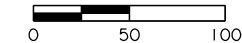
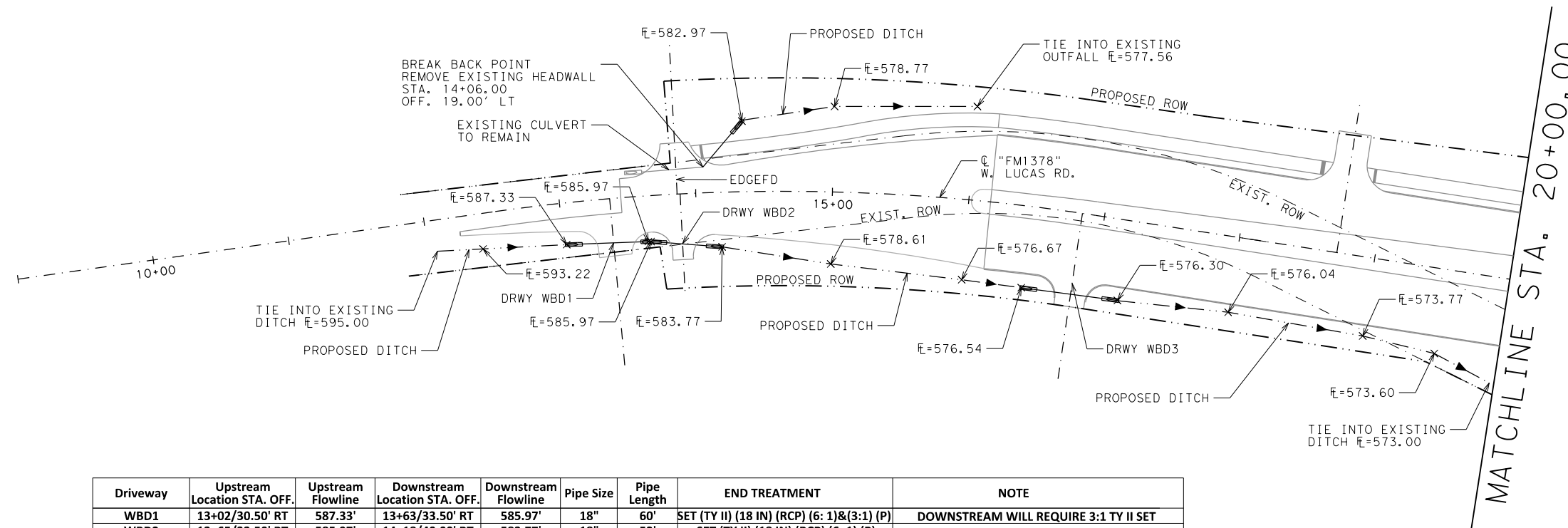


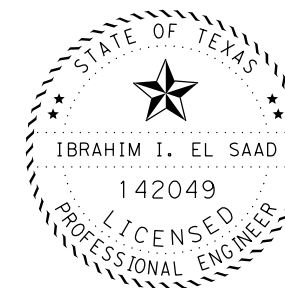
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- LEGEND
- PROP ROW
 - - - EXIST ROW
 - ▭ SET TY II
 - - - DITCH FLOWLINE



Driveway	Upstream Location STA. OFF.	Upstream Flowline	Downstream Location STA. OFF.	Downstream Flowline	Pipe Size	Pipe Length	END TREATMENT	NOTE
WBD1	13+02/30.50' RT	587.33'	13+63/33.50' RT	585.97'	18"	60'	SET (TY II) (18 IN) (RCP) (6: 1)&(3:1) (P)	DOWNSTREAM WILL REQUIRE 3:1 TY II SET
WBD2	13+65/33.50' RT	585.97'	14+18/40.00' RT	583.77'	18"	52'	SET (TY II) (18 IN) (RCP) (6: 1) (P)	
EDGFED	14+06/19.00' LT	584.73'	14+35.75/51.63' RT	582.97'	18"	44'	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EXISTING DRWY TO STAY IN PLACE AND EXTENDED
WBD3	16+49/56.00' RT	576.54'	17+18.50/56.00' RT	576.30'	18"	71'	SET (TY II) (18 IN) (RCP) (6: 1) (P)	



Ibrahim I. El Saad, P.E. 11-7-22
Signature of Registrant & Date



FM 1378
AT FM 3286

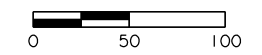
DITCH LAYOUT

SCALE: 1" = 100'			SHEET 1 OF 6	
DESIGN KB	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1378, ETC.
GRAPHICS KB	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN	SHEET NO. 179
CHECK IIE	CONTROL 1392	SECTION 01	JOB 044, ETC.	

QUANTITIES THIS SHEET

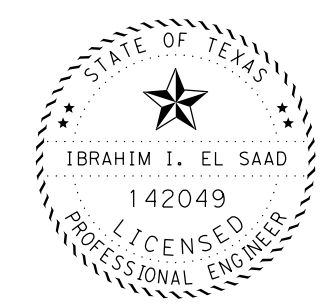
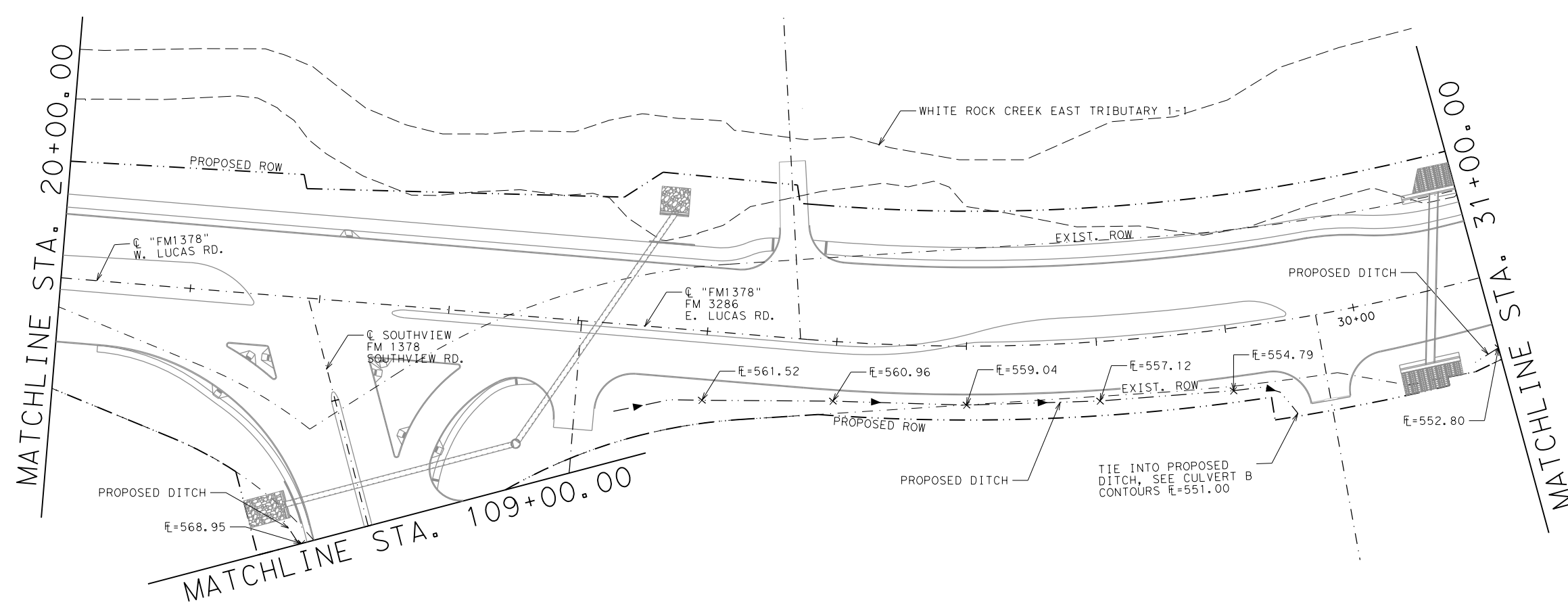
ITEM #	DESCRIPTION	UNIT	TOTAL
464-6003	RC PIPE (CL III) (18 IN)	LF	227
467-6356	SET (TY II) (18") (RCP) (3:1) (P)	EA	1
467-6363	SET (TY II) (18") (RCP) (6:1) (P)	EA	6

DATE: 10/29/2022 TIME: 11:57:00 PM FILE: c:\txdot\pw\onl\ine\txdot5\james.igwe\d0671090\Di\ch*Drwy\Culvert*Layout*Sheets.dgn



LEGEND

	PROP ROW
	EXIST ROW
	SET TY II
	DITCH FLOWLINE



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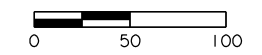
FM 1378
AT FM 3286

DITCH LAYOUT

SCALE: 1"=100' SHEET 2 OF 6

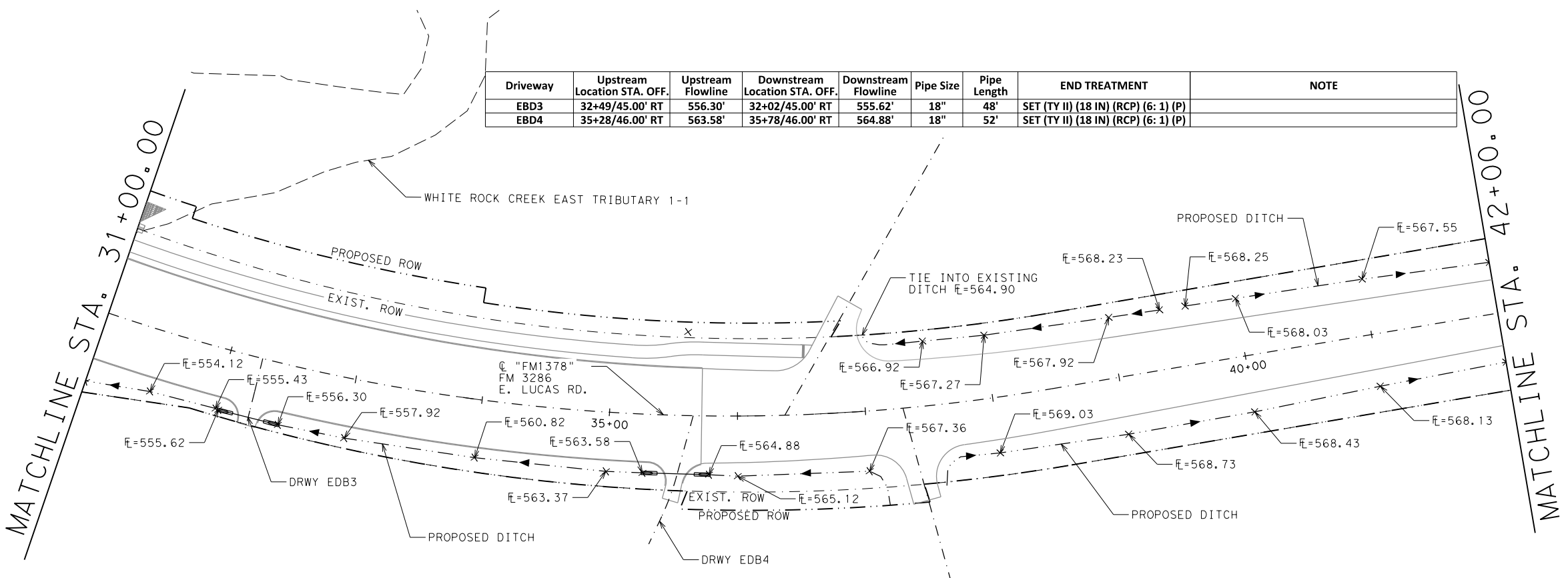
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GRAPHICS KB	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN	SHEET NO. 180
CHECK IIE	CONTROL 1392	SECTION 01	JOB 044, ETC.	

DATE: 10/29/2022 TIME: 11:57:03 PM FILE: c:\txdot\pw\onl\ine\txdot5\james.i.gwe\d0671090\Di+ch*DrwyCulvert+*Layout*Sheets.dgn

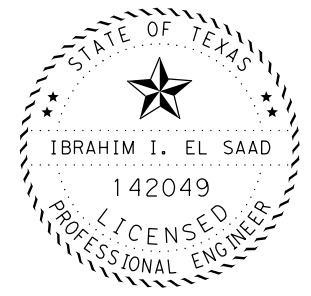


LEGEND

- PROP ROW
- - - EXIST ROW
- ▭ SET TY II
- - - DITCH FLOWLINE



Driveway	Upstream Location STA. OFF.	Upstream Flowline	Downstream Location STA. OFF.	Downstream Flowline	Pipe Size	Pipe Length	END TREATMENT	NOTE
EBD3	32+49/45.00' RT	556.30'	32+02/45.00' RT	555.62'	18"	48'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
EBD4	35+28/46.00' RT	563.58'	35+78/46.00' RT	564.88'	18"	52'	SET (TY II) (18 IN) (RCP) (6:1) (P)	



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FM 1378
AT FM 3286

DITCH LAYOUT

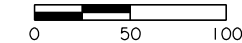
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DESIGN	KB	FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	SEE TITLE SHEET	HIGHWAY NO.	FM 1378, ETC.
GRAPHICS	KB	STATE	TEXAS	DISTRICT	DAL	COUNTY	COLLIN
CHECK	IIE	CONTROL	1392	SECTION	01	JOB	044, ETC.
CHECK							181

QUANTITIES THIS SHEET

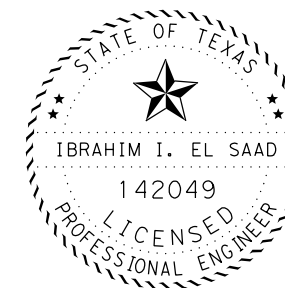
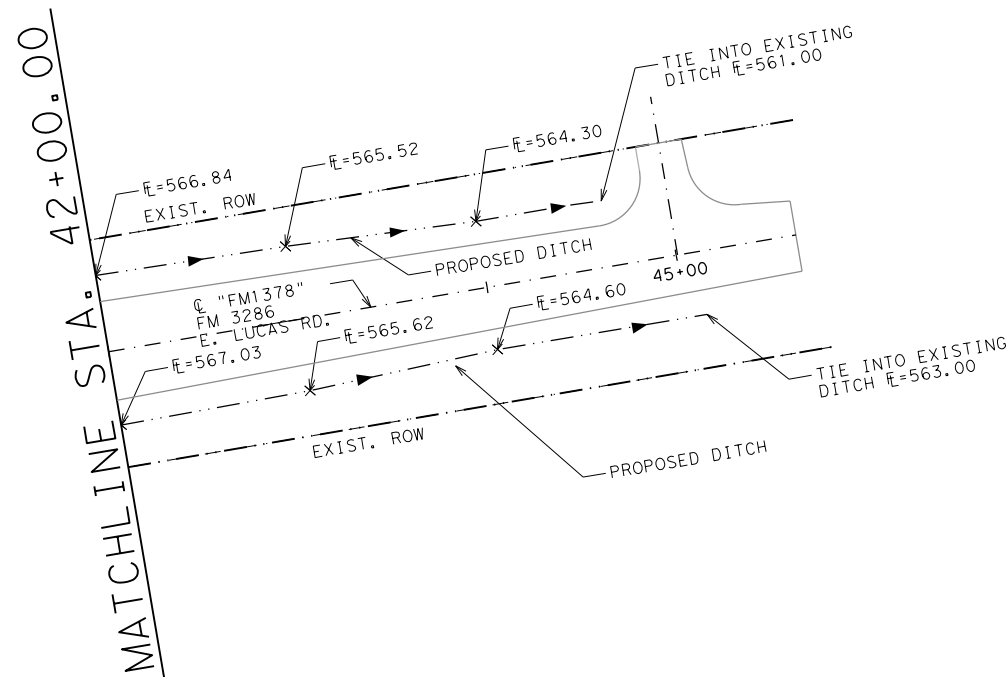
ITEM #	DESCRIPTION	UNIT	TOTAL
464-6003	RC PIPE (CL III) (18 IN)	LF	100
467-6363	SET (TY II) (18") (RCP) (6:1) (P)	EA	4

DATE: 10/29/2022 TIME: 11:57:05 PM FILE: c:\t\dot\pw\onl\me\t\dot\5\james.igwe\d0671090\di\tch*DrwyCulvert*Layout*Sheets.dgn



LEGEND

---	PROP ROW
- - - -	EXIST ROW
▭	SET TY II
---	DITCH FLOWLINE



Ibrahim I. El Saad, P.E. 11-7-22
Signature of Registrant & Date

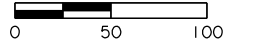
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FM 1378
AT FM 3286

DITCH LAYOUT

SCALE: 1"=100' SHEET 4 OF 6

DESIGN KB	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1378, ETC.
GRAPHICS KB	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN	SHEET NO. 182
CHECK IIE	CONTROL 1392	SECTION 01	JOB 044, ETC.	



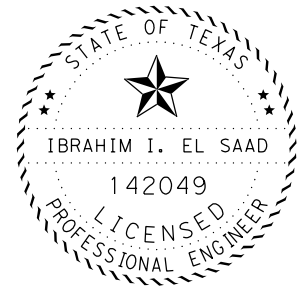
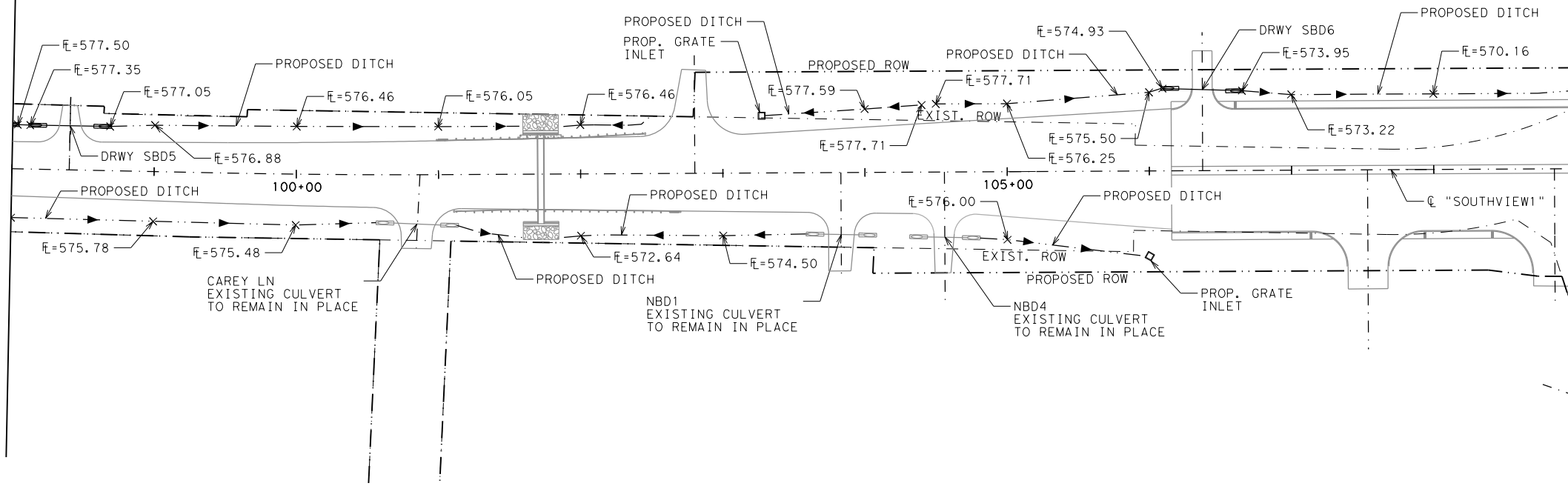
LEGEND

---	PROP ROW
- - -	EXIST ROW
▭	SET TY II
---	DITCH FLOWLINE

Driveway	Upstream Location STA. OFF.	Upstream Flowline	Downstream Location STA. OFF.	Downstream Flowline	Pipe Size	Pipe Length	END TREATMENT	NOTE
SBD6	106+09.50/ 58.00' LT	574.93'	106+65.50/56.00' LT	573.95'	18"	56'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
SBD5	98+12/31.00' LT	577.35'	98+68/31.00' LT	577.05'	18"	56'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
CAREY LN								EXISTING DRWY TO STAY IN PLACE
NBD1								EXISTING DRWY TO STAY IN PLACE
NBD4								EXISTING DRWY TO STAY IN PLACE

MATCHLINE STA. 98+00.00

MATCHLINE STA. 109+00.00



Abraham I. Saad, P.E. 11-7-22
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FM 1378
AT FM 3286

DITCH LAYOUT

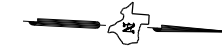
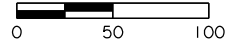
SCALE: 1" = 100'		SHEET 5 OF 6	
DESIGN KB	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET	HIGHWAY NO. FM 1378, ETC.
GRAPHICS KB	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN
CHECK IIE	CONTROL 1392	SECTION 01	JOB 044, ETC.
CHECK			183

QUANTITIES THIS SHEET

ITEM #	DESCRIPTION	UNIT	TOTAL
464-6003	RC PIPE (CL III) (18 IN)	LF	112
467-6363	SET (TY II) (18") (RCP) (6:1) (P)	EA	4

DATE: 10/29/2022 TIME: 11:57:07 PM FILE: c:\txdot\pw\onl\ine\txdot5\james.igwe\d0671090\dit\ch*DrwyCulvert*Layout*Sheets.dgn

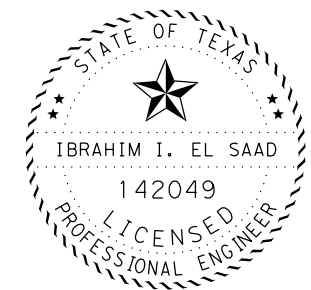
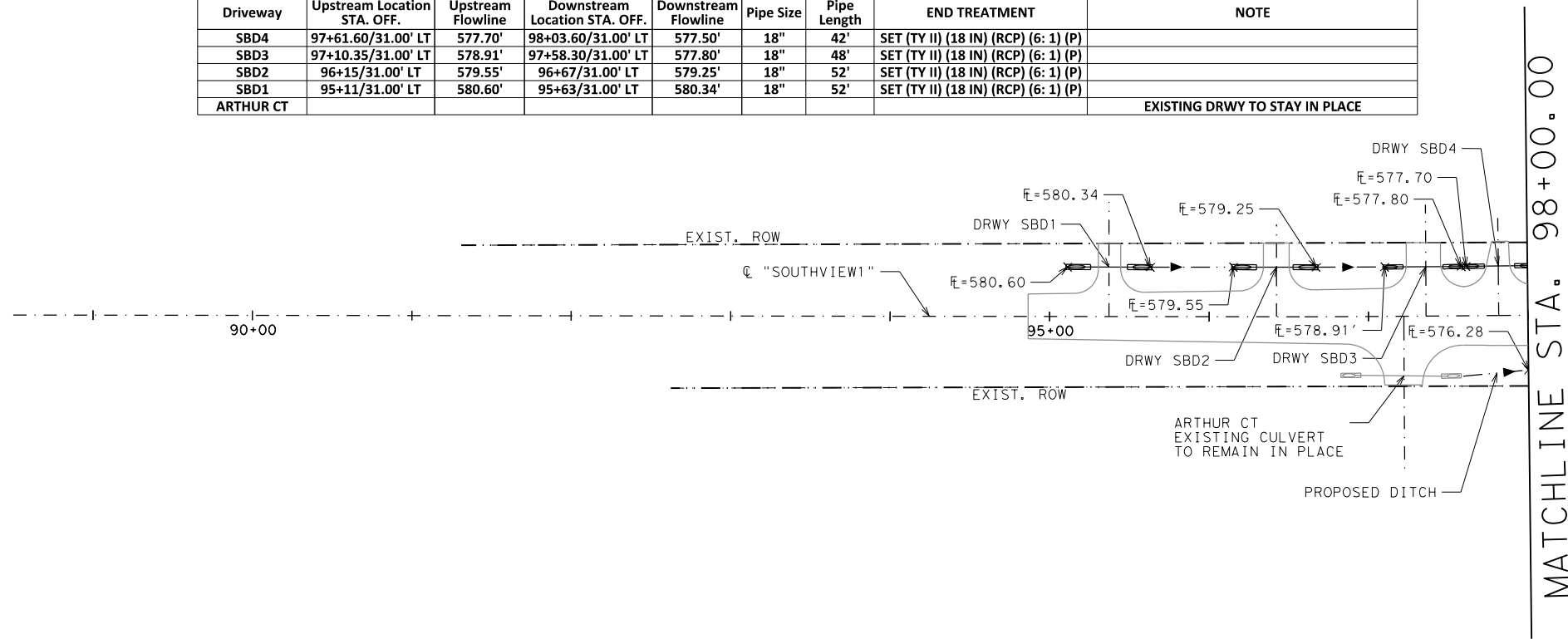
DATE: 10/29/2022 TIME: 11:57:09 PM FILE: c:\txdot\pw\onl\me\txdot5\james.igwe\d0671090\dit\ch*DrwyCulvert*Layout*Sheets.dgn



LEGEND

	PROP ROW
	EXIST ROW
	SET TY II
	DITCH FLOWLINE

Driveway	Upstream Location STA. OFF.	Upstream Flowline	Downstream Location STA. OFF.	Downstream Flowline	Pipe Size	Pipe Length	END TREATMENT	NOTE
SBD4	97+61.60/31.00' LT	577.70'	98+03.60/31.00' LT	577.50'	18"	42'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
SBD3	97+10.35/31.00' LT	578.91'	97+58.30/31.00' LT	577.80'	18"	48'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
SBD2	96+15/31.00' LT	579.55'	96+67/31.00' LT	579.25'	18"	52'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
SBD1	95+11/31.00' LT	580.60'	95+63/31.00' LT	580.34'	18"	52'	SET (TY II) (18 IN) (RCP) (6:1) (P)	
ARTHUR CT								EXISTING DRWY TO STAY IN PLACE



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Signature of Registrant & Date

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FM 1378
AT FM 3286

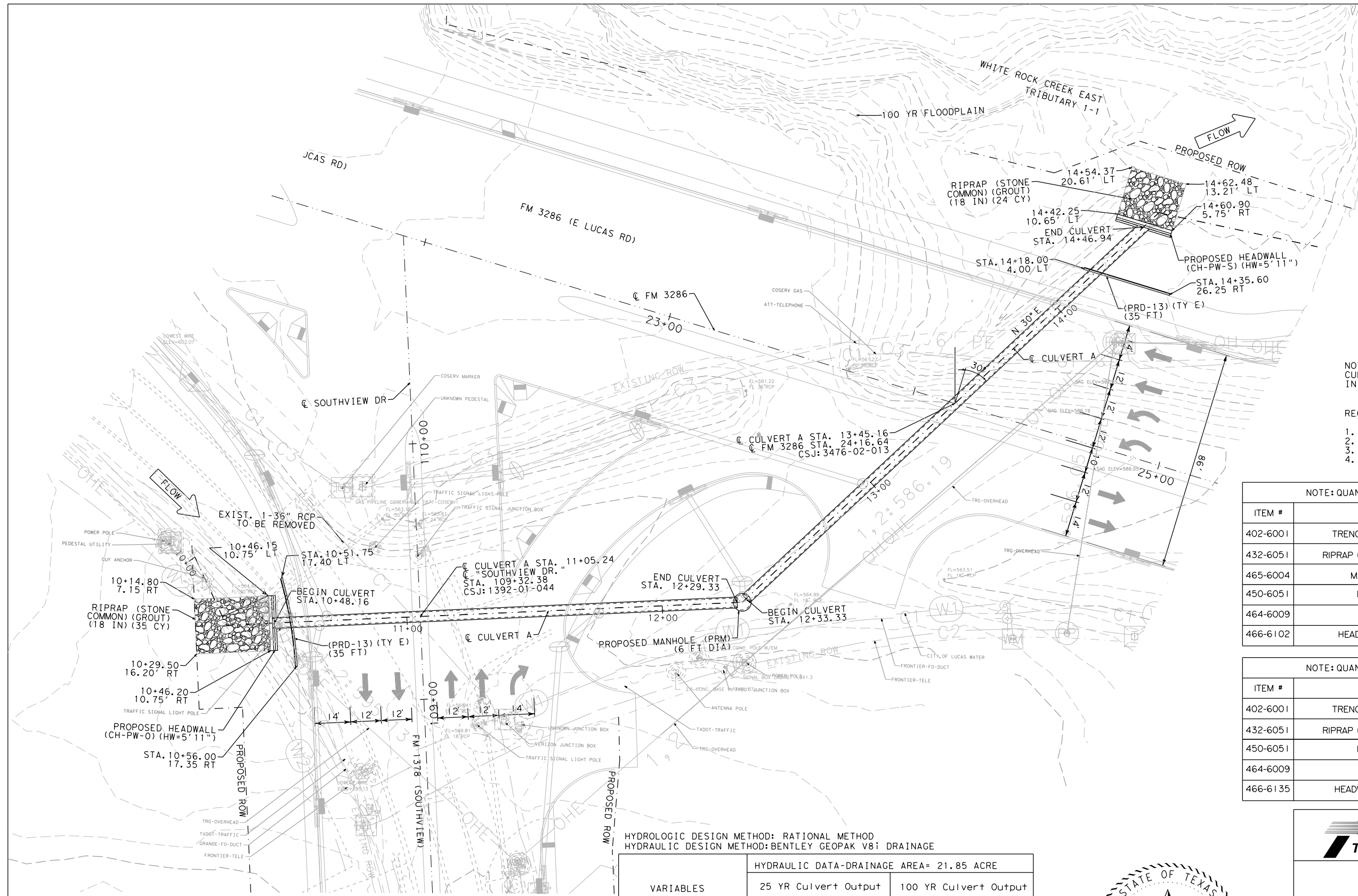
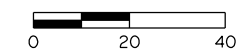
DITCH LAYOUT

SCALE: 1" = 100' SHEET 6 OF 6

DESIGN KB	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1378, ETC.
GRAPHICS KB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK IIE	TEXAS	DAL	COLLIN	184
CHECK	CONTROL	SECTION	JOB	
	1392	01	044, ETC.	

QUANTITIES THIS SHEET

ITEM #	DESCRIPTION	UNIT	TOTAL
464-6003	RC PIPE (CL III) (18 IN)	LF	194
467-6363	SET (TY II) (18") (RCP) (6:1) (P)	EA	8



NOTE:
CULVERT CONSTRUCTION SHOWN
IN TRAFFIC CONTROL PLAN

- REQUIRED STANDARDS:
1. CH-PW-0: PARALLEL WINGS NON SKEWED
 2. CH-PW-S: PARALLEL WINGS SKEWED
 3. SRR: STONE RIPRAP DETAILS
 4. PRM: MANHOLE DETAILS

NOTE: QUANTITIES BASED ON CSJ: 1392-01-044

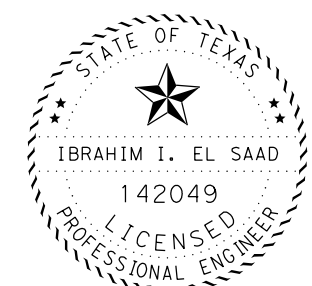
ITEM #	DESCRIPTION	UNIT	SHEET TOTAL
402-6001	TRENCH EXCAVATION PROTECTION	LF	181
432-6051	RIPRAP (STONE COMMON)(GROUT)(18IN)	CY	35
465-6004	MANH (COMPLX)(PRM)(72IN)	EA	1
450-6051	RAIL (HANDRAIL)(TY E)	LF	35
464-6009	RC PIPE (CL III)(42 IN)	LF	181
466-6102	HEADWALL (CH-PW-0) (DIA=42IN)	EA	1

NOTE: QUANTITIES BASED ON CSJ: 3476-02-013

ITEM #	DESCRIPTION	UNIT	SHEET TOTAL
402-6001	TRENCH EXCAVATION PROTECTION	LF	133
432-6051	RIPRAP (STONE COMMON)(GROUT)(18IN)	CY	24
450-6051	RAIL (HANDRAIL)(TY E)	LF	35
464-6009	RC PIPE (CL III)(42 IN)	LF	213
466-6135	HEADWALL (CH-PW-S) (DIA = 42IN)	EA	1

HYDROLOGIC DESIGN METHOD: RATIONAL METHOD
HYDRAULIC DESIGN METHOD: BENTLEY GEOPAK V8i DRAINAGE

VARIABLES	HYDRAULIC DATA-DRAINAGE AREA= 21.85 ACRE			
	25 YR Culvert Output		100 YR Culvert Output	
	Existing	Proposed	Existing	Proposed
Q CulvGroup (cfs)	44.67	44.67	54.89	54.89
#Barrels	1 - 36" Ø	1 - 42" Ø	1 - 36" Ø	1 - 42" Ø
Q Barrels (cfs)	44.67	44.67	54.89	54.89
Culv Vel US (ft/s)	N/A	N/A	N/A	N/A
Culv Vel DS (ft/s)	7.06	10.61	11.14	11.16
TW VEL DS (FT/S)	5.08	6.68	5.17	6.74
W.S US. (ft)	567.87	567.44	568.66	567.92
W.S DS. (ft)	556.99	556.85	557.24	557.05



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Signature of Registrant & Date

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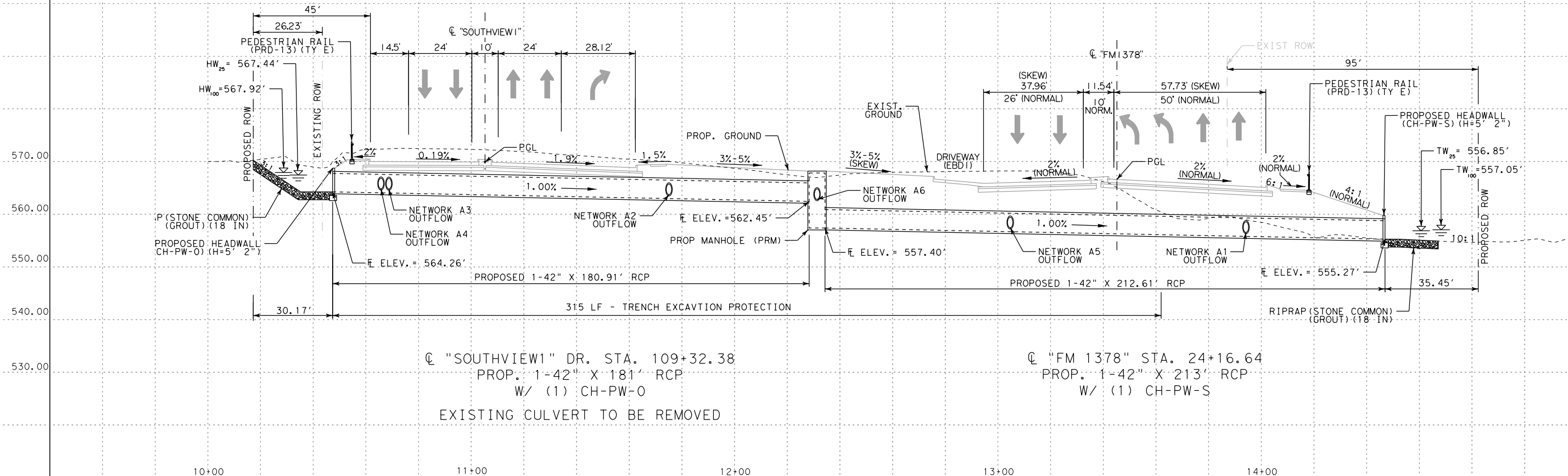
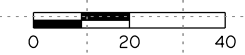
Texas Department of Transportation

**FM 1378
AT FM 3286
CULVERT A LAYOUT**

SCALE: 1" = 40' - H
1" = 20' - V

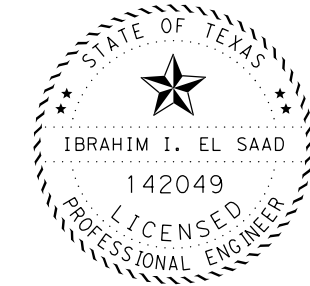
SHEET 1 OF 2

DESIGN IE	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS IE	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DAL	COLLIN	185
CHECK	CONTROL	SECTION	JOB	
	1392	01	044, ETC.	



CL "SOUTHVIEW1" DR. STA. 109+32.38
 PROP. 1-42" X 181' RCP
 W/ (1) CH-PW-0
 EXISTING CULVERT TO BE REMOVED

CL "FM 1378" STA. 24+16.64
 PROP. 1-42" X 213' RCP
 W/ (1) CH-PW-S



Abraham I. El Saad, P.E. 11-7-22
 Signature of Registrant & Date



FM 1378
AT FM 3286
CULVERT A LAYOUT

SCALE: 1"=40'-H
1"=20'-V

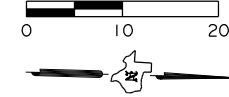
SHEET 2 OF 2

DESIGN	IE	FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	SEE TITLE SHEET	HIGHWAY NO.	FM 1378, ETC.
GRAPHICS	IE	STATE	TEXAS	DISTRICT	DAL	COUNTY	COLLIN
CHECK		CONTROL	1392	SECTION	01	JOB	044, ETC.

186

FILE: c:\t\dot\pw\on\line\t\dot5\ibrahim.e\saad\0461657\Culvert B Layout Sheets.dgn
 TIME: 7:58:34 AM
 DATE: 2/20/2023

- REQUIRED STANDARDS:
1. PW: PARALLEL WINGS SKEWED/NON SKEWED
 2. SCP-6: RECAST 6' SPAN BOXES
 3. SCP-MD: PRECAST MISCELLANEOUS DETAILS
 4. BCS: SUPPLEMENT WING AND END TREATMENT
 5. ECD: EXT CURB DETAILS FROM 1' TO 5'
 6. SRR: STONE RIPRAP DETAILS
 7. PR11: PEDESTRIAN RAIL

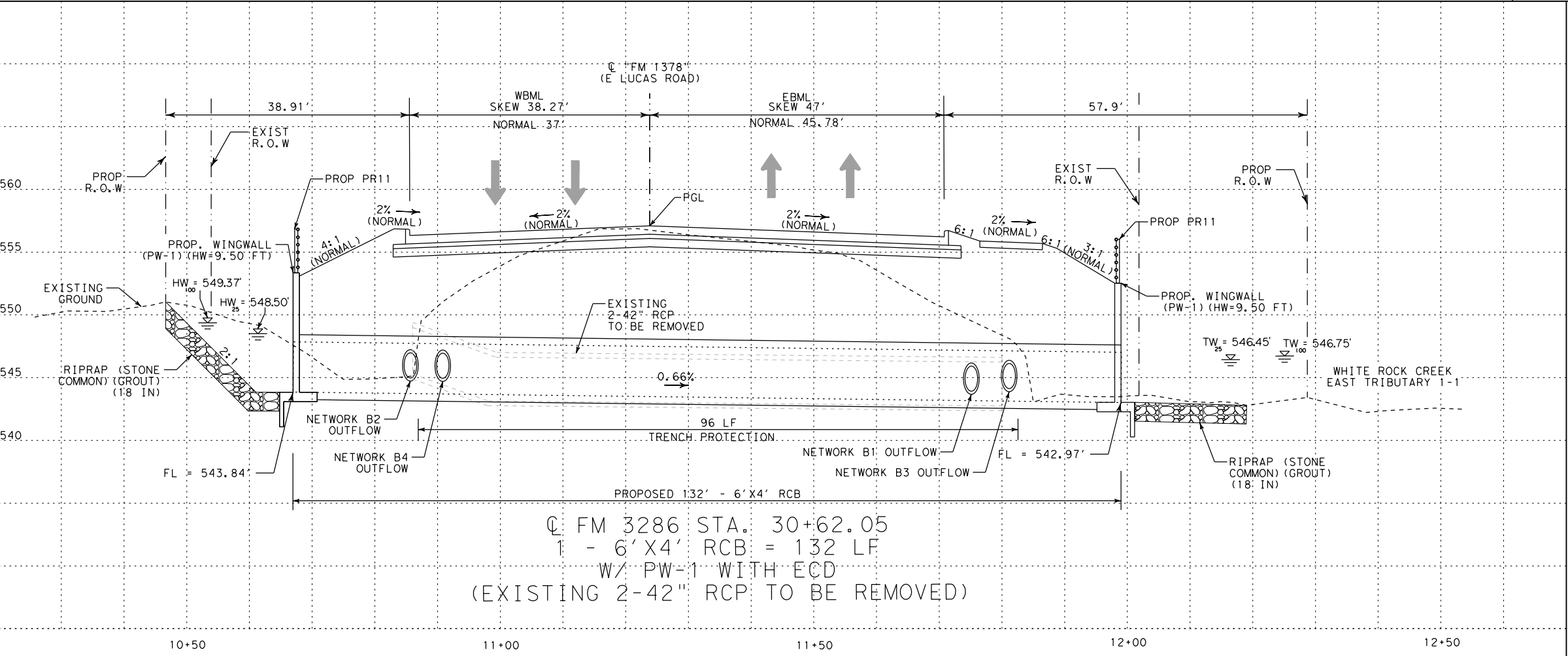
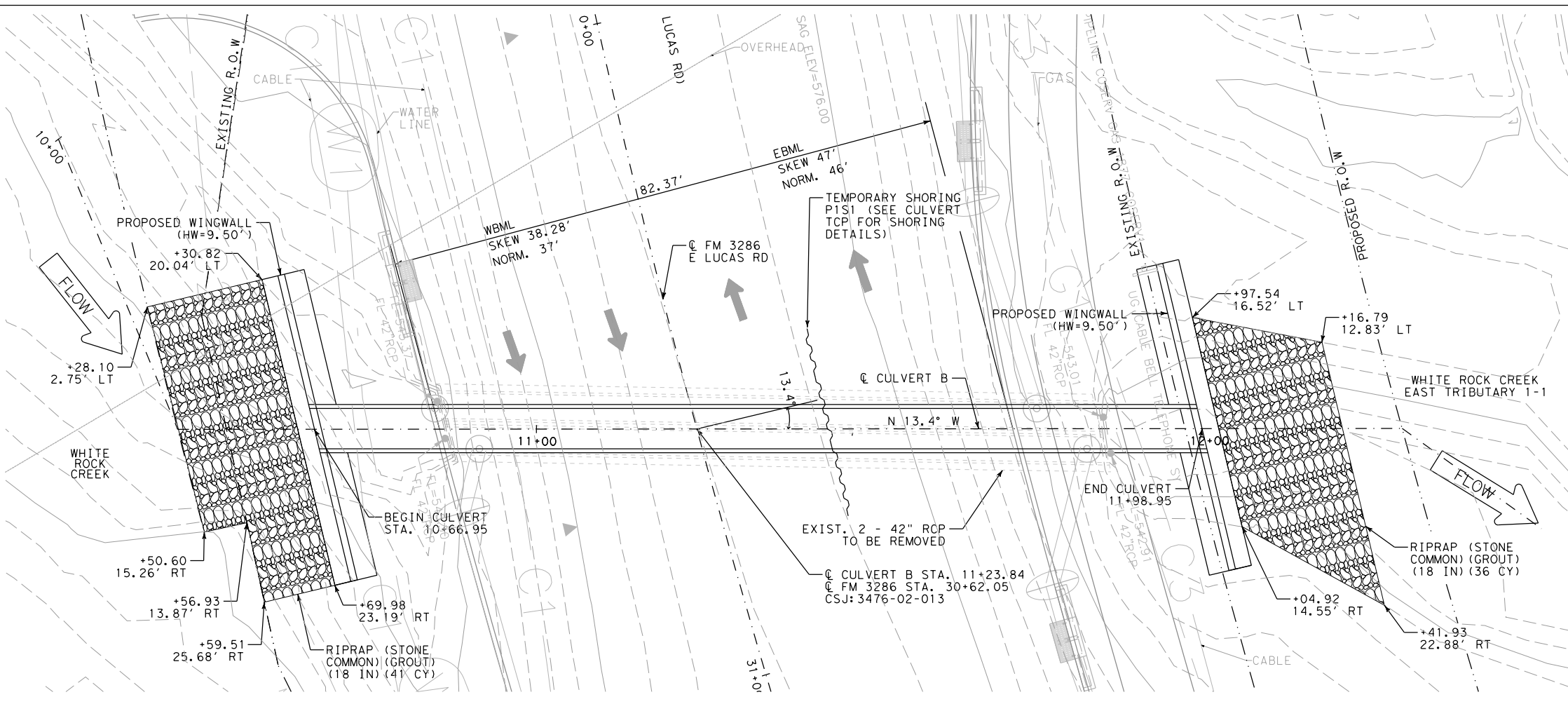


NOTE: CULVERT CONSTRUCTION SHOWN IN TRAFFIC CONTROL PLAN

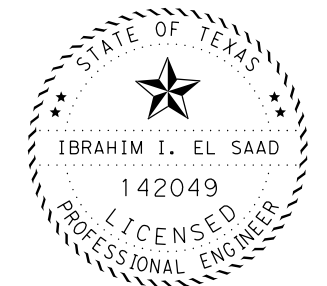
VARIABLES	HYDRAULIC DATA-DRAINAGE AREA= 71.96 ACRES			
	HYDRAULIC ANALYSIS USING HY-8			
	25 YR Culvert Output		100 YR Culvert Output	
	Existing	Proposed	Existing	Proposed
Q CulvGroup (cfs)	152.07	152.07	186.68	186.68
#Barrels	2-42"	1- 6'X4'	2-42"	1- 6'X4'
Q Barrels (cfs)	152.07	152.07	186.68	186.68
Culv Vel US (ft/s)	N/A	N/A	N/A	N/A
Culv Vel DS (ft/s)	8.31	7.29	9.74	8.28
TW VEL DS (FT/S)	6.20	6.20	6.52	6.52
W.S US. (ft)	548.51	548.50	549.74	549.37
W.S DS. (ft)	546.44	546.45	546.72	546.75

NOTE: QUANTITIES BASED ON CSJ: 3476-02-013

ITEM #	DESCRIPTION	UNIT	SHEET TOTAL
402-6001	TRENCH EXCAVATION PROTECTION	LF	96
432-6051	RIPRAP (STONE COMMON) (GROUT) (18IN)	CY	76
450-6103	RAIL (TY PR11)	LF	58
462-6011	CONC BOX CULV (6 FT X 4 FT)	LF	132
466-6171	WINGWALL (PW-1) (HW=10 FT)	EA	2



@ FM 3286 STA. 30+62.05
 1 - 6'X4' RCB = 132 LF
 W/ PW-1 WITH ECD
 (EXISTING 2-42" RCP TO BE REMOVED)



Abraham I. Saad, P.E. 2-20-23
 Signature of Registrant & Date



FM 1378
 AT FM 3286
CULVERT B LAYOUT
STA 30+62.00

SCALE: 1"=20'-H
 1"=10'-V

SHEET 1 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS		STATE	DISTRICT	COUNTY
IIE		TEXAS	DAL	COLLIN
CHECK		CONTROL	SECTION	JOB
CHECK		1392	01	044, ETC.

187

Table 1 - Summary of Culvert Flows at Crossing: Crossing B (EXISTING)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert B Discharge (cfs)	Roadway Discharge (cfs)	Iterations
546.8	2 yr	86.62	86.62	0	1
547.52	5 yr	110.63	110.63	0	1
547.91	10 yr	128.62	128.62	0	1
548.51	25 yr	152.07	152.07	0	1
549.09	50 yr	169.4	169.4	0	1
549.74	100 yr	186.68	186.68	0	1
557.06	Overtopping	317.89	317.89	0	Overtopping

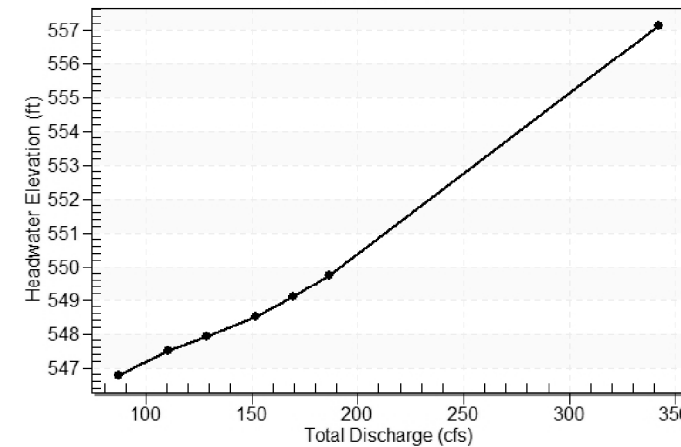
Table 2 - Culvert Summary Table: Culvert B (EXISTING)

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 yr	86.62	86.62	546.8	3.107	2.706	1-JS1t	1.955	2.05	2.497	2.837	5.9	5.383
5 yr	110.63	110.63	547.52	3.671	3.828	1-S1t	2.297	2.328	2.769	3.109	6.776	5.722
10 yr	128.62	128.62	547.91	4.132	4.216	7-M1t	2.576	2.514	2.95	3.29	7.432	5.942
25 yr	152.07	152.07	548.51	4.817	4.77	7-M1t	3.083	2.728	3.163	3.503	8.312	6.196
50 yr	169.4	169.4	549.09	5.398	5.26	3-M2t	3.5	2.867	3.308	3.648	8.997	6.366
100 yr	186.68	186.68	549.74	6.048	5.913	7-M2t	3.5	2.988	3.443	3.783	9.736	6.522

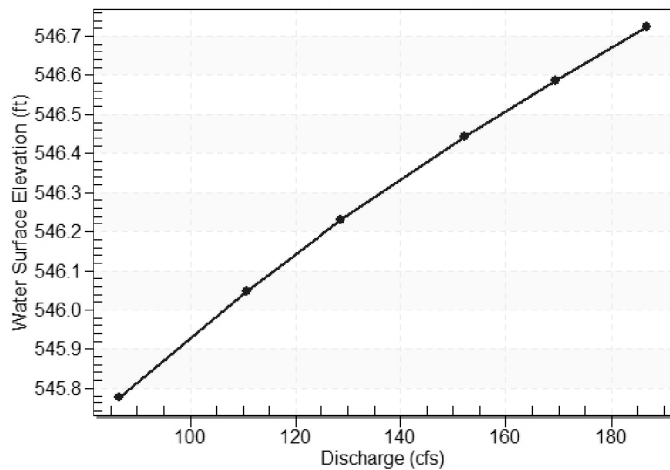
Table 3 - Downstream Channel Rating Curve (Crossing: CULV_B (EXISTING))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
86.62	545.78	2.84	5.38	1.52	0.8
110.63	546.05	3.11	5.72	1.67	0.81
128.62	546.23	3.29	5.94	1.77	0.82
152.07	546.44	3.5	6.2	1.88	0.83
169.4	546.59	3.65	6.37	1.96	0.83
186.68	546.72	3.78	6.52	2.03	0.84

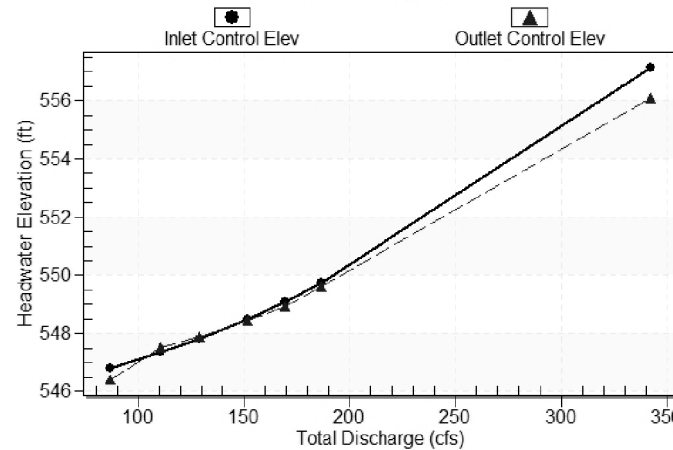
Total Rating Curve
Crossing: Crossing B_3286



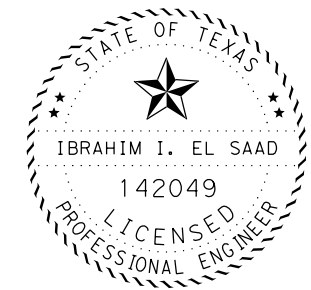
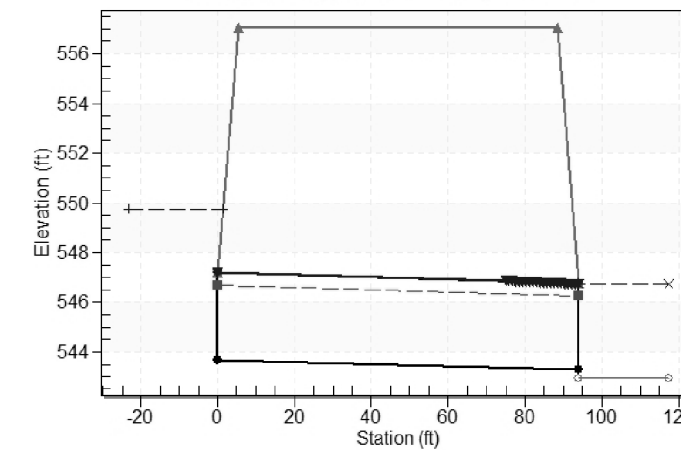
Downstream Channel Rating Curve



Performance Curve
Culvert: Culvert B_3286



Crossing - Crossing B_3286, Design Discharge - 186.7 cfs
Culvert - Culvert B_3286, Culvert Discharge - 186.7 cfs



Abraham I. Saad, P.E. 11-7-22
Signature of Registrant & Date



FM 1378
AT FM 3286
CULVERT B LAYOUT
(EXISTING HYDRAULIC CALCULATIONS)

SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IIE	TEXAS	DAL	COLLIN	
CHECK	CONTROL	SECTION	JOB	
IIE	1392	01	044, ETC.	

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Table 1 - Summary of Culvert Flows at Crossing: Crossing B (Proposed)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert B Discharge (cfs)	Roadway Discharge (cfs)	Iterations
546.98	2 yr	86.62	86.62	0	1
547.54	5 yr	110.63	110.63	0	1
547.95	10 yr	128.62	128.62	0	1
548.5	25 yr	152.07	152.07	0	1
548.92	50 yr	169.4	169.4	0	1
549.37	100 yr	186.68	186.68	0	1
557.09	Overtopping	376.65	376.65	0	Overtopping

HYDROLOGIC COMPUTATION
 HYDROLOGIC METHOD: RATIONAL
 DRAINAGE AREA: ACRES:71.96, DESIGN FREQUENCY: 25 YR

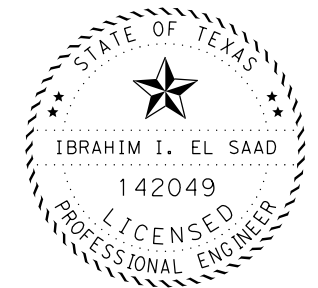
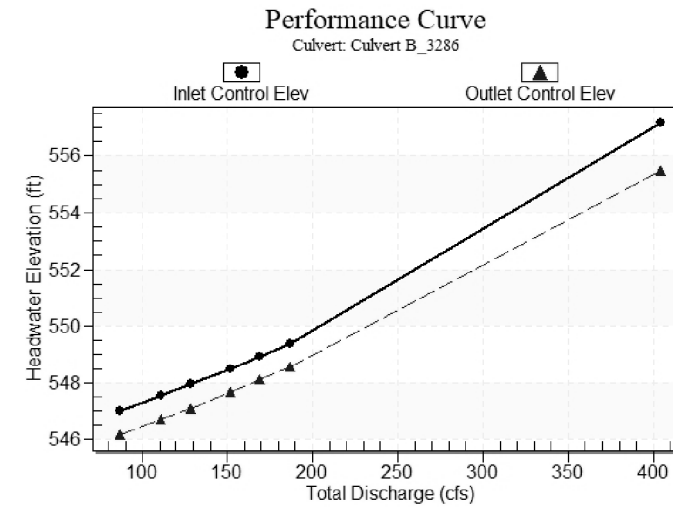
DRAINAGE AREA			WEIGHTED RUNOFF COEFFICIENT	tc ACTUAL (MIN)	Q ₂ (cfs)	Q ₅ (cfs)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₅₀ (cfs)	Q ₁₀₀ (cfs)	Q _{OT} (cfs)	CULVERT LOCATION "FM 1378" STA.
AREA NO.	ACRES	SQ. MI.										
B	71.96	0.11	0.35	16.00	86.62	110.63	128.62	152.07	169.4	186.68	376.65	30+62.05

Table 2 - Culvert Summary Table: Culvert B (Proposed)

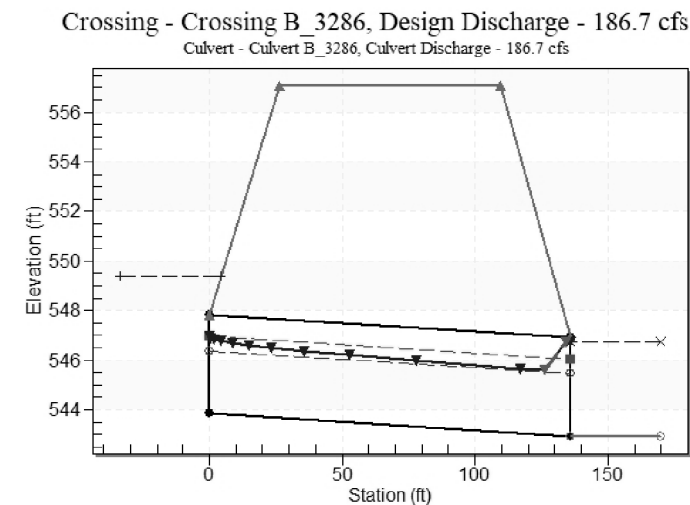
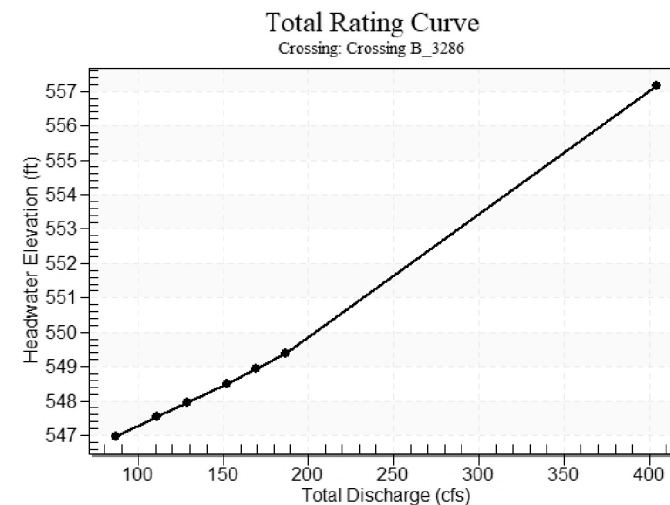
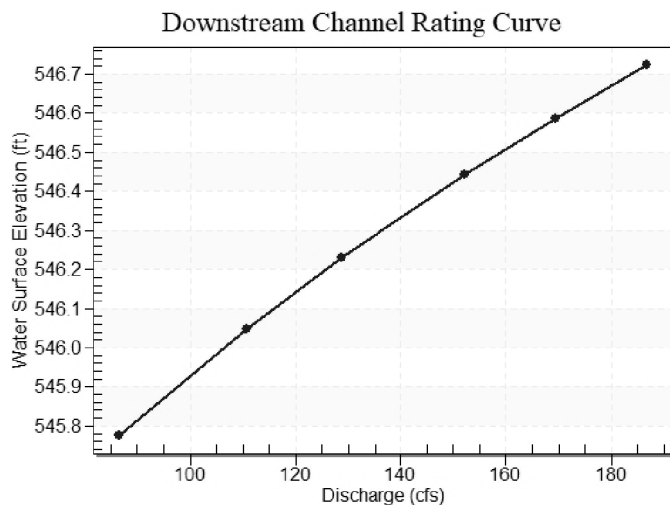
Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2 yr	86.62	86.62	546.98	3.143	2.33	1-JS1t	1.451	1.864	2.81	2.837	5.14	5.383
5 yr	110.63	110.63	547.54	3.701	2.851	1-JS1t	1.721	2.194	3.08	3.109	5.98	5.722
10 yr	128.62	128.62	547.95	4.111	3.257	5-JS1t	1.914	2.426	3.26	3.29	6.57	5.942
25 yr	152.07	152.07	548.5	4.658	3.816	5-JS1t	2.158	2.712	3.48	3.503	7.29	6.196
50 yr	169.4	169.4	548.92	5.083	4.240	5-JS1t	2.333	2.914	3.62	3.648	7.80	6.366
100 yr	186.68	186.68	549.37	5.531	4.700	5-JS1t	2.505	3.109	3.76	3.783	8.28	6.522

Table 3 - Downstream Channel Rating Curve (Crossing: CULV-B (Proposed))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
86.62	545.78	2.84	5.38	1.52	0.8
110.63	546.05	3.11	5.72	1.67	0.81
128.62	546.23	3.29	5.94	1.77	0.82
152.07	546.44	3.5	6.2	1.88	0.83
169.4	546.59	3.65	6.37	1.96	0.83
186.68	546.72	3.78	6.52	2.03	0.84



Abraham I. Saad, P.E. 11-7-22
 Signature of Registrant & Date



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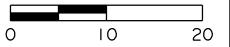
FM 1378
AT FM 3286
CULVERT B LAYOUT
(PROPOSED HYDRAULIC CALCULATIONS)

SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IIE	TEXAS	DAL	COLLIN	
CHECK	CONTROL	SECTION	JOB	
CHECK	1392	01	044, ETC.	

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DATE: 10/29/2022 TIME: 11:51:16 PM FILE: c:\txdot\pw\onl\me\t\dot\5\james.i.gwe\d0601455\HYDRAULIC_CALCULATIONS_CULV*B.dgn



NOTE:
 CULVERT CONSTRUCTION SHOWN
 IN TRAFFIC CONTROL PLAN

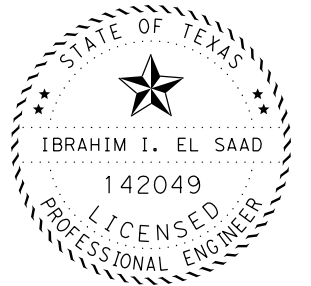
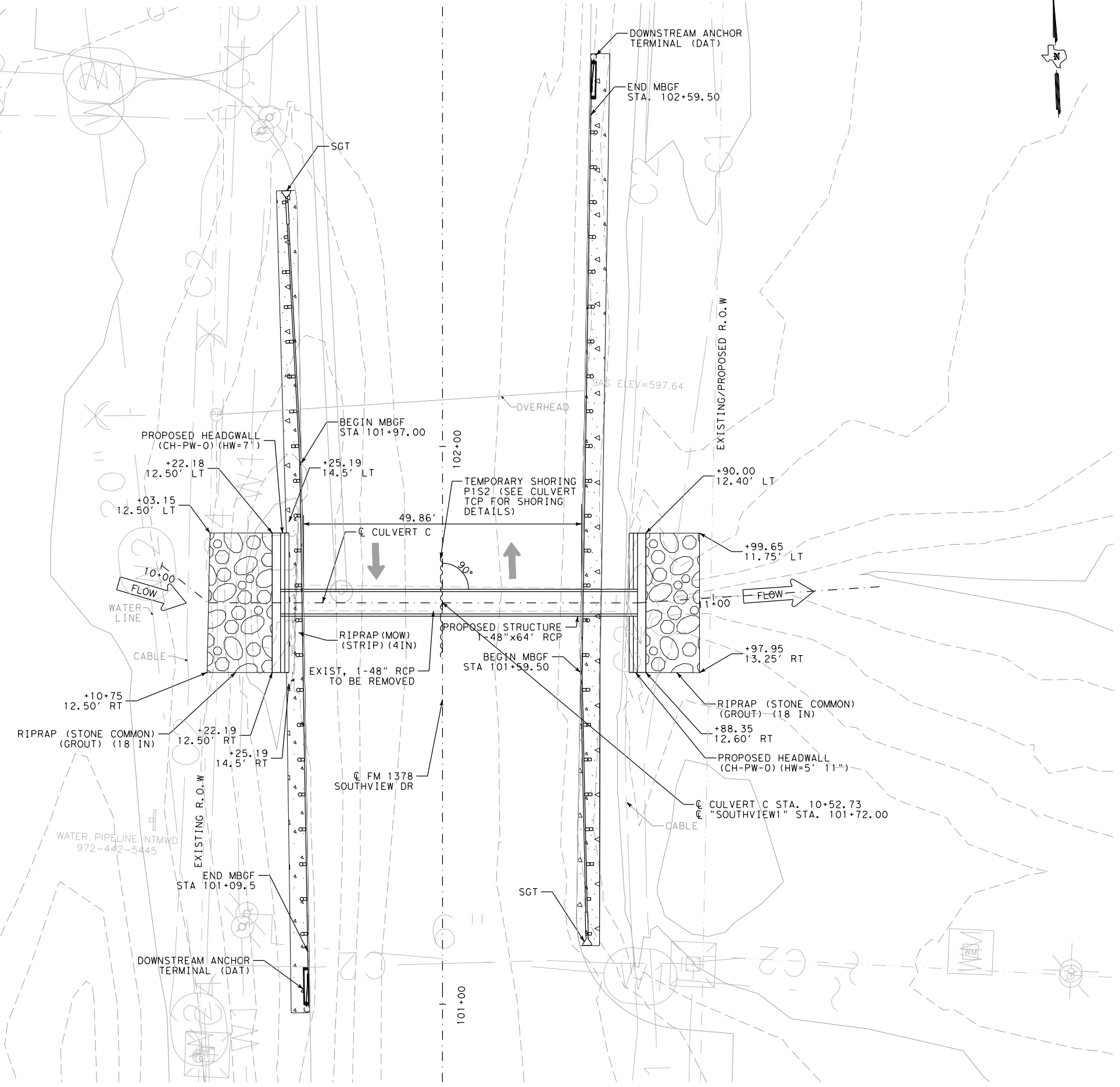
REQUIRED STANDARDS:
 1. CH-PW-0: PARALLEL WINGS SKEWED/NON SKEWED
 2. SCP-MD: PRECAST MISCELLANEOUS DETAILS
 3. SRR: STONE RIPRAP DETAILS

VARIABLES	HYDRAULIC DATA-DRAINAGE AREA= 33.47 ACRES			
	HYDRAULIC ANALYSIS USING HY-8			
	25 YR Culvert Output		100 YR Culvert Output	
	Existing	Proposed	Existing	Proposed
Q CulvGroup (cfs)	66.72	66.72	82.03	82.03
#Barrels	1-48"	1-48"	1-48"	1-48"
Q Barrels (cfs)	66.72	66.72	82.03	82.03
Culv Vel US (ft/s)	N/A	N/A	N/A	N/A
Culv Vel DS (ft/s)	7.11	9.23	8.05	9.75
TW VEL DS (FT/S)	4.26	4.26	4.49	4.49
W.S US. (ft)	575.10	576.59	575.65	577.20
W.S DS. (ft)	573.67	575.26	573.89	575.48

NOTE: QUANTITIES BASED ON CSJ:1392-01-044

ITEM #	DESCRIPTION	UNIT	SHEET TOTAL
402-6001	TRENCH EXCAVATION PROTECTION	LF	42
432-6051	RIPRAP (STONE COMMON) (GROUT) (18 IN)	CY	30
464-6010	RC PIPE (CLIII) (48 IN)	LF	64
466-6103	HEADWALL (CH-PW-0) (DIA=48IN)	EA	2

DATE: 2/28/2023 TIME: 12:38:07 PM FILE: c:\txdot\pw\onl\line\txdot5\ibrahim.e\saad\0461657\Culvert C Layout Sheets.dgn



Abraham El Saad, P.E. 2-28-23
 Signature of Registrant & Date

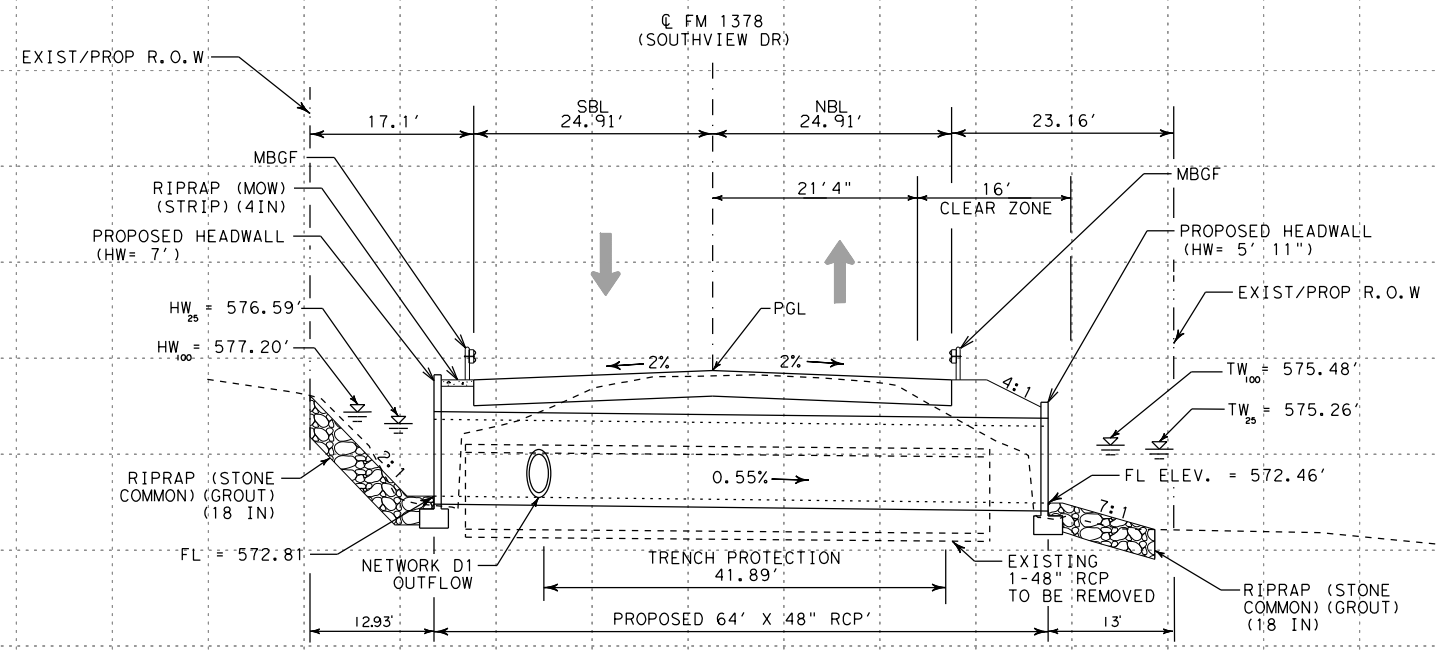
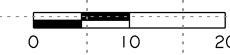


FM 1378
 AT FM 3286
CULVERT C LAYOUT
STA 101+72.00

SCALE: 1"=20'-H
 1"=10'-V SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS	IIE	STATE	DISTRICT	COUNTY
CHECK		TEXAS	DAL	COLLIN
CHECK		CONTROL	SECTION	JOB
		1392	01	044, ETC.

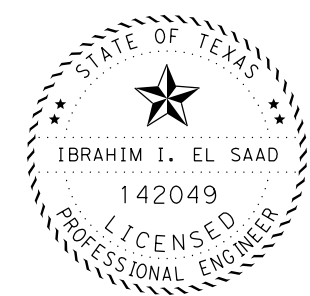
190



585
580
575
570

9+50 10+00 10+50 11+00 11+50

CL FM 1378 STA. 101+72.00
1 - 48" RCP = 64 LF
W/ CH-PW-0 BOTH US & DS
(EXISTING 1-48" RCP TO BE REMOVED)



Abraham I. Saad, P.E. 11-7-22
Signature of Registrant & Date



**FM 1378
AT FM 3286
CULVERT C LAYOUT
STA 101+72.00**

SCALE: 1"=20'-H
1"=10'-V SHEET 2 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IIE	TEXAS	DAL	COLLIN	
CHECK	CONTROL	SECTION	JOB	
CHECK	1392	01	044, ETC.	

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DATE: 10/29/2022 TIME: 11:47:48 PM FILE: c:\txdot\pw\onl\me\txdot5\james.igwe\d0461657\Culvert C Layout Sheets.dgn

Table 1 - Summary of Culvert Flows at Crossing: Crossing C (EXISTING)

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert C Discharge (cfs)	Roadway Discharge (cfs)	Iterations
573.95	2 yr	37.90	37.90	0.00	1
574.39	5 yr	48.46	48.46	0.00	1
574.71	10 yr	56.38	56.38	0.00	1
575.10	25 yr	66.72	66.72	0.00	1
575.38	50 yr	74.37	74.37	0.00	1
575.65	100 yr	82.03	82.03	0.00	1
579.66	Overtopping	153.41	153.41	0.00	Overtopping

Table 2 - Culvert Summary Table: Culvert C (EXISTING)

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 yr	37.90	37.90	573.95	2.661	2.851	1-S1t	1.707	1.835	2.262	2.262	5.171	3.702
5 yr	48.46	48.46	574.39	3.094	3.294	1-S1t	1.964	2.087	2.481	2.481	5.919	3.937
10 yr	56.38	56.38	574.71	3.397	3.609	1-S1t	2.150	2.259	2.626	2.626	6.448	4.089
25 yr	66.72	66.72	575.10	3.788	4.001	1-S1t	2.390	2.466	2.797	2.797	7.110	4.265
50 yr	74.37	74.37	575.38	4.083	4.278	1-S1t	2.571	2.609	2.913	2.913	7.586	4.382
100 yr	82.03	82.03	575.65	4.391	4.552	7-M1t	2.759	2.744	3.022	3.022	8.053	4.491

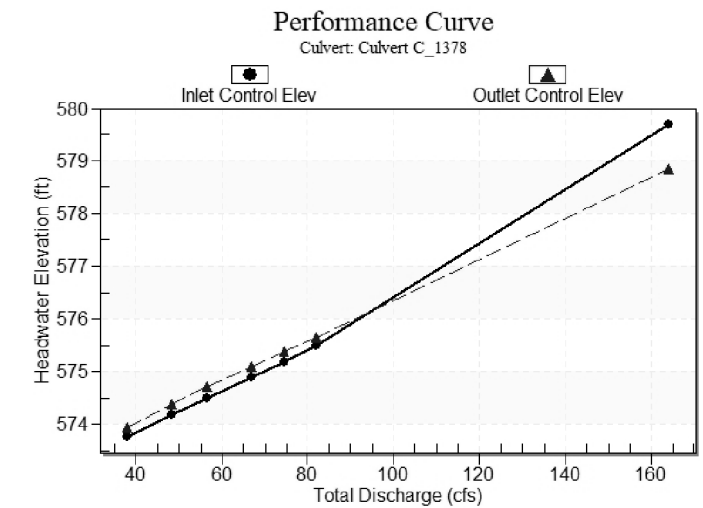
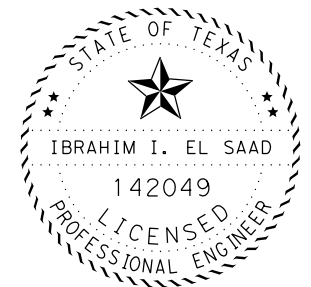
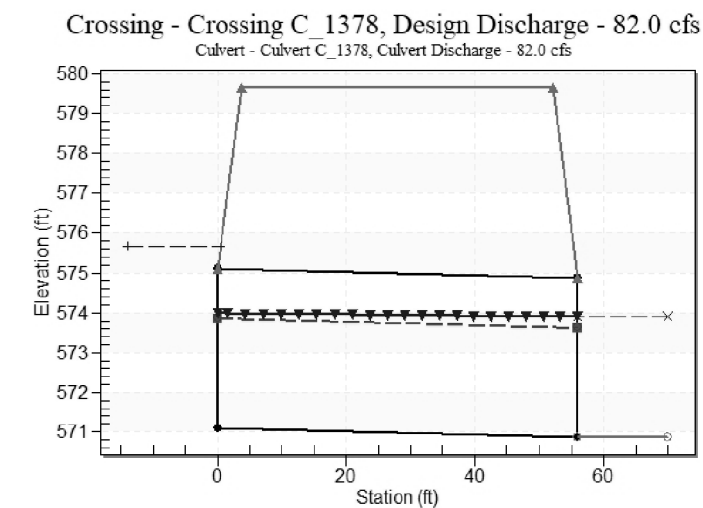
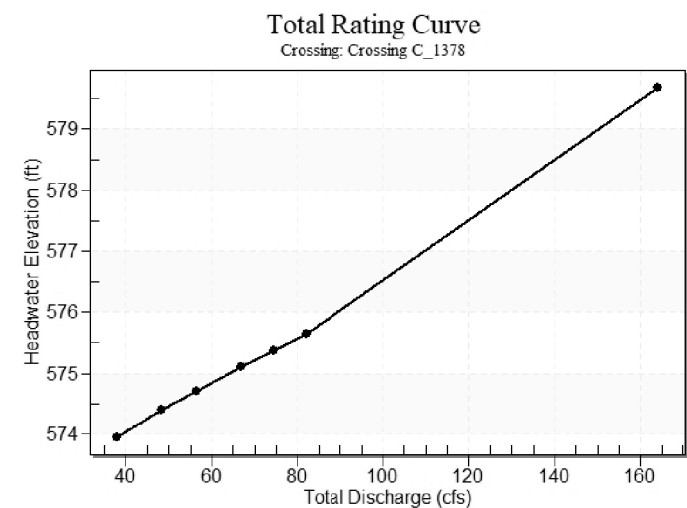
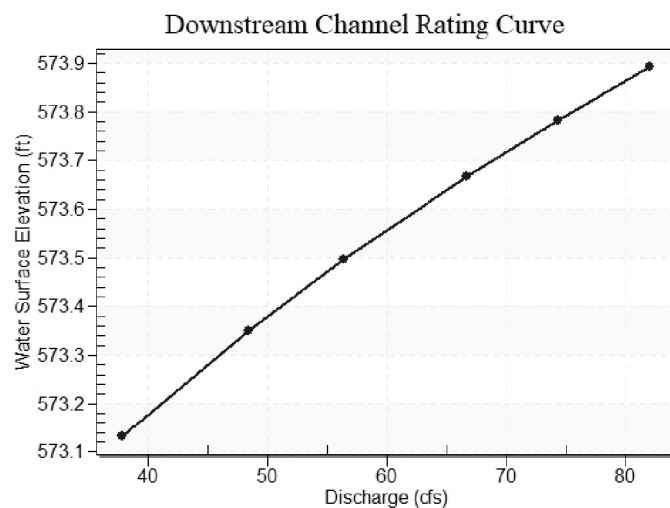


Table 3 - Downstream Channel Rating Curve (Crossing: CULV_C (EXISTING))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
37.90	573.13	2.26	3.70	0.78	0.61
48.46	573.35	2.48	3.94	0.85	0.62
56.38	573.50	2.63	4.09	0.90	0.63
66.72	573.67	2.80	4.26	0.96	0.64
74.37	573.78	2.91	4.38	1.00	0.64
82.03	573.89	3.02	4.49	1.04	0.64



Abraham El Saad, P.E. 11-7-22
Signature of Registrant & Date



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Texas Department of Transportation

FM 1378
AT FM 3286

CULVERT C LAYOUT
(EXISTING HYDRAULIC CALCULATIONS)

SHEET 3 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE	6	SEE TITLE SHEET		FM 1378, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
IIE	TEXAS	DAL	COLLIN	
CHECK	CONTROL	SECTION	JOB	
IIE	1392	01	044, ETC.	

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DATE: 10/29/2022 TIME: 11:48:04 PM FILE: c:\txdot\pw\onlime\txdot5\james.igwe\d0601455\HYDRAULIC_CALCULATIONS_CULV_C.dgn

Table 1 - Summary of Culvert Flows at Crossing: Crossing C

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert C Discharge (cfs)	Roadway Discharge (cfs)	Iterations
575.47	2 yr	37.90	37.90	0.00	1
575.90	5 yr	48.46	48.46	0.00	1
576.20	10 yr	56.38	56.38	0.00	1
576.59	25 yr	66.72	66.72	0.00	1
576.89	50 yr	74.37	74.37	0.00	1
577.20	100 yr	82.03	82.03	0.00	1
579.66	Overtopping	129.42	129.42	0.00	Overtopping

HYDROLOGIC COMPUTATION
 HYDROLOGIC METHOD: RATIONAL
 DRAINAGE AREA: ACRES:33.47, DESIGN FREQUENCY: 25 YR

AREA NO.	DRAINAGE AREA		WEIGHTED RUNOFF COEFFICIENT	tc ACTUAL (MIN)	Q ₂ (cfs)	Q ₅ (cfs)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₅₀ (cfs)	Q ₁₀₀ (cfs)	Q _{OT} (cfs)	CULVERT LOCATION "SOUTHVIEW1" STA.
	ACRES	SQ. MI.										
B	33.47	0.11	0.052	20.00	37.90	48.46	56.38	66.72	74.37	82.03	129.42	101+71.95

Table 2 - Culvert Summary Table: Culvert C (Proposed)

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 yr	37.90	37.90	575.47	2.659	2.162	1-JS1t	1.578	1.835	2.262	2.262	5.171	3.702
5 yr	48.46	48.46	575.90	3.091	2.539	1-JS1t	1.809	2.087	2.481	2.481	5.919	3.937
10 yr	56.38	56.38	576.20	3.395	2.828	1-JS1t	1.974	2.259	2.626	2.626	6.448	4.089
25 yr	66.72	66.72	576.59	3.785	3.220	1-S2n	2.184	2.466	2.237	2.797	9.230	4.265
50 yr	74.37	74.37	576.89	4.080	3.524	5-S2n	2.337	2.609	2.389	2.913	9.501	4.382
100 yr	82.03	82.03	577.20	4.389	3.842	5-S2n	2.493	2.744	2.539	3.022	9.752	4.491

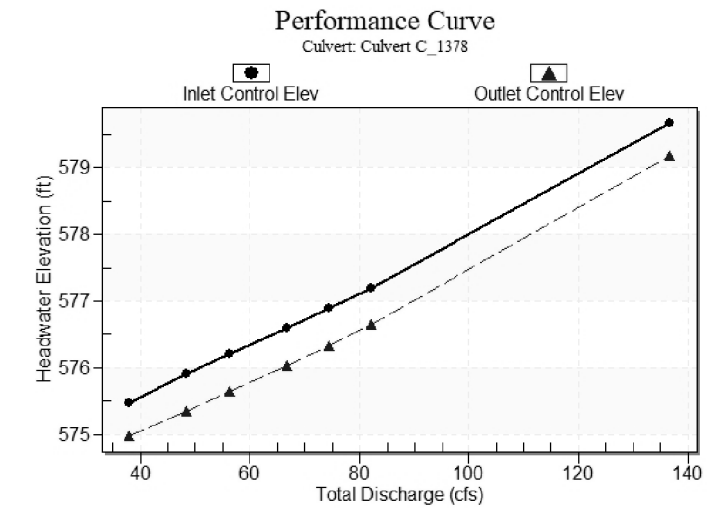
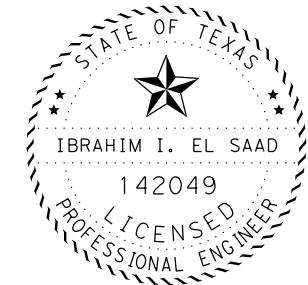
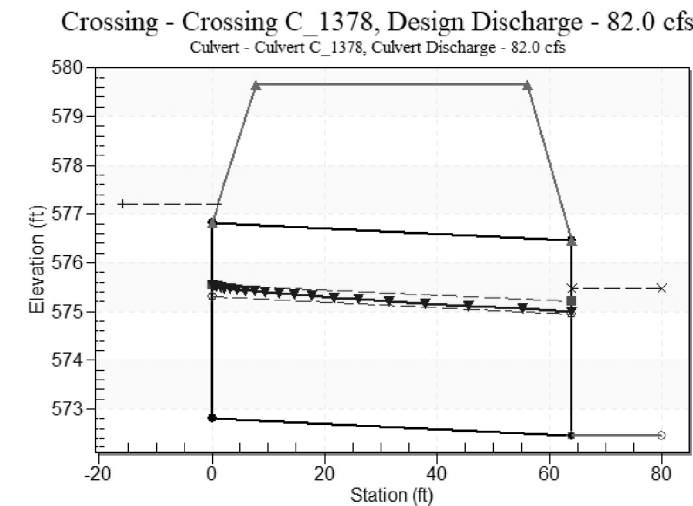
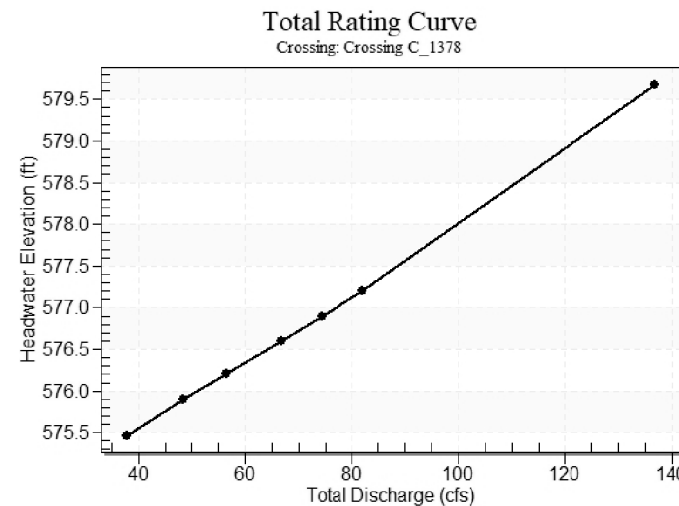
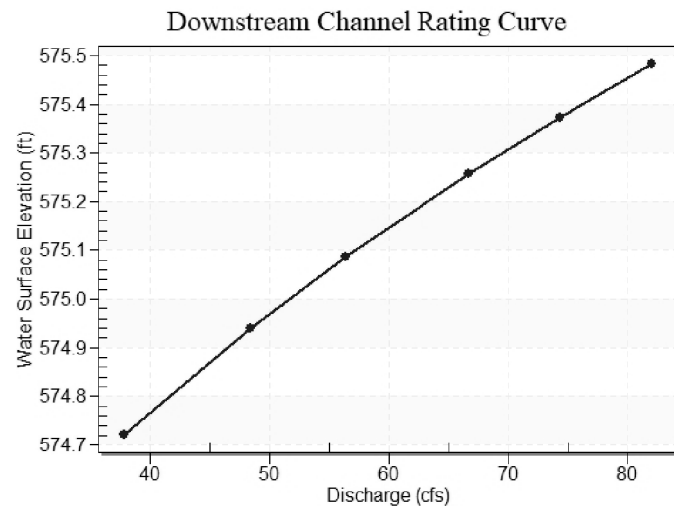


Table 3 - Downstream Channel Rating Curve (Crossing: CULV. C (Proposed))

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
37.90	574.72	2.26	3.70	0.78	0.61
48.46	574.94	2.48	3.94	0.85	0.62
56.38	575.09	2.63	4.09	0.90	0.63
66.72	575.26	2.80	4.26	0.96	0.64
74.37	575.37	2.91	4.38	1.00	0.64
82.03	575.48	3.02	4.49	1.04	0.64



Abraham I. Saad, P.E. 11-7-22
 Signature of Registrant & Date



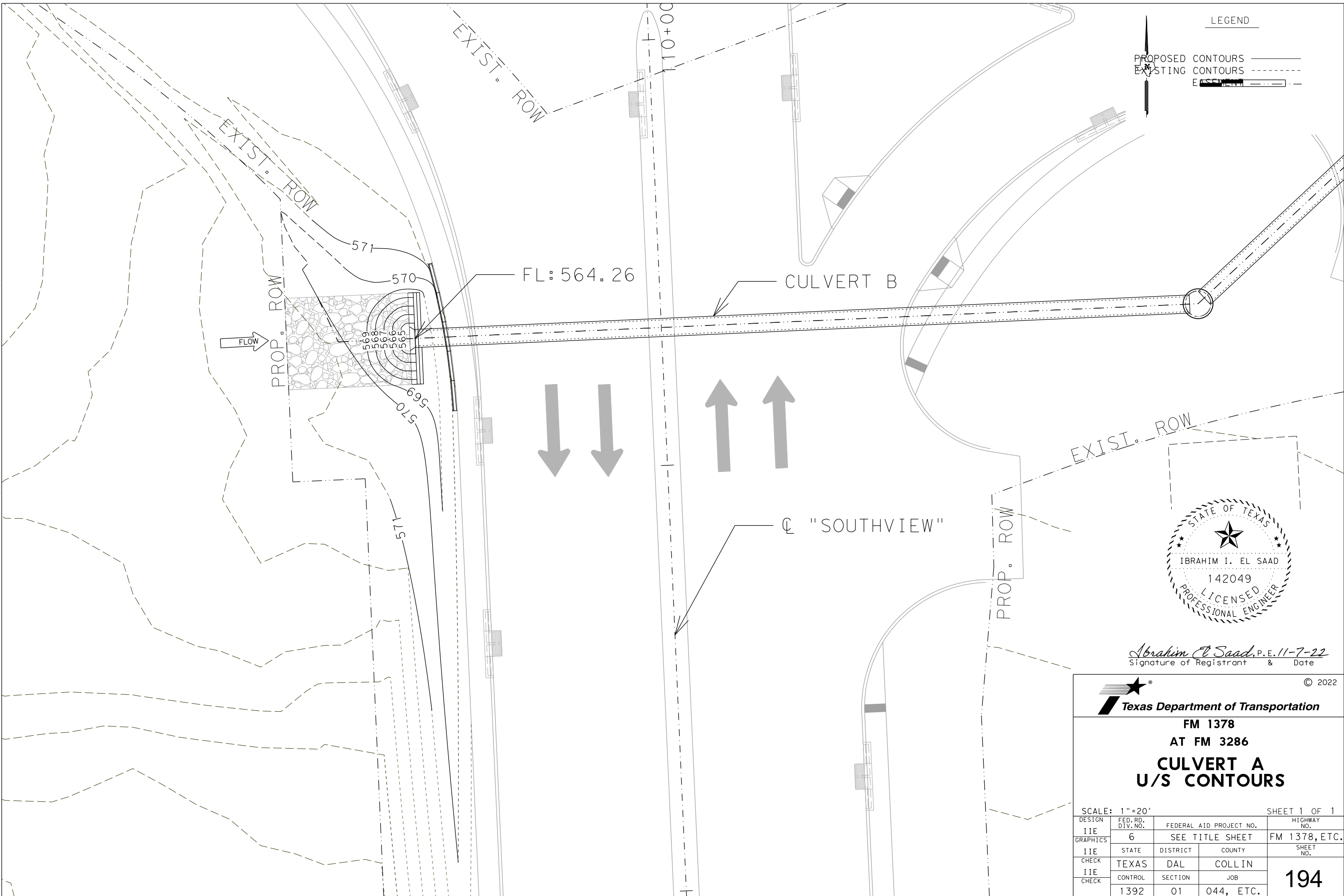
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Texas Department of Transportation
 FM 1378
 AT FM 3286
CULVERT C LAYOUT
 (PROPOSED HYDRAULIC CALCULATIONS)

SHEET 4 OF 4

DESIGN IIE	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1378, ETC.
CHECK IIE	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN	SHEET NO. 193
CHECK IIE	CONTROL 1392	SECTION 01	JOB 044, ETC.	

DATE: 10/29/2022 TIME: 11:48:08 PM FILE: c:\t\dot\pw\on\line\t\dot\5\james.i.gwe\d0601455\HYDRAULIC CALCULATIONS CULV.C.dgn

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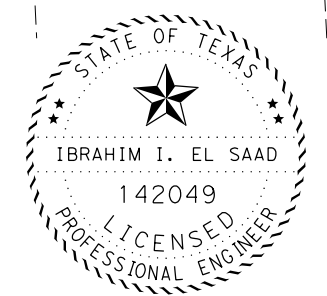


LEGEND

PROPOSED CONTOURS ————

EXISTING CONTOURS - - - - -

EXISTING EASEMENT [Symbol]



Abraham El Saad, P.E. 11-7-22
Signature of Registrant & Date



FM 1378
AT FM 3286
**CULVERT A
U/S CONTOURS**

SCALE: 1"=20' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
IIE GRAPHICS	6	SEE TITLE SHEET		FM 1378, ETC.
IIE CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
IIE CHECK	TEXAS	DAL	COLLIN	194
	CONTROL	SECTION	JOB	
	1392	01	044, ETC.	

LEGEND

0 10 20

PROPOSED CONTOURS ———

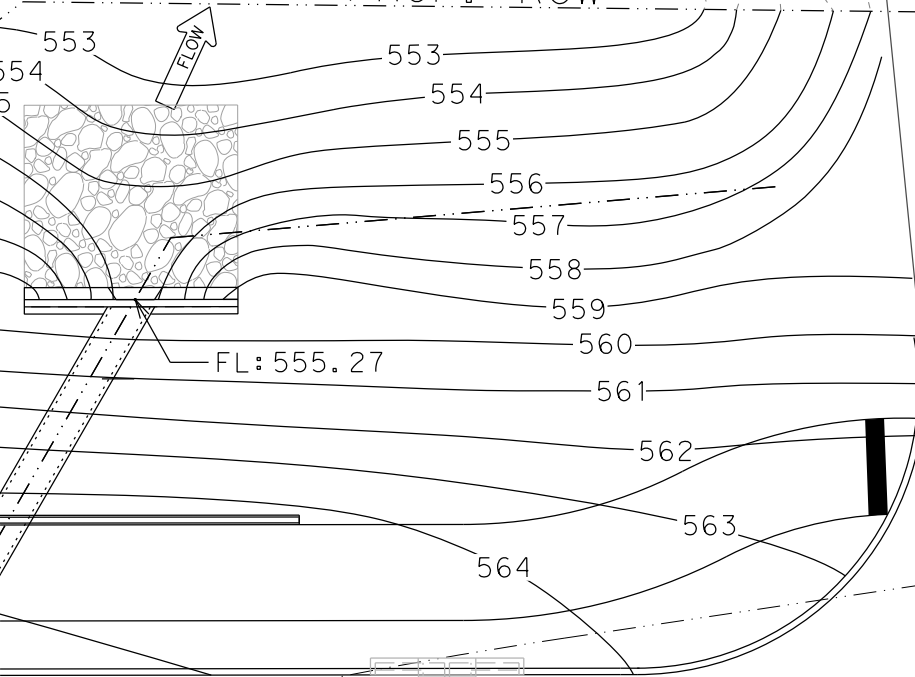
EXISTING CONTOURS - - - - -

EASEMENT - · - · - ·

WHITE ROCK CREEK EAST TRIBUTARY 1-1

PROTECT WETLAND FROM PERMANENT IMPACT

PROP. ROW

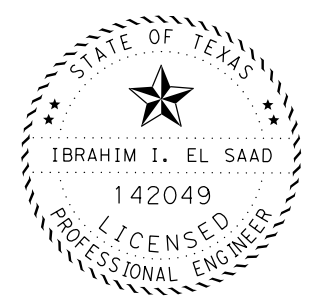


PROP. ROW

CULVERT B

☉ "FM 1378"
E. LUCAS RD.

EXIST. ROW



Abraham I. El Saad, P.E. 11-7-22
Signature of Registrant & Date



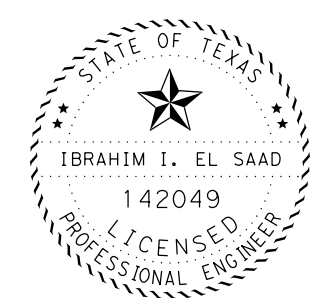
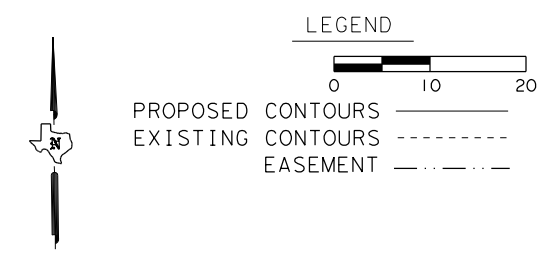
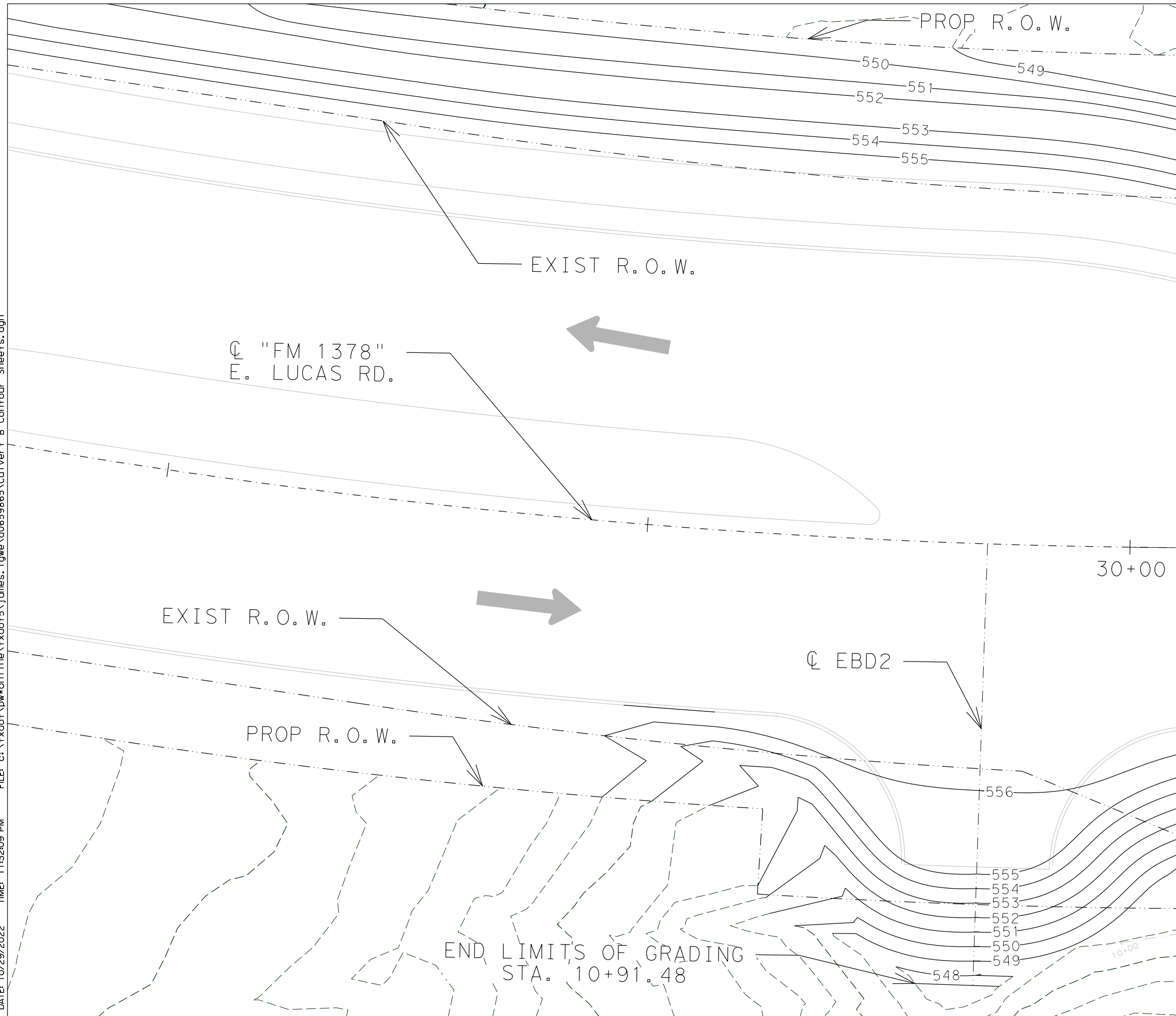
FM 1378
AT FM 3286
CULVERT A
D/S CONTOURS

SCALE: 1"=20' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
RI/IE GRAPHICS	6	SEE TITLE SHEET		FM 1378, ETC.
RI/IE CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
IIE CHECK	TEXAS	DAL	COLLIN	195
	CONTROL	SECTION	JOB	
	1392	01	044, ETC.	

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DATE: 11/7/2022 TIME: 4:08:34 PM

DATE: 10/29/2022 TIME: 11:32:09 PM FILE: c:\txdot\pw\online\txdot5\james.igwe\d0659865\Culvert B Contour Sheets.dgn



Ibrahim I. El Saad, P.E. 11-7-22
Signature of Registrant & Date

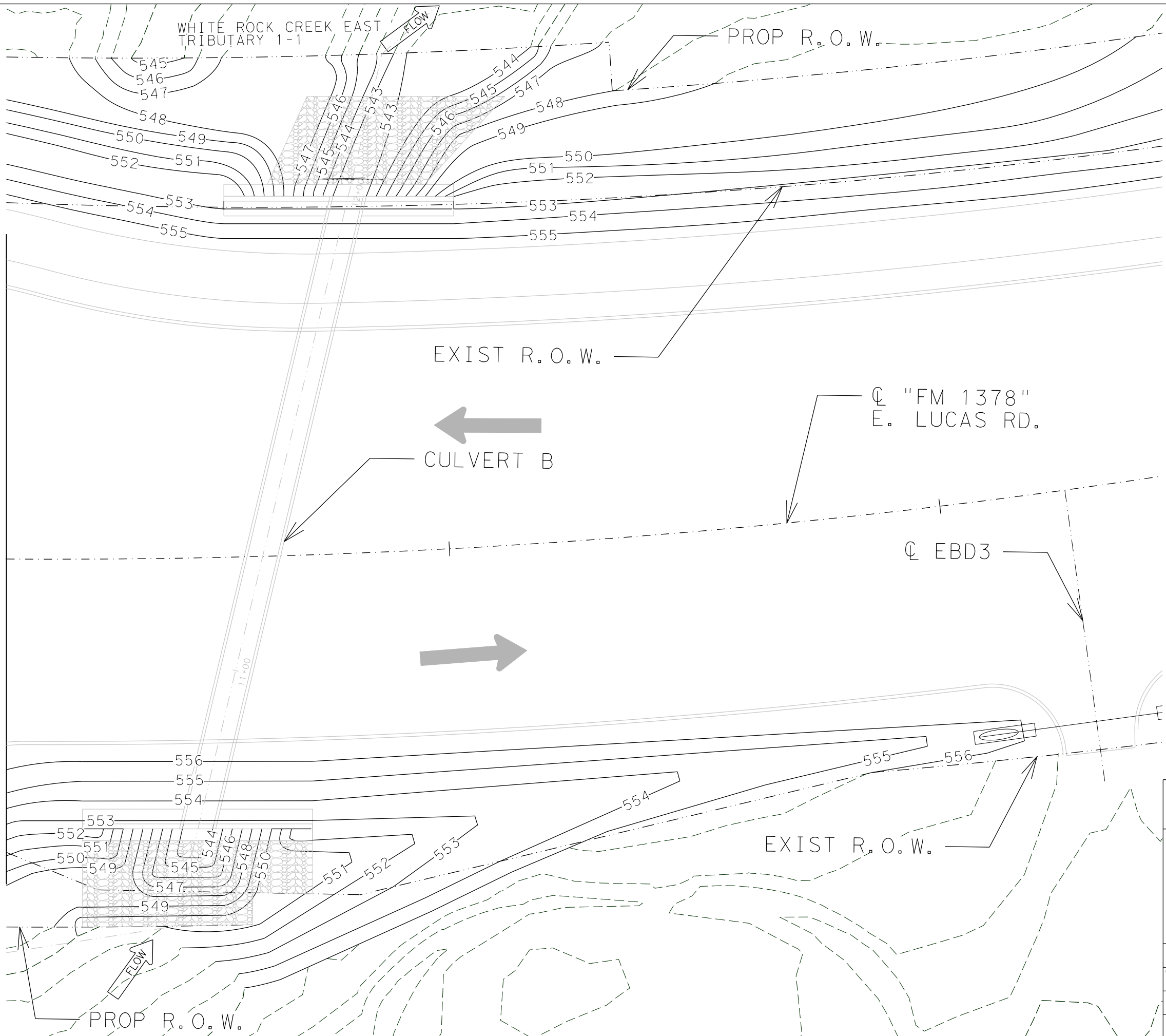


**FM 1378
AT FM 3286
CULVERT B
CONTOURS**

SCALE: 1"=20'	SHEET 1 OF 2		
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GRAPHICS RRP	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN
CHECK	CONTROL 1392	SECTION 01	JOB 044, ETC.
CHECK	196		

DATE: 10/29/2022 TIME: 11:32:11 PM FILE: c:\txdot\pw\onl\ine\txdot5\james.igwe\d0659865\Culvert B Contour Sheets.dgn

MATCH LINE @ "FM 1378"
STA. 30+10.00



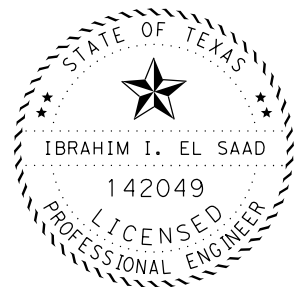
LEGEND

PROPOSED CONTOURS ————

EXISTING CONTOURS - - - - -

EASEMENT - · - · - -

0 10 20



Abraham El Saad, P.E. 11-7-22
Signature of Registrant & Date

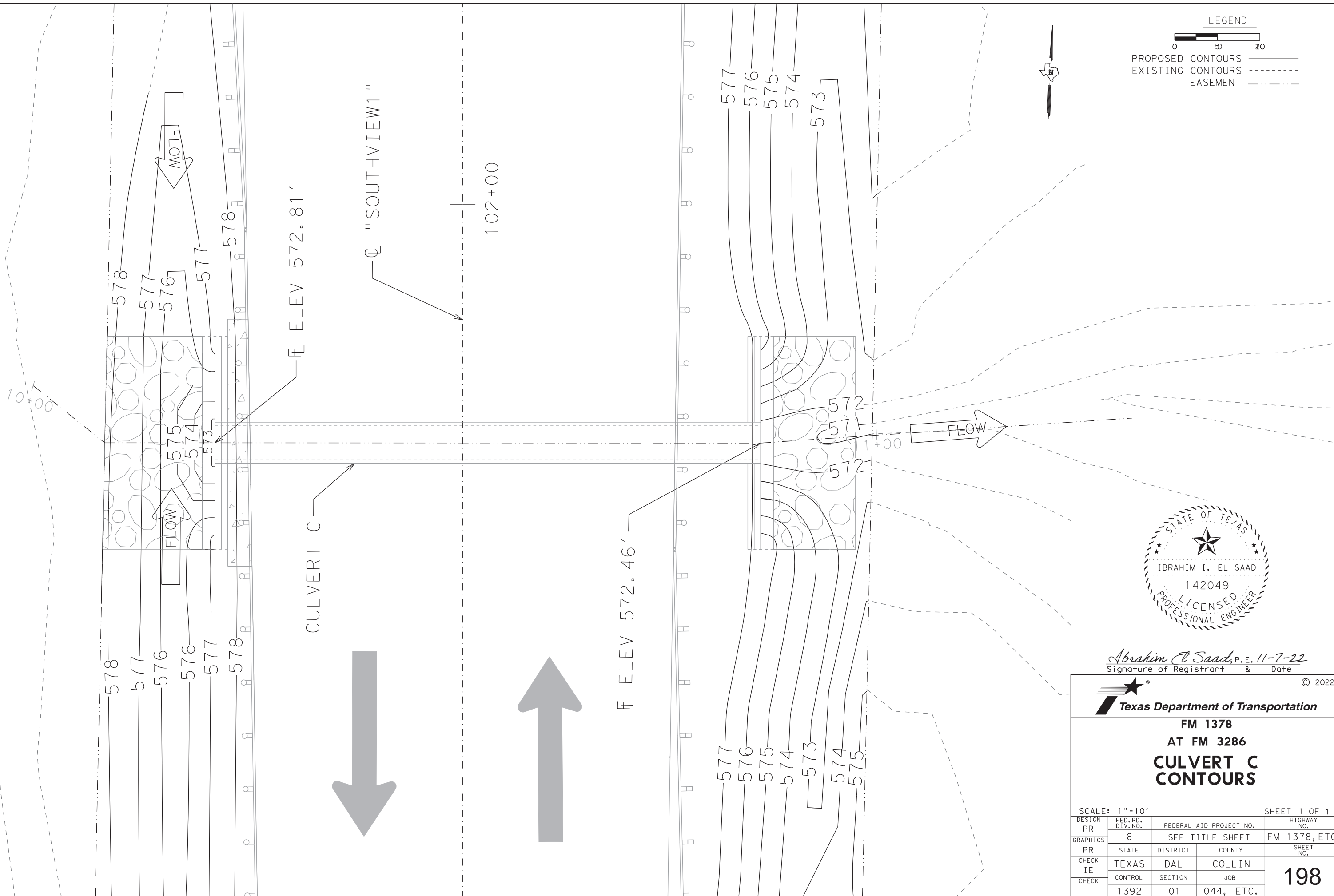


**FM 1378
AT FM 3286
CULVERT B
CONTOURS**

SCALE: 1"=20' SHEET 2 OF 2

DESIGN RRP	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1378, ETC.
GRAPHICS RRP	STATE TEXAS	DISTRICT DAL	COUNTY COLLIN	SHEET NO.
CHECK	CONTROL 1392	SECTION 01	JOB 044, ETC.	197

DATE: 11/7/2022 TIME: 4:24:35 PM FILE: c:\txdot\pw\onl\ine\txdot\5\ibrahim.e\isaad\0659865\CULVERT C CONTOURS Sheet.dgn



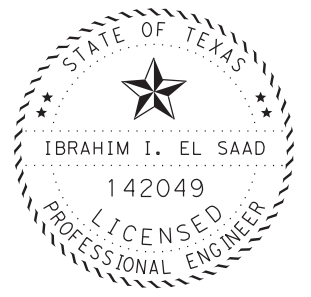
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0 10 20

PROPOSED CONTOURS ————

EXISTING CONTOURS - - - - -

EASEMENT - - - - -



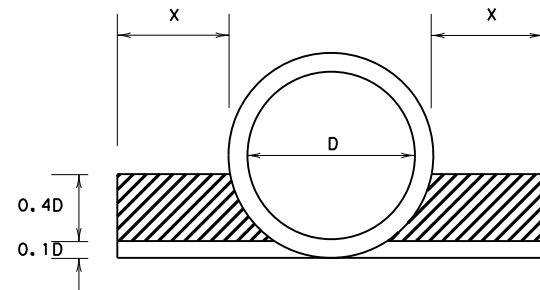
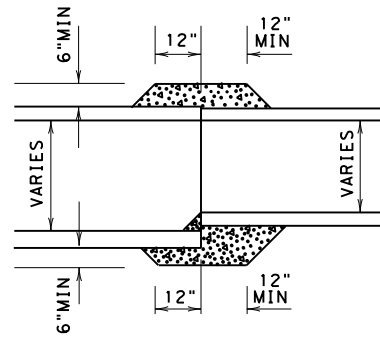
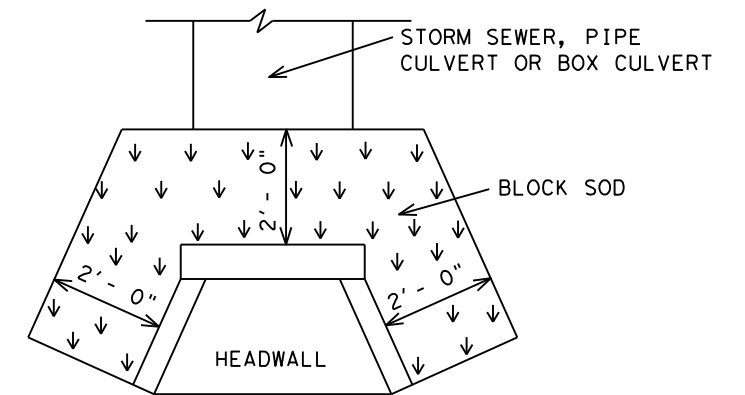
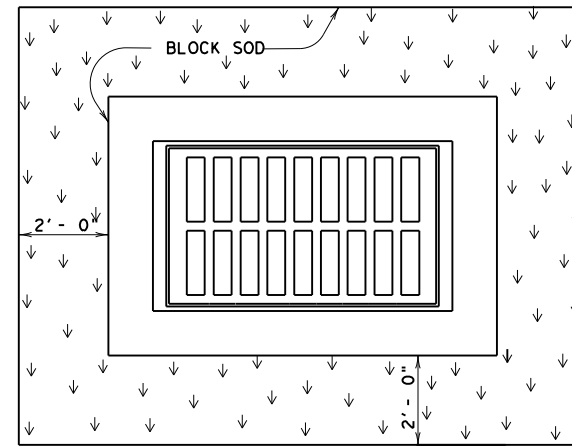
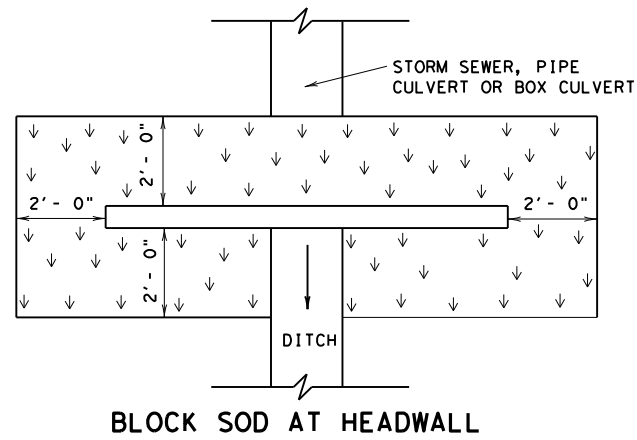
Abraham El Saad, P.E. 11-7-22
Signature of Registrant & Date



FM 1378
AT FM 3286
**CULVERT C
CONTOURS**

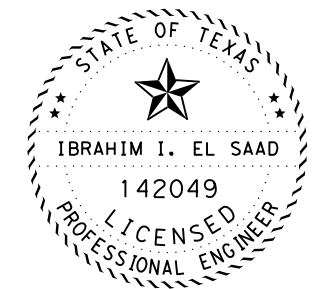
SCALE: 1"=10' SHEET 1 OF 1

DESIGN PR	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
PR	6	SEE TITLE SHEET		FM 1378, ETC.
CHECK IE	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DAL	COLLIN	198
	CONTROL	SECTION	JOB	
	1392	01	044, ETC.	



X = 1'-0" FOR PIPES 42" OR LESS
AND
X = 2'-0" FOR PIPES OVER 42"

CEMENT STABILIZED BACKFILL
FOR STORM SEWERS ON SLOPES GREATER THAN 10%



Ibrahim I. Saad, P.E. 11-7-22
Signature of Registrant & Date

NOTE: Quantities for Block Sod shown at drainage structures are included in SW3P layout sheets.



FM 1378
AT FM 3286
**MISCELLANEOUS
DRAINAGE DETAILS**

SCALE: NTS			SHEET 1 OF 1
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
IIE	6	SEE TITLE SHEET	FM 1378, ETC.
GRAPHICS			
IIE	STATE	DISTRICT	COUNTY
CHECK	TEXAS	DAL	COLLIN
CHECK	CONTROL	SECTION	JOB
	1392	01	044, ETC.

199

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DATE: 10/29/2022 8:42:33 PM
FILE: c:\txdot\pw_online\txdot5\james.i.gwe\d0484749\bcsstd1-20.dgn

Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°, 15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (CY)	Class "C" Conc (Curb) (CY)	Class "C" Conc (Wingwall) (CY)	Total Wingwall Area (SF)
Culvert B (30+62.05) (Rt)	1 ~ 6' X 4'	7.35'	SCP-6	PW-1	15	2:1	7"	7"	4.917	9.500	N/A	N/A	19.670	7.419	N/A	0.0	1.4	23.2	374
Culvert B (30+62.05) (Lt)	1 ~ 6' X 4'	7.35'	SCP-6	PW-1	15	2:1	7"	7"	4.922	9.500	N/A	N/A	19.670	7.419	N/A	0.0	1.4	23.2	374

NOTES:

Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical
 • Side slope at culvert for flared or straight wingwalls.
 • Channel slope for parallel wingwalls.
 • Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

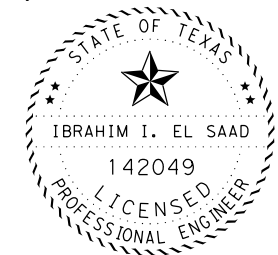
B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)
 Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.
 Area for four wingwalls (two structure ends) if Both.

- (1) Round the wall heights shown to the nearest foot for bidding purposes.
- (2) Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class 5 concrete is required for the top slab of the culvert, also provide Class 5 concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.
- (3) Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.
- (4) Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

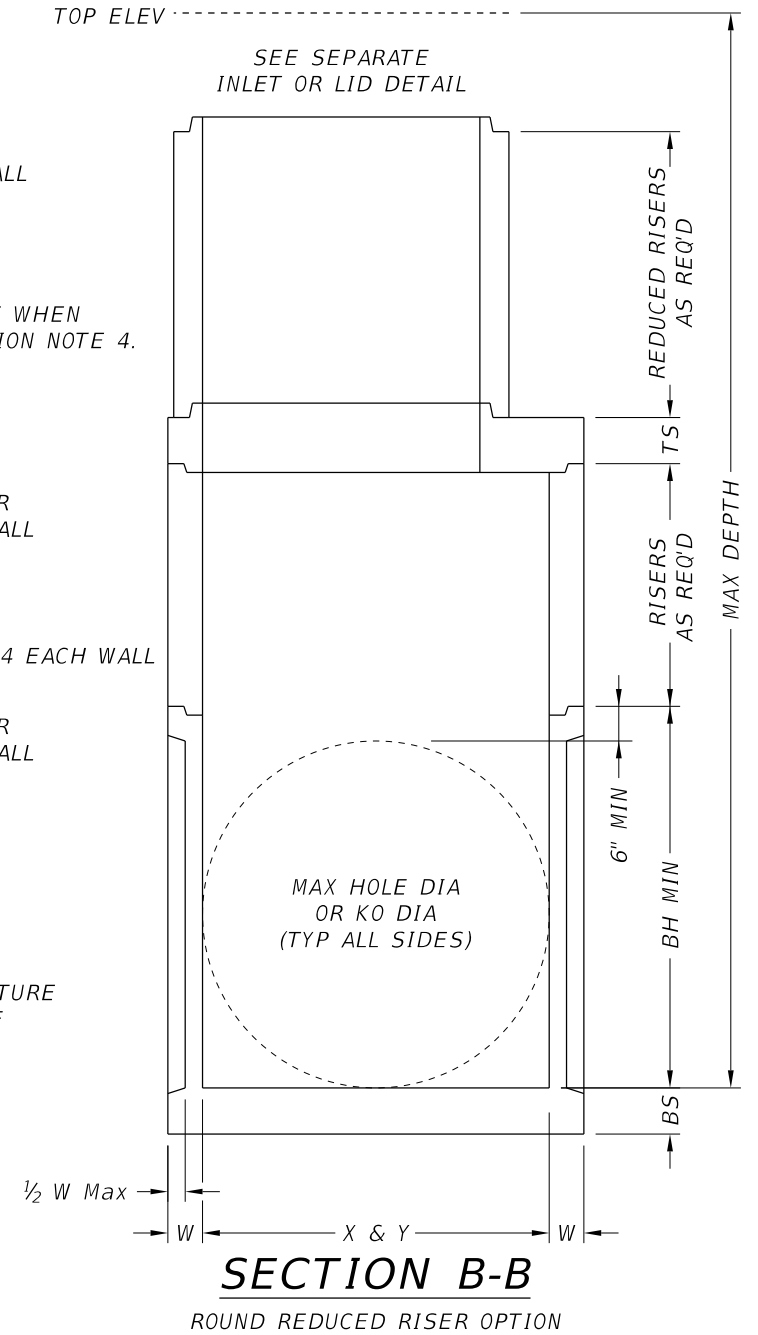
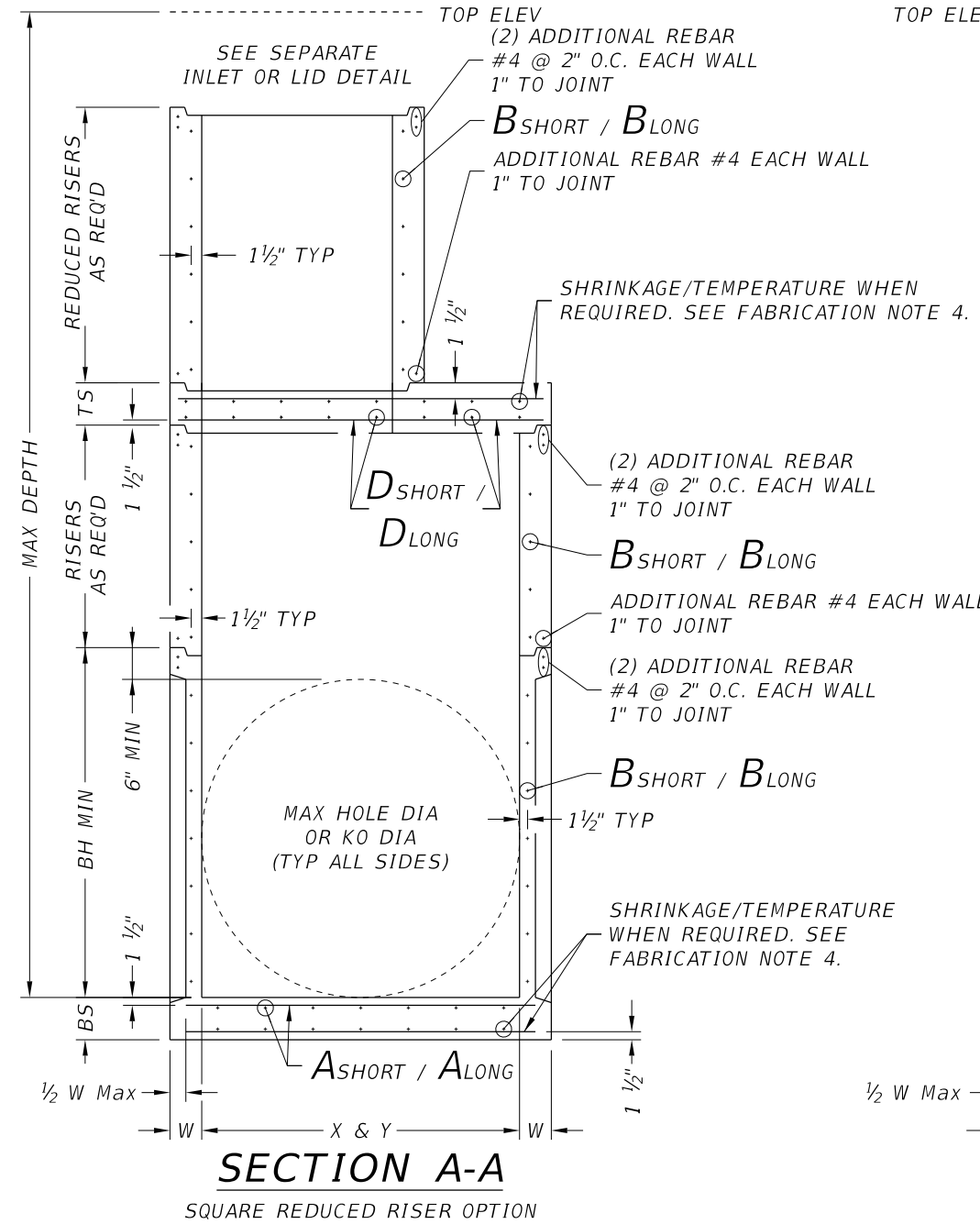
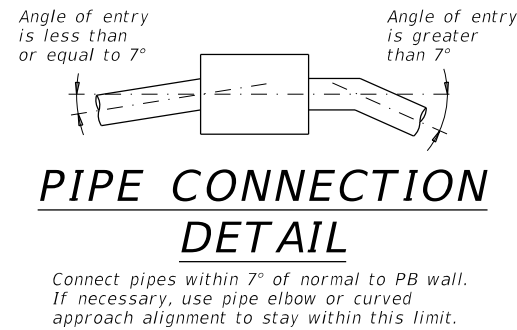
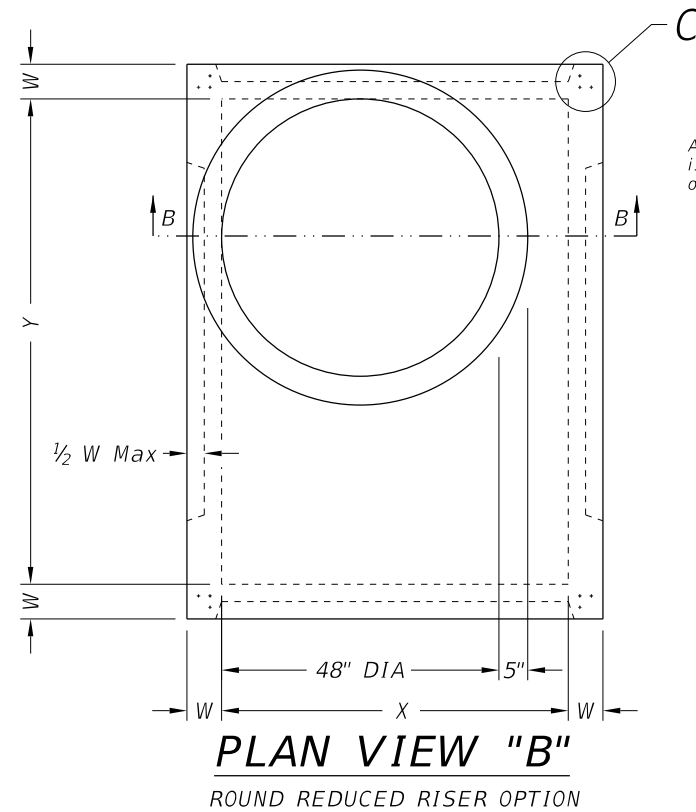
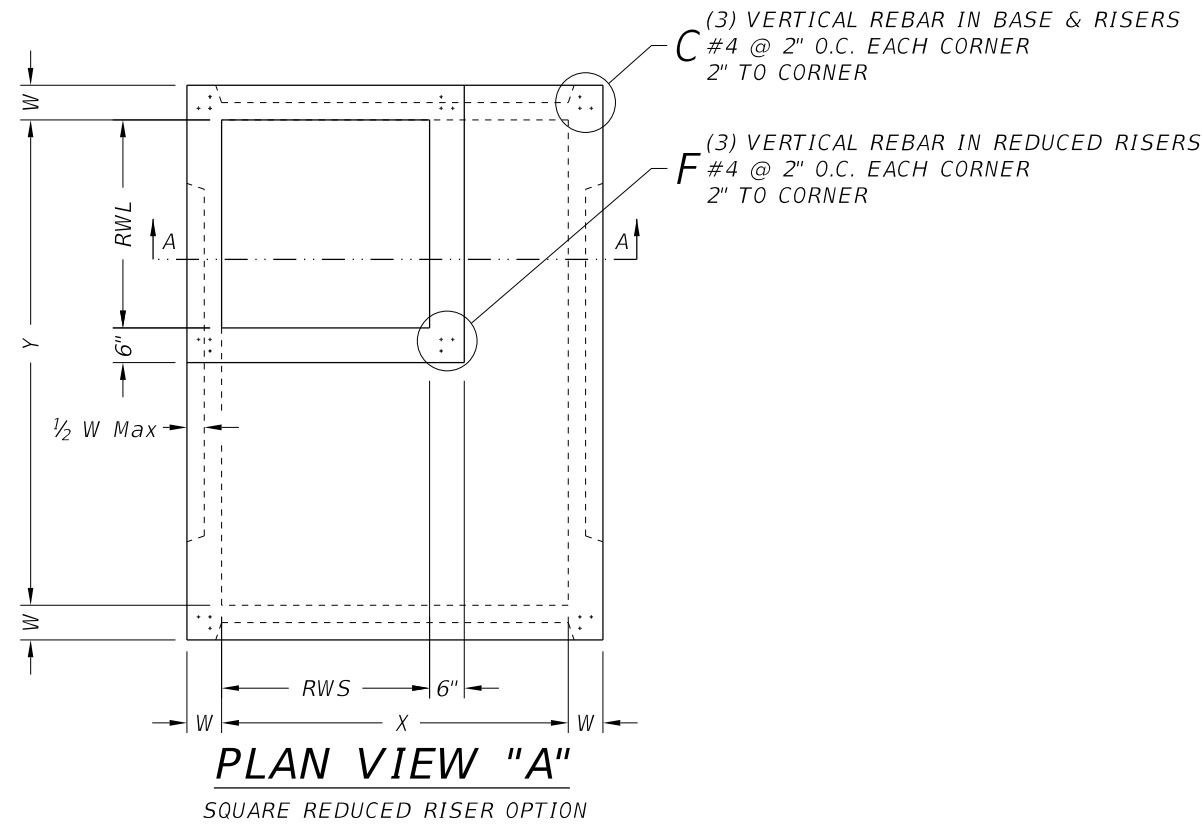


Ibrahim I. El Saad, P.E. 11-7-22
Signature of Registrant & Date

						Bridge Division Standard	
<h2 style="margin: 0;">BOX CULVERT SUPPLEMENT</h2> <h3 style="margin: 0;">WINGS AND END TREATMENTS</h3>							
BCS							
FILE:	bcsstd1-20.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT
©TxDOT	February 2020	REVISIONS	CONT	SECT	JOB	HIGHWAY	
		1392	01	044, ETC.	FM	1378, ETC.	
		DIST	COUNTY		SHEET NO.		
		DAL	COLLIN		200		

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DATE: 10/29/2022 8:42:51 PM
 FILE: c:\txdot\pw_online\txdot5\james.i.gwe\d0482319\prest01-20.dgn



FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 1/2" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.

INSTALLATION NOTES:

1. If required elsewhere. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to specified inlet or manhole.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for precast base is subsidiary to the specified inlet, per Item 465, "Junction Boxes, Manholes, and Inlets."

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Bridge Division Standard

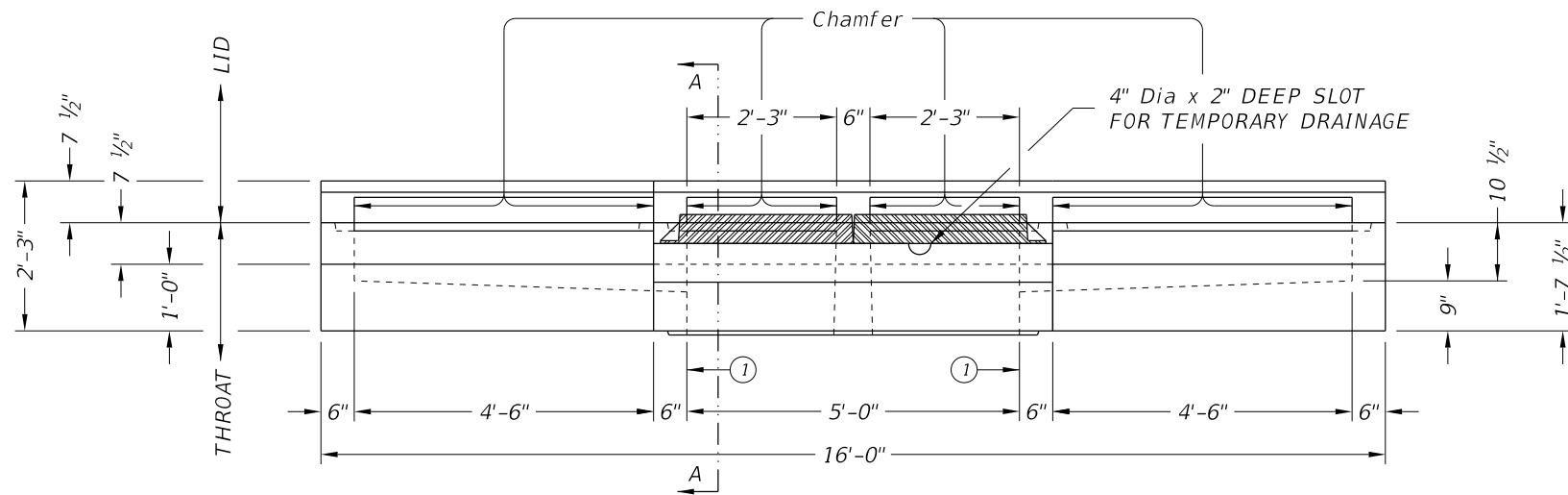
PRECAST BASE

PB

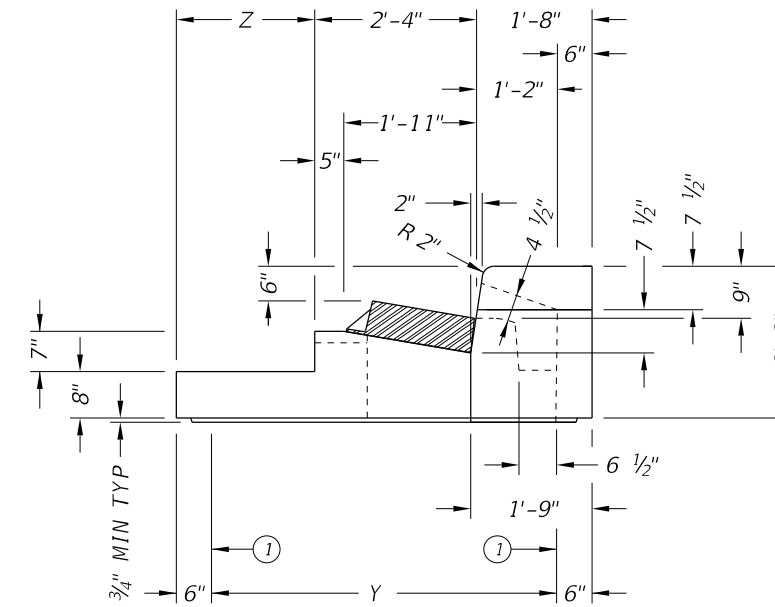
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
	DIST	COUNTY	SHEET NO.	
	DAL	COLLIN	201	

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DATE: 10/29/2022 8:42:58 PM
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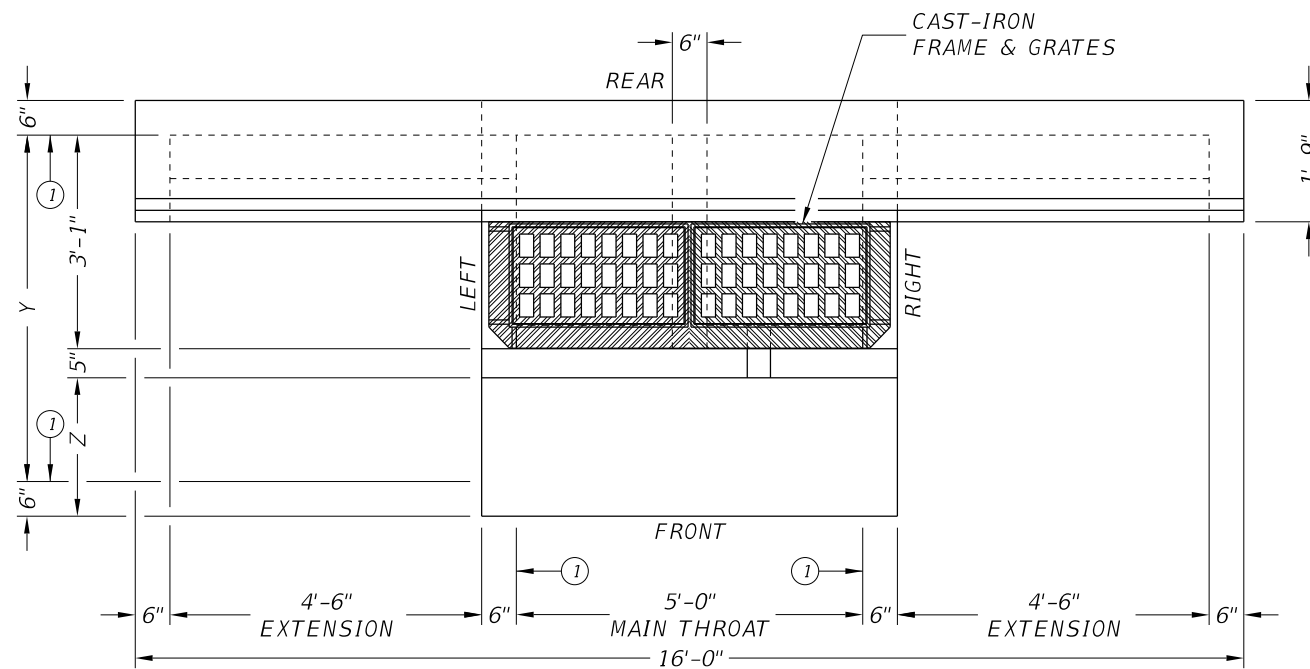


FRONT VIEW
(SHOWING LEFT AND RIGHT EXTENSIONS)



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



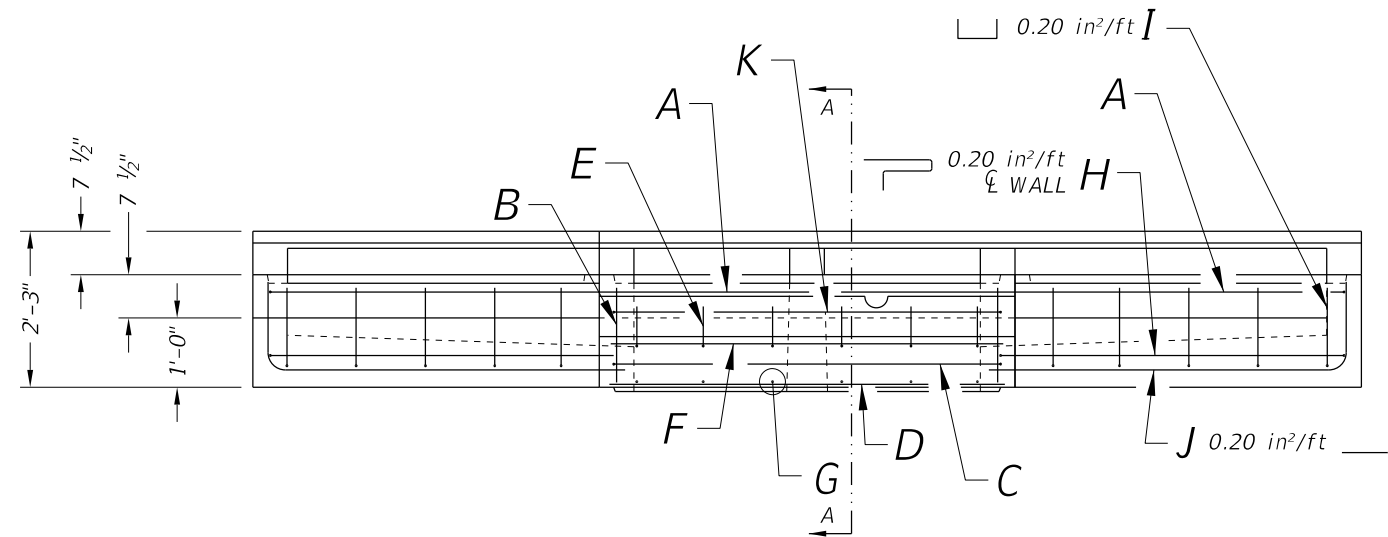
**PRECAST CURB INLET
UNDER ROADWAY**

PCU

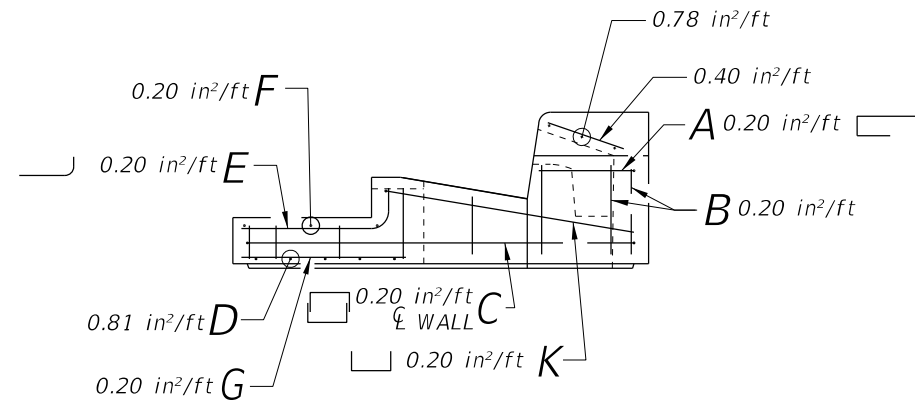
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
	DIST	COUNTY	SHEET NO.	
	DAL	COLLIN	202	

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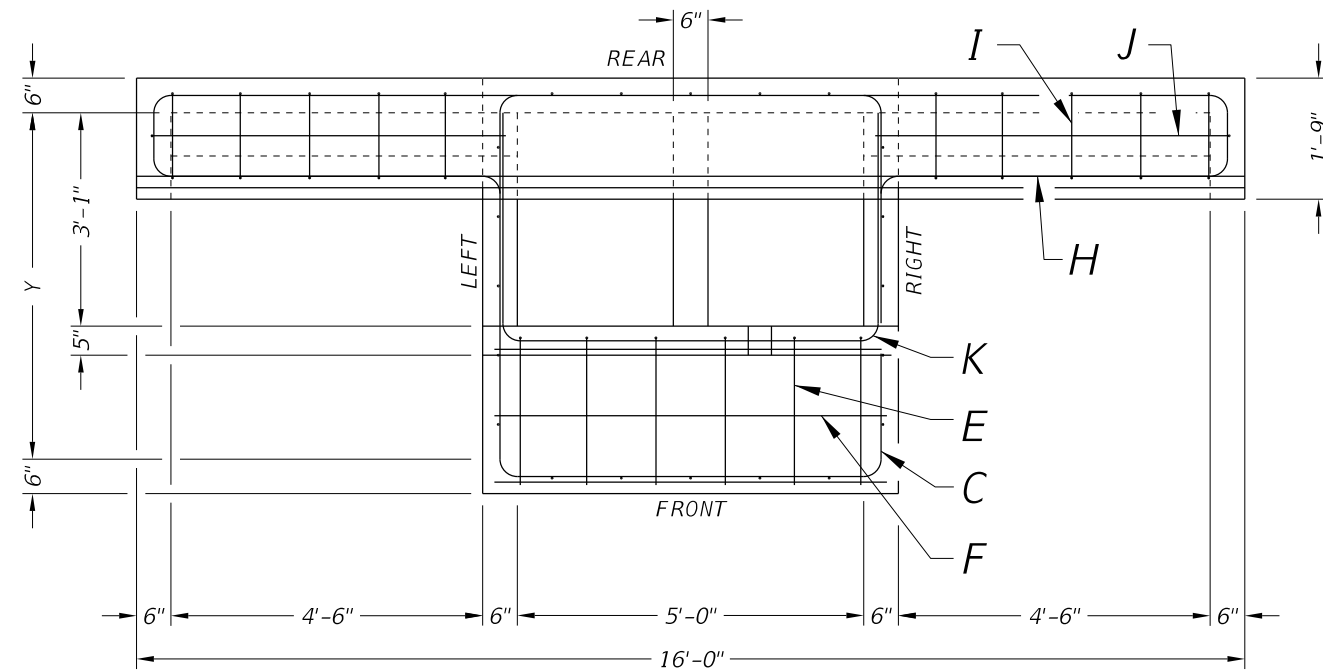
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FRONT VIEW
 (SHOWING LEFT AND RIGHT EXTENSIONS)



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 1/2" 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 3/4". 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 3/4" 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 1/2 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'



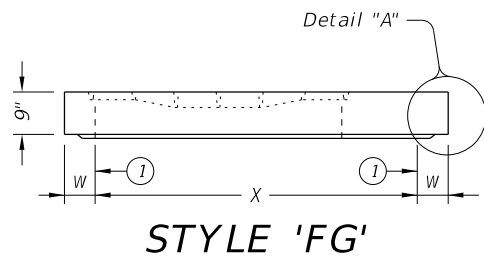
**PRECAST CURB INLET
 UNDER ROADWAY**

PCU

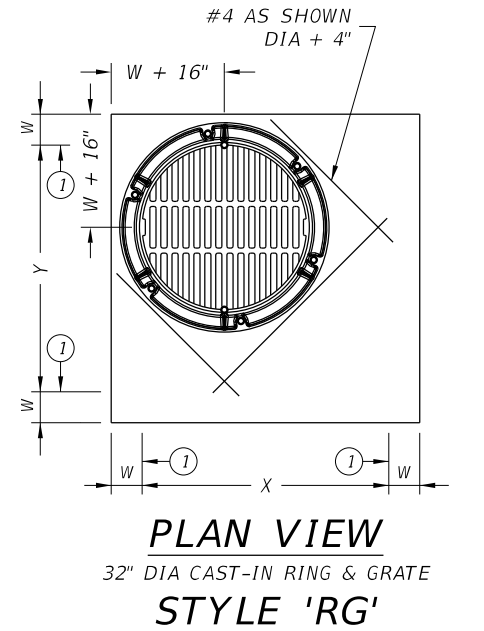
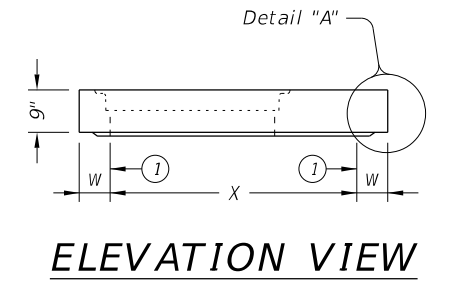
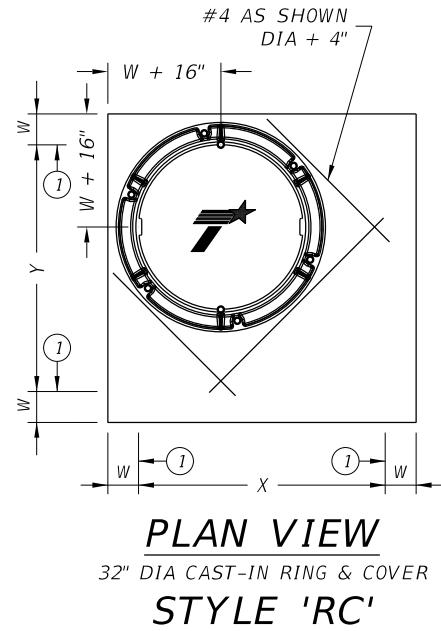
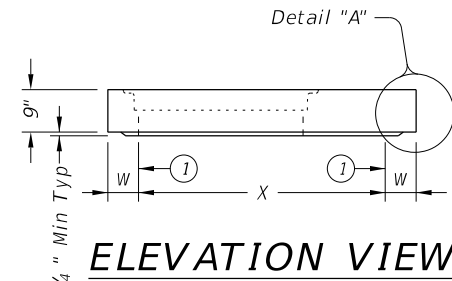
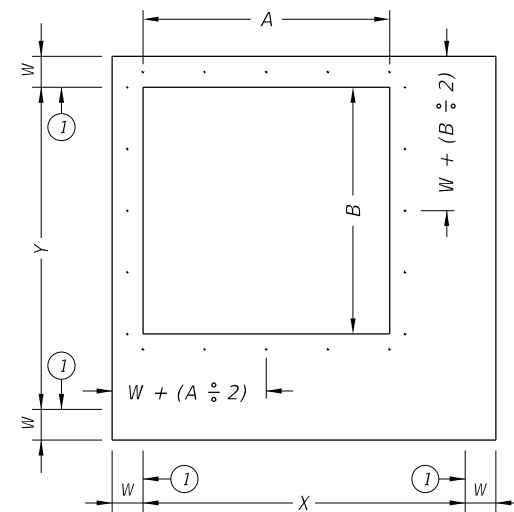
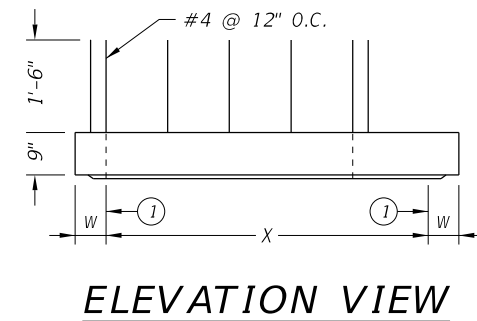
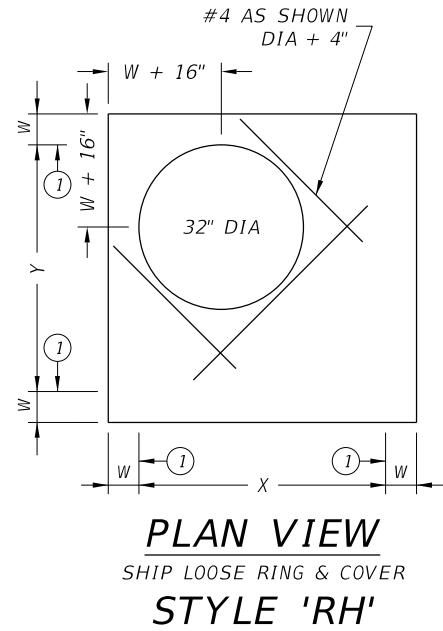
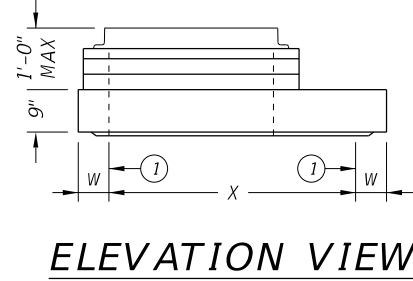
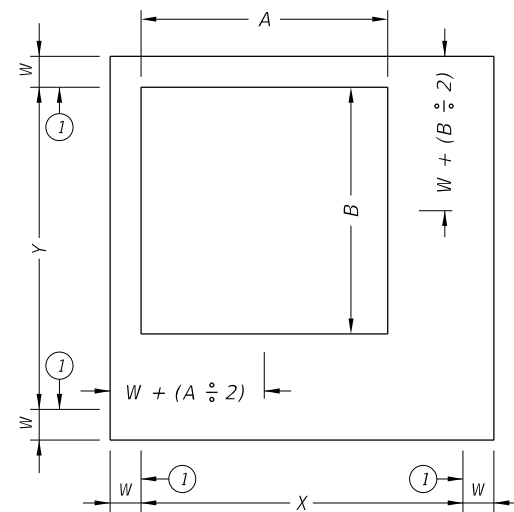
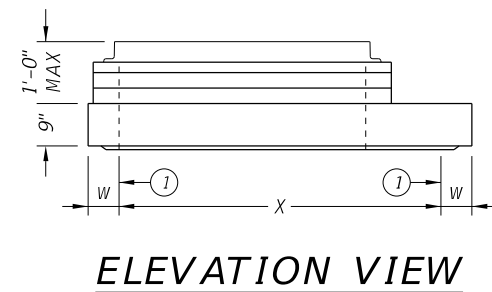
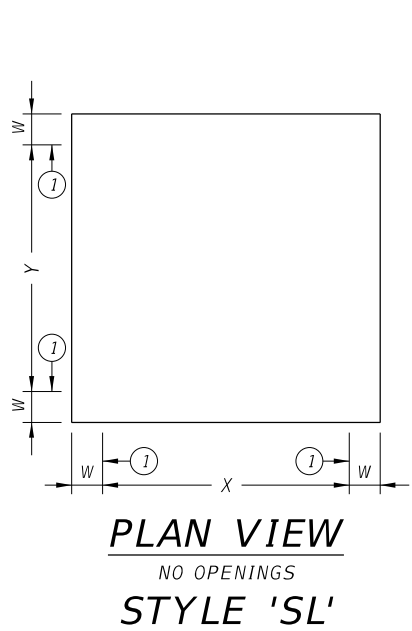
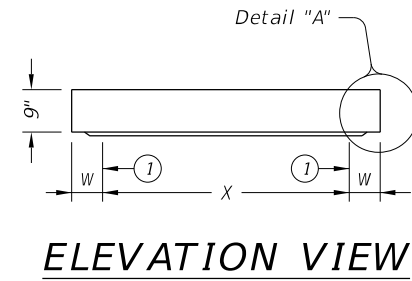
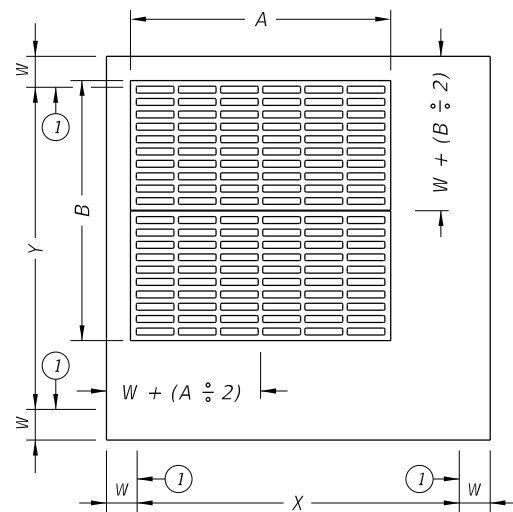
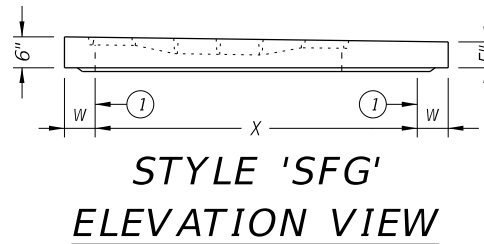
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
DIST	COUNTY	SHEET NO.		
DAL	COLLIN	203		

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ORIENT TAPER TO CORRESPOND WITH ROADWAY CROSS-SLOPE.



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

HL93 LOADING SHEET 1 OF 2



PRECAST SLAB LID

PSL

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REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
DIST	COUNTY		SHEET NO.	
DAL	COLLIN		204	

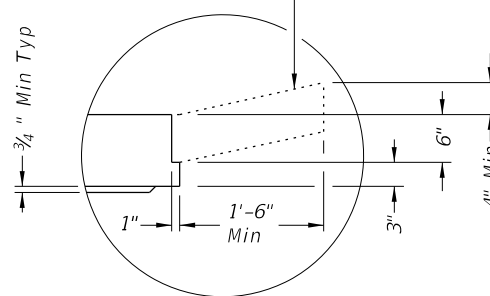
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Style	Size (X x Y)	W ^②	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in ² /ft	0.37 in ² /ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in ² /ft	0.37 in ² /ft
SFG	3'x3'	6"	3'x3'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x4'	6"	n/a	0.34 in ² /ft	0.34 in ² /ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in ² /ft	0.41 in ² /ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in ² /ft	0.41 in ² /ft
SFG	4'x4'	6"	4'x4'	0.32 in ² /ft	0.32 in ² /ft
SL	3'x5'	6"	n/a	0.39 in ² /ft	0.39 in ² /ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in ² /ft	0.48 in ² /ft
SFG	3'x5'	6"	3'x5'	0.32 in ² /ft	0.32 in ² /ft
SL	4'x5'	6"	n/a	0.42 in ² /ft	0.42 in ² /ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in ² /ft	0.42 in ² /ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in ² /ft	0.66 in ² /ft
SL	5'x5'	6"	n/a	0.36 in ² /ft	0.36 in ² /ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in ² /ft	0.43 in ² /ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in ² /ft	0.63 in ² /ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in ² /ft	0.63 in ² /ft
SL	5'x6'	6"/8"	n/a	0.48 in ² /ft	0.48 in ² /ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in ² /ft	0.48 in ² /ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in ² /ft	0.60 in ² /ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in ² /ft	0.60 in ² /ft
SL	6'x6'	6"/8"	n/a	0.43 in ² /ft	0.43 in ² /ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in ² /ft	0.56 in ² /ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in ² /ft	0.59 in ² /ft
SL	8'x8'	8"/10"	n/a	0.45 in ² /ft	0.45 in ² /ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in ² /ft	0.45 in ² /ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in ² /ft	0.45 in ² /ft

^② See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)
 When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of 3/4" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

SHEET 2 OF 2



PRECAST SLAB LID

PSL

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	DIST	COUNTY	SHEET NO.	
	DAL	COLLIN	205	

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TABLE OF DIMENSIONS AND REINFORCING STEEL
 (Wings for one structure end)

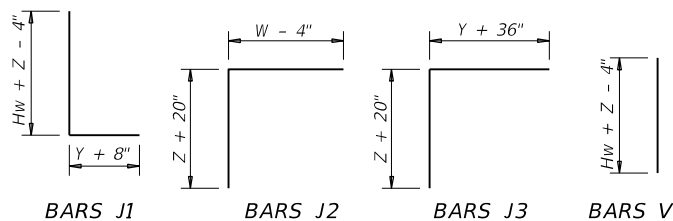
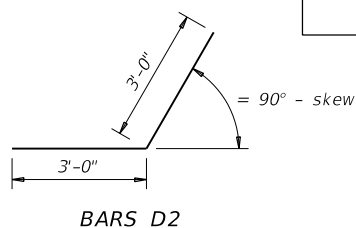
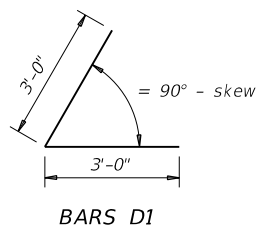
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) ④		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



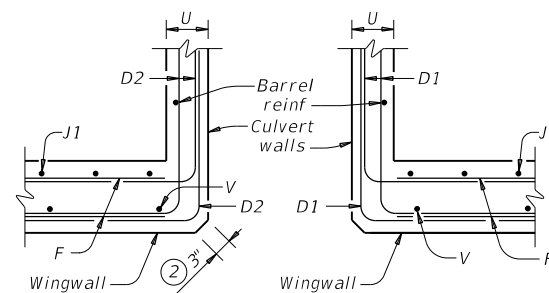
WING DIMENSION FORMULAS:

(All values are in feet.)
 $Hw = H + T + C$
 $Lw = (Hw) (SL) \div \cosine (\theta)$ for Type PW-1
 $= (Hw - 1') (SL) \div \cosine (\theta)$ for Type PW-2 and $Hw \geq 4'$
 $= (Hw - 0.5') (SL) \div \cosine (\theta)$ for Type PW-2 and $Hw < 4'$
 For cast-in-place culverts:
 $Ltw = [(N) (S) + (N + 1) (U)] \div \cosine (\theta)$
 For precast culverts:
 $Ltw = [(N) (2 U + S) + (N - 1) (0.5')] \div \cosine (\theta)$
 Total Wingwall Area (two wings ~ SF)
 $= (2)(Hw)(Lw)$ for Type PW-1
 $= (2)(Hw)(Lw) - 6 SF$ for Type PW-2 and $Hw \geq 4'$
 $= (2)(Hw)(Lw) - 1.5 SF$ for Type PW-2 and $Hw < 4'$

Hw = Height of wingwall
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans
 $SL:1$ = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)
 θ = Culvert skew

See applicable box culvert standard sheet for S, H, T, and U values.

- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"
For 30° skew ~ 2"
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.



SECTION C-C - PW-1

SECTION C-C - PW-2

DESIGNER NOTES:

Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall. Type PW-2 can only be used for applications without a railing mounted to the wingwall.

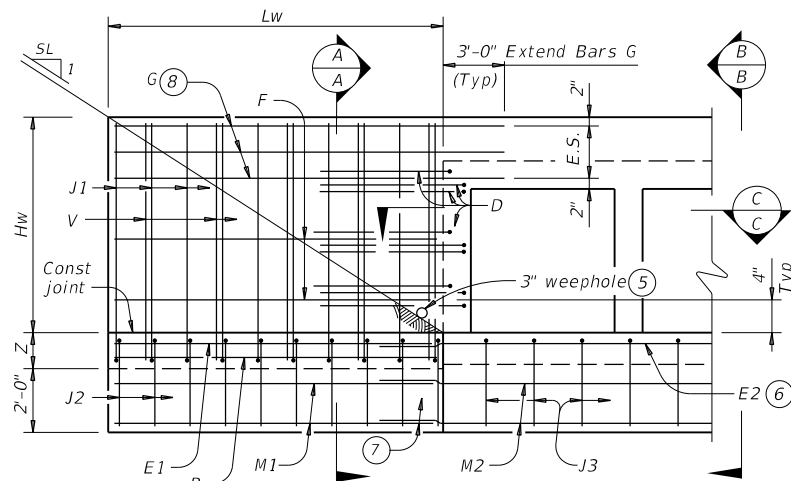
MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.

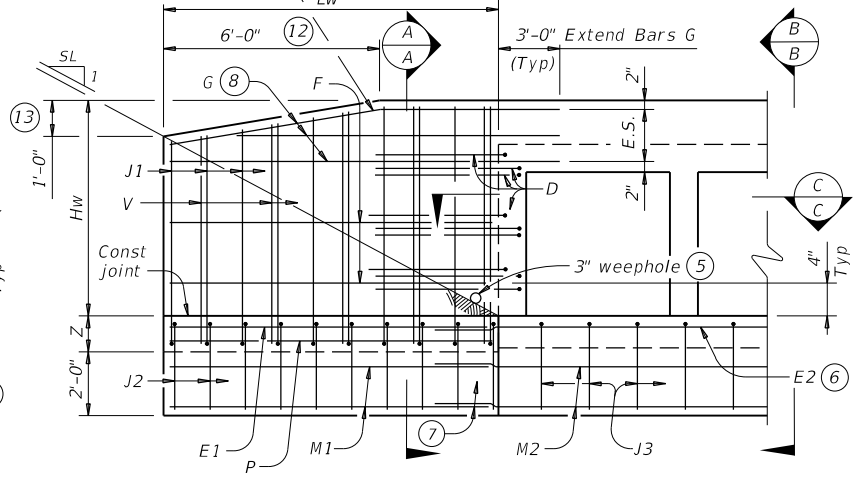
GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information. Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

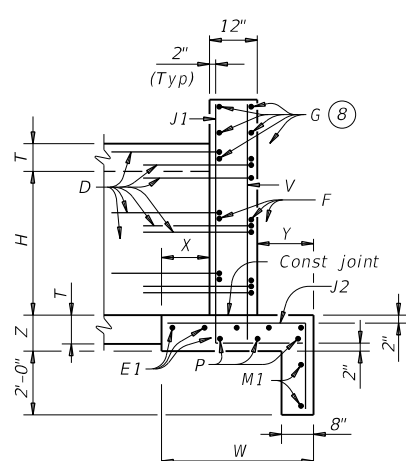
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



PARTIAL ELEVATION - PW-1

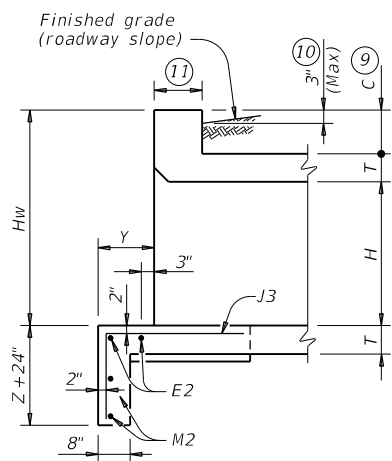


PARTIAL ELEVATION - PW-2



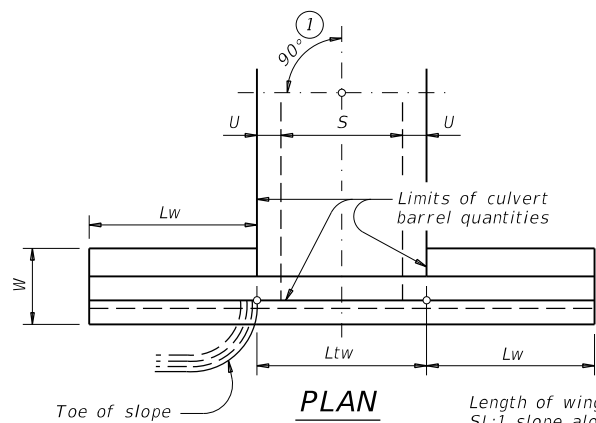
SECTION A-A

(Showing wing reinforcement.)



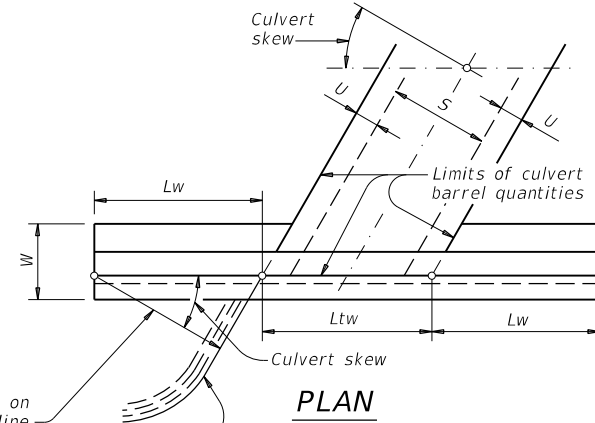
SECTION B-B

(Showing wing reinforcement.)



DETAILS FOR NON-SKEWED BOX CULVERTS

Length of wings based on SL:1 slope along this line.



DETAILS FOR SKEWED BOX CULVERTS

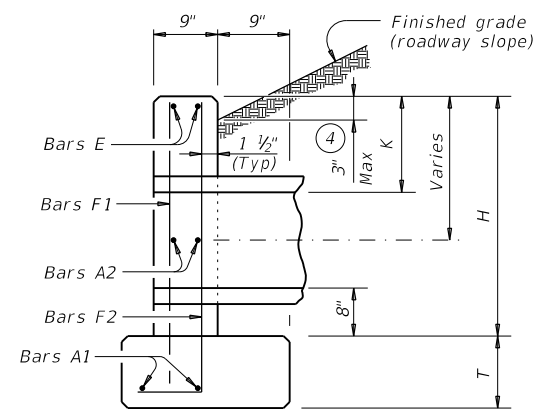
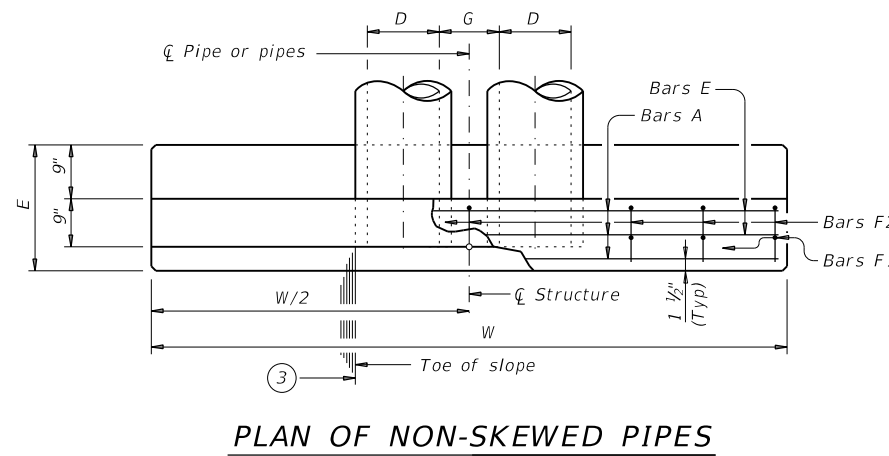
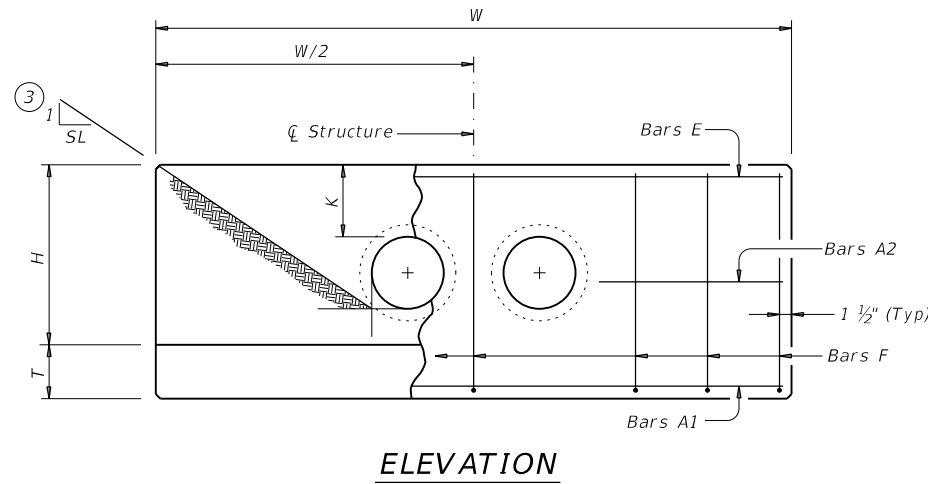
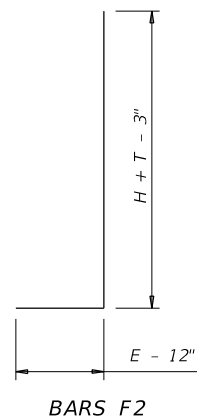
(Showing 30° skew.)

		Bridge Division Standard	
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2			
PW			
FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT
REVISIONS	CONTRACT NO. 1392	SECTION 01	JOB NO. 044, ETC.
	DIST. DAL	COUNTY. COLLIN	SHEET NO. 206

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TABLE OF VARIABLE DIMENSIONS (5) AND QUANTITIES FOR ONE HEADWALL

Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Add'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9'-0"	122	1.1	1'-9"	15	0.2
	15"	10'-3"	136	1.3	2'-2"	16	0.2
	18"	11'-6"	163	1.5	2'-8"	19	0.3
	21"	12'-9"	200	1.8	3'-1"	31	0.4
	24"	14'-0"	217	2.1	3'-7"	34	0.4
	27"	15'-3"	254	2.4	3'-11"	37	0.5
	30"	16'-6"	272	2.7	4'-4"	40	0.6
	33"	17'-9"	314	3.1	4'-8"	43	0.6
	36"	19'-0"	371	3.9	5'-1"	46	0.8
	42"	21'-6"	442	4.9	5'-10"	52	1.0
	48"	25'-0"	569	6.4	6'-7"	59	1.3
	54"	27'-6"	701	7.5	7'-6"	82	1.6
60"	30'-0"	794	8.8	8'-3"	90	1.8	
66"	32'-6"	894	10.2	8'-9"	96	2.0	
72"	35'-0"	1,055	11.7	9'-4"	103	2.3	
3:1	12"	13'-0"	175	1.6	1'-9"	14	0.2
	15"	14'-9"	193	1.9	2'-2"	17	0.2
	18"	16'-6"	228	2.2	2'-8"	19	0.3
	21"	18'-3"	299	2.6	3'-1"	31	0.4
	24"	20'-0"	323	3.0	3'-7"	33	0.4
	27"	21'-9"	371	3.5	3'-11"	37	0.5
	30"	23'-6"	415	4.0	4'-4"	40	0.5
	33"	25'-3"	469	4.6	4'-8"	43	0.6
	36"	27'-0"	556	5.7	5'-1"	46	0.8
	42"	30'-6"	675	7.1	5'-10"	52	1.0
	48"	35'-6"	837	9.2	6'-7"	59	1.3
	54"	39'-0"	1,015	11.0	7'-6"	84	1.6
60"	42'-6"	1,171	12.9	8'-3"	91	1.8	
66"	46'-0"	1,298	14.9	8'-9"	98	2.0	
72"	49'-6"	1,561	17.1	9'-4"	103	2.3	
4:1	12"	17'-0"	229	2.0	1'-9"	15	0.2
	15"	19'-3"	266	2.4	2'-2"	17	0.2
	18"	21'-6"	308	2.9	2'-8"	19	0.3
	21"	23'-9"	382	3.5	3'-1"	31	0.3
	24"	26'-0"	430	3.9	3'-7"	34	0.4
	27"	28'-3"	486	4.7	3'-11"	37	0.5
	30"	30'-6"	539	5.2	4'-4"	40	0.6
	33"	32'-9"	603	6.0	4'-8"	42	0.6
	36"	35'-0"	738	7.5	5'-1"	47	0.8
	42"	39'-6"	881	9.3	5'-10"	52	1.0
	48"	46'-0"	1,102	12.1	6'-7"	61	1.3
	54"	50'-6"	1,364	14.4	7'-6"	84	1.6
60"	55'-0"	1,547	16.9	8'-3"	91	1.8	
66"	59'-6"	1,741	19.5	8'-9"	98	2.0	
72"	64'-0"	2,077	22.4	9'-4"	102	2.3	
6:1	12"	25'-0"	336	3.0	1'-9"	14	0.2
	15"	28'-3"	384	3.6	2'-2"	17	0.2
	18"	31'-6"	452	4.2	2'-8"	19	0.3
	21"	34'-9"	581	5.1	3'-1"	31	0.4
	24"	38'-0"	644	5.8	3'-7"	34	0.4
	27"	41'-3"	737	6.9	3'-11"	37	0.5
	30"	44'-6"	807	7.7	4'-4"	39	0.6
	33"	47'-9"	912	8.9	4'-8"	44	0.6
	36"	51'-0"	1,108	11.0	5'-1"	48	0.8
	42"	57'-6"	1,318	13.7	5'-10"	54	1.0
	48"	67'-0"	1,682	17.9	6'-7"	59	1.3
	54"	73'-6"	2,072	21.3	7'-6"	83	1.6
60"	80'-0"	2,351	24.9	8'-3"	89	1.8	
66"	86'-6"	2,643	28.9	8'-9"	96	2.0	
72"	93'-0"	3,121	33.1	9'-4"	101	2.3	



- ① Total quantities include one 3'-1" lap for bars over 60' in length.
- ② Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- ③ Indicated slope is perpendicular to centerline pipe or pipes.
- ④ For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-4"	1'-3"	7'-11"	1'-0"	4'-0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Do not mount bridge rails of any type directly to these culvert headwalls.
 This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation
Bridge Division Standard

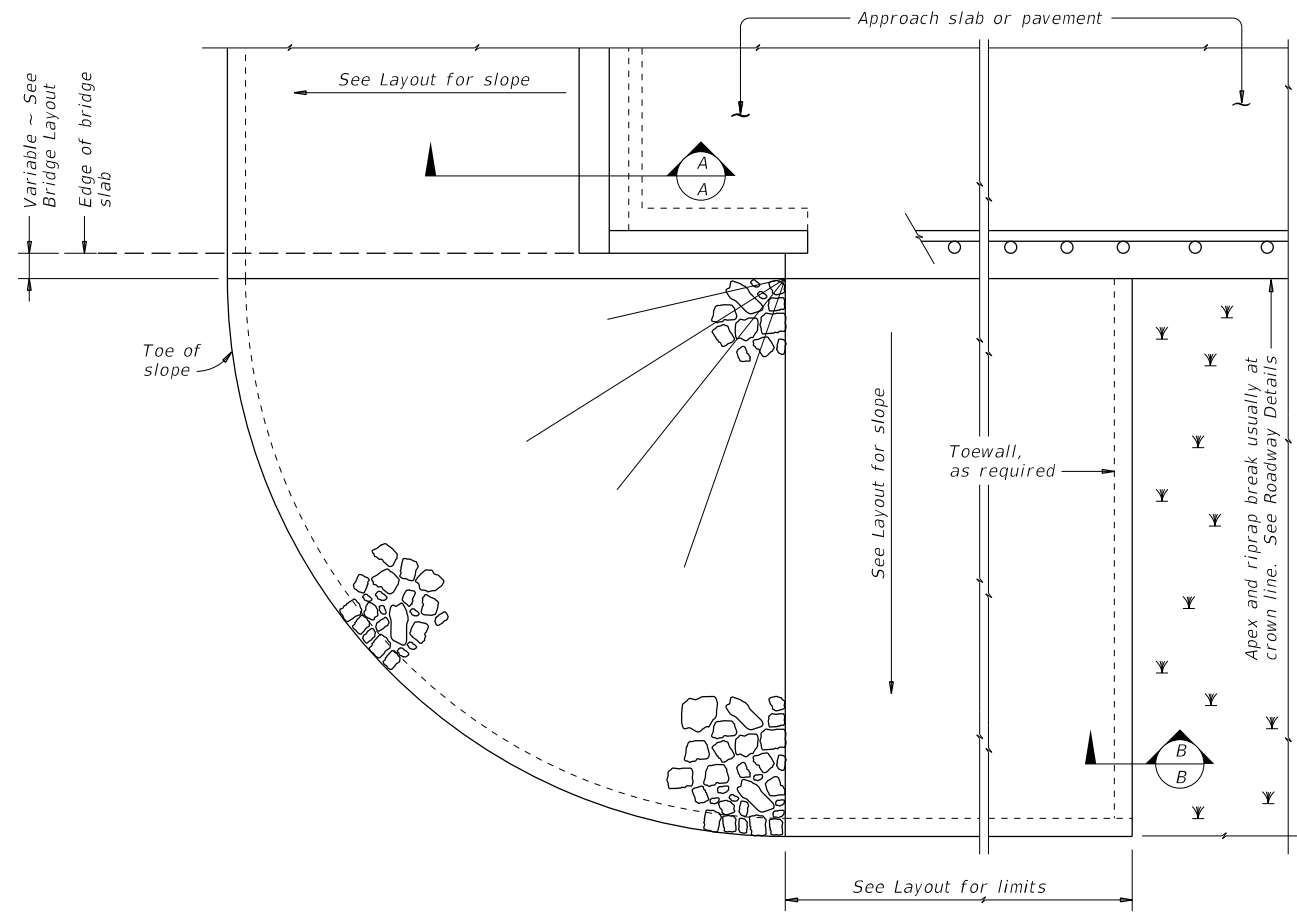
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

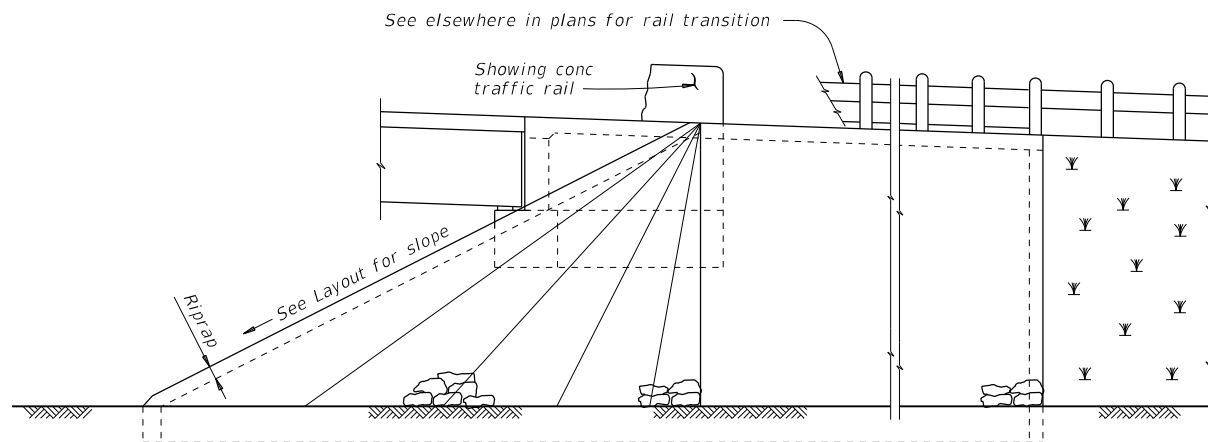
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
	DIST	COUNTY	SHEET NO.	
	DAL	COLLIN	207	

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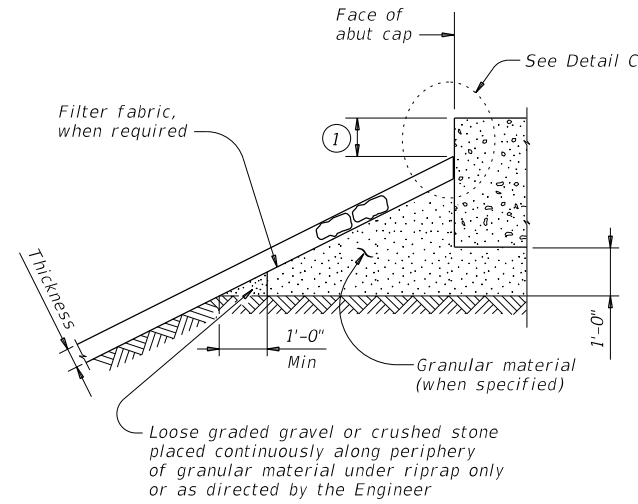
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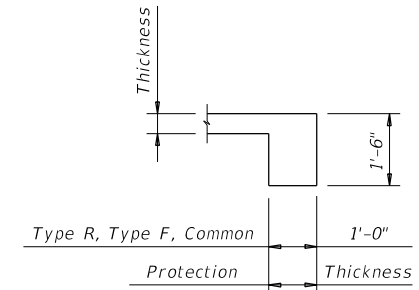
PLAN



ELEVATION

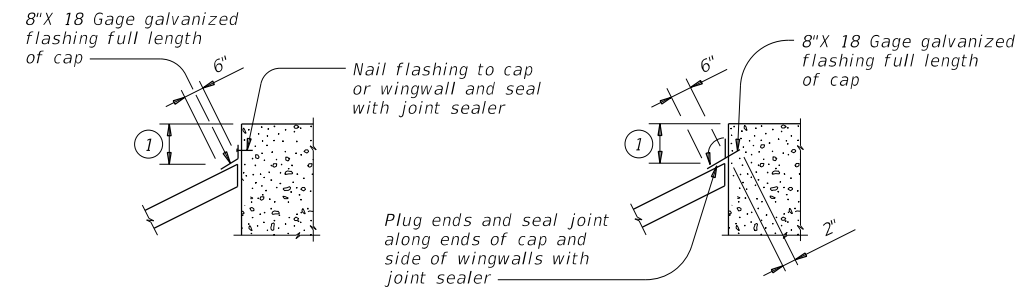


SECTION A-A AT CAP



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

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:

Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
 See elsewhere in plans for locations and details of shoulder drains.

SHEET 1 OF 2

		Bridge Division Standard	
<h1>STONE RIPRAP</h1>			
<h2>SRR</h2>			
FILE: srrstd1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	1392	01	044, ETC.FM 1378, ETC.
DIST	COUNTY		SHEET NO.
DAL	COLLIN		209

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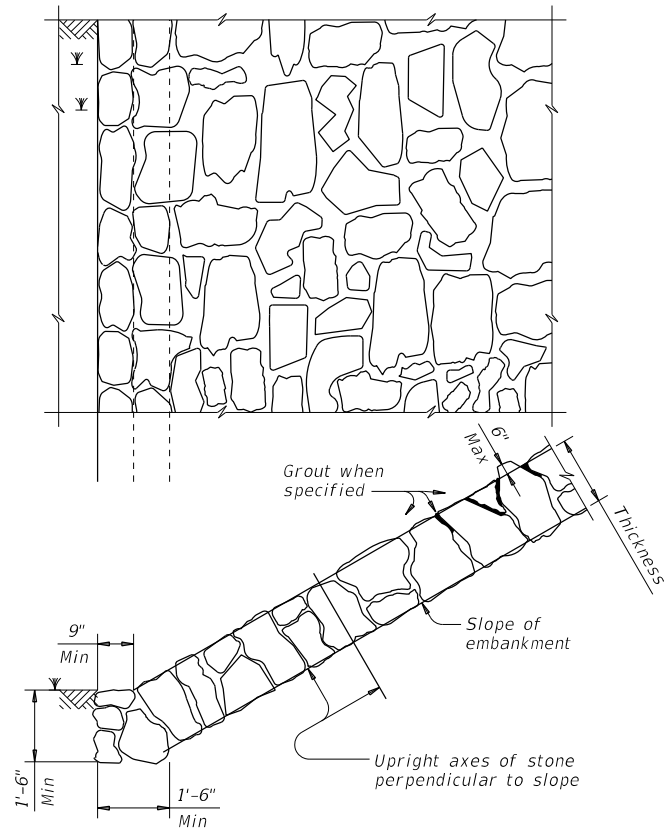


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

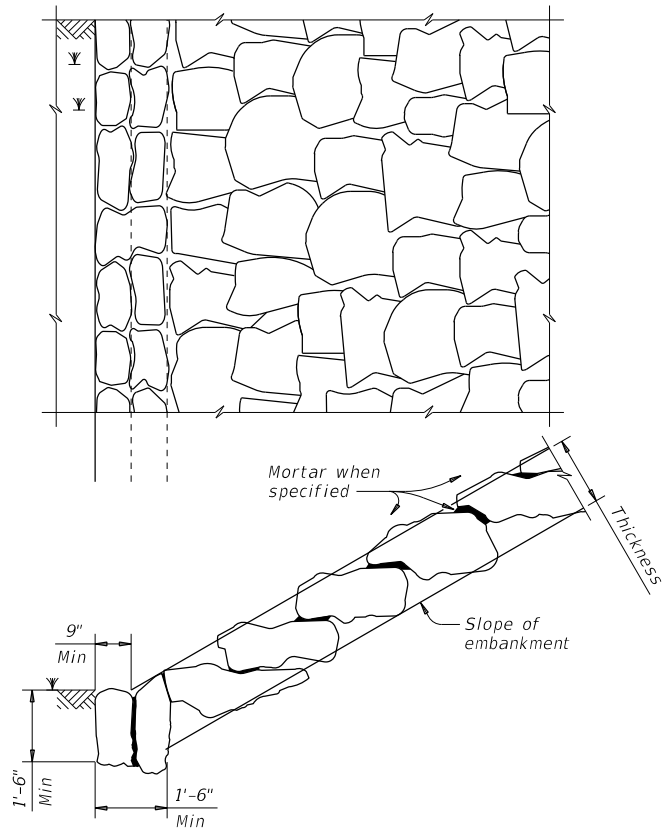


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

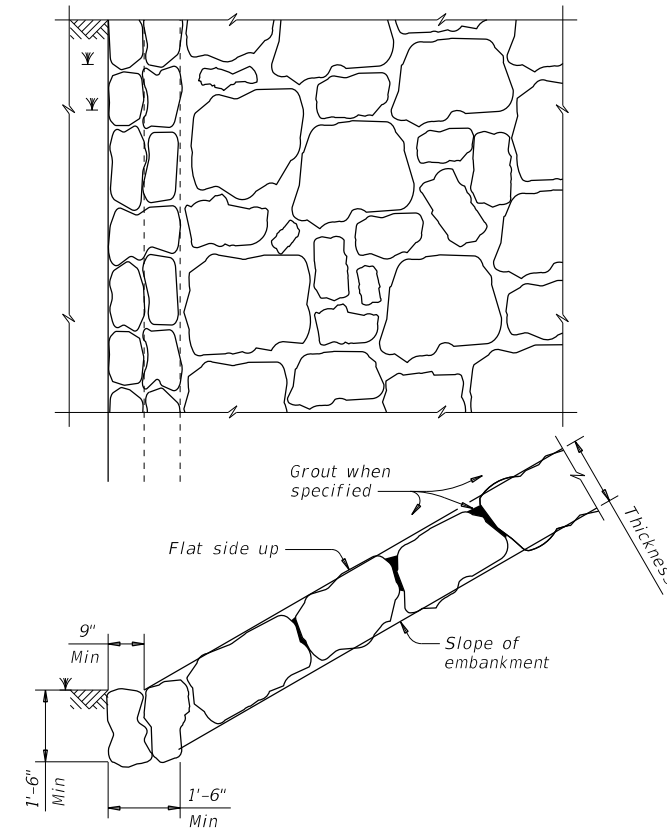
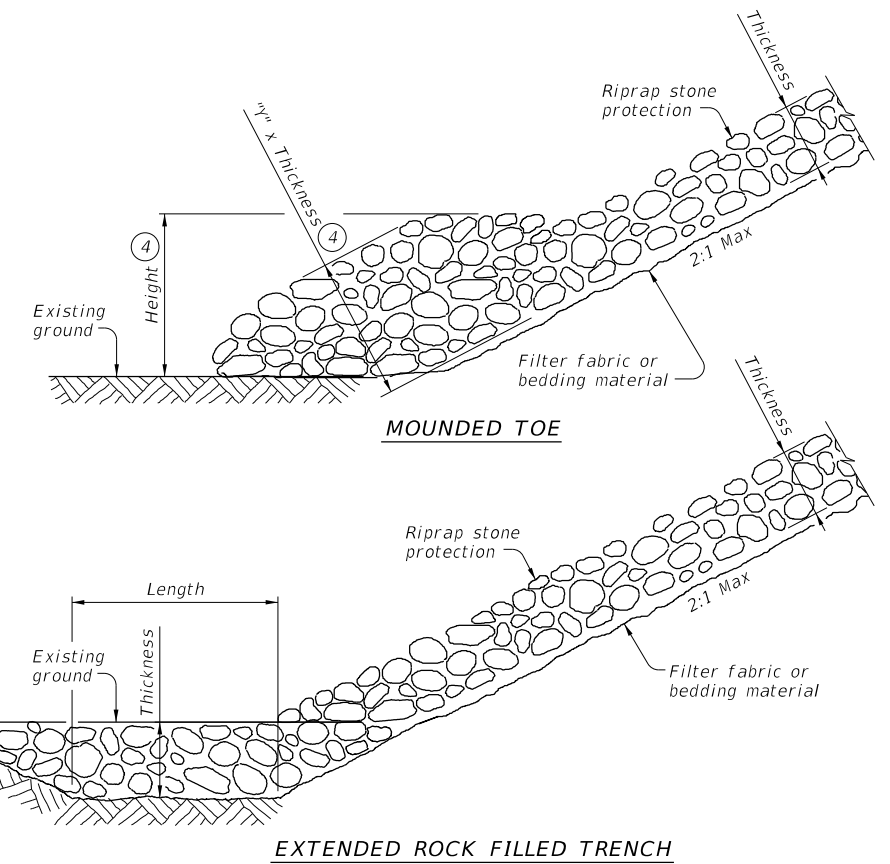


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

- 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.



PROTECTION STONE RIPRAP TOE OPTIONS ⑤

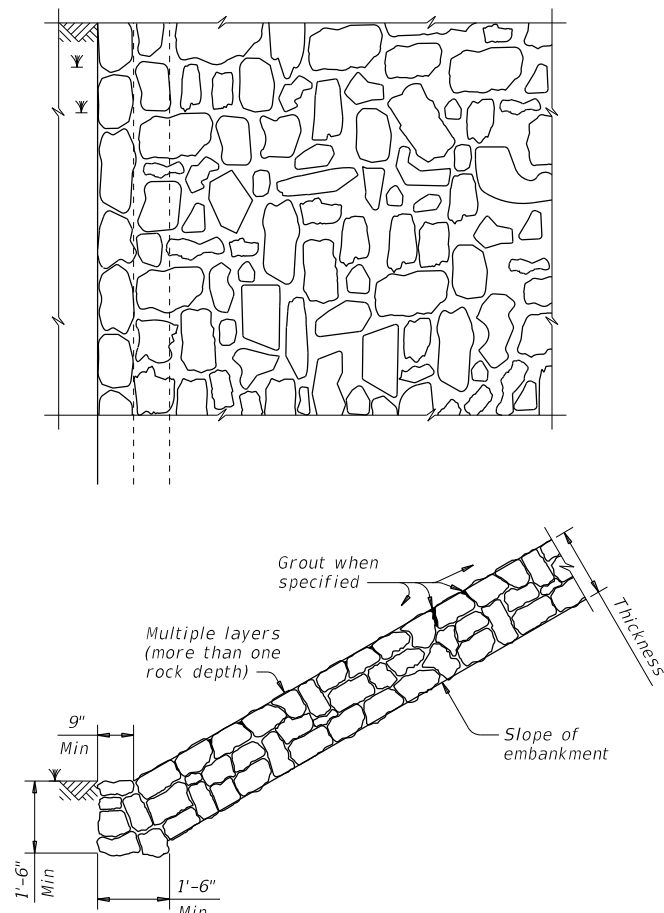


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

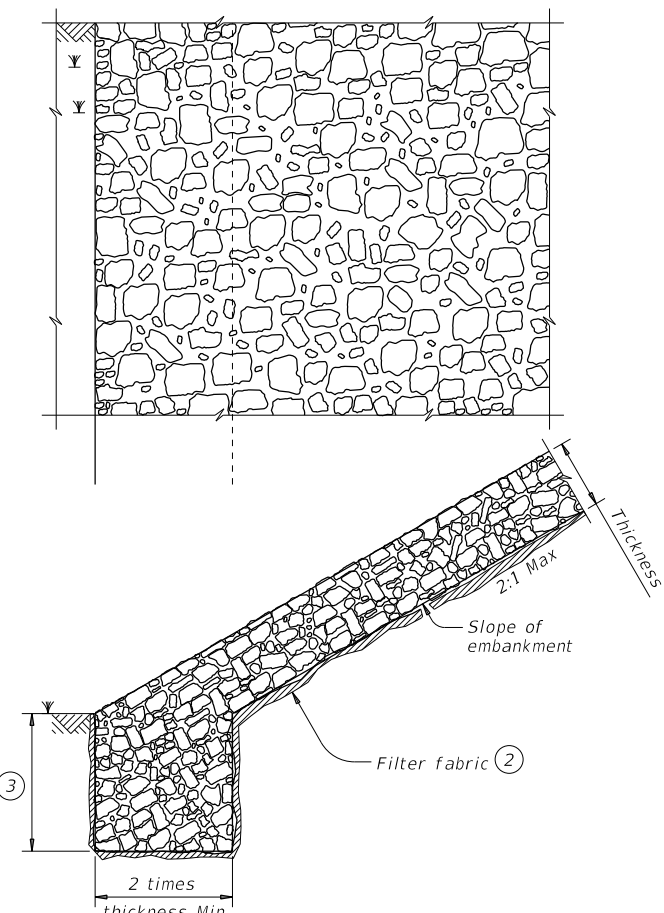
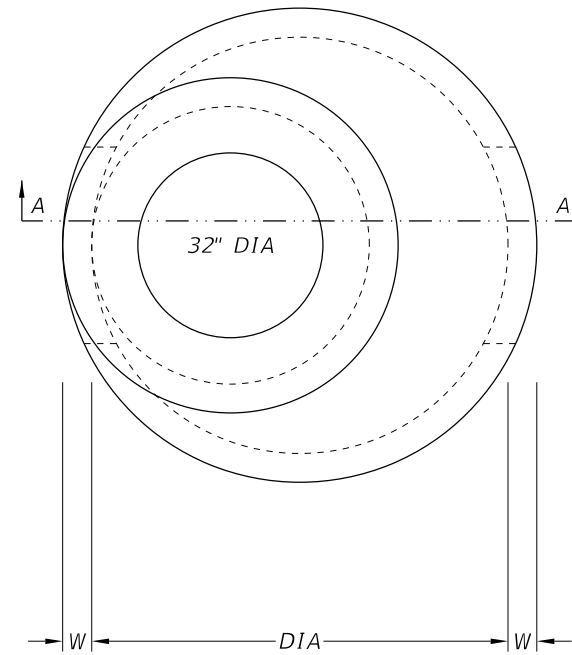


FIGURE 5 ~ PROTECTION STONE RIPRAP ⑤

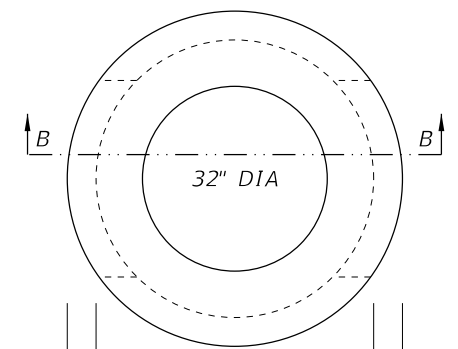
		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH
① TxDOT April 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	1392 01	044, ETC.FM 1378, ETC.	
DIST	COUNTY	SHEET NO.	
DAL	COLLIN	210	

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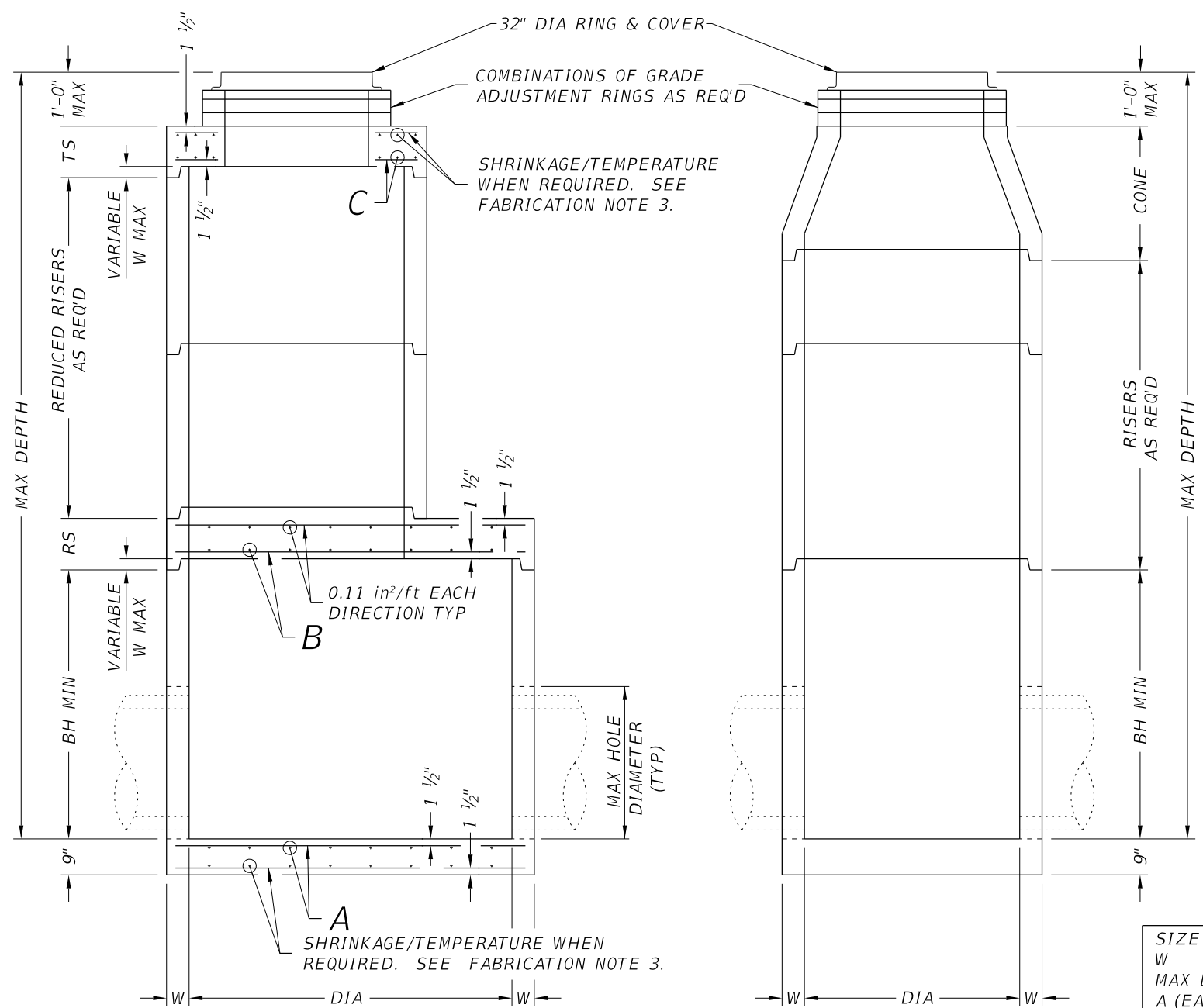
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PLAN VIEW "A"



PLAN VIEW "B"



SECTION A-A
 ROUND REDUCED RISER OPTION
 SHOWING FLAT SLAB TOP

SECTION B-B
 ROUND RISER OPTION
 SHOWING CONE

- 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. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
 3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
 4. Manufacture base and risers to nearest 3" increment.
 5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
 6. Provide lifting devices in conformance with Manufacturer's recommendations.
 7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

- INSTALLATION NOTES:**
1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
 2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
 3. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
 4. Do not grout rubber gasket joints without Manufacturer's recommendation.
 5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
 6. Grade adjustment rings may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

- GENERAL NOTES:**
1. Designed according to ASTM C478.
 2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
 3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in ² /ft	0.30 in ² /ft	0.45 in ² /ft
B (EACH WAY)	N/A	0.37 in ² /ft	0.62 in ² /ft
C (EACH WAY)	0.24 in ² /ft	0.46 in ² /ft	0.46 in ² /ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

HL93 LOADING



PRECAST ROUND MANHOLE

PRM

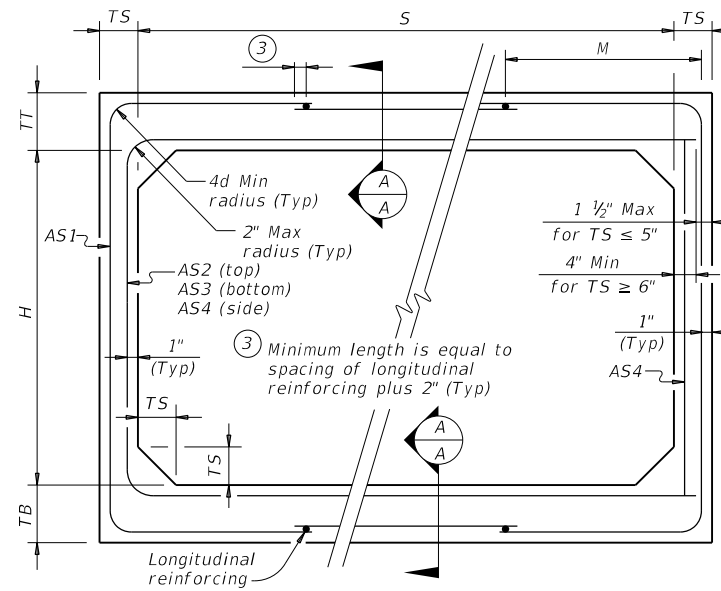
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DIST	COUNTY		SHEET NO.	
DAL	COLLIN		211	

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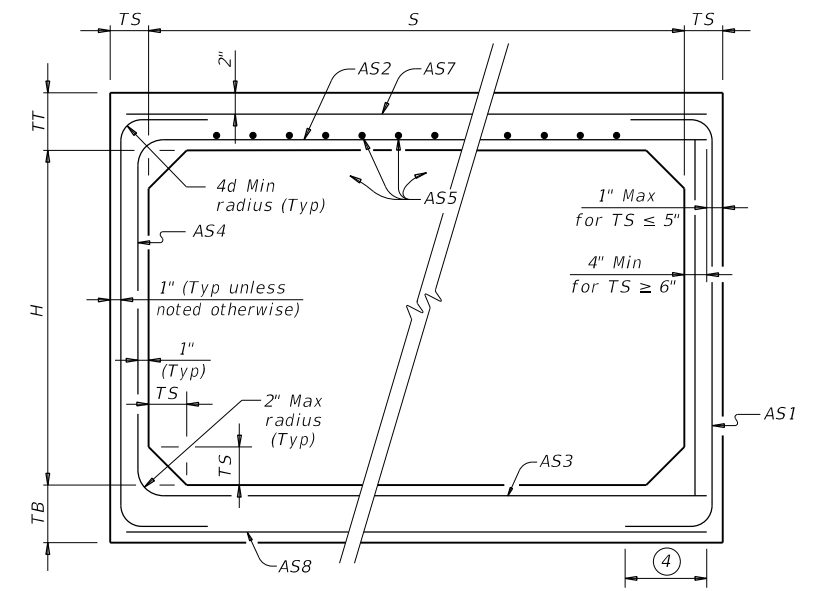
BOX DATA

SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②						① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	
6	2	8	7	7	< 2	-	0.23	0.27	0.19	0.17	0.19	0.17	7.2
6	2	7	7	7	2 < 3	43	0.25	0.21	0.17	0.17	-	-	6.8
6	2	7	7	7	3 - 5	43	0.20	0.17	0.17	0.17	-	-	6.8
6	2	7	7	7	10	39	0.20	0.17	0.17	0.17	-	-	6.8
6	2	7	7	7	15	39	0.26	0.20	0.20	0.17	-	-	6.8
6	2	7	7	7	20	39	0.34	0.26	0.26	0.17	-	-	6.8
6	2	7	7	7	25	39	0.43	0.32	0.32	0.17	-	-	6.8
6	2	7	7	7	30	39	0.52	0.38	0.39	0.17	-	-	6.8
6	3	8	7	7	< 2	-	0.20	0.31	0.22	0.17	0.19	0.19	7.9
6	3	7	7	7	2 < 3	43	0.21	0.24	0.19	0.17	-	-	7.5
6	3	7	7	7	3 - 5	39	0.17	0.18	0.17	0.17	-	-	7.5
6	3	7	7	7	10	39	0.17	0.18	0.19	0.17	-	-	7.5
6	3	7	7	7	15	38	0.22	0.24	0.24	0.17	-	-	7.5
6	3	7	7	7	20	38	0.28	0.31	0.31	0.17	-	-	7.5
6	3	7	7	7	25	38	0.35	0.38	0.39	0.17	-	-	7.5
6	3	7	7	7	30	38	0.42	0.46	0.46	0.17	-	-	7.5
6	4	8	7	7	< 2	-	0.19	0.34	0.25	0.17	0.19	0.19	8.6
6	4	7	7	7	2 < 3	43	0.19	0.27	0.21	0.17	-	-	8.2
6	4	7	7	7	3 - 5	39	0.17	0.21	0.19	0.17	-	-	8.2
6	4	7	7	7	10	39	0.17	0.20	0.21	0.17	-	-	8.2
6	4	7	7	7	15	38	0.18	0.27	0.27	0.17	-	-	8.2
6	4	7	7	7	20	38	0.24	0.34	0.35	0.17	-	-	8.2
6	4	7	7	7	25	38	0.29	0.43	0.42	0.17	-	-	8.2
6	4	7	7	7	30	38	0.35	0.51	0.52	0.17	-	-	8.2
6	5	8	7	7	< 2	-	0.19	0.37	0.28	0.17	0.19	0.19	9.3
6	5	7	7	7	2 < 3	43	0.17	0.30	0.24	0.17	-	-	8.9
6	5	7	7	7	3 - 5	43	0.17	0.23	0.21	0.17	-	-	8.9
6	5	7	7	7	10	39	0.17	0.22	0.23	0.17	-	-	8.9
6	5	7	7	7	15	38	0.17	0.28	0.29	0.17	-	-	8.9
6	5	7	7	7	20	38	0.20	0.37	0.38	0.17	-	-	8.9
6	5	7	7	7	25	38	0.25	0.45	0.46	0.17	-	-	8.9
6	5	7	7	7	30	38	0.30	0.54	0.55	0.17	-	-	8.9
6	6	8	7	7	< 2	-	0.19	0.38	0.30	0.17	0.19	0.19	10
6	6	7	7	7	2 < 3	52	0.17	0.32	0.26	0.17	-	-	9.6
6	6	7	7	7	3 - 5	52	0.17	0.24	0.22	0.17	-	-	9.6
6	6	7	7	7	10	43	0.17	0.23	0.24	0.17	-	-	9.6
6	6	7	7	7	15	39	0.17	0.29	0.31	0.17	-	-	9.6
6	6	7	7	7	20	39	0.18	0.38	0.39	0.17	-	-	9.6
6	6	7	7	7	25	38	0.23	0.46	0.48	0.17	-	-	9.6
6	6	7	7	7	30	38	0.27	0.55	0.57	0.17	-	-	9.6



CORNER OPTION "A" CORNER OPTION "B"

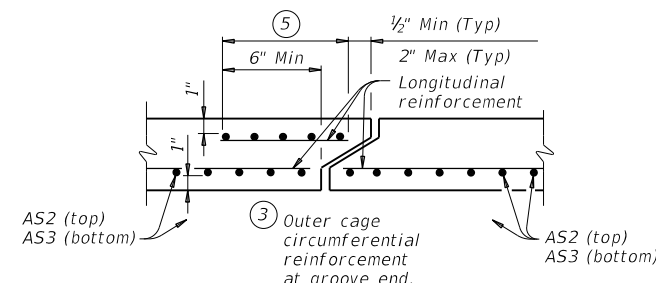
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcing at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
 Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

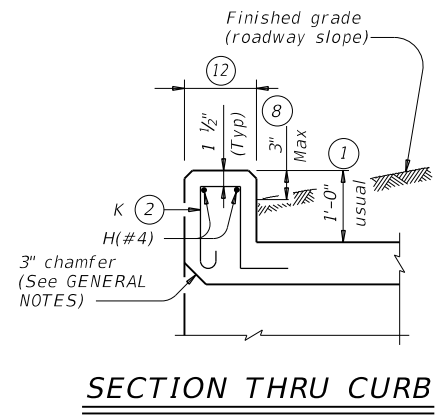
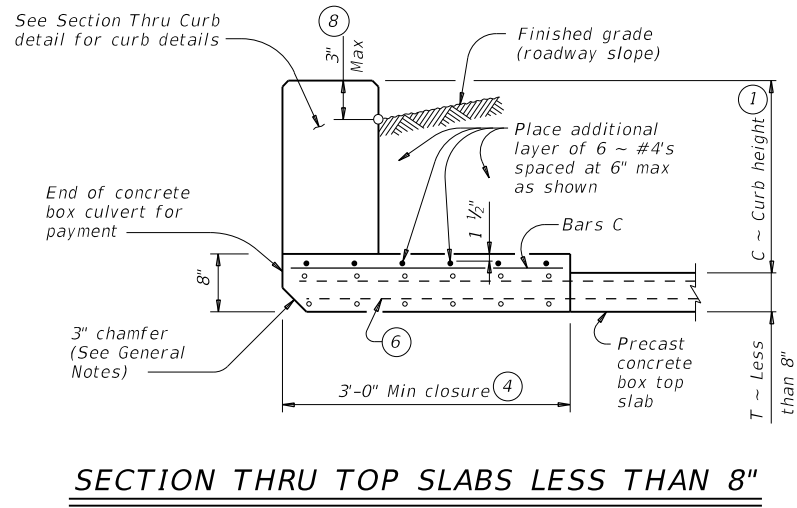
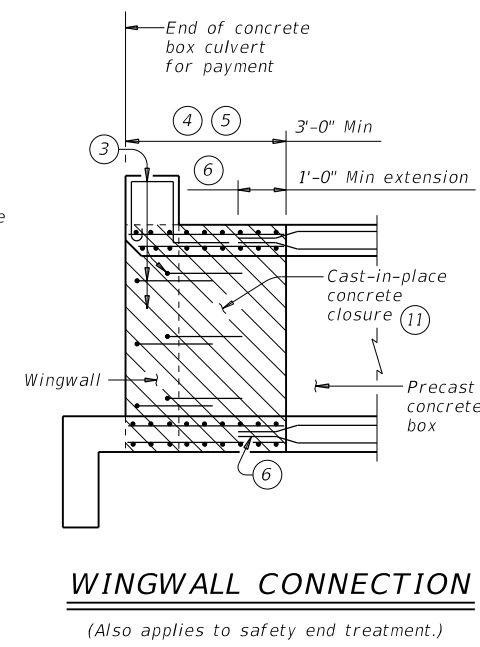
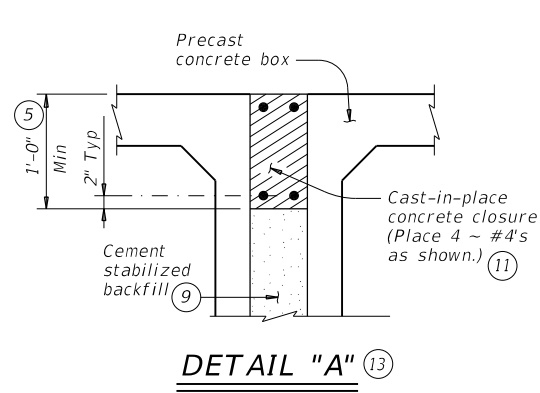
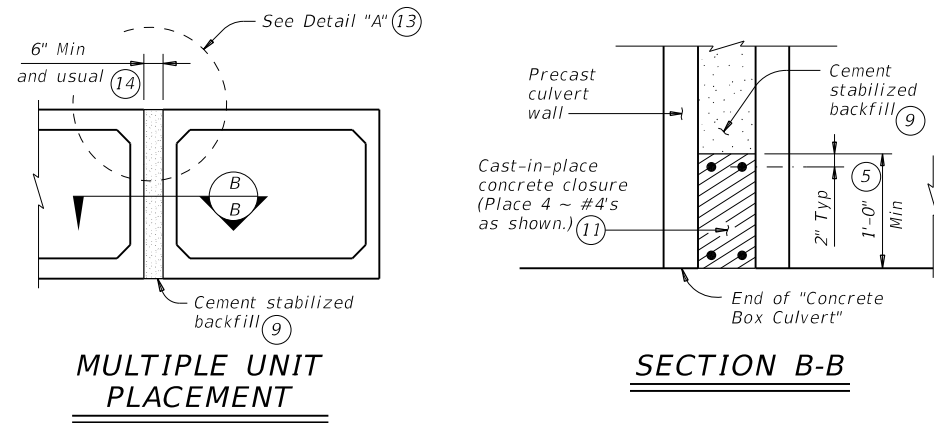
		Bridge Division Standard	
SINGLE BOX CULVERTS PRECAST 6'-0" SPAN			
SCP-6			
FILE:	scp06sts-20.dgn	DN: TxDOT	CK: TxDOT
©TxDOT	February 2020	REVISIONS	
CONT	SECT	JOB	HIGHWAY
1392	01	044, ETC.	FM 1378, ETC.
DIST	COUNTY	SHEET NO.	
DAL	COLLIN	212	

① For box length = 8'-0"

② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcing per linear foot of box length. AS5 is minimum required area of reinforcing per linear foot of box width.

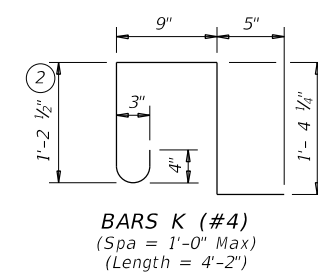
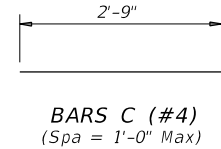
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QUANTITIES PER FOOT OF CURB (10)

Reinforcing Steel	4.12 Lb
Concrete	0.037 CY

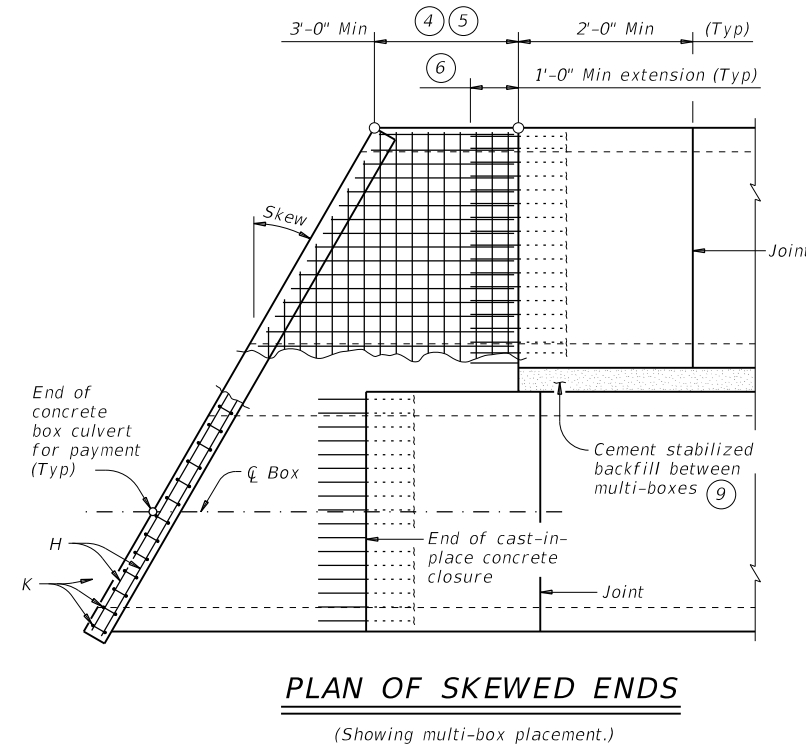
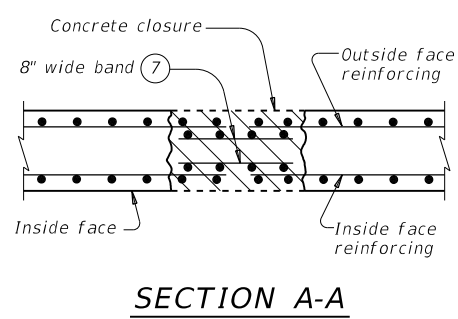
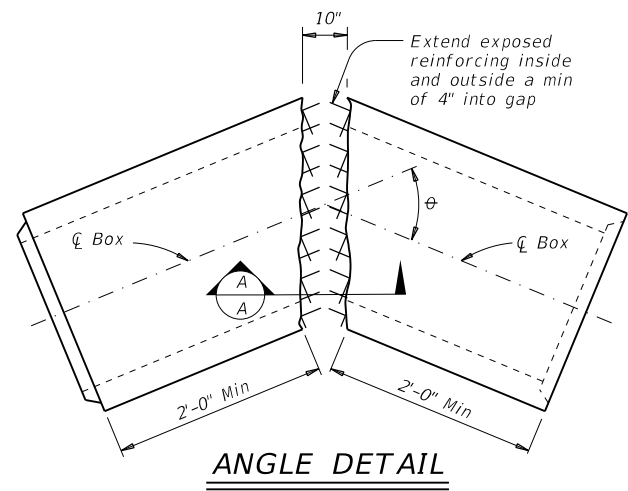


- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
- Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
- For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
- Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- All curb concrete and reinforcing is considered part of the box culvert for payment.
- Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
- This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide ASTM A1064 welded wire reinforcement.
 Provide Class C concrete (f'c = 3,600 psi) for the closures.
 Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
 Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
 Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bars dimensions are out-to-out of bars.



HL93 LOADING

Texas Department of Transportation Bridge Division Standard

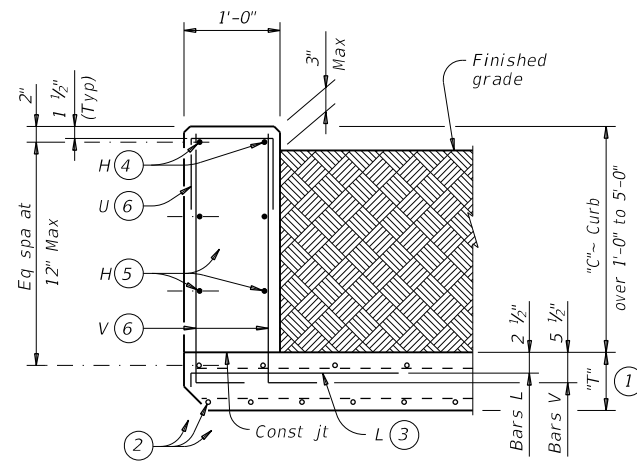
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1392	01	044, ETC.FM 1378, ETC.	
DIST	COUNTY	SHEET NO.		
DAL	COLLIN	213		

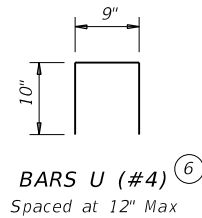
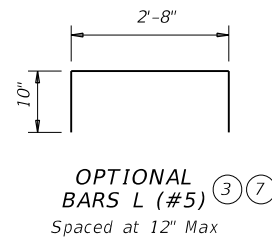
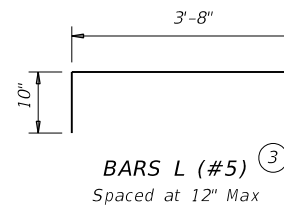
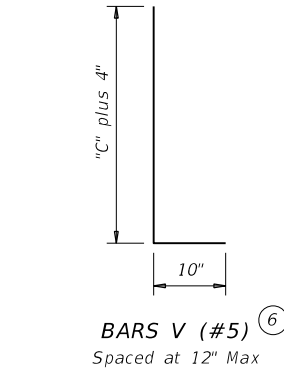
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TYPICAL SECTION

Used for curbs over 1'-0" to 5'-0"



- ① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES ⑧		
Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:
Adjust reinforcing steel as necessary to provide 1 1/4" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.
Provide bar laps, where required, as follows:
• Uncoated or galvanized ~ #4 = 1'-8" Min

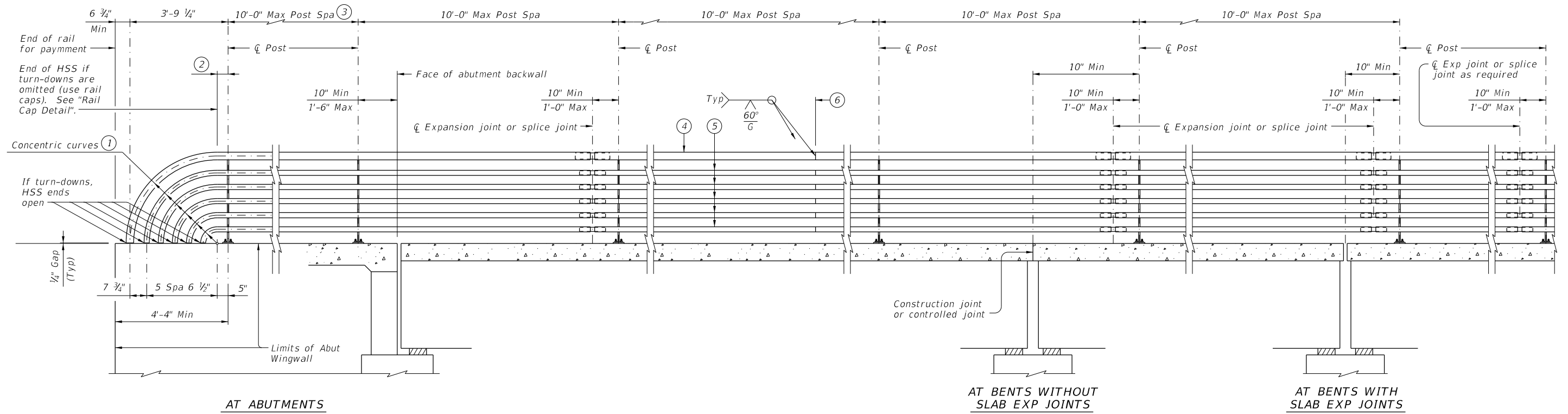
GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

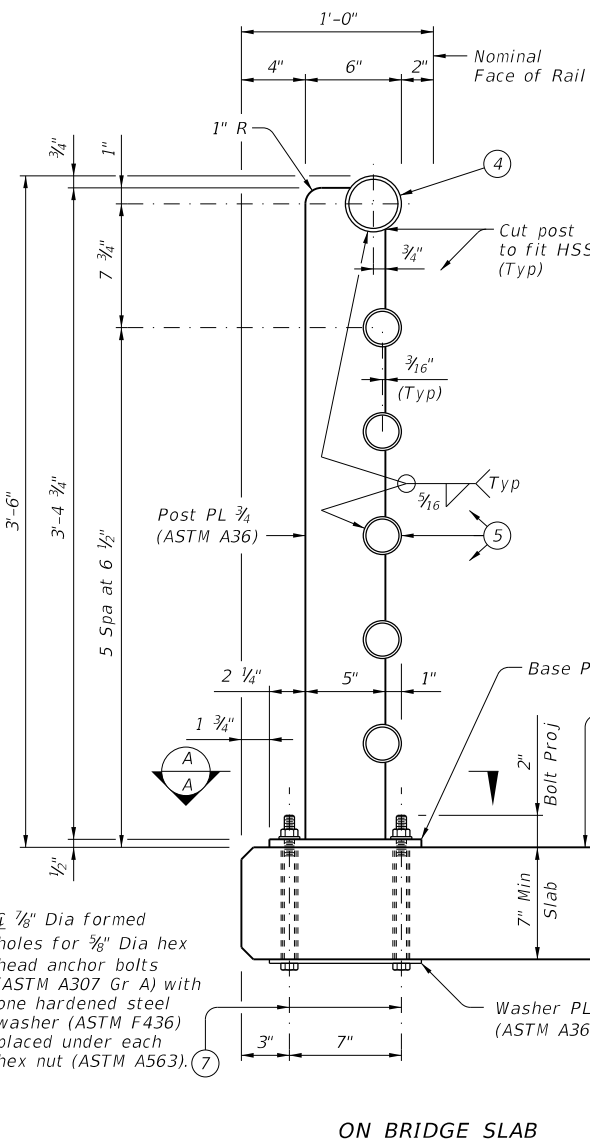
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EXTENDED CURB DETAILS FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL			
ECD			
FILE: ecdstde1-20.dgn	DN: GAF	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	1392	01	044, ETC.FM 1378, ETC.
DIST	COUNTY		SHEET NO.
DAL	COLLIN		214

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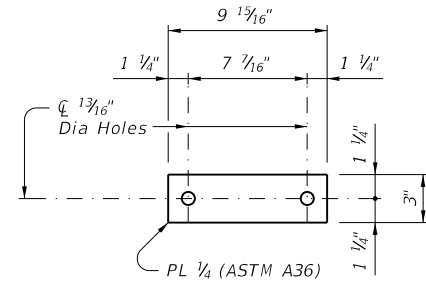


ROADWAY ELEVATION OF RAIL

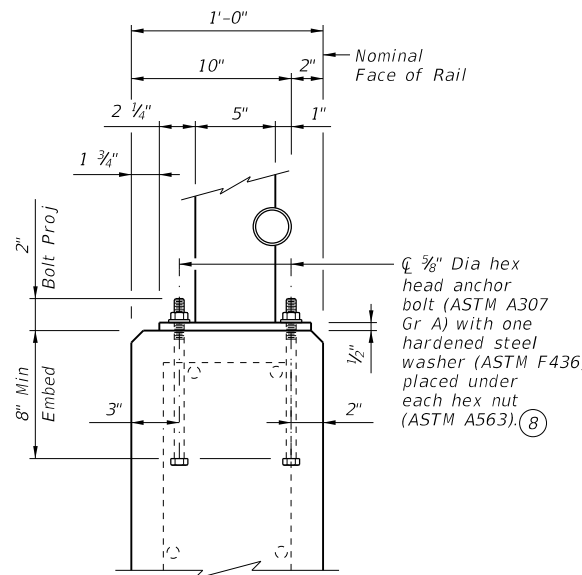


SECTION A-A

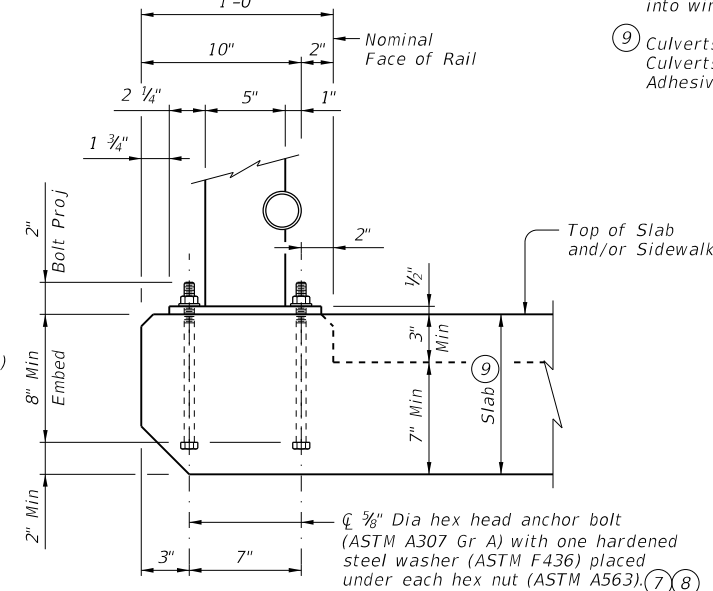
Showing base plate detail.



WASHER PLATE DETAIL



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON CULVERTS WITH OR WITHOUT CURBS

Used with 1'-0" Min thick parallel wings on culverts.

- ① Portion of railing with turn-downs to be used or omitted as indicated on Bridge Layout.
- ② 10" Min ~ 1'-6" Max if turn-downs are omitted.
- ③ Min of 2 posts required on wingwall.
- ④ HSS 3.500 x 0.216 (Rail Member)
- ⑤ HSS 2.375 x 0.154 (Rail Member)
- ⑥ One shop splice per panel is permitted (with minimum 85 percent penetration). The weld may be square groove or single vee groove. Grind smooth.
- ⑦ At Contractor's option, adhesive anchors may be used. Adhesive anchors must be 5/8" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 5" into slabs or culverts without curbs. See "Material Notes" for adhesive anchor requirements.
- ⑧ At Contractor's option, adhesive anchors may be used. Adhesive anchors must be 5/8" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 7" into wingwalls or culverts with curbs. See "Material Notes" for adhesive anchor requirements.
- ⑨ Culverts without curbs for cast-in-place anchor bolts require a 10" Min slab thickness. Culverts with curbs for cast-in-place anchor bolts require a curb plus slab thickness of 10" Min. Adhesive anchors may be used with a 7" Min slab thickness or culverts with curbs.

ON BRIDGE SLAB

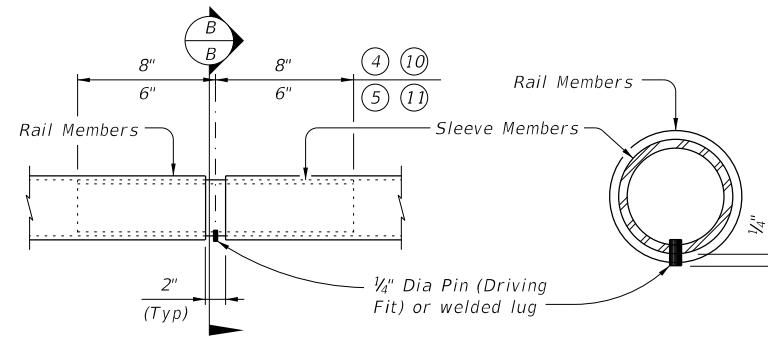
SECTIONS THRU RAIL

SHEET 1 OF 2

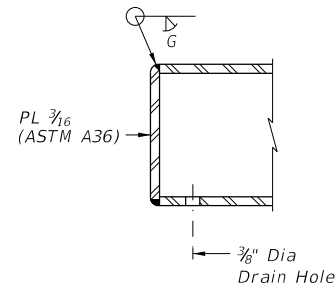
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<h2>TYPE PR11</h2>			
FILE: r1std028-19.dgn	DN: TAR	CK: TBE	DW: JTR
©TxDOT September 2019	CONT	SECT	JOB
REVISIONS	1392	01	044, ETC.FM 1378, ETC.
DIST	COUNTY		SHEET NO.
DAL	COLLIN		215

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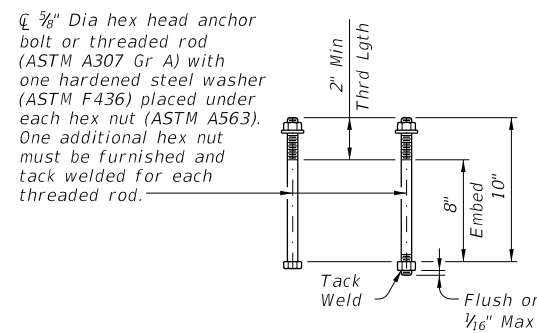


AT SPLICES OR EXP JTS SECTION B-B
PIPE SPLICE DETAIL



RAIL CAP DETAIL

- ④ HSS 3.500 x 0.216 (Rail Member)
- ⑤ HSS 2.375 x 0.154 (Rail Member)
- ⑩ HSS 2.875 x 0.203 (Sleeve Member)
- ⑪ HSS 1.900 x 0.145 (Sleeve Member)



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS

CONSTRUCTION NOTES:

Panel lengths of railing must be attached to a minimum of three posts except at abutment wingwalls.
 At the Contractor's option anchor bolts may be an adhesive anchorage system. See "Material Notes".
 Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.
 Face of rail and posts must be vertical transversely unless otherwise approved. Posts must be perpendicular to adjacent roadway grade. Use Type VIII epoxy mortar under post base plates if gaps larger than 1/16" exist.
 For curved railing applications, fabricate the HSS rail to the radius when the radius is 600' or less. Submit shop drawings for approval when tubes are required to be fabricated to a radius. Shop drawings must be submitted to the Engineer for approval.
 Round or chamfer all exposed edges of steel components 1/16" by grinding prior to galvanizing.

MATERIAL NOTES:

Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.
 Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.
 Anchor bolts must be 5/8" Dia ASTM A307 Gr A with one hardened steel washer (ASTM F436) placed under each hex nut or ASTM A307 Gr A threaded rods with one tack welded hex nut each and with one hex nut with one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements.
 Optional adhesive anchorage system must be 5/8" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436). Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into slab, wingwalls, or culvert curbs using a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a nominal bond strength in tension, Na, of a single anchor of 10 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 Do not use this railing on bridges with expansion joints providing more than 5" movement.
 Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
 For all rails, submit erection drawings showing section lengths, splice locations, rail post spacing and anchor bolt setting for approval. Average weight of railing is 30 plf.

		Bridge Division Standard	
<h1>PEDESTRIAN RAIL</h1>			
<h2>TYPE PR11</h2>			
FILE: r1std028-19.dgn	DN: TAR	CK: TBE	DW: JTR
CON: September 2019	SECT:	JOB:	HIGHWAY:
REVISIONS		1392 01	044, ETC. FM 1378, ETC.
DIST:	COUNTY:	SHEET NO.	
DAL	COLLIN	216	

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF EXISTING SUBSURFACE UTILITIES
SUBSURFACE UTILITY ENGINEERING (SUE)
QUALITY LEVEL - B

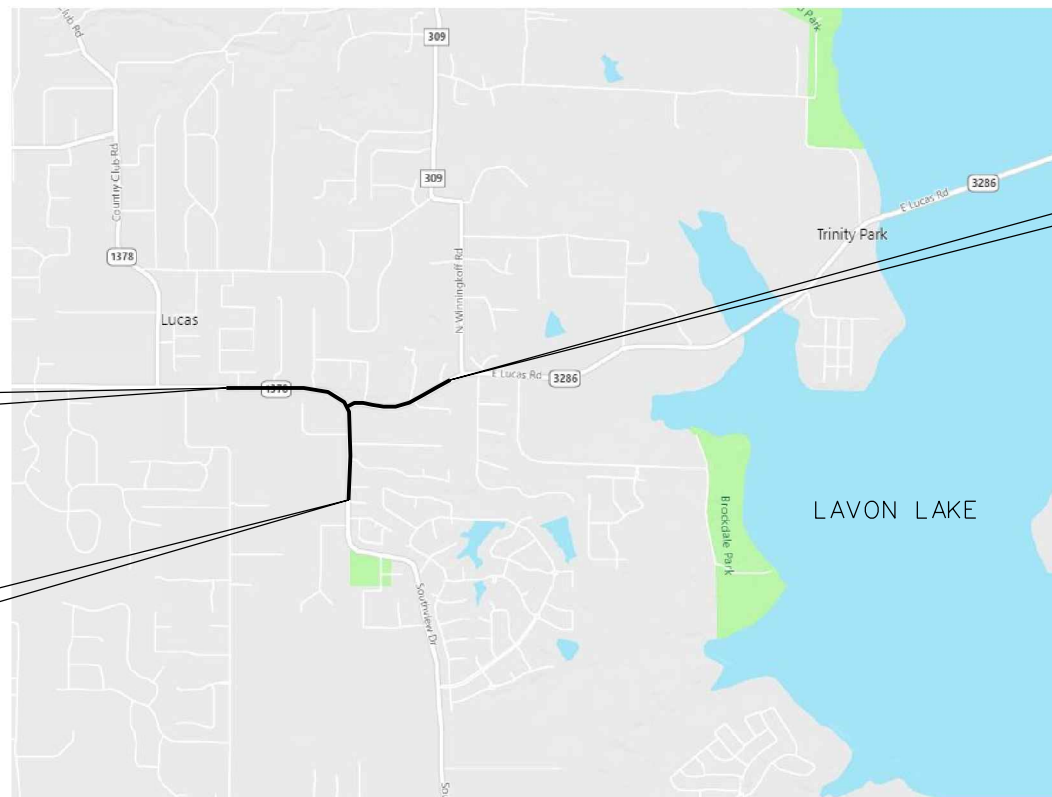
COLLIN COUNTY
HIGHWAY: FM 1378
PROJECT: FM 1378

FM 1378 WEST 300' PAST HOLLY LN, EAST 300' PAST LOST VALLEY, &
SOUTH 500' PAST ARTHUR CT
CSJ: 1392-01-044

BEGIN PROJECT @ FM 1378 STA 2+00
CSJ: 1392-01-044
NORTHING: 7084205.11
EASTING: 2555909.21

END PROJECT @ FM 1378 STA 92+00
CSJ: 1392-01-044
NORTHING: 7082122.20
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CSJ: 1392-01-044
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EASTING: 2559596.20



VICINITY MAP
NOT TO SCALE



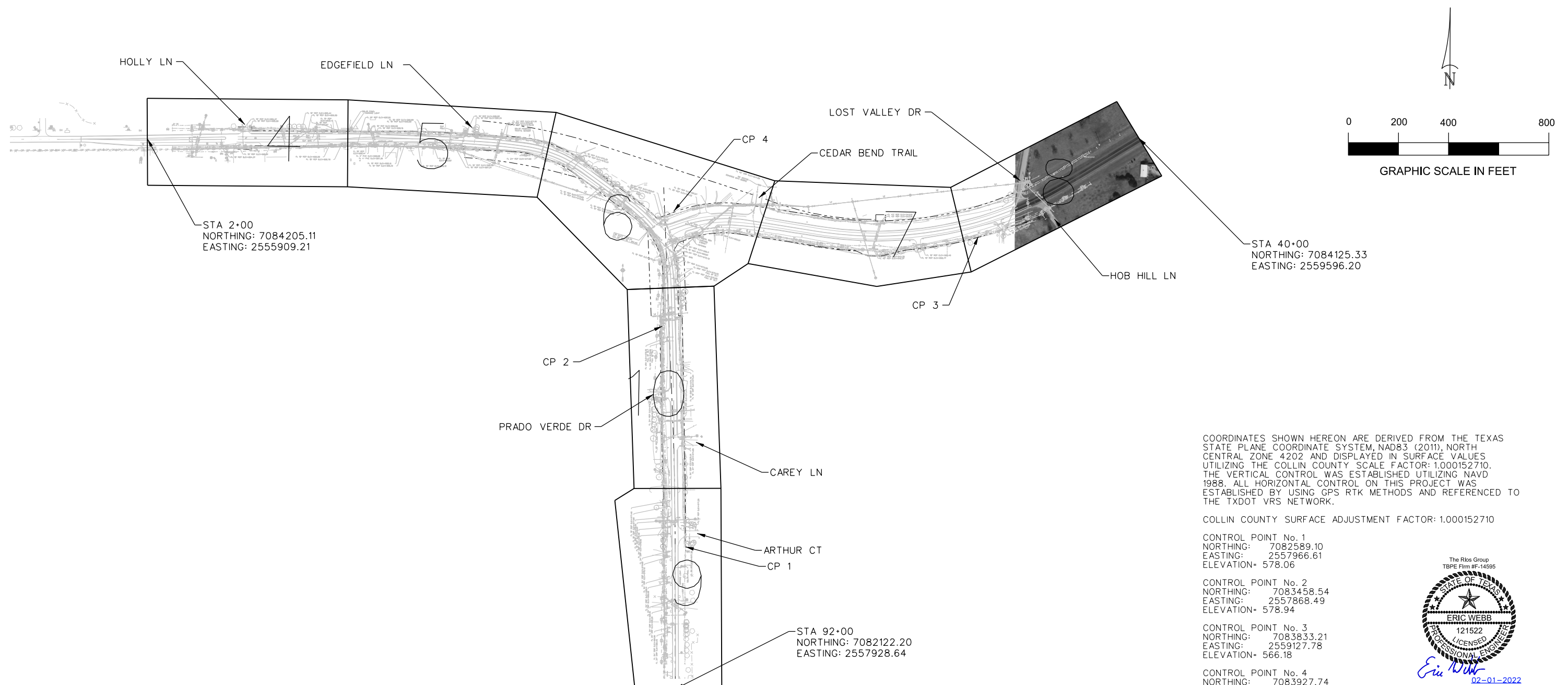
REV	DATE	BY	DESCRIPTION

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TEXAS DEPARTMENT OF TRANSPORTATION

THE RIOS GROUP
Subsurface Utility Engineering/Utility Coordination
7400 Sand Street Fort Worth, TX 76118
817-345-7500 www.rios-group.com

FM 1378
SUE TITLE SHEET

DESIGNED BY: MD	CHECKED BY: EW	DATE: 08-28-2019
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
TXDT1901.01	01 OF 10	08-28-2019
CSJ NUMBERS	PLAN SHEET NO.	
1392-01-044	217	
STATE	DISTRICT	COUNTY
TX	DALLAS	COLLIN



COORDINATES SHOWN HEREON ARE DERIVED FROM THE TEXAS STATE PLANE COORDINATE SYSTEM, NAD83 (2011), NORTH CENTRAL ZONE 4202 AND DISPLAYED IN SURFACE VALUES UTILIZING THE COLLIN COUNTY SCALE FACTOR: 1.000152710. THE VERTICAL CONTROL WAS ESTABLISHED UTILIZING NAVD 1988. ALL HORIZONTAL CONTROL ON THIS PROJECT WAS ESTABLISHED BY USING GPS RTK METHODS AND REFERENCED TO THE TXDOT VRS NETWORK.

COLLIN COUNTY SURFACE ADJUSTMENT FACTOR: 1.000152710

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 NORTHING: 7082589.10
 EASTING: 2557966.61
 ELEVATION: 578.06

CONTROL POINT No. 2
 NORTHING: 7083458.54
 EASTING: 2557868.49
 ELEVATION: 578.94

CONTROL POINT No. 3
 NORTHING: 7083833.21
 EASTING: 2559127.78
 ELEVATION: 566.18

CONTROL POINT No. 4
 NORTHING: 7083927.84
 EASTING: 2557911.55
 ELEVATION: 568.00



UTILITY CONTACT INFORMATION

UTILITY TYPE	OWNER	CONTACT	PHONE	EMAIL	ADDRESS
COMMUNICATION	AT&T	PETER RUSSELL	469.215.0541	PR7004@ATT.COM	2513 W E ROBERTS ST. GRAND PRAIRIE, TX 75051
COMMUNICATION	FRONTIER	ANDY KING	469.978.2890	ANDY.A.KING@FTR.COM	1132 HWY 407 LEWISVILLE, TX 75077
COMMUNICATION	GRANDE	MIKE BOWDEN	972.410.0592	MICHAEL.BOWDEN@MYGRANDE.COM	500 TITLE DR. SUITE 400 LEWISVILLE, TX 75056
COMMUNICATION	SUDDENLINK	TERRY MACKAY	903.266.4642	THAYER.MACKAY@AL TICEUSA.COM	3015 S SOUTHWEST LOOP SUITE 323 TYLER TX, 75702
ELECTRIC	GCEC	MICHAEL LAUER	903.815.1670	MLAUER@GCEC.NET	PO BOX 548 VAN ALSTYNE, TX 75495
GAS	COSERV	SHAWN MEAD	214.458.7851	SMEAD@COSERVE.COM	771 S. STEMMONS CORINTH, TX 76210
WATER	NTMWD	KEVIN MCNEELY	469.626.4750	KMCNEELY@NTMWD.COM	501 E. BROWN ST. WYLIE, TX 75098
WATER	CITY OF LUCAS	STANTON FORESTER	972.912.1208	STANTON@LUCASTEXAS.US	665 COUNTRY CLUB RD LUCAS, TX 75002

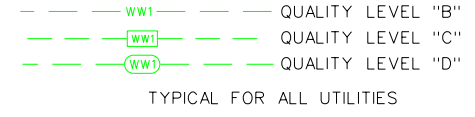
INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	EXISTING UTILITY LAYOUT
3	EXISTING UTILITY LEGEND
4-10	EXISTING UTILITY PLANS

QUANTITY TOTALS

QUALITY LEVEL "B" - 31,549'
 QUALITY LEVEL "C" - 1,204'
 OVERHEAD (QL-"C") - 8,005'
 QUALITY LEVEL "D" - 6,180'

QUALITY LEVEL LEGEND



Subsurface Utility Engineering (SUE) Certification

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.

REV	DATE	BY	DESCRIPTION

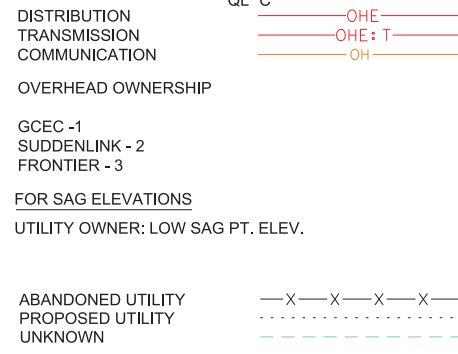
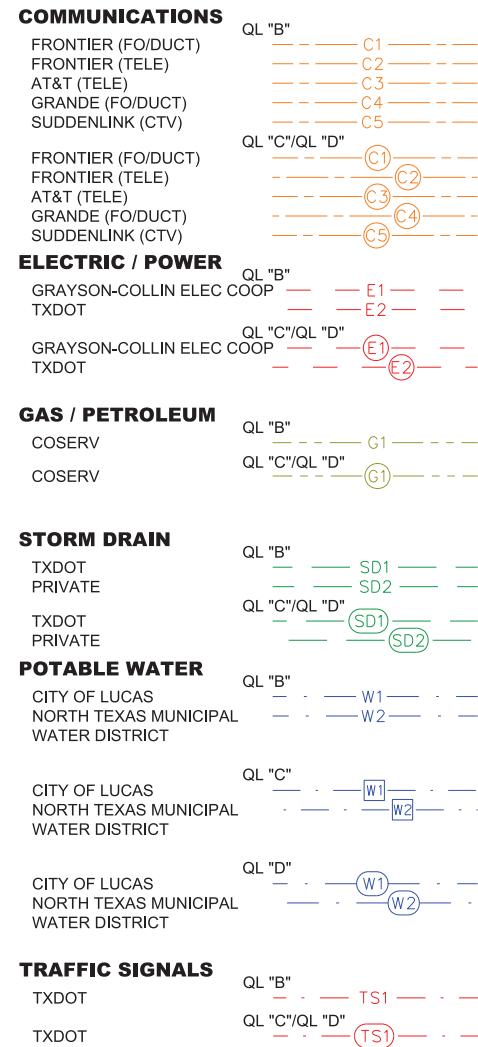
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 TEXAS DEPARTMENT OF TRANSPORTATION
THE RIOS GROUP
 Subsurface Utility Engineering/Utility Coordination
 7400 Sand Street Fort Worth, TX 76118
 817-345-7500 www.rios-group.com

FM 1378
EXISTING UTILITY LAYOUT

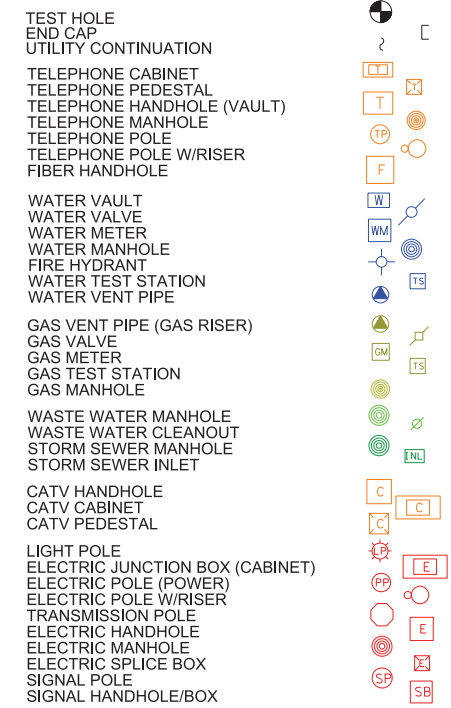
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CSJ NUMBERS	PLAN SHEET NO.	
1392-01-044	218	
STATE	DISTRICT	COUNTY
TX	DALLAS	COLLIN

ERIC WEBB
 01/20/2019 10:00 AM
 P:\Projects\TXDT1901.01 - 3e-sUDP5146_WA01_FM1378 - SUE Survey Services\Work In Progress\Plan Set

LEGEND OF UTILITY TYPES



LEGEND OF UTILITY SYMBOLS



QUALITY LEVELS

Quality Level "D" - Information derived from existing records and/or oral collection.

Quality Level "C" - Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating information to Quality Level "D" information.

Quality Level "B" - Designate: Two-dimensional horizontal mapping. This information is obtained through the application and interpretation of appropriate non-destructive surface geophysical methods. Utility indications are referenced to established survey control. Incorporates Quality Levels "C" and "D" information to produce Quality Level "B" information.

Quality Level "A" - Locate: Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities at a specific point. Diameters shown are verified visually and may not be exact.

QUALITY LEVEL LEGEND



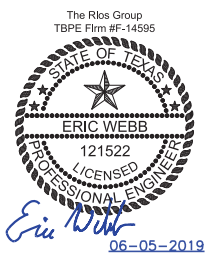
TYPICAL FOR ALL UTILITIES

Subsurface Utility Engineering (SUE) Certification

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.

SPECIAL NOTES

- ALL PIPE SIZES WERE TAKEN FROM UTILITY RECORDS WHERE POSSIBLE. THE UTILITIES DEPICTED WERE INVESTIGATED BY THE RIOS GROUP, INC.. ALL OTHER PLAN INFORMATION, NOTABLY THE BACKGROUND INFORMATION, WAS PROVIDED BY OTHERS AND THE RIOS GROUP, INC. DISCLAIMS RESPONSIBILITY FOR ITS ACCURACY.
- EXISTING SUBSURFACE UTILITY INVESTIGATIONS WERE COMPLETED ON 04/25/2019. THE RIOS GROUP, INC. EXPRESSLY DISCLAIMS ANY AND ALL RESPONSIBILITY FOR NEW UTILITY INSTALLATIONS, MODIFICATIONS, AND/OR ADJUSTMENTS TO EXISTING UTILITIES AFTER THE COMPLETION DATE.
- UTILITY LOCATIONS ON THESE DRAWINGS ARE INTENDED FOR DESIGN PURPOSES AND NOT CONSTRUCTION. THEY REFLECT SUBSURFACE UTILITIES AT THE TIME OF FIELD INVESTIGATION. CALL TEXAS ONE CALL SYSTEM (800)245-4545 FOR UTILITY LOCATIONS 48 HOURS PRIOR TO ANY WORK.
- WHERE POSSIBLE, WATER, GAS, AND COMMUNICATION SERVICE LINES WERE DESIGNATED. HOWEVER, SOME SERVICE LINES ARE CONSTRUCTED OF NON-CONDUCTIVE MATERIAL AND UTILITY COMPANY DRAWINGS MAY NOT SHOW SERVICE LINE LOCATIONS. THEREFORE ALL SERVICE LINES MAY NOT BE SHOWN.



REV	DATE	BY	DESCRIPTION

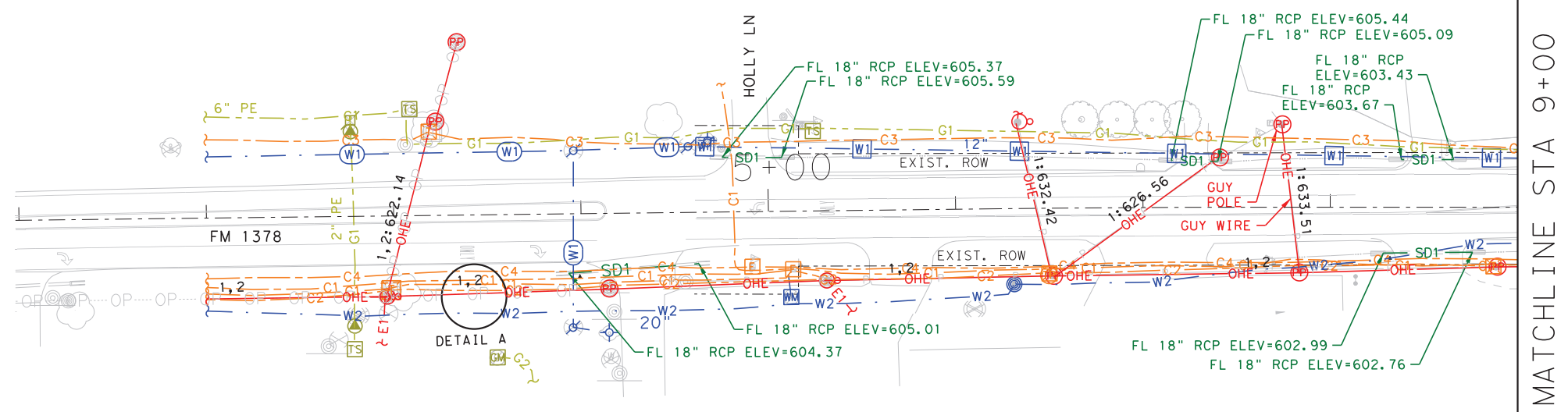
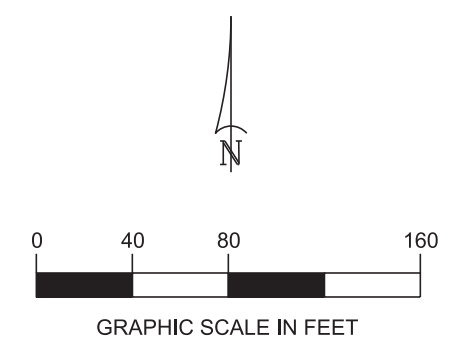


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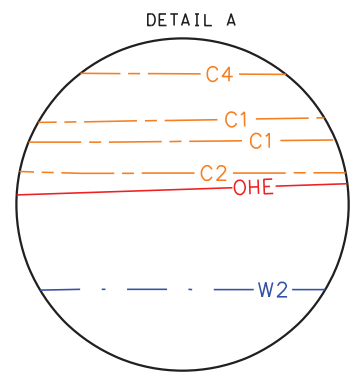
FM 1378 EXISTING UTILITY LEGEND

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 03 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 219	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

MICHAEL DOOLIN
 06-05-2019
 P:\Projects\TXDT1901.01 - 3e-SUE Survey Services\Work In Progress\Plan Set



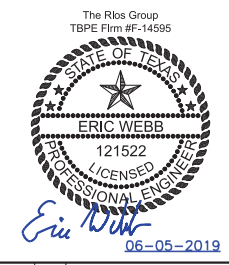
MATCHLINE STA 9+00



QUANTITY TOTALS
 QUALITY LEVEL "B" - 5,054'
 QUALITY LEVEL "C" - 443'
 OVERHEAD (QL-"C") - 1,104'
 QUALITY LEVEL "D" - 371'

QUALITY LEVEL LEGEND
 --- WW1 --- QUALITY LEVEL "B"
 --- WW1 --- QUALITY LEVEL "C"
 --- WW1 --- QUALITY LEVEL "D"
 TYPICAL FOR ALL UTILITIES

Subsurface Utility Engineering (SUE) Certification
 The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.



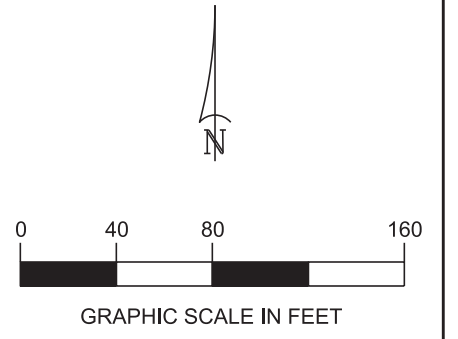
REV	DATE	BY	DESCRIPTION

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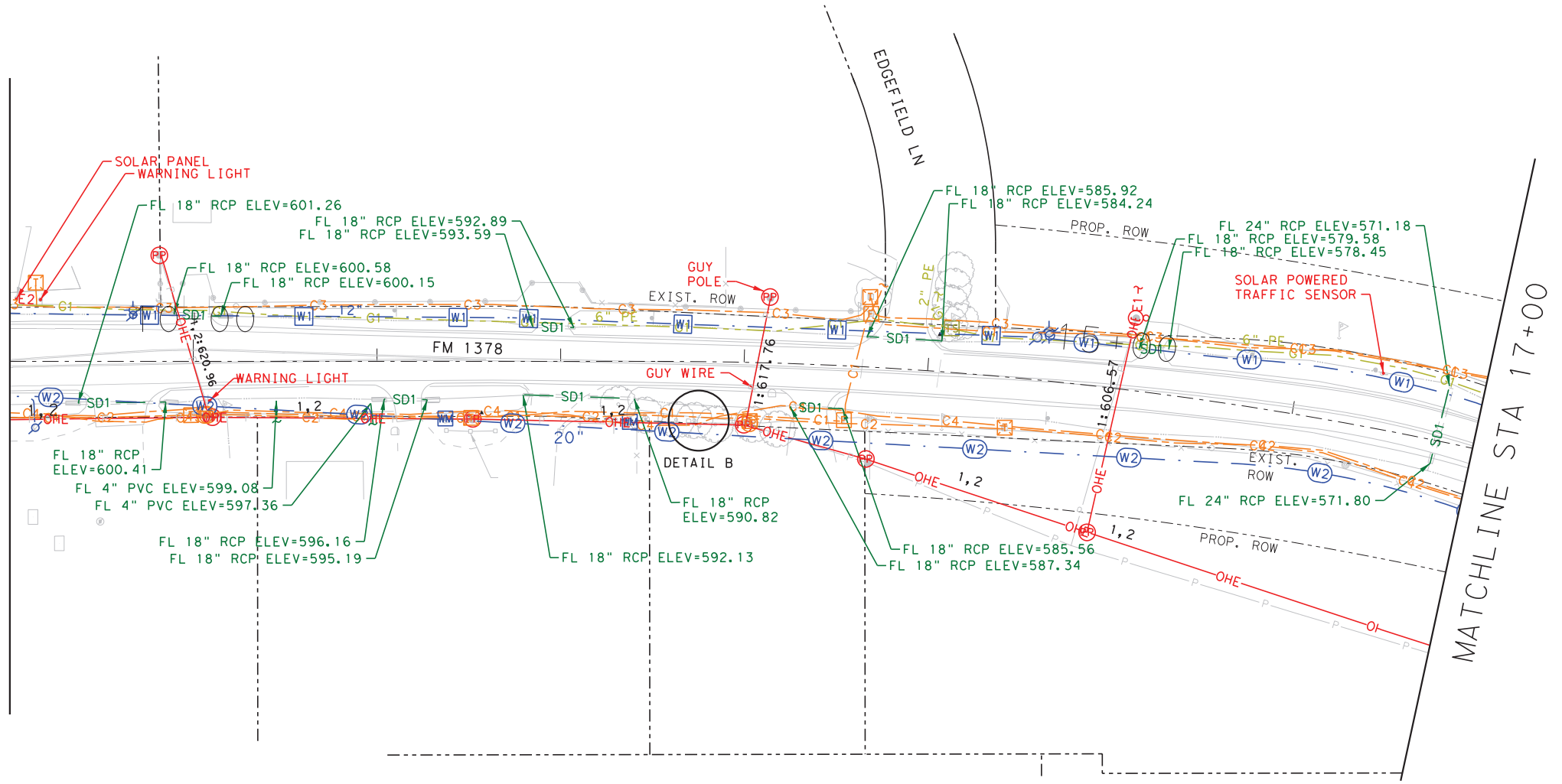
FM 1378
SUE PLAN SHEET
BEGINNING OF PROJECT TO STA. 9+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 04 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 220	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

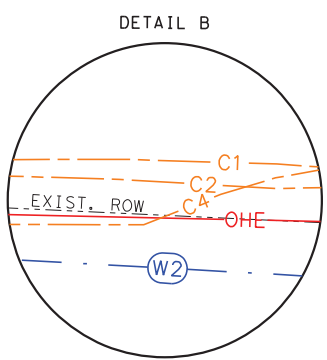
MICHAEL DOOLIN
 06-05-2019
 C:\ProgramData\TXDOT\1901_01\3e-sjdp5146_WA01_FM1378_SUE_Survey_Services\Work In Progress\Plan_Sht



MATCHLINE STA 9+00



MATCHLINE STA 17+00



QUANTITY TOTALS

QUALITY LEVEL "B" - 4,452'
 QUALITY LEVEL "C" - 560'
 OVERHEAD (QL-"C") - 1,068'
 QUALITY LEVEL "D" - 1,017'

QUALITY LEVEL LEGEND

--- WW1 --- QUALITY LEVEL "B"
 --- WW1 --- QUALITY LEVEL "C"
 --- WW1 --- QUALITY LEVEL "D"
 TYPICAL FOR ALL UTILITIES

Subsurface Utility Engineering (SUE) Certification

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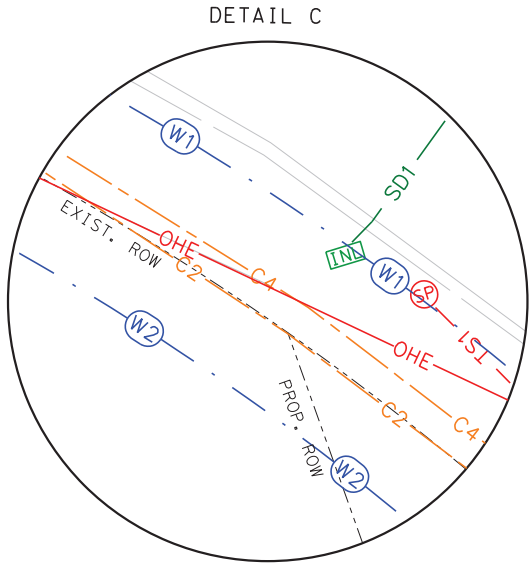
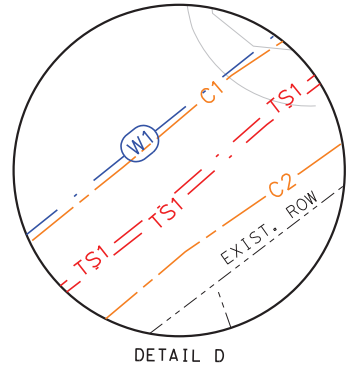
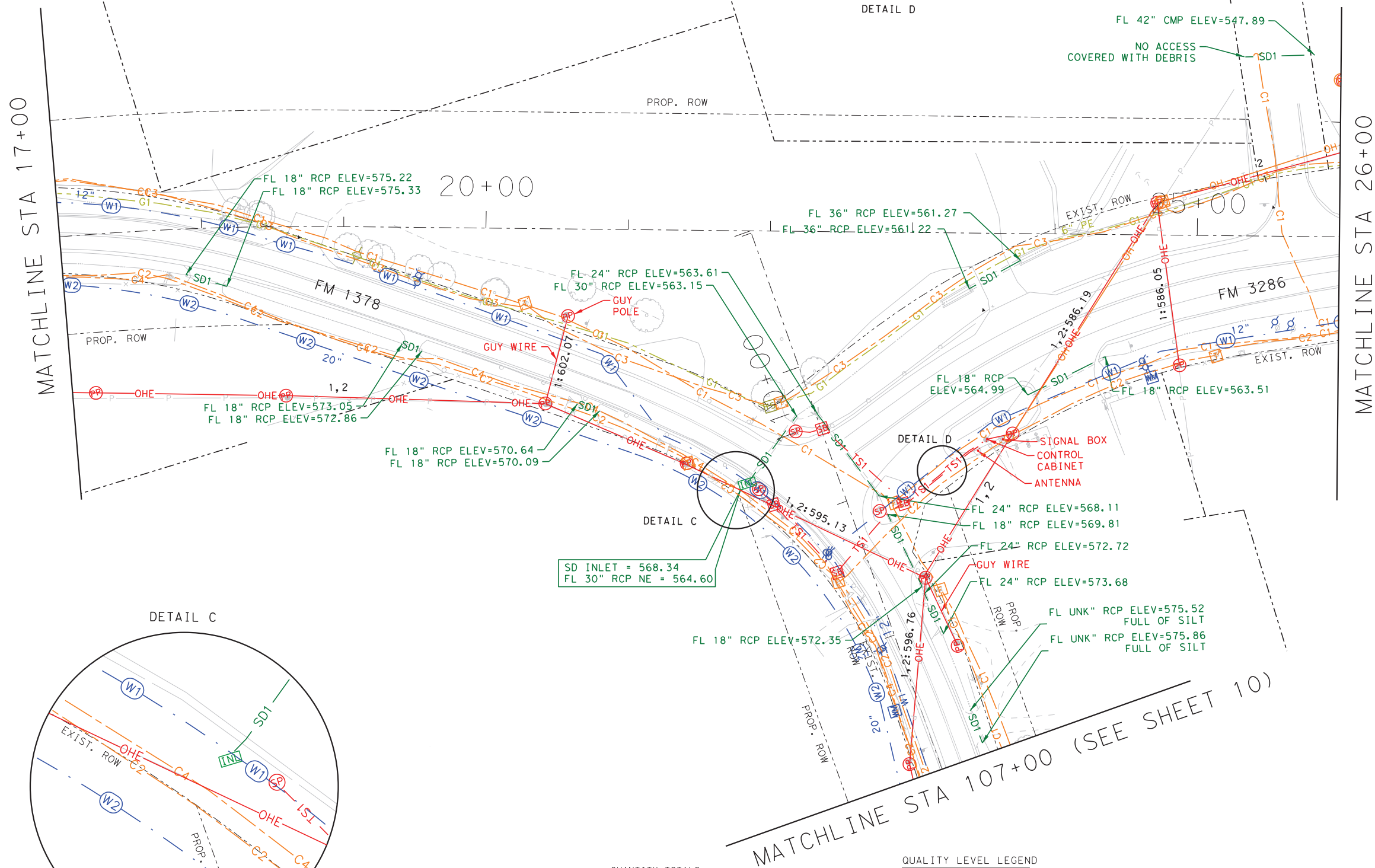
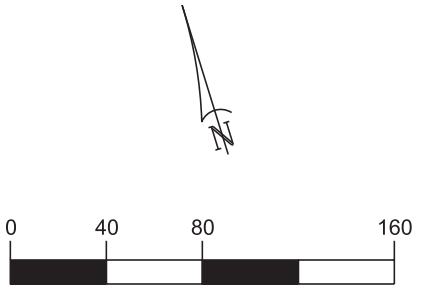
REV	DATE	BY	DESCRIPTION

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FM 1378
SUE PLAN SHEET
STA. 9+00 TO STA. 17+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
TXDT1901.01	05 OF 10	06-05-2019
CSJ NUMBERS	PLAN SHEET NO.	
1392-01-044	221	
STATE	DISTRICT	COUNTY
TX	DALLAS	COLLIN

MICHAEL DOOLIN
 06/05/2019 10:01:33 AM
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 RCP\Project\TXDT1901.01-3e-sjdp5146_WA01_FM1378_SUE_Survey_Surfaces\Work In Progress\Plan Set



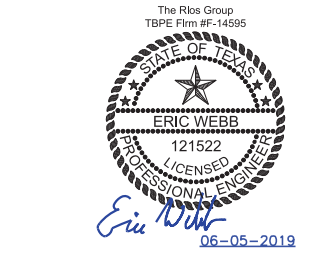
SD INLET = 568.34
FL 30" RCP NE = 564.60

QUANTITY TOTALS
QUALITY LEVEL "B" - 6,442'
QUALITY LEVEL "C" - 0'
OVERHEAD (QL-"C") - 1,770'
QUALITY LEVEL "D" - 1,768'

QUALITY LEVEL LEGEND	
--- (Green dashed line)	QUALITY LEVEL "B"
--- (Blue dashed line)	QUALITY LEVEL "C"
--- (Red dashed line)	QUALITY LEVEL "D"
TYPICAL FOR ALL UTILITIES	

Subsurface Utility Engineering (SUE) Certification

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REV	DATE	BY	DESCRIPTION

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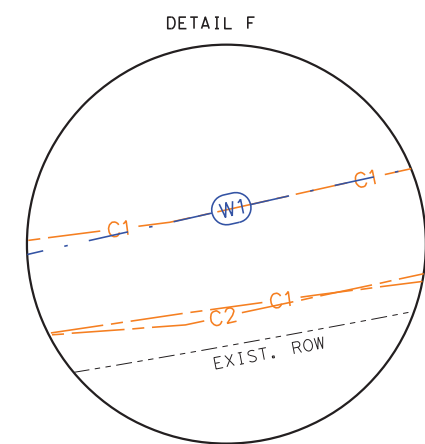
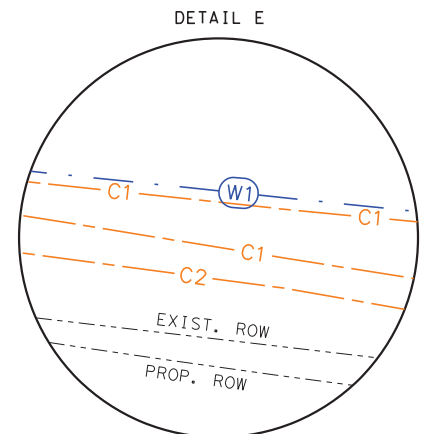
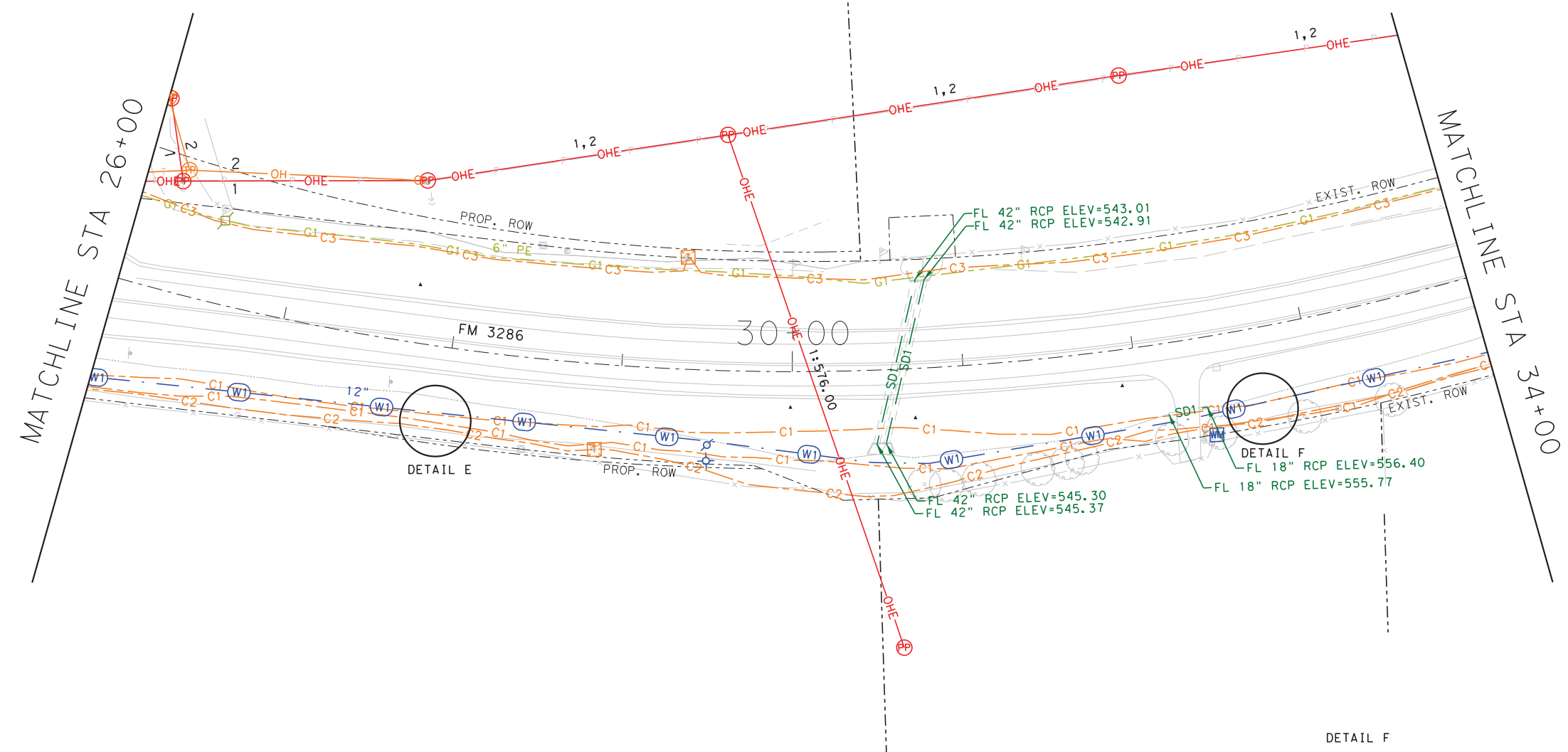
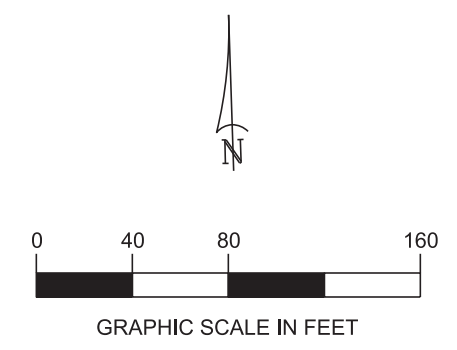
FM 1378

SUE PLAN SHEET

STA. 17+00 TO STA. 26+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 06 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 222	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

MICHAEL DOOLIN
P:\Projects\TXDT1901_01 - 3e-SDP15146_WA01_FM1378_SUE_Survey_Series\Work In Progress\Plan_Sat



QUANTITY TOTALS

QUALITY LEVEL "B" - 4,235'

QUALITY LEVEL "C" - 0'

OVERHEAD (QL-"C") - 1,314'

QUALITY LEVEL "D" - 828'

QUALITY LEVEL LEGEND

--- WW1 --- QUALITY LEVEL "B"

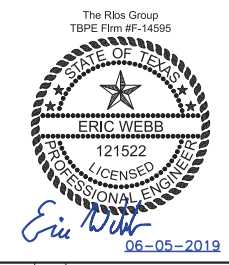
--- WW1 --- QUALITY LEVEL "C"

--- WW1 --- QUALITY LEVEL "D"

TYPICAL FOR ALL UTILITIES

Subsurface Utility Engineering (SUE) Certification

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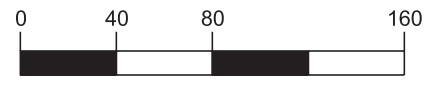
FM 1378

SUE PLAN SHEET

STA. 26+00 TO STA. 34+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 07 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 223	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

MICHAEL DOOLIN
06-05-2019
C:\ProgramData\TXDT\1901.01\3e-sue\Drawings\Work In Progress\Plan_Sht



GRAPHIC SCALE IN FEET



QUANTITY TOTALS
 QUALITY LEVEL "B" - 2,424'
 QUALITY LEVEL "C" - 0'
 OVERHEAD (QL - "C") - 692'
 QUALITY LEVEL "D" - 556'

QUALITY LEVEL LEGEND
 --- WW1 --- QUALITY LEVEL "B"
 --- WW1 --- QUALITY LEVEL "C"
 --- WW1 --- QUALITY LEVEL "D"
 TYPICAL FOR ALL UTILITIES

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REV	DATE	BY	DESCRIPTION

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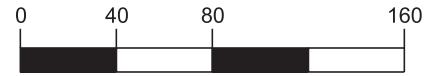
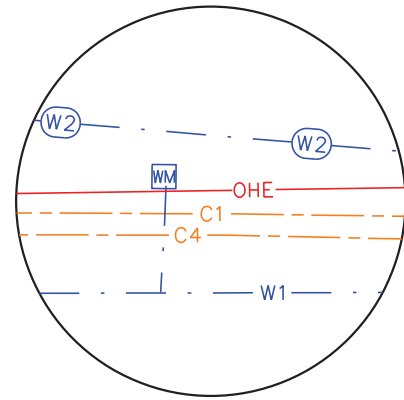
THE RIOS GROUP
 Subsurface Utility Engineering/Utility Coordination
 7400 Sand Street Fort Worth, TX 76118
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FM 1378
SUE PLAN SHEET
STA. 34+00 TO END OF PROJECT

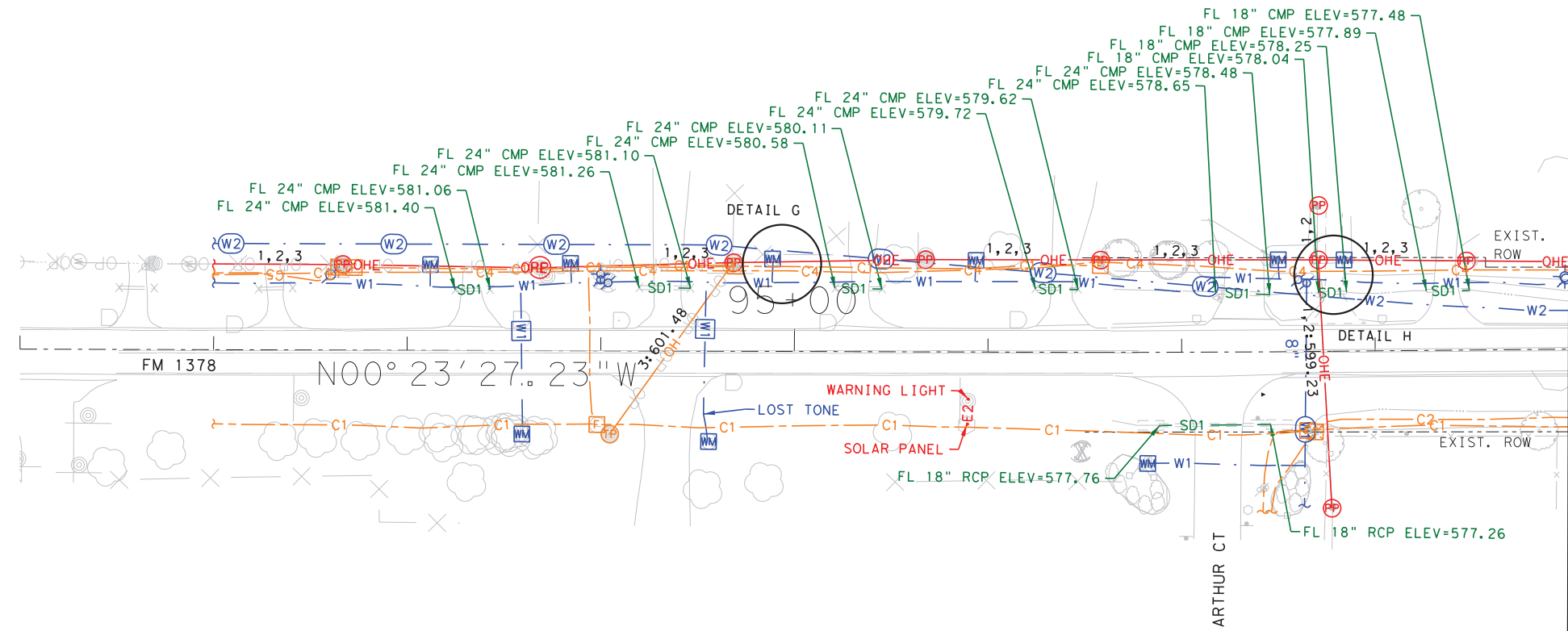
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TRG PROJECT NUMBER	SUE SHEET NO.	DATE
TXDT1901.01	08 OF 10	06-05-2019
CSJ NUMBERS	PLAN SHEET NO.	
1392-01-044	224	
STATE	DISTRICT	COUNTY
TX	DALLAS	COLLIN

MICHAEL DOOLIN
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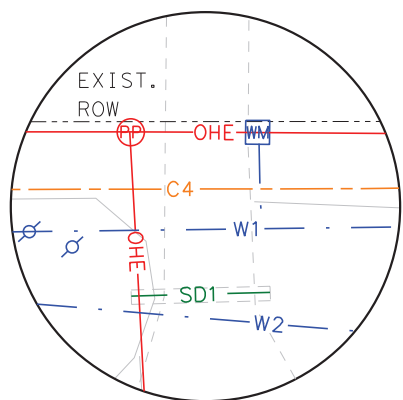
DETAIL G



GRAPHIC SCALE IN FEET



DETAIL H



QUANTITY TOTALS
 QUALITY LEVEL "B" - 3,386'
 QUALITY LEVEL "C" - 144'
 OVERHEAD (QL-"C") - 950'
 QUALITY LEVEL "D" - 709'

QUALITY LEVEL LEGEND
 --- WW1 --- QUALITY LEVEL "B"
 --- WW1 --- QUALITY LEVEL "C"
 --- WW1 --- QUALITY LEVEL "D"
 TYPICAL FOR ALL UTILITIES

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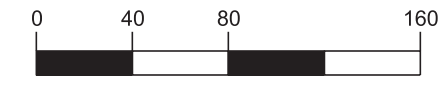
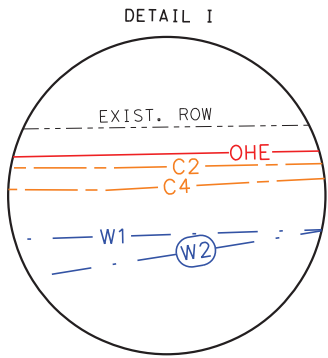
REV	DATE	BY	DESCRIPTION

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FM 1378
SUE PLAN SHEET
 END OF PROJECT TO STA. 99+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 09 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 225	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

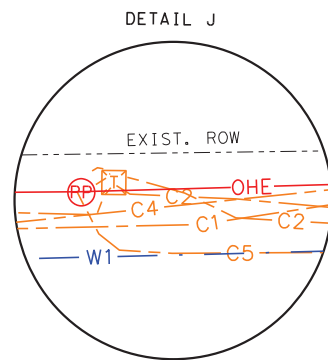
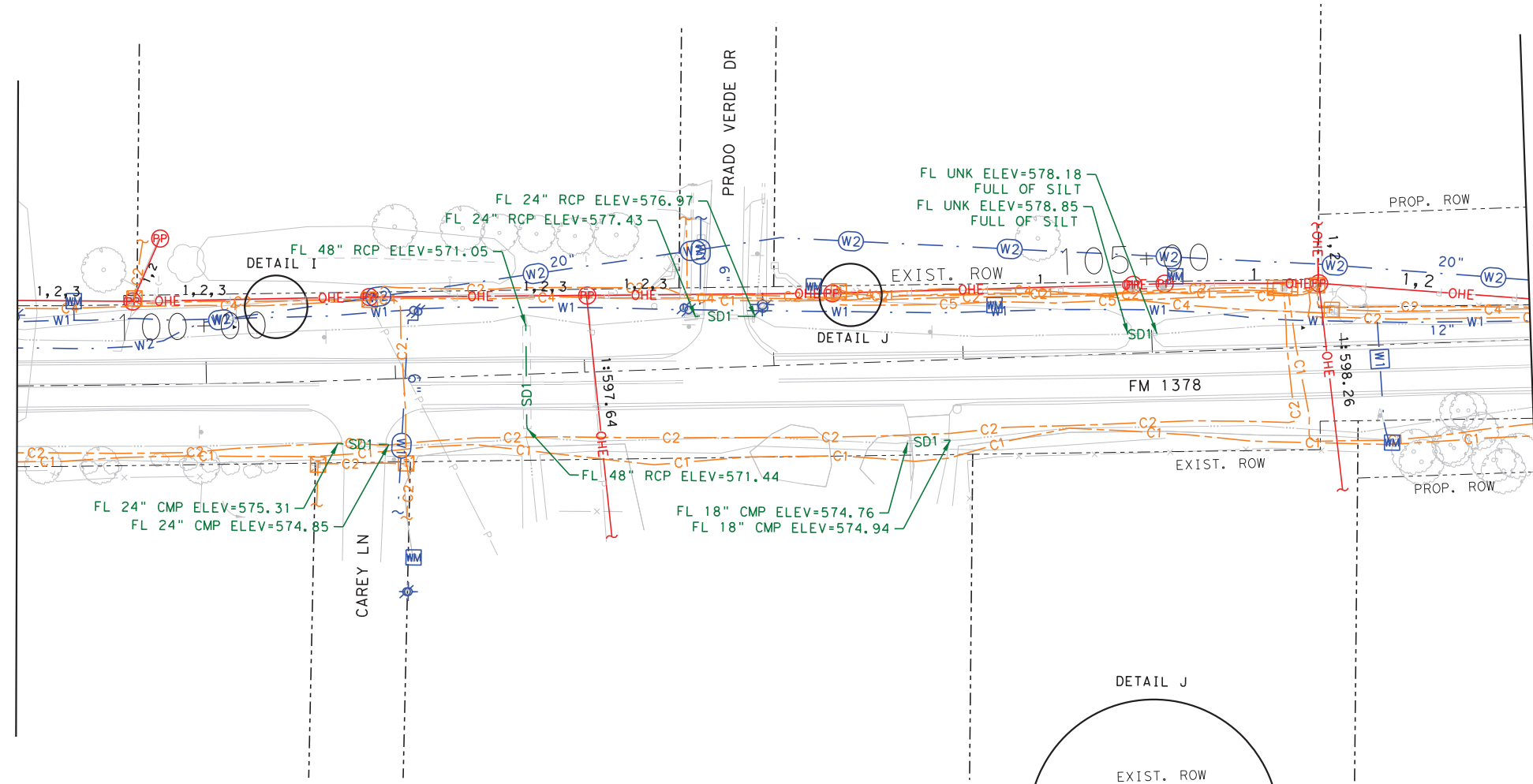
MICHAEL DOOLIN
 06-05-2019
 P:\Projects\TXDT1901.01 - 3e-sidp5146_WA01_FM1378_SUE_Survey_Series\Work In Progress\Plan_Set



GRAPHIC SCALE IN FEET

MATCHLINE STA 99+00

MATCHLINE STA 107+00 (SEE SHEET 6)



QUANTITY TOTALS

QUALITY LEVEL "B"	- 5,556'
QUALITY LEVEL "C"	- 57'
OVERHEAD (QL-"C")	- 1,107'
QUALITY LEVEL "D"	- 931'

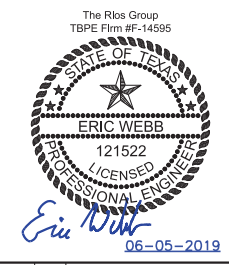
QUALITY LEVEL LEGEND

	QUALITY LEVEL "B"
	QUALITY LEVEL "C"
	QUALITY LEVEL "D"

TYPICAL FOR ALL UTILITIES

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FM 1378
SUE PLAN SHEET
STA. 99+00 TO STA. 107+00

DESIGNED BY: MD	CHECKED BY: EW	DATE: 06-05-2019
TRG PROJECT NUMBER TXDT1901.01	SUE SHEET NO. 10 OF 10	DATE 06-05-2019
CSJ NUMBERS 1392-01-044	PLAN SHEET NO. 226	
STATE TX	DISTRICT DALLAS	COUNTY COLLIN

MICHAEL DOOLIN
 06-05-2019
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STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

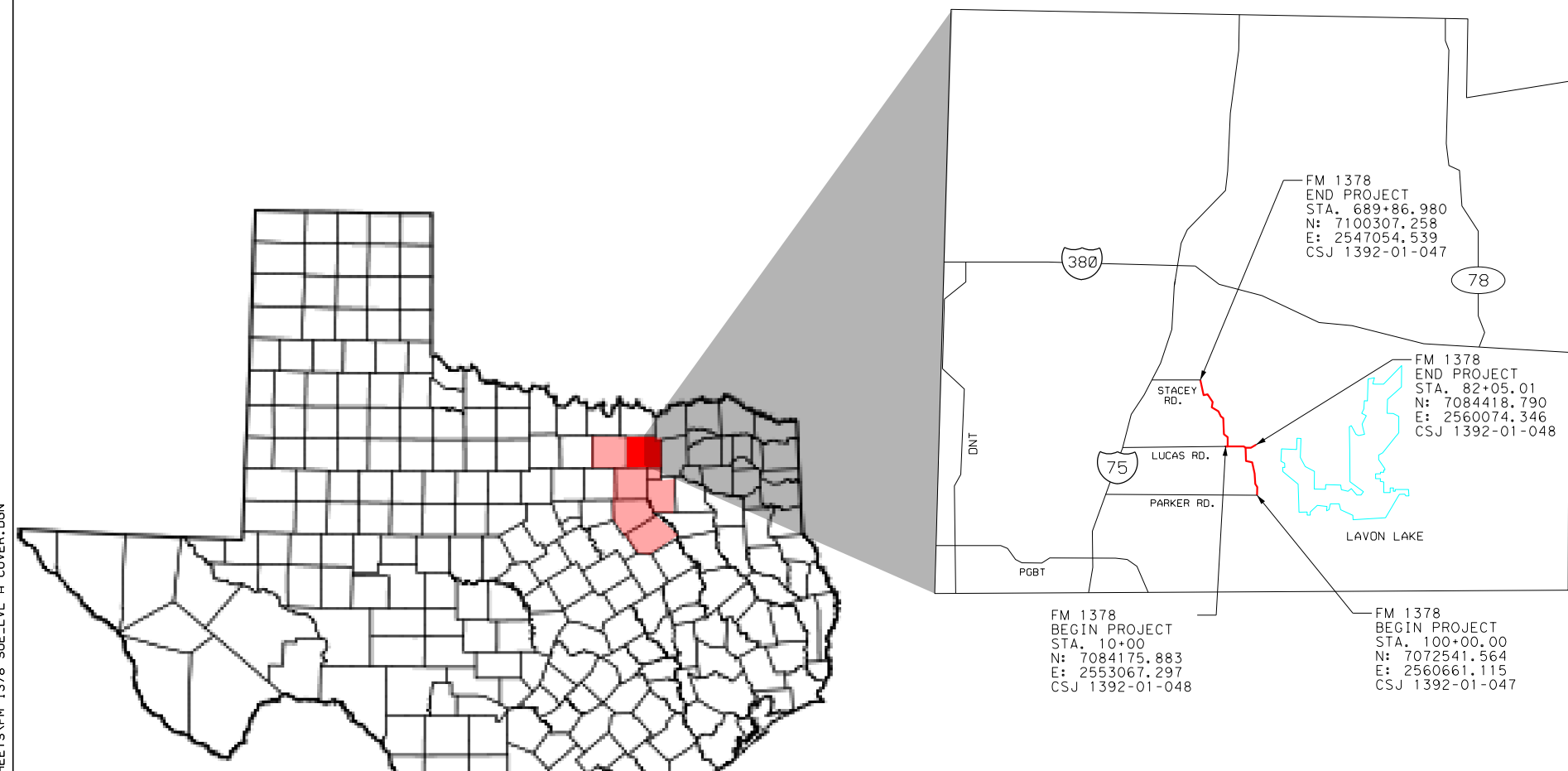
PLANS OF EXISTING SUBSURFACE UTILITIES

QUALITY LEVEL A COLLIN COUNTY

HIGHWAY: FM 1378
 FROM INTERSECTION OF PARKER RD. and S FM 1378
 NORTH
 TO INTERSECTION OF W LUCAS RD. and S FM 1378
 CJS 1392-01-047

HIGHWAY: FM 1378
 FROM INTERSECTION OF W LUCAS RD. and S FM 1378
 WEST
 TO INTERSECTION OF W LUCAS RD. AND N FM 1378
 CSJ 1392-01-047

HIGHWAY: FM 1378
 FROM INTERSECTION OF W LUCAS RD. AND S FM 1378
 EAST
 ALONG FM 3286 TO 100 FEET WEST OF N WINNINGKOFF RD.
 CSJ 1392-01-048



LOCATION MAP
N.T.S.

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Anil M. Sandhu
 12/23/2021

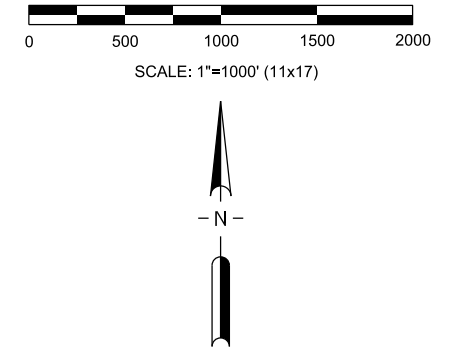
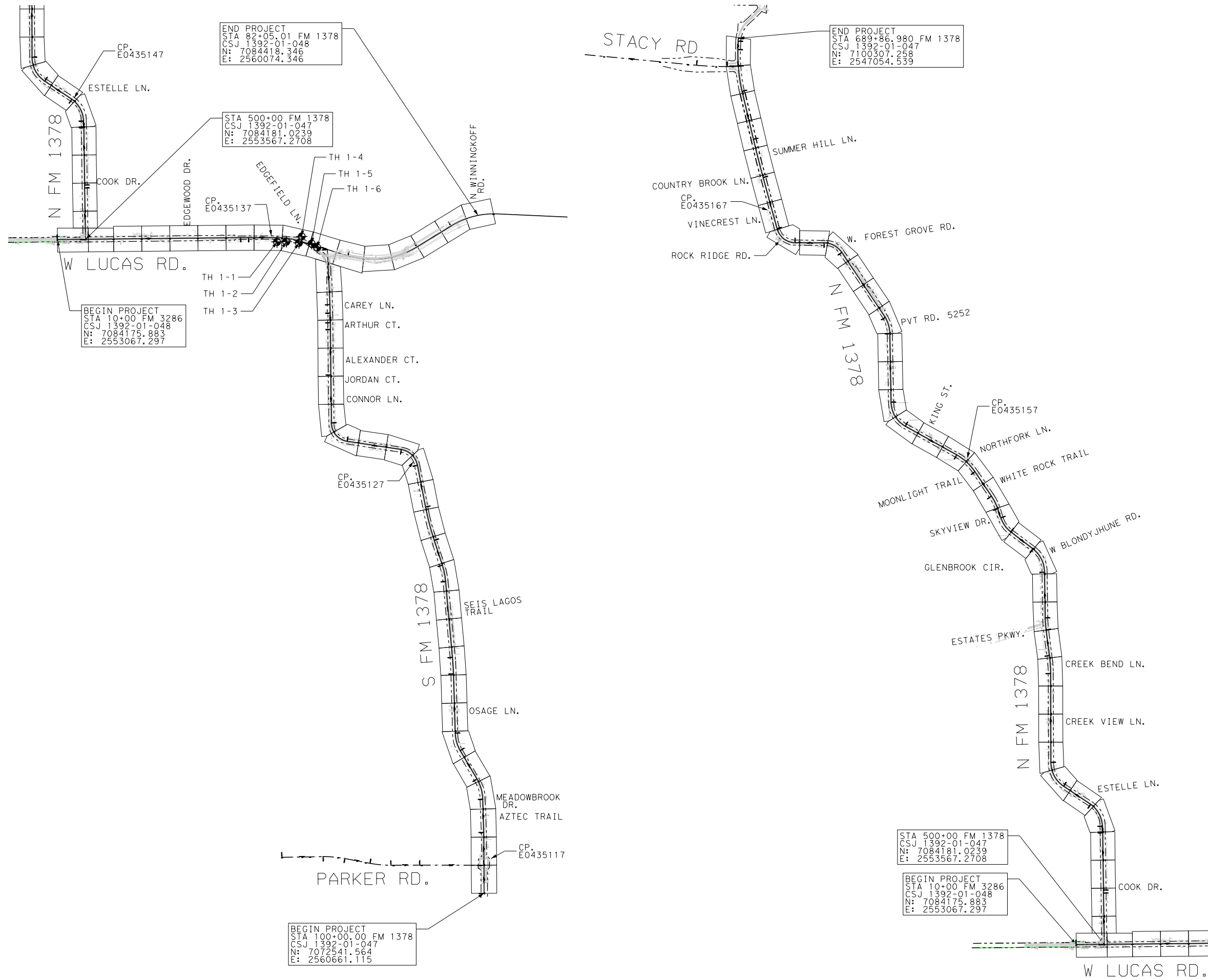


FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	30118066.07	227
STATE	DISTRICT	COUNTY
TEXAS	DALLAS	COLLIN
CONTROL	SECTION	JOB
1392	01	048
		HIGHWAY NO.
		FM 1378

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12/24/2021 11:15:28 AM
 P:\30118066.07 FM 1378\DCN\SHEETS\FM 1378 SUE_LVL A LAYOUT.DGN



Anil M. Sandhu
 12/23/2021

NO.	DATE	REVISION	APPROV.



FM 1378
PROJECT LAYOUT

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6	30118066.07	228	
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	JOB	HIGHWAY NO.
1392	01	048	FM 1378

12/24/2021 11:15:28 AM P:\30118066.07 FM 1378\DCN\SHEETS\FM 1378 SUE_LVL A LAYOUT.DGN

SUE LEGEND

OVERHEAD		SEE OH LEGEND
ELECTRIC		ONCOR
ELECTRIC		GRAYSON-COLLIN ELECTRIC COOPERATIVE INC.
TRAFFIC SIGNAL		TxDOT
TELEPHONE		AT&T
TELEPHONE		FRONTIER
TELEPHONE		ZAYO GROUP
TELEPHONE		SUDDENLINK COMMUNICATIONS
TELEPHONE		GRANDE COMMUNICATIONS
TELEPHONE		UNITE PRIVATE NETWORKS
TELEPHONE		VERIZON
FIBER OPTIC		AT&T
FIBER OPTIC		FRONTIER
FIBER OPTIC		ZAYO GROUP
FIBER OPTIC		SUDDENLINK COMMUNICATIONS
FIBER OPTIC		GRANDE COMMUNICATIONS
FIBER OPTIC		UNITE PRIVATE NETWORKS
FIBER OPTIC		VERIZON
CABLE		SPECTRUM/CHARTER
CABLE		SUDDENLINK COMMUNICATIONS
CABLE		SPECTRUM/CHARTER
GAS		ATMOS
GAS		COSERV GAS LTD
WATER		CITY OF PARKER
WATER		CITY OF LUCAS
WATER		CITY OF FAIRVIEW
WATER		CITY OF ALLEN
WATER		CITY OF WYLIE
WATER		NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER		WYLIE NORTHEAST SUD
WATER		SEIS LAGOS UTILITY DISTRICT
WASTEWATER		CITY OF PARKER
WASTEWATER		CITY OF LUCAS
WASTEWATER		CITY OF FAIRVIEW
WASTEWATER		CITY OF ALLEN
WASTEWATER		CITY OF WYLIE
WASTEWATER		NORTH TEXAS MUNICIPAL WATER DISTRICT
WASTEWATER		WYLIE NORTHEAST SUD
STORM		CITY OF PARKER
STORM		CITY OF LUCAS
STORM		CITY OF FAIRVIEW
STORM		CITY OF ALLEN
STORM		CITY OF WYLIE
		EXISTING RIGHT-OF-WAY
		PROPOSED RIGHT-OF-WAY

QUALITY LEGEND

	TRANSMISSION TOWER
	CELL TOWER
	POWER POLE
	POWER POLE WITH LIGHT
	POWER MANHOLE
	PULL/TRANSFORMER BOX
	ELECTRIC METER
	UG ELECTRIC MARKER
	LIGHT POLE
	TRAFFIC SIGNAL POLE
	TRAFFIC SIGNAL CONTROL BOX
	SIGNAL PEDESTAL
	TELEPHONE HAND HOLE
	TELEPHONE PEDESTAL
	TELEPHONE MANHOLE
	CATV PEDESTAL
	UG TELEPHONE MARKER
	UG FIBER MARKER
	GAS MANHOLE
	GAS METER
	GAS APPURTENANCE
	UG GAS MARKER
	GAS VENT
	GAS TEST VALVE
	WATER VALVE
	FIRE HYDRANT
	WATER METER
	WATER MANHOLE
	WASTEWATER MANHOLE
	WASTEWATER CLEANOUT
	UG WASTEWATER MARKER
	STORM SEWER MANHOLE
	IRRIGATION EQUIPMENT
	SITE SIGN
	CONTROL POINT
	CONTINUATION MARK

	QUALITY LEVEL "A"
	QUALITY LEVEL "B"
	QUALITY LEVEL "C"
	QUALITY LEVEL "D"

QUALITY LEVEL "D":

INFORMATION DERIVED FROM EXISTING RECORDS AND/OR ORAL RECOLLECTIONS,

QUALITY LEVEL "C":

INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

QUALITY LEVEL "B":

INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES (AKA DESIGNATING).

QUALITY LEVEL "A":

PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT (AKA LOCATING).

TEST HOLE QUANTITIES

DEPTH	QUANTITY
0' - 5'	5
5' - 8'	1
8' - 13'	0
13' - 20'	0
20'+	0
TOTAL TEST HOLES	6

NO.	DATE	REVISION
APPROV.		



FM 1378
 PROJECT LEGEND
 &
 GENERAL NOTES

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	30118066.07		229
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	JOB	HIGHWAY NO.
1392	01	048	FM 1378

UTILITY CONTACT INFORMATION

UTILITY TYPE	OWNER	CONTACT	PHONE	EMAIL
Telecommunications	Frontier Communications	Nannette Ash-Gantt	972-578-3339	nanette.ash@ftr.com
Telecommunications	Frontier Communications	Carl Shipman	972-318-3245	carl.x.shipman@ftr.com
Gas	Coserv Gas Ltd	Lorna Curran	940-321-7800	Lcurran@coserv.com
Water	City of Lucas	Stanton Foerster	972-912-1208	stanton@lucastexas.us

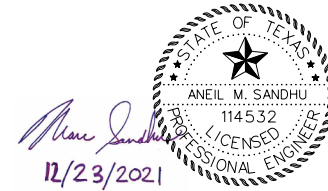
TEST HOLE SUMMARY

TH	UTILITY TYPE	UTILITY OWNER	STATION	POINT	N	E	GROUND ELEVATION	DEPTH	T.O.U
1_1	TELEPHONE	FRONTIER	STA. 49+57.25, 29.79 RT	90002	7,084,178.096	2,557,023.063	589.46'	2.36'	587.10'
1_2	TELEPHONE	FRONTIER	STA. 50+45.70, 28.86 RT	90001	7,084,172.725	2,557,109.608	586.36'	3.45'	582.91'
1_3	TELEPHONE	FRONTIER	STA. 51+46.28, 21.01 RT	90000	7,084,167.117	2,557,208.653	581.21'	2.26'	578.95'
1_4	WATER	CITY OF LUCAS	STA. 51+64.44, 32.71 LT	30002	7,084,216.835	2,557,235.979	580.56'	3.80'	576.76'
1_5	GAS	COSERV	STA. 55+50.94, 4.34 LT	30001	7,084,085.738	2,557,603.587	574.03'	6.50'	567.53'
1_6	WATER	CITY OF LUCAS	STA. 55+94.51, 17.17 RT	30000	7,084,052.477	2,557,639.007	574.15'	4.88'	569.27'

SURVEY CONTROL POINTS

<p>CONTROL POINT E0435117</p> <p>APPROXIMATE LOCATION: AT THE NORTHEAST CORNER OF THE INTERSECTION OF F.N. 2514 (PARKER ROAD) AND F.M. 1378 (SOUTHVIEW DRIVE), 25.0' NORTH OF THE NORTH CURB LINE OF F.M. 2514, 23.0' NORTH OF A STORM INLET MANHOLE AND 23.4' NORTHEAST OF A TRAFFIC SIGN.</p> <p>ELEVATION = 575.540' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435117" SURFACE NORTHING: 7073158.880' SURFACE EASTING: 2560782.232'</p>	<p>CONTROL POINT E0435127</p> <p>APPROXIMATE LOCATION: ON THE WEST SIDE OF F.M. 1378 (SOUTHVIEW DRIVE) 0.25 MILES NORTH OF THE INTERSECTION OF F.M. 1378 AND KENWOOD TRAIL, 220.0' NORTH OF A FIRE HYDRANT, 60.0' NORTHWEST OF A SPEED LIMIT 50 MPH SIGN AND 33.0' WEST OF THE EDGE OF PAVEMENT OF F.M. 1378.</p> <p>ELEVATION = 574.265' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435127" SURFACE NORTHING: 7080222.677 SURFACE EASTING: 2559400.00</p>	<p>CONTROL POINT E0435137</p> <p>APPROXIMATE LOCATION: ON THE NORTH SIDE OF F.M. 1378 (SOUTHVIEW DRIVE), 220.0' WEST OF THE INTERSECTION OF F.M. 1378 AND EDGEFIELD LANE, 56.9' EAST OF A SCHOOL ADVANCE WARNING SIGN, 15.3' NORTH OF THE EDGE OF PAVEMENT OF F.M. 1378 AND 3.0' SOUTH OF A FENCE LINE.</p> <p>ELEVATION = 596.215' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435137" SURFACE NORTHING: 7084239.674' SURFACE EASTING: 2556875.671'</p>	<p>CONTROL POINT F0430940</p> <p>APPROXIMATE LOCATION: APPROXIMATELY 1,473 FEET WEST OF THE INTERSECTION OF F.M. 1378 AND LUCAS ROAD; LOCATED +/- 153 FEET WEST OF A FIRE HYDRANT, +/- 170 FEET NORTHWEST OF A POWER POLE, AND +/- 200 FEET NORTHWEST OF THE NORTHWEST CORNER OF A CONCRETE DRAINAGE STRUCTURE.</p> <p>ELEVATION = 620.712' MONUMENT: 3-1/2" TXDOT TYPE II CONCRETE MONUMENT WITH ALUMINUM DISK. STAMPED: "TXDOT CONTROL MARK F0430940" SURFACE NORTHING: 7084201.412' SURFACE EASTING: 2552093.259'</p>
<p>CONTROL POINT E0435147</p> <p>APPROXIMATE LOCATION: ON THE NORTHEAST SIDE OF F.M. 1378 (SOUTHVIEW DRIVE) 270.0' SOUTHEAST OF THE INTERSECTION OF F.M. 1378 AND ESTELLE LANE, 73.5' NORTHWEST OF A CURVE DIRECTION SIGN, 27.5' NORTHEAST OF THE EDGE OF PAVEMENT OF F.M. 1378 AND 53.5' SOUTHEAST OF A CURVE DIRECTION SIGN.</p> <p>ELEVATION = 614.967' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435147" SURFACE NORTHING: 7086695.098' SURFACE EASTING: 2553363.852'</p>	<p>CONTROL POINT E0435157</p> <p>APPROXIMATE LOCATION: AT THE NORTHEAST CORNER OF THE INTERSECTION OF F.M. 1378 (SOUTHVIEW DRIVE) AND NORTHFORK LANE, 13.2' EAST OF A WATER VALVE, 11.2' NORTHEAST OF A WATER VALVE AND 15.3' NORTH OF A TELEPHONE PEDESTAL.</p> <p>ELEVATION = 601.656' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435157" SURFACE NORTHING: 7092832.973' SURFACE EASTING: 2551128.908'</p>	<p>CONTROL POINT E0435167</p> <p>APPROXIMATE LOCATION: ON THE WEST SIDE OF F.M. 1378 (SOUTHVIEW DRIVE), 600.0' SOUTH OF THE INTERSECTION OF F.M. 1378 AND COUNTRYBROOK LANE, 54.0' WEST OF THE EDGE OF PAVEMENT OF F.M. 1378, 47.0' SOUTH OF A TELEPHONE PEDESTAL AND 8.1' EAST OF A FENCE LINE.</p> <p>ELEVATION = 615.961' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435167" SURFACE NORTHING: 7097248.010 SURFACE EASTING: 2547582.278</p>	<p>CONTROL POINT F0430950</p> <p>APPROXIMATE LOCATION: APPROXIMATELY 127 FEET NORTH OF THE INTERSECTION OF OLD STACY ROAD AND F.M. 1378; LOCATED +/- 21 FEET WEST OF EDGE OF PAVEMENT OF F.M. 1378, +/- 89 FEET SOUTHWEST OF A SPEED LIMIT SIGN, AND +/- 79 FEET NORTHWEST OF A CURVE LEFT SIGN.</p> <p>ELEVATION = 593.801' MONUMENT: 3-1/2" TXDOT TYPE II CONCRETE MONUMENT WITH ALUMINUM DISK. STAMPED: "TXDOT CONTROL MARK F0430950" SURFACE NORTHING: 7010148.202' SURFACE EASTING: 2547490.751'</p>

TEST HOLE QUANTITIES	
DEPTH	QUANTITY
0' - 5'	5
5' - 8'	1
8' - 13'	0
13' - 20'	0
20'+	0
TOTAL TEST HOLES	6



ANIL M. SANDHU
114532
LICENSED PROFESSIONAL ENGINEER
12/23/2021

NO.	DATE	REVISION	APPROV.



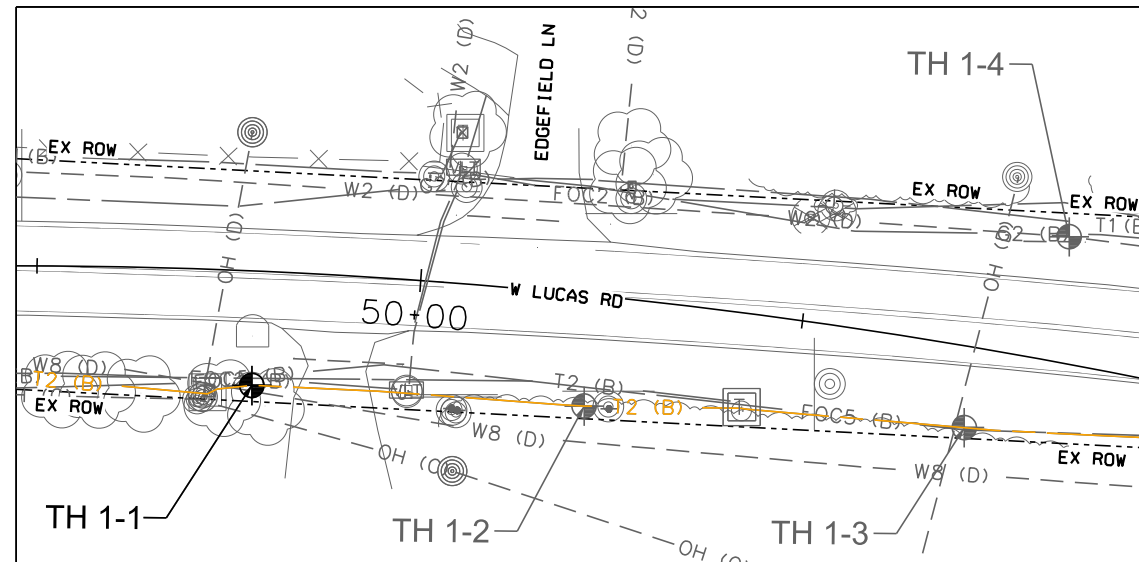
FM 1378

UTILITY CONTACTS,
SURVEY CONTROL,
& TEST HOLE SUMMARY

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	30118066.07	230
STATE	DISTRICT	COUNTY
TEXAS	DALLAS	COLLIN
CONTROL	SECTION	JOB
1392	01	048
		HIGHWAY NO.
		FM 1378

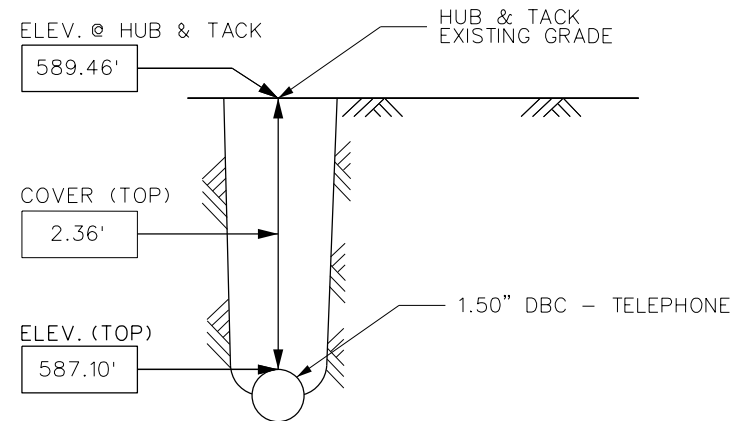
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PLAN VIEW

1" = 50'



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TEXAS.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BOUINNONTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

LEGEND

- T2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:

- COORDINATES PROVIDED ARE IN SURFACE
- 1. E0435127
NORTHING: 7.080,222.677 EASTING: 2.559,400.000 ELEV.: 574.27'
- 2. E0435137
NORTHING: 6.084,239.674 EASTING: 2.556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

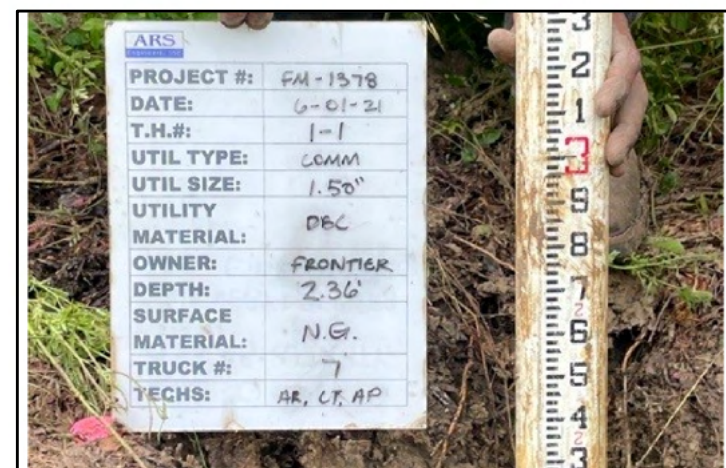


PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION: APPROX 30' SOUTH OF W LUCAS RD CL,
& APPROX 2800' EAST OF STINSON RD

UTILITY STATION/OFFSET: STA. 49+57.25, 29.79 RT

HORIZONTAL DATUM: NAD83 (2011)

SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)

VERTICAL DATUM: NAVD88

TEST HOLE NO.: 1-1 POINT NUMBER: 90002

NORTHING: 7084178.096 EASTING: 2557023.063

GROUND ELEVATION: 589.46' DEPTH OF UTILITY: 2.36'

FIELD MANAGER: JAE KOONTZ

DATE OF WORK: 06-01-2021

VACUUM TRUCK NO.: 7

UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY

UTILITY OWNER: FRONTIER

UTILITY TYPE: TELEPHONE

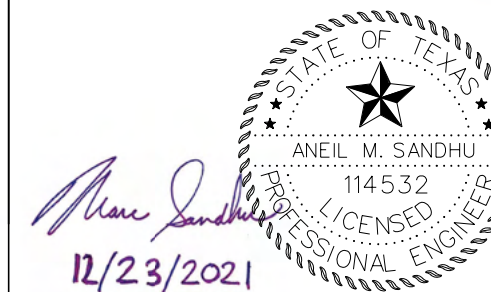
UTILITY SIZE: 1.50" T.O.U. 587.10'

UTILITY MATERIAL: DBC

UTILITY CONDITION: GOOD

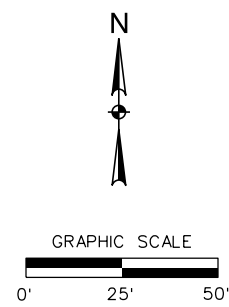
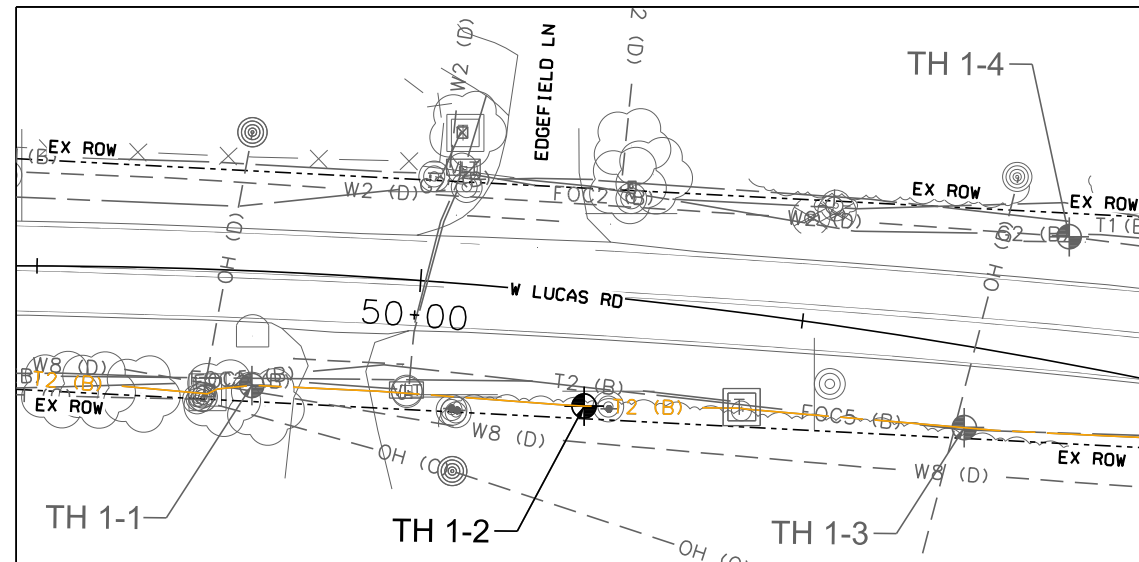
SURFACE MATERIAL: NATURAL GROUND

PAVEMENT TYPE/DEPTH: N/A

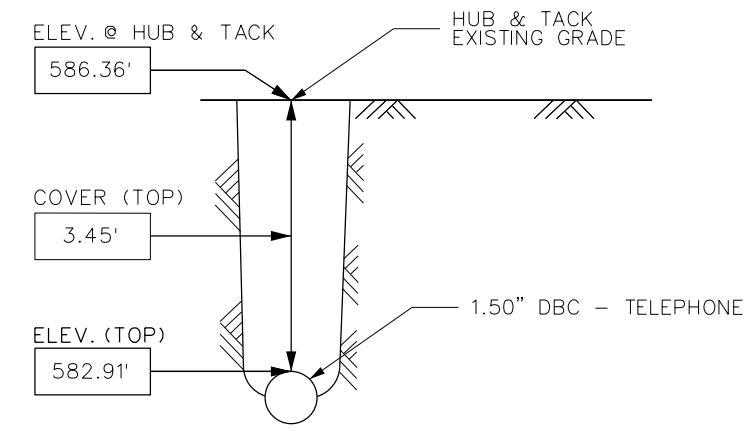


TEST HOLE DATA FORM
SUE: QUALITY LEVEL - A
PROJECT: 30118066.07 FM 1378

PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	231
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	



PLAN VIEW
1" = 50'



UTILITY CROSS-SECTION VIEW
NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TX.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BOUINNONTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

- LEGEND**
- T2 — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
• COORDINATES PROVIDED ARE IN SURFACE
1. E0435127
NORTHING: 7,080,222.677 EASTING: 2,559,400.000 ELEV.: 574.27'
2. E0435137
NORTHING: 6,084,239.674 EASTING: 2,556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



PHOTO OF DEPTH INFORMATION



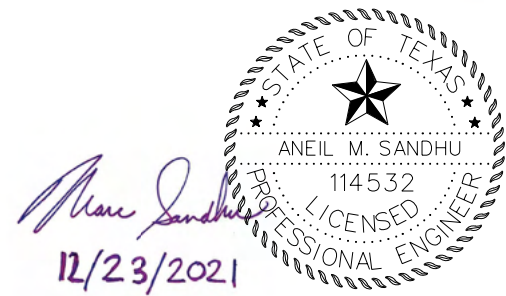
LOCATION MAP
NOT TO SCALE

LOCATION: APPROX 30' SOUTH OF W LUCAS RD CL,
& APPROX 2885' EAST OF STINSON RD

UTILITY STATION/OFFSET: STA. 50+45.70, 28.86 RT	
HORIZONTAL DATUM: NAD83 (2011)	
SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)	
VERTICAL DATUM: NAVD88	
TEST HOLE NO.: 1-2	POINT NUMBER: 90001
NORTHING: 7084172.725	EASTING: 2557109.608
GROUND ELEVATION: 586.36'	DEPTH OF UTILITY: 3.45'
FIELD MANAGER: JAE KOONTZ	
DATE OF WORK: 06-01-2021	
VACUUM TRUCK NO.: 7	

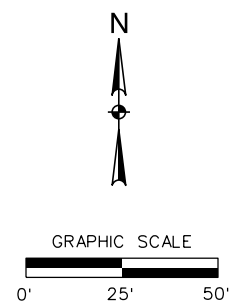
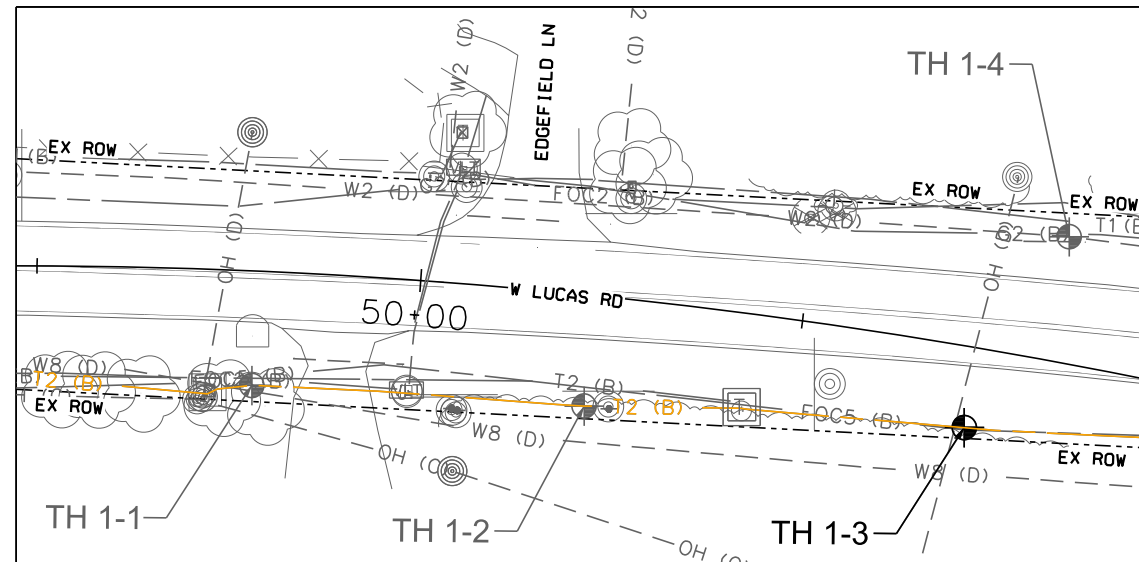
UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY	
UTILITY OWNER: FRONTIER	
UTILITY TYPE: TELEPHONE	
UTILITY SIZE: 1.50"	T.O.U. 582.91'
UTILITY MATERIAL: DBC	
UTILITY CONDITION: GOOD	
SURFACE MATERIAL: NATURAL GROUND	
PAVEMENT TYPE/DEPTH: N/A	

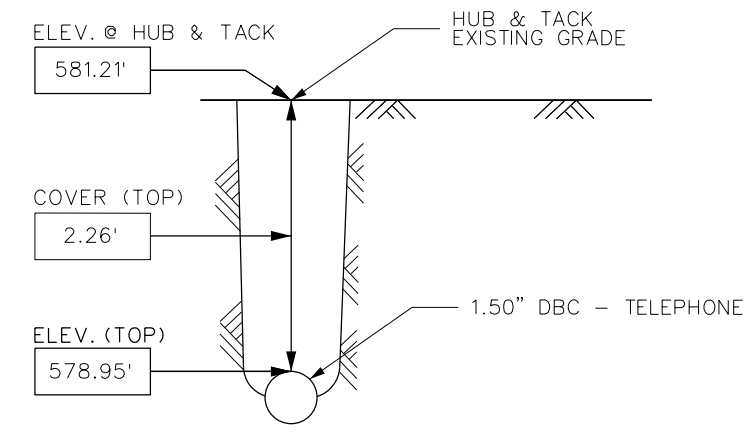


TEST HOLE DATA FORM
SUE: QUALITY LEVEL - A
PROJECT: 30118066.07 FM 1378

PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	232
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	



PLAN VIEW
1" = 50'



UTILITY CROSS-SECTION VIEW
NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TEXAS.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BOUINNONTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

- LEGEND**
- T2 — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
• COORDINATES PROVIDED ARE IN SURFACE
1. E0435127
NORTHING: 7,080,222.677 EASTING: 2,559,400.000 ELEV.: 574.27'
2. E0435137
NORTHING: 6,084,239.674 EASTING: 2,556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



PHOTO OF DEPTH INFORMATION



LOCATION MAP
NOT TO SCALE

LOCATION: APPROX 20' SOUTH OF W LUCAS RD CL,
& APPROX 2985' EAST OF STINSON RD

UTILITY STATION/OFFSET: STA. 51+46.28, 21.01 RT

HORIZONTAL DATUM: NAD83 (2011)

SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)

VERTICAL DATUM: NAVD88

TEST HOLE NO.: 1-3 POINT NUMBER: 90000

NORTHING: 7084167.117 EASTING: 2557208.653

GROUND ELEVATION: 581.21' DEPTH OF UTILITY: 2.26'

FIELD MANAGER: JAE KOONTZ

DATE OF WORK: 06-01-2021

VACUUM TRUCK NO.: 7

UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY

UTILITY OWNER: FRONTIER

UTILITY TYPE: TELEPHONE

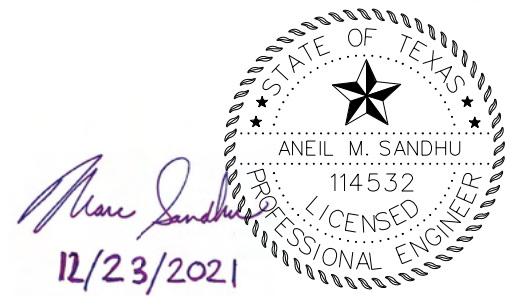
UTILITY SIZE: 1.50" T.O.U. 578.95'

UTILITY MATERIAL: DBC

UTILITY CONDITION: GOOD

SURFACE MATERIAL: NATURAL GROUND

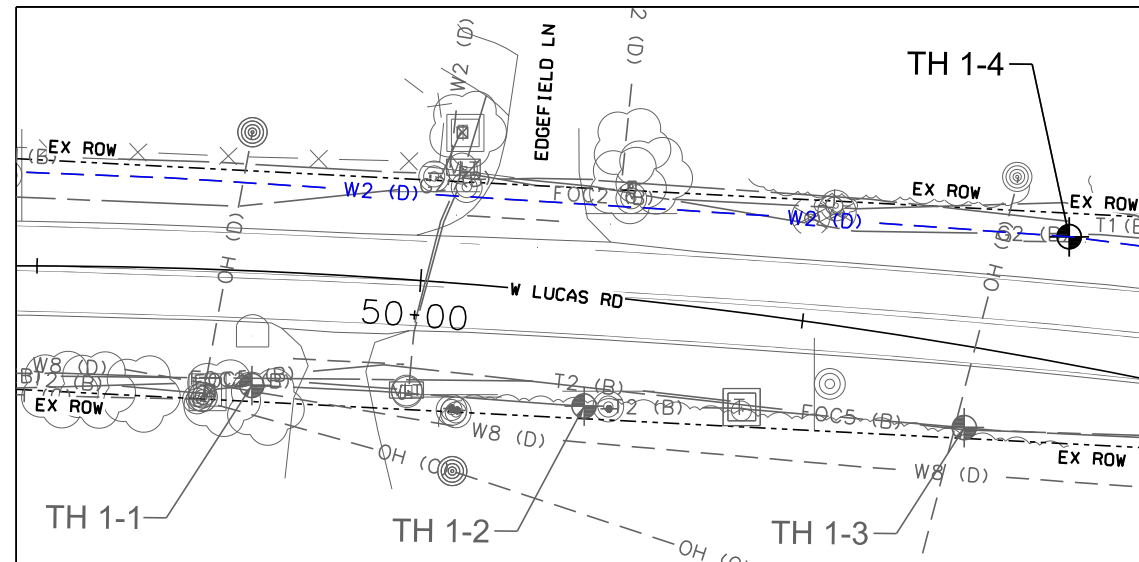
PAVEMENT TYPE/DEPTH: N/A



TEST HOLE DATA FORM
SUE: QUALITY LEVEL - A
PROJECT: 30118066.07 FM 1378

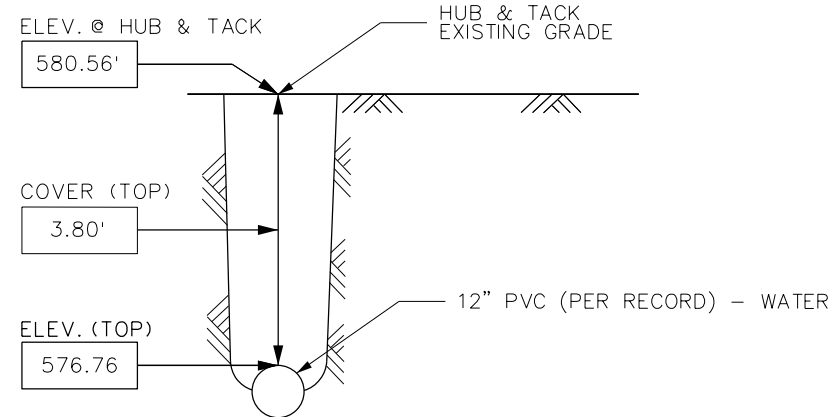
PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	233
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	

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PLAN VIEW

1" = 50'



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TEXAS.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BOUINNONTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

LEGEND

- W2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:

- COORDINATES PROVIDED ARE IN SURFACE
- 1. E0435127
NORTHING: 7.080,222.677 EASTING: 2.559,400.000 ELEV.: 574.27'
- 2. E0435137
NORTHING: 6.084,239.674 EASTING: 2.556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

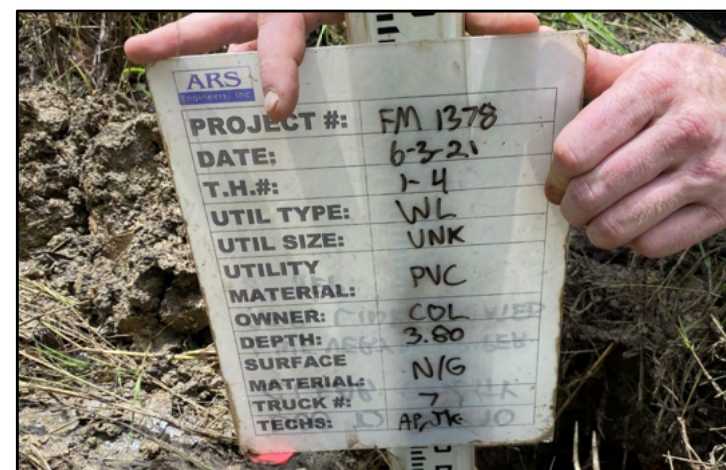


PHOTO OF DEPTH INFORMATION



LOCATION MAP

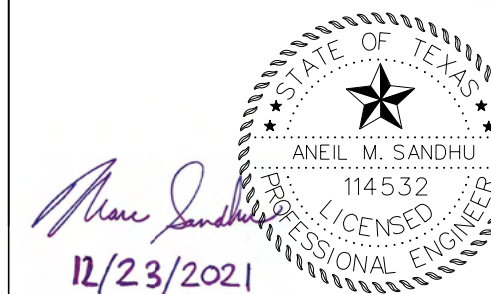
NOT TO SCALE

LOCATION: APPROX 35' NORTH OF W LUCAS RD CL,
& APPROX 140' EAST OF EDGEFIELD LN

UTILITY STATION/OFFSET: STA. 51+64.44, 32.71 LT	
HORIZONTAL DATUM: NAD83 (2011)	
SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)	
VERTICAL DATUM: NAVD88	
TEST HOLE NO.: 1-4	POINT NUMBER: 30002
NORTHING: 7084216.835	EASTING: 2557235.979
GROUND ELEVATION: 580.56'	DEPTH OF UTILITY: 3.80'
FIELD MANAGER: JAE KOONTZ	
DATE OF WORK: 06-03-2021	
VACUUM TRUCK NO.: 7	

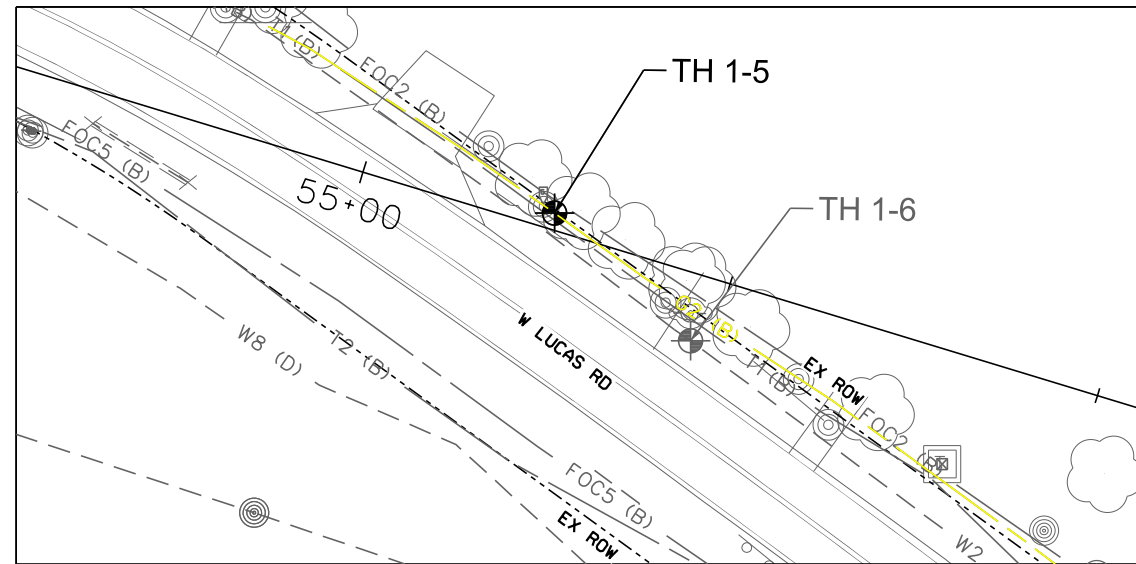
UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY	
UTILITY OWNER: CITY OF LUCAS	
UTILITY TYPE: WATER	
UTILITY SIZE: 12" (PER RECORD)	T.O.U. 576.76'
UTILITY MATERIAL: PVC	
UTILITY CONDITION: GOOD	
SURFACE MATERIAL: NATURAL GROUND	
PAVEMENT TYPE/DEPTH: N/A	



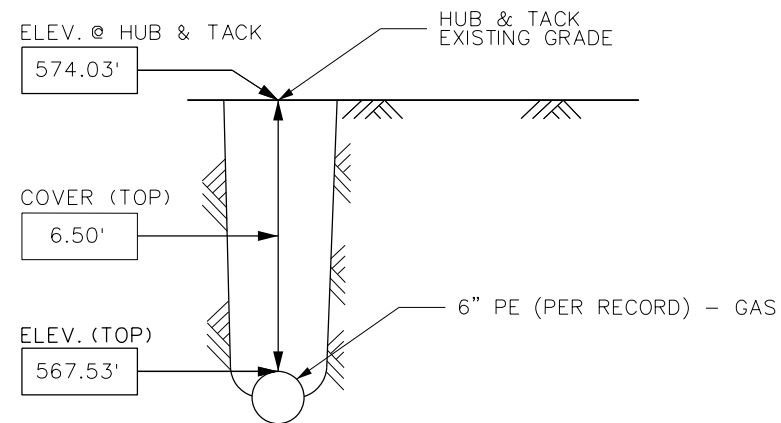
TEST HOLE DATA FORM
SUE: QUALITY LEVEL - A
PROJECT: 30118066.07 FM 1378

PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	234
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	



PLAN VIEW

1" = 50'



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TEXAS.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BQUINN@NTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

LEGEND

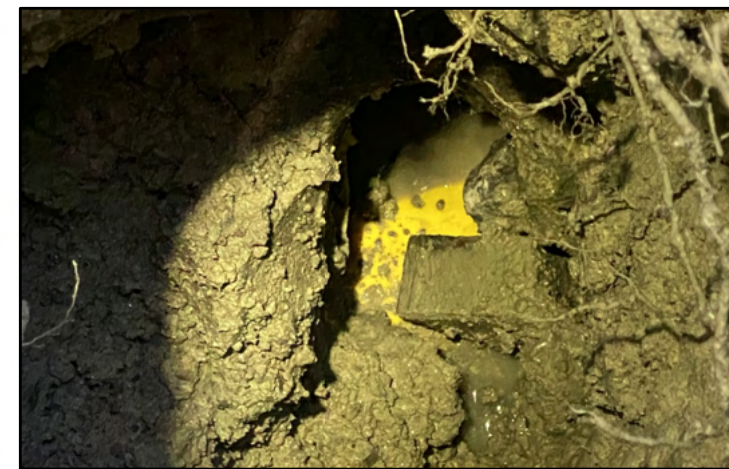
- G2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:

- COORDINATES PROVIDED ARE IN SURFACE
- 1. E0435127
NORTHING: 7.080,222.677 EASTING: 2.559,400.000 ELEV.: 574.27'
- 2. E0435137
NORTHING: 6.084,239.674 EASTING: 2.556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION: APPROX 5' NORTH OF W LUCAS RD CL,
& APPROX 540' EAST OF EDGEFIELD LN

UTILITY STATION/OFFSET: STA. 55+50.94, 4.34 LT

HORIZONTAL DATUM: NAD83 (2011)

SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)

VERTICAL DATUM: NAVD88

TEST HOLE NO.: 1-5

POINT NUMBER: 30001

NORTHING: 7084085.738

EASTING: 2557603.587

GROUND ELEVATION: 574.03'

DEPTH OF UTILITY: 6.50'

FIELD MANAGER: JAE KOONTZ

DATE OF WORK: 06-03-2021

VACUUM TRUCK NO.: 7

UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY

UTILITY OWNER: COSERV

UTILITY TYPE: GAS

UTILITY SIZE: 6" (PER RECORD)

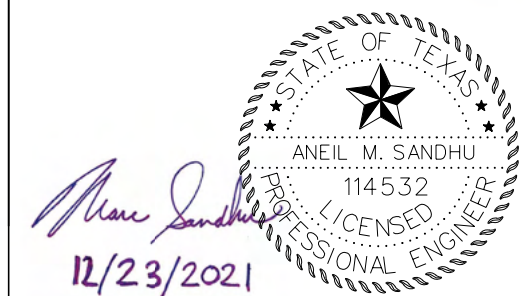
T.O.U. 567.53'

UTILITY MATERIAL: PE

UTILITY CONDITION: GOOD

SURFACE MATERIAL: NATURAL GROUND

PAVEMENT TYPE/DEPTH: N/A

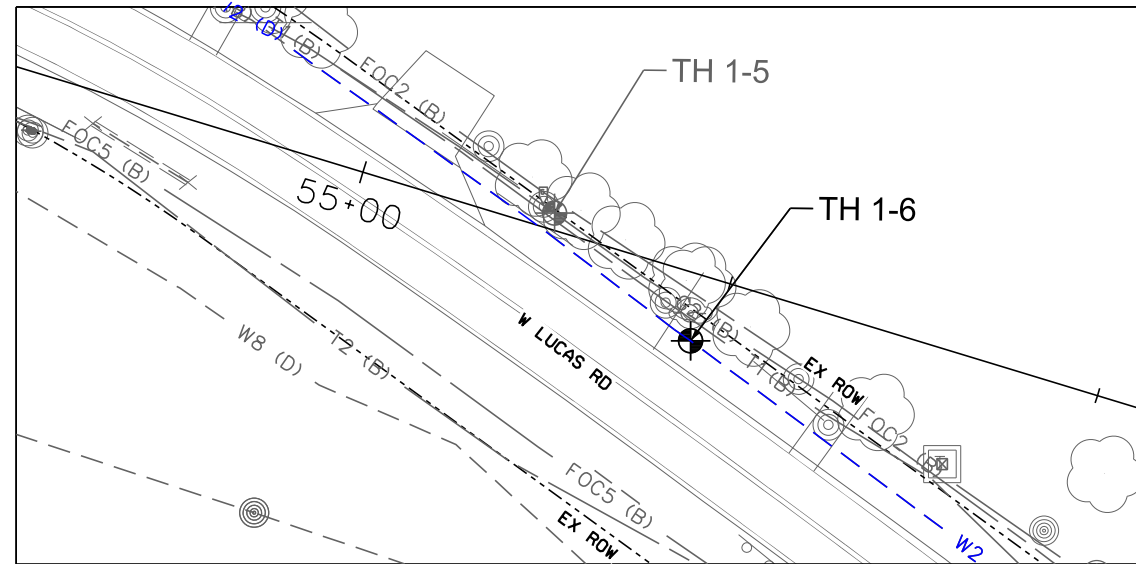


TEST HOLE DATA FORM

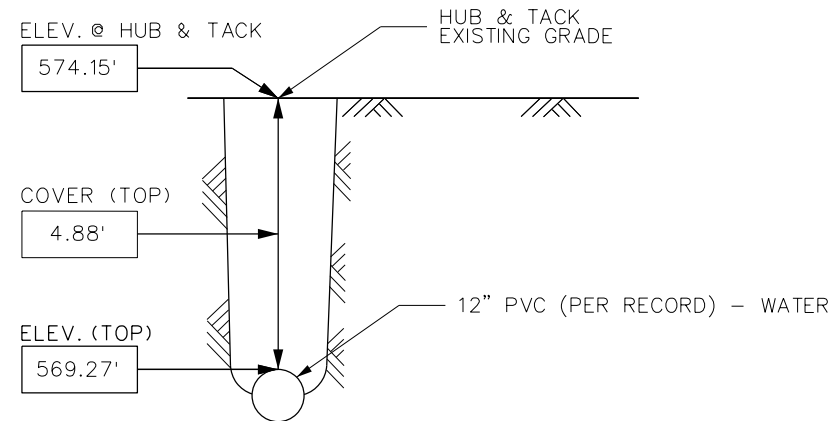
SUE: QUALITY LEVEL - A

PROJECT: 30118066.07 FM 1378

PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	235
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	



PLAN VIEW
1" = 50'



UTILITY CROSS-SECTION VIEW
NOT TO SCALE

COMPANY	UTILITIES COORDINATOR	PHONE	EMAIL	ADDRESS
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCAS.TX.US	665 COUNTRY CLUB RD, LUCAS, TX, 75002
COSERV	LORNA CURRAN	940-321-7800	LCURRAN@COSERV.COM	7701 S STEMMONS FWY, CORINTH, TX 76210
FRONTIER	CARL SHIPMAN	972-318-3245	BOUINN@NTMWD.COM	415 AIRPORT FWY, IRVING, TX 75062

LEGEND

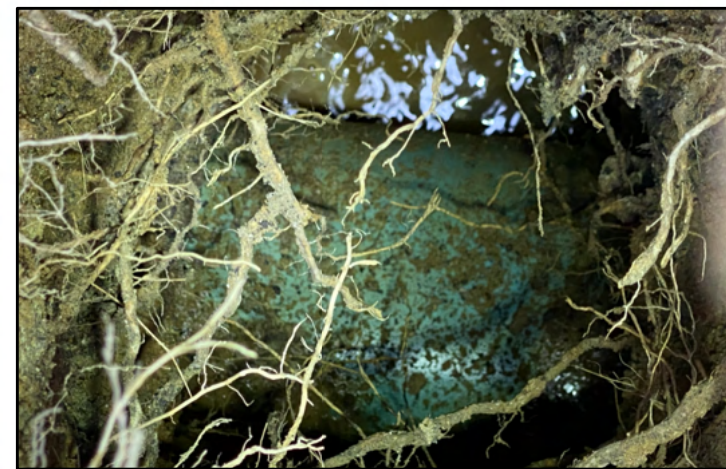
- W2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:

- COORDINATES PROVIDED ARE IN SURFACE
- 1. E0435127
NORTHING: 7,080,222.677 EASTING: 2,559,400.000 ELEV.: 574.27'
- 2. E0435137
NORTHING: 6,084,239.674 EASTING: 2,556,875.671 ELEV.: 596.22'

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



PHOTO OF DEPTH INFORMATION



LOCATION MAP
NOT TO SCALE

LOCATION: APPROX 20' SOUTH OF W LUCAS RD CL,
& APPROX 585' EAST OF EDGEFIELD LN

UTILITY STATION/OFFSET: STA. 55+94.51, 17.17 RT

HORIZONTAL DATUM: NAD83 (2011)

SURFACE ADJUSTMENT FACTOR: 1.00015271 (COLLIN COUNTY)

VERTICAL DATUM: NAVD88

TEST HOLE NO.: 1-6

POINT NUMBER: 30000

NORTHING: 7084052.477

EASTING: 2557639.007

GROUND ELEVATION: 574.15'

DEPTH OF UTILITY: 4.88'

FIELD MANAGER: JAE KOONTZ

DATE OF WORK: 06-03-2021

VACUUM TRUCK NO.: 7

UTILITY INFORMATION

DESCRIPTION: FOUND UTILITY

UTILITY OWNER: CITY OF LUCAS

UTILITY TYPE: WATER

UTILITY SIZE: 12" (PER RECORD)

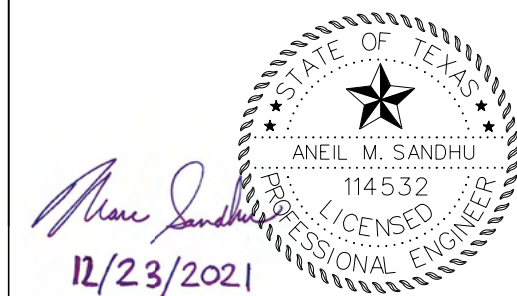
T.O.U. 569.27'

UTILITY MATERIAL: PVC

UTILITY CONDITION: GOOD

SURFACE MATERIAL: NATURAL GROUND

PAVEMENT TYPE/DEPTH: N/A



TEST HOLE DATA FORM
SUE: QUALITY LEVEL - A
PROJECT: 30118066.07 FM 1378

PROJECT MANAGER	FED RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
MARC SANDHU	6			1378
SURVEYED BY	STATE	DISTRICT	COUNTY	SHEET NO.
ARS ENGINEERS	TEXAS	DALLAS	COLLIN	236
CITY/TOWN	CONTROL	SECTION	JOB	
LUCAS	1392	01	048	

STATE OF TEXAS

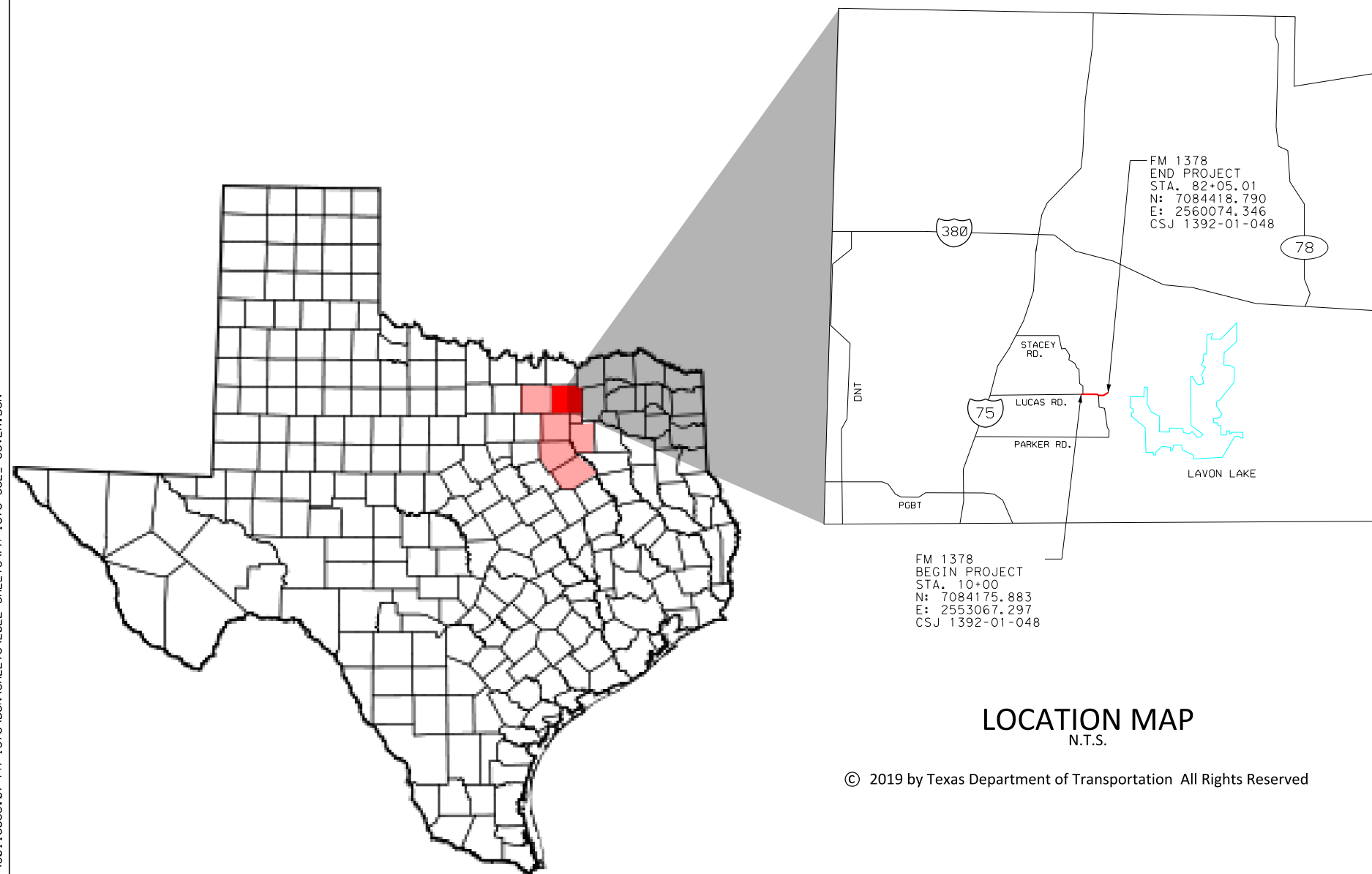
DEPARTMENT OF TRANSPORTATION

PLANS OF EXISTING SUBSURFACE UTILITIES

QUALITY LEVEL A COLLIN COUNTY

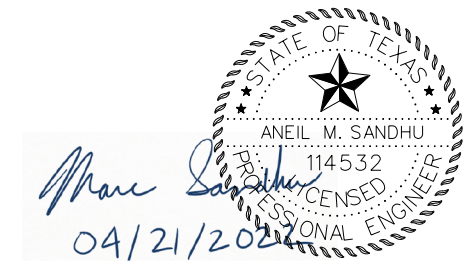
HIGHWAY: 1378

ALONG LUCAS RD. FROM THE INTERSECTION OF W LUCAS RD AND COUNTRY CLUB RD
TO THE INTERSECTION OF E LUCAS RD AND WINNINGKOFF RD.
CSJ 1392-01-048



LOCATION MAP
N.T.S.

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FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			237
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	JOB	HIGHWAY NO.
1392	01	048	FM 1378

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4/25/2022 10:48:24 AM P:\30118066.07 FM 1378\DGN\SHEETS\2022 SHEETS\FM 1378 SUE COVER.DGN

SUE LEGEND

OVERHEAD		SEE OH LEGEND
ELECTRIC		ONCOR
ELECTRIC		GRAYSON-COLLIN ELECTRIC COOPERATIVE INC.
TRAFFIC SIGNAL		TxDOT
TELEPHONE		AT&T
TELEPHONE		FRONTIER
TELEPHONE		ZAYO GROUP
TELEPHONE		SUDDENLINK COMMUNICATIONS
TELEPHONE		GRANDE COMMUNICATIONS
TELEPHONE		UNITE PRIVATE NETWORKS
TELEPHONE		VERIZON
FIBER OPTIC		AT&T
FIBER OPTIC		FRONTIER
FIBER OPTIC		ZAYO GROUP
FIBER OPTIC		SUDDENLINK COMMUNICATIONS
FIBER OPTIC		GRANDE COMMUNICATIONS
FIBER OPTIC		UNITE PRIVATE NETWORKS
FIBER OPTIC		VERIZON
CABLE		SPECTRUM/CHARTER
CABLE		SUDDENLINK COMMUNICATIONS
CABLE		SPECTRUM/CHARTER
GAS		ATMOS
GAS		COSERV GAS LTD
WATER		CITY OF PARKER
WATER		CITY OF LUCAS
WATER		CITY OF FAIRVIEW
WATER		CITY OF ALLEN
WATER		CITY OF WYLIE
WATER		NORTH TEXAS MUNICIPAL WATER DISTRICT
WATER		WYLIE NORTHEAST SUD
WATER		SEIS LAGOS UTILITY DISTRICT
WASTEWATER		CITY OF PARKER
WASTEWATER		CITY OF LUCAS
WASTEWATER		CITY OF FAIRVIEW
WASTEWATER		CITY OF ALLEN
WASTEWATER		CITY OF WYLIE
WASTEWATER		NORTH TEXAS MUNICIPAL WATER DISTRICT
WASTEWATER		WYLIE NORTHEAST SUD
STORM		CITY OF PARKER
STORM		CITY OF LUCAS
STORM		CITY OF FAIRVIEW
STORM		CITY OF ALLEN
STORM		CITY OF WYLIE
		EXISTING RIGHT-OF-WAY
		PROPOSED RIGHT-OF-WAY

QUALITY LEGEND

	TRANSMISSION TOWER		QUALITY LEVEL "A"
	CELL TOWER		QUALITY LEVEL "B"
	POWER POLE		QUALITY LEVEL "C"
	POWER POLE WITH LIGHT		QUALITY LEVEL "D"
	POWER MANHOLE		
	PULL/TRANSFORMER BOX		
	ELECTRIC METER		
	UG ELECTRIC MARKER		
	LIGHT POLE		
	TRAFFIC SIGNAL POLE		
	TRAFFIC SIGNAL CONTROL BOX		
	SIGNAL PEDESTAL		
	TELEPHONE HAND HOLE		
	TELEPHONE PEDESTAL		
	TELEPHONE MANHOLE		
	CATV PEDESTAL		
	UG TELEPHONE MARKER		
	UG FIBER MARKER		
	GAS MANHOLE		
	GAS METER		
	GAS APPURTENANCE		
	UG GAS MARKER		
	GAS VENT		
	GAS TEST VALVE		
	WATER VALVE		
	FIRE HYDRANT		
	WATER METER		
	WATER MANHOLE		
	WASTEWATER MANHOLE		
	WASTEWATER CLEANOUT		
	UG WASTEWATER MARKER		
	STORM SEWER MANHOLE		
	IRRIGATION EQUIPMENT		
	SITE SIGN		
	CONTROL POINT		
	CONTINUATION MARK		

QUALITY LEVEL "D":
INFORMATION DERIVED FROM EXISTING RECORDS AND/OR ORAL RECOLLECTIONS.

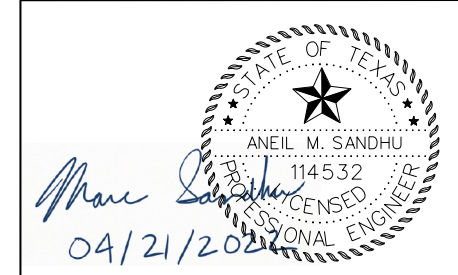
QUALITY LEVEL "C":
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

QUALITY LEVEL "B":
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES (AKA DESIGNATING).

QUALITY LEVEL "A":
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT (AKA LOCATING).

SHEET INDEX

1	COVER
2	SUE LEGEND & QUALITY DESCRIPTION
3	TEST HOLE LAYOUT
4	TEST HOLE SUMMARY & SURVEY CONTROL
5-17	TEST HOLE DATA SHEETS



NO.	DATE	REVISION	APPROV.



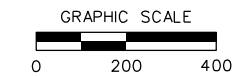
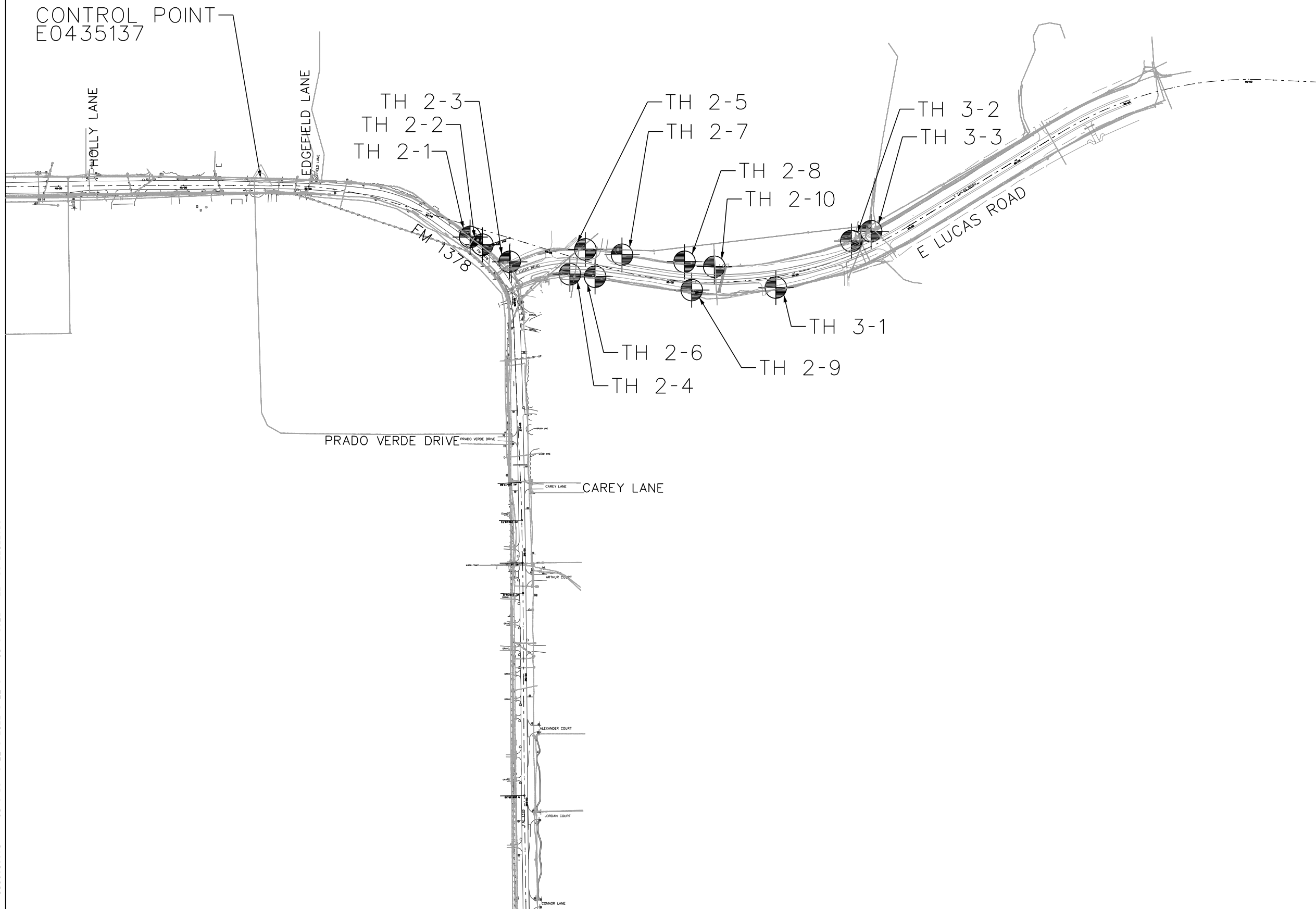
FM 1378
SUE LEGEND
&
QUALITY DESCRIPTION

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			238
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	COLLIN	
CONTROL	SECTION	JOB	HIGHWAY NO.
1392	01	048	FM 1378

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TEST HOLE QUANTITIES	
DEPTH	QUANTITY
0' - 5'	11
5' - 8'	1
8' - 13'	1
13' - 20'	0
20'	0
TOTAL TEST HOLES	13



NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE LAYOUT

DESIGNED	FED. NO.	FEDERAL AID PROJECT NO.		PROJECT
JS				FM 1378
DRAWN	STATE	DISTRICT	COUNTY	PAGE NUMBER
CM	TX	DALLAS	COLLIN	239
CHECKED	CONT	SECT	JOB	
JS	1392	01	048	
APPROVED				
MH				

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Client: DALLAS TxDOT			TEST HOLE SUMMARY SHEET								Project Manager: Jared Silva		
Project Name: 1378											Field Foreman: JK		
Project #: 30118066.07			Project location: FROM INTERSECTION OF W LUCAS RD. AND S FM 1378								Field Technicians: KM,PH,TY,AJ		
CSJ #: 1392-01-048			City: LUCAS				County: COLLIN		State: TX		Truck #: 6136		
TH#	UTILITY TYPE	UTILITY SIZE	UTILITY MATERIAL	UTILITY OBSERVED	DEPTH OF HOLE (FT)	SURFACE MATERIAL	DATE	POINT #	NORTHING	EASTING	GROUND ELEVATION	UTILITY ELEVATION	OWNER/NOTES
TH 2-1	TELEPHONE	1"	DIRECT BURIED CABLE	YES	2.93	NG	1/29/2022	65015	7084003.310	2557713.794	573.01'	570.08'	AT&T
TH 2-2	GAS	UNKNOWN	PE	YES	7.03	NG	1/31/2022	65002	7083972.487	2557763.289	572.32'	565.29'	COSERV
TH 2-3	TELEPHONE	1"	DIRECT BURIED CABLE	YES	2.30	NG	1/28/2022	65016	7083904.186	2557872.202	566.44'	564.14'	AT&T
TH 2-4	WATER	10"	PVC	YES	3.75	NG	2/1/2022	65003	7083854.543	2558113.271	566.28'	562.53'	CITY OF LUCAS
TH 2-5	TELEPHONE	1"	DIRECT BURIED CABLE	YES	3.31	NG	2/1/2022	65000	7083953.680	2558175.020	556.75'	553.44'	AT&T
TH 2-6	WATER	12"	PVC	YES	3.12	NG	2/1/2022	65004	7083844.597	2558214.092	563.24'	560.12'	CITY OF LUCAS
TH 2-7	GAS	6"	PE	YES	4.35	NG	2/1/2022	65001	7083932.034	2558321.868	553.73'	549.38'	COSERV
TH 2-8	TELEPHONE	1"	DIRECT BURIED CABLE	YES	3.00	NG	2/1/2022	65008	7083904.493	2558571.867	549.48'	546.48'	AT&T
TH 2-9	WATER	12"	PVC	YES	4.13	NG	2/2/2022	65010	7083791.313	2558600.643	552.46'	548.33'	CITY OF LUCAS
TH 2-10	GAS	7"	PE	YES	9.34	NG	2/2/2022	65009	7083884.431	2558690.975	548.99'	539.65'	COSERV
TH 3-1	WATER	12"	PVC	YES	4.12	NG	2/1/2022	65005	7083800.960	2558937.305	558.58'	554.46'	CITY OF LUCAS
TH 3-2	GAS	7"	PE	YES	3.52	NG	2/1/2022	65007	7083987.423	2559239.675	565.57'	562.05'	COSERV
TH 3-3	TELEPHONE	1 3/4"	PE	YES	2.44	NG	1/31/2022	65006	7084026.604	2559318.813	565.89'	563.45'	AT&T

SURVEY CONTROL POINTS

<p>CONTROL POINT E0435127</p> <p>APPROXIMATE LOCATION: ON THE WEST SIDE OF F.M. 1378 (SOUTHVIEW DRIVE) 0.25 MILES NORTH OF THE INTERSECTION OF F.M. 1378 AND KENWOOD TRAIL, 220.0' NORTH OF A FIRE HYDRANT, 60.0' NORTHWEST OF A SPEED LIMIT 50 MPH SIGN AND 33.0' WEST OF THE EDGE OF PAVEMENT OF F.M. 1378.</p> <p>ELEVATION = 574.265' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435127" SURFACE NORTHING: 7080222.677 SURFACE EASTING: 2559400.00</p>	<p>CONTROL POINT E0435137</p> <p>APPROXIMATE LOCATION: ON THE NORTH SIDE OF F.M. 1378 (SOUTHVIEW DRIVE), 220.0' WEST OF THE INTERSECTION OF F.M. 1378 AND EDGEFIELD LANE, 56.9' EAST OF A SCHOOL ADVANCE WARNING SIGN, 15.3' NORTH OF THE EDGE OF PAVEMENT OF F.M. 1378 AND 3.0' SOUTH OF A FENCE LINE.</p> <p>ELEVATION = 596.215' MONUMENT: ALUMINUM DISK IN TYPE II SETTING STAMPED: "TXDOT CONTROL MARK E0435137" SURFACE NORTHING: 7084239.674' SURFACE EASTING: 2556875.671'</p>
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Aneil M. Sandhu
 04/21/2022

NO.	DATE	REVISION	APPROV.

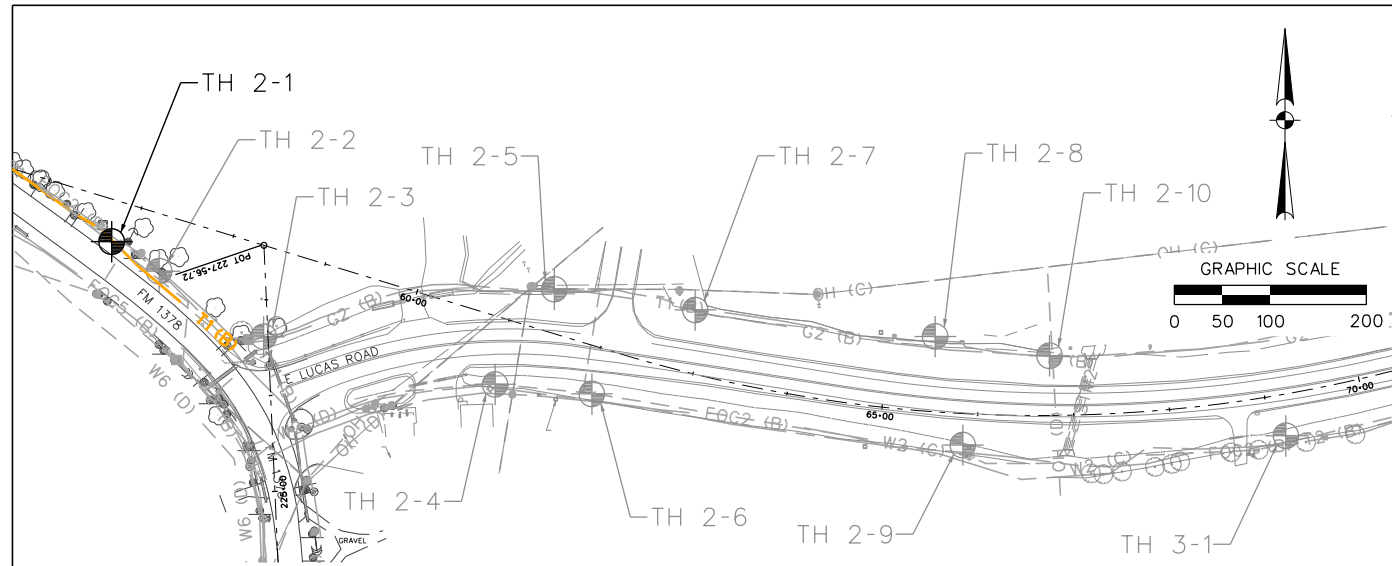


TEXAS DEPARTMENT OF TRANSPORTATION
 © 2021 TxDOT

FM 1378			
TEST HOLE SUMMARY			
DESIGNED JS	FED. NO. 6	FEDERAL AID PROJECT NO.	PROJECT FM 1378
DRAWN CM	STATE TX	DISTRICT DALLAS	PAGE NUMBER 240
CHECKED JS	COUNTY COLLIN	JOB	
APPROVED MH			
	1392	01	048

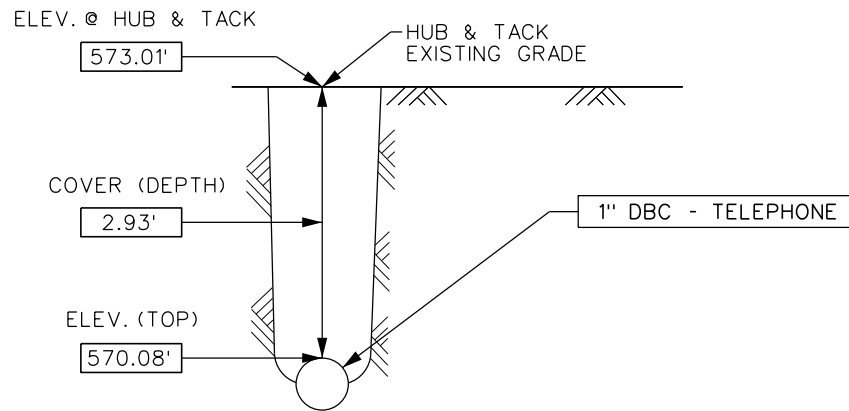
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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
AT&T	MARC COSTELLO	972-470-7577	MC9971@ATT.COM

- LEGEND**
- TH — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

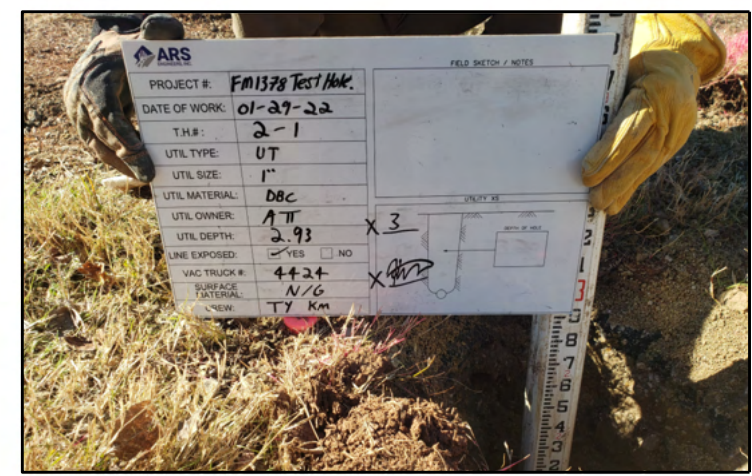


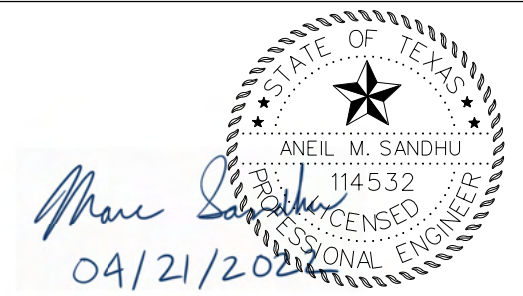
PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 7' NE OF W. LUCAS RD EOP APPROX. 205' NW OF E. LUCAS RD EOP		
UTILITY STATION/OFFSET:	56+80.37 / 42.44' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-1	POINT NUMBER:	65015
NORTHING:	7084003.310	EASTING:	2557713.794
GROUND ELEVATION:	573.01'	DEPTH OF UTILITY:	2.93'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	1/29/2022		
VACUUM TRUCK NO.:	4424		
UTILITY INFORMATION			
DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	AT&T		
UTILITY TYPE:	TELEPHONE		
UTILITY SIZE:	1"	T.O.U.	570.08'
UTILITY MATERIAL:	DIRECT BURIED CABLE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



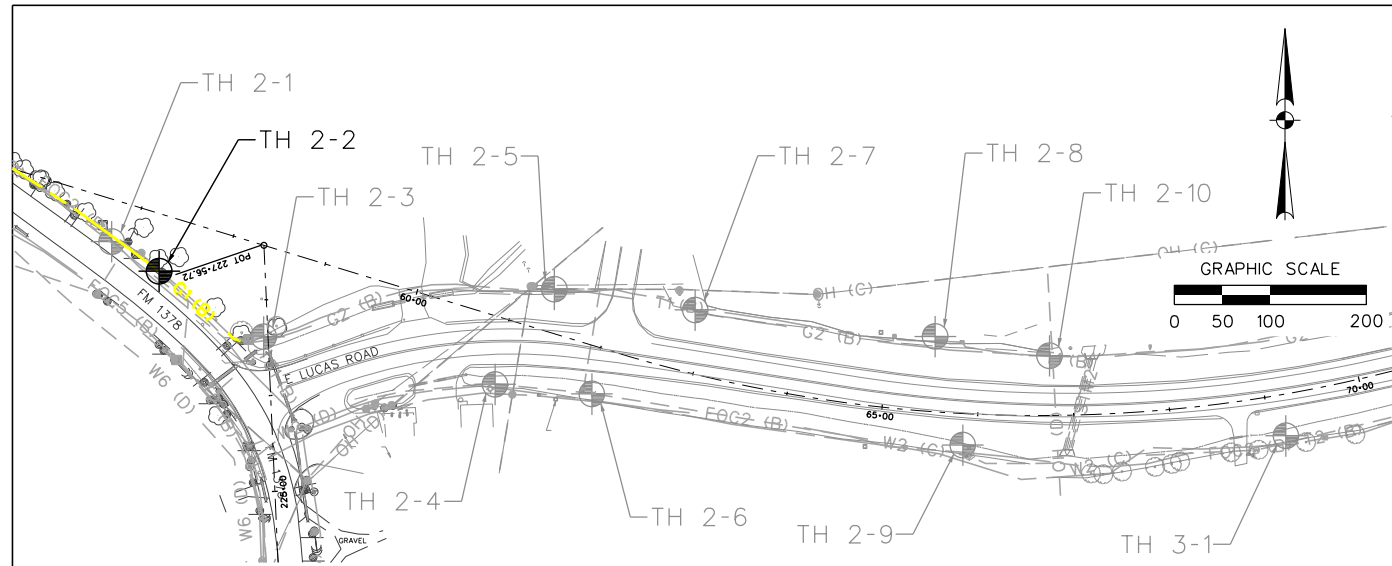
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

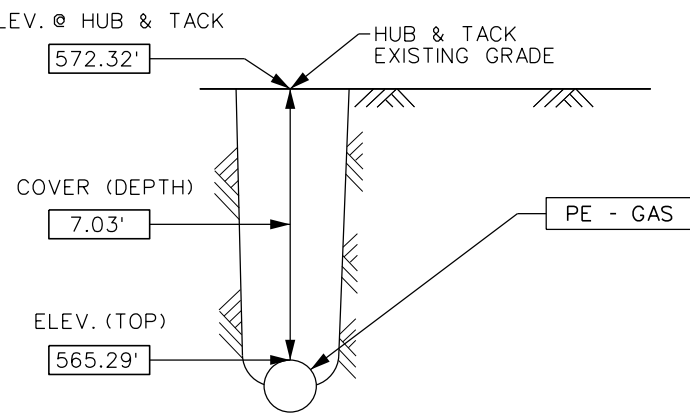
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
COSERV	LORNA CURRAN	940-270-7734	LCURRAN@COSERV.COM

LEGEND

- G2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

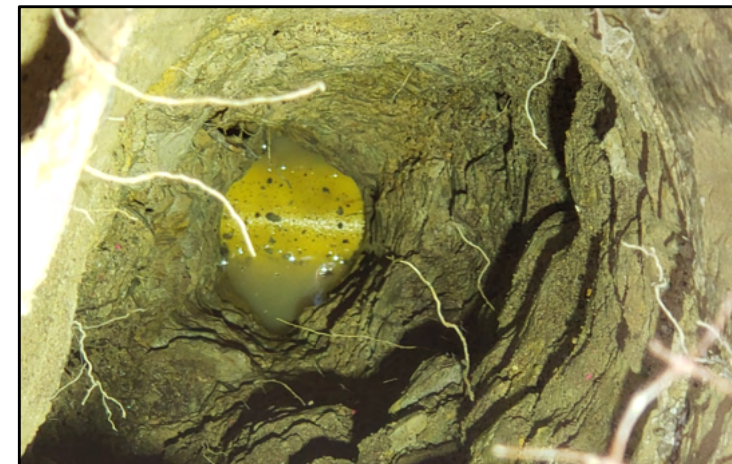
PROJECT CONTROL:

CONTROL POINTS:

E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

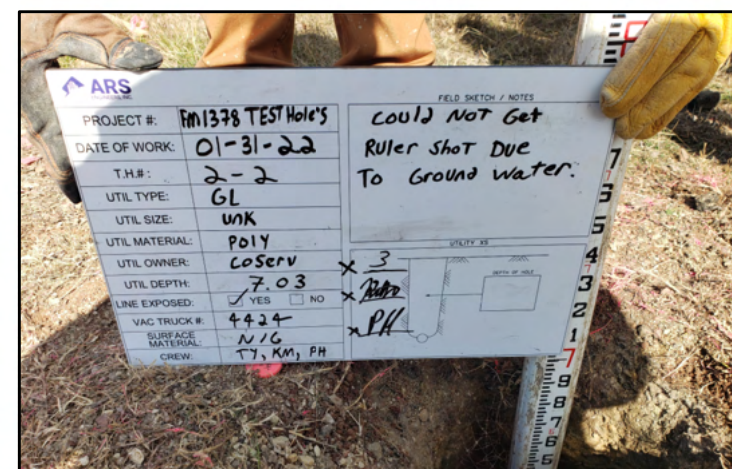


PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 15' NE OF W. LUCAS RD EOP APPROX. 145' NW OF E. LUCAS RD EOP		
UTILITY STATION/OFFSET:	57+36.69 / 57.52' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-2	POINT NUMBER:	65002
NORTHING:	7083972.487	EASTING:	2557763.289
GROUND ELEVATION:	572.32'	DEPTH OF UTILITY:	7.03'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	1/31/2022		
VACUUM TRUCK NO.:	4424		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA. UNABLE TO GET UTILITY SIZE DUE TO GROUND WATER.		
UTILITY OWNER:	COSERV		
UTILITY TYPE:	GAS		
UTILITY SIZE:	UNKNOWN	T.O.U.	565.29'
UTILITY MATERIAL:	PE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		

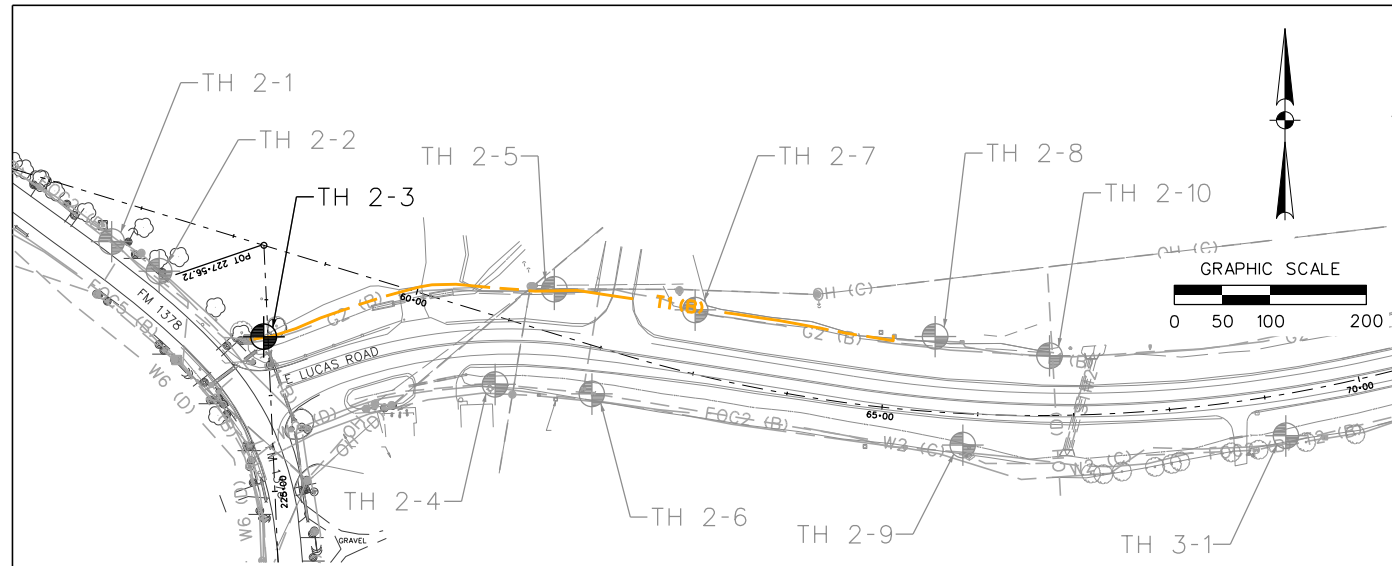


NO.	DATE	REVISION	APPROV.



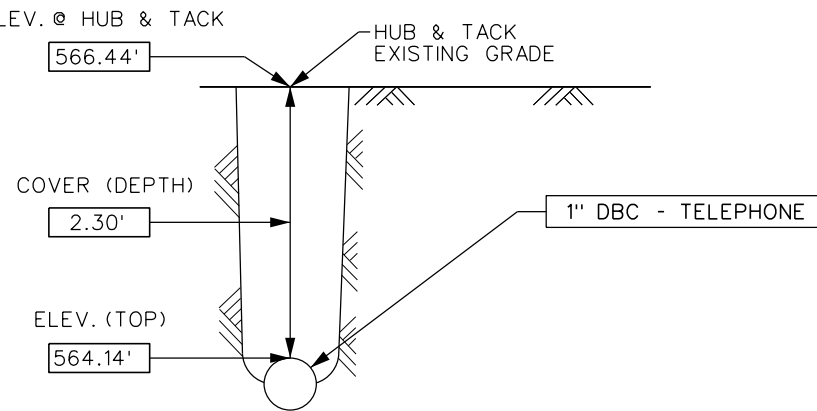
FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048



PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
AT&T	MARC COSTELLO	972-470-7577	MC9971@ATT.COM

LEGEND

- TH — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

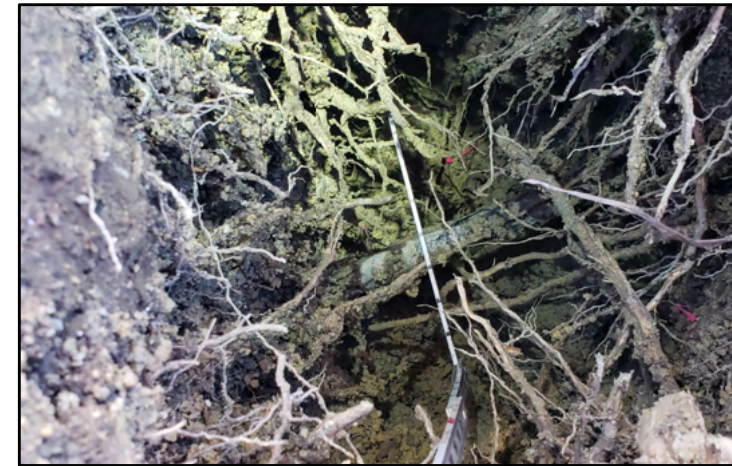
PROJECT CONTROL:

CONTROL POINTS:

E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

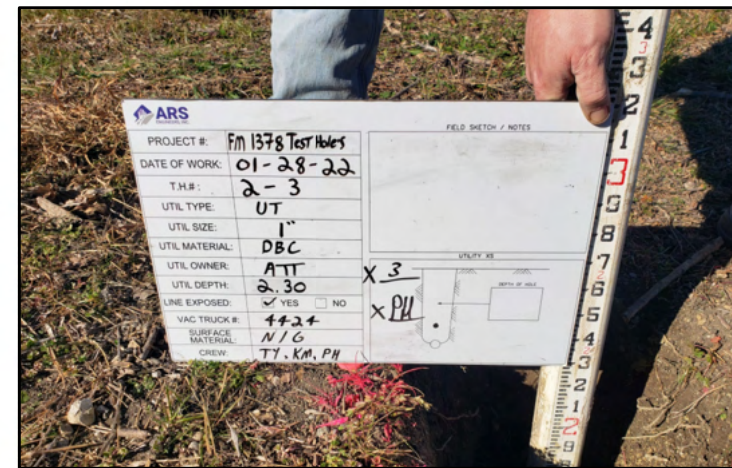


PHOTO OF DEPTH INFORMATION



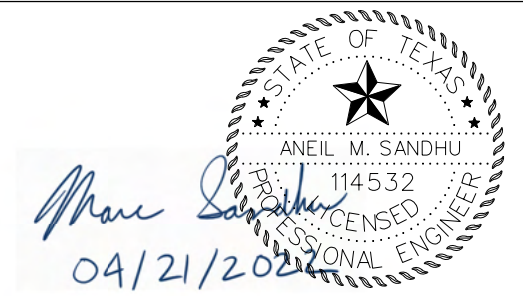
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 40' NE OF W. LUCAS RD EOP APPROX. 35' NW OF E. LUCAS RD EOP		
UTILITY STATION/OFFSET:	58+60.77 / 91.17' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-3	POINT NUMBER:	65016
NORTHING:	7083904.186	EASTING:	2557872.202
GROUND ELEVATION:	566.44'	DEPTH OF UTILITY:	2.30'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	1/28/2022		
VACUUM TRUCK NO.:	4424		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	AT&T		
UTILITY TYPE:	TELEPHONE		
UTILITY SIZE:	1"	T.O.U.	564.14'
UTILITY MATERIAL:	DIRECT BURIED CABLE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



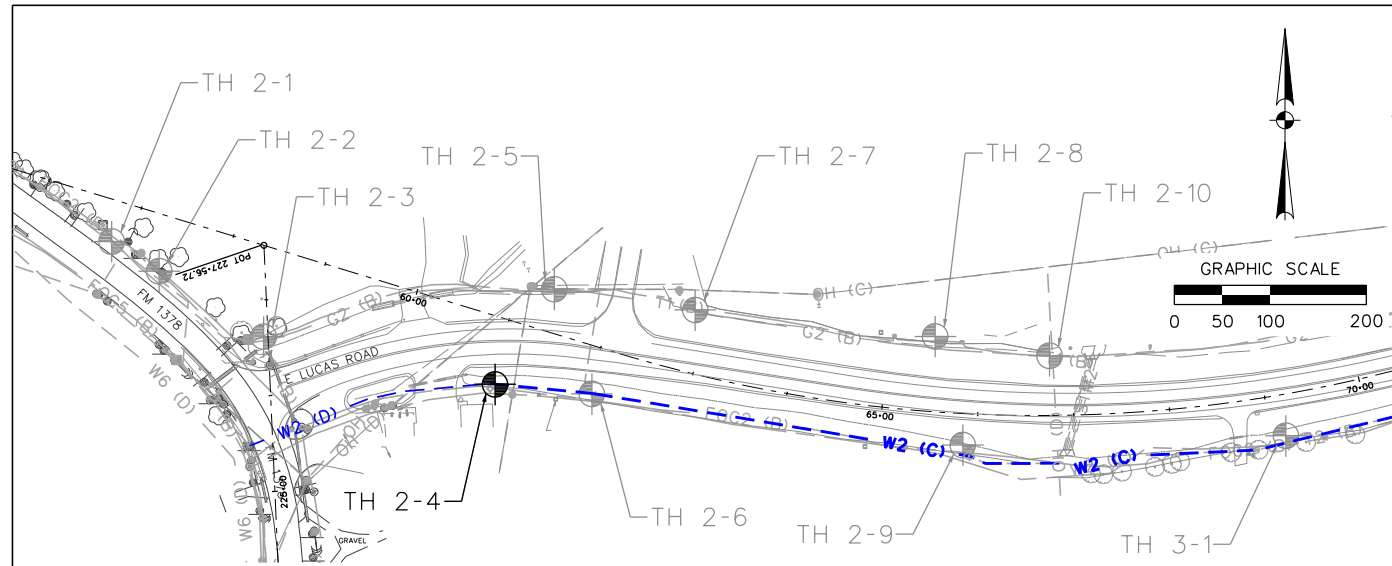
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

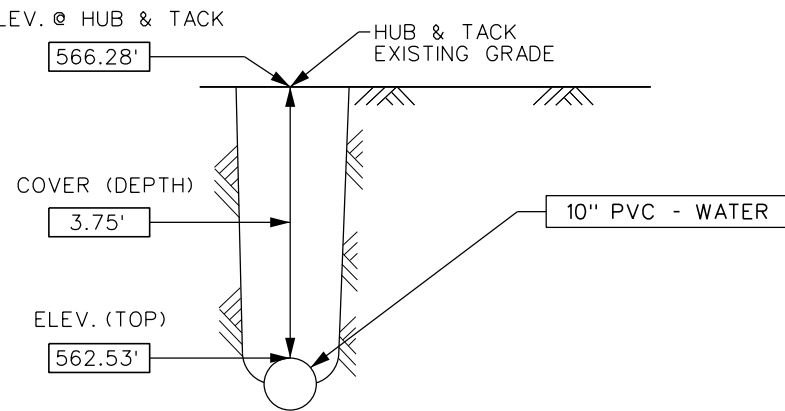
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DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

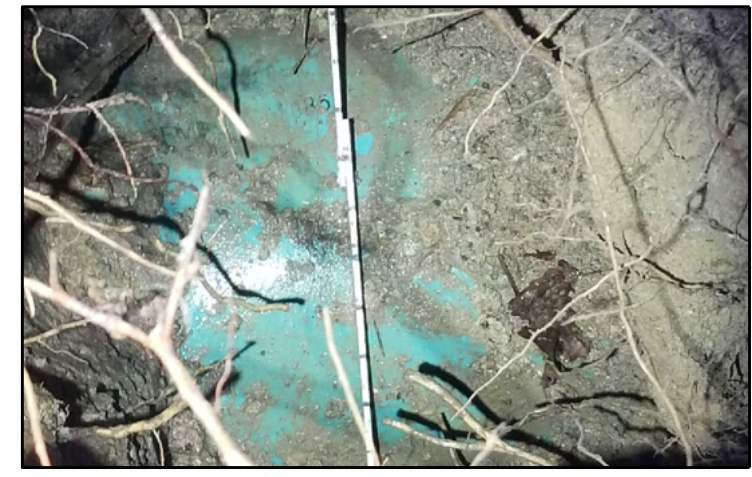
COMPANY	CONTACT	PHONE	EMAIL
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCASTEXAS.US

- LEGEND**
- W2 — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

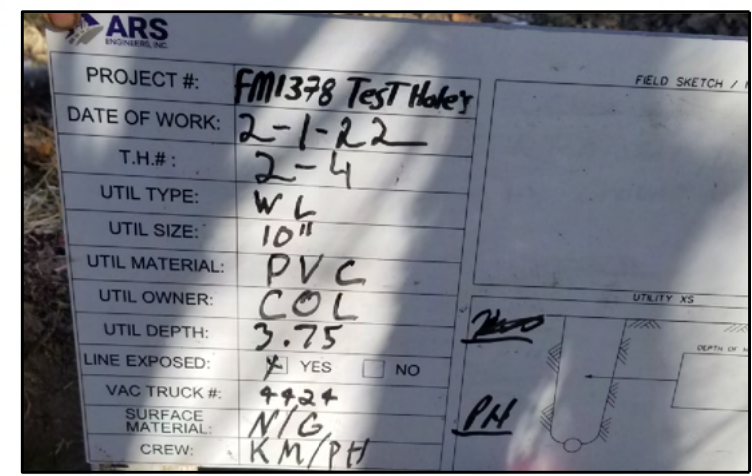


PHOTO OF DEPTH INFORMATION



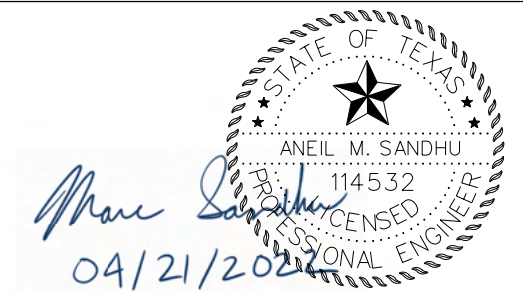
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' S OF E. LUCAS RD EOP APPROX. 230' NE OF SOUTHVIEW DR EOP		
UTILITY STATION/OFFSET:	61+05.85 / 68.50' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-4	POINT NUMBER:	65003
NORTHING:	7083854.543	EASTING:	2558113.271
GROUND ELEVATION:	566.28'	DEPTH OF UTILITY:	3.75'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	4424		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	CITY OF LUCAS		
UTILITY TYPE:	WATER		
UTILITY SIZE:	10"	T.O.U.	562.53'
UTILITY MATERIAL:	PVC		
UTILITY UNCOVERED?:	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



NO.	DATE	REVISION	APPROV.

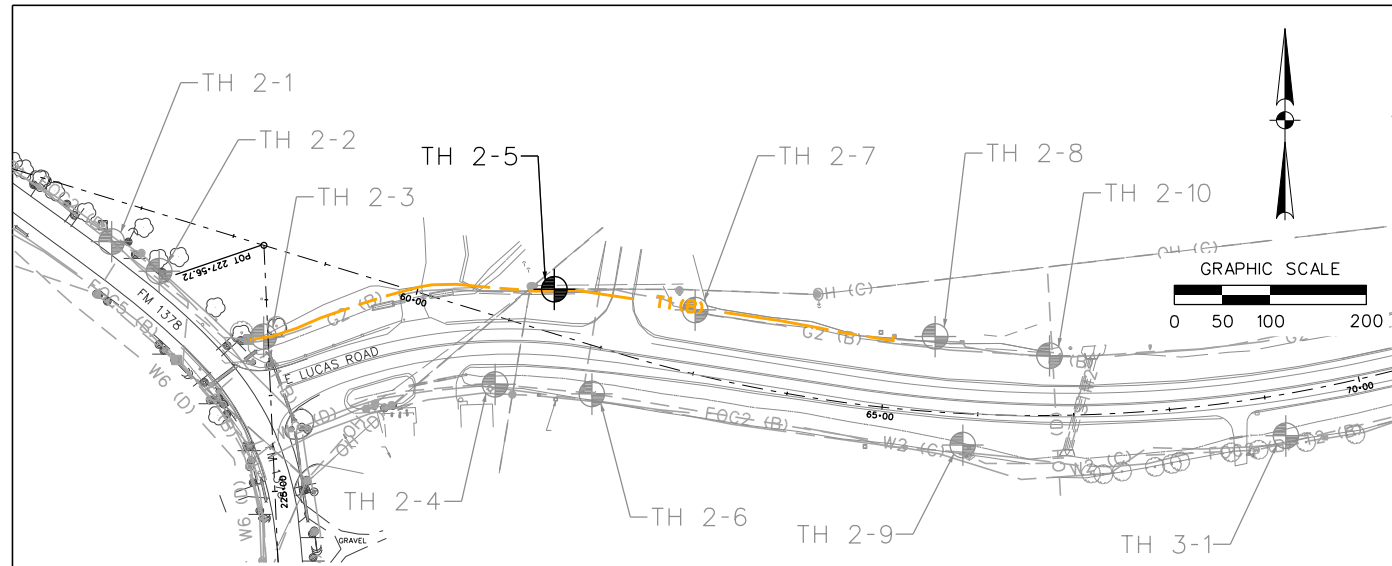


FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

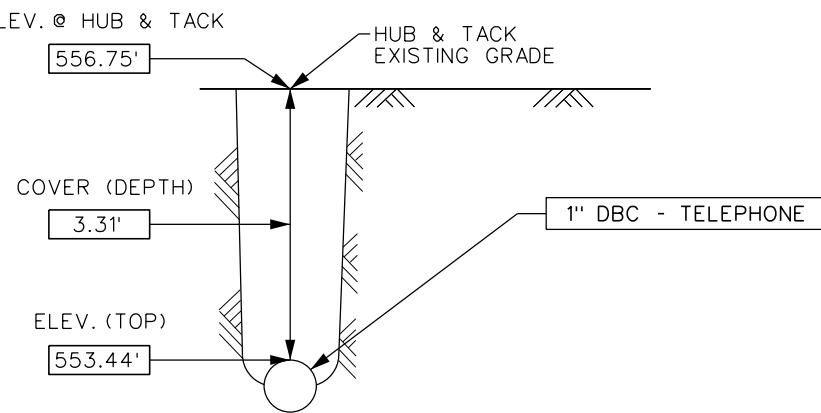
243A

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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW
NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
AT&T	MARC COSTELLO	972-470-7577	MC9971@ATT.COM

LEGEND

- TH — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

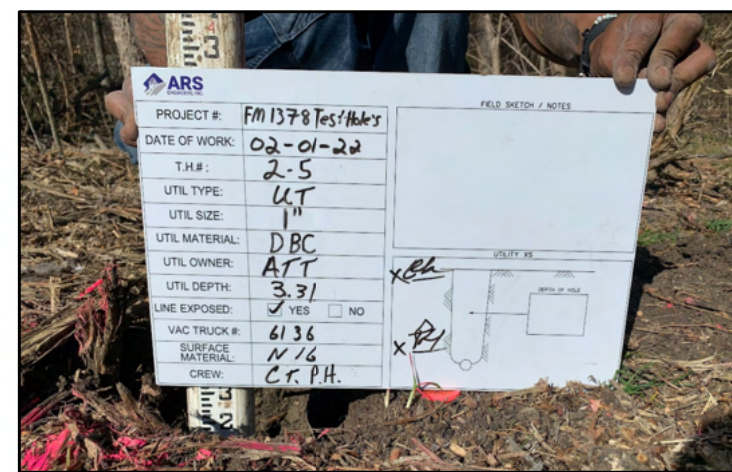
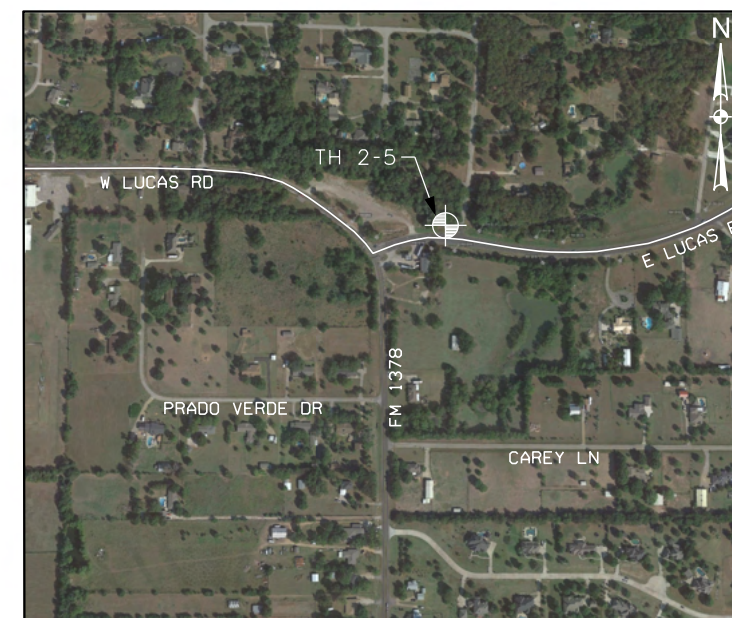


PHOTO OF DEPTH INFORMATION

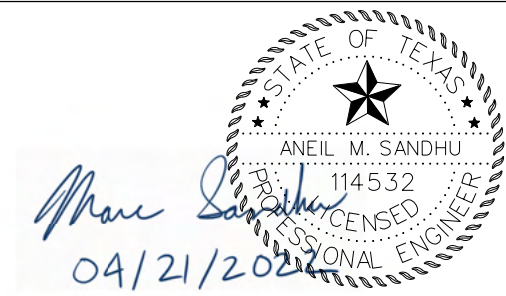


LOCATION MAP
NOT TO SCALE

LOCATION:	APPROX. 35' N OF E. LUCAS RD EOP APPROX. 55' W OF CEDAR BEND TRAIL EOP		
UTILITY STATION/OFFSET:	61+36.07 / 44.31' LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-5	POINT NUMBER:	65000
NORTHING:	7083953.680	EASTING:	2558175.020
GROUND ELEVATION:	556.75'	DEPTH OF UTILITY:	3.31'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	6136		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	AT&T		
UTILITY TYPE:	TELEPHONE		
UTILITY SIZE:	1"	T.O.U.	553.44'
UTILITY MATERIAL:	DIRECT BURIED CABLE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



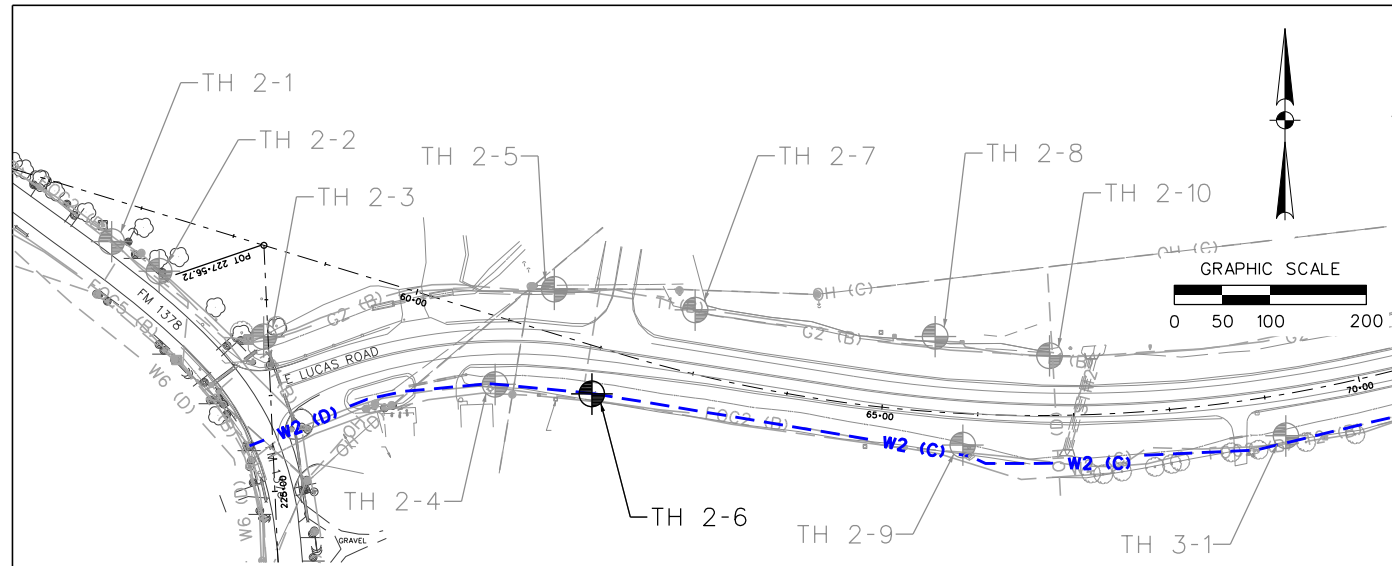
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

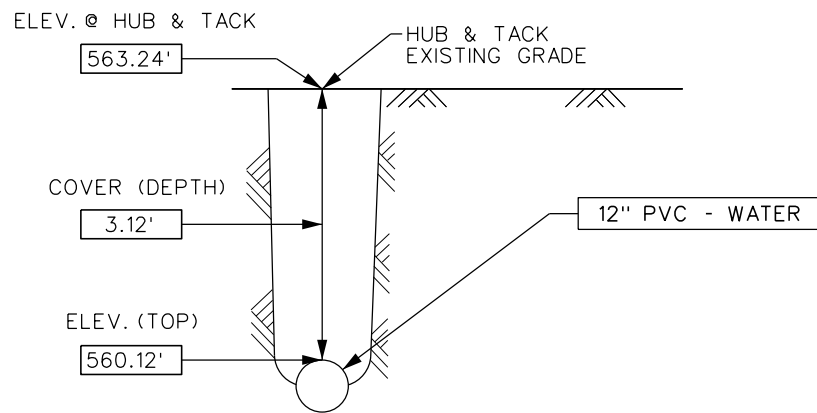
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

243B



PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCASTEXAS.US

LEGEND

- W2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:

E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

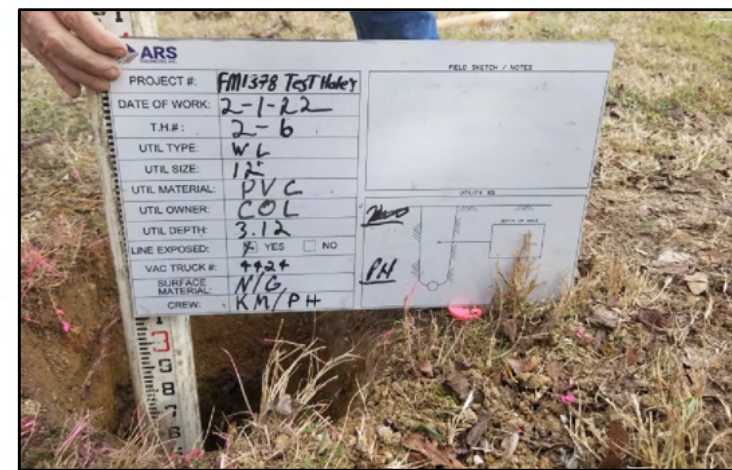


PHOTO OF DEPTH INFORMATION



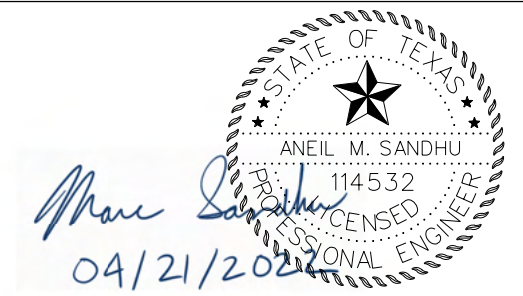
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' S OF E. LUCAS RD EOP APPROX. 325' NE OF SOUTHVIEW DR EOP		
UTILITY STATION/OFFSET:	62+05.20 / 48.68' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-6	POINT NUMBER:	65004
NORTHING:	7083844.597	EASTING:	2558214.092
GROUND ELEVATION:	563.24'	DEPTH OF UTILITY:	3.12'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	4424		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	CITY OF LUCAS		
UTILITY TYPE:	WATER		
UTILITY SIZE:	12"	T.O.U.	560.12'
UTILITY MATERIAL:	PVC		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



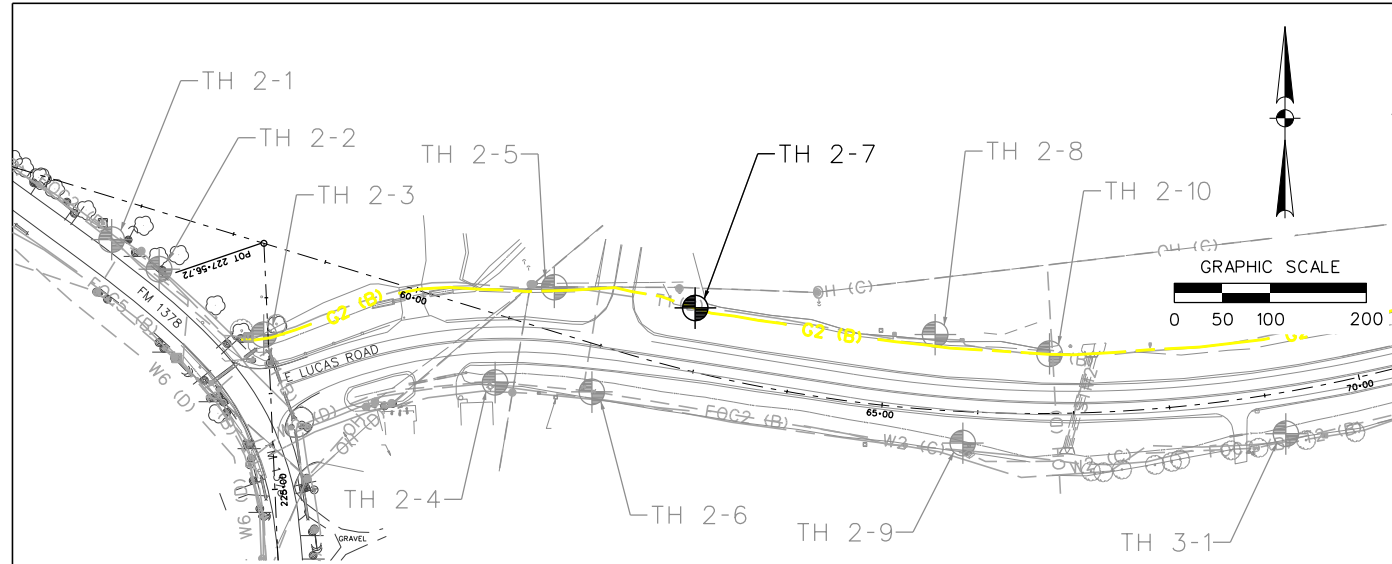
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

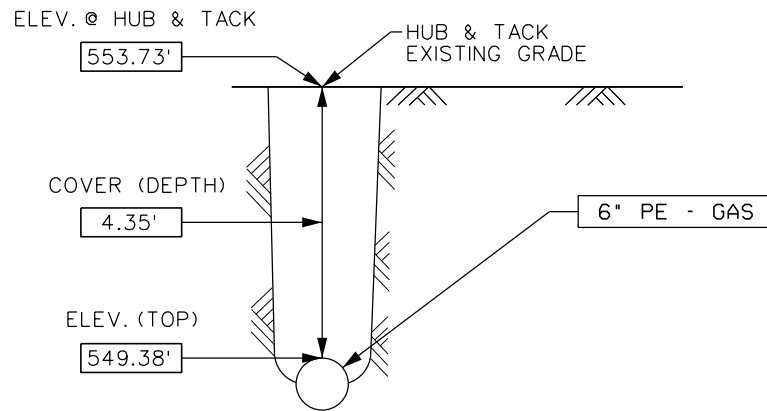
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

243C



PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
COSERV	LORNA CURRAN	940-270-7734	LCURRAN@COSERV.COM

LEGEND

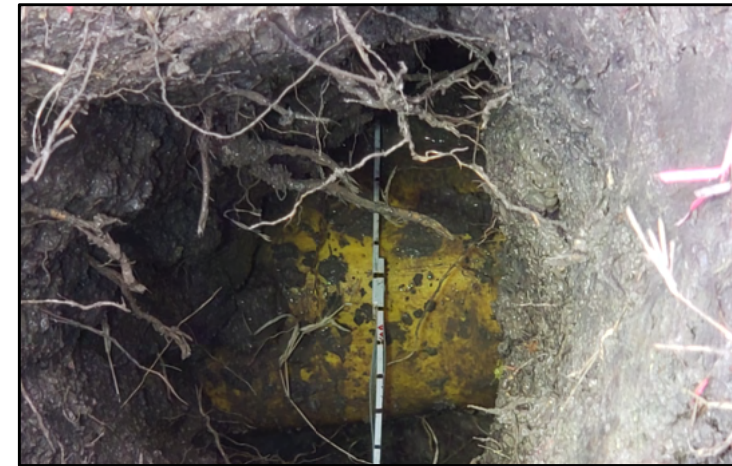
- G2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

PROJECT CONTROL:

CONTROL POINTS:
 E0435127 N:7080222.677 E:2559400.000 EL:574.27'
 E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
 UNIT: US SURVEY FEET
 GEOID: 12B
 TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

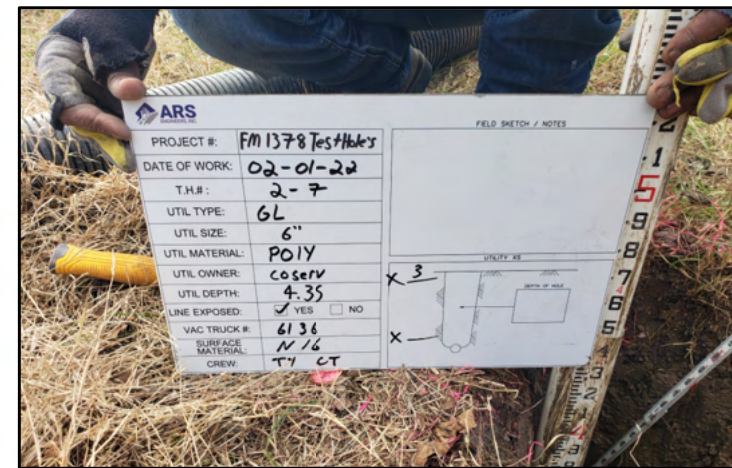


PHOTO OF DEPTH INFORMATION



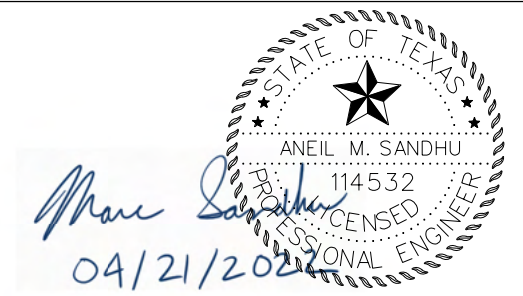
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' N OF E. LUCAS RD EOP APPROX. 70' E OF CEDAR BEND TRAIL EOP		
UTILITY STATION/OFFSET:	62+85.75 / 64.94' LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-7	POINT NUMBER:	65001
NORTHING:	7083932.034	EASTING:	2558321.868
GROUND ELEVATION:	553.73'	DEPTH OF UTILITY:	4.35'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	6136		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	COSERV		
UTILITY TYPE:	GAS		
UTILITY SIZE:	6"	T.O.U.	549.38'
UTILITY MATERIAL:	PE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



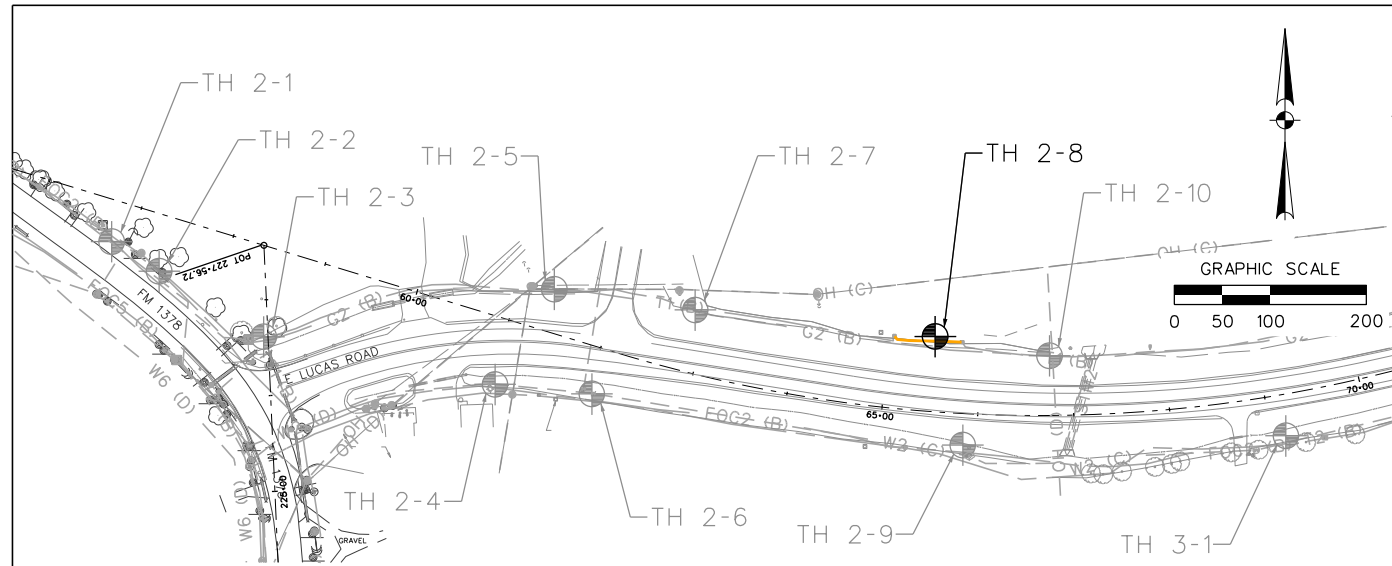
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

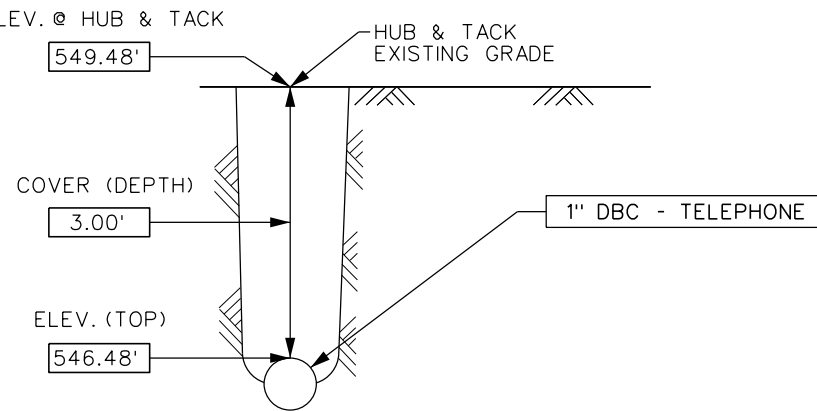
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

243D



PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
AT&T	MARC COSTELLO	972-470-7577	MC9971@ATT.COM

- LEGEND**
- TH — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

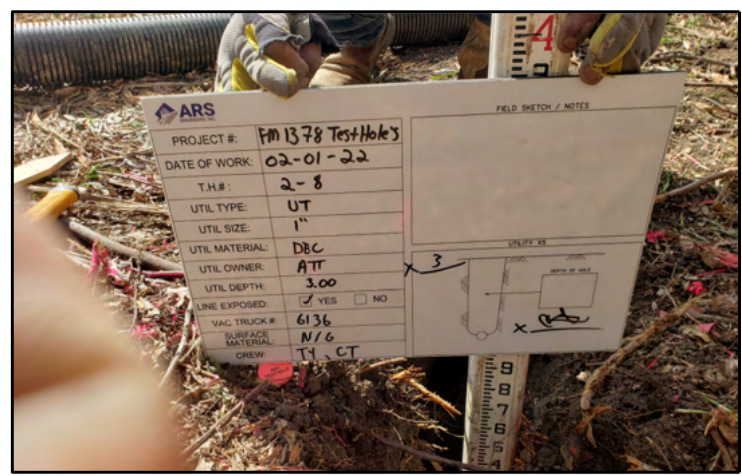
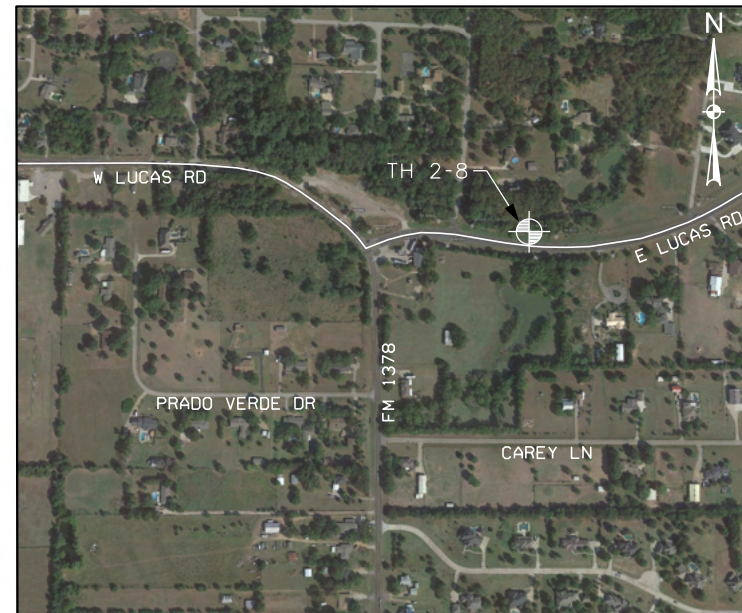


PHOTO OF DEPTH INFORMATION



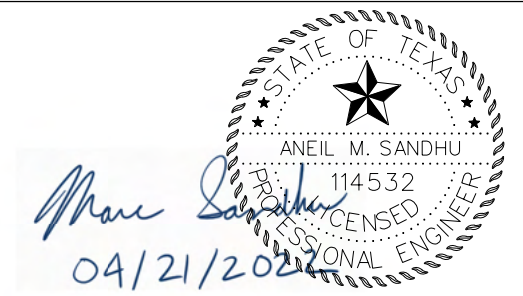
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 40' N OF E. LUCAS RD EOP APPROX. 320' E OF CEDAR BEND TRAIL EOP		
UTILITY STATION/OFFSET:	65+49.85 / 78.42' LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-8	POINT NUMBER:	65008
NORTHING:	7083904.493	EASTING:	2558571.867
GROUND ELEVATION:	549.48'	DEPTH OF UTILITY:	3.00'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/01/2022		
VACUUM TRUCK NO.:	6316		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	AT&T		
UTILITY TYPE:	TELEPHONE		
UTILITY SIZE:	1"	T.O.U.	546.48'
UTILITY MATERIAL:	DIRECT BURIED CABLE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



NO.	DATE	REVISION	APPROV.

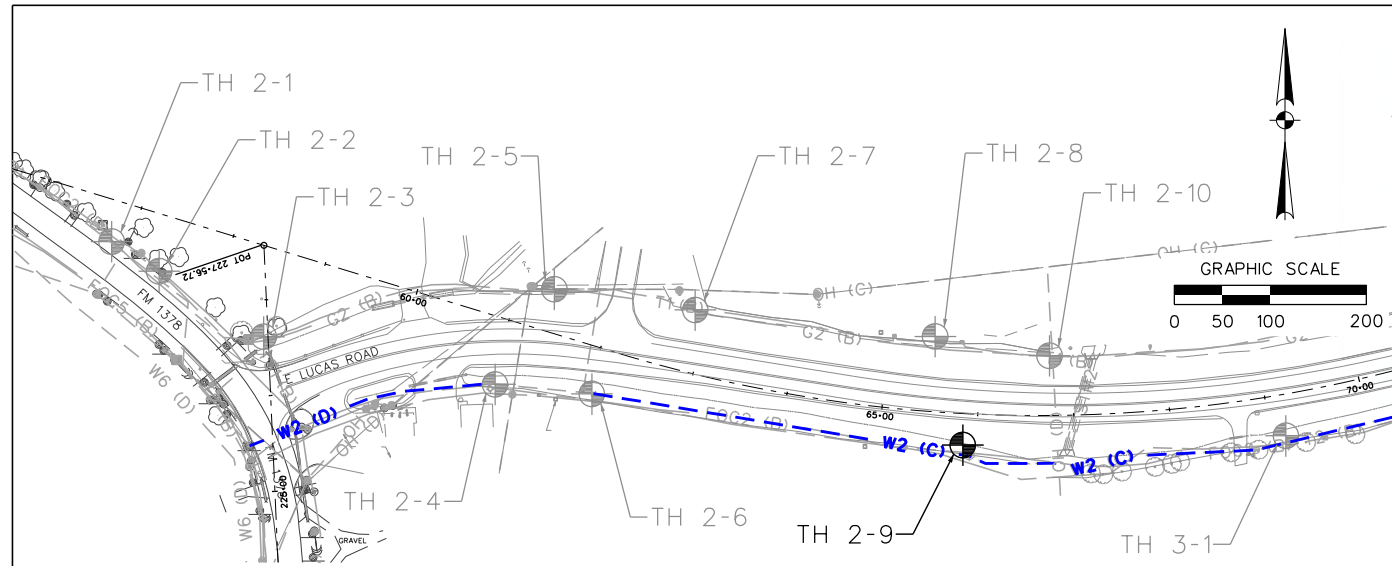


FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

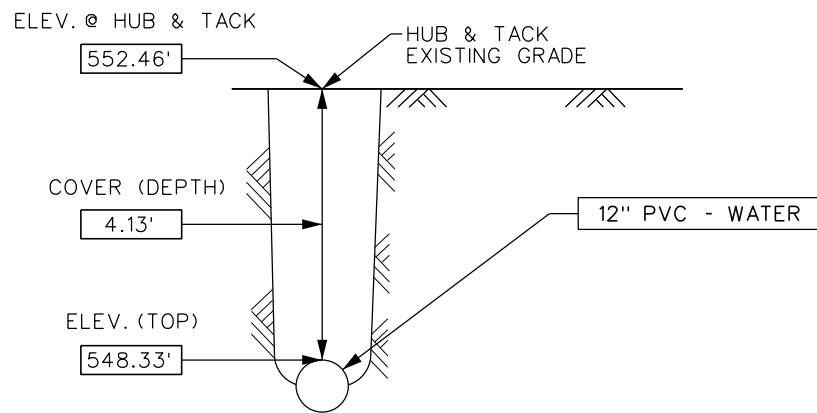
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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCASTEXAS.US

LEGEND

- W2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

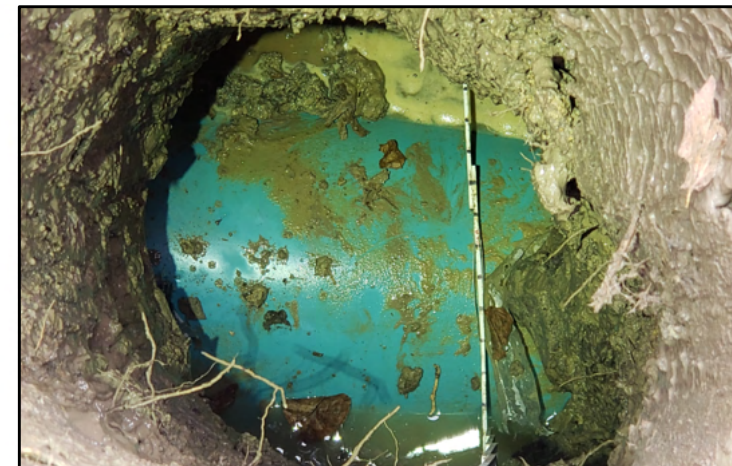
PROJECT CONTROL:

CONTROL POINTS:

E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

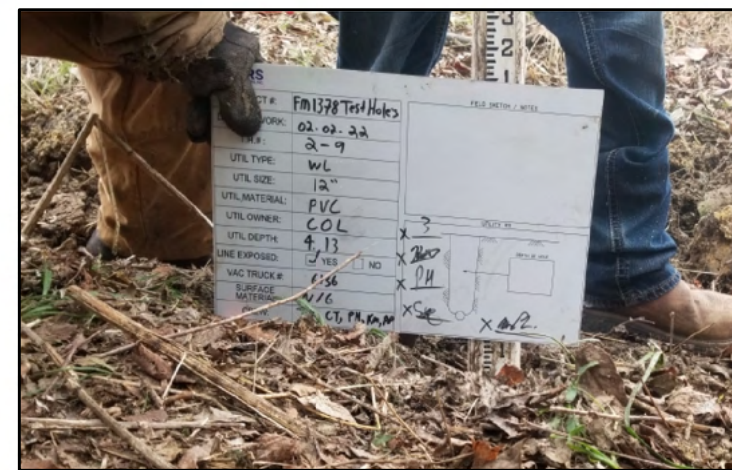


PHOTO OF DEPTH INFORMATION



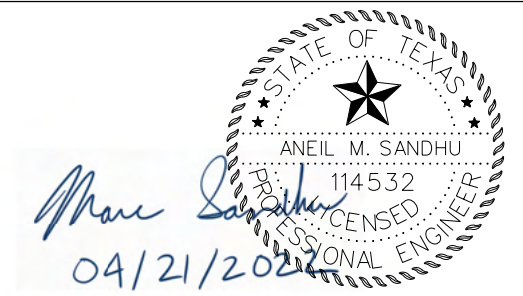
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' S OF E. LUCAS RD EOP APPROX. 705' E OF SOUTHVIEW DR EOP		
UTILITY STATION/OFFSET:	65+86.25 / 32.74' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-9	POINT NUMBER:	65010
NORTHING:	7083791.313	EASTING:	2558600.643
GROUND ELEVATION:	552.46'	DEPTH OF UTILITY:	4.13'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/2/2022		
VACUUM TRUCK NO.:	6136		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	CITY OF LUCAS		
UTILITY TYPE:	WATER		
UTILITY SIZE:	12"	T.O.U.	548.33'
UTILITY MATERIAL:	PVC		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



NO.	DATE	REVISION	APPROV.

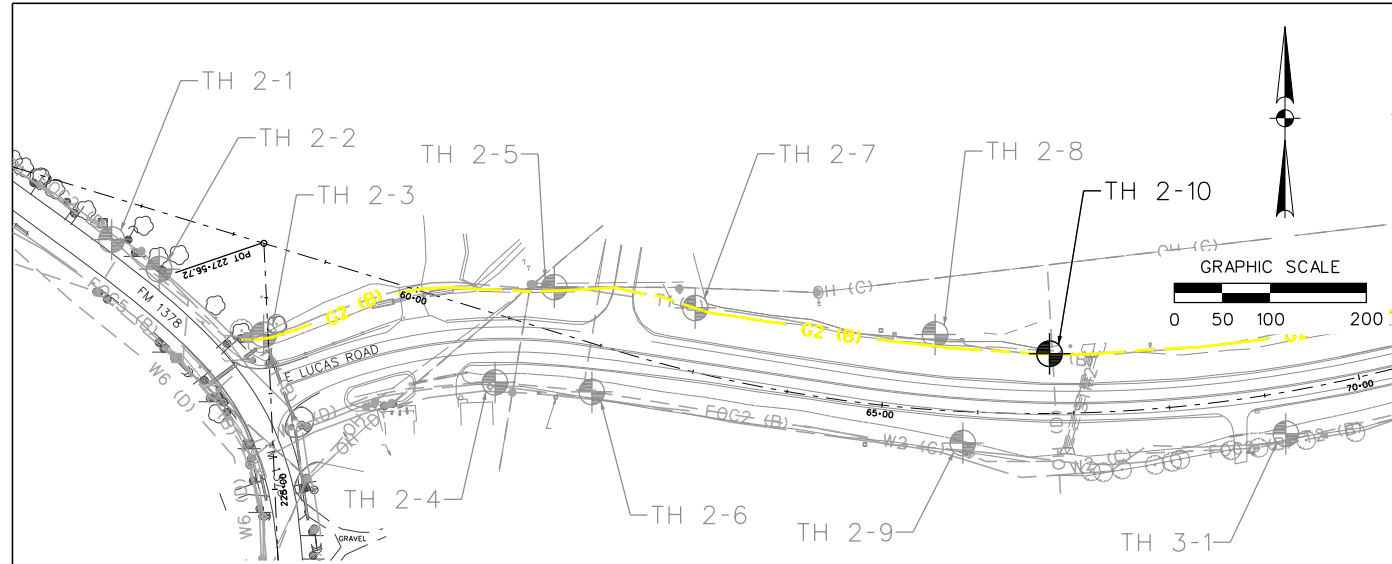


FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

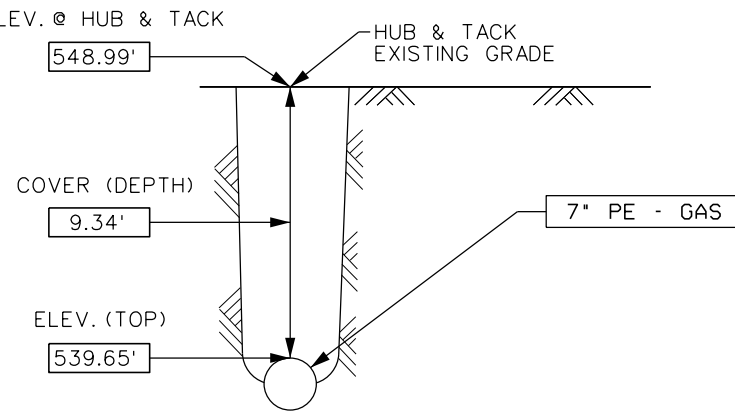
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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
COSERV	LORNA CURRAN	940-270-7734	LCURRAN@COSERV.COM

- LEGEND**
- G2 — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



PHOTO OF DEPTH INFORMATION



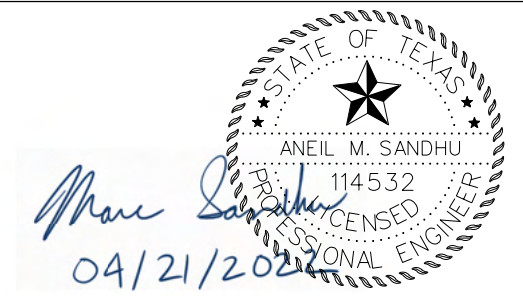
LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' N OF E. LUCAS RD EOP APPROX. 440' E OF CEDAR BEND TRAIL EOP		
UTILITY STATION/OFFSET:	66+75.49 / 62.30 LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	2-10	POINT NUMBER:	65009
NORTHING:	7083884.431	EASTING:	2558690.975
GROUND ELEVATION:	548.99'	DEPTH OF UTILITY:	9.34'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/2/2022		
VACUUM TRUCK NO.:	6136		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	COSERV		
UTILITY TYPE:	GAS		
UTILITY SIZE:	7"	T.O.U.	539.65'
UTILITY MATERIAL:	PE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



NO.	DATE	REVISION	APPROV.

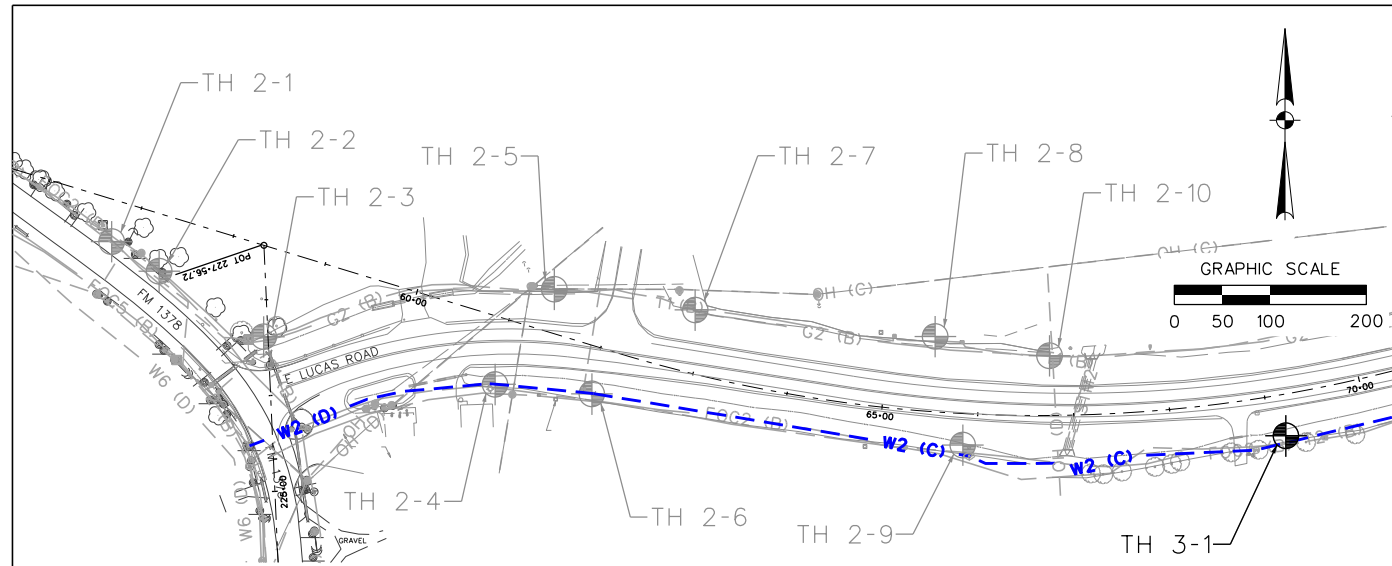


FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL	1392	SECTION	01	JOB	048
APPROVED	MH						

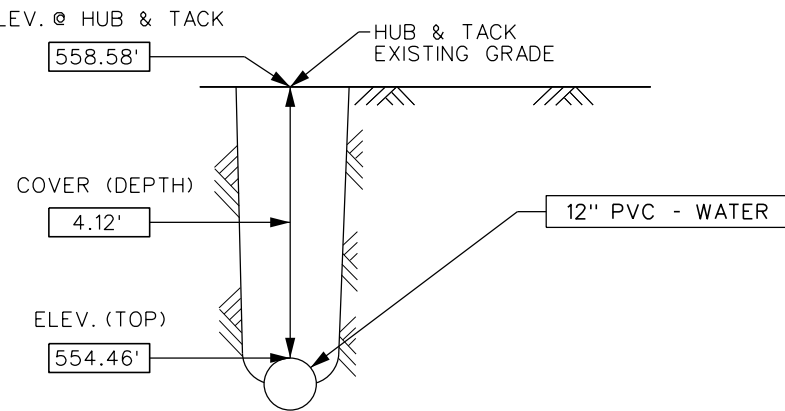
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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
CITY OF LUCAS	STANTON FOERSTER	972-912-1208	STANTON@LUCASTEXAS.US

LEGEND

- W2 — UTILITY DESCRIPTION
- TEST HOLE LOCATION
- UTILITY SECTION

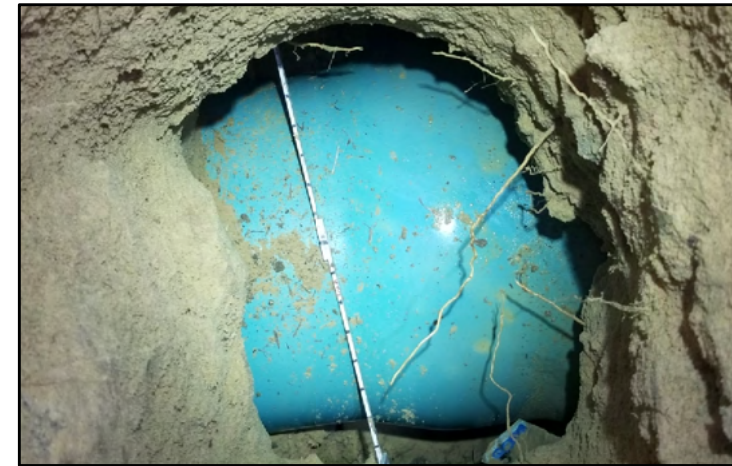
PROJECT CONTROL:

CONTROL POINTS:

E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

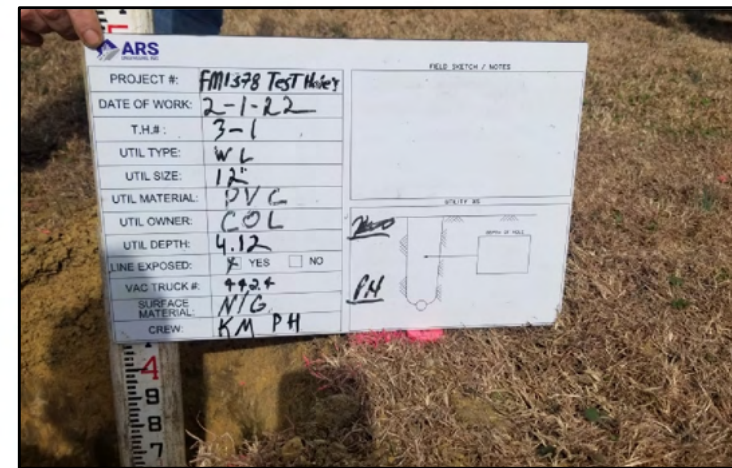


PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 33' S OF E. LUCAS RD EOP APPROX. 457' W OF HOBBS HILL LN EOP		
UTILITY STATION/OFFSET:	69+15.26 / 42.97' RT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL (4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	3-1	POINT NUMBER:	65005
NORTHING:	7083800.960	EASTING:	2558937.305
GROUND ELEVATION:	558.58'	DEPTH OF UTILITY:	4.12'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	4424		

UTILITY INFORMATION

DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	CITY OF LUCAS		
UTILITY TYPE:	WATER		
UTILITY SIZE:	12"	T.O.U.	554.46'
UTILITY MATERIAL:	PVC		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



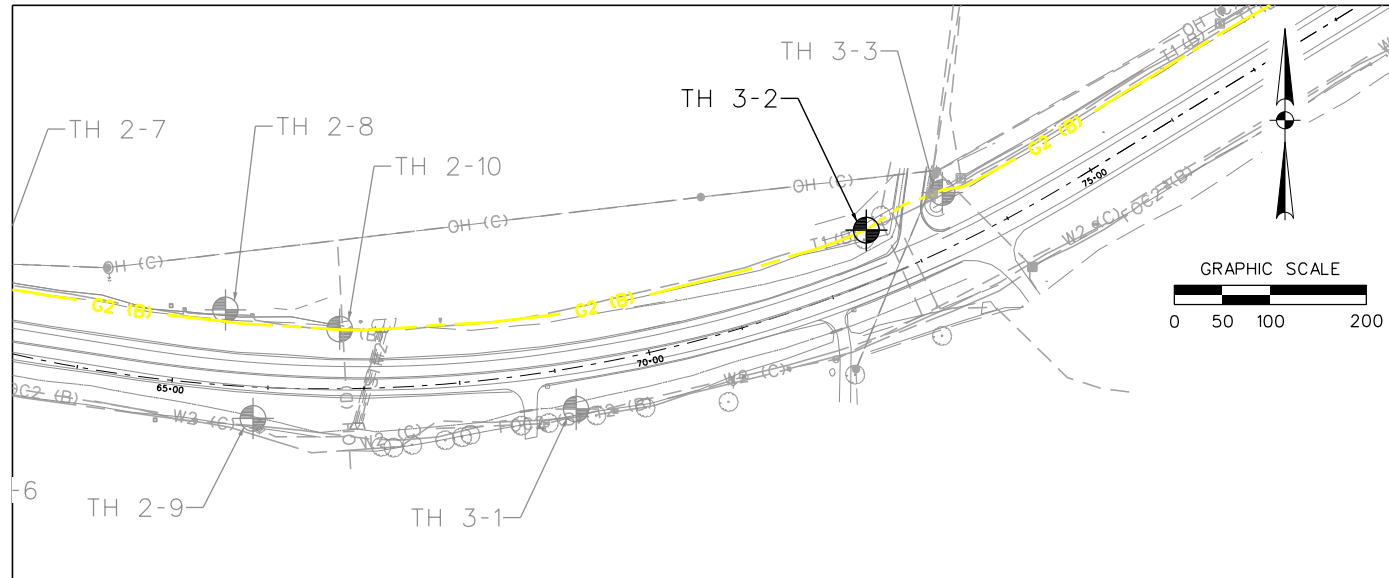
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

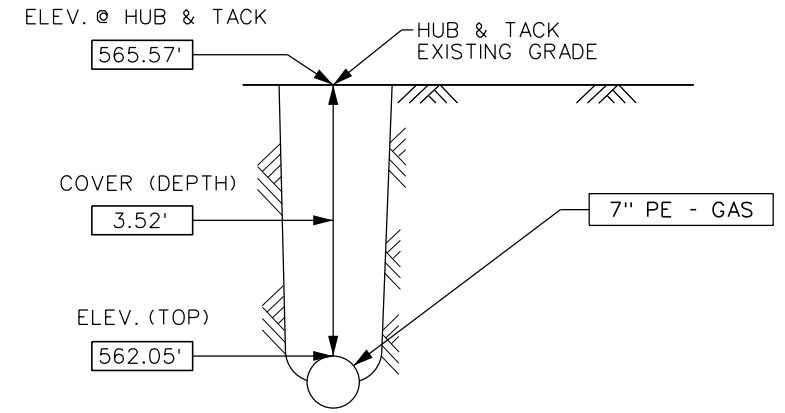
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

243H



PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

COMPANY	CONTACT	PHONE	EMAIL
COSERV	LORNA CURRAN	940-270-7734	LCURRAN@COSERV.COM

- LEGEND**
- G2 — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY

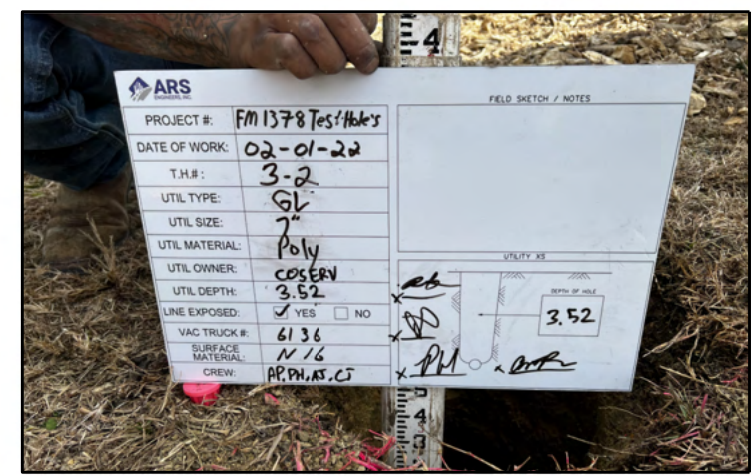


PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 30' N OF E. LUCAS RD EOP APPROX. 35' W OF LOST VALLEY DR EOP		
UTILITY STATION/OFFSET:	72+59.51 / 52.17' LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	3-2	POINT NUMBER:	65007
NORTHING:	7083987.423	EASTING:	2559239.675
GROUND ELEVATION:	565.57'	DEPTH OF UTILITY:	3.52'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	2/1/2022		
VACUUM TRUCK NO.:	6136		
UTILITY INFORMATION			
DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	COSERV		
UTILITY TYPE:	GAS		
UTILITY SIZE:	7"	T.O.U.	562.05'
UTILITY MATERIAL:	PE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



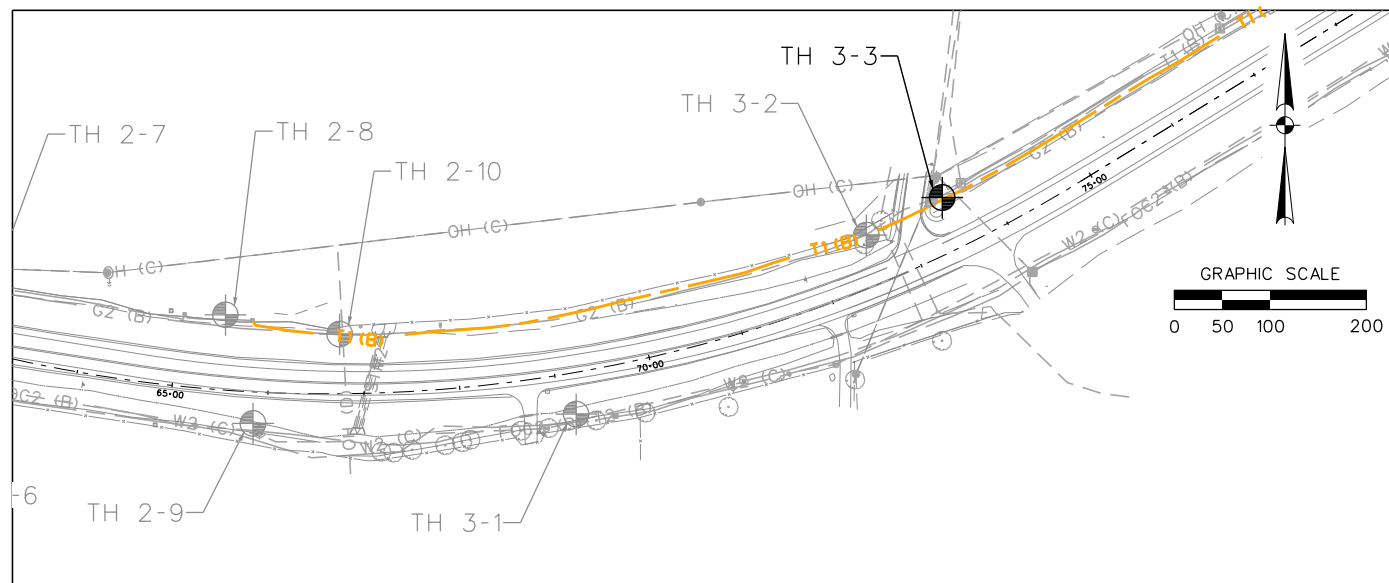
NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

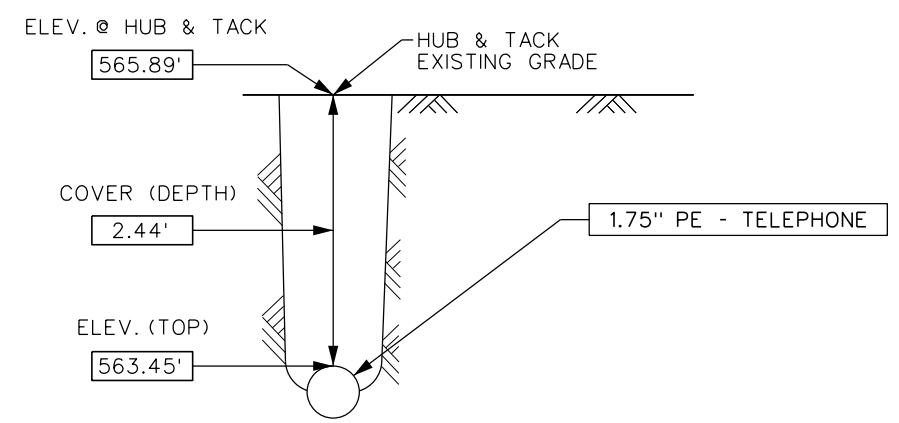
DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378	
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN	
CHECKED	JS	CONTROL		SECTION		JOB		
APPROVED	MH		1392		01		048	
2431							PAGE NUMBER	

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PLAN VIEW

1" = 200'
Planimetric DGN Provided by TxDOT



UTILITY CROSS-SECTION VIEW

NOT TO SCALE

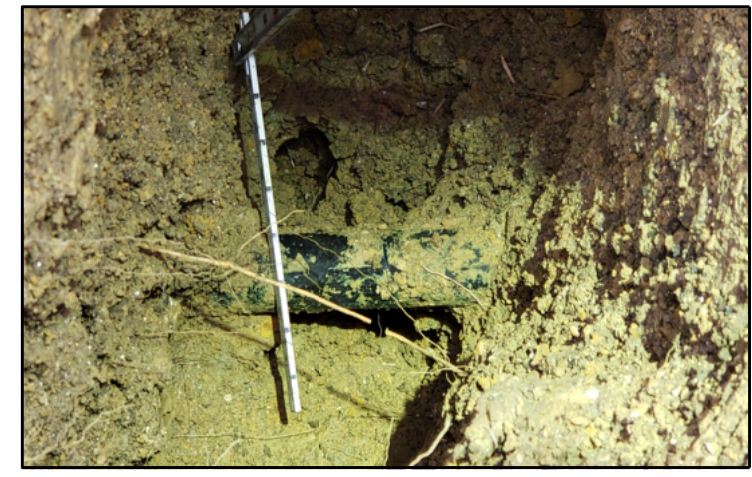
COMPANY	CONTACT	PHONE	EMAIL
AT&T	MARC COSTELLO	972-470-7577	MC9971@ATT.COM

- LEGEND**
- TH — UTILITY DESCRIPTION
 - TEST HOLE LOCATION
 - UTILITY SECTION

PROJECT CONTROL:
CONTROL POINTS:
E0435127 N:7080222.677 E:2559400.000 EL:574.27'
E0435137 N:7084239.674 E:2556875.671 EL:596.22'

PROJECTION ZONE: 4202 NORTH CENTRAL ZONE
UNIT: US SURVEY FEET
GEOID: 12B
TEST HOLE MARKER: 5/8" CAPPED IRON ROD

NOTE: SURVEYED USING THE TXDOT VRS NETWORK



TEST HOLE PHOTO OF UTILITY



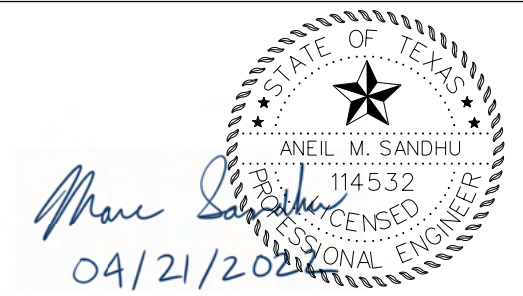
PHOTO OF DEPTH INFORMATION



LOCATION MAP

NOT TO SCALE

LOCATION:	APPROX. 35' N OF E. LUCAS RD EOP APPROX. 28' E OF LOST VALLEY DR EOP		
UTILITY STATION/OFFSET:	73+51.05 / 54.92' LT		
HORIZONTAL DATUM:	NAD 83' (2011), NORTH CENTRAL(4202)		
SURFACE ADJUSTMENT FACTOR:	1.000152710 (COLLIN)		
VERTICAL DATUM:	NAVD 88, GEOID 12B		
TEST HOLE NO.:	3-3	POINT NUMBER:	65006
NORTHING:	7084026.604	EASTING:	2559318.813
GROUND ELEVATION:	565.89'	DEPTH OF UTILITY:	2.44'
FIELD MANAGER:	JAE KOONTZ		
DATE OF WORK:	1/31/2022		
VACUUM TRUCK NO.:	4424		
UTILITY INFORMATION			
DESCRIPTION:	TEST HOLE LOCATION BASED ON LEVEL B FIELD DATA.		
UTILITY OWNER:	AT&T		
UTILITY TYPE:	TELEPHONE		
UTILITY SIZE:	1.75"	T.O.U.	563.45'
UTILITY MATERIAL:	PE		
UTILITY UNCOVERED?	YES		
SURFACE MATERIAL:	NATURAL GROUND		
PAVEMENT TYPE/DEPTH:	N/A		



NO.	DATE	REVISION	APPROV.



FM 1378
TEST HOLE DATA SHEET
LEVEL A SUE

DESIGNED	JS	FED. NO.	6	FEDERAL AID PROJECT NO.		PROJECT	FM 1378
DRAWN	CM	STATE	TX	DISTRICT	DALLAS	COUNTY	COLLIN
CHECKED	JS	CONTROL		SECTION		JOB	
APPROVED	MH		1392		01		048

243J

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