

20.2

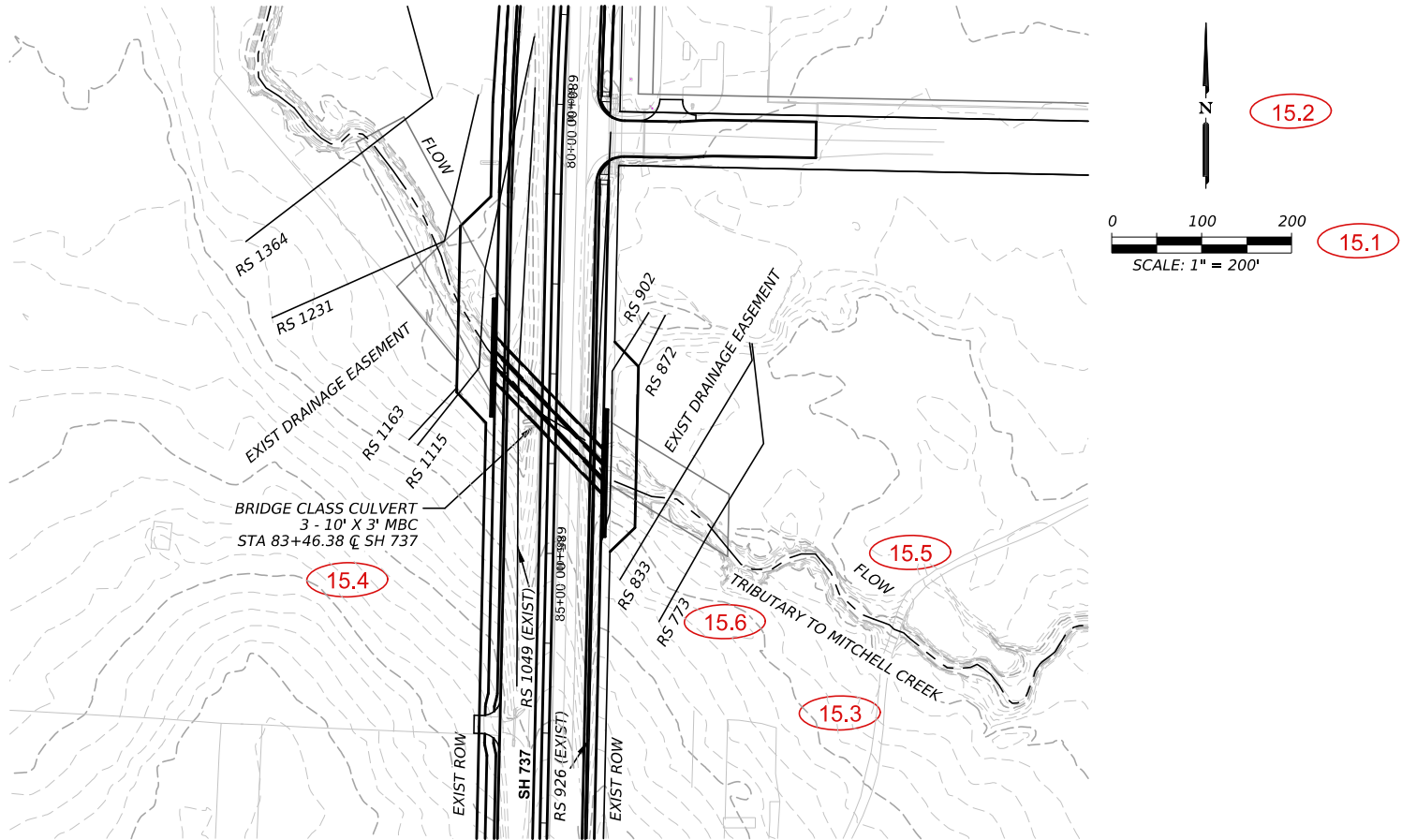
20.1

20.5

20.3

20.3

HEC-RAS RIVER: MITCHELL TRIB REACH: 737														
Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Δ W.S. (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Δ V (ft/s)	Flow Area (sq ft)	Top Width (ft)
737	1364	25yr	Existing	600	629.50	635.59			636.02	0.003571	5.56		138.65	89.60
737	1364	25yr	Proposed	600	629.50	635.59	0.00		636.02	0.003567	5.56	0.00	138.74	89.72
737	1364	100yr	Existing	933	629.50	636.82		635.09	637.05	0.001929	4.80		382.04	289.11
737	1364	100yr	Proposed	933	629.50	636.82	0.00	635.09	637.05	0.001915	4.79	-0.01	383.54	289.64
737	1231	25yr	Existing	600	629.56	633.70		633.70	635.06	0.015674	9.50		68.03	26.87
737	1231	25yr	Proposed	600	629.56	633.70	0.00	633.70	635.06	0.015725	9.51	0.01	67.95	26.86
737	1231	100yr	Existing	933	629.56	634.87		634.87	636.38	0.013402	10.31		106.35	41.80
737	1231	100yr	Proposed	933	629.56	634.85	-0.02	634.85	636.38	0.013660	10.38	0.07	105.47	41.11
737	1163	25yr	Existing	600	629.66	633.07		632.71	633.78	0.010689	6.75		91.28	52.22
737	1163	25yr	Proposed	600	628.76	632.43	-0.64	631.30	632.69	0.004032	4.07	-2.68	147.41	64.46
737	1163	100yr	Existing	933	629.66	634.24		633.55	634.84	0.005746	6.46		174.24	100.08
737	1163	100yr	Proposed	933	628.76	633.76	-0.48	631.92	633.99	0.002343	3.83	-2.63	247.11	86.40
737	1115	25yr	Existing	600	628.47	632.92		631.77	633.36	0.005336	5.30		113.27	41.32
737	1115	25yr	Proposed	600	627.24	632.47	-0.45	629.39	632.54	0.000518	2.03	-3.27	296.12	78.51
737	1115	100yr	Existing	933	628.47	634.16		632.61	634.59	0.003402	5.39		204.25	102.10
737	1115	100yr	Proposed	933	627.24	633.79	-0.37	629.93	633.87	0.000509	2.30	-3.09	405.25	88.61
737	1049	25yr	Existing	600	628.17	632.81		631.59	633.02	0.002144	4.21		193.86	154.71
737	1049	100yr	Existing	933	628.17	634.14		632.15	634.32	0.001354	4.05		310.97	317.56
737	1000			Culvert				SEE DETAILED CULVERT OUTPUT TABLES						
737	926	25yr	Existing	600	627.00	632.06		630.86	632.44	0.003372	5.33		133.87	93.71
737	926	100yr	Existing	933	627.00	632.80		631.63	633.38	0.004158	6.60		171.11	164.13
737	902	25yr	Existing	600	626.63	632.11		629.91	632.27	0.001356	3.46		199.04	80.91
737	902	25yr	Proposed	600	626.41	632.17	0.06	628.40	632.24	0.000385	2.17	-1.29	276.23	104.69
737	902	100yr	Existing	933	626.63	632.89		630.56	633.14	0.001813	4.45		239.73	178.44
737	902	100yr	Proposed	933	626.41	633.09	0.20	628.99	633.22	0.000542	2.87	-1.58	324.98	202.90
737	872	25yr	Existing	600	626.09	631.82		630.12	632.18	0.003552	5.46		150.93	108.16
737	872	25yr	Proposed	600	626.09	631.93	0.11	629.96	632.17	0.002051	4.21	-1.25	169.05	152.87
737	872	100yr	Existing	933	626.09	632.61		631.18	633.05	0.003814	6.25		210.21	183.81
737	872	100yr	Proposed	933	626.09	632.78	0.17	630.68	633.12	0.002408	5.13	-1.12	222.86	188.51
737	833	25yr	Existing	600	625.50	631.15		629.81	631.95	0.007461	7.21		89.87	155.04
737	833	25yr	Proposed	600	625.50	631.17	0.02	629.81	631.97	0.007379	7.19	-0.02	88.17	160.67
737	833	100yr	Existing	933	625.50	631.94		631.94	632.80	0.007490	8.02		164.23	222.23
737	833	100yr	Proposed	933	625.50	631.94	0.00	631.94	632.90	0.008114	8.35	0.33	150.07	222.19



15 CROSS-SECTION LAYOUT

- NOTES:
- CULVERT IS LOCATED AT RS 1000.
 - HYDRAULIC ANALYSIS COMPLETED USING HEC-RAS VERSION 6.5 STEADY STATE, 1D MODELING.
 - TERRAIN DATA SOURCE: 2019 LIDAR DATA (2019 1-METER WEST TEXAS LIDAR SET FROM TEXAS NATURAL RESOURCES INFORMATION SYSTEM (TNRIS)). FIELD SURVEY DATA OBTAINED ON MARCH 23,2022.
 - ALL ELEVATIONS BASED ON THE NAVD88 VERTICAL DATUM.
 - THE STARTING WATER SURFACE ELEVATION AT RS 773 WAS BASED ON NORMAL DEPTH CALCULATION WITH A DOWNSTREAM CHANNEL SLOPE OF 0.007 FT/FT.
 - THIS CROSSING IS IN A DESIGNATED FEMA FLOOD ZONE A WITH NO BASE FLOOD ELEVATIONS AS SHOWN ON FEMA FIRM PANEL 48000C0995B FOR PHILLIPS COUNTY, DATED FEBRUARY 29, 2024.
 - INFORMAL COORDINATION WITH THE PHILLIPS COUNTY FLOODPLAIN ADMINISTRATOR WAS COMPLETED ON SEPTEMBER 14, 2024.
 - SEE THE TECHNICAL MEMO REGARDING CULVERT 84 DATED AUGUST 17, 2024, BY MASON & BURGER, INC. FOR ADDITIONAL INFORMATION.
 - BASED ON ANALYSIS OF EXISTING AND PROPOSED CONDITIONS, THERE ARE NO SIGNIFICANT ADVERSE IMPACTS ANTICIPATED AS A RESULT OF THE PROJECT.
- * MAY BE OMITTED IF OUTSIDE OF FEMA SPECIAL FLOOD HAZARD AREA.

x REFERENCE ITEM ON PBLR H&H CHECKLIST

28 EXISTING NBI #: 28-255-0-9999-99-099
PROPOSED NBI #: 28-255-0-9999-99-101

SH 737

BRIDGE CLASS CULVERT

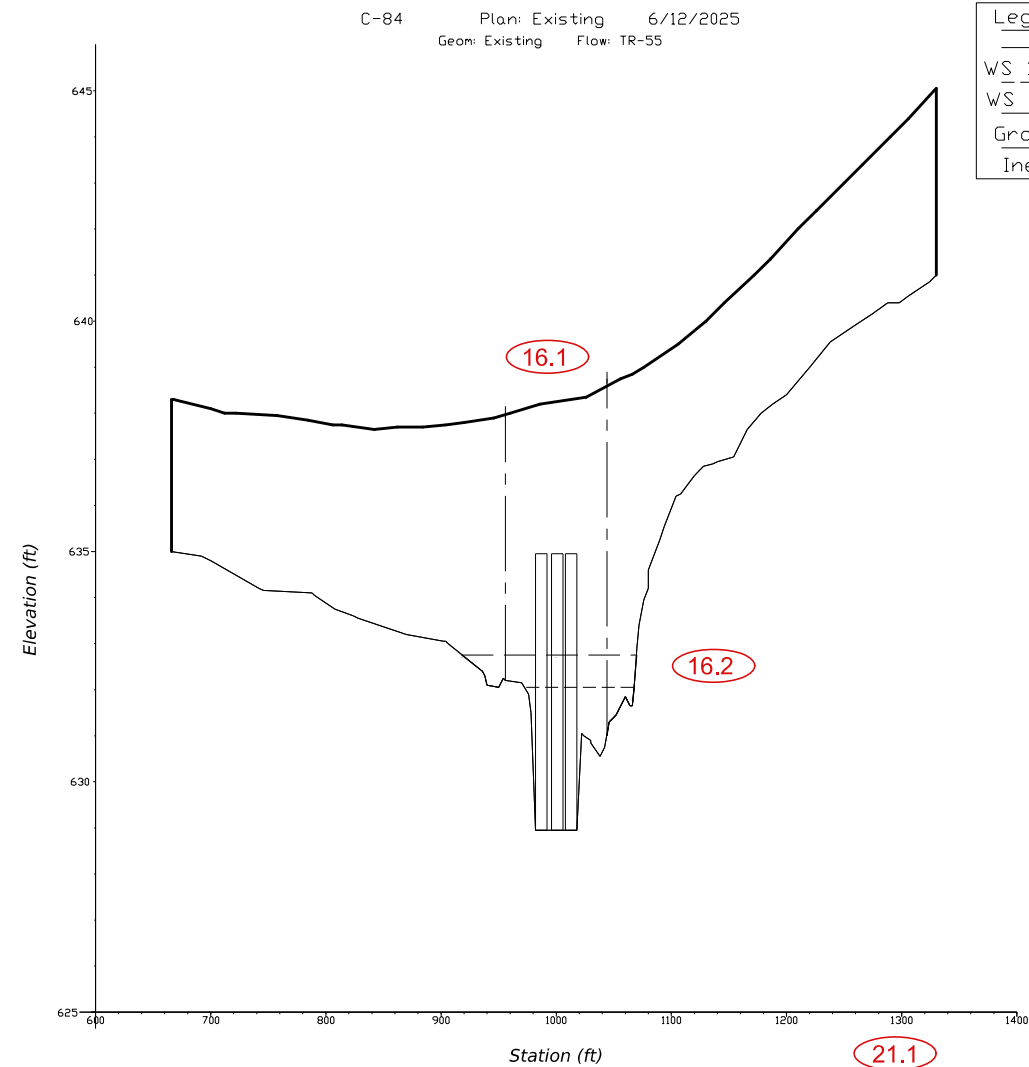
STA 83+46.38

HYDRAULIC DATA SHEET

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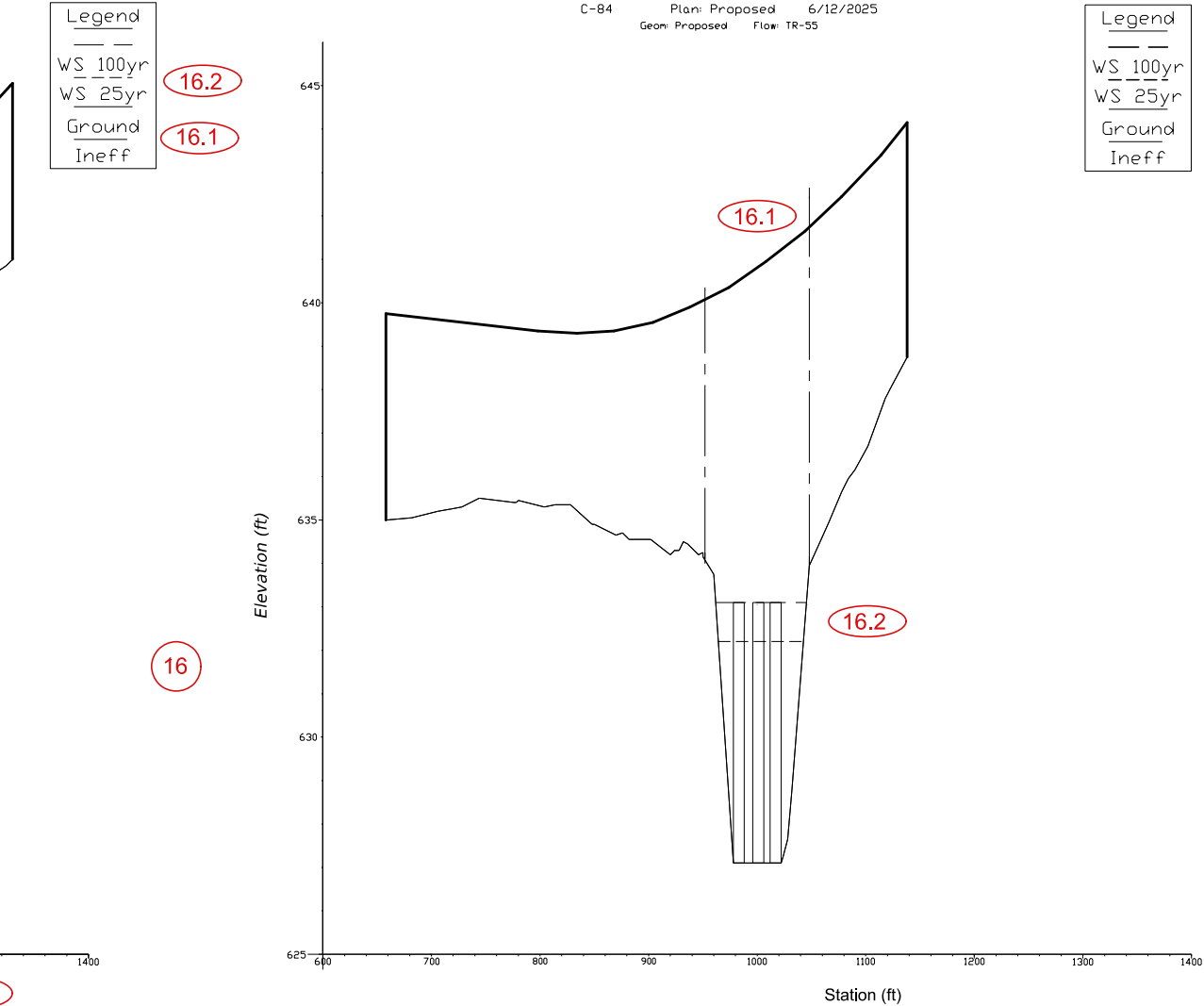
SHEET 2 OF 4

CWNT	SECT	JOB	HIGHWAY
9999	99	101	SH 737
DIST	COUNTY	SHEET NO.	
DIY	PHILLIPS		



Plan: Existing Mitchell Trib 737 RS: 1000 Culv Group: Culvert #1 Profile: 25yr			
Q Culv Group (cfs)	600	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	6.54
Q Barrel (cfs)	200	Culv Vel DS (ft/s)	5.99
E.G. US. (ft)	633.02	Culv Inv El Up (ft)	628.97
W.S. US. (ft)	632.81	Culv Inv El Dn (ft)	628.72
E.G. DS (ft)	632.44	Culv Frctn Ls (ft)	0.08
W.S. DS (ft)	632.06	Culv Exit Loss (ft)	0.17
Delta EG (ft)	0.58	Culv Entr Loss (ft)	0.33
Delta WS (ft)	0.75	Q Weir (cfs)	
E.G. IC (ft)	632.65	Weir Sta Lft (ft)	
E.G. OC (ft)	633.02	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	632.03	Weir Max Depth (ft)	
Culv WS Outlet (ft)	632.06	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.11	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.32	Min El Weir Flow (ft)	638.11

Plan: Proposed Mitchell Trib 737 RS: 1000 Culv Group: Culvert #1 Profile: 25yr			
Q Culv Group (cfs)	600	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	3.93
Q Barrel (cfs)	200	Culv Vel DS (ft/s)	3.58
E.G. US. (ft)	632.54	Culv Inv El Up (ft)	627.09
W.S. US. (ft)	632.47	Culv Inv El Dn (ft)	626.58
E.G. DS (ft)	632.24	Culv Frctn Ls (ft)	0.05
W.S. DS (ft)	632.17	Culv Exit Loss (ft)	0.13
Delta EG (ft)	0.30	Culv Entr Loss (ft)	0.12
Delta WS (ft)	0.31	Q Weir (cfs)	
E.G. IC (ft)	630.88	Weir Sta Lft (ft)	
E.G. OC (ft)	632.54	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	632.18	Weir Max Depth (ft)	
Culv WS Outlet (ft)	632.17	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.38	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.32	Min El Weir Flow (ft)	640.37



Plan: Existing Mitchell Trib 737 RS: 1000 Culv Group: Culvert #1 Profile: 100yr			
Q Culv Group (cfs)	933	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	8.20
Q Barrel (cfs)	311	Culv Vel DS (ft/s)	7.61
E.G. US. (ft)	634.33	Culv Inv El Up (ft)	628.97
W.S. US. (ft)	634.14	Culv Inv El Dn (ft)	628.72
E.G. DS (ft)	633.38	Culv Frctn Ls (ft)	0.10
W.S. DS (ft)	632.80	Culv Exit Loss (ft)	0.33
Delta EG (ft)	0.95	Culv Entr Loss (ft)	0.52
Delta WS (ft)	1.34	Q Weir (cfs)	
E.G. IC (ft)	633.95	Weir Sta Lft (ft)	
E.G. OC (ft)	634.33	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	632.76	Weir Max Depth (ft)	
Culv WS Outlet (ft)	632.80	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.87	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.11	Min El Weir Flow (ft)	638.11

Plan: Proposed Mitchell Trib 737 RS: 1000 Culv Group: Culvert #1 Profile: 100yr			
Q Culv Group (cfs)	933	Culv Full Len (ft)	177.95
# Barrels	3	Culv Vel US (ft/s)	5.18
Q Barrel (cfs)	311	Culv Vel DS (ft/s)	5.18
E.G. US. (ft)	633.87	Culv Inv El Up (ft)	627.09
W.S. US. (ft)	633.79	Culv Inv El Dn (ft)	626.58
E.G. DS (ft)	633.22	Culv Frctn Ls (ft)	0.16
W.S. DS (ft)	633.09	Culv Exit Loss (ft)	0.29
Delta EG (ft)	0.66	Culv Entr Loss (ft)	0.21
Delta WS (ft)	0.70	Q Weir (cfs)	
E.G. IC (ft)	632.18	Weir Sta Lft (ft)	
E.G. OC (ft)	633.87	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	633.09	Weir Max Depth (ft)	
Culv WS Outlet (ft)	632.58	Weir Avg Depth (ft)	
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.11	Min El Weir Flow (ft)	640.37

- NOTES:
- CULVERT IS LOCATED AT RS 1000.
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* MAY BE OMITTED IF OUTSIDE OF FEMA SPECIAL FLOOD HAZARD AREA.

REFERENCE ITEM ON PBLR H&H CHECKLIST

NOTE TO DESIGNER: PROPOSED DATA SHOULD MATCH DATA SHOWN ON CULVERT LAYOUT SHEET



SH 737

BRIDGE CLASS CULVERT

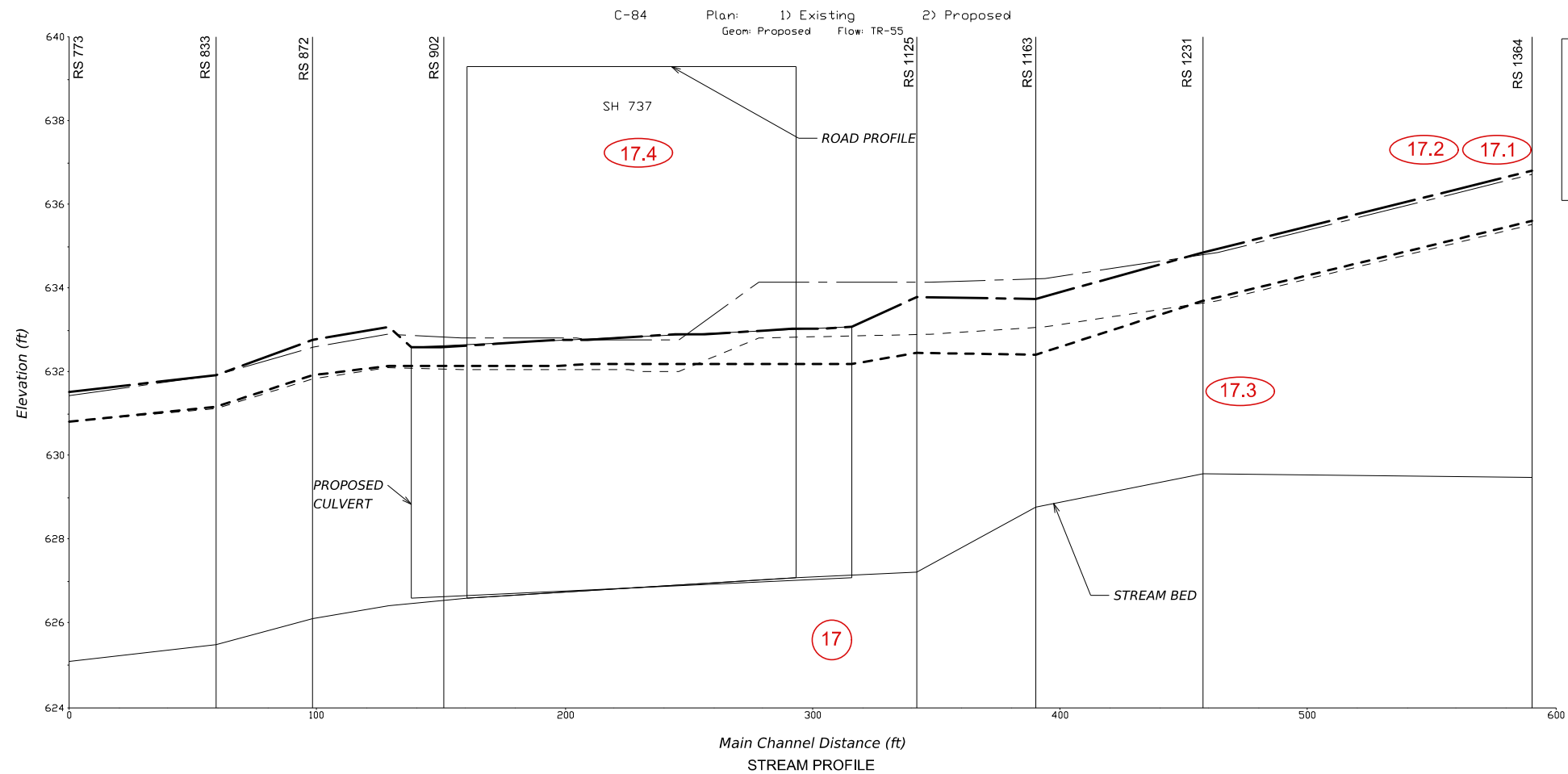
STA 83+46.38

HYDRAULIC DATA SHEET

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SHEET 3 OF 4

COUNT	SECT	JOB	HIGHWAY
9999	99	101	SH 737
DIST	COUNTY		SHEET NO.
DIY	PHILLIPS		



Legend	
WS 100yr - Existing	
WS 100yr - Proposed	
WS 25yr - Proposed	
WS 25yr - Existing	
Stream Bed	

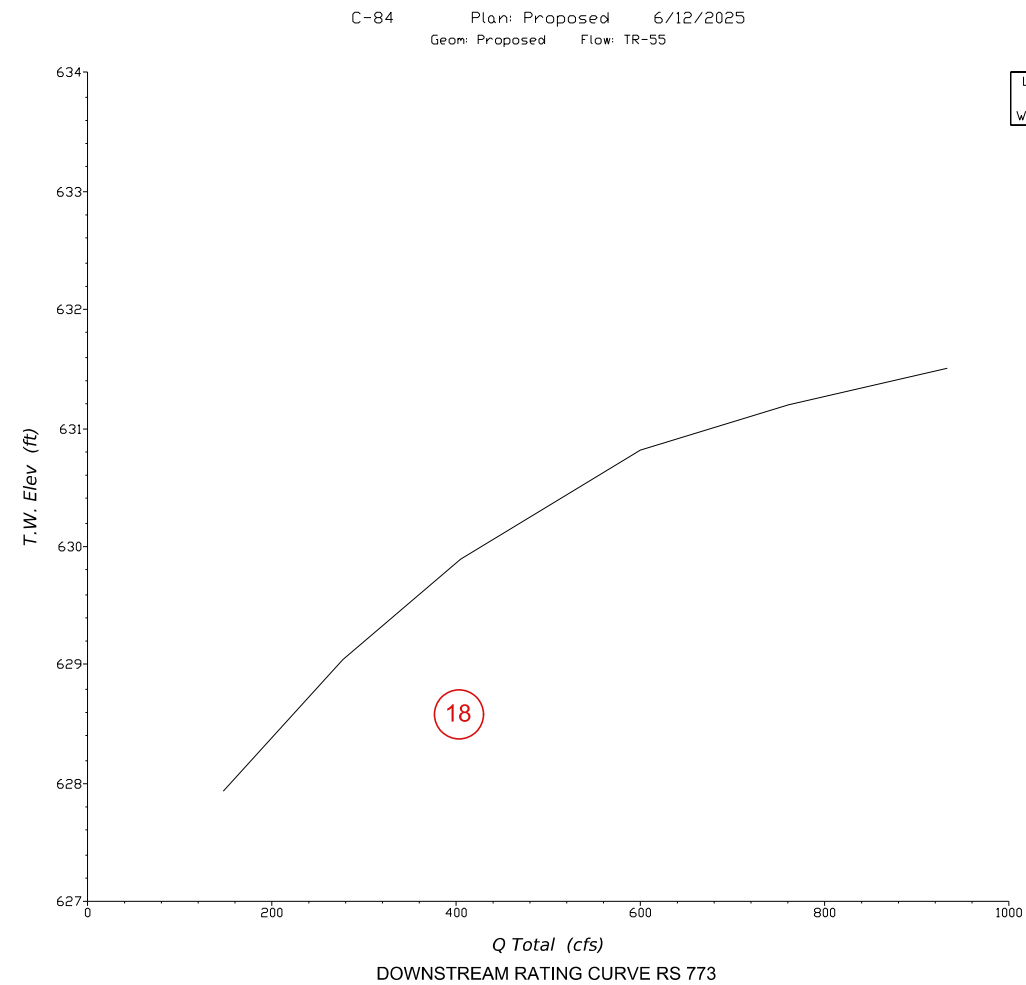
NOTES:

1. CULVERT IS LOCATED AT RS 1000.
2. HYDRAULIC ANALYSIS COMPLETED USING HEC-RAS VERSION 6.5 STEADY STATE, 1D MODELING.
3. TERRAIN DATA SOURCE: 2019 LIDAR DATA (2019 1-METER WEST TEXAS LIDAR SET FROM TEXAS NATURAL RESOURCES INFORMATION SYSTEM (TNRIS). FIELD SURVEY DATA OBTAINED ON MARCH 23, 2022.
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7. INFORMAL COORDINATION WITH THE PHILLIPS COUNTY FLOODPLAIN ADMINISTRATOR WAS COMPLETED ON SEPTEMBER 14, 2024.
8. SEE THE TECHNICAL MEMO REGARDING CULVERT 84 DATED AUGUST 17, 2024, BY MASON & BURGER, INC. FOR ADDITIONAL INFORMATION.
9. BASED ON ANALYSIS OF EXISTING AND PROPOSED CONDITIONS, THERE ARE NO SIGNIFICANT ADVERSE IMPACTS ANTICIPATED AS A RESULT OF THE PROJECT.

* MAY BE OMITTED IF OUTSIDE OF FEMA SPECIAL FLOOD HAZARD AREA.

x REFERENCE ITEM ON PBLR H&H CHECKLIST

28 EXISTING NB#: 28-255-0-9999-99-099
PROPOSED NB#: 28-255-0-9999-99-101



NOTE TO DESIGNER: RATING CURVE SHOWN HERE FOR REFERENCE PURPOSES ONLY.
RATING CURVE IS ONLY REQUIRED IF USED AS A BOUNDARY CONDITION.

Texas Department of Transportation			
SH 737			
BRIDGE CLASS CULVERT			
STA 83+46.38			
HYDRAULIC DATA SHEET			
© 2024 TxDOT		SHEET 4 OF 4	
CONT	SECT	JOB	HIGHWAY
9999	99	101	SH 737
DIST	COUNTY		SHEET NO.
DIY	PHILLIPS		