WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 1

Project:	*21IFB15*
Roadway:	*Thrall - Bounds Street*
CSJ Number:	

1. CONTRACTOR: **Chasco Constructors**

2. Change Order Work Limits: Sta. **207+34** to Sta. **323+50**

3. Type of Change(on federal-aid non-exempt projects): **Minor** (Major/Minor)

4. Reasons: **2G, 3F** (3 Max. - In order of importance - Primary first)

5. Describe the work being revised:

2G. Differing Site Conditions (unforeseeable). Unadjusted utility. This Change Order revises the location of the drainage pipe and curb inlets to clear existing utilities and changes the curb inlets from PCO to PCU. **3F. County Convenience. Additional work desired by the County.** This Change Order revises the pipe connection between the curb inlet and the pipe under the driveway and increases the quantity of pavement repair due to the current condition of the pavement.

6. Work to be performed in accordance with Items: **see attached**
7. New or revised plan sheet(s) are attached and numbered: **23, 55, 57, 58, 60-63, 65**
8. New Special Provisions/Specifications to the contract are attached: ☐ Yes ☑ No
9. New Special Provisions to Item N/A No. N/A , Special Specification Item N/A are attached.

Each signatory hereby warrants that each has the authority to execute this Change Order (CO).

The contractor must sign the Change Order and, by doing so, agrees to waive any and all claims for additional compensation due to any and all other expenses; additional changes for time, overhead and profit; or loss of compensation as a result of this change.

THE CONTRACTOR Date 2.9.22

By [signature]

Typed/Printed Name CHARLES KING

Typed/Printed Title VP

The following information must be provided

Time Ext. #: **N/A** Days added on this CO: **0**

Amount added by this change order: **$47,437.00**

RECOMMENDED FOR EXECUTION:

[signature] 2/9/2022
Project Manager Date

N/A
Design Engineer Date

[signature] 2/9/2022
Program Manager Date

City of Austin Program Manager Date

County Commissioner Precinct 1 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 2 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 3 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 4 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Judge Date
☐ APPROVED

Design Engineer's Seal:

see attached plan sheets

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: ***1*** ***Project #*** ***21IFB15***

TABLE A: Force Account Work and Materials Placed into Stock

	LABOR	HOURLY RATE			HOURLY RATE

TABLE B: Contract Items:

				ORIGINAL + PREVIOUSLY REVISED		ADD or (DEDUCT)	NEW		
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	QUANTITY	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR (6")	SY	$58.00	1311.00	$76,038.00	289.00	1,600.00	$92,800.00	$16,762.00
401-6001	FLOWABLE BACKFILL	CY	$160.00	0.00	$0.00	150.00	150.00	$24,000.00	$24,000.00
420-6071	CL C CONC (COLLAR)	EA	$800.00	2.00	$1,600.00	1.00	3.00	$2,400.00	$800.00
432-6003	RIPRAP (CONC)(6IN)	CY	$650.00	27.00	$17,550.00	(4.00)	23.00	$14,950.00	($2,600.00)
464-6003	RC PIPE (CL III)(18")	LF	$100.00	761.00	$76,100.00	10.00	771.00	$77,100.00	$1,000.00
464-6005	RCPIPE (CL III)(24IN)	LF	$120.00	180.00	$21,600.00	6.00	186.00	$22,320.00	$720.00
465-6014	INLET (COMP)(PCO)(3FT)(LEFT)	EA	$5,500.00	3.00	$16,500.00	(3.00)	0.00	$0.00	($16,500.00)
465-6030	INLET (COMP)(CLU)(3FT)(LEFT)	EA	$7,600.00	0.00	$0.00	3.00	3.00	$22,800.00	$22,800.00
466-6005	HEADWALL (CH-FW-0)(24IN)	EA	$5,000.00	1.00	$5,000.00	(1.00)	0.00	$0.00	($5,000.00)
467-6395	SET (TY II)(24IN)(RCP)(6:1)(P)	EA	$3,800.00	1.00	$3,800.00	1.00	2.00	$7,600.00	$3,800.00
481-6002	PIPE(PVC)(SDR-35)(6IN)	LF	$80.00	10.00	$800.00	11.00	21.00	$1,680.00	$880.00
496-6007	REMOVE STR (PIPE)	LF	$25.00	261.00	$6,525.00	10.00	271.00	$6,775.00	$250.00
760-6001	DITCH CLEANING AND RESHAPING (FOOT)	LF	$15.00	1492.00	$22,380.00	(35.00)	1,457.00	$21,855.00	($525.00)
3076-WC01	BLADE LAY TY B HMAC OVER PIPE	TON	$105.00	0.00	$0.00	10.00	10.00	$1,050.00	$1,050.00
TOTALS					$247,893.00			$295,330.00	$47,437.00

CHANGE ORDER REASON(S) CODE CHART

1. Design Error or Omission	1A. Incorrect PS&E 1B. Other
2. Differing Site Conditions (unforeseeable)	2A. Dispute resolution (expense caused by conditions and/or resulting delay) 2B. Unavailable material 2C. New development (conditions changing after PS&E completed) 2D. Environmental remediation 2E. Miscellaneous difference in site conditions (unforeseeable)(Item 9) 2F. Site conditions altered by an act of nature 2G. Unadjusted utility (unforeseeable) 2H. Unacquired Right-of-Way (unforeseeable) 2I. Additional safety needs (unforeseeable) 2J. Other
3. County Convenience	3A. Dispute resolution (not resulting from error in plans or differing site conditions) 3B. Public relations improvement 3C. Implementation of a Value Engineering finding 3D. Achievement of an early project completion 3E. Reduction of future maintenance 3F. Additional work desired by the County 3G. Compliance requirements of new laws and/or policies 3H. Cost savings opportunity discovered during construction 3I. Implementation of improved technology or better process 3J. Price adjustment on finished work (price reduced in exchange for acceptance) 3K. Addition of stock account or material supplied by state provision 3L. Revising safety work/measures desired by the County 3M. Other
4. Third Party Accommodation	4A. Failure of a third party to meet commitment 4B. Third party requested work 4C. Compliance requirements of new laws and/or policies (impacting third party) 4D. Other
5. Contractor Convenience	5A. Contractor exercises option to change the traffic control plan 5B. Contractor requested change in the sequence and/or method of work 5C. Payment for Partnering workshop
	5D. Additional safety work/measures desired by the contractor 5E. Other
6. Untimely ROW/Utilities	6A. Right-of-Way not clear (third party responsibility for ROW) 6B. Right-of-Way not clear (County responsibility for ROW) 6C. Utilities not clear 6D. Other

Williamson County Road Bond Program

Bounds Street Improvements (Thrall)
Williamson County Project No. 21IFB15

Change Order No. 1

Reason for Change

This Change Order revises the location of the drainage pipe and curb inlets to clear existing utilities and changes the curb inlets from PCO to PCU type inlets. PCO is an inlet with the box located behind the face of the curb. The conflict with the existing utility was located behind the curb. PCU is an inlet with the box located in front of the face of the curb. This Change Order also revises the pipe connection between the curb inlet and the pipe under the driveway and increases the quantity of pavement repair due to the current condition of the pavement.

Following is a summary of the new items required for this Change Order:

ITEM	DESCRIPTION	QTY	UNIT
401-6001	FLOWABLE BACKFILL	150	CY
465-6030	INLET (COMP)(PCU)(3FT)(LEFT)	3	EA
3076-WC01	BLADE LAY TY B HMAC OVER PIPE	10	TON

This Change Order results in a net increase of $47,437.00 to the Contract amount, for an adjusted Contract total of $937,425.00. The original Contract amount was $889,988.00. As a result of this and all Change Orders to-date, the Contract has been increased by $47,437.00, resulting in an 5.33% net increase in the Contract cost. No additional days will be added to the Contract, as a result of this Change Order.

HNTB Corporation

Oscar Salazar-Bueno, P.E.

BID FORM
WILLIAMSON COUNTY, TEXAS

CHASCO CONSTRUCTORS

P.O. Box 1057
Round Rock, TX 78680
(512) 244-0600
Fax (512) 244-6085

12/8/2021

JOB# 21119 SOUTH BOUNDS STREET OVERLAY

CP #1

ITEM	DESC CODE	DESCRIPTION	UNIT	PLAN QTY	REV QTY	DELTA	UNIT PRICE	EXTENSION
401	6001	FLOWABLE BACKFILL	CY	0	150	150	$160.00	$ 24,000.00
420	6071	CL C CONC (COLLAR)	EA	2	3	1	$800.00	$ 800.00
432	6003	RIPRAP (CONC)(6 IN)	CY	27	23	(4)	$650.00	$ (2,600.00)
464	6003	RC PIPE (CL III)(18 IN)	LF	761	771	10	$100.00	$ 1,000.00
464	6005	RC PIPE (CL III)(24 IN)	LF	180	186	6	$120.00	$ 720.00
465	6014	INLET (COMPL)(PCO)(3FT)(LEFT)	EA	3	0	(3)	$5,500.00	$ (16,500.00)
465	6030	INLET (COMPL)(PCU)(3FT)(LEFT)	EA	0	3	3	$7,600.00	$ 22,800.00
466	6005	HEADWALL (CH - FW - 0) (DIA = 24 IN)	EA	1	0	(1)	$5,000.00	$ (5,000.00)
467	6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	1	2	1	$3,800.00	$ 3,800.00
481	6002	PIPE (PVC) (SDR - 35) (6 IN)	LF	10	21	11	$80.00	$ 880.00
496	6007	REMOV STR (PIPE)	LF	261	271	10	$25.00	$ 250.00
760	6001	DITCH CLEANING AND RESHAPING (FOOT)	LF	1492	1457	(35)	$15.00	$ (525.00)

BLADE LAY TY 'B' OVER 18" RCP	TON	$105.00		$ 29,625.00

[1]Refer to the Technical Specifications section for a description of the specific reference number.

DRAINAGE SUMMARY

PLAN SHEET NO	STATION TO STATION	0420 6071 CL C CONC (COLLAR)	0420 6074 CL C CONC (MISC)	0432 6003 RIPRAP (CONC)(6 IN)	0464 6002 RC PIPE (CL III)(15 IN)	0464 6003 RC PIPE (CL III)(18 IN)	0464 6005 RC PIPE (CL III)(24 IN)	0464 6007 RC PIPE (CL III)(30 IN)	0465 6014 INLET (COMPL)(PCO)(3 FT)(LEFT)	0467 6337 SET (TY II) (15 IN) (RCP) (3: 1) (P)	0467 6357 SET (TY II) (18 IN) (RCP) (3: 1) (P)	0467 6363 SET (TY II) (18 IN) (RCP) (6: 1) (P)	0467 6395 SET (TY II) (24 IN) (RCP) (6: 1) (P)
		EA	CY	CY	LF	LF	LF	LF	EA	EA	EA	EA	EA
1 OF 4	STA 10+00 TO STA 15+00			8	70	32				2	1	1	
2 OF 4	STA 15+00 TO STA 20+00			4		329			1		1	1	
3 OF 4	STA 20+00 TO STA 25+00	3	0.03	4		410		140	2		1	2	
4 OF 4	STA 25+00 TO STA 30+60	1		7			4	42				1	1
	TOTAL	**4**	**0.03**	**23**	**70**	**771**	**4**	**182**	**3**	**2**	**3**	**5**	**1**

PLAN SHEET NO	STATION TO STATION	0467 6420 SET (TY II) (30 IN) (RCP) (4: 1) (P)	0467 6423 SET (TY II) (30 IN) (RCP) (6: 1) (P)	0481 6002 PIPE (PVC) (SDR - 35) (6 IN)	0496 6004 REMOV STR (SET)	0496 6006 REMOV STR (HEADWALL)	0496 6007 REMOV STR (PIPE)	0506 6038 TEMP SEDMT CONT FENCE (INSTALL)	0506 6039 TEMP SEDMT CONT FENCE (REMOVE)	0529 6030 CONC CURB & GUTTER (VALLEY GUTTER)	0760 6001 DITCH CLEANING AND RESHAPING (FOOT)	0764 6025 STORM SEWER CLEANING (ALL SIZES)
		EA	EA	LF	EA	EA	LF	LF	LF	LF	LF	LF
1 OF 4	STA 10+00 TO STA 15+00					2	32	500	500		309	79
2 OF 4	STA 15+00 TO STA 20+00					2	32	500	500	101	321	166
3 OF 4	STA 20+00 TO STA 25+00	1		21		1	164	650	650	344	292	176
4 OF 4	STA 25+00 TO STA 30+60		1		2		43	650	650	401	535	370
	TOTAL	**1**	**1**	**21**	**2**	**5**	**271**	**2,300**	**2,300**	**846**	**1,457**	**791**

SIGNING & PAVEMENT MARKING SUMMARY

PLAN SHEET NO	STATION TO STATION	0644 6067 IN SM RD SN SUP&AM (INST SIGN ONLY)	0644 6068 RELOCATE SM RD SN SUP&AM TY 10BWG	0662 6111 WK ZN PAV MRK SHT TERM (TAB)TY Y-2	0666 6048 REFL PAV MRK TY I (W)24"(SLD)(100MIL)			0666 6093 REFL PAV MRK TY I (W)(RR XING)(100MIL)	0666 6126 REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	0666 6147 REFL PAV MRK TY I (Y)24"(SLD)(100 MIL)	0672 6009 REFL PAV MRKR TY II-A-A	0672 9999 REFL PAV MRKR TY II-B-B
					RR CROSSING	CROSSWALK	STOP BAR					
		EA	EA	EA	LF	LF	LF	EA	LF	LF	EA	0
1 OF 2	STA 10+00 TO STA 20+00	7	5	200	36	60	44	1	1848	37	24	3
2 OF 2	STA 20+00 TO STA 30+60	5	2	200		30	78		1,718		22	1
	TOTAL	12	7	400	36	90	122	1	3,566	37	46	4

STATE OF TEXAS
BENNETT B. LOVE, JR.
136400
LICENSED PROFESSIONAL ENGINEER

NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

WILLIAMSON COUNTY 1848

RS&H, Inc.
8240 N. Mopac Expressway, Suite 300
Austin, Texas 78759
512-279-5427 FAX 512-459-2233
Texas Registration No. F-3401

BOUNDS STREET OVERLAY

SUMMARY OF QUANTITIES

SHEET 2 OF 2

DISTRICT	ROADWAY
AUSTIN	BOUNDS STREET
COUNTY	SHEET NO.
WILLIAMSON	23

DS: MV CK: BL
DW: MV CK: FM

RATIONAL METHOD CALCULATIONS

Basin ID	Area (ac)	C	Tc (min)	Intensity (in/hr)						Discharge (cfs)					
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
O-1	2.76	0.69	15	4.16	5.16	6.00	7.12	8.04	8.92	7.98	9.90	11.51	13.66	15.42	17.11

TIME OF CONCENTRATION CALCULATIONS

BASIN ID	SHEET FLOW					SHALLOW CONCENTRATED FLOW					CHANNEL FLOW									TOTAL TRAVEL TIME (Tc) (HR)	TOTAL TRAVEL TIME (Tc) (MIN)
	ROUGHNESS COEFFICIENT n_{ol}	FLOW LENGTH (FT)	2-YR / 24-HR RAINFALL (IN)	SLOPE (FT/FT)	TRAVEL TIME, T_{sh} (HR)	SURFACE TYPE	FLOW LENGTH (FT)	SLOPE (FT/FT)	AVERAGE VELOCITY (FT/S)	TRAVEL TIME, T_{sc} (HR)	MANNING'S COEFFICIENT n	FLOW LENGTH (FT)	SLOPE (FT/FT)	BOTTOM WIDTH (FT)	DEPTH (FT)	SIDE SLOPE (H:1V)	SIDE SLOPE (H:1V)	AVERAGE VELOCITY (FT/S)	TRAVEL TIME, T_{ch} (HR)		
O-1	0.011	100	3.93	0.015	0.02	paved	1040.00	0.004	1.27	0.23	0.01	158.00	0.013	2	2	6	6	25.13	0.00	0.25	15.03

RUNOFF COEFFICIENT CALCULATIONS

Basin ID	Total Area (ac)	C Value			
		Road (ac)	School (ac)	Open Space (ac)	Composite C Value
		0.90	0.70	0.30	
O-1	2.76	0.43	2.08	0.26	0.69

RUNOFF CALCULATIONS

Basin Data			Time of Conc.		Rainfall Data		
Area ID	Total Area (ac)	C-Value	Tc Actual (min)	Tc Used (min)	Design Freq (yr)	I (in/hr)	Q (cfs)
CI-1	0.16	0.90	10	10	5	5.81	0.84
CI-2	0.12	0.90	10	10	5	5.81	0.64
CI-3	0.11	0.90	10	10	5	5.81	0.56

INLET COMPUTATIONS DATA

Inlet ID	Library Name	Reference Chain	Inlet Station	Inlet Offset (ft)	Inlet Elevation (ft)	Inlet Type	Profile Type	Total Discharge (cfs)	Inlet Capacity (cfs)	Bypass Flow (cfs)	Bypass Flow into	Ponding Width (ft)	Allow Ponding Width (ft)	Ponding Depth (ft)	Allow Ponding Depth (ft)	Spread n	Long Slope on Grade (%)	Inlet Curb Length (ft)
CI-1	PCO10L-3x5	THRALL_CL	17+00	-15	554.75	Curb	On Grade	0.84	0.84	-	-	6.620	7	0.13	0.5	0.015	1	9.5
CI-2	PCO10L-3x5	THRALL_CL	20+50	-15	549.00	Curb	On Grade	0.64	0.64	-	-	5.958	7	0.12	0.5	0.015	1	9.5
CI-3	PCO10L-3x5	THRALL_CL	23+65	-14.5	545.61	Curb	On Grade	0.56	0.56	-	-	5.678	13.5	0.11	0.5	0.015	1	9.5

STORM SEWER HYDRAULIC DATA

Line ID	Upstream Node	Downstream Node	Culvert Size (in)	Pipe Length (ft)	Mannings n	Slope (%)	Upstream Invert (ft)	Downstream Invert (ft)	Discharge (cfs)	Capacity (cfs)	Uniform Velocity (ft/s)	Uniform Depth (ft)	Actual Velocity (ft/s)	Actual Depth (ft)	Upstream HGL (ft)	Downstream HGL (ft)
LINE 1	CI-1	CI-2	18-inch	345	0.012	1.52	549.75	544.50	0.84	15.10	4.37	0.25	2.77	0.34	550.24	544.75
LINE 2	CI-2	CI-3	18-inch	310	0.012	0.84	544.40	541.80	1.41	11.21	4.11	0.37	3.22	0.45	544.92	542.17
LINE 3	CI-3	OUTLET-1	18-inch	16	0.012	1.56	540.45	540.20	1.87	15.29	5.57	0.37	3.48	0.52	541.35	541.29

NOTES:

1. ATLAS 14 PRECIPITATION VALUES USED TO CALCULATE RUNOFF
2. PER TXDOT HYD, MAX PONDING = WIDTH AND DEPTH THAT WILL ALLOW THE SAFE PASSAGE OF ONE LANE OF TRAFFIC PER DIRECTION. A MAX VALUE OF 7 FT WAS USED.

STATE OF TEXAS
NIKKI CHRISTINE BROM
137308
LICENSED
PROFESSIONAL ENGINEER

NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

WILLIAMSON COUNTY 1848

RS&H, Inc.
8240 N. Mopac Expressway, Suite 300
Austin, Texas 78759
512-279-5427 FAX 512-459-2233
Texas Registration No. F-3401

BOUNDS STREET OVERLAY

DRAINAGE CALCULATIONS

SHEET 1 OF 1

DS:	CK:	DISTRICT	ROADWAY
BV	NB	AUSTIN	BOUNDS STREET
DW:	CK:	COUNTY	SHEET NO.
MV	NB	WILLIAMSON	55

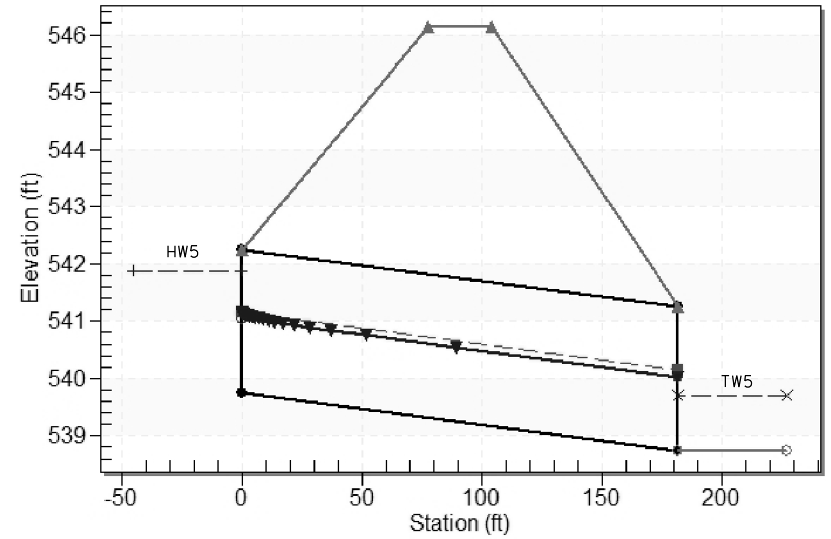
11/11/2021 3:22:09 PM
X:\P\115001000 2*Thrall*Williamson Cty WA2\CAD\C\Drainage\DRN-HYD01.dgn

HY-8 PROPOSED CULVERT ANALYSIS - BOUNDS ST- CULVERT 3

TABLE 1 - SUMMARY OF CULVERT FLOWS AT CULVERT 3 (PROP)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	30 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
541.11	2 year	7.98	7.98	0.00	1
541.29	5 year	9.90	9.90	0.00	1
541.43	10 year	11.51	11.51	0.00	1
541.60	25 year	13.66	13.66	0.00	1
541.74	50 year	15.42	15.42	0.00	1
541.87	100 year	17.11	17.11	0.00	1
544.47	Overtopping	38.91	38.91	0.00	Overtopping

Crossing - Culvert 3 (Proposed - Revised_11.10.21), Design Discharge - 17.1 cfs
Culvert - 30, Culvert Discharge - 17.1 cfs



NOTES:
1. HY-8 7.60 WAS USED FOR HYDRAULIC CALCULATIONS
2. DESIGN STORM: 5-YR
   CHECK STORM: 100-YR

TABLE 2 - CULVERT SUMMARY TABLE: CULVERT 3 (PROP)

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 year	7.98	7.98	541.11	1.364	0.067	1-S2n	0.837	0.939	0.837	0.661	5.538	1.514
5 year	9.90	9.90	541.29	1.540	0.248	1-S2n	0.938	1.051	0.938	0.734	5.879	1.604
10 year	11.51	11.51	541.43	1.676	0.403	1-S2n	1.019	1.137	1.019	0.789	6.123	1.670
25 year	13.66	13.66	541.60	1.847	0.619	1-S2n	1.121	1.243	1.121	0.856	6.407	1.747
50 year	15.42	15.42	541.74	1.985	0.803	1-S2n	1.201	1.325	1.201	0.906	6.610	1.804
100 year	17.11	17.11	541.87	2.119	0.988	1-S2n	1.277	1.399	1.277	0.951	6.785	1.854

****

Straight Culvert

Inlet Elevation (invert): 539.75 ft, Outlet Elevation (invert): 538.75 ft

Culvert Length: 182.00 ft, Culvert Slope: 0.0055

****

Site Data - 30

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 539.75 ft
Outlet Station: 182.00 ft
Outlet Elevation: 538.75 ft
Number of Barrels: 1

Culvert Data Summary - 30

Barrel Shape: Circular
Barrel Diameter: 2.50 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Mitered to Conform to Slope
Inlet Depression: None

Roadway Data for Crossing: Culvert 3 (Proposed - Revised_11.10.21)

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section:

Coord No.	Station (ft)	Elevation (ft)
0	0.00	546.15
1	25.00	545.91
2	50.00	545.67
3	75.00	545.43
4	100.00	545.19
5	125.00	544.95
6	150.00	544.71
7	175.00	544.47

Roadway Surface: Paved
Roadway Top Width: 27.00 ft

Tailwater Channel Data - Culvert 3 (Proposed - Revised_11.10.21)

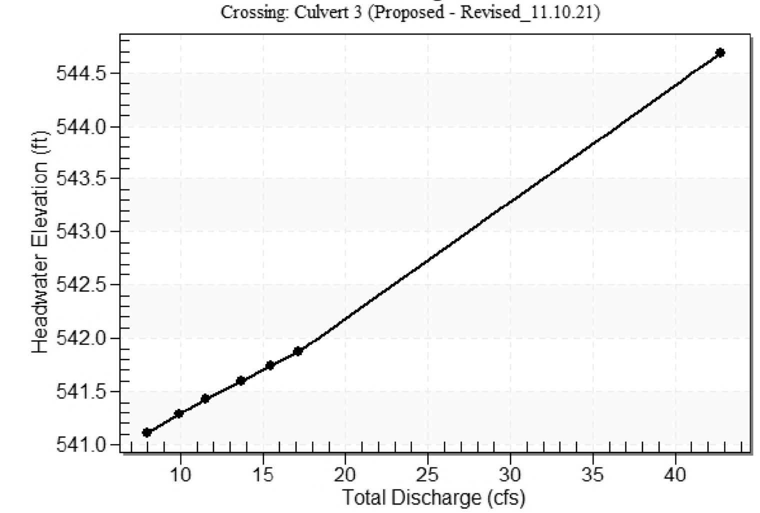
Tailwater Channel Option: Trapezoidal Channel
Bottom Width: 4.00 ft
Side Slope (H:V): 6.00 (_:1)
Channel Slope: 0.0050
Channel Manning's n: 0.0400
Channel Invert Elevation: 538.75 ft

DOWNSTREAM CHANNEL RATING CURVE

	Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
	7.98	539.41	0.66	1.51	0.21	0.40
*	9.90	539.48	0.73	1.60	0.23	0.41
	11.51	539.54	0.79	1.67	0.25	0.41
	13.66	539.61	0.86	1.75	0.27	0.42
	15.42	539.66	0.91	1.80	0.28	0.42
**	17.11	539.70	0.95	1.85	0.30	0.42

* 5-YR (DESIGN STORM)
** 100-YR (CHECK STORM)

Total Rating Curve
Crossing: Culvert 3 (Proposed - Revised_11.10.21)



STATE OF TEXAS
NIKKI CHRISTINE BROM
137308
LICENSED
PROFESSIONAL ENGINEER

NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

WILLIAMSON COUNTY 1848

RS&H, Inc.
8240 N. Mopac Expressway, Suite 300
Austin, Texas 78759
512-279-5427 FAX 512-459-2233
Texas Registration No. F-3401

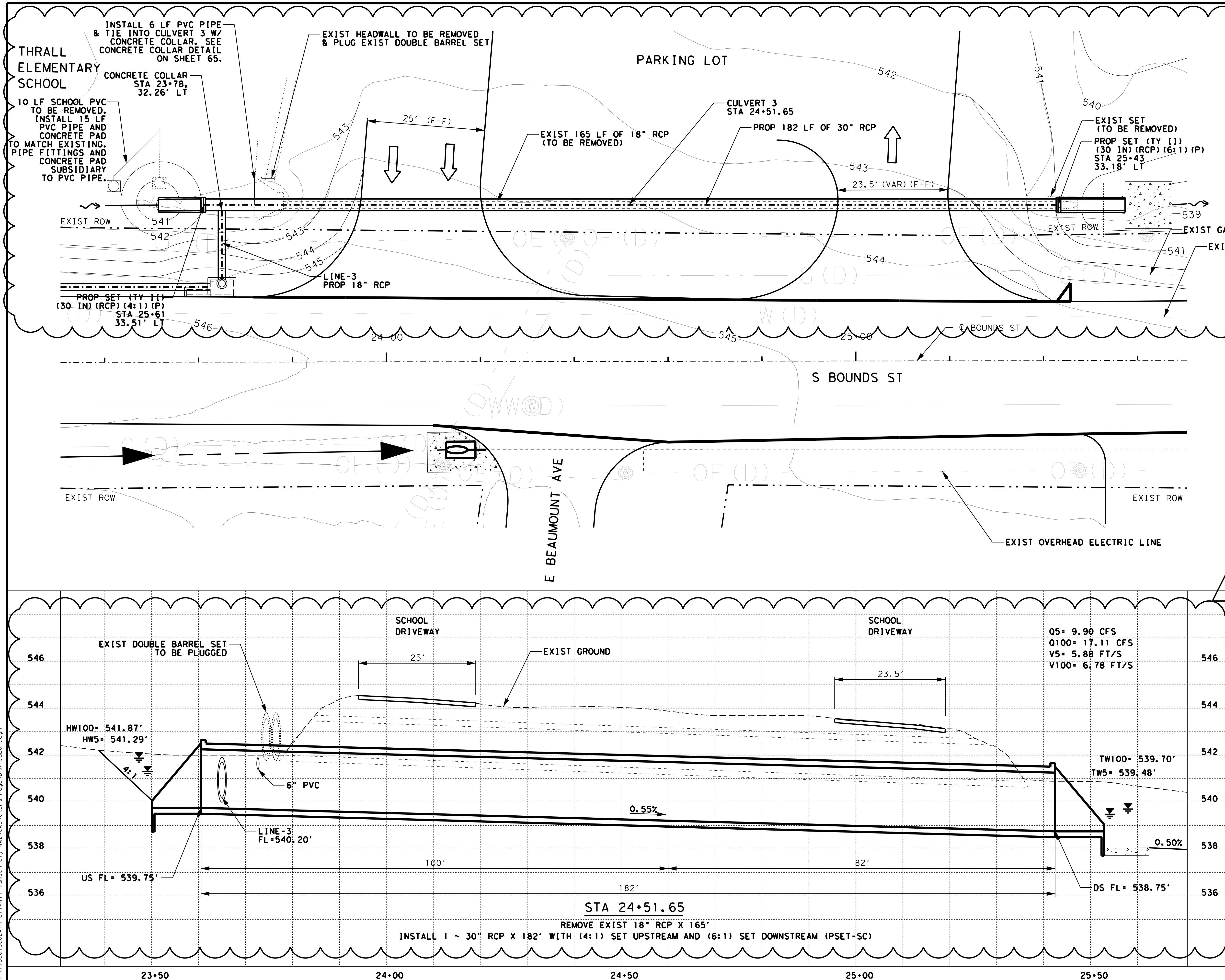
BOUNDS STREET OVERLAY

CULVERT HYDRAULIC DATA SHEET

SHEET 2 OF 2

DISTRICT	ROADWAY
AUSTIN	BOUNDS STREET
COUNTY	SHEET NO.
WILLIAMSON	57

DS: NB CK: NB
DW: MV CK: NB



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NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

SCALES (IN FEET):
HORZ 0 20
VERT 0 4

WILLIAMSON COUNTY 1848

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BOUNDS STREET OVERLAY
CULVERT 3 LAYOUT
STA 24+51.65

SHEET 1 OF 1

© 2021		DISTRICT	ROADWAY
DS: NB	CK: NB	AUSTIN	BOUNDS STREET
DW: MV	CK: NB	COUNTY: WILLIAMSON	SHEET NO. 58

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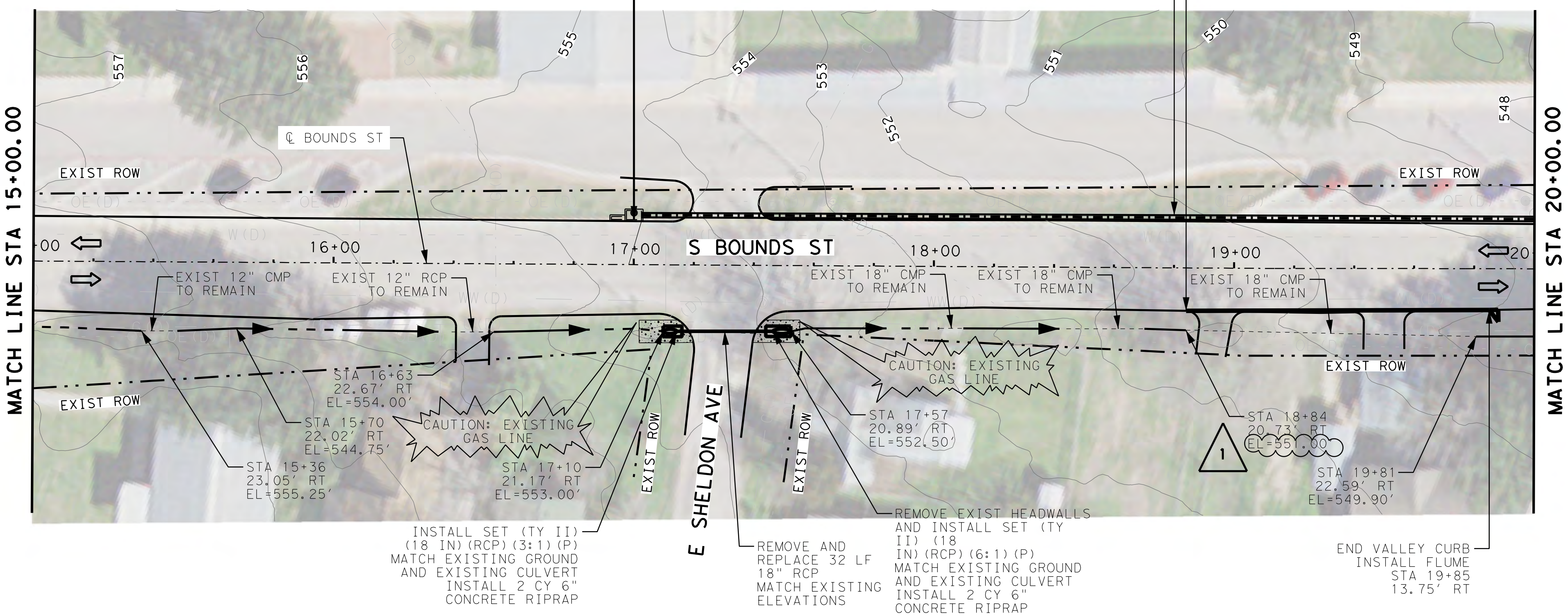

LEGEND

- DITCH CENTERLINE
- EXIST CULVERT
- PROP CULVERT
- PROP VALLEY CURB
- EXIST SET
- PROP SET

NOTES:

1. CLEAN AND RESHAPE DITCH BOTTOM AND SIDE SLOPES, AND FIELD VERIFY ALL ELEVATIONS. MAXIMUM FRONT SLOPE IS 6:1 AND MAXIMUM BACK SLOPE IS 3:1.
2. CLEAR ALL EXISTING PIPES OF DEBRIS.
3. PRIOR TO INSTALLING SET TO EXISTING CULVERTS, COORDINATE WITH CONSTRUCTION OBSERVER TO CONFIRM STRUCTURAL INTEGRITY OF THE EXISTING CULVERT. IF EXISTING CULVERT IS DAMAGED, REPLACE WITH RCP. IF EXISTING CULVERT HAS INSIDE DIAMETER OF 15" OR LESS, REPLACE WITH 15" RCP. IF EXISTING CULVERT HAS INSIDE DIAMETER GREATER THAN 15", REPLACE WITH EQUIVALENT SIZE RCP.
4. COORDINATE WITH CONSTRUCTION OBSERVER TO PLACE SETS AT EXISTING PARALLEL DRIVEWAY CULVERTS AS NEEDED FOR SAFETY OR EROSION PROTECTION.

STATE OF TEXAS
NIKKI CHRISTINE BROM
137308
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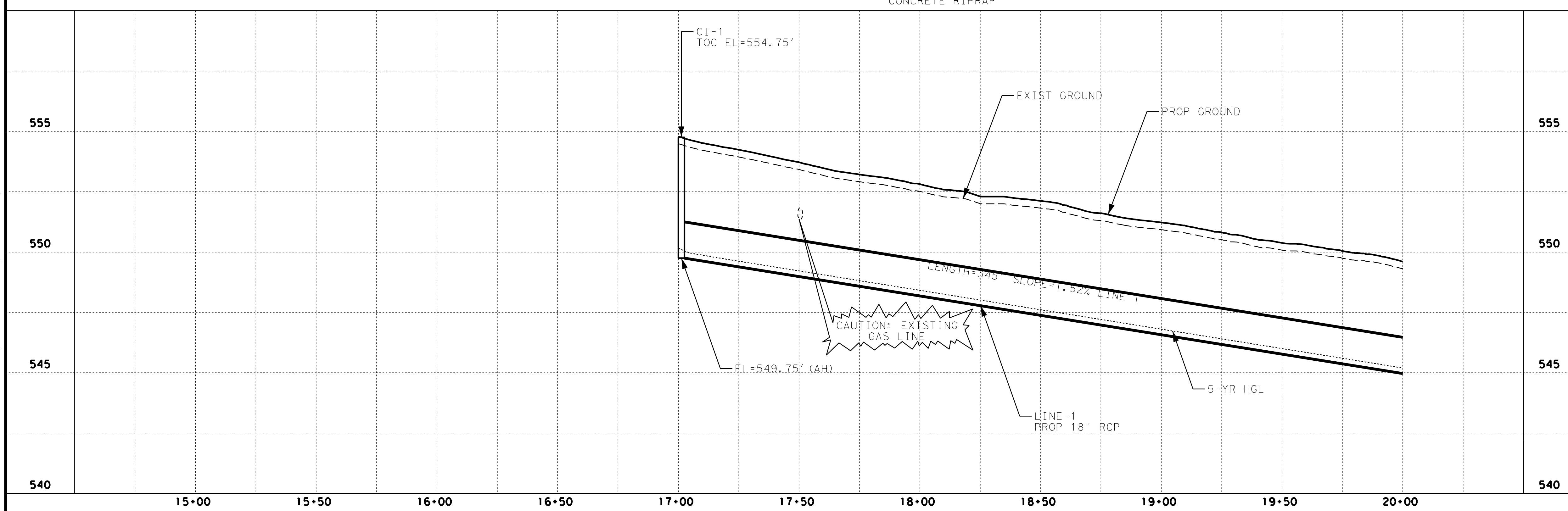
NOVEMBER 10, 2021



REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

SCALES (IN FEET):
HORZ 0 50
VERT 0 5

WILLIAMSON COUNTY 1848

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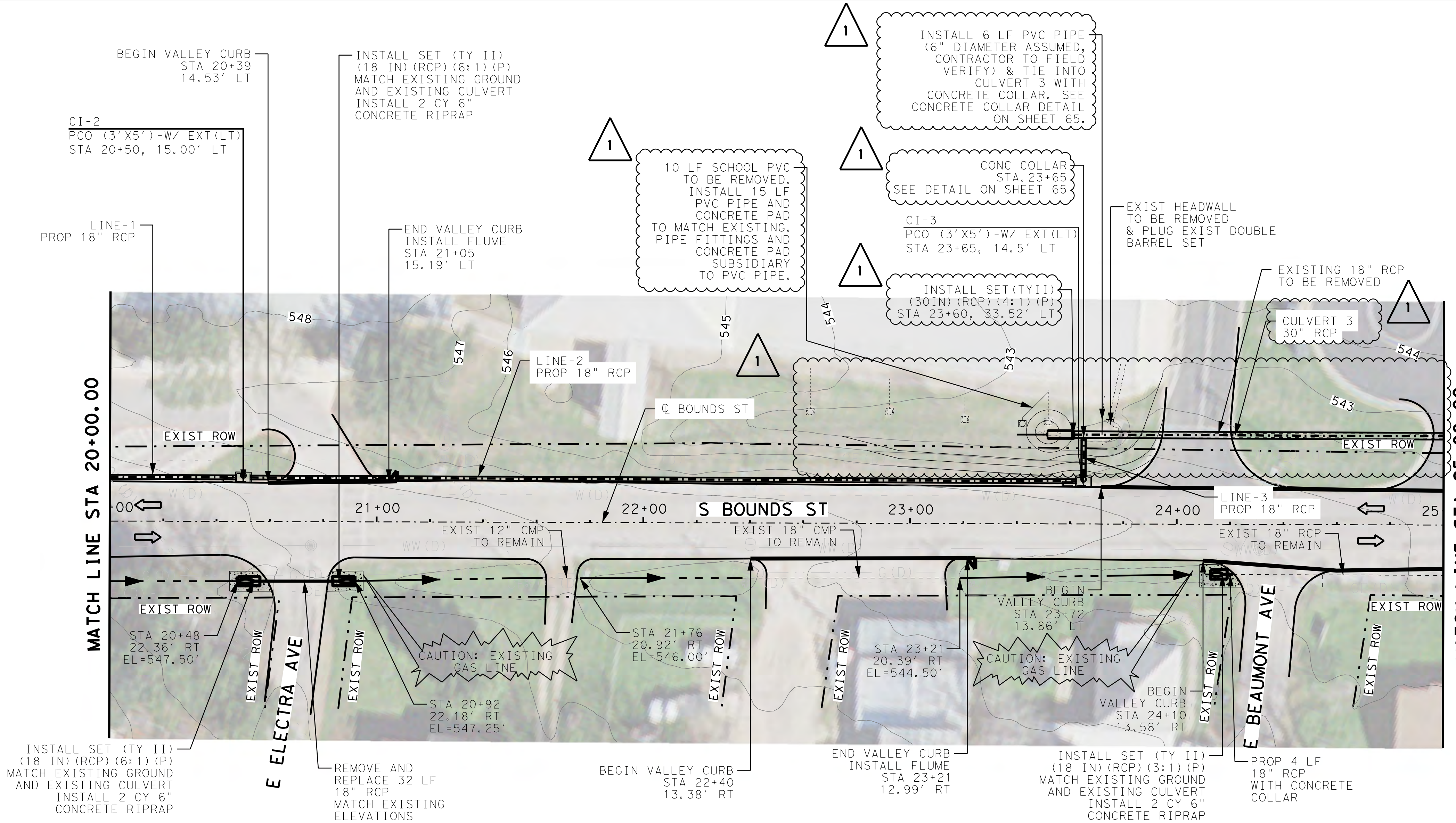
BOUNDS STREET OVERLAY
DRAINAGE PLANS
STA 15+00.00 TO STA 20+00.00

SHEET 2 OF 4

DS: BV	CK: NB	DISTRICT: AUSTIN	ROADWAY: BOUNDS STREET
DW: MV	CK: NB	COUNTY: WILLIAMSON	SHEET NO.: 60



LEGEND

- DITCH CENTERLINE
- EXIST CULVERT
- PROP CULVERT
- PROP VALLEY CURB
- EXIST SET
- PROP SET

NOTES:

1. CLEAN AND RESHAPE DITCH BOTTOM AND SIDE SLOPES, AND FIELD VERIFY ALL ELEVATIONS. MAXIMUM FRONT SLOPE IS 6:1 AND MAXIMUM BACK SLOPE IS 3:1.
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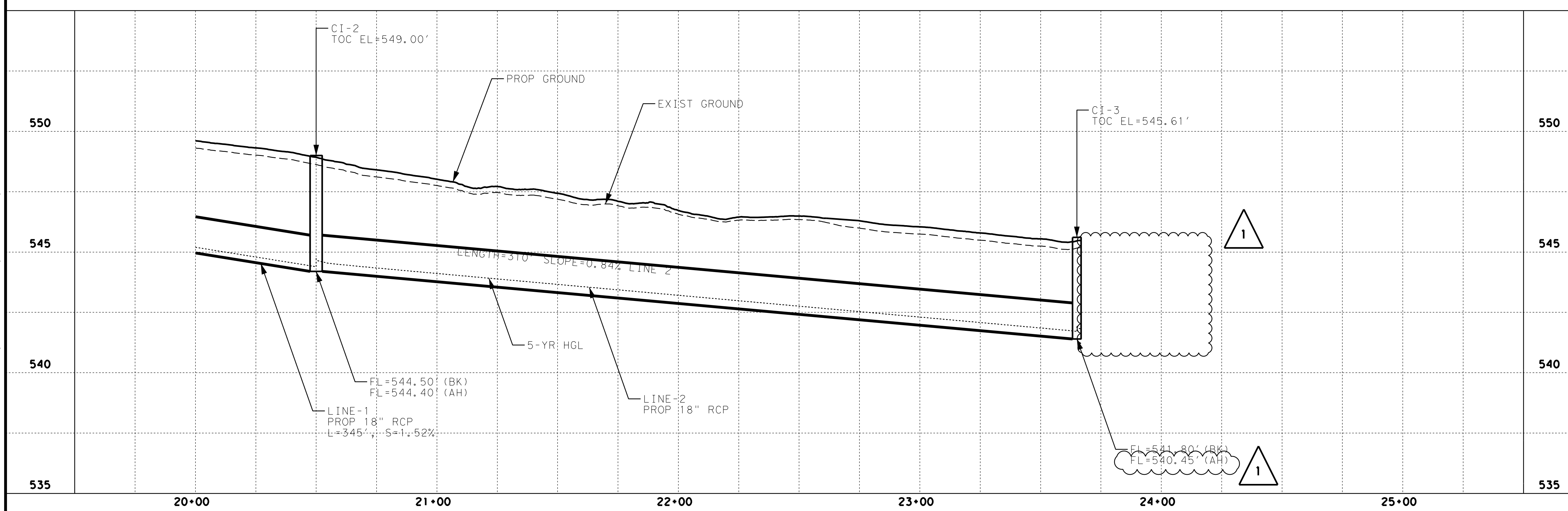
STATE OF TEXAS
NIKKI CHRISTINE BROM
137308
LICENSED
PROFESSIONAL ENGINEER

NOVEMBER 10, 2021



REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

SCALES (IN FEET):
HORZ 0 50 VERT 0 5

WILLIAMSON COUNTY 1848

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BOUNDS STREET OVERLAY

DRAINAGE PLANS

STA 20+00.00 TO STA 25+00.00

SHEET 3 OF 4

DS:	CK:	DISTRICT	ROADWAY
BV	NB	AUSTIN	BOUNDS STREET
DW:	CK:	COUNTY	SHEET NO.
MV	NB	WILLIAMSON	61

11/11/2021 3:22:25 PM
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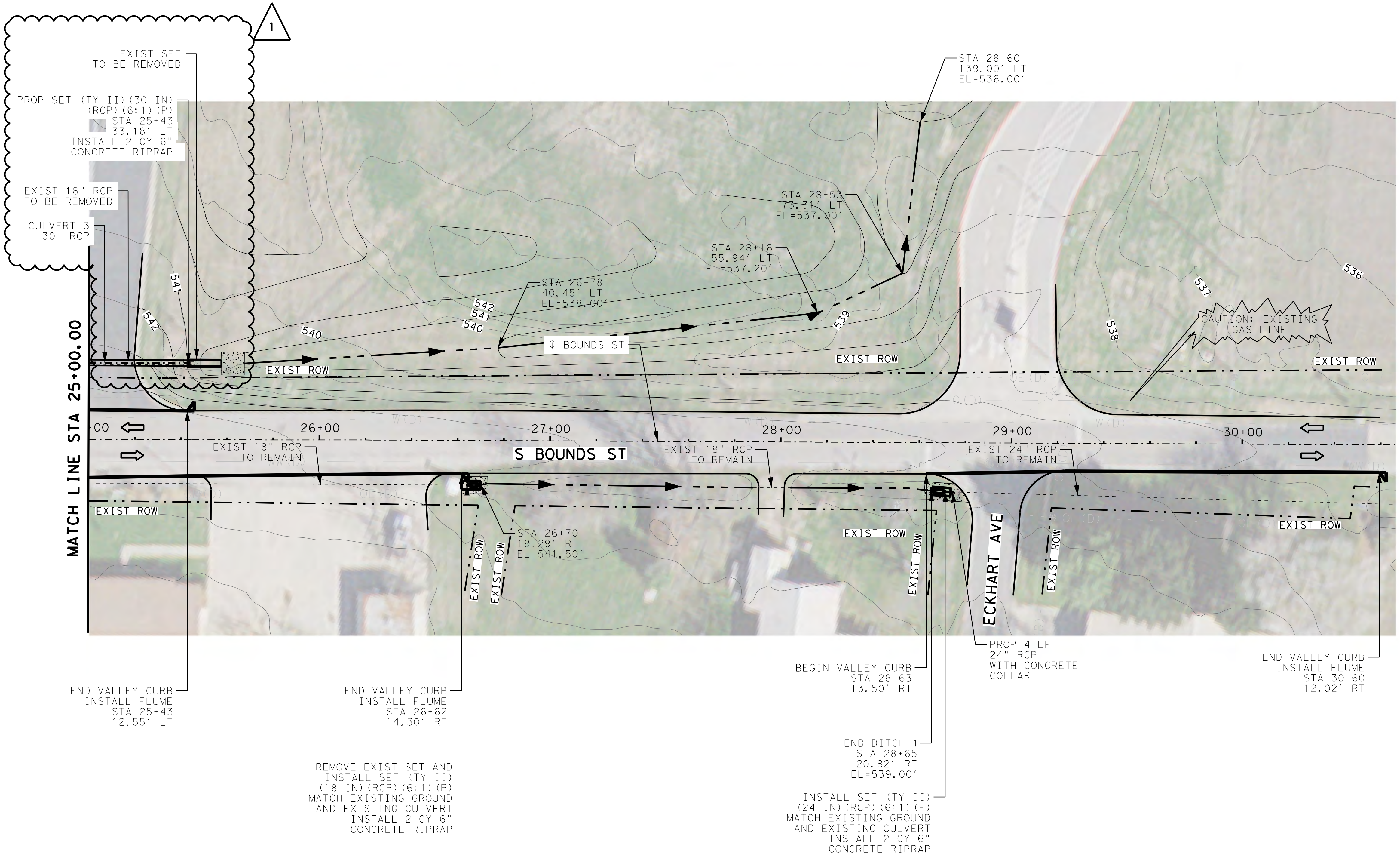

LEGEND

- DITCH CENTERLINE
- EXIST CULVERT
- PROP CULVERT
- PROP VALLEY CURB
- EXIST SET
- PROP SET

NOTES:

1. CLEAN AND RESHAPE DITCH BOTTOM AND SIDE SLOPES, AND FIELD VERIFY ALL ELEVATIONS. MAXIMUM FRONT SLOPE IS 6:1 AND MAXIMUM BACK SLOPE IS 3:1.
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STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER

NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

SCALES (IN FEET):
HORZ 0 50
VERT 0 5

WILLIAMSON COUNTY 1848

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BOUNDS STREET OVERLAY

DRAINAGE PLANS

STA 25+00.00 TO STA 30+60.00

SHEET 4 OF 4

© 2021		DISTRICT	ROADWAY
DS: BV	CK: NB	AUSTIN	BOUNDS STREET
		COUNTY	SHEET NO.
DW: MV	CK: NB	WILLIAMSON	62

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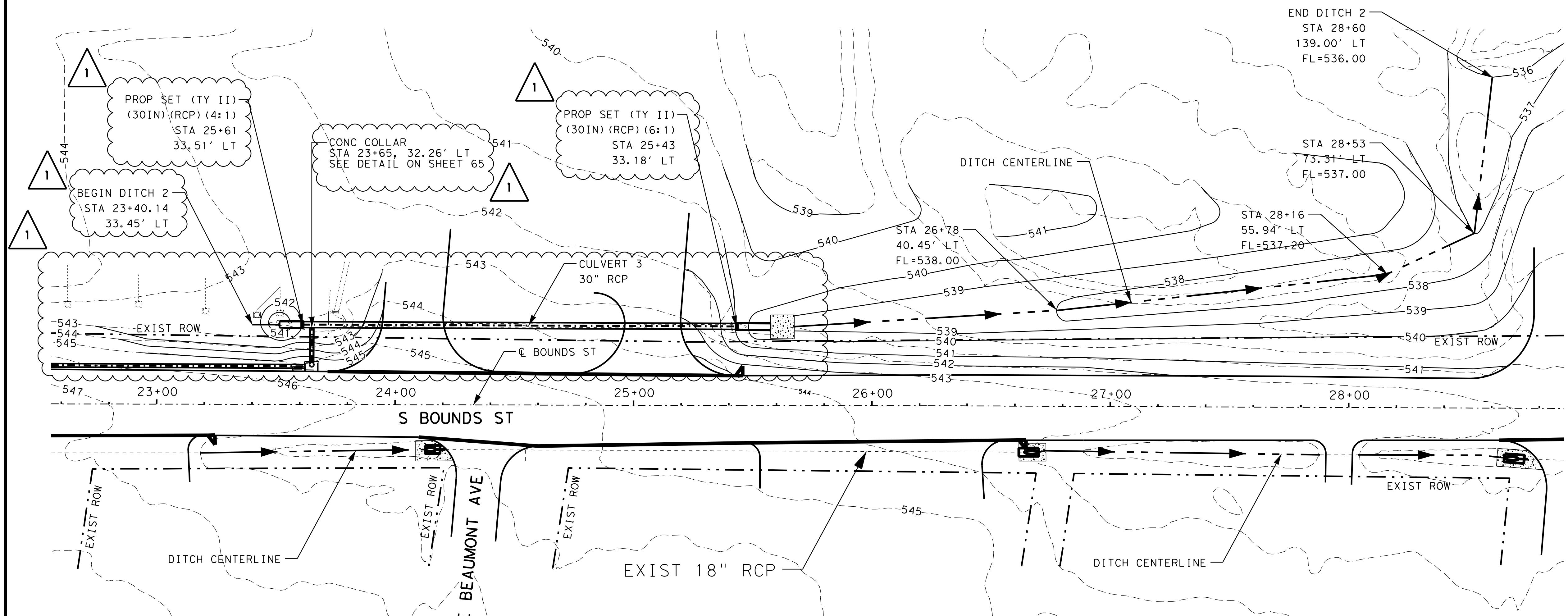
LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- DITCH CENTERLINE



STATE OF TEXAS
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NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

SCALE (IN FEET):
0 50

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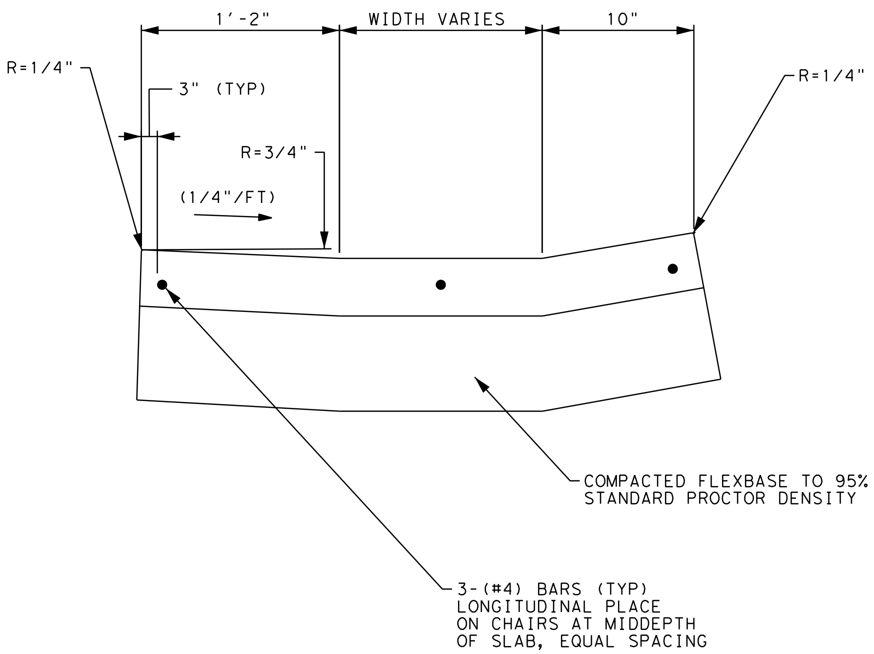
Texas Registration No. F-3401

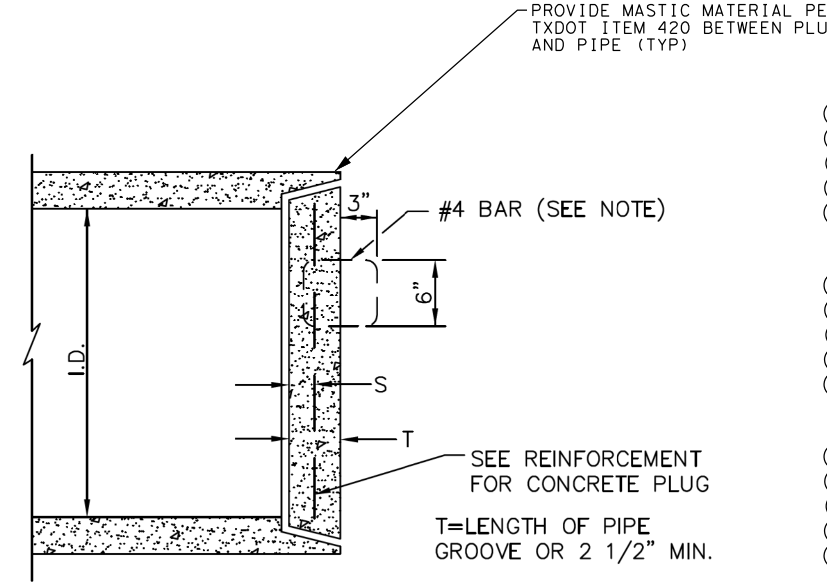
BOUNDS STREET OVERLAY
GRADING LAYOUT

SHEET 1 OF 1

DS: NB	CK: NB	DISTRICT: AUSTIN	ROADWAY: BOUNDS STREET
DW: MV	CK: NB	COUNTY: WILLIAMSON	SHEET NO. 63



SECTION A-A



REINFORCEMENT FOR CONCRETE PLUG

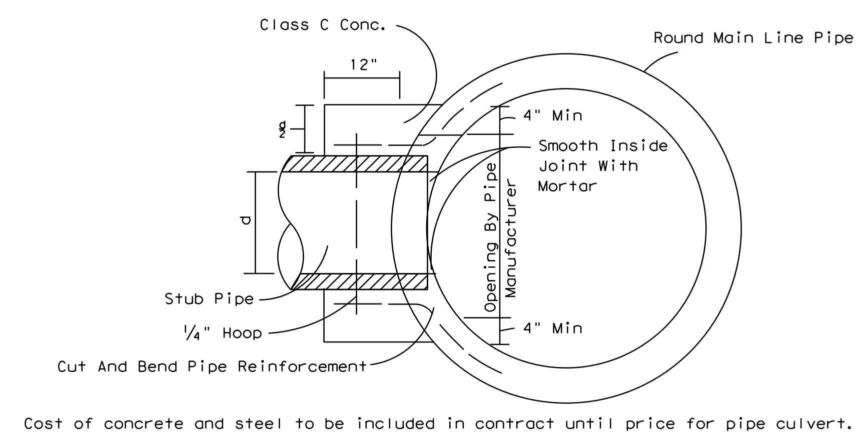
PIPE SIZE	REINF. BAR	DISTANCE C–C	S
18"–39"	#3	12" E.W.	1/2T
42"–54"	#3	12" E.W.	1/3T
60"–72"	#4	12" E.W.	1/4T

NOTE: STEEL HANDLE FOR REINFORCED CONCRETE PIPE PLUG SHALL BE LOCATED ¼ I.D. ABOVE CENTER POINT OF PLUG. TWO STEEL HANDLES WILL BE REQUIRED ON PLUGS OF 36" PIPES OR LARGER AND SHALL BE PLACED ¼ I.D. APART AND ¼ I.D. ABOVE CENTER OF PLUG. MASTIC MATERIAL IS SUBSIDIARY TO CONCRETE PLUG.

CONCRETE PLUG DETAILS

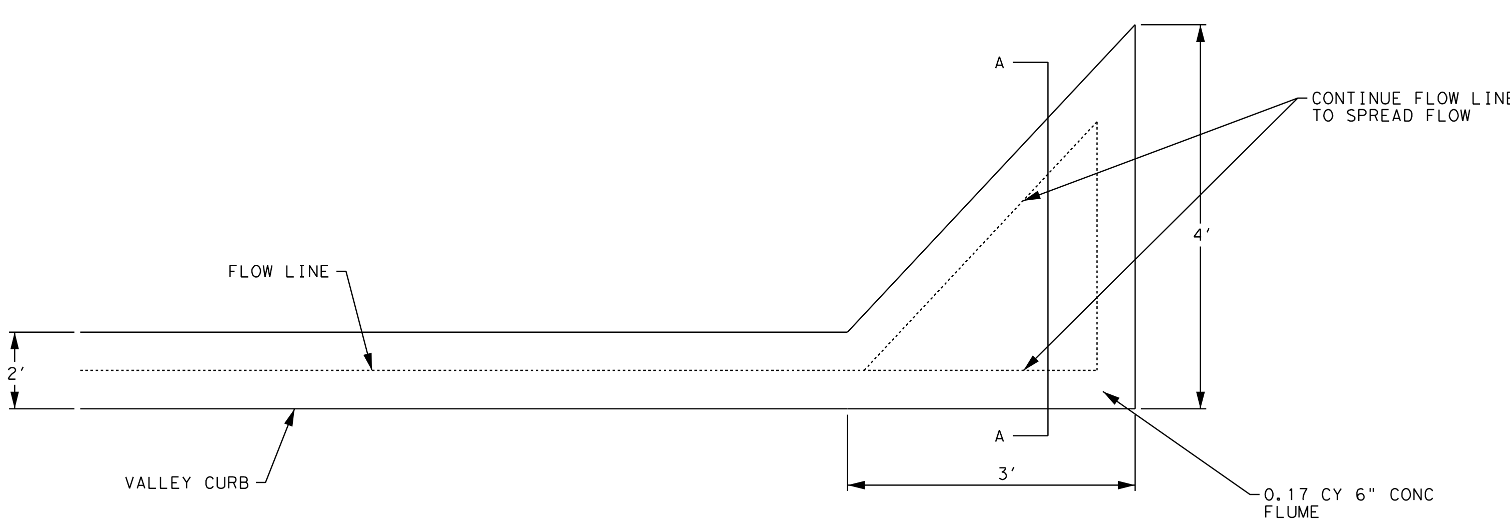
NO SCALE

1



Cost of concrete and steel to be included in contract until price for pipe culvert.

CONCRETE COLLAR FOR JOINING MAINLINE PIPE AND STUB PIPE



FLUME DETAIL

FLUME TO BE PAY UNDER ITEM 0432-6003.

NOVEMBER 10, 2021

REV. NO.	DATE	DESCRIPTION	BY
1	11/10/21	DRAINAGE CO#1	NCB

N.T.S.

WILLIAMSON COUNTY 1848

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BOUNDS STREET OVERLAY

DRAINAGE DETAIL

SHEET 2 OF 2

© 2021		DISTRICT	ROADWAY
DS: BL	CK: NB	AUSTIN	BOUNDS STREET
DW: BL	CK: NB	COUNTY: WILLIAMSON	SHEET NO.: 65

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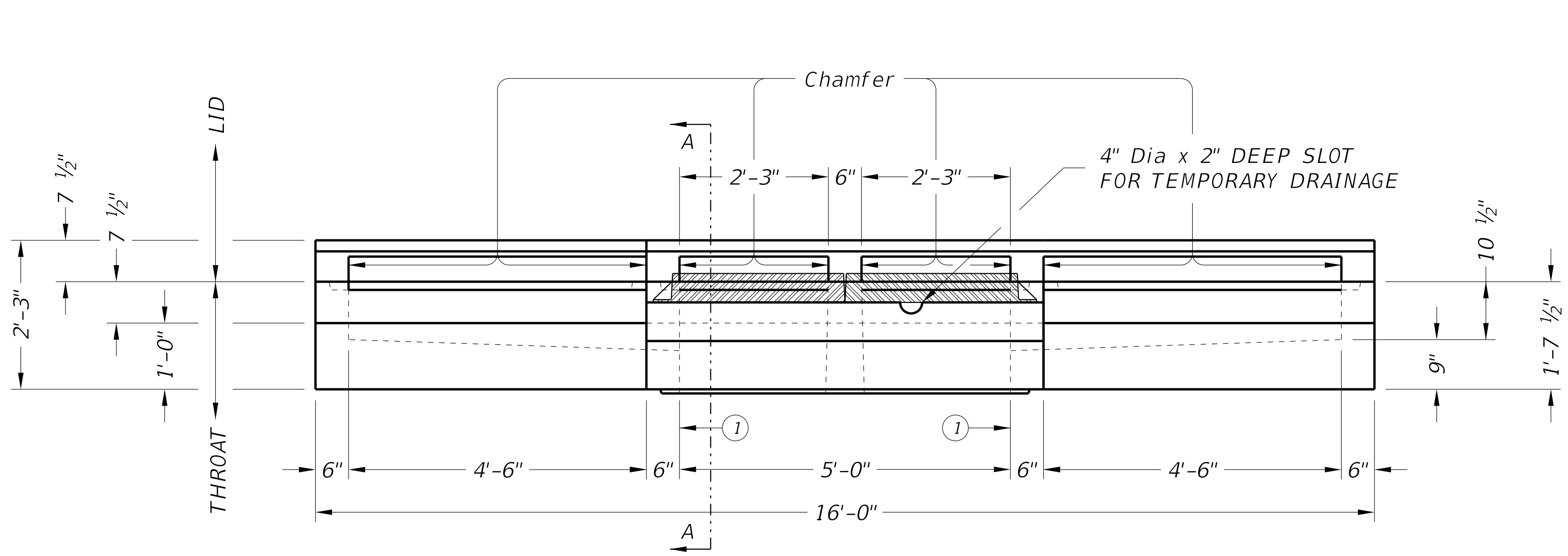
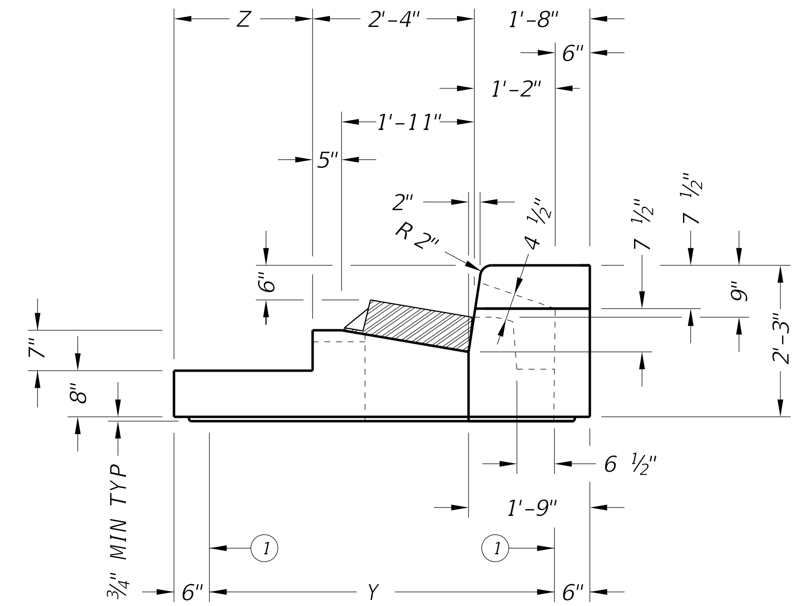


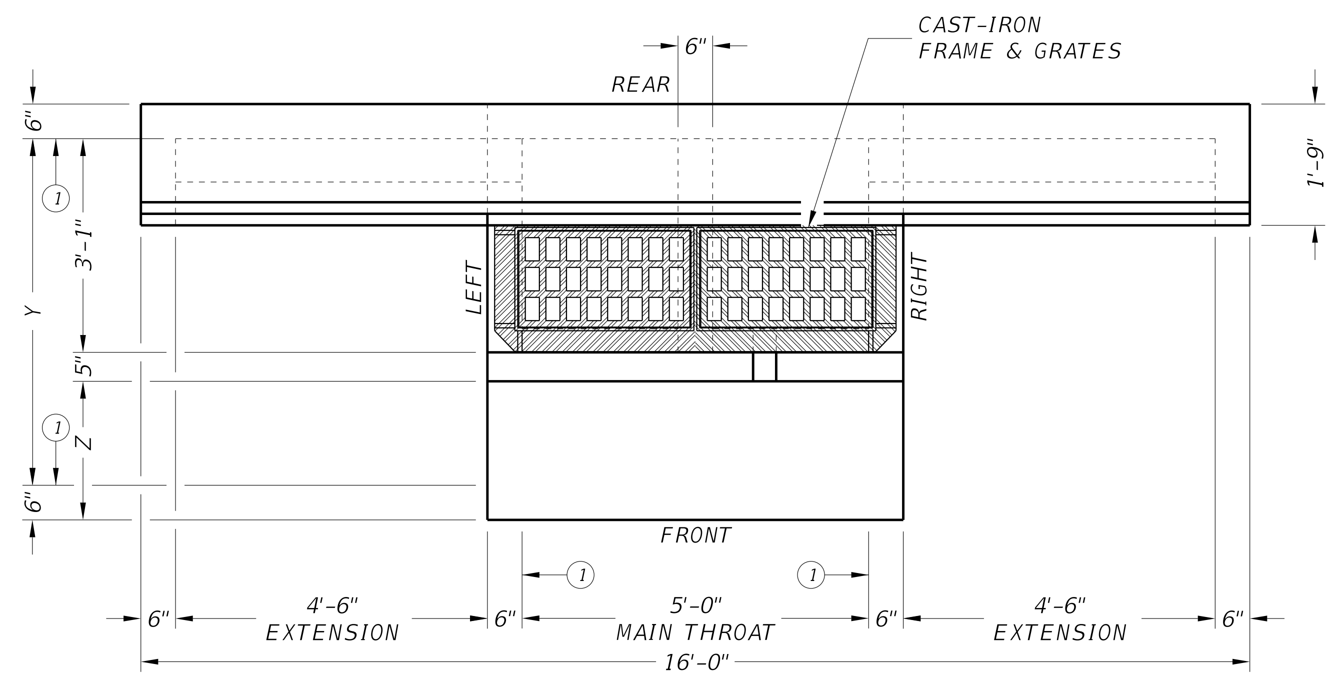
FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



SECTION A-A

1 Matches inside face of wall of precast base or riser below inlet.



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

HS20 LOADING

SHEET 1 OF 2

Texas Department of Transportation

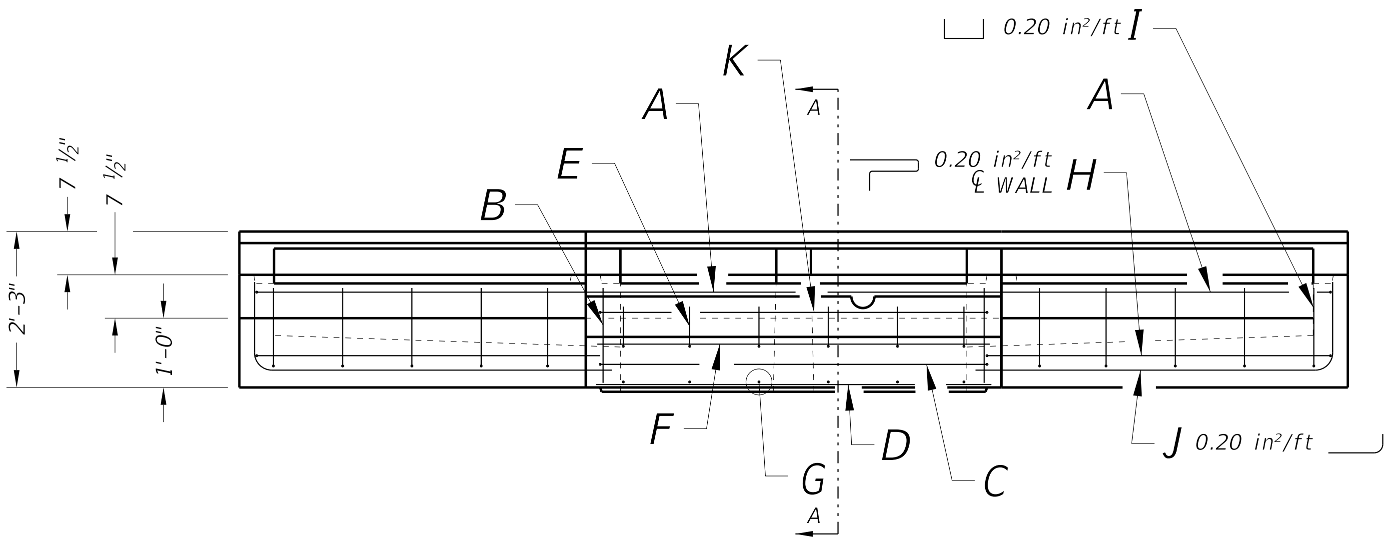
Bridge Division Standard

PRECAST CURB INLET UNDER ROADWAY

PCU

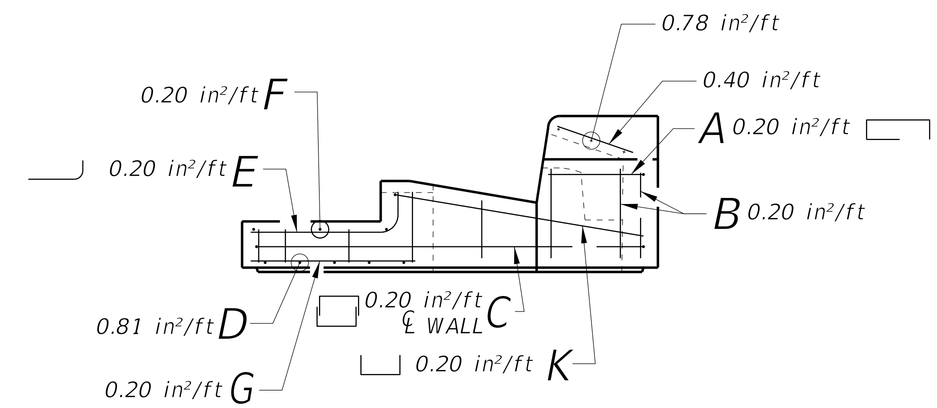
FILE: prestd04-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

DATE:
FILE:

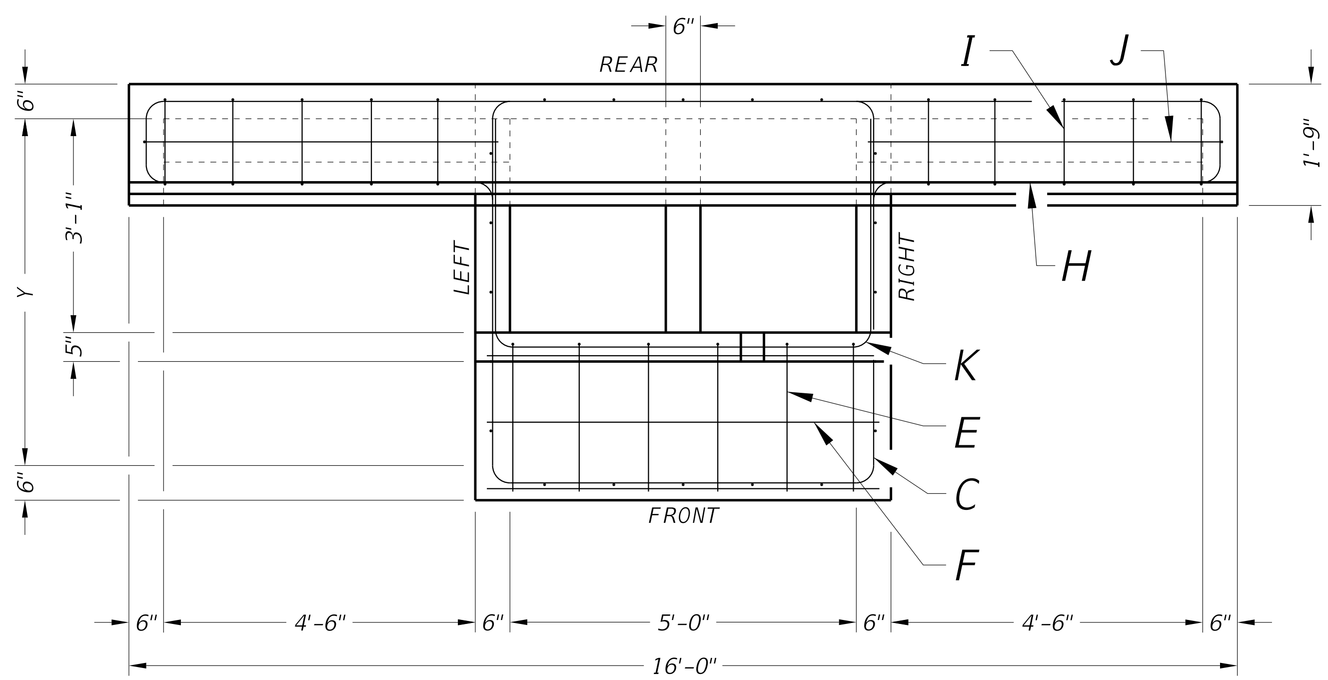


FRONT VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)



SECTION A-A



PLAN VIEW

(SHOWING LEFT AND RIGHT EXTENSIONS)

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel from surface of concrete or lower outside shoulder.
4. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in plans.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Top slab may employ a butt joint with dowels at the Contractor's option.
6. Provide lifting devices in conformance with Manufacturer's recommendations.
7. Chamfer vertical edges on inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat is placed under roadway and intended for direct traffic. Inlet lid is not for direct traffic. Do not place Inlet lid in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 324 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes and Inlets" by type, size and extension placement. Extensions are subsidiary to inlet.

SIZE(Y)	Z
3'	0'
4'	1'
5'	2'
6'	3'

HS20 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET UNDER ROADWAY

PCU

FILE: prestd04-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST		COUNTY	SHEET NO.

DATE:
FILE: