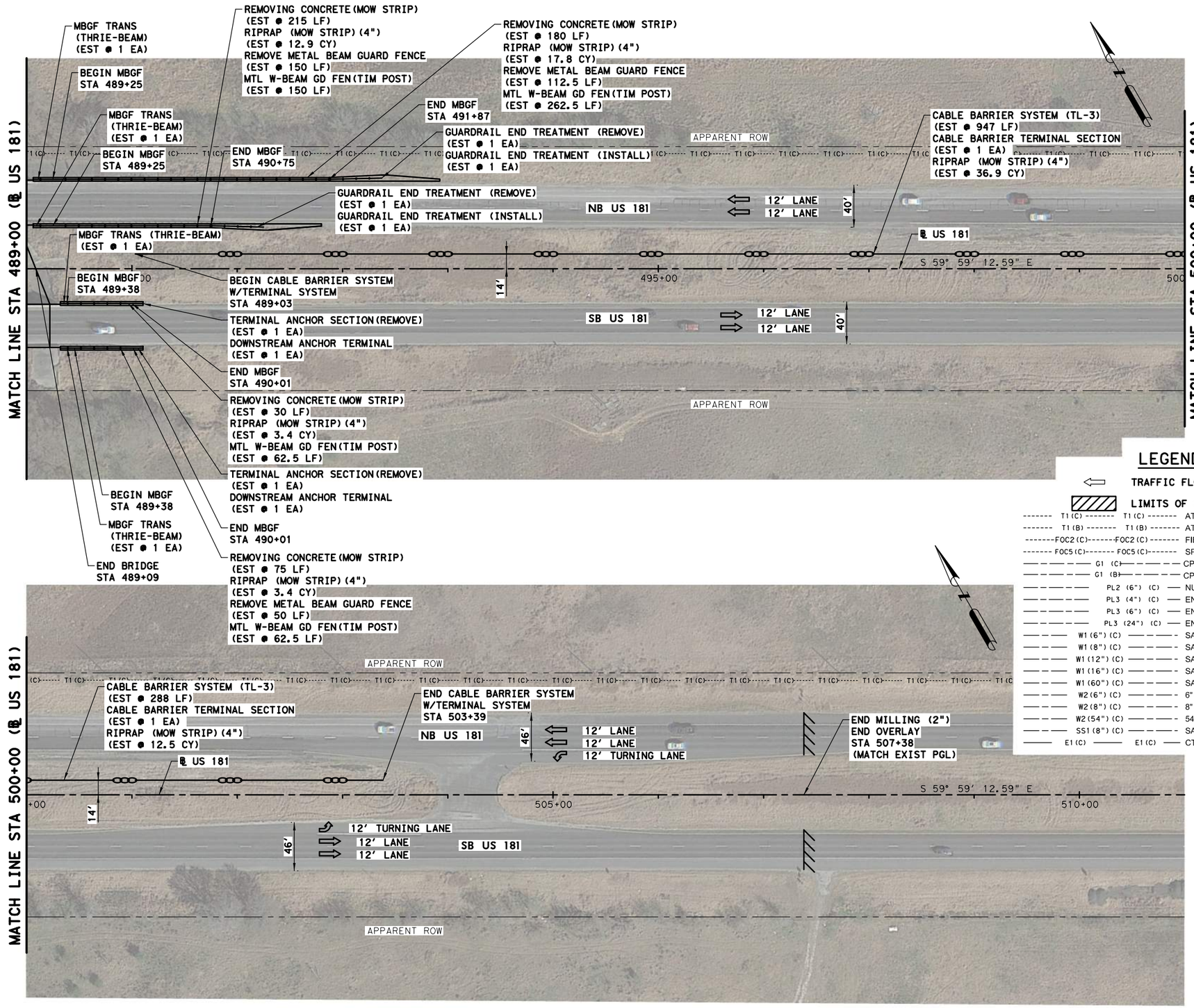

ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	500 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	24 CY
	134-6002	BACKFILL (TY B)	36.76 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	71 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	71 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	71 SY
	168-6001	VEGETATIVE WATERING	3 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	182 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	17290 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	17190 SY
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	100 SY
	356-6021	PAV JT UNDERSEAL (24")	22 LF
	432-6045	RIPRAP (MOW STRIP)(4 IN)	86.9 CY
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	598 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	598 LF
	543-6001	CABLE BARRIER SYSTEM (TL-3)	1235 LF
	543-6019	CABLE BARRIER TERMINAL SECTION (TL-3)	2 EA
	540-6001	MTL W-BEAM GD FEN (TIM POST)	537.5 LF
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	4 EA
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	2 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	470 LF
	542-6002	REMOVE TERMINAL ANCHOR SECTION	2 EA
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	2 EA
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	2 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	2 EA
#	3085-6001	UNDERSEAL COURSE	17290 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- T1 (C) — T1 (C) — AT&T (QC)
- T1 (B) — T1 (B) — AT&T (QB)
- FOC2 (C) — FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

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US 181
PLAN LAYOUT

SHEET 21 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			128
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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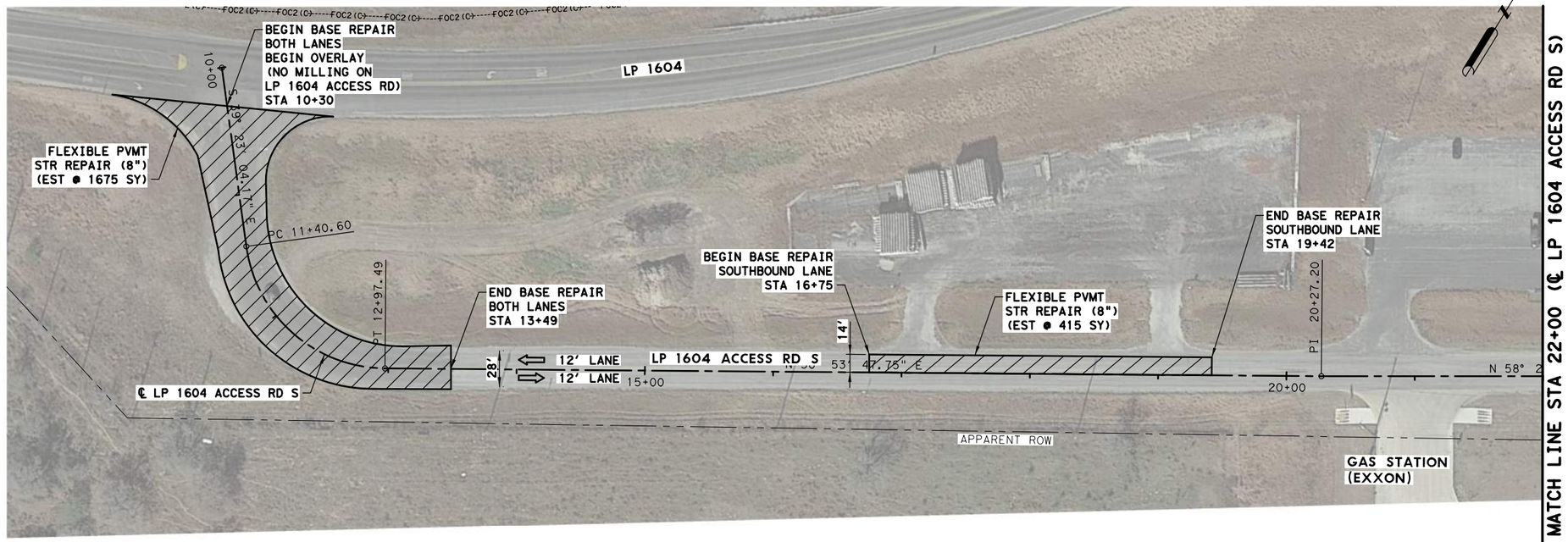

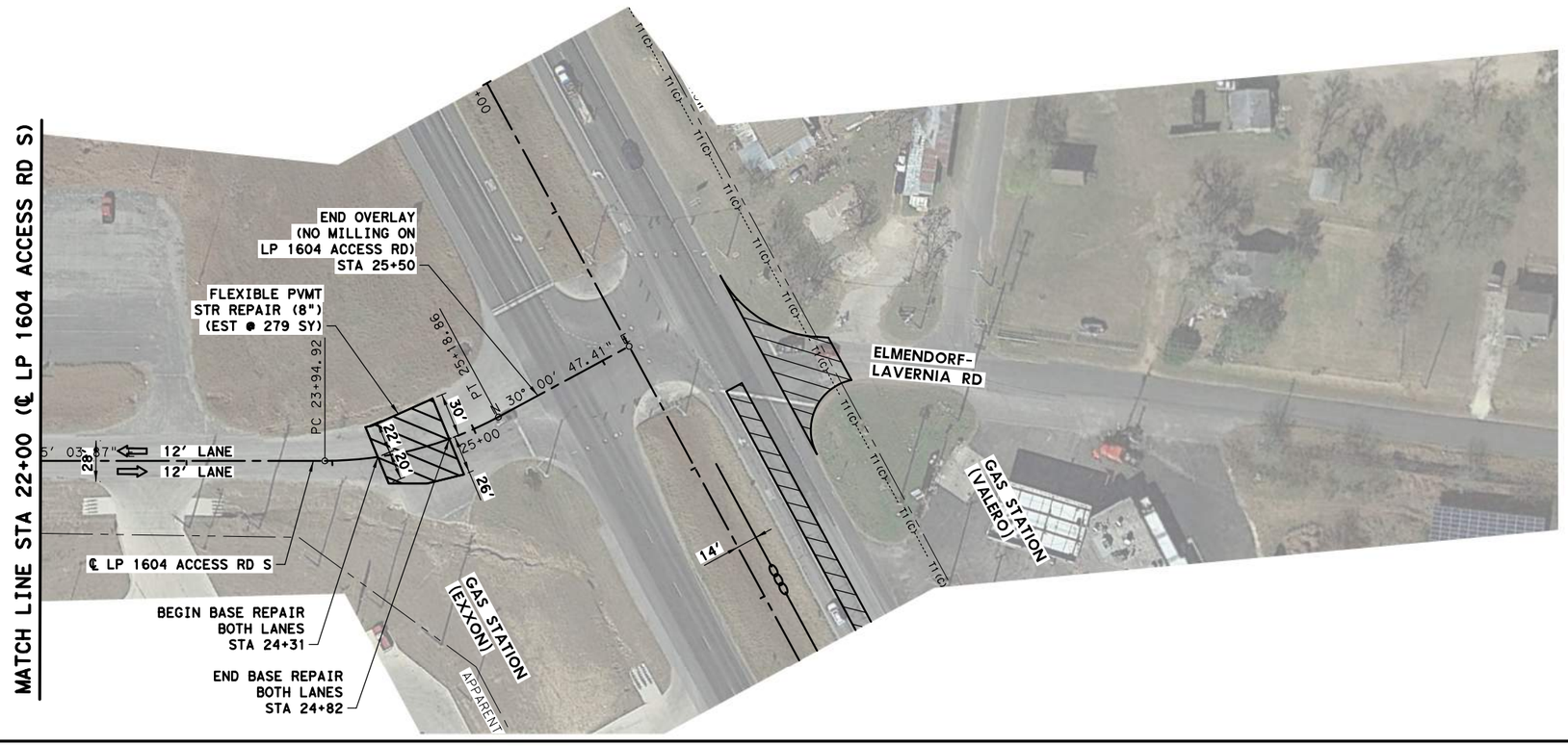

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	15.2 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	67 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	5815 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	2369 SY
#	3085-6001	UNDERSEAL COURSE	5815 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

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US 181
PLAN LAYOUT
(LP 1604 ACCESS RD S)

SHEET 22 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			129
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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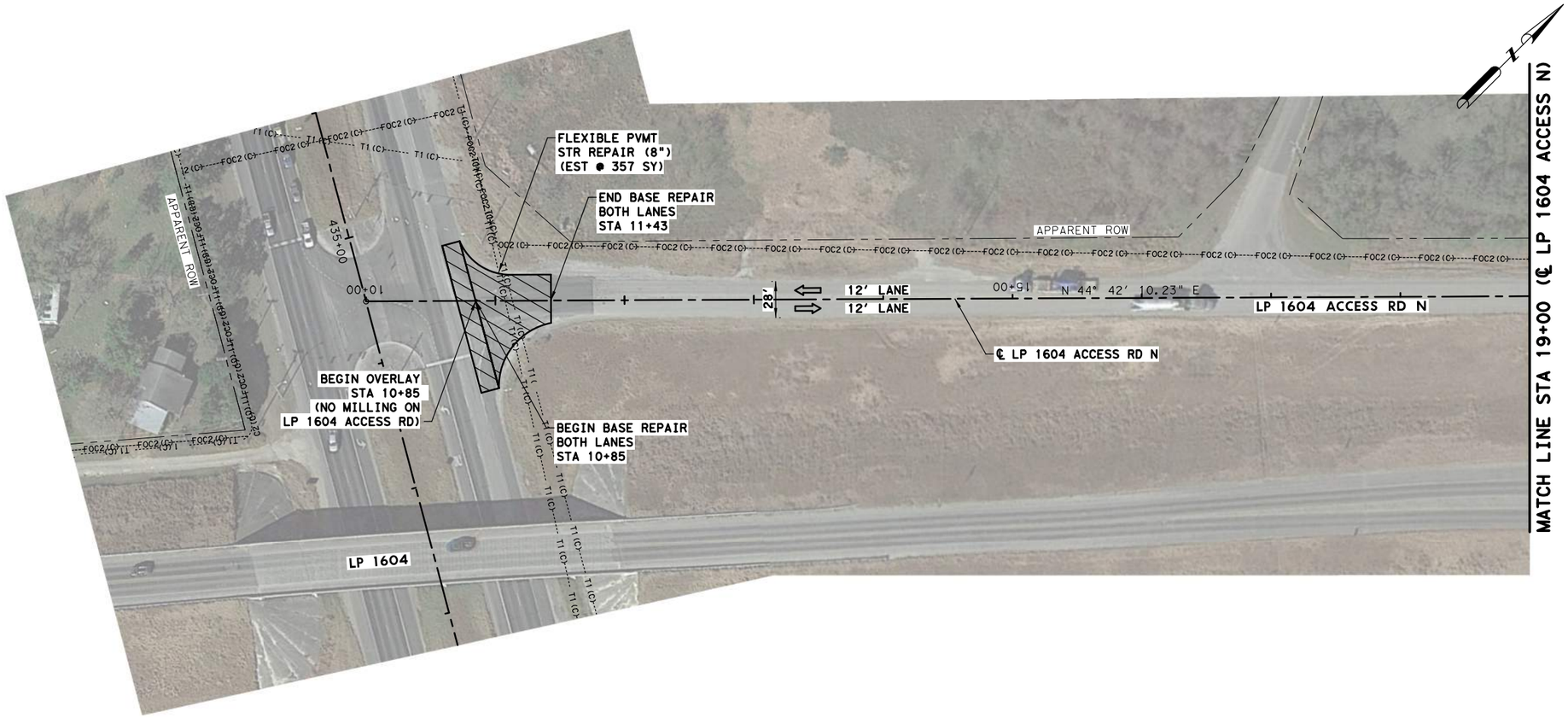
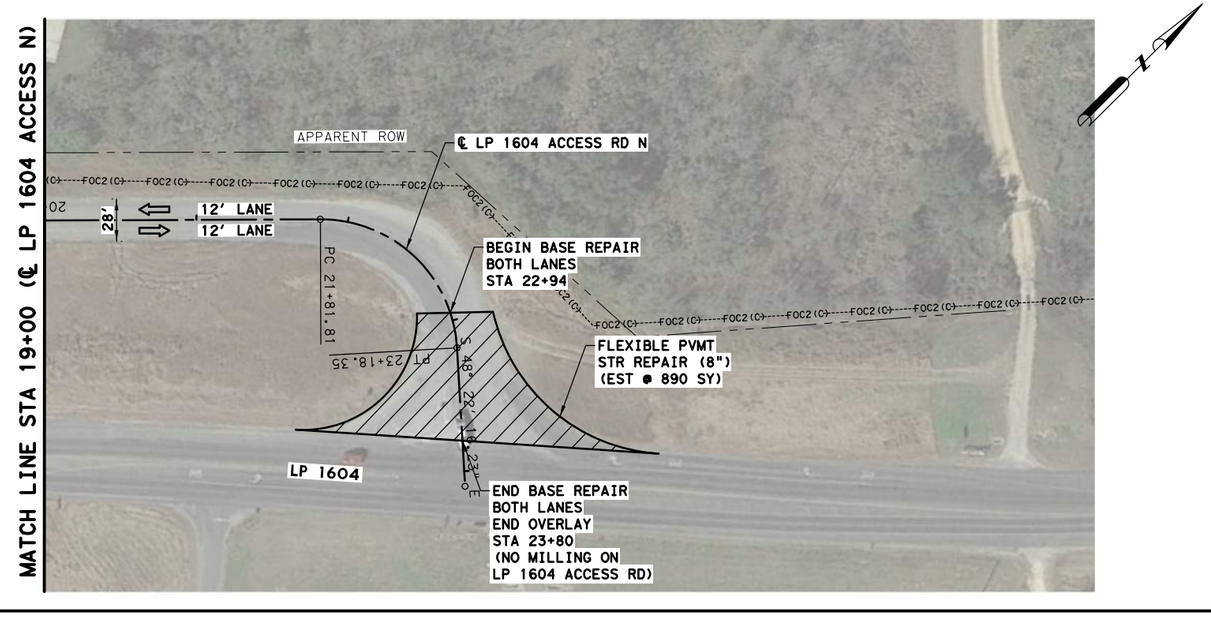
ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	12.95 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	57 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	4977 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1247 SY
#	3085-6001	UNDERSEAL COURSE	4977 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY





LEGEND

TRAFFIC FLOW DIRECTION

LIMITS OF 8" BASE REPAIR

- T1 (C) — AT&T (QC)
- T1 (B) — AT&T (QB)
- FOC2 (C) — FIBERLIGHT (QC)
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- G1 (B) — CPS ENERGY GAS LINE (QB)
- PL2 (6") (C) — NUSTAR GAS LINE (QC)
- PL3 (4") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (6") (C) — ENTERPRISE GAS LINE (QC)
- PL3 (24") (C) — ENTERPRISE GAS LINE (QC)
- W1 (6") (C) — SAWS 6" WATER LINE (QC)
- W1 (8") (C) — SAWS 8" WATER LINE (QC)
- W1 (12") (C) — SAWS 12" WATER LINE (QC)
- W1 (16") (C) — SAWS 16" WATER LINE (QC)
- W1 (60") (C) — SAWS 60" WATER LINE (QC)
- W2 (6") (C) — 6" EAST CENTRAL SUD WL (QC)
- W2 (8") (C) — 8" EAST CENTRAL SUD WL (QC)
- W2 (54") (C) — 54" CPS ENERGY WL (QC)
- SS1 (8") (C) — SAWS 8" SAN SWR (QC)
- E1 (C) — CTMS - TXDOT (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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US 181
PLAN LAYOUT
(LP 1604 ACCESS RD N)

SHEET 23 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			130
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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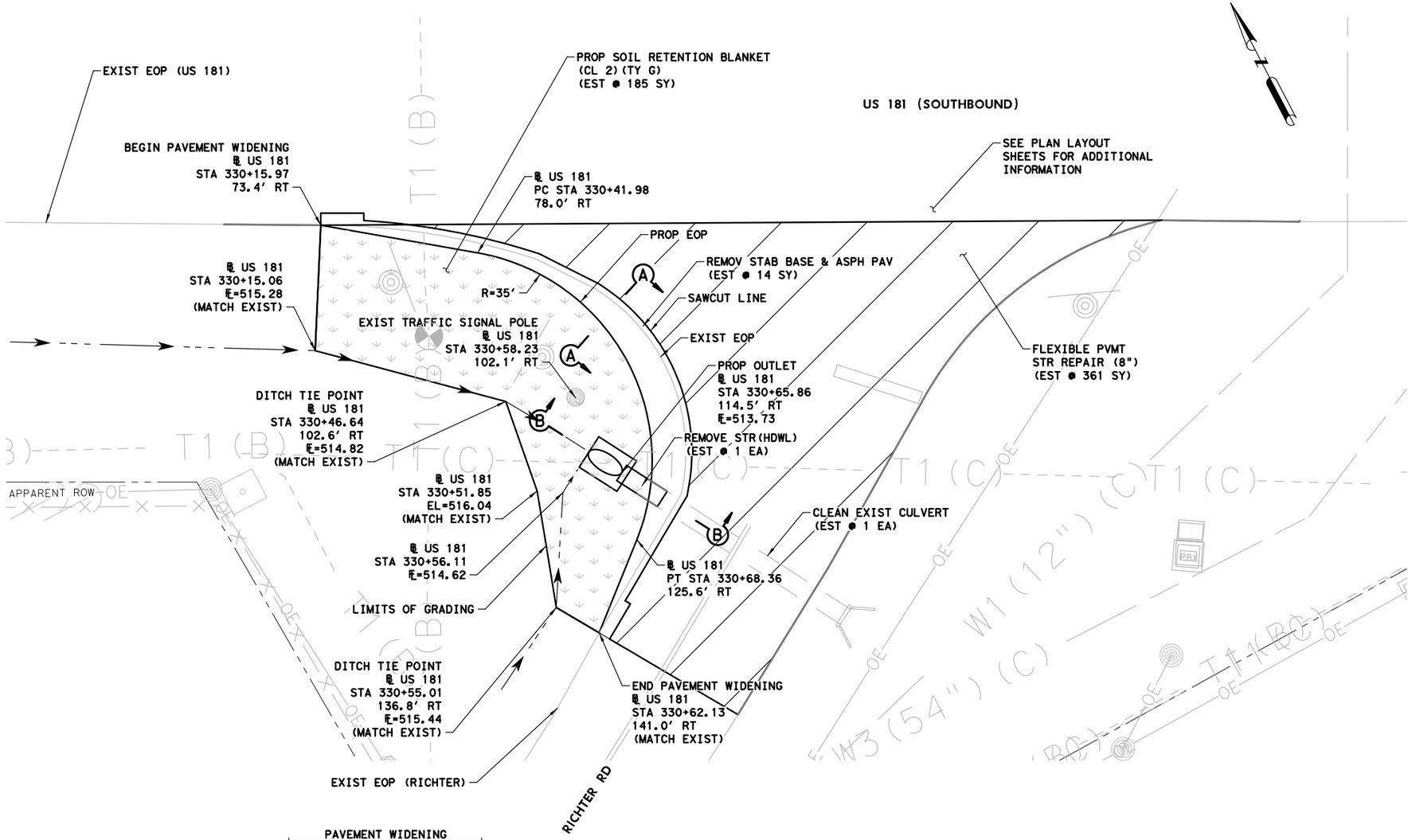
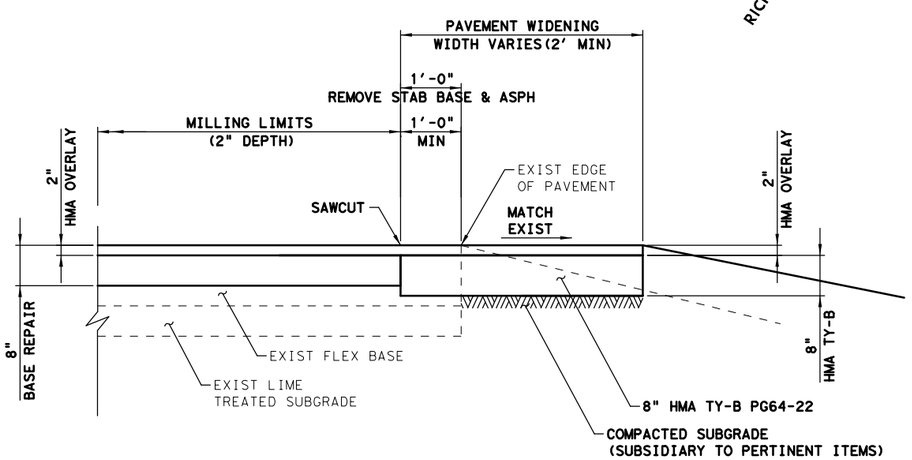
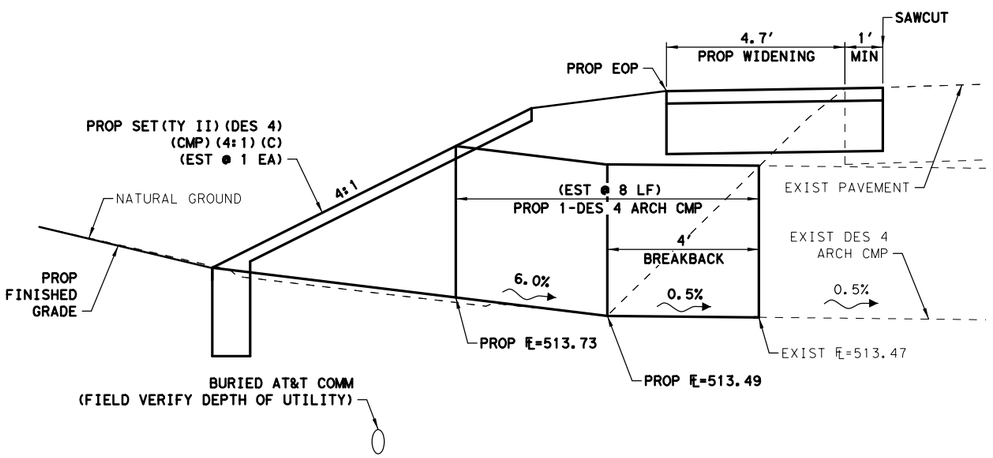




SECTION A-A

NTS



SECTION B-B

NTS

ESTIMATED SHEET QUANTITIES

	105-6044	REMOVING STAB BASE AND ASPH PAV (10")	14 SY
	110-6002	EXCAVATION (CHANNEL)	21 CY
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	11 CY
	161-6017	COMPOST MANUF TOPSOIL (4")	185 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	185 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	185 SY
	168-6001	VEGETATIVE WATERING	9 MG
	169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	185 SY
#	340-6011	D-GR HMA(SQ) TY-B PG64-22	49 SY
	3077-6023	SP MIXES SP-C SAC-B PG70-22	410 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	361 SY
	354-6003	PLAN & TEXT ASPH CONC PAV(0" TO 3")	361 SY
	460-6011	CMP AR (GAL STL DES 4)	8 LF
	467-6547	SET (TY II) (DES 4) (CMP) (4:1) (C)	1 EA
	480-6001	CLEAN EXIST CULVERTS	1 EA
	496-6006	REMOV STR (HEADWALL)	1 EA
#	3085-6001	UNDERSEAL COURSE	459 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

1. CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL INSTALL SRB WITHIN 24 HOURS AFTER SEEDING AND COMPOST OPERATION BEGINS.
3. CONC COLLAR OR COUPLING BAND SUBSIDIARY TO ITEM 460.

0 10 20

SCALE: 1" = 20'

STATE OF TEXAS
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US 181 GRADING LAYOUT AT RICHTER RD

SHEET 1 OF 1

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			131
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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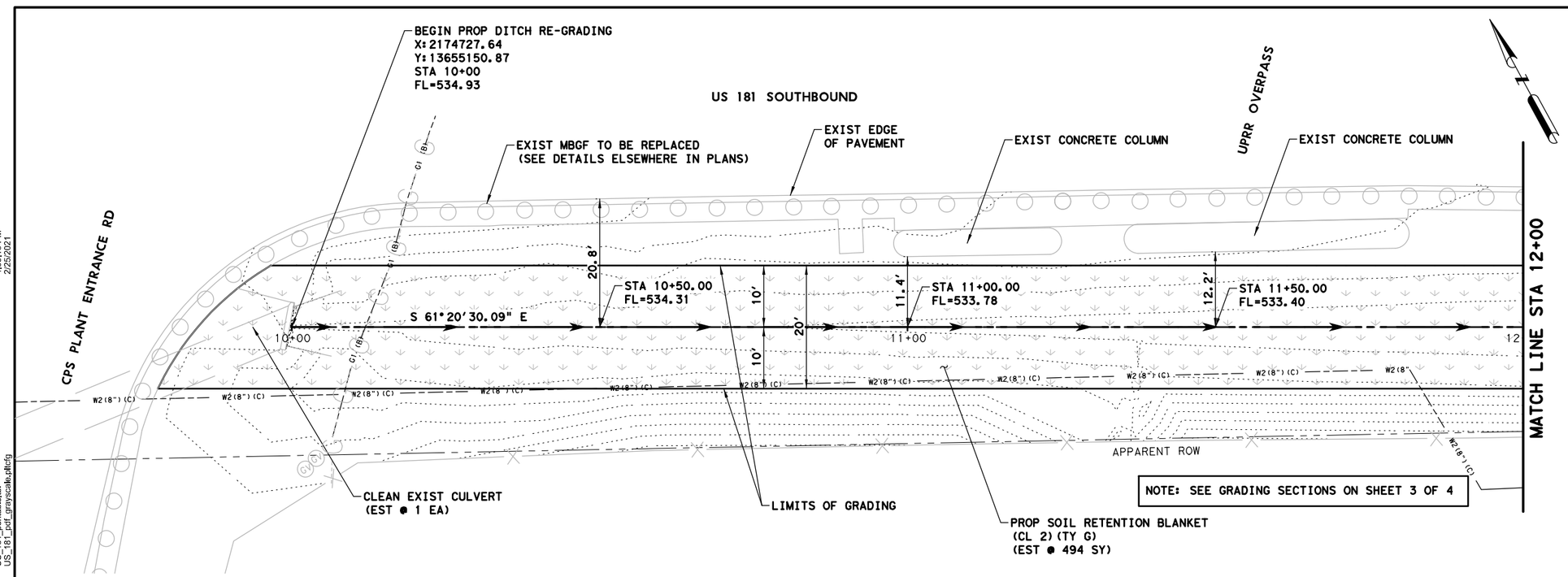
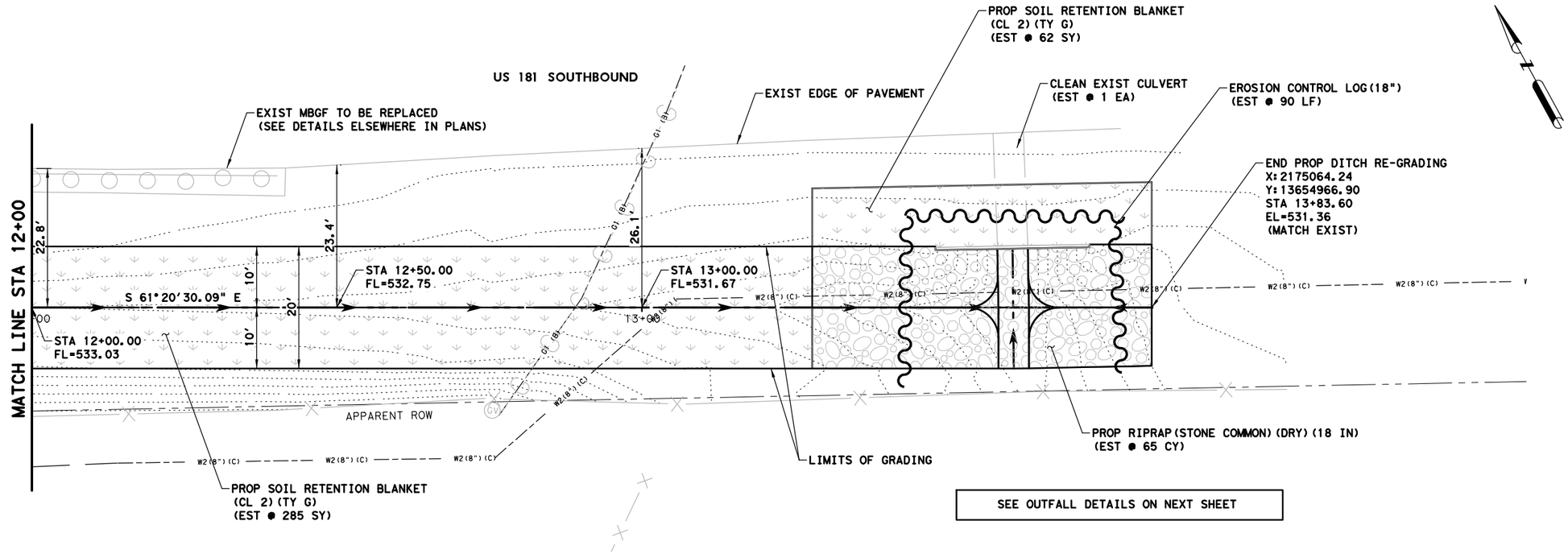


ESTIMATED SHEET QUANTITIES			
110-6002	EXCAVATION (CHANNEL)	129	CY
132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	67	CY
161-6017	COMPOST MANUF TOPSOIL (4")	841	SY
164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	841	SY
164-6051	DRILL SEED (TEMP)(WARM OR COOL)	841	SY
168-6001	VEGETATIVE WATERING	39	MG
169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	841	SY
432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	65	CY
480-6001	CLEAN EXIST CULVERTS	1	EA
506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	90	LF
506-6043	BIODEG EROSN CONT LOGS (REMOVE)	90	LF

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

1. CONTRACTOR SHALL INSTALL SRB WITHIN 24 HOURS AFTER SEEDING AND COMPOST OPERATION BEGINS.



0 10 20
SCALE: 1" = 20'

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US 181
GRADING LAYOUT
AT UPRR CROSSING

SHEET 1 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			132
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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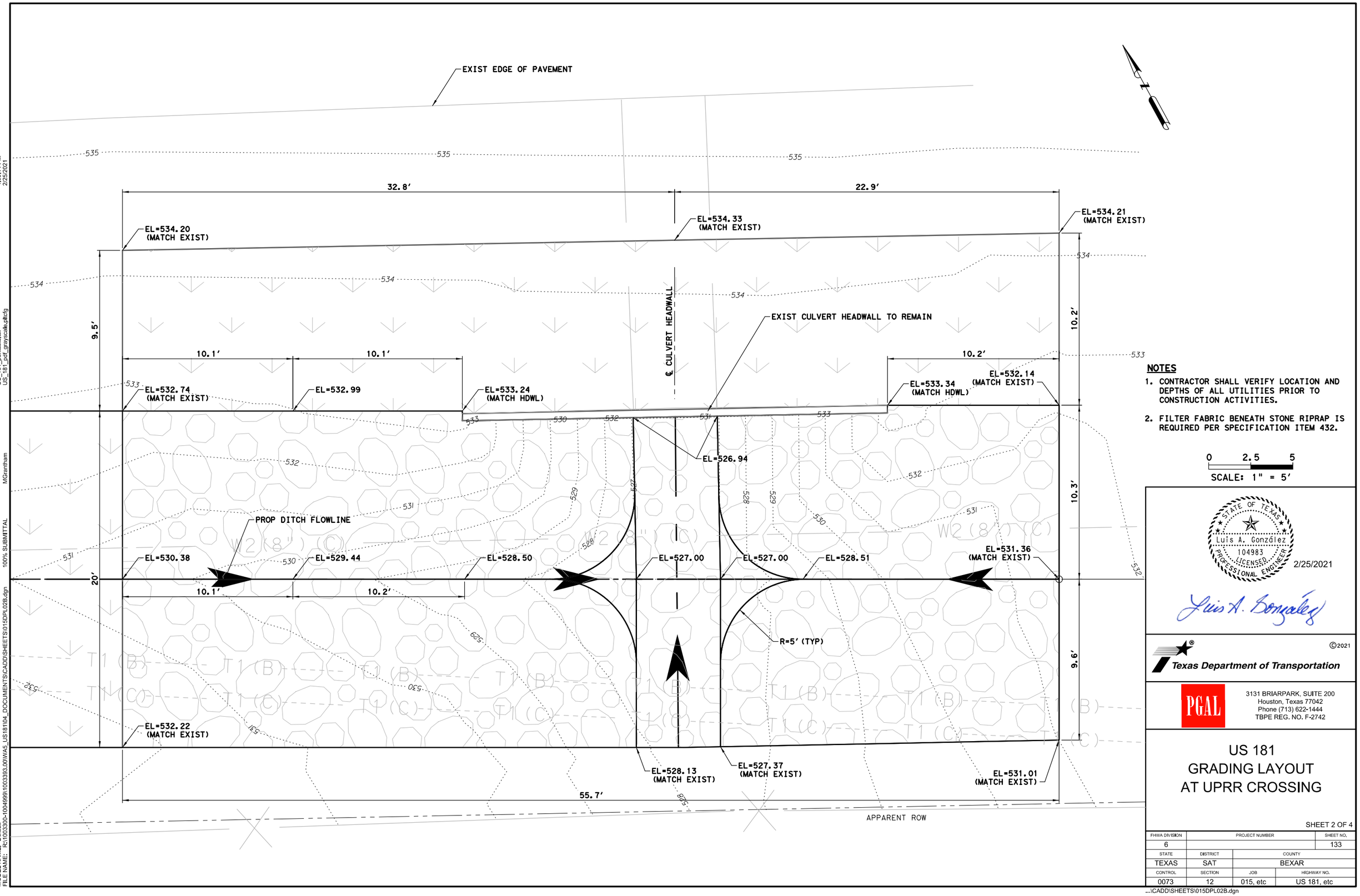

NOTES

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTHS OF ALL UTILITIES PRIOR TO CONSTRUCTION ACTIVITIES.
2. FILTER FABRIC BENEATH STONE RIPRAP IS REQUIRED PER SPECIFICATION ITEM 432.

0 2.5 5

SCALE: 1" = 5'

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US 181
GRADING LAYOUT
AT UPRR CROSSING

SHEET 2 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			133
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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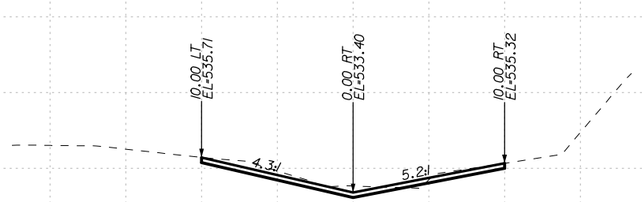

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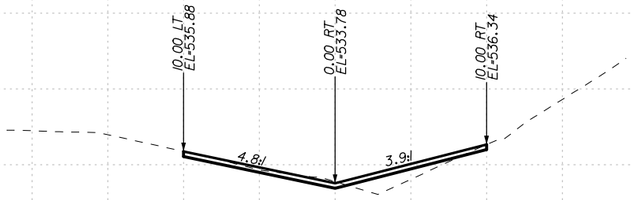

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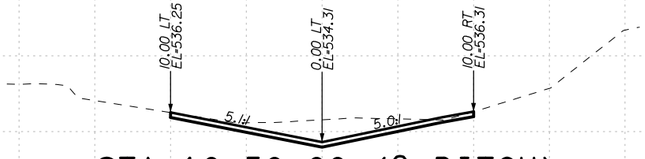

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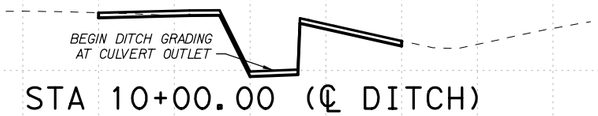

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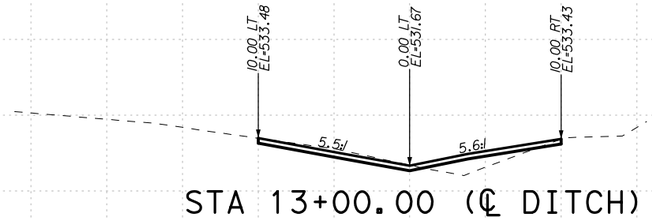

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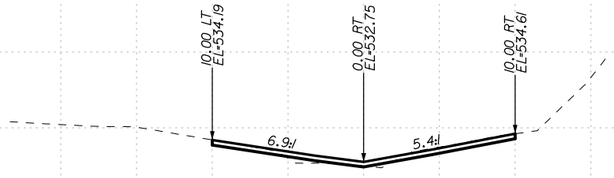
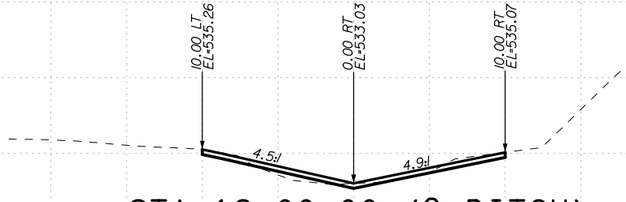


STA 12+50.00 (℄ DITCH)



STA 12+00.00 (℄ DITCH)

0 5 10

SCALE: 1" = 10'

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US 181
GRADING LAYOUT
AT UPRR CROSSING

SHEET 3 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			134
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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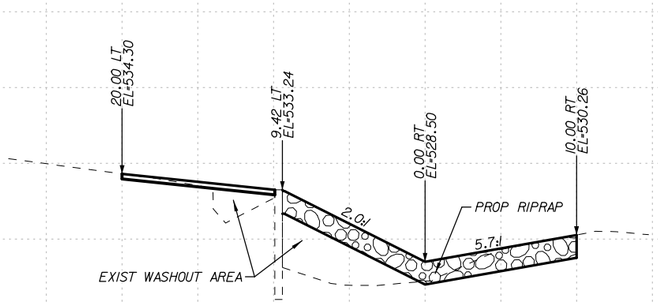
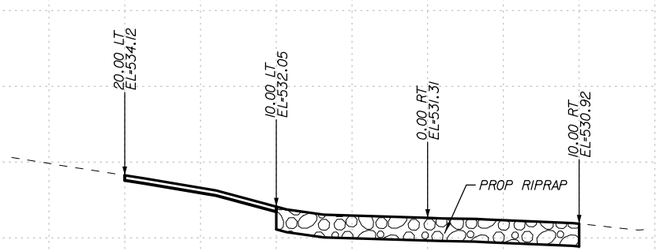
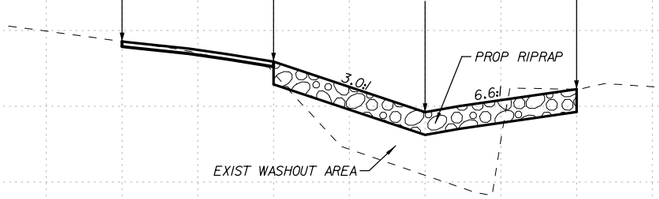


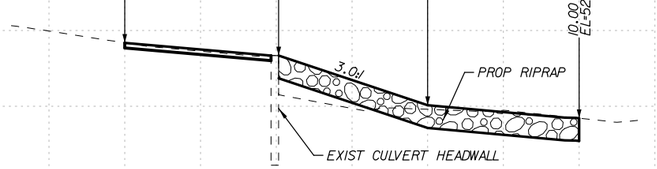
STA 13+48.26 (℄ DITCH)



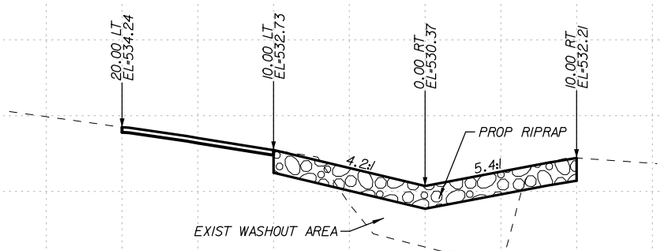
STA 13+83.19 (℄ DITCH)



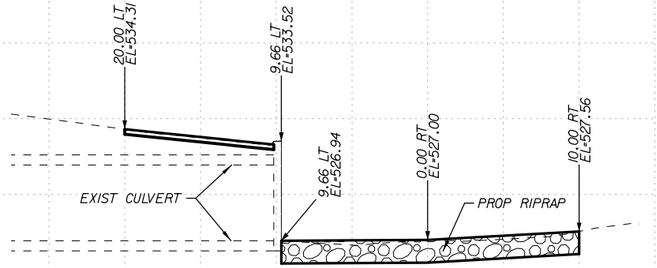
STA 13+36.26 (℄ DITCH)



STA 13+73.40 (℄ DITCH)



STA 13+28.11 (℄ DITCH)



STA 13+61.26 (℄ DITCH)

0 5 10
SCALE: 1" = 10'

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GRADING LAYOUT
AT UPRR CROSSING

SHEET 4 OF 4

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			135
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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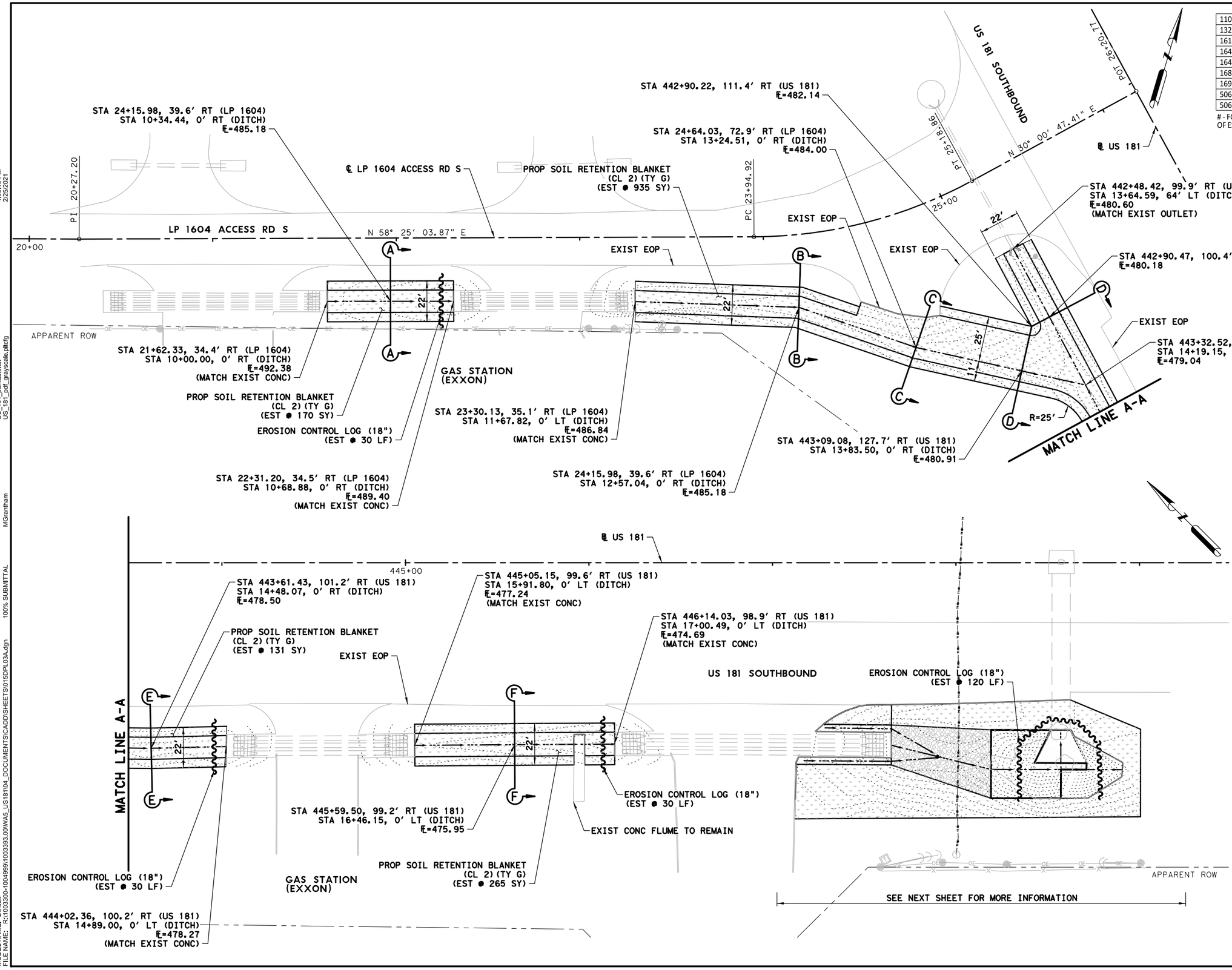
ESTIMATED SHEET QUANTITIES

110-6002	EXCAVATION (CHANNEL)	197 CY
132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	19 CY
161-6017	COMPOST MANUF TOPSOIL (4")	1501 SY
164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	1501 SY
164-6051	DRILL SEED (TEMP)(WARM OR COOL)	1501 SY
168-6001	VEGETATIVE WATERING	70 MG
169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	1501 SY
506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	210 LF
506-6043	BIODEG EROSN CONT LOGS (REMOVE)	210 LF

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY



NOTES

1. CONTRACTOR SHALL INSTALL SRB WITHIN 24 HOURS AFTER SEEDING AND COMPOST OPERATION BEGINS.

0 25 50
SCALE: 1" = 50'

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US 181
GRADING LAYOUT
AT LP 1604 ACCESS RD

SHEET 1 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			136
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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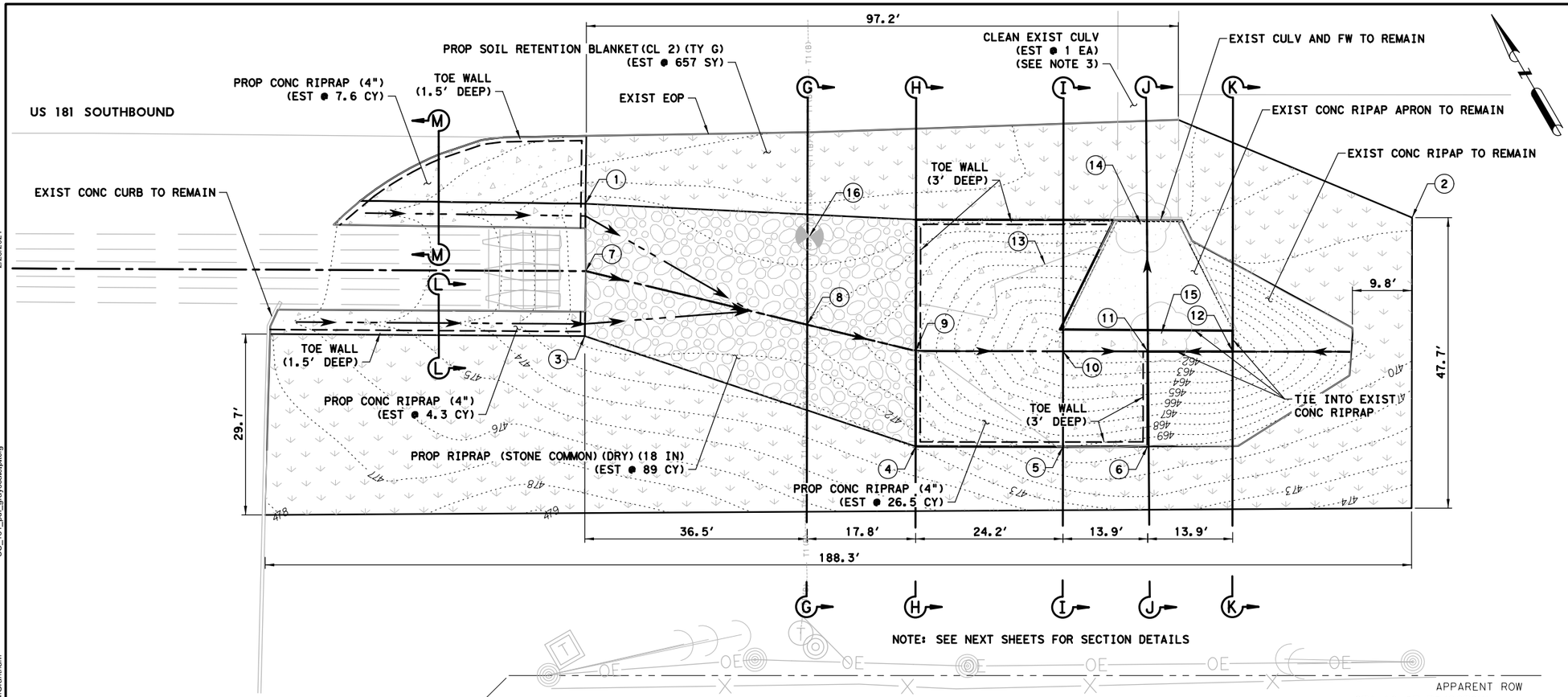


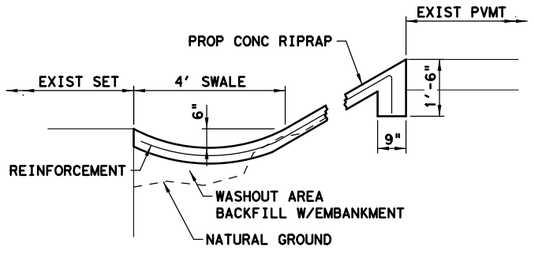
ESTIMATED SHEET QUANTITIES		
100-6001	PREPARING ROW	0.25 AC
104-6009	REMOVING CONC (RIPRAP)	100 SY
110-6002	EXCAVATION (CHANNEL)	185 CY
132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	1 CY
161-6017	COMPOST MANUF TOPSOIL (4")	657 SY
164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	657 SY
164-6051	DRILL SEED (TEMP)(WARM OR COOL)	657 SY
168-6001	VEGETATIVE WATERING	31 MG
169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	657 SY
432-6001	RIPRAP (CONC)(4 IN)	38.4 CY
432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	89 CY
480-6001	CLEAN EXIST CULVERTS	1 EA

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

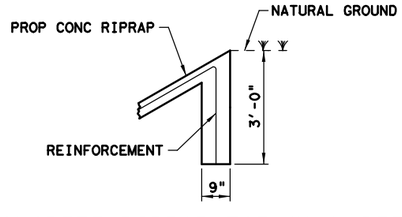
1. CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION.
2. REMOVAL OF DEBRIS, BRUSH, AND TREES WITHIN THE GRADING LIMITS SHOWN ON THIS SHEET SHALL BE PAID FOR WITH ITEM 100 "PREP ROW".
3. REMOVAL OF SILT, DEBRIS, AND VEGETATION WITHIN THE CULVERT BARRELS, FROM END TO END, SHALL BE PAID FOR WITH ITEM 480 "CLEAN EXISTING CULVERT".
4. FILTER FABRIC BENEATH STONE RIPRAP IS REQUIRED PER SPECIFICATION ITEM 432.

0 10 20
SCALE: 1" = 20'

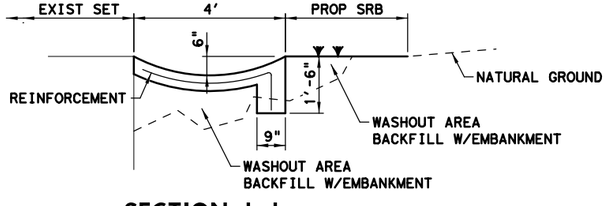


SECTION M-M

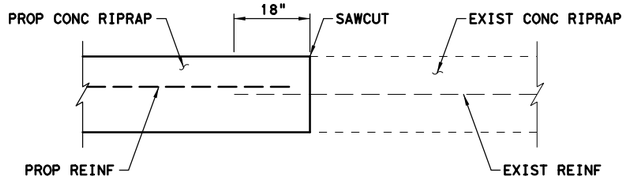
NOTE: CONC SWALE IS INTEGRAL TO RIPRAP



CONCRETE RIPRAP TOE WALL DETAIL



SECTION L-L



CONCRETE RIPRAP TIE-IN DETAIL

NOTE: EXPOSE AND CLEAN 18" OF EXISTING REINFORCEMENT

(1) X=2190754.84
Y=13646608.28
EL=471.47

(2) X=2190871.27
Y=13646538.39
EL=470.11

(3) X=2190743.87
Y=13646589.50
EL=471.60

(4) X=2190781.87
Y=13646546.64
EL=472.95

(5) X=2190802.79
Y=13646534.51
EL=468.90

(6) X=2190814.87
Y=13646527.58
EL=469.79

(7) X=2190749.35
Y=13646598.68
FL=471.50

(8) STA 18+88.95 (DITCH)
X=2190776.43
Y=13646572.86
FL=471.00

(9) STA 19+07.30 (DITCH)
X=2190789.73
Y=13646560.19
FL=469.13

(10) STA 19+31.49 (DITCH)
X=2190810.65
Y=13646548.06
FL=461.07

(11) STA 19+45.41 (DITCH)
X=2190822.69
Y=13646541.08
FL=461.07

(12) STA 19+59.35 (DITCH)
X=2190834.76
Y=13646534.08
FL=461.07

(13) REMOVE CONC (RIPRAP)
(EST ● 100 SY)
(FAILING AND BROKEN RIPRAP)

(14) EXIST TREE TO BE REMOVED
(SEE NOTE 2)

(15) EXIST TREE TO BE REMOVED
(SEE NOTE 2)

(16) TEST HOLE-5
X=2190784.04
Y=13646585.24
AT&T 4" CONDUIT
DEPTH: 5.17'
NG ELEV.: 472.43
T.O.P.: 467.26

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SHEET 2 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			137
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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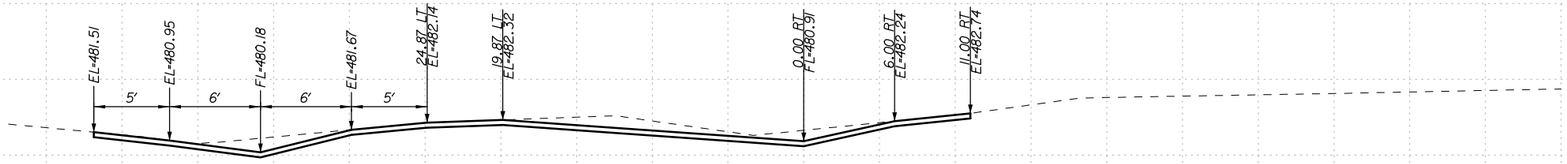
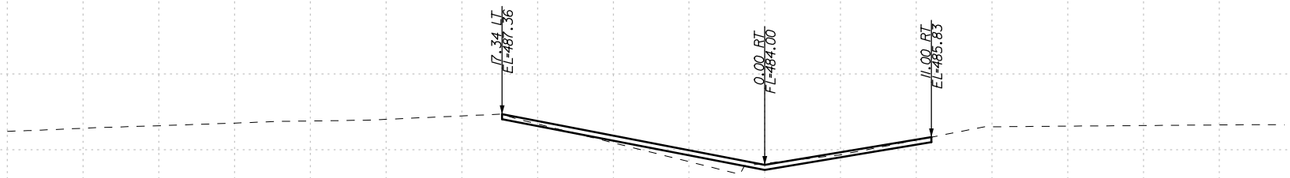
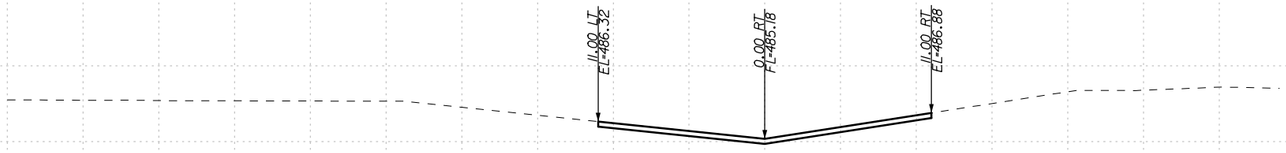


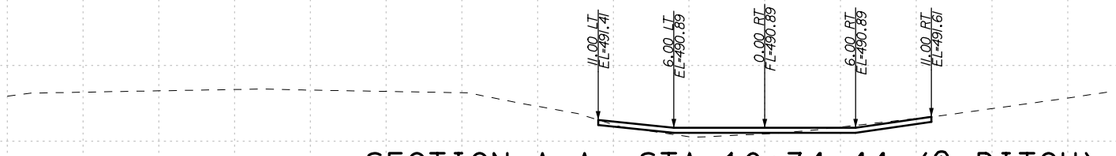
SECTION D-D, STA 13+83.50 (℄ DITCH)



SECTION C-C, STA 13+24.51 (℄ DITCH)



SECTION B-B, STA 12+57.04 (℄ DITCH)



SECTION A-A, STA 10+34.44 (℄ DITCH)

0 5 10

SCALE: 1" = 10'

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AT LP 1604 ACCESS RD

SHEET 3 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			138
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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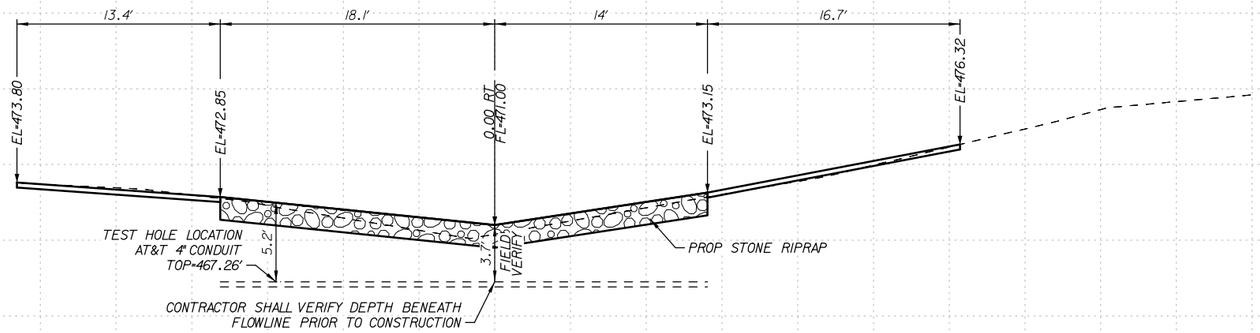
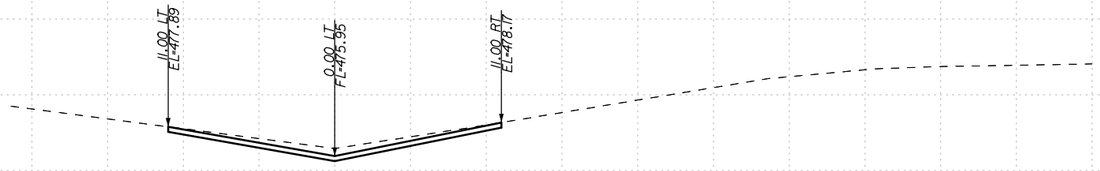
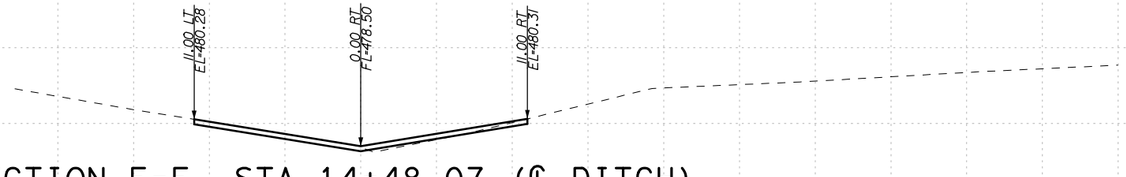


SECTION G-G, STA 18+88.95 (℄ DITCH)



SECTION F-F, STA 16+46.15 (℄ DITCH)



SECTION E-E, STA 14+48.07 (℄ DITCH)

0 5 10
SCALE: 1" = 10'

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Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

US 181
GRADING LAYOUT
AT LP 1604 ACCESS RD

SHEET 4 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			139
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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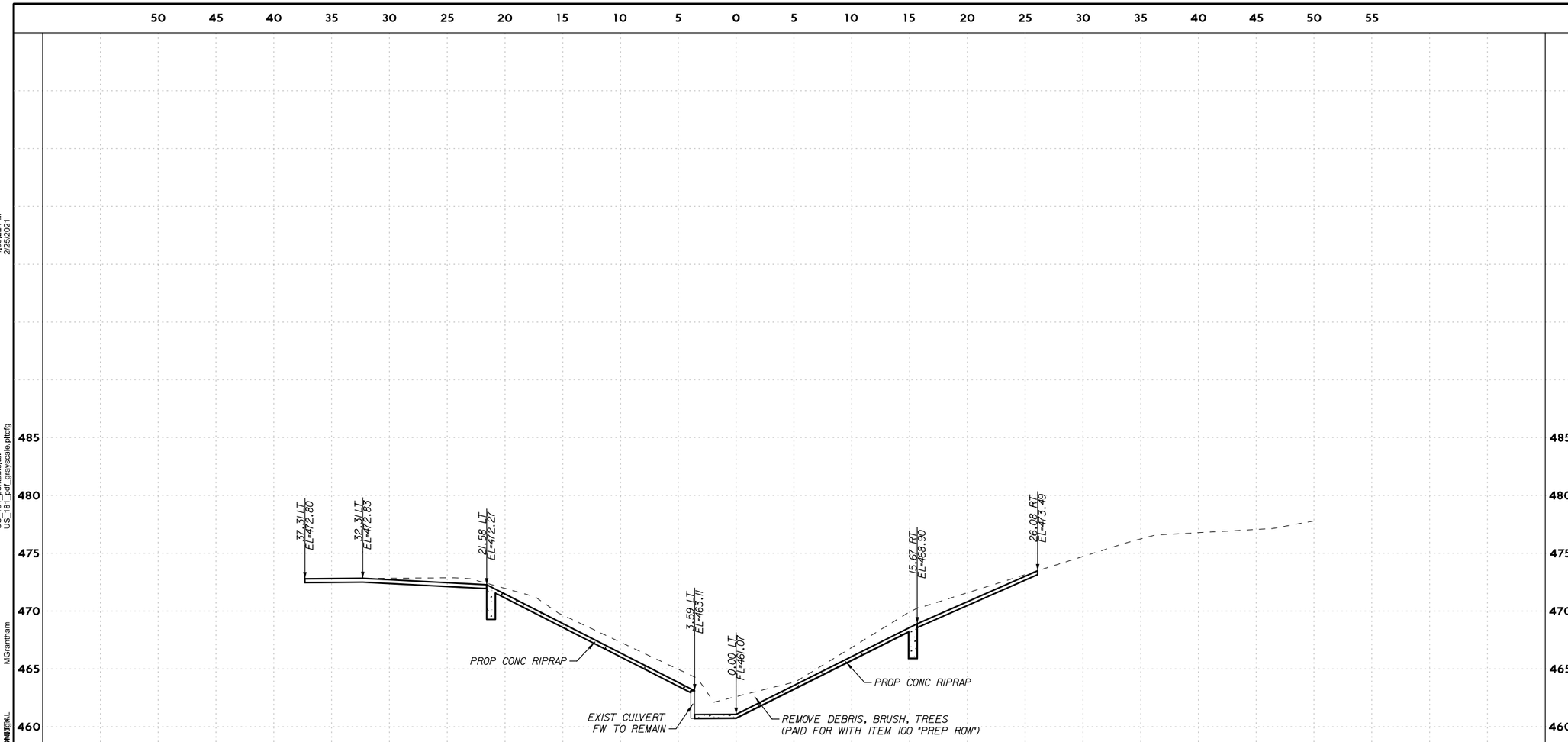

SECTION I-I, STA 19+31.49 (℄ DITCH)

SECTION H-H, STA 19+07.30 (℄ DITCH)

0 5 10
SCALE: 1" = 10'

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

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US 181
GRADING LAYOUT
AT LP 1604 ACCESS RD

SHEET 5 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			140
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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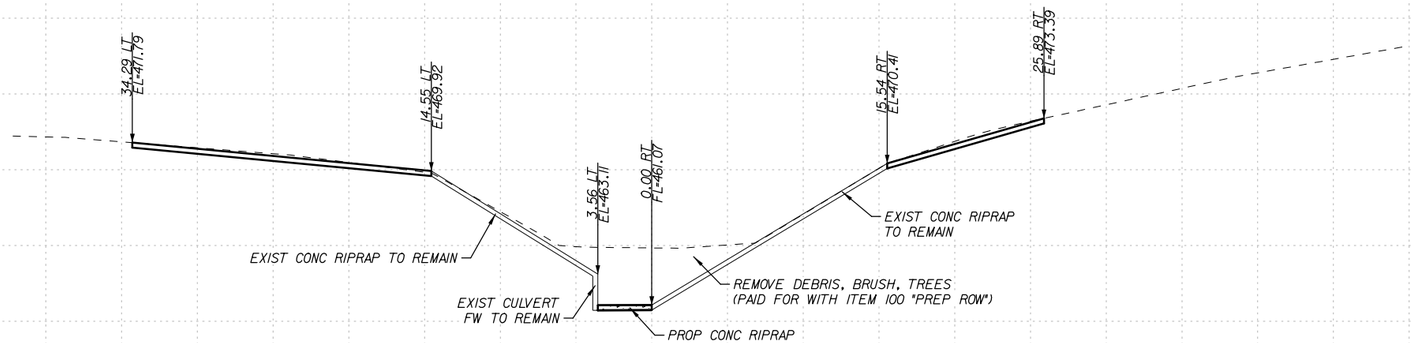
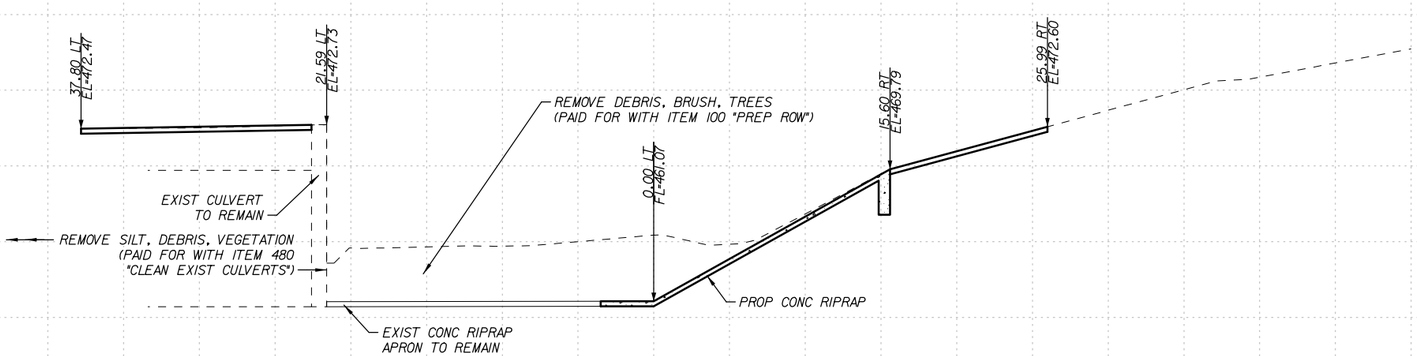


SECTION K-K, STA 19+59.35 (℄ DITCH)



SECTION J-J, STA 19+45.41 (℄ DITCH)

0 5 10
SCALE: 1" = 10'

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 181
GRADING LAYOUT
AT LP 1604 ACCESS RD

SHEET 6 OF 6

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			141
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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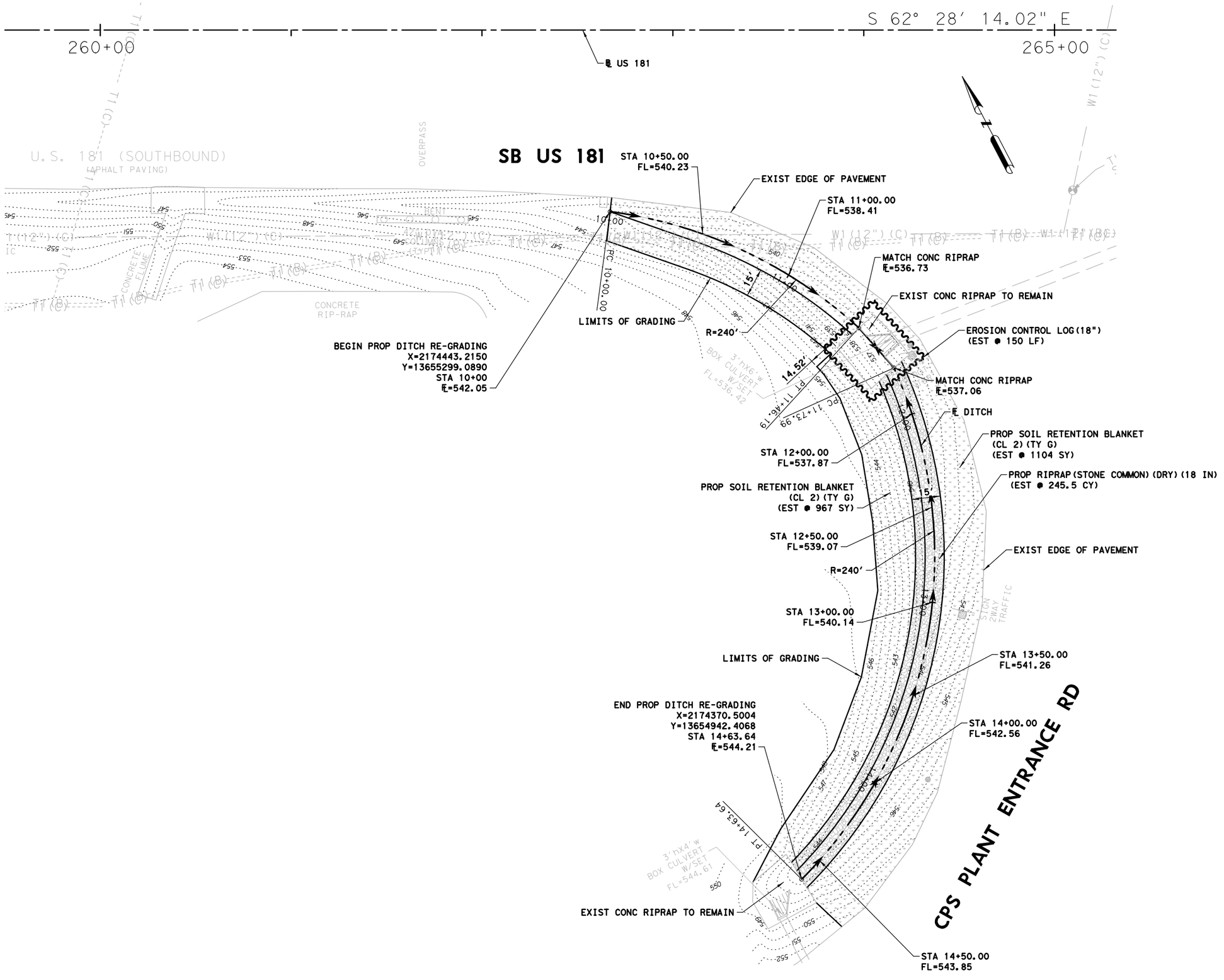

ESTIMATED SHEET QUANTITIES

110-6002	EXCAVATION (CHANNEL)	469 CY
132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	58 CY
161-6017	COMPOST MANUF TOPSOIL (4")	2071 SY
164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	2071 SY
164-6051	DRILL SEED (TEMP)(WARM OR COOL)	2071 SY
168-6001	VEGETATIVE WATERING	97 MG
169-6007	SOIL RETENTION BLANKETS (CL 2) (TY G)	2071 SY
432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	245.5 CY
506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	150 LF
506-6043	BIODEG EROSN CONT LOGS (REMOVE)	150 LF

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

1. SEE NEXT SHEETS FOR DITCH CROSS SECTIONS.
2. CONTRACTOR SHALL INSTALL SRB WITHIN 24 HOURS AFTER SEEDING AND COMPOST OPERATION BEGINS.
3. FILTER FABRIC BENEATH STONE RIPRAP IS REQUIRED PER SPECIFICATION ITEM 432.

0 25 50

SCALE: 1" = 50′

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TBPE REG. NO. F-2742

US 181
GRADING LAYOUT
AT CENTERPOINT RD

SHEET 1 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			142
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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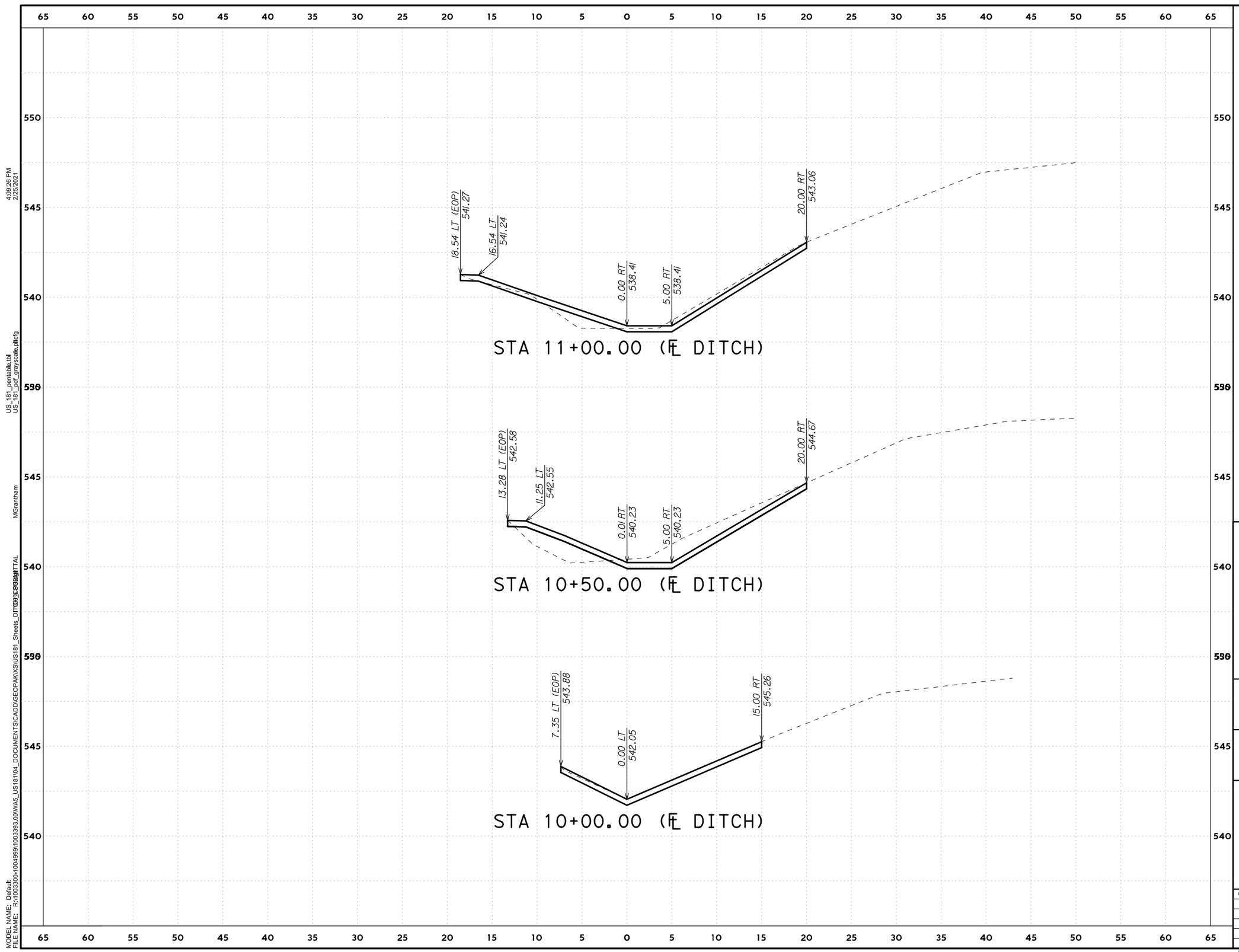

0 5 10

SCALE: 1" = 10' H
1" = 5' V

STATE OF TEXAS
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TBPE REG. NO. F-2742

US 181
GRADING LAYOUT
AT CENTERPOINT RD

SHEET 2 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			143
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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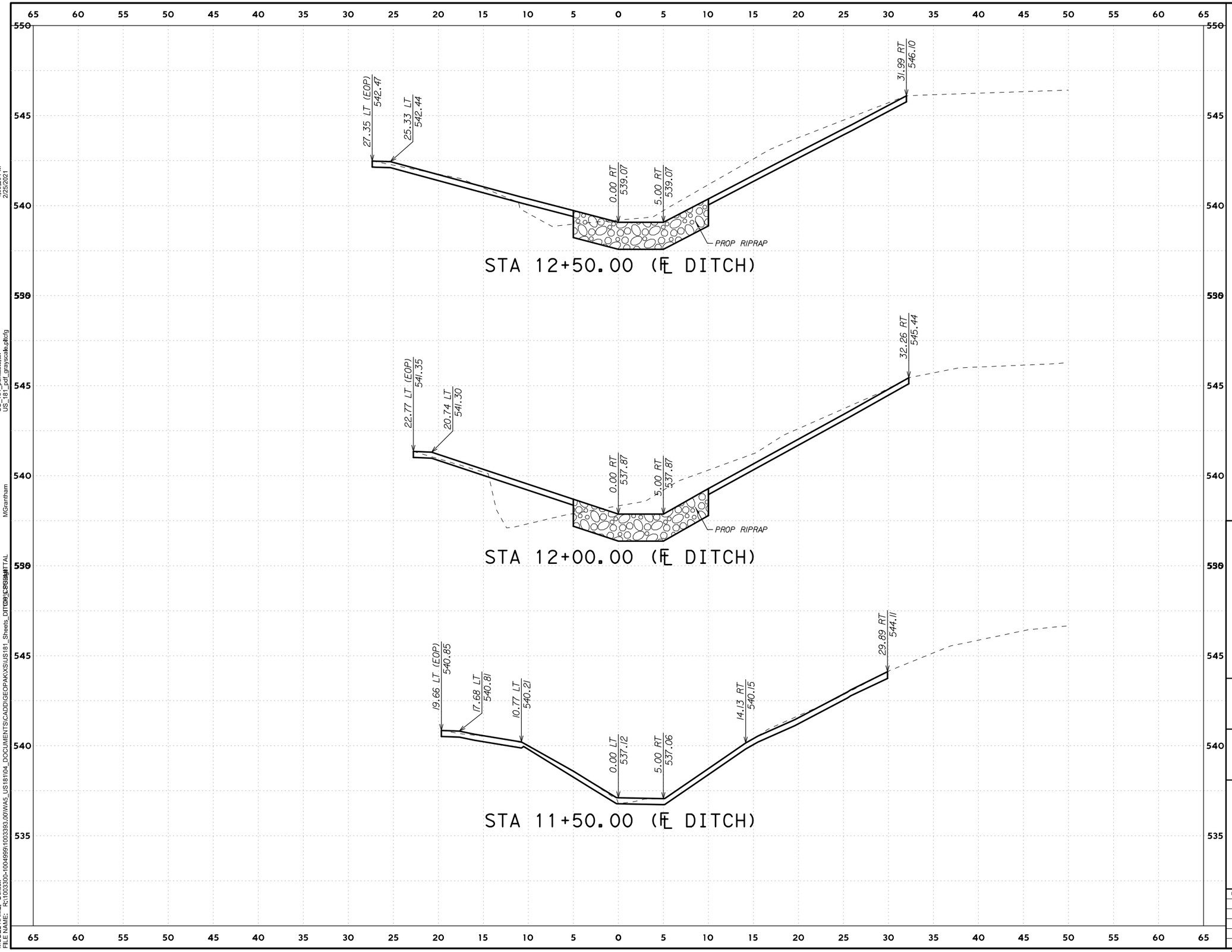

0 5 10
SCALE: 1" = 10' H
1" = 5' V

STATE OF TEXAS
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US 181
GRADING LAYOUT
AT CENTERPOINT RD

SHEET 3 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			144
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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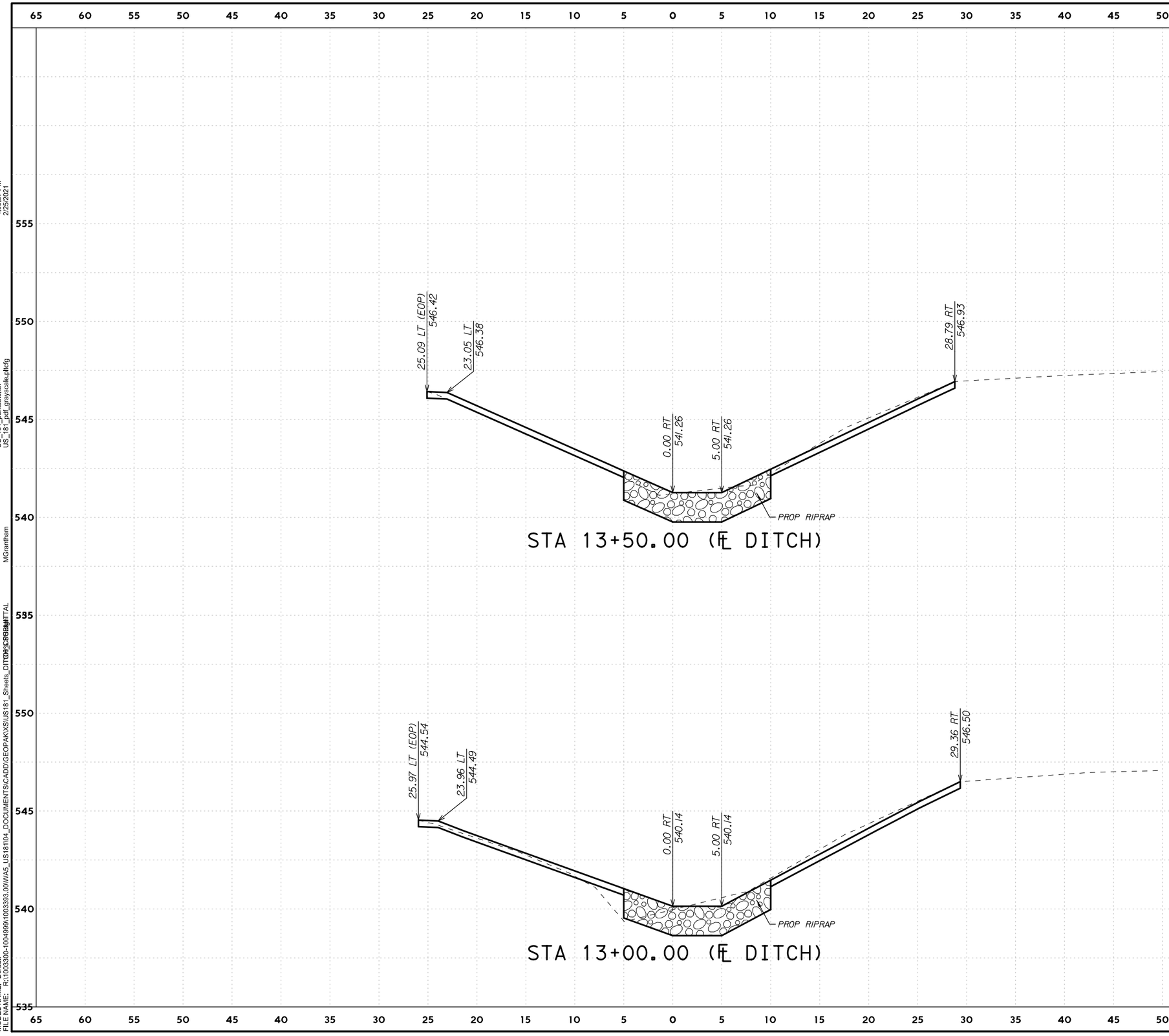

0 5 10
SCALE: 1" = 10' H
1" = 5' V

STATE OF TEXAS
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US 181
GRADING LAYOUT
AT CENTERPOINT RD

SHEET 4 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			145
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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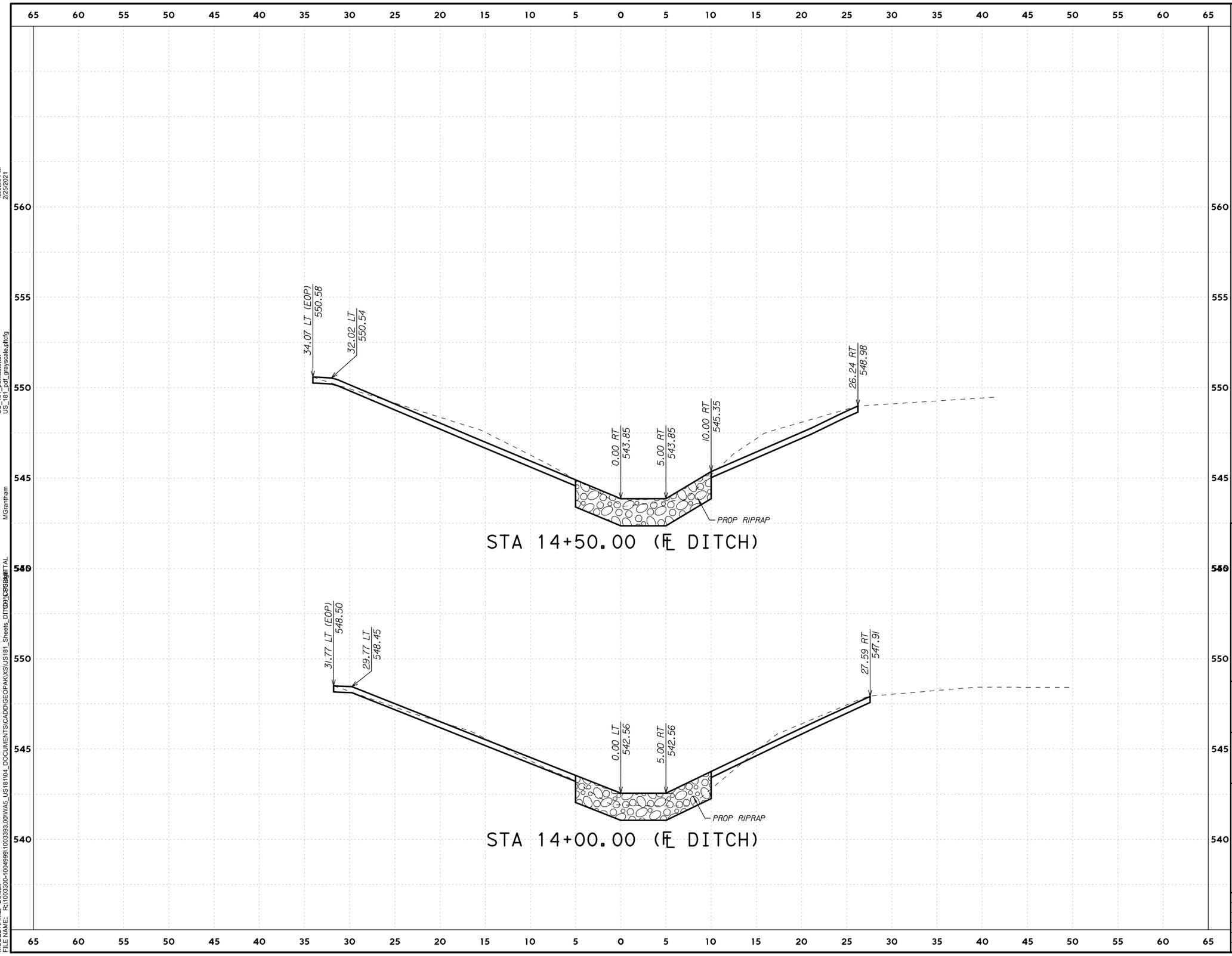

0 5 10
SCALE: 1" = 10' H
1" = 5' V

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US 181
GRADING LAYOUT
AT CENTERPOINT RD

SHEET 5 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			146
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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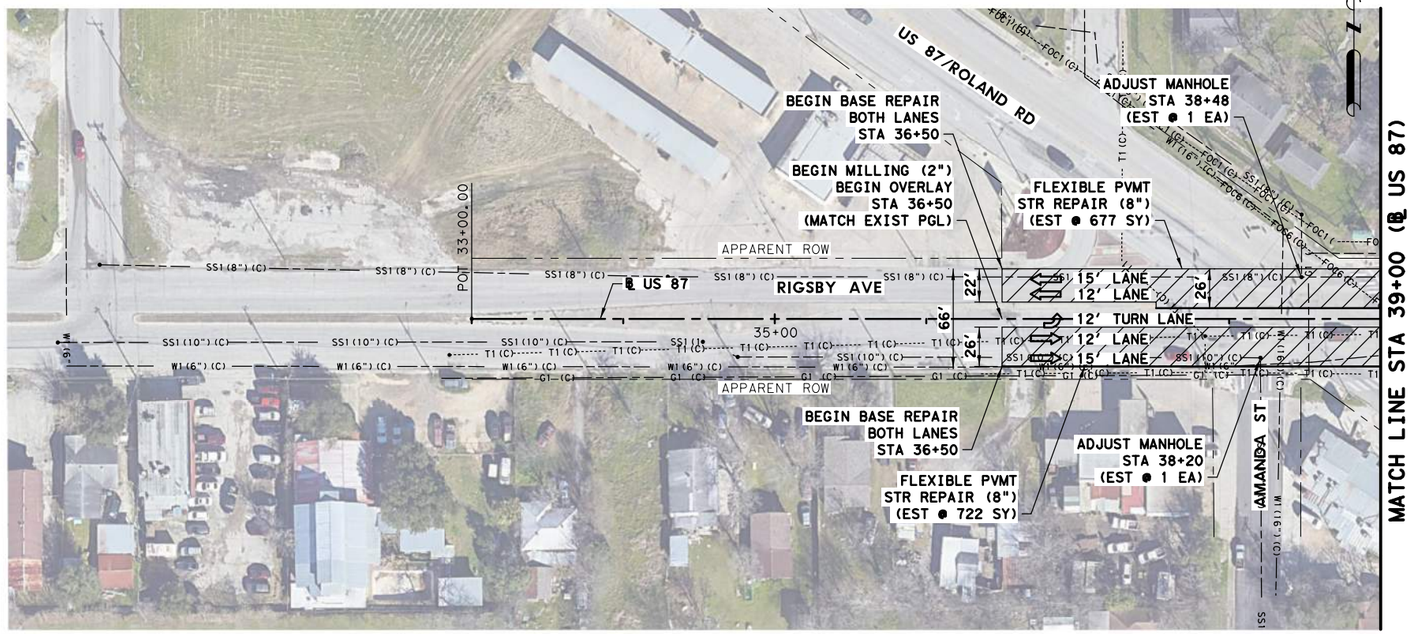

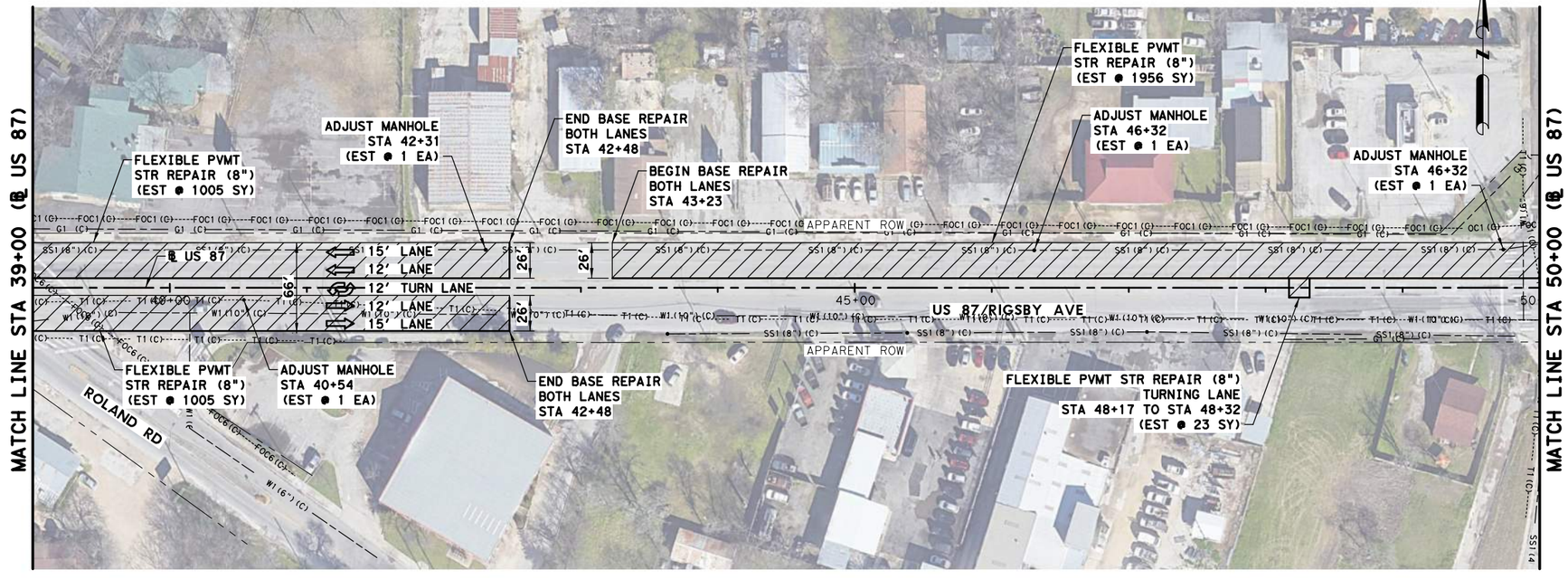

ESTIMATED SHEET QUANTITIES

340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	114	TON
# 3077-6023	SP MIXES SP-C SAC-B PG70-22	9900	SY
351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	5388	SY
354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	9900	SY
479-6001	ADJUSTING MANHOLES	6	EA
# 3085-6001	UNDERSEAL COURSE	9900	SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

8" BASE REPAIR 4" BASE REPAIR

- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
- W1 (SIZE) (8") (C) — SAWS (8") WATER LINE (QC)
- W1 (SIZE) (10") (C) — SAWS (10") WATER LINE (QC)
- W1 (SIZE) (12") (C) — SAWS (12") WATER LINE (QC)
- W1 (SIZE) (16") (C) — SAWS (16") WATER LINE (QC)
- W1 (SIZE) (18") (C) — SAWS (18") WATER LINE (QC)
- W1 (SIZE) (24") (C) — SAWS (24") WATER LINE (QC)
- SS1 (8") (C) — SAWS (8") SAN SWR (QC)
- SS1 (10") (C) — SAWS (10") SAN SWR (QC)
- SS1 (12") (C) — SAWS (12") SAN SWR (QC)
- SS1 (15") (C) — SAWS (15") SAN SWR (QC)
- SS1 (18") (C) — SAWS (18") SAN SWR (QC)
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING CENTERLINE, PGL, AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
Brian Legaspi
113039
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2/25/2021

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TBPE REG. NO. F-2742

US 87
PLAN LAYOUT

SHEET 1 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			147
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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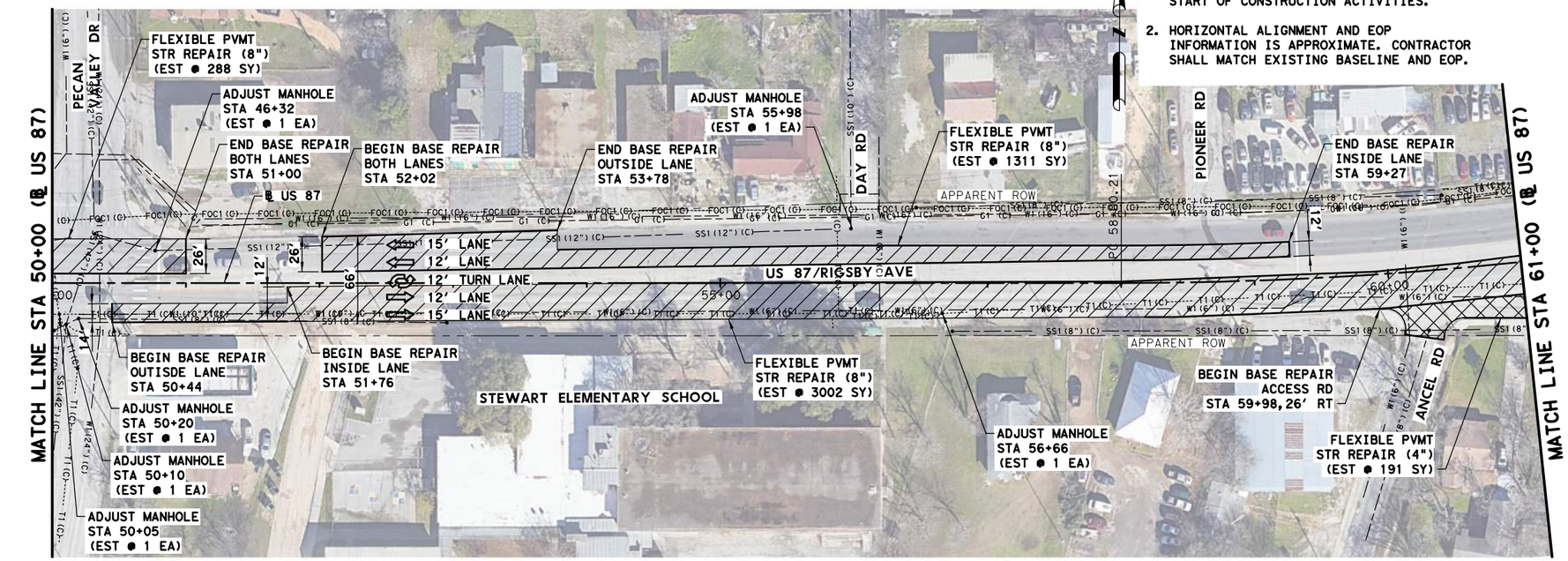


NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100
SCALE: 1" = 100'

ESTIMATED SHEET QUANTITIES

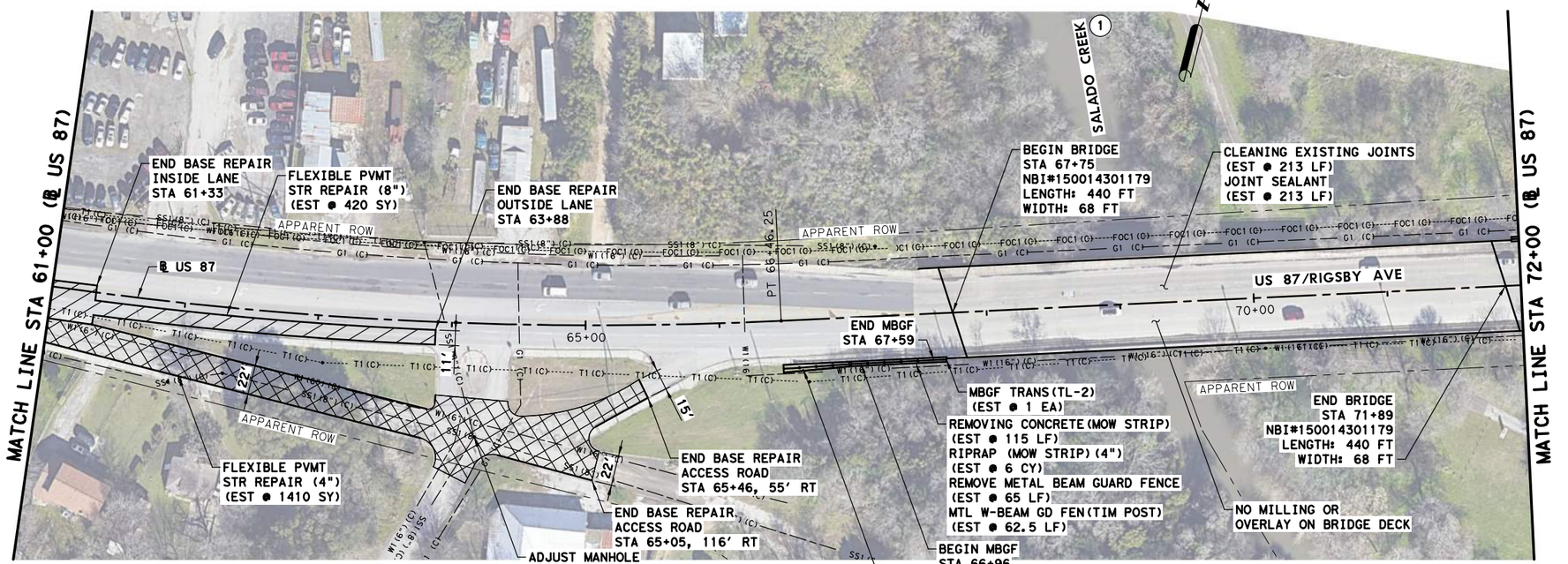
	104-6054	REMOVING CONCRETE(MOW STRIP)	115 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	4 CY
	161-6017	COMPOST MANUF TOPSOIL (4")	25 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	25 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	25 SY
	168-6001	VEGETATIVE WATERING	1 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	164 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	14354 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	5021 SY
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	1601 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	14354 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	6 CY
	438-6009	CLEANING EXISTING JOINTS	213 LF
	454-6009	JOINT SEALANT	213 LF
	479-6001	ADJUSTING MANHOLES	7 EA
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	123 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	123 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	62.5 LF
	540-6007	MTL BEAM GD FEN TRANS (TL2)	1 EA
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	1 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	1 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	65 LF
#	3085-6001	UNDERSEAL COURSE	14354 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION
LIMITS OF 8" BASE REPAIR
LIMITS OF 4" BASE REPAIR

- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- SS1 (8") (C) — SAWS (8") SAN SWR (QC)
- SS1 (10") (C) — SAWS (10") SAN SWR (QC)
- SS1 (12") (C) — SAWS (12") SAN SWR (QC)
- SS1 (15") (C) — SAWS (15") SAN SWR (QC)
- SS1 (18") (C) — SAWS (18") SAN SWR (QC)
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
- W1 (SIZE) (8") (C) — SAWS (8") WATER LINE (QC)
- W1 (SIZE) (10") (C) — SAWS (10") WATER LINE (QC)
- W1 (SIZE) (12") (C) — SAWS (12") WATER LINE (QC)
- W1 (SIZE) (16") (C) — SAWS (16") WATER LINE (QC)
- W1 (SIZE) (18") (C) — SAWS (18") WATER LINE (QC)
- W1 (SIZE) (24") (C) — SAWS (24") WATER LINE (QC)



(1) THE PROPOSED WORK DOES NOT IMPACT THE HYDRAULICS OF THIS BRIDGE.

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 87
PLAN LAYOUT

SHEET 2 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			148
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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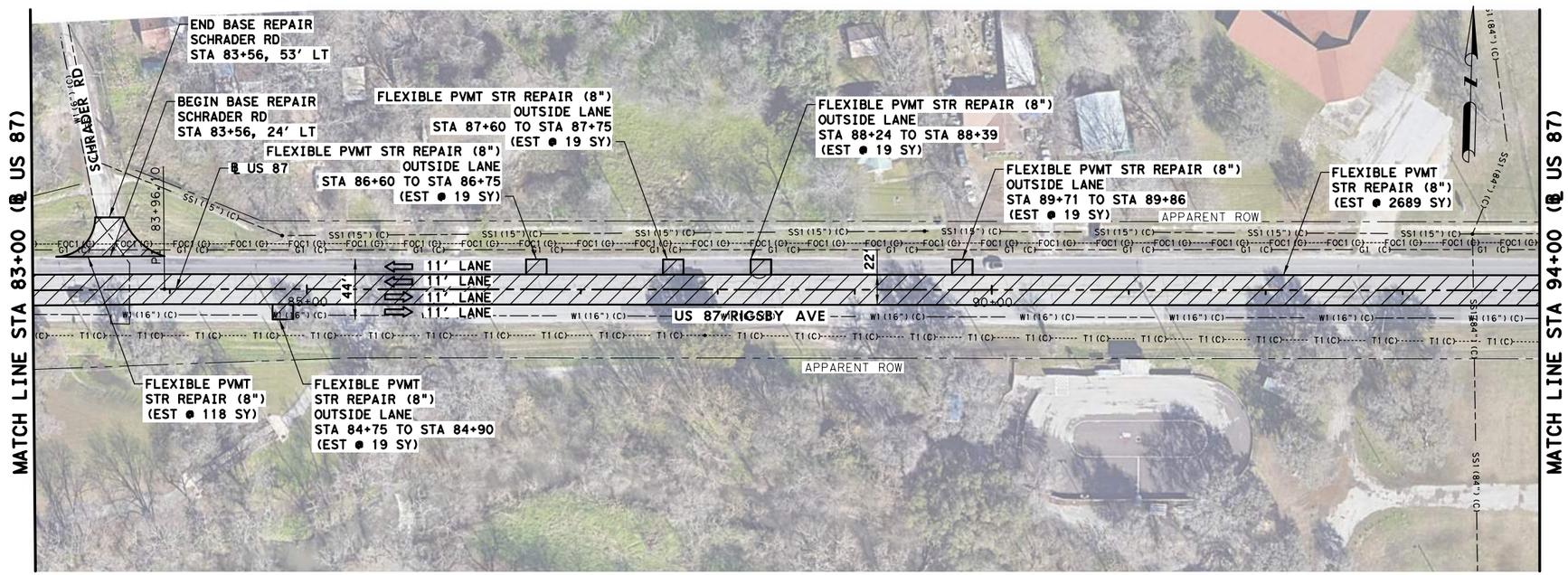
NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

0 50 100
SCALE: 1" = 100'



ESTIMATED SHEET QUANTITIES

	104-6054	REMOVING CONCRETE(MOW STRIP)	115 LF
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	4 CY
	134-6002	BACKFILL (TY B)	23 STA
	161-6017	COMPOST MANUF TOPSOIL (4")	25 SY
	164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	25 SY
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	25 SY
	168-6001	VEGETATIVE WATERING	1 MG
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	116 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	10892 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	3155 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	10892 SY
	432-6045	RIPRAP (MOW STRIP)(4 IN)	6 CY
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	123 LF
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	123 LF
	540-6001	MTL W-BEAM GD FEN (TIM POST)	62.5 LF
	540-6007	MTL BEAM GD FEN TRANS (TL2)	1 EA
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	1 EA
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	1 EA
	542-6001	REMOVE METAL BEAM GUARD FENCE	65 LF
#	3085-6001	UNDERSEAL COURSE	10892 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- LIMITS OF 4" BASE REPAIR
- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- SS1 (8") (C) — SAWS (8") SAN SWR (QC)
- SS1 (10") (C) — SAWS (10") SAN SWR (QC)
- SS1 (12") (C) — SAWS (12") SAN SWR (QC)
- SS1 (15") (C) — SAWS (15") SAN SWR (QC)
- SS1 (18") (C) — SAWS (18") SAN SWR (QC)
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
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- W1 (SIZE) (24") (C) — SAWS (24") WATER LINE (QC)

STATE OF TEXAS
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2/25/2021

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TBPE REG. NO. F-2742

US 87
PLAN LAYOUT

SHEET 3 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			149
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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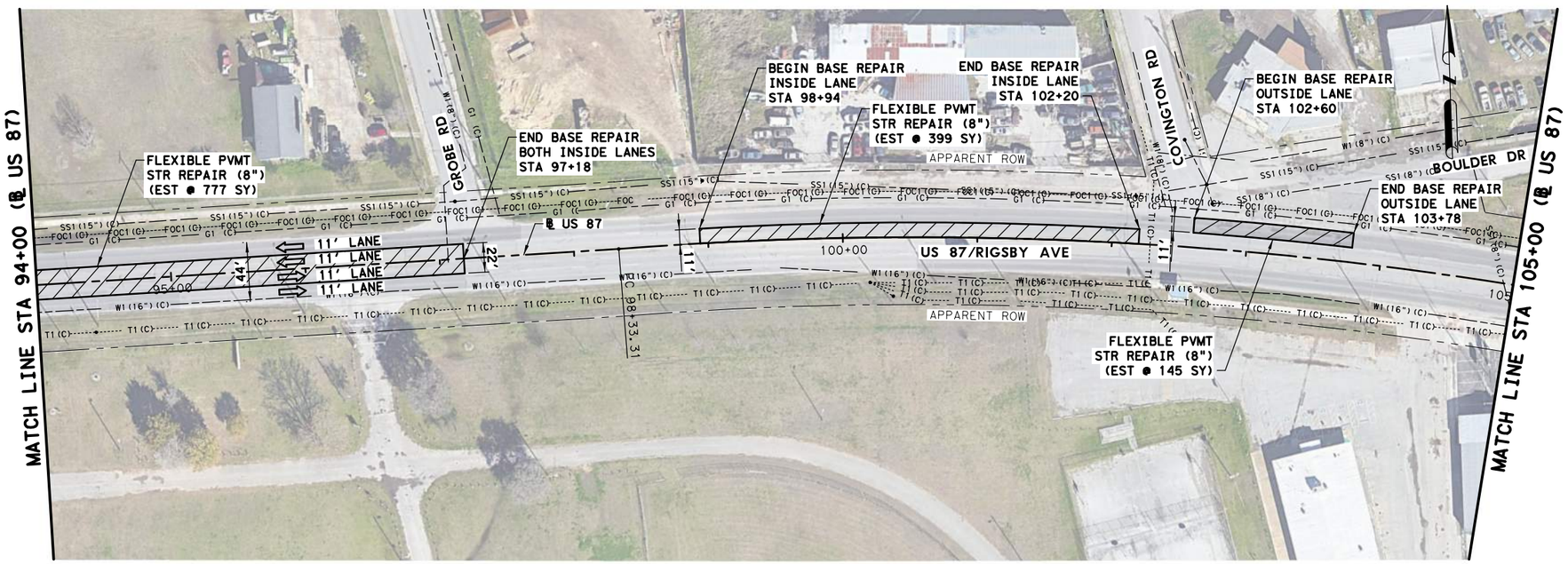

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SCALE: 1" = 100'

ESTIMATED SHEET QUANTITIES			
132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	3	CY
134-6002	BACKFILL (TY B)	22	STA
161-6017	COMPOST MANUF TOPSOIL (4")	19	SY
164-6033	DRILL SEEDING (PERM) (RURAL) (SANDY)	19	SY
164-6051	DRILL SEED (TEMP)(WARM OR COOL)	19	SY
168-6001	VEGETATIVE WATERING	1	MG
340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	124	TON
# 3077-6023	SP MIXES SP-C SAC-B PG70-22	10755	SY
351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	2491	SY
354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	10755	SY
432-6001	RIPRAP (CONC)(4 IN)	4	CY
432-6045	RIPRAP (MOW STRIP)(4 IN)	5	CY
506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	98	LF
506-6043	BIODEG EROSN CONT LOGS (REMOVE)	98	LF
540-6001	MTL W-BEAM GD FEN (TIM POST)	37.5	LF
544-6001	GUARDRAIL END TREATMENT (INSTALL)	1	EA
540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	1	EA
542-6001	REMOVE METAL BEAM GUARD FENCE	100	LF
542-6002	REMOVE TERMINAL ANCHOR SECTION	1	EA
# 3085-6001	UNDERSEAL COURSE	10755	SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING BASELINE AND EOP.

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
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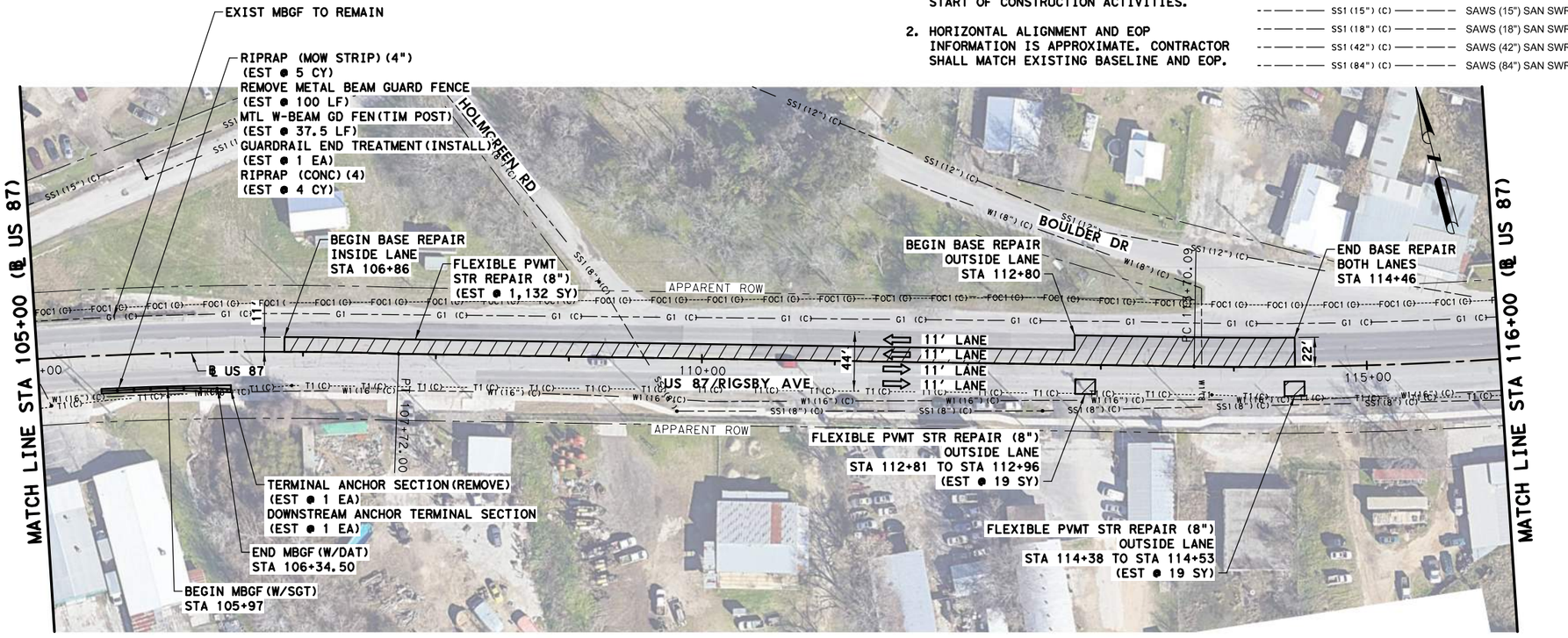
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)



STATE OF TEXAS
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US 87
PLAN LAYOUT

SHEET 4 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			150
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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NOTES

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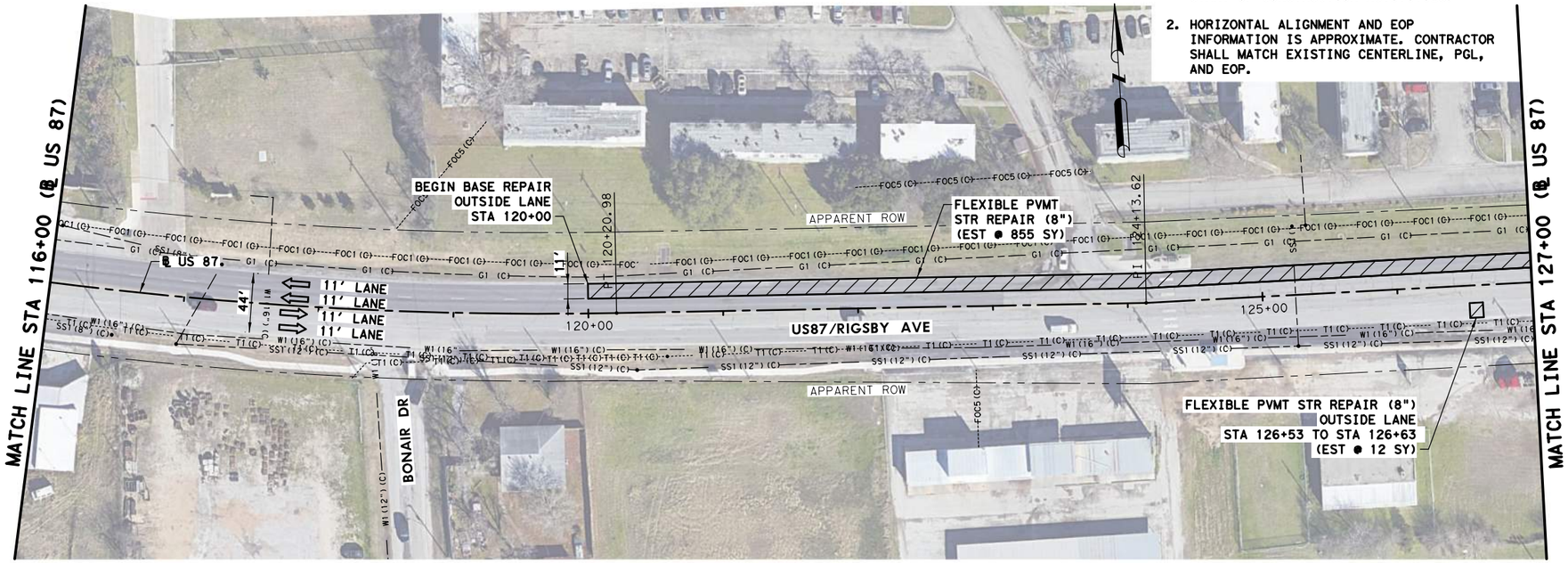

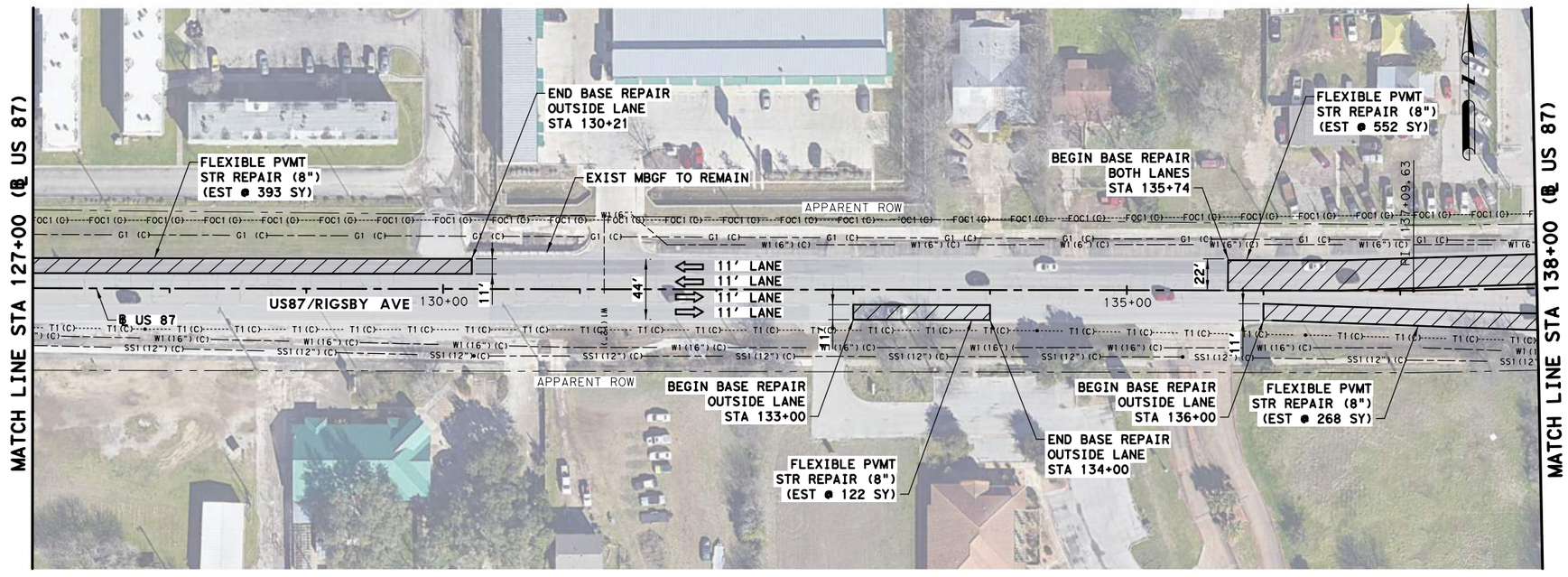

ESTIMATED SHEET QUANTITIES

	134-6002	BACKFILL (TY B)	21 STA
	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	127 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	11001 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	2202 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	11001 SY
#	3085-6001	UNDERSEAL COURSE	11001 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

- TRAFFIC FLOW DIRECTION
- LIMITS OF 8" BASE REPAIR
- LIMITS OF 4" BASE REPAIR
- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
- W1 (SIZE) (8") (C) — SAWS (8") WATER LINE (QC)
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- SS1 (8") (C) — SAWS (8") SAN SWR (QC)
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- SS1 (12") (C) — SAWS (12") SAN SWR (QC)
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- SS1 (18") (C) — SAWS (18") SAN SWR (QC)
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)

0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
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US 87
PLAN LAYOUT

SHEET 5 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			151
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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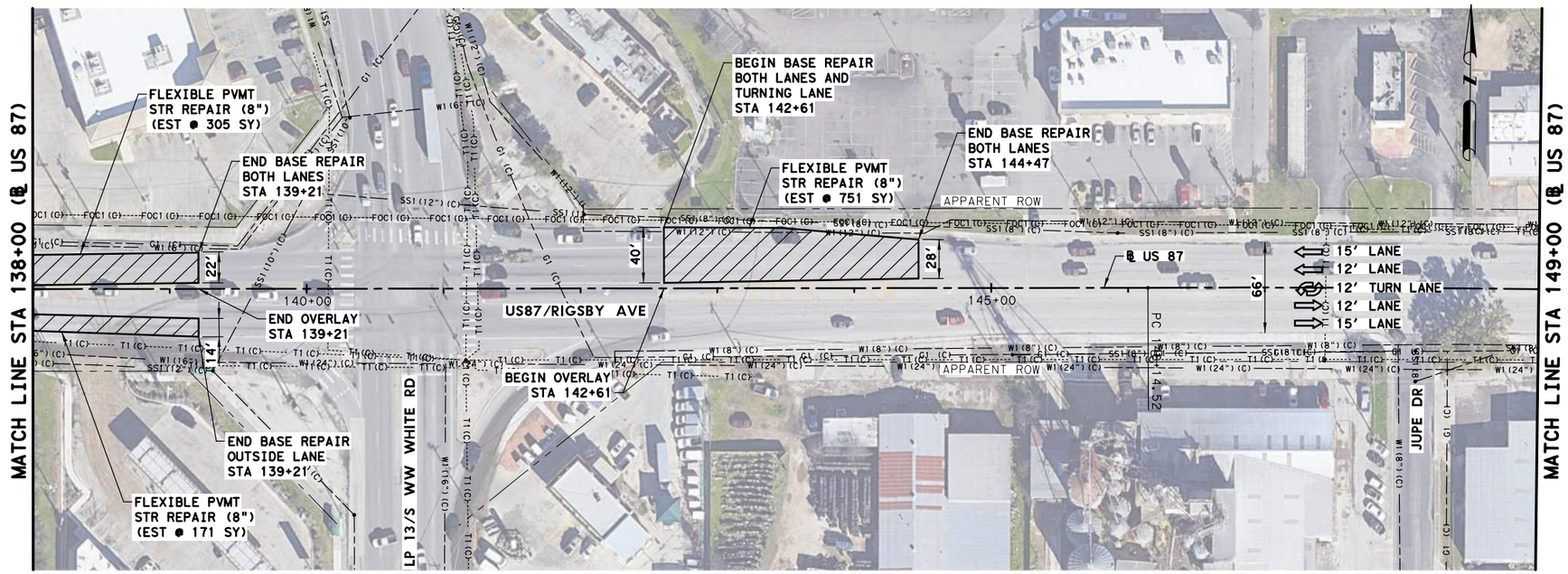

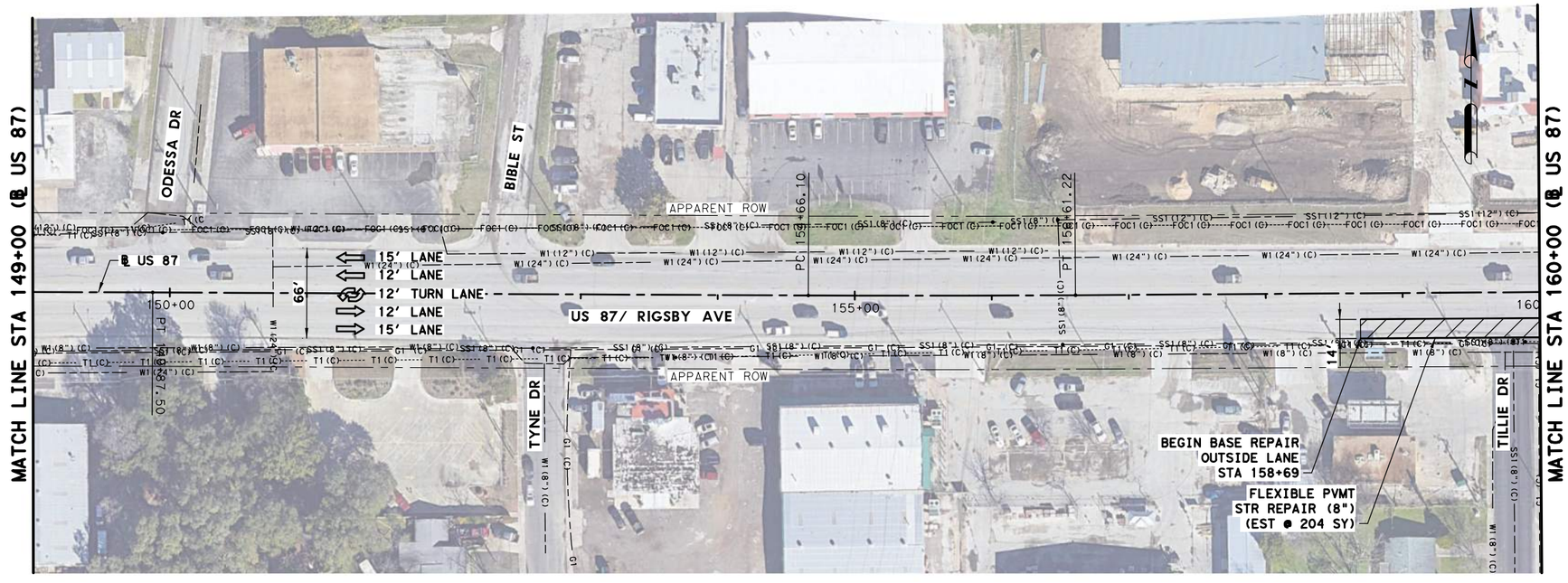

ESTIMATED SHEET QUANTITIES

	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	162 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	14063 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	1422 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	14063 SY
#	3085-6001	UNDERSEAL COURSE	14063 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

8" BASE REPAIR 4" BASE REPAIR

- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
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- SS1 (18") (C) — SAWS (18") SAN SWR (QC)
- SS1 (42") (C) — SAWS (42") SAN SWR (QC)
- SS1 (84") (C) — SAWS (84") SAN SWR (QC)

NOTES

1. CONTRACTOR SHALL VERIFY LIMITS OF BASE REPAIR WITH THE ENGINEER PRIOR TO START OF CONSTRUCTION ACTIVITIES.
2. HORIZONTAL ALIGNMENT AND EOP INFORMATION IS APPROXIMATE. CONTRACTOR SHALL MATCH EXISTING CENTERLINE, PGL, AND EOP.

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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US 87
PLAN LAYOUT

SHEET 6 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			152
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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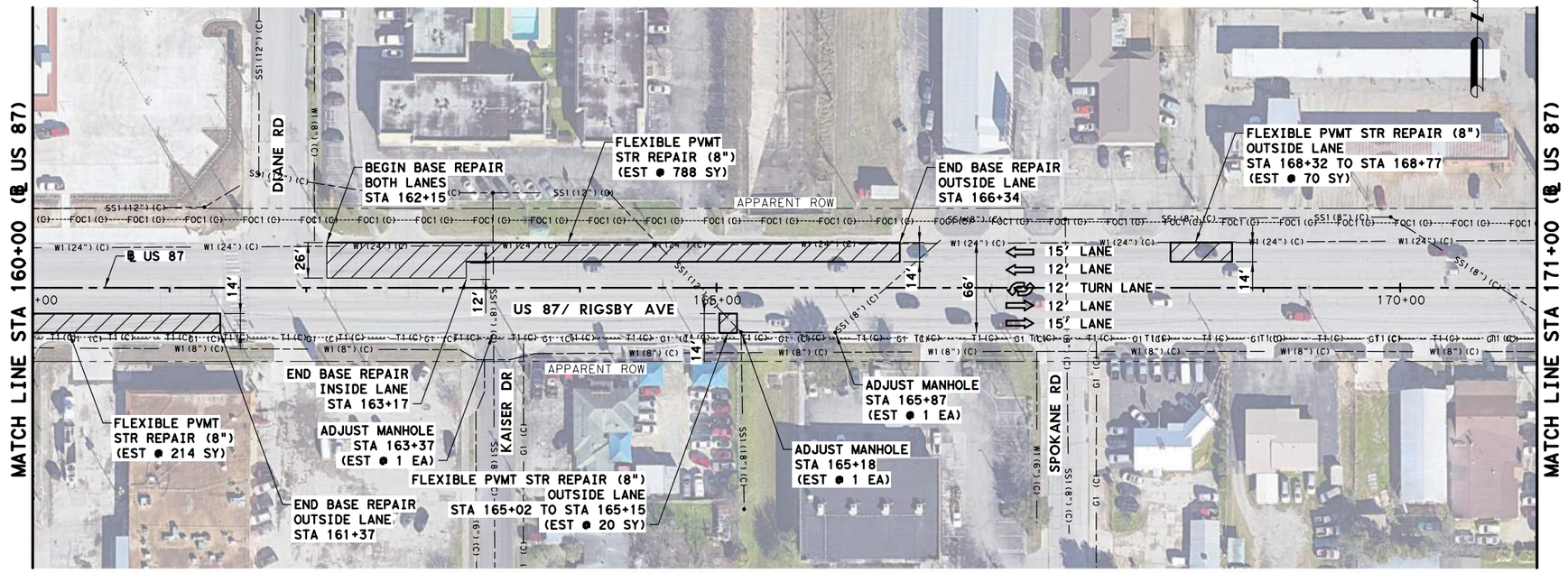

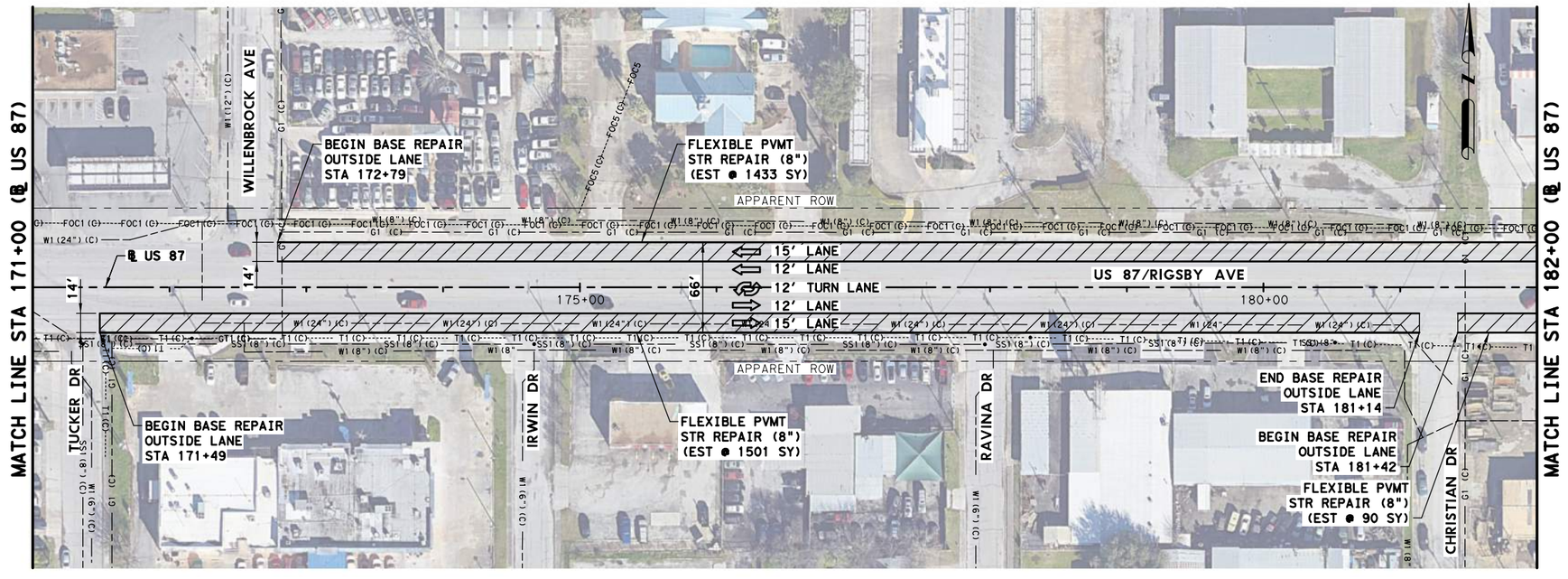

ESTIMATED SHEET QUANTITIES

	340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	186 TON
#	3077-6023	SP MIXES SP-C SAC-B PG70-22	16134 SY
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	4116 SY
	354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	16134 SY
	479-6001	ADJUSTING MANHOLES	3 EA
#	3085-6001	UNDERSEAL COURSE	16134 SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

TRAFFIC FLOW DIRECTION

8" BASE REPAIR 4" BASE REPAIR

- T1 (C) / T1 (C) — AT&T (QC)
- FOC1 (C) / FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) / FOC6 (C) — VERIZON
- FOC5 (C) / FOC5 (C) — SPECTRUM (QC)
- G1 (C) — CPS ENERGY GAS LINE (QC)
- W1 (SIZE) (6") (C) — SAWS (6") WATER LINE (QC)
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NOTES

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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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2/25/2021

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US 87
PLAN LAYOUT

SHEET 7 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			153
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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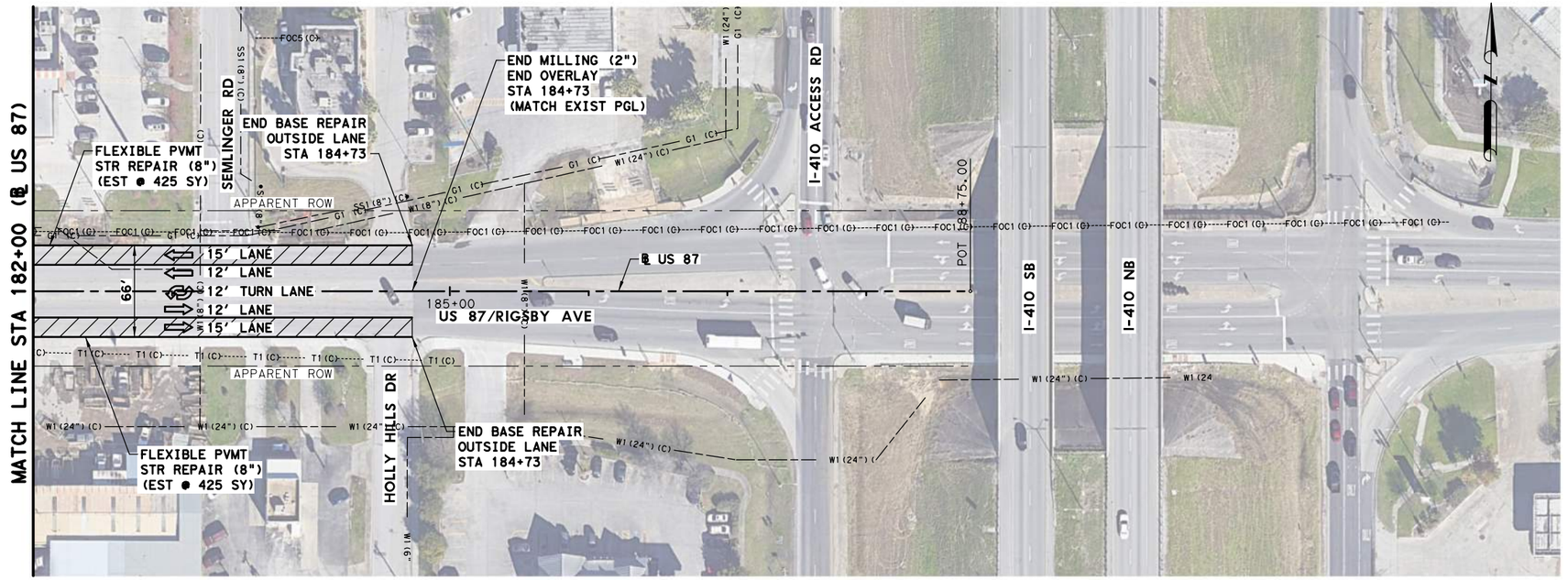

ESTIMATED SHEET QUANTITIES			
340-6247	D-GR HMA (SQ) TY-D PG 70-22(LEVEL-UP)	23	TON
# 3077-6023	SP MIXES SP-C SAC-B PG70-22	2009	SY
351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	850	SY
354-6208	PLANE ASPH CONC PAV(MICRO-MLLING)(2")	2009	SY
# 3085-6001	UNDERSEAL COURSE	2009	SY

- FOR CONTRACTOR'S INFORMATION ONLY. SEE GENERAL NOTES BASIS OF ESTIMATE FOR PAY QUANTITY

LEGEND

⇦ TRAFFIC FLOW DIRECTION

8" BASE REPAIR 4" BASE REPAIR

- T1 (C) — AT&T (QC)
- FOC1 (C) — CYRUS ONE DUCT (QC) (FBL/ZAYO/CENTURYLINK)
- FOC6 (C) — VERIZON
- FOC5 (C) — SPECTRUM (QC)
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NOTES

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0 50 100

SCALE: 1" = 100'

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US 87
PLAN LAYOUT

SHEET 8 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			154
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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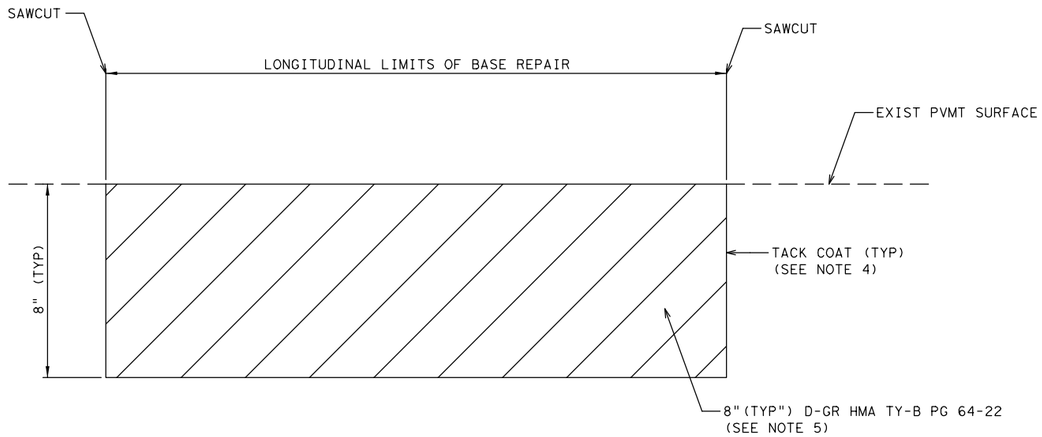
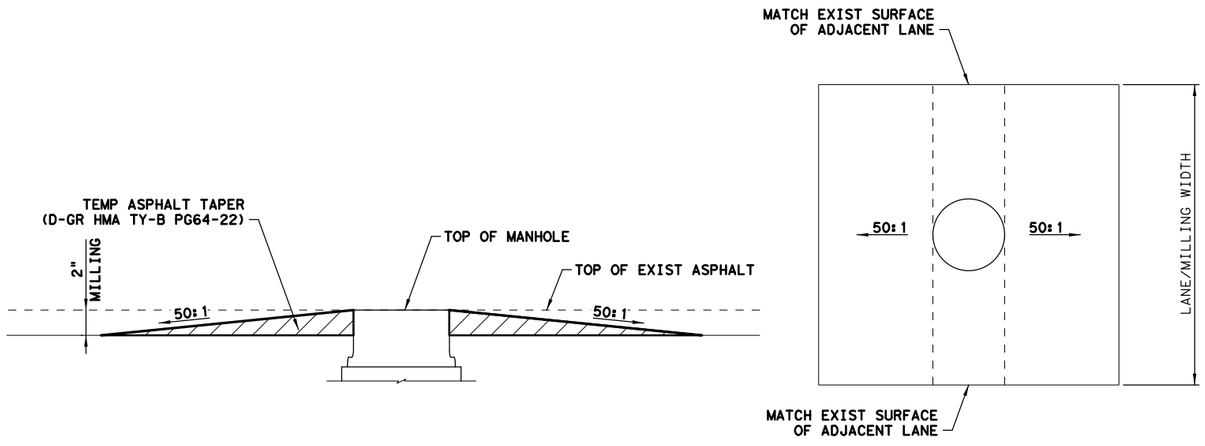


FLEXIBLE PAVEMENT STRUCTURE REPAIR (4" OR 8")

NOTES:

1. SAWCUT OF EXISTING PAVEMENT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 351.
2. HMA TY-B MATERIAL SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 351.
3. MINIMUM TRANSVERSE WIDTH OF BASE REPAIR SHALL BE ONE (1) LANE-WIDTH WIDE (BASED ON EXISTING LANE WIDTH, 12' TO 14' TYPICAL), UNLESS OTHERWISE APPROVED BY THE ENGINEER. SEE "PLAN LAYOUT" SHEETS FOR MORE INFORMATION.
4. APPLY TACK COAT TO EXPOSED EDGES OF EXISTING ASPHALT OR FLEXIBLE BASE. THIS WILL BE CONSIDERED SUBSIDIARY TO ITEM 351.
5. HMA TO BE PLACED INTO TWO EQUAL LIFTS.



ELEVATION PLAN

US 87 - MANHOLE TAPER DETAILS

NOTES:

1. CONTRACTOR SHALL PLACE TEMPORARY ASPHALT TAPER AT MANHOLES PRIOR TO OPENING LANES TO TRAFFIC.
2. TEMP ASPHALT PAID FOR WITH ITEM 340-6011. REMOVAL OF TEMP ASPHALT PAID FOR WITH ITEM 105-6002.
3. CONTRACTOR SHALL ADJUST MANHOLES SO TOP OF MANHOLE IS FLUSH WITH PROPOSED PAVEMET SURFACE. THIS WORK TO BE PAID FOR WITH ITEM 479-6001.

NOT TO SCALE

STATE OF TEXAS
Luis A. González
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2/25/2021

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TBPE REG. NO. F-2742

MISCELLANEOUS ROADWAY DETAILS

SHEET 1 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			155
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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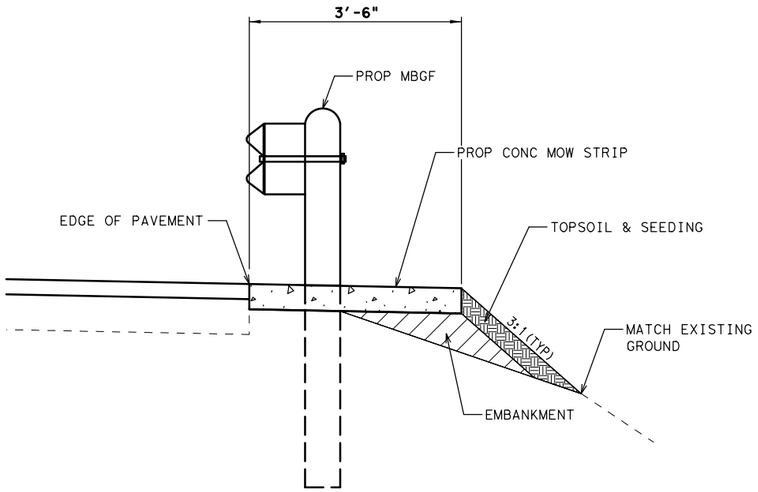
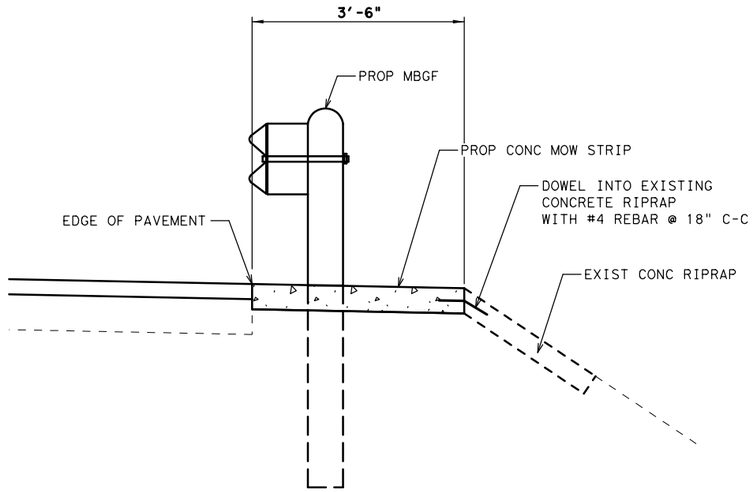


METAL BEAM GUARD FENCE DETAIL

NOTES:

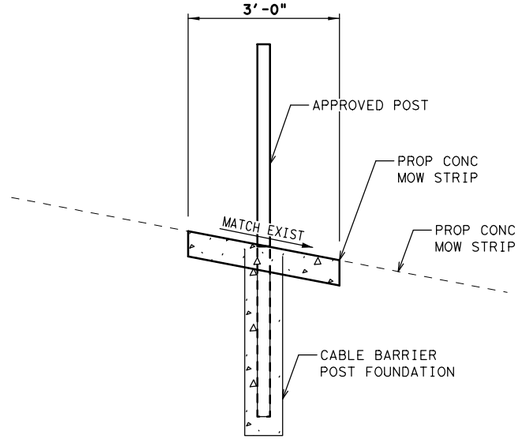
1. CONTRACTOR SHALL LOCATE UTILITIES IN THE FIELD PRIOR TO STARTING MBGF REPLACEMENT.



MOW STRIP TIE-IN DETAIL

NOTES:

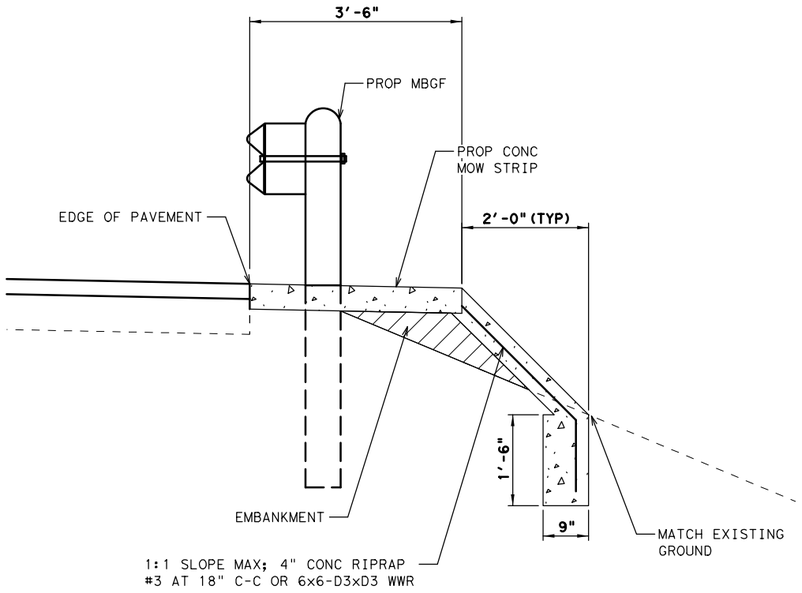
1. CONTRACTOR SHALL LOCATE UTILITIES IN THE FIELD PRIOR TO STARTING MBGF REPLACEMENT.



MOW STRIP DETAIL AT CABLE BARRIER

NOTES:

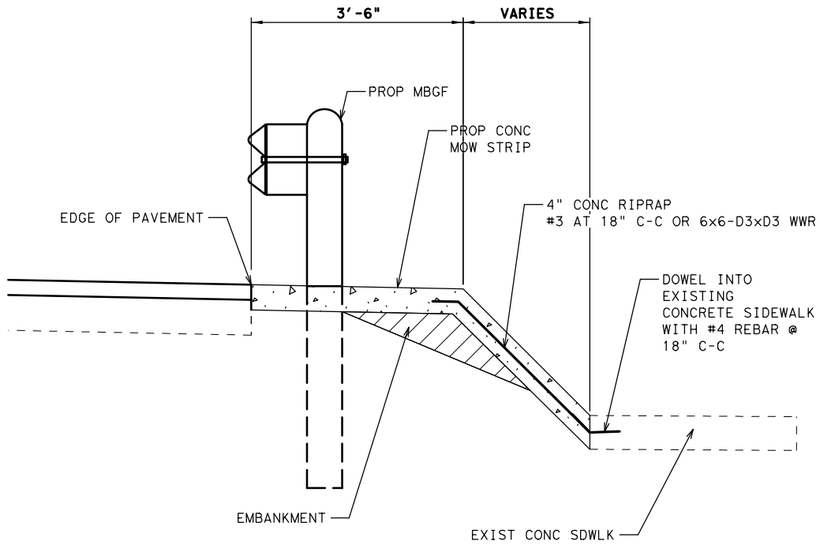
1. CONTRACTOR SHALL LOCATE UTILITIES IN THE FIELD PRIOR TO STARTING CABLE BARRIER INSTALLATION.



METAL BEAM GUARD FENCE & RIPRAP DETAIL FOR STEEP SLOPES

NOTES:

1. THE ENGINEER SHALL DETERMINE FINAL LOCATIONS OF EROSION CONTROL LOGS IN THE FIELD.



METAL BEAM GUARD FENCE & RIPRAP DETAIL (US 87 @ STA 105+50)

NOTES:

1. SEE "US 87 PLAN LAYOUT" SHEETS FOR MORE INFORMATION

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MISCELLANEOUS ROADWAY DETAILS

SHEET 2 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			156
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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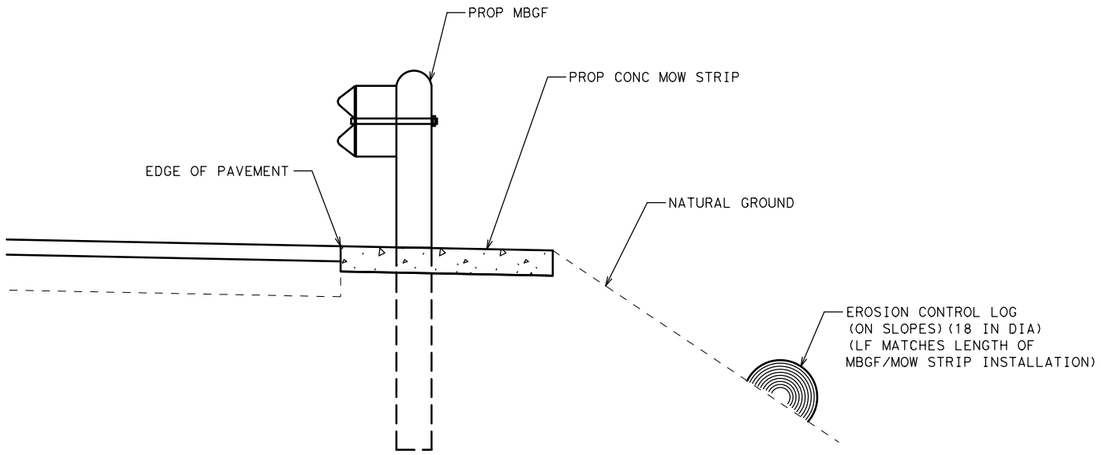
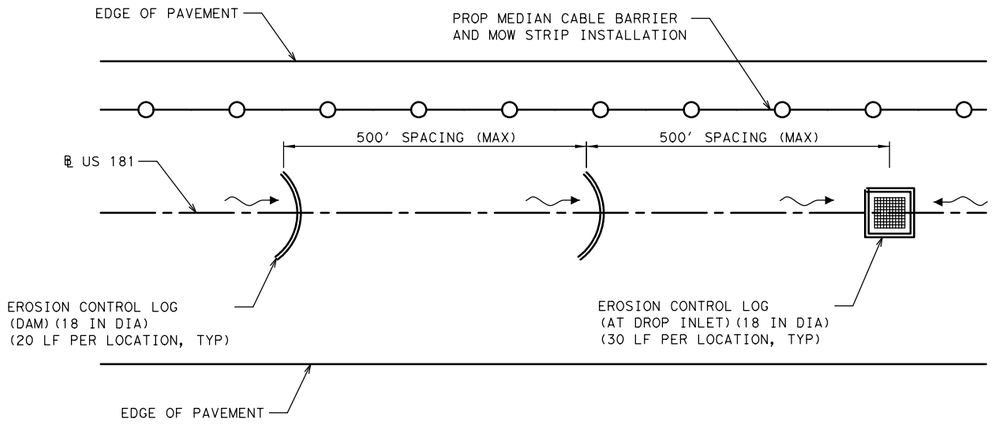


EROSION CONTROL DETAIL AT MBGF/MOW STRIP INSTALLATION

NOTES:

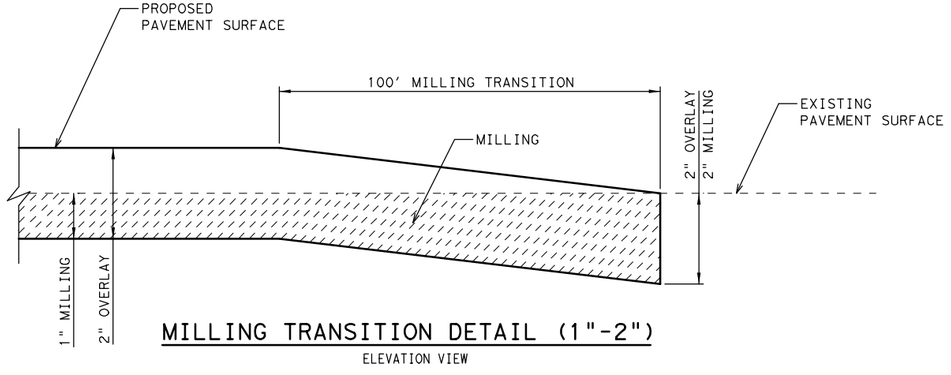
1. THE ENGINEER SHALL DETERMINE FINAL LOCATIONS OF EROSION CONTROL LOGS IN THE FIELD.



EROSION CONTROL DETAIL AT MEDIAN CABLE BARRIER/MOW STRIP INSTALLATION

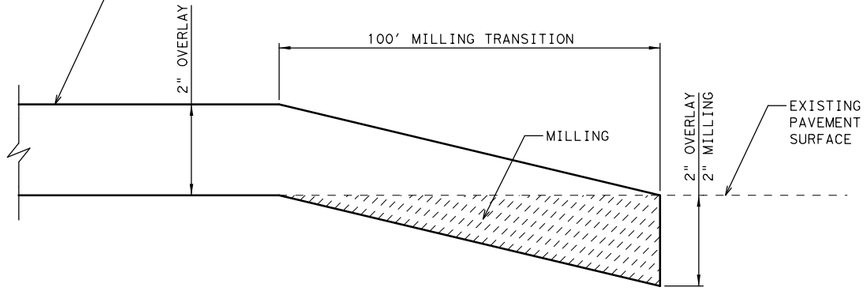
NOTES:

1. THE ENGINEER SHALL DETERMINE FINAL LOCATIONS OF EROSION CONTROL LOGS IN THE FIELD.



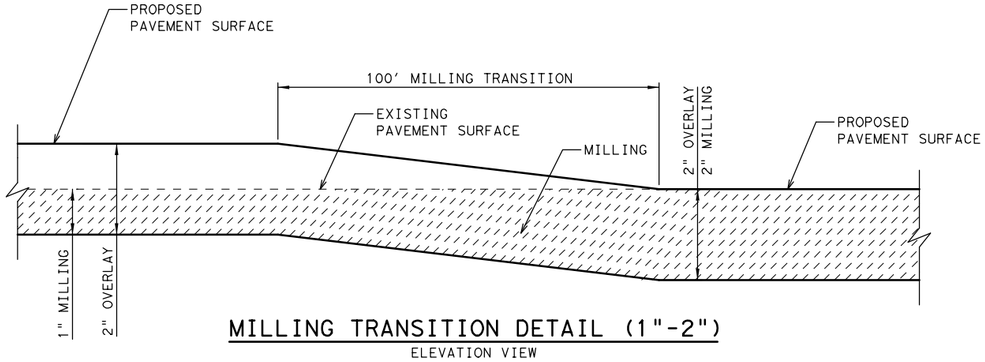
MILLING TRANSITION DETAIL (1"-2")

ELEVATION VIEW



MILLING TRANSITION DETAIL (0"-2")

ELEVATION VIEW



MILLING TRANSITION DETAIL (1"-2")

ELEVATION VIEW

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MISCELLANEOUS ROADWAY DETAILS

SHEET 3 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			157
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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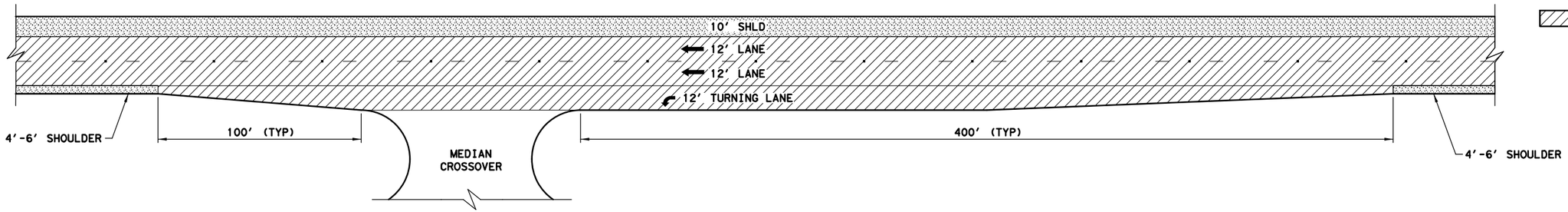
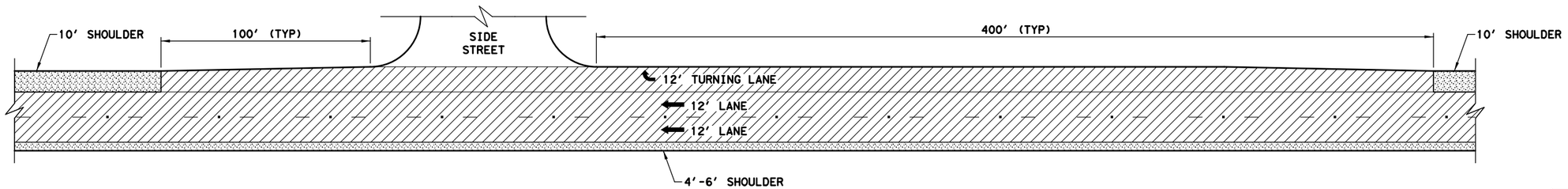
LEGEND

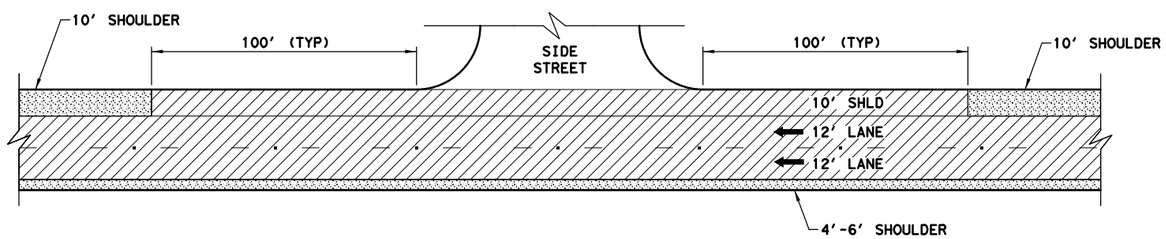
- TRAFFIC FLOW DIRECTION
- 1"-2" TAPERED OVERLAY THICKNESS (SEE "TYPICAL SECTION" SHEETS)
- 2" OVERLAY THICKNESS



US 181 OVERLAY THICKNESS DETAIL AT MEDIAN CROSSOVERS (LEFT-TURN LANES)



US 181 OVERLAY THICKNESS DETAIL AT SIDE STREETS (RIGHT-TURN LANES)



US 181 OVERLAY THICKNESS DETAIL AT SIDE STREETS

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MISCELLANEOUS ROADWAY DETAILS

SHEET 4 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			158
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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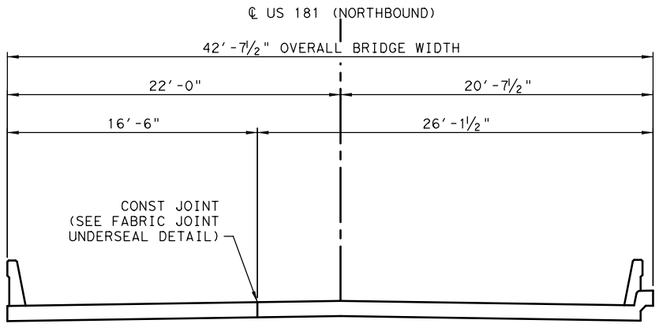
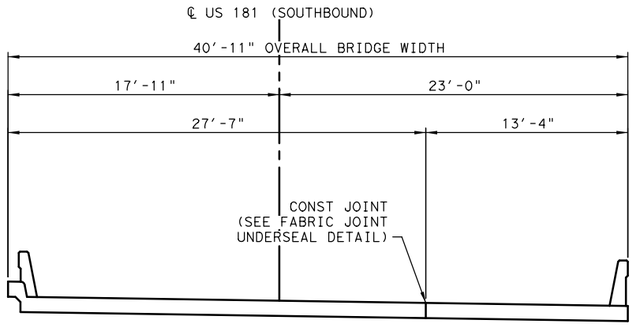


US 181 - EXISTING BRIDGE DECK TYPICAL SECTION

US 181 NORTHBOUND
BRIDGE OVER CALAVERAS CREEK

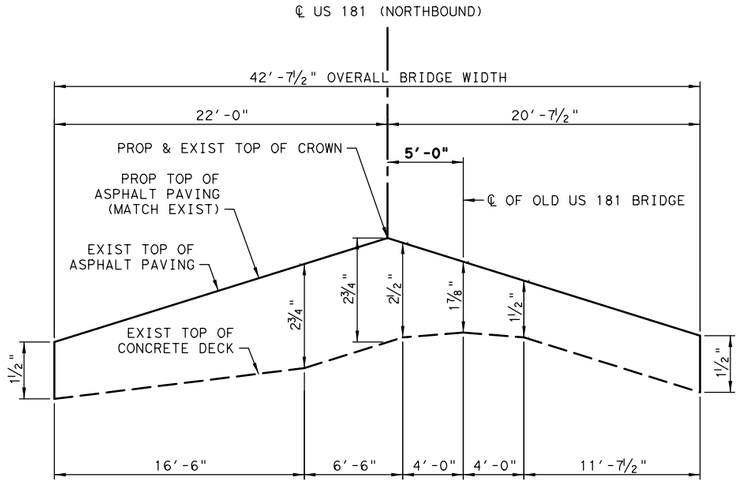


US 181 - EXISTING BRIDGE DECK TYPICAL SECTION

US 181 SOUTHBOUND
BRIDGE OVER CALAVERAS CREEK

NOTES:

1. CONTRACTOR SHALL MILL VARIABLE DEPTH DOWN TO THE DECK OF THE EXISTING BRIDGES: US 181 OVER IH37, US 181 OVER CALAVERAS CREEK (NORTHBOUND), US 181 OVER CALAVERAS CREEK (SOUTHBOUND). CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ASPHALT DEPTH ON THE DECKS TO AVOID DAMAGING THE EXISTING DECKS. MILLING OVER BRIDGE DECKS SHALL BE PAID FOR WITH ITEM 354-6003, PLAN & TEXT ASPH CONC PAV(0" TO 3").
2. PRIOR TO PLACING OVERLAY ON DECK OF NORTHBOUND AND SOUTHBOUND CALAVERAS CREEK BRIDGES, CONTRACTOR SHALL LOCATE ALL DECK DRAINS AND ENSURE THAT PROPOSED WORK AND OVERLAY DOES NOT CLOG OR BLOCK DRAIN OPENINGS.

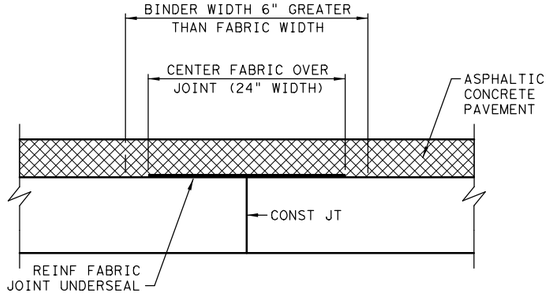


US 181 - EXISTING BRIDGE DECK TYPICAL SECTION

US 181 NORTHBOUND
BRIDGE OVER CALAVERAS CREEK

NOTES:

1. CONTRACTOR SHALL MILL VARIABLE DEPTH DOWN TO THE DECK OF THE EXISTING BRIDGE. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ASPHALT DEPTH ON THE DECK TO AVOID DAMAGING THE EXISTING DECK.
2. PROPOSED ASPHALT SURFACE ON BRIDGE DECK SHALL MATCH THE EXISTING ASPHALT SURFACE ELEVATIONS.



FABRIC JOINT UNDERSEAL

US 181 NORTHBOUND AND SOUTHBOUND
BRIDGES OVER CALAVERAS CREEK

NOTES:

1. ANY TOOLS, EQUIPMENT, MATERIALS AND TECHNIQUES USED TO PREPARE THE JOINT SEAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE START OF THE FABRIC JOINT UNDER SEAL OPERATION.
2. PRIOR TO THE PLACEMENT OF THE FABRIC JOINT UNDER SEAL, THE CONSTRUCTION JOINT SHALL BE CLEANED OF ALL BITUMINOUS MATERIALS, DIRT, GREASE AND ALL OTHER DELETERIOUS MATERIALS.
3. ANY SIGNIFICANT SPALLED OR CRACKED AREAS AS DETERMINED BY THE ENGINEER IN THE JOINT AREA SHALL BE PATCHED WITH AS APPROVED PROPRIETARY CONCRETE REPAIR MATERIAL AS APPROVED BY THE ENGINEER. THIS WORK SHALL BE PAID FOR BY EXTRA WORK ORDER.
4. THE FABRIC JOINT UNDERSEAL SHALL MEET THE REQUIREMENTS OF DMS-6260, "REINFORCED FABRIC JOINT UNDERSEAL", OR AS APPROVED BY THE ENGINEER.
5. REMOVAL OF EXISTING FABRIC JOINT UNDERSEAL, SURFACE PREPARATION, FURNISHING AND PLACING NEW FABRIC JOINT UNDERSEAL SHALL BE PAID FOR UNDER ITEM 356-6021 "PAV JT UNDERSEAL (24")".
6. CONTRACTOR SHALL MILL DEPTH DOWN TO THE DECK OF THE EXISTING BRIDGE. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ASPHALT DEPTH ON THE DECK TO AVOID DAMAGING THE EXISTING DECK.

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MISCELLANEOUS ROADWAY DETAILS

SHEET 5 OF 5

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			159
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc

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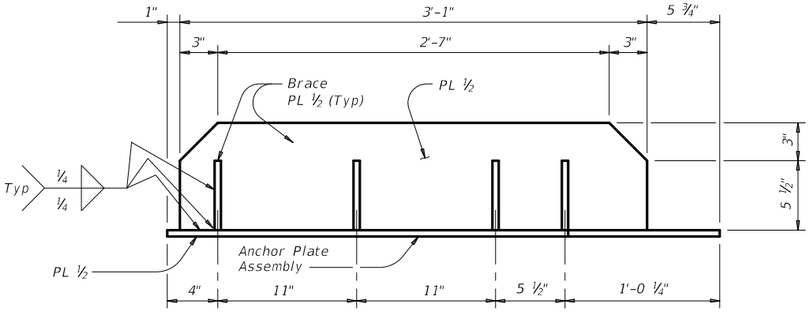

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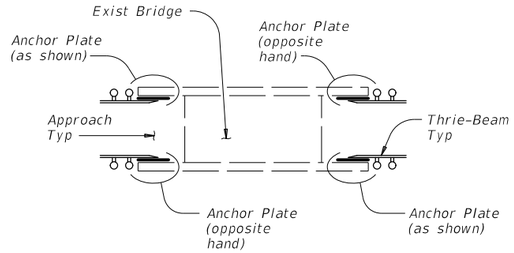
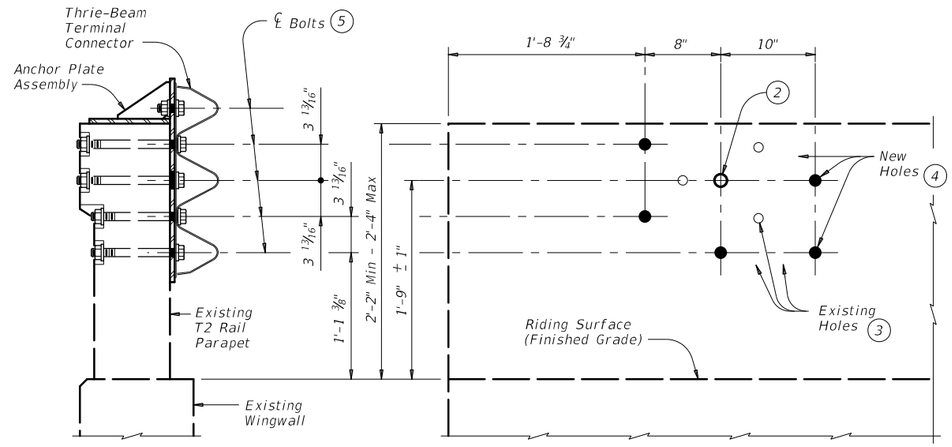


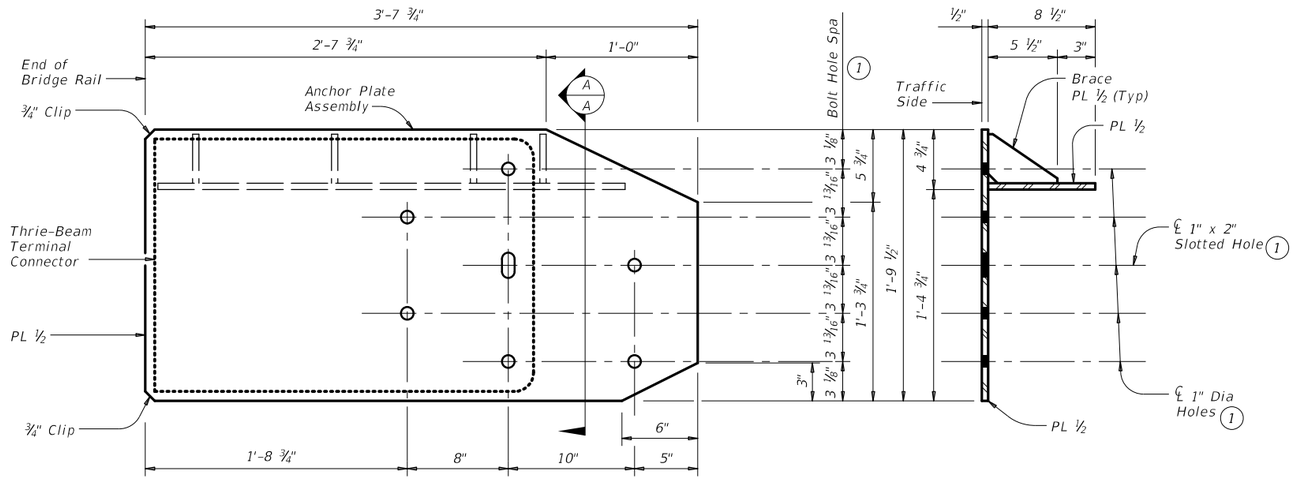
LOCATION DETAILS



SECTION
Showing completed installation

ROADSIDE ELEVATION
Anchor Plate assembly and Thrie-Beam Terminal Connector not shown for clarity

THRIE-BEAM TERMINAL CONNECTION DETAILS (1)

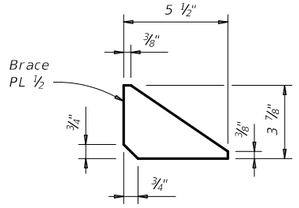


ROADSIDE ELEVATION

SECTION A-A

ANCHOR PLATE DETAILS

Anchor Plate shown is detailed for one end of one side of rail only. For other side, Anchor Plate must be built opposite hand.



BRACE PLATE DETAIL

CONSTRUCTION NOTES:

Field verify dimensions before commencing work and ordering materials.

On T2 rail remove any MBGF (W-beam) and attachment hardware, from the face of rail if present, prior to installation of new MBGF Transition. Dispose of these materials as directed by the Engineer. Plugging of newly exposed existing bolt holes is not necessary except as stated here in or otherwise indicated on the plans. This work is considered subsidiary to the pertinent bid items.

Attach the MBGF Transition to the existing parapet using the Anchor Plate assembly and the Thrie-Beam Terminal Connection. Splice the Thrie-Beam Terminal Connection and Thrie-Beam with the normal 12 connection bolts. Refer to Metal Beam Guard Fence Transition and Metal Beam Guard Fence detail sheets for additional details and information not shown herein.

MATERIAL NOTES:

Fabricate Anchor Plate assembly with steel conforming to either ASTM A36 or A572 Gr 50. Anchor Plate assembly must be free of burrs, sharp edges and weld splatter. Grind edges and corners to a 1/16" flat or radius. Hot-dip galvanize Anchor Plate assembly in accordance with Item 445, "Galvanizing". Anchor bolts, nuts, and washers must conform to Item 449, "Anchor Bolts".

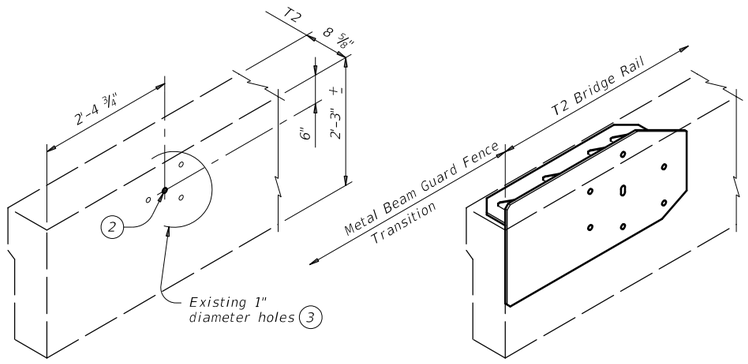
GENERAL NOTES:

These details are for retrofitting existing rails only, not new construction, with a Thrie-Beam Terminal Connection.

Shop drawings are not required for this installation.

Payment for materials, fabrication, and installation of this assembly are to be included in unit price bid in accordance with Item 540 "Mtl Bm Gd Fen Trans (Anchor Plate)".

Estimated weight of a single Anchor Plate assembly, including bolts, nuts, and washers, but not including the Thrie-Beam Terminal Connector = 190 Lbs.



EXISTING PARAPET
Shown after removal of existing MBGF Transition connector and prior to coring new bolt holes

ANCHOR PLATE PLACEMENT

INSTALLATION DETAILS

(1) *The Contractor must verify that locations of bolt holes match those in the Thrie-Beam Terminal Connector to be installed in that location, prior to fabrication of Anchor Plate assembly and prior to coring bolt holes in the existing T2 parapet.*

(2) *If the existing holes are aligned as expected, use the indicated existing 1" diameter hole in the installation of the Anchor Plate assembly and the Thrie-Beam Terminal Connector.*

(3) *If the existing holes are not aligned as expected, holes that cannot be utilized in the installation and are within 3" of a new bolt hole must be filled with epoxy grout prior to coring new holes.*

(4) *Drill new 1" diameter holes, each with a 2 ½" diameter x 1" deep recess, through existing railing parapet. Note that recesses are only required when pedestrian sidewalks are adjacent to back of rail unless directed otherwise by the Engineer. Holes should be perpendicular to the roadside face of the parapet. Drill holes and recesses with coring type equipment. Percussion drilling is not allowed. Patch spalls, when directed by the Engineer, in accordance with Item 429, "Concrete Structure Repair", at the Contractor's expense.*

(5) *7 ~ ⅞" diameter ASTM F3125 Gr A325 Hex Head Anchor Bolts each with 2 ~ 1 ¾" O.D. washers. Place washer under each head and nut. Provide bolts of sufficient length to extend a minimum of ½" beyond nut. Cut excess bolt length and paint cut surface with zinc-rich paint if directed by the Engineer.*

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2/25/2021

Texas Department of Transportation

Bridge Division Standard

T2 TRANSITION RETROFIT DETAIL

T2 TR (MOD)

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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		160

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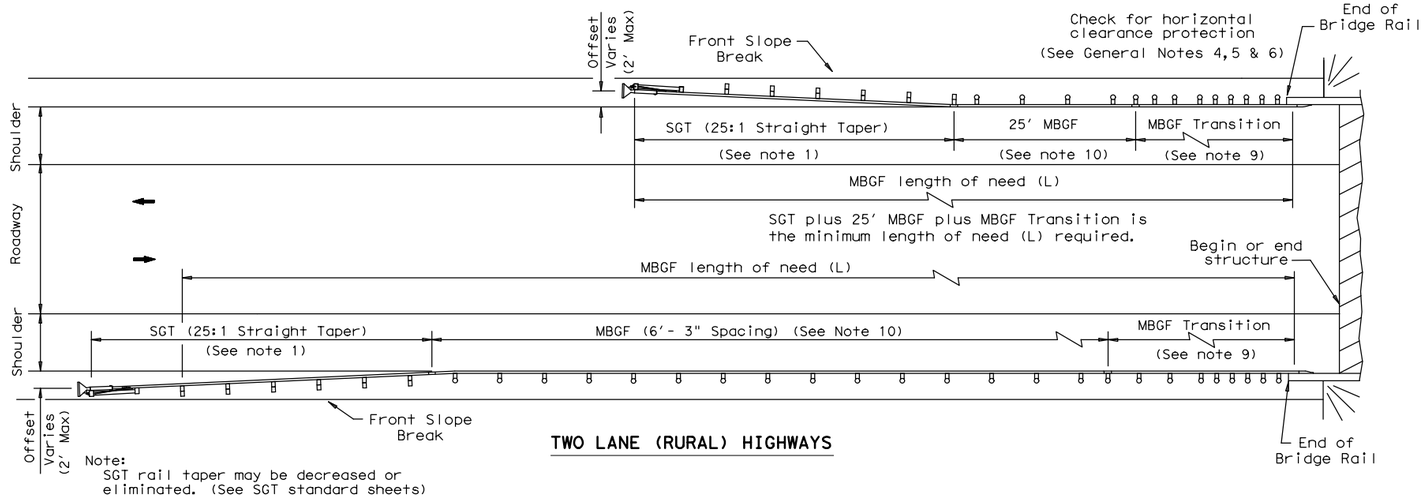
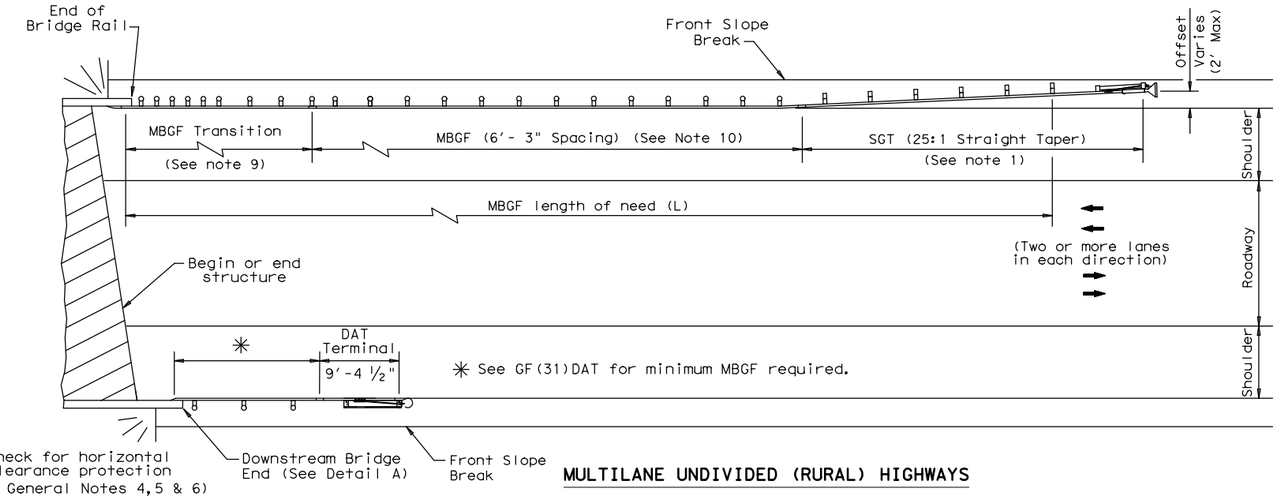
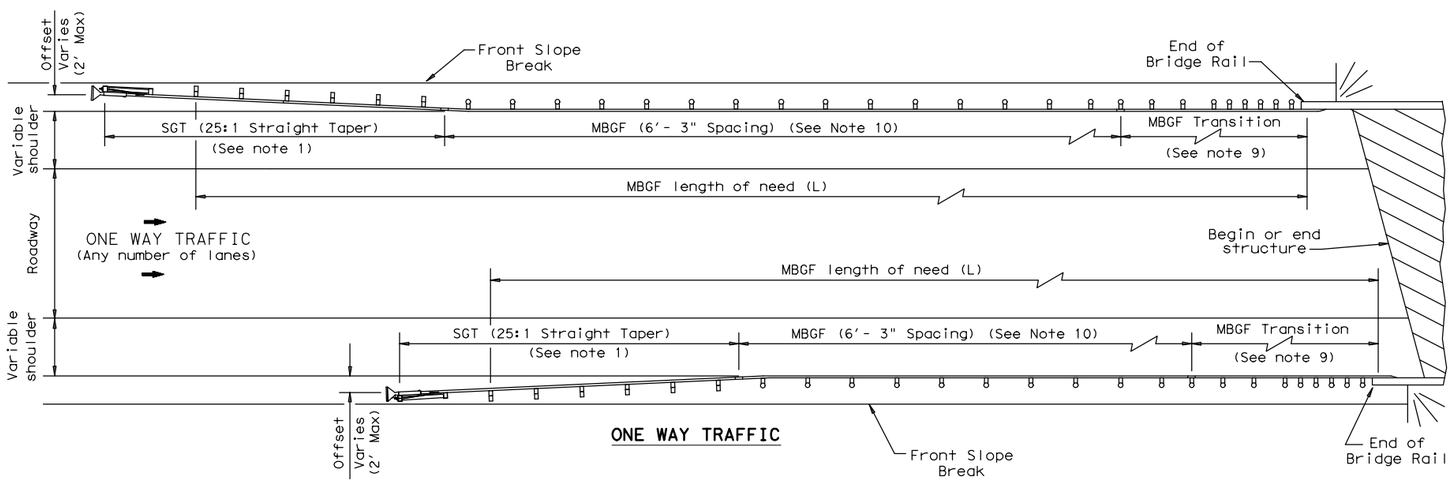


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



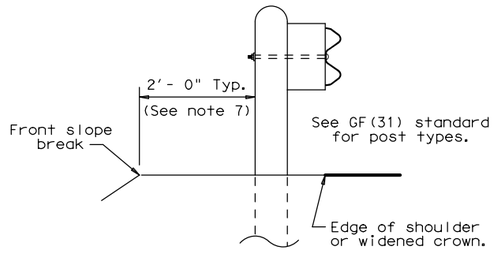
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



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. For restrictive bridge widths: 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
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		161

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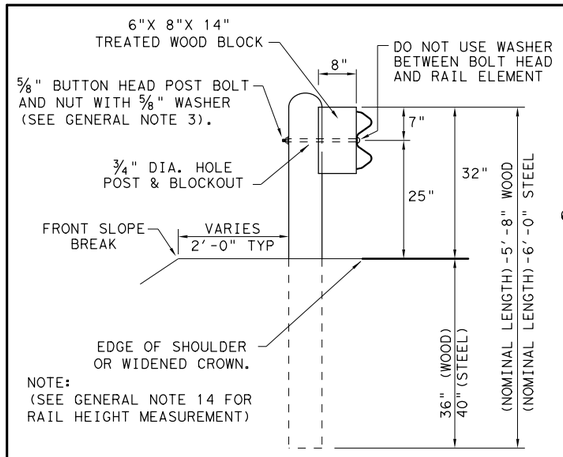
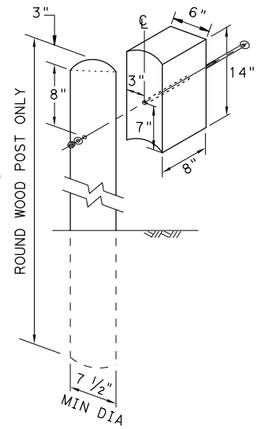
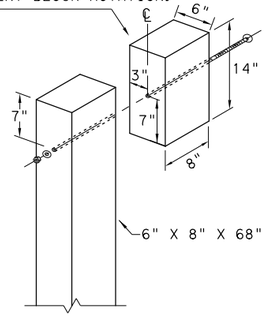


TYPICAL POST PLACEMENT

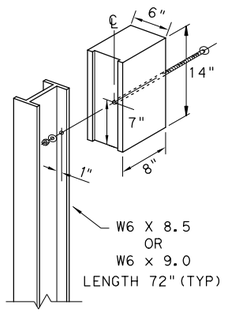


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

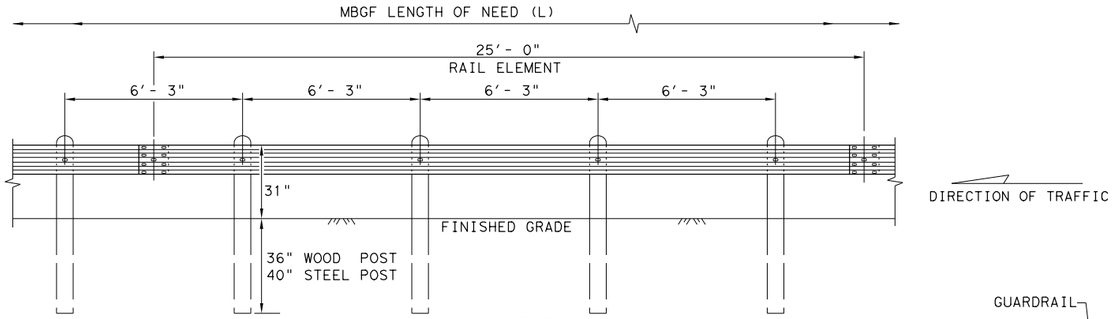


WOOD BLOCK TO RECTANGULAR WOOD POST



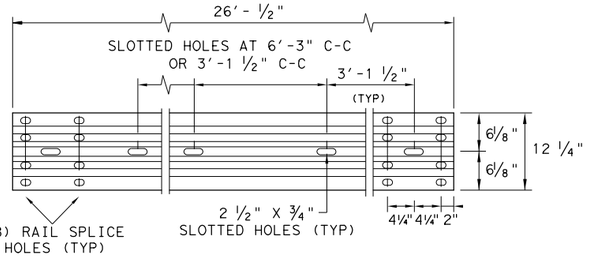
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ✻✻ "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

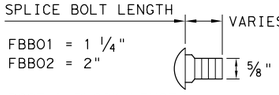
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

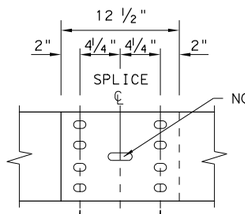
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



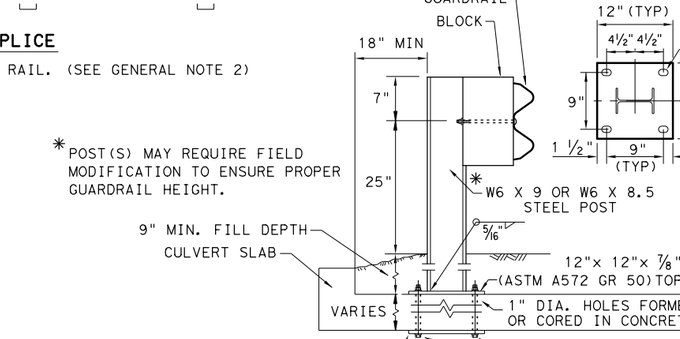
BUTTON HEAD BOLT

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.



LOW FILL CULVERT POST

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

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.

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.

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.

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

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©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0073	12	015,etc	US 181,etc	
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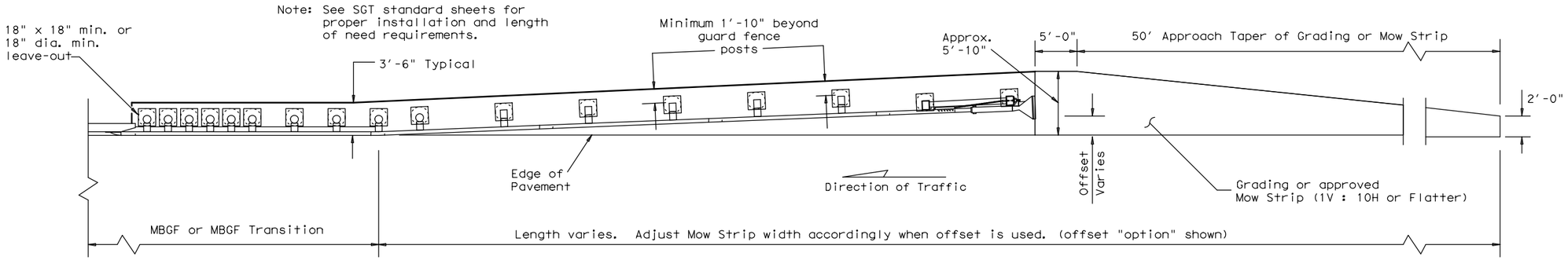
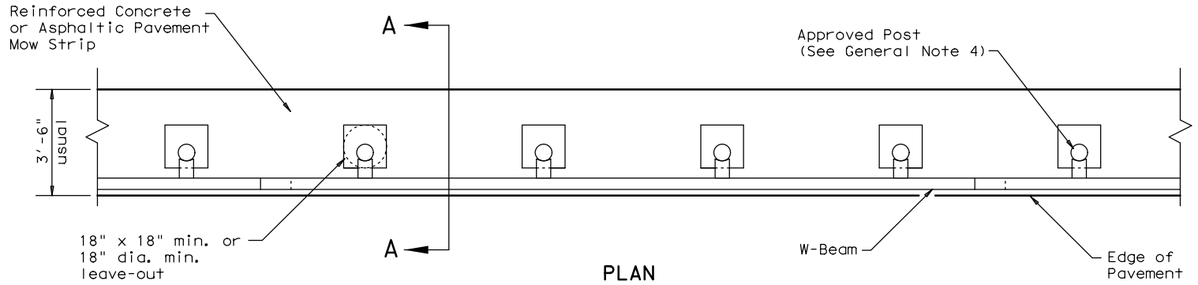


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



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.

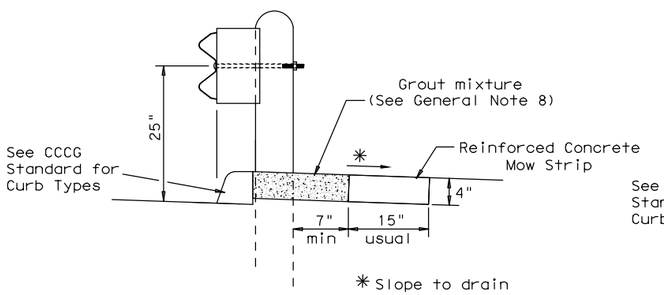
Note: Site Condition(s)

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.

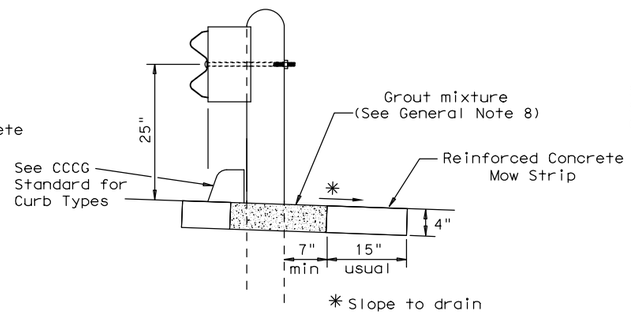
GENERAL NOTES

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.



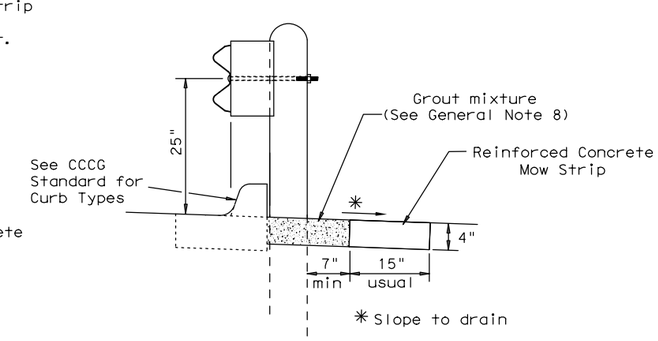
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

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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©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		163

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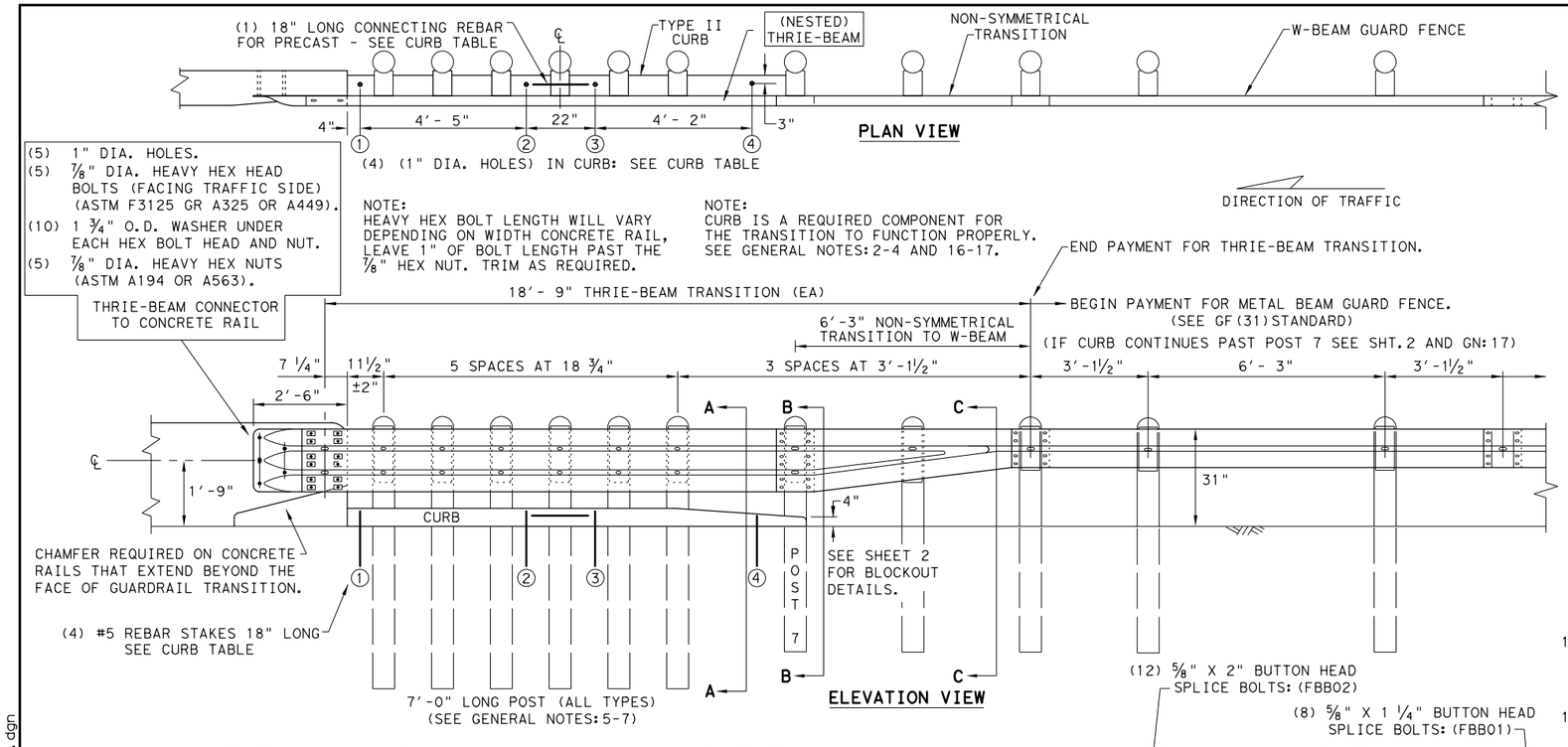


THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

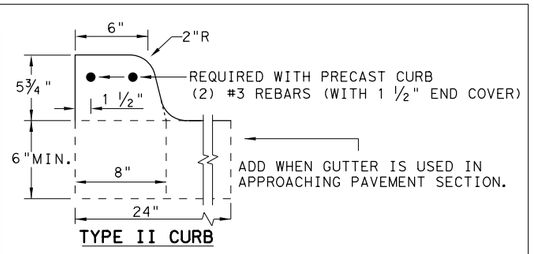
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.

* NOTES: NOT NEEDED FOR CAST-IN-PLACE.
SEE TYPE II CURB DETAIL FOR REBAR AND COVER REQUIREMENTS.
PERCUSSION DRILLING IS NOT PERMITTED WITH:
TYPE II CURB, BRIDGE RAIL OR CONCRETE TRAFFIC RAIL.

TYPE II CURB DETAILS



TYPE II CURB

NOTE: OPTIONS FOR TYPE II CURB:
1. PRECAST
2. CAST-IN-PLACE

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- 3/4" 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 1/2" 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 5/8" 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 5/8" 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

SHEET 1 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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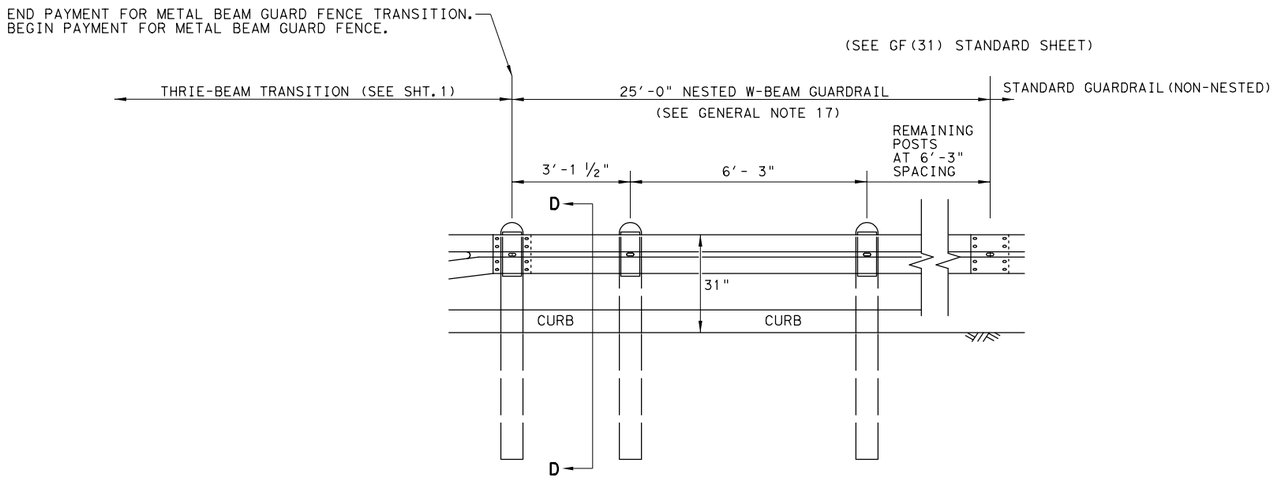
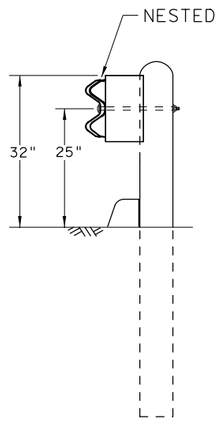
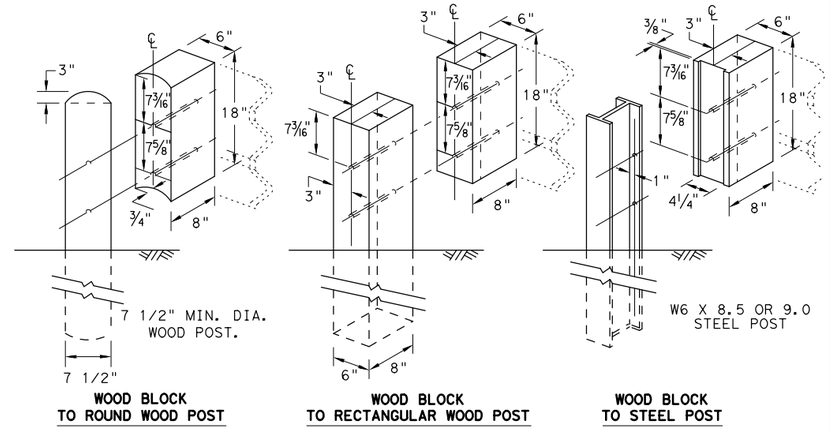
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



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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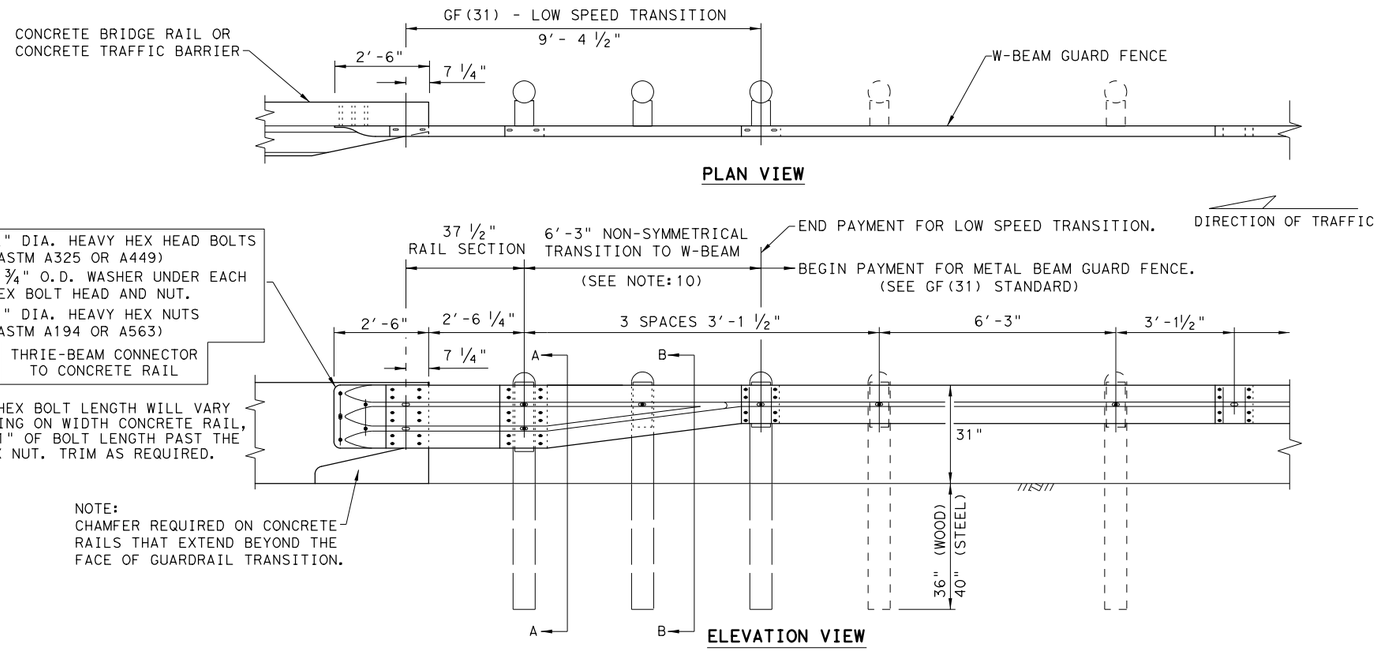


GENERAL NOTES

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 TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31)STANDARD SHEET.
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
8. 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 CAN FURNISH COMPOSITE MATERIAL BLOCKS.
9. REFER TO GF(31)STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE TRANSITION.

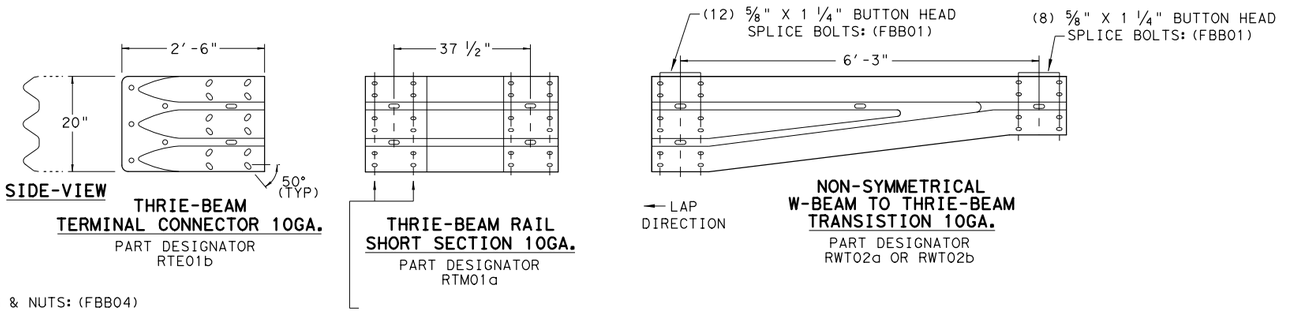
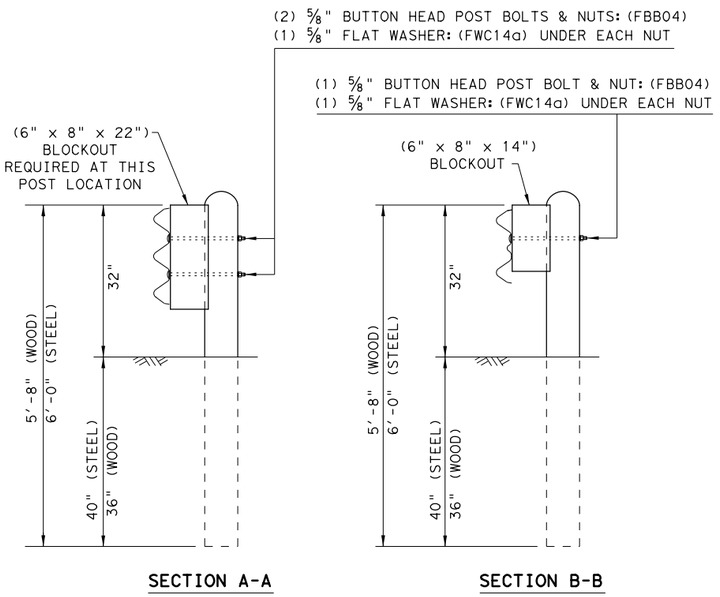
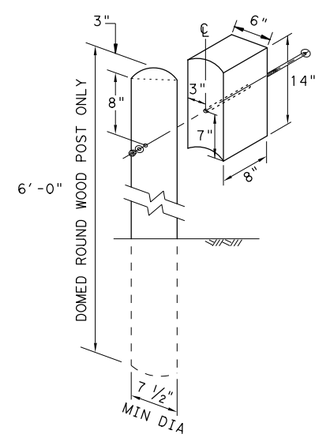
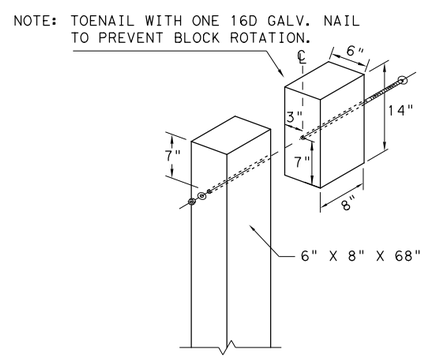


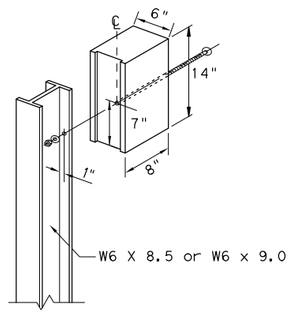
PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.









LOW-SPEED TRANSITION

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-2 MASH COMPLIANT

GF(31)TR TL2-19

FILE: gf31trt1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		166

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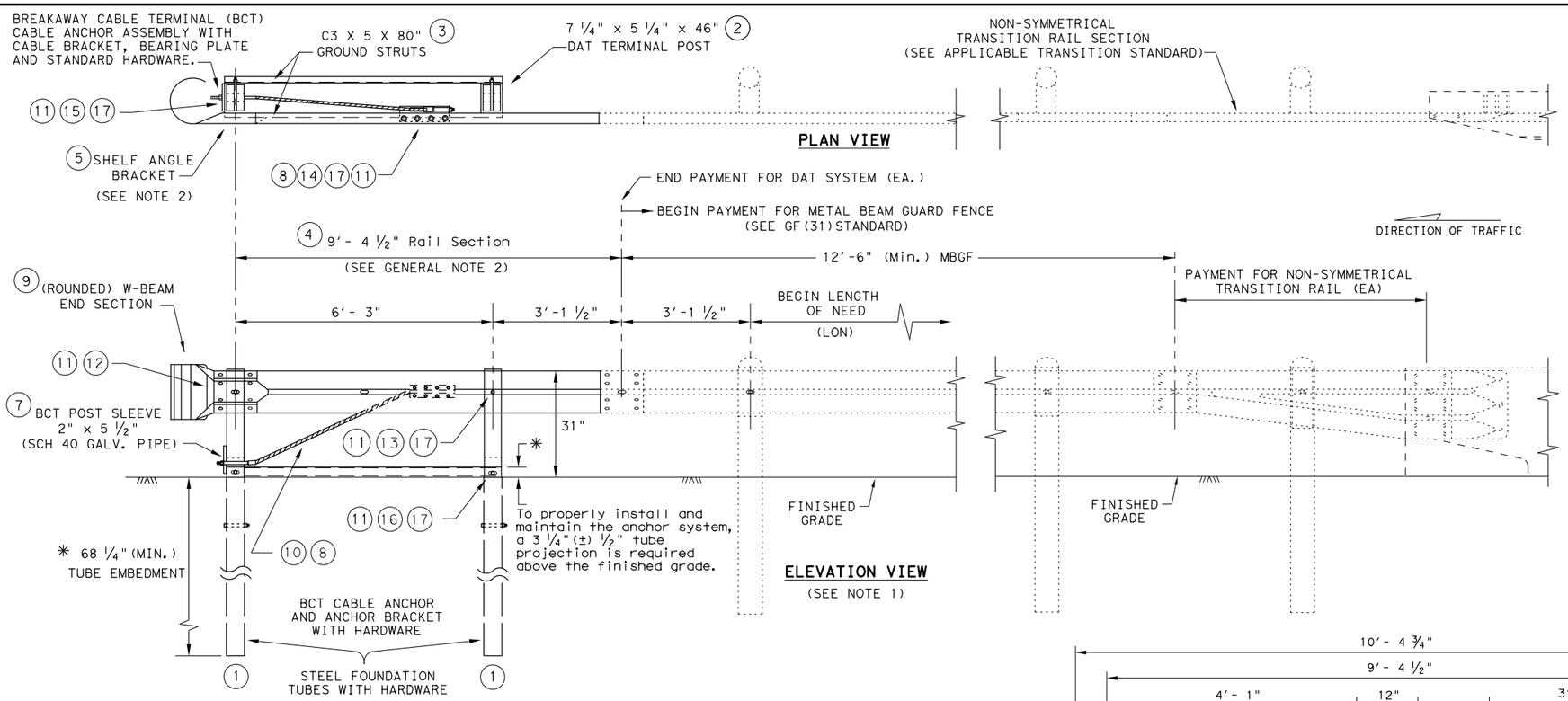


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

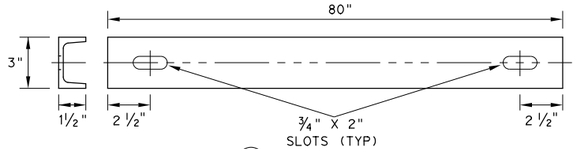
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 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

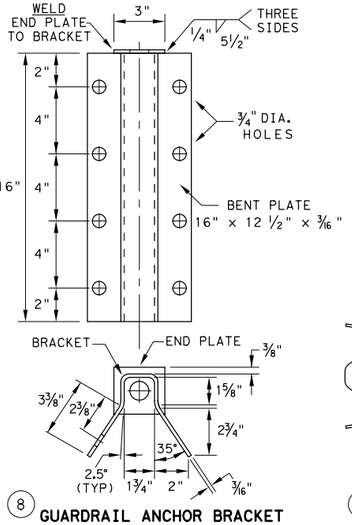
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(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

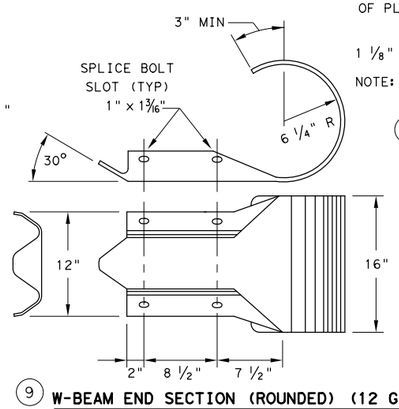
(4) TERMINAL RAIL ELEMENT FOR DAT



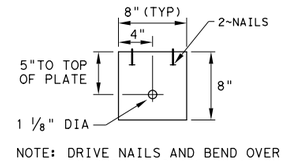
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

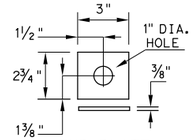


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

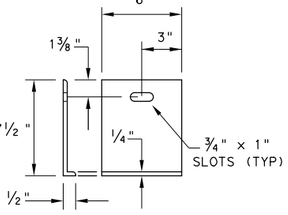


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

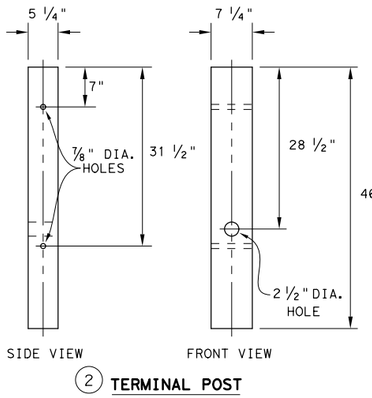
(6) BEARING PLATE
8"x 8"x 5/8" R



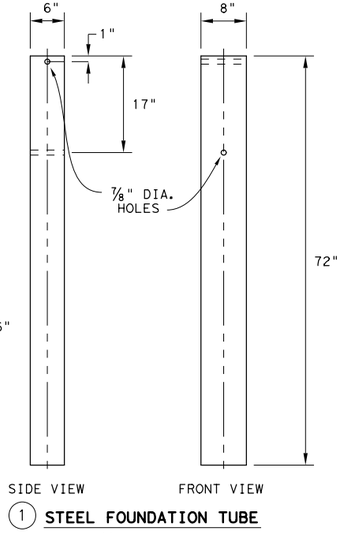
END PLATE



(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

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		167

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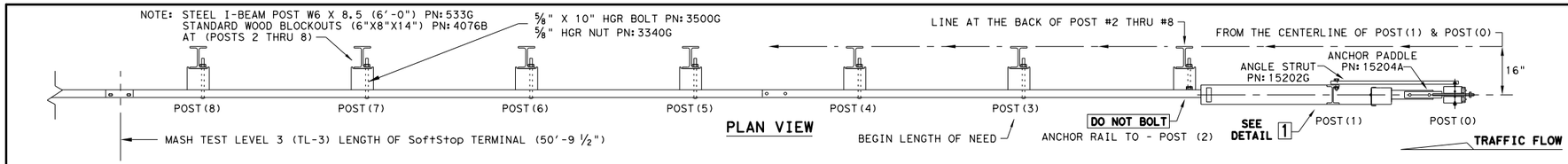
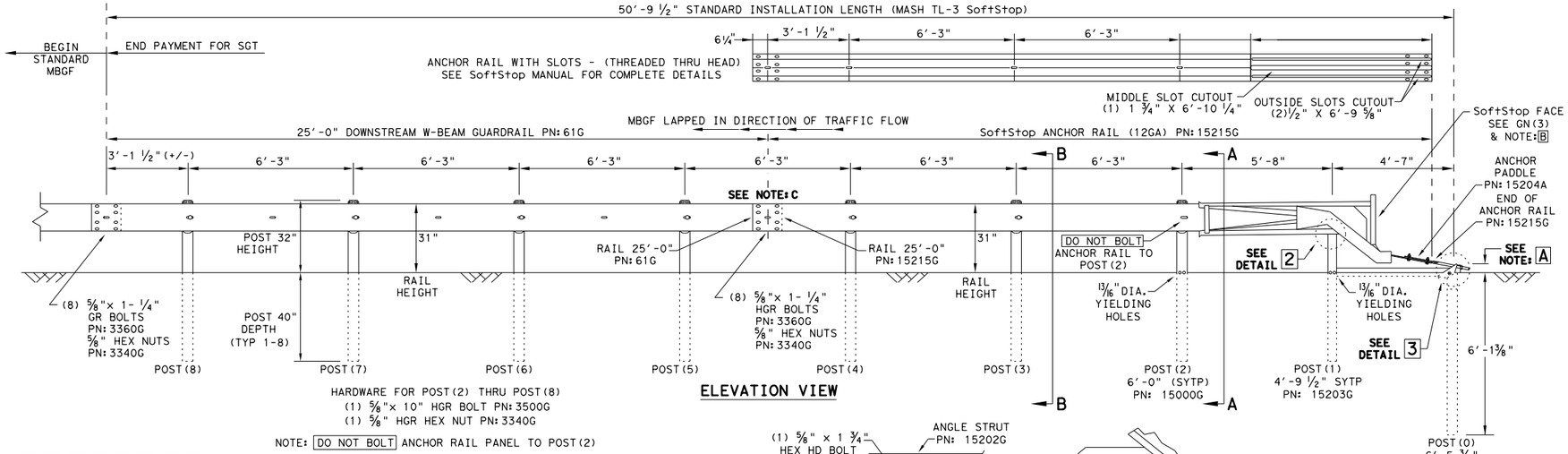
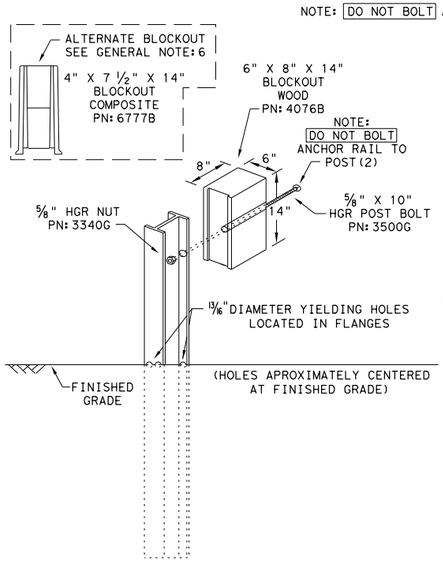


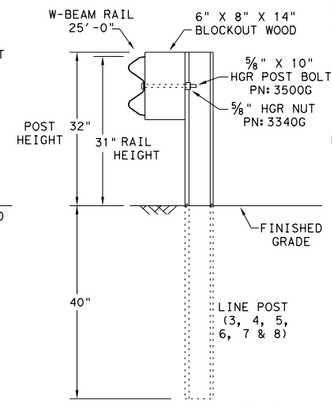




ISOMETRIC VIEW POST(1 & 2)

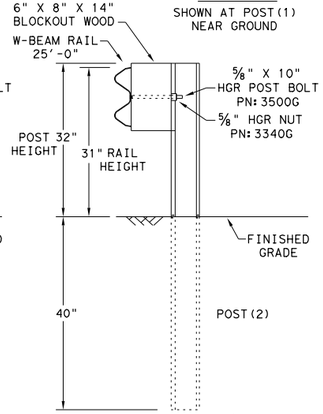
W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)



SECTION VIEW B-B

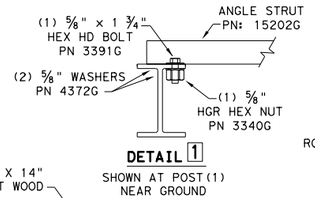
6'-0" (W6 X 8.5)
I-BEAM POST PN: 533G



SECTION VIEW A-A

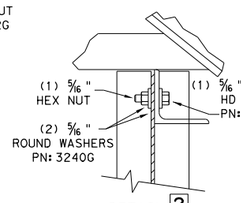
6'-0" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)



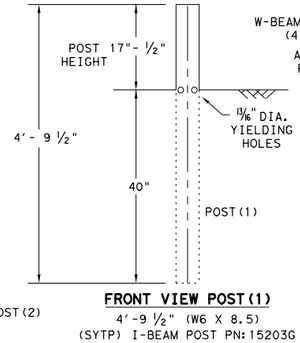
DETAIL 1

SHOWN AT POST(1) NEAR GROUND



DETAIL 2

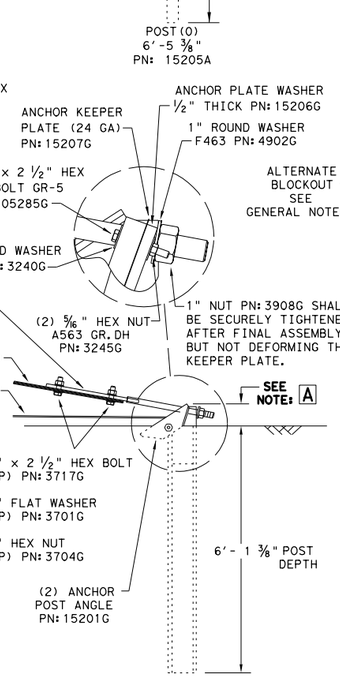
SHOWN AT POST(1)



FRONT VIEW POST(1)

4'-9 1/2" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15203G

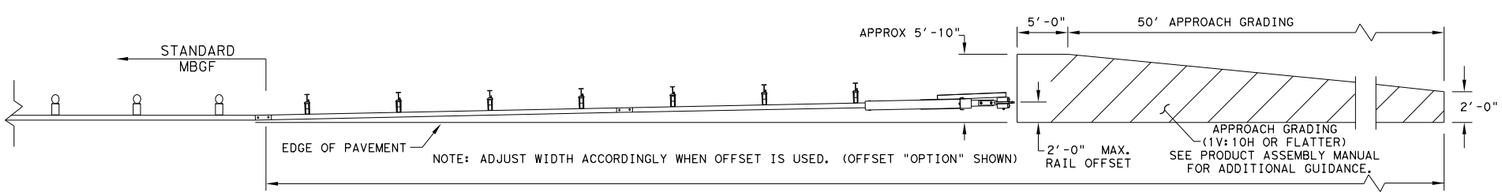
NOTE: NO BLOCKOUT INSTALLED AT POST(1)



DETAIL 3 AT POST(0)

6'-5 3/8" (W6 X 15)
I-BEAM POST PN: 15205A

TRAFFIC FLOW



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 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR. DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR. DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	7/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR. DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY SOFTSTOP END TERMINAL MASH - TL-3

SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP		
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0073	12	015,etc	US 181,etc		
	DIST	COUNTY		SHEET NO.		
	SAT	BEXAR		168		

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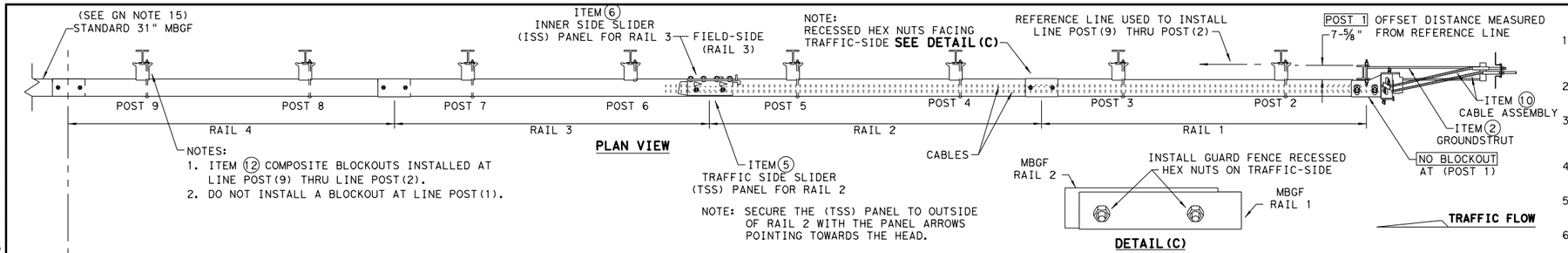
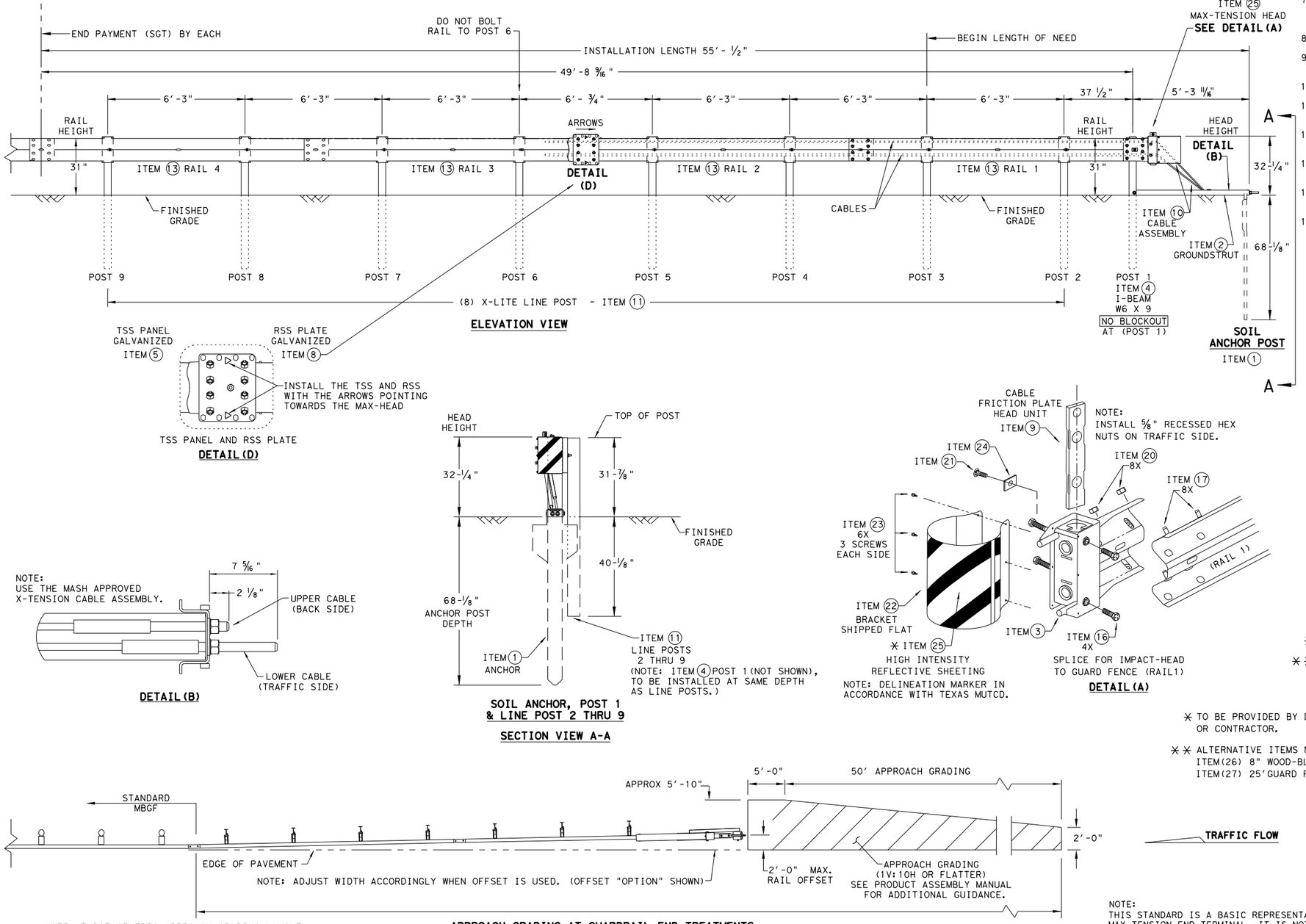


PLAN VIEW

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).

DETAIL (C)



ELEVATION VIEW

TSS PANEL AND RSS PLATE

DETAIL (D)

DETAIL (B)

SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9

SECTION VIEW A-A

DETAIL (A)

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO 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

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	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		169

DATE: 2/25/2021
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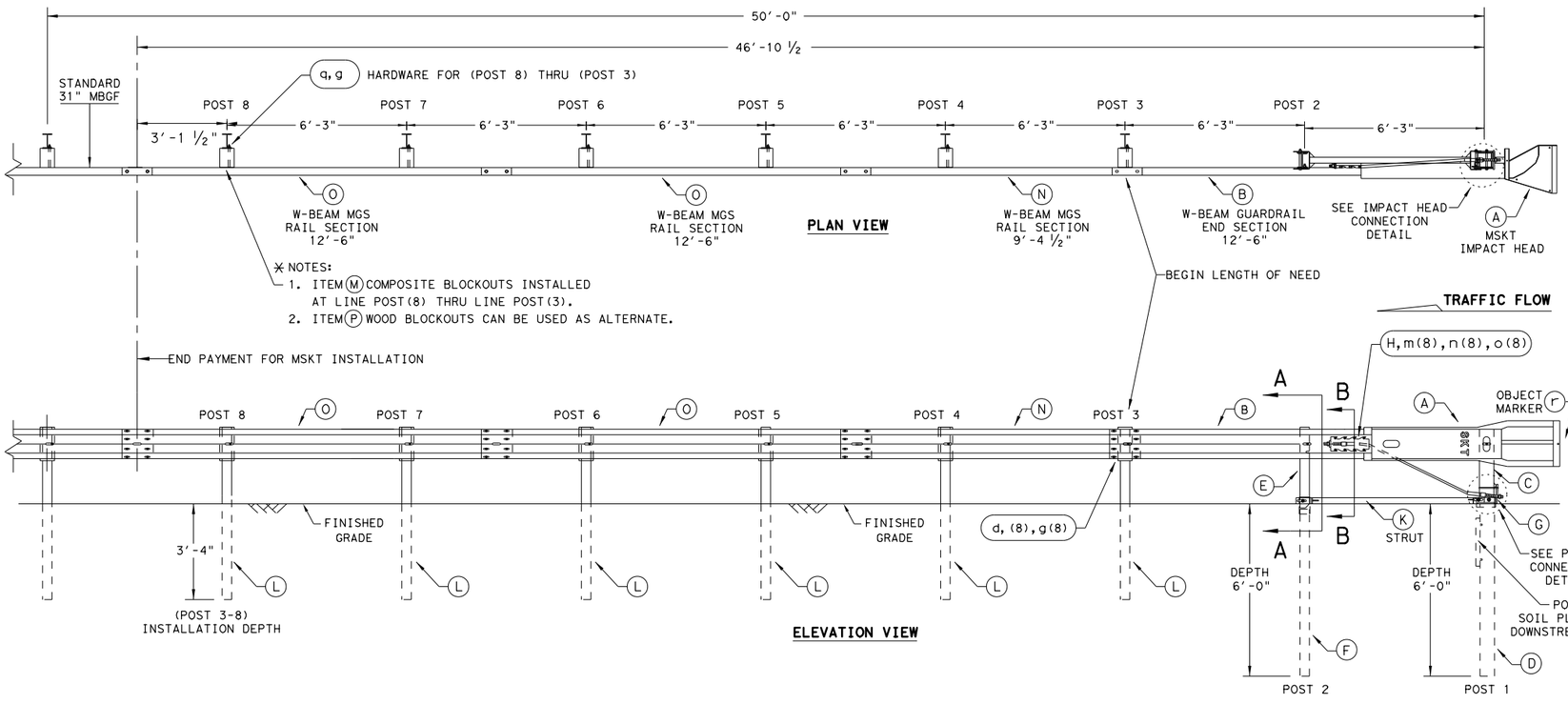
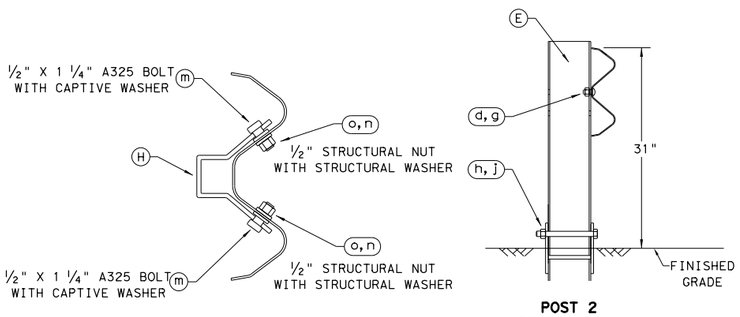
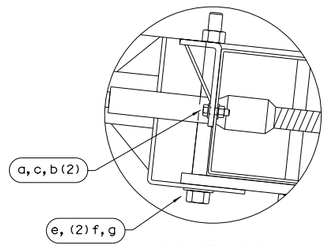


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

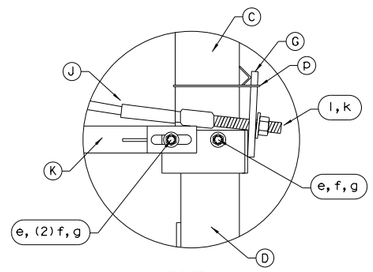


SECTION B-B
ANCHOR BRACKET

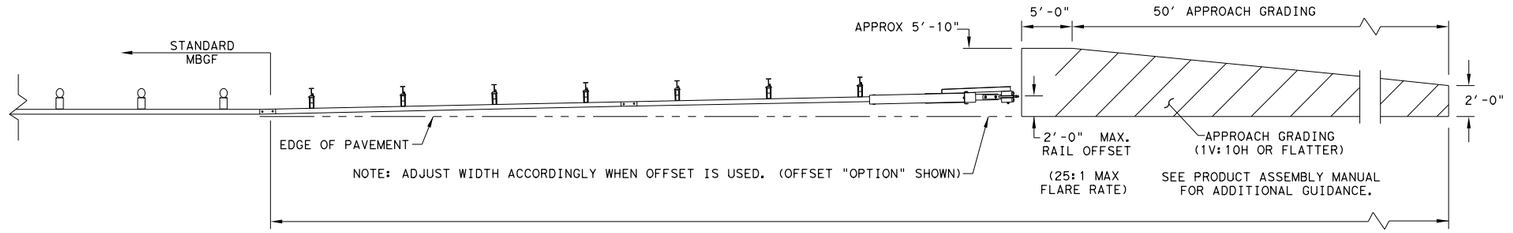
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



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.

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.

SEE NOTES: ✳

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

ALTERNATIVE ITEMS NOT SHOWN. ✳✳
✳ ITEM(P) 8" WOOD-BLOCKOUT
✳✳ ITEM(Q) 25'GUARD FENCE PANEL

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN:TxDOT	CK:KM	DW:VP	CK:CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0073	12	015,etc	US 181,etc	
	DIST	COUNTY		SHEET NO.	
	SAT	BEXAR		170	

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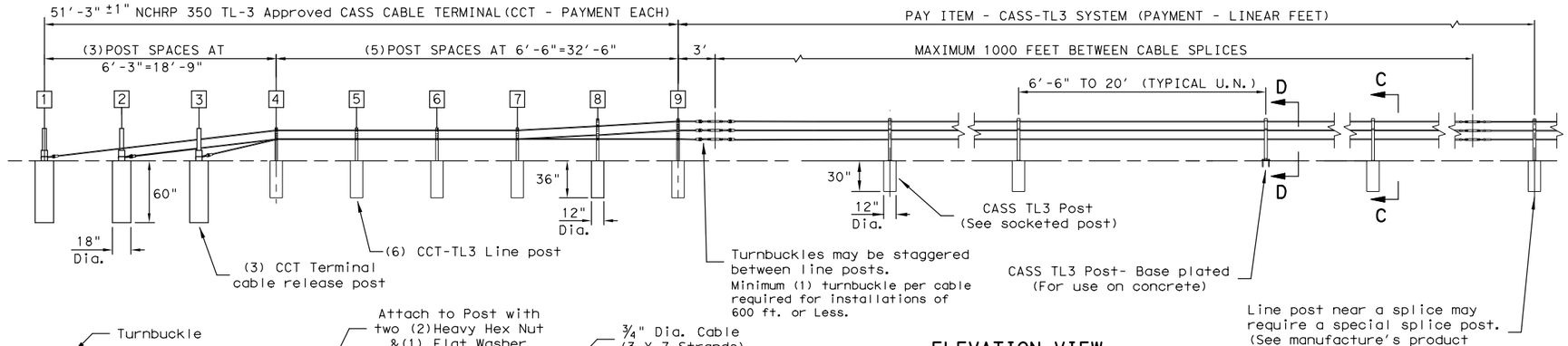
Preferred Installation: Locate post #2 away from nearest traffic.
System has been succesfully tested with opposite installation.

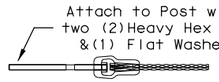
Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Past Post #4)

PLAN VIEW

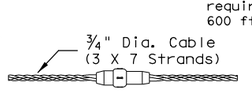


ELEVATION VIEW
(TYPICAL LAY-OUT)

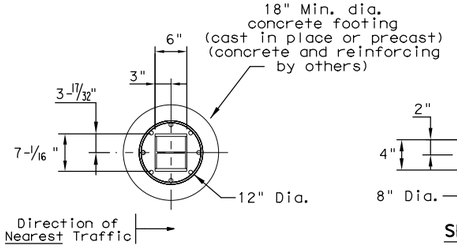
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)



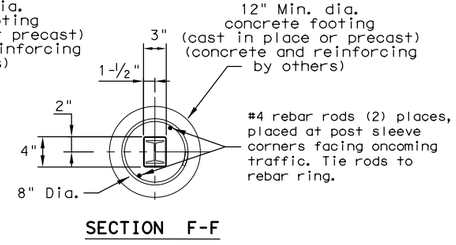
CABLE STUD ASSEMBLY



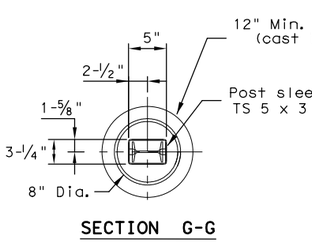
TORPEDO CABLE SPLICE



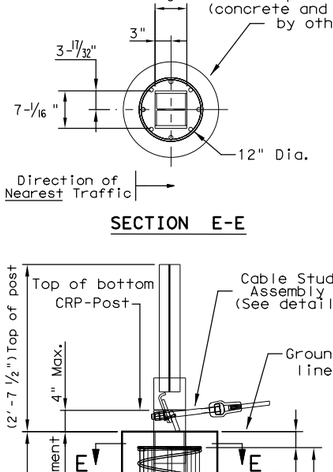
SECTION E-E



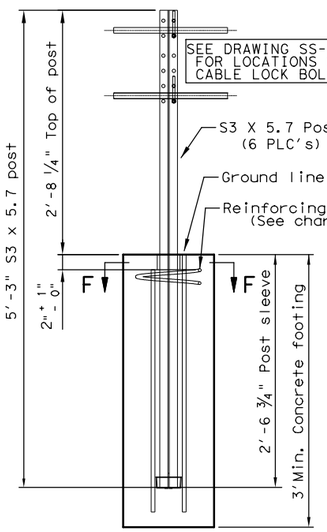
SECTION F-F



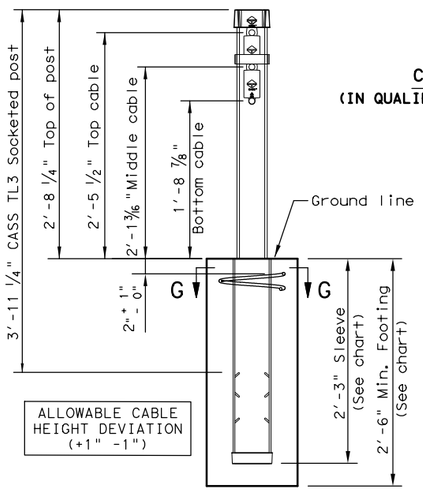
SECTION G-G



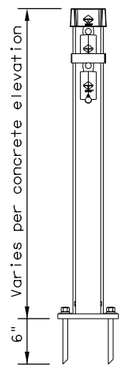
VIEW A-A
(CABLE RELEASE POST 1-3)



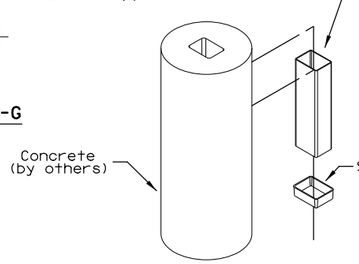
VIEW B-B
(TERMINAL LINE POST 4-7)



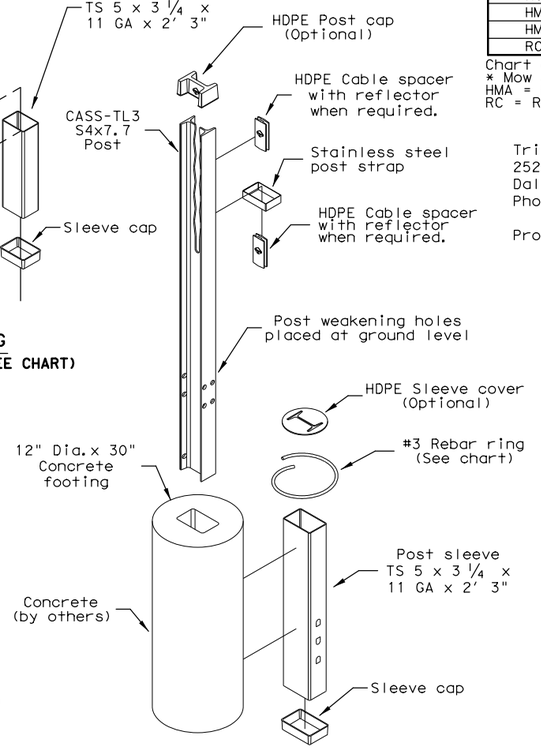
SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)



CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)



STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-3 Barrier System. See SS-730 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS TL-3 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-3 post spacing may be modified to avoid obstacles that conflict with the installation of CASS TL-3 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-3 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately ⅛" per foot).
10. CASS TL-3 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
* Mow strip or pavement.
HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
RC = Reinforced Concrete (TxDOT Class A Minimum).

CABLE TENSION CHART	
FAHRENHEIT	PRE-STRETCHED
DEGREES	LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

Trinity Highway Products, LLC.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: (800) 644-7976

Product.INFO@TRIN.NET

Texas Department of Transportation

Design Division Standard

TRINITY CABLE SAFETY SYSTEM (TL-3)

CASS(TL3)-14

FILE: casst1314.dgn	DN: TxDOT	CK: RM	DW: VP	CK:	
©TxDOT: MARCH 2014	CONT	SECT	JOB		HIGHWAY
REVISIONS	0073	12	015,etc		US 181,etc
	DIST	COUNTY			SHEET NO.
	SAT	BEXAR			171

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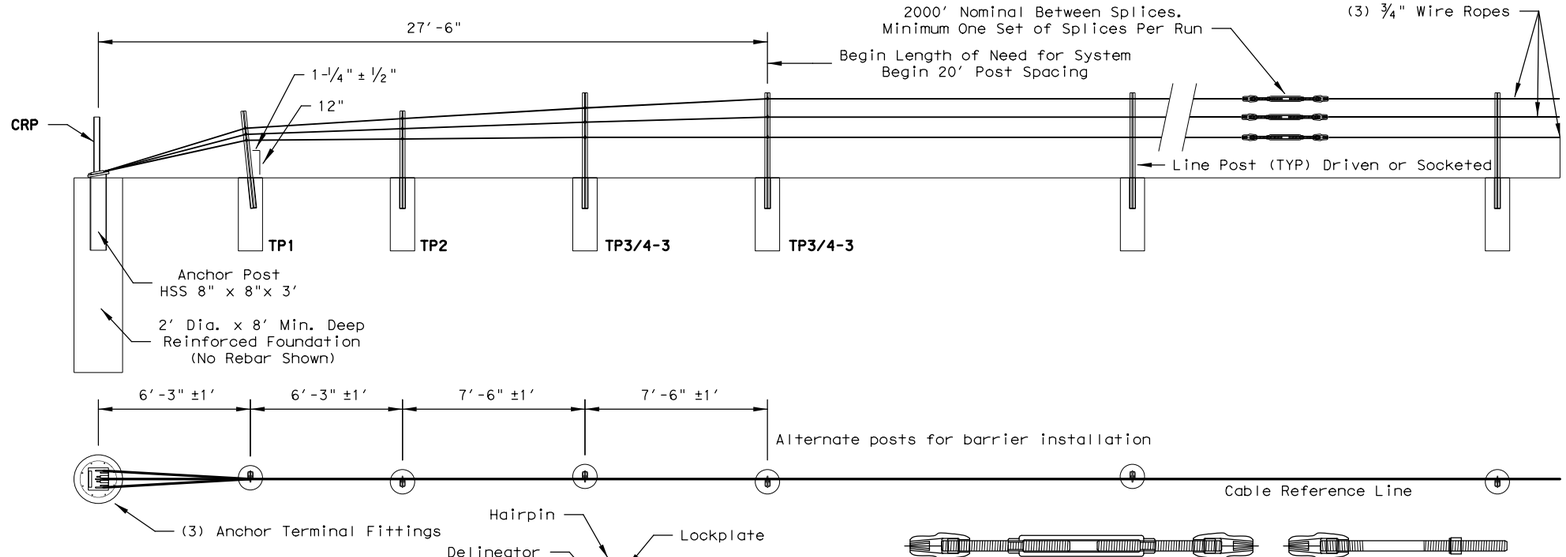
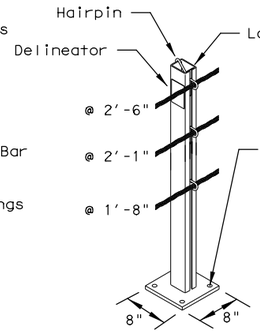
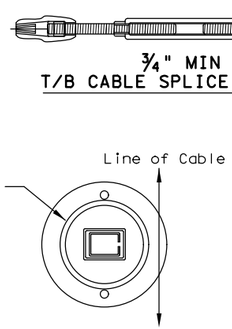
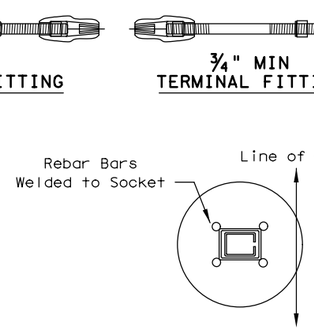




LINE POST
(BASE-PLATED OPTION)
Low-Fill Box Culvert Less than 15" Fill



SECTION A



SECTION B

C-SECTION POST

¾" MIN
T/B CABLE SPLICE FITTING

¾" MIN
TERMINAL FITTING

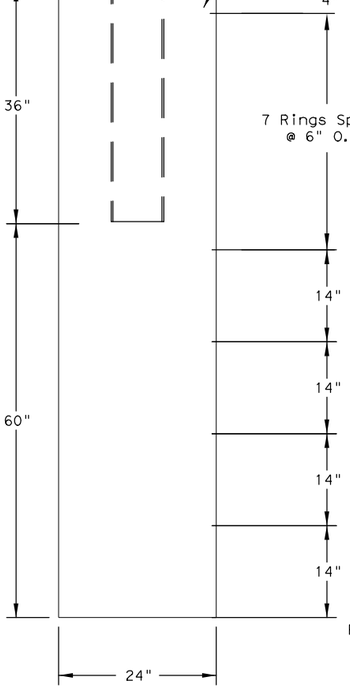
GENERAL NOTES

1. For additional information contact Gibraltar, Inc. at 1-800-495-8957, 830-798-5444, or see the manufacturer's product manual.
2. All concrete shall be CLASS A.
3. The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter.
4. The Cable Barrier System is accepted by the FHWA Test Level - 3.
5. See the Texas MUTCD for proper "Barrier" delineation.
6. Rock Clause: Where solid rock is encountered:
   A. For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
   B. For driven post, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
   C. For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
7. Tolerances:
   * LP = 3" out of plumb, at top
   * Cable height = 1"
   * Anchor Post = 5" off of Cable Reference Line
8. The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
9. All non-welded rebar by others.
10. Minimum recommended line post foundation.
    A. Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long
    B. With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long.
    C. With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required)
    D. Direct drive post 42" deep.

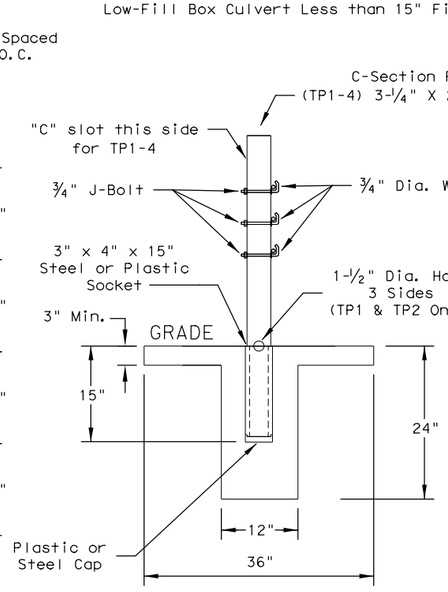
CABLE TENSION CHART*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

DEFLECTION	
Deflection	Post Spacing
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

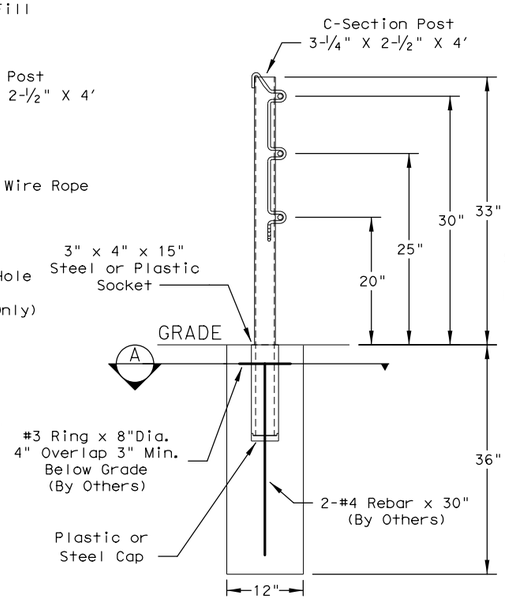
* Allowable Deviation from Chart +/- 10%



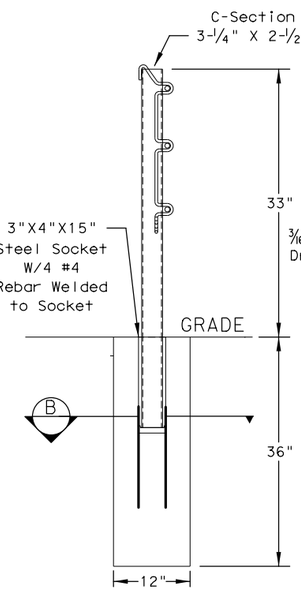
CABLE RELEASE AND ANCHOR POST



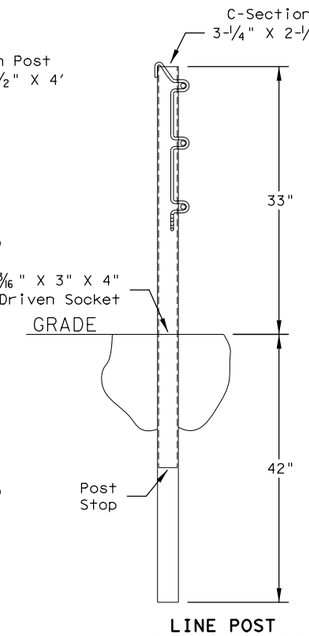
TERMINAL POST
(SHOWN WITH CONCRETE MOWSTRIP)
(Shown with Tube Plate Option)
(See Note 9)



LINE POST SOCKETED
(Shown with Rebar Ring/Bars Socket Option)
(See Note 9)



LINE POST SOCKETED
(Shown with Welded Rebar Socket Option)
(See Note 9)



LINE POST
(DRIVEN OPTION)
(Shown with Driven
Socket Option)
(See Note 9)

Texas Department of Transportation

Design Division Standard

GIBRALTAR
CABLE BARRIER SYSTEM
(TL-3)

GBRLTR(TL3)-14

FILE: gbrltrt1314.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		172

DATE: 2/25/2021
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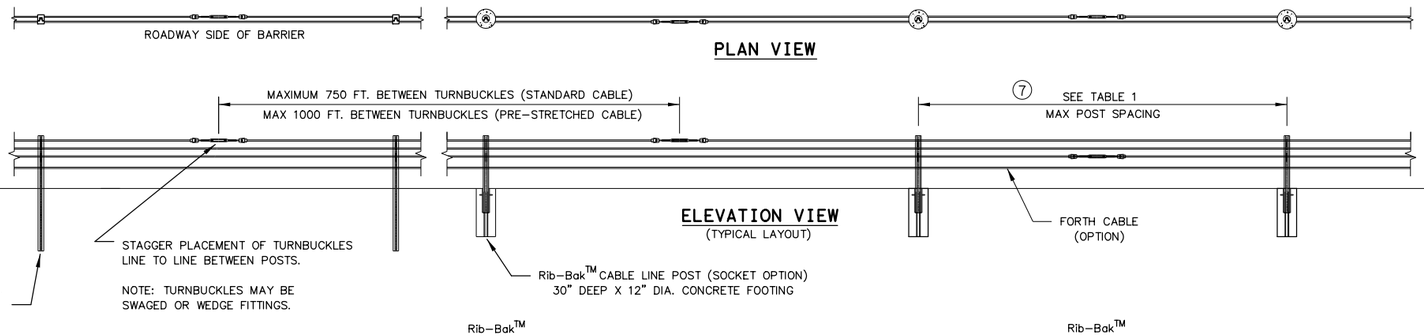
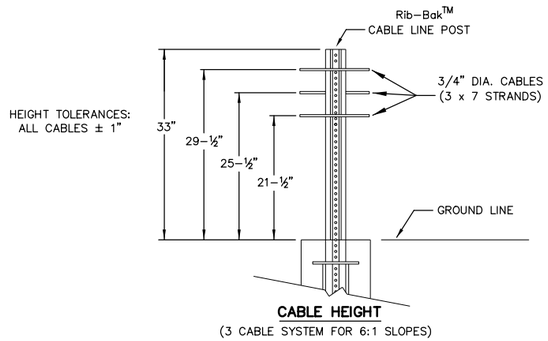
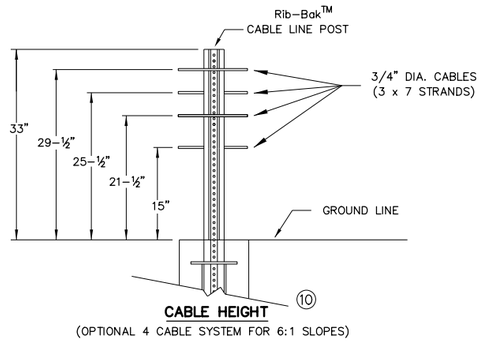
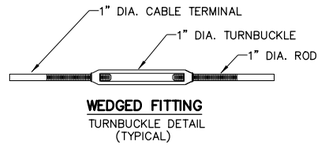




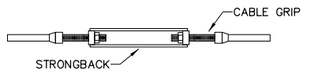
CABLE HEIGHT
(3 CABLE SYSTEM FOR 6:1 SLOPES)



CABLE HEIGHT
(OPTIONAL 4 CABLE SYSTEM FOR 6:1 SLOPES)



WEDGED FITTING
TURNBUCKLE DETAIL
(TYPICAL)



STRONGBACK (SELF-SWAGING)
TURNBUCKLE DETAIL
(OPTIONAL)

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (603) 430-9350.
2. FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
3. FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
4. THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
5. THE NU-CABLE SYSTEM SHALL BE INSTALLED ON SHOULDERS OR MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC. THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
6. THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bak™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
7. THE TL-3 THREE-CABLE AND FOUR-CABLE FOR 6:1 SLOPES CAN USE EITHER A 4# /LF OR 5# /LF POST. SEE TABLE # 1 FOR POST SIZE PER SPACING.
8. SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
9. SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
10. FOURTH (LOWEST) CABLE IS OPTIONAL. SEE PROJECT SPECIFICATIONS FOR REQUIRMENT OF FOURTH CABLE.
11. CONSULT YOUR PROJECT PLAN SHEET AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
12. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

⑦ TABLE 1

POST SIZE TABLE	
POST SPACING	POST SIZE
0' – 17'-6"	4# / LF X 4' OR 6' POST
17'-6" – 20'	5# / LF X 4' POST

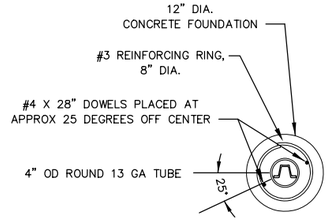
POST SPACING IS PER 8 FOOT DEFLECTION REQUIRMENTS.
CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

⑧ TABLE 2

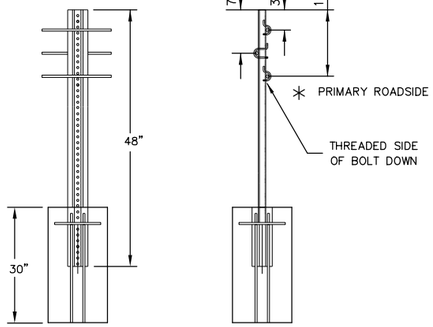
CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

⑨ TABLE 3

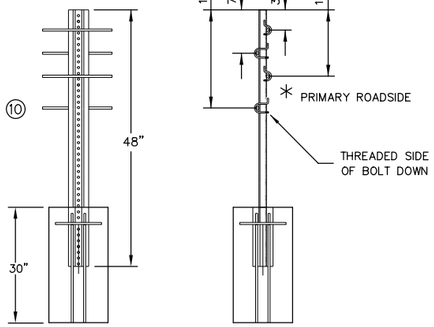
CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918



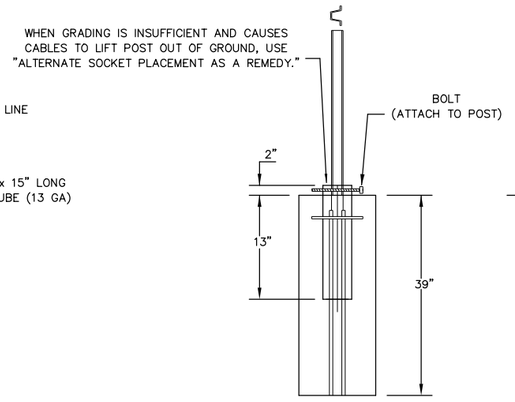
SOCKETED POST OPTION ⑪
(TYPE S POST)



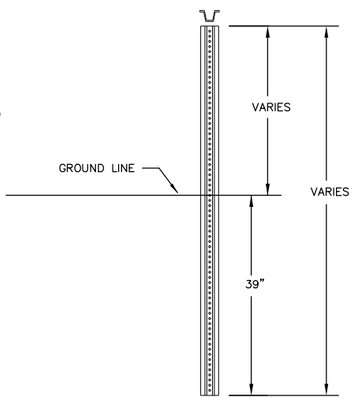
INSTALLATION DETAIL
3 CABLE 6:1



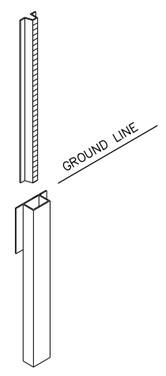
INSTALLATION DETAIL
4 CABLE 6:1



ALTERNATE SOCKET PLACEMENT
(TYPE S POST)



DRIVEN POST OPTION
(TYPE D POST)



DRIVEN SOCKET OPTION
(TYPE S POST)

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-3) (3 OR 4 CABLE)

NU-CABLE(TL3)-14

FILE:	DN:	CK:	DW:	CK:
©TxDOT:	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		173

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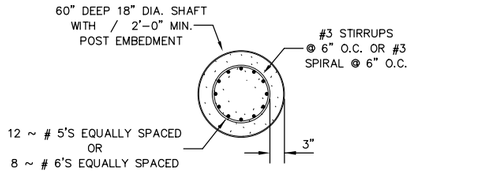
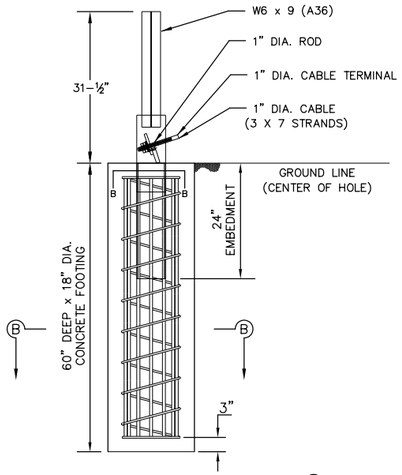
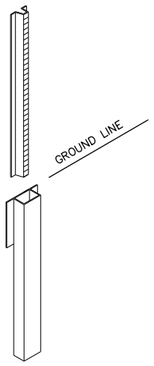


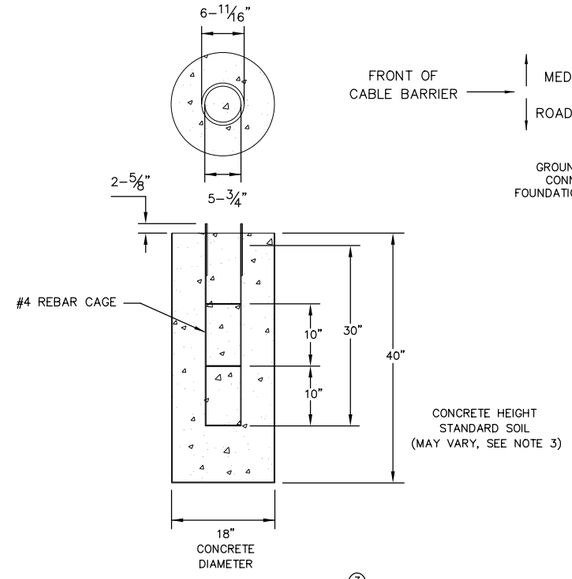
SECTION B-B
(CABLE RELEASE POST)



DETAIL A – CRP IN CONCRETE FOOTING ③
(3000 PSI MIN CONCRETE)



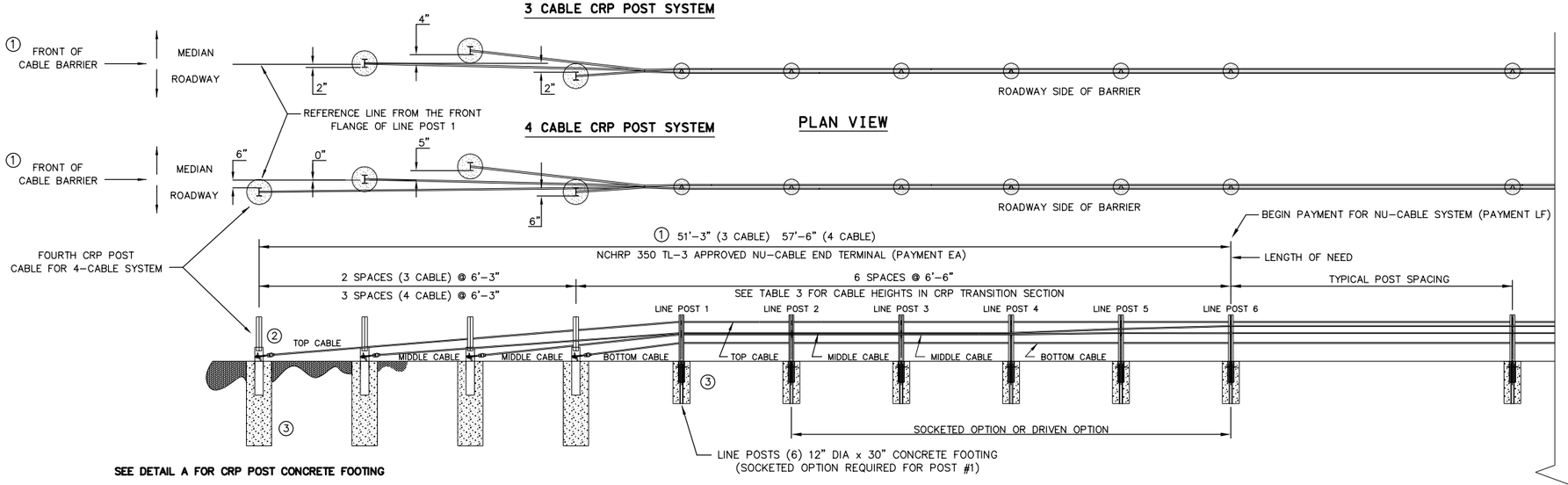
DRIVEN SOCKET OPTION



NU-TEN CONCRETE FOOTING DETAIL ③

3 CABLE CRP POST SYSTEM

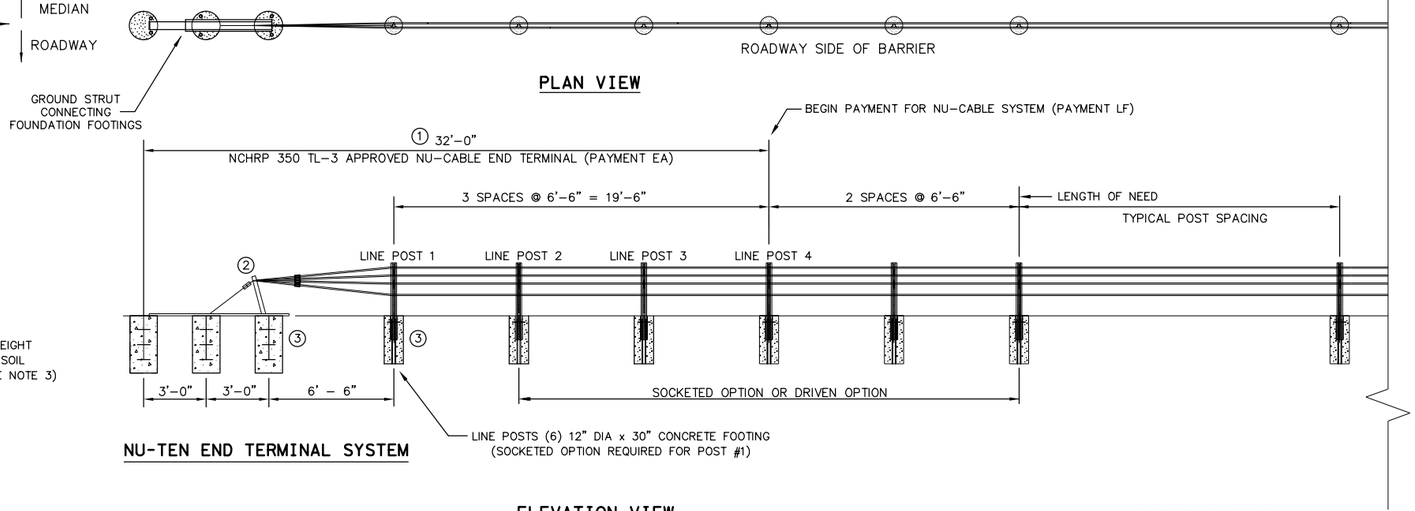
4 CABLE CRP POST SYSTEM



SEE DETAIL A FOR CRP POST CONCRETE FOOTING

CRP POST END TERMINAL SYSTEMS (3 AND 4 CABLE)

ELEVATION VIEW



PLAN VIEW

NU-TEN END TERMINAL SYSTEM

ELEVATION VIEW

④ **TABLE 4**

CRP END TERMINAL CABLE HEIGHTS - TL-3- THREE CABLE						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	28"	28"	28"	28"	30"	30"
MIDDLE CABLE	22"	22"	22"	23"	25"	25"
BOTTOM CABLE	19"	19"	19"	20"	20"	21"
CRP END TERMINAL CABLE HEIGHTS - TL-3- FOUR CABLE 6:1						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	28"	28"	28"	28"	30"	30"
UPPER-MIDDLE CABLE	22"	22"	22"	23"	25"	25"
BOTTOM-MIDDLE CABLE	19"	19"	19"	20"	20"	21"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"

REFER TO SHEET 1 OF 2 FOR LENGTH OF NEED CABLE HEIGHTS.

NOTES:

1. THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT. SYSTEM PAYMENT IS PER EACH (EA). REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL PAYMENT INFORMATION.
2. REFER TO INSTALLATION MANUAL FOR CABLE END ASSEMBLY DETAIL.
3. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1)SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGNS IF SOIL TYPES DIFFER.
4. SEE TABLE 2 CABLE HEIGHTS IN CRP TRANSITION SECTION.

Texas Department of Transportation

Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-3) (3 OR 4 CABLE)

NU-CABLE(TL3)-14

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©TxDOT:	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		174

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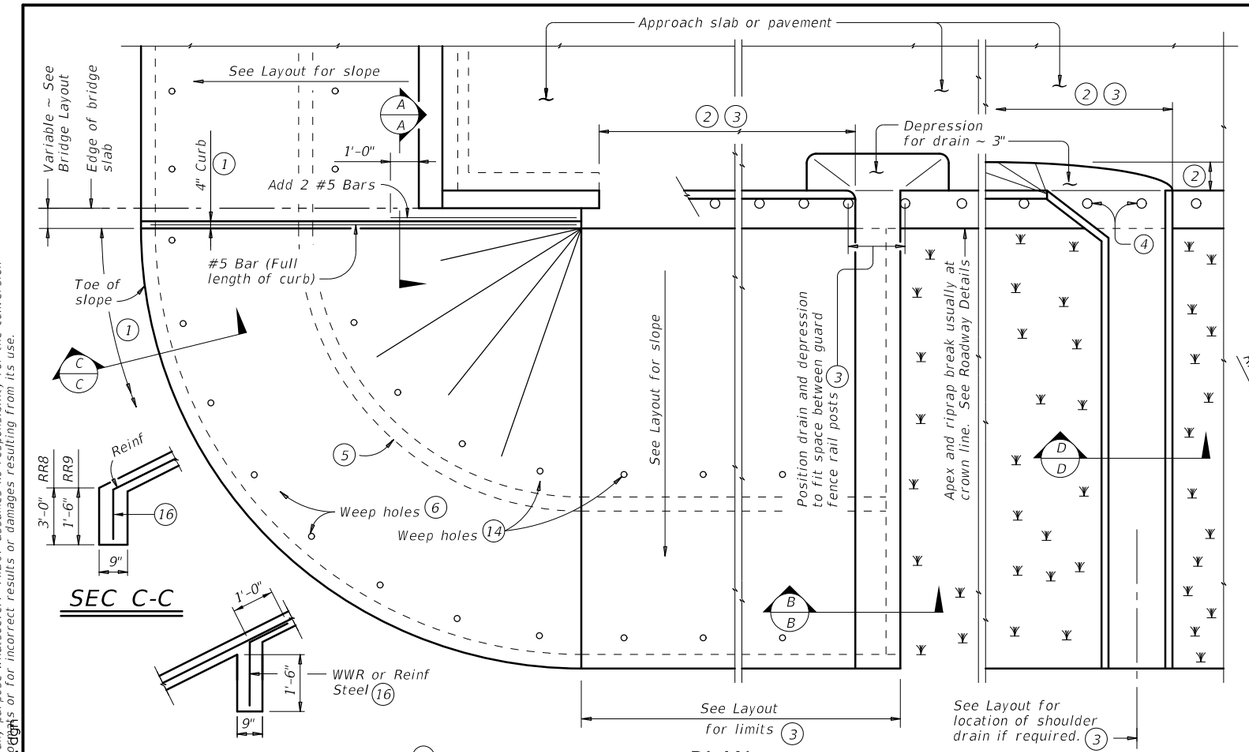
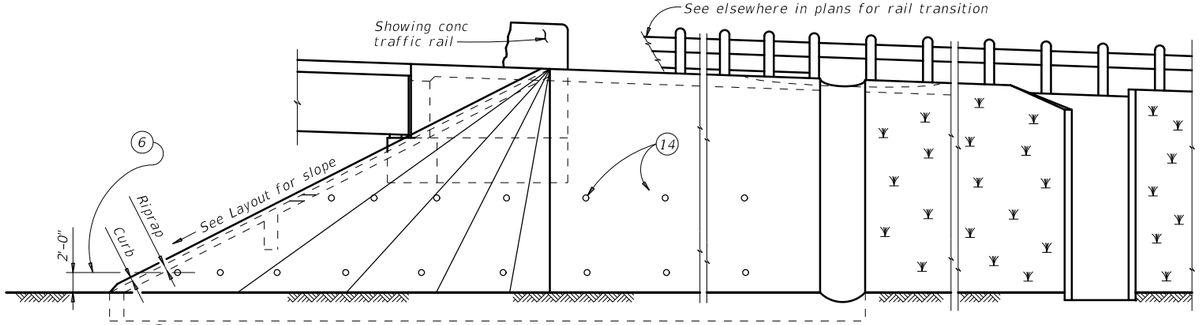
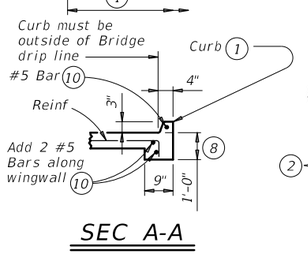
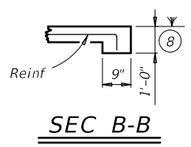
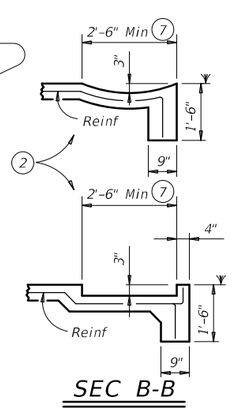
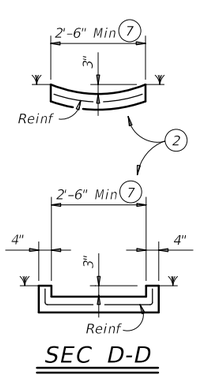


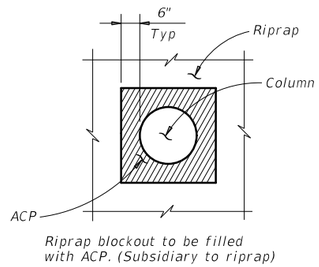


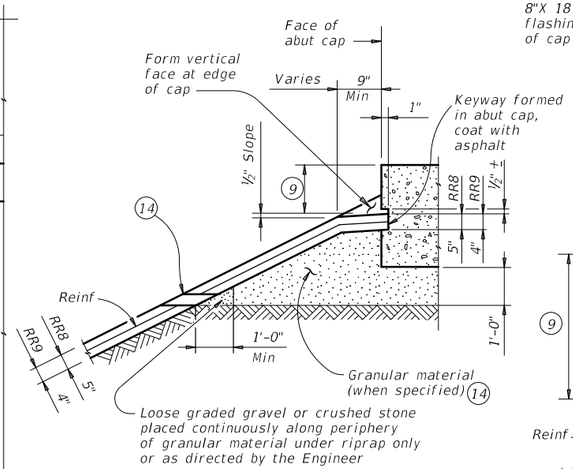


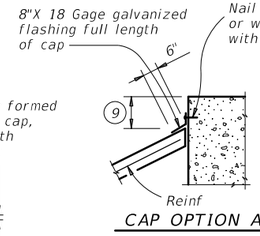


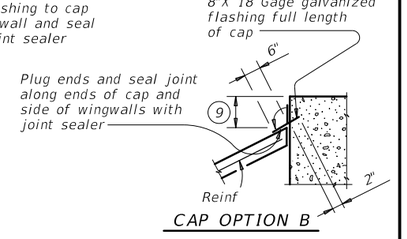


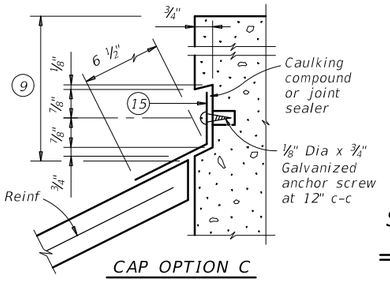


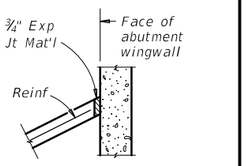






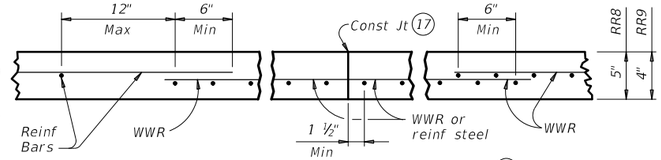






SECTIONS THRU RIPRAP AT CAP (11)

1. When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.
2. Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.
3. Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.
4. See details elsewhere in plans for installation of guard fence posts through concrete riprap.
5. Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.
6. Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.
7. Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.
8. Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.
9. Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.
10. #5 bars shown are required even when synthetic fiber reinforcing option is selected.
11. Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.
12. Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.
13. Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.
14. If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.
15. 8" x 18 Gage Galv Sheet Metal
16. Provide WWR or #3 bars, with 1'-0" extension into slope.
17. WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.



See General Notes for optional synthetic fiber reinforcement.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		175

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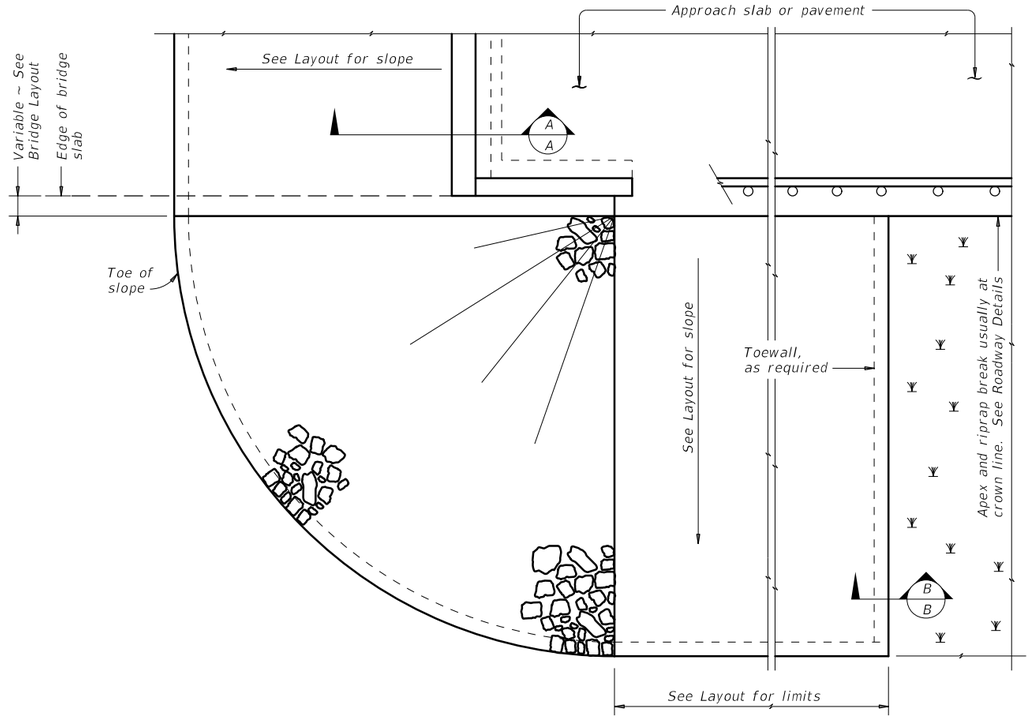
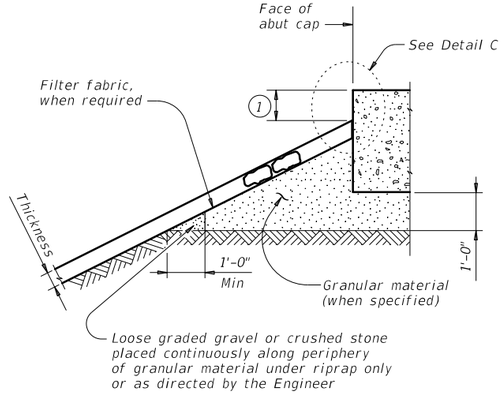
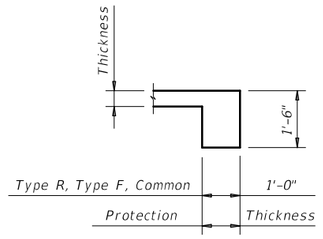


PLAN

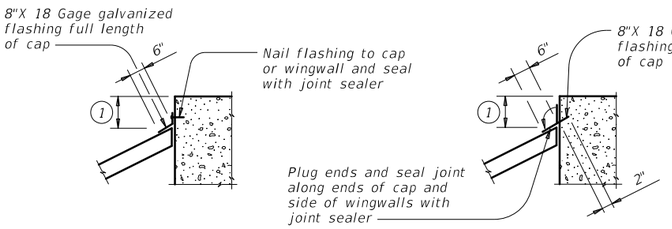


SECTION A-A AT CAP



SECTION B-B

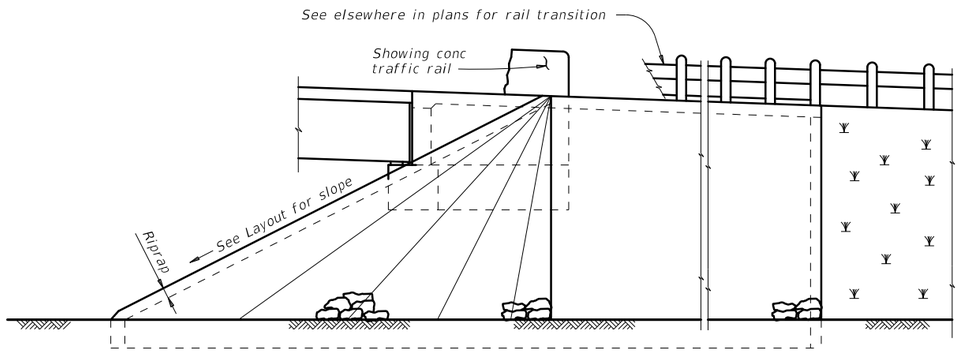
Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C



ELEVATION

GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

(1) Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		176

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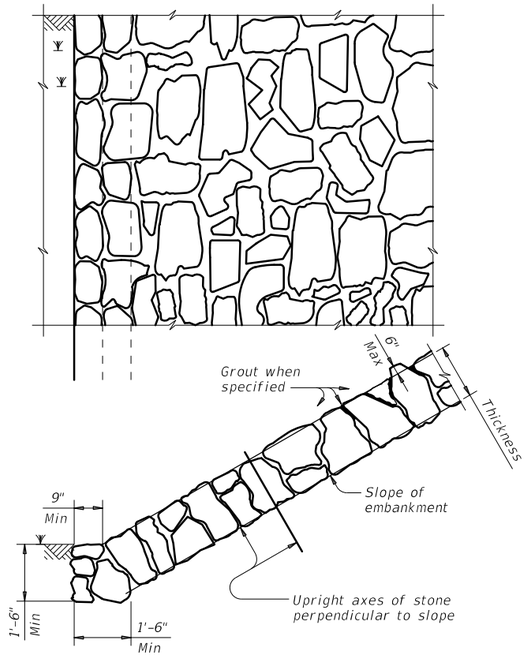


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

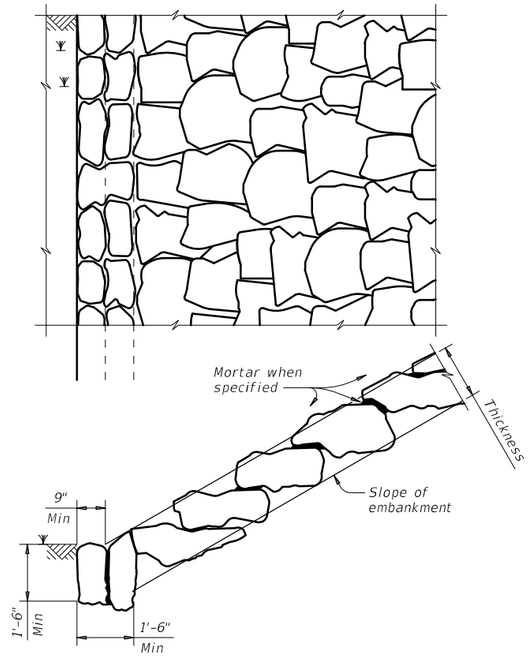


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

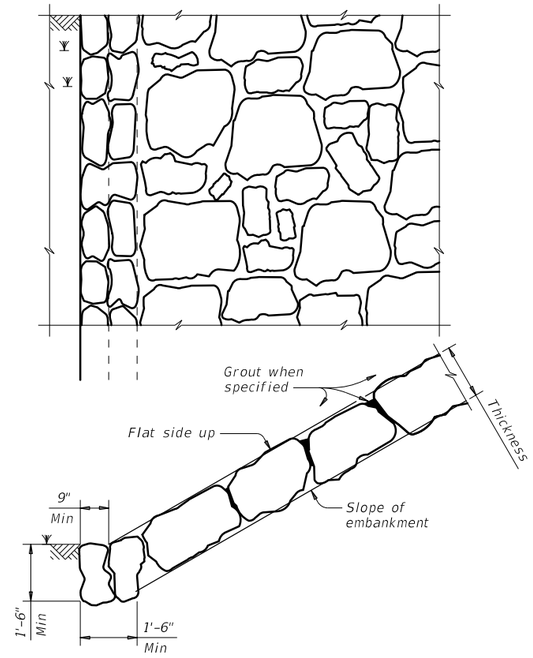


FIGURE 3 ~ TYPE F STONE RIPRAP

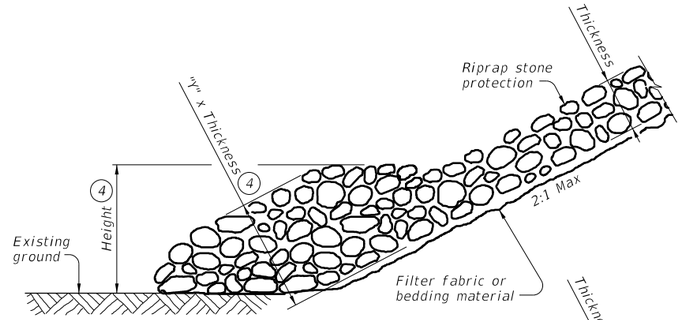
grouted

2 Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

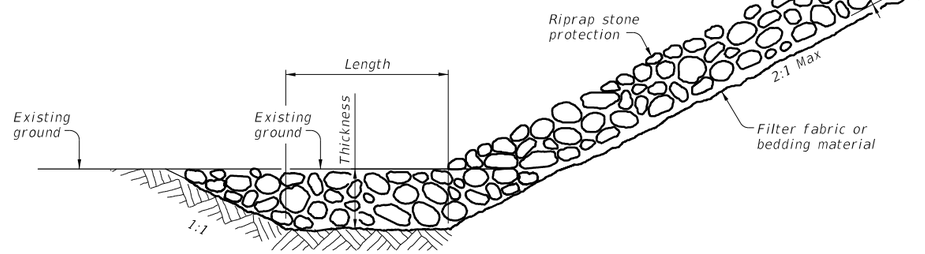
3 Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

4 "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

5 List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS 5

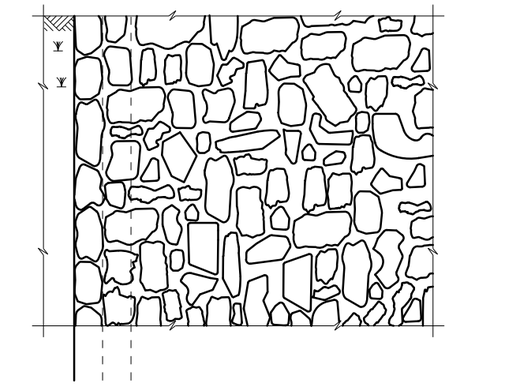


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

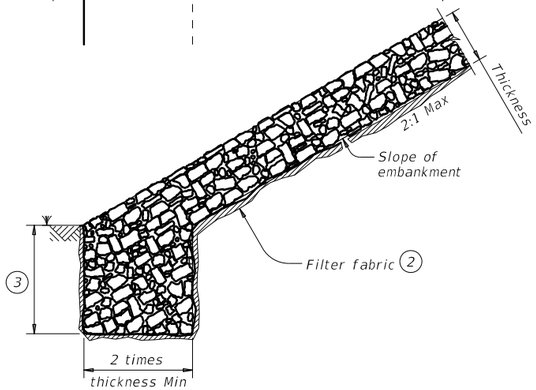


FIGURE 5 ~ PROTECTION STONE RIPRAP 5

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		177

LEVELS DISPLAYED

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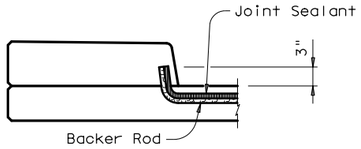
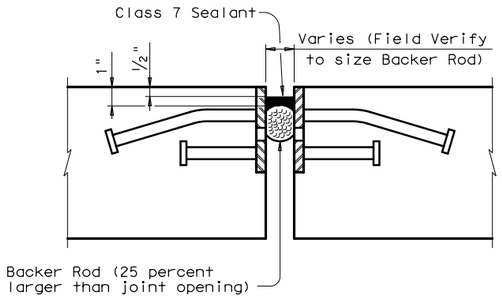


SHOWN AT CURB

JOINT SEALANT TERMINATION DETAILS



CLEANING AND SEALING EXISTING ARMOR JOINTS

(Showing Armor Joint Section)

PROCEDURE FOR CLEANING AND SEALING EXISTING ARMOR JOINTS:

1) Remove existing seal.

2) Abrasive blast clean existing steel surface where silicone seal is to be placed.

3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.

4) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening.

5) Seal the joint opening with a Class 7 Silicone. Recess seal ½" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

GENERAL NOTES:

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting joint opening, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints and Cracks" and measured by the foot of "Cleaning and Sealing of Existing Joints."

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

Provide Class 7 silicone sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete.

Extend sealant up into rail or curb 3 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 compatible with the Class 7 sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

PGAL
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Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

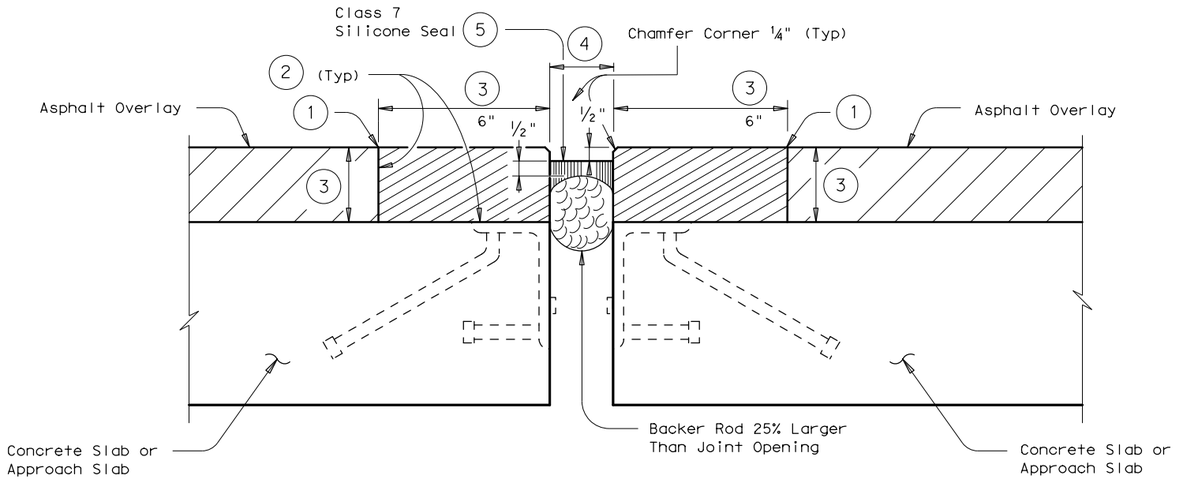
Luis A. González

Texas Department of Transportation
Bridge Division

CLEANING AND SEALING EXISTING BRIDGE JOINTS

US 87 BRIDGE OVER SALADO CREEK

FILE: beejr001.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	SAT			178
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	BEXAR	0073	12	015, ETC	US 181, ETC



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

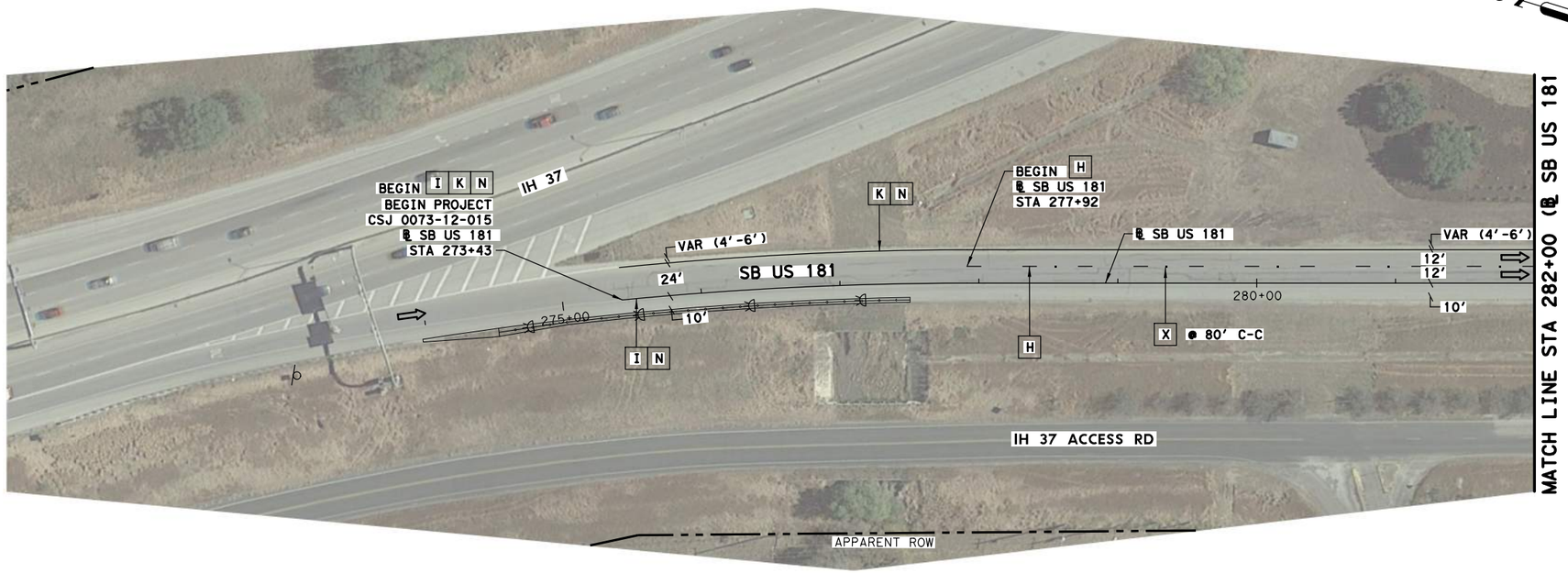
(5) After placing header material, install backer rod and sealant in accordance with Item 438, "Cleaning and Sealing Joints".
Extend sealant up into rail or curb 6 inches on low side or sides of deck. If the Class 7 sealant cannot be effectively placed in the vertical position, a Class 4 sealant is allowed 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.

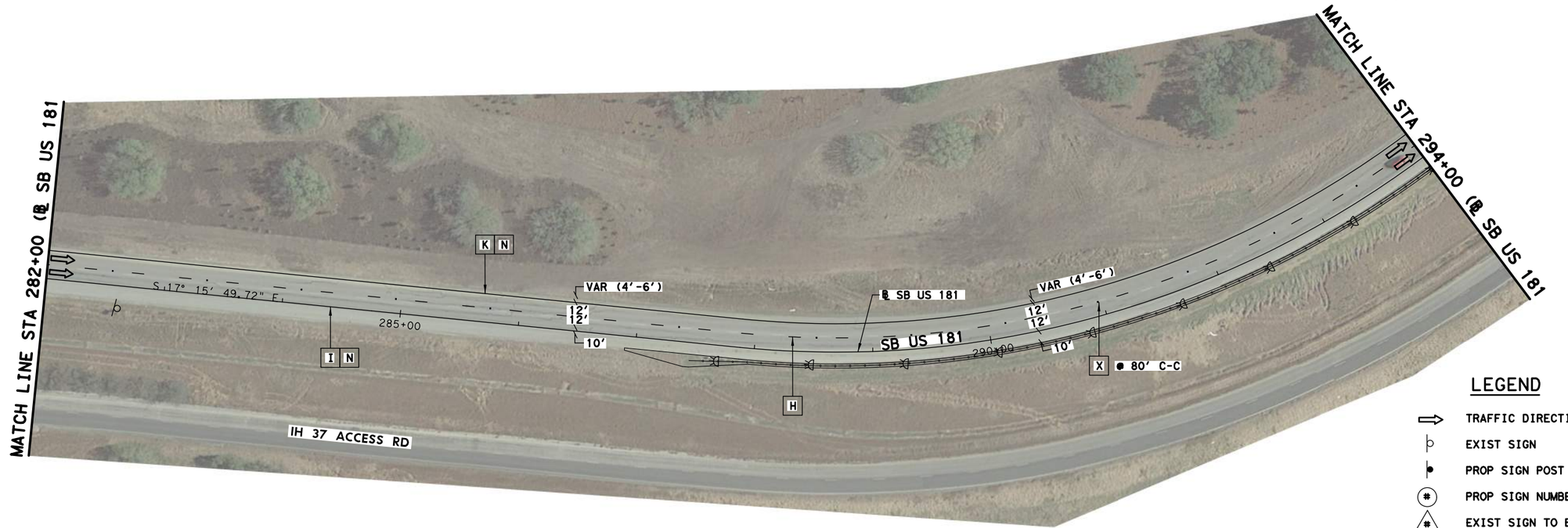
SAN ANTONIO DISTRICT STANDARD

Texas Department of Transportation

EXPANSION JOINT HEADER REPAIR

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
6			179
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0073	12	015, etc	US 181, etc





US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
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	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	13
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	410
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2057
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	2057
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	4114
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	
X	672	6010	REFL PAV MRKR TY II-C-R	EA	21
	666	6225	PAVEMENT SEALER 6"	LF	4524
	666	6226	PAVEMENT SEALER 8"	LF	
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
BEGIN PROJECT TO STA 294+00

SHEET 1 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			180
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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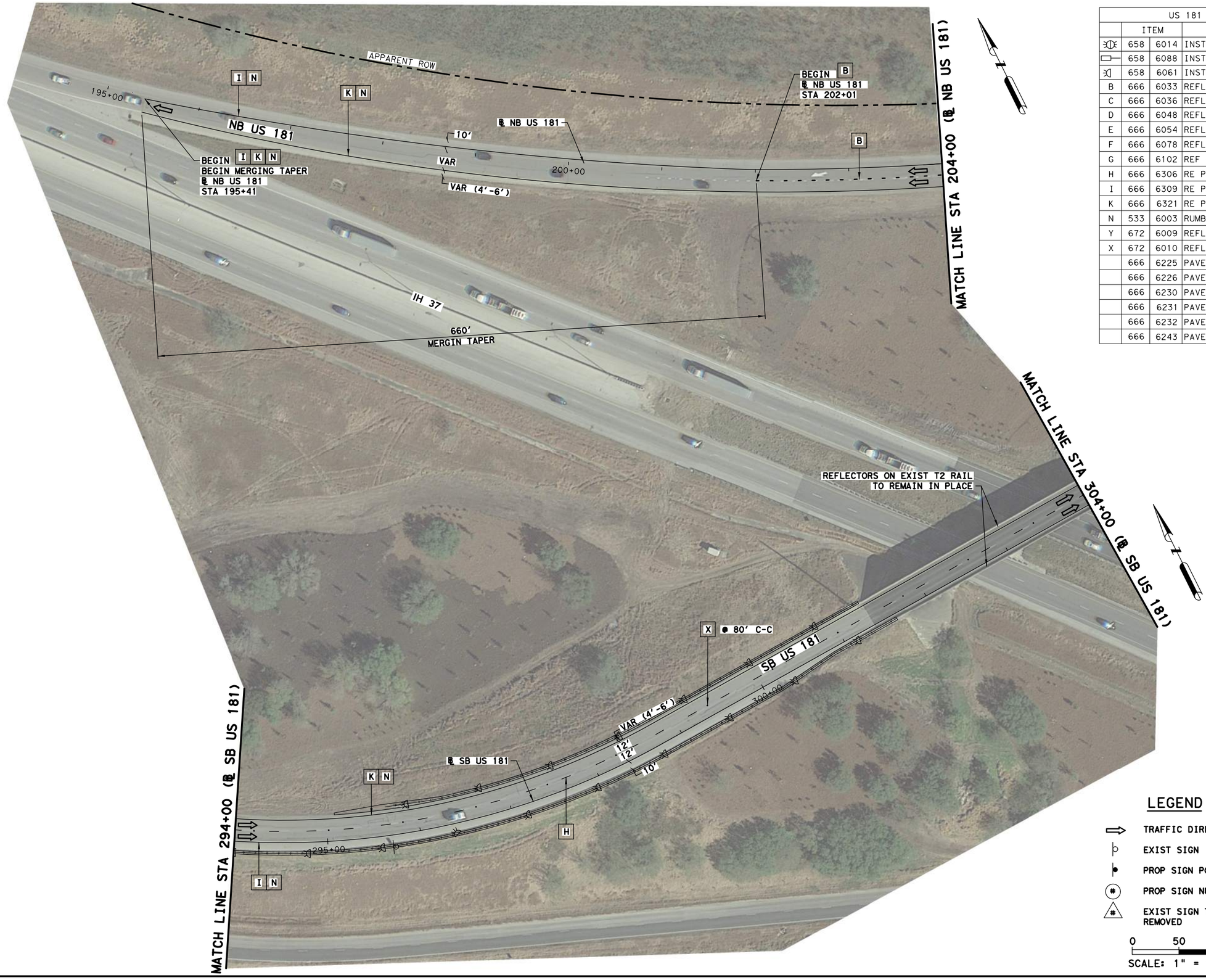

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
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B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	42
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	250
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1859
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	1859
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	3718
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	
X	672	6010	REFL PAV MRKR TY II-C-R	EA	14
	666	6225	PAVEMENT SEALER 6"	LF	3968
	666	6226	PAVEMENT SEALER 8"	LF	42
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

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LEGEND

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- EXIST SIGN
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- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 294+00 TO STA 304+00

SHEET 2 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			181
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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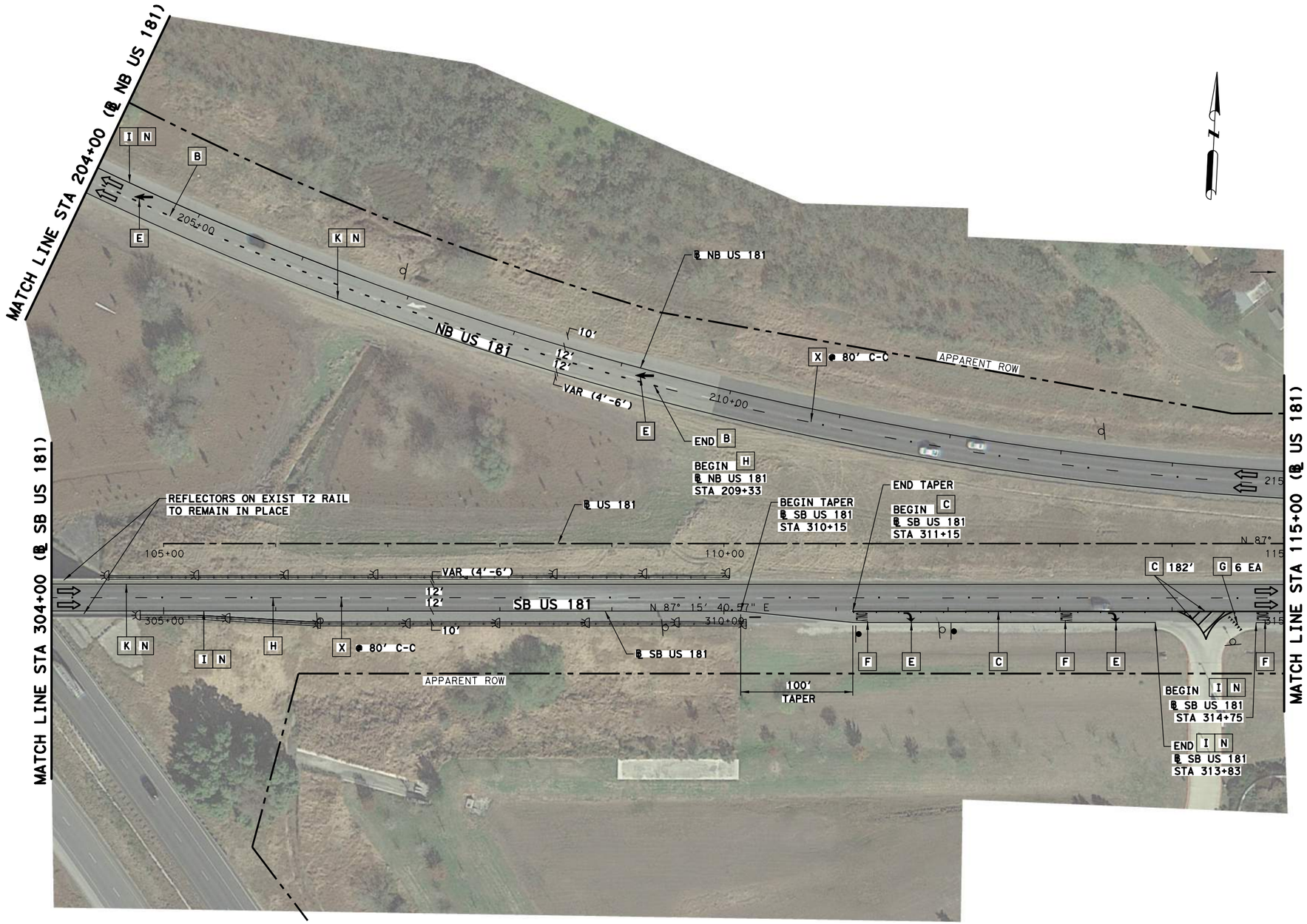

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	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	16
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	134
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	567
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	3
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	6
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	400
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2102
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	2200
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	4302
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	
X	672	6010	REFL PAV MRKR TY II-C-R	EA	25
	666	6225	PAVEMENT SEALER 6"	LF	4702
	666	6226	PAVEMENT SEALER 8"	LF	701
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	3
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	6

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

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STATE OF TEXAS
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Robert S. Doty 3/19/2021

Texas Department of Transportation

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US 181 PAVEMENT MARKING LAYOUT

STA 304+00 TO STA 115+00

SHEET 3 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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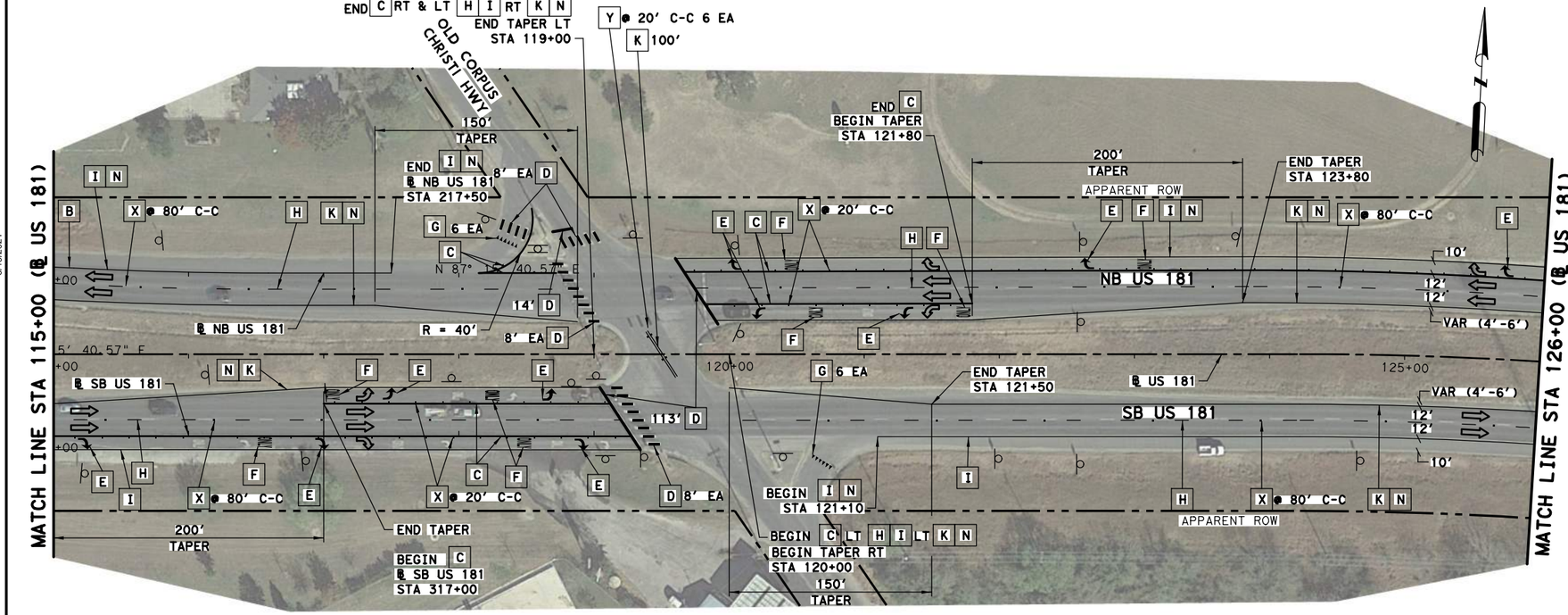
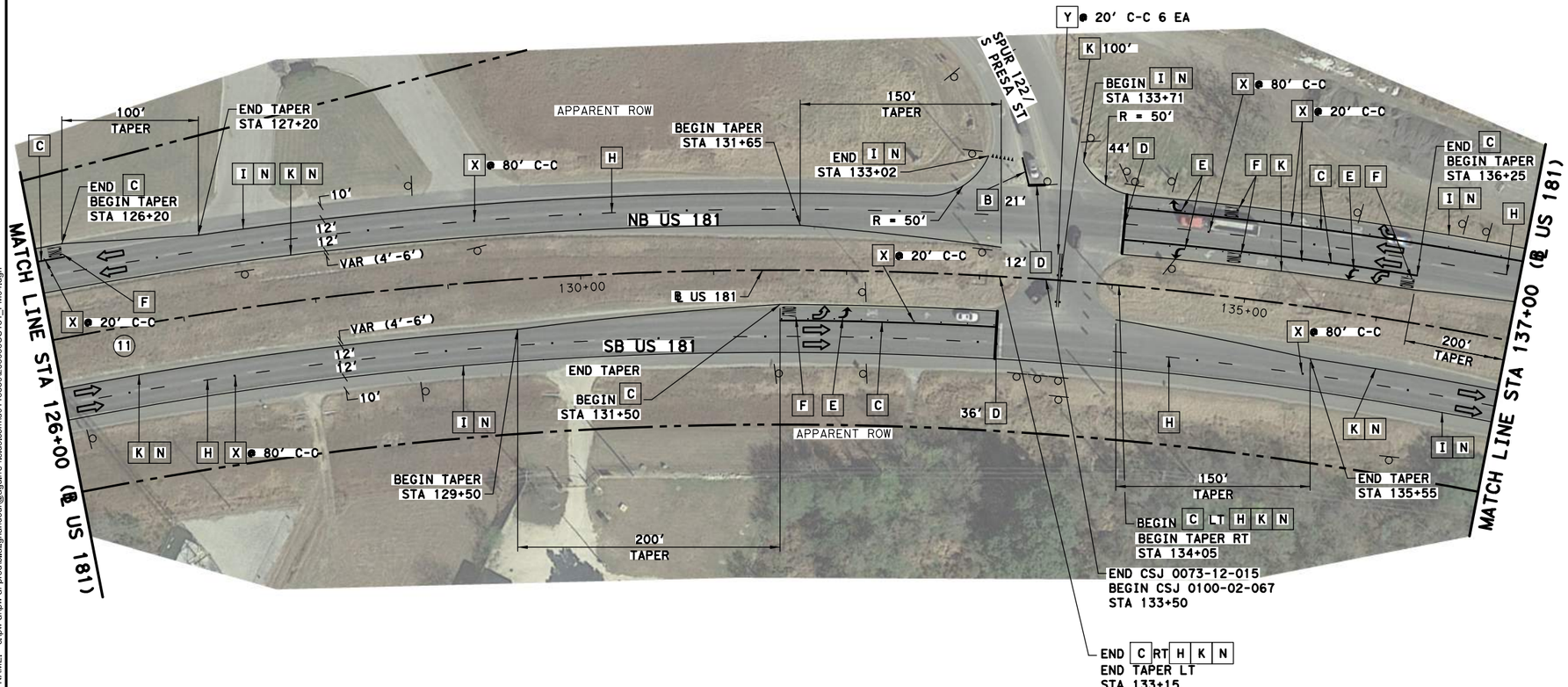


US 181 LEGEND & ESTIMATED SHEET QUANTITIES						
	ITEM		DESCRIPTION	UNIT	QTY	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA		
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA		
	658	6061	INSTL DEL ASSM (D-SW) SZ 1 (BRF)GF2	EA		
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF		
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	1375	515
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	363	56
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	11	3
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	10	3
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	12	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	800	160
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	3256	679
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	3530	690
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	6786	1369
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	4	4
X	672	6010	REFL PAV MRKR TY II-C-R	EA	96	34
	666	6225	PAVEMENT SEALER 6"	LF	7586	1529
	666	6226	PAVEMENT SEALER 8"	LF	1375	515
	666	6230	PAVEMENT SEALER 24"	LF	363	56
	666	6231	PAVEMENT SEALER (ARROW)	EA	11	3
	666	6232	PAVEMENT SEALER (WORD)	EA	10	3
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	12	

CSJ 0073-12-015

CSJ 0100-02-067



LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 115+00 TO STA 137+00

SHEET 4 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			183
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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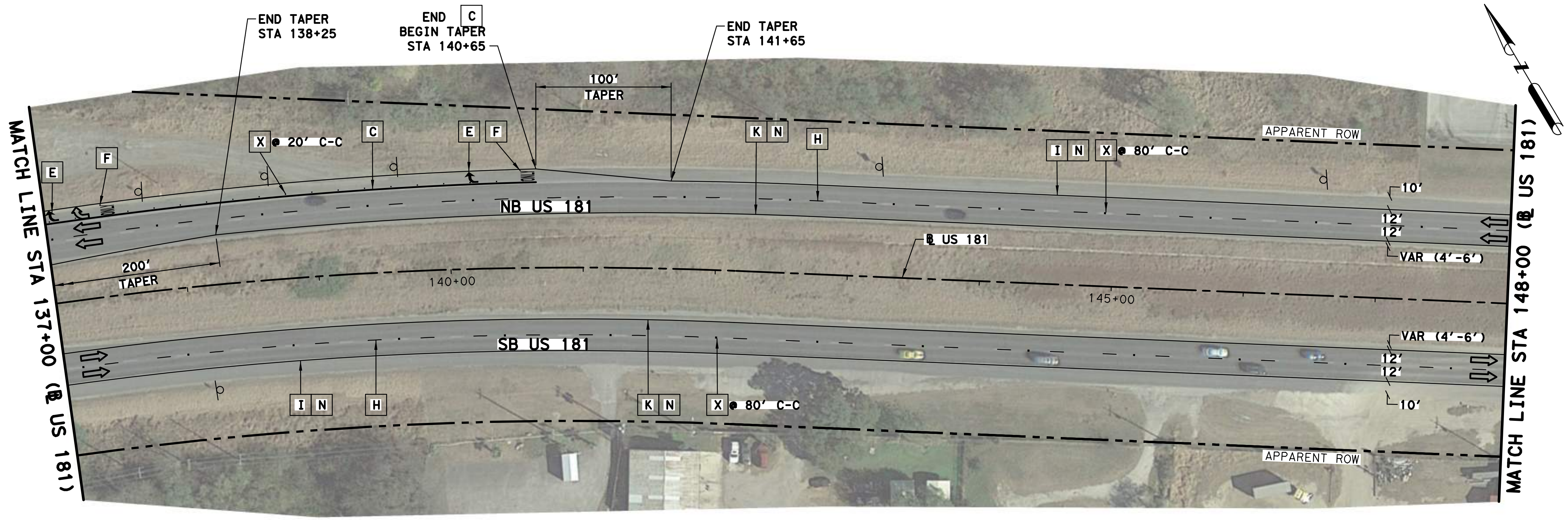
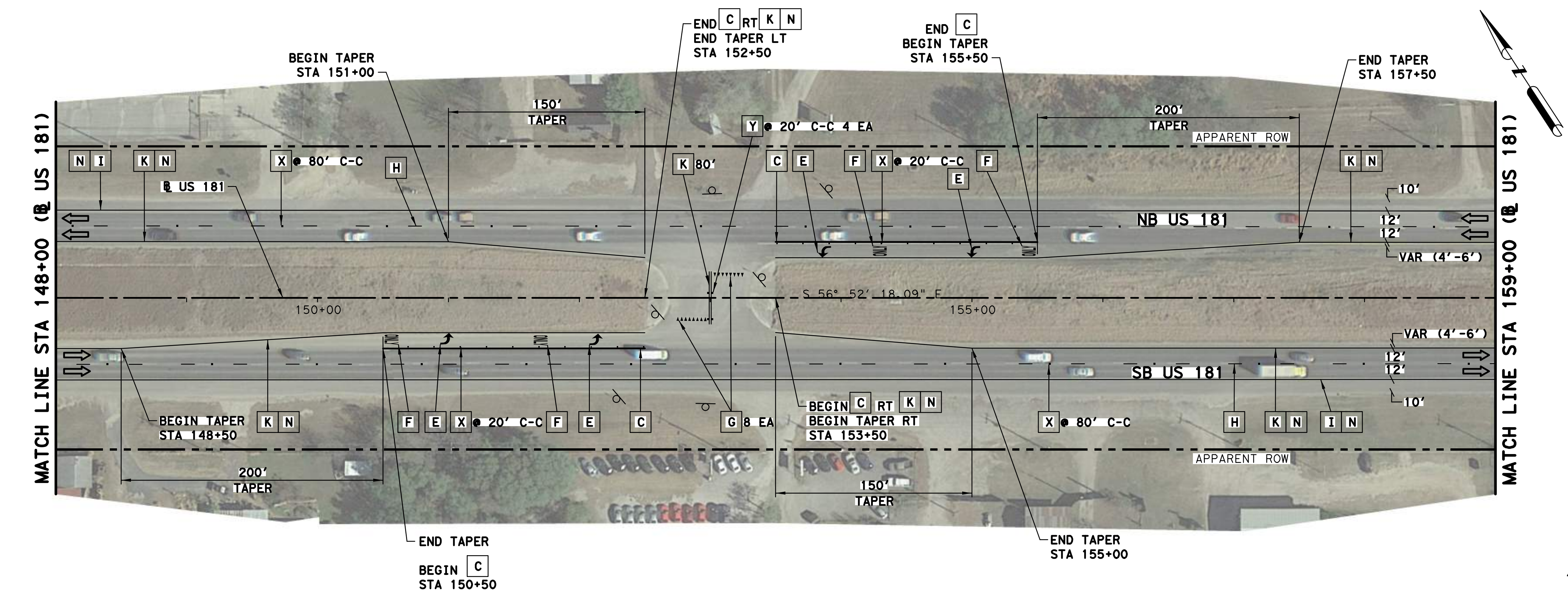


	ITEM		DESCRIPTION	UNIT	QTY
US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	765
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	6
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	6
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4200
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8600
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	4
X	672	6010	REFL PAV MRKR TY II-C-R	EA	94
	666	6225	PAVEMENT SEALER 6"	LF	9700
	666	6226	PAVEMENT SEALER 8"	LF	765
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	6
	666	6232	PAVEMENT SEALER (WORD)	EA	6
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.



STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100
SCALE: 1" = 100'

US 181 PAVEMENT MARKING LAYOUT

STA 137+00 TO STA 159+00

SHEET 5 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			184
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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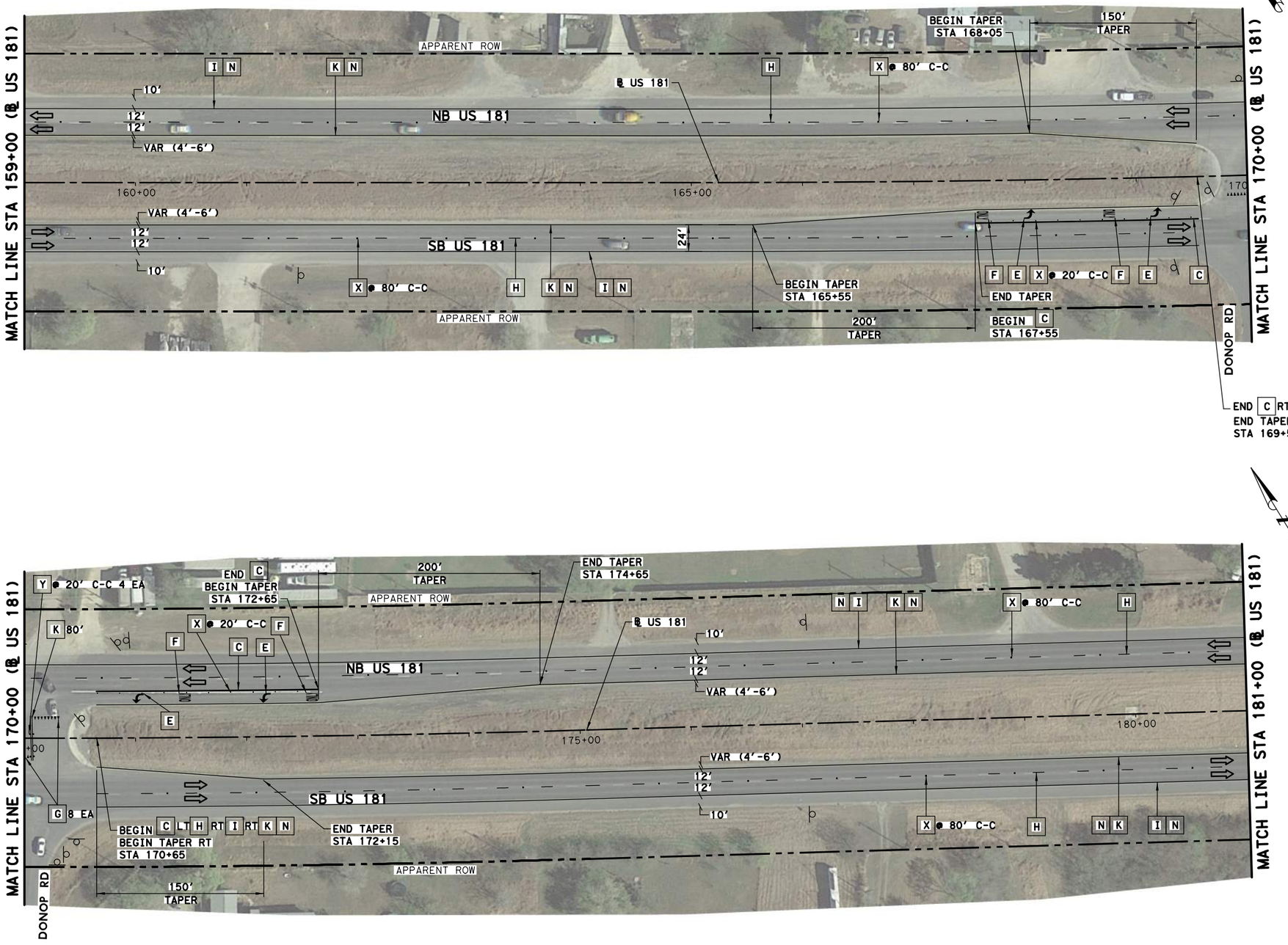

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	400
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4290
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4180
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8470
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	4
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9570
	666	6226	PAVEMENT SEALER 8"	LF	400
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 159+00 TO STA 181+00

SHEET 6 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			185
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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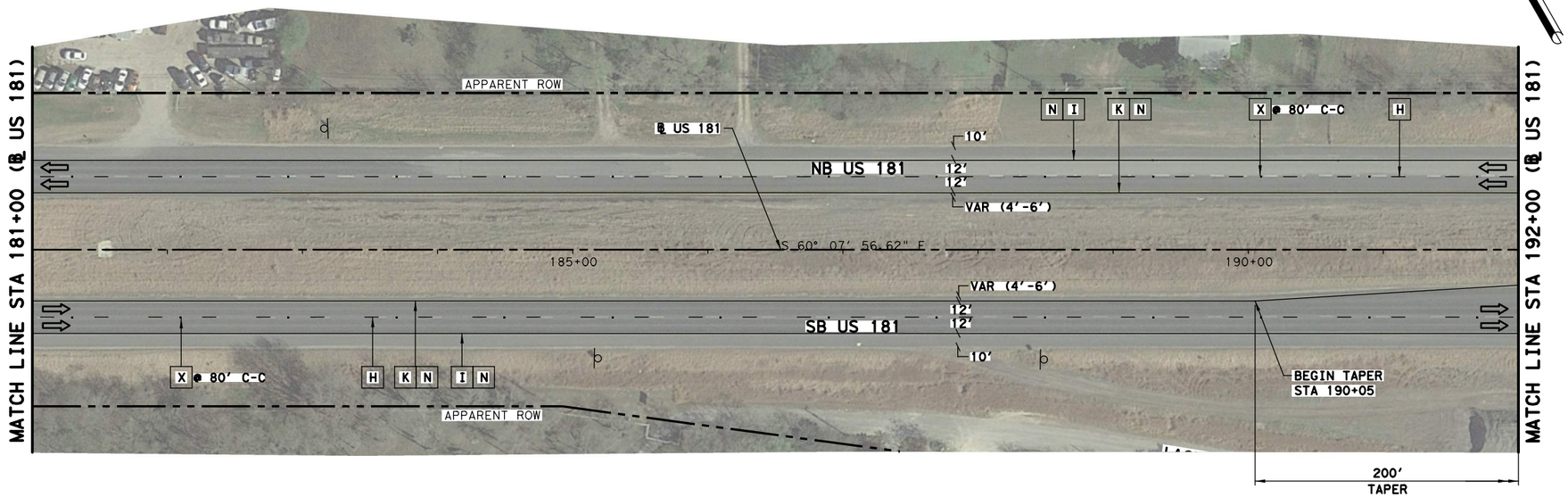

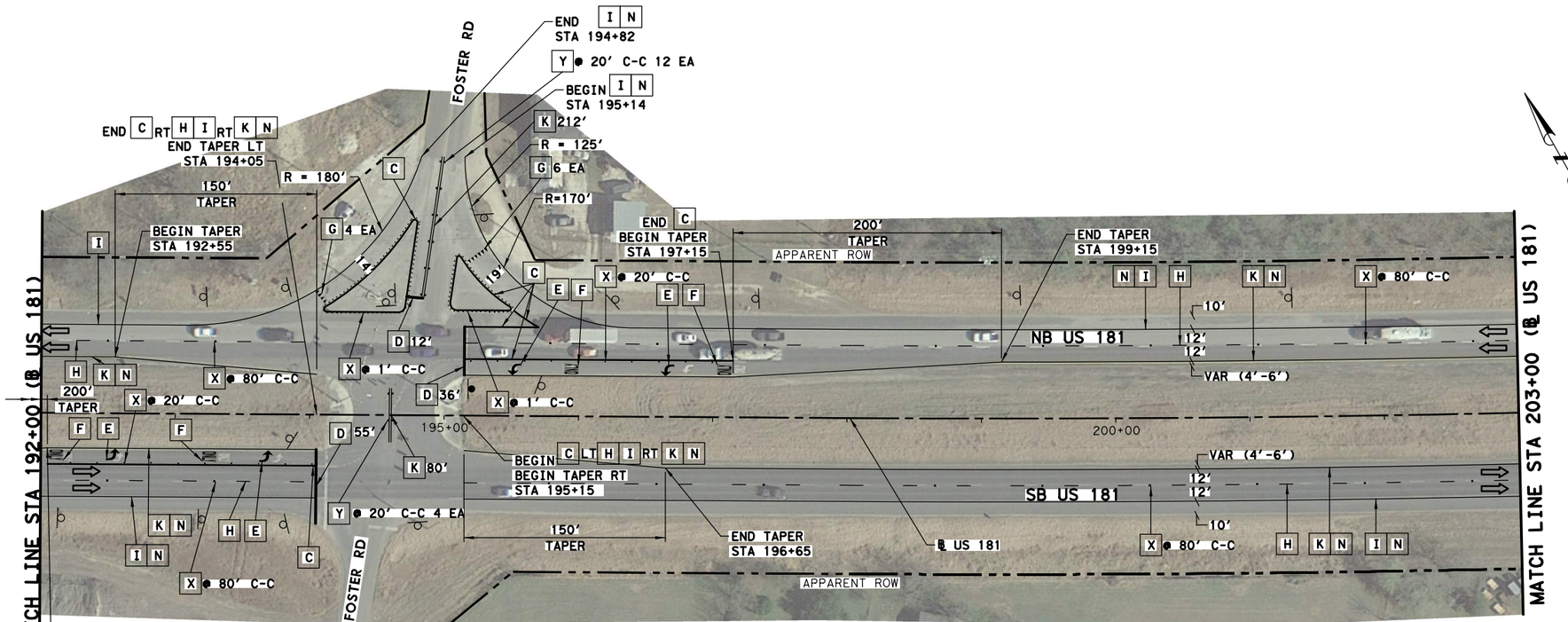

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	840
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	103
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	10
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1050
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4660
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4180
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8840
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	16
X	672	6010	REFL PAV MRKR TY II-C-R	EA	400
	666	6225	PAVEMENT SEALER 6"	LF	9890
	666	6226	PAVEMENT SEALER 8"	LF	840
	666	6230	PAVEMENT SEALER 24"	LF	103
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	10

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 181+00 TO STA 203+00

SHEET 7 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			186
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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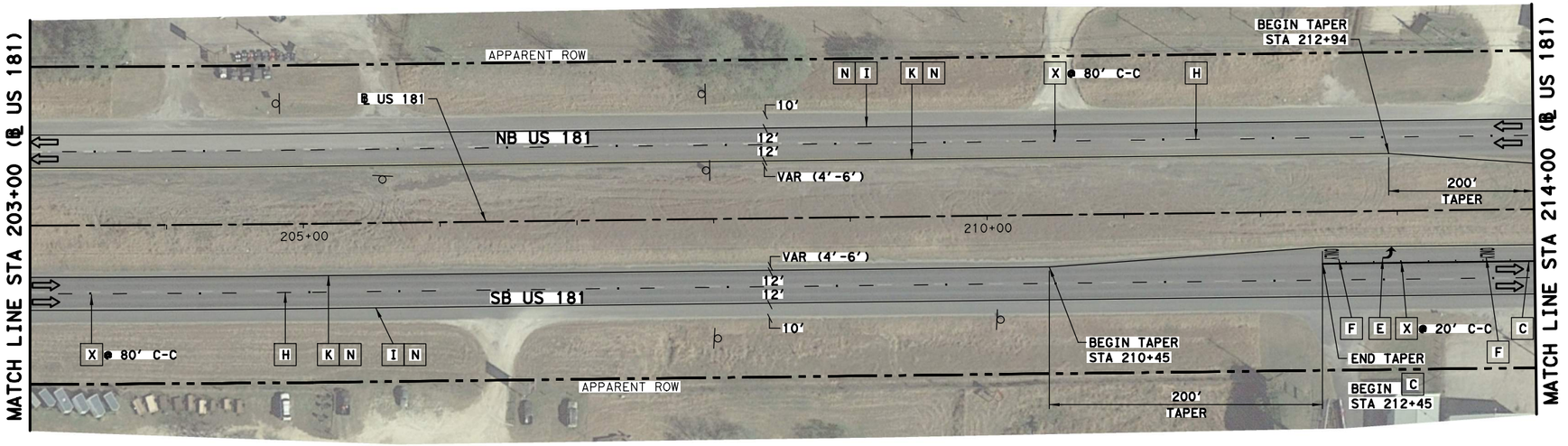

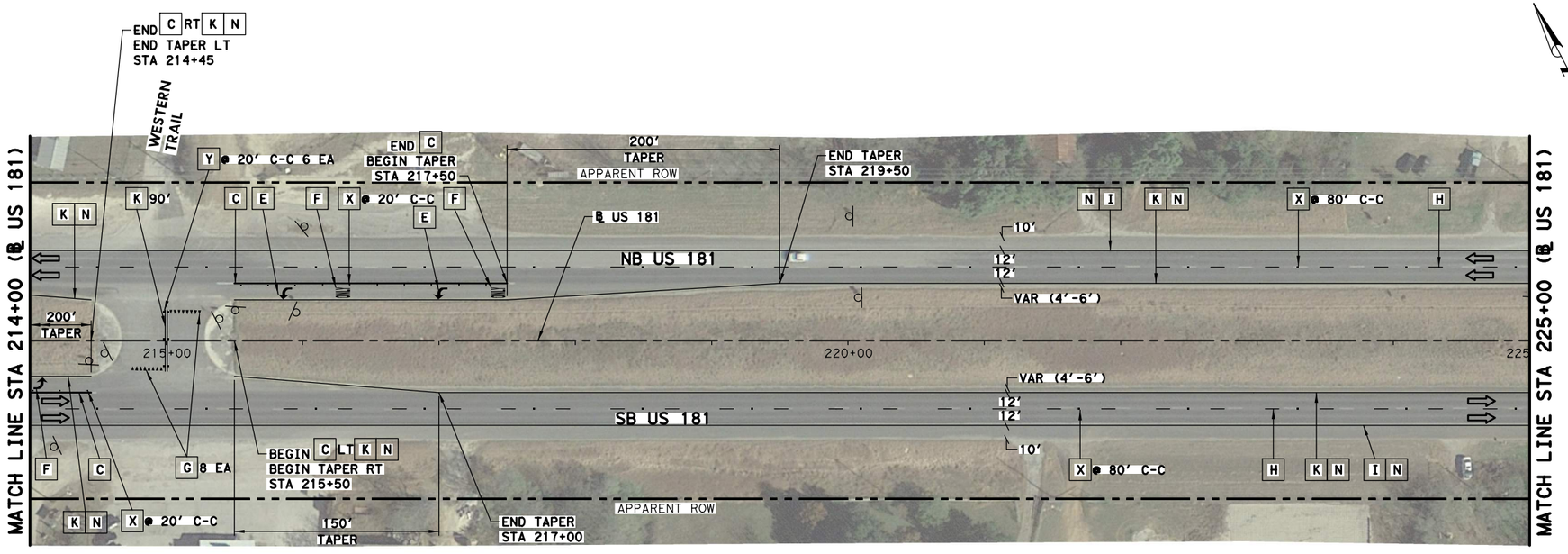

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	400
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4190
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8590
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9690
	666	6226	PAVEMENT SEALER 8"	LF	400
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 203+00 TO STA 225+00

SHEET 8 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			187
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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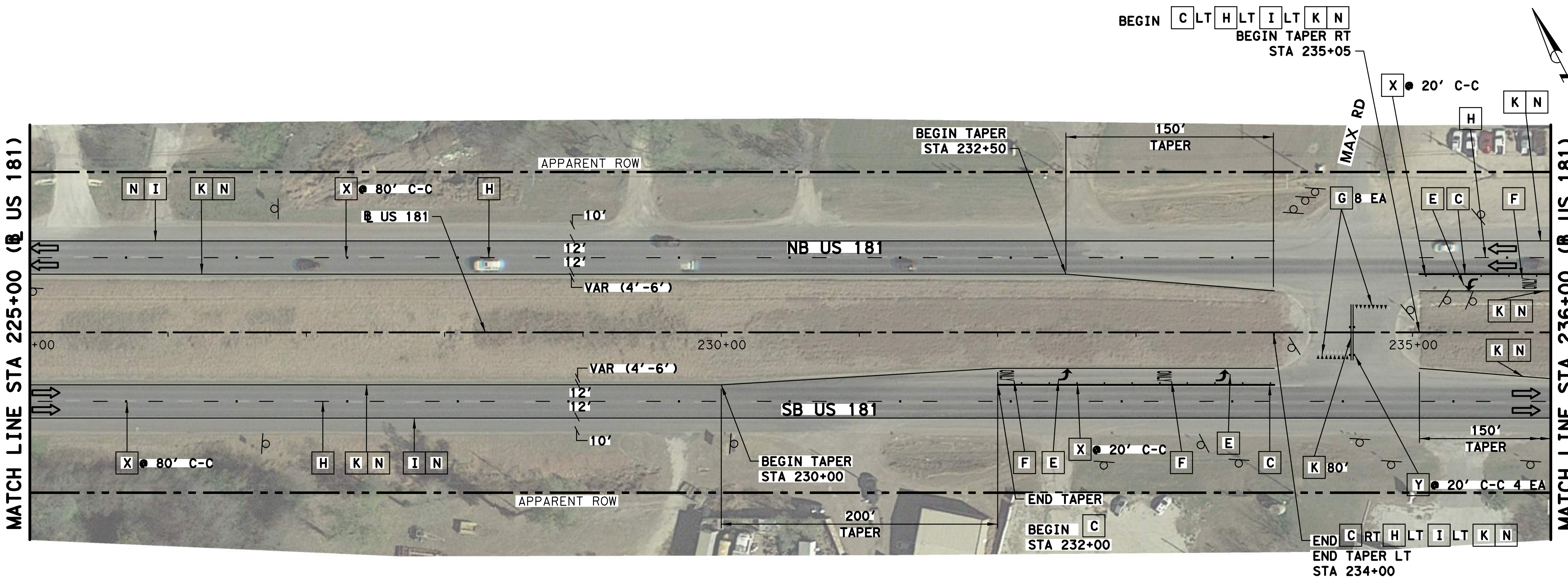
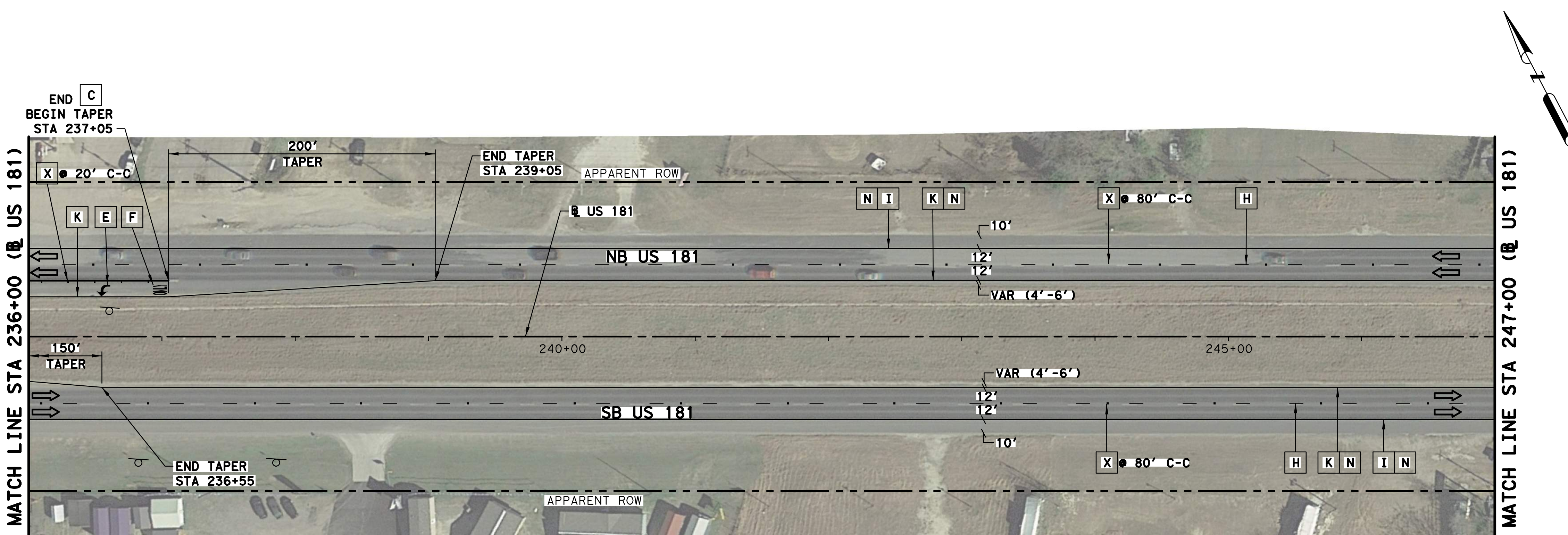


US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
[symbol]	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
[symbol]	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
[symbol]	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	400
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1000
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4295
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4190
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8485
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9485
	666	6226	PAVEMENT SEALER 8"	LF	400
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.



LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 225+00 TO STA 247+00

SHEET 9 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			188
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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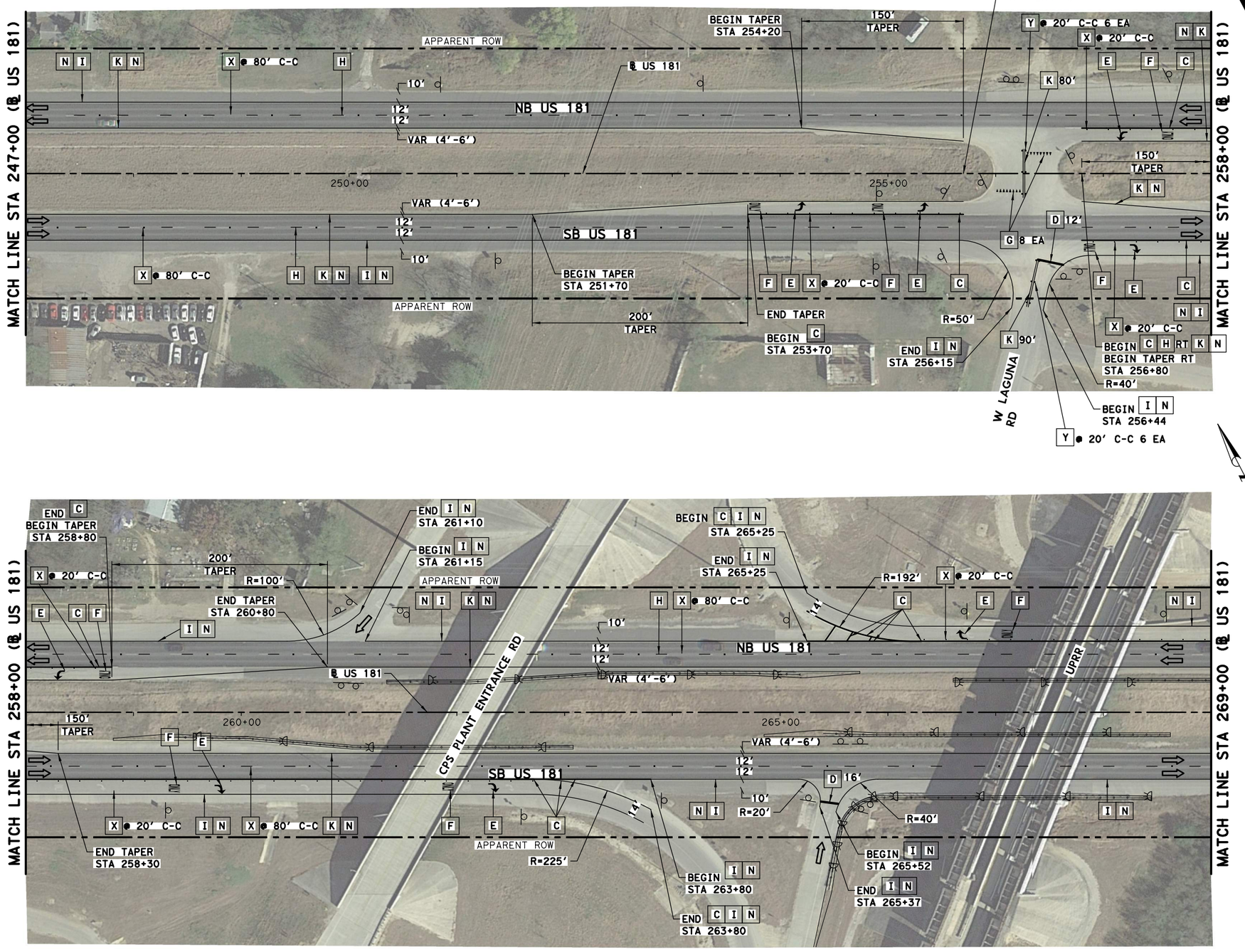

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	25
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	1735
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	28
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	8
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	8
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4645
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4180
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8825
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	12
X	672	6010	REFL PAV MRKR TY II-C-R	EA	120
	666	6225	PAVEMENT SEALER 6"	LF	9925
	666	6226	PAVEMENT SEALER 8"	LF	1735
	666	6230	PAVEMENT SEALER 24"	LF	28
	666	6231	PAVEMENT SEALER (ARROW)	EA	8
	666	6232	PAVEMENT SEALER (WORD)	EA	8
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 247+00 TO STA 269+00

SHEET 10 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			189
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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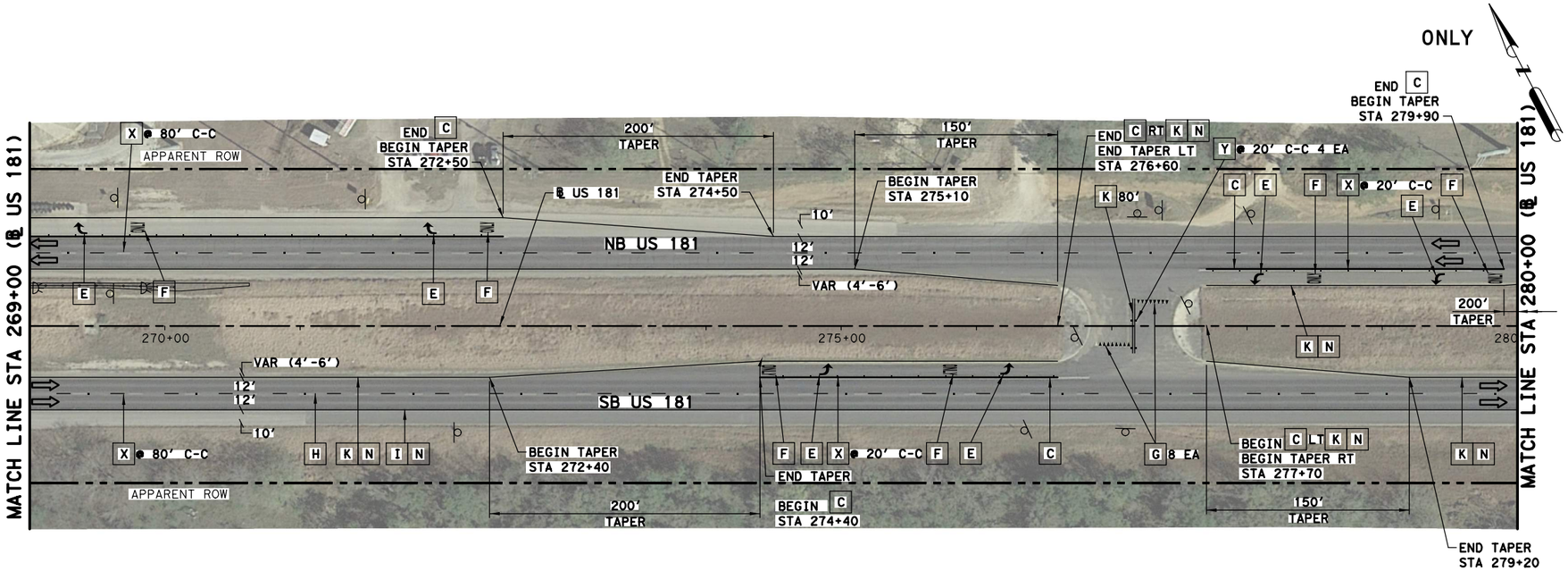

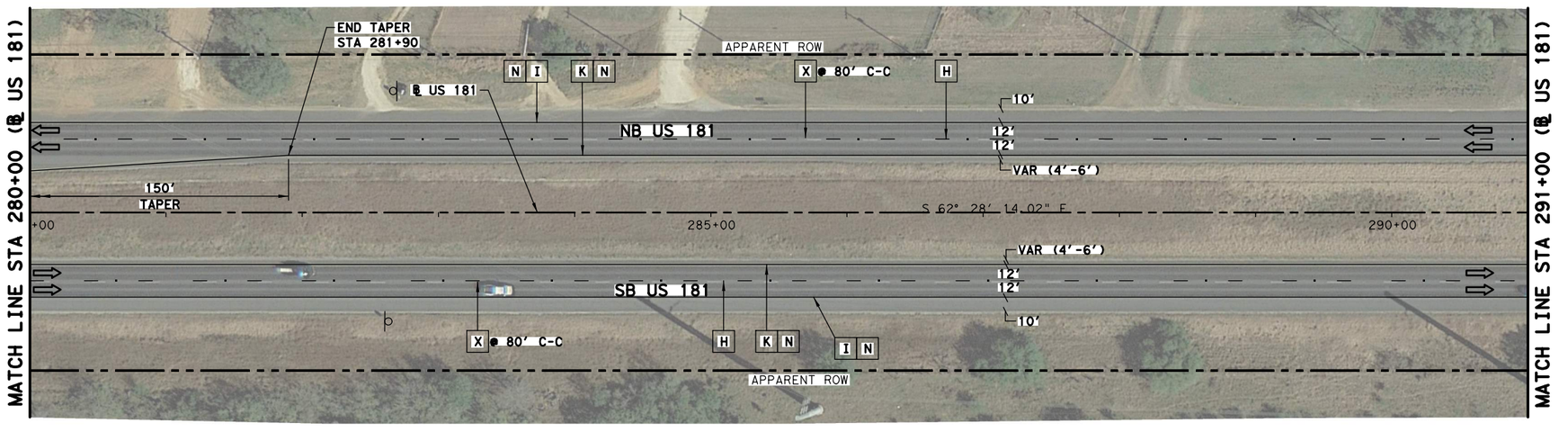

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	2
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	750
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	6
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	6
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4260
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8660
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	93
	666	6225	PAVEMENT SEALER 6"	LF	9760
	666	6226	PAVEMENT SEALER 8"	LF	750
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	6
	666	6232	PAVEMENT SEALER (WORD)	EA	6
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 269+00 TO STA 291+00

SHEET 11 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			190
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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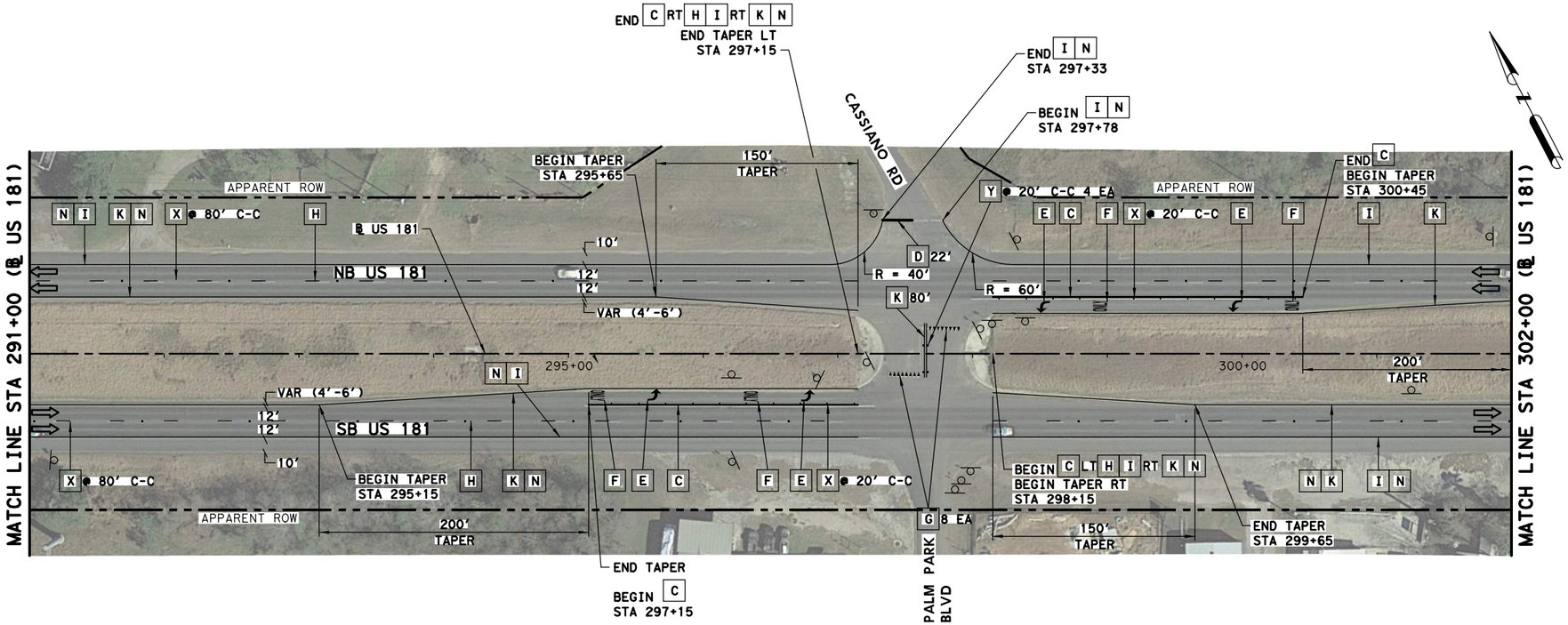

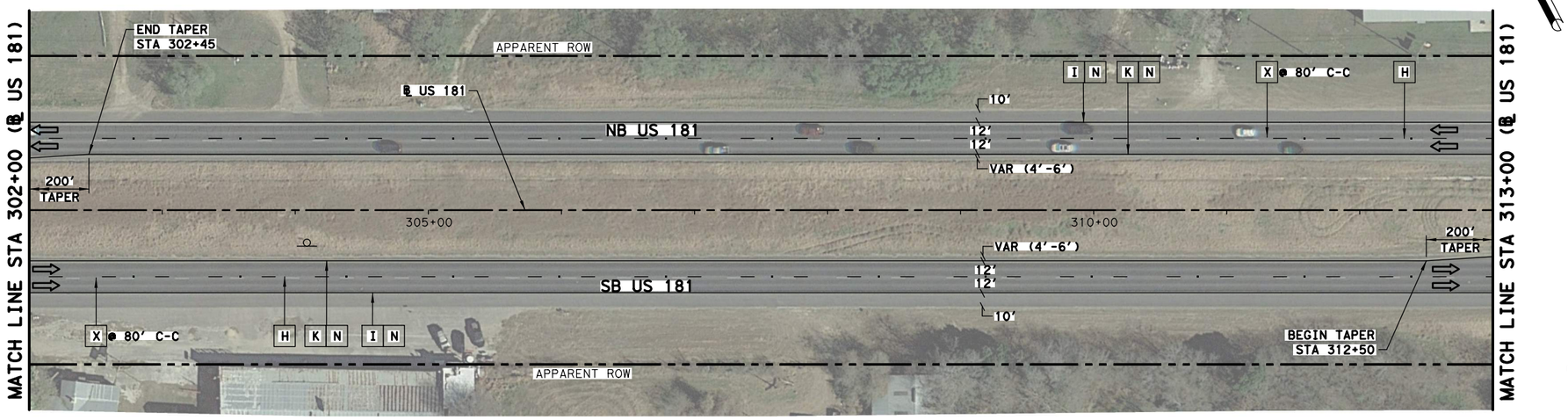

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	400
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	22
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1000
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4322
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4280
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8602
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9602
	666	6226	PAVEMENT SEALER 8"	LF	400
	666	6230	PAVEMENT SEALER 24"	LF	22
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 291+00 TP STA 313+00

SHEET 12 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			191
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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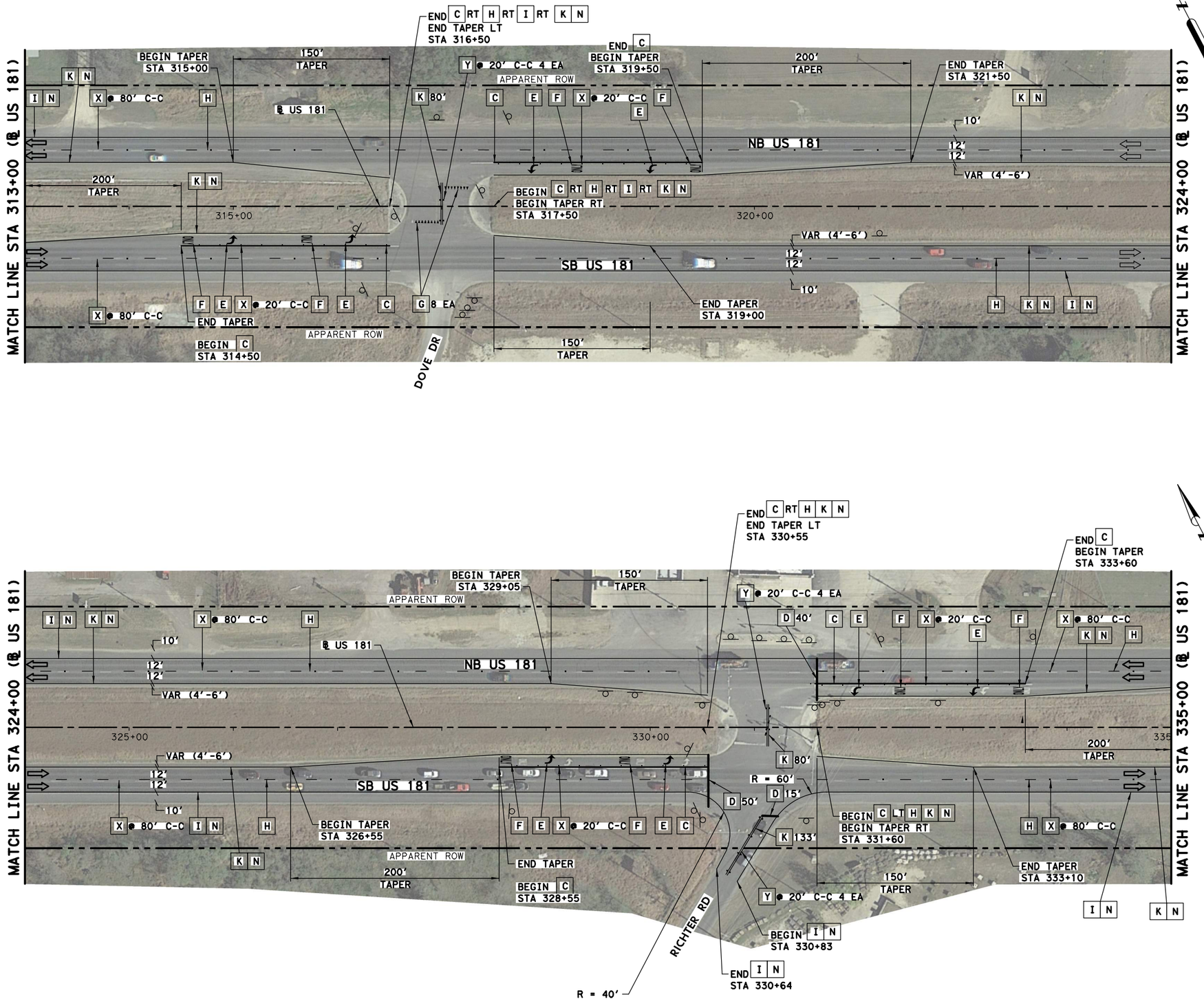

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	800
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	105
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	8
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	8
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1050
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4422
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4283
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8705
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	18
X	672	6010	REFL PAV MRKR TY II-C-R	EA	73
	666	6225	PAVEMENT SEALER 6"	LF	9755
	666	6226	PAVEMENT SEALER 8"	LF	800
	666	6230	PAVEMENT SEALER 24"	LF	105
	666	6231	PAVEMENT SEALER (ARROW)	EA	8
	666	6232	PAVEMENT SEALER (WORD)	EA	8
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- PROP SIGN NUMBER
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0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 313+00 TO STA 335+00

SHEET 13 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			192
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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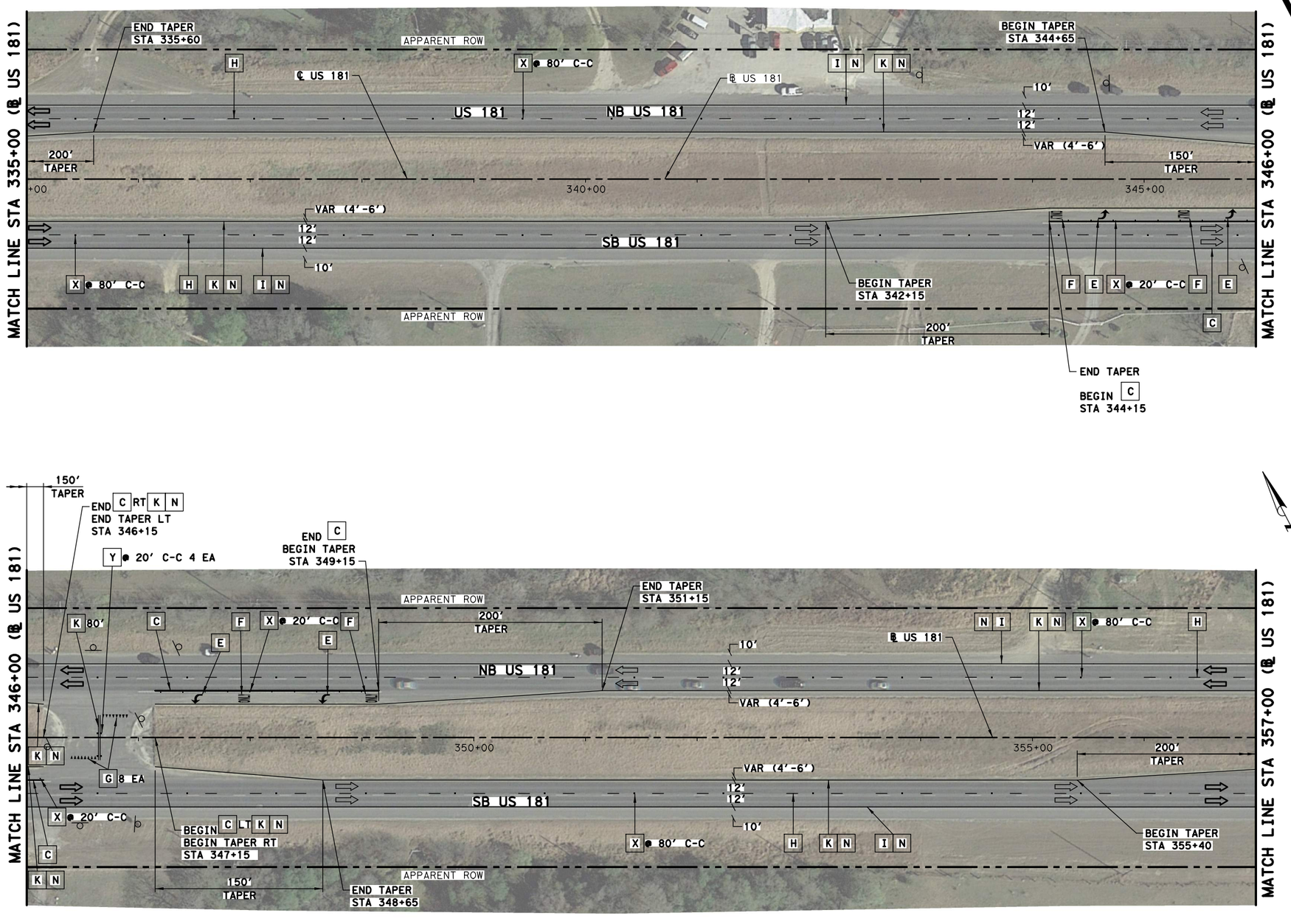

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	400
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4280
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8680
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9780
	666	6226	PAVEMENT SEALER 8"	LF	400
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 335+00 TO STA 357+00

SHEET 14 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			193
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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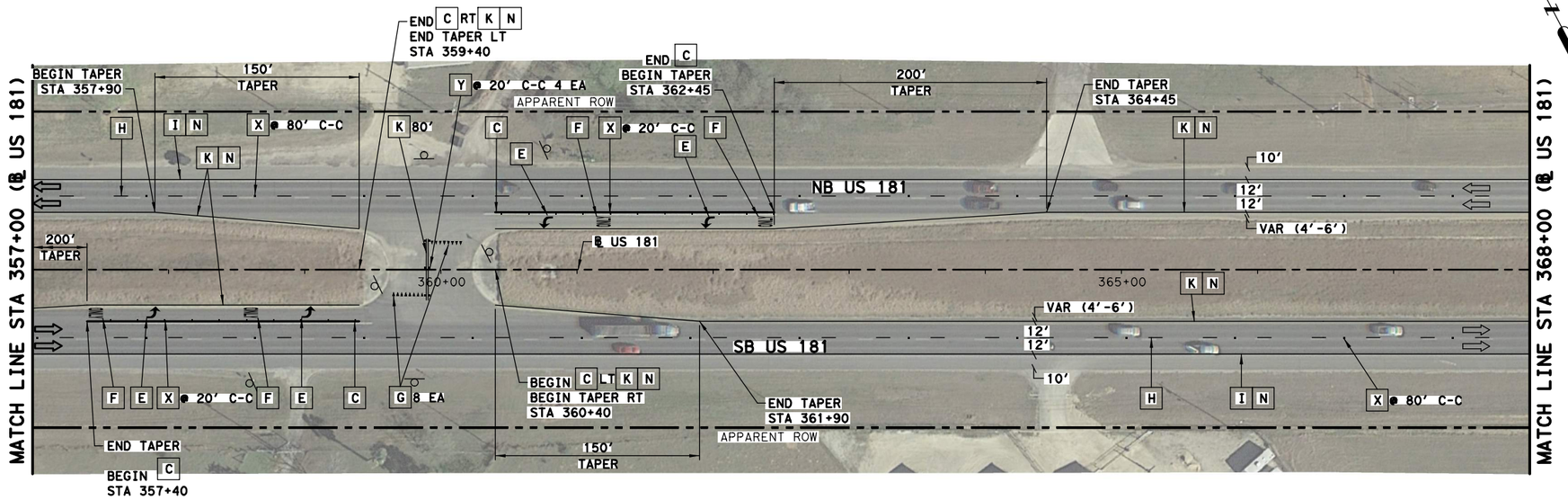

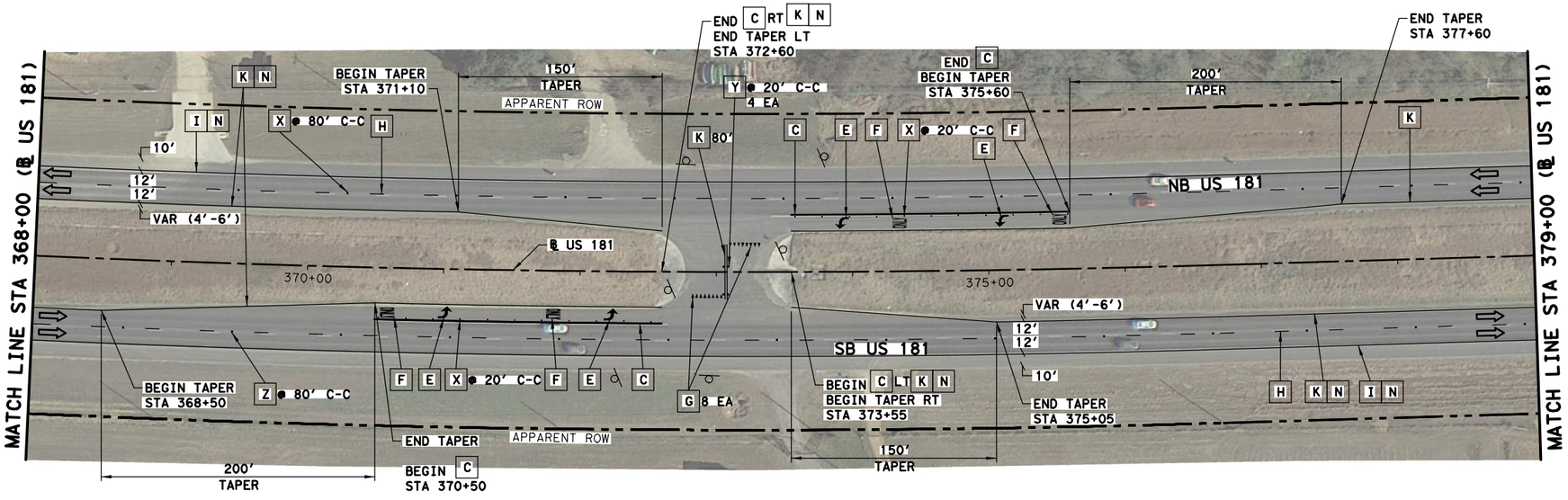

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	800
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	8
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	8
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	32
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4090
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8490
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	12
X	672	6010	REFL PAV MRKR TY II-C-R	EA	40
	666	6225	PAVEMENT SEALER 6"	LF	9590
	666	6226	PAVEMENT SEALER 8"	LF	800
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	8
	666	6232	PAVEMENT SEALER (WORD)	EA	8
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	32

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 357+00 TO STA 379+00

SHEET 15 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			194
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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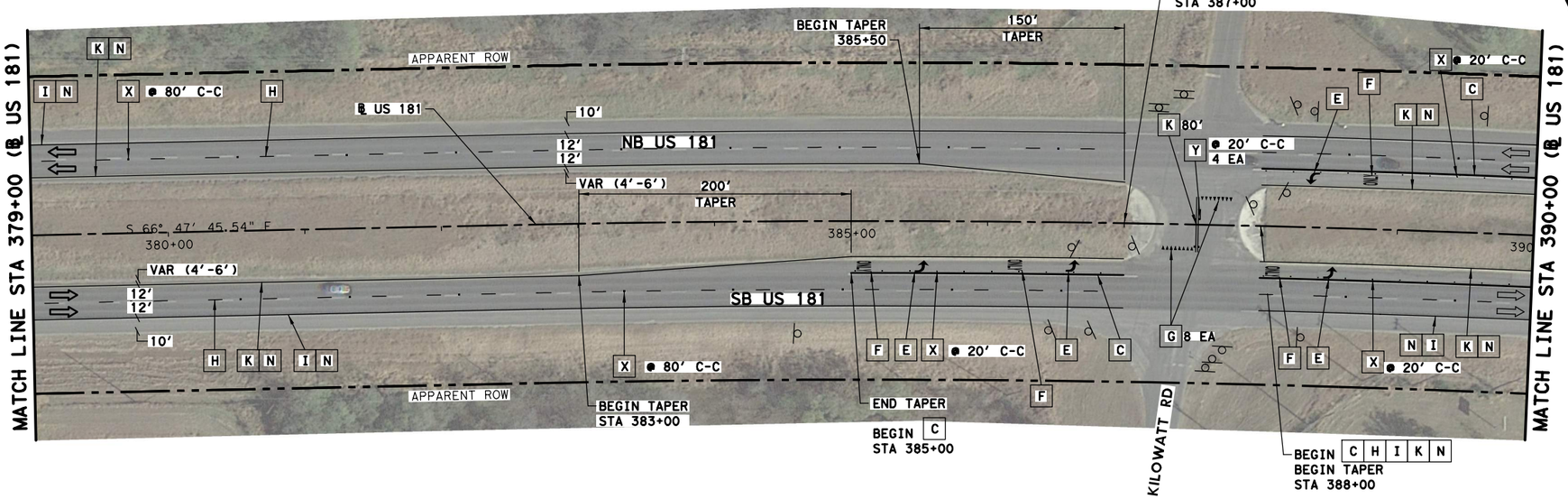

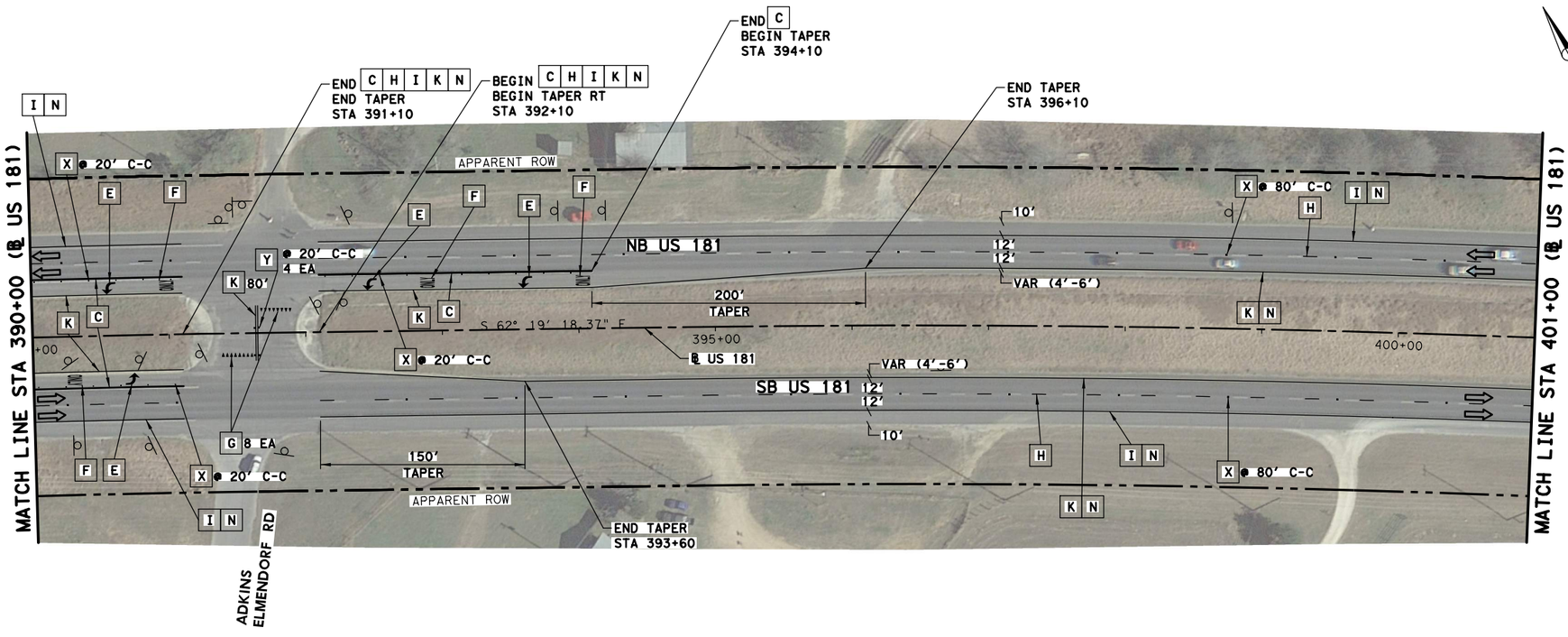

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	800
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	8
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	8
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	32
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1000
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4000
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4000
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8000
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	12
X	672	6010	REFL PAV MRKR TY II-C-R	EA	40
	666	6225	PAVEMENT SEALER 6"	LF	9000
	666	6226	PAVEMENT SEALER 8"	LF	800
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	8
	666	6232	PAVEMENT SEALER (WORD)	EA	8
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	32

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
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- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 379+00 TO STA 401+00

SHEET 16 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			195
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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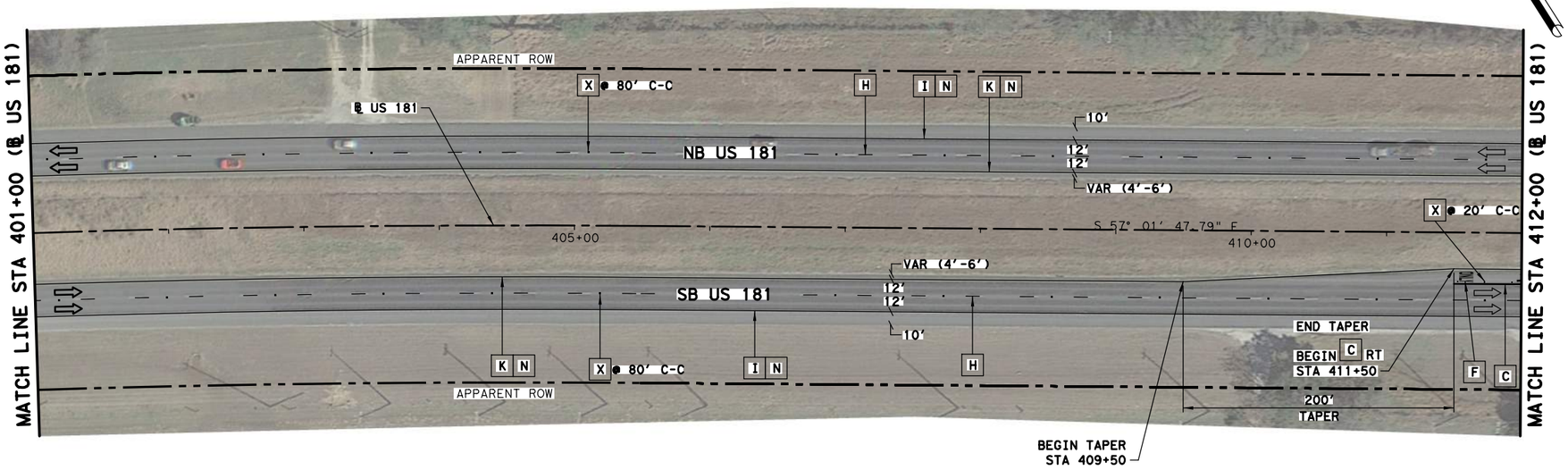

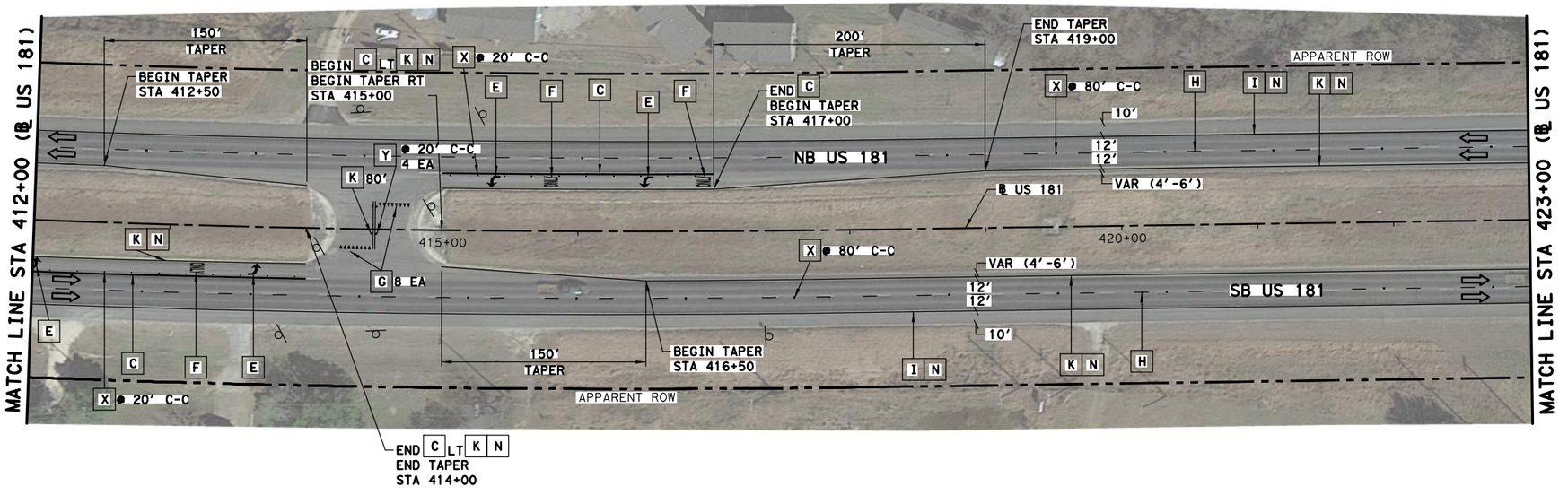

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	450
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	4
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4280
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8680
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	75
	666	6225	PAVEMENT SEALER 6"	LF	9780
	666	6226	PAVEMENT SEALER 8"	LF	450
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	4
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 401+00 TO STA 423+00

SHEET 17 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			196
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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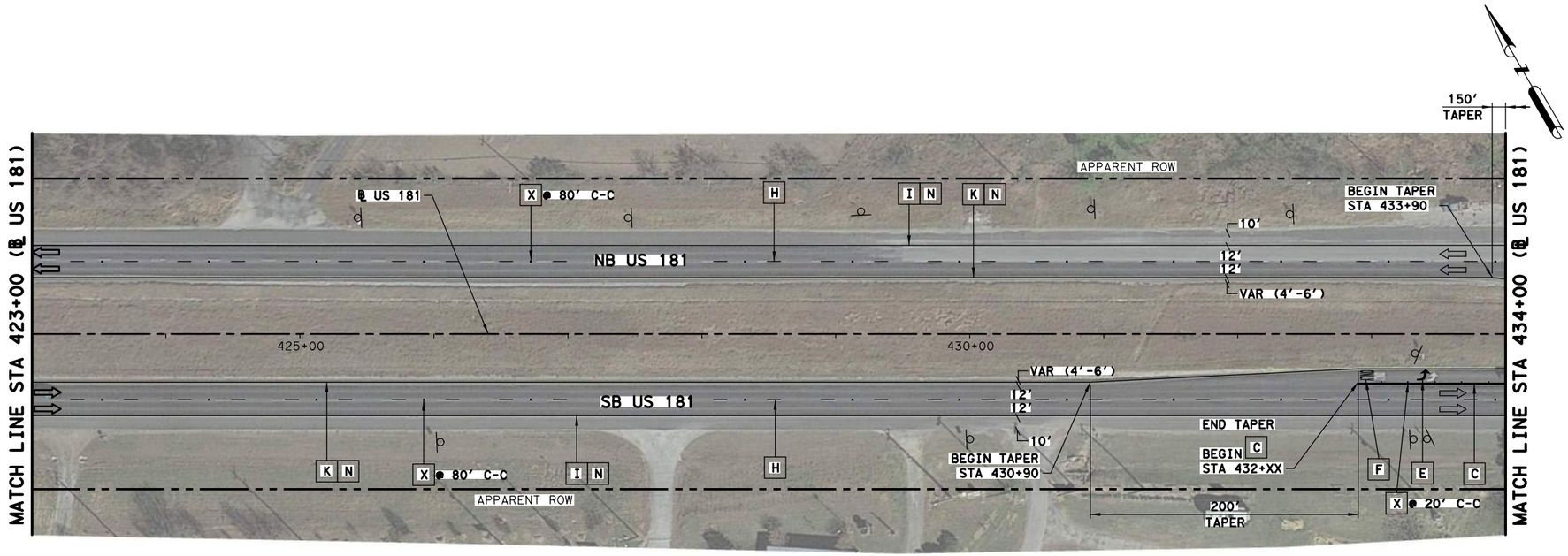

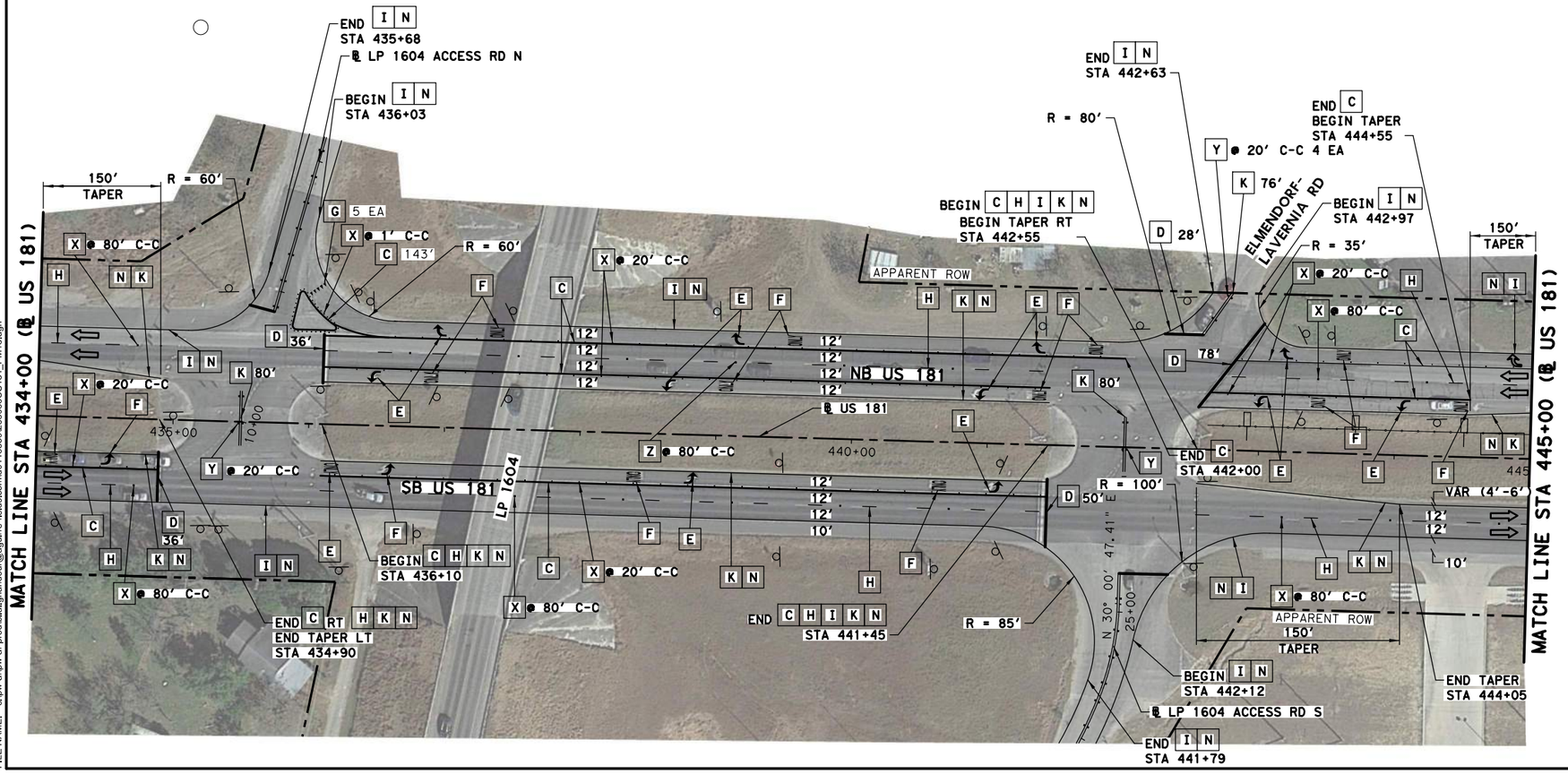

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	3
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	2315
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	228
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	14
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	14
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	5
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	990
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	3940
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4176
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8116
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	12
X	672	6010	REFL PAV MRKR TY II-C-R	EA	238
	666	6225	PAVEMENT SEALER 6"	LF	9106
	666	6226	PAVEMENT SEALER 8"	LF	2315
	666	6230	PAVEMENT SEALER 24"	LF	228
	666	6231	PAVEMENT SEALER (ARROW)	EA	14
	666	6232	PAVEMENT SEALER (WORD)	EA	14
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	5

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.
3. STRIPING DETAILS OF NORTH AND SOUTH LOOP 1604 ACCESS RD ARE SHOWN ON "SHEET 22 OF 23" AND "SHEET 23 OF 23" OF US 181 SIGNING LAYOUTS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100′

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 423+00 TO STA 445+00

SHEET 18 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			197
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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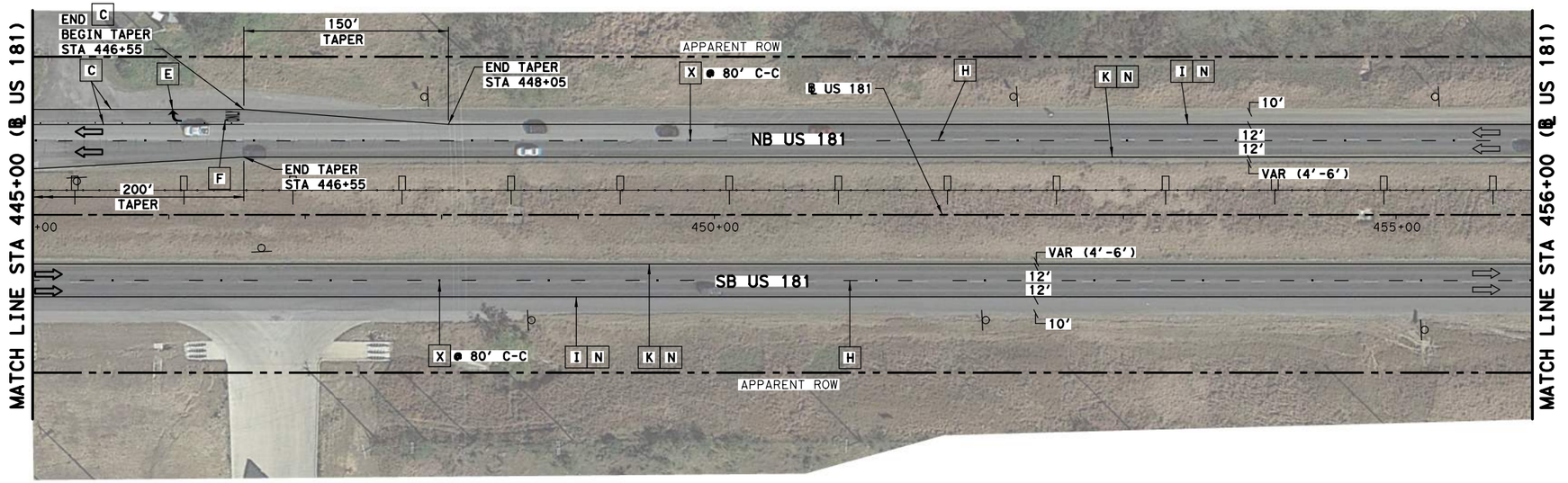

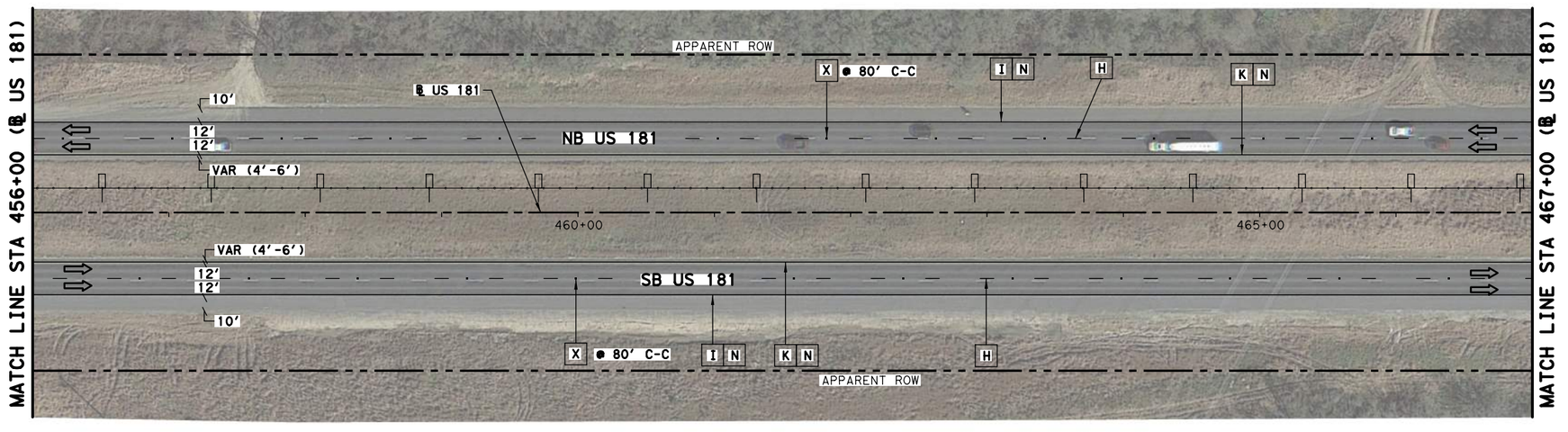

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	28
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	155
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	1
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	1
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4400
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8800
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	
X	672	6010	REFL PAV MRKR TY II-C-R	EA	8
	666	6225	PAVEMENT SEALER 6"	LF	9900
	666	6226	PAVEMENT SEALER 8"	LF	155
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	1
	666	6232	PAVEMENT SEALER (WORD)	EA	1
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100′

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 445+00 TO STA 467+00

SHEET 19 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			198
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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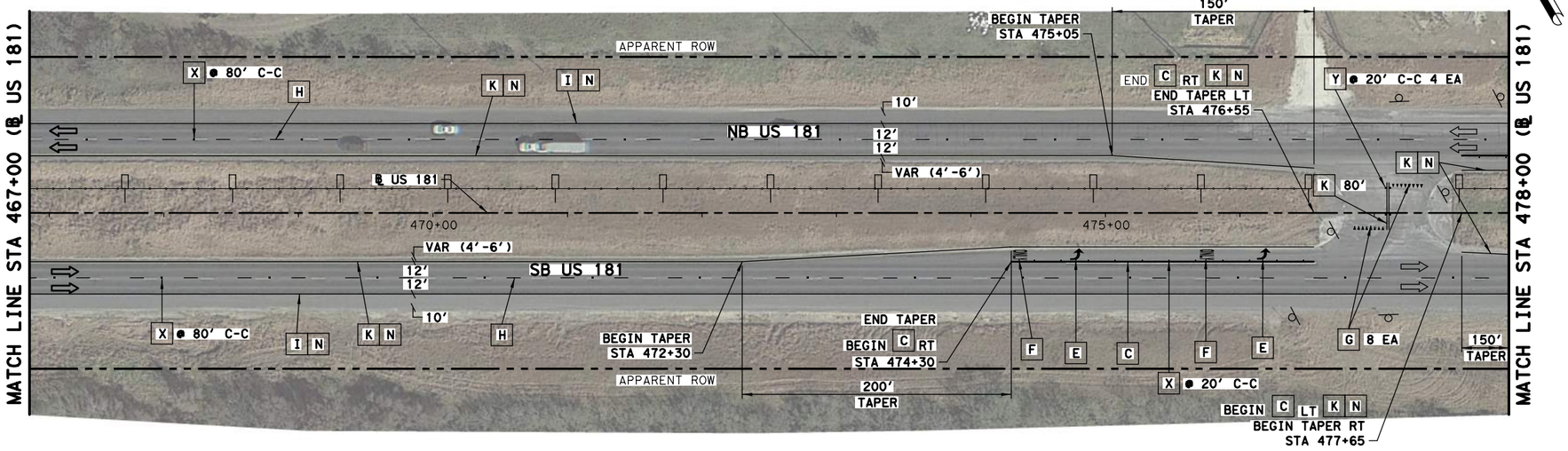

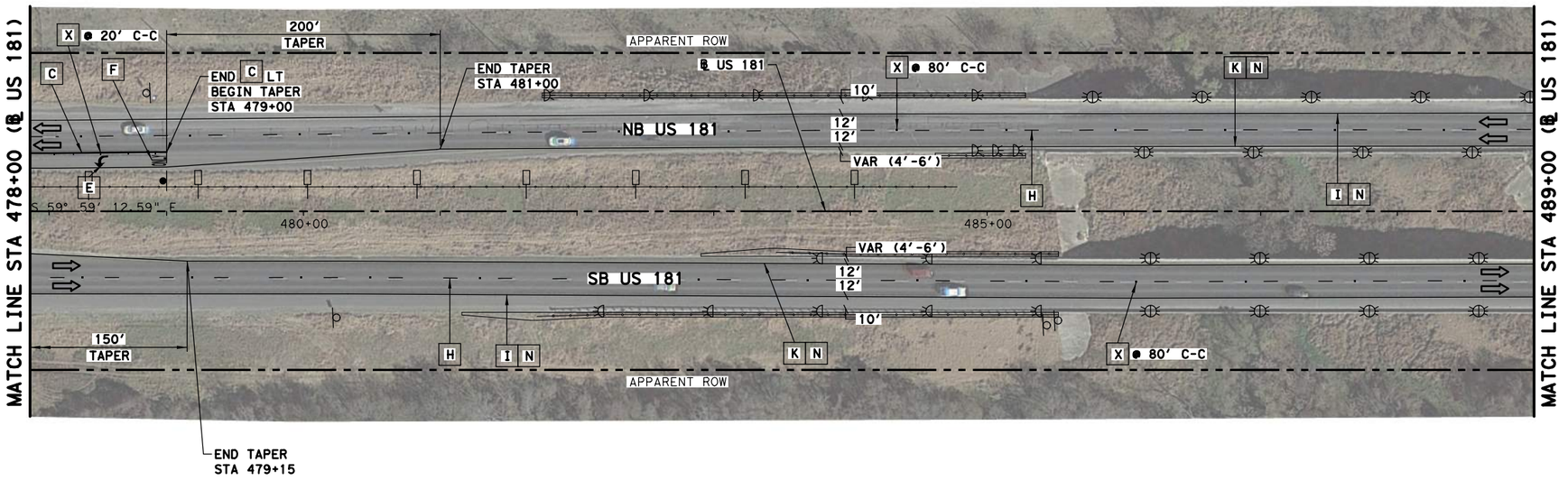

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	17
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	21
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	16
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	360
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	3
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	3
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1100
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	4400
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	4200
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	8600
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	6
X	672	6010	REFL PAV MRKR TY II-C-R	EA	18
	666	6225	PAVEMENT SEALER 6"	LF	9700
	666	6226	PAVEMENT SEALER 8"	LF	360
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	3
	666	6232	PAVEMENT SEALER (WORD)	EA	3
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
STA 467+00 TO STA 489+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			199
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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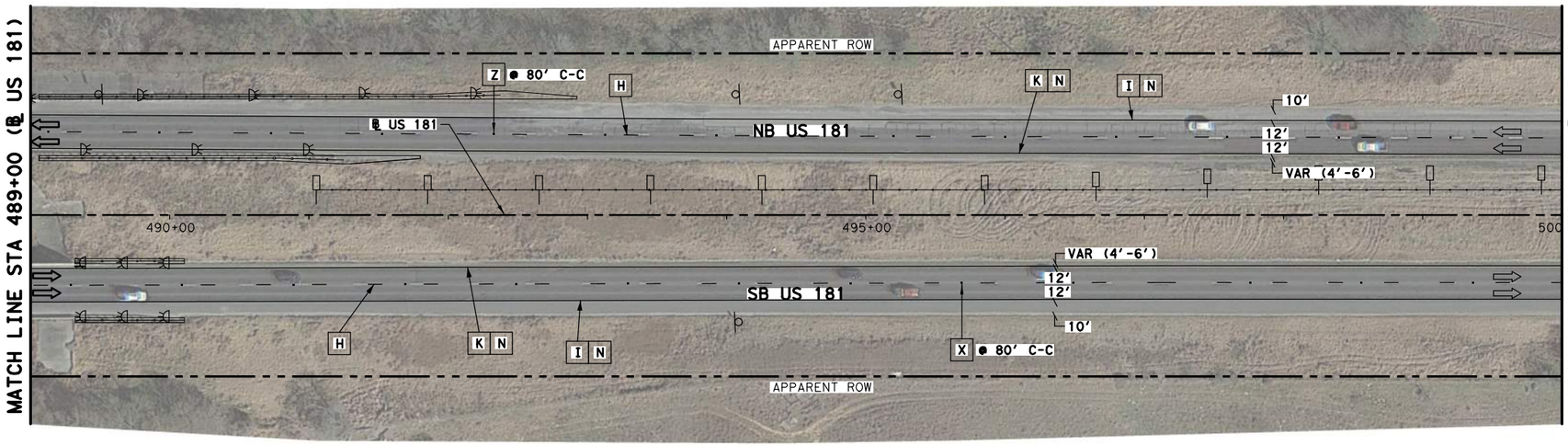

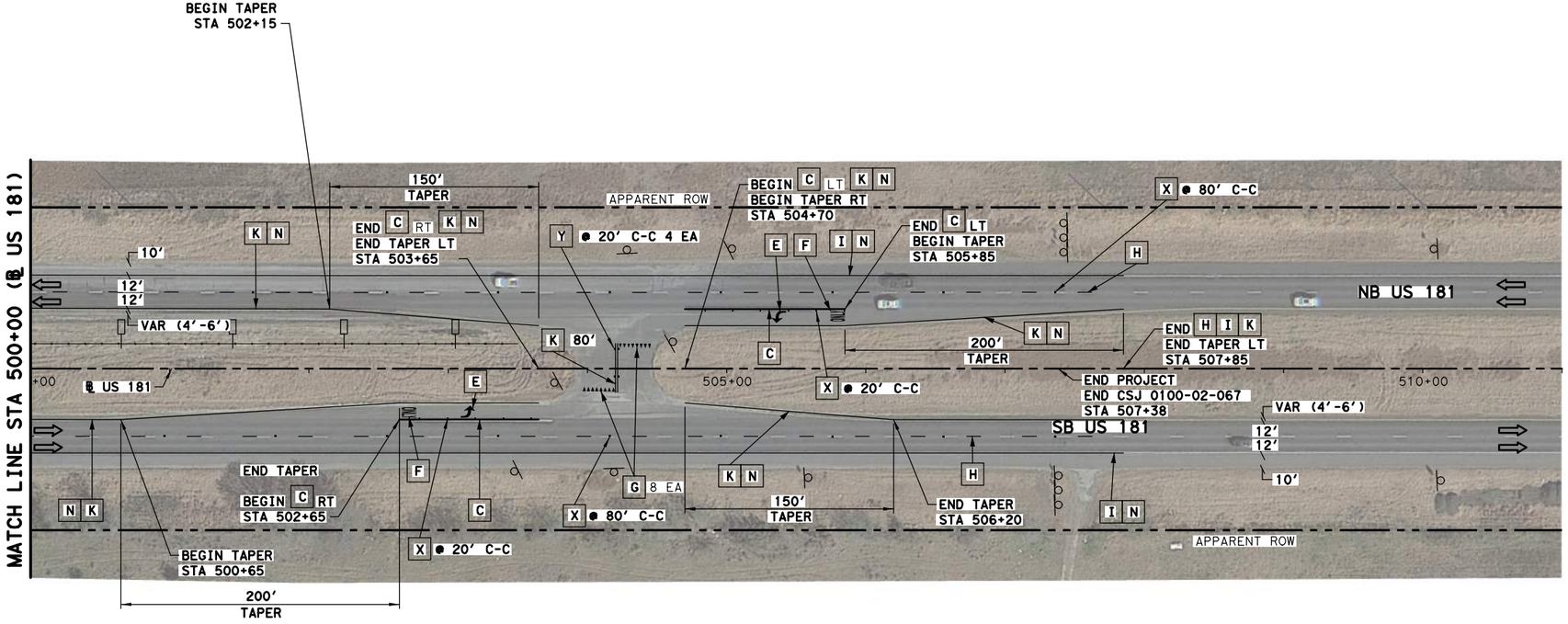

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	16
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	13
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	215
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	2
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	2
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	16
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	950
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	3770
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	3560
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	7330
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	4
X	672	6010	REFL PAV MRKR TY II-C-R	EA	11
	666	6225	PAVEMENT SEALER 6"	LF	8280
	666	6226	PAVEMENT SEALER 8"	LF	215
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	2
	666	6232	PAVEMENT SEALER (WORD)	EA	2
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	16

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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PROFESSIONAL ENGINEER

Robert S. Doty 3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

STA 489+00 TO END PROJECT

SHEET 21 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			200
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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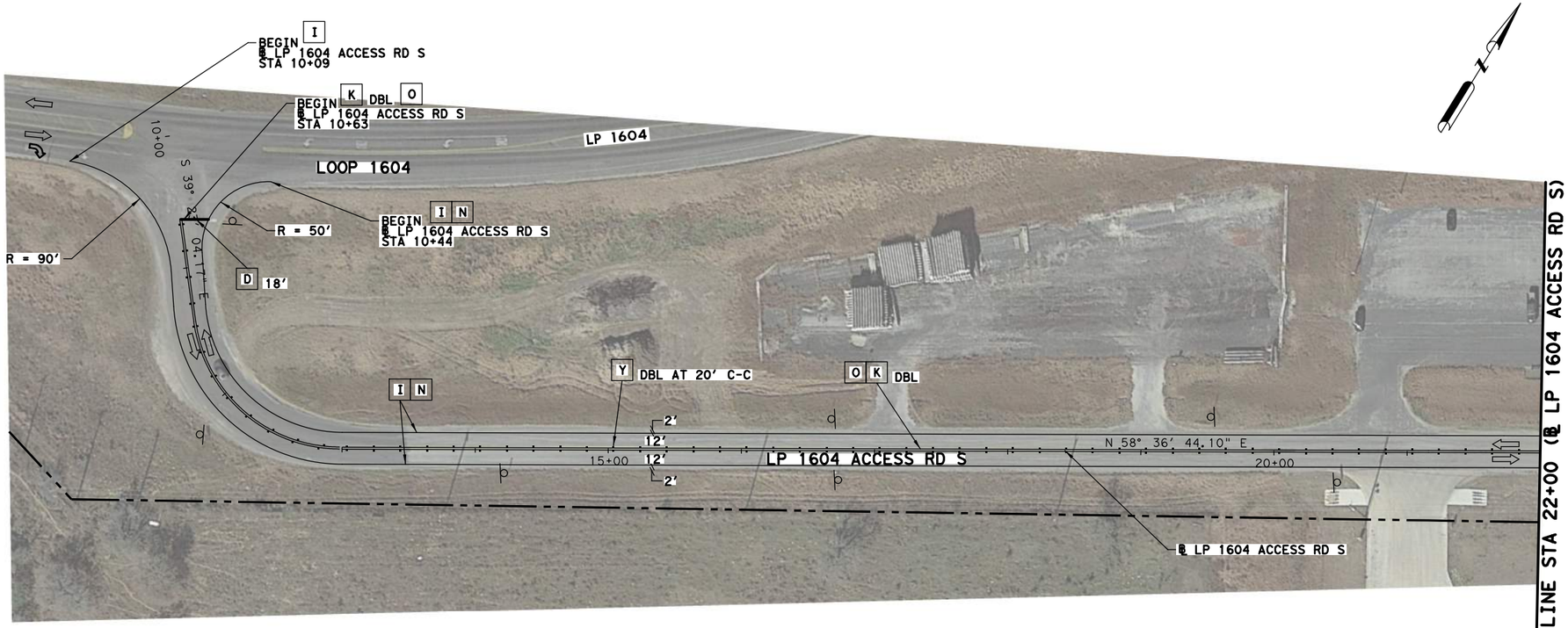
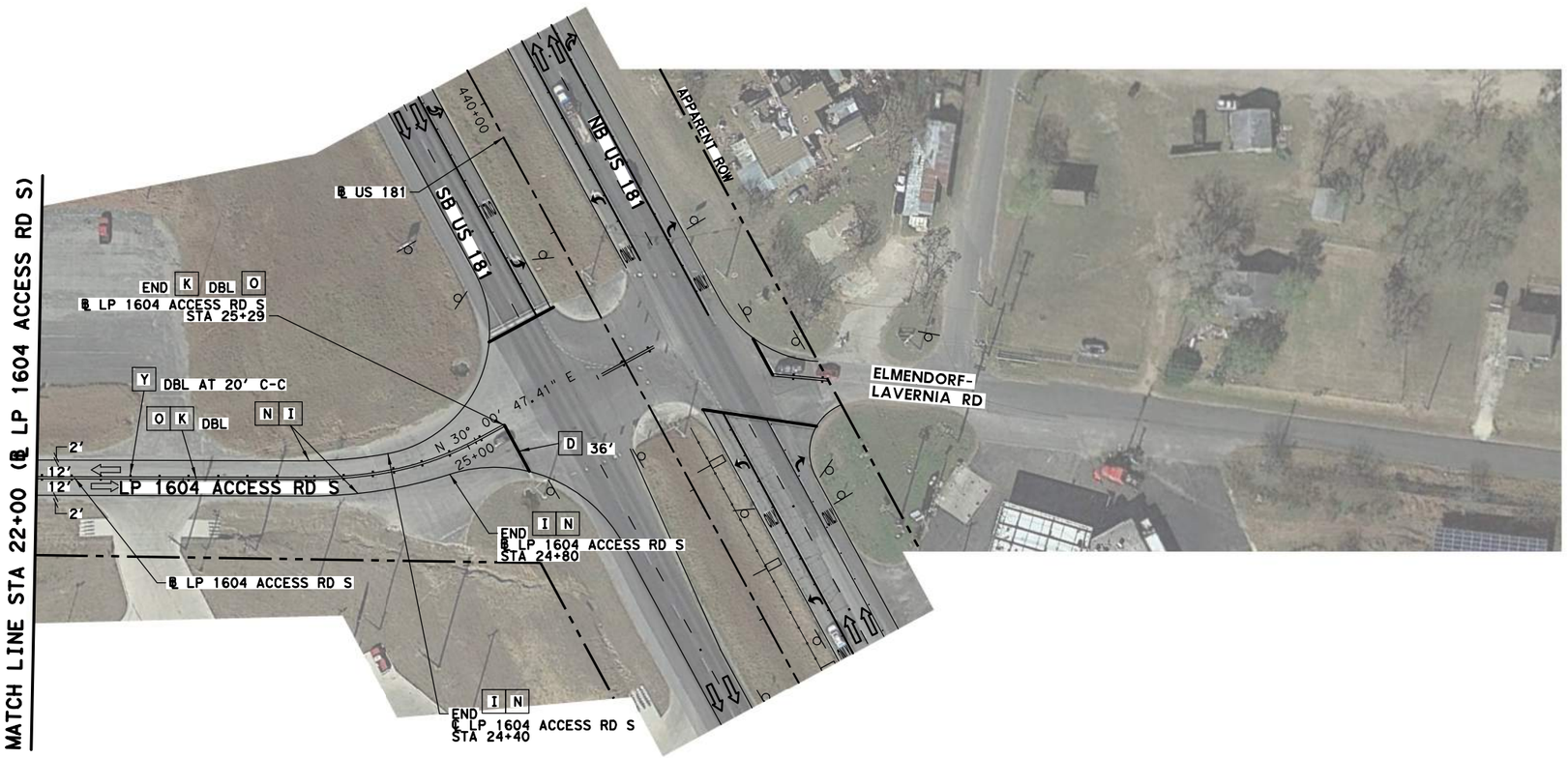


MATCH LINE STA 22+00 (℄ LP 1604 ACCESS RD S)



MATCH LINE STA 22+00 (℄ LP 1604 ACCESS RD S)

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	54
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2900
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	2920
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	2900
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	146
X	672	6010	REFL PAV MRKR TY II-C-R	EA	
	666	6225	PAVEMENT SEALER 6"	LF	5820
	666	6226	PAVEMENT SEALER 8"	LF	
	666	6230	PAVEMENT SEALER 24"	LF	54
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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LICENSED
PROFESSIONAL ENGINEER

3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
PAVEMENT MARKING LAYOUT
LP 1604 ACCESS RD S

SHEET 22 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			201
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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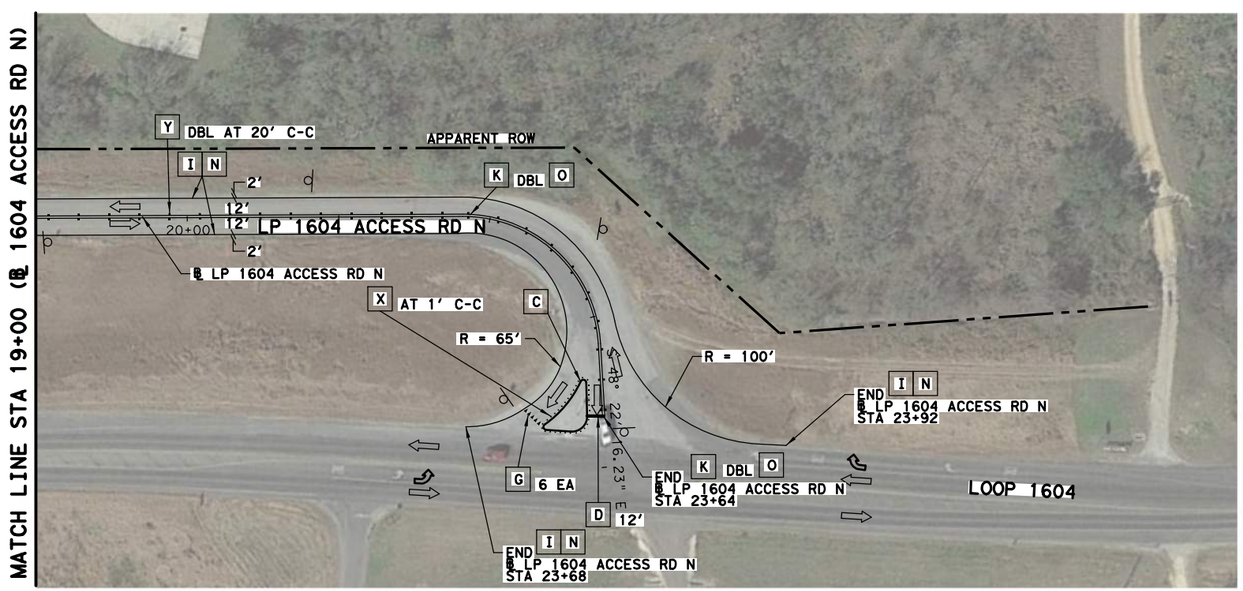

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6088	INSTL DEL ASSM (D-SY)SZ 1 (YFLX)SRF	EA	
	658	6061	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2	EA	
B	666	6033	REFL PAV MRK TY I (W)8"(LNDP)(100MIL)	LF	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	102
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	31
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	
I	666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2580
K	666	6321	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	LF	2614
N	533	6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	2580
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	131
X	672	6010	REFL PAV MRKR TY II-C-R	EA	102
	666	6225	PAVEMENT SEALER 6"	LF	5194
	666	6226	PAVEMENT SEALER 8"	LF	102
	666	6230	PAVEMENT SEALER 24"	LF	31
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. USE US 181 LEGEND FOR US 181 STRIPING.
2. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

3/19/2021

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181 PAVEMENT MARKING LAYOUT

LP 1604 ACCESS RD N

SHEET 23 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			202
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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3/19/2021

bghandour
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$DATE$

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	2

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

BEGIN PROJECT TO STA 294+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			203
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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FILE NAME: $FILE$

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	1

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
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09/23/2020

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Texas Department of Transportation

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TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 294+00 TO STA 304+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			204
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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$TIME$
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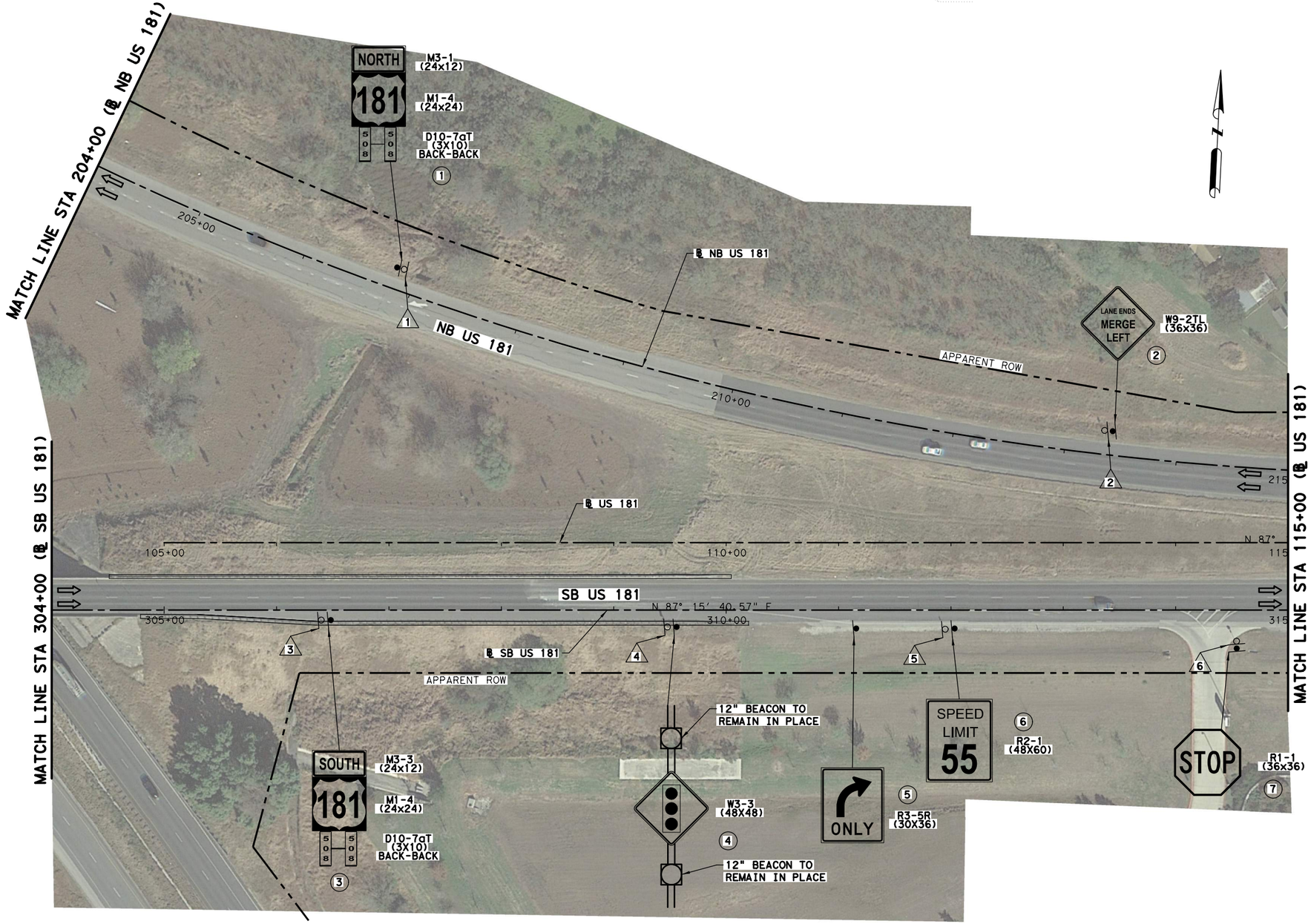

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	6

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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09/23/2020

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Texas Department of Transportation

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TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 304+00 TO STA 115+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			205
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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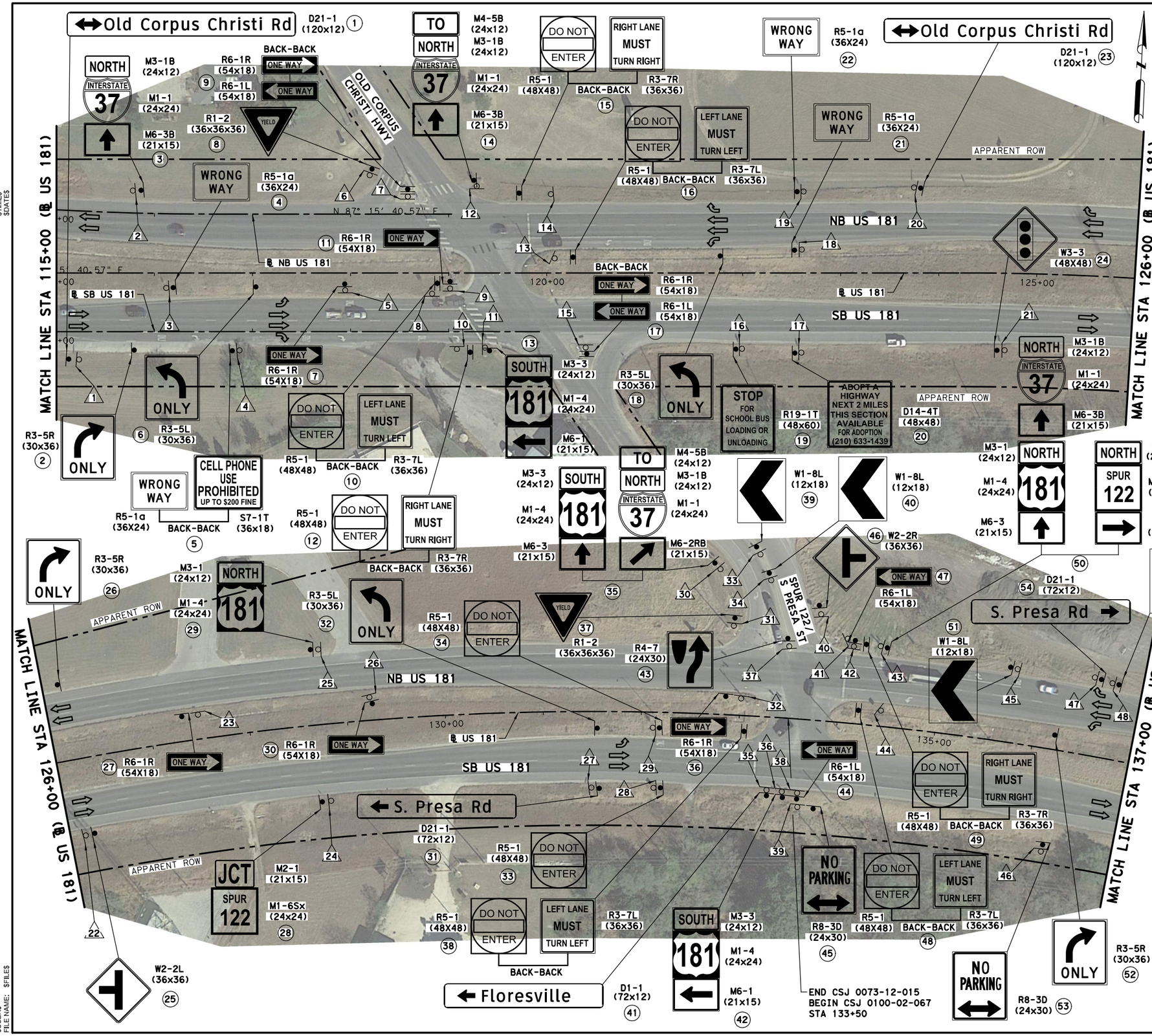

US 181 LEGEND & ESTIMATED SHEET QUANTITIES						
	ITEM		DESCRIPTION	UNIT	QTY	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	20	5
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA		
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	12	4
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA		
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	10	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	1	1
	644	6076	REMOVE SM RD SN SUP&AM	EA	37	11

CSJ 0073-12-015

CSJ 0100-02-067

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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US 181
SIGNING LAYOUT

STA 115+00 TO STA 137+00

SHEET 4 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			206
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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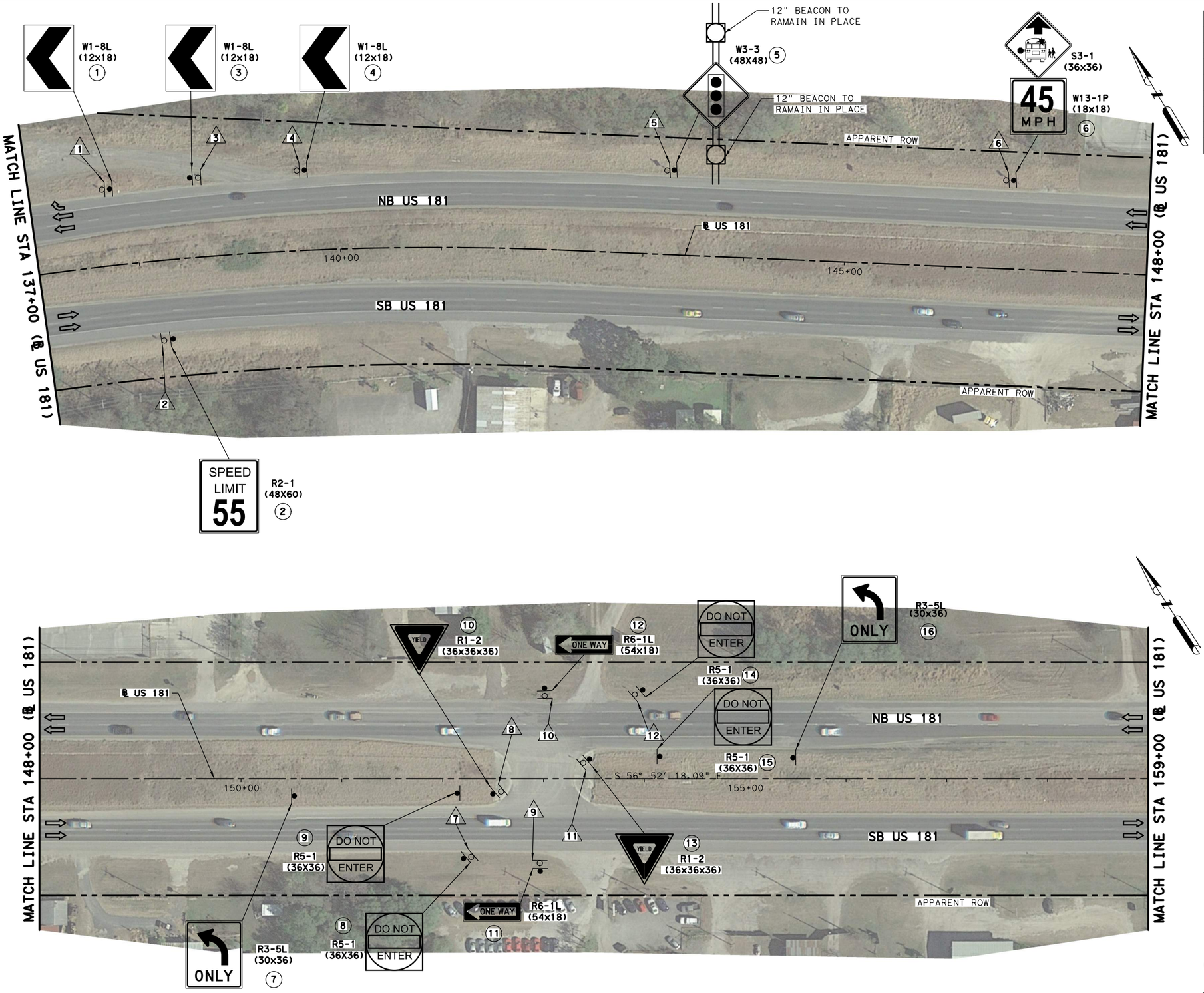
$TIME$
$DATE$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	12

NOTES:

1. **ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.**

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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US 181
SIGNING LAYOUT

STA 137+00 TO STA 159+00

SHEET 5 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			207
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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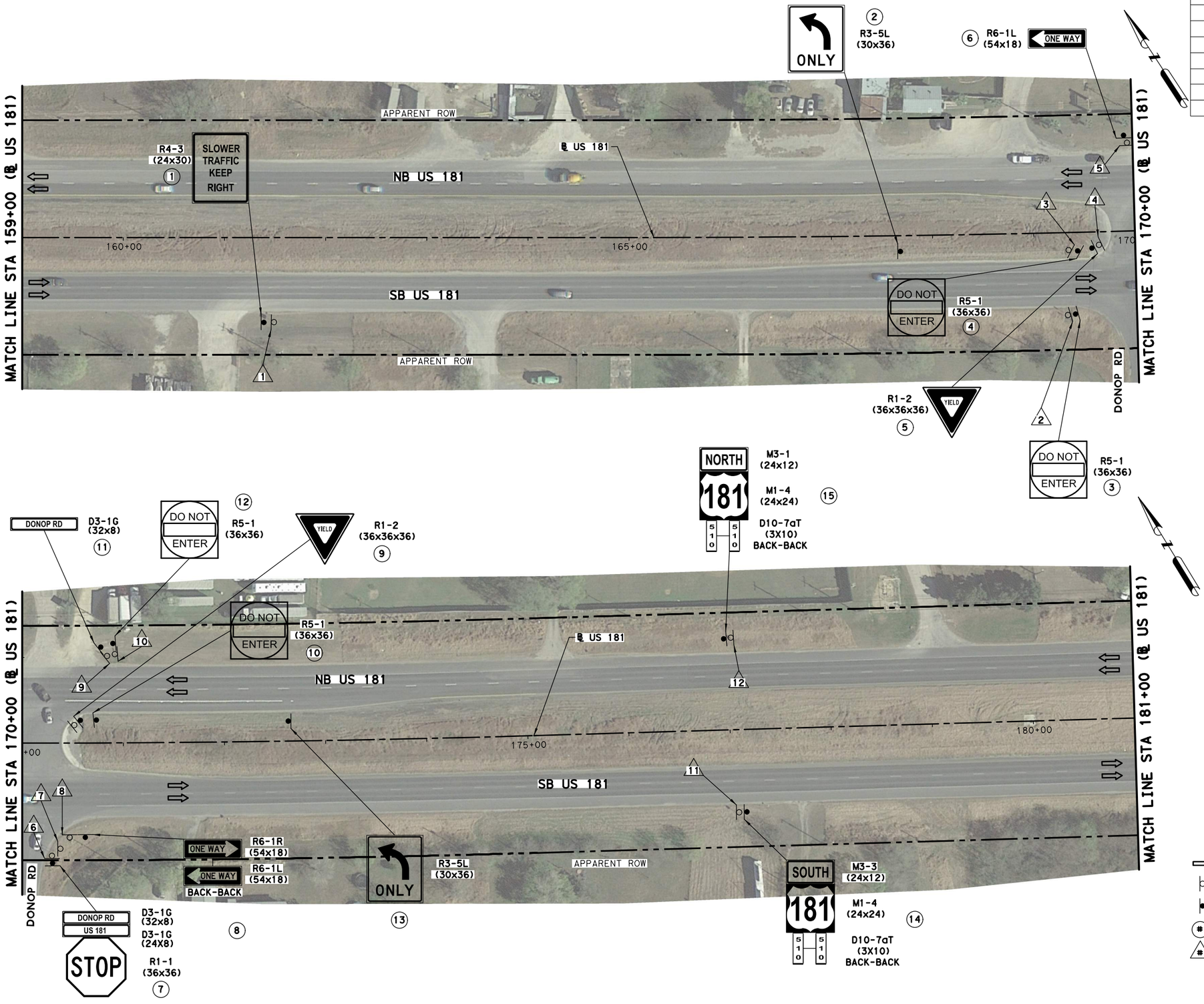

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	2
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	12

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
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09/23/2020

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Texas Department of Transportation

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TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 159+00 TO STA 181+00

SHEET 6 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			208
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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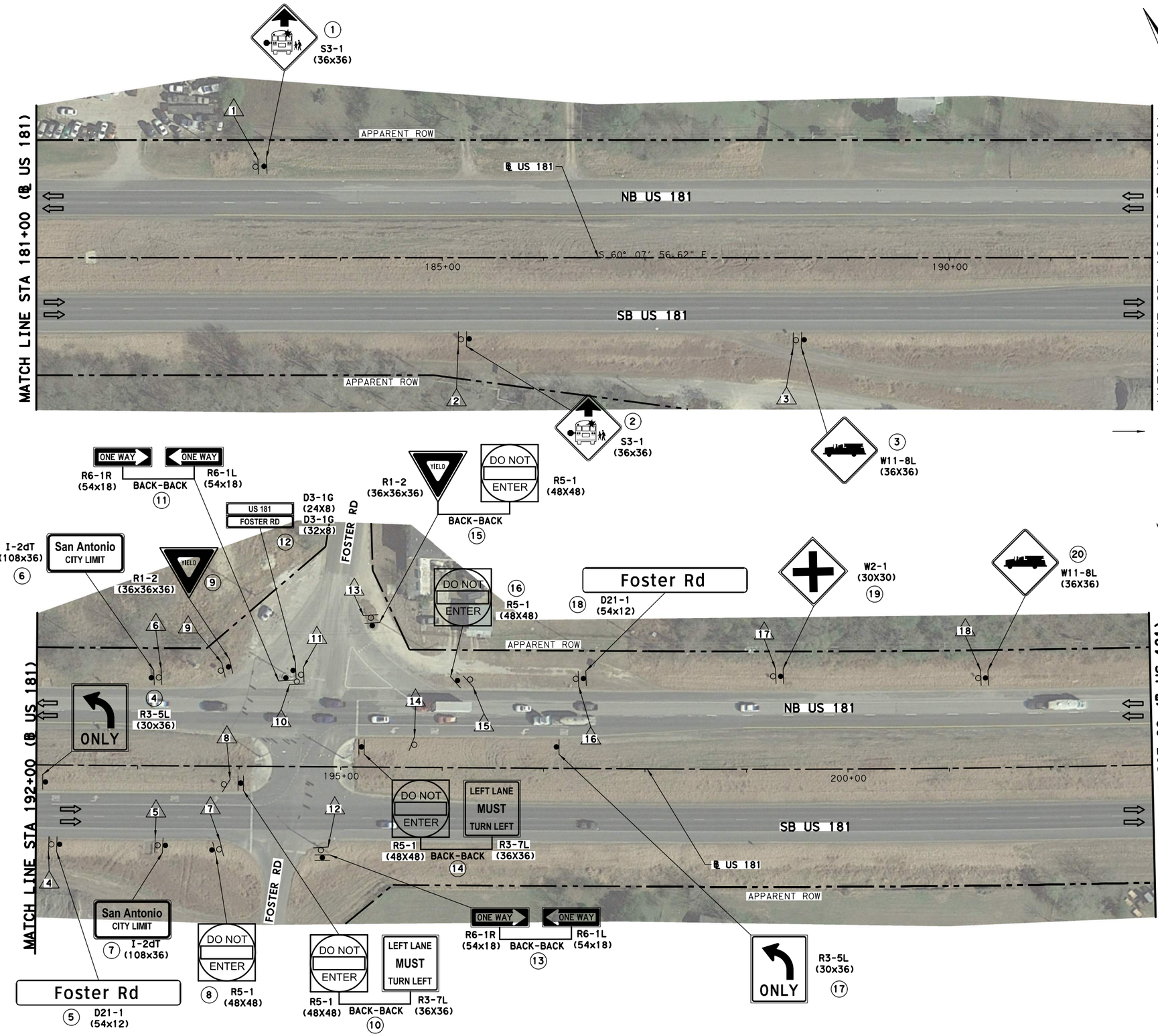
FILE NAME: $FILE$

$TIME$
$DATE$

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	8
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	7
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	18



NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

STATE OF TEXAS
ROBERT S. DOTY
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09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 181+00 TO STA 203+00

SHEET 7 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			209
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

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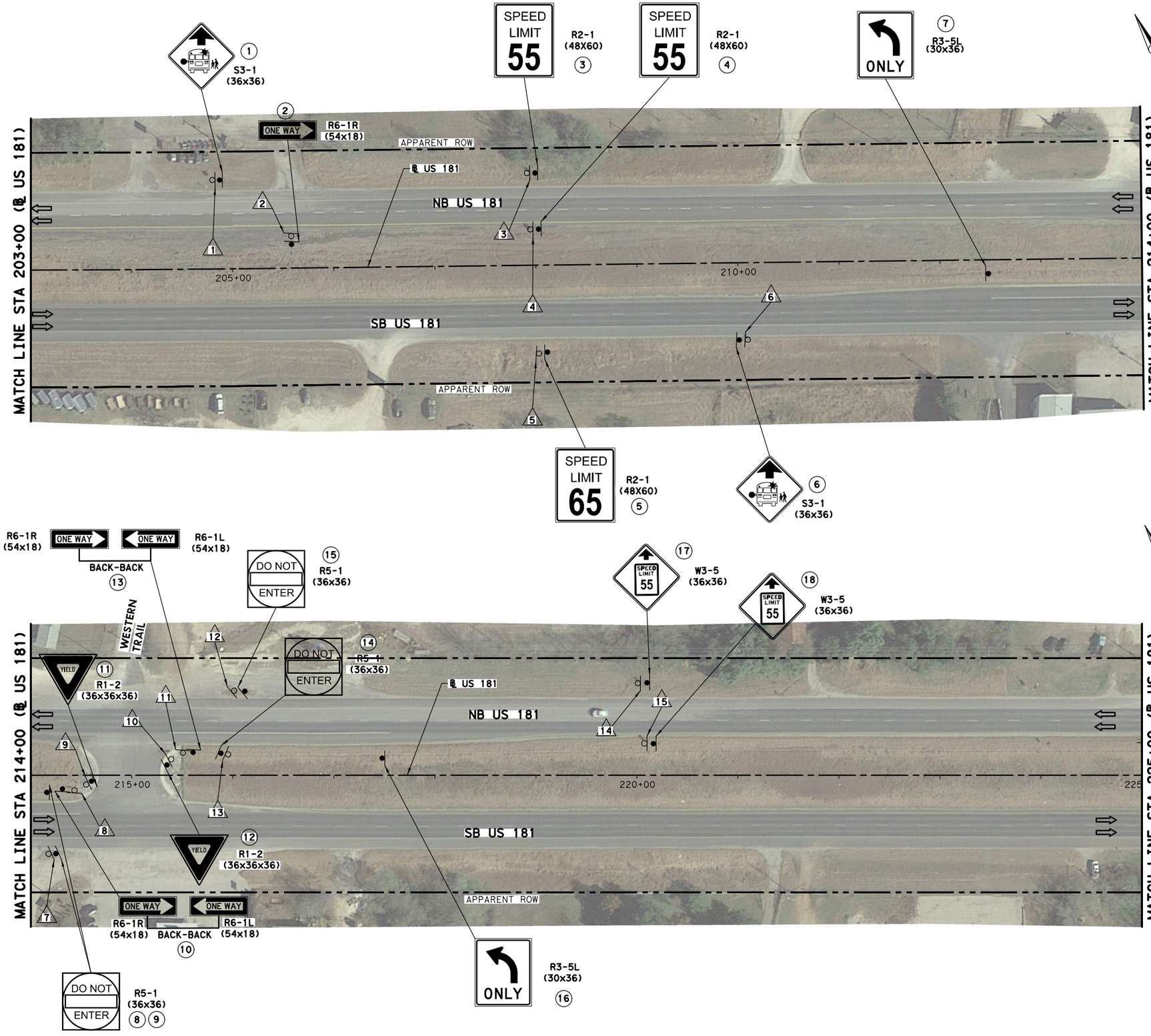

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	12
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	3
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	15

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER
09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 203+00 TO STA 225+00

SHEET 8 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			210
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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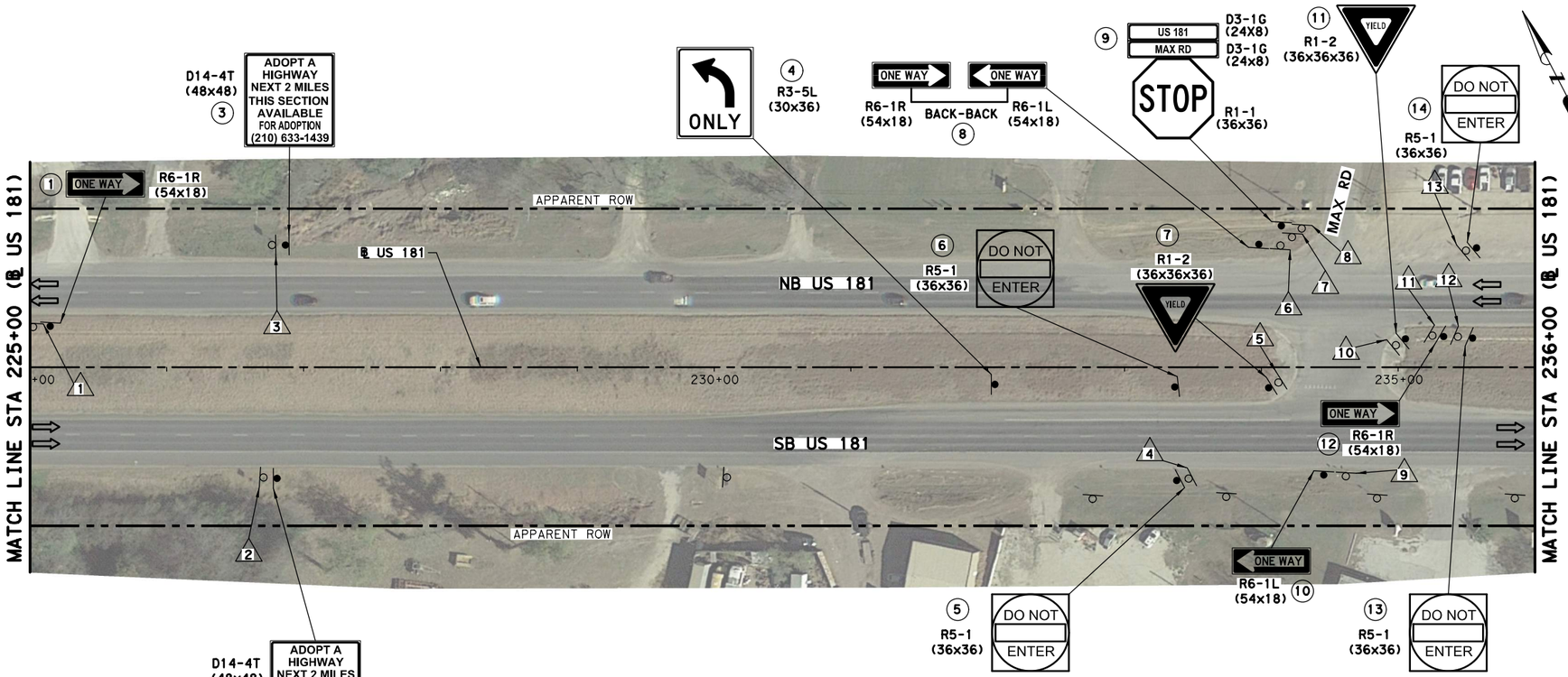

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	8
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	5
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	14

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
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09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 225+00 TO STA 247+00

SHEET 9 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			211
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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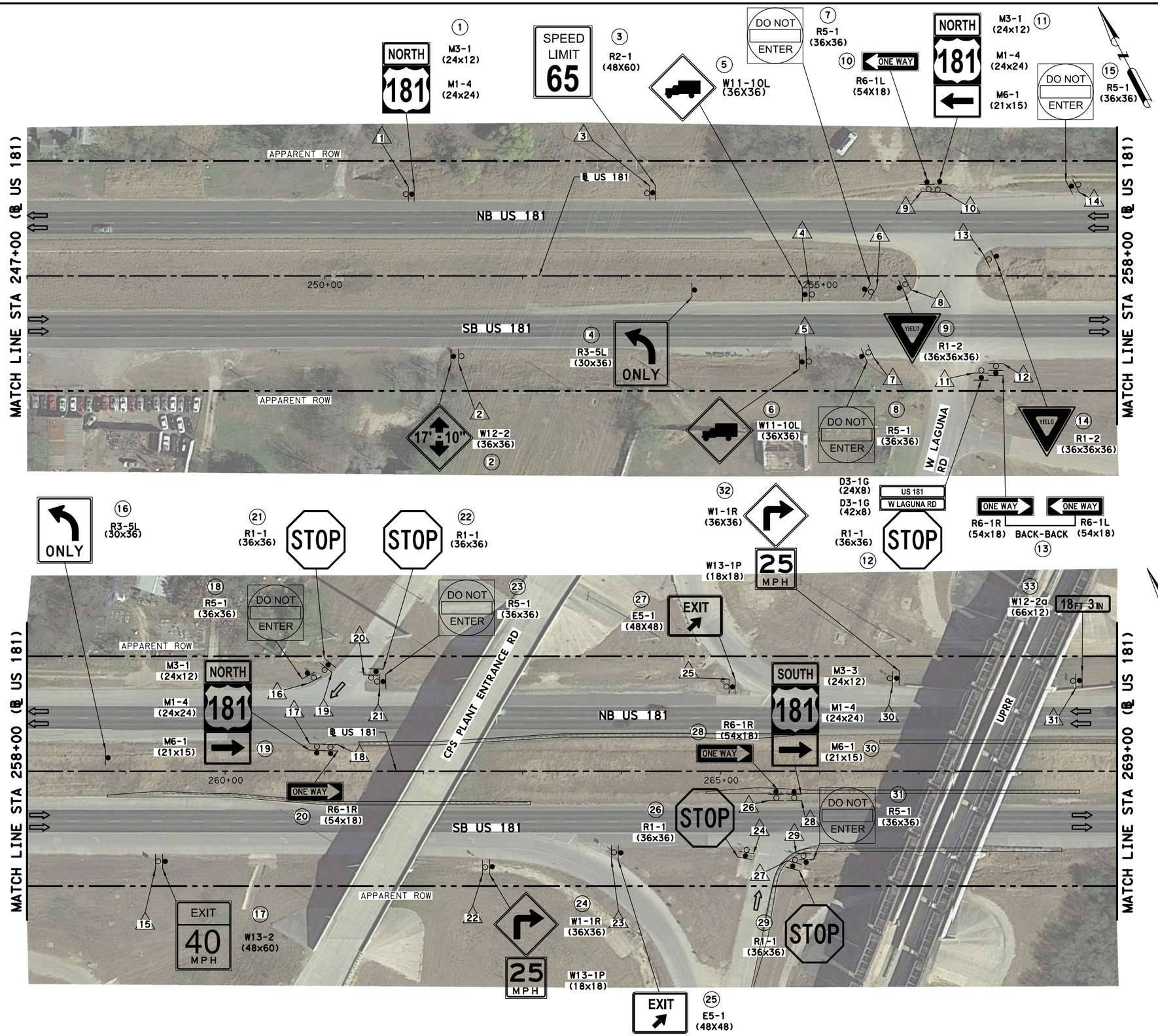

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	21
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	7
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	4
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	31

NOTES:

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LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 247+00 TO STA 269+00

SHEET 10 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			212
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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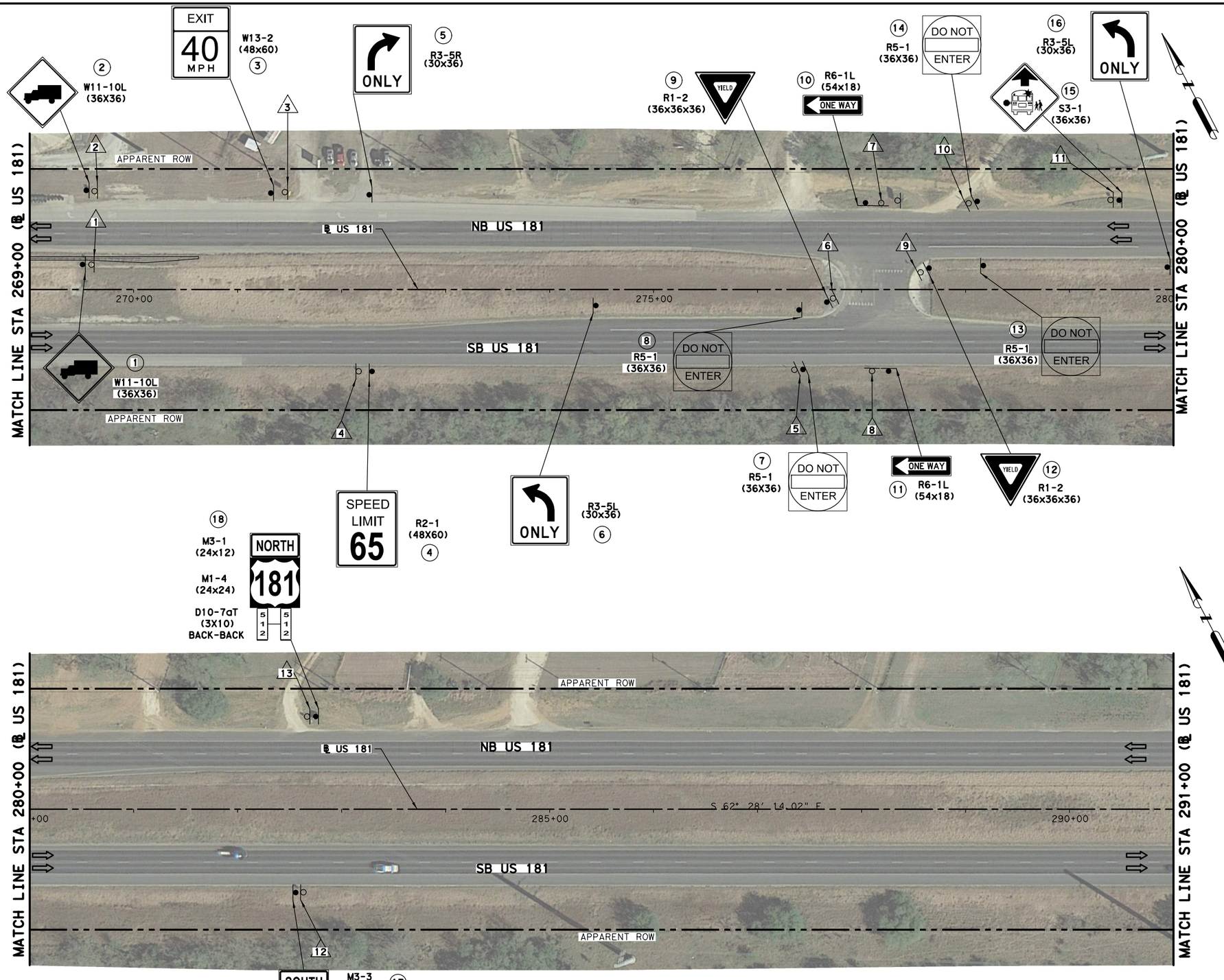

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	13

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 269+00 TO STA 291+00

SHEET 11 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			213
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

$TIME$
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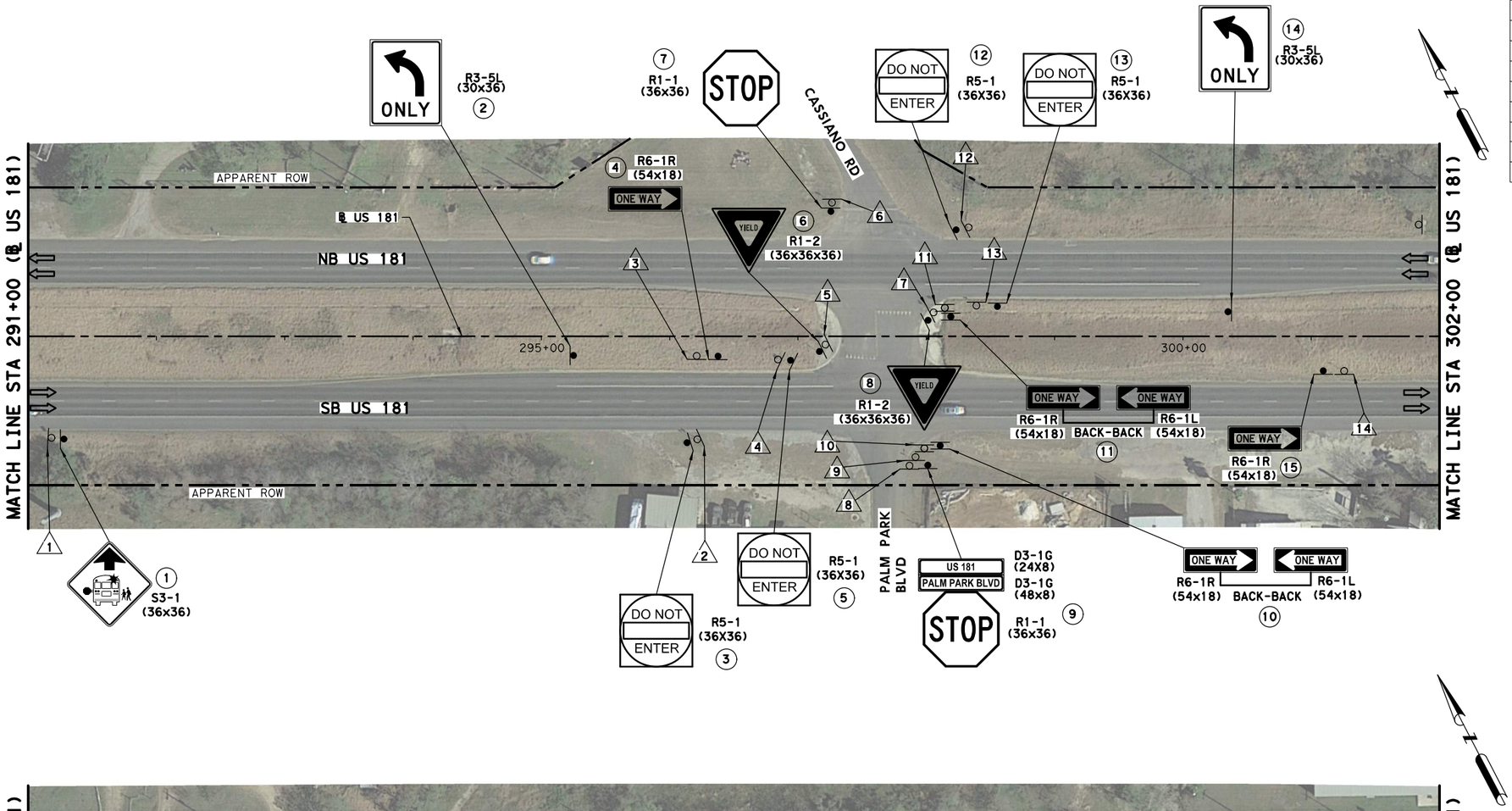
$USER$
FILE NAME: $FILE$
$FILEABBREV$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	10
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	5
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	15

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER
09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 291+00 TP STA 313+00

SHEET 12 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			214
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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$TIME$
$DATE$

$USER$
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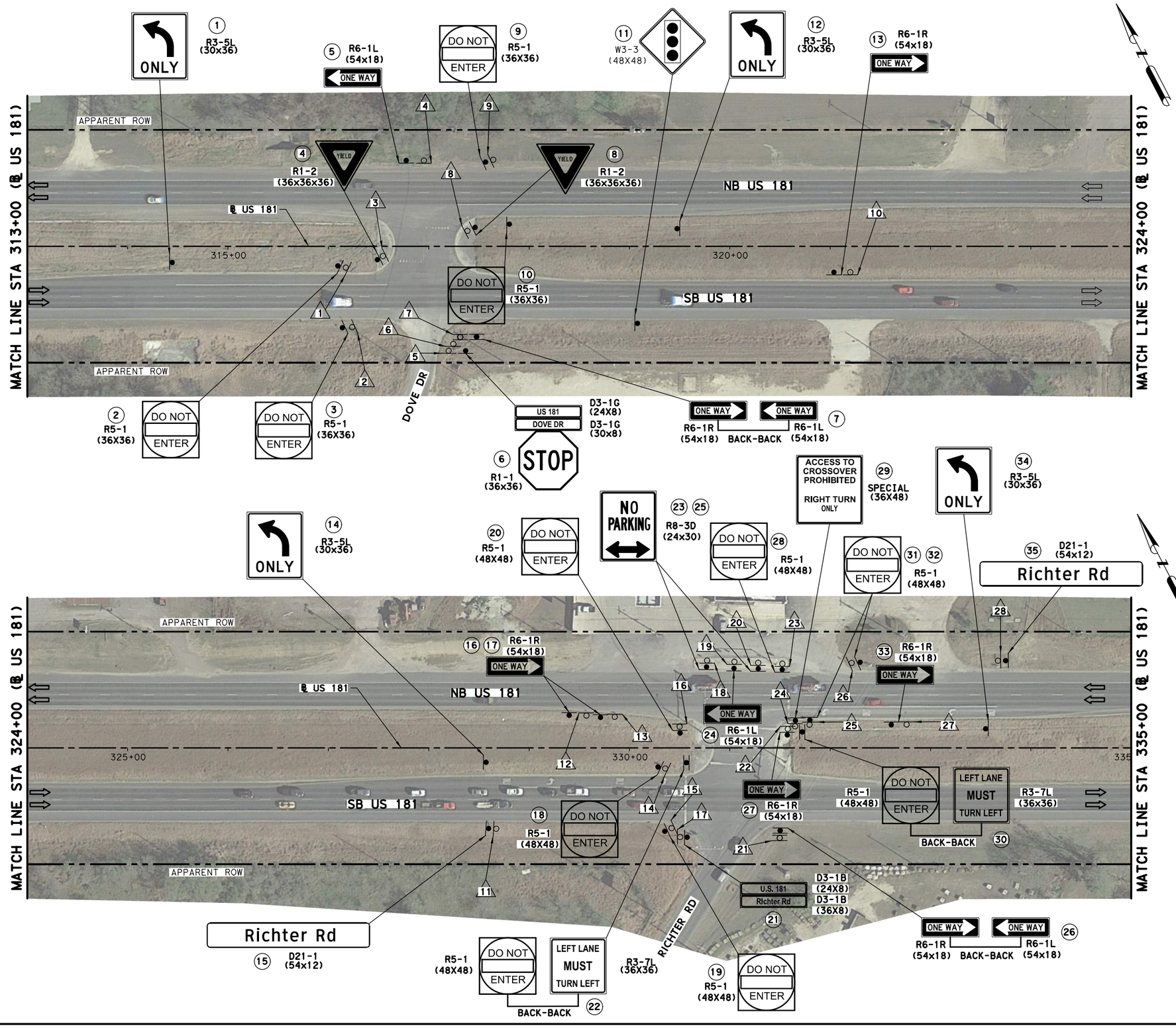

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	13
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	3
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	10
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	9
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	28

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 313+00 TO STA 335+00

SHEET 13 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			215
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

$TIME$
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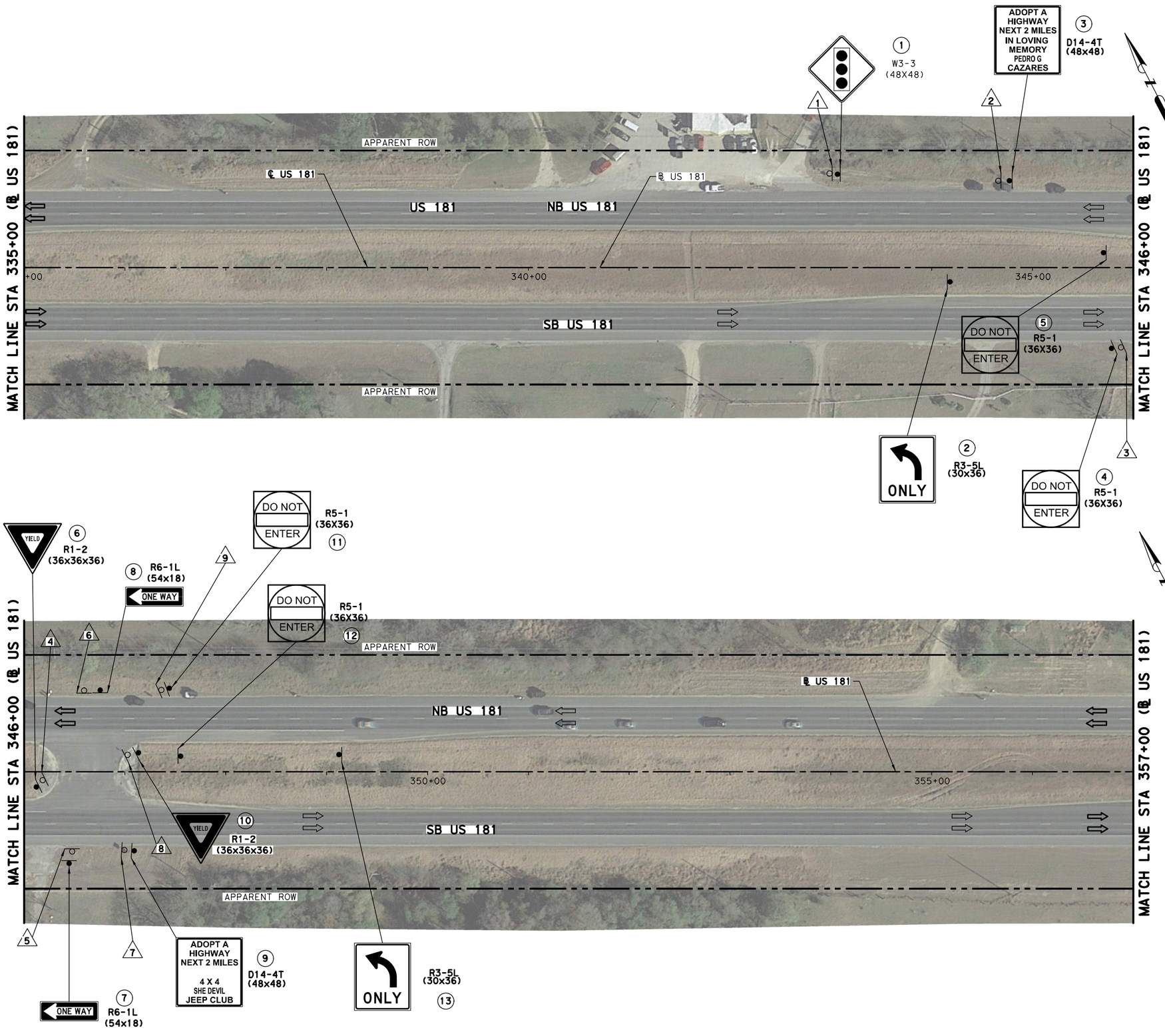
FILE NAME: $FILE$
$FILEABBREV$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	8
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	3
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	9

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (#) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER
09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 335+00 TO STA 357+00

SHEET 14 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			216
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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$DATE$

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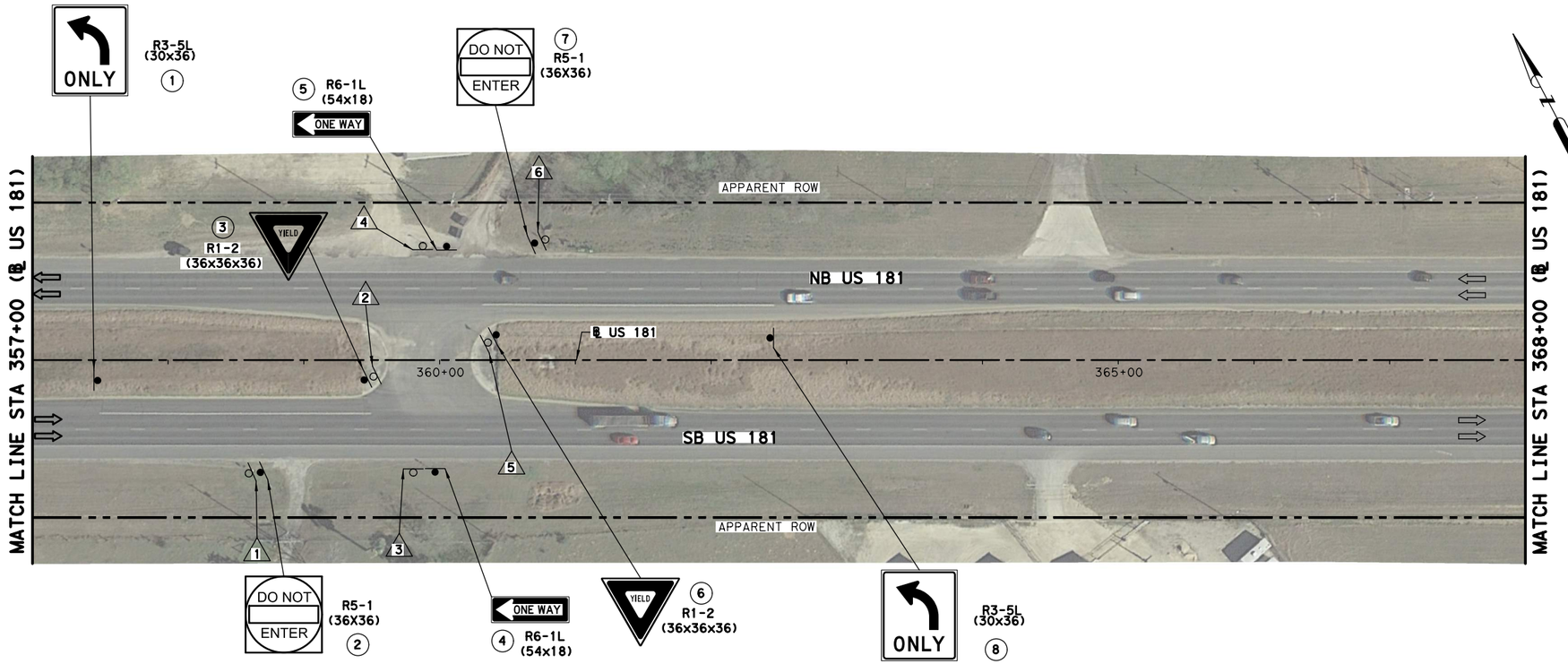
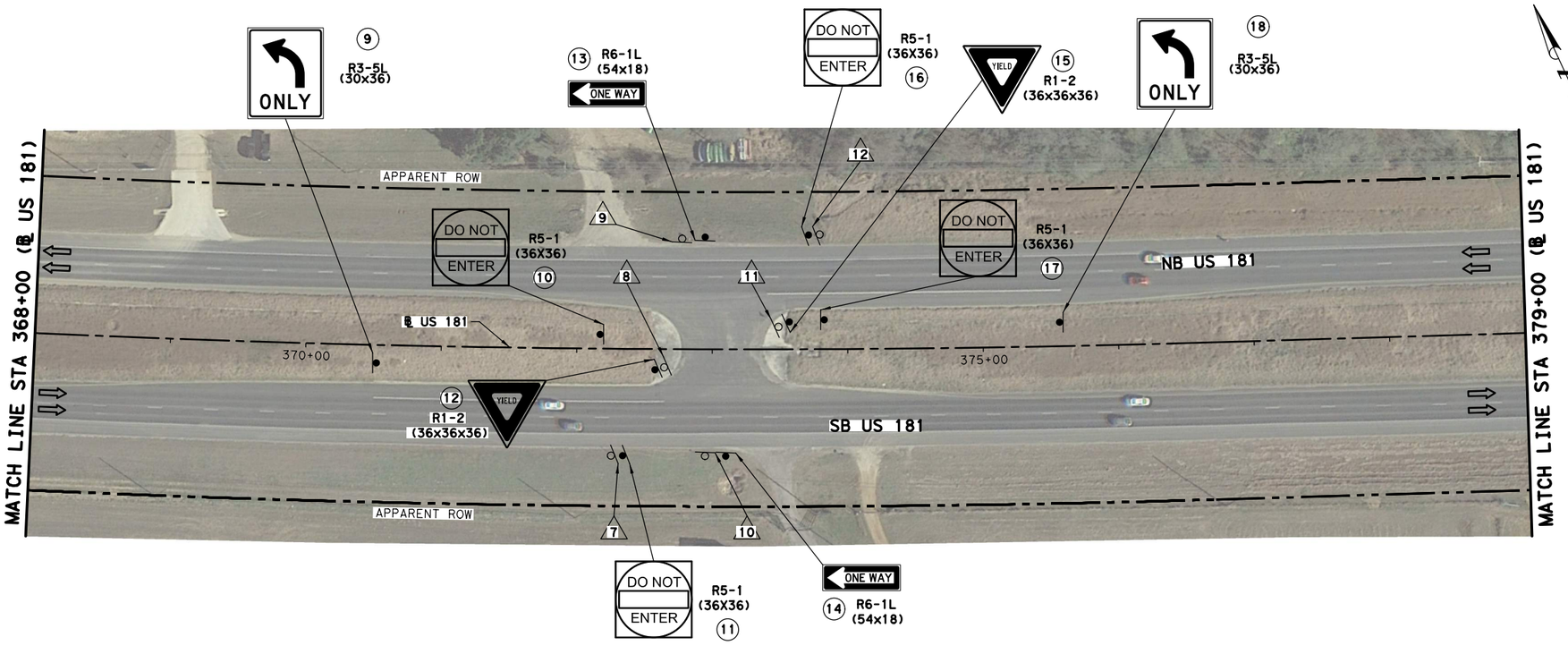
FILE NAME: $FILE$





US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	12

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 357+00 TO STA 379+00

SHEET 15 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			217
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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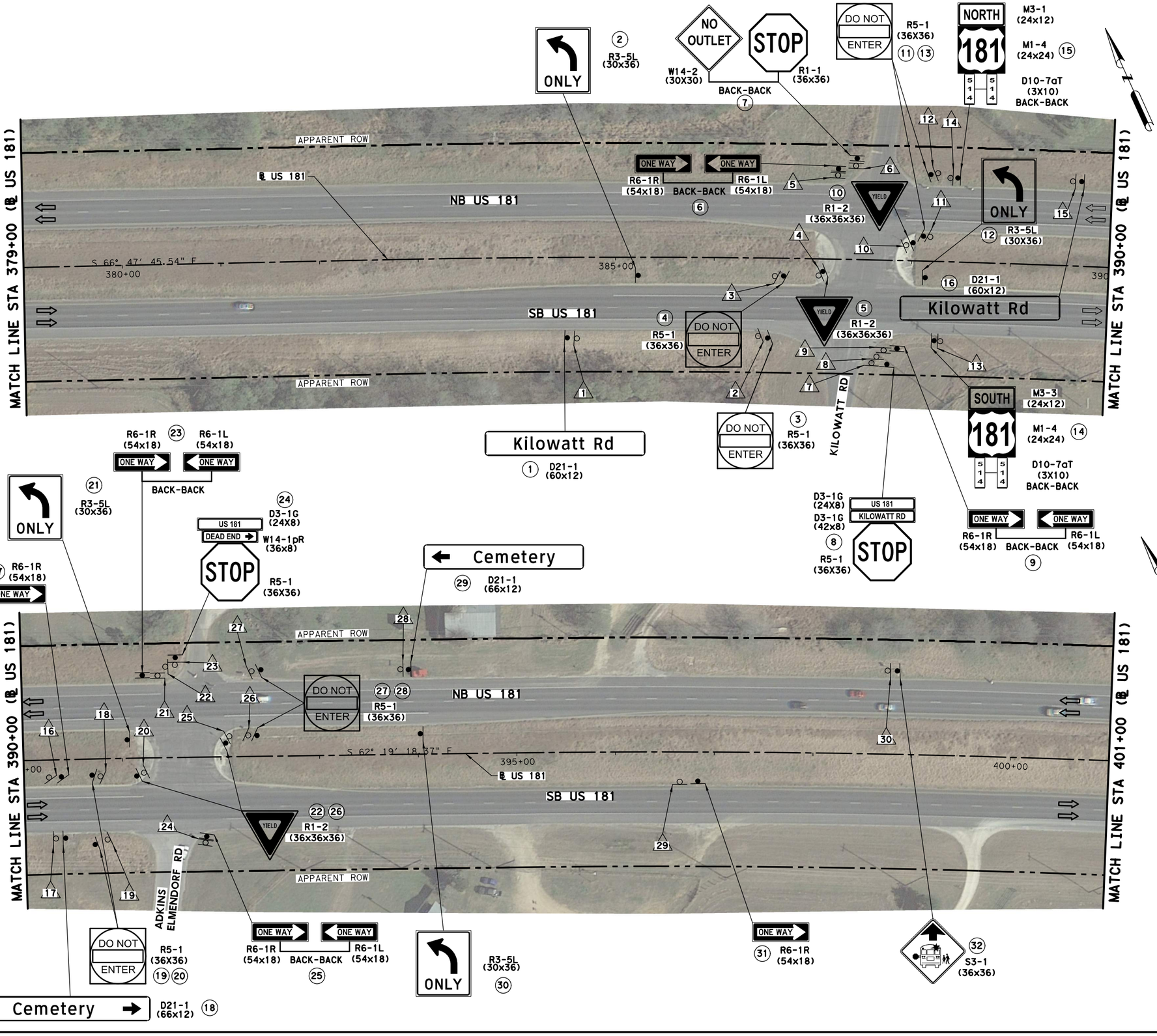
$TIME$
$DATE$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	19
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	2
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	10
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	30

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER
09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 379+00 TO STA 401+00

SHEET 16 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			218
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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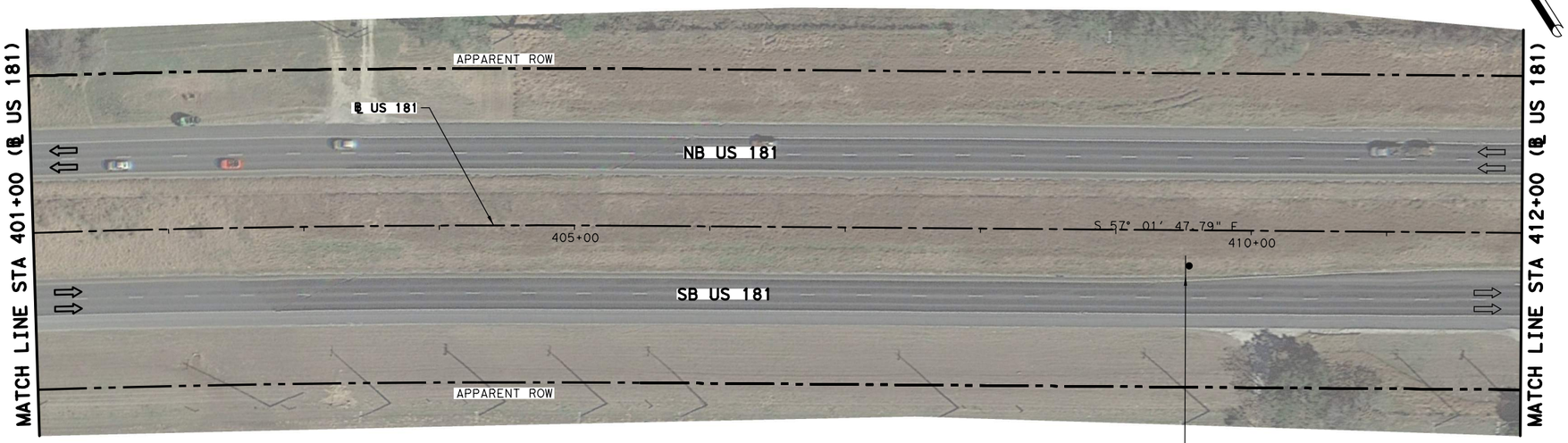
FILE NAME: $FILE$

$TIME$
$DATE$

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	9
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	7



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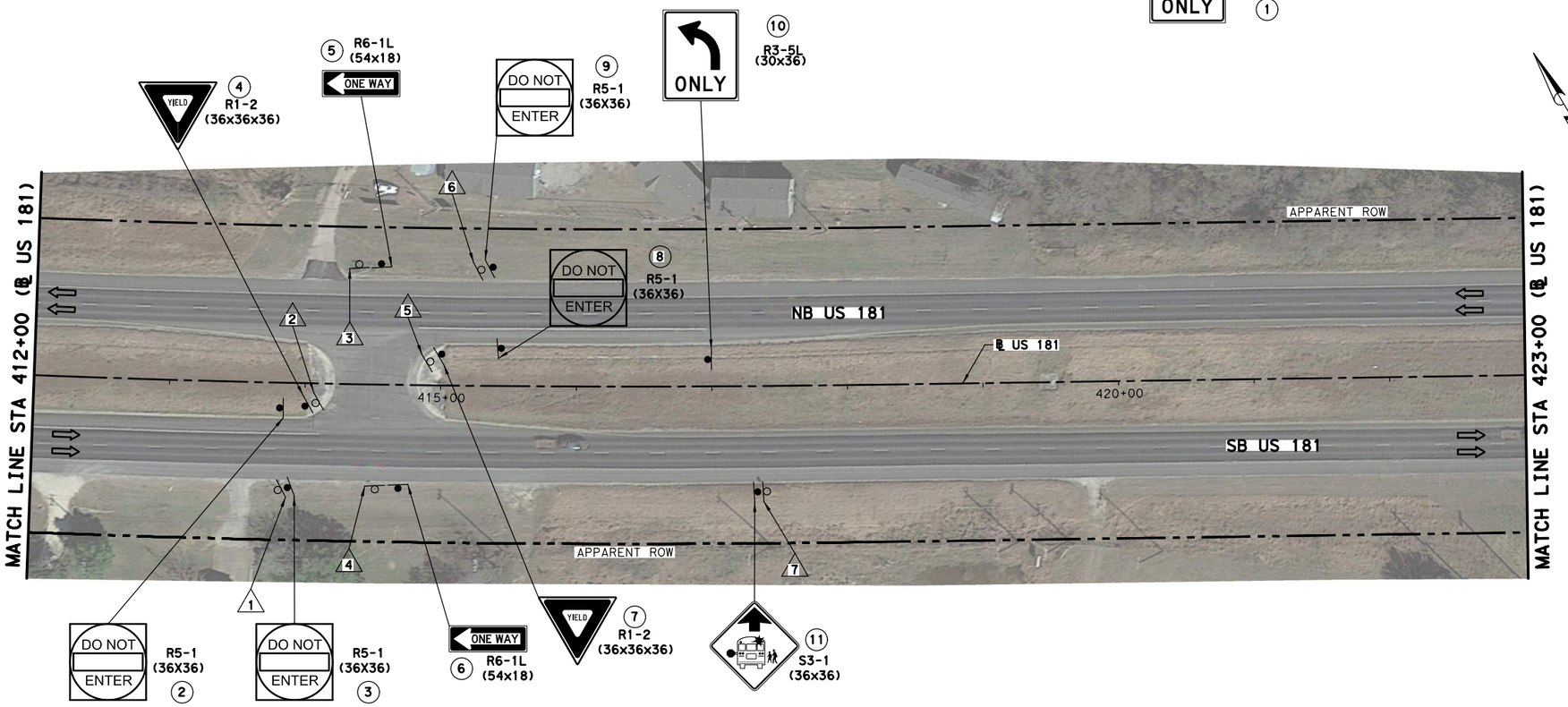

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 401+00 TO STA 423+00

SHEET 17 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			219
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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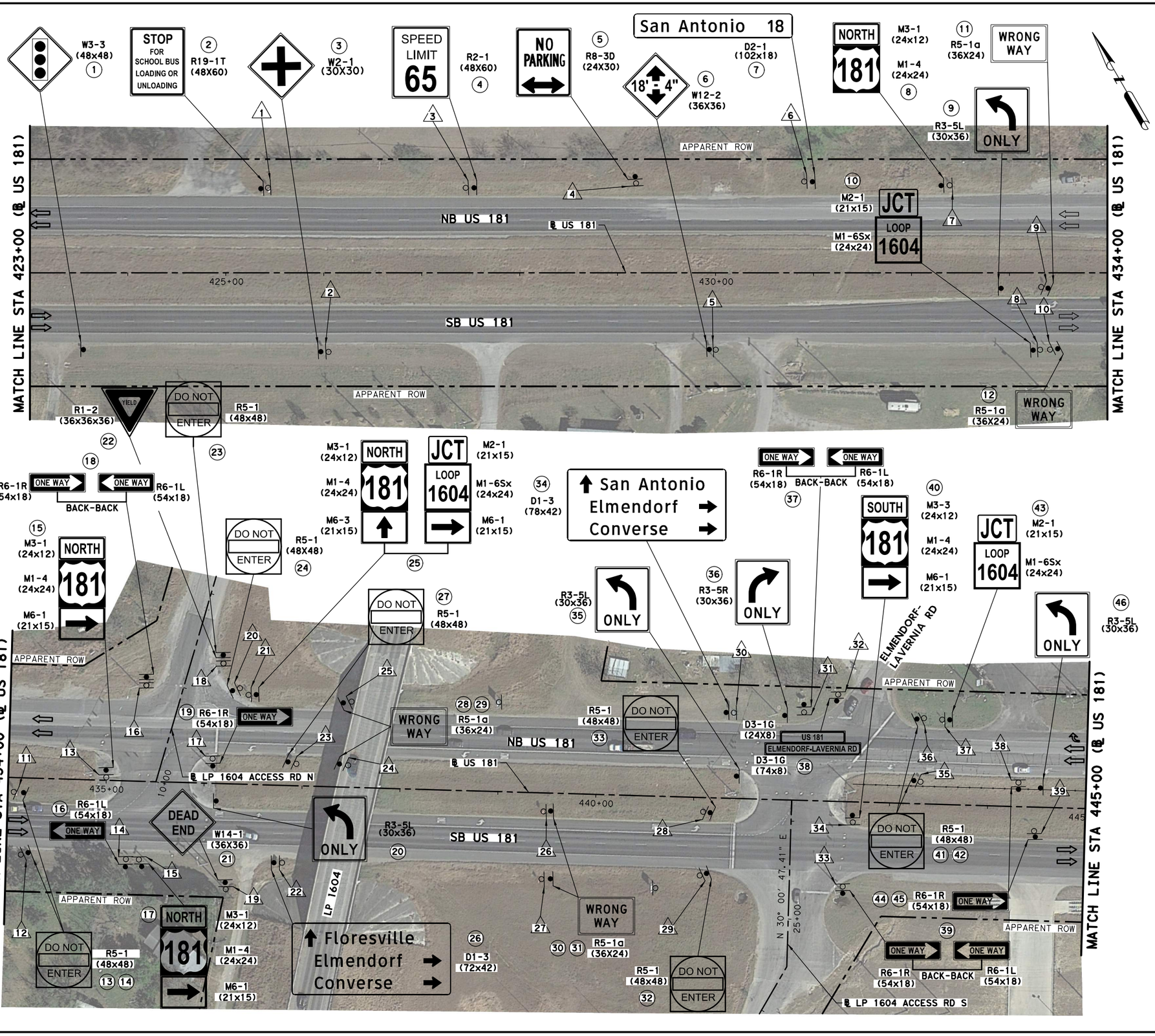

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	21
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	10
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	1
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	13
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	39

NOTES:

1. ALL STATIONS ARE BASED ON ℄ US 181, UNLESS NOTED OTHERWISE.
2. SIGNING DETAILS OF NORTH AND SOUTH LOOP 1604 ACCESS RD ARE SHOWN ON "SHEET 22 OF 23" AND "SHEET 23 OF 23" OF US 181 SIGNING LAYOUTS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER
09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 423+00 TO STA 445+00

SHEET 18 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			220
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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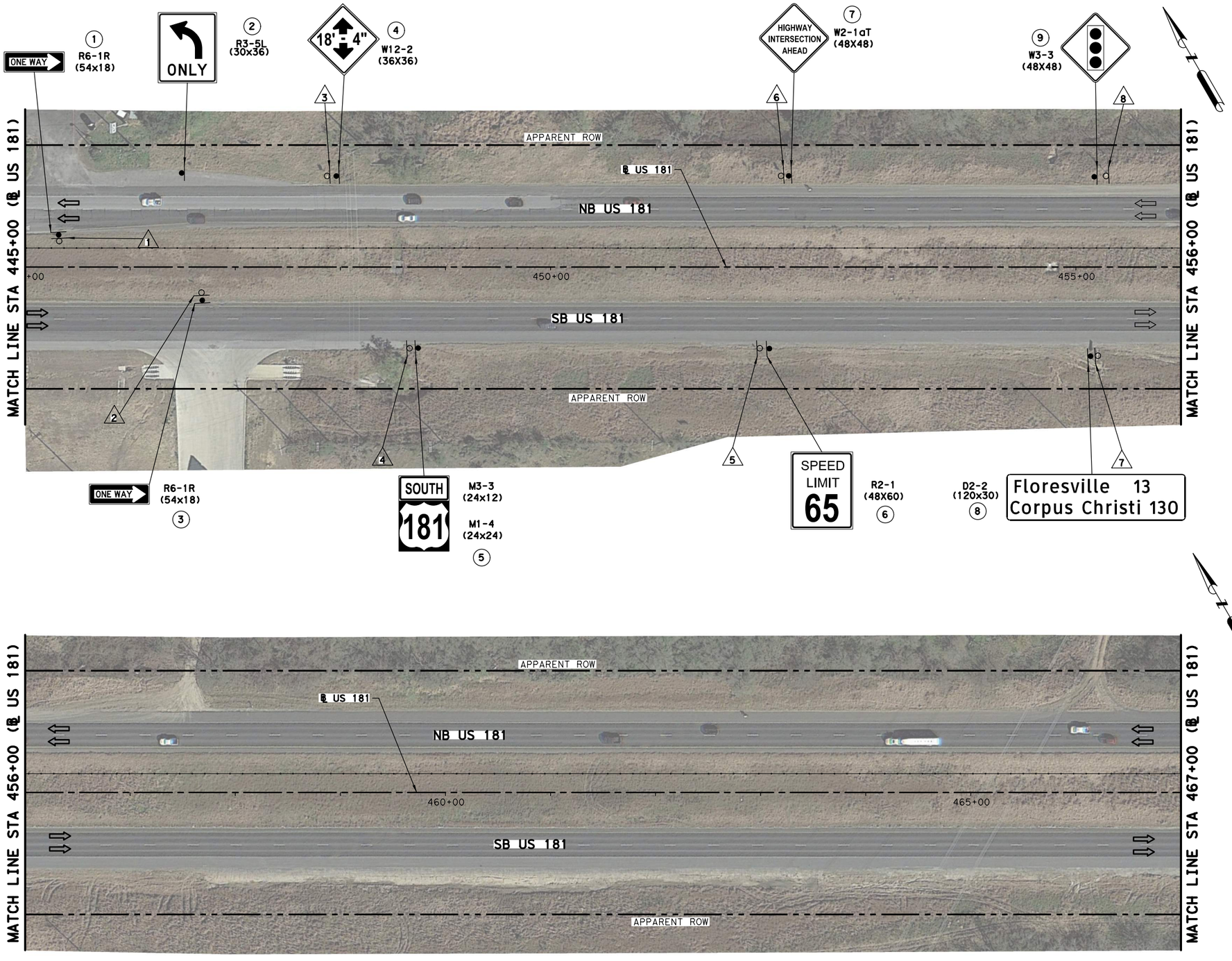

US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	8

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 445+00 TO STA 467+00

SHEET 19 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			221
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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FILE NAME: $FILE$

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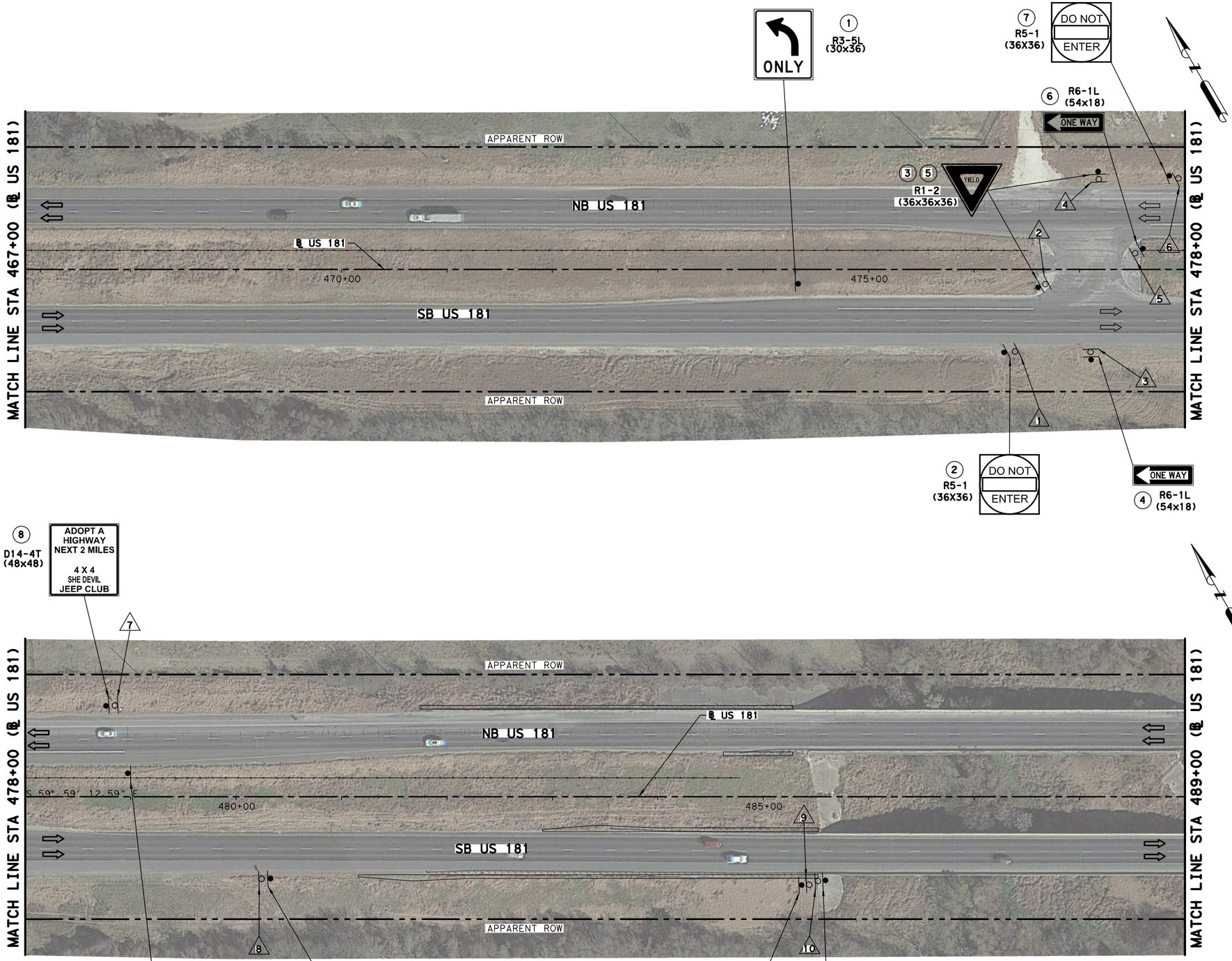
$DATE$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	7
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	10

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 467+00 TO STA 489+00

SHEET 20 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			222
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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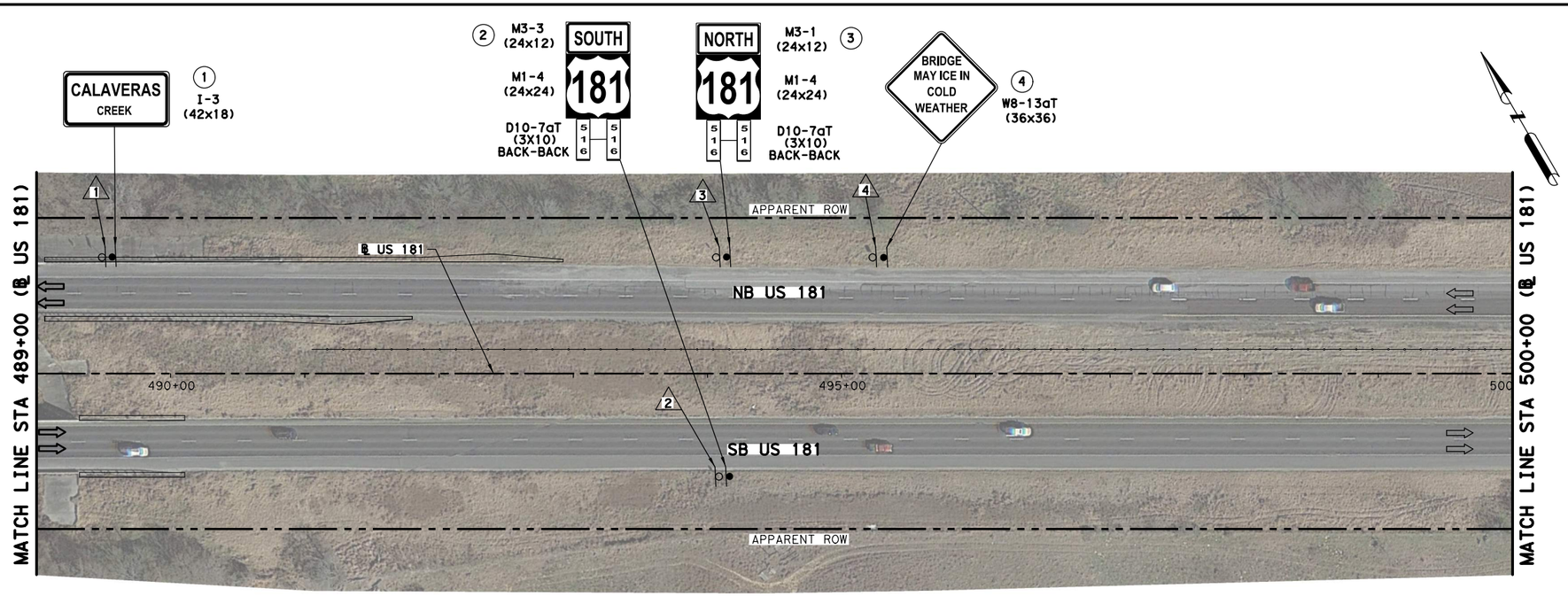
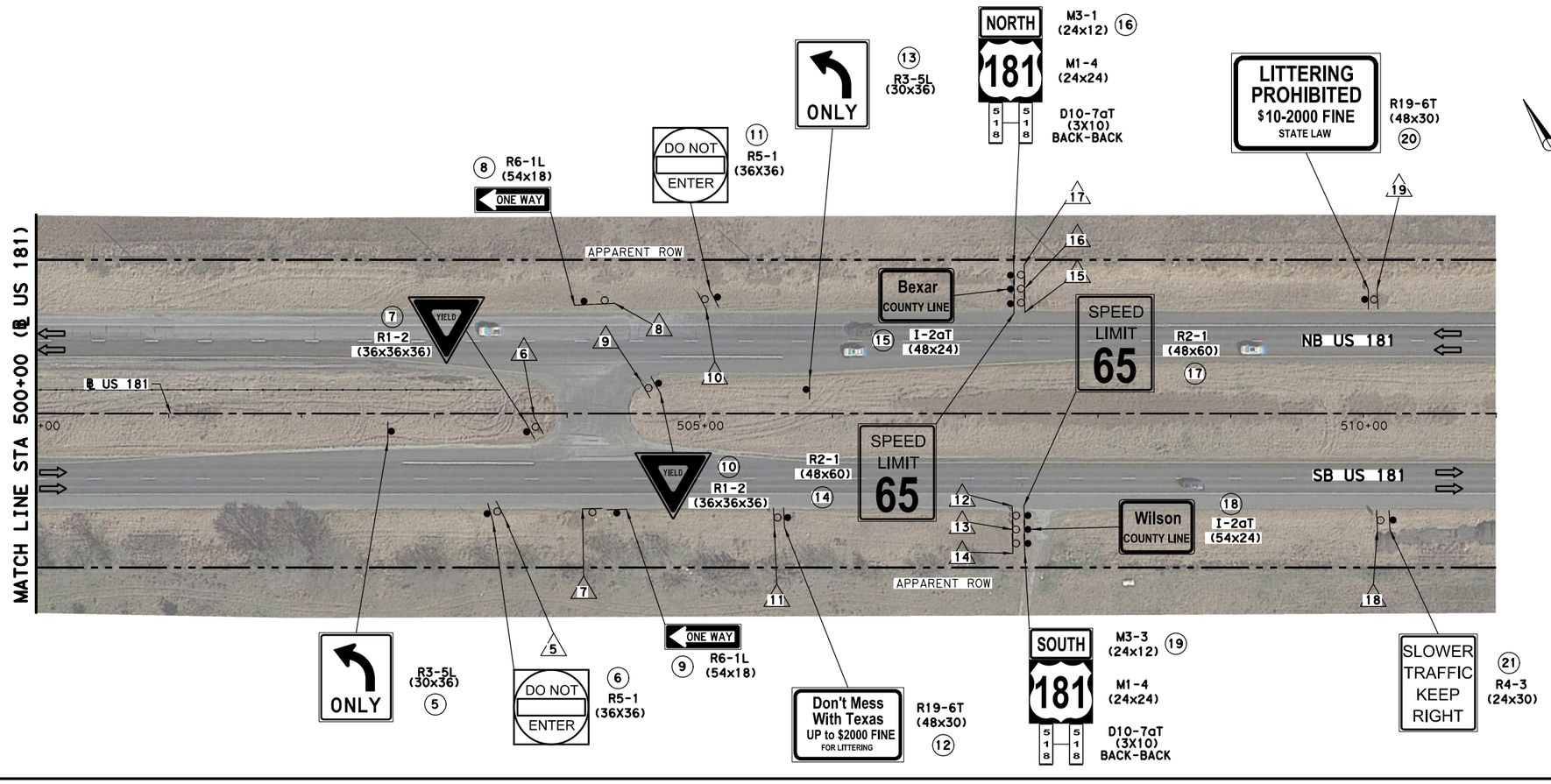
FILE NAME: $FILE$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	5
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	19



NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

STA 489+00 TO END PROJECT

SHEET 21 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			223
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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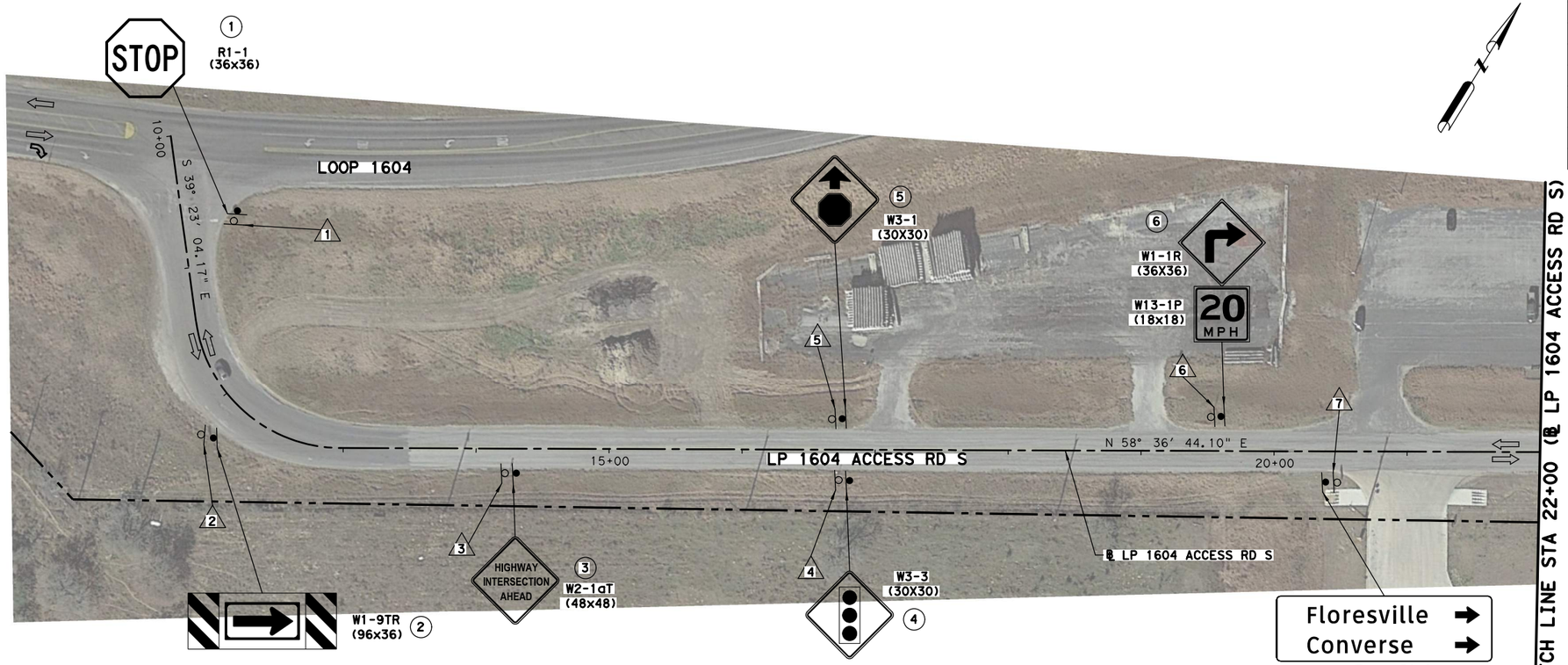
FILE NAME: $FILE$

$TIME$
$DATE$



US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	7

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. SIGNING DETAILS OF SB & NB US 181 ARE SHOWN ON "SHEET 18 OF 23" OF US 181 SIGNING LAYOUTS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
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09/23/2020

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AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

LP 1604 ACCESS RD S

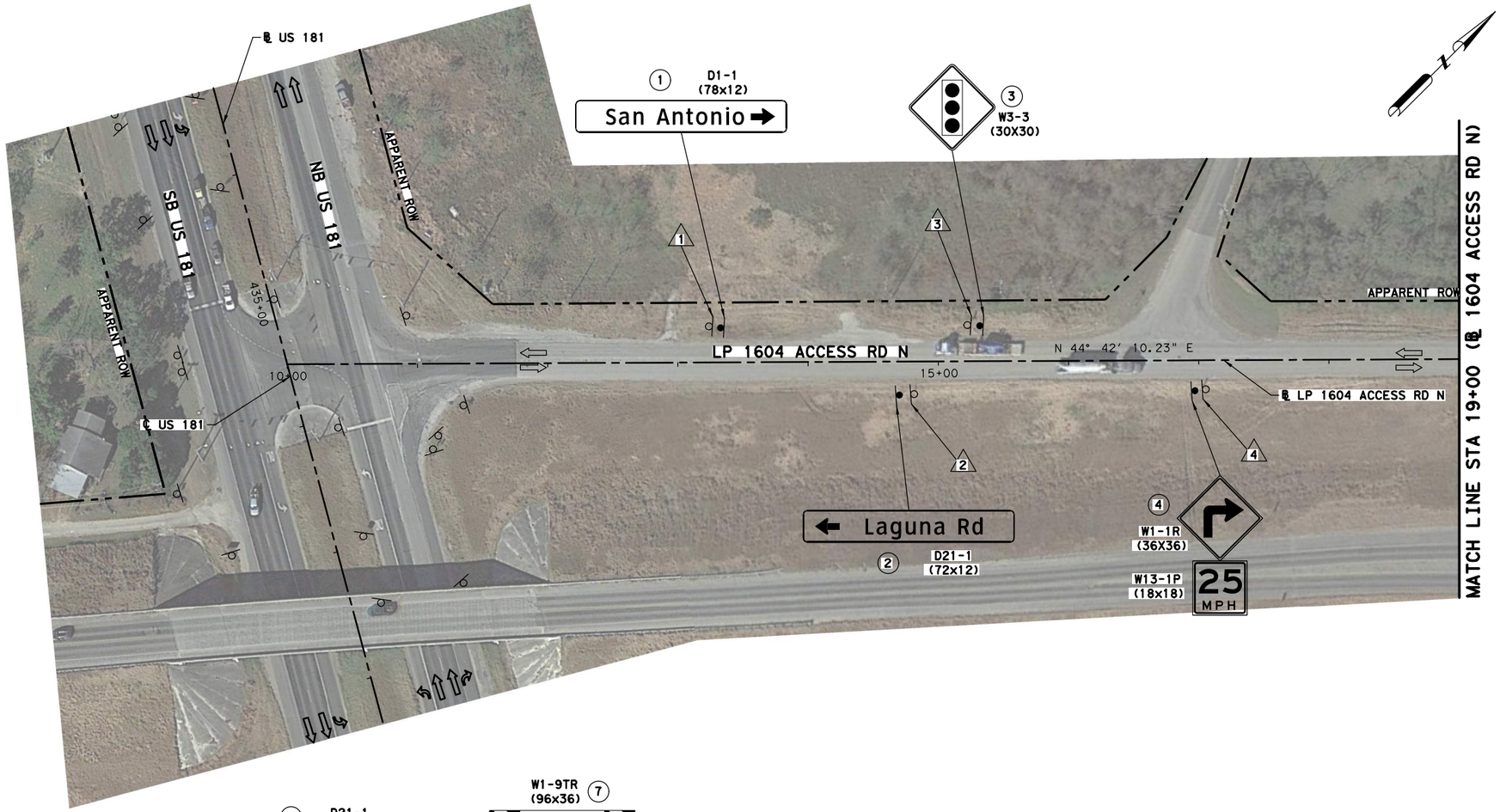
SHEET 22 OF 23

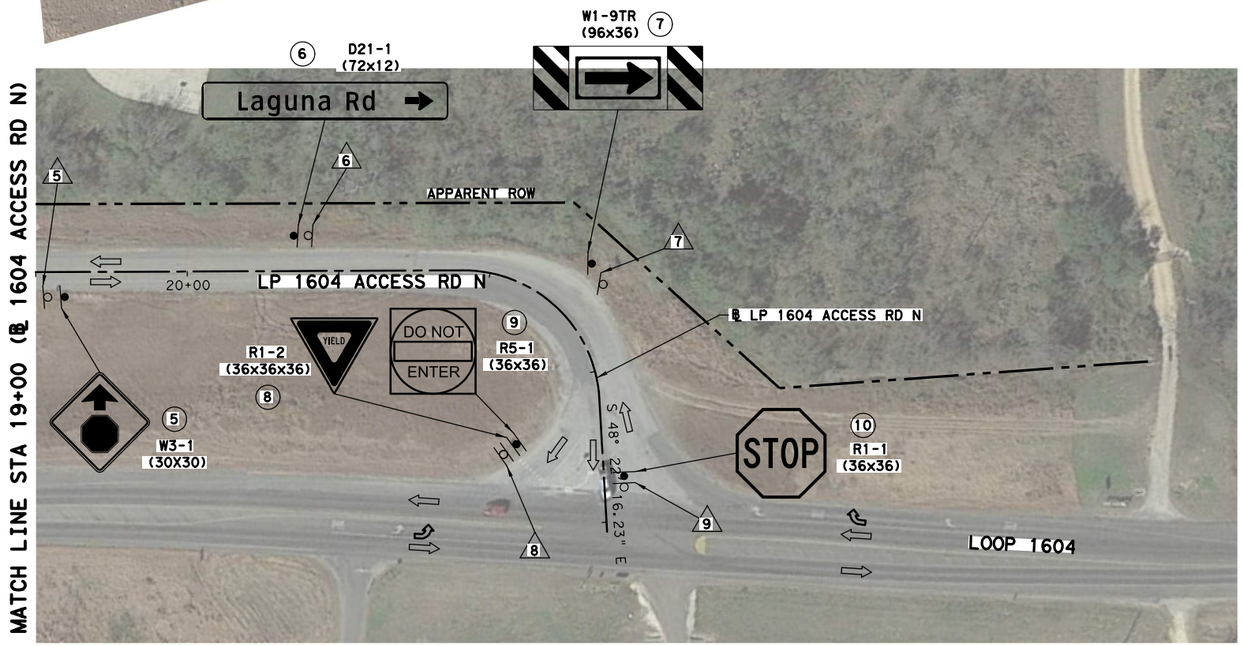
FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			224
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

$USER$
FILE NAME: $FILE$

$FILEABBREV$

$TIME$
$DATE$





US 181 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
	644	6002	IN SM RD SN SUP&AM TY10BWG(1)SA (P-BM)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4
	644	6007	IN SM RD SN SUP&AM TY10BWG(1) SA(U)	EA	
	644	6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
	644	6034	IN SM RD SN SUP&AM TYS80(1)SA (U-1EXT)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	9

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. SIGNING DETAILS OF SB & NB US 181 ARE SHOWN ON "SHEET 18 OF 23" OF US 181 SIGNING LAYOUTS.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- (*) PROP SIGN NUMBER
- (*) EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 181
SIGNING LAYOUT

LP 1604 ACCESS RD N

SHEET 23 OF 23

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			225
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

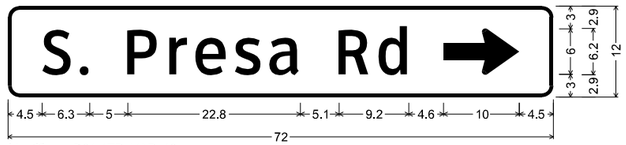
$FILEABBREV$

$USER$
FILE NAME: $FILE$

SIGN #20 (SHEET 4 OF 23)
SIGN #3 (SHEET 9 OF 23)

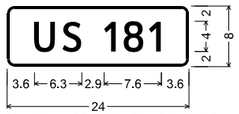
Identifier : D14-4T-4_48x48;
3.0" Radius, 1.0" Border, White on Blue;
[ADOPT A] C; [HIGHWAY] C; [NEXT 2 MILES] C;
3.0" Radius, 1.0" Border, White on Blue;
[THIS SECTION] C; [AVAILABLE] C;
[FOR ADOPTION] C; [(210) 633-1439] C;

SIGN #54 (SHEET 4 OF 23)



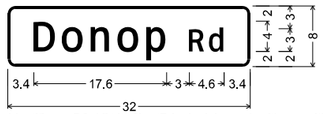
Identifier : D21-1TR_VARx12
1.5" Radius, 0.5" Border, White on Green;
[S. Presa Rd] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

SIGN #7 (SHEET 6 OF 23)
SIGN #12 (SHEET 7 OF 23)
SIGN #9 (SHEET 9 OF 23)
SIGN #12 (SHEET 10 OF 23)
SIGN #9 (SHEET 12 OF 23)
SIGN #6 (SHEET 13 OF 23)
SIGN #21 (SHEET 13 OF 23)
SIGN #8 (SHEET 16 OF 23)
SIGN #24 (SHEET 16 OF 23)
SIGN #37 (SHEET 18 OF 23)



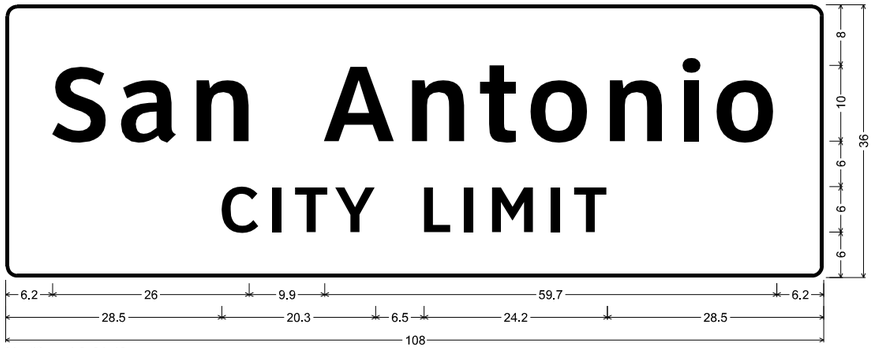
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[US 181] ClearviewHwy-3-W;

SIGN #7 (SHEET 6 OF 23)
SIGN #11 (SHEET 6 OF 23)



Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Donop] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

SIGN #6 (SHEET 7 OF 23)
SIGN #7 (SHEET 7 OF 23)

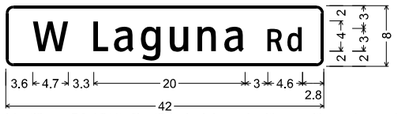


Identifier : I-2_24x18
1.5" Radius, 0.5" Border, White on Green;
[San Antonio] ClearviewHwy-5-W 74% spacing; [CITY LIMIT] ClearviewHwy-5-W;

SIGN #2 (SHEET 9 OF 23)
SIGN #3 (SHEET 14 OF 23)

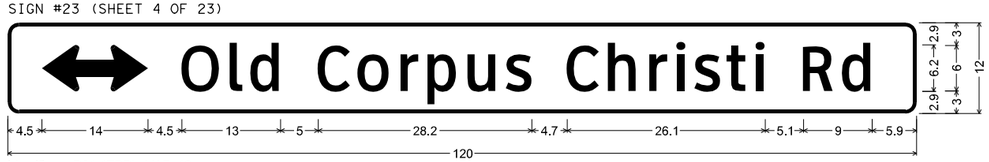
Identifier : D14-4T-4_48x48;
3.0" Radius, 1.0" Border, White on Blue;
[ADOPT A] C; [HIGHWAY] C; [NEXT 2 MILES] C;
3.0" Radius, 1.0" Border, White on Blue;
[IN LOVING] C; [MEMORY] C; [PEDRO G] C;
[CAZARES] C;

SIGN #12 (SHEET 10 OF 23)



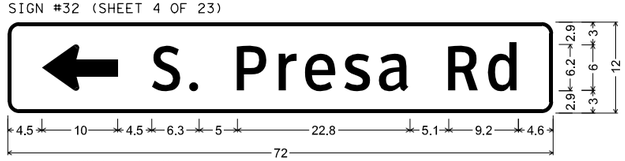
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[W Laguna] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

SIGN #23 (SHEET 4 OF 23)



Identifier : D21-1TDBL_VARx12
1.5" Radius, 0.5" Border, White on Green;
Double Headed Arrow Custom - 14.0" 0°; [Old Corpus Christi Rd] ClearviewHwy-3-W 90% spacing;

SIGN #32 (SHEET 4 OF 23)

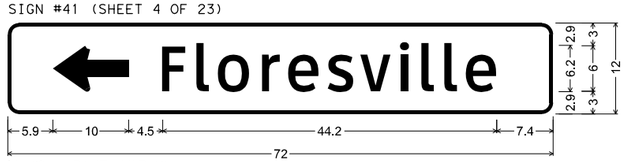


Identifier : D21-1TL_VARx12
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; [S. Presa Rd] ClearviewHwy-3-W;

SIGN #12 (SHEET 7 OF 23)

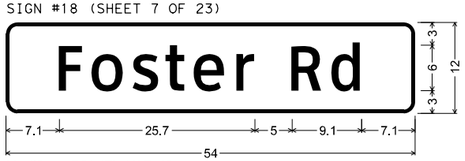
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Foster] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

SIGN #41 (SHEET 4 OF 23)



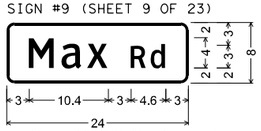
Identifier : D1-1TL_VARx12
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; [Floresville] ClearviewHwy-3-W;

SIGN #5 (SHEET 7 OF 23)
SIGN #18 (SHEET 7 OF 23)



Identifier : D21-1TL_VARx12
1.5" Radius, 0.5" Border, White on Green;
[Foster Rd] ClearviewHwy-3-W;

SIGN #9 (SHEET 9 OF 23)



Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Max] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

STATE OF TEXAS
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09/23/2020

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AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

SMALL SIGN DETAIL

SHEET 1 OF 3

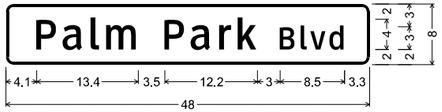
FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			226
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

$FILEABBREV$

$TIME$
$DATE$

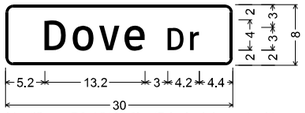
$USER$
FILE NAME: $FILE$

SIGN #9 (SHEET 12 OF 23)



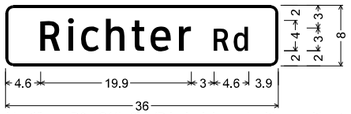
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Palm Park] ClearviewHwy-3-W; [Blvd] ClearviewHwy-3-W;

SIGN #6 (SHEET 13 OF 23)



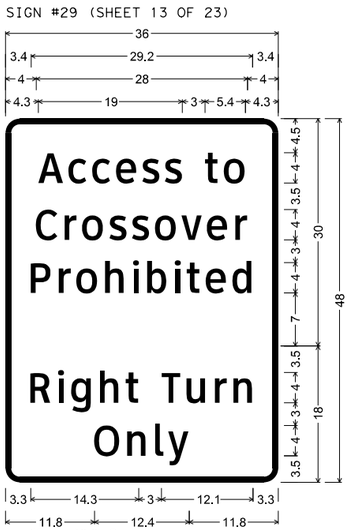
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Dove] ClearviewHwy-3-W;
[Dr] ClearviewHwy-3-W;

SIGN #21 (SHEET 13 OF 23)



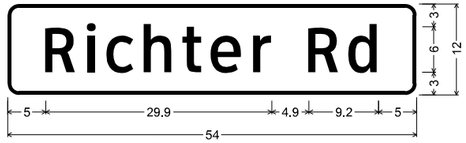
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Richter] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

SIGN #29 (SHEET 13 OF 23)



Identifier : D2-2 (Special);
1.9" Radius, 0.8" Border, Black on White;
[Access to] ClearviewHwy-3-W;
[Crossover] ClearviewHwy-3-W;
[Prohibited] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, Black on White;
[Right Turn] ClearviewHwy-3-W;
[Only] ClearviewHwy-3-W;

SIGN #15 (SHEET 13 OF 23)
SIGN #35 (SHEET 13 OF 23)

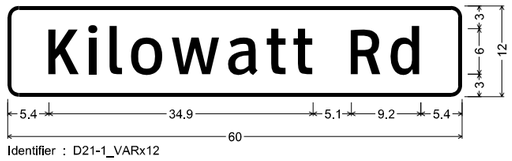


Identifier : D21-1_VARx12
1.5" Radius, 0.5" Border, White on Green;
[Richter Rd] ClearviewHwy-3-W;

SIGN #9 (SHEET 14 OF 23)
SIGN #8 (SHEET 20 OF 23)

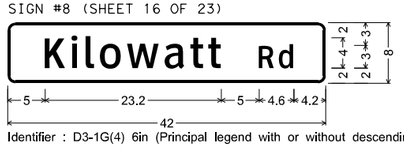
Identifier : D14-4T-3_48x48;
3.0" Radius, 1.0" Border, White on Blue;
[ADOPT A] C; [HIGHWAY] C; [NEXT 2 MILES] C;
3.0" Radius, 1.0" Border, White on Blue;
[4 X 4] C; [SHE DEVIL] C; [JEEP CLUB] C;

SIGN #1 (SHEET 16 OF 23)
SIGN #16 (SHEET 16 OF 23)



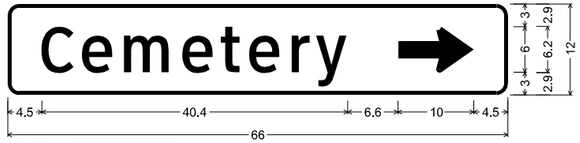
Identifier : D21-1_VARx12
1.5" Radius, 0.5" Border, White on Green;
[Kilowatt Rd] ClearviewHwy-3-W;

SIGN #8 (SHEET 16 OF 23)



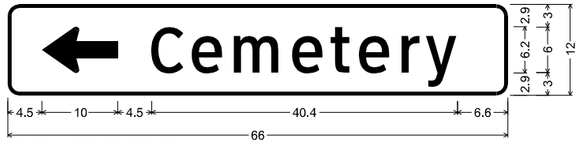
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Kilowatt] ClearviewHwy-3-W;
[Rd] ClearviewHwy-3-W;

SIGN #18 (SHEET 16 OF 23)



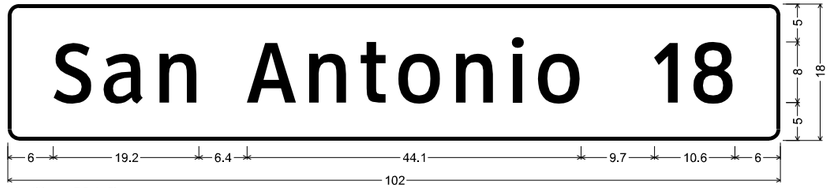
Identifier : D21-1TR_VARx12
1.5" Radius, 0.5" Border, White on Green;
[Cemetery] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

SIGN #29 (SHEET 16 OF 23)



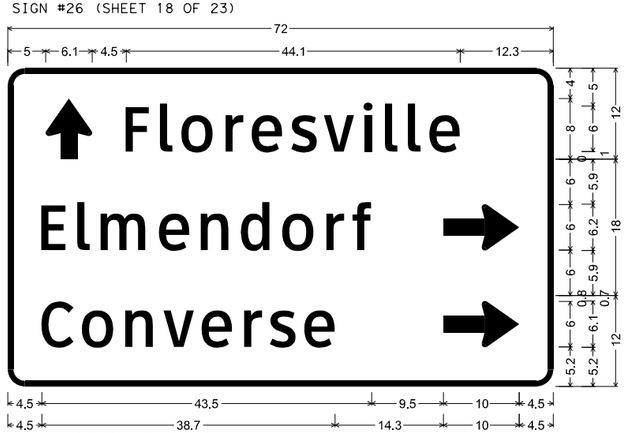
Identifier : D21-1TL_VARx12
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; [Cemetery] ClearviewHwy-3-W;

SIGN #7 (SHEET 18 OF 23)



Identifier : D2-1 6In
1.5" Radius, 0.5" Border, White on Green;
[San Antonio] ClearviewHwy-3-W; [18] ClearviewHwy-3-W;

SIGN #26 (SHEET 18 OF 23)



Identifier : D1-3 6in UP-45RT-45RT;
2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 8.0" X 6.1" 90°; [Floresville] ClearviewHwy-3-W;
2.3" Radius, 0.8" Border, White on Green;
[Elmendorf] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;
2.3" Radius, 0.8" Border, White on Green;
[Converse] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

STATE OF TEXAS
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09/23/2020

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AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

SMALL SIGN DETAIL

SHEET 2 OF 3

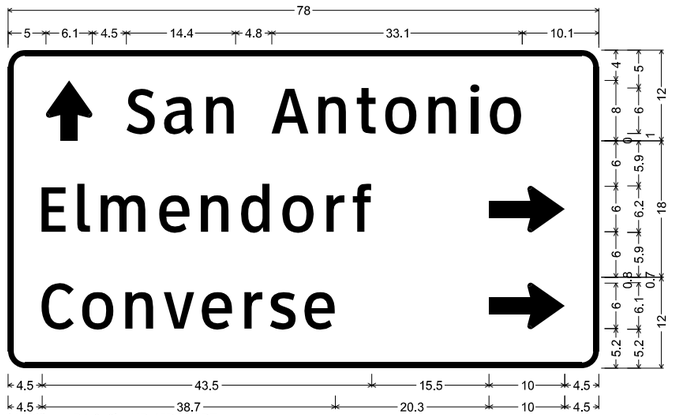
FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			227
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

$FILEABBREV$

$TIME$
$DATE$

$USER$
FILE NAME: $FILE$

SIGN #34 (SHEET 18 OF 23)

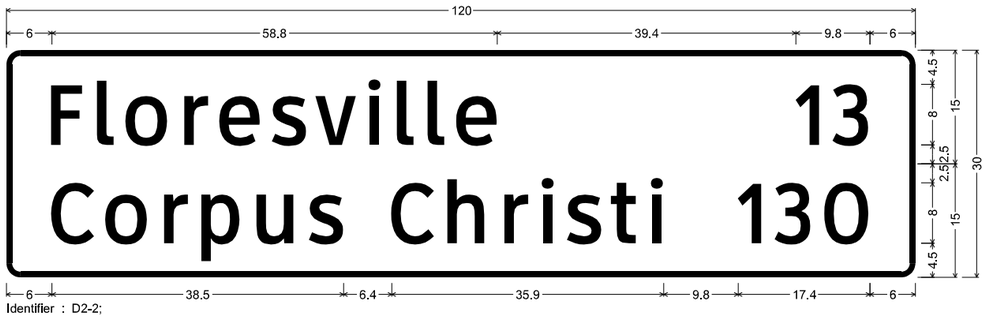


Identifier : D1-3 6in UP-45RT-45RT;
2.3" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 8.0" X 6.1" 90°; [San Antonio] ClearviewHwy-3-W;
2.3" Radius, 0.8" Border, White on Green;
[Elmendorf] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;
2.3" Radius, 0.8" Border, White on Green;
[Converse] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

SIGN #37 (SHEET 18 OF 23)

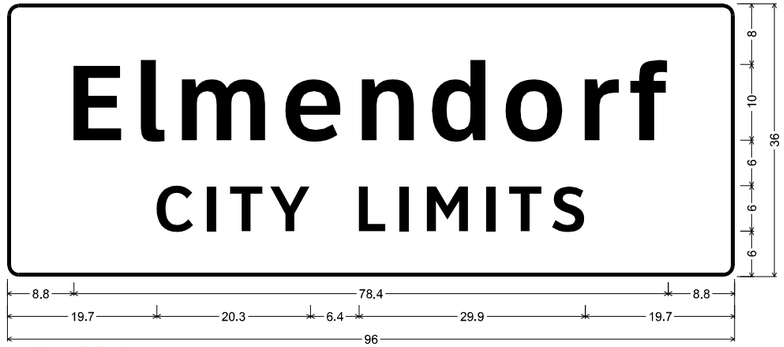
Identifier : D3-1G(4) 6in (Principal legend with or without descending strokes)
1.0" Radius, 0.4" Border, White on Blue;
[Elmendorf-Lavernia] ClearviewHwy-3-W; [Rd] ClearviewHwy-3-W;

SIGN #8 (SHEET 19 OF 23)



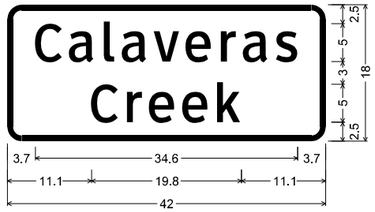
Identifier : D2-2;
1.9" Radius, 0.8" Border, White on Green;
[Floresville] ClearviewHwy-3-W; [13] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, White on Green;
[Corpus Christi] ClearviewHwy-3-W; [130] ClearviewHwy-3-W;

SIGN #11 (SHEET 20 OF 23)



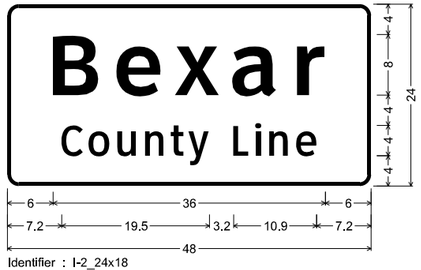
Identifier : I-2_24x18
1.5" Radius, 0.5" Border, White on Green;
[Elmendorf] ClearviewHwy-5-W 74% spacing; [CITY LIMITS] ClearviewHwy-5-W;

SIGN #12 (SHEET 20 OF 23)
SIGN #1 (SHEET 21 OF 23)



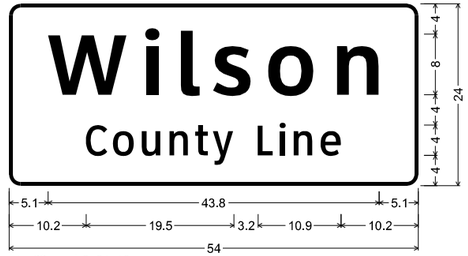
Identifier : I-3 8in
1.9" Radius, 0.8" Border, White on Green;
[Calaveras] ClearviewHwy-3-W;
[Creek] ClearviewHwy-3-W;

SIGN #15 (SHEET 21 OF 23)



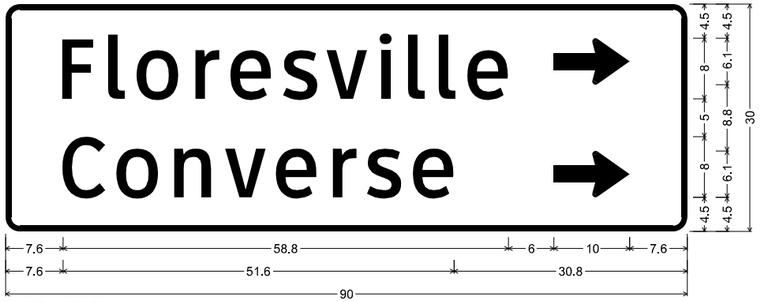
Identifier : I-2_24x18
1.5" Radius, 0.5" Border, White on Green;
[Bexar] ClearviewHwy-5-W;
[County Line] ClearviewHwy-3-W;

SIGN #18 (SHEET 21 OF 23)



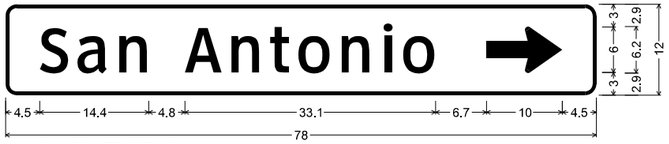
Identifier : I-2_24x18
1.5" Radius, 0.5" Border, White on Green;
[Wilson] ClearviewHwy-5-W; [County Line] ClearviewHwy-3-W;

SIGN #7 (SHEET 22 OF 23)



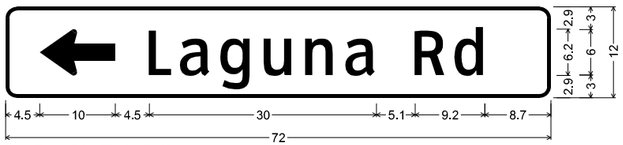
Identifier : D1-2
1.9" Radius, 0.8" Border, White on Green;
[Floresville] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°; [Converse] ClearviewHwy-3-W;
Standard Arrow Custom 10.0" X 6.1" 0°;

SIGN #1 (SHEET 23 OF 23)



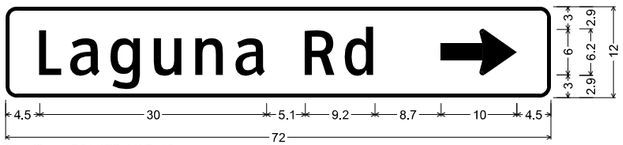
Identifier : D21-1TR_VARx12
1.5" Radius, 0.5" Border, White on Green;
[San Antonio] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

SIGN #2 (SHEET 23 OF 23)



Identifier : D21-1TL_VARx12
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; [Laguna Rd] ClearviewHwy-3-W;

SIGN #6 (SHEET 23 OF 23)



Identifier : D21-1TR_VARx12
1.5" Radius, 0.5" Border, White on Green;
[Laguna Rd] ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

STATE OF TEXAS
ROBERT S. DOTY
97218
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09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

SMALL SIGN DETAIL

SHEET 3 OF 3

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			228
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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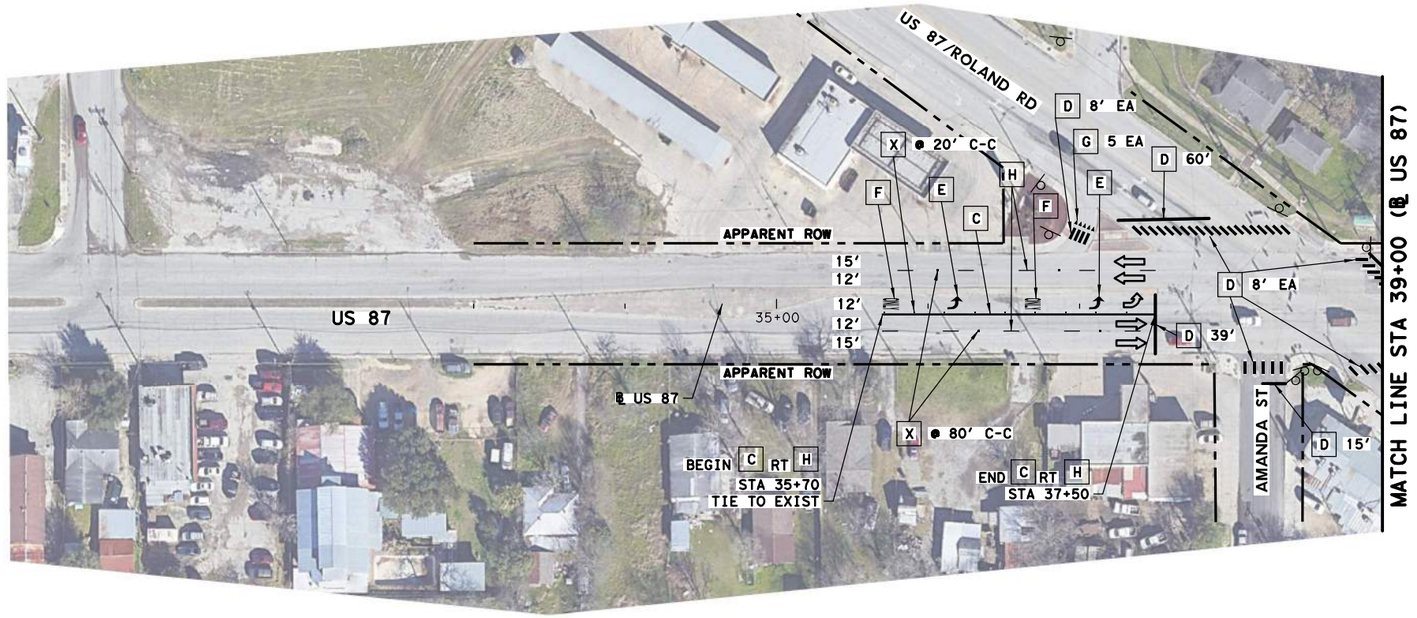
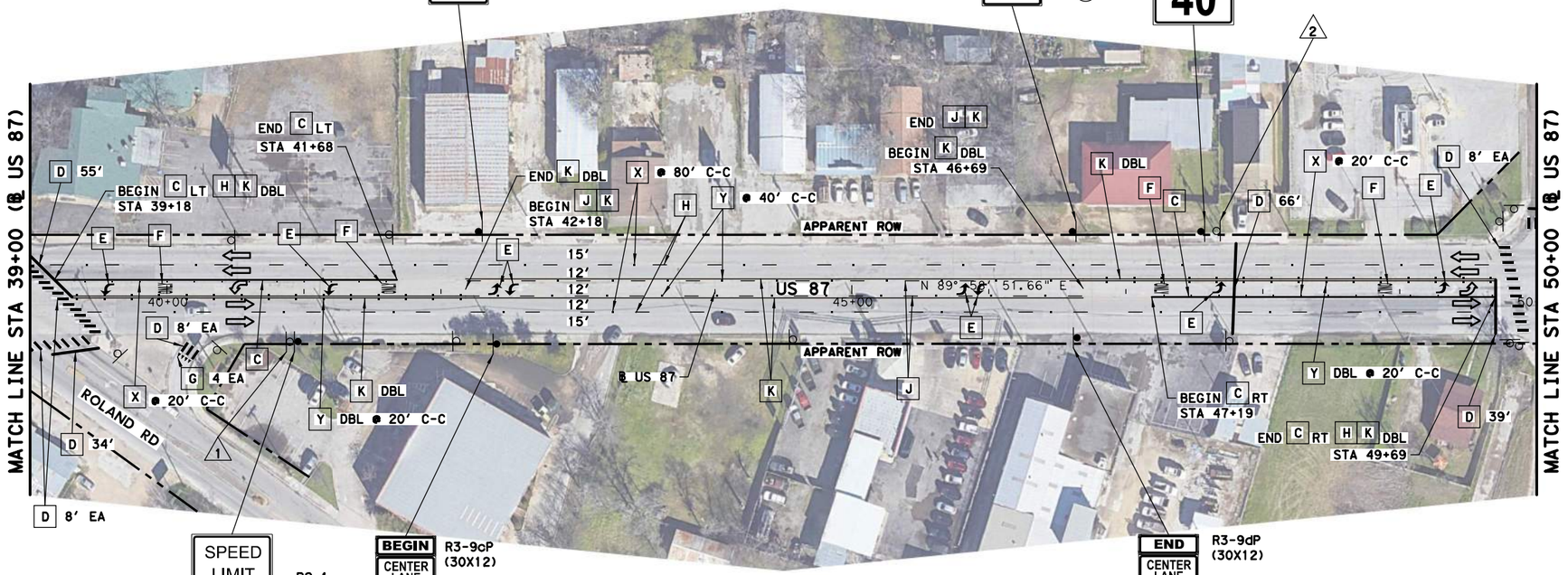
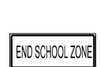




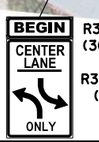
R3-9dP (30X12)
R3-9bPost (30X36)
3

R3-9cP (30X12)
R3-9bPost (30X36)
5

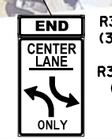


S5-2aTP (24x10)
6
R2-1 (36X48)

R2-1 (36X48)
1



R3-9cP (30X12)
R3-9bPost (30X36)
2



R3-9dP (30X12)
R3-9bPost (30X36)
4

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6
	644	6076	REMOVE SM RD SN SUP&AM	EA	2
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	680
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	746
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	10
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	6
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	9
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	620
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	230
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2080
X	672	6007	REFL PAV MRKR TY I-C	EA	74
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	42
	666	6224	PAVEMENT SEALER 4"	LF	2930
	666	6226	PAVEMENT SEALER 8"	LF	680
	666	6230	PAVEMENT SEALER 24"	LF	746
	666	6231	PAVEMENT SEALER (ARROW)	EA	10
	666	6232	PAVEMENT SEALER (WORD)	EA	6
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	9

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100
SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
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09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
BEGIN PROJECT TO STA 50+00

SHEET 1 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			229
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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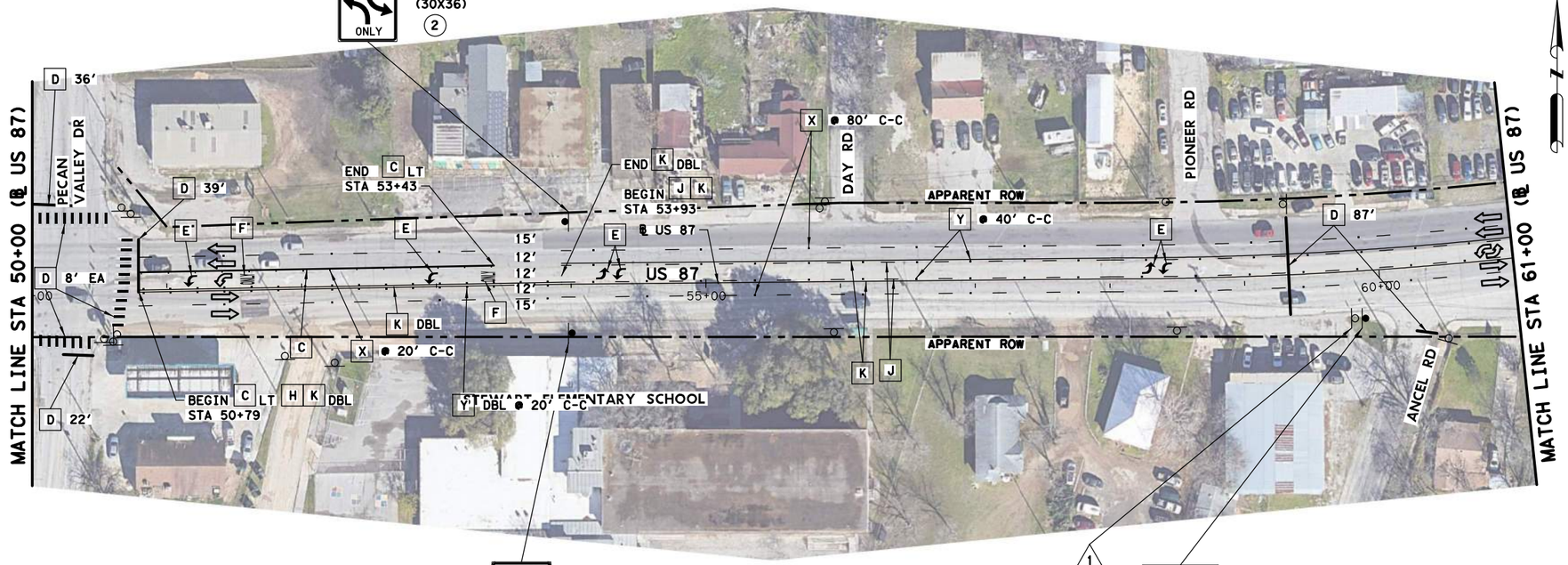

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6
	644	6076	REMOVE SM RD SN SUP&AM	EA	2
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	22
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	508
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	411
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	9
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	3
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1020
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	500
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4492
X	672	6007	REFL PAV MRKR TY I-C	EA	44
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	145
	666	6224	PAVEMENT SEALER 4"	LF	6012
	666	6226	PAVEMENT SEALER 8"	LF	508
	666	6230	PAVEMENT SEALER 24"	LF	411
	666	6231	PAVEMENT SEALER (ARROW)	EA	9
	666	6232	PAVEMENT SEALER (WORD)	EA	3
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

STATE OF TEXAS
ROBERT S. DOTY
97218
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09/23/2020

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100
SCALE: 1" = 100'

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 50+00 TO STA 72+00

SHEET 2 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			230
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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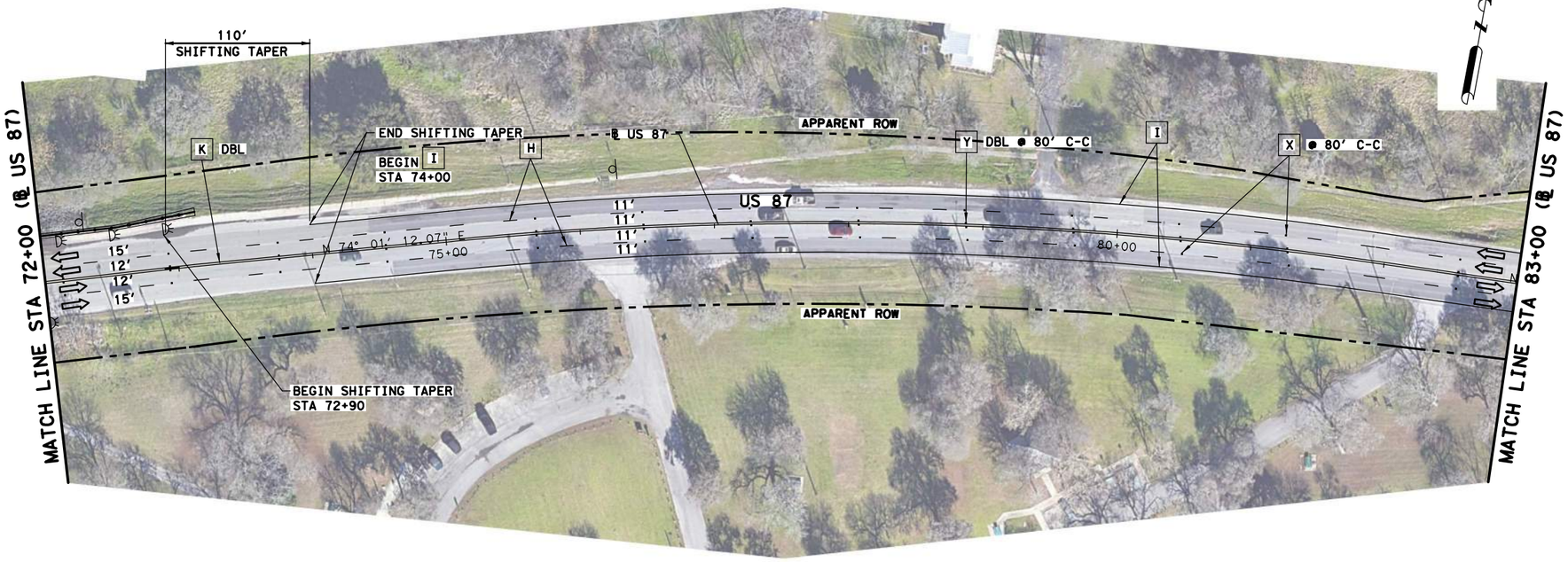

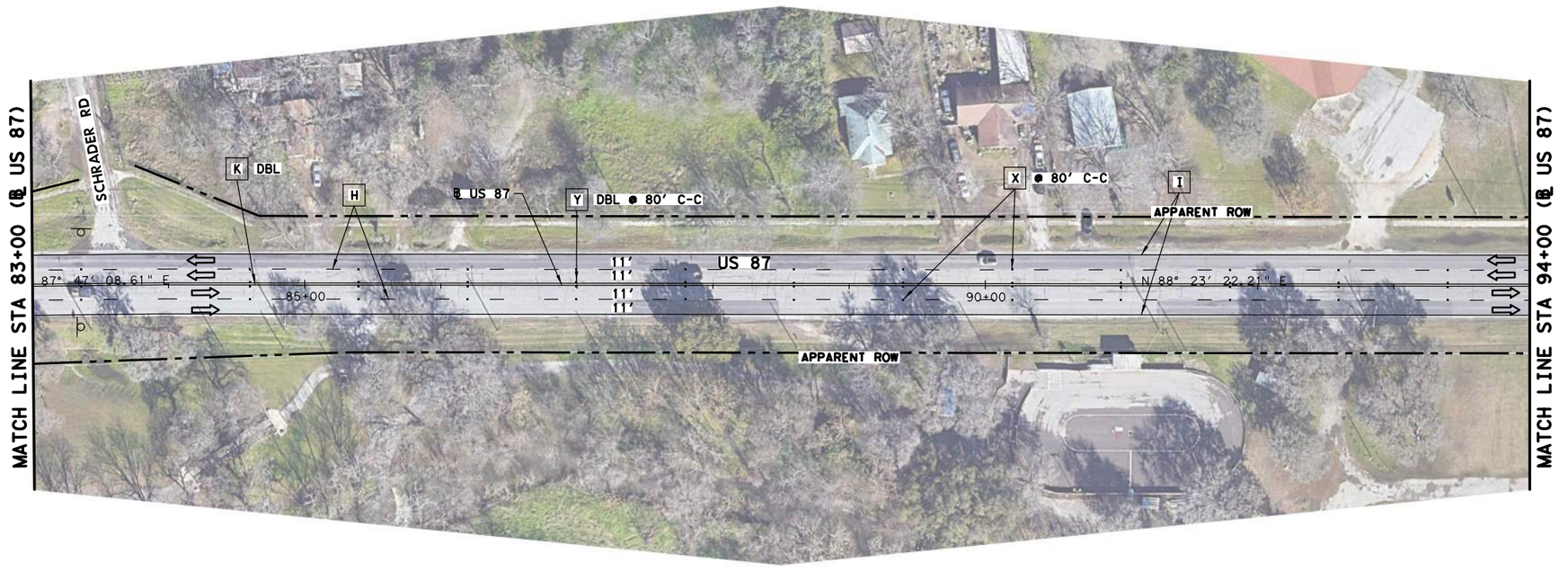

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	3
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1100
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4000
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4400
X	672	6007	REFL PAV MRKR TY I-C	EA	55
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	55
	666	6224	PAVEMENT SEALER 4"	LF	9500
	666	6226	PAVEMENT SEALER 8"	LF	
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 72+00 TO STA 94+00

SHEET 3 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			231
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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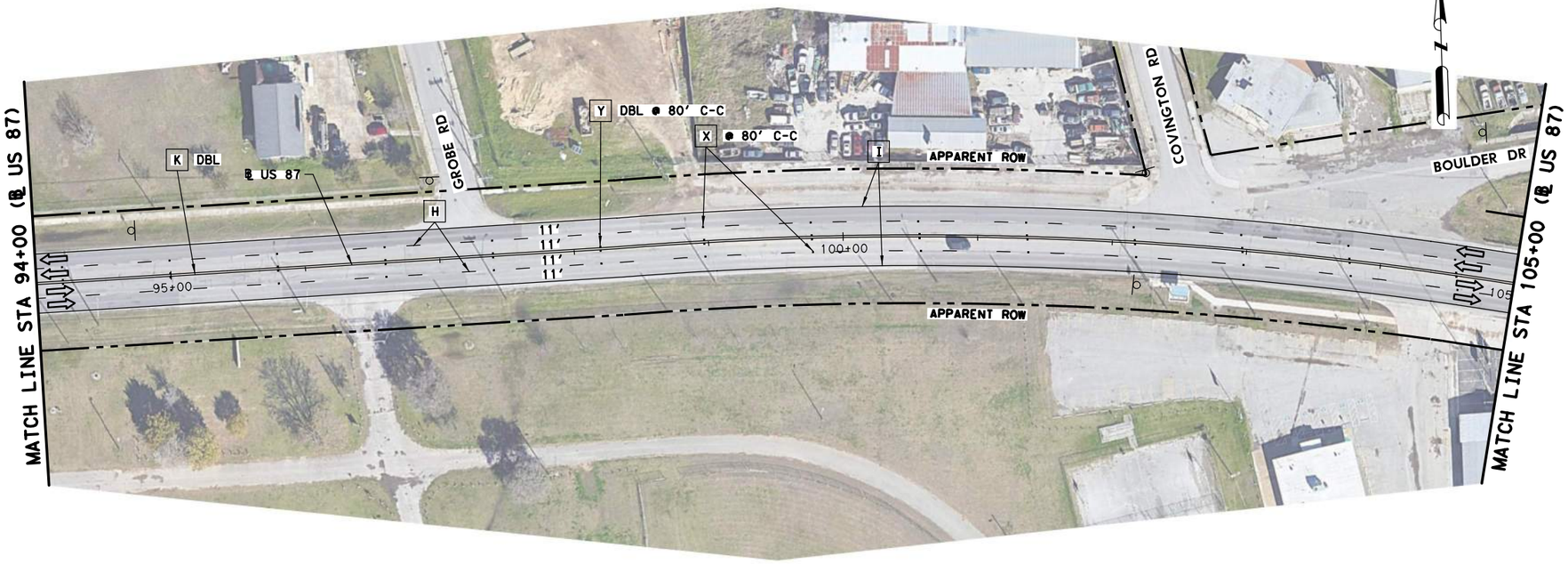

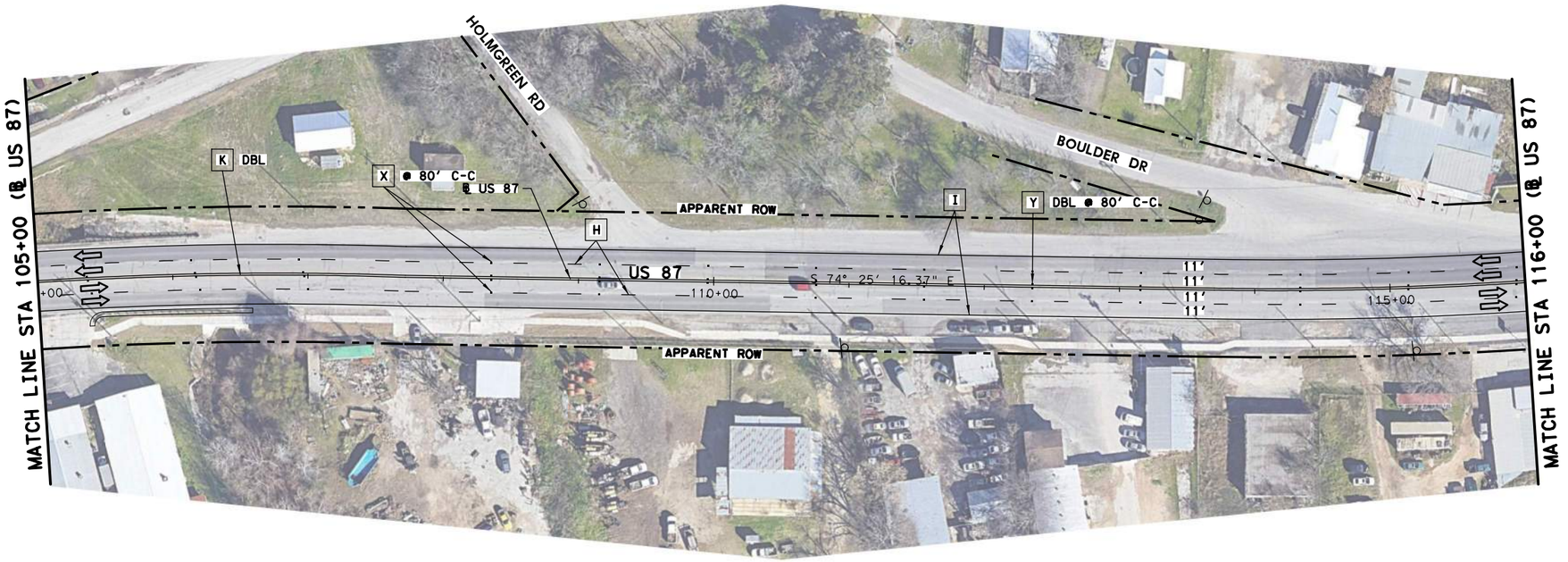

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1100
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4400
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4400
X	672	6007	REFL PAV MRKR TY I-C	EA	55
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	55
	666	6224	PAVEMENT SEALER 4"	LF	9900
	666	6226	PAVEMENT SEALER 8"	LF	
	666	6230	PAVEMENT SEALER 24"	LF	
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 94+00 TO STA 116+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			232
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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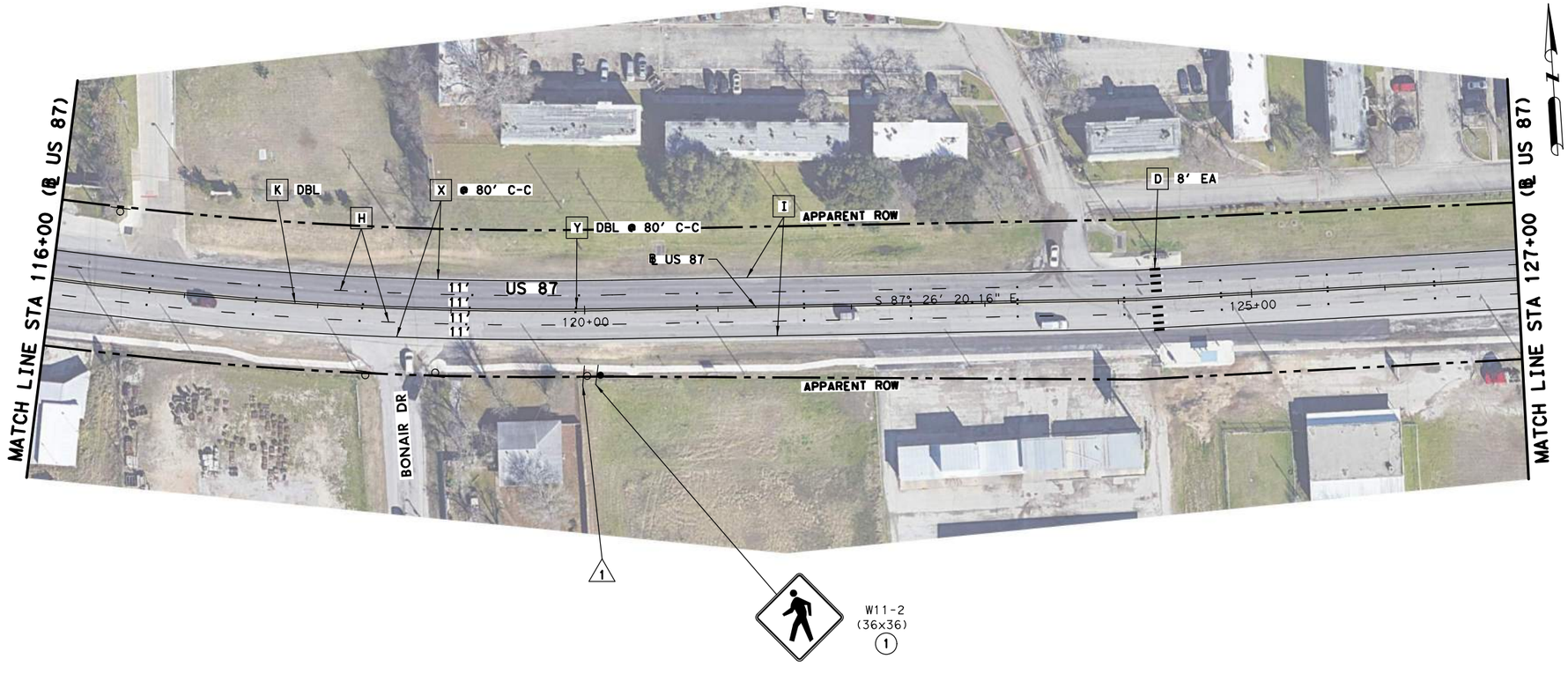

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	
	644	6076	REMOVE SM RD SN SUP&AM	EA	1
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	20
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	64
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	1
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1090
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4158
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4840
X	672	6007	REFL PAV MRKR TY I-C	EA	56
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	97
	666	6224	PAVEMENT SEALER 4"	LF	10088
	666	6226	PAVEMENT SEALER 8"	LF	20
	666	6230	PAVEMENT SEALER 24"	LF	64
	666	6231	PAVEMENT SEALER (ARROW)	EA	
	666	6232	PAVEMENT SEALER (WORD)	EA	1
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. **ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.**
2. **USE US 87 LEGEND FOR US 87 STRIPING.**

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 116+00 TO STA 138+00

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			233
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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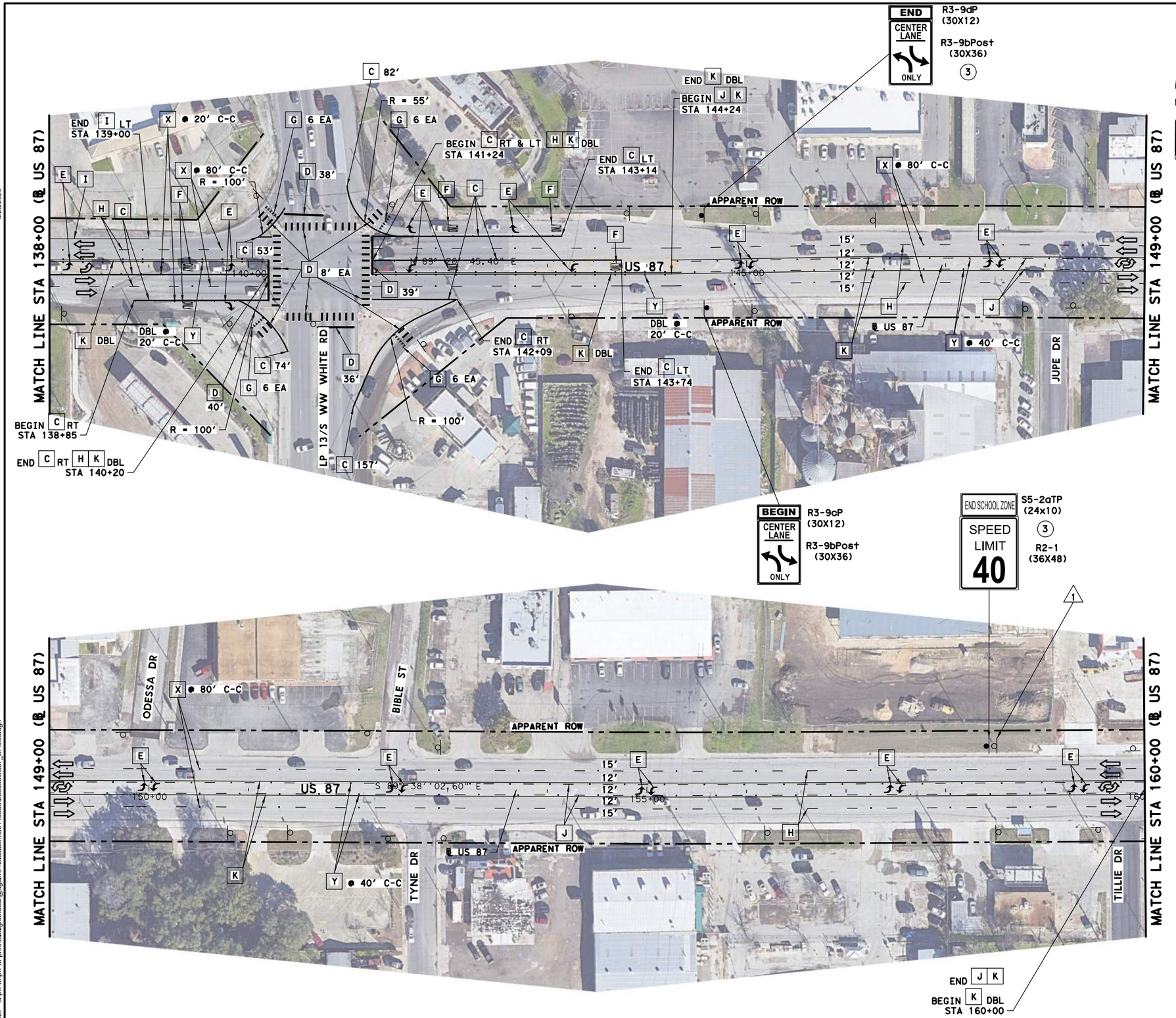

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	3
	644	6076	REMOVE SM RD SN SUP&AM	EA	1
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	1245
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	616
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	21
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	6
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	24
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1050
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	100
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	800
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4292
X	672	6007	REFL PAV MRKR TY I-C	EA	115
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	136
	666	6224	PAVEMENT SEALER 4"	LF	6242
	666	6226	PAVEMENT SEALER 8"	LF	1245
	666	6230	PAVEMENT SEALER 24"	LF	616
	666	6231	PAVEMENT SEALER (ARROW)	EA	21
	666	6232	PAVEMENT SEALER (WORD)	EA	6
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	24

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 138+00 TO STA 160+00

SHEET 6 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			234
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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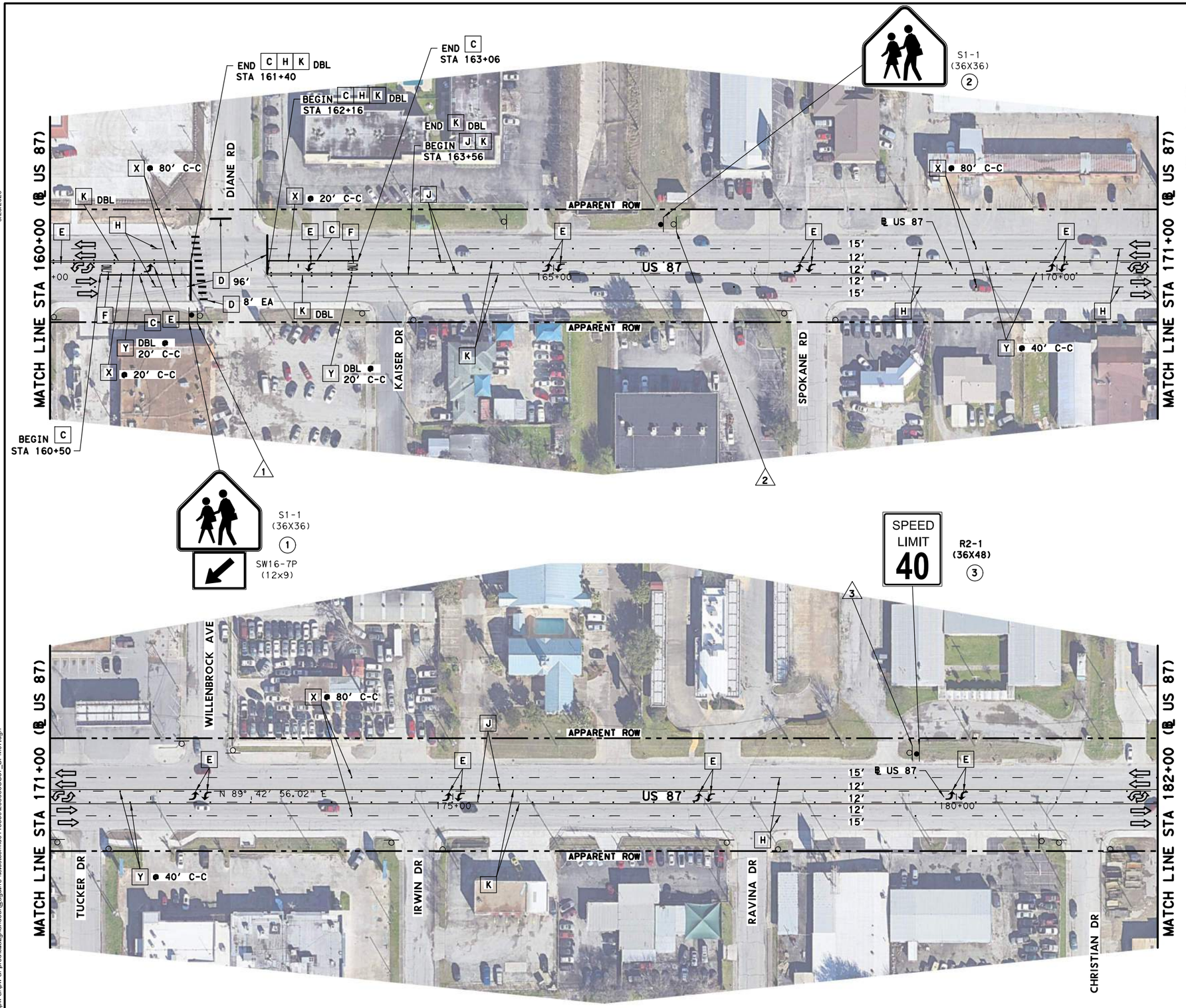

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
	644	6076	REMOVE SM RD SN SUP&AM	EA	3
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	180
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	184
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	16
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	2
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1060
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	920
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	4240
X	672	6007	REFL PAV MRKR TY I-C	EA	63
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	126
	666	6224	PAVEMENT SEALER 4"	LF	6220
	666	6226	PAVEMENT SEALER 8"	LF	180
	666	6230	PAVEMENT SEALER 24"	LF	184
	666	6231	PAVEMENT SEALER (ARROW)	EA	16
	666	6232	PAVEMENT SEALER (WORD)	EA	2
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100′

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 160+00 TO STA 182+00

SHEET 7 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			235
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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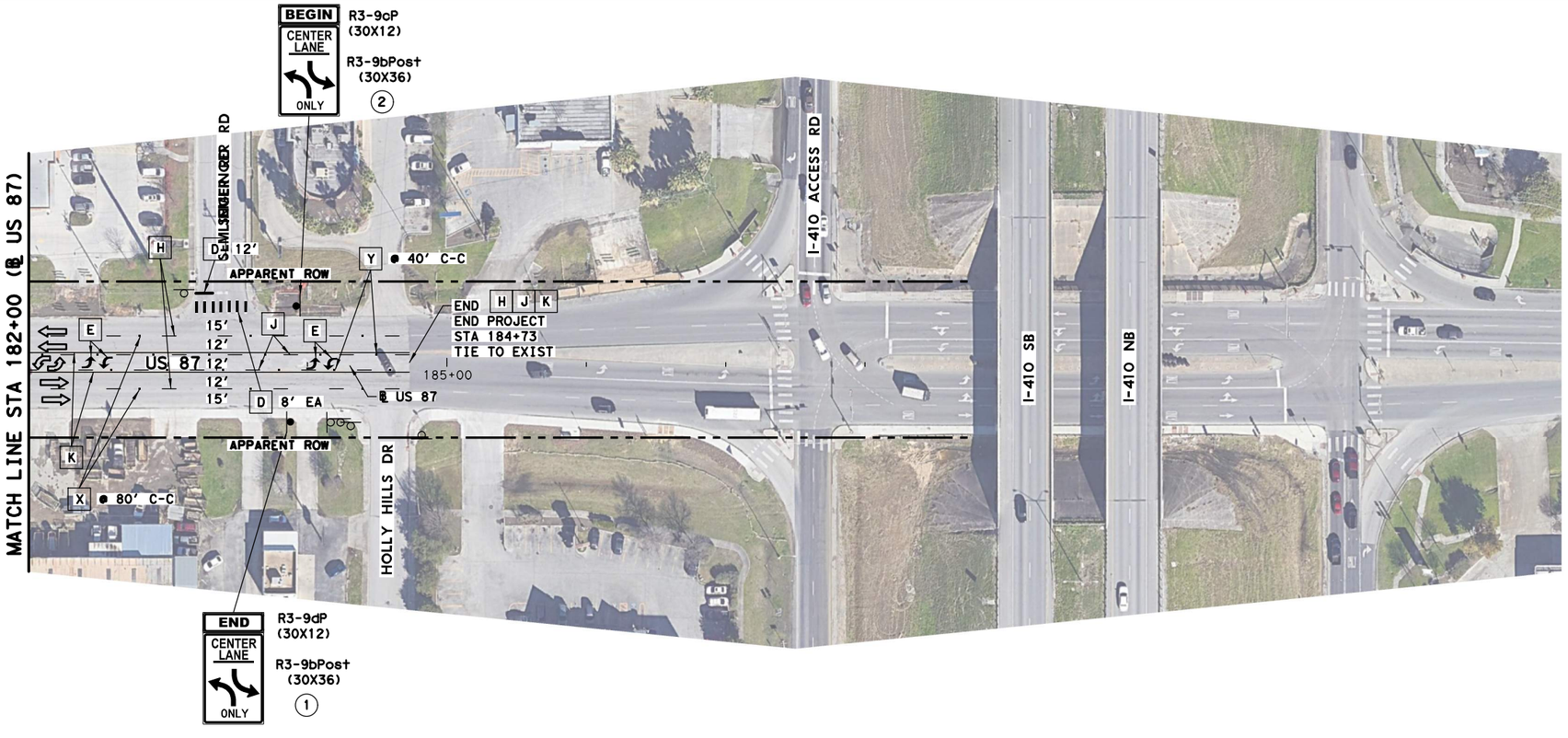

US 87 LEGEND & ESTIMATED SHEET QUANTITIES					
	ITEM		DESCRIPTION	UNIT	QTY
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	
	644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
	644	6076	REMOVE SM RD SN SUP&AM	EA	
	658	6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	
	658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	
C	666	6036	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	LF	
D	666	6048	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	LF	68
E	666	6054	REFL PAV MRK TY I (W)(ARROW) (100MIL)	EA	4
F	666	6078	REFL PAV MRK TY I (W)(WORD) (100MIL)	EA	
G	666	6102	REF PAV MRK TY I(W)36"(YLD TRI) (100MIL)	EA	
H	666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	140
I	666	6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	
J	666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	140
K	666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	546
X	672	6007	REFL PAV MRKR TY I-C	EA	14
Y	672	6009	REFL PAV MRKR TY II-A-A	EA	14
	666	6224	PAVEMENT SEALER 4"	LF	826
	666	6226	PAVEMENT SEALER 8"	LF	
	666	6230	PAVEMENT SEALER 24"	LF	68
	666	6231	PAVEMENT SEALER (ARROW)	EA	4
	666	6232	PAVEMENT SEALER (WORD)	EA	
	666	6243	PAVEMENT SEALER (YLD TRI)	EA	

NOTES:

1. ALL EXISTING SIGNS TO REMAIN IN PLACE UNLESS NOTED OTHERWISE IN THE PLANS.
2. USE US 87 LEGEND FOR US 87 STRIPING.

LEGEND

- TRAFFIC DIRECTION
- EXIST SIGN
- PROP SIGN POST
- PROP SIGN NUMBER
- EXIST SIGN TO BE REMOVED

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
ROBERT S. DOTY
97218
LICENSED
PROFESSIONAL ENGINEER

09/23/2020

Robert S. Doty

Texas Department of Transportation

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

US 87
SIGNING AND PAVEMENT MARKING LAYOUT
STA 182+00 TO END PROJECT

SHEET 8 OF 8

FHWA DIVISION	PROJECT NUMBER		SHEET NO.
6			236
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	HIGHWAY NO.
0073	12	015, etc.	US 181, etc

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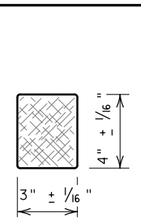
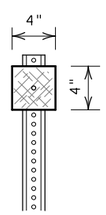
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			

NOTE

1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx).
2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

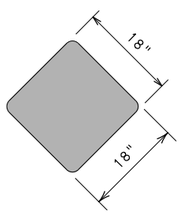
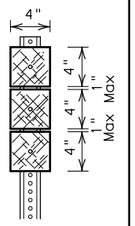
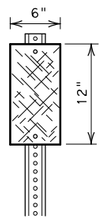
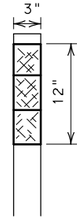
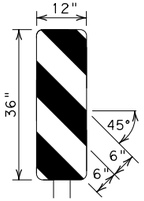
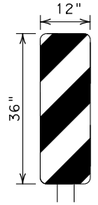
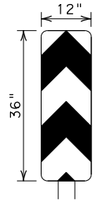
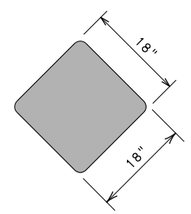
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

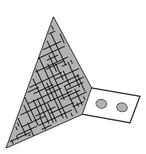
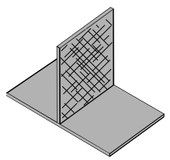
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

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

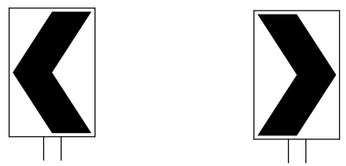
BARRIER REFLECTORS (BRF)

	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

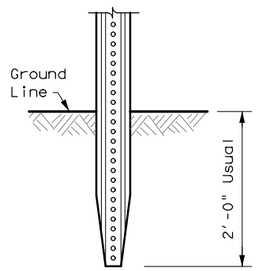
FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		237

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

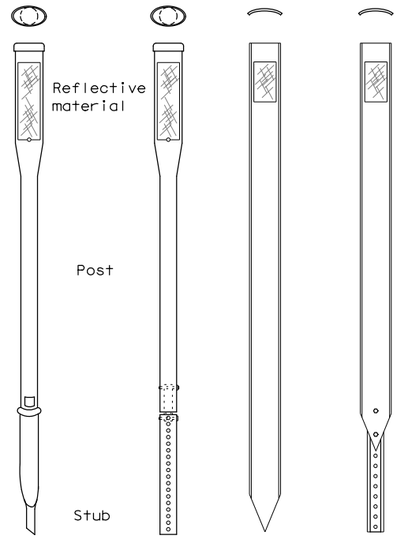


NOTES

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.

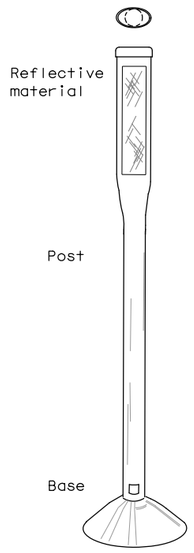
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



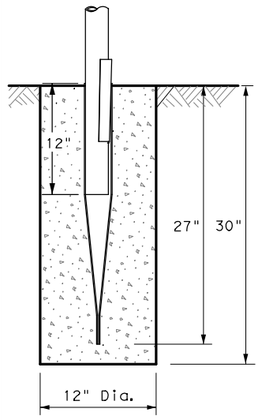
SURFACE MOUNT

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.

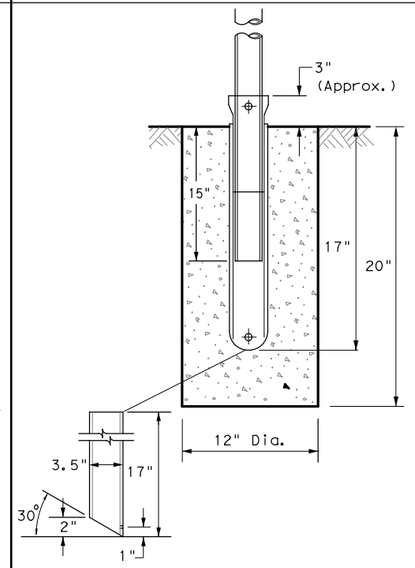
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

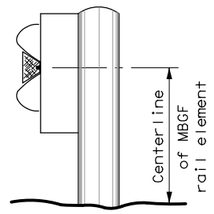
NOTE

1. Install per manufacturer's recommendations.

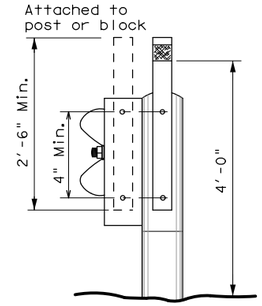
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

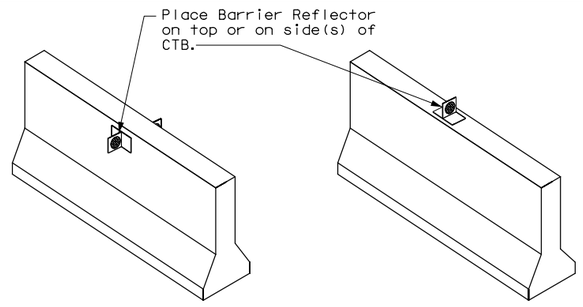
GF1



GF2



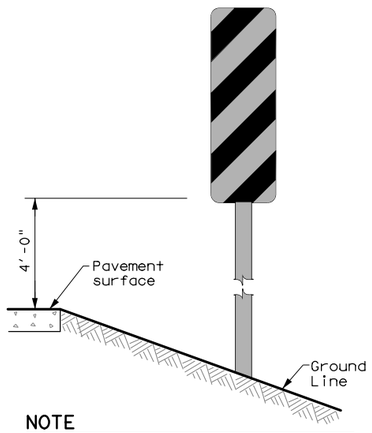
CONCRETE TRAFFIC BARRIER (CTB)



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.

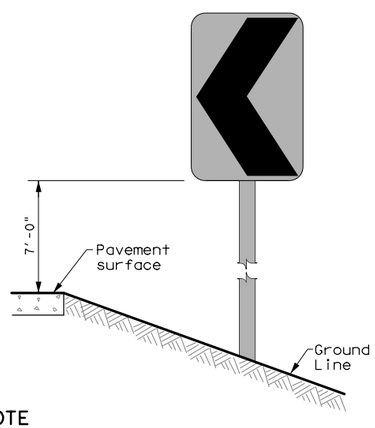
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

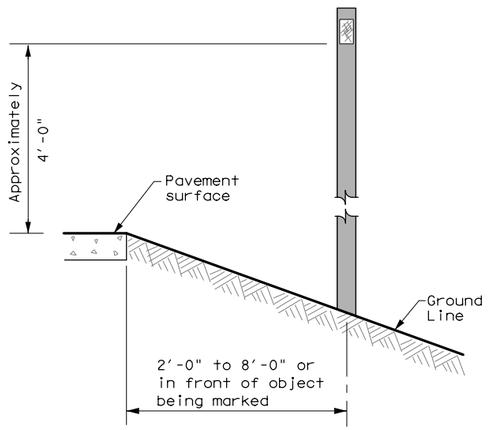
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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
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10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	SAT	BEXAR		238

20B

DATE: 9/23/2020 4:34:39 PM
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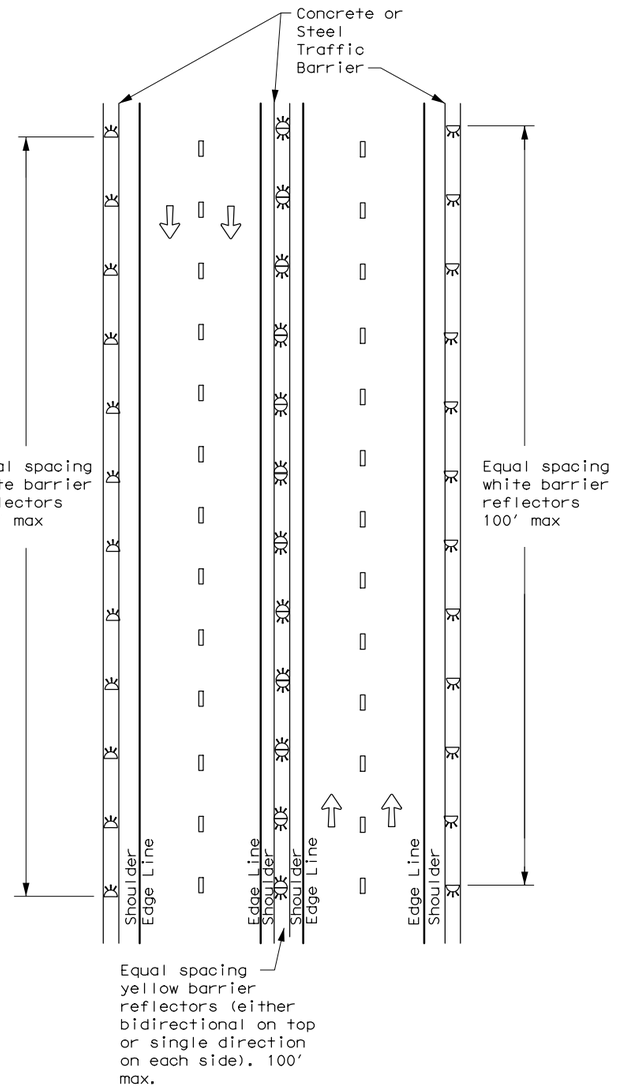
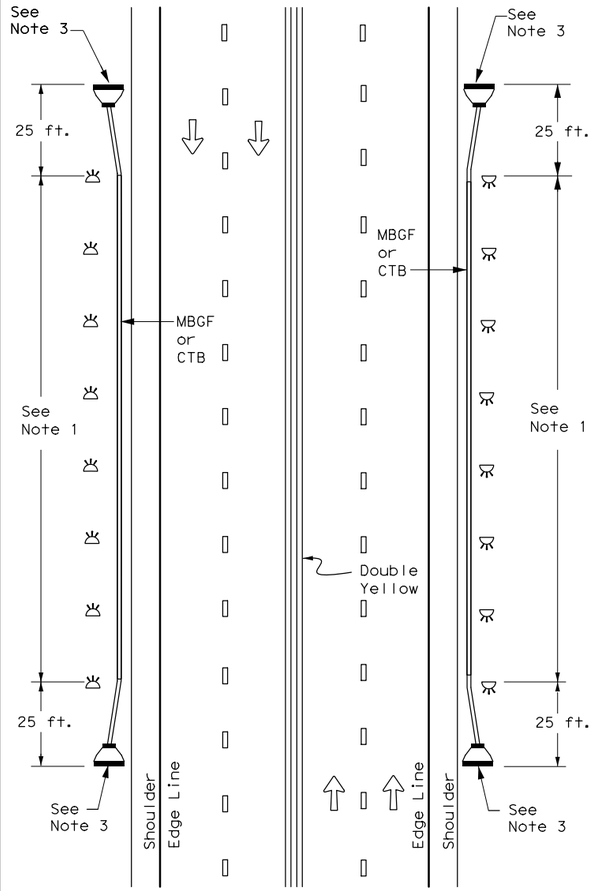
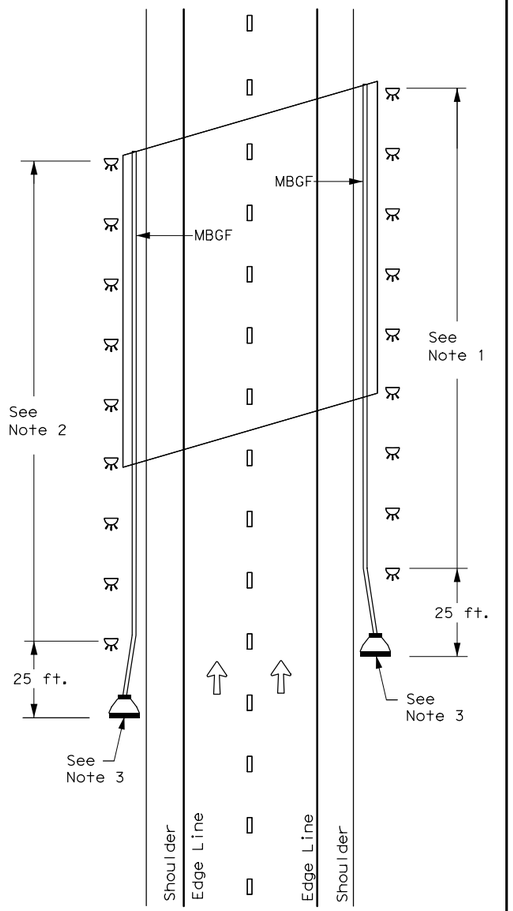
CONTINUOUS CONCRETE OR STEEL BARRIER



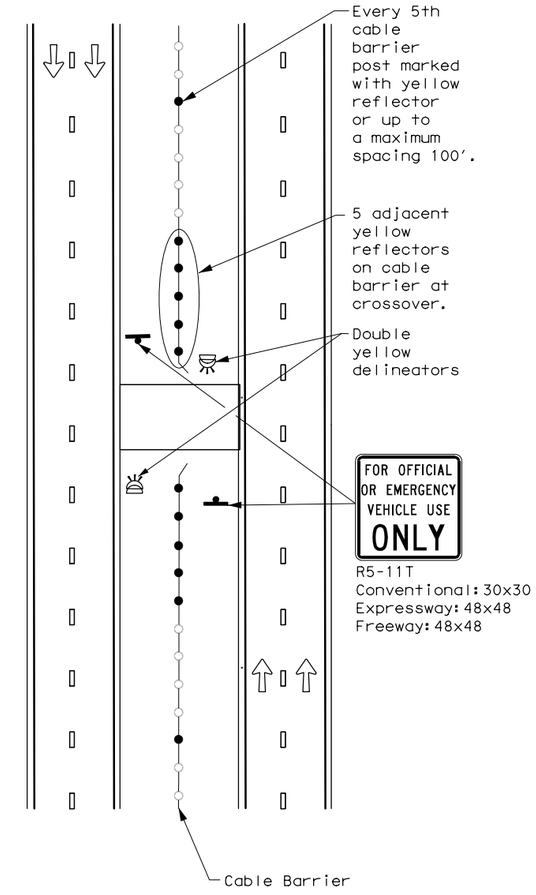
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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7-20	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		239

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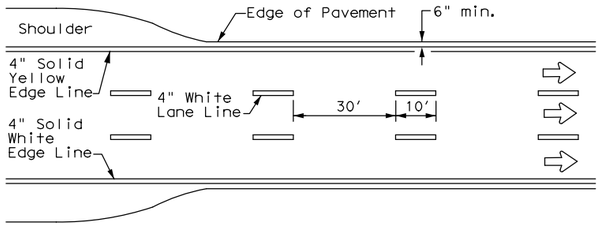
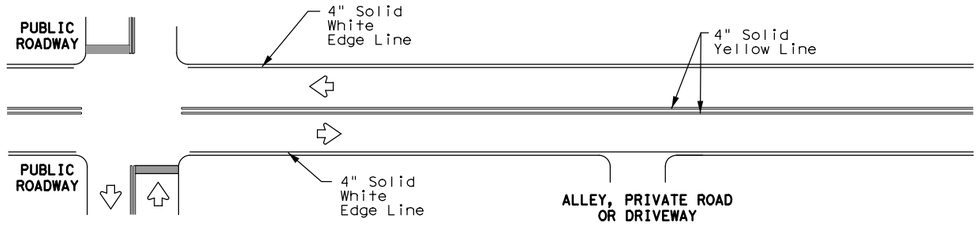
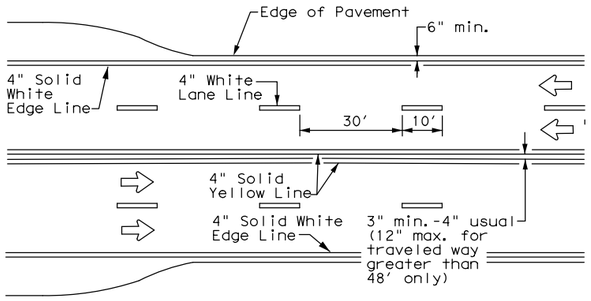


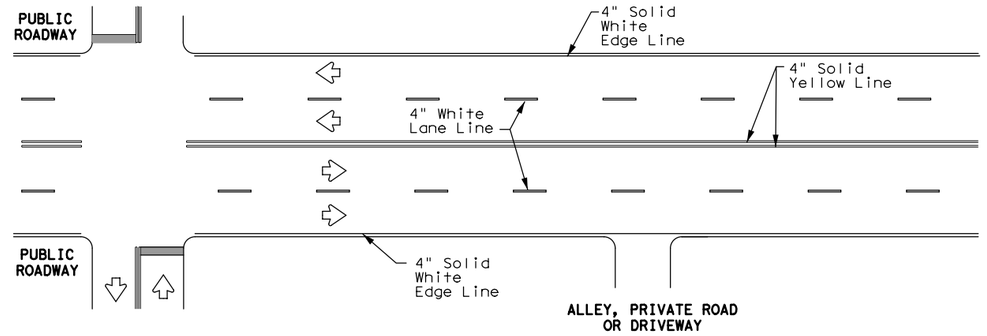
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



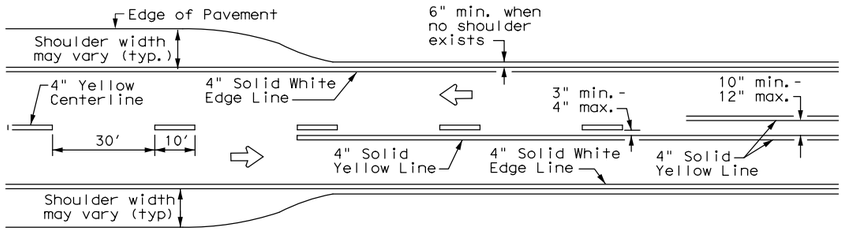
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



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

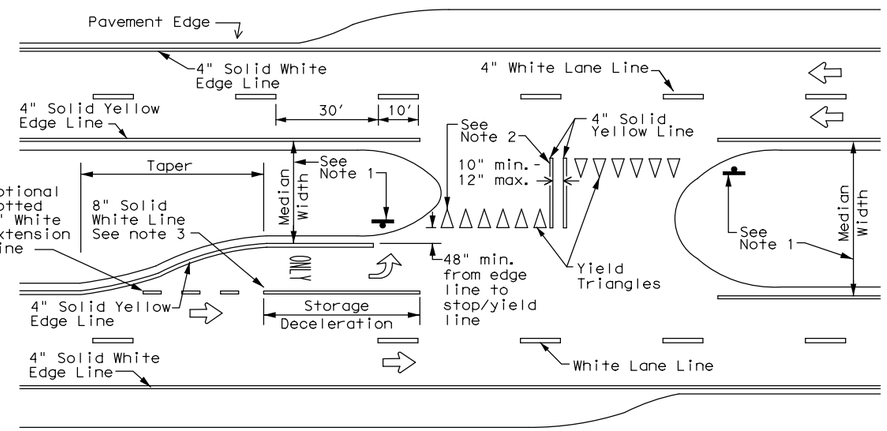


TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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.

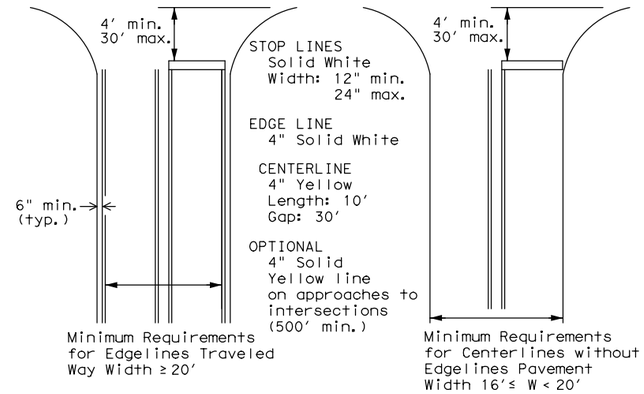
GENERAL NOTES

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	0073	12	015,etc	US 181,etc
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8-00 6-20	SAT	BEXAR		240

22A

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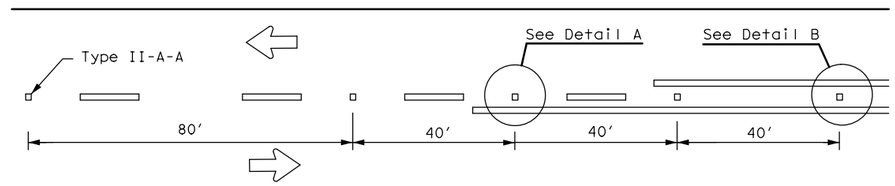
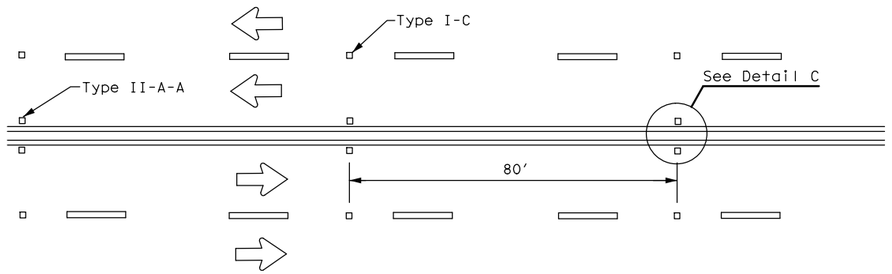
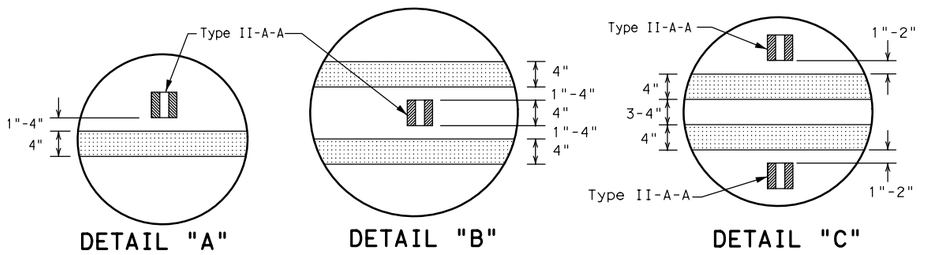
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



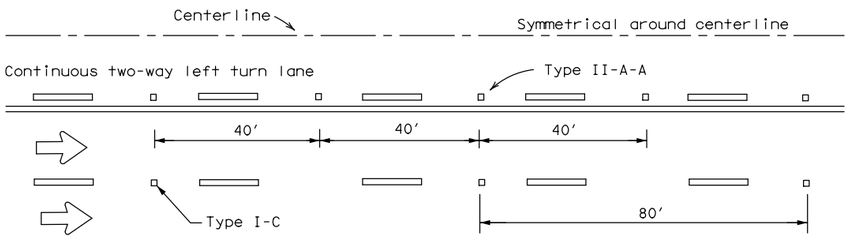
CENTERLINE FOR ALL TWO LANE ROADWAYS



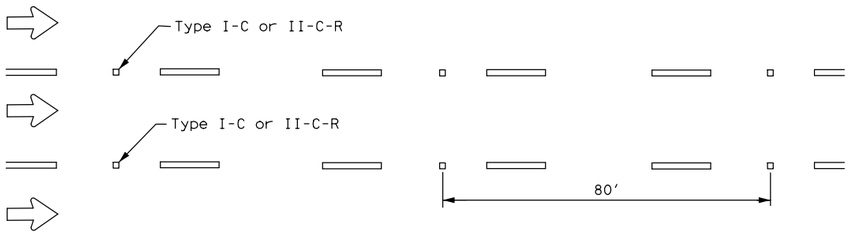
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

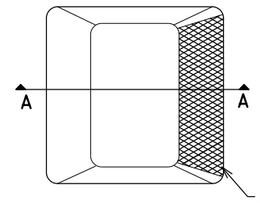


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

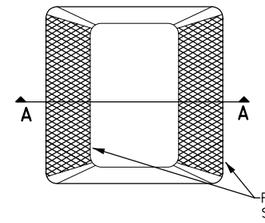
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

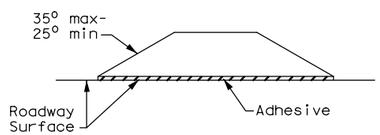
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

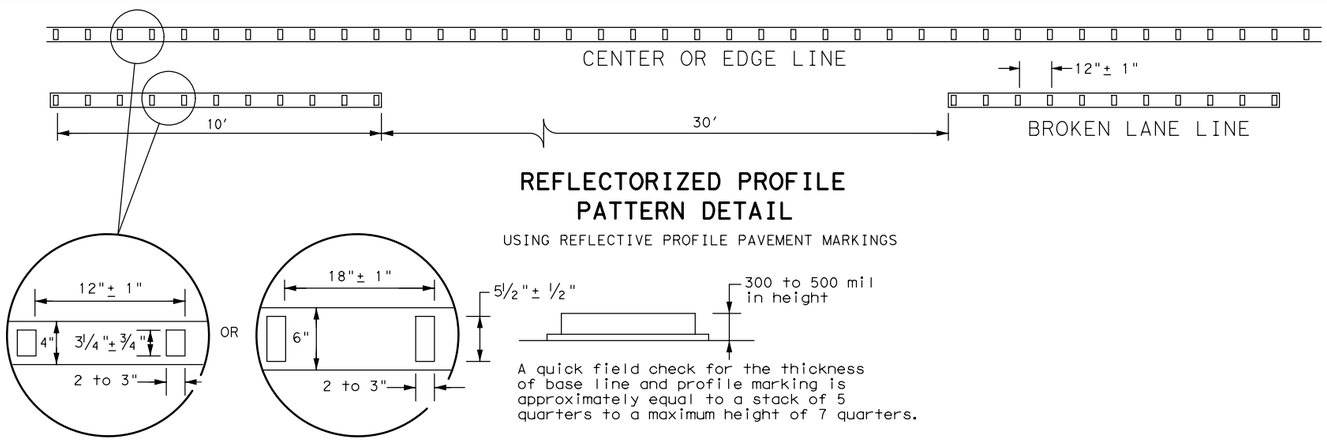


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

NOTE

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

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	0073	12	015,etc	US 181,etc
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22B

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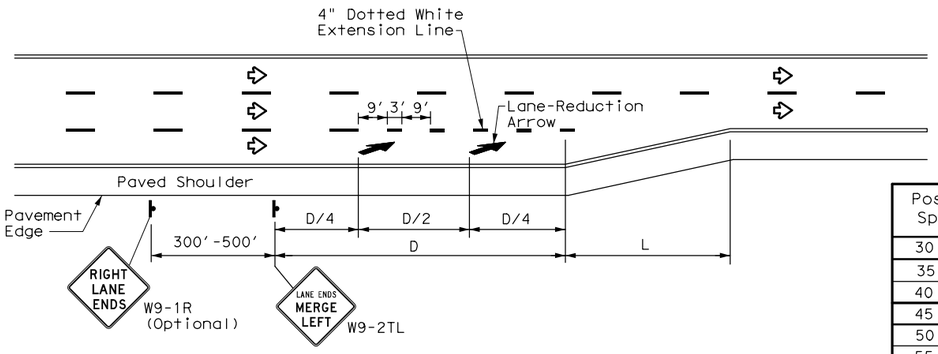
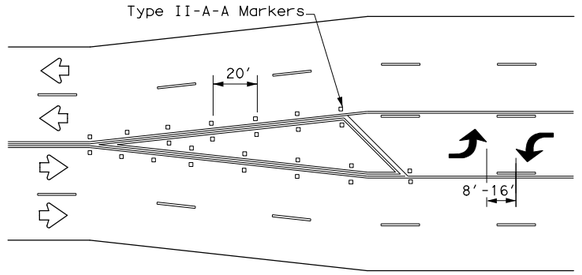


LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



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

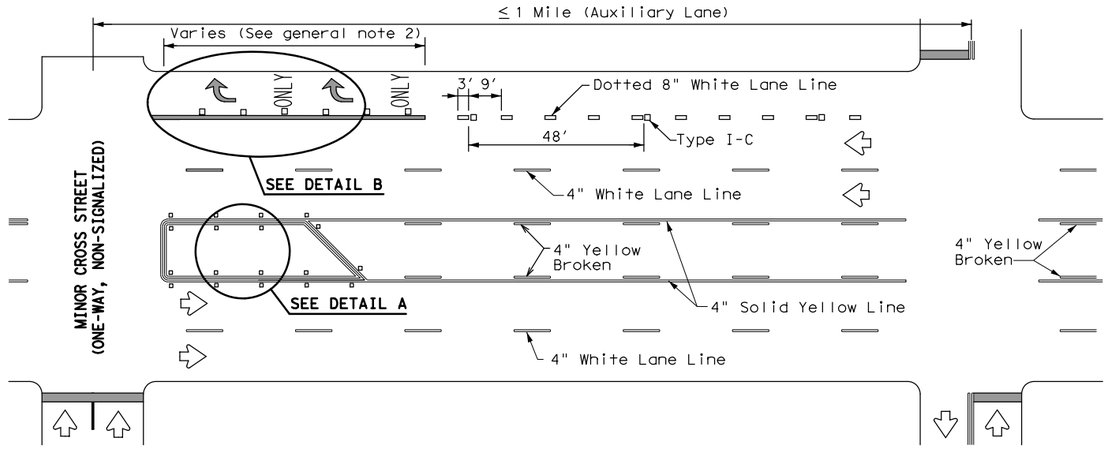
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

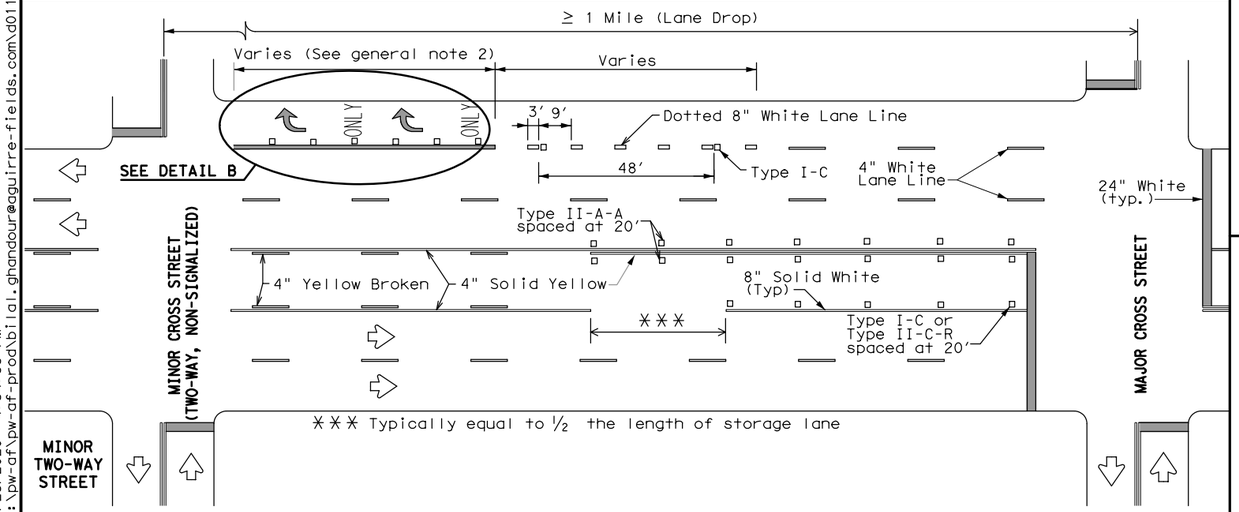
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

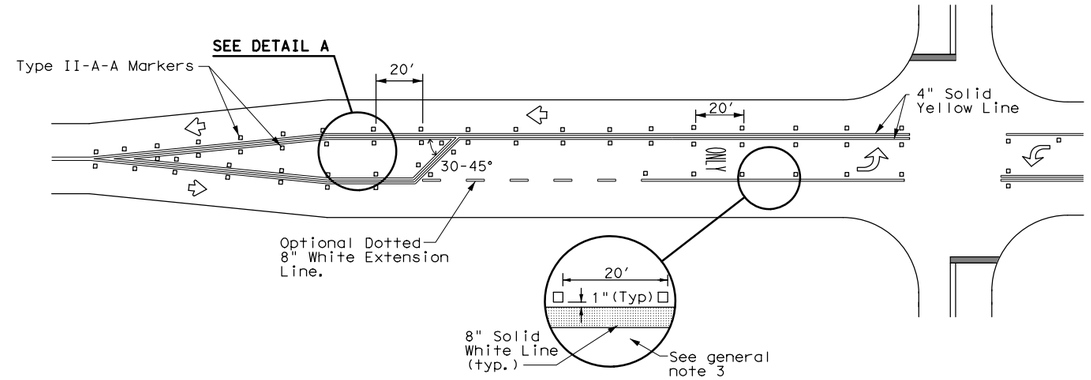
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



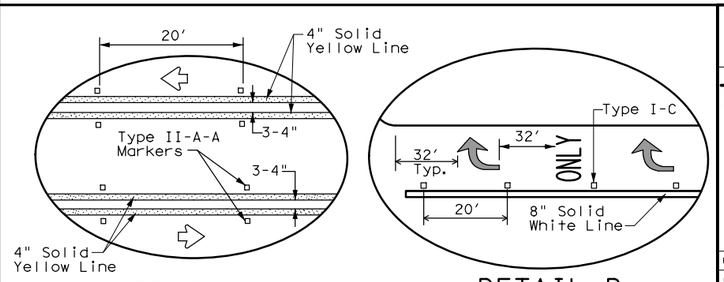
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

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©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
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3-03 6-20				

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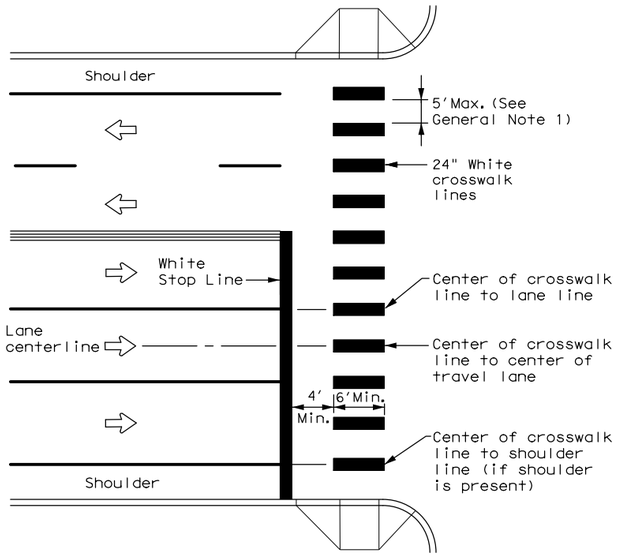


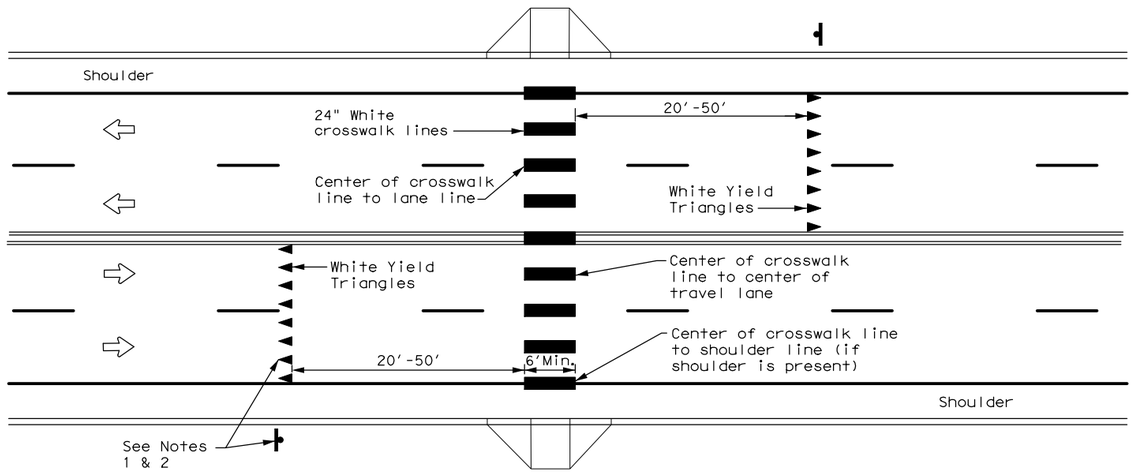
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar/Yield Triangles and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

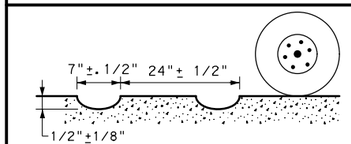
PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		243

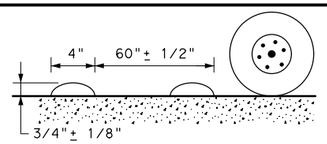
22D

DATE: 9/23/2020 4:35:04 PM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118552\rs(3)-13.dgn

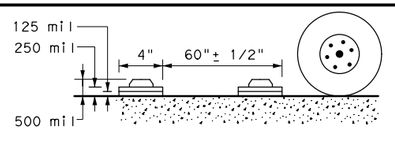
CENTERLINE RUMBLE STRIPS



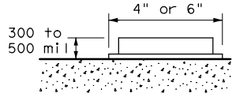
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

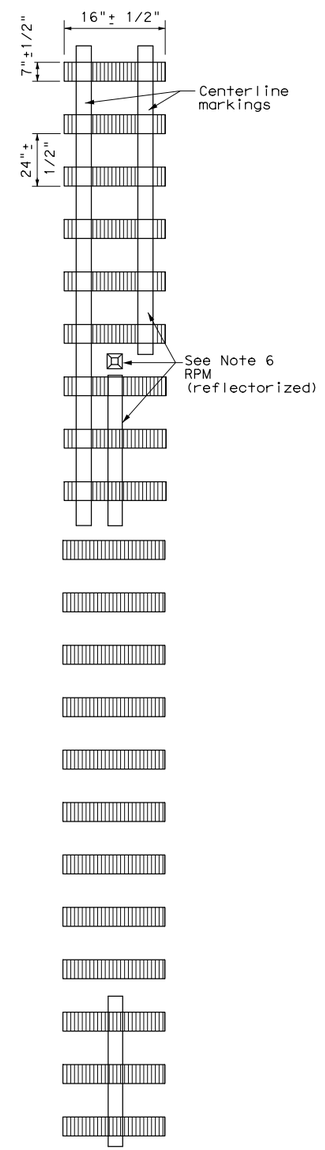


PREFORMED THERMOPLASTIC STRIPS



PROFILE MARKINGS

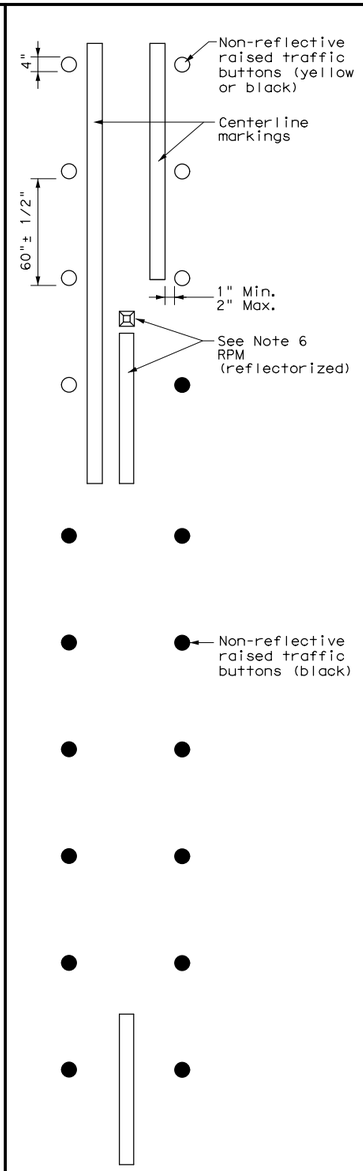
PROFILE VIEW



TWO LANE TWO-WAY ROADWAYS

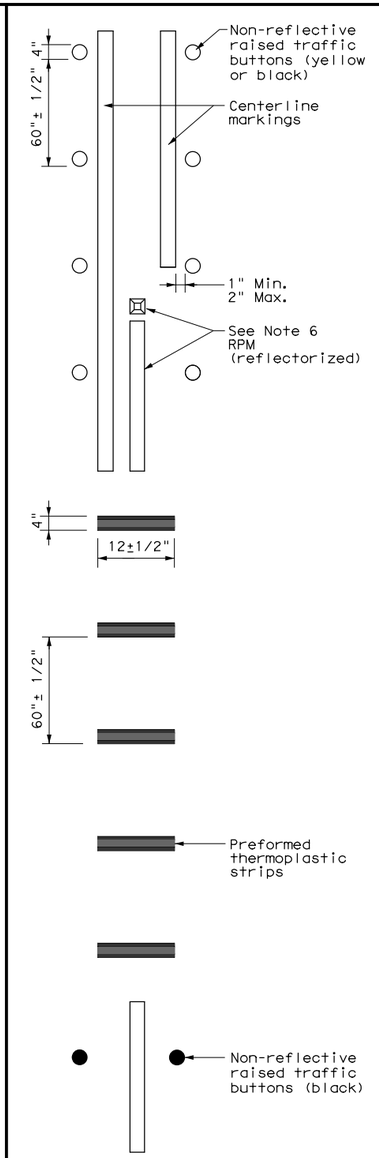
PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS



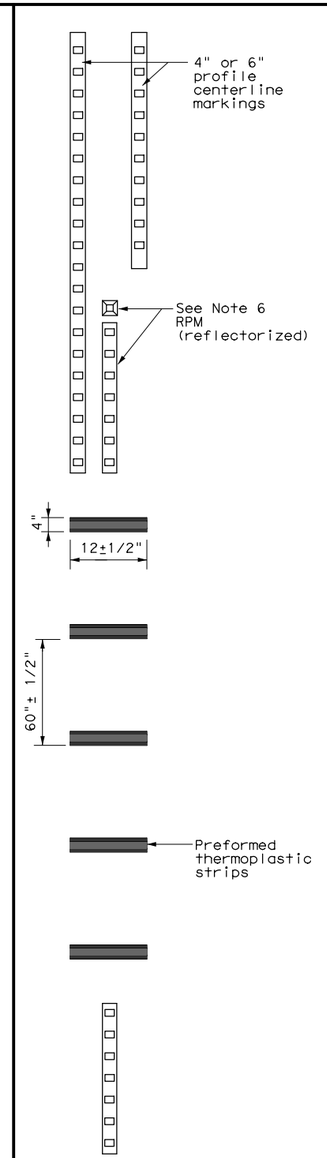
PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PLAN VIEW
OPTION 3

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

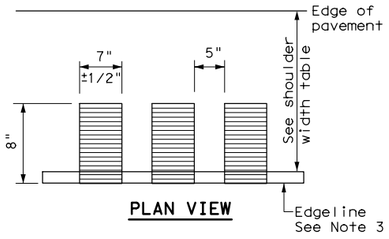
12. See standard sheet RS(4).

Texas Department of Transportation®

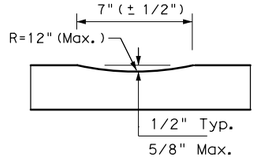
CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

RS(3)-13

FILE: rs(3)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		244

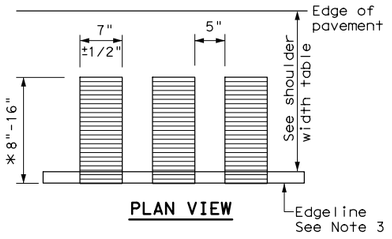


PLAN VIEW

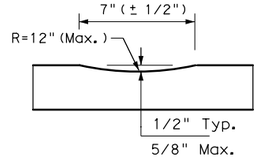


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



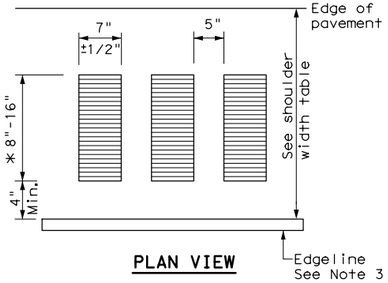
PLAN VIEW



* This distance may vary based on width of shoulder

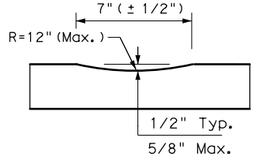
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



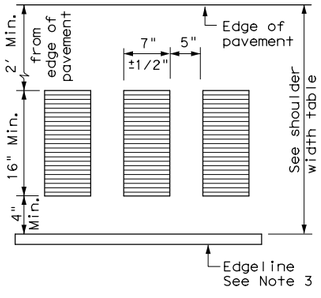
PLAN VIEW

* This distance may vary based on width of shoulder

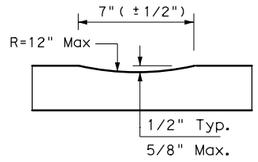


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

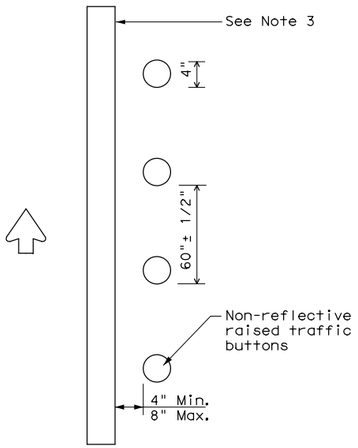


PLAN VIEW



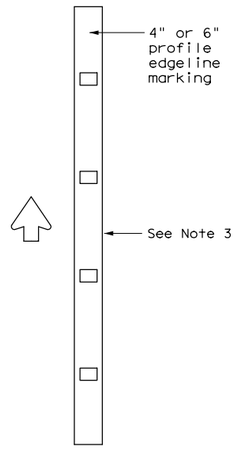
PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

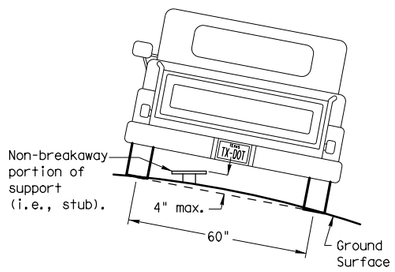
Anchor Type

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

Sign Mounting Designation

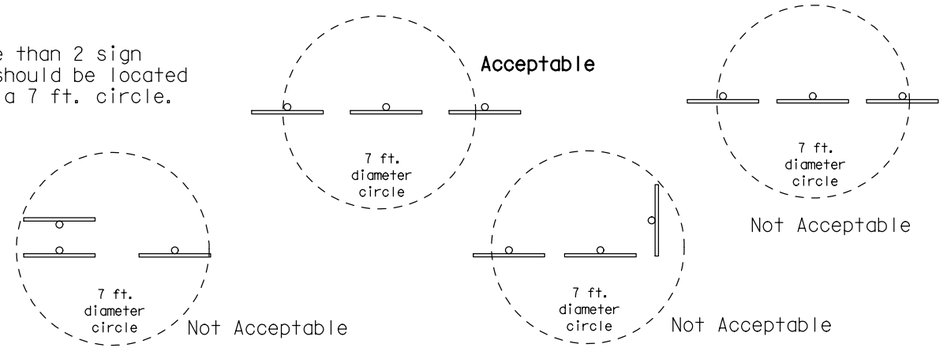
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



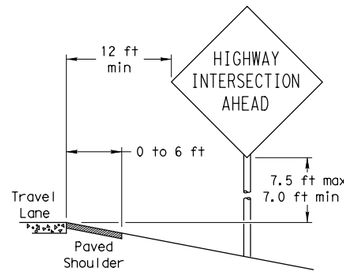
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



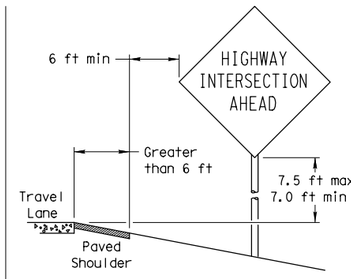
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

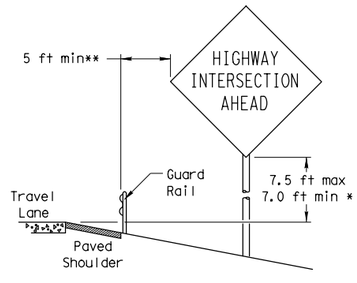
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



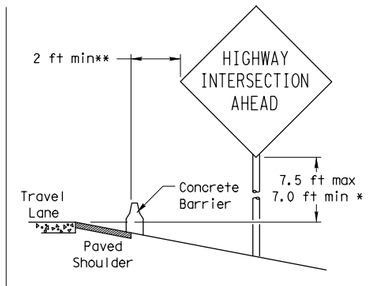
GREATER THAN 6 FT. WIDE

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



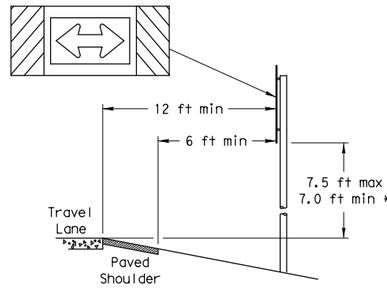
BEHIND GUARDRAIL



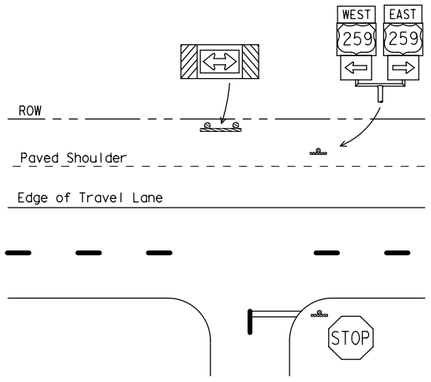
BEHIND CONCRETE BARRIER

**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.

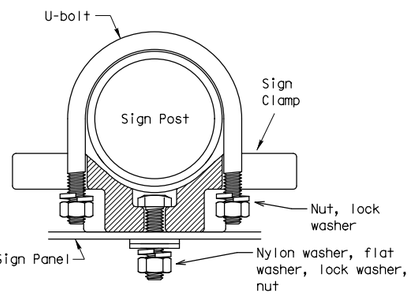
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

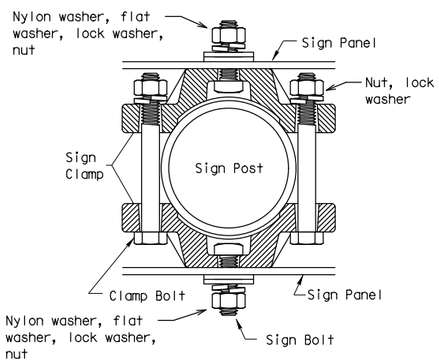
The website address is:
http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



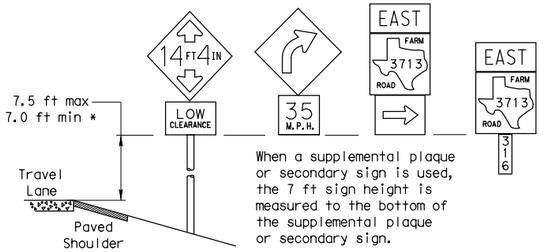
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

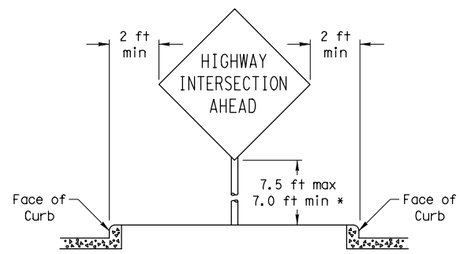
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



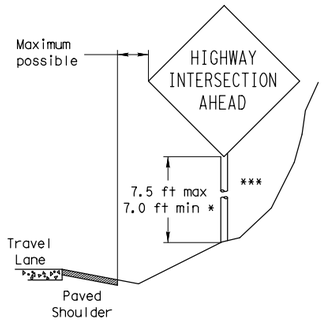
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

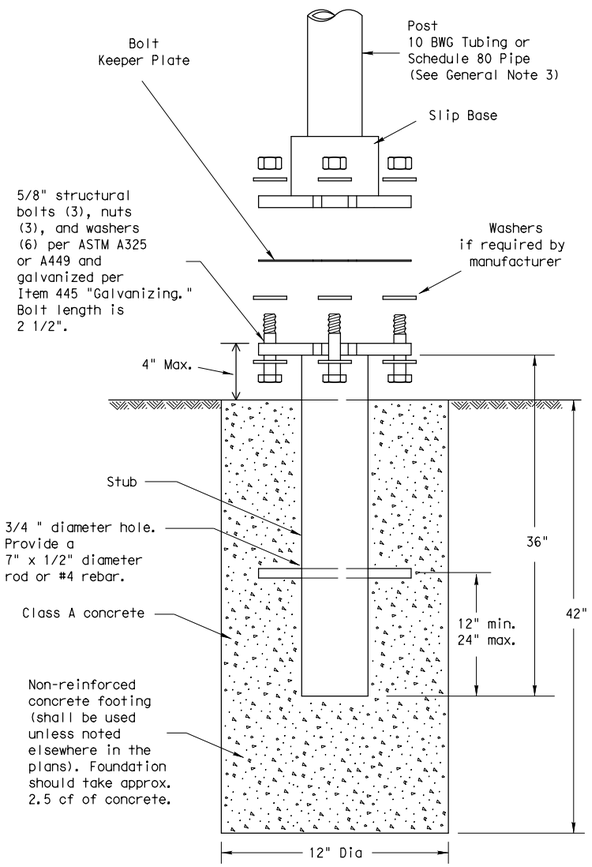
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0073	12	015,etc	US 181,etc

DIST	COUNTY	SHEET NO.
SAT	BEXAR	246

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

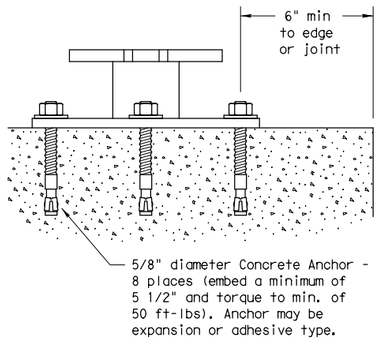
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0073	12	015,etc	US 181,etc

DIST	COUNTY	SHEET NO.
SAT	BEXAR	247

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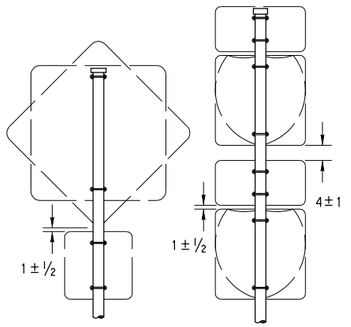
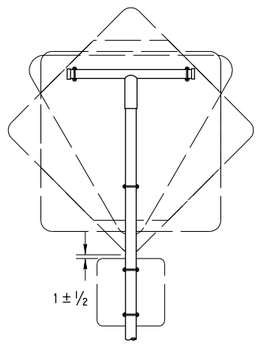


SM RD SGN ASSM TY XXXXX(1)XX(P)



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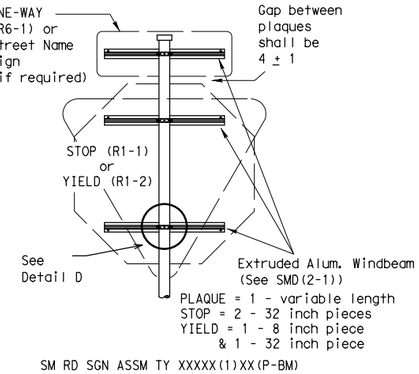
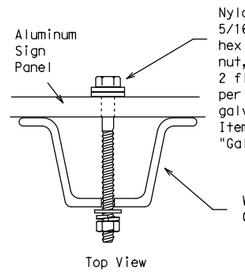
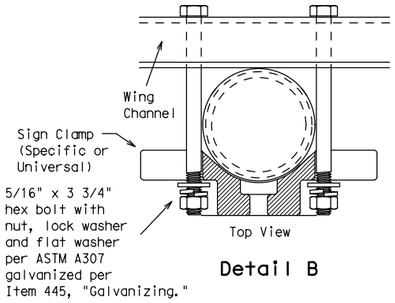


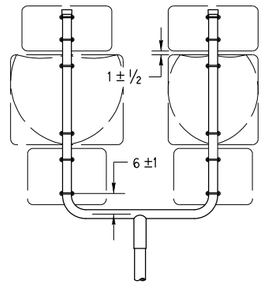
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



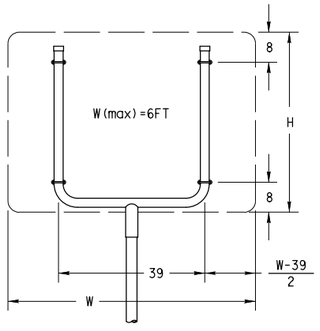
Detail A



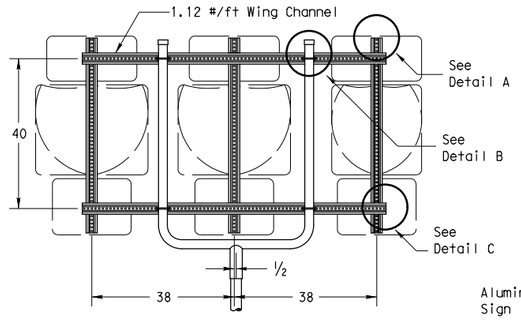
Detail B



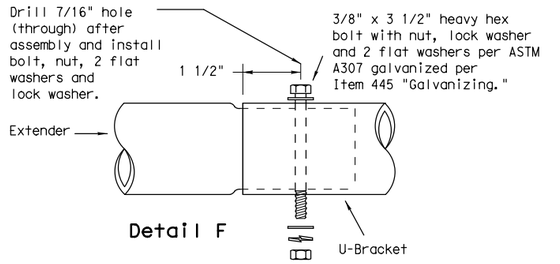
SM RD SGN ASSM TY XXXXX(1)XX(U)



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

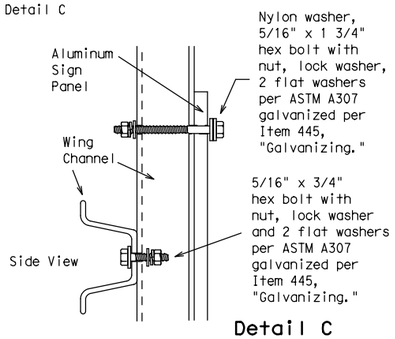


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

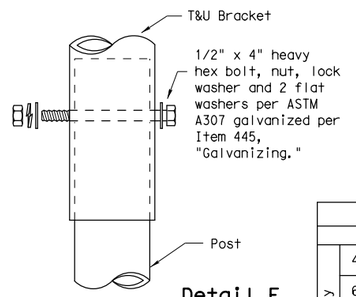


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



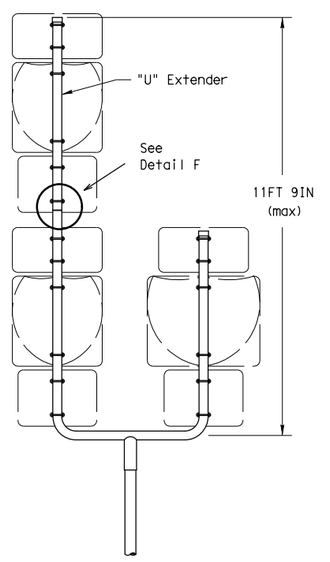
Detail E

GENERAL NOTES:

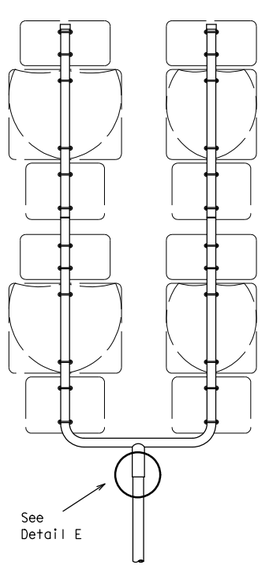
1.

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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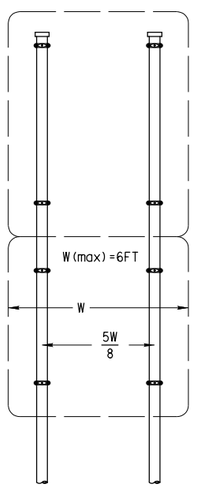
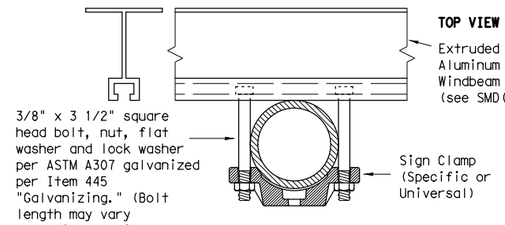
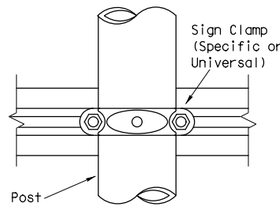


SM RD SGN ASSYM TY XXXXX(2)XX(P)

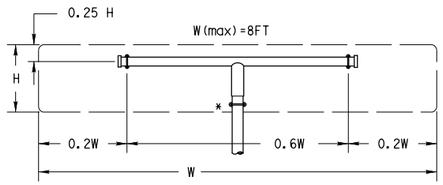
SIDE VIEW



Detail D



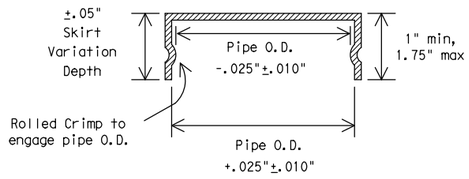
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		248

26C

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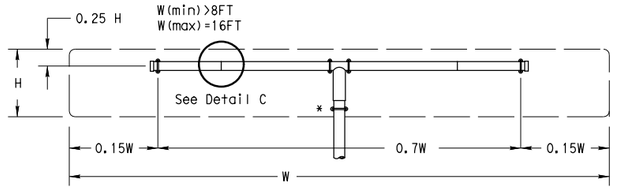
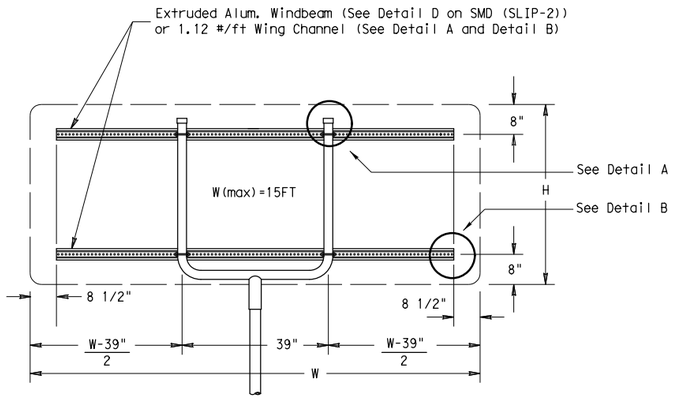
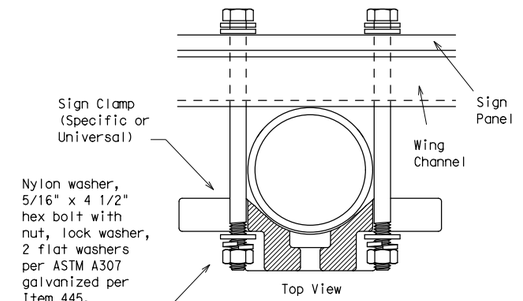


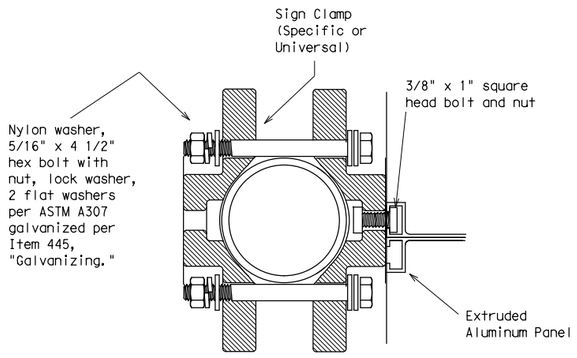
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



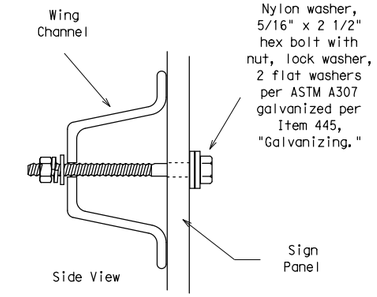
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



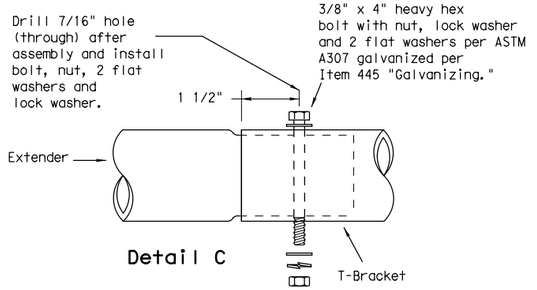
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

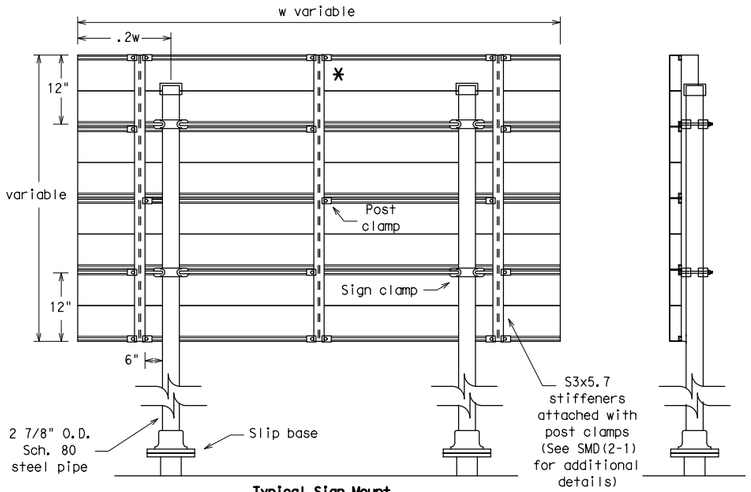


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

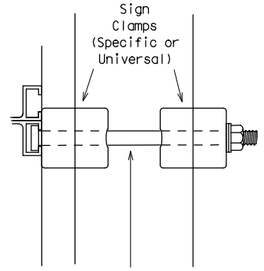


Typical Sign Mount

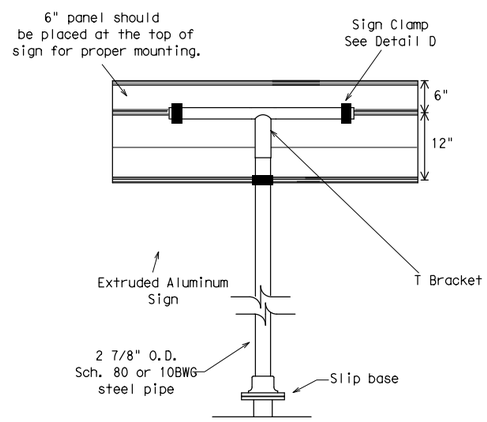
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

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

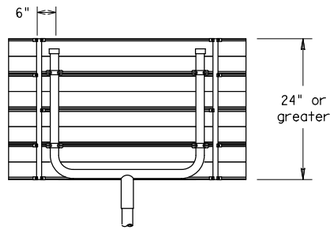
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



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

See Detail E
for clamp installation

GENERAL NOTES:

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

1. 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	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0073	12	015,etc	US 181,etc
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		249

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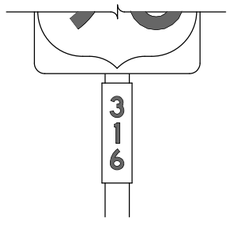
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

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	0073	12	015,etc	US 181,etc
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		250

DATE: 9/23/2020 4:35:50 PM
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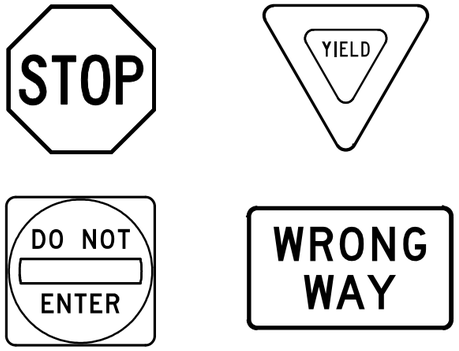
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

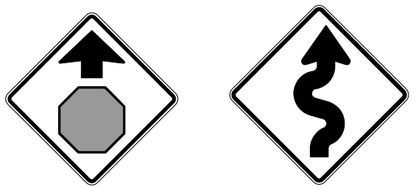
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

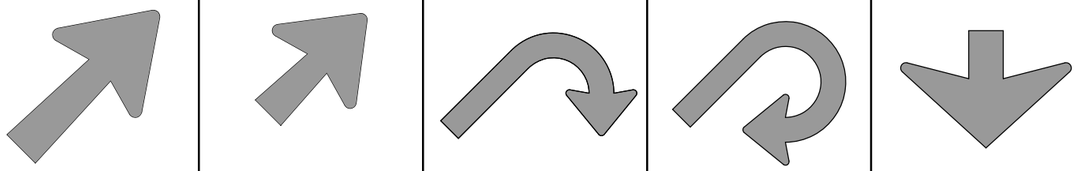
TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		251

DATE: 9/23/2020 4:35:54 PM
FILE: c:\pw-af\pw-af-prod\bilal.ghandour@aguirre-fields.com\d0118552\tsr5-13.dgn

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

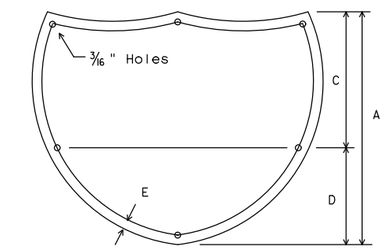
NOTE

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.

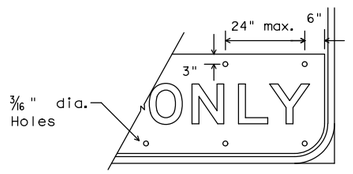
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

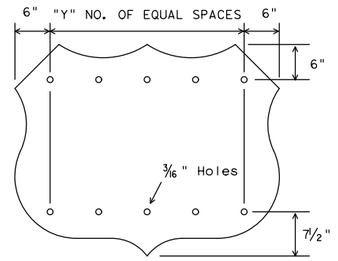


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

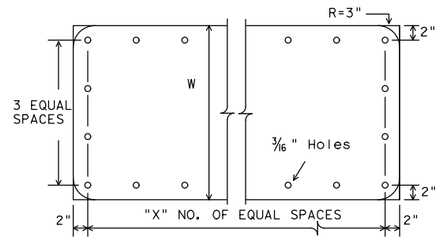


EXIT ONLY PANEL



U.S. ROUTE MARKERS

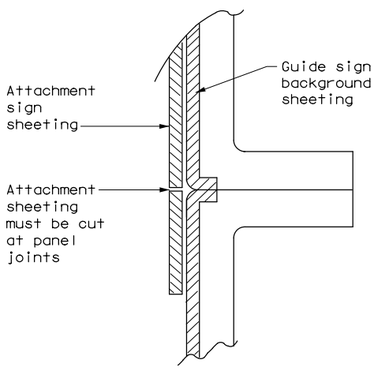
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



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

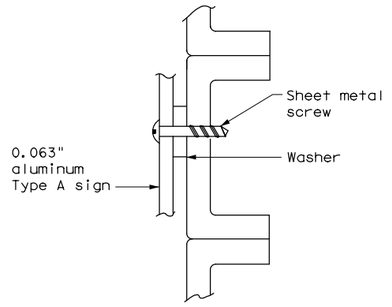
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



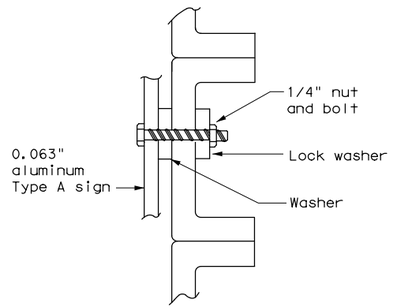
DIRECT APPLIED ATTACHMENT

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



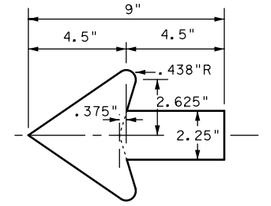
NUT/BOLT ATTACHMENT

NOTE:

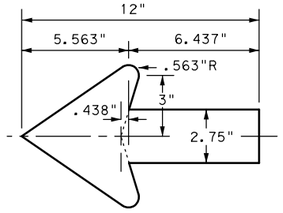
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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

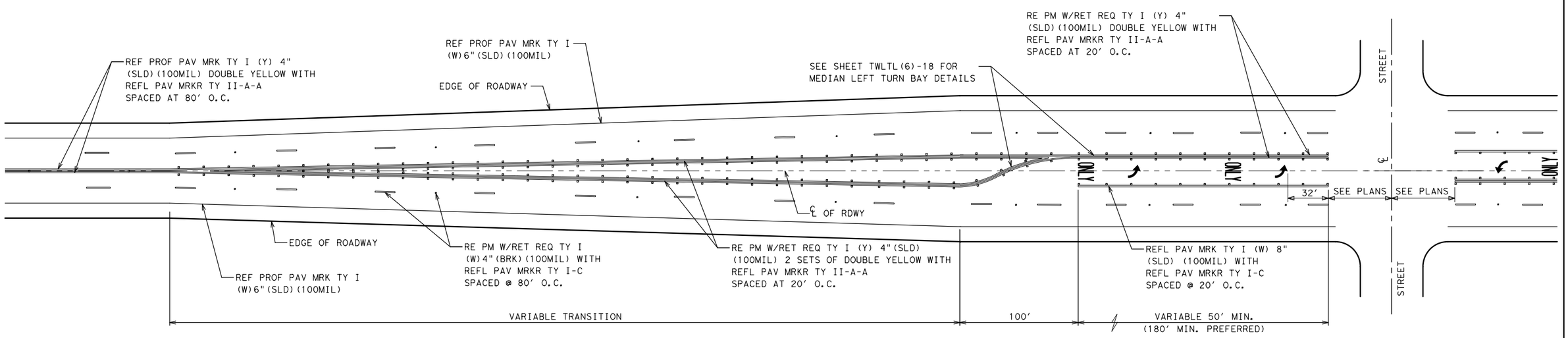
Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

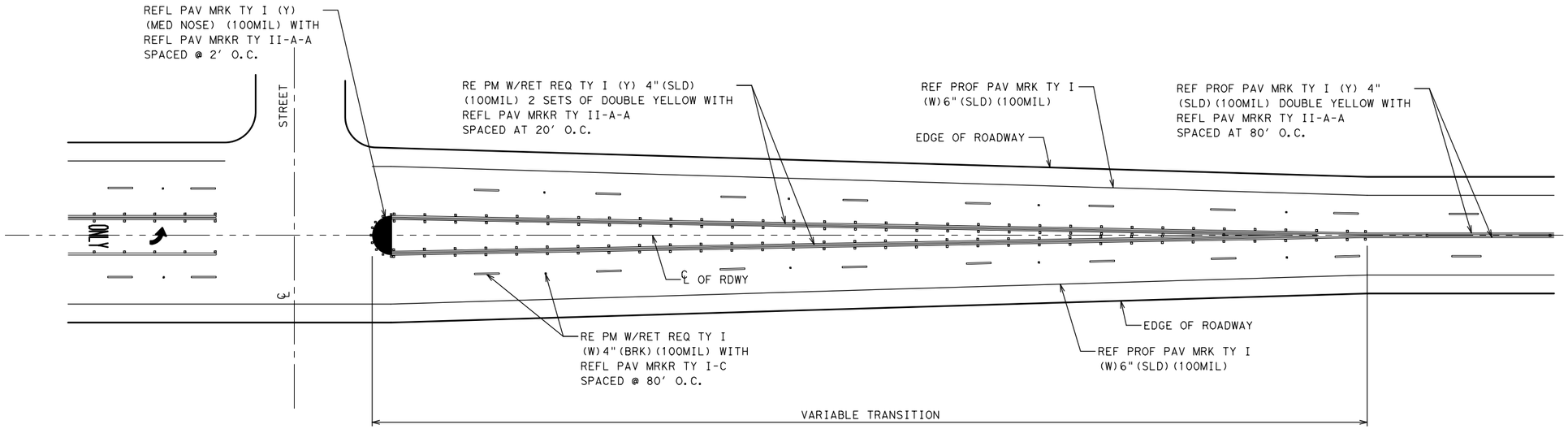
FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		252

5



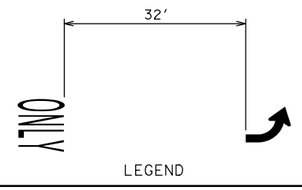
TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
WITH LEFT TURN BAY



TYPICAL TRANSITION

LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - RURAL ROADS

SCALE: NS

TWLTL(1)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			253
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	BEXAR	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010				
MAY 2010	0073	12	015,etc	US 181,etc
MAY 2018				

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REVISED BY: JC03
CHECKED BY: G.G./OMG
REVISED ON: 5-18
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REVISED ON: 5-18
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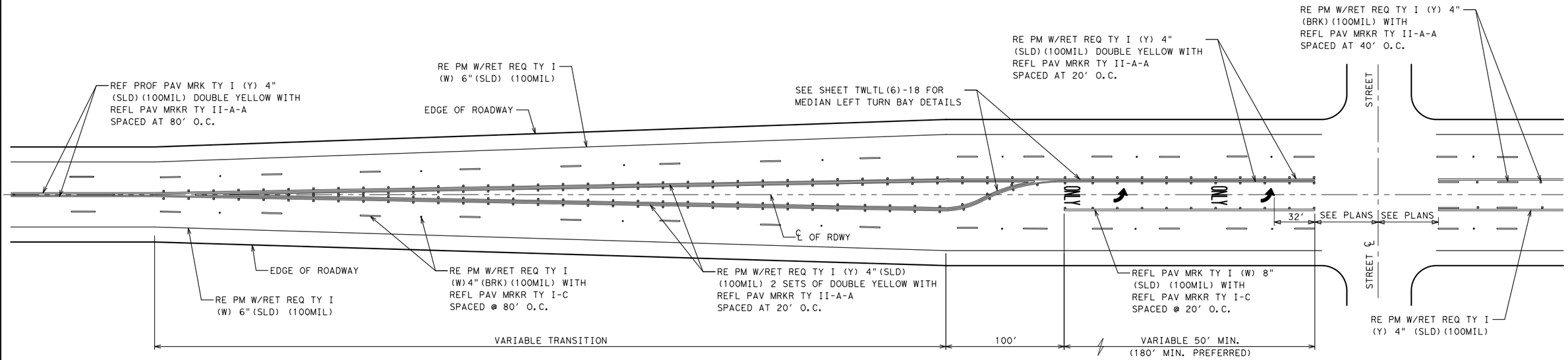
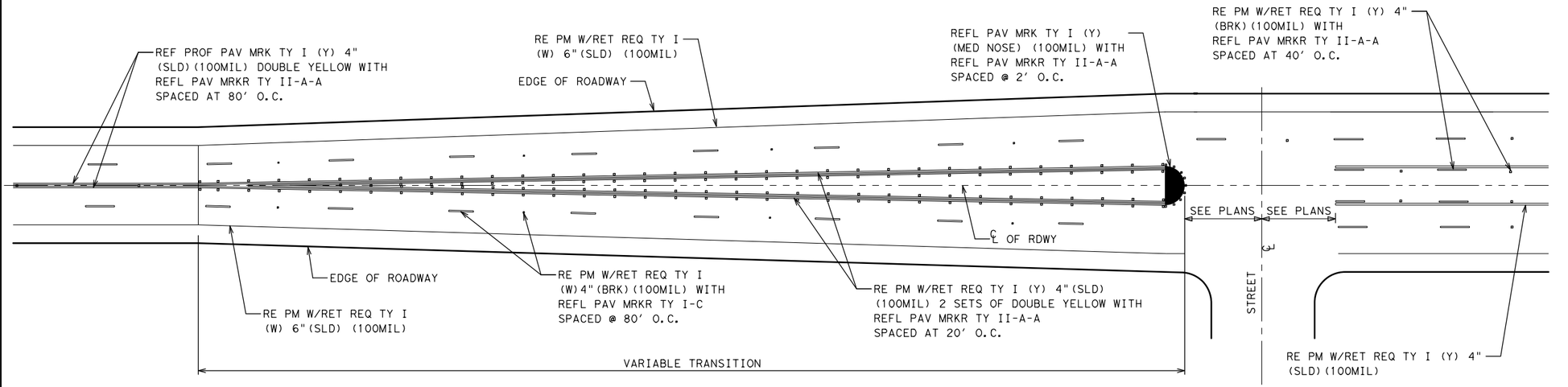


TYPICAL MEDIAN LEFT TURN BAY

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



TYPICAL TRANSITION

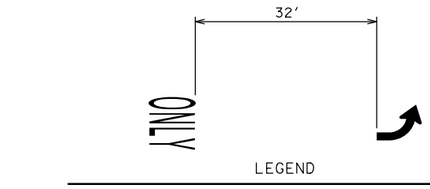
AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(2)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			254
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	BEXAR	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0073	12	015,etc	US 181,etc
MAY 2010				
MAY 2018				

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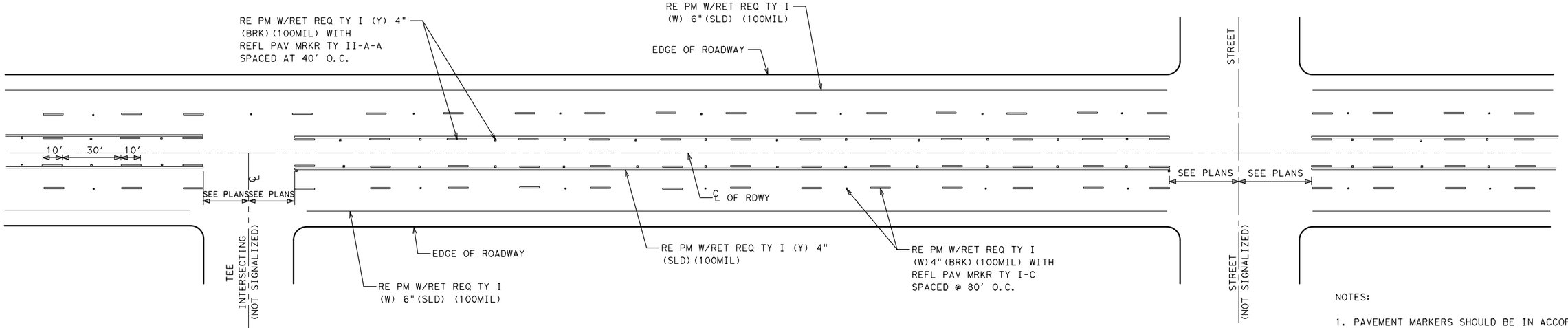


TWO WAY LEFT TURN LANE DETAILS
NON-SIGNALIZED INTERSECTIONS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

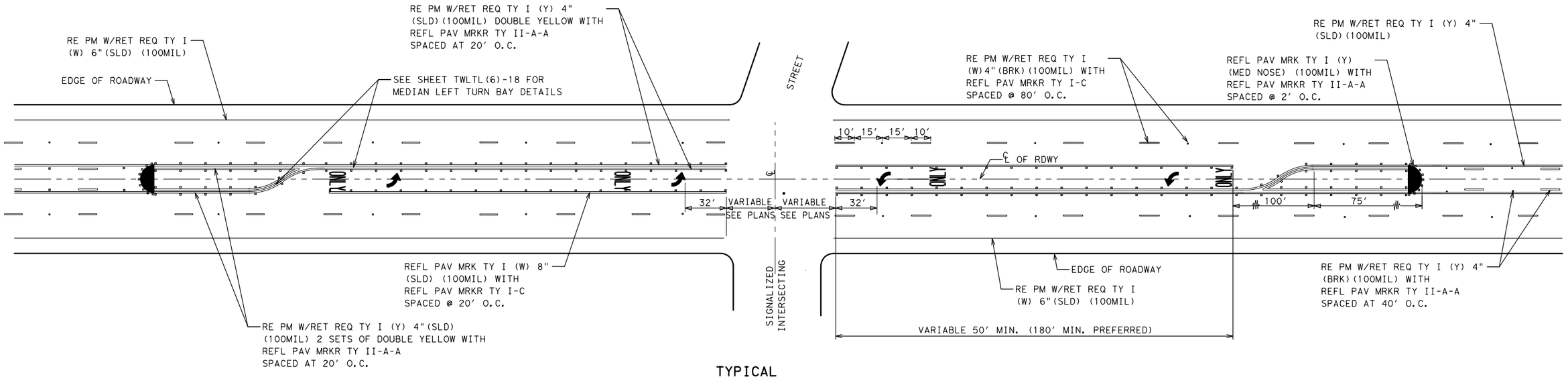
☐ REFLECTIVE MARKER

San Antonio District Standard

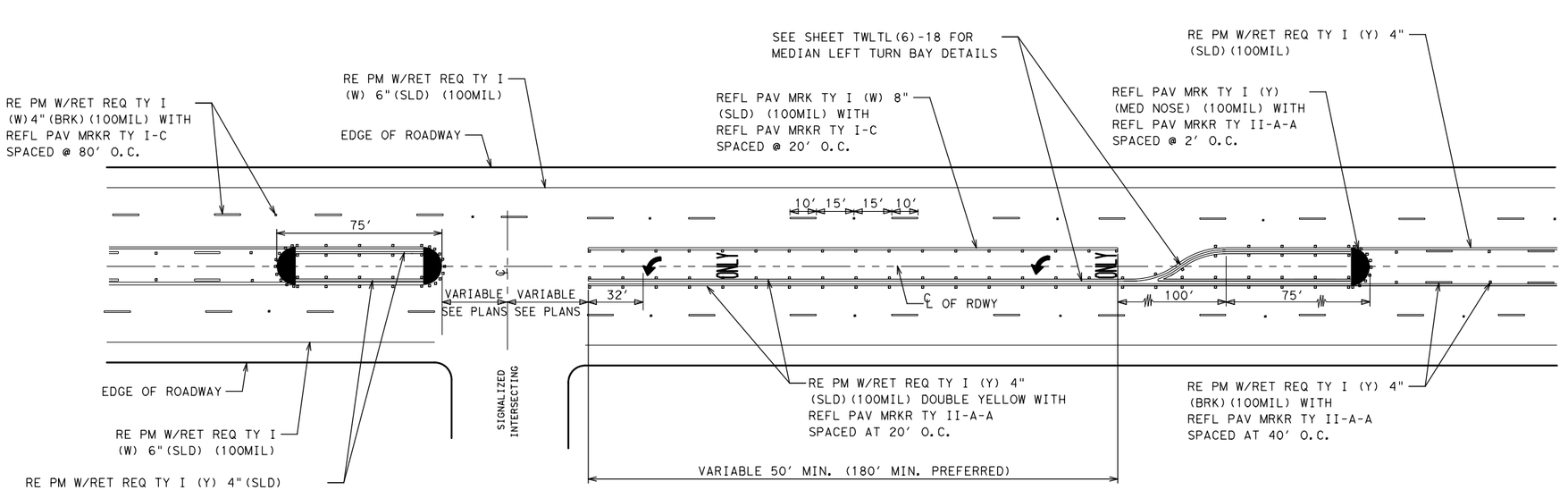
TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS **TWLTL(3)-18**

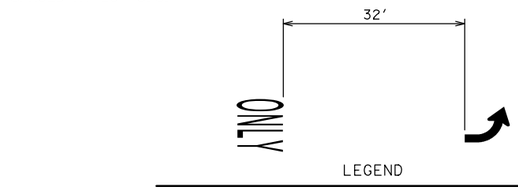
REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			255
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007				
SEPT 2008	TEXAS	SAT	BEXAR	
MARCH 2010	CONT.	SECT.	JOB	HIGHWAY NO.
MAY 2010				
MAY 2018	0073	12	015,etc	US 181,etc



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTING



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(4)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			256
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	BEXAR	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0073	12	015,etc	US 181,etc
MAY 2010				
MAY 2018				

REVISED ON: 5-18 CHECKED BY: G.G./OMG REVISED BY: JCO3 DRAWN BY: TED
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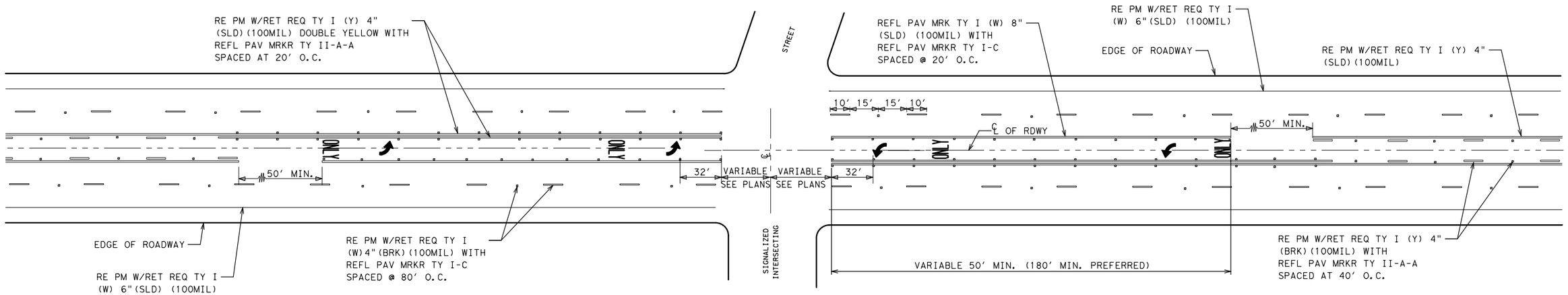
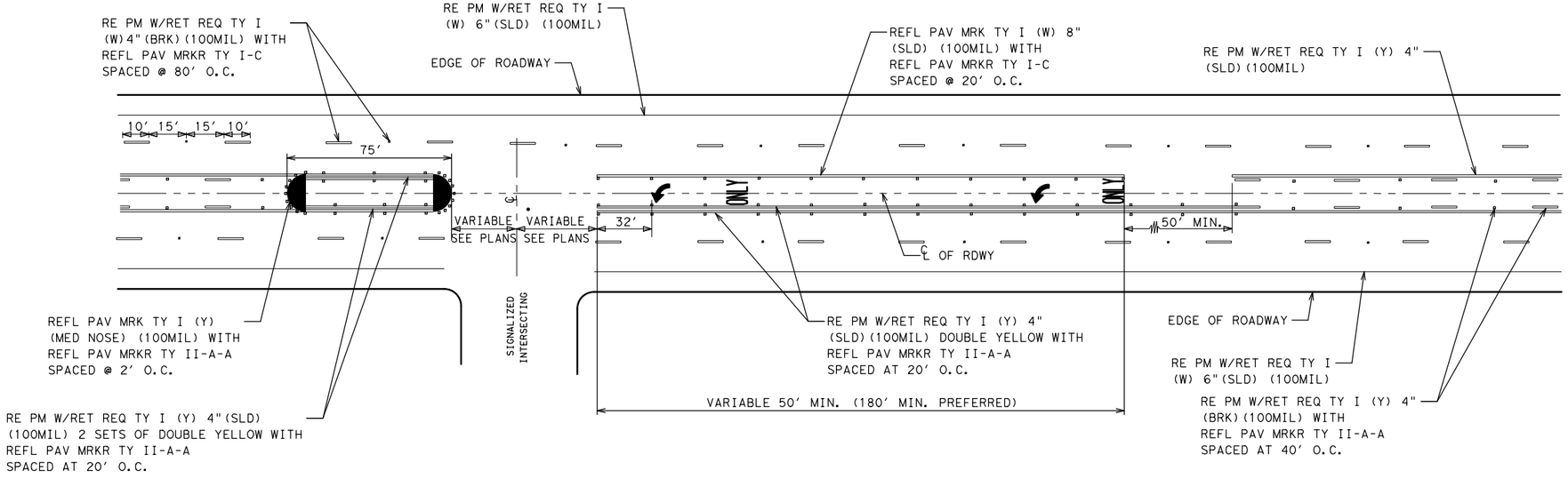


TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTION



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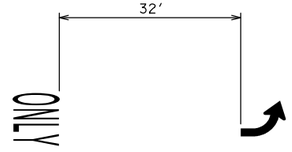
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-12)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

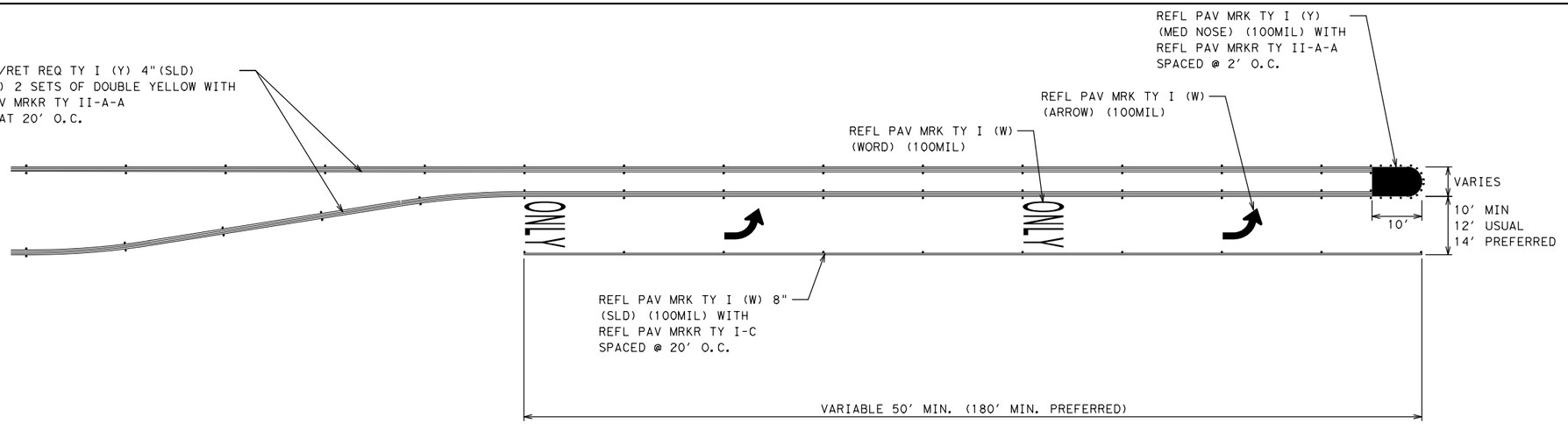
☐ REFLECTIVE MARKER

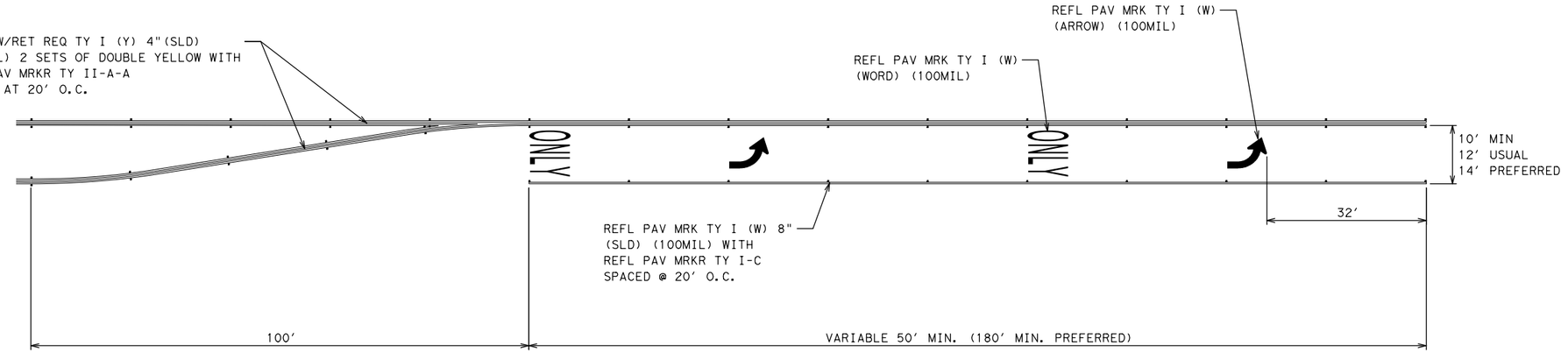
San Antonio District Standard

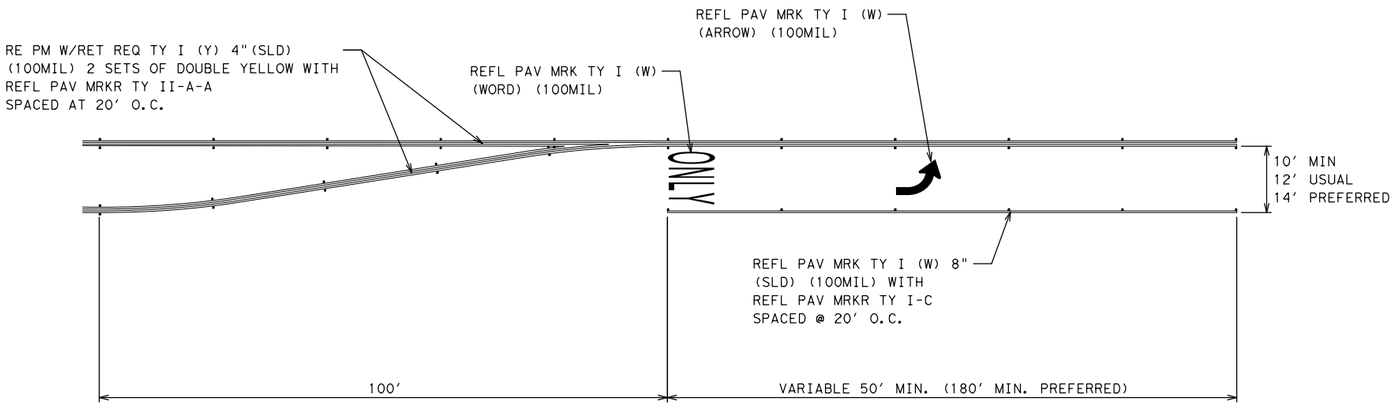
TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS **TWLTL(5)-18**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			257
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	BEXAR	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0073	12	015,etc	US 181,etc
MAY 2010				
MAY 2018				







MEDIAN LEFT TURN BAY DETAILS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-12 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE. ALSO REFER TO STATE STANDARD PM(3)-12)

LEGEND

☐ REFLECTIVE MARKER

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(6)-18

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
AUG 2002	6			258
APRIL 2003	STATE	DIST.	COUNTY	
NOV 2007	TEXAS	SAT	BEXAR	
SEPT 2008	CONT.	SECT.	JOB	HIGHWAY NO.
MARCH 2010	0073	12	015,etc	US 181,etc
MAY 2010				
MAY 2018				

DRAWN BY: TED
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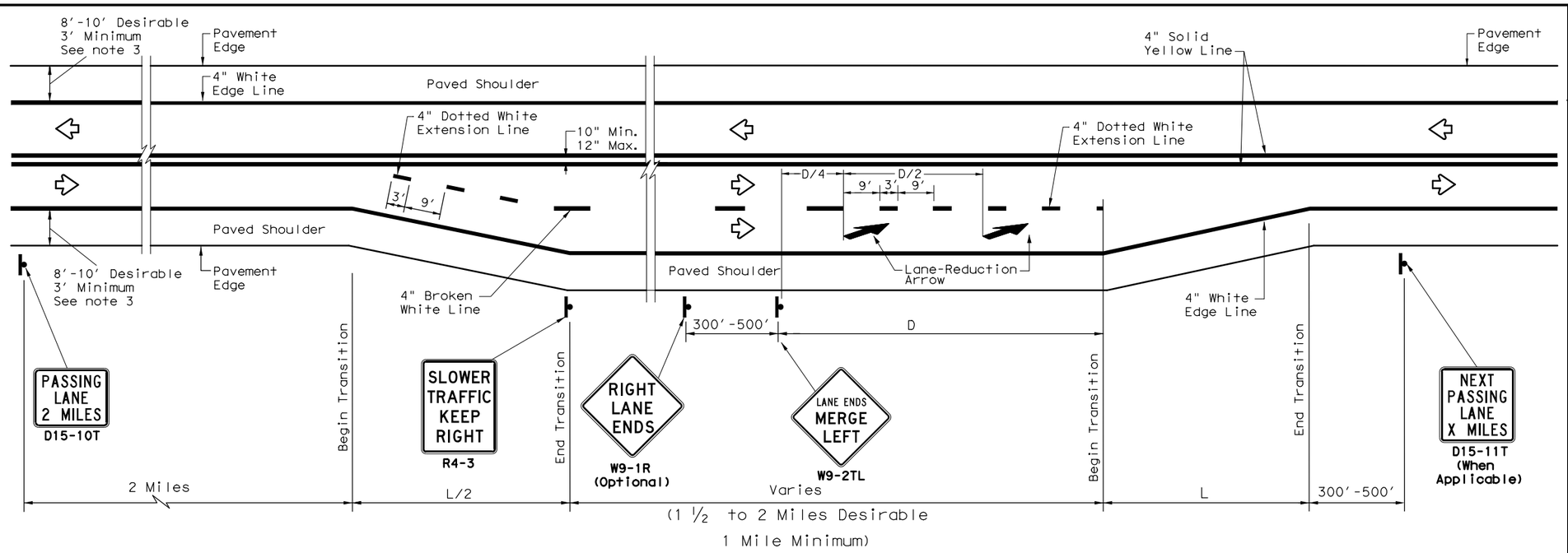

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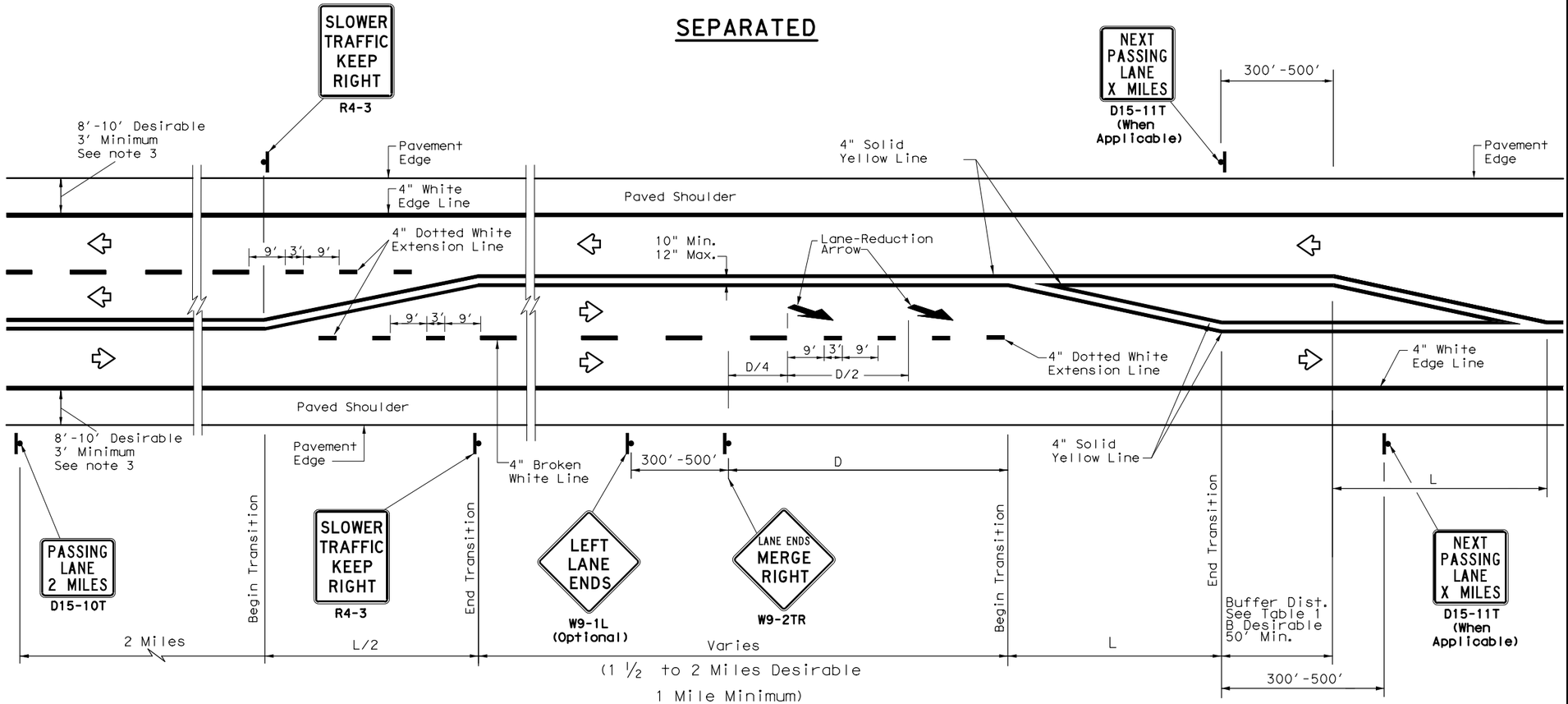

ALTERNATING

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)	
Formula *	L = WS

* Transition length should be rounded up to nearest 5 foot increment.

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

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers(RPM) details, see Pavement Markings Standard sheet, PM(2). Note that RPMs are not recommended on the 4" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see rumble strip standard sheet RS(4).

Texas Department of Transportation

Traffic Operations Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-1)-18

FILE: ts2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0073	12	015,etc	US 181,etc
2-12	DIST	COUNTY		SHEET NO.
3-12	SAT	BEXAR		259
3-18				

25

DATE/TIME 4:11:19 PM
DOCUMENT NAME 04999\1003393.00\WA5_US181\04_DOCUMENTS\CADD\STANDARDS\ENVIRONMENTAL\epic_2015-10-09_SAT.dgn

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 appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the 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.

2.

3.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1.

2.

3.

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	0073	12	015,etc		US 181,etc	
	DIST	COUNTY			SHEET NO.	
	SAT	BEXAR			260	

DATE: 2/25/2021
FILE: R:\1003300-1004999\1003393.00\WA5_US181\04_DOCUMENTS\CADD\STANDARDS\ENVIRONMENTAL\015SWP3I.dgn

A. GENERAL SITE DATA

1. PROJECT LIMITS: *FROM IH 37 TO WILSON COUNTY LINE*

2. PROJECT SITE MAPS:
   - *Project Latitude 29°18'28.20"N Project Longitude 98°23'39.14"W*
   - *Project Location Map: Shown on Title Sheet*
   - *Drainage Patterns: N/A*
   - *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: N/A*
   - *Major Controls and Locations of Stabilization Practices: N/A*
   - *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
   - *Surface Waters and Discharge Locations: N/A*

3. PROJECT DESCRIPTION: *FOR THE CONSTRUCTION OF BASE REPAIR, MILL, INLAY, AND PAVEMENT MARKINGS*

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)*
      ____ *Other: _____*

5. EXISTING AND PROPOSED CONDITIONS:

   Description of existing vegetative cover: Grasses with little to no brush or trees within the ROW
   Percentage of existing vegetative cover: 76%
   Existing vegetative cover: (mark one)
   __X__ *Thick or uniformly established*
   ____ *Thin and Patchy*
   ____ *None or minimal cover*
   Description of soils: Miguel Fine Sandy Loam, Floresville Fine Sandy Loam
   Site Acreage: 267.07 Ac Acreage disturbed: 13.65 Ac
   Site runoff coefficient (pre-construction): 0.48 Site runoff coefficient (post-construction): 0.48

6. RECEIVING WATERS: *(Mark all that apply)*

   ____ *A classified stream does not pass through project.*
   __X__ *A classified stream passes through project. Name Calaveras Creek Segment Number 1911M*
   Name of receiving waters that will receive discharges from disturbed areas of the project: Upper San Antonio River

   Site is in a Municipal Separate Storm Sewer System (MS4).
   MS4 Operator (name): City of San Antonio

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
   ____ SODDING
   ____ PRESERVATION OF NATURAL RESOURCES
   ____ FLEXIBLE CHANNEL LINER
   ____ RIGID CHANNEL LINER
   ____ SOIL RETENTION BLANKET
   ____ COMPOST MANUFACTURED TOPSOIL
   ____ OTHER: (Specify Practice)

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).*
   __X__ *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.

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

 Texas Department of Transportation

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Luis A. González

REVISION DATE: 10/12

STORM WATER POLLUTION PREVENTION PLAN (SW3P)
(US 181)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			US 181, etc
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	SHEET NO.
0073	12	015, etc	261

DATE: 2/25/2021
FILE: R:\1003300-1004999\1003393.00\WA5_US181\04_DOCUMENTS\CADD\STANDARDS\ENVIRONMENTAL\060SWP3I.dgn

A. GENERAL SITE DATA

1. PROJECT LIMITS: *FROM AMANDA ST TO IH 410*

2. PROJECT SITE MAPS:
   - *Project Latitude 29°23'53.16"N Project Longitude 98°26'11.11"W*
   - *Project Location Map: Shown on Title Sheet*
   - *Drainage Patterns: N/A*
   - *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: N/A*
   - *Major Controls and Locations of Stabilization Practices: N/A*
   - *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
   - *Surface Waters and Discharge Locations: N/A*

3. PROJECT DESCRIPTION: *FOR THE CONSTRUCTION OF BASE REPAIR, MILL, INLAY, AND PAVEMENT MARKINGS*

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)*
      ____ *Other:* _____

5. EXISTING AND PROPOSED CONDITIONS:

   Description of existing vegetative cover: Grasses with little to no brush or trees within the ROW
   Percentage of existing vegetative cover: 52%
   Existing vegetative cover:(mark one)
   __X__ *Thick or uniformly established*
   ____ *Thin and Patchy*
   ____ *None or minimal cover*
   Description of soils: Lewisville Silty Clay, Loire Clay Loam, Patrick Soils
   Site Acreage: 38.80 Ac Acreage disturbed: 1.08 Ac
   Site runoff coefficient (pre-construction): 0.61 Site runoff coefficient (post-construction): 0.61

6. RECEIVING WATERS: *(Mark all that apply)*

   ____ *A classified stream does not pass through project.*
   __X__ *A classified stream passes through project. Name* Salado Creek *Segment Number* 1910
   Name of receiving waters that will receive discharges from disturbed areas of the project: Upper San Antonio River

   Site is in a Municipal Separate Storm Sewer System (MS4).
   MS4 Operator (name): City of San Antonio

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
   ____ SODDING
   ____ PRESERVATION OF NATURAL RESOURCES
   ____ FLEXIBLE CHANNEL LINER
   ____ RIGID CHANNEL LINER
   ____ SOIL RETENTION BLANKET
   ____ COMPOST MANUFACTURED TOPSOIL
   ____ OTHER: (Specify Practice)

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
   __P__ CURBS AND GUTTERS
   __P__ 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).*
   __X__ *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.

PGAL
3131 BRIARPARK, SUITE 200
Houston, Texas 77042
Phone (713) 622-1444
TBPE REG. NO. F-2742

 Texas Department of Transportation

STATE OF TEXAS
Luis A. González
104983
LICENSED
PROFESSIONAL ENGINEER
2/25/2021

Luis A. González

STORM WATER POLLUTION PREVENTION PLAN (SW3P)
(US 87)

REVISION DATE: 10/12

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			US 181, etc
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	SHEET NO.
0073	12	015, etc	262

DATE: 2/25/2021
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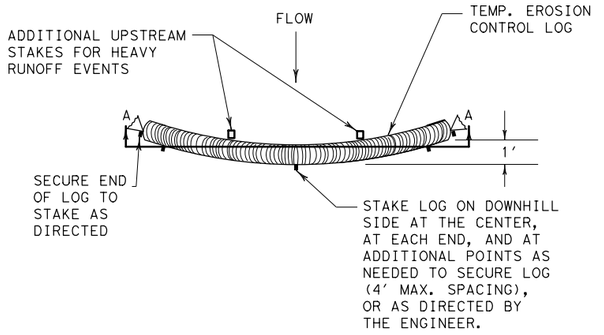
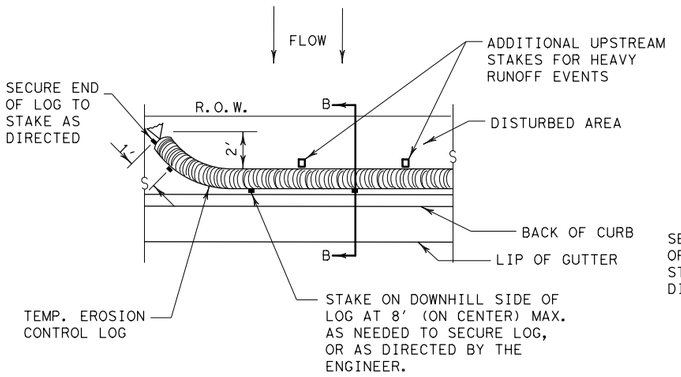


PLAN VIEW



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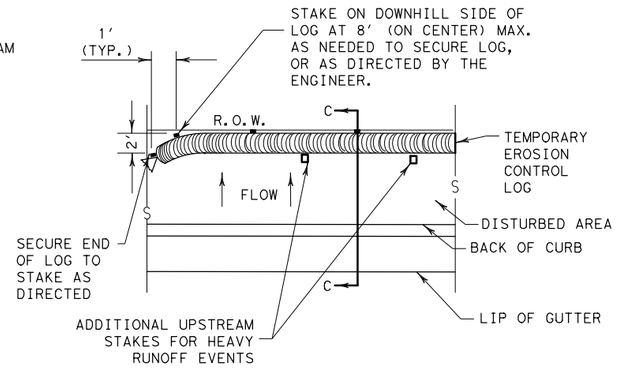

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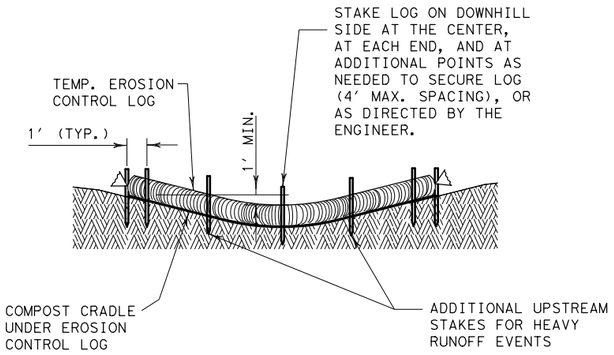
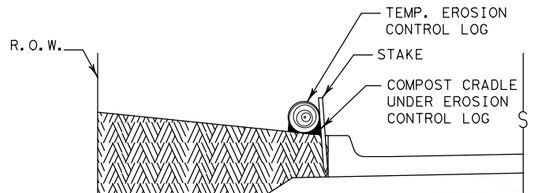


SECTION A-A

EROSION CONTROL LOG DAM

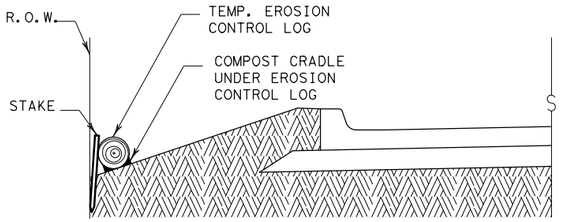
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

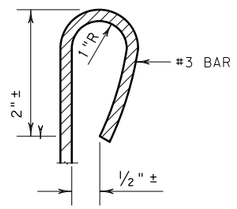
CL-BOC



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.

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.

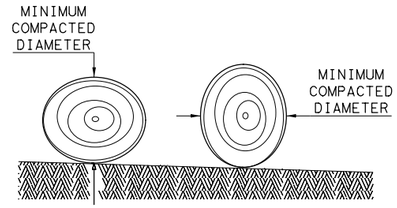
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		263

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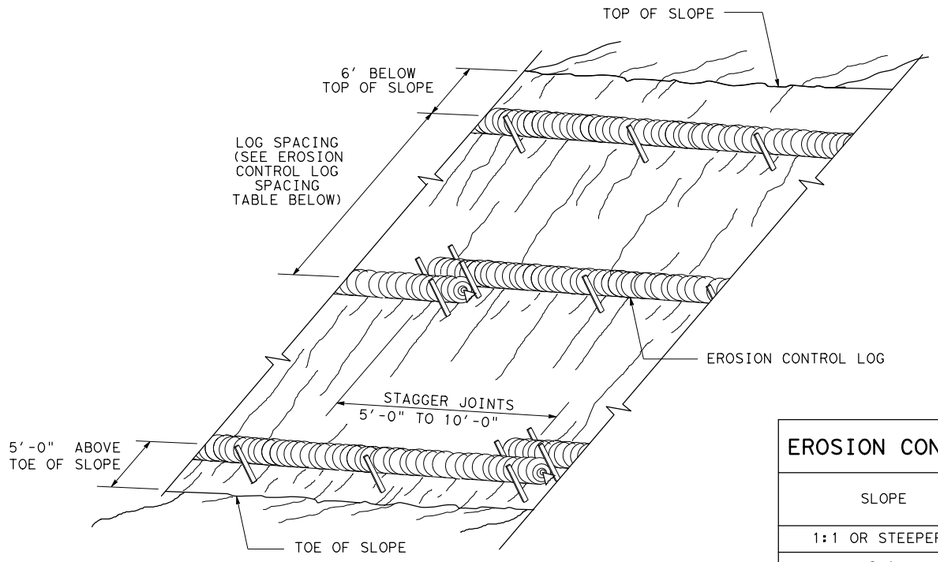
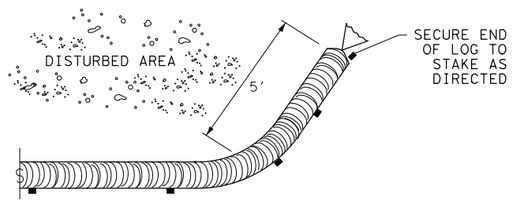


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

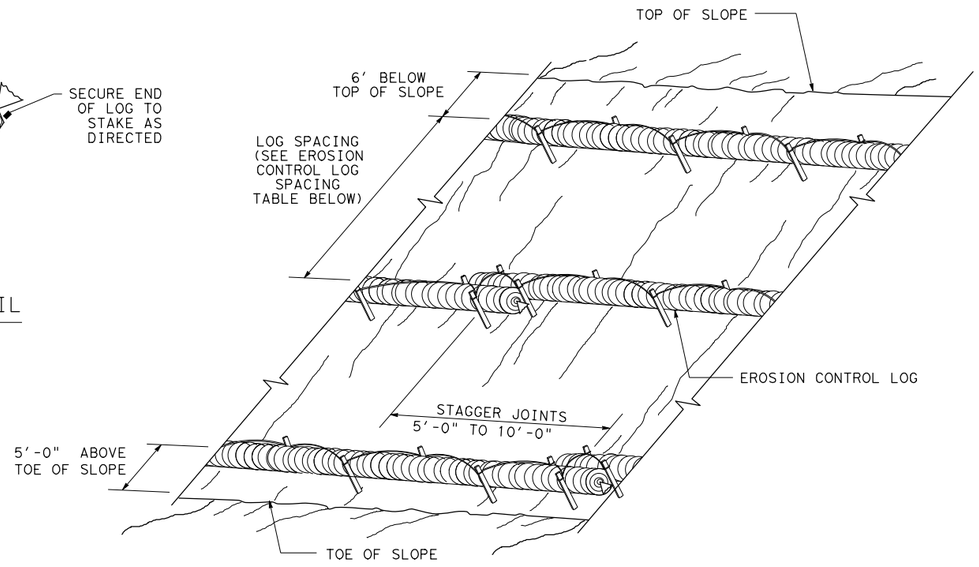
CL-SST



END SECTION RAP DETAIL

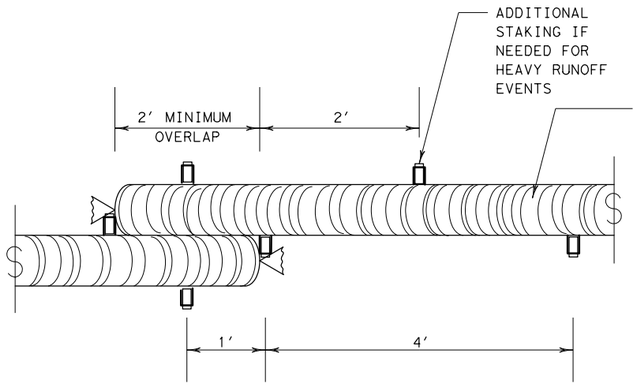
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

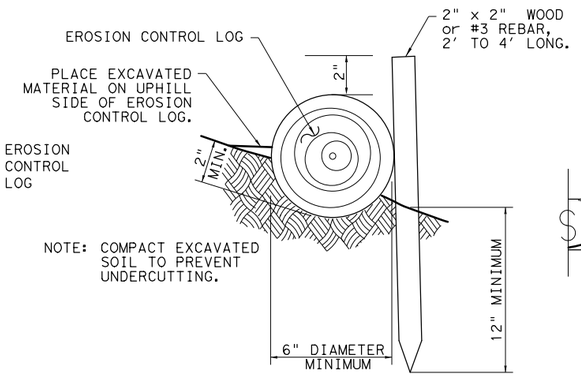
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

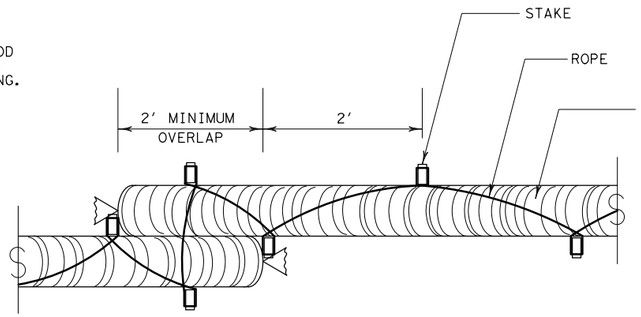


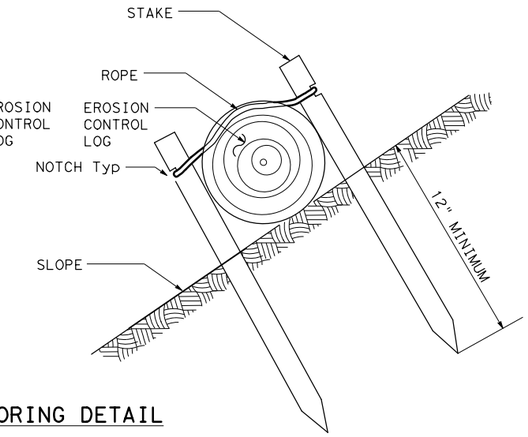


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

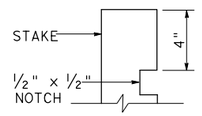
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		264

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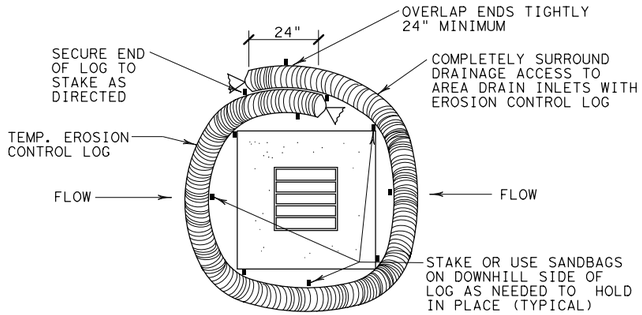
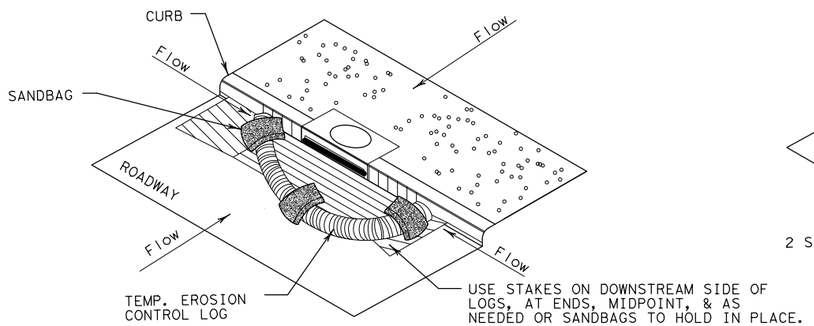


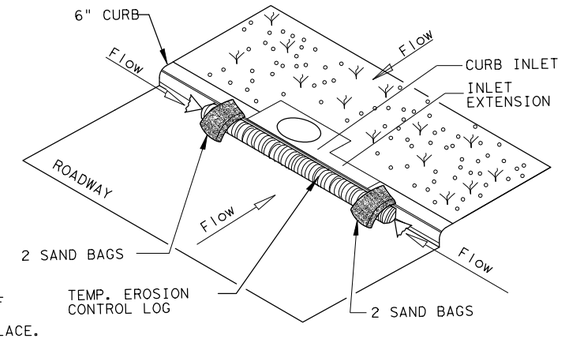
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

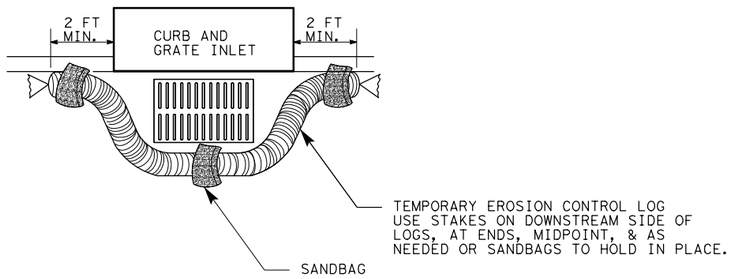
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

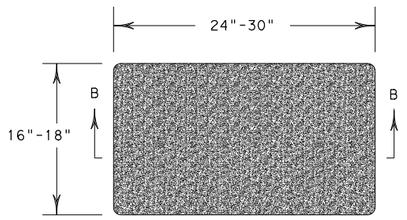
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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	DIST	COUNTY			SHEET NO.		
	SAT	BEXAR			265		