Hydrology and Hydraulics Study

US 290 / SH 71

Oakhill Parkway Project

Travis County

PREPARED BY:

H & H RESOURCES, INC.
TX PE # 3678



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1 Project Description

The following report details the findings of the offsite drainage hydrology and hydraulic impact study of the proposed Oakhill Parkway (US 290/ SH 71) improvement project in southwest Austin, Travis County, Texas. These impacts include the increased impervious area, the proposed offsite detention evaluation, diverted flow from the Kincheon Branch sub-basin, the hydraulic evaluation of 4 major stream crossings, overbank impacts due to encroachment of the proposed grade and elevated roadways, and the proposed hydraulic mitigation efforts deemed necessary, such as berms and overbank grading.

H & H Resources, Inc. (HHR) produced two previous technical memos as part of this overall drainage study. The first memo from February 5, 2014 (Feb-2014 HHR), outlined the initial hydrologic impacts drawing information from a previous feasibility study performed by HDR Engineering, Inc. (HDR) in 2007 (SH 71/US 290 Offsite Detention Feasibility Study). The Feb-2014 HHR memo assessed the previous study's findings and adjusted and expanded on those recommendations accordingly. The second technical memo produced by HHR on June 3 2016 (June-2014 HHR) outlined the initial hydraulic analysis and results. Specifically, it analyzed the impacts of the proposed detention scenarios presented in the Feb-2014 HHR memo, corresponding peak flow reductions in Williamson Creek in the project area, and the performance of the initial bridge layouts available at that time. The following report will combine the findings from these previous technical memos, outline the updated hydrologic and hydraulic modeling of the latest layouts and alignments, and review final results.

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1.1 Project Location

The proposed project area extends along US 290 from Circle Drive to Joe Tanner Lane, and along SH 71 from Silvermine Drive to the interchange with US 290. The existing US 290 highway consists of four main lanes with a continuous center turn lane and runs along the south bank of Williamson Creek between the SH 71 interchange until it crosses the creek just east of McCarty Lane. The bulk of the project impact will occur at this section along Williamson Creek and will impact, expand, or replace four existing creek crossings structures.

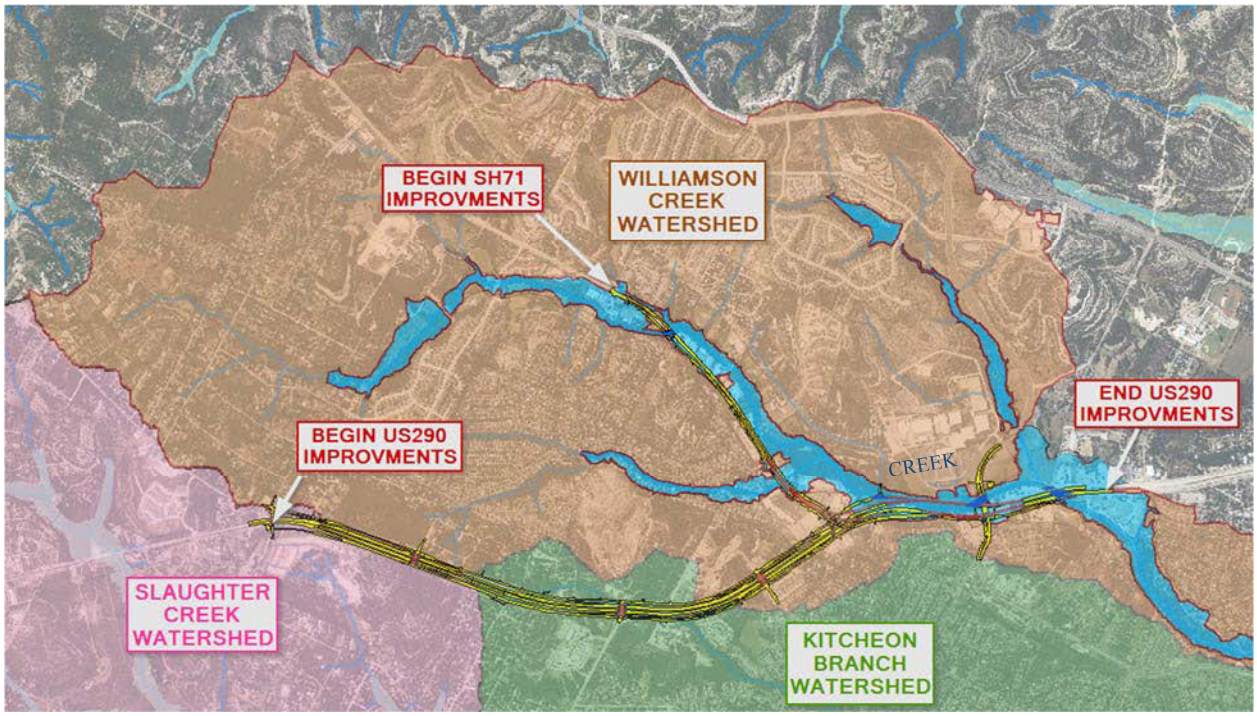


Figure 1 - Project Location

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1.2 Existing Structures

The main crossing of US 290 over Williamson Creek just east of McCarty Lane consists of a 120 foot long bridge with 6 - 20 foot spans. Another crossing within the project area occurs at William Cannon Blvd and consists of a 120 foot bridge with 4 - 30 foot spans. Currently Old Bee Cave Road also crosses Williamson Creek as a low water crossing with a 6 foot by 2 foot concrete box culvert. Approximately one mile north of the US 290/SH 71 interchange, SH 71 crosses Williamson Creek just south of Silvermine Drive. This bridge consists of 4 - 25 foot spans with a total length of 100 feet.

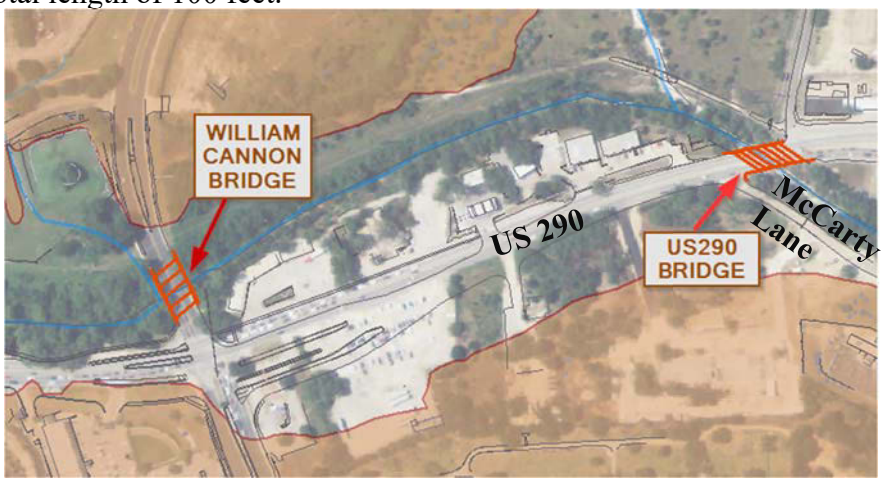


Figure 2 - Existing Bridge Locations (US 290 & William Cannon Drive – Williamson Creek crossings)

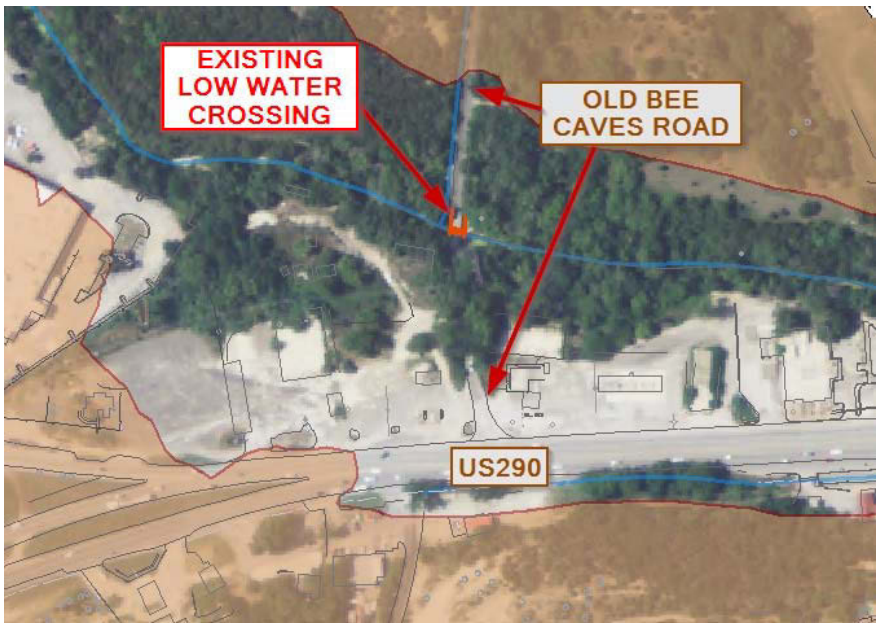


Figure 3 - Existing Structure Location (Old Bee Cave low-water Williamson Creek crossing)

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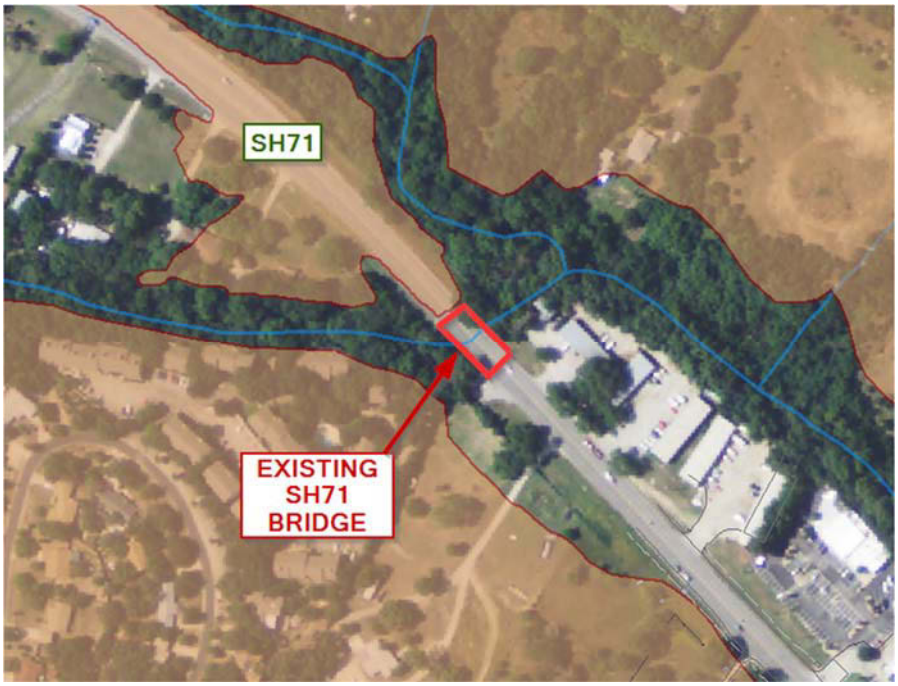


Figure 4 - Existing Bridge Location (SH 71 - Williamson Creek crossing)

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1.3 Proposed Designs

Throughout the development of this project, multiple improvement concepts have been considered. The two remaining concepts for consideration are referred to as Concept A and Concept C. The major differences between these concepts are the design approaches to the US 290/SH 71 interchange. Concept A shifts both the westbound frontage road and the westbound main lanes to the north bank of Williamson Creek. The west bound main lanes are elevated throughout the creek bank area while the westbound frontage roads are mostly on grade and only elevated in places with close proximity to the bank. The eastbound main lanes are elevated and remain on the south bank, while the eastbound frontage road is on grade and maintains a fairly similar alignment to the existing highway.

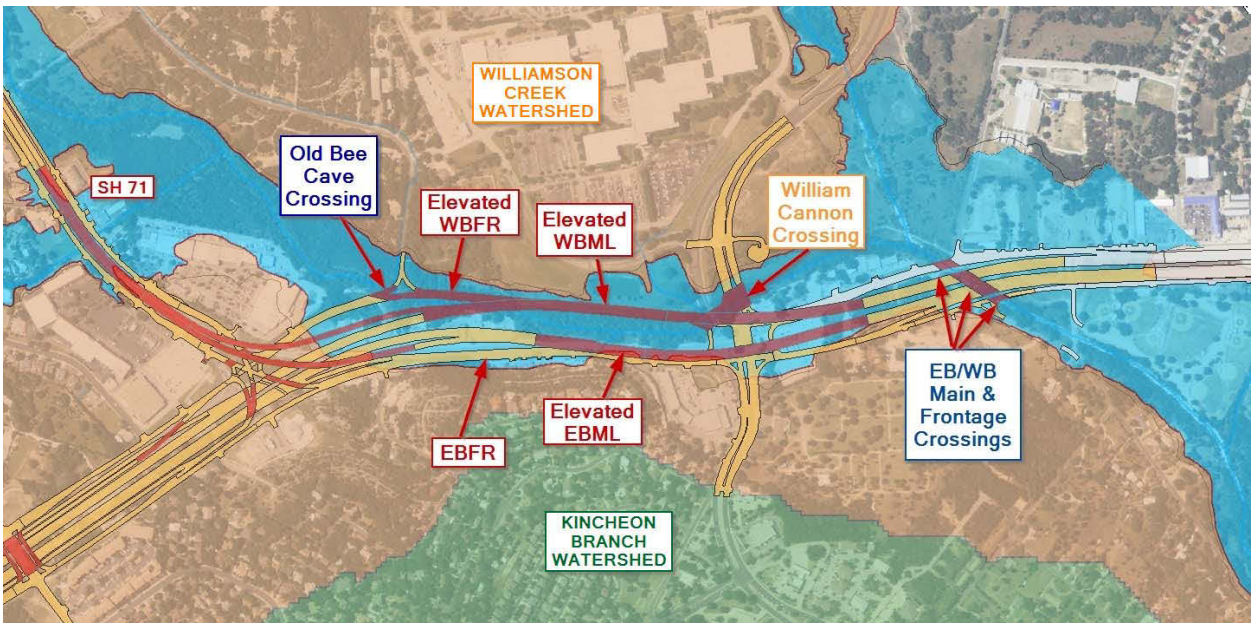


Figure 5 - Concept A Plan View

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Concept C consists of west and eastbound frontage roads that follow a footprint similar to that of the existing US 290 highway, while the proposed main lanes would be elevated starting just west of the interchange and extend across the entire creek impact area returning to grade just west of Joe Tanner, effectively eliminating most all hydraulic impact of the new lane construction.

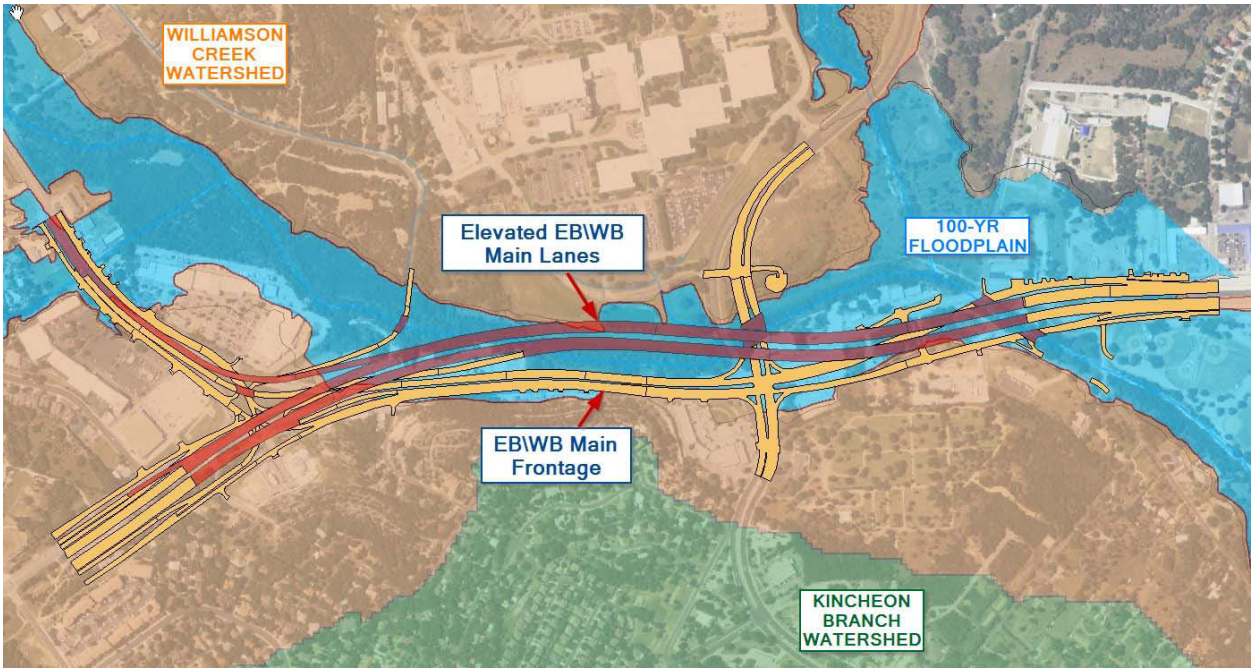


Figure 6 - Concept C Plan View

Although both concepts would have similar increased impervious area impacts on the existing watershed, Concept C would have significantly less impact due to the main lane additions being elevated throughout the impact area along Williamson Creek. Therefore, the project team determined that only Concept A would be further analyzed for its potential hydraulic impact on the creek and its watershed.

2 Hydrologic Analysis

2.1 Overview

In the February 2014 technical memo, HHR outlined our initial hydrologic analysis of the two proposed detention sites as well as the proposed impervious of both the Concept A and Concept C designs. The memo identifies and defines two off-site detention areas. The first proposed detention basin site (hereafter referred to as the OBC site) is located west of Old Bee Cave Rd and just north of Fletcher Lane.



Figure 7 - OBC Detention Site - Location Map

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The second proposed detention basin (hereafter referred to as the SH 71 site) is located along the west side of SH 71 just north of Covered Bridge Drive.



Figure 8 - SH 71 Detention Site - Location Map

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The Feb-2014 HHR memo further analyzed the two design concepts with various off-site detention scenarios evaluating the impact of each site individually and jointly. Results were reported at junction JWCR1050 which is located downstream of the US 290 crossing of Williamson Creek, and at junction JWCR1040, adjacent downstream of JWCR1050, since this location included inflow from all sub-basins impacted by added impervious area from the two concepts. The results from that initial evaluation are outlined in the table below.

Location	Concept	Scenario	Event	Revised Exist Q (cfs)	Prop Q (w/o detention) (cfs)	Prop Q (w/detention) (cfs)	% Change (btwn Rev Exist & Prop w/det)
JWCR1040	A	BOTH	100-Yr	11587	11601	9971	-14%
JWCR1040	A	BOTH	25-Yr	7582	7602	6576	-13%
JWCR1040	A	SH71	100-Yr	11587	11601	10539	-9%
JWCR1040	A	SH71	25-Yr	7582	7602	6909	-9%
JWCR1040	A	OBC	100-Yr	11587	11601	10924	-6%
JWCR1040	A	OBC	25-Yr	7582	7602	7155	-6%
JWCR1040	C	BOTH	100-Yr	11587	11602	9972	-14%
JWCR1040	C	BOTH	25-Yr	7582	7603	6578	-13%
JWCR1040	C	SH71	100-Yr	11587	11602	10540	-9%
JWCR1040	C	SH71	25-Yr	7582	7603	6919	-9%
JWCR1040	C	OBC	100-Yr	11587	11602	10925	-6%
JWCR1040	C	OBC	25-Yr	7582	7603	7156	-6%
JWCR1050	A	BOTH	100-Yr	11159	11170	9651	-14%
JWCR1050	A	BOTH	25-Yr	7429	7447	6323	-15%
JWCR1050	A	SH71	100-Yr	11159	11170	10228	-8%
JWCR1050	A	SH71	25-Yr	7429	7447	6690	-10%
JWCR1050	A	OBC	100-Yr	11159	11170	10520	-6%
JWCR1050	A	OBC	25-Yr	7429	7447	6961	-6%
JWCR1050	C	BOTH	100-Yr	11159	11170	9651	-14%
JWCR1050	C	BOTH	25-Yr	7429	7447	6323	-15%
JWCR1050	C	SH71	100-Yr	11159	11170	10228	-8%
JWCR1050	C	SH71	25-Yr	7429	7447	6698	-10%
JWCR1050	C	OBC	100-Yr	11159	11170	10520	-6%
JWCR1050	C	OBC	25-Yr	7429	7447	6961	-6%

Table 1 - Initial Flow Reduction Results (February 2014 - HHR)

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It was also decided that the Concept A design will ultimately have more potential stream and floodplain impacts on Williamson Creek than Concept C. It was determined, in later hydraulic analysis (June-2014 HHR), that to adequately mitigate the impervious impact of either design concept the implementation of both detention sites would be necessary. Therefore, all further hydraulic analysis focused on the implementation of both detention sites on the Concept A design alone. No other additional flow or design scenarios were further analyzed.

2.2 Existing Conditions

The Williamson Creek watershed is located in the south/southwest portion of the City of Austin. The project area is located primarily within this watershed, with small portions of the project area to the west found within the Slaughter Creek watershed, and project areas to the east in the Barton Creek watershed. HHR obtained the 2007 Effective FEMA HEC-HMS model for the Williamson Creek drainage from the City of Austin. This model included the entire Williamson Creek watershed which consists of 81 sub-basins. Of those 81 sub-basins, 18 are upstream of the proposed US 290 / SH 71 improvements.

2.3 Revised Existing Conditions

Modifications to the existing conditions model were made in order to better analyze the two proposed offsite detention sites. The OBC site lies in the WCR30W30 sub-basin. Similar to the approach of the 2007 HDR study, the WCR30W30 sub-basin, was divided into two sub-basins (WCR30W30_US and WCR30W30_DS.) These new sub-basins represent the upstream area that will drain into the proposed detention basin at the OBC site, and the area downstream of the proposed detention basin. The curve number, percent impervious, Snyder lag times, and channel cross-section shape were identical to those used in the 2007 study. HHR assessed these parameters as still representative of current conditions. Slight modifications in sub-basin area, and routing reach length and slope were made based on more current information. The SH 71 site is located in sub-basin WCR10W10. Because the proposed detention basin for the SH 71 site occurs so close to the downstream outlet of WCR10W10, it was decided that sub-dividing that basin and additional flow routing would be unnecessary.

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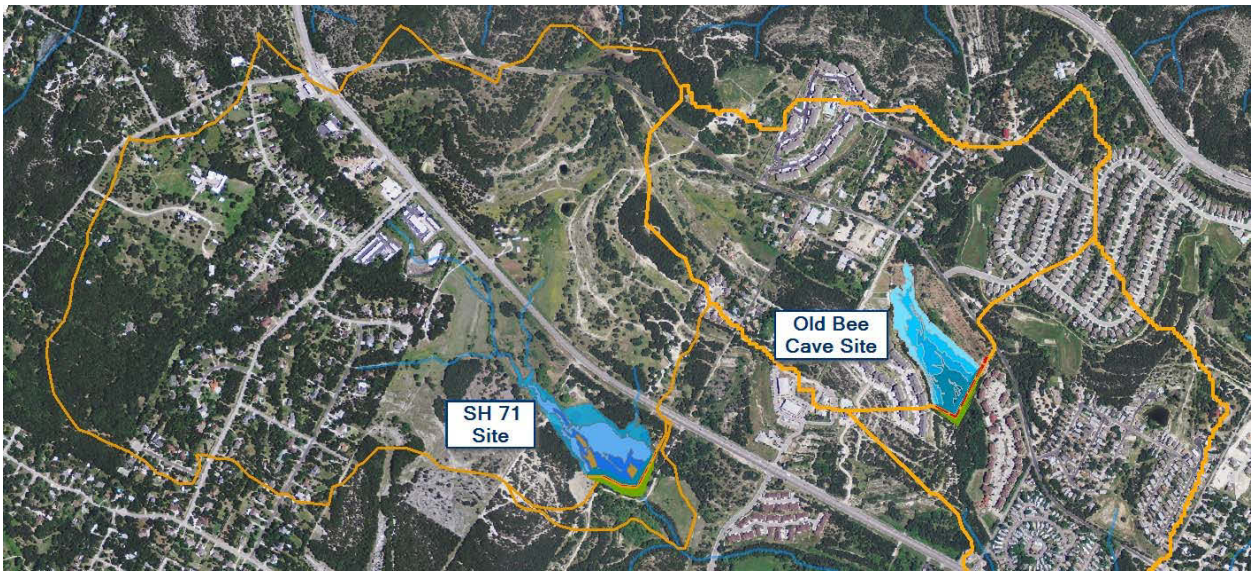


Figure 9 - Sub-basin map of detention sites

Other revisions to the existing model included the addition of a 25-year frequency storm not previously included in the effective FEMA hydrologic model. HHR developed the 25-year frequency storm using the same initial loss rate of 1.5 inches used in the HDR 2007 study

2.4 Proposed Conditions

2.4.1 Impervious

The proposed improvements stretch across 10 sub-basins within the Williamson Creek watershed model. It was necessary to update the impervious percentage parameter for all of these sub-basins based on the impact from the proposed improvements. In order to determine the change in impervious percentage, the area of proposed impervious within the project right-of-way was compared with the existing impervious within the same right-of-way. The percent impervious set by the original FEMA model was used to determine the actual impervious area for the sub-basin. The increase in impervious area was then added and a new percent impervious calculated for each of the affected sub-basins. The following tables summarize the added impervious percentages for each of the affected sub-basins according to design concept.

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Sub-Basin	Existing Percent Impervious	New Percentage
WCR1050W1100	40%	41%
WCR30W30	25%	25%
WCR50W50	35%	35%
WCR60W60	30%	31%
WCR630W720	30%	30%
WCR680W730	55%	61%
WCR690W710	20%	20%
WCR790W810	55%	56%
WCR80W80	40%	43%
WCR810W870	50%	50%

Table 2 : Concept A - Percent Impervious
(Note: Percentages are rounded to the nearest whole number.)

2.4.2 Detention

Since the Feb-2014 HHR technical memo, further design modifications have been made to the offsite detention areas. Due changes in proposed right-of-way acquisition and other considerations associated with adjacent property access, the detention footprints and curves have been modified from the previous study. The footprints and curves were developed using the same 2012 2-ft LiDAR contour data provided by the COA as used in the previous analysis. The final OBC detention facility design parameters are outlined in the following tables.

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OBC Detention Berm	
Top Berm Width	20 ft
Total Berm Length	730 LF
Berm Crest Elevation	926'
Max Berm Height (from bank)	~ 16 ft
100-YR Water Surface Elevation	925.2'
Primary Outlet	
Model Method	Culvert Outlet
Shape	Circular Concrete Pipe
Diameter	3 ft
Inlet Elevation	910'
Outlet Elevation	908'
Length	160 LF
Entrance Coefficient	0.5
Exit Coefficient	1.0
Manning's n	0.013
Auxillary Spillway	
Model Method	Broad-Crested
Weir Coefficient	3.0
Length	20 LF
Elevation	925'

Table 3 - OBC Berm Design Details

Elevation	Incremental Area (acre)	Incremental Volume (acre-ft)	Cumulative Volume (acre-ft)
908	0.00	0.00	0.00
910	0.13	0.13	0.13
912	0.79	0.91	1.04
914	1.79	2.58	3.62
916	2.75	4.54	8.16
918	3.99	6.74	14.90
920	5.34	9.34	24.23
922	6.64	11.98	36.21
924	8.14	14.78	50.99
926	9.92	18.06	69.05

Table 4 - OBC Stage-Storage Curve

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Figure 10 - OBC Footprint Map

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The final SH 71 detention facility design parameters are outlined in the following tables.

SH 71 Detention Berm	
Top Berm Width	20 ft
Total Berm Length	830 LF
Berm Crest Elevation	936'
Max Berm Height (from bank)	~ 20 ft
100-YR Water Surface Elevation	935.2'
Primary Outlet	
Model Method	Culvert Outlet
Shape	Circular Concrete Pipe
Diameter	4 ft
Inlet Elevation	920'
Outlet Elevation	914'
Length	500 LF
Entrance Coefficient	0.5
Exit Coefficient	1.0
Manning's n	0.013
Auxillary Spillway	
Model Method	Broad-Crested
Weir Coefficient	3.0
Stage 1 - Length	100 LF
Stage 1 - Elevation	933'
Stage 2 - Length	100 LF
Stage 2 - Elevation	934'
Stage 3 - Length	100 LF
Stage 3 - Elevation	935'

Table 5- SH 71 Berm Design Details

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Elevation	Incremental Area (acre)	Incremental Volume (acre-ft)	Cumulative Volume (acre-ft)
918	0.00	0.00	0.00
920	0.05	0.05	0.05
922	0.30	0.35	0.40
924	0.63	0.93	1.33
926	1.42	2.05	3.39
928	2.83	4.25	7.64
930	4.96	7.79	15.43
932	7.33	12.30	27.73
934	9.72	17.05	44.78
936	11.68	21.40	66.18
938	13.97	25.65	91.82

Table 6 - SH 71 Stage-Storage Curve



Table 7 - SH 71 Footprint Map

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2.4.3 Kincheon Branch Re-routing

Additional basin revisions were made to the HMS model to represent a shift of area away from Kincheon Branch. A portion of the proposed project area falls within the boundary of Kincheon Branch (a downstream tributary to Williamson Creek). Due to the nature of the proposed profile a portion of sub-basin WCR680W730 will no longer drain to Kitchen Branch, but will be captured on the project site and routed to eventual discharge near the proposed William Cannon bridge. In order to reflect this area shift, the WCR680W730 sub-basin was altered to reflect the loss of area due to improvements and sub basin WCR80W80 was altered to reflect this gain in drainage area as well.

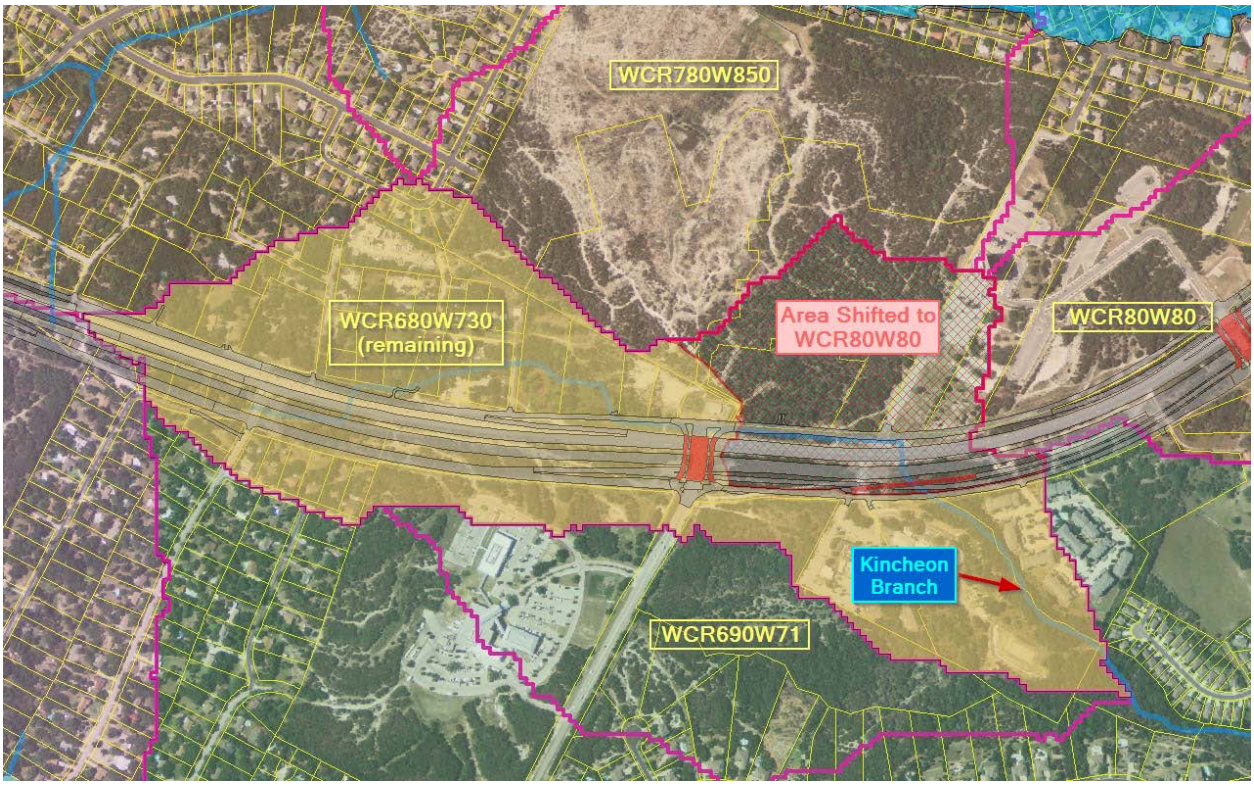


Table 8 - Kincheon Branch Area Map

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New impervious calculations were made for the reduced WCR680W730 sub-basin and expanded WCR80W80 sub-basin as outlined in the table below. This area shift resulted in a modest increase in flows (1.2%-1.5%) to the discharge outlet site and an approximate 17% decrease in the WCR680W730 sub-basin flows for the 100 year frequency storm.

Sub-basin	Existing			
	Total Area	Total Area	Total Imp Area	Total Calculated % IMP
	(sq miles)	(acres)	(acres)	
WCR80W80	0.755	483.2	193.28	40.00%
WCR680W730	0.258	165.37	90.96	55.00%
Shifted Area	-	-	-	-

Table 9 - Kincheon Branch Existing Sub-basin Details

Sub-basin	Proposed				
	Total Area	Total Area	Total Imp Area	% IMP (prior to shift)	NEW % IMP
	(sq miles)	(acres)	(acres)		
WCR80W80	0.818	523.45	219.78	43.00%	41.99%
WCR680W730	0.196	125.12	80.53	61.00%	64.36%
Shifted Area	*0.063*	*40.25*	*26.50*	-	-

Table 10 - Kincheon Branch Proposed Sub-basin Details

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2.5 HMS Model Results

In order to establish meaningful and comparable points of reference between the HMS modeling results and the HEC-RAS hydraulic model, flow change locations in the HEC-RAS model were correlated to the appropriate junction in HMS. These correlations establish more detailed points of interest within the HMS model than were analyzed in the initial hydrologic memo (Feb-2014 HHR).

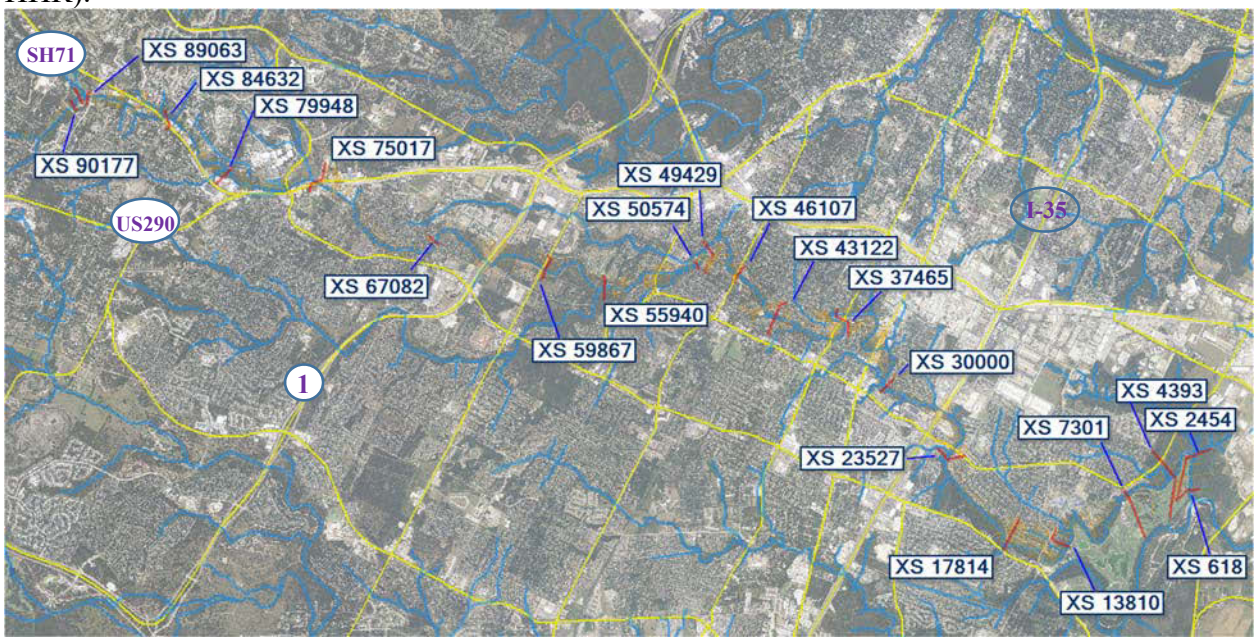


Figure 11 - HEC-RAS Cross-section Location

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Using the established points of interest, the following table summarizes the results comparison between the revised existing and the proposed HMS model. The final hydrologic analysis shows average 100-year peak flow reductions ranging from 10-17% across the project area.

XS	HMS Node	Revised EXSITING			PROPOSED			Percent Change		
		10-yr	25-yr	100-yr	10-yr	25-yr	100-yr	10-yr	25-yr	100-yr
4031	JWCR90A	928.8	1256.2	1758.4	899.8	1241.4	1758.4	-3%	-1%	0%
90177	OAKHILL	950.3	1104.9	1289.5	950.8	1105.5	1289.5	0%	0%	0%
89063	JWCR50	1734.2	2356.1	3156.6	1329.7	1915.9	2980.1	-23%	-19%	-6%
84632	JWCR60	2625.2	3824.6	5463.0	1864.2	2516.4	3974.3	-29%	-34%	-27%
79948	JWCR80	4015.2	5985.0	8738.8	3405.0	5026.9	7224.6	-15%	-16%	-17%
75171.9	JWCR1050	4835.3	7429.2	11158.6	4414.3	6664.8	10113.9	-9%	-10%	-9%
75017	JWCR1050	4835.3	7429.2	11158.6	4414.3	6664.8	10113.9	-9%	-10%	-9%
67082	JWCR1040	4968.1	7582.1	11587.3	4591.7	6911.8	10448.0	-8%	-9%	-10%
59867	JWCR100	5144.7	7875.2	11950.4	4808.2	7259.7	10928.5	-7%	-8%	-9%
55940	JWCR160	10592.5	15374.2	22355.9	10476.9	15053.3	21678.3	-1%	-2%	-3%
50574	JWCR130	11262.1	16391.3	24439.0	11201.3	16009.0	23857.3	-1%	-2%	-2%
49429	JWCR120	11437.2	16636.4	24849.2	11388.3	16263.1	24299.3	0%	-2%	-2%
46107	JWCR1170	11466.9	16546.7	24781.1	11418.6	16210.4	24190.6	0%	-2%	-2%
43122	JWCR1000	11843.1	16984.4	25521.0	11813.6	16673.8	24963.6	0%	-2%	-2%
37465	JWCR103	11901.1	16991.8	25435.4	11862.6	16688.7	24843.7	0%	-2%	-2%
30000	JWCR360	12031.3	17072.3	25541.8	11983.7	16772.3	24922.3	0%	-2%	-2%
23527	JWCR880	12141.2	17171.5	25736.4	12082.8	16870.0	25120.6	0%	-2%	-2%
17814	JWCR370A	12180.6	17211.6	25753.1	12116.5	16908.2	25154.9	-1%	-2%	-2%
13810	JWCR370	12207.8	17244.5	25795.7	12142.6	16942.2	25203.4	-1%	-2%	-2%
7301	JWCR3900	12262.8	17328.9	25925.9	12179.6	17028.5	25344.2	-1%	-2%	-2%
4393	J400W	12284.0	17342.2	25709.3	12193.7	17042.0	25229.3	-1%	-2%	-2%
2454	JWCR400	12419.4	17511.3	25955.7	12330.7	17216.1	25480.3	-1%	-2%	-2%
618	outlet	12408.2	17493.6	25831.2	12317.0	17198.0	25387.5	-1%	-2%	-2%

Table 11 - HMS Model Results (Concept A)

3 Hydraulic Analysis

With proposed flow conditions established, HHR further revised the hydraulic modeling in order to determine if the flow reductions and the resulting water surface elevation reductions were sufficient to mitigate the proposed improvement impacts or if further mitigation efforts would be required.

The hydraulic analysis consists of two HEC-RAS models. The first is a revised existing conditions model that updates the effective FEMA HEC-RAS model to current existing

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conditions. This model is the basis for which comparisons are made with proposed conditions to assess the project impact. The second is a proposed condition model that reflects the project Concept A design; this concept has been assumed to have the most severe potential impact to flood elevations due to the "at-grade" encroachment of the alignment on the Williamson Creek floodplain. The proposed condition model will use flows developed in the hydrologic analysis representing the implementation of both detention sites, the increased impervious area, and the shifted area from Kincheon Branch sub-basin WCR680W730 to WCR80W80.

3.1 Hydraulic Modeling

3.1.1 Currently Effective Model

The current effective hydraulic model for Williamson Creek is the 2006 Williamson Creek Restudy (2006 restudy model), as provided by the City of Austin (COA). This model includes all of the Williamson Creek drainage area, starting at the confluence of Williamson Creek and Onion Creek and extends up past the proposed project site. It includes a total of three reaches and 344 cross-sections. The Manning's n values for the main channel vary between 0.040-0.060 with an overbank variance of 0.035-0.100. This model is the foundation for developing the revised existing conditions model.

3.1.2 Revised Existing Conditions

Modifications were made to the 2006 restudy model around the project area in order to develop a revised existing conditions model. Multiple cross-sections were altered or added in the project area in order to accurately capture the conceptual crossing improvements. These additions and modifications include a new cross-section (74437) just downstream of the existing US 290 bridge, over Williamson Creek, in order to accommodate the new eastbound frontage road bridge. A new cross-section (75171.9) was added approximately 180 feet upstream of the new westbound frontage bridge in order to better model the bridge backwater transition. A new cross-section (76786) was added upstream from the existing William Cannon bridge to accommodate the expansion of that bridge. Two cross-sections (84745 and 84982) were added on either side of the existing SH 71 to reflect the conceptual widening of the crossing. All new cross-section geometry was defined using the 2012 2-ft LiDAR contour data provided by the COA and downloaded from their GIS database. The 2012 contour data was also used to compare the existing conditions model cross-sections throughout our project area. In most areas the geometry as found in the effective FEMA model appeared to be a more detailed resolution than the 2012 contour data, especially in the stream channel. However, in selected locations, the channel was modified to follow the 2012 data where it appeared to more accurately reflect conditions on the ground.

There was an issue with using the HEC-RAS flow file with the 2006 restudy model as a foundation for inserting updated detention flows to the modeling. Documentation found in the Flood Insurance Study (FIS) for the City of Austin (Revised September 26, 2008) indicates the flows generated by the HEC-HMS model provided by the City of Austin for the Onion Creek

Watershed (Williamson Creek is contained in this watershed) were not used "as-is" in the 2006 restudy HEC-RAS model. The FIS indicates that HEC-HMS flows were first input to a previous HEC-2 model that was judged to correctly estimate split flow conditions in the watershed. The split flows results were then input to the 2006 restudy FEMA model. Since HHR does not have access to the HEC-2 model or the specific procedure and process to input HEC-HMS flows into HEC-RAS model through an intermediate HEC-2 model, a revised existing flow file was created to represent flows at locations found in both the City of Austin HEC-HMS and HEC-RAS models. Moderate discrepancies resulted between flows in the revised existing model and those found in the FIS and the 2006 restudy HEC-RAS model. However, since this effort is focused on project impacts and potential mitigation based on detention, using flows directly from HEC-HMS is a representative comparison.

3.1.3 Proposed Conditions

In HHR's initial hydraulic analysis (June-2014 HHR) preliminary bridge layouts were analyzed and determined to not meet required performance criteria. This continued hydraulic assessment determines the minimum necessary performance structures for the proposed improvements establishing low chords, span lengths and abutment designs necessary to meet the minimum design criteria. TxDOT design criteria requires that frontage roads be able to pass the 25-year event without overtopping while main lanes are required to pass the 100-year event without overtopping. HHR was provided with profile information, when available, for the proposed Concept A layout, however due to the preliminary nature of the design some assumptions were required.

Eastbound Frontage Road Bridge

The most downstream project impact is the proposed eastbound frontage road bridge. This bridge is located approximately 400 feet downstream of the existing US 290 crossing. The left abutment (west) is defined and limited by the proposed McCarty Lane intersection. The final bridge design is a total of 240 feet long with (6) forty foot spans. A 2:1 sloping abutment was assumed on the left (east) end of the bridge, however due to the limits of the intersection to the west, a vertical abutment was assumed on the right (west) end of the bridge. Additional overbank grading was required in the vicinity of the bridge in order to achieve a no impact scenario with a final low chord elevation of 809.25'.

Main Lanes Bridge

Located approximately 35 feet upstream of the proposed eastbound frontage road bridge and 30 feet downstream from the existing US 290 bridge, is the proposed main lanes bridge which will convey both east and westbound lanes as well as a portion of the eastbound on ramp. A final bridge design resulted in a 280 foot long bridge with (7) forty foot spans. Sloped abutments of 2:1 were used at both the east and west end of the bridge and additional overbank grading was

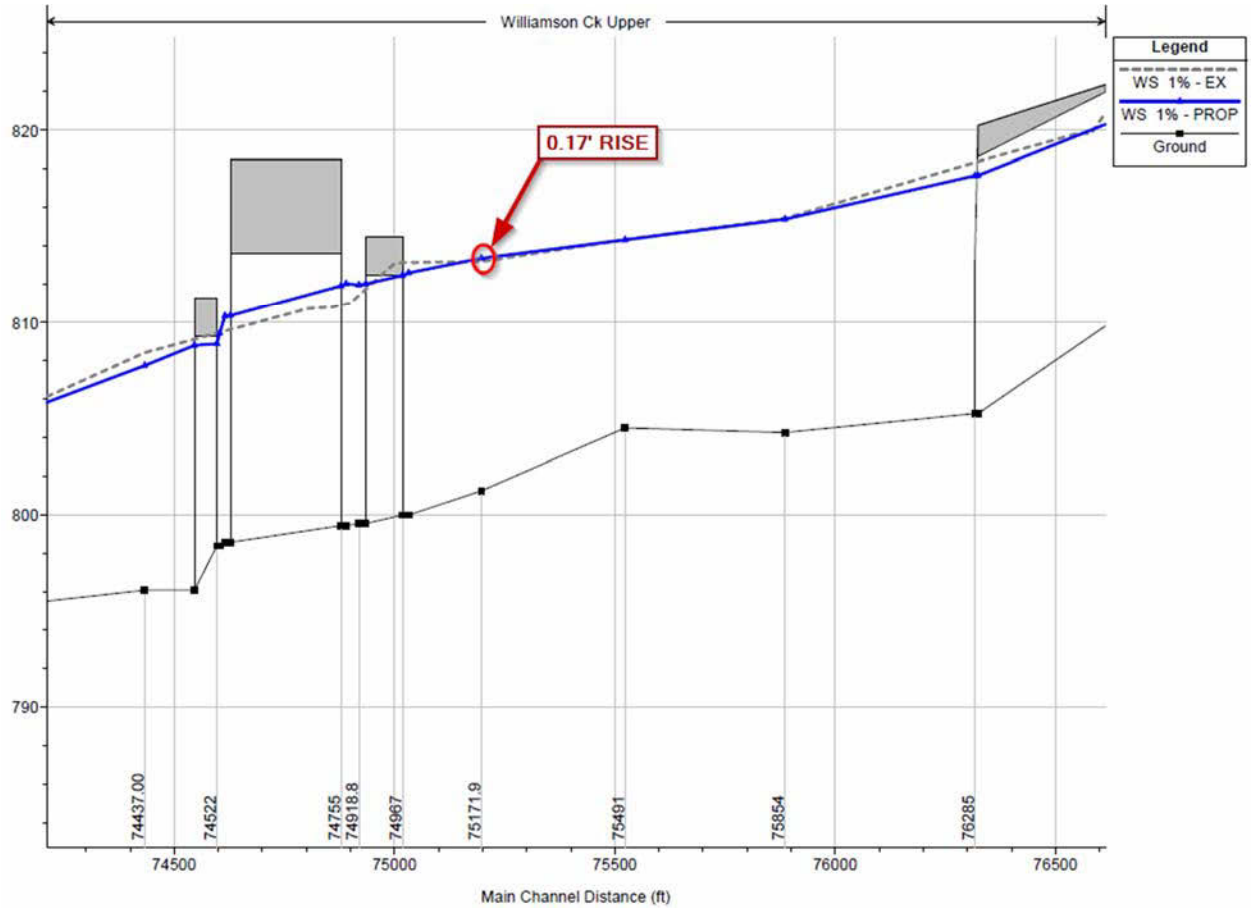
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required in the vicinity of the bridge in order to achieve a no impact scenario with a final low chord elevation of 813.5'.

Westbound Frontage Road

The proposed westbound frontage road bridge will be located in approximately the same location as the existing US 290 bridge. Similar to the eastbound frontage road bridge, it is limited due to the proposed Patton Ranch Road intersection to the east and a private driveway access the west. A final bridge design of 200 feet with (5) forty foot spans was required to achieve the performance criteria. Side slope abutments at 2:1, as well as more expansive overbank grading upstream of the grouped crossings was required to maintain no impact criteria with a final low chord elevation of 812.5'.

Despite additional overbank grading, HHR was unable to achieve the strict no impact scenario at a single cross-section. At HEC-RAS cross-section 75171.9 the 100-year water surface level rises 0.17'feet above the existing profile.



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HHR tested various options of additional bridge expansion and extensive grading scenarios. No solution resulted in a strict no impact result for this cross-section. However, we believe that with more detailed survey of the banks and channel, this anomalous impact section can be resolved in final project design.

William Cannon Drive Bridge

The existing bridge at William Cannon Drive will be replaced by a significantly expanded proposed bridge. The proposed structure will extend an additional 72 feet upstream of the existing bridge face and an additional 240 downstream. It will convey the widened and realigned William Cannon Blvd as well as portions of the westbound frontage road and a portion of the eastbound frontage road turnaround. Preliminary designs only included a partially developed profile for the improved William Cannon intersection. A proposed bridge profile was projected based on the available profile and existing grade information. Due to the fairly large width of the proposed structure, HHR also assumed a typical cross-slope of 2% in order to establish the upstream and downstream low chords. The final proposed bridge is a total length of 160 feet with (4) forty) foot spans. Abutment slopes of 2:1 were used on both north and south ends of the bridge. Additional overbank grading was required to achieve performance criteria with a proposed downstream low chord elevation of 818.48’ and a proposed upstream low chord elevation of 822.37’.

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Westbound Main Lanes Flyover

The Concept A design calls for a shift of the westbound main lanes to the north bank. The resulting main lane flyover structure is proposed just east of the Old Bee Cave crossing. Due to the preliminary nature of the design and significant proposed freeboard between the water surface and the low chord, the flyover was modeled as representative pier obstruction rather than a standard bridge layout. A 2-column bent, assuming 10ft by 10ft piers, was provided by the design team as typical for a structure of this configuration and was applied to cross-section 78181 of the proposed HEC-RAS model. This cross-section also includes representative obstruction on the left (north) bank accounting for the elevated section of the westbound frontage road, as well as obstructions on the right bank (south) reflecting the eastbound main lanes and eastbound frontage road. Additional overbank grading was also applied to this section to mitigate the impact of the pier obstruction.

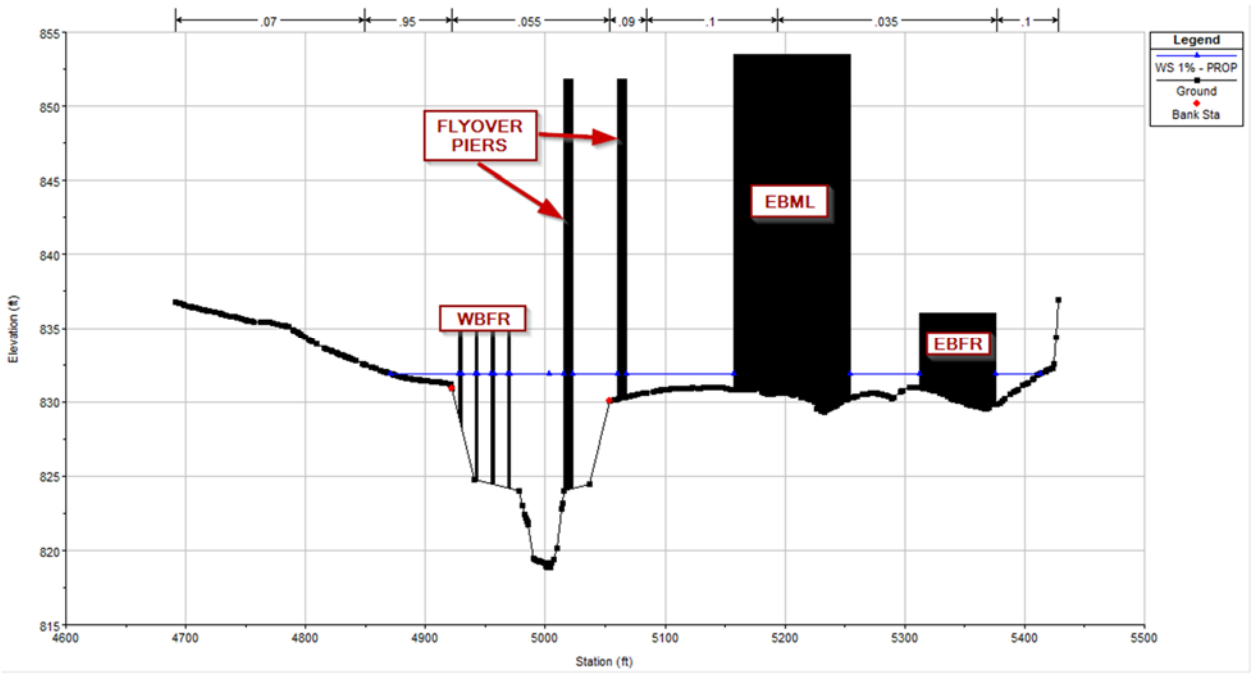


Figure 12 - Westbound Main Lanes Flyover

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Old Bee Cave Road Bridge

The Concept A design calls for the removal of the existing Old Bee Cave Road low water crossing and replacement with a bridge. During preliminary design, approach road profiles were not yet defined and HHR assumed an initial profile based on the adjacent main lane profile and the existing grade. Other considerations for this crossing included obstructions representative of the blended elevated westbound frontage road structure. The final bridge design calls for a 135 foot bridge with (3) forty-five foot spans. Abutment slopes of 2:1 were assumed and additional overbank grading was applied in the bridge vicinity with a final upstream low chord elevation of 838.30' and a downstream low chord of 837.41'. The original low water crossing at this location has resulted in an exaggerated upstream sedimentation, resulting in a significant grade break in the channel slope through this crossing.

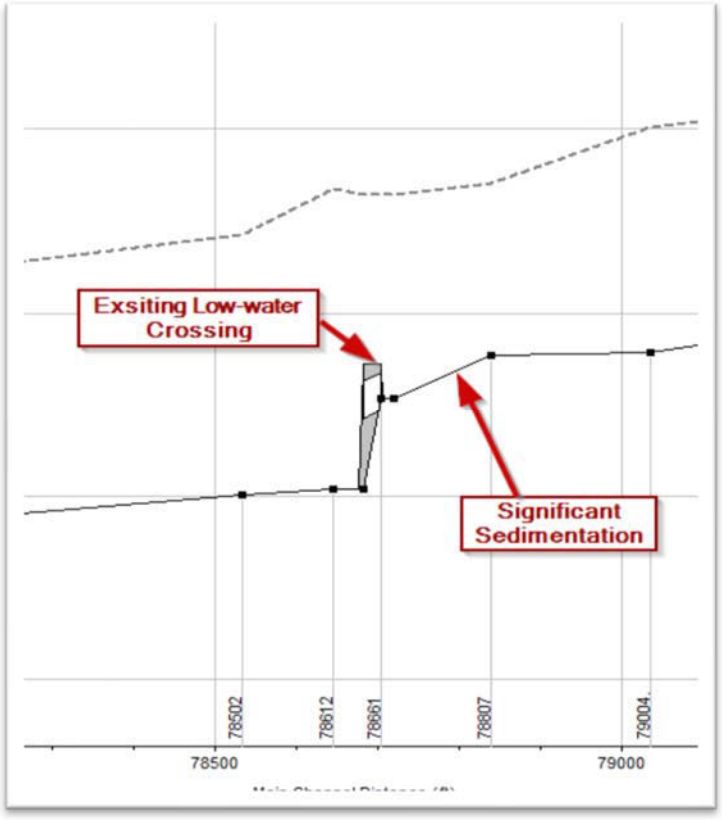


Figure 13 - OBC - Existing Stream Profile

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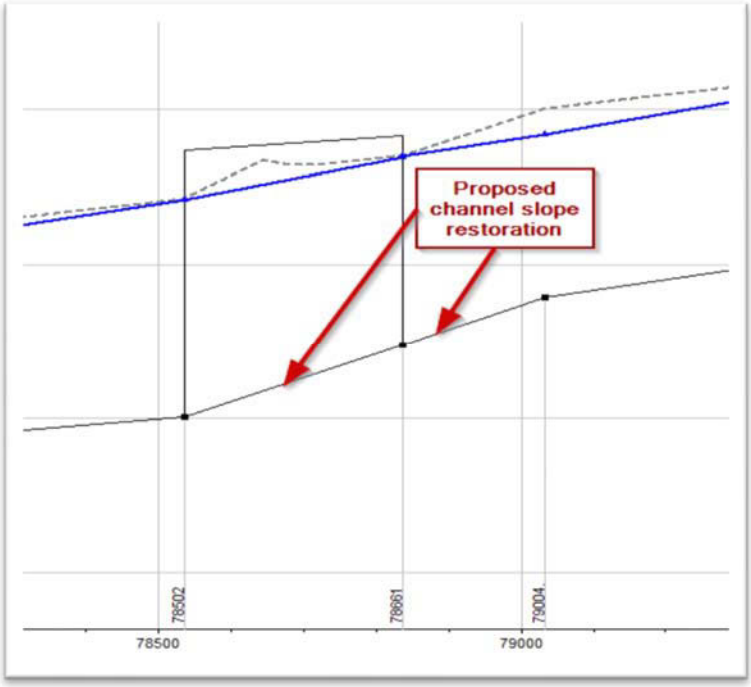


Figure 14 - OBC - Proposed Stream Profile

The proposed improvements will require that a more natural stream thalweg be establishedto maintain stable stream channel geometry and provide for a feasible bridge structure. A channel slope was assumed by projecting a slope between the channel bottom of upstream cross-section 79004 down to the channel bottom of cross-section 78502.

State Highway 71 Bridge

The proposed SH 71 alignment crossing calls for two individual stream crossings: one for the northbound lanes and one for southbound lanes. The existing bridge adequately conveys the 100 year storm and no profile changes were proposed for this section of the highway. Since both proposed bridges are of similar geometry and no major changes to this crossing are proposed, the crossing was modeled as a simple expansion, treating the proposed bridges as one crossing. The profile, low chords, and span arrangements were not altered from the existing bridge model. The crossing was widened to accommodate both travel directions . This widened structure conveys the 100-year flow , and no overbank adjustments or further mitigations are required.

Overbank Obstructions

Additional overbank obstructions were applied throughout the proposed HEC-RAS model in order to model the impact of proposed profile changes in the adjacent roadway. These obstructions appear in the right and left overbanks of cross-sections in the area where there are proposed roadway profile changes. The obstructions represent either the roadway fill associated

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with the new structure or the straddle support structures that will be used to elevate main lanes in various places along the corridor.

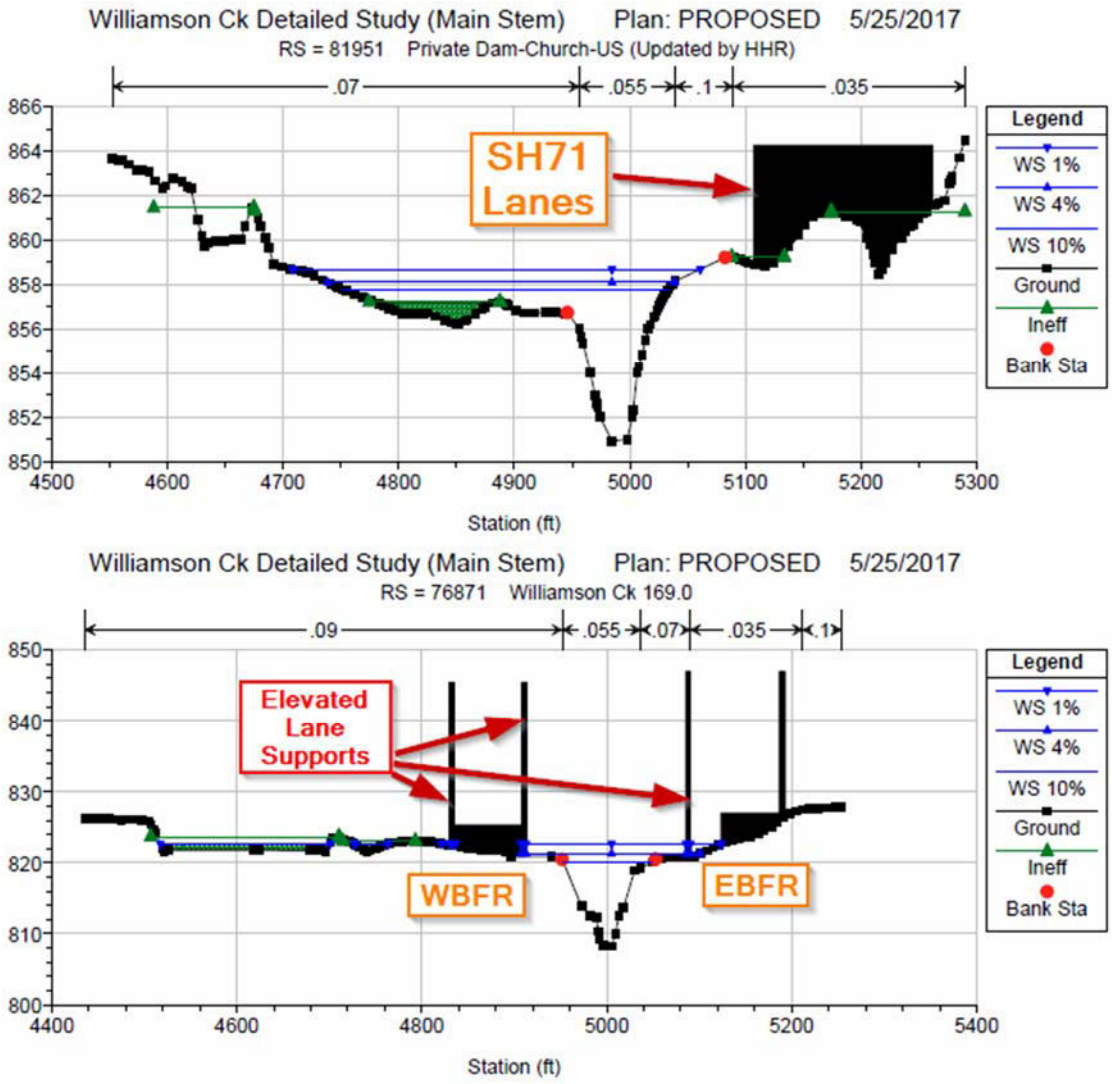


Figure 15 - Overbank Obstruction Examples

Overbank Mitigation

Overbank mitigations are recommended at six of the seven proposed stream crossings. Those mitigations follow some basic assumptions: the beginning of the mitigation at the bank is approximately 5 feet above the channel bottom, and the overbank grading is designed to maintain a 2% or greater slope to maintain proper drainage to the channel.

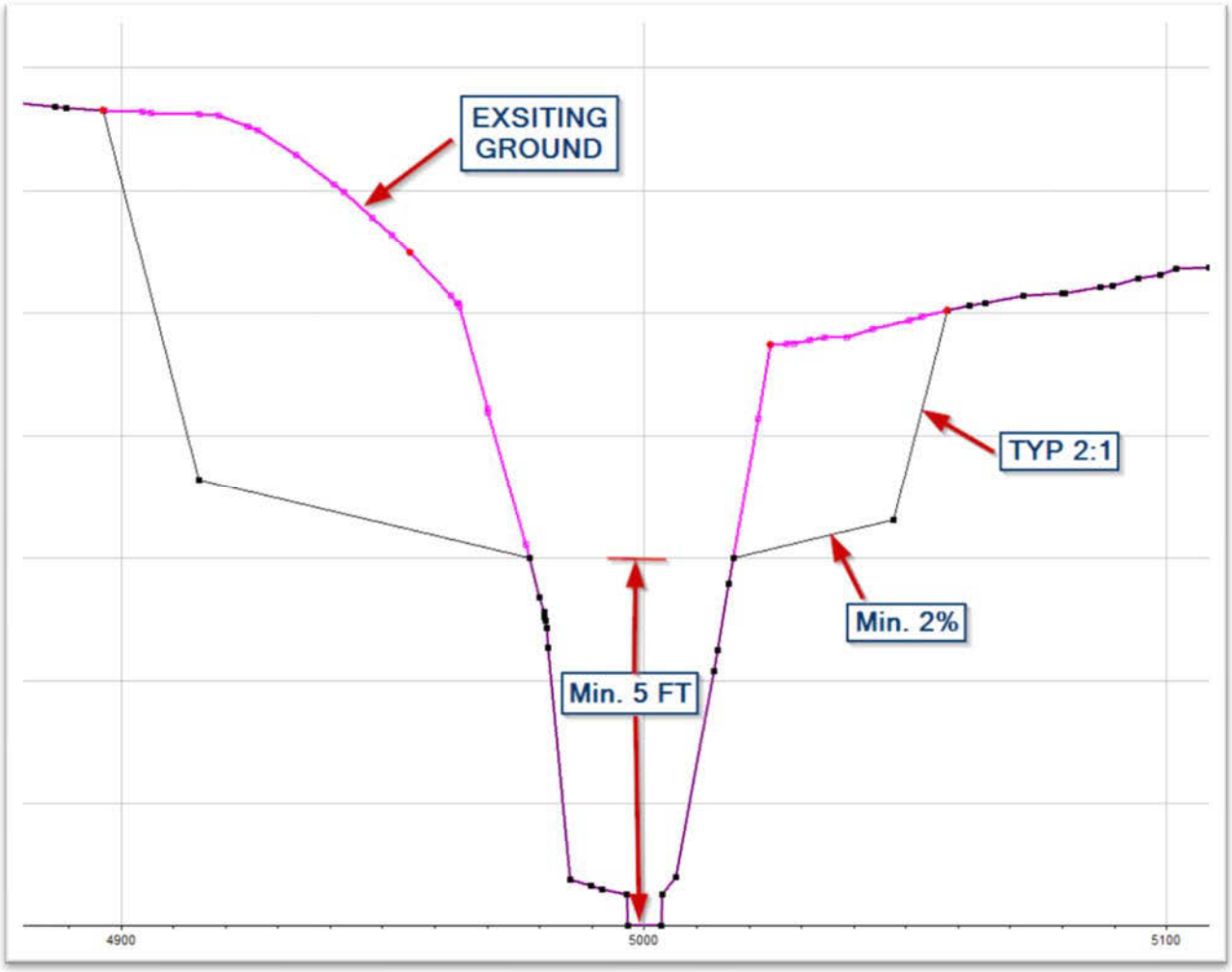


Figure 16 - Overbank Mitigation Example

Main Lanes Berm

HHR also modeled a levee in cross-section 79004 and 78807 south of the Old Bee Cave crossing. The proposed profile for the eastbound main lanes depresses between stations 359+00 and 362+25 in order to accommodate elevated frontage road crossings. It was believed that this

might result in flooding of the main lanes during a low frequency storm event, so a berm was developed as a mitigation recommendation. The berm has a maximum height of approximately 2.5 ft and was modeled in HEC-RAS as a simple levee.

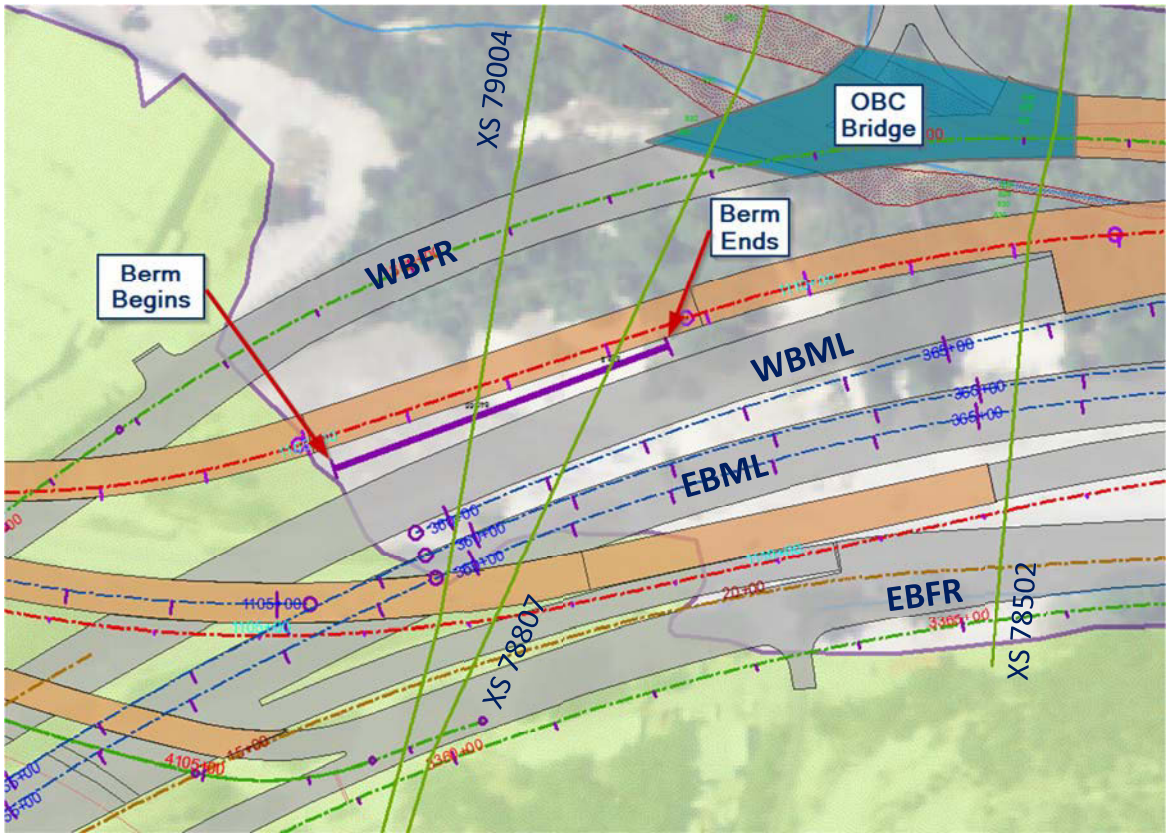


Figure 17 - Berm Plan View

Levee Profile	
STA	ELEV
359+00	841
361+00	840
361+75	839
362+25	838

Table 12 - Levee Profile (WBML alignment)

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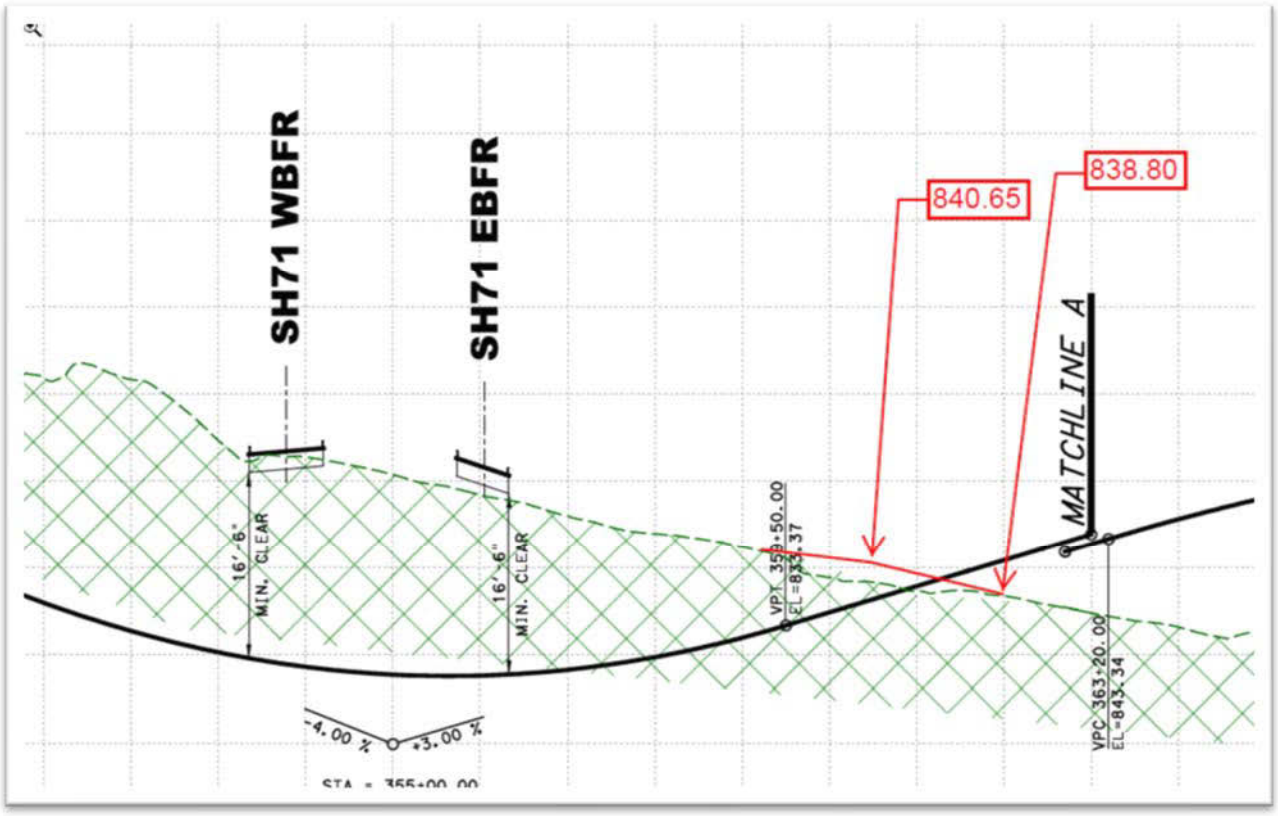


Figure 18 - Berm Location in Profile

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3.2 HEC-RAS Model Results

Details of the proposed structure are outlined in the table below.

Crossing	Low Chord	Total Length	Spans
EBFR	Upstream - 809.25'	200'	5 @ 40'
	Downstream - 809.25'		
Main Lanes	Upstream - 813.50'	280'	7 @ 40'
	Downstream - 813.50'		
WBFR	Upstream - 812.50'	200'	5 @ 40'
	Downstream - 812.50'		
William Cannon	Upstream - 822.37'	160'	4 @ 40'
	Downstream - 818.48'		
Old Bee Caves	Upstream - 838.30'	135'	3 @ 45'
	Downstream - 837.41'		
SH 71	Upstream - 879.54'	100'	4 @ 25'
	Downstream - 878.54''		

Table 13 - Proposed Bridge Details

These designs were the configurations required in order to maintain conveyance criteria and without causing a water surface elevation increase during the 100-year frequency storm.

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HEC-RAS River Station	Location	Existing W.S. Elev (ft)	Proposed W.S. Elev (ft)	Change
86254		887.43	887.19	-0.24
85611		883.63	883.36	-0.27
85045		879.44	879.43	-0.01
84982	Upstream of State Hwy 71 Bridge	879.40	879.39	-0.01
84745		878.54	877.00	-1.54
84632		877.66	876.44	-1.22
83997		874.68	873.42	-1.26
79948		845.88	845.14	-0.74
79547		842.98	842.83	-0.15
79004	Main Lanes Berm	840.09	838.40	-1.69
78807	Upstream of Old Bee Caves	837.08	836.99	-0.09
78502	Upstream of WestBound Flyover	834.26	834.21	-0.05
77960		831.34	830.57	-0.77
77525		827.84	827.12	-0.72
76871		823.30	822.71	-0.59
76786	Upstream of William Cannon Bridge	822.80	822.48	-0.32
76285		818.34	817.66	-0.68
75854		815.45	815.40	-0.05
75491		814.34	814.33	-0.01
75171.9		813.20	813.37	0.17
75017	Upstream of Main Lanes and Frontage crossings	813.15	812.61	-0.54
74437		808.41	807.74	-0.67
74163		805.59	805.38	-0.21
74022	Upstream of Joe Tanner	805.18	804.98	-0.20
73960		804.90	804.71	-0.19

Table 14 - 100-YR HEC-RAS Results

4 Conclusions and Recommendations

The goal of this study was to determine the hydrologic and hydraulic impacts of the proposed Oakhill Parkway project.

The Old Bee Cave site and SH 71 site are two detention sites, proposed for the project, to help mitigate the increased impervious and floodplain encroachment impacts. These sites were analyzed with design layouts that will contain the 100-year frequency storm while reducing the downstream flows. It was also determined that due to a shift of area from offsite flow to onsite flow, in the headwaters of Kincheon Branch, flows in that branch will be reduced by

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approximately 17%. Ultimately the proposed analysis reports a 9%-10% reduction of flows across the proposed US 290/SH 71 interchange area.

The proposed Oakhill Parkway Concept A design includes 7 major stream crossings: the US 290 eastbound frontage road bridge, the US 290 main lanes bridge, the US 290 westbound frontage road bridge, the William Cannon Drive bridge, the US 290 westbound main lane flyover, the Old Bee Cave road bridge, and the SH 71 Bridge. The crossings were analyzed and proposed bridge lengths, spans, and low chords have been established for all of the crossings that allow for the conveyance of the 100 year frequency storm without overtopping. In order to achieve this conveyance and also mitigate impact to the 100-year floodplain, overbank mitigations have been proposed for all crossings except the SH 71 bridge. A 325 foot long berm is also proposed along a depressed section of the US 290 main lanes in order to ensure the lanes remain serviceable during a storm event.

Despite numerous design scenarios, a minor rise of 0.17 feet in cross-section 75171.9 was not mitigated. This section occurs just upstream of the group crossings of US 290 east and westbound frontage roads and main lanes. It is recommended that detailed survey of the channel and overbank topography be conducted prior to final design in order to establish if further mitigation is necessary in this area.

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Appendix A

Patton Ranch Rd
XS 75017
XS 74918.8
XS 74890
XS 74620.5
XS 74607.3
XS 74437
XS 74163
XS 74002
Overbank Mitigation Area
Westbound Frontage Road
1400+00
1405+00
10+00
1410+00
Westbound Main Lanes
405+00
410+00
Eastbound Main Lanes
400+00
400+00
20+00
3405+00
3410+00
Overbank Mitigation Area
Joe Tanner Lane
XS 73960
Eastbound Frontage Road
15+00
3400+00
McCarty Lane
Williamson Creek
XS 73862
1 inch = 100 feet
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Eastbound Frontage Road Bridge

Overbank Mitigation Area

Patton Ranch Rd

XS 75017

XS 74918.8

XS 74890

XS 74620.5

XS 74607.3

XS 74437

XS 74163

XS 74002

1405+00

10+00

1410+00

Westbound Frontage Road

1400+00

Westbound Main Lanes

405+00

410+00

Eastbound Main Lanes

400+00

400+00

20+00

Eastbound Frontage Road

3405+00

3410+00

Overbank Mitigation Area

Joe Tanner Lane

15+00

3400+00

McCarty Lane

N

1 inch = 100 feet

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CIVIL ENGINEERS

Main Lanes Bridge

Overbank Mitigation Area

Patton Ranch Road

XS 75017

XS 74918.8

XS 74890

XS 74620.5

XS 74607.3

XS 74437

XS 74163

XS 74002

1405+00

10+00

1410+00

1400+00

Westbound Frontage Road

Westbound Main Lanes

Eastbound Main Lanes

405+00

410+00

400+00

400+00

20+00

3405+00

3410+00

Overbank Mitigation Area

Joe Tanner Lane

15+00

Eastbound Frontage Road

3400+00

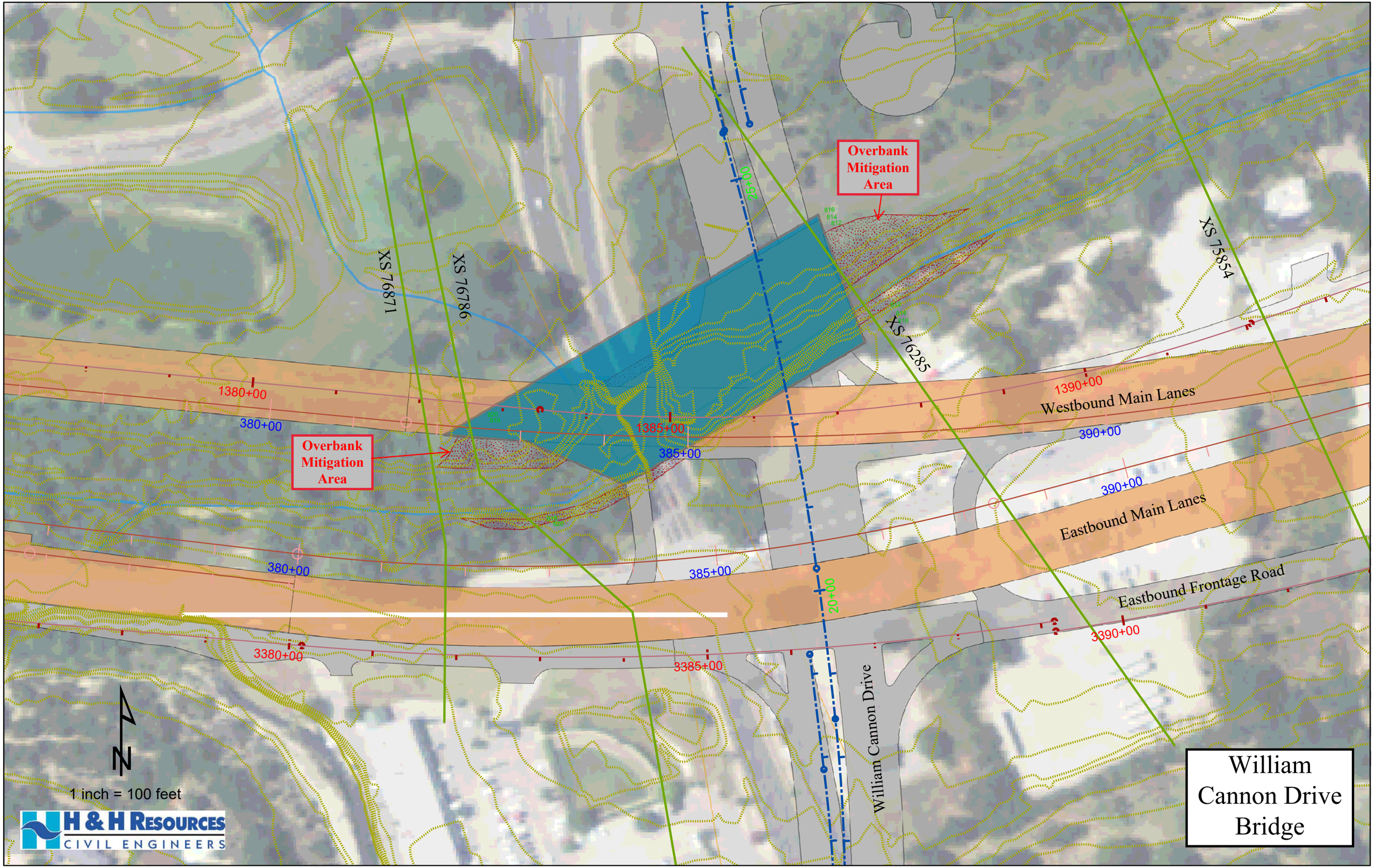
McCarty Lane

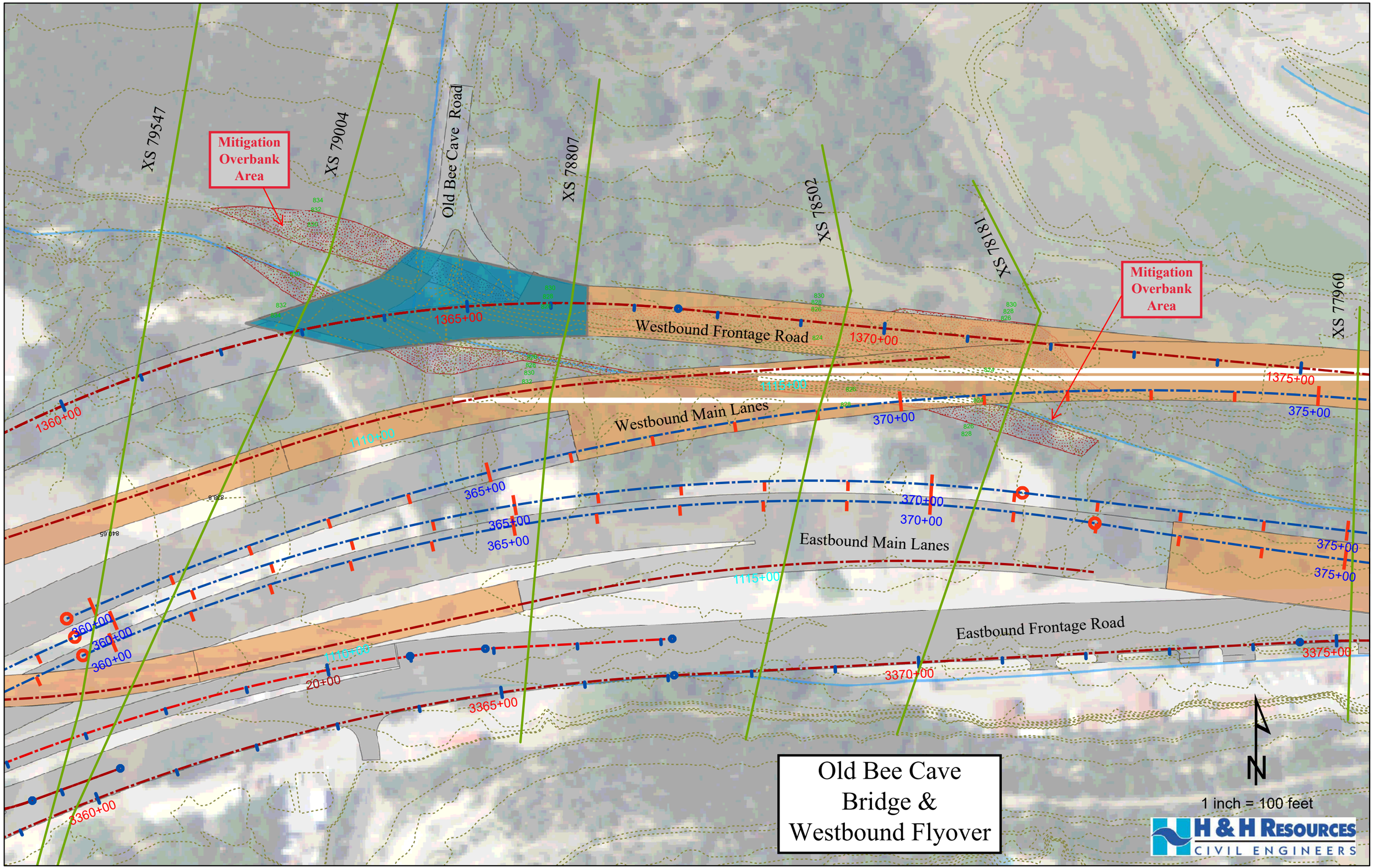
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1 inch = 100 feet

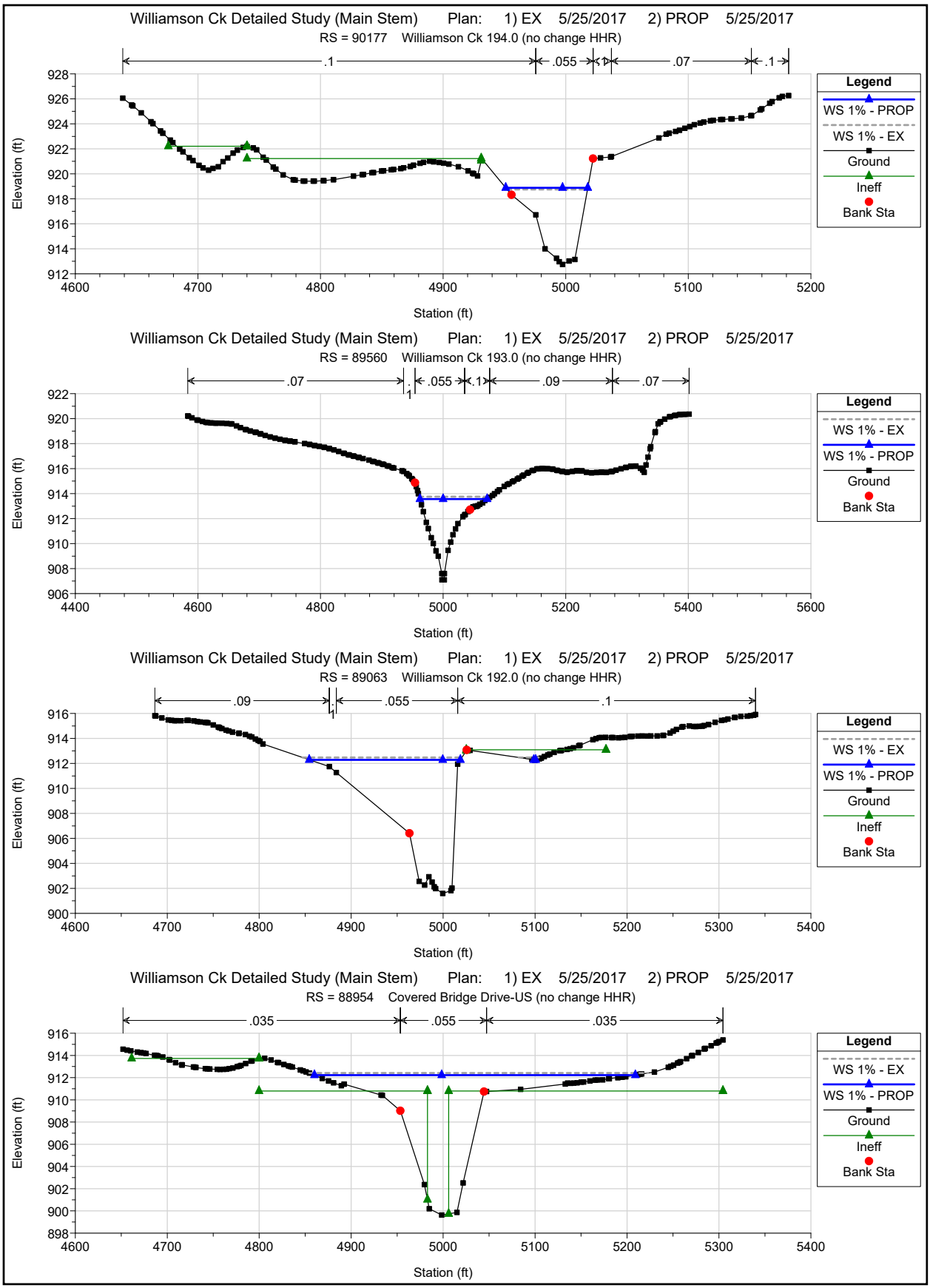
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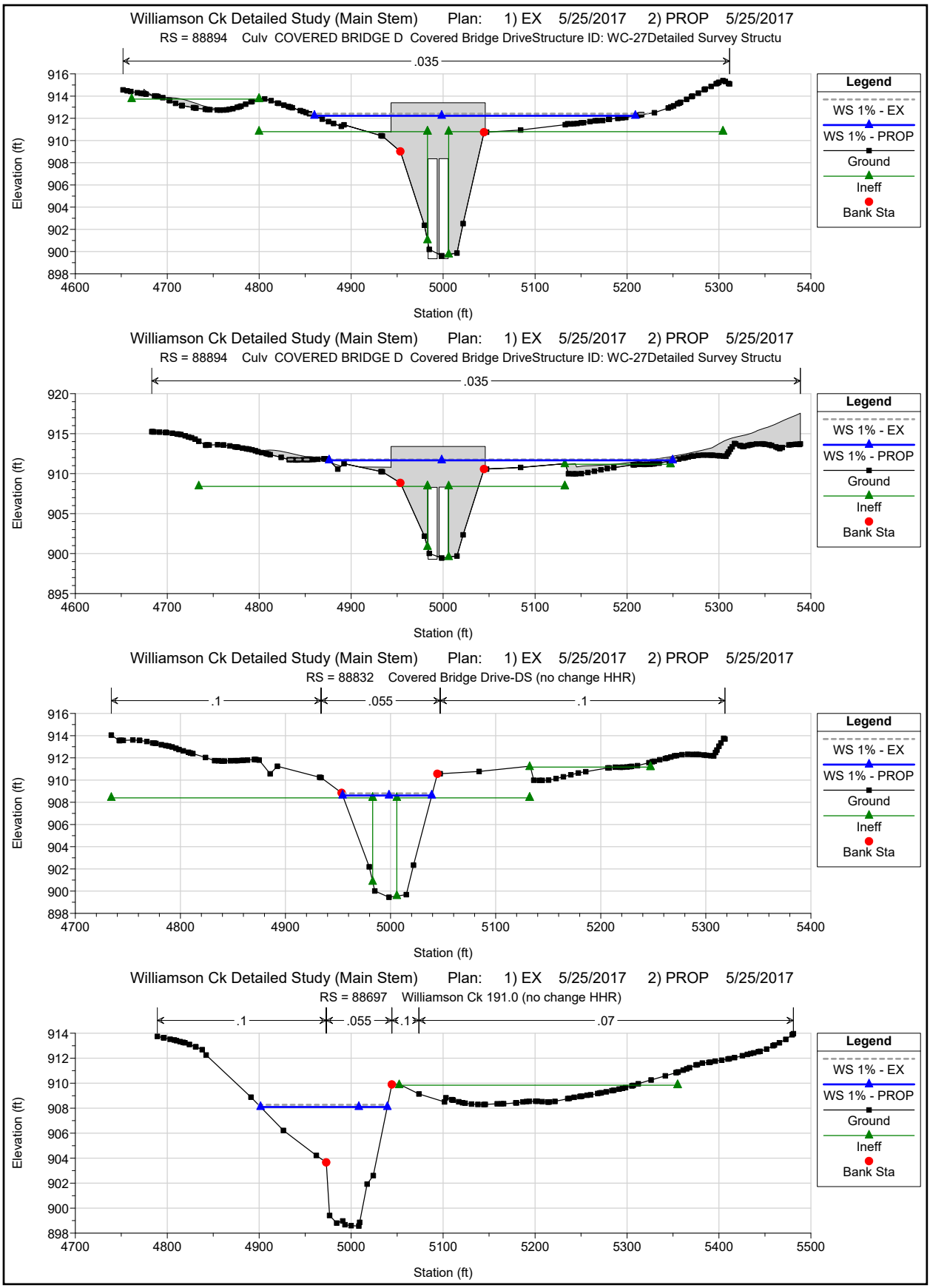
Westbound Frontage Road Bridge

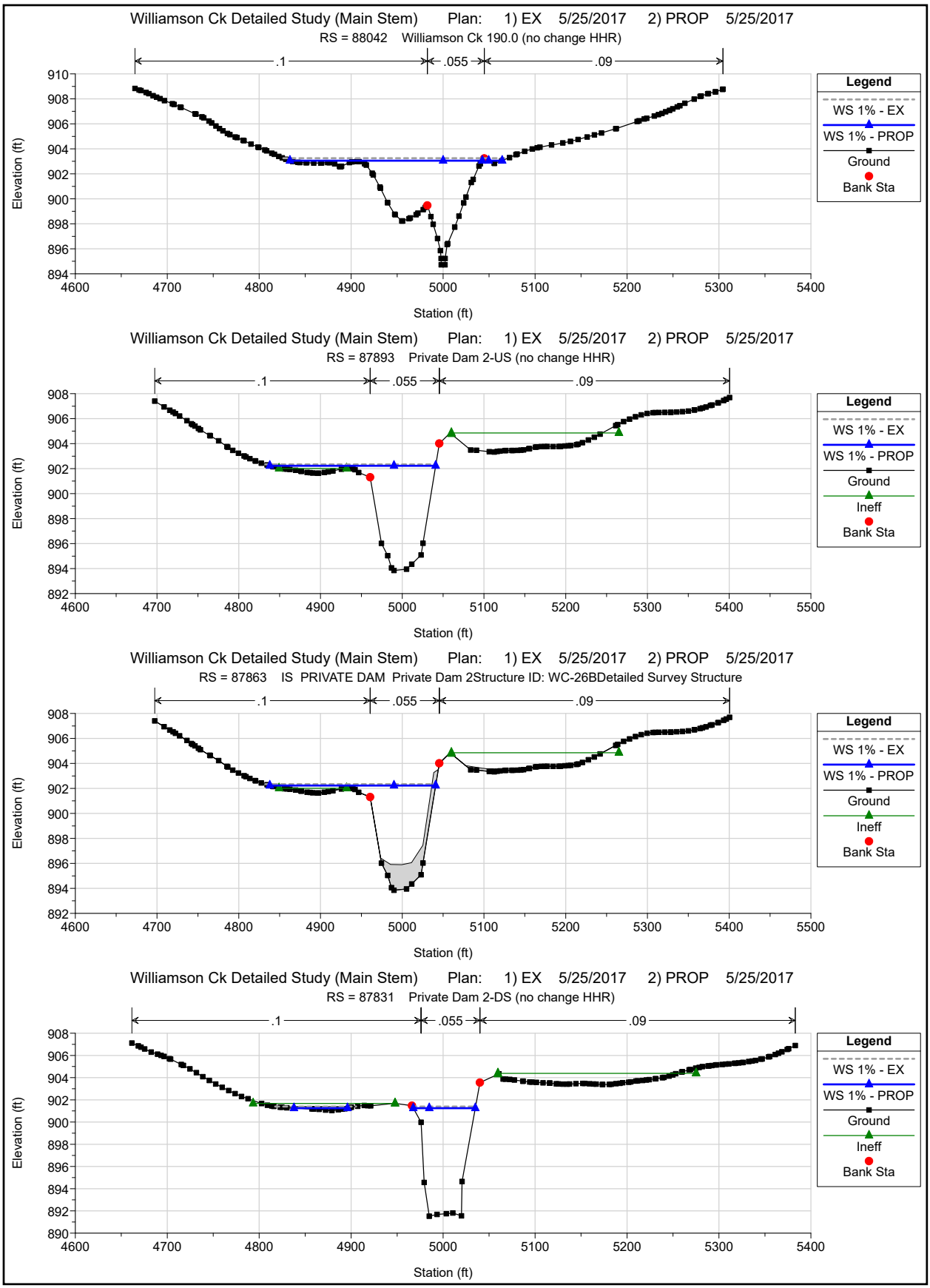

Overbank Mitigation Area
XS 76871
XS 76786
XS 76285
XS 75854
00+20
816
814
812
1380+00
380+00
1385+00
385+00
1390+00
Westbound Main Lanes
390+00
390+00
Eastbound Main Lanes
Eastbound Frontage Road
3390+00
380+00
385+00
20+00
3380+00
3385+00
William Cannon Drive
Overbank Mitigation Area
N
1 inch = 100 feet
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William Cannon Drive Bridge

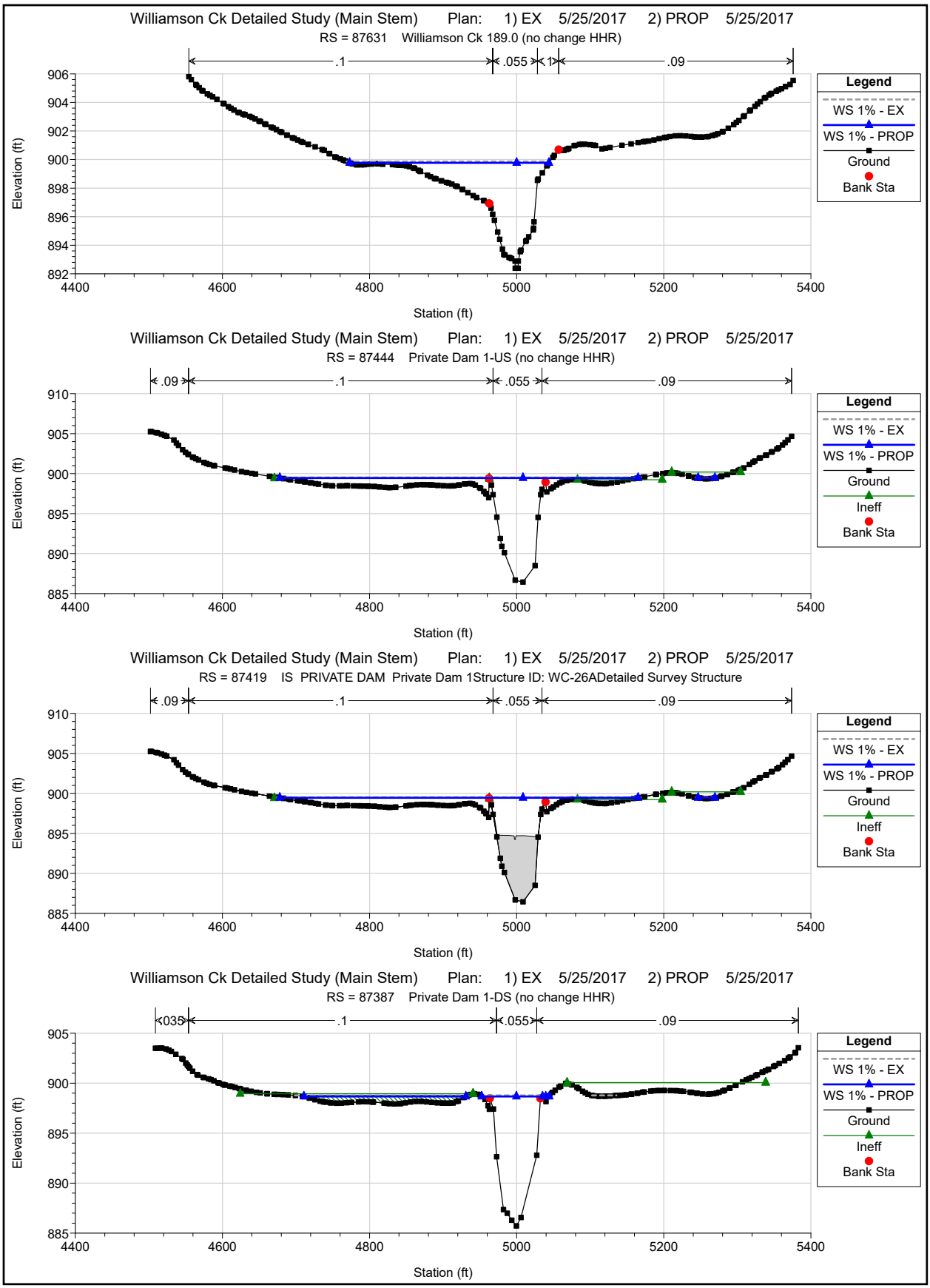

XS 79547
Mitigation Overbank Area
XS 79004
Old Bee Cave Road
XS 78807
XS 78502
XS 78181
Mitigation Overbank Area
XS 77960
1365+00
Westbound Frontage Road
1370+00
1360+00
1115+00
1375+00
Westbound Main Lanes
370+00
375+00
1110+00
365+00
365+00
365+00
370+00
370+00
Eastbound Main Lanes
375+00
375+00
1115+00
Eastbound Frontage Road
360+00
360+00
360+00
1110+00
20+00
3375+00
3370+00
3365+00
3360+00
N
1 inch = 100 feet
Old Bee Cave Bridge & Westbound Flyover
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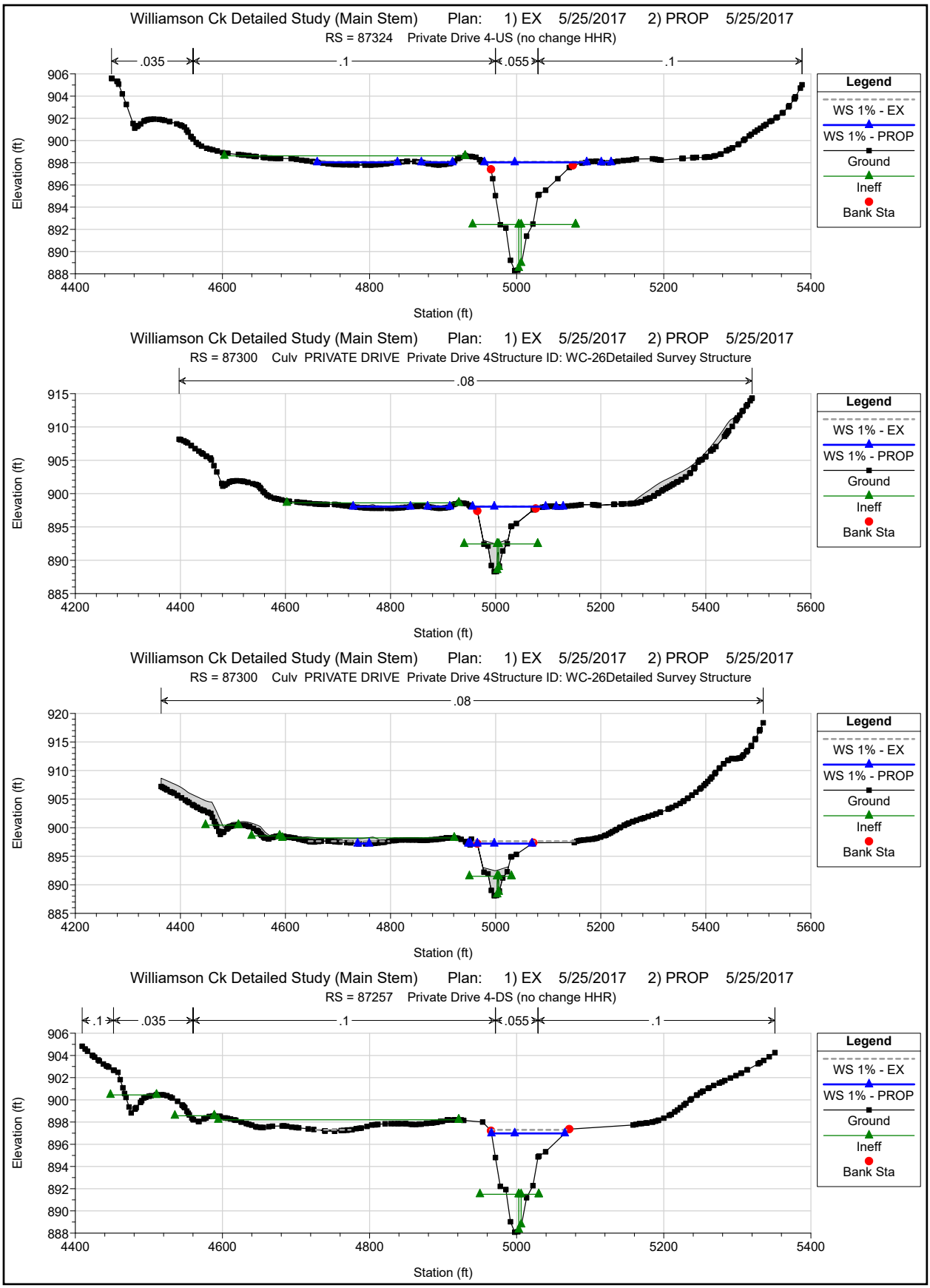
Appendix B

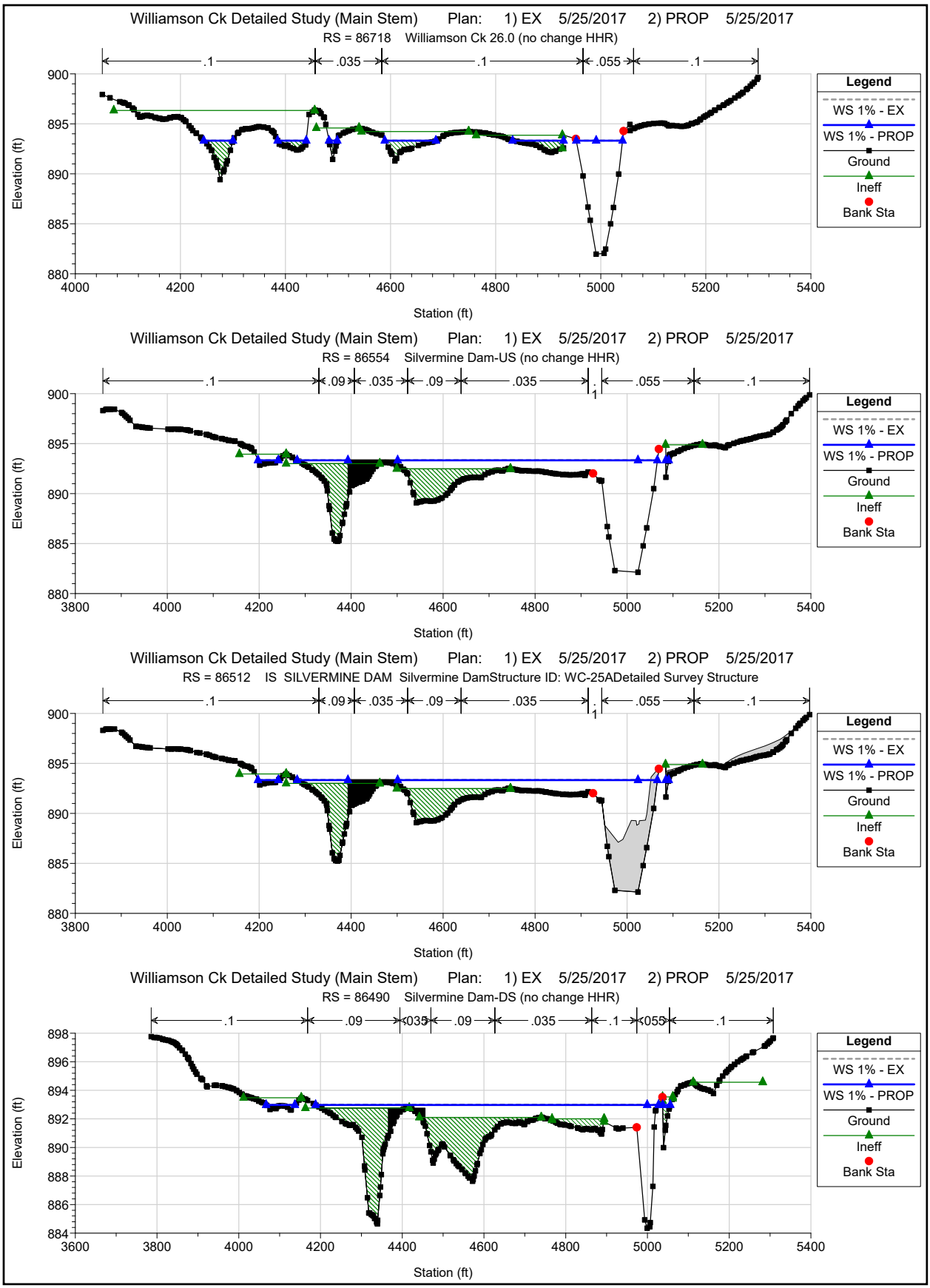

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 90177 Williamson Ck 194.0 (no change HHR)
.1
.055
.07
.1
Elevation (ft)
928
926
924
922
920
918
916
914
912
4600
4700
4800
4900
5000
5100
5200
Station (ft)
Legend
WS 1% - PROP
WS 1% - EX
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 89560 Williamson Ck 193.0 (no change HHR)
.07
.1
.055
.1
.09
.07
Elevation (ft)
922
920
918
916
914
912
910
908
906
4400
4600
4800
5000
5200
5400
5600
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 89063 Williamson Ck 192.0 (no change HHR)
.09
.1
.055
.1
Elevation (ft)
916
914
912
910
908
906
904
902
900
4600
4700
4800
4900
5000
5100
5200
5300
5400
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88954 Covered Bridge Drive-US (no change HHR)
.035
.055
.035
Elevation (ft)
916
914
912
910
908
906
904
902
900
898
4600
4700
4800
4900
5000
5100
5200
5300
5400
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

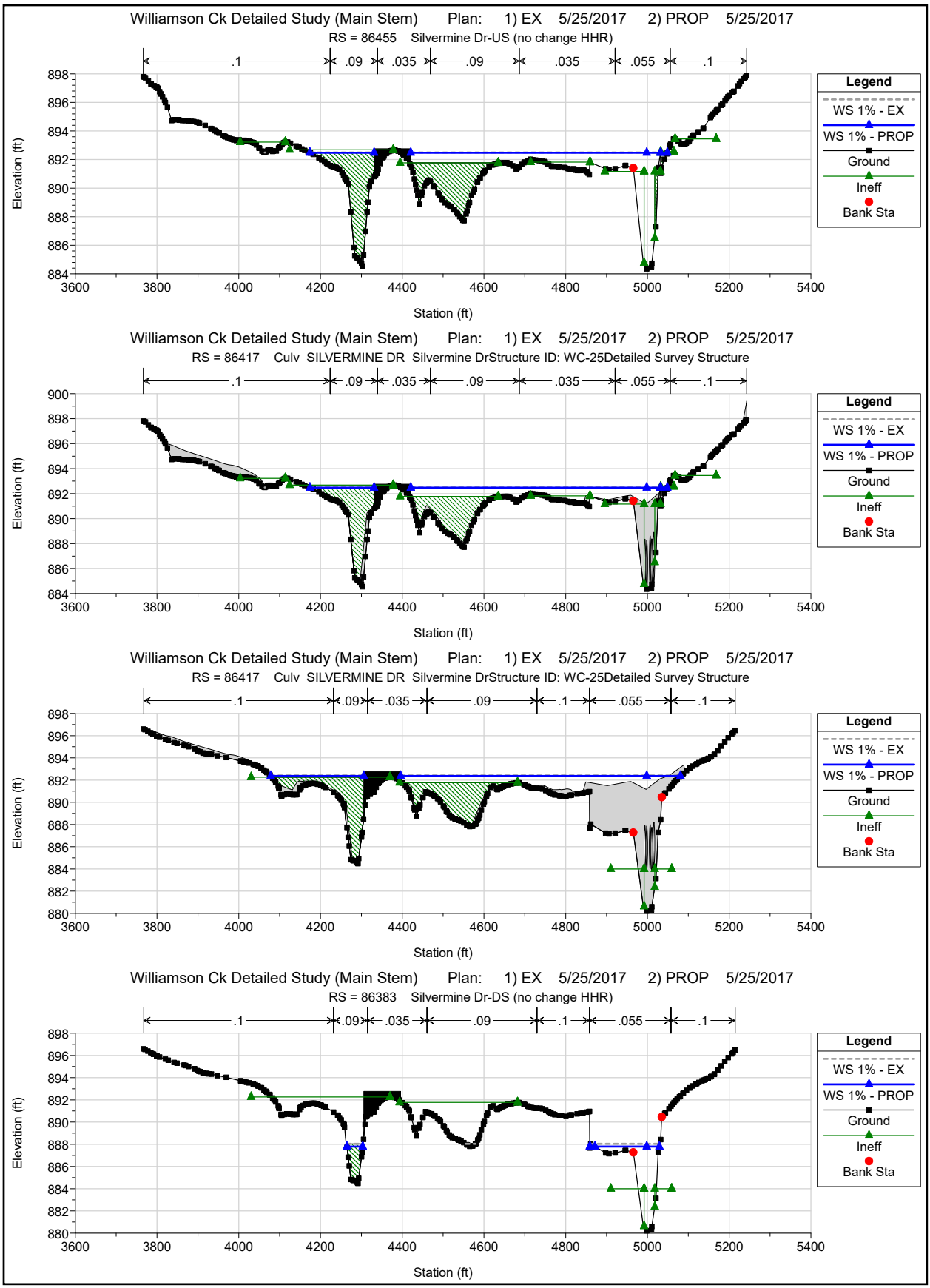

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88894 Culv COVERED BRIDGE D Covered Bridge DriveStructure ID: WC-27Detailed Survey Structu
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88894 Culv COVERED BRIDGE D Covered Bridge DriveStructure ID: WC-27Detailed Survey Structu
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88832 Covered Bridge Drive-DS (no change HHR)
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88697 Williamson Ck 191.0 (no change HHR)
.1
.055
.1
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

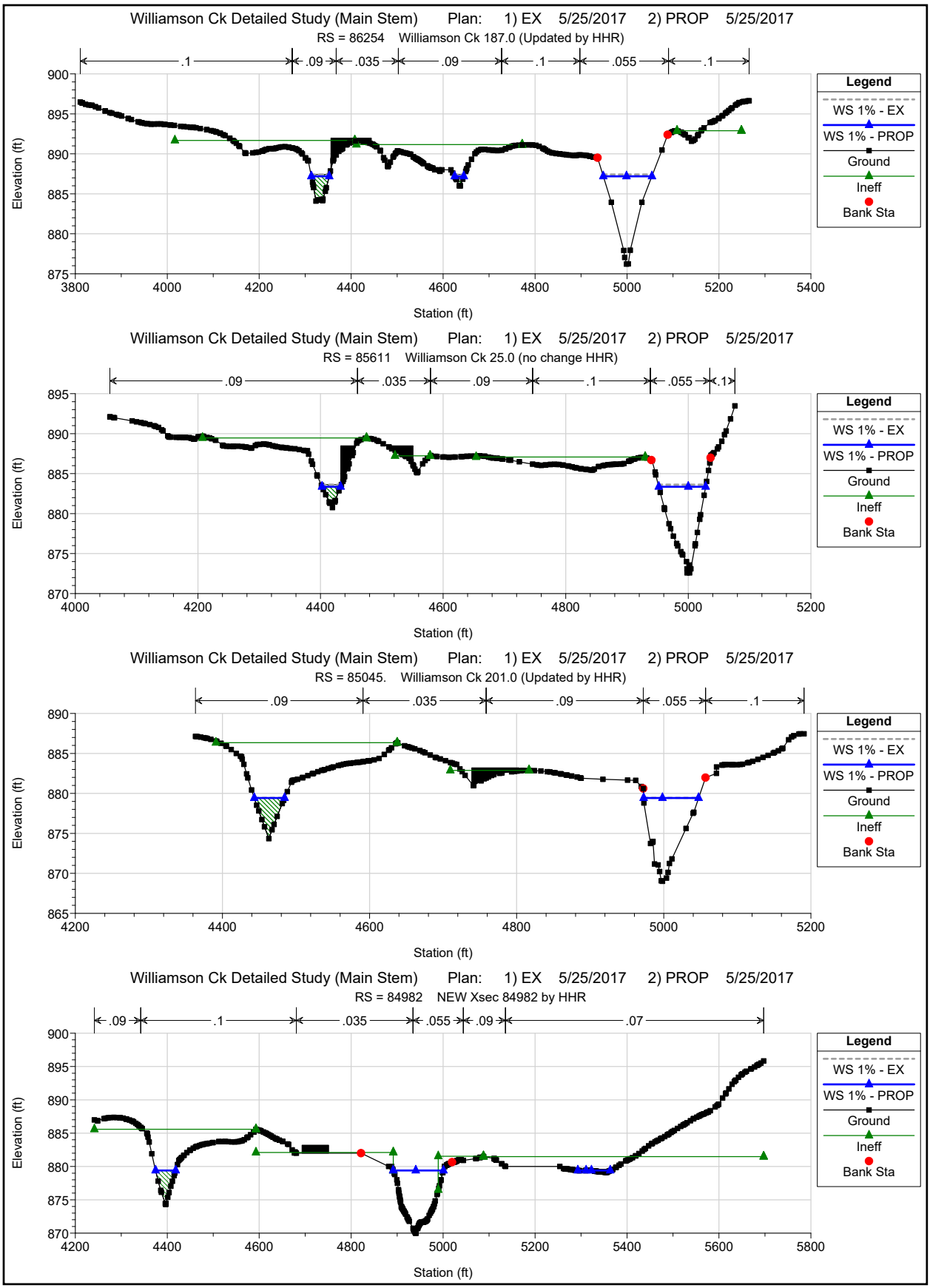

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 88042 Williamson Ck 190.0 (no change HHR)
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87893 Private Dam 2-US (no change HHR)
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87863 IS PRIVATE DAM Private Dam 2Structure ID: WC-26BDetailed Survey Structure
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87831 Private Dam 2-DS (no change HHR)
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

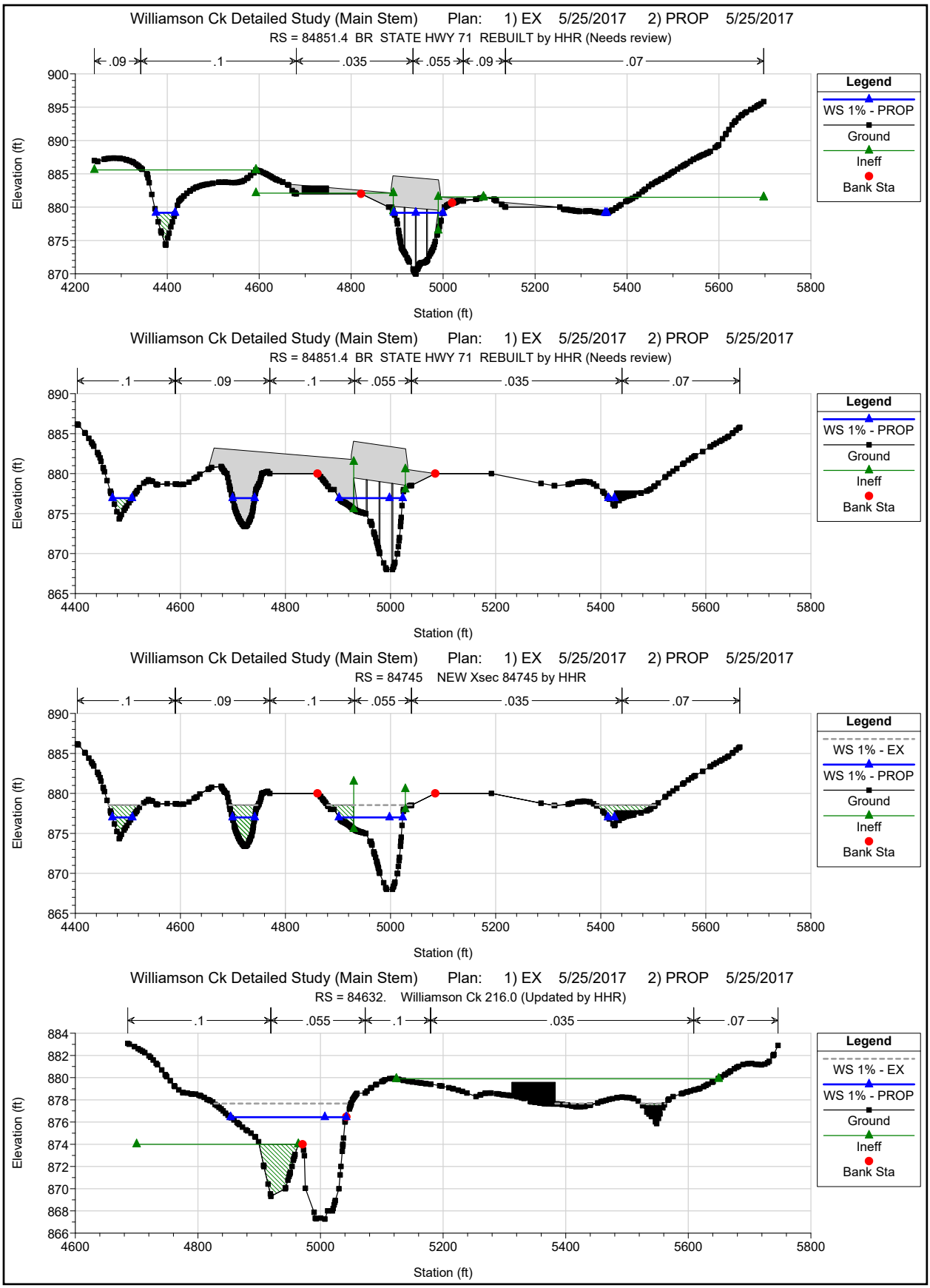

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87631 Williamson Ck 189.0 (no change HHR)
.1
.055
.1
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87444 Private Dam 1-US (no change HHR)
.09
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87419 IS PRIVATE DAM Private Dam 1Structure ID: WC-26ADetailed Survey Structure
.09
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87387 Private Dam 1-DS (no change HHR)
.035
.1
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

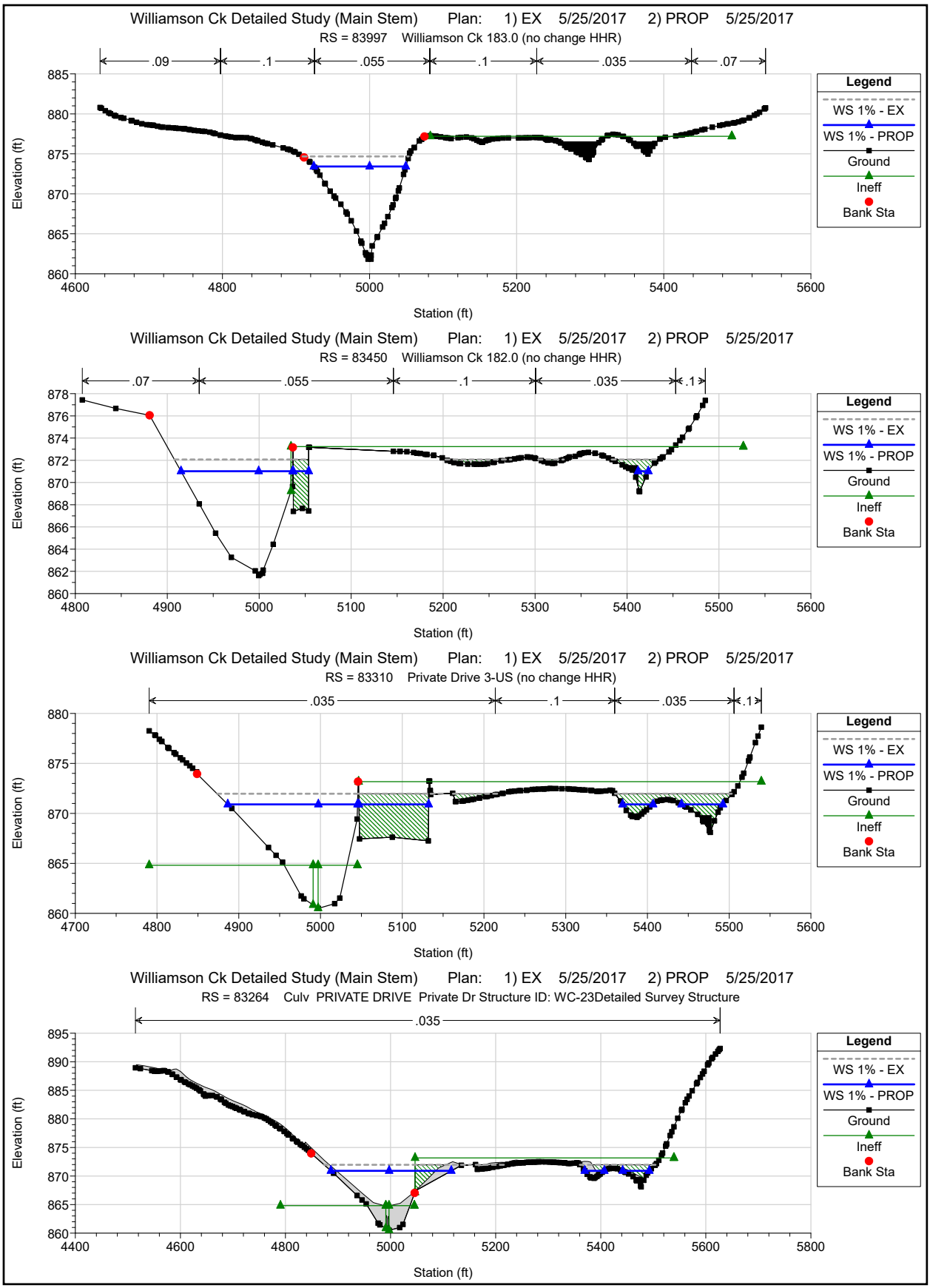

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87324 Private Drive 4-US (no change HHR)
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87300 Culv PRIVATE DRIVE Private Drive 4Structure ID: WC-26Detailed Survey Structure
.08
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87300 Culv PRIVATE DRIVE Private Drive 4Structure ID: WC-26Detailed Survey Structure
.08
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 87257 Private Drive 4-DS (no change HHR)
.1
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

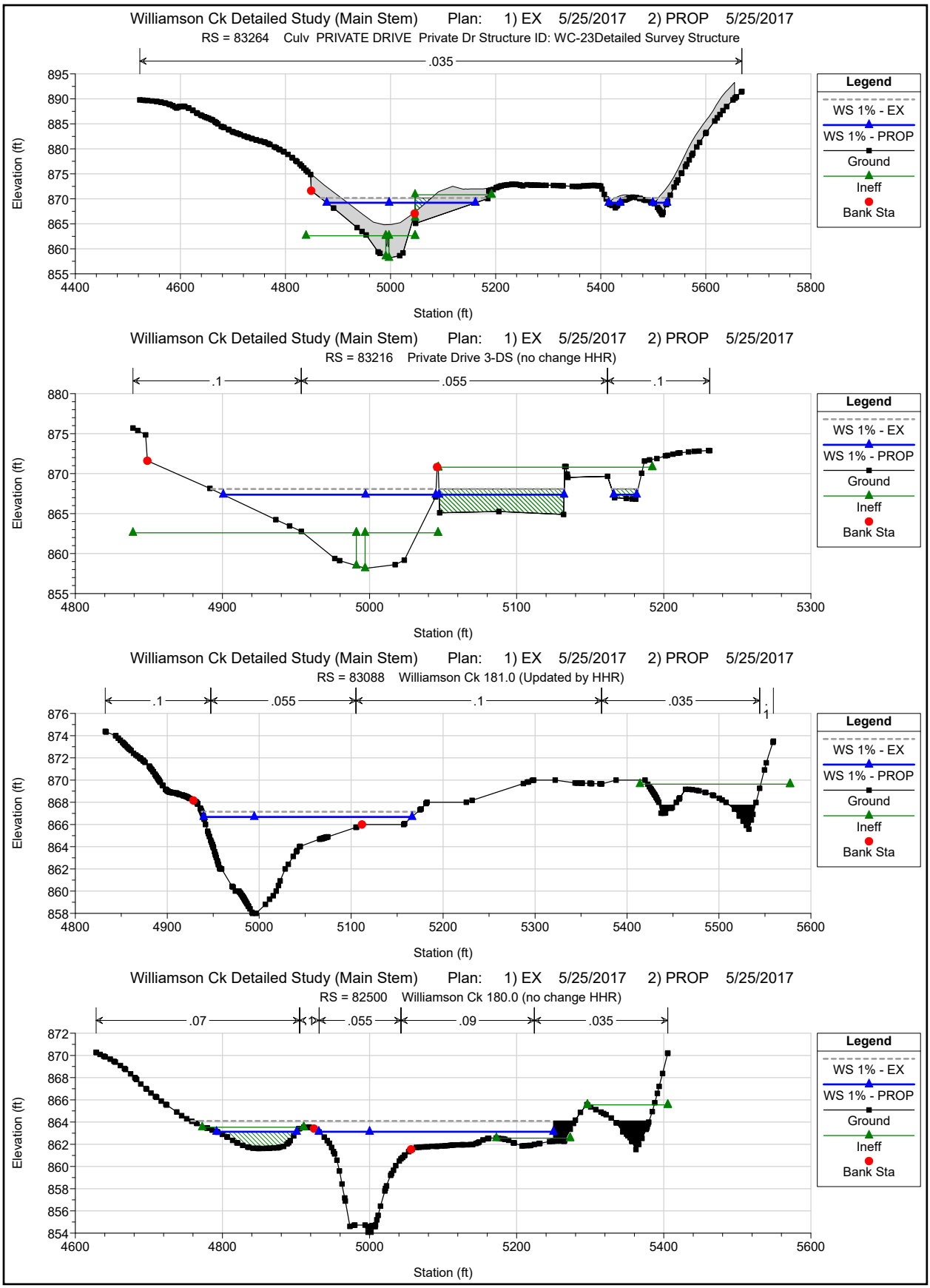

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86718 Williamson Ck 26.0 (no change HHR)
.1
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86554 Silvermine Dam-US (no change HHR)
.1
.09
.035
.09
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86512 IS SILVERMINE DAM Silvermine DamStructure ID: WC-25ADetailed Survey Structure
.1
.09
.035
.09
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86490 Silvermine Dam-DS (no change HHR)
.1
.09
.035
.09
.035
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

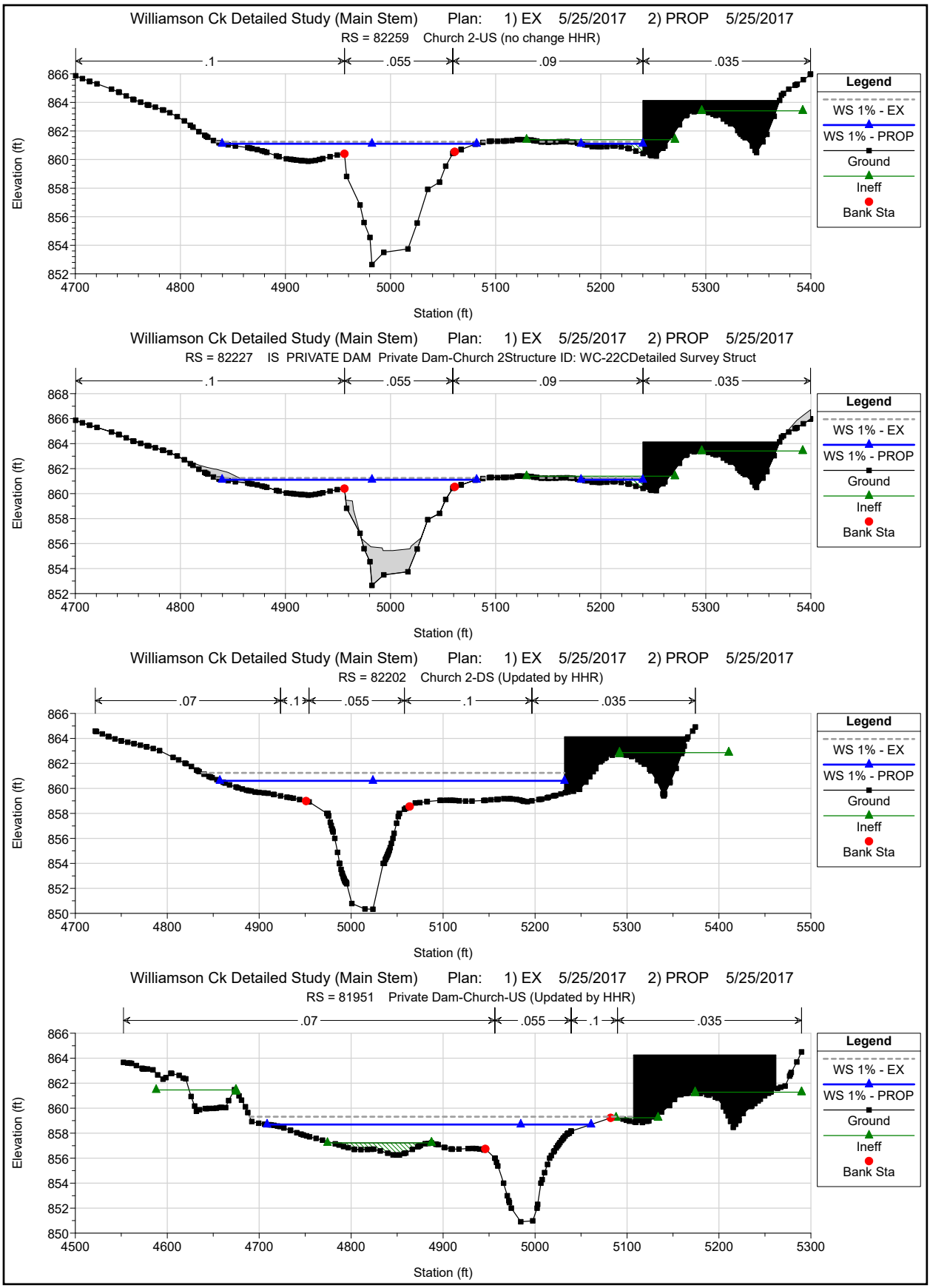

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86455 Silvermine Dr-US (no change HHR)
.1
.09
.035
.09
.035
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86417 Culv SILVERMINE DR Silvermine DrStructure ID: WC-25Detailed Survey Structure
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86417 Culv SILVERMINE DR Silvermine DrStructure ID: WC-25Detailed Survey Structure
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86383 Silvermine Dr-DS (no change HHR)

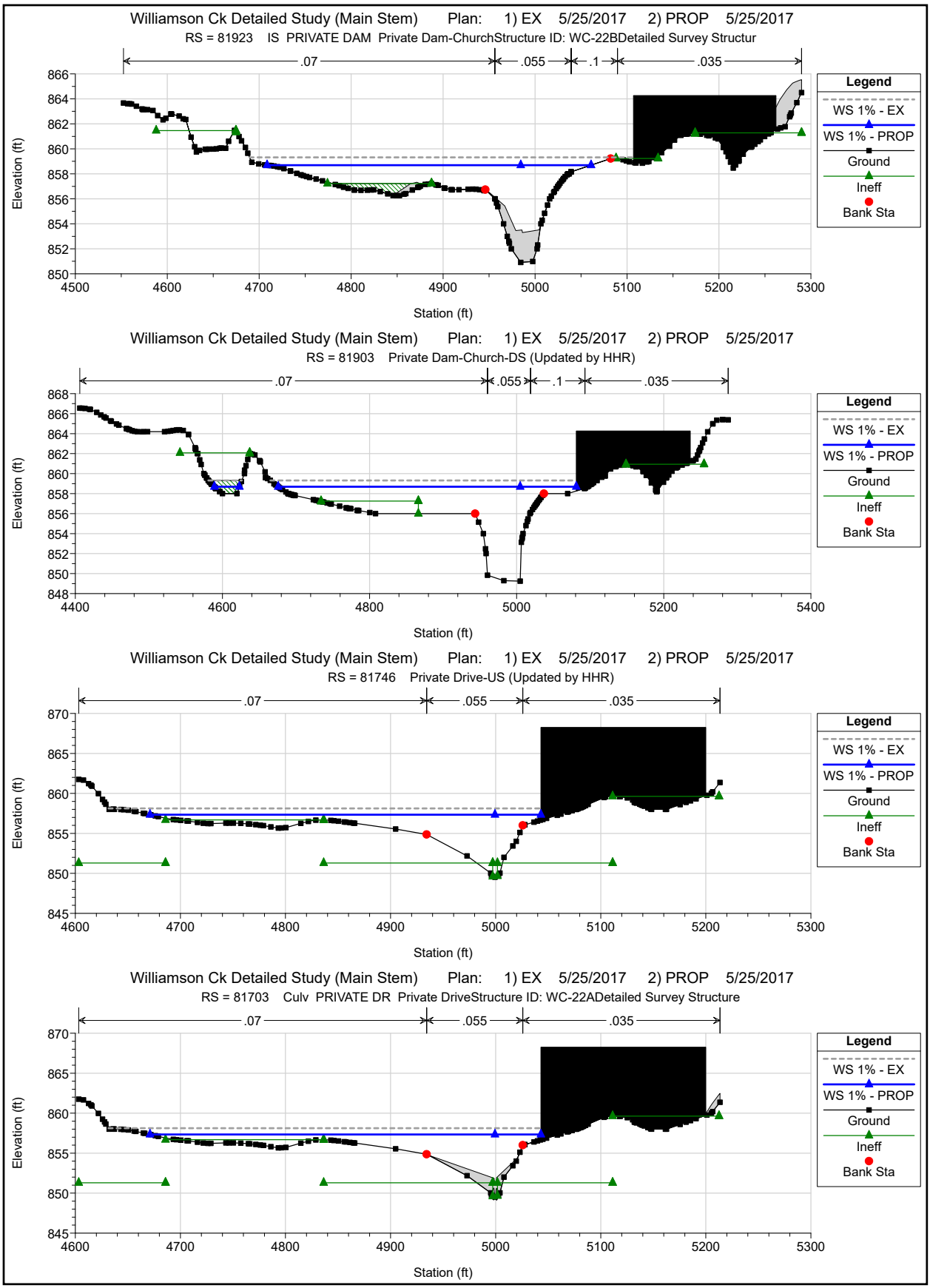

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 86254 Williamson Ck 187.0 (Updated by HHR)
.1
.09
.035
.09
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 85611 Williamson Ck 25.0 (no change HHR)
.09
.035
.09
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 85045. Williamson Ck 201.0 (Updated by HHR)
.09
.035
.09
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 84982 NEW Xsec 84982 by HHR
.09
.1
.035
.055
.09
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

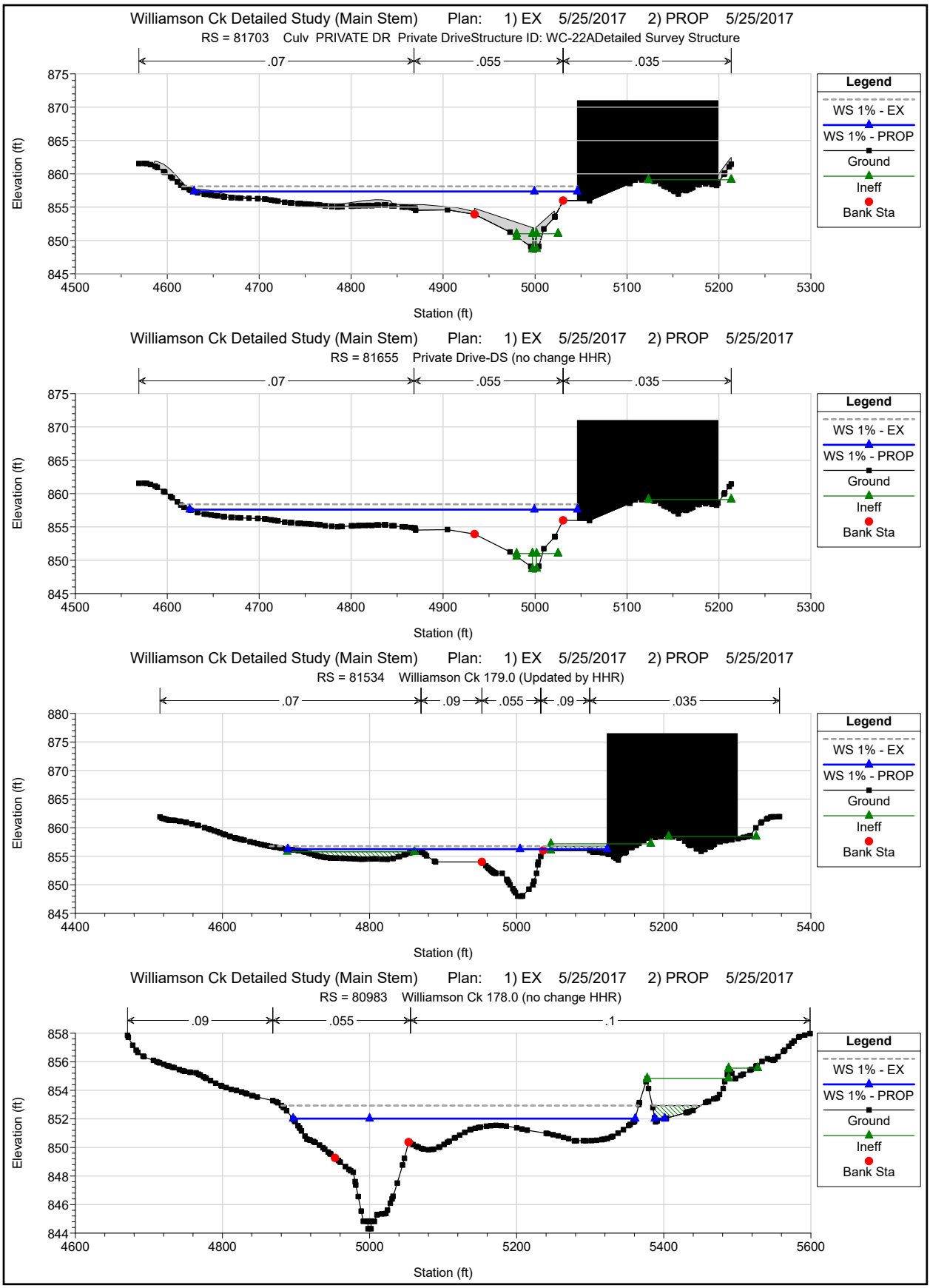

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 84851.4 BR STATE HWY 71 REBUILT by HHR (Needs review)
.09
.1
.035
.055
.09
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 84851.4 BR STATE HWY 71 REBUILT by HHR (Needs review)
.1
.09
.1
.055
.035
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 84745 NEW Xsec 84745 by HHR
.1
.09
.1
.055
.035
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 84632. Williamson Ck 216.0 (Updated by HHR)
.1
.055
.1
.035
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

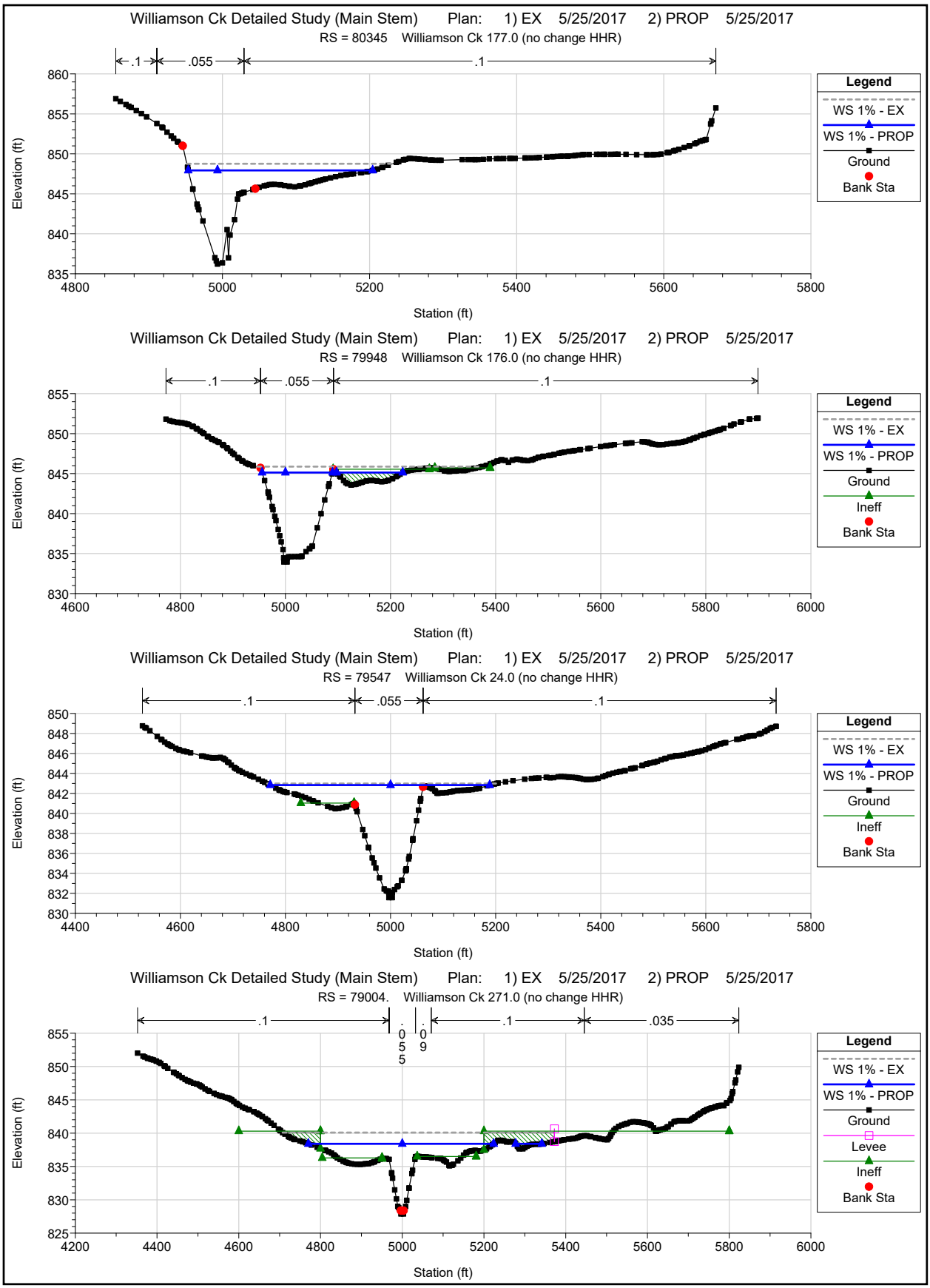

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83997 Williamson Ck 183.0 (no change HHR)
.09
.1
.055
.1
.035
.07
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83450 Williamson Ck 182.0 (no change HHR)
.07
.055
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83310 Private Drive 3-US (no change HHR)
.035
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83264 Culv PRIVATE DRIVE Private Dr Structure ID: WC-23Detailed Survey Structure
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

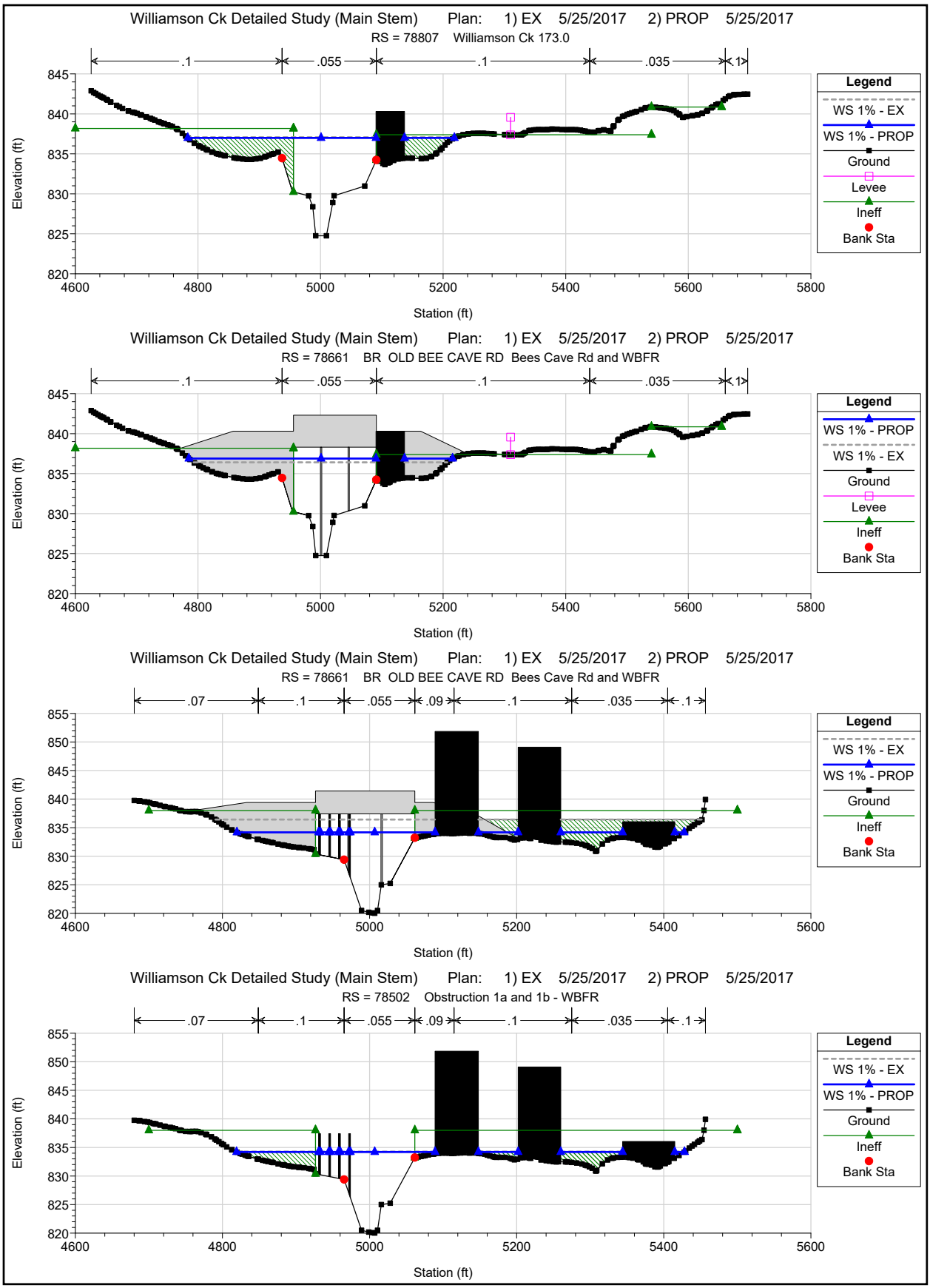

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83264 Culv PRIVATE DRIVE Private Dr Structure ID: WC-23Detailed Survey Structure
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83216 Private Drive 3-DS (no change HHR)
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 83088 Williamson Ck 181.0 (Updated by HHR)
.1
.055
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 82500 Williamson Ck 180.0 (no change HHR)
.07
.055
.09
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

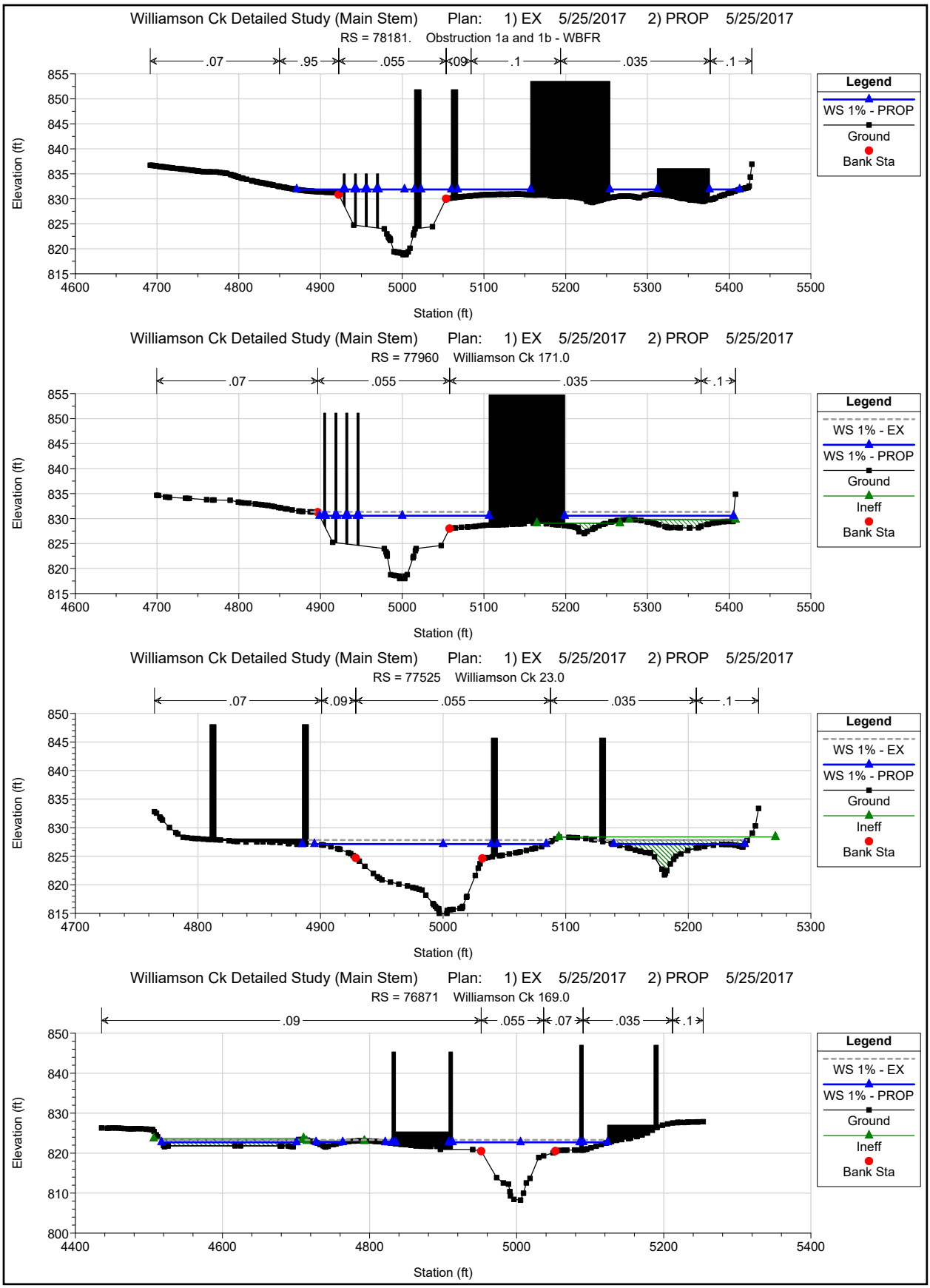

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 82259 Church 2-US (no change HHR)
.1
.055
.09
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 82227 IS PRIVATE DAM Private Dam-Church 2Structure ID: WC-22CDetailed Survey Struct
.1
.055
.09
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 82202 Church 2-DS (Updated by HHR)
.07
.1
.055
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81951 Private Dam-Church-US (Updated by HHR)
.07
.055
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

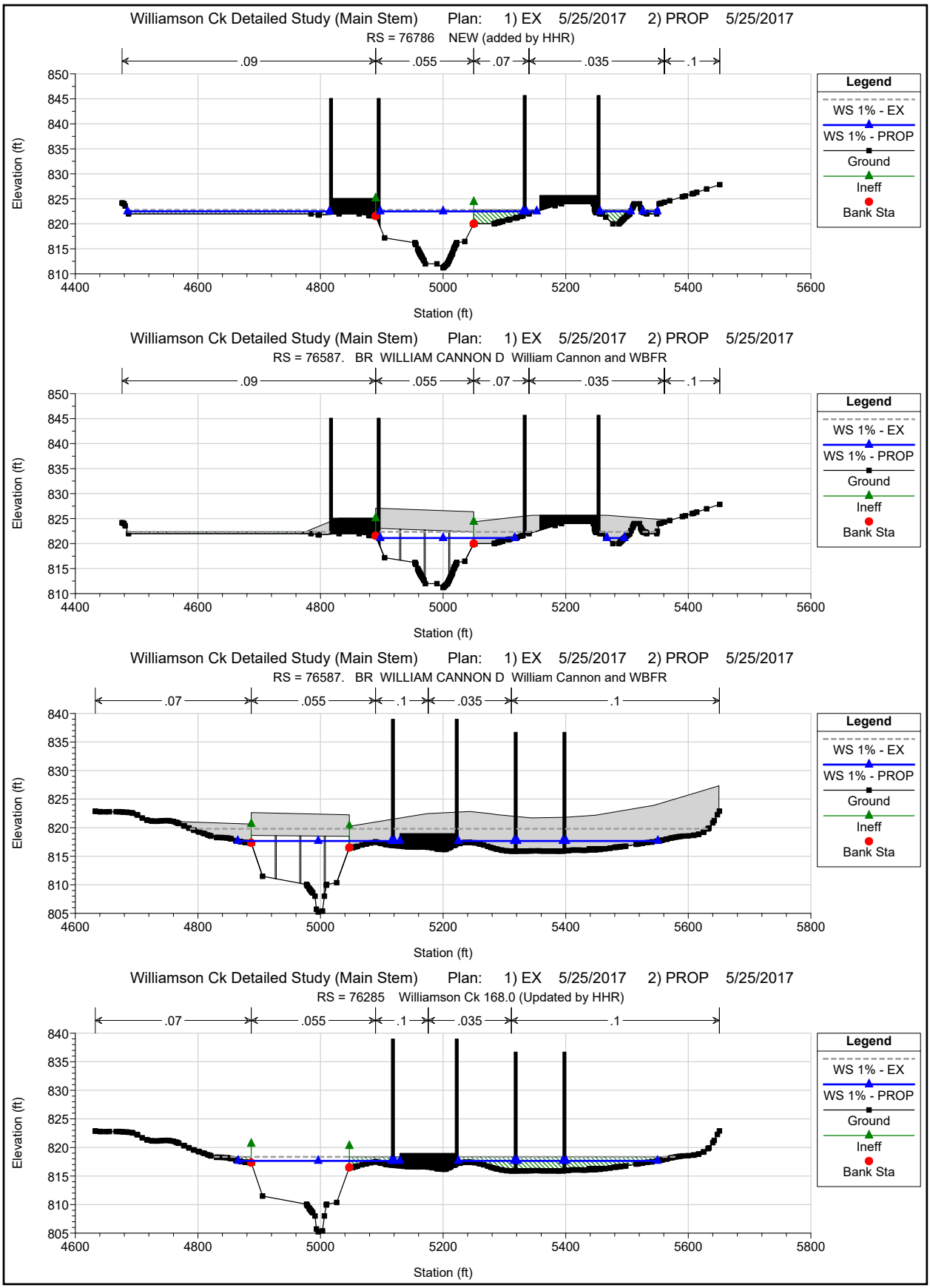

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81923 IS PRIVATE DAM Private Dam-ChurchStructure ID: WC-22BDetailed Survey Structur
.07
.055
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81903 Private Dam-Church-DS (Updated by HHR)
.07
.055
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81746 Private Drive-US (Updated by HHR)
.07
.055
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81703 Culv PRIVATE DR Private DriveStructure ID: WC-22ADetailed Survey Structure
.07
.055
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

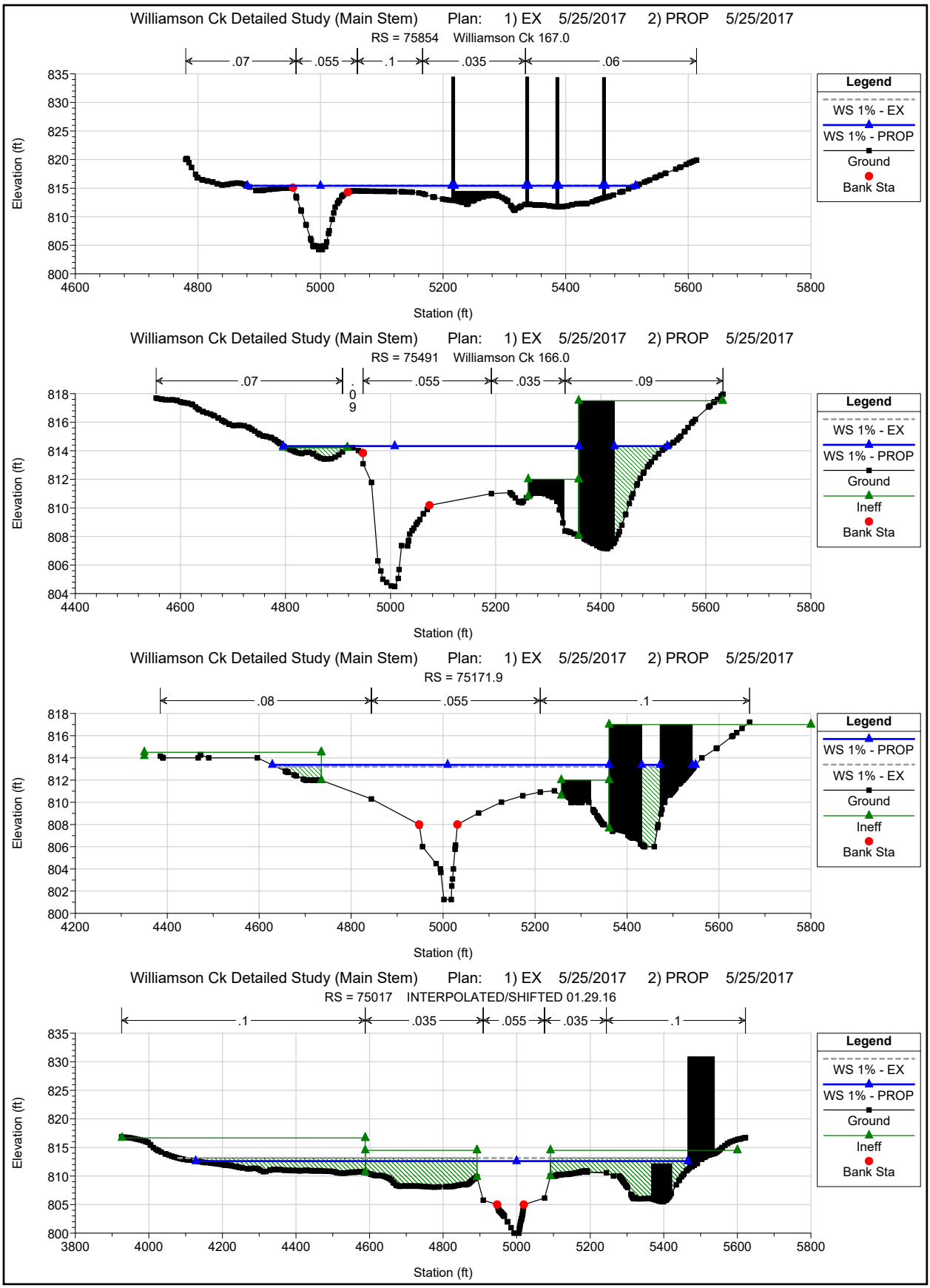

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81703 Culv PRIVATE DR Private DriveStructure ID: WC-22ADetailed Survey Structure
.07
.055
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81655 Private Drive-DS (no change HHR)
.07
.055
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 81534 Williamson Ck 179.0 (Updated by HHR)
.07
.09
.055
.09
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 80983 Williamson Ck 178.0 (no change HHR)
.09
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

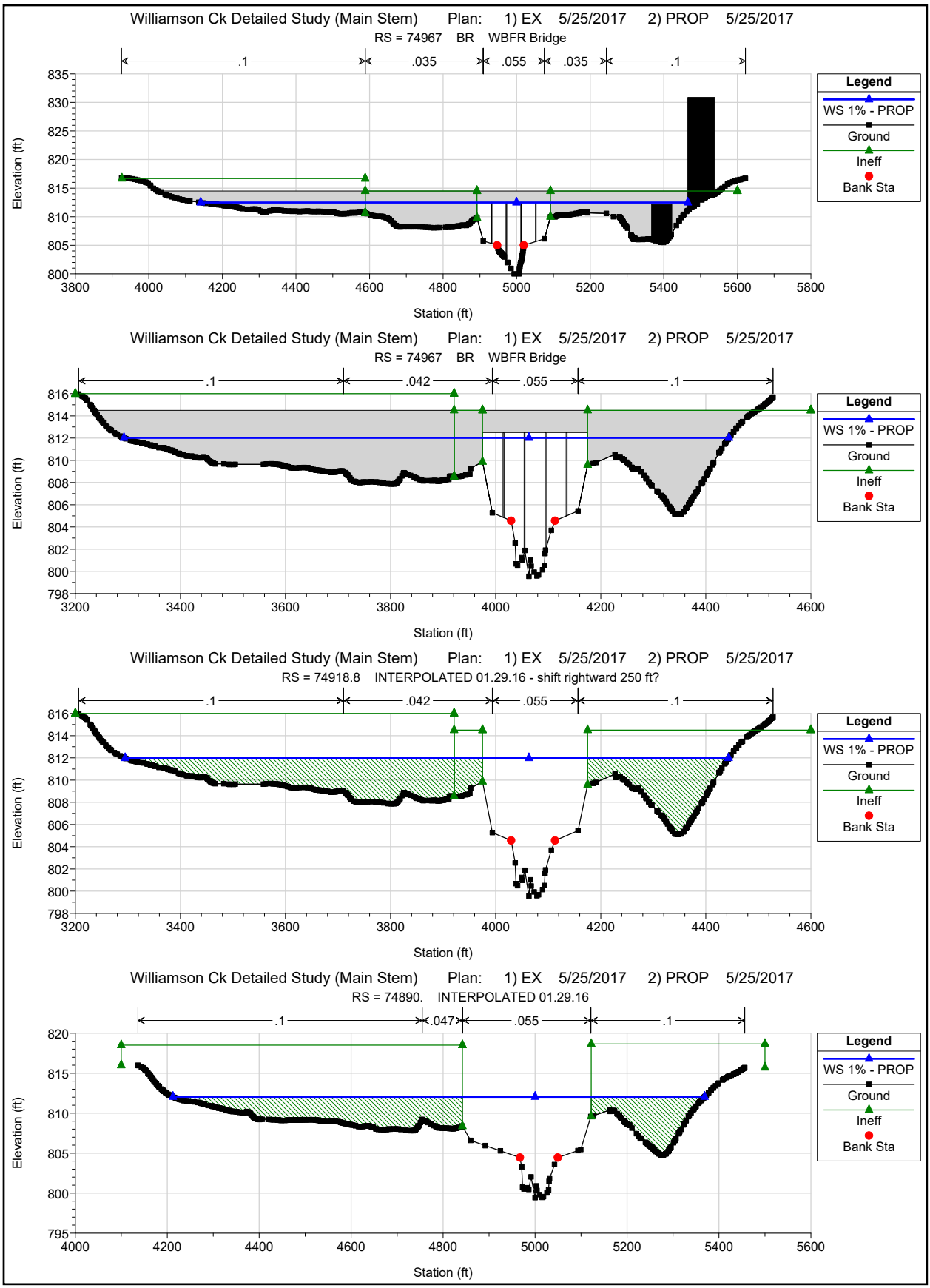

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 80345 Williamson Ck 177.0 (no change HHR)
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 79948 Williamson Ck 176.0 (no change HHR)
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 79547 Williamson Ck 24.0 (no change HHR)
.1
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 79004. Williamson Ck 271.0 (no change HHR)
.1
.055
.09
.1
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Levee
Ineff
Bank Sta

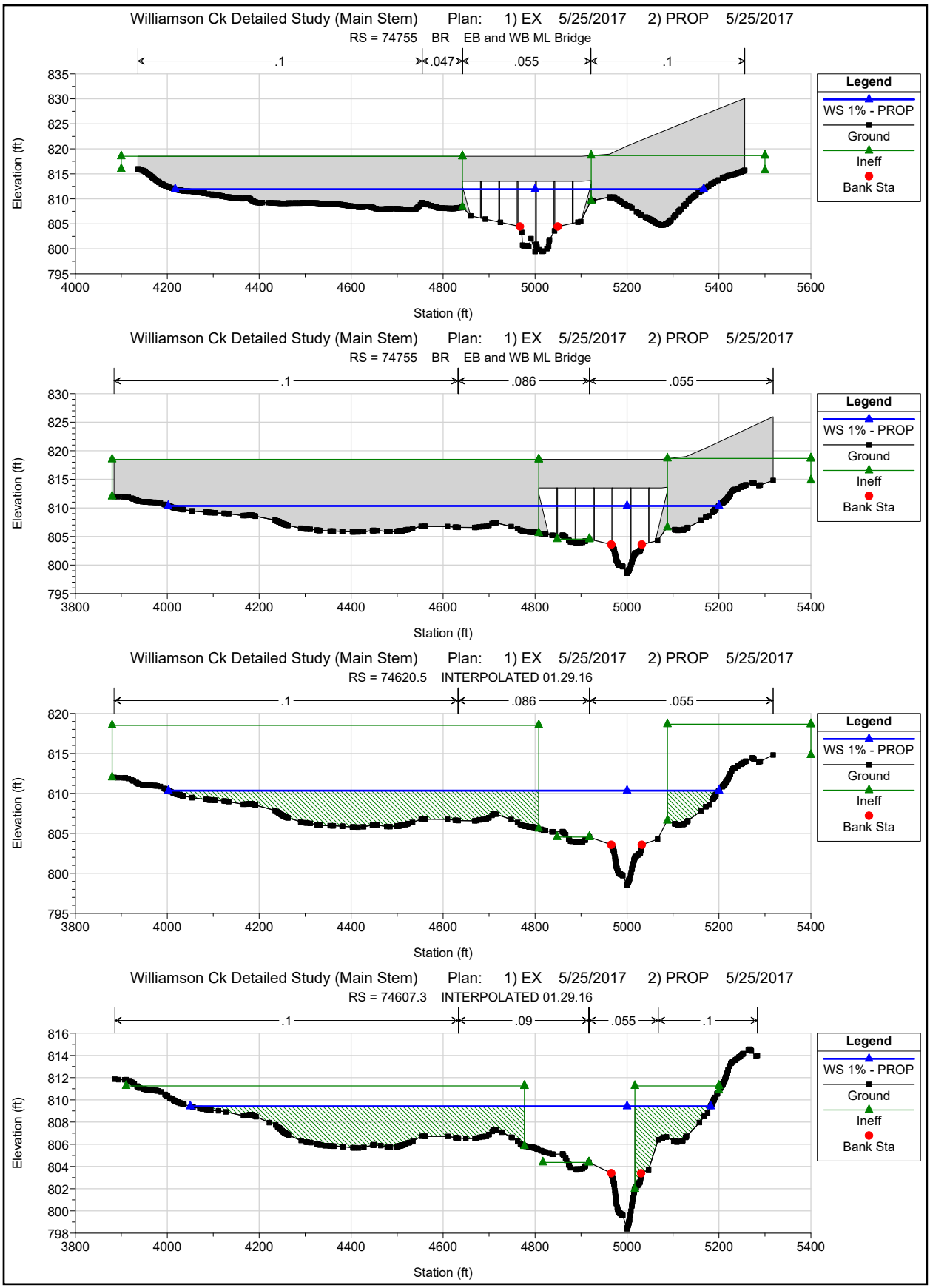

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 78807 Williamson Ck 173.0
.1
.055
.1
.035
1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Levee
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 78661 BR OLD BEE CAVE RD Bees Cave Rd and WBFR
.1
.055
.1
.035
1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
WS 1% - EX
Ground
Levee
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 78661 BR OLD BEE CAVE RD Bees Cave Rd and WBFR
.07
.1
.055
.09
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 78502 Obstruction 1a and 1b - WBFR
.07
.1
.055
.09
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

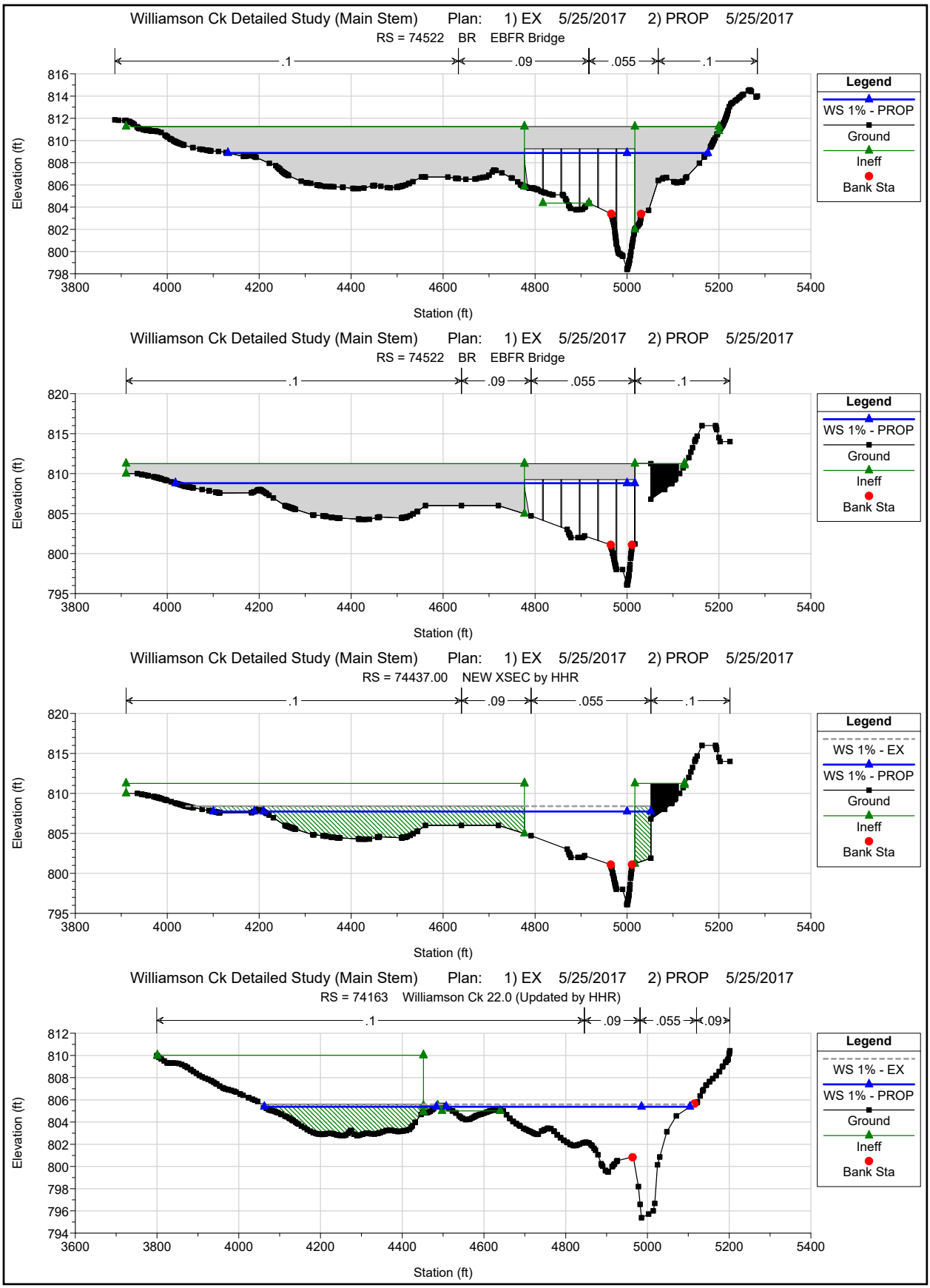

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 78181. Obstruction 1a and 1b - WBFR
.07
.95
.055
.09
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 77960 Williamson Ck 171.0
.07
.055
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 77525 Williamson Ck 23.0
.07
.09
.055
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 76871 Williamson Ck 169.0
.09
.055
.07
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

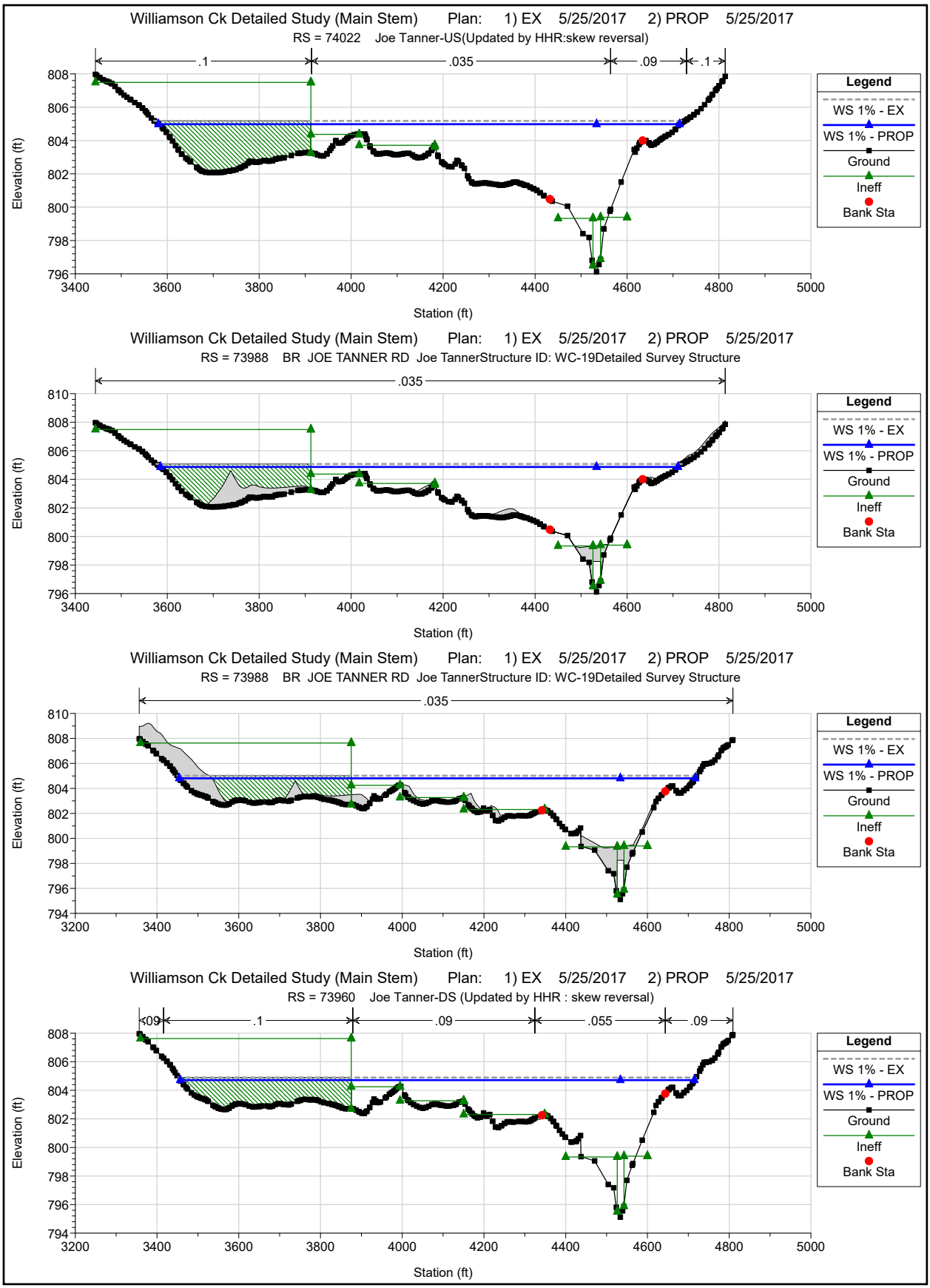

Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 76786 NEW (added by HHR)
.09
.055
.07
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 76587. BR WILLIAM CANNON D William Cannon and WBFR
.09
.055
.07
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 76587. BR WILLIAM CANNON D William Cannon and WBFR
.07
.055
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 76285 Williamson Ck 168.0 (Updated by HHR)
.07
.055
.1
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta


Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 75854 Williamson Ck 167.0
.07
.055
.1
.035
.06
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 75491 Williamson Ck 166.0
.07
.09
.055
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 75171.9
.08
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
WS 1% - EX
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 75017 INTERPOLATED/SHIFTED 01.29.16
.1
.035
.055
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta


Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74967 BR WBFR Bridge
.1
.035
.055
.035
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74967 BR WBFR Bridge
.1
.042
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74918.8 INTERPOLATED 01.29.16 - shift rightward 250 ft?
.1
.042
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74890. INTERPOLATED 01.29.16
.1
.047
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta


Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74755 BR EB and WB ML Bridge
.1
.047
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74755 BR EB and WB ML Bridge
.1
.086
.055
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74620.5 INTERPOLATED 01.29.16
.1
.086
.055
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74607.3 INTERPOLATED 01.29.16
.1
.09
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta


Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74522 BR EBFR Bridge
.1
.09
.055
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74522 BR EBFR Bridge
Elevation (ft)
Station (ft)
Legend
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74437.00 NEW XSEC by HHR
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74163 Williamson Ck 22.0 (Updated by HHR)
.1
.09
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta


Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 74022 Joe Tanner-US(Updated by HHR:skew reversal)
.1
.035
.09
.1
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 73988 BR JOE TANNER RD Joe TannerStructure ID: WC-19Detailed Survey Structure
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 73988 BR JOE TANNER RD Joe TannerStructure ID: WC-19Detailed Survey Structure
.035
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta
Williamson Ck Detailed Study (Main Stem) Plan: 1) EX 5/25/2017 2) PROP 5/25/2017
RS = 73960 Joe Tanner-DS (Updated by HHR : skew reversal)
.09
.1
.09
.055
.09
Elevation (ft)
Station (ft)
Legend
WS 1% - EX
WS 1% - PROP
Ground
Ineff
Bank Sta

HEC-RAS

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	90177	10%	EX	950.30	912.75	918.81	916.59	919.11	0.004480	4.38	218.12	66.21	0.41
Williamson Ck	Upper	90177	10%	PROP	950.30	912.75	918.81	916.59	919.11	0.004480	4.38	218.12	66.21	0.41
Williamson Ck	Upper	90177	4%	EX	1104.90	912.75	918.86	916.95	919.25	0.005826	5.01	221.62	66.75	0.47
Williamson Ck	Upper	90177	4%	PROP	1104.90	912.75	919.19	916.95	919.52	0.004612	4.58	244.07	70.10	0.41
Williamson Ck	Upper	90177	1%	EX	1289.50	912.75	918.75	917.37	919.31	0.008656	6.05	213.84	65.54	0.57
Williamson Ck	Upper	90177	1%	PROP	1289.50	912.75	918.88	917.37	919.40	0.007851	5.82	222.60	66.90	0.54
Williamson Ck	Upper	89560	10%	EX	950.30	907.10	911.95	911.95	912.97	0.036460	8.10	117.31	58.12	1.00
Williamson Ck	Upper	89560	10%	PROP	950.30	907.10	911.95	911.95	912.97	0.036460	8.10	117.31	58.12	1.00
Williamson Ck	Upper	89560	4%	EX	1104.90	907.10	912.75		913.40	0.017885	6.44	171.62	78.19	0.76
Williamson Ck	Upper	89560	4%	PROP	1104.90	907.10	912.23	912.23	913.28	0.035717	8.22	134.43	64.29	1.00
Williamson Ck	Upper	89560	1%	EX	1289.50	907.10	913.76		914.15	0.007956	5.05	270.22	116.41	0.51
Williamson Ck	Upper	89560	1%	PROP	1289.50	907.10	913.56		914.01	0.009711	5.42	248.16	109.80	0.56
Williamson Ck	Upper	89063	10%	EX	1734.20	901.59	910.10	906.12	910.35	0.002018	4.20	475.88	111.67	0.28
Williamson Ck	Upper	89063	10%	PROP	1329.70	901.59	908.50	905.50	908.80	0.003110	4.51	318.45	84.40	0.33
Williamson Ck	Upper	89063	4%	EX	2356.10	901.59	911.67	907.00	911.90	0.001606	4.19	671.87	138.23	0.25
Williamson Ck	Upper	89063	4%	PROP	1915.90	901.59	910.81	906.37	911.03	0.001678	4.04	559.02	123.67	0.26
Williamson Ck	Upper	89063	1%	EX	3156.60	901.59	912.47	908.07	912.77	0.001888	4.80	795.89	199.50	0.29
Williamson Ck	Upper	89063	1%	PROP	2980.10	901.59	912.29	907.86	912.57	0.001854	4.70	764.35	166.55	0.28
Williamson Ck	Upper	88954	10%	EX	1734.20	899.63	908.54	905.52	909.72	0.005938	8.72	198.79	83.13	0.52
Williamson Ck	Upper	88954	10%	PROP	1329.70	899.63	907.14	904.61	908.13	0.006288	7.98	166.62	73.74	0.52
Williamson Ck	Upper	88954	4%	EX	2356.10	899.63	911.60	906.80	911.74	0.000781	3.00	867.67	272.94	0.18
Williamson Ck	Upper	88954	4%	PROP	1915.90	899.63	909.16	905.90	910.42	0.005752	8.99	213.06	88.77	0.52
Williamson Ck	Upper	88954	1%	EX	3156.60	899.63	912.41	908.26	912.57	0.000852	3.34	1129.21	368.31	0.20
Williamson Ck	Upper	88954	1%	PROP	2980.10	899.63	912.22	907.95	912.38	0.000859	3.30	1060.77	349.09	0.20
Williamson Ck	Upper	88894 COVERED BRIDGE D			Culvert									
Williamson Ck	Upper	88832	10%	EX	1734.20	899.45	906.06	905.34	908.26	0.016661	11.89	145.87	67.68	0.83
Williamson Ck	Upper	88832	10%	PROP	1329.70	899.45	905.54	904.42	907.07	0.013020	9.93	133.94	64.20	0.73
Williamson Ck	Upper	88832	4%	EX	2356.10	899.45	906.61	906.61	910.04	0.023295	14.86	158.55	71.38	1.00
Williamson Ck	Upper	88832	4%	PROP	1915.90	899.45	906.24	905.72	908.78	0.018534	12.77	149.99	68.88	0.88
Williamson Ck	Upper	88832	1%	EX	3156.60	899.45	908.80	908.09	909.39	0.005039	6.16	512.27	86.06	0.45
Williamson Ck	Upper	88832	1%	PROP	2980.10	899.45	908.61	907.77	909.17	0.004894	6.00	496.30	84.80	0.44
Williamson Ck	Upper	88697	10%	EX	1734.20	898.57	906.10	902.99	906.46	0.003464	4.88	399.26	105.30	0.36
Williamson Ck	Upper	88697	10%	PROP	1329.70	898.57	905.41	902.38	905.70	0.003075	4.31	331.99	91.14	0.34
Williamson Ck	Upper	88697	4%	EX	2356.10	898.57	907.02	903.78	907.47	0.003819	5.52	504.05	120.68	0.39
Williamson Ck	Upper	88697	4%	PROP	1915.90	898.57	906.38	903.23	906.77	0.003601	5.09	429.43	110.34	0.37
Williamson Ck	Upper	88697	1%	EX	3156.60	898.57	908.27	904.77	908.76	0.003672	5.90	666.98	140.63	0.39
Williamson Ck	Upper	88697	1%	PROP	2980.10	898.57	908.10	904.57	908.57	0.003552	5.74	643.05	137.88	0.38
Williamson Ck	Upper	88042	10%	EX	1734.20	894.72	901.58		902.26	0.014803	7.41	309.83	106.31	0.70
Williamson Ck	Upper	88042	10%	PROP	1329.70	894.72	900.78		901.52	0.019009	7.63	229.10	95.67	0.77
Williamson Ck	Upper	88042	4%	EX	2356.10	894.72	902.48		903.19	0.012991	7.63	411.84	119.59	0.67
Williamson Ck	Upper	88042	4%	PROP	1915.90	894.72	901.89		902.56	0.013767	7.39	343.54	110.43	0.68
Williamson Ck	Upper	88042	1%	EX	3156.60	894.72	903.25	902.08	904.23	0.016412	8.98	544.62	244.23	0.76
Williamson Ck	Upper	88042	1%	PROP	2980.10	894.72	903.06	901.94	904.09	0.017033	9.09	499.95	223.83	0.77
Williamson Ck	Upper	87893	10%	EX	1734.20	893.85	901.00	897.83	901.31	0.003091	4.40	394.01	76.27	0.34
Williamson Ck	Upper	87893	10%	PROP	1329.70	893.85	900.30	897.31	900.53	0.002739	3.89	341.39	72.66	0.32
Williamson Ck	Upper	87893	4%	EX	2356.10	893.85	901.78	898.56	902.20	0.003724	5.18	458.22	130.66	0.38
Williamson Ck	Upper	87893	4%	PROP	1915.90	893.85	901.28	898.05	901.61	0.003247	4.61	415.32	77.69	0.35
Williamson Ck	Upper	87893	1%	EX	3156.60	893.85	902.34	899.36	902.94	0.004890	6.25	562.31	208.84	0.44
Williamson Ck	Upper	87893	1%	PROP	2980.10	893.85	902.23	899.19	902.79	0.004637	6.02	539.81	203.03	0.43
Williamson Ck	Upper	87863 PRIVATE DAM			Inl Struct									
Williamson Ck	Upper	87831	10%	EX	1734.20	891.53	900.06	895.76	900.39	0.002706	4.59	377.56	56.92	0.31
Williamson Ck	Upper	87831	10%	PROP	1329.70	891.53	899.41	895.12	899.64	0.002121	3.89	341.45	54.62	0.27
Williamson Ck	Upper	87831	4%	EX	2356.10	891.53	900.59	896.63	901.10	0.003968	5.76	408.89	61.58	0.39
Williamson Ck	Upper	87831	4%	PROP	1915.90	891.53	900.21	896.03	900.59	0.003089	4.96	386.22	58.25	0.34
Williamson Ck	Upper	87831	1%	EX	3156.60	891.53	901.40	897.63	902.12	0.005124	6.84	461.54	156.82	0.47
Williamson Ck	Upper	87831	1%	PROP	2980.10	891.53	901.25	897.43	901.93	0.004831	6.59	451.88	125.64	0.45
Williamson Ck	Upper	87631	10%	EX	1734.20	892.39	899.42		899.74	0.003870	4.77	461.51	179.78	0.40
Williamson Ck	Upper	87631	10%	PROP	1329.70	892.39	898.79		899.08	0.003770	4.39	359.03	147.79	0.37
Williamson Ck	Upper	87631	4%	EX	2356.10	892.39	899.47		900.06	0.006835	6.38	472.11	183.78	0.53
Williamson Ck	Upper	87631	4%	PROP	1915.90	892.39	899.45		899.84	0.004614	5.23	467.08	181.90	0.44
Williamson Ck	Upper	87631	1%	EX	3156.60	892.39	899.87	898.80	900.72	0.009429	7.76	563.58	276.34	0.64
Williamson Ck	Upper	87631	1%	PROP	2980.10	892.39	899.77	898.56	900.59	0.009078	7.56	537.99	271.00	0.63
Williamson Ck	Upper	87444	10%	EX	1734.20	886.43	899.28	891.34	899.39	0.000820	2.71	679.98	461.84	0.17
Williamson Ck	Upper	87444	10%	PROP	1329.70	886.43	898.72	890.77	898.80	0.000545	2.24	601.31	316.82	0.14
Williamson Ck	Upper	87444	4%	EX	2356.10	886.43	899.20	892.20	899.41	0.001556	3.73	647.94	435.98	0.23
Williamson Ck	Upper	87444	4%	PROP	1915.90	886.43	899.28	891.63	899.41	0.001002	3.00	679.50	460.38	0.18
Williamson Ck	Upper	87444	1%	EX	3156.60	886.43	899.51	893.14	899.80	0.002213	4.50	994.75	523.29	0.27
Williamson Ck	Upper	87444	1%	PROP	2980.10	886.43	899.45	892.92	899.72	0.002038	4.30	968.75	509.90	0.26
Williamson Ck	Upper	87419 PRIVATE DAM			Inl Struct									
Williamson Ck	Upper	87387	10%	EX	1734.20	885.72	897.57	891.21	897.74	0.001372	3.30	525.73	64.88	0.20
Williamson Ck	Upper	87387	10%	PROP	1329.70	885.72	896.90	890.55	897.01	0.000983	2.75	483.12	62.03	0.17
Williamson Ck	Upper	87387	4%	EX	2356.10	885.72	898.36	892.10	898.62	0.002169	4.08	580.53	275.05	0.25
Williamson Ck	Upper	87387	4%	PROP	1915.90	885.72	897.83	891.49	898.03	0.001593	3.53	543.03	67.94	0.22
Williamson Ck	Upper	87387	1%	EX	3156.60	885.72	898.77	893.04	899.19	0.003385	5.20	615.33	360.25	0.31
Williamson Ck	Upper	87387	1%	PROP	2980.10	885.72	898.67	892.85	899.05	0.003143	4.97	605.89	307.71	0.30
Williamson Ck	Upper	87324	10%	EX	1734.20	888.29	897.24	894.09	897.53	0.008065	4.34	399.53	101.01	0.38
Williamson Ck	Upper	87324	10%	PROP	1329.70	888.29	896.61	893.51	896.85	0.006333	3.91	339.72	89.46	0.35
Williamson Ck	Upper	87324	4%	EX	2356.10	888.29	897.94	894.89	898.32	0.010087	4.96	478.00	250.87	0.42
Williamson Ck	Upper	87324	4%	PROP	1915.90	888.29	897.48	894.34	897.79	0.008750	4.52	423.99	106.13	0.40
Williamson Ck	Upper	87324	1%	EX	3156.60	888.29	898.09	896.02	898.73	0.016143	6.41	499.42	335.47	0.54
Williamson Ck	Upper	87324	1%	PROP	2980.10	888.29	898.04	895.80	898.62	0.014989	6.13	491.12	303.74	0.52
Williamson Ck	Upper	87300 PRIVATE DRIVE			Culvert									
Williamson Ck	Upper	87257	10%	EX	1734.20	888.09	894.13	893.90	895.52	0.025412	9.47	183.09	54.21	0.91

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	87257	10%	PROP	1329.70	888.09	893.30	893.30	894.70	0.032657	9.50	139.91	49.90	1.00
Williamson Ck	Upper	87257	4%	EX	2356.10	888.09	895.73	894.69	896.81	0.025991	8.32	283.28	76.96	0.76
Williamson Ck	Upper	87257	4%	PROP	1915.90	888.09	894.51	894.13	895.88	0.022714	9.39	204.02	56.18	0.87
Williamson Ck	Upper	87257	1%	EX	3156.60	888.09	897.30	895.82	898.15	0.023391	7.39	427.01	153.91	0.65
Williamson Ck	Upper	87257	1%	PROP	2980.10	888.09	896.98	895.62	897.87	0.024518	7.58	393.32	99.82	0.67
Williamson Ck	Upper	86718	10%	EX	1734.20	881.97	892.76	886.97	892.91	0.001407	3.10	559.85	271.50	0.21
Williamson Ck	Upper	86718	10%	PROP	1329.70	881.97	892.38	886.35	892.48	0.000949	2.52	527.55	177.90	0.18
Williamson Ck	Upper	86718	4%	EX	2356.10	881.97	893.54	887.83	893.76	0.001967	3.75	629.93	444.56	0.25
Williamson Ck	Upper	86718	4%	PROP	1915.90	881.97	892.93	887.25	893.11	0.001617	3.34	574.85	315.57	0.23
Williamson Ck	Upper	86718	1%	EX	3156.60	881.97	893.33	888.75	893.75	0.003818	5.18	610.58	410.60	0.35
Williamson Ck	Upper	86718	1%	PROP	2980.10	881.97	893.32	888.56	893.69	0.003421	4.90	609.19	408.19	0.33
Williamson Ck	Upper	86554	10%	EX	1734.20	882.13	892.75	885.25	892.79	0.000280	1.73	1143.20	713.95	0.12
Williamson Ck	Upper	86554	10%	PROP	1329.70	882.13	892.37	884.80	892.40	0.000204	1.44	959.61	600.32	0.10
Williamson Ck	Upper	86554	4%	EX	2356.10	882.13	893.57	885.87	893.61	0.000280	1.81	1728.75	851.75	0.12
Williamson Ck	Upper	86554	4%	PROP	1915.90	882.13	892.92	885.44	892.97	0.000303	1.82	1242.37	670.39	0.12
Williamson Ck	Upper	86554	1%	EX	3156.60	882.13	893.36	886.57	893.45	0.000596	2.61	1560.96	835.56	0.17
Williamson Ck	Upper	86554	1%	PROP	2980.10	882.13	893.33	886.43	893.42	0.000545	2.49	1509.27	725.90	0.16
Williamson Ck	Upper	86512 SILVERMINE DAM			Inl Struct									
Williamson Ck	Upper	86490	10%	EX	1734.20	884.35	891.75	890.32	892.76	0.012030	8.08	237.04	607.47	0.64
Williamson Ck	Upper	86490	10%	PROP	1329.70	884.35	891.79	889.56	892.37	0.006909	6.14	241.13	609.69	0.49
Williamson Ck	Upper	86490	4%	EX	2356.10	884.35	891.93	891.93	893.60	0.019607	10.49	258.66	668.28	0.83
Williamson Ck	Upper	86490	4%	PROP	1915.90	884.35	891.66	890.62	892.95	0.015648	9.13	226.24	526.68	0.73
Williamson Ck	Upper	86490	1%	EX	3156.60	884.35	893.00	893.00	893.42	0.007592	6.61	880.06	931.99	0.52
Williamson Ck	Upper	86490	1%	PROP	2980.10	884.35	892.98	892.98	893.39	0.007282	6.48	846.44	928.07	0.51
Williamson Ck	Upper	86455	10%	EX	1734.20	884.35	892.02	889.95	892.33	0.004193	4.83	514.57	776.20	0.39
Williamson Ck	Upper	86455	10%	PROP	1329.70	884.35	891.89	889.11	892.12	0.002981	4.03	434.72	704.04	0.33
Williamson Ck	Upper	86455	4%	EX	2356.10	884.35	891.43	892.09	892.62	0.015230	8.73	272.84	461.83	0.73
Williamson Ck	Upper	86455	4%	PROP	1915.90	884.35	892.03	890.32	892.41	0.005077	5.32	518.17	747.95	0.43
Williamson Ck	Upper	86455	1%	EX	3156.60	884.35	892.50	892.38	892.90	0.006207	6.11	813.19	844.79	0.48
Williamson Ck	Upper	86455	1%	PROP	2980.10	884.35	892.48	892.32	892.86	0.005778	5.89	790.86	783.96	0.46
Williamson Ck	Upper	86417 SILVERMINE DR			Culvert									
Williamson Ck	Upper	86383	10%	EX	1734.20	880.21	885.85	885.02	886.91	0.015941	8.26	210.01	79.65	0.74
Williamson Ck	Upper	86383	10%	PROP	1329.70	880.21	885.04	884.40	886.01	0.017759	7.93	167.66	69.76	0.76
Williamson Ck	Upper	86383	4%	EX	2356.10	880.21	886.90	885.85	888.09	0.014718	8.77	268.77	92.10	0.72
Williamson Ck	Upper	86383	4%	PROP	1915.90	880.21	886.19	885.28	887.28	0.015403	8.40	228.16	83.65	0.73
Williamson Ck	Upper	86383	1%	EX	3156.60	880.21	888.04	886.80	889.21	0.012484	8.86	406.44	236.60	0.68
Williamson Ck	Upper	86383	1%	PROP	2980.10	880.21	887.80	886.60	889.01	0.013264	8.96	365.83	197.08	0.70
Williamson Ck	Upper	86254	10%	EX	1734.20	876.21	885.10	882.48	885.49	0.005195	5.04	343.99	102.72	0.43
Williamson Ck	Upper	86254	10%	PROP	1329.70	876.21	884.22	881.83	884.58	0.005145	4.78	278.23	82.27	0.42
Williamson Ck	Upper	86254	4%	EX	2356.10	876.21	886.23	883.32	886.67	0.005083	5.32	442.85	131.02	0.43
Williamson Ck	Upper	86254	4%	PROP	1915.90	876.21	885.46	882.75	885.87	0.005142	5.12	374.11	110.09	0.43
Williamson Ck	Upper	86254	1%	EX	3156.60	876.21	887.43	884.24	887.92	0.004912	5.59	564.38	173.43	0.43
Williamson Ck	Upper	86254	1%	PROP	2980.10	876.21	887.19	884.04	887.66	0.004944	5.54	538.25	164.62	0.43
Williamson Ck	Upper	85611	10%	EX	1734.20	872.59	881.49	879.02	881.97	0.005747	5.55	312.27	75.22	0.45
Williamson Ck	Upper	85611	10%	PROP	1329.70	872.59	880.53	878.38	880.96	0.006182	5.29	251.40	60.27	0.46
Williamson Ck	Upper	85611	4%	EX	2356.10	872.59	882.54	879.88	883.12	0.005974	6.13	384.13	92.98	0.47
Williamson Ck	Upper	85611	4%	PROP	1915.90	872.59	881.70	879.29	882.24	0.006210	5.87	326.26	78.83	0.47
Williamson Ck	Upper	85611	1%	EX	3156.60	872.59	883.63	880.79	884.34	0.006269	6.77	466.36	111.39	0.49
Williamson Ck	Upper	85611	1%	PROP	2980.10	872.59	883.36	880.59	884.06	0.006342	6.69	445.51	106.89	0.49
Williamson Ck	Upper	85045.	10%	EX	1734.20	869.01	876.95	875.39	877.68	0.010332	6.84	253.57	81.72	0.59
Williamson Ck	Upper	85045.	10%	PROP	1329.70	869.01	876.67	874.73	877.16	0.007334	5.62	236.55	77.47	0.49
Williamson Ck	Upper	85045.	4%	EX	2356.10	869.01	878.10	876.26	878.90	0.009438	7.18	328.00	98.64	0.58
Williamson Ck	Upper	85045.	4%	PROP	1915.90	869.01	877.84	875.66	878.43	0.007313	6.18	310.06	94.99	0.51
Williamson Ck	Upper	85045.	1%	EX	3156.60	869.01	879.44	877.18	880.30	0.008178	7.45	423.90	116.02	0.55
Williamson Ck	Upper	85045.	1%	PROP	2980.10	869.01	879.43	877.00	880.20	0.007336	7.05	422.95	115.86	0.52
Williamson Ck	Upper	84982	10%	EX	1734.20	870.00	876.79	874.66	877.14	0.003438	4.76	364.20	110.95	0.41
Williamson Ck	Upper	84982	10%	PROP	1329.70	870.00	876.55	874.22	876.78	0.002403	3.87	343.22	107.48	0.34
Williamson Ck	Upper	84982	4%	EX	2356.10	870.00	878.01	875.30	878.39	0.002876	4.94	476.98	128.96	0.39
Williamson Ck	Upper	84982	4%	PROP	1915.90	870.00	877.77	874.86	878.05	0.002097	4.25	450.53	125.39	0.33
Williamson Ck	Upper	84982	1%	EX	3156.60	870.00	879.40	875.99	879.81	0.002545	5.09	619.90	218.17	0.38
Williamson Ck	Upper	84982	1%	PROP	2980.10	870.00	879.39	875.85	879.77	0.002132	4.95	602.60	212.14	0.35
Williamson Ck	Upper	84858	10%	EX	1734.20	867.31	876.58	872.87	876.78	0.001995	3.58	483.82	110.32	0.27
Williamson Ck	Upper	84858	4%	EX	2356.10	867.31	877.81	873.51	878.05	0.001989	3.94	598.47	140.81	0.28
Williamson Ck	Upper	84858	1%	EX	3156.60	867.31	879.21	874.25	879.49	0.001964	4.28	737.26	352.68	0.28
Williamson Ck	Upper	84815. STATE HWY 71			Bridge									
Williamson Ck	Upper	84784	10%	EX	1734.20	867.85	876.04	873.42	876.35	0.003744	4.44	390.30	109.24	0.36
Williamson Ck	Upper	84784	4%	EX	2356.10	867.85	877.26	874.05	877.61	0.003422	4.75	496.18	178.96	0.36
Williamson Ck	Upper	84784	1%	EX	3156.60	867.85	878.63	874.79	879.03	0.003149	5.05	625.16	393.64	0.35
Williamson Ck	Upper	84745	10%	EX	1734.20	868.00	875.80	872.89	876.16	0.005276	4.82	359.70	152.42	0.44
Williamson Ck	Upper	84745	10%	PROP	1329.70	868.00	874.51	872.27	874.92	0.005780	5.13	259.24	88.59	0.45
Williamson Ck	Upper	84745	4%	EX	2356.10	868.00	877.12	873.73	877.46	0.003757	4.64	507.26	242.37	0.40
Williamson Ck	Upper	84745	4%	PROP	1915.90	868.00	875.51	873.15	876.03	0.008198	5.75	332.94	139.85	0.53
Williamson Ck	Upper	84745	1%	EX	3156.60	868.00	878.54	874.72	878.86	0.003473	4.51	700.56	408.83	0.38
Williamson Ck	Upper	84745	1%	PROP	2980.10	868.00	877.00	874.51	877.62	0.006621	6.34	469.70	214.00	0.50
Williamson Ck	Upper	84632.	10%	EX	2625.20	867.27	874.92		875.52	0.005553	6.34	466.41	149.96	0.46
Williamson Ck	Upper	84632.	10%	PROP	1864.20	867.27	873.82		874.34	0.005694	5.75	324.27	127.26	0.45
Williamson Ck	Upper	84632.	4%	EX	3824.60	867.27	876.29		876.92	0.005066	6.75	696.67	193.07	0.45
Williamson Ck	Upper	84632.	4%	PROP	2516.40	867.27	874.78		875.37	0.005602	6.28	445.42	146.76	0.46
Williamson Ck	Upper	84632.	1%	EX	5463.00	867.27	877.66		878.35	0.004741	7.31	975.37	343.86	0.45
Williamson Ck	Upper	84632.	1%	PROP	3974.30	867.27	876.44		877.07	0.005049	6.79	724.39	188.81	0.45
Williamson Ck	Upper	83997	10%	EX	2625.20	861.84	871.96		872.34	0.004311	4.97	528.14	109.79	0.40
Williamson Ck	Upper	83997	10%	PROP	1864.20	861.84	870.92		871.23	0.004080	4.44	419.69	99.07	0.38
Williamson Ck	Upper	83997	4%	EX	3824.60	861.84	873.27		873.76	0.004571	5.61	681.28	123.37	0.42

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	83997	4%	PROP	2516.40	861.84	871.83		872.20	0.004271	4.90	513.81	108.46	0.40
Williamson Ck	Upper	83997	1%	EX	5463.00	861.84	874.68		875.29	0.004534	6.30	867.74	153.14	0.45
Williamson Ck	Upper	83997	1%	PROP	3974.30	861.84	873.42		873.92	0.004565	5.69	699.08	125.10	0.42
Williamson Ck	Upper	83450	10%	EX	2625.20	861.62	869.85		870.21	0.003518	4.80	546.91	135.97	0.38
Williamson Ck	Upper	83450	10%	PROP	1864.20	861.62	869.02		869.28	0.003084	4.08	456.76	122.06	0.35
Williamson Ck	Upper	83450	4%	EX	3824.60	861.62	870.89		871.40	0.004080	5.74	666.88	152.36	0.43
Williamson Ck	Upper	83450	4%	PROP	2516.40	861.62	869.77		870.11	0.003394	4.67	538.33	134.46	0.37
Williamson Ck	Upper	83450	1%	EX	5463.00	861.62	872.08		872.78	0.004628	6.72	812.48	296.40	0.47
Williamson Ck	Upper	83450	1%	PROP	3974.30	861.62	871.01		871.54	0.004127	5.83	681.53	149.46	0.43
Williamson Ck	Upper	83310	10%	EX	2625.20	860.50	869.75	865.19	869.93	0.000693	3.39	775.49	260.44	0.26
Williamson Ck	Upper	83310	10%	PROP	1864.20	860.50	868.94	864.82	869.07	0.000534	2.82	661.88	221.47	0.22
Williamson Ck	Upper	83310	4%	EX	3824.60	860.50	870.78	866.25	871.04	0.000898	4.11	930.63	323.83	0.30
Williamson Ck	Upper	83310	4%	PROP	2516.40	860.50	869.68	865.09	869.85	0.000661	3.29	764.90	235.17	0.25
Williamson Ck	Upper	83310	1%	EX	5463.00	860.50	871.96	867.39	872.33	0.001102	4.85	1125.47	477.45	0.33
Williamson Ck	Upper	83310	1%	PROP	3974.30	860.50	870.90	866.38	871.18	0.000918	4.18	949.96	332.16	0.30
Williamson Ck	Upper	83264 PRIVATE DRIVE			Culvert									
Williamson Ck	Upper	83216	10%	EX	2625.20	858.15	866.28	862.86	866.56	0.002670	4.23	620.91	214.44	0.34
Williamson Ck	Upper	83216	10%	PROP	1864.20	858.15	865.19	862.61	865.41	0.002517	3.83	487.01	168.43	0.33
Williamson Ck	Upper	83216	4%	EX	3824.60	858.15	867.26	863.90	867.65	0.003467	5.07	753.95	243.43	0.39
Williamson Ck	Upper	83216	4%	PROP	2516.40	858.15	866.15	862.74	866.42	0.002634	4.17	603.82	212.52	0.34
Williamson Ck	Upper	83216	1%	EX	5463.00	858.15	868.08	865.05	868.69	0.004786	6.23	876.72	255.94	0.46
Williamson Ck	Upper	83216	1%	PROP	3974.30	858.15	867.36	864.03	867.78	0.003555	5.17	769.05	245.02	0.39
Williamson Ck	Upper	83088	10%	EX	2625.20	858.00	865.63		866.02	0.006672	4.97	528.71	158.92	0.48
Williamson Ck	Upper	83088	10%	PROP	1864.20	858.00	864.47		864.86	0.006916	5.00	372.57	111.07	0.48
Williamson Ck	Upper	83088	4%	EX	3824.60	858.00	866.58		867.05	0.006258	5.53	716.65	236.96	0.49
Williamson Ck	Upper	83088	4%	PROP	2516.40	858.00	865.49		865.87	0.006730	4.96	506.95	152.76	0.48
Williamson Ck	Upper	83088	1%	EX	5463.00	858.00	867.15		867.87	0.008195	6.83	848.54	260.74	0.57
Williamson Ck	Upper	83088	1%	PROP	3974.30	858.00	866.69		867.17	0.006199	5.58	740.75	226.76	0.49
Williamson Ck	Upper	82500	10%	EX	2625.20	854.09	861.96	859.44	862.43	0.005565	5.53	483.37	271.79	0.47
Williamson Ck	Upper	82500	10%	PROP	1864.20	854.09	861.11	858.55	861.47	0.004867	4.85	384.65	96.47	0.43
Williamson Ck	Upper	82500	4%	EX	3824.60	854.09	863.01	860.62	863.51	0.005834	5.92	793.87	467.22	0.47
Williamson Ck	Upper	82500	4%	PROP	2516.40	854.09	861.85	859.32	862.31	0.005463	5.44	465.94	204.94	0.47
Williamson Ck	Upper	82500	1%	EX	5463.00	854.09	864.10	862.11	864.47	0.004098	5.52	1424.56	568.67	0.41
Williamson Ck	Upper	82500	1%	PROP	3974.30	854.09	863.13	860.76	863.64	0.005852	5.96	820.54	428.01	0.48
Williamson Ck	Upper	82259	10%	EX	2625.20	852.65	860.71	858.35	861.14	0.005057	5.32	532.17	227.45	0.44
Williamson Ck	Upper	82259	10%	PROP	1864.20	852.65	860.10	857.39	860.40	0.003954	4.39	429.78	138.50	0.38
Williamson Ck	Upper	82259	4%	EX	3824.60	852.65	861.01	859.32	861.80	0.008574	7.22	595.94	313.75	0.57
Williamson Ck	Upper	82259	4%	PROP	2516.40	852.65	860.63	858.20	861.05	0.004913	5.19	518.28	196.12	0.43
Williamson Ck	Upper	82259	1%	EX	5463.00	852.65	861.25	860.64	862.67	0.014665	9.73	654.45	381.27	0.75
Williamson Ck	Upper	82259	1%	PROP	3974.30	852.65	861.11	859.42	861.92	0.008596	7.32	619.80	301.06	0.57
Williamson Ck	Upper	82227 PRIVATE DAM			Inl Struct									
Williamson Ck	Upper	82202	10%	EX	2625.20	850.33	859.72	856.06	860.03	0.003343	4.58	679.14	344.36	0.36
Williamson Ck	Upper	82202	10%	PROP	1864.20	850.33	859.02	855.16	859.26	0.002914	3.92	480.56	186.28	0.34
Williamson Ck	Upper	82202	4%	EX	3824.60	850.33	860.51	857.27	860.89	0.003658	5.24	977.04	408.95	0.39
Williamson Ck	Upper	82202	4%	PROP	2516.40	850.33	859.63	855.94	859.94	0.003294	4.50	650.63	325.08	0.36
Williamson Ck	Upper	82202	1%	EX	5463.00	850.33	861.24	859.45	861.71	0.004186	6.03	1276.44	448.93	0.42
Williamson Ck	Upper	82202	1%	PROP	3974.30	850.33	860.60	857.40	860.99	0.003714	5.33	997.05	374.84	0.39
Williamson Ck	Upper	81951	10%	EX	2625.20	850.91	858.16	857.14	858.68	0.008675	6.21	561.72	302.97	0.56
Williamson Ck	Upper	81951	10%	PROP	1864.20	850.91	857.78	855.89	858.17	0.006338	5.26	448.63	281.29	0.48
Williamson Ck	Upper	81951	4%	EX	3824.60	850.91	858.63	858.27	859.32	0.010862	7.38	712.39	345.38	0.68
Williamson Ck	Upper	81951	4%	PROP	2516.40	850.91	858.11	857.02	858.61	0.008453	6.11	544.41	300.01	0.55
Williamson Ck	Upper	81951	1%	EX	5463.00	850.91	859.32	859.02	860.03	0.010775	7.77	986.07	455.34	0.72
Williamson Ck	Upper	81951	1%	PROP	3974.30	850.91	858.69	858.35	859.40	0.011029	7.49	734.06	352.41	0.69
Williamson Ck	Upper	81923 PRIVATE DAM			Inl Struct									
Williamson Ck	Upper	81903	10%	EX	2625.20	849.25	857.95	854.17	858.14	0.003437	3.91	893.56	344.89	0.29
Williamson Ck	Upper	81903	10%	PROP	1864.20	849.25	857.22	853.17	857.44	0.003354	3.90	538.23	295.09	0.30
Williamson Ck	Upper	81903	4%	EX	3824.60	849.25	858.62	855.59	858.86	0.003977	4.51	1159.57	458.73	0.32
Williamson Ck	Upper	81903	4%	PROP	2516.40	849.25	857.85	854.02	858.04	0.003394	3.89	858.73	338.68	0.29
Williamson Ck	Upper	81903	1%	EX	5463.00	849.25	859.32	857.56	859.62	0.004565	5.19	1457.50	509.42	0.35
Williamson Ck	Upper	81903	1%	PROP	3974.30	849.25	858.69	855.73	858.93	0.004068	4.60	1182.02	439.10	0.33
Williamson Ck	Upper	81746	10%	EX	2625.20	849.52	856.53	855.49	857.21	0.009885	6.76	439.69	306.44	0.59
Williamson Ck	Upper	81746	10%	PROP	1864.20	849.52	856.30	854.77	856.70	0.006217	5.15	398.60	265.84	0.46
Williamson Ck	Upper	81746	4%	EX	3824.60	849.52	857.21	856.88	857.92	0.009499	7.34	726.61	381.60	0.60
Williamson Ck	Upper	81746	4%	PROP	2516.40	849.52	856.52	855.39	857.15	0.009199	6.50	437.16	303.73	0.57
Williamson Ck	Upper	81746	1%	EX	5463.00	849.52	858.12	857.53	858.76	0.007642	7.41	1100.71	466.27	0.55
Williamson Ck	Upper	81746	1%	PROP	3974.30	849.52	857.34	856.95	858.02	0.008875	7.23	771.99	371.97	0.58
Williamson Ck	Upper	81703 PRIVATE DR			Culvert									
Williamson Ck	Upper	81655	10%	EX	2625.20	848.58	856.54	854.77	856.77	0.003283	4.35	818.92	406.77	0.35
Williamson Ck	Upper	81655	10%	PROP	1864.20	848.58	855.75	853.87	856.00	0.003923	4.24	540.14	302.80	0.37
Williamson Ck	Upper	81655	4%	EX	3824.60	848.58	857.53	855.77	857.74	0.002532	4.34	1254.20	475.62	0.32
Williamson Ck	Upper	81655	4%	PROP	2516.40	848.58	856.46	854.51	856.70	0.003296	4.32	780.82	378.90	0.35
Williamson Ck	Upper	81655	1%	EX	5463.00	848.58	858.39	856.51	858.62	0.002438	4.67	1663.02	536.01	0.32
Williamson Ck	Upper	81655	1%	PROP	3974.30	848.58	857.61	855.84	857.84	0.002678	4.50	1245.16	421.59	0.33
Williamson Ck	Upper	81534	10%	EX	2625.20	848.00	855.25	854.30	855.99	0.010407	7.10	434.72	298.90	0.60
Williamson Ck	Upper	81534	10%	PROP	1864.20	848.00	854.74	853.29	855.26	0.008161	5.92	354.81	242.73	0.53
Williamson Ck	Upper	81534	4%	EX	3824.60	848.00	856.05	855.28	856.97	0.011938	8.18	609.02	457.00	0.65
Williamson Ck	Upper	81534	4%	PROP	2516.40	848.00	855.34	854.13	855.98	0.008932	6.63	448.52	285.86	0.56
Williamson Ck	Upper	81534	1%	EX	5463.00	848.00	856.75	856.58	857.83	0.012698	9.22	865.96	523.10	0.68
Williamson Ck	Upper	81534	1%	PROP	3974.30	848.00	856.24	855.38	857.10	0.010816	7.98	675.30	434.08	0.62
Williamson Ck	Upper	80983	10%	EX	2625.20	844.31	851.29	849.70	851.71	0.005897	5.47	635.26	372.84	0.46
Williamson Ck	Upper	80983	10%	PROP	1864.20	844.31	850.32	848.99	850.77	0.008169	5.44	364.97	175.38	0.52
Williamson Ck	Upper	80983	4%	EX	3824.60	844.31	852.09	850.88	852.55	0.005613	5.97	988.92	485.34	0.46
Williamson Ck	Upper	80983	4%	PROP	2516.40	844.31	850.96	849.61	851.47	0.007587	5.88	523.10	308.95	0.52

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	80983	1%	EX	5463.00	844.31	852.93	851.90	853.41	0.005347	6.44	1388.58	551.47	0.46
Williamson Ck	Upper	80983	1%	PROP	3974.30	844.31	852.02	850.97	852.54	0.006484	6.36	957.05	478.90	0.50
Williamson Ck	Upper	80345	10%	EX	2625.20	836.21	845.39		846.37	0.012424	7.96	329.66	76.10	0.67
Williamson Ck	Upper	80345	10%	PROP	1864.20	836.21	844.57		845.27	0.009011	6.73	276.97	58.14	0.54
Williamson Ck	Upper	80345	4%	EX	3824.60	836.21	847.07		847.99	0.009295	7.82	563.45	194.49	0.60
Williamson Ck	Upper	80345	4%	PROP	2516.40	836.21	846.17		846.80	0.007003	6.35	407.08	153.82	0.52
Williamson Ck	Upper	80345	1%	EX	5463.00	836.21	848.76		849.57	0.007056	7.65	974.78	279.83	0.52
Williamson Ck	Upper	80345	1%	PROP	3974.30	836.21	847.94		848.59	0.006031	6.70	755.44	250.74	0.48
Williamson Ck	Upper	79948	10%	EX	4015.20	833.96	842.88	839.94	843.47	0.005209	6.15	652.90	113.80	0.45
Williamson Ck	Upper	79948	10%	PROP	3405.00	833.96	842.38	839.45	842.89	0.004783	5.70	597.42	109.49	0.43
Williamson Ck	Upper	79948	4%	EX	5985.00	833.96	844.37	841.28	845.17	0.005964	7.19	832.72	223.04	0.49
Williamson Ck	Upper	79948	4%	PROP	5026.90	833.96	843.79	840.66	844.47	0.005395	6.62	759.84	145.05	0.47
Williamson Ck	Upper	79948	1%	EX	8738.80	833.96	845.88	842.81	846.88	0.006463	8.17	1292.01	428.79	0.53
Williamson Ck	Upper	79948	1%	PROP	7224.60	833.96	845.14	842.00	846.07	0.006394	7.75	932.66	260.08	0.52
Williamson Ck	Upper	79547	10%	EX	4015.20	831.58	840.82	837.99	841.38	0.005189	5.98	671.78	171.14	0.45
Williamson Ck	Upper	79547	10%	PROP	3405.00	831.58	840.70	837.52	841.12	0.003958	5.18	657.56	158.44	0.39
Williamson Ck	Upper	79547	4%	EX	5985.00	831.58	841.98	839.28	842.76	0.006070	7.18	925.98	246.10	0.50
Williamson Ck	Upper	79547	4%	PROP	5026.90	831.58	841.91	838.68	842.48	0.004435	6.11	909.74	240.32	0.43
Williamson Ck	Upper	79547	1%	EX	8738.80	831.58	842.98	840.74	844.09	0.007515	8.70	1281.98	435.46	0.57
Williamson Ck	Upper	79547	1%	PROP	7224.60	831.58	842.83	839.97	843.64	0.005599	7.40	1217.12	417.83	0.49
Williamson Ck	Upper	79004.	10%	EX	4015.20	827.88	837.93	836.88	838.33	0.006254	9.42	992.17	443.12	0.52
Williamson Ck	Upper	79004.	10%	PROP	3405.00	827.88	836.63	836.63	837.57	0.013400	12.57	518.71	314.12	0.75
Williamson Ck	Upper	79004.	4%	EX	5985.00	827.88	839.01	837.65	839.38	0.006303	10.12	1571.40	658.30	0.54
Williamson Ck	Upper	79004.	4%	PROP	5026.90	827.88	837.27	837.27	838.37	0.016677	14.70	728.36	340.45	0.85
Williamson Ck	Upper	79004.	1%	EX	8738.80	827.88	840.09	838.40	840.41	0.005657	10.20	2391.54	806.30	0.52
Williamson Ck	Upper	79004.	1%	PROP	7224.60	827.88	838.40	837.99	839.28	0.013634	14.34	1172.98	517.35	0.78
Williamson Ck	Upper	78807	10%	EX	4015.20	827.71	835.49	835.49	836.63	0.012099	9.19	688.31	380.08	0.72
Williamson Ck	Upper	78807	10%	PROP	3405.00	824.75	833.58	831.89	834.15	0.007253	6.02	565.85	146.35	0.51
Williamson Ck	Upper	78807	4%	EX	5985.00	827.71	836.27	836.27	837.59	0.013673	10.43	999.23	409.28	0.76
Williamson Ck	Upper	78807	4%	PROP	5026.90	824.75	835.21	832.78	835.85	0.005559	6.41	784.43	321.34	0.47
Williamson Ck	Upper	78807	1%	EX	8738.80	827.71	837.08	837.08	838.63	0.015677	11.90	1341.75	439.24	0.81
Williamson Ck	Upper	78807	1%	PROP	7224.60	824.75	836.99	833.83	837.77	0.004807	7.06	1023.83	388.61	0.45
Williamson Ck	Upper	78688	10%	EX	4015.20	825.39	833.76	831.38	834.15	0.004296	5.01	802.06	251.91	0.40
Williamson Ck	Upper	78688	4%	EX	5985.00	825.39	835.09	832.26	835.61	0.004294	5.81	1060.77	429.53	0.42
Williamson Ck	Upper	78688	1%	EX	8738.80	825.39	836.41	833.32	837.06	0.004289	6.63	1677.34	644.67	0.43
Williamson Ck	Upper	78661 OLD BEE CAVE RD			Culvert									
Williamson Ck	Upper	78612	10%	EX	4015.20	820.34	833.80	827.01	833.88	0.000539	2.28	1956.91	554.67	0.13
Williamson Ck	Upper	78612	4%	EX	5985.00	820.34	835.16	827.20	835.27	0.000649	2.75	2740.51	654.89	0.15
Williamson Ck	Upper	78612	1%	EX	8738.80	820.34	836.73	828.26	836.85	0.000673	3.08	3832.90	757.60	0.16
Williamson Ck	Upper	78502	10%	EX	4015.20	820.03	832.90		833.58	0.003558	6.83	773.72	348.96	0.39
Williamson Ck	Upper	78502	10%	PROP	3405.00	820.03	831.11	827.52	831.67	0.004852	6.02	597.01	122.44	0.41
Williamson Ck	Upper	78502	4%	EX	5985.00	820.03	833.69	830.65	834.81	0.005525	8.97	951.86	512.11	0.49
Williamson Ck	Upper	78502	4%	PROP	5026.90	820.03	832.77	828.99	833.49	0.005379	6.92	795.33	258.22	0.44
Williamson Ck	Upper	78502	1%	EX	8738.80	820.03	834.26	833.39	836.14	0.009041	11.89	1169.76	610.12	0.63
Williamson Ck	Upper	78502	1%	PROP	7224.60	820.03	834.21	830.74	835.23	0.006454	8.27	974.72	410.87	0.49
Williamson Ck	Upper	78181.	10%	PROP	3405.00	818.83	829.33		829.81	0.006697	5.58	610.12	106.77	0.41
Williamson Ck	Upper	78181.	4%	PROP	5026.90	818.83	830.69		831.36	0.008168	6.57	786.25	200.76	0.45
Williamson Ck	Upper	78181.	1%	PROP	7224.60	818.83	831.87		832.67	0.009189	7.42	1138.38	355.06	0.47
Williamson Ck	Upper	77960	10%	EX	4015.20	818.01	828.64	827.04	830.13	0.013393	9.90	440.83	239.66	0.71
Williamson Ck	Upper	77960	10%	PROP	3405.00	818.01	827.78		828.26	0.007252	5.54	614.22	158.61	0.47
Williamson Ck	Upper	77960	4%	EX	5985.00	818.01	830.21	830.21	831.16	0.008202	8.80	932.84	466.18	0.57
Williamson Ck	Upper	77960	4%	PROP	5026.90	818.01	829.13		829.69	0.006675	6.10	846.26	321.64	0.45
Williamson Ck	Upper	77960	1%	EX	8738.80	818.01	831.34		832.03	0.005561	7.97	1472.67	517.32	0.48
Williamson Ck	Upper	77960	1%	PROP	7224.60	818.01	830.57		831.07	0.005325	6.00	1328.67	404.07	0.40
Williamson Ck	Upper	77525	10%	EX	4015.20	815.00	824.92		825.69	0.007325	7.05	571.16	130.86	0.53
Williamson Ck	Upper	77525	10%	PROP	3405.00	815.00	824.22		824.95	0.007896	6.84	497.69	112.88	0.54
Williamson Ck	Upper	77525	4%	EX	5985.00	815.00	826.35		827.38	0.007304	8.20	767.23	213.52	0.55
Williamson Ck	Upper	77525	4%	PROP	5026.90	815.00	825.72		826.63	0.007263	7.68	667.93	168.61	0.54
Williamson Ck	Upper	77525	1%	EX	8738.80	815.00	827.84		829.13	0.007352	9.37	1072.11	397.19	0.57
Williamson Ck	Upper	77525	1%	PROP	7224.60	815.00	827.12		828.29	0.007284	8.79	890.13	290.94	0.56
Williamson Ck	Upper	76871	10%	EX	4015.20	808.26	820.32		821.14	0.006635	7.27	552.62	98.73	0.54
Williamson Ck	Upper	76871	10%	PROP	3405.00	808.26	820.10		820.74	0.005299	6.41	531.42	96.50	0.48
Williamson Ck	Upper	76871	4%	EX	5985.00	808.26	821.98		822.95	0.006253	8.03	853.58	448.09	0.53
Williamson Ck	Upper	76871	4%	PROP	5026.90	808.26	821.30		822.20	0.006341	7.66	689.48	182.64	0.53
Williamson Ck	Upper	76871	1%	EX	8738.80	808.26	823.30	821.48	824.48	0.006761	9.17	1268.73	615.32	0.56
Williamson Ck	Upper	76871	1%	PROP	7224.60	808.26	822.71		823.79	0.006426	8.58	965.10	435.05	0.54
Williamson Ck	Upper	76786	10%	EX	4015.20	811.20	819.27	817.78	820.36	0.012258	8.38	479.36	100.45	0.68
Williamson Ck	Upper	76786	10%	PROP	3405.00	811.20	819.85	817.44	820.20	0.004079	4.78	712.00	151.86	0.39
Williamson Ck	Upper	76786	4%	EX	5985.00	811.20	821.25	819.31	822.28	0.009871	8.26	783.10	241.27	0.62
Williamson Ck	Upper	76786	4%	PROP	5026.90	811.20	821.07	818.27	821.56	0.004152	5.59	899.07	245.62	0.41
Williamson Ck	Upper	76786	1%	EX	8738.80	811.20	822.80	821.32	823.79	0.007855	8.44	1340.36	763.53	0.57
Williamson Ck	Upper	76786	1%	PROP	7224.60	811.20	822.48	819.25	823.13	0.004256	6.49	1113.37	654.08	0.42
Williamson Ck	Upper	76649.	10%	EX	4015.20	808.68	819.22	814.03	819.48	0.001550	4.06	999.87	179.80	0.26
Williamson Ck	Upper	76649.	4%	EX	5985.00	808.68	821.18	815.12	821.48	0.001548	4.43	1495.06	342.48	0.26
Williamson Ck	Upper	76649.	1%	EX	8738.80	808.68	822.66	816.45	823.06	0.001755	5.23	2136.41	723.31	0.29
Williamson Ck	Upper	76587. WILLIAM CANNON D			Bridge									
Williamson Ck	Upper	76524.	10%	EX	4015.20	807.79	818.25	813.15	818.51	0.001593	4.09	989.67	195.03	0.26
Williamson Ck	Upper	76524.	4%	EX	5985.00	807.79	819.06	814.24	819.52	0.002519	5.46	1141.45	266.85	0.33
Williamson Ck	Upper	76524.	1%	EX	8738.80	807.79	819.87	815.55	820.52	0.003726	6.63	1478.30	571.22	0.41
Williamson Ck	Upper	76285	10%	EX	4015.20	805.25	817.07	814.84	817.71	0.006650	6.79	840.21	543.14	0.50
Williamson Ck	Upper	76285	10%	PROP	3405.00	805.25	815.81	812.72	816.09	0.002799	4.24	802.49	152.81	0.33
Williamson Ck	Upper	76285	4%	EX	5985.00	805.25	817.74	817.38	818.46	0.007405	7.73	1263.70	691.81	0.54

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	76285	4%	PROP	5026.90	805.25	816.88	813.57	817.30	0.003411	5.18	969.86	411.37	0.37
Williamson Ck	Upper	76285	1%	EX	8738.80	805.25	818.34	818.13	819.16	0.008439	8.76	1692.79	751.81	0.59
Williamson Ck	Upper	76285	1%	PROP	7224.60	805.25	817.66	814.56	818.33	0.004779	6.61	1093.69	573.87	0.45
Williamson Ck	Upper	75854	10%	EX	4015.20	804.26	813.54	813.26	814.31	0.009783	7.82	675.45	340.16	0.60
Williamson Ck	Upper	75854	10%	PROP	3405.00	804.26	813.66		814.22	0.006928	6.61	651.76	280.43	0.51
Williamson Ck	Upper	75854	4%	EX	5985.00	804.26	814.48		815.10	0.008597	7.40	1056.72	521.74	0.56
Williamson Ck	Upper	75854	4%	PROP	5026.90	804.26	814.53		815.13	0.007985	7.16	940.13	517.66	0.54
Williamson Ck	Upper	75854	1%	EX	8738.80	804.26	815.45		815.98	0.006642	7.12	1629.34	635.20	0.50
Williamson Ck	Upper	75854	1%	PROP	7224.60	804.26	815.40		815.92	0.006501	7.01	1441.71	613.20	0.50
Williamson Ck	Upper	75491	10%	EX	4015.20	804.50	812.07		812.26	0.003489	4.06	1268.45	442.15	0.35
Williamson Ck	Upper	75491	10%	PROP	3405.00	804.50	812.53	810.34	812.72	0.002612	3.94	1088.77	460.32	0.31
Williamson Ck	Upper	75491	4%	EX	5985.00	804.50	813.21		813.41	0.002937	4.17	1823.04	535.62	0.33
Williamson Ck	Upper	75491	4%	PROP	5026.90	804.50	813.36	811.70	813.58	0.002607	4.22	1427.89	483.95	0.32
Williamson Ck	Upper	75491	1%	EX	8738.80	804.50	814.34		814.56	0.002704	4.57	2476.23	732.02	0.33
Williamson Ck	Upper	75491	1%	PROP	7224.60	804.50	814.33	812.18	814.58	0.002446	4.53	1844.00	663.30	0.32
Williamson Ck	Upper	75171.90	10%	EX	4835.30	801.25	810.61		811.02	0.006334	5.84	1217.70	481.05	0.48
Williamson Ck	Upper	75171.90	10%	PROP	4414.30	801.25	809.70	809.12	810.86	0.011887	8.96	585.29	319.56	0.68
Williamson Ck	Upper	75171.90	4%	EX	7429.20	801.25	812.05		812.45	0.004683	6.03	2058.51	736.82	0.43
Williamson Ck	Upper	75171.90	4%	PROP	6664.80	801.25	811.29	810.59	812.13	0.007294	8.33	1141.01	557.31	0.55
Williamson Ck	Upper	75171.90	1%	EX	11158.60	801.25	813.20		813.64	0.004629	6.74	2979.68	873.76	0.44
Williamson Ck	Upper	75171.90	1%	PROP	10113.90	801.25	813.37	811.78	813.76	0.003186	6.53	2490.35	779.83	0.38
Williamson Ck	Upper	75017	10%	EX	4835.30	800.00	809.89	807.44	810.28	0.003871	5.57	1208.83	547.96	0.39
Williamson Ck	Upper	75017	10%	PROP	4414.30	800.00	809.41	807.05	809.78	0.002883	5.44	955.93	523.12	0.35
Williamson Ck	Upper	75017	4%	EX	7429.20	800.00	811.97	808.58	812.08	0.000896	3.23	3254.74	1282.51	0.20
Williamson Ck	Upper	75017	4%	PROP	6664.80	800.00	810.83	808.00	811.31	0.002960	6.20	1238.32	916.42	0.37
Williamson Ck	Upper	75017	1%	EX	11158.60	800.00	813.15	809.83	813.28	0.000834	3.41	4328.28	1428.61	0.20
Williamson Ck	Upper	75017	1%	PROP	10113.90	800.00	812.61	809.16	813.26	0.003017	7.08	1594.23	1337.95	0.38
Williamson Ck	Upper	74997	10%	EX	4835.30	799.85	809.62	806.48	810.15	0.003861	6.18	1023.92	479.94	0.40
Williamson Ck	Upper	74997	4%	EX	7429.20	799.85	811.90	808.12	812.04	0.001059	3.48	2869.72	1128.10	0.21
Williamson Ck	Upper	74997	1%	EX	11158.60	799.85	813.05	809.75	813.24	0.001077	3.83	3741.44	1207.04	0.22
Williamson Ck	Upper	74941 US HWY 290			Bridge									
Williamson Ck	Upper	74918.8	10%	PROP	4414.30	799.56	808.94	806.14	809.28	0.002541	5.13	1001.31	571.36	0.33
Williamson Ck	Upper	74918.8	4%	PROP	6664.80	799.56	810.28	807.17	810.76	0.002894	6.10	1266.86	969.86	0.36
Williamson Ck	Upper	74918.8	1%	PROP	10113.90	799.56	811.97	808.39	812.64	0.003207	7.21	1605.00	1148.53	0.39
Williamson Ck	Upper	74890.	10%	PROP	4414.30	799.45	808.93	806.12	809.16	0.001859	4.44	1260.87	666.59	0.28
Williamson Ck	Upper	74890.	4%	PROP	6664.80	799.45	810.30	807.15	810.60	0.001920	5.03	1643.41	998.40	0.29
Williamson Ck	Upper	74890.	1%	PROP	10113.90	799.45	812.04	808.18	812.42	0.001960	5.71	2129.62	1156.25	0.31
Williamson Ck	Upper	74854	10%	EX	4835.30	799.31	808.59	805.93	809.14	0.004419	6.39	1025.36	624.36	0.42
Williamson Ck	Upper	74854	4%	EX	7429.20	799.31	809.55	807.43	810.29	0.005739	7.78	1363.84	846.61	0.49
Williamson Ck	Upper	74854	1%	EX	11158.60	799.31	810.79	809.51	811.41	0.005105	7.16	2156.45	1051.07	0.51
Williamson Ck	Upper	74801.00	10%	EX	4835.30	801.03	808.56	806.14	808.77	0.003102	4.52	1569.06	1022.96	0.36
Williamson Ck	Upper	74801.00	4%	EX	7429.20	801.03	809.57	807.70	809.82	0.003149	5.04	2153.06	1138.73	0.36
Williamson Ck	Upper	74801.00	1%	EX	11158.60	801.03	810.73	808.39	811.04	0.003232	5.65	2841.08	1230.63	0.37
Williamson Ck	Upper	74620.5	10%	PROP	4414.30	798.58	807.72	805.95	808.04	0.003285	5.51	1135.42	920.79	0.37
Williamson Ck	Upper	74620.5	4%	PROP	6664.80	798.58	808.85	806.76	809.27	0.003591	6.38	1451.70	1036.61	0.40
Williamson Ck	Upper	74620.5	1%	PROP	10113.90	798.58	810.34	807.66	810.89	0.003792	7.35	1867.50	1197.55	0.42
Williamson Ck	Upper	74607.3	10%	PROP	4414.30	798.40	807.14	806.33	807.86	0.007183	8.14	826.54	869.03	0.55
Williamson Ck	Upper	74607.3	4%	PROP	6664.80	798.40	808.10	807.21	809.05	0.008427	9.63	1056.63	946.10	0.61
Williamson Ck	Upper	74607.3	1%	PROP	10113.90	798.40	809.43	808.27	810.63	0.009076	11.10	1375.30	1131.78	0.65
Williamson Ck	Upper	74437.00	10%	EX	4835.30	796.09	806.14	805.12	806.92	0.008610	7.90	975.86	788.57	0.59
Williamson Ck	Upper	74437.00	10%	PROP	4414.30	796.09	805.53	804.24	806.08	0.005266	7.18	852.34	577.19	0.47
Williamson Ck	Upper	74437.00	4%	EX	7429.20	796.09	807.24	806.00	808.01	0.008022	8.42	1516.60	840.25	0.58
Williamson Ck	Upper	74437.00	4%	PROP	6664.80	796.09	806.54	805.31	807.24	0.005790	8.21	1095.69	810.51	0.50
Williamson Ck	Upper	74437.00	1%	EX	11158.60	796.09	808.41	807.49	809.22	0.007886	9.16	2119.54	1051.58	0.58
Williamson Ck	Upper	74437.00	1%	PROP	10113.90	796.09	807.74	806.26	808.69	0.006568	9.56	1382.23	931.64	0.55
Williamson Ck	Upper	74163	10%	EX	4835.30	795.39	804.08	802.81	804.54	0.008938	6.45	1088.22	690.75	0.51
Williamson Ck	Upper	74163	10%	PROP	4414.30	795.39	803.88	802.62	804.33	0.008678	6.29	1012.78	667.62	0.50
Williamson Ck	Upper	74163	4%	EX	7429.20	795.39	804.81	803.89	805.43	0.012552	7.69	1386.40	848.28	0.62
Williamson Ck	Upper	74163	4%	PROP	6664.80	795.39	804.60	803.66	805.19	0.011454	7.45	1299.38	795.34	0.59
Williamson Ck	Upper	74163	1%	EX	11158.60	795.39	805.59	804.91	806.37	0.017359	8.83	1872.92	1056.68	0.73
Williamson Ck	Upper	74163	1%	PROP	10113.90	795.39	805.38	804.71	806.13	0.016387	8.61	1726.77	1017.25	0.71
Williamson Ck	Upper	74022	10%	EX	4835.30	796.12	803.73	802.33	803.99	0.001815	4.57	1341.82	933.58	0.41
Williamson Ck	Upper	74022	10%	PROP	4414.30	796.12	803.55	802.21	803.80	0.001734	4.39	1186.98	909.58	0.40
Williamson Ck	Upper	74022	4%	EX	7429.20	796.12	804.41	803.08	804.74	0.002144	5.29	1848.38	1093.46	0.45
Williamson Ck	Upper	74022	4%	PROP	6664.80	796.12	804.23	802.91	804.54	0.002022	5.05	1653.14	1042.30	0.43
Williamson Ck	Upper	74022	1%	EX	11158.60	796.12	805.18	803.99	805.56	0.002258	5.81	2457.51	1154.10	0.45
Williamson Ck	Upper	74022	1%	PROP	10113.90	796.12	804.98	803.63	805.35	0.002233	5.68	2296.30	1133.66	0.45
Williamson Ck	Upper	73988 JOE TANNER RD			Bridge									
Williamson Ck	Upper	73960	10%	EX	4835.30	795.12	803.53	801.41	803.76	0.003829	4.01	1467.31	1087.22	0.37
Williamson Ck	Upper	73960	10%	PROP	4414.30	795.12	803.33	801.24	803.55	0.003859	3.94	1344.49	1011.28	0.37
Williamson Ck	Upper	73960	4%	EX	7429.20	795.12	804.16	802.52	804.50	0.004944	4.99	1883.23	1211.78	0.43
Williamson Ck	Upper	73960	4%	PROP	6664.80	795.12	803.98	802.09	804.29	0.004687	4.72	1765.71	1181.17	0.41
Williamson Ck	Upper	73960	1%	EX	11158.60	795.12	804.90	803.52	805.33	0.005458	5.83	2624.29	1266.82	0.46
Williamson Ck	Upper	73960	1%	PROP	10113.90	795.12	804.71	803.15	805.12	0.005278	5.59	2465.48	1258.45	0.45
Williamson Ck	Upper	73862	10%	EX	4835.30	794.05	802.99	801.67	803.30	0.004330	5.36	1406.23	1131.49	0.47
Williamson Ck	Upper	73862	10%	PROP	4414.30	794.05	802.74	801.48	803.08	0.004620	5.47	1202.41	839.01	0.48
Williamson Ck	Upper	73862	4%	EX	7429.20	794.05	803.41	802.38	803.86	0.006320	6.60	1716.49	1207.23	0.57
Williamson Ck	Upper	73862	4%	PROP	6664.80	794.05	803.26	802.32	803.69	0.005982	6.38	1607.97	1191.80	0.56
Williamson Ck	Upper	73862	1%	EX	11158.60	794.05	804.09	803.47	804.61	0.007202	7.24	2231.55	1346.57	0.61
Williamson Ck	Upper	73862	1%	PROP	10113.90	794.05	803.92	803.34	804.41	0.006977	7.08	2096.36	1306.26	0.60
Williamson Ck	Upper	73413	10%	EX	4835.30	790.62	797.99	797.99	799.06	0.027146	9.25	709.37	751.43	0.93

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	73413	10%	PROP	4414.30	790.62	797.97	797.97	798.88	0.023000	8.52	702.40	738.55	0.86
Williamson Ck	Upper	73413	4%	EX	7429.20	790.62	798.69	798.58	799.21	0.016353	7.21	1440.01	810.73	0.72
Williamson Ck	Upper	73413	4%	PROP	6664.80	790.62	798.49	797.97	799.06	0.017838	7.49	1282.53	798.34	0.75
Williamson Ck	Upper	73413	1%	EX	11158.60	790.62	799.40	798.97	799.93	0.013327	7.19	2050.16	902.00	0.67
Williamson Ck	Upper	73413	1%	PROP	10113.90	790.62	799.23	798.85	799.74	0.013975	7.12	1891.51	878.91	0.68
Williamson Ck	Upper	72862	10%	EX	4835.30	784.40	791.54	790.38	791.89	0.007231	5.45	1128.19	405.53	0.56
Williamson Ck	Upper	72862	10%	PROP	4414.30	784.40	791.34	790.23	791.68	0.007199	5.38	1053.11	386.88	0.57
Williamson Ck	Upper	72862	4%	EX	7429.20	784.40	792.56	791.09	792.99	0.007409	5.95	1545.70	568.86	0.53
Williamson Ck	Upper	72862	4%	PROP	6664.80	784.40	792.30	790.92	792.70	0.007261	5.77	1434.22	538.33	0.53
Williamson Ck	Upper	72862	1%	EX	11158.60	784.40	793.56	791.90	794.05	0.007749	6.62	2315.40	749.87	0.53
Williamson Ck	Upper	72862	1%	PROP	10113.90	784.40	793.31	791.71	793.78	0.007653	6.44	2127.62	723.90	0.53
Williamson Ck	Upper	72474	10%	EX	4835.30	780.01	786.77	786.46	787.65	0.015885	7.74	722.47	385.25	0.77
Williamson Ck	Upper	72474	10%	PROP	4414.30	780.01	786.60	786.27	787.45	0.016012	7.55	665.04	355.77	0.77
Williamson Ck	Upper	72474	4%	EX	7429.20	780.01	787.66	787.31	788.70	0.015385	8.70	1120.84	488.13	0.76
Williamson Ck	Upper	72474	4%	PROP	6664.80	780.01	787.42	787.08	788.44	0.015668	8.49	958.96	454.67	0.77
Williamson Ck	Upper	72474	1%	EX	11158.60	780.01	788.69	788.33	789.81	0.013735	9.38	1654.87	546.84	0.73
Williamson Ck	Upper	72474	1%	PROP	10113.90	780.01	788.42	788.11	789.52	0.014167	9.22	1507.37	528.63	0.74
Williamson Ck	Upper	71962	10%	EX	4835.30	771.78	782.33		782.76	0.006122	5.58	973.30	312.32	0.47
Williamson Ck	Upper	71962	10%	PROP	4414.30	771.78	782.09		782.51	0.006206	5.42	904.93	250.23	0.47
Williamson Ck	Upper	71962	4%	EX	7429.20	771.78	783.54		784.07	0.005675	6.33	1423.80	408.98	0.47
Williamson Ck	Upper	71962	4%	PROP	6664.80	771.78	783.21		783.72	0.005795	6.14	1292.14	393.16	0.47
Williamson Ck	Upper	71962	1%	EX	11158.60	771.78	784.86		785.51	0.005453	7.15	2036.06	516.95	0.48
Williamson Ck	Upper	71962	1%	PROP	10113.90	771.78	784.54		785.16	0.005457	6.93	1871.98	505.31	0.48
Williamson Ck	Upper	71530	10%	EX	4835.30	769.68	779.33	777.85	779.91	0.007217	6.60	993.98	314.71	0.52
Williamson Ck	Upper	71530	10%	PROP	4414.30	769.68	779.06	777.60	779.62	0.007229	6.48	911.18	299.36	0.52
Williamson Ck	Upper	71530	4%	EX	7429.20	769.68	780.62	779.01	781.29	0.007488	7.33	1445.35	419.37	0.54
Williamson Ck	Upper	71530	4%	PROP	6664.80	769.68	780.30	778.71	780.94	0.007326	7.10	1323.63	366.06	0.53
Williamson Ck	Upper	71530	1%	EX	11158.60	769.68	781.94	780.22	782.71	0.008068	8.11	2076.39	503.03	0.57
Williamson Ck	Upper	71530	1%	PROP	10113.90	769.68	781.62	779.94	782.37	0.007941	7.95	1916.27	490.02	0.57
Williamson Ck	Upper	71025	10%	EX	4835.30	766.76	776.10	774.68	776.50	0.006266	5.62	986.37	296.69	0.48
Williamson Ck	Upper	71025	10%	PROP	4414.30	766.76	775.92	774.52	776.30	0.005971	5.43	933.89	286.90	0.46
Williamson Ck	Upper	71025	4%	EX	7429.20	766.76	777.10	775.49	777.61	0.007104	6.34	1313.48	354.88	0.51
Williamson Ck	Upper	71025	4%	PROP	6664.80	766.76	776.83	775.26	777.32	0.007023	6.21	1220.09	343.38	0.51
Williamson Ck	Upper	71025	1%	EX	11158.60	766.76	778.22	776.63	778.84	0.007365	6.83	1796.57	555.53	0.53
Williamson Ck	Upper	71025	1%	PROP	10113.90	766.76	777.94	776.17	778.55	0.007291	6.71	1629.25	479.30	0.53
Williamson Ck	Upper	70416	10%	EX	4835.30	764.10	771.78	771.13	772.22	0.008295	5.86	937.66	326.44	0.54
Williamson Ck	Upper	70416	10%	PROP	4414.30	764.10	771.54	770.66	771.99	0.008889	5.88	860.05	321.90	0.55
Williamson Ck	Upper	70416	4%	EX	7429.20	764.10	772.98	771.57	773.47	0.006853	6.05	1343.49	351.37	0.50
Williamson Ck	Upper	70416	4%	PROP	6664.80	764.10	772.66	771.44	773.13	0.007047	5.96	1234.61	344.28	0.51
Williamson Ck	Upper	70416	1%	EX	11158.60	764.10	774.27	772.38	774.85	0.006153	6.56	1859.62	703.13	0.49
Williamson Ck	Upper	70416	1%	PROP	10113.90	764.10	773.95	772.17	774.51	0.006364	6.41	1716.36	561.23	0.50
Williamson Ck	Upper	69976	10%	EX	4835.30	759.86	768.64	766.24	769.12	0.006258	5.54	872.99	207.71	0.48
Williamson Ck	Upper	69976	10%	PROP	4414.30	759.86	768.38	765.96	768.83	0.006088	5.39	819.68	199.22	0.47
Williamson Ck	Upper	69976	4%	EX	7429.20	759.86	769.85	767.56	770.50	0.006798	6.49	1154.33	262.47	0.51
Williamson Ck	Upper	69976	4%	PROP	6664.80	759.86	769.56	767.24	770.15	0.006717	6.19	1079.30	245.80	0.50
Williamson Ck	Upper	69976	1%	EX	11158.60	759.86	771.10	769.01	771.99	0.007030	7.65	1533.74	338.50	0.54
Williamson Ck	Upper	69976	1%	PROP	10113.90	759.86	770.78	768.63	771.61	0.006979	7.36	1427.46	322.62	0.53
Williamson Ck	Upper	69450	10%	EX	4835.30	757.29	765.64	763.34	766.08	0.005284	5.40	951.63	287.06	0.44
Williamson Ck	Upper	69450	10%	PROP	4414.30	757.29	765.39	763.06	765.81	0.005371	5.27	881.40	272.23	0.44
Williamson Ck	Upper	69450	4%	EX	7429.20	757.29	766.98	764.89	767.48	0.004797	5.94	1449.80	446.40	0.44
Williamson Ck	Upper	69450	4%	PROP	6664.80	757.29	766.66	764.70	767.14	0.004834	5.78	1274.69	413.41	0.43
Williamson Ck	Upper	69450	1%	EX	11158.60	757.29	768.40	766.08	768.96	0.004563	6.50	2131.93	515.60	0.44
Williamson Ck	Upper	69450	1%	PROP	10113.90	757.29	768.02	765.76	768.57	0.004648	6.38	1939.92	497.08	0.44
Williamson Ck	Upper	68928	10%	EX	4835.30	753.63	762.59	760.57	763.09	0.006228	5.71	846.65	217.57	0.48
Williamson Ck	Upper	68928	10%	PROP	4414.30	753.63	762.30	760.12	762.78	0.006317	5.57	792.10	194.38	0.48
Williamson Ck	Upper	68928	4%	EX	7429.20	753.63	764.20	761.65	764.76	0.005746	5.97	1258.31	281.56	0.47
Williamson Ck	Upper	68928	4%	PROP	6664.80	753.63	763.83	761.34	764.35	0.006016	5.80	1154.95	267.38	0.47
Williamson Ck	Upper	68928	1%	EX	11158.60	753.63	765.85	763.12	766.51	0.004808	6.59	1779.12	350.17	0.45
Williamson Ck	Upper	68928	1%	PROP	10113.90	753.63	765.42	762.58	766.06	0.005014	6.44	1631.36	332.21	0.45
Williamson Ck	Upper	68467	10%	EX	4835.30	751.05	759.38		760.01	0.007083	6.38	757.56	158.96	0.52
Williamson Ck	Upper	68467	10%	PROP	4414.30	751.05	759.12		759.71	0.006931	6.16	717.01	156.28	0.51
Williamson Ck	Upper	68467	4%	EX	7429.20	751.05	760.71		761.61	0.008022	7.59	978.23	173.55	0.56
Williamson Ck	Upper	68467	4%	PROP	6664.80	751.05	760.31		761.15	0.007909	7.32	910.47	168.90	0.56
Williamson Ck	Upper	68467	1%	EX	11158.60	751.05	762.44		763.59	0.008446	8.58	1300.78	199.91	0.59
Williamson Ck	Upper	68467	1%	PROP	10113.90	751.05	761.99		763.07	0.008329	8.34	1212.24	192.18	0.59
Williamson Ck	Upper	68025	10%	EX	4835.30	747.92	754.70		755.64	0.014615	7.80	620.06	166.82	0.71
Williamson Ck	Upper	68025	10%	PROP	4414.30	747.92	754.41		755.33	0.015126	7.70	573.35	161.33	0.72
Williamson Ck	Upper	68025	4%	EX	7429.20	747.92	756.34		757.35	0.011733	8.07	920.82	199.69	0.66
Williamson Ck	Upper	68025	4%	PROP	6664.80	747.92	755.98		756.94	0.011673	7.84	850.11	191.70	0.66
Williamson Ck	Upper	68025	1%	EX	11158.60	747.92	757.74		759.03	0.012825	9.12	1224.02	236.37	0.71
Williamson Ck	Upper	68025	1%	PROP	10113.90	747.92	757.38		758.60	0.012519	8.86	1141.26	225.78	0.69
Williamson Ck	Upper	67407	10%	EX	4835.30	744.51	752.22		752.48	0.002341	4.11	1182.45	230.68	0.30
Williamson Ck	Upper	67407	10%	PROP	4414.30	744.51	751.87		752.12	0.002366	3.99	1105.52	211.05	0.30
Williamson Ck	Upper	67407	4%	EX	7429.20	744.51	752.90		753.39	0.003790	5.61	1345.74	248.87	0.39
Williamson Ck	Upper	67407	4%	PROP	6664.80	744.51	752.44		752.90	0.003919	5.44	1234.28	236.84	0.40
Williamson Ck	Upper	67407	1%	EX	11158.60	744.51	755.69		756.09	0.002166	5.32	2592.33	582.80	0.31
Williamson Ck	Upper	67407	1%	PROP	10113.90	744.51	754.87		755.32	0.002634	5.53	2130.64	545.67	0.34
Williamson Ck	Upper	67305	10%	EX	4835.30	743.18	751.93	747.93	752.23	0.002255	4.41	1095.46	173.25	0.31
Williamson Ck	Upper	67305	10%	PROP	4414.30	743.18	751.60	747.72	751.88	0.002220	4.25	1039.27	170.54	0.30
Williamson Ck	Upper	67305	4%	EX	7429.20	743.18	752.27	749.09	752.92	0.004520	6.44	1153.68	176.03	0.44
Williamson Ck	Upper	67305	4%	PROP	6664.80	743.18	751.84	748.75	752.43	0.004475	6.17	1080.39	172.52	0.43
Williamson Ck	Upper	67305	1%	EX	11158.60	743.18	755.10	750.50	755.75	0.003262	6.53	1767.02	647.31	0.39
Williamson Ck	Upper	67305	1%	PROP	10113.90	743.18	754.24	750.12	754.93	0.003923	6.68	1530.20	563.65	0.42
Williamson Ck	Upper	67239 BRUSH COUNTRY RD			Bridge									
Williamson Ck	Upper	67185	10%	EX	4835.30	741.78	750.33	746.52	750.65	0.002496	4.56	1060.77	171.58	0.32

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	67185	10%	PROP	4414.30	741.78	750.02	746.30	750.32	0.002438	4.38	1008.91	169.07	0.31
Williamson Ck	Upper	67185	4%	EX	7429.20	741.78	751.83	747.68	752.33	0.002963	5.63	1319.60	183.87	0.36
Williamson Ck	Upper	67185	4%	PROP	6664.80	741.78	751.51	747.36	751.94	0.002736	5.28	1263.01	181.21	0.34
Williamson Ck	Upper	67185	1%	EX	11158.60	741.78	753.58	749.09	754.26	0.003425	6.65	1771.93	435.34	0.40
Williamson Ck	Upper	67185	1%	PROP	10113.90	741.78	753.13	748.72	753.77	0.003438	6.43	1576.93	316.29	0.39
Williamson Ck	Upper	67082	10%	EX	4968.10	739.92	749.57	746.92	750.17	0.006548	6.22	799.37	164.92	0.50
Williamson Ck	Upper	67082	10%	PROP	4591.70	739.92	749.26	746.72	749.84	0.006498	6.13	748.99	156.08	0.49
Williamson Ck	Upper	67082	4%	EX	7582.10	739.92	751.02	748.43	751.81	0.006529	7.09	1073.55	219.71	0.54
Williamson Ck	Upper	67082	4%	PROP	6911.80	739.92	750.70	748.07	751.44	0.006451	6.87	1006.02	201.90	0.53
Williamson Ck	Upper	67082	1%	EX	11587.30	739.92	752.60	750.27	753.66	0.007082	8.30	1471.05	283.88	0.56
Williamson Ck	Upper	67082	1%	PROP	10448.00	739.92	752.21	749.79	753.19	0.006897	7.97	1362.37	268.06	0.55
Williamson Ck	Upper	66495	10%	EX	4968.10	733.60	743.86	742.42	744.94	0.012561	8.33	596.70	135.65	0.70
Williamson Ck	Upper	66495	10%	PROP	4591.70	733.60	743.61	742.13	744.64	0.012520	8.15	563.55	129.17	0.69
Williamson Ck	Upper	66495	4%	EX	7582.10	733.60	745.42		746.69	0.011959	9.04	843.75	184.01	0.71
Williamson Ck	Upper	66495	4%	PROP	6911.80	733.60	745.07		746.29	0.012336	8.86	781.59	171.67	0.72
Williamson Ck	Upper	66495	1%	EX	11587.30	733.60	747.31		748.72	0.010023	9.65	1311.75	312.37	0.69
Williamson Ck	Upper	66495	1%	PROP	10448.00	733.60	746.80		748.20	0.010535	9.55	1163.53	278.99	0.69
Williamson Ck	Upper	66021	10%	EX	4968.10	731.79	740.33	737.77	740.95	0.005695	6.34	804.70	168.54	0.46
Williamson Ck	Upper	66021	10%	PROP	4591.70	731.79	740.01	737.55	740.61	0.005828	6.21	752.66	161.91	0.47
Williamson Ck	Upper	66021	4%	EX	7582.10	731.79	742.18	739.10	742.95	0.005248	7.15	1149.41	205.29	0.46
Williamson Ck	Upper	66021	4%	PROP	6911.80	731.79	741.75	738.78	742.49	0.005309	6.95	1063.60	194.99	0.46
Williamson Ck	Upper	66021	1%	EX	11587.30	731.79	744.33	740.82	745.32	0.005136	8.16	1666.64	346.35	0.48
Williamson Ck	Upper	66021	1%	PROP	10448.00	731.79	743.78	740.36	744.71	0.005139	7.90	1516.00	277.70	0.47
Williamson Ck	Upper	65470	10%	EX	4968.10	723.88	737.75		738.31	0.004041	6.01	826.96	149.69	0.45
Williamson Ck	Upper	65470	10%	PROP	4591.70	723.88	737.48		738.01	0.003851	5.83	787.33	145.93	0.44
Williamson Ck	Upper	65470	4%	EX	7582.10	723.88	739.34		740.10	0.005129	7.01	1089.08	190.48	0.48
Williamson Ck	Upper	65470	4%	PROP	6911.80	723.88	738.96		739.68	0.004894	6.78	1021.31	173.27	0.48
Williamson Ck	Upper	65470	1%	EX	11587.30	723.88	741.22		742.24	0.006179	8.16	1519.23	280.66	0.50
Williamson Ck	Upper	65470	1%	PROP	10448.00	723.88	740.74		741.69	0.005912	7.86	1394.23	244.29	0.50
Williamson Ck	Upper	64970	10%	EX	4968.10	723.81	734.79	733.89	735.50	0.008179	7.05	880.76	297.76	0.62
Williamson Ck	Upper	64970	10%	PROP	4591.70	723.81	734.56	733.70	735.26	0.008257	7.01	810.44	291.46	0.63
Williamson Ck	Upper	64970	4%	EX	7582.10	723.81	736.16	734.88	736.90	0.008044	7.42	1311.48	333.81	0.58
Williamson Ck	Upper	64970	4%	PROP	6911.80	723.81	735.86	734.66	736.58	0.007957	7.28	1213.87	325.88	0.59
Williamson Ck	Upper	64970	1%	EX	11587.30	723.81	737.69	736.01	738.55	0.008529	8.15	1865.42	396.85	0.59
Williamson Ck	Upper	64970	1%	PROP	10448.00	723.81	737.30	735.71	738.12	0.008391	7.96	1713.97	380.21	0.58
Williamson Ck	Upper	64522	10%	EX	4968.10	722.53	731.58		732.15	0.006634	6.54	1010.70	292.51	0.51
Williamson Ck	Upper	64522	10%	PROP	4591.70	722.53	731.33		731.89	0.006651	6.43	939.29	280.97	0.50
Williamson Ck	Upper	64522	4%	EX	7582.10	722.53	732.76		733.49	0.007163	7.57	1407.38	371.90	0.57
Williamson Ck	Upper	64522	4%	PROP	6911.80	722.53	732.46		733.17	0.007243	7.41	1299.23	357.33	0.56
Williamson Ck	Upper	64522	1%	EX	11587.30	722.53	734.20		735.05	0.007155	8.36	1994.81	447.81	0.61
Williamson Ck	Upper	64522	1%	PROP	10448.00	722.53	733.84		734.66	0.007111	8.17	1838.45	424.46	0.60
Williamson Ck	Upper	64114	10%	EX	4968.10	718.38	728.67	726.46	729.36	0.006981	6.67	755.12	290.69	0.56
Williamson Ck	Upper	64114	10%	PROP	4591.70	718.38	728.36	726.20	729.05	0.007232	6.63	696.07	262.71	0.57
Williamson Ck	Upper	64114	4%	EX	7582.10	718.38	730.56	728.21	731.09	0.004670	6.17	1590.24	462.27	0.46
Williamson Ck	Upper	64114	4%	PROP	6911.80	718.38	730.20	727.94	730.73	0.004803	6.11	1433.74	422.88	0.47
Williamson Ck	Upper	64114	1%	EX	11587.30	718.38	732.55	729.85	732.98	0.003384	5.95	2931.15	851.09	0.38
Williamson Ck	Upper	64114	1%	PROP	10448.00	718.38	731.98	729.47	732.46	0.003858	6.13	2461.13	778.27	0.41
Williamson Ck	Upper	63777	10%	EX	4968.10	717.24	727.82	725.20	728.03	0.002235	4.09	1394.46	528.87	0.30
Williamson Ck	Upper	63777	10%	PROP	4591.70	717.24	727.35	725.08	727.58	0.002641	4.24	1250.60	515.45	0.32
Williamson Ck	Upper	63777	4%	EX	7582.10	717.24	730.30	725.98	730.40	0.000920	3.22	3295.28	774.33	0.20
Williamson Ck	Upper	63777	4%	PROP	6911.80	717.24	729.88	725.80	729.99	0.001019	3.29	2978.80	761.87	0.21
Williamson Ck	Upper	63777	1%	EX	11587.30	717.24	732.39	726.93	732.47	0.000666	2.88	4994.87	844.71	0.17
Williamson Ck	Upper	63777	1%	PROP	10448.00	717.24	731.81	726.66	731.90	0.000724	2.99	4513.38	828.71	0.18
Williamson Ck	Upper	63669	10%	EX	4968.10	715.69	727.57	723.35	727.87	0.000909	4.35	1145.18	210.77	0.30
Williamson Ck	Upper	63669	10%	PROP	4591.70	715.69	727.11	723.16	727.40	0.000977	4.33	1060.19	178.85	0.31
Williamson Ck	Upper	63669	4%	EX	7582.10	715.69	730.07	724.57	730.29	0.000545	4.06	2464.83	813.24	0.25
Williamson Ck	Upper	63669	4%	PROP	6911.80	715.69	729.51	724.29	729.84	0.000761	4.58	1518.48	754.45	0.29
Williamson Ck	Upper	63669	1%	EX	11587.30	715.69	732.25	726.11	732.41	0.000339	3.73	4276.16	912.53	0.20
Williamson Ck	Upper	63669	1%	PROP	10448.00	715.69	731.66	725.69	731.83	0.000383	3.82	3777.53	893.32	0.21
Williamson Ck	Upper	63608 MOPAC (SOUTH-BOU			Bridge									
Williamson Ck	Upper	63546	10%	EX	4968.10	715.63	727.31	723.30	727.63	0.002566	4.48	1108.17	183.87	0.32
Williamson Ck	Upper	63546	10%	PROP	4591.70	715.63	726.84	723.10	727.15	0.002692	4.49	1022.70	175.44	0.33
Williamson Ck	Upper	63546	4%	EX	7582.10	715.63	729.69	724.51	730.05	0.002083	4.84	1565.81	593.58	0.30
Williamson Ck	Upper	63546	4%	PROP	6911.80	715.63	729.31	724.22	729.64	0.002038	4.64	1490.48	536.34	0.30
Williamson Ck	Upper	63546	1%	EX	11587.30	715.63	731.48	726.04	732.05	0.002464	6.03	1920.25	894.77	0.34
Williamson Ck	Upper	63546	1%	PROP	10448.00	715.63	730.98	725.62	731.49	0.002387	5.73	1821.86	830.58	0.33
Williamson Ck	Upper	63530	10%	EX	4968.10	714.15	726.86	723.52	727.55	0.001975	6.66	745.88	105.91	0.44
Williamson Ck	Upper	63530	10%	PROP	4591.70	714.15	726.40	723.00	727.08	0.002049	6.58	697.82	103.86	0.45
Williamson Ck	Upper	63530	4%	EX	7582.10	714.15	729.22	725.06	729.98	0.002275	6.99	1083.95	787.82	0.48
Williamson Ck	Upper	63530	4%	PROP	6911.80	714.15	728.87	724.68	729.57	0.002183	6.72	1028.22	781.20	0.46
Williamson Ck	Upper	63530	1%	EX	11587.30	714.15	730.81	727.67	731.95	0.002845	8.56	1353.48	854.96	0.55
Williamson Ck	Upper	63530	1%	PROP	10448.00	714.15	730.36	726.50	731.40	0.002745	8.20	1274.51	815.72	0.53
Williamson Ck	Upper	63419 MOPAC (MAINLANES			Bridge									
Williamson Ck	Upper	63314	10%	EX	4968.10	712.77	724.69	722.14	725.56	0.006893	7.49	663.07	464.91	0.52
Williamson Ck	Upper	63314	10%	PROP	4591.70	712.77	724.18	721.66	725.05	0.007497	7.51	611.42	364.38	0.54
Williamson Ck	Upper	63314	4%	EX	7582.10	712.77	726.78	723.67	727.84	0.008808	8.25	919.26	633.03	0.59
Williamson Ck	Upper	63314	4%	PROP	6911.80	712.77	726.53	723.28	727.48	0.008218	7.84	881.16	619.56	0.56
Williamson Ck	Upper	63314	1%	EX	11587.30	712.77	727.34	726.26	729.41	0.016148	11.54	1004.46	661.35	0.80
Williamson Ck	Upper	63314	1%	PROP	10448.00	712.77	727.21	725.11	728.96	0.013875	10.61	984.31	655.14	0.74
Williamson Ck	Upper	63293	10%	EX	4968.10	712.37	724.57	721.20	725.44	0.004890	7.50	662.53	628.62	0.65
Williamson Ck	Upper	63293	10%	PROP	4591.70	712.37	724.06	720.85	724.96	0.002966	7.64	601.25	518.13	0.54
Williamson Ck	Upper	63293	4%	EX	7582.10	712.37	726.88	723.37	727.66	0.002918	7.10	1067.23	914.19	0.53
Williamson Ck	Upper	63293	4%	PROP	6911.80	712.37	726.60	722.79	727.32	0.002794	6.81	1014.68	892.82	0.52
Williamson Ck	Upper	63293	1%	EX	11587.30	712.37	727.64	726.02	729.05	0.004724	9.52	1216.66	1045.53	0.68
Williamson Ck	Upper	63293	1%	PROP	10448.00	712.37	727.44	725.62	728.66	0.004226	8.89	1175.71	966.48	0.64

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	63250 MOPAC (NORTH-BOU			Bridge									
Williamson Ck	Upper	63183	10%	EX	4968.10	712.91	721.74	721.74	724.48	0.026634	13.29	373.74	67.87	1.00
Williamson Ck	Upper	63183	10%	PROP	4591.70	712.91	721.38	721.38	724.06	0.026991	13.12	350.04	65.50	1.00
Williamson Ck	Upper	63183	4%	EX	7582.10	712.91	725.63	725.63	726.98	0.017594	9.59	1007.15	749.55	0.80
Williamson Ck	Upper	63183	4%	PROP	6911.80	712.91	723.35	723.35	726.42	0.025570	14.05	491.85	79.79	1.00
Williamson Ck	Upper	63183	1%	EX	11587.30	712.91	726.86	726.86	727.98	0.013944	9.48	2067.22	1193.33	0.73
Williamson Ck	Upper	63183	1%	PROP	10448.00	712.91	726.66	726.66	727.75	0.013614	9.22	1876.18	1174.51	0.72
Williamson Ck	Upper	63087	10%	EX	4968.10	711.16	722.02		722.12	0.000979	2.91	2732.58	809.78	0.20
Williamson Ck	Upper	63087	10%	PROP	4591.70	711.16	721.81		721.91	0.000966	2.85	2563.86	799.93	0.20
Williamson Ck	Upper	63087	4%	EX	7582.10	711.16	723.32		723.44	0.001061	3.30	3849.86	941.75	0.21
Williamson Ck	Upper	63087	4%	PROP	6911.80	711.16	723.00		723.11	0.001036	3.20	3560.80	883.18	0.21
Williamson Ck	Upper	63087	1%	EX	11587.30	711.16	724.88		725.01	0.001121	3.67	5441.94	1098.16	0.22
Williamson Ck	Upper	63087	1%	PROP	10448.00	711.16	724.48		724.61	0.001107	3.59	5005.73	1061.84	0.21
Williamson Ck	Upper	62257	10%	EX	4968.10	710.19	720.10	718.85	720.51	0.006470	5.77	1223.07	386.85	0.47
Williamson Ck	Upper	62257	10%	PROP	4591.70	710.19	719.91	718.71	720.31	0.006460	5.66	1150.24	383.97	0.47
Williamson Ck	Upper	62257	4%	EX	7582.10	710.19	721.28	719.64	721.76	0.006485	6.39	1691.61	405.81	0.47
Williamson Ck	Upper	62257	4%	PROP	6911.80	710.19	721.00	719.46	721.46	0.006479	6.25	1577.18	401.09	0.47
Williamson Ck	Upper	62257	1%	EX	11587.30	710.19	722.71	720.56	723.29	0.006567	7.23	2322.47	511.25	0.48
Williamson Ck	Upper	62257	1%	PROP	10448.00	710.19	722.35	720.32	722.90	0.006551	6.97	2144.03	479.39	0.48
Williamson Ck	Upper	61907	10%	EX	4968.10	708.17	718.07	716.41	718.44	0.005371	5.35	1234.09	383.98	0.44
Williamson Ck	Upper	61907	10%	PROP	4591.70	708.17	717.87	716.24	718.23	0.005453	5.24	1158.58	372.71	0.44
Williamson Ck	Upper	61907	4%	EX	7582.10	708.17	719.38	717.34	719.83	0.004710	5.95	1789.39	468.95	0.43
Williamson Ck	Upper	61907	4%	PROP	6911.80	708.17	719.11	717.14	719.52	0.004714	5.76	1662.69	444.27	0.43
Williamson Ck	Upper	61907	1%	EX	11587.30	708.17	720.64	718.29	721.25	0.005186	7.11	2467.74	610.53	0.47
Williamson Ck	Upper	61907	1%	PROP	10448.00	708.17	720.34	718.04	720.90	0.005014	6.79	2286.76	578.99	0.46
Williamson Ck	Upper	61507 P	10%	EX	4968.10	706.10	715.99	713.82	716.34	0.005186	5.30	1302.58	406.39	0.41
Williamson Ck	Upper	61507 P	10%	PROP	4591.70	706.10	715.80	713.65	716.13	0.005081	5.14	1226.05	389.98	0.40
Williamson Ck	Upper	61507 P	4%	EX	7582.10	706.10	717.14	714.69	717.65	0.006398	6.57	1898.35	669.36	0.46
Williamson Ck	Upper	61507 P	4%	PROP	6911.80	706.10	716.91	714.47	717.39	0.006137	6.30	1752.05	615.28	0.45
Williamson Ck	Upper	61507 P	1%	EX	11587.30	706.10	718.32	716.03	718.90	0.006725	7.42	2815.47	848.01	0.47
Williamson Ck	Upper	61507 P	1%	PROP	10448.00	706.10	718.02	715.66	718.59	0.006747	7.26	2561.94	821.79	0.47
Williamson Ck	Upper	61007 O	10%	EX	4968.10	703.87	712.98	711.41	713.29	0.007653	5.13	1201.24	441.67	0.50
Williamson Ck	Upper	61007 O	10%	PROP	4591.70	703.87	712.80	711.39	713.10	0.007756	4.98	1133.09	401.81	0.50
Williamson Ck	Upper	61007 O	4%	EX	7582.10	703.87	714.00	712.05	714.37	0.006918	5.86	1840.02	713.20	0.50
Williamson Ck	Upper	61007 O	4%	PROP	6911.80	703.87	713.75	711.85	714.11	0.007211	5.74	1663.23	689.61	0.51
Williamson Ck	Upper	61007 O	1%	EX	11587.30	703.87	714.99	712.93	715.47	0.007242	6.89	2597.86	818.32	0.53
Williamson Ck	Upper	61007 O	1%	PROP	10448.00	703.87	714.76	712.65	715.20	0.007017	6.58	2406.50	786.62	0.52
Williamson Ck	Upper	60522 N	10%	EX	4968.10	701.56	708.68		709.14	0.008064	5.42	915.95	354.79	0.52
Williamson Ck	Upper	60522 N	10%	PROP	4591.70	701.56	708.49		708.92	0.008050	5.32	863.76	345.43	0.52
Williamson Ck	Upper	60522 N	4%	EX	7582.10	701.56	709.93		710.47	0.008129	5.90	1286.19	437.93	0.54
Williamson Ck	Upper	60522 N	4%	PROP	6911.80	701.56	709.67		710.18	0.007795	5.76	1199.56	407.10	0.52
Williamson Ck	Upper	60522 N	1%	EX	11587.30	701.56	711.38		711.99	0.006363	6.32	1932.20	641.52	0.51
Williamson Ck	Upper	60522 N	1%	PROP	10448.00	701.56	710.90		711.53	0.007219	6.36	1660.52	565.14	0.54
Williamson Ck	Upper	60166	10%	EX	4968.10	698.92	707.15	704.76	707.39	0.003035	4.08	1267.64	502.10	0.33
Williamson Ck	Upper	60166	10%	PROP	4591.70	698.92	706.98	704.61	707.21	0.002944	3.92	1218.55	478.67	0.33
Williamson Ck	Upper	60166	4%	EX	7582.10	698.92	708.38	705.64	708.72	0.003071	4.80	1638.69	739.92	0.35
Williamson Ck	Upper	60166	4%	PROP	6911.80	698.92	708.27	705.46	708.56	0.002735	4.47	1604.36	713.39	0.33
Williamson Ck	Upper	60166	1%	EX	11587.30	698.92	709.93	706.59	710.41	0.003164	5.68	2102.77	918.19	0.37
Williamson Ck	Upper	60166	1%	PROP	10448.00	698.92	709.26	706.35	709.73	0.003586	5.68	1900.73	860.46	0.38
Williamson Ck	Upper	60068 BRODIE LANE			Bridge									
Williamson Ck	Upper	59977 M	10%	EX	4968.10	698.22	705.54	704.05	705.94	0.006489	5.20	995.39	356.93	0.47
Williamson Ck	Upper	59977 M	10%	PROP	4591.70	698.22	705.42	703.90	705.79	0.006163	4.97	961.48	350.28	0.46
Williamson Ck	Upper	59977 M	4%	EX	7582.10	698.22	706.32	704.95	706.94	0.007760	6.41	1231.39	468.63	0.53
Williamson Ck	Upper	59977 M	4%	PROP	6911.80	698.22	706.17	704.73	706.72	0.007297	6.08	1184.88	428.09	0.51
Williamson Ck	Upper	59977 M	1%	EX	11587.30	698.22	707.14	705.89	708.13	0.010072	8.15	1476.62	673.84	0.62
Williamson Ck	Upper	59977 M	1%	PROP	10448.00	698.22	706.96	705.65	707.82	0.009260	7.64	1421.80	590.81	0.59
Williamson Ck	Upper	59867	10%	EX	5144.70	698.76	704.88		705.17	0.006716	4.73	1262.69	704.84	0.48
Williamson Ck	Upper	59867	10%	PROP	4808.20	698.76	704.77		705.05	0.006732	4.64	1185.51	697.12	0.48
Williamson Ck	Upper	59867	4%	EX	7875.20	698.76	705.72		706.05	0.006173	5.24	1926.79	892.24	0.47
Williamson Ck	Upper	59867	4%	PROP	7259.70	698.76	705.56		705.88	0.006180	5.11	1785.93	872.85	0.47
Williamson Ck	Upper	59867	1%	EX	11950.40	698.76	706.59		707.00	0.006228	5.95	2780.58	1021.11	0.48
Williamson Ck	Upper	59867	1%	PROP	10928.50	698.76	706.38		706.77	0.006297	5.82	2567.09	1007.95	0.48
Williamson Ck	Upper	59523 L	10%	EX	5144.70	694.48	701.96		702.43	0.009702	5.49	959.25	598.13	0.53
Williamson Ck	Upper	59523 L	10%	PROP	4808.20	694.48	701.79		702.24	0.010149	5.42	901.79	551.91	0.54
Williamson Ck	Upper	59523 L	4%	EX	7875.20	694.48	703.21		703.74	0.007429	5.93	1606.46	926.43	0.49
Williamson Ck	Upper	59523 L	4%	PROP	7259.70	694.48	702.97		703.50	0.007876	5.89	1384.70	906.85	0.50
Williamson Ck	Upper	59523 L	1%	EX	11950.40	694.48	704.55		705.03	0.005450	6.03	2893.10	990.74	0.44
Williamson Ck	Upper	59523 L	1%	PROP	10928.50	694.48	704.28		704.75	0.005666	5.96	2620.97	977.46	0.44
Williamson Ck	Upper	58920	10%	EX	5144.70	686.50	695.85		696.67	0.009306	7.26	708.40	150.19	0.59
Williamson Ck	Upper	58920	10%	PROP	4808.20	686.50	695.64		696.42	0.009111	7.10	677.19	146.16	0.58
Williamson Ck	Upper	58920	4%	EX	7875.20	686.50	697.31		698.38	0.010682	8.27	951.81	184.29	0.64
Williamson Ck	Upper	58920	4%	PROP	7259.70	686.50	697.02		698.03	0.010400	8.08	897.93	176.37	0.63
Williamson Ck	Upper	58920	1%	EX	11950.40	686.50	699.14		700.35	0.012108	8.79	1359.16	342.07	0.68
Williamson Ck	Upper	58920	1%	PROP	10928.50	686.50	698.76		699.93	0.012233	8.67	1260.62	319.34	0.68
Williamson Ck	Upper	58533 K	10%	EX	5144.70	683.83	692.76	691.12	693.31	0.007768	5.94	866.03	217.64	0.52
Williamson Ck	Upper	58533 K	10%	PROP	4808.20	683.83	692.59	691.00	693.11	0.007713	5.80	828.64	214.55	0.52
Williamson Ck	Upper	58533 K	4%	EX	7875.20	683.83	694.07	692.14	694.78	0.007768	6.76	1165.14	241.35	0.54
Williamson Ck	Upper	58533 K	4%	PROP	7259.70	683.83	693.79	691.94	694.47	0.007824	6.61	1097.76	236.21	0.54
Williamson Ck	Upper	58533 K	1%	EX	11950.40	683.83	695.66	693.38	696.56	0.007755	7.59	1574.73	273.97	0.56
Williamson Ck	Upper	58533 K	1%	PROP	10928.50	683.83	695.33	693.10	696.17	0.007557	7.36	1485.48	265.51	0.55
Williamson Ck	Upper	57960 J	10%	EX	5144.70	681.08	688.84	686.96	689.31	0.006159	5.51	934.47	221.45	0.47
Williamson Ck	Upper	57960 J	10%	PROP	4808.20	681.08	688.61	686.85	689.07	0.006355	5.45	882.74	217.62	0.48
Williamson Ck	Upper	57960 J	4%	EX	7875.20	681.08	690.45	687.93	691.01	0.005450	6.01	1311.34	262.98	0.46
Williamson Ck	Upper	57960 J	4%	PROP	7259.70	681.08	690.13	687.72	690.67	0.005492	5.88	1233.71	242.81	0.46

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	57960 J	1%	EX	11950.40	681.08	692.16	689.14	692.82	0.005276	6.61	1950.17	475.32	0.47
Williamson Ck	Upper	57960 J	1%	PROP	10928.50	681.08	691.81	688.85	692.45	0.005408	6.44	1792.19	442.17	0.47
Williamson Ck	Upper	57442 I	10%	EX	5144.70	673.04	684.81		685.18	0.010675	4.91	1048.62	181.14	0.36
Williamson Ck	Upper	57442 I	10%	PROP	4808.20	673.04	684.55		684.91	0.010391	4.80	1002.72	175.62	0.35
Williamson Ck	Upper	57442 I	4%	EX	7875.20	673.04	686.45		686.95	0.012240	5.72	1391.39	249.84	0.39
Williamson Ck	Upper	57442 I	4%	PROP	7259.70	673.04	686.14		686.61	0.012083	5.54	1316.98	233.17	0.39
Williamson Ck	Upper	57442 I	1%	EX	11950.40	673.04	688.00		688.72	0.013323	6.88	1844.12	341.59	0.43
Williamson Ck	Upper	57442 I	1%	PROP	10928.50	673.04	687.66		688.33	0.013013	6.61	1732.34	319.74	0.42
Williamson Ck	Upper	57095	10%	EX	5144.70	672.25	680.17		680.93	0.013937	7.00	734.49	224.10	0.68
Williamson Ck	Upper	57095	10%	PROP	4808.20	672.25	680.04		680.76	0.013647	6.81	705.81	221.00	0.67
Williamson Ck	Upper	57095	4%	EX	7875.20	672.25	681.12		682.17	0.015220	8.21	958.89	246.24	0.73
Williamson Ck	Upper	57095	4%	PROP	7259.70	672.25	680.93		681.91	0.014953	7.97	911.28	241.70	0.72
Williamson Ck	Upper	57095	1%	EX	11950.40	672.25	682.30		683.69	0.015377	9.48	1265.08	276.14	0.76
Williamson Ck	Upper	57095	1%	PROP	10928.50	672.25	682.00		683.33	0.015607	9.24	1185.03	268.51	0.76
Williamson Ck	Upper	56824 H	10%	EX	5144.70	669.06	677.92	676.65	678.39	0.006435	5.97	1021.16	343.96	0.49
Williamson Ck	Upper	56824 H	10%	PROP	4808.20	669.06	677.73	676.26	678.20	0.006664	5.93	957.27	337.74	0.49
Williamson Ck	Upper	56824 H	4%	EX	7875.20	669.06	679.13	677.39	679.66	0.005721	6.42	1464.58	385.56	0.48
Williamson Ck	Upper	56824 H	4%	PROP	7259.70	669.06	678.87	677.28	679.39	0.005894	6.35	1364.32	376.76	0.48
Williamson Ck	Upper	56824 H	1%	EX	11950.40	669.06	680.68	678.57	681.23	0.005137	6.66	2101.23	476.64	0.46
Williamson Ck	Upper	56824 H	1%	PROP	10928.50	669.06	680.31	678.36	680.87	0.005182	6.69	1939.78	425.61	0.46
Williamson Ck	Upper	56416	10%	EX	5144.70	663.03	675.14	673.26	675.71	0.006940	6.16	879.65	337.23	0.50
Williamson Ck	Upper	56416	10%	PROP	4808.20	663.03	675.08	673.10	675.60	0.006331	5.84	866.32	335.39	0.48
Williamson Ck	Upper	56416	4%	EX	7875.20	663.03	676.41	674.63	677.15	0.006888	7.10	1189.90	383.10	0.52
Williamson Ck	Upper	56416	4%	PROP	7259.70	663.03	676.32	674.41	676.97	0.006201	6.68	1165.89	379.58	0.49
Williamson Ck	Upper	56416	1%	EX	11950.40	663.03	677.93	675.85	678.87	0.006876	8.14	1594.63	471.75	0.54
Williamson Ck	Upper	56416	1%	PROP	10928.50	663.03	677.78	675.58	678.61	0.006179	7.63	1554.62	466.76	0.51
Williamson Ck	Upper	55940 G	10%	EX	10592.50	659.79	673.23	669.93	673.65	0.003533	5.65	2607.73	719.75	0.36
Williamson Ck	Upper	55940 G	10%	PROP	10476.90	659.79	673.19	669.88	673.61	0.003543	5.64	2578.31	718.88	0.36
Williamson Ck	Upper	55940 G	4%	EX	15374.20	659.79	674.67	671.32	675.13	0.003356	6.17	3666.14	751.78	0.36
Williamson Ck	Upper	55940 G	4%	PROP	15053.30	659.79	674.58	671.13	675.04	0.003366	6.14	3599.47	749.59	0.36
Williamson Ck	Upper	55940 G	1%	EX	22355.90	659.79	676.19	673.15	676.75	0.003515	7.00	4853.04	802.28	0.38
Williamson Ck	Upper	55940 G	1%	PROP	21678.30	659.79	676.04	672.88	676.59	0.003527	6.94	4731.48	797.30	0.38
Williamson Ck	Upper	55450	10%	EX	10592.50	658.15	670.66	668.03	671.39	0.006316	7.09	1797.43	557.93	0.48
Williamson Ck	Upper	55450	10%	PROP	10476.90	658.15	670.60	667.97	671.32	0.006427	7.10	1768.80	546.83	0.48
Williamson Ck	Upper	55450	4%	EX	15374.20	658.15	672.05	669.86	672.93	0.006327	8.02	2419.21	685.54	0.49
Williamson Ck	Upper	55450	4%	PROP	15053.30	658.15	671.97	669.40	672.83	0.006331	7.96	2378.66	678.15	0.49
Williamson Ck	Upper	55450	1%	EX	22355.90	658.15	674.11	671.27	674.84	0.004522	7.86	4303.42	769.65	0.43
Williamson Ck	Upper	55450	1%	PROP	21678.30	658.15	673.93	671.15	674.66	0.004615	7.84	4161.92	764.79	0.43
Williamson Ck	Upper	55338	10%	EX	10592.50	657.75	669.63	667.86	670.52	0.008895	7.88	1575.60	438.71	0.55
Williamson Ck	Upper	55338	10%	PROP	10476.90	657.75	669.51	667.82	670.43	0.009343	7.99	1531.87	424.66	0.57
Williamson Ck	Upper	55338	4%	EX	15374.20	657.75	670.92	669.32	672.04	0.009057	9.01	2065.59	564.74	0.58
Williamson Ck	Upper	55338	4%	PROP	15053.30	657.75	670.84	669.24	671.94	0.009058	8.95	2033.43	556.67	0.58
Williamson Ck	Upper	55338	1%	EX	22355.90	657.75	673.45	670.64	674.28	0.005259	8.32	4011.94	770.06	0.46
Williamson Ck	Upper	55338	1%	PROP	21678.30	657.75	673.24	670.53	674.08	0.005449	8.35	3848.75	762.94	0.47
Williamson Ck	Upper	55296 PRIVATE DR			Culvert									
Williamson Ck	Upper	55243 F	10%	EX	10592.50	657.53	669.08	666.51	669.73	0.006089	6.80	1825.92	333.80	0.47
Williamson Ck	Upper	55243 F	10%	PROP	10476.90	657.53	669.03	666.50	669.67	0.006122	6.80	1807.50	332.53	0.47
Williamson Ck	Upper	55243 F	4%	EX	15374.20	657.53	671.17	667.70	671.81	0.004899	6.94	2879.26	658.71	0.43
Williamson Ck	Upper	55243 F	4%	PROP	15053.30	657.53	671.02	667.64	671.71	0.005201	7.09	2530.44	639.23	0.44
Williamson Ck	Upper	55243 F	1%	EX	22355.90	657.53	673.52	669.21	674.13	0.003895	7.05	4505.78	713.50	0.38
Williamson Ck	Upper	55243 F	1%	PROP	21678.30	657.53	673.32	669.08	673.92	0.003957	7.03	4361.42	710.05	0.39
Williamson Ck	Upper	55074	10%	EX	10592.50	655.24	668.80	664.82	669.23	0.001377	5.31	2087.25	379.58	0.34
Williamson Ck	Upper	55074	10%	PROP	10476.90	655.24	668.74	664.79	669.17	0.001384	5.29	2065.65	375.87	0.34
Williamson Ck	Upper	55074	4%	EX	15374.20	655.24	671.02	665.97	671.42	0.000992	5.33	3450.37	732.80	0.30
Williamson Ck	Upper	55074	4%	PROP	15053.30	655.24	670.89	665.91	671.29	0.001016	5.34	3353.61	726.29	0.30
Williamson Ck	Upper	55074	1%	EX	22355.90	655.24	673.49	667.48	673.82	0.000681	5.11	5361.31	810.88	0.26
Williamson Ck	Upper	55074	1%	PROP	21678.30	655.24	673.28	667.31	673.61	0.000699	5.12	5191.87	805.93	0.26
Williamson Ck	Upper	55041 PRIVATE DR			Culvert									
Williamson Ck	Upper	55001 E	10%	EX	10592.50	655.49	668.69	664.63	669.05	0.004323	4.85	2292.00	414.79	0.31
Williamson Ck	Upper	55001 E	10%	PROP	10476.90	655.49	668.63	664.61	668.99	0.004349	4.84	2266.97	409.51	0.32
Williamson Ck	Upper	55001 E	4%	EX	15374.20	655.49	670.92	665.69	671.28	0.003347	5.02	3757.27	781.40	0.29
Williamson Ck	Upper	55001 E	4%	PROP	15053.30	655.49	670.79	665.61	671.15	0.003406	5.02	3653.88	776.96	0.29
Williamson Ck	Upper	55001 E	1%	EX	22355.90	655.49	673.37	667.04	673.71	0.002595	5.10	5818.21	902.00	0.26
Williamson Ck	Upper	55001 E	1%	PROP	21678.30	655.49	673.17	666.91	673.51	0.002628	5.08	5639.04	885.55	0.26
Williamson Ck	Upper	54897 D	10%	EX	10592.50	654.26	668.44	663.29	668.69	0.002377	4.08	2847.49	672.63	0.26
Williamson Ck	Upper	54897 D	10%	PROP	10476.90	654.26	668.38	663.24	668.63	0.002394	4.08	2804.81	670.83	0.26
Williamson Ck	Upper	54897 D	4%	EX	15374.20	654.26	670.73	664.52	670.98	0.001886	4.20	4478.08	771.33	0.23
Williamson Ck	Upper	54897 D	4%	PROP	15053.30	654.26	670.60	664.47	670.85	0.001906	4.19	4375.93	761.50	0.23
Williamson Ck	Upper	54897 D	1%	EX	22355.90	654.26	673.20	665.84	673.45	0.001631	4.45	6610.39	963.69	0.22
Williamson Ck	Upper	54897 D	1%	PROP	21678.30	654.26	672.99	665.72	673.25	0.001641	4.42	6423.83	952.34	0.22
Williamson Ck	Upper	54416	10%	EX	10592.50	648.40	667.37		667.73	0.001683	4.86	2270.37	253.90	0.26
Williamson Ck	Upper	54416	10%	PROP	10476.90	648.40	667.31		667.67	0.001676	4.84	2255.13	252.15	0.26
Williamson Ck	Upper	54416	4%	EX	15374.20	648.40	669.51		670.03	0.001965	5.83	2892.98	347.05	0.29
Williamson Ck	Upper	54416	4%	PROP	15053.30	648.40	669.39		669.89	0.001946	5.77	2850.53	340.53	0.28
Williamson Ck	Upper	54416	1%	EX	22355.90	648.40	671.76		672.48	0.002345	6.98	3831.02	482.43	0.32
Williamson Ck	Upper	54416	1%	PROP	21678.30	648.40	671.58		672.28	0.002310	6.88	3744.46	476.17	0.32
Williamson Ck	Upper	53998 C	10%	EX	10592.50	648.01	665.94		666.67	0.003898	7.06	1737.36	255.63	0.39
Williamson Ck	Upper	53998 C	10%	PROP	10476.90	648.01	665.89		666.61	0.003881	7.02	1723.70	254.58	0.39
Williamson Ck	Upper	53998 C	4%	EX	15374.20	648.01	667.79		668.78	0.004645	8.35	2268.18	324.20	0.44
Williamson Ck	Upper	53998 C	4%	PROP	15053.30	648.01	667.68		668.66	0.004600	8.27	2233.83	321.63	0.43
Williamson Ck	Upper	53998 C	1%	EX	22355.90	648.01	669.52		670.94	0.006028	10.15	2892.71	411.85	0.50
Williamson Ck	Upper	53998 C	1%	PROP	21678.30	648.01	669.40		670.78	0.005850	9.96	2844.93	404.57	0.50
Williamson Ck	Upper	53431	10%	EX	10592.50	645.99	664.60	659.49	664.93	0.002287	5.00	2976.16	639.18	0.30
Williamson Ck	Upper	53431	10%	PROP	10476.90	645.99	664.54	659.42	664.86	0.002308	5.00	2938.14	636.49	0.30

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	53431	4%	EX	15374.20	645.99	666.60	661.66	666.95	0.002076	5.41	4284.82	951.38	0.29
Williamson Ck	Upper	53431	4%	PROP	15053.30	645.99	666.51	661.57	666.85	0.002049	5.34	4215.39	869.41	0.29
Williamson Ck	Upper	53431	1%	EX	22355.90	645.99	667.81	663.11	668.39	0.003064	7.03	5719.67	1366.06	0.36
Williamson Ck	Upper	53431	1%	PROP	21678.30	645.99	667.69	662.98	668.27	0.003060	6.98	5552.10	1359.21	0.36
Williamson Ck	Upper	53430			Lat Struct									
Williamson Ck	Upper	53313	10%	EX	10592.50	644.73	664.34	658.75	664.69	0.002153	5.18	2880.48	606.37	0.31
Williamson Ck	Upper	53313	10%	PROP	10476.90	644.73	664.27	658.69	664.62	0.002161	5.17	2843.80	597.94	0.31
Williamson Ck	Upper	53313	4%	EX	15374.20	644.73	666.38	660.57	666.74	0.002020	5.51	4312.45	1155.92	0.30
Williamson Ck	Upper	53313	4%	PROP	15053.30	644.73	666.29	660.49	666.64	0.001991	5.45	4239.78	1100.23	0.30
Williamson Ck	Upper	53313	1%	EX	22355.90	644.73	667.51	663.00	668.08	0.002961	7.00	5763.06	1315.83	0.36
Williamson Ck	Upper	53313	1%	PROP	21678.30	644.73	667.38	662.90	667.95	0.002953	6.96	5599.64	1311.64	0.36
Williamson Ck	Upper	53312			Lat Struct									
Williamson Ck	Upper	53274 B	10%	EX	10592.50	643.92	664.20	657.82	664.59	0.002099	5.36	2714.64	589.45	0.30
Williamson Ck	Upper	53274 B	10%	PROP	10476.90	643.92	664.13	657.77	664.52	0.002101	5.34	2681.31	579.27	0.30
Williamson Ck	Upper	53274 B	4%	EX	15374.20	643.92	666.20	659.64	666.63	0.002080	5.91	4078.27	1212.33	0.30
Williamson Ck	Upper	53274 B	4%	PROP	15053.30	643.92	666.11	659.52	666.54	0.002037	5.82	4015.19	1179.87	0.30
Williamson Ck	Upper	53274 B	1%	EX	22355.90	643.92	667.22	662.73	667.91	0.003112	7.58	5324.57	1269.02	0.37
Williamson Ck	Upper	53274 B	1%	PROP	21678.30	643.92	667.11	662.58	667.79	0.003088	7.51	5175.06	1261.60	0.37
Williamson Ck	Upper	53273			Lat Struct									
Williamson Ck	Upper	53127	10%	EX	10592.50	644.66	663.89	657.50	664.28	0.002099	5.33	2654.17	527.86	0.30
Williamson Ck	Upper	53127	10%	PROP	10476.90	644.66	663.83	657.46	664.21	0.002104	5.32	2625.98	524.09	0.30
Williamson Ck	Upper	53127	4%	EX	15374.20	644.66	665.71	660.22	666.28	0.002647	6.51	3766.87	1135.97	0.34
Williamson Ck	Upper	53127	4%	PROP	15053.30	644.66	665.62	659.62	666.19	0.002646	6.49	3663.32	1119.27	0.34
Williamson Ck	Upper	53127	1%	EX	22355.90	644.66	666.62	662.32	667.40	0.003696	8.00	4829.91	1200.35	0.40
Williamson Ck	Upper	53127	1%	PROP	21678.30	644.66	666.51	662.17	667.29	0.003652	7.92	4699.04	1194.16	0.40
Williamson Ck	Upper	53126			Lat Struct									
Williamson Ck	Upper	52920	10%	EX	10592.50	644.15	663.40		663.81	0.002492	5.44	2540.60	600.56	0.32
Williamson Ck	Upper	52920	10%	PROP	10476.90	644.15	663.33		663.75	0.002509	5.44	2503.63	595.25	0.32
Williamson Ck	Upper	52920	4%	EX	15374.20	644.15	665.21		665.73	0.002676	6.26	4041.99	1319.59	0.34
Williamson Ck	Upper	52920	4%	PROP	15053.30	644.15	665.11		665.63	0.002698	6.25	3913.92	1318.24	0.34
Williamson Ck	Upper	52920	1%	EX	22355.90	644.15	665.83		666.62	0.004110	8.01	4875.75	1373.29	0.42
Williamson Ck	Upper	52920	1%	PROP	21678.30	644.15	665.72		666.51	0.004079	7.94	4731.17	1366.45	0.42
Williamson Ck	Upper	52919			Lat Struct									
Williamson Ck	Upper	52815 A	10%	EX	10592.50	644.33	663.16		663.54	0.002444	5.27	2608.70	548.08	0.31
Williamson Ck	Upper	52815 A	10%	PROP	10476.90	644.33	663.09		663.47	0.002454	5.27	2576.15	524.58	0.31
Williamson Ck	Upper	52815 A	4%	EX	15374.20	644.33	665.00		665.40	0.002429	5.70	4513.61	1301.20	0.30
Williamson Ck	Upper	52815 A	4%	PROP	15053.30	644.33	664.90		665.31	0.002450	5.70	4383.63	1297.68	0.31
Williamson Ck	Upper	52815 A	1%	EX	22355.90	644.33	665.47		666.13	0.004058	7.52	5133.01	1359.08	0.39
Williamson Ck	Upper	52815 A	1%	PROP	21678.30	644.33	665.37		666.03	0.004013	7.44	4996.21	1337.62	0.39
Williamson Ck	Upper	52814			Lat Struct									
Williamson Ck	Upper	52758	10%	EX	10592.50	644.11	663.17	655.70	663.41	0.000617	4.55	3282.98	908.44	0.23
Williamson Ck	Upper	52758	10%	PROP	10476.90	644.11	663.09	655.63	663.34	0.000629	4.58	3222.19	896.66	0.24
Williamson Ck	Upper	52758	4%	EX	15374.20	644.11	665.06	658.13	665.24	0.000472	4.19	5542.64	1415.64	0.21
Williamson Ck	Upper	52758	4%	PROP	15053.30	644.11	664.96	658.01	665.14	0.000476	4.20	5402.76	1401.65	0.21
Williamson Ck	Upper	52758	1%	EX	22355.90	644.11	665.57	662.49	665.86	0.000761	5.42	6279.09	1446.62	0.27
Williamson Ck	Upper	52758	1%	PROP	21678.30	644.11	665.47	662.39	665.76	0.000756	5.37	6131.24	1445.61	0.26
Williamson Ck	Upper	52709 WEST GATE BLVD			Bridge									
Williamson Ck	Upper	52658	10%	EX	10592.50	644.17	660.98	655.31	661.84	0.004158	7.47	1552.94	445.10	0.41
Williamson Ck	Upper	52658	10%	PROP	10476.90	644.17	660.93	655.23	661.78	0.004131	7.43	1536.35	435.63	0.41
Williamson Ck	Upper	52658	4%	EX	15374.20	644.17	662.63	657.50	663.69	0.005037	8.48	2450.43	993.61	0.47
Williamson Ck	Upper	52658	4%	PROP	15053.30	644.17	662.58	657.36	663.62	0.004947	8.38	2397.61	979.75	0.47
Williamson Ck	Upper	52658	1%	EX	22355.90	644.17	664.13	660.88	665.18	0.005053	9.13	4355.53	1364.84	0.47
Williamson Ck	Upper	52658	1%	PROP	21678.30	644.17	664.00	659.66	665.06	0.005080	9.09	4180.03	1361.89	0.47
Williamson Ck	Upper	52657			Lat Struct									
Williamson Ck	Upper	52513	10%	EX	10592.50	645.65	659.81		660.96	0.007190	8.98	1449.74	370.22	0.51
Williamson Ck	Upper	52513	10%	PROP	10476.90	645.65	659.76		660.91	0.007177	8.95	1434.74	357.24	0.51
Williamson Ck	Upper	52513	4%	EX	15374.20	645.65	661.62	659.23	662.80	0.006754	9.65	2601.38	1048.50	0.50
Williamson Ck	Upper	52513	4%	PROP	15053.30	645.65	661.52	659.11	662.72	0.006808	9.64	2508.81	1023.98	0.50
Williamson Ck	Upper	52513	1%	EX	22355.90	645.65	663.38		664.36	0.005623	9.69	4495.34	1313.90	0.47
Williamson Ck	Upper	52513	1%	PROP	21678.30	645.65	663.24		664.23	0.005696	9.68	4336.89	1305.89	0.47
Williamson Ck	Upper	52237	10%	EX	10592.50	642.55	658.71	654.14	659.40	0.003902	7.13	2216.12	628.08	0.40
Williamson Ck	Upper	52237	10%	PROP	10476.90	642.55	658.66	654.08	659.35	0.003910	7.12	2187.07	624.93	0.40
Williamson Ck	Upper	52237	4%	EX	15374.20	642.55	660.65	656.96	661.34	0.003564	7.58	3617.64	1032.67	0.39
Williamson Ck	Upper	52237	4%	PROP	15053.30	642.55	660.56	656.75	661.25	0.003563	7.54	3540.51	1023.15	0.39
Williamson Ck	Upper	52237	1%	EX	22355.90	642.55	662.38	659.18	663.07	0.003550	8.21	5614.10	1266.15	0.39
Williamson Ck	Upper	52237	1%	PROP	21678.30	642.55	662.22	659.09	662.93	0.003615	8.23	5413.51	1265.75	0.39
Williamson Ck	Upper	52236			Lat Struct									
Williamson Ck	Upper	52114	10%	EX	10592.50	642.38	658.13		658.76	0.006630	6.70	1942.00	774.56	0.40
Williamson Ck	Upper	52114	10%	PROP	10476.90	642.38	658.08		658.71	0.006650	6.68	1920.89	765.73	0.40
Williamson Ck	Upper	52114	4%	EX	15374.20	642.38	660.24		660.78	0.004891	6.64	3801.83	1119.65	0.35
Williamson Ck	Upper	52114	4%	PROP	15053.30	642.38	660.14		660.68	0.004977	6.66	3688.06	1115.41	0.36
Williamson Ck	Upper	52114	1%	EX	22355.90	642.38	662.12		662.54	0.003696	6.42	5949.12	1147.29	0.32
Williamson Ck	Upper	52114	1%	PROP	21678.30	642.38	661.96		662.38	0.003768	6.43	5764.72	1146.75	0.32
Williamson Ck	Upper	52113			Lat Struct									
Williamson Ck	Upper	51898	10%	EX	10592.50	641.58	656.38		657.19	0.007906	7.41	1618.46	499.09	0.45
Williamson Ck	Upper	51898	10%	PROP	10476.90	641.58	656.33		657.13	0.007897	7.38	1605.12	494.69	0.44
Williamson Ck	Upper	51898	4%	EX	15374.20	641.58	658.49		659.43	0.007689	8.20	2438.03	706.94	0.45
Williamson Ck	Upper	51898	4%	PROP	15053.30	641.58	658.37		659.31	0.007791	8.19	2354.70	706.38	0.45
Williamson Ck	Upper	51898	1%	EX	22355.90	641.58	660.68		661.49	0.005980	8.21	3996.30	716.91	0.41

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Upper	51898	1%	PROP	21678.30	641.58	660.50		661.32	0.006060	8.19	3870.91	716.15	0.41
Williamson Ck	Upper	51897			Lat Struct									
Williamson Ck	Upper	51402	10%	EX	10592.50	638.74	654.37		654.77	0.003035	5.55	2322.54	337.22	0.32
Williamson Ck	Upper	51402	10%	PROP	10476.90	638.74	654.33		654.73	0.003021	5.53	2307.75	336.90	0.32
Williamson Ck	Upper	51402	4%	EX	15374.20	638.74	656.63		657.08	0.002882	5.99	3103.48	378.66	0.32
Williamson Ck	Upper	51402	4%	PROP	15053.30	638.74	656.52		656.97	0.002864	5.94	3062.67	354.28	0.31
Williamson Ck	Upper	51402	1%	EX	22355.90	638.74	658.74		659.32	0.003159	6.85	4123.25	499.96	0.33
Williamson Ck	Upper	51402	1%	PROP	21678.30	638.74	658.59		659.15	0.003110	6.75	4046.13	499.27	0.33
Williamson Ck	Upper	51401			Lat Struct									
Williamson Ck	Upper	51050	10%	EX	10592.50	638.40	653.68		653.95	0.001680	4.41	2638.68	328.69	0.25
Williamson Ck	Upper	51050	10%	PROP	10476.90	638.40	653.64		653.91	0.001667	4.38	2625.92	327.57	0.25
Williamson Ck	Upper	51050	4%	EX	15374.20	638.40	655.95		656.29	0.001648	4.99	3428.19	353.20	0.25
Williamson Ck	Upper	51050	4%	PROP	15053.30	638.40	655.85		656.18	0.001632	4.94	3391.02	352.88	0.25
Williamson Ck	Upper	51050	1%	EX	22355.90	638.40	657.92		658.42	0.001993	6.06	4129.98	359.24	0.29
Williamson Ck	Upper	51050	1%	PROP	21678.30	638.40	657.79		658.26	0.001941	5.94	4082.23	358.84	0.28
Williamson Ck	Upper	51049			Lat Struct									
Williamson Ck	Upper	50915	10%	EX	10592.50	638.16	653.60		653.76	0.000879	3.33	3424.82	368.54	0.18
Williamson Ck	Upper	50915	10%	PROP	10476.90	638.16	653.56		653.71	0.000870	3.31	3410.67	368.43	0.18
Williamson Ck	Upper	50915	4%	EX	15374.20	638.16	655.88		656.09	0.000942	3.91	4271.16	375.19	0.19
Williamson Ck	Upper	50915	4%	PROP	15053.30	638.16	655.77		655.98	0.000929	3.86	4231.93	374.89	0.19
Williamson Ck	Upper	50915	1%	EX	22355.90	638.16	657.83		658.16	0.001218	4.86	5010.23	380.81	0.22
Williamson Ck	Upper	50915	1%	PROP	21678.30	638.16	657.70		658.01	0.001181	4.76	4960.49	380.44	0.22
Williamson Ck	Upper	50914			Lat Struct									
Williamson Ck	Upper	50574	10%	EX	11262.10	637.58	652.72		653.24	0.002476	5.76	1953.69	187.39	0.31
Williamson Ck	Upper	50574	10%	PROP	11201.30	637.58	652.68		653.20	0.002473	5.75	1946.92	187.13	0.31
Williamson Ck	Upper	50574	4%	EX	16391.30	637.58	654.77		655.50	0.002886	6.89	2523.66	379.10	0.35
Williamson Ck	Upper	50574	4%	PROP	16009.00	637.58	654.70		655.40	0.002817	6.79	2494.39	378.90	0.34
Williamson Ck	Upper	50574	1%	EX	24439.00	637.58	656.19		657.35	0.004210	8.85	3061.97	382.67	0.43
Williamson Ck	Upper	50574	1%	PROP	23857.30	637.58	656.09		657.22	0.004125	8.73	3025.71	382.43	0.42
Williamson Ck	Upper	50573			Lat Struct									
Williamson Ck	Upper	50403	10%	EX	11262.10	636.42	652.33	645.64	652.85	0.002075	5.79	1946.05	186.71	0.31
Williamson Ck	Upper	50403	10%	PROP	11201.30	636.42	652.29	645.62	652.81	0.002075	5.78	1939.35	186.05	0.31
Williamson Ck	Upper	50403	4%	EX	16391.30	636.42	654.27	647.36	655.04	0.002495	7.07	2387.54	460.64	0.36
Williamson Ck	Upper	50403	4%	PROP	16009.00	636.42	654.21	647.24	654.95	0.002420	6.94	2369.70	439.42	0.35
Williamson Ck	Upper	50403	1%	EX	24439.00	636.42	655.34	649.64	656.65	0.003920	9.36	2984.08	656.32	0.45
Williamson Ck	Upper	50403	1%	PROP	23857.30	636.42	655.27	649.48	656.54	0.003815	9.20	2948.46	631.05	0.44
Williamson Ck	Upper	50284	10%	EX	11262.10	635.36	652.29	644.40	652.62	0.000756	4.89	2702.15	612.55	0.24
Williamson Ck	Upper	50284	10%	PROP	11201.30	635.36	652.25	644.38	652.58	0.000759	4.89	2685.76	605.08	0.24
Williamson Ck	Upper	50284	4%	EX	16391.30	635.36	654.34	646.18	654.68	0.000702	5.20	4152.97	790.28	0.24
Williamson Ck	Upper	50284	4%	PROP	16009.00	635.36	654.28	646.06	654.61	0.000687	5.13	4102.16	789.38	0.23
Williamson Ck	Upper	50284	1%	EX	24439.00	635.36	655.54	648.47	656.04	0.000980	6.47	5103.74	799.24	0.28
Williamson Ck	Upper	50284	1%	PROP	23857.30	635.36	655.46	648.32	655.95	0.000962	6.39	5040.92	798.88	0.28
Williamson Ck	Upper	50227 JONES RD			Bridge									
Williamson Ck	Upper	50177	10%	EX	11262.10	636.27	649.67	645.31	650.62	0.004400	7.81	1443.28	207.30	0.45
Williamson Ck	Upper	50177	10%	PROP	11201.30	636.27	649.65	645.29	650.59	0.004388	7.79	1439.45	196.74	0.45
Williamson Ck	Upper	50177	4%	EX	16391.30	636.27	651.32	647.09	652.69	0.005223	9.48	1877.06	727.72	0.50
Williamson Ck	Upper	50177	4%	PROP	16009.00	636.27	651.23	646.98	652.57	0.005147	9.36	1848.04	710.52	0.50
Williamson Ck	Upper	50177	1%	EX	24439.00	636.27	652.88	649.51	654.72	0.006350	11.42	3066.69	800.55	0.57
Williamson Ck	Upper	50177	1%	PROP	23857.30	636.27	652.79	649.36	654.60	0.006290	11.30	2988.80	795.30	0.56
Williamson Ck	Upper	50176			Lat Struct									
Williamson Ck	Upper	50085	10%	EX	11262.10	636.70	649.40	645.89	650.08	0.004299	6.62	1785.94	564.21	0.43
Williamson Ck	Upper	50085	10%	PROP	11201.30	636.70	649.38	645.86	650.05	0.004302	6.61	1777.37	551.06	0.43
Williamson Ck	Upper	50085	4%	EX	16391.30	636.70	651.27	647.43	651.96	0.003550	7.00	3256.58	847.43	0.41
Williamson Ck	Upper	50085	4%	PROP	16009.00	636.70	651.16	647.32	651.85	0.003570	6.96	3165.03	840.69	0.41
Williamson Ck	Upper	50085	1%	EX	24439.00	636.70	652.96	649.38	653.77	0.003656	7.95	4752.25	920.33	0.42
Williamson Ck	Upper	50085	1%	PROP	23857.30	636.70	652.86	649.24	653.66	0.003640	7.88	4657.56	916.09	0.42
Williamson Ck	Upper	50084			Lat Struct									
Williamson Ck	Upper	50003	10%	EX	11262.10	635.20	649.24	645.57	649.73	0.003107	5.82	2289.03	687.30	0.37
Williamson Ck	Upper	50003	10%	PROP	11201.30	635.20	649.21	645.55	649.71	0.003117	5.82	2271.24	684.37	0.37
Williamson Ck	Upper	50003	4%	EX	16391.30	635.20	651.17	646.96	651.66	0.002488	6.05	3809.03	865.27	0.34
Williamson Ck	Upper	50003	4%	PROP	16009.00	635.20	651.06	646.86	651.55	0.002499	6.02	3714.63	858.56	0.34
Williamson Ck	Upper	50003	1%	EX	24439.00	635.20	652.86	649.08	653.46	0.002640	6.95	5327.87	932.88	0.36
Williamson Ck	Upper	50003	1%	PROP	23857.30	635.20	652.76	648.97	653.35	0.002623	6.88	5232.51	929.35	0.36
Williamson Ck	Upper	50002			Lat Struct									
Williamson Ck	Upper	49934	10%	EX	11262.10	634.20	648.75		649.46	0.004324	6.82	1921.91	687.09	0.44
Williamson Ck	Upper	49934	10%	PROP	11201.30	634.20	648.73		649.43	0.004339	6.82	1903.40	685.24	0.44
Williamson Ck	Upper	49934	4%	EX	16391.30	634.20	650.81		651.44	0.003207	6.89	3559.05	899.76	0.39
Williamson Ck	Upper	49934	4%	PROP	16009.00	634.20	650.69		651.33	0.003230	6.86	3458.50	889.78	0.39
Williamson Ck	Upper	49934	1%	EX	24439.00	634.20	652.50		653.23	0.003288	7.76	5143.15	970.32	0.41
Williamson Ck	Upper	49934	1%	PROP	23857.30	634.20	652.40		653.12	0.003271	7.70	5045.27	966.37	0.40
Williamson Ck	Upper	49820	10%	EX	11262.10	631.20	647.93	644.52	648.90	0.005294	7.91	1510.36	654.23	0.48
Williamson Ck	Upper	49820	10%	PROP	11201.30	631.20	647.91	644.50	648.87	0.005286	7.89	1503.29	648.78	0.48
Williamson Ck	Upper	49820	4%	EX	16391.30	631.20	649.87	646.07	650.94	0.004935	8.68	2770.41	975.10	0.47
Williamson Ck	Upper	49820	4%	PROP	16009.00	631.20	649.74	645.96	650.83	0.005002	8.68	2648.54	950.04	0.47
Williamson Ck	Upper	49820	1%	EX	24439.00	631.20	651.65	648.75	652.72	0.004740	9.38	4646.55	1102.19	0.47
Williamson Ck	Upper	49820	1%	PROP	23857.30	631.20	651.54	648.52	652.61	0.004750	9.34	4526.65	1098.92	0.47
Williamson Ck	Lower	49429.	10%	EX	11437.20	630.30	646.42	642.08	647.08	0.003764	6.56	1743.65	352.23	0.41
Williamson Ck	Lower	49429.	10%	PROP	11388.30	630.30	646.39	642.07	647.06	0.003762	6.55	1738.75	343.42	0.41
Williamson Ck	Lower	49429.	4%	EX	16636.40	630.30	648.31	643.65	649.17	0.003945	7.51	2470.74	931.28	0.43

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	49429.	4%	PROP	16263.10	630.30	648.19	643.56	649.03	0.003934	7.45	2416.89	887.62	0.43
Williamson Ck	Lower	49429.	1%	EX	24849.20	630.30	650.26	645.71	651.06	0.003505	7.82	5161.46	1188.23	0.42
Williamson Ck	Lower	49429.	1%	PROP	24299.30	630.30	650.15	645.60	650.95	0.003514	7.79	5028.97	1178.22	0.42
Williamson Ck	Lower	48993.	10%	EX	11437.20	631.00	644.51	640.69	645.27	0.004575	7.00	1634.73	312.37	0.45
Williamson Ck	Lower	48993.	10%	PROP	11388.30	631.00	644.49	640.67	645.25	0.004571	6.99	1630.27	295.55	0.45
Williamson Ck	Lower	48993.	4%	EX	16636.40	631.00	646.37	642.25	647.31	0.004554	7.88	2532.25	873.50	0.46
Williamson Ck	Lower	48993.	4%	PROP	16263.10	631.00	646.25	642.13	647.18	0.004562	7.83	2425.40	799.47	0.46
Williamson Ck	Lower	48993.	1%	EX	24849.20	631.00	648.74	644.35	649.52	0.003490	7.84	5372.06	1325.05	0.42
Williamson Ck	Lower	48993.	1%	PROP	24299.30	631.00	648.60	644.22	649.40	0.003546	7.85	5194.24	1312.85	0.42
Williamson Ck	Lower	48448.	10%	EX	11437.20	628.03	643.47	637.53	643.77	0.001572	4.37	2723.15	543.47	0.27
Williamson Ck	Lower	48448.	10%	PROP	11388.30	628.03	643.45	637.51	643.74	0.001572	4.37	2711.44	541.00	0.27
Williamson Ck	Lower	48448.	4%	EX	16636.40	628.03	645.44	638.84	645.80	0.001572	4.95	3938.41	763.87	0.28
Williamson Ck	Lower	48448.	4%	PROP	16263.10	628.03	645.31	638.73	645.67	0.001568	4.91	3850.17	688.73	0.28
Williamson Ck	Lower	48448.	1%	EX	24849.20	628.03	647.98	640.54	648.36	0.001380	5.29	7189.90	1527.60	0.27
Williamson Ck	Lower	48448.	1%	PROP	24299.30	628.03	647.83	640.43	648.21	0.001401	5.29	6959.69	1517.38	0.27
Williamson Ck	Lower	47988.	10%	EX	11437.20	626.00	641.34	638.30	642.33	0.007592	7.99	1433.38	249.38	0.56
Williamson Ck	Lower	47988.	10%	PROP	11388.30	626.00	641.32	638.27	642.31	0.007613	7.98	1428.07	247.34	0.56
Williamson Ck	Lower	47988.	4%	EX	16636.40	626.00	643.32	640.24	644.46	0.006361	8.63	2103.86	366.92	0.53
Williamson Ck	Lower	47988.	4%	PROP	16263.10	626.00	643.20	640.12	644.32	0.006408	8.58	2058.98	365.18	0.53
Williamson Ck	Lower	47988.	1%	EX	24849.20	626.00	645.96	642.56	647.22	0.005268	9.30	3348.03	837.01	0.51
Williamson Ck	Lower	47988.	1%	PROP	24299.30	626.00	645.79	642.42	647.05	0.005345	9.27	3245.17	776.57	0.51
Williamson Ck	Lower	47525.	10%	EX	11437.20	628.00	639.71		640.16	0.002818	5.61	2142.27	303.41	0.35
Williamson Ck	Lower	47525.	10%	PROP	11388.30	628.00	639.68		640.13	0.002832	5.61	2132.46	303.06	0.36
Williamson Ck	Lower	47525.	4%	EX	16636.40	628.00	642.08		642.58	0.002375	5.97	3029.67	461.97	0.34
Williamson Ck	Lower	47525.	4%	PROP	16263.10	628.00	641.94		642.44	0.002398	5.94	2964.45	455.28	0.34
Williamson Ck	Lower	47525.	1%	EX	24849.20	628.00	645.17		645.67	0.001824	6.29	4928.76	890.69	0.31
Williamson Ck	Lower	47525.	1%	PROP	24299.30	628.00	644.97		645.48	0.001857	6.28	4763.80	822.57	0.31
Williamson Ck	Lower	46966.	10%	EX	11437.20	623.90	639.20		639.34	0.000772	3.19	3848.81	511.58	0.19
Williamson Ck	Lower	46966.	10%	PROP	11388.30	623.90	639.16		639.30	0.000778	3.19	3830.09	507.27	0.19
Williamson Ck	Lower	46966.	4%	EX	16636.40	623.90	641.71		641.87	0.000640	3.43	5504.90	755.95	0.18
Williamson Ck	Lower	46966.	4%	PROP	16263.10	623.90	641.57		641.72	0.000642	3.40	5395.01	739.16	0.18
Williamson Ck	Lower	46966.	1%	EX	24849.20	623.90	644.90		645.08	0.000544	3.73	8504.64	1130.55	0.17
Williamson Ck	Lower	46966.	1%	PROP	24299.30	623.90	644.70		644.88	0.000551	3.72	8283.41	1096.17	0.17
Williamson Ck	Lower	46500	10%	EX	11437.20	622.69	638.68		638.89	0.001527	3.66	3125.16	353.89	0.22
Williamson Ck	Lower	46500	10%	PROP	11388.30	622.69	638.64		638.85	0.001532	3.66	3111.33	353.51	0.22
Williamson Ck	Lower	46500	4%	EX	16636.40	622.69	641.20		641.46	0.001584	4.11	4051.39	382.11	0.22
Williamson Ck	Lower	46500	4%	PROP	16263.10	622.69	641.05		641.31	0.001571	4.07	3996.64	380.64	0.22
Williamson Ck	Lower	46500	1%	EX	24849.20	622.69	644.35		644.69	0.001625	4.69	5362.41	453.36	0.23
Williamson Ck	Lower	46500	1%	PROP	24299.30	622.69	644.15		644.49	0.001626	4.66	5273.54	448.43	0.23
Williamson Ck	Lower	46304	10%	EX	11437.20	621.59	638.18		638.53	0.002058	4.75	2408.72	234.05	0.26
Williamson Ck	Lower	46304	10%	PROP	11388.30	621.59	638.14		638.49	0.002062	4.75	2399.44	233.76	0.26
Williamson Ck	Lower	46304	4%	EX	16636.40	621.59	640.59		641.07	0.002322	5.53	3079.43	323.62	0.28
Williamson Ck	Lower	46304	4%	PROP	16263.10	621.59	640.46		640.92	0.002296	5.47	3036.23	319.18	0.28
Williamson Ck	Lower	46304	1%	EX	24849.20	621.59	643.65		644.27	0.002541	6.39	4263.77	467.16	0.30
Williamson Ck	Lower	46304	1%	PROP	24299.30	621.59	643.46		644.07	0.002538	6.35	4173.62	456.05	0.30
Williamson Ck	Lower	46232	10%	EX	11437.20	621.11	637.93	630.87	638.38	0.001813	5.40	2145.31	242.47	0.29
Williamson Ck	Lower	46232	10%	PROP	11388.30	621.11	637.89	630.85	638.34	0.001820	5.40	2135.52	241.55	0.29
Williamson Ck	Lower	46232	4%	EX	16636.40	621.11	640.36	632.67	640.91	0.001800	6.07	2896.00	352.70	0.30
Williamson Ck	Lower	46232	4%	PROP	16263.10	621.11	640.23	632.55	640.77	0.001793	6.02	2848.42	347.64	0.30
Williamson Ck	Lower	46232	1%	EX	24849.20	621.11	643.52	635.17	644.12	0.001593	6.47	4183.08	464.14	0.29
Williamson Ck	Lower	46232	1%	PROP	24299.30	621.11	643.32	635.00	643.92	0.001611	6.46	4090.90	456.49	0.29
Williamson Ck	Lower	46164 MANCHACA RD			Bridge									
Williamson Ck	Lower	46107	10%	EX	11466.90	621.46	636.06	631.22	636.80	0.003953	6.89	1664.06	194.42	0.42
Williamson Ck	Lower	46107	10%	PROP	11418.60	621.46	636.03	631.21	636.77	0.003957	6.89	1658.25	194.21	0.42
Williamson Ck	Lower	46107	4%	EX	16546.70	621.46	638.91	632.99	639.74	0.003438	7.33	2371.91	290.11	0.39
Williamson Ck	Lower	46107	4%	PROP	16210.40	621.46	638.73	632.89	639.56	0.003468	7.31	2320.91	287.01	0.39
Williamson Ck	Lower	46107	1%	EX	24781.10	621.46	642.69	635.40	643.56	0.002942	7.71	3705.68	432.73	0.36
Williamson Ck	Lower	46107	1%	PROP	24190.60	621.46	642.46	635.26	643.32	0.002962	7.68	3606.30	428.78	0.36
Williamson Ck	Lower	46015	10%	EX	11466.90	618.34	635.07		636.25	0.008167	8.72	1314.99	147.68	0.51
Williamson Ck	Lower	46015	10%	PROP	11418.60	618.34	635.04		636.22	0.008160	8.71	1310.77	147.48	0.51
Williamson Ck	Lower	46015	4%	EX	16546.70	618.34	637.90		639.23	0.007914	9.28	1872.86	243.28	0.50
Williamson Ck	Lower	46015	4%	PROP	16210.40	618.34	637.72		639.04	0.008023	9.28	1828.00	241.08	0.50
Williamson Ck	Lower	46015	1%	EX	24781.10	618.34	641.79		643.12	0.006347	9.54	2899.65	284.31	0.45
Williamson Ck	Lower	46015	1%	PROP	24190.60	618.34	641.56		642.88	0.006398	9.51	2834.13	281.81	0.45
Williamson Ck	Lower	45398	10%	EX	11466.90	614.60	632.18		632.90	0.003603	6.78	1691.83	180.78	0.39
Williamson Ck	Lower	45398	10%	PROP	11418.60	614.60	632.16		632.87	0.003598	6.77	1687.36	180.59	0.39
Williamson Ck	Lower	45398	4%	EX	16546.70	614.60	634.75		635.64	0.004163	7.58	2182.49	202.22	0.41
Williamson Ck	Lower	45398	4%	PROP	16210.40	614.60	634.57		635.46	0.004122	7.55	2146.25	200.15	0.41
Williamson Ck	Lower	45398	1%	EX	24781.10	614.60	638.74		639.73	0.004527	8.01	3118.89	293.37	0.40
Williamson Ck	Lower	45398	1%	PROP	24190.60	614.60	638.47		639.46	0.004588	8.00	3041.37	284.12	0.40
Williamson Ck	Lower	44968	10%	EX	11466.90	614.55	631.25	625.22	631.67	0.002040	5.19	2211.19	265.26	0.32
Williamson Ck	Lower	44968	10%	PROP	11418.60	614.55	631.22	625.22	631.64	0.002040	5.18	2204.64	264.98	0.32
Williamson Ck	Lower	44968	4%	EX	16546.70	614.55	633.85	626.85	634.35	0.001939	5.63	2940.72	294.38	0.31
Williamson Ck	Lower	44968	4%	PROP	16210.40	614.55	633.67	626.73	634.16	0.001960	5.62	2886.12	292.19	0.31
Williamson Ck	Lower	44968	1%	EX	24781.10	614.55	638.01	629.05	638.54	0.001533	5.81	4271.69	403.36	0.29
Williamson Ck	Lower	44968	1%	PROP	24190.60	614.55	637.72	628.92	638.25	0.001568	5.80	4170.45	388.03	0.29
Williamson Ck	Lower	44450	10%	EX	11466.90	614.55	629.84		630.30	0.003524	5.45	2102.22	253.20	0.33
Williamson Ck	Lower	44450	10%	PROP	11418.60	614.55	629.81		630.27	0.003526	5.45	2096.03	252.96	0.33
Williamson Ck	Lower	44450	4%	EX	16546.70	614.55	632.56		633.09	0.003072	5.84	2832.04	284.02	0.33
Williamson Ck	Lower	44450	4%	PROP	16210.40	614.55	632.36		632.89	0.003111	5.84	2775.01	280.26	0.33
Williamson Ck	Lower	44450	1%	EX	24781.10	614.55	637.14		637.66	0.001898	5.83	4426.44	423.42	0.27
Williamson Ck	Lower	44450	1%	PROP	24190.60	614.55	636.82		637.34	0.001960	5.84	4296.89	404.32	0.28
Williamson Ck	Lower	43919	10%	EX	11466.90	613.92	628.39	622.99	628.83	0.002219	5.31	2158.76	253.79	0.32
Williamson Ck	Lower	43919	10%	PROP	11418.60	613.92	628.36	622.98	628.80	0.002221	5.30	2152.43	253.56	0.32
Williamson Ck	Lower	43919	4%	EX	16546.70	613.92	631.29	624.50	631.79	0.001983	5.71	2896.35	291.08	0.30

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	43919	4%	PROP	16210.40	613.92	631.07	624.42	631.57	0.002011	5.71	2839.22	288.11	0.30
Williamson Ck	Lower	43919	1%	EX	24781.10	613.92	636.27	626.37	636.80	0.001365	5.87	4223.77	679.71	0.26
Williamson Ck	Lower	43919	1%	PROP	24190.60	613.92	635.94	626.25	636.47	0.001396	5.85	4134.61	615.98	0.26
Williamson Ck	Lower	43864	10%	EX	11466.90	612.26	627.39	622.12	628.64	0.001574	8.98	1276.86	252.12	0.44
Williamson Ck	Lower	43864	10%	PROP	11418.60	612.26	627.37	622.10	628.62	0.001569	8.96	1274.93	251.80	0.44
Williamson Ck	Lower	43864	4%	EX	16546.70	612.26	629.68	624.17	631.55	0.001883	10.97	1507.80	526.41	0.50
Williamson Ck	Lower	43864	4%	PROP	16210.40	612.26	629.49	624.02	631.33	0.001886	10.89	1488.71	505.62	0.50
Williamson Ck	Lower	43864	1%	EX	24781.10	612.26	633.99	627.07	636.52	0.001813	12.75	1943.11	820.54	0.51
Williamson Ck	Lower	43864	1%	PROP	24190.60	612.26	633.71	626.88	636.19	0.001817	12.64	1914.04	809.28	0.51
Williamson Ck	Lower	43812 MOPAC RAILROAD			Bridge									
Williamson Ck	Lower	43770	10%	EX	11466.90	612.38	626.20	622.23	627.76	0.003742	10.01	1144.98	337.72	0.52
Williamson Ck	Lower	43770	10%	PROP	11418.60	612.38	626.20	622.21	627.74	0.003719	9.98	1144.24	337.40	0.52
Williamson Ck	Lower	43770	4%	EX	16546.70	612.38	627.63	624.26	630.19	0.005257	12.84	1288.44	445.61	0.63
Williamson Ck	Lower	43770	4%	PROP	16210.40	612.38	627.56	624.16	630.04	0.005138	12.65	1281.47	440.44	0.63
Williamson Ck	Lower	43770	1%	EX	24781.10	612.38	628.75	627.18	633.60	0.008908	17.68	1401.49	537.24	0.84
Williamson Ck	Lower	43770	1%	PROP	24190.60	612.38	628.76	626.99	633.38	0.008464	17.25	1402.72	537.93	0.82
Williamson Ck	Lower	43712	10%	EX	11466.90	611.50	626.72	622.90	627.21	0.004303	5.61	2044.41	393.29	0.39
Williamson Ck	Lower	43712	10%	PROP	11418.60	611.50	626.71	622.89	627.19	0.004291	5.60	2040.47	393.00	0.39
Williamson Ck	Lower	43712	4%	EX	16546.70	611.50	628.74	624.19	629.31	0.004334	6.05	2733.93	479.15	0.40
Williamson Ck	Lower	43712	4%	PROP	16210.40	611.50	628.63	624.13	629.19	0.004378	6.03	2689.24	475.58	0.40
Williamson Ck	Lower	43712	1%	EX	24781.10	611.50	631.37	625.91	632.04	0.003503	6.59	3764.34	828.07	0.38
Williamson Ck	Lower	43712	1%	PROP	24190.60	611.50	631.23	625.82	631.89	0.003503	6.53	3708.71	817.81	0.38
Williamson Ck	Lower	43122	10%	EX	11843.10	608.08	624.68		625.07	0.003038	4.97	2407.89	407.61	0.33
Williamson Ck	Lower	43122	10%	PROP	11813.60	608.08	624.67		625.06	0.003032	4.97	2404.53	406.98	0.33
Williamson Ck	Lower	43122	4%	EX	16984.40	608.08	626.72		627.16	0.003024	5.38	3384.25	564.39	0.32
Williamson Ck	Lower	43122	4%	PROP	16673.80	608.08	626.57		627.01	0.003067	5.39	3302.38	546.00	0.32
Williamson Ck	Lower	43122	1%	EX	25521.00	608.08	629.95		630.32	0.002195	5.21	5841.08	948.75	0.26
Williamson Ck	Lower	43122	1%	PROP	24963.60	608.08	629.79		630.17	0.002215	5.20	5694.41	941.09	0.26
Williamson Ck	Lower	42738	10%	EX	11843.10	608.06	623.16	619.03	623.72	0.003998	5.99	1978.80	310.10	0.42
Williamson Ck	Lower	42738	10%	PROP	11813.60	608.06	623.16	619.02	623.71	0.003983	5.97	1977.78	310.00	0.42
Williamson Ck	Lower	42738	4%	EX	16984.40	608.06	625.24	620.52	625.87	0.003633	6.35	2737.26	479.67	0.40
Williamson Ck	Lower	42738	4%	PROP	16673.80	608.06	625.06	620.45	625.69	0.003746	6.39	2652.48	444.71	0.41
Williamson Ck	Lower	42738	1%	EX	25521.00	608.06	629.02	622.63	629.49	0.002093	5.78	5794.36	1138.24	0.30
Williamson Ck	Lower	42738	1%	PROP	24963.60	608.06	628.85	622.51	629.32	0.002137	5.80	5597.05	1133.46	0.30
Williamson Ck	Lower	42616	10%	EX	11843.10	609.29	622.97	616.63	623.52	0.000841	5.94	1992.11	189.99	0.32
Williamson Ck	Lower	42616	10%	PROP	11813.60	609.29	622.97	616.60	623.52	0.000837	5.93	1991.69	189.98	0.32
Williamson Ck	Lower	42616	4%	EX	16984.40	609.29	624.84	618.20	625.63	0.001065	7.15	2474.60	416.87	0.36
Williamson Ck	Lower	42616	4%	PROP	16673.80	609.29	624.65	618.10	625.46	0.001059	7.20	2351.95	404.42	0.36
Williamson Ck	Lower	42616	1%	EX	25521.00	609.29	628.76	620.43	629.35	0.000642	6.69	5336.51	1050.28	0.29
Williamson Ck	Lower	42616	1%	PROP	24963.60	609.29	628.58	620.32	629.18	0.000659	6.73	5144.33	1037.73	0.30
Williamson Ck	Lower	42546 EMERALD FORREST			Bridge									
Williamson Ck	Lower	42456	10%	EX	11843.10	609.32	621.18	616.65	621.97	0.004509	7.13	1660.64	181.45	0.41
Williamson Ck	Lower	42456	10%	PROP	11813.60	609.32	621.16	616.64	621.95	0.004507	7.12	1658.25	181.39	0.41
Williamson Ck	Lower	42456	4%	EX	16984.40	609.32	623.19	618.20	624.28	0.004798	8.38	2026.60	205.97	0.44
Williamson Ck	Lower	42456	4%	PROP	16673.80	609.32	623.08	618.14	624.16	0.004778	8.31	2006.75	203.53	0.44
Williamson Ck	Lower	42456	1%	EX	25521.00	609.32	625.67	620.48	627.19	0.005584	9.97	2817.92	643.55	0.49
Williamson Ck	Lower	42456	1%	PROP	24963.60	609.32	625.53	620.34	627.03	0.005571	9.88	2753.86	625.62	0.49
Williamson Ck	Lower	42379	10%	EX	11843.10	609.21	620.99		621.56	0.004342	6.06	1975.91	312.04	0.41
Williamson Ck	Lower	42379	10%	PROP	11813.60	609.21	620.98		621.54	0.004345	6.06	1971.51	311.61	0.41
Williamson Ck	Lower	42379	4%	EX	16984.40	609.21	623.19		623.81	0.003939	6.38	2735.76	389.45	0.40
Williamson Ck	Lower	42379	4%	PROP	16673.80	609.21	623.06		623.68	0.003959	6.36	2689.02	384.43	0.40
Williamson Ck	Lower	42379	1%	EX	25521.00	609.21	625.95		626.59	0.003368	6.63	4324.24	750.69	0.37
Williamson Ck	Lower	42379	1%	PROP	24963.60	609.21	625.79		626.44	0.003414	6.63	4205.94	744.22	0.37
Williamson Ck	Lower	41965	10%	EX	11843.10	603.72	619.84		620.13	0.002529	4.32	2739.53	430.88	0.30
Williamson Ck	Lower	41965	10%	PROP	11813.60	603.72	619.82		620.11	0.002531	4.32	2732.93	430.56	0.30
Williamson Ck	Lower	41965	4%	EX	16984.40	603.72	622.22		622.53	0.002176	4.48	3812.31	468.07	0.27
Williamson Ck	Lower	41965	4%	PROP	16673.80	603.72	622.09		622.40	0.002190	4.47	3752.32	466.23	0.27
Williamson Ck	Lower	41965	1%	EX	25521.00	603.72	625.06		625.45	0.002086	5.03	5206.94	528.48	0.26
Williamson Ck	Lower	41965	1%	PROP	24963.60	603.72	624.90		625.28	0.002084	4.99	5124.73	524.03	0.26
Williamson Ck	Lower	41490	10%	EX	11843.10	603.54	618.78	612.80	619.05	0.002025	4.23	2801.88	320.37	0.25
Williamson Ck	Lower	41490	10%	PROP	11813.60	603.54	618.76	612.79	619.04	0.002025	4.22	2796.91	320.24	0.25
Williamson Ck	Lower	41490	4%	EX	16984.40	603.54	621.18	614.01	621.53	0.002048	4.73	3592.75	343.91	0.26
Williamson Ck	Lower	41490	4%	PROP	16673.80	603.54	621.05	613.94	621.39	0.002043	4.70	3549.69	342.19	0.25
Williamson Ck	Lower	41490	1%	EX	25521.00	603.54	623.90	615.57	624.39	0.002341	5.62	4593.67	505.12	0.27
Williamson Ck	Lower	41490	1%	PROP	24963.60	603.54	623.75	615.49	624.23	0.002325	5.57	4521.12	500.04	0.27
Williamson Ck	Lower	41034	10%	EX	11843.10	601.35	617.46		617.78	0.004099	4.53	2616.18	337.22	0.27
Williamson Ck	Lower	41034	10%	PROP	11813.60	601.35	617.44		617.76	0.004102	4.52	2611.31	337.03	0.27
Williamson Ck	Lower	41034	4%	EX	16984.40	601.35	619.87		620.26	0.003928	5.04	3371.73	690.15	0.27
Williamson Ck	Lower	41034	4%	PROP	16673.80	601.35	619.74		620.13	0.003922	5.00	3331.82	685.37	0.27
Williamson Ck	Lower	41034	1%	EX	25521.00	601.35	622.35		622.92	0.004633	6.09	4201.19	1071.76	0.30
Williamson Ck	Lower	41034	1%	PROP	24963.60	601.35	622.21		622.77	0.004587	6.03	4150.89	1025.26	0.30
Williamson Ck	Lower	40749	10%	EX	11843.10	599.23	616.42		616.70	0.003417	4.27	2775.82	384.67	0.25
Williamson Ck	Lower	40749	10%	PROP	11813.60	599.23	616.40		616.68	0.003420	4.26	2770.53	381.84	0.25
Williamson Ck	Lower	40749	4%	EX	16984.40	599.23	618.88		619.23	0.003260	4.75	3574.93	706.29	0.26
Williamson Ck	Lower	40749	4%	PROP	16673.80	599.23	618.76		619.10	0.003255	4.72	3533.84	703.20	0.26
Williamson Ck	Lower	40749	1%	EX	25521.00	599.23	621.16		621.69	0.003937	5.86	4424.13	1069.86	0.29
Williamson Ck	Lower	40749	1%	PROP	24963.60	599.23	621.04		621.56	0.003900	5.79	4361.80	1050.66	0.29
Williamson Ck	Lower	40017	10%	EX	11843.10	596.21	614.13		614.52	0.002590	5.02	2360.83	579.39	0.32
Williamson Ck	Lower	40017	10%	PROP	11813.60	596.21	614.11		614.50	0.002594	5.02	2354.58	577.77	0.32
Williamson Ck	Lower	40017	4%	EX	16984.40	596.21	616.77		617.20	0.002378	5.27	3419.49	1106.19	0.29
Williamson Ck	Lower	40017	4%	PROP	16673.80	596.21	616.65		617.07	0.002384	5.25	3353.45	1076.97	0.29
Williamson Ck	Lower	40017	1%	EX	25521.00	596.21	618.90		619.40	0.002551	5.95	5786.44	1229.24	0.30
Williamson Ck	Lower	40017	1%	PROP	24963.60	596.21	618.77		619.27	0.002559	5.93	5626.70	1227.24	0.30
Williamson Ck	Lower	39950	10%	EX	11843.10	596.88	613.81	607.67	614.40	0.000962	6.16	1921.13	552.05	0.34

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	39950	10%	PROP	11813.60	596.88	613.79	607.66	614.38	0.000963	6.16	1917.70	549.90	0.34
Williamson Ck	Lower	39950	4%	EX	16984.40	596.88	616.41	609.31	617.08	0.000919	6.72	3056.48	1084.05	0.34
Williamson Ck	Lower	39950	4%	PROP	16673.80	596.88	616.28	609.22	616.95	0.000923	6.69	2989.91	1062.99	0.34
Williamson Ck	Lower	39950	1%	EX	25521.00	596.88	618.38	611.62	619.26	0.001068	7.99	5083.64	1290.61	0.37
Williamson Ck	Lower	39950	1%	PROP	24963.60	596.88	618.26	611.46	619.13	0.001067	7.94	4922.68	1288.56	0.37
Williamson Ck	Lower	39876 SOUTH FIRST ST			Bridge									
Williamson Ck	Lower	39807	10%	EX	11843.10	595.82	613.61	606.61	614.12	0.002298	5.70	2079.84	730.84	0.30
Williamson Ck	Lower	39807	10%	PROP	11813.60	595.82	613.59	606.60	614.10	0.002298	5.69	2076.40	725.79	0.30
Williamson Ck	Lower	39807	4%	EX	16984.40	595.82	616.28	608.25	616.79	0.002006	5.95	3472.73	1173.98	0.28
Williamson Ck	Lower	39807	4%	PROP	16673.80	595.82	616.15	608.15	616.66	0.002015	5.93	3405.20	1138.41	0.28
Williamson Ck	Lower	39807	1%	EX	25521.00	595.82	618.33	610.54	618.91	0.002207	6.77	5861.83	1449.24	0.30
Williamson Ck	Lower	39807	1%	PROP	24963.60	595.82	618.21	610.40	618.78	0.002217	6.75	5677.35	1447.34	0.30
Williamson Ck	Lower	39700	10%	EX	11843.10	595.32	613.28		613.77	0.004706	5.60	2113.97	741.98	0.32
Williamson Ck	Lower	39700	10%	PROP	11813.60	595.32	613.27		613.75	0.004705	5.60	2109.80	740.80	0.32
Williamson Ck	Lower	39700	4%	EX	16984.40	595.32	615.96		616.49	0.004240	5.95	3148.02	1299.43	0.31
Williamson Ck	Lower	39700	4%	PROP	16673.80	595.32	615.83		616.35	0.004288	5.94	3076.00	1279.35	0.31
Williamson Ck	Lower	39700	1%	EX	25521.00	595.32	618.11		618.60	0.003669	6.20	5937.46	1401.51	0.29
Williamson Ck	Lower	39700	1%	PROP	24963.60	595.32	617.98		618.47	0.003739	6.22	5748.18	1397.34	0.30
Williamson Ck	Lower	39228	10%	EX	11843.10	594.16	611.76		612.08	0.002674	4.50	2631.50	823.97	0.25
Williamson Ck	Lower	39228	10%	PROP	11813.60	594.16	611.74		612.06	0.002678	4.50	2626.02	822.65	0.25
Williamson Ck	Lower	39228	4%	EX	16984.40	594.16	614.73		615.08	0.002123	4.78	3858.66	1333.20	0.24
Williamson Ck	Lower	39228	4%	PROP	16673.80	594.16	614.58		614.92	0.002149	4.77	3775.71	1253.93	0.24
Williamson Ck	Lower	39228	1%	EX	25521.00	594.16	617.00		617.37	0.002066	5.26	6752.77	1407.41	0.24
Williamson Ck	Lower	39228	1%	PROP	24963.60	594.16	616.84		617.21	0.002107	5.28	6525.96	1404.68	0.24
Williamson Ck	Lower	38594	10%	EX	11843.10	592.62	610.47		610.79	0.001590	4.59	2582.95	762.76	0.25
Williamson Ck	Lower	38594	10%	PROP	11813.60	592.62	610.44		610.77	0.001591	4.58	2577.76	761.63	0.25
Williamson Ck	Lower	38594	4%	EX	16984.40	592.62	613.61		613.99	0.001421	4.99	3648.87	1166.04	0.24
Williamson Ck	Lower	38594	4%	PROP	16673.80	592.62	613.45		613.83	0.001434	4.97	3566.63	1154.47	0.24
Williamson Ck	Lower	38594	1%	EX	25521.00	592.62	615.61		616.17	0.001836	6.18	5069.10	1385.83	0.28
Williamson Ck	Lower	38594	1%	PROP	24963.60	592.62	615.44		615.99	0.001852	6.16	4825.98	1362.14	0.28
Williamson Ck	Lower	38508	10%	EX	11843.10	590.82	610.24	603.15	610.69	0.000695	5.41	2190.71	783.64	0.29
Williamson Ck	Lower	38508	10%	PROP	11813.60	590.82	610.22	603.14	610.67	0.000696	5.40	2186.46	777.69	0.29
Williamson Ck	Lower	38508	4%	EX	16984.40	590.82	613.48	605.11	613.91	0.000537	5.45	3600.38	1180.21	0.26
Williamson Ck	Lower	38508	4%	PROP	16673.80	590.82	613.31	605.03	613.75	0.000546	5.45	3511.75	1173.13	0.26
Williamson Ck	Lower	38508	1%	EX	25521.00	590.82	615.78	607.20	616.01	0.000326	4.72	11363.30	1397.81	0.21
Williamson Ck	Lower	38508	1%	PROP	24963.60	590.82	615.61	607.07	615.84	0.000330	4.71	11117.24	1381.33	0.21
Williamson Ck	Lower	38452 SOUTH FIRST ST			Bridge									
Williamson Ck	Lower	38387	10%	EX	11843.10	591.87	609.37	604.19	610.04	0.004020	6.57	1802.71	624.29	0.38
Williamson Ck	Lower	38387	10%	PROP	11813.60	591.87	609.35	604.18	610.02	0.004026	6.57	1799.28	623.89	0.38
Williamson Ck	Lower	38387	4%	EX	16984.40	591.87	611.73	606.15	612.57	0.004151	7.36	2381.71	993.02	0.40
Williamson Ck	Lower	38387	4%	PROP	16673.80	591.87	611.60	606.04	612.43	0.004182	7.32	2331.89	980.19	0.40
Williamson Ck	Lower	38387	1%	EX	25521.00	591.87	615.07	608.22	615.74	0.002946	7.10	5318.01	1331.32	0.34
Williamson Ck	Lower	38387	1%	PROP	24963.60	591.87	614.85	608.11	615.55	0.003080	7.18	5028.98	1295.73	0.35
Williamson Ck	Lower	38323	10%	EX	11843.10	590.90	608.97	603.45	609.75	0.004730	7.09	1671.26	574.01	0.39
Williamson Ck	Lower	38323	10%	PROP	11813.60	590.90	608.95	603.46	609.73	0.004726	7.08	1668.45	573.71	0.39
Williamson Ck	Lower	38323	4%	EX	16984.40	590.90	611.16	605.24	612.23	0.006056	8.30	2056.05	904.66	0.43
Williamson Ck	Lower	38323	4%	PROP	16673.80	590.90	611.04	605.14	612.09	0.006029	8.23	2031.78	887.05	0.43
Williamson Ck	Lower	38323	1%	EX	25521.00	590.90	614.72	607.72	615.52	0.004279	7.83	4873.56	1154.13	0.36
Williamson Ck	Lower	38323	1%	PROP	24963.60	590.90	614.48	607.57	615.31	0.004464	7.93	4655.46	1131.67	0.37
Williamson Ck	Lower	37983	10%	EX	11843.10	591.17	608.87	601.44	608.99	0.000793	3.19	4797.03	603.55	0.17
Williamson Ck	Lower	37983	10%	PROP	11813.60	591.17	608.85	601.44	608.98	0.000793	3.19	4785.98	603.18	0.17
Williamson Ck	Lower	37983	4%	EX	16984.40	591.17	611.19	602.74	611.34	0.000813	3.58	6235.54	728.80	0.17
Williamson Ck	Lower	37983	4%	PROP	16673.80	591.17	611.06	602.68	611.21	0.000812	3.56	6154.41	724.17	0.17
Williamson Ck	Lower	37983	1%	EX	25521.00	591.17	614.59	604.16	614.78	0.000798	4.04	8452.98	914.81	0.17
Williamson Ck	Lower	37983	1%	PROP	24963.60	591.17	614.36	604.08	614.55	0.000802	4.02	8303.57	898.17	0.17
Williamson Ck	Lower	37465	10%	EX	11901.10	589.77	607.26	601.49	607.88	0.011296	6.30	1889.96	297.14	0.44
Williamson Ck	Lower	37465	10%	PROP	11862.60	589.77	607.24	601.46	607.86	0.011328	6.30	1884.29	297.01	0.44
Williamson Ck	Lower	37465	4%	EX	16991.80	589.77	609.62	603.59	610.28	0.008589	6.51	2617.40	326.49	0.40
Williamson Ck	Lower	37465	4%	PROP	16688.70	589.77	609.49	603.49	610.14	0.008695	6.49	2575.26	324.46	0.40
Williamson Ck	Lower	37465	1%	EX	25435.40	589.77	613.11	607.00	613.82	0.006017	6.76	3853.68	559.45	0.35
Williamson Ck	Lower	37465	1%	PROP	24843.70	589.77	612.88	606.90	613.58	0.006148	6.74	3765.80	544.05	0.35
Williamson Ck	Lower	37146	10%	EX	11901.10	588.21	605.35	600.22	606.01	0.003557	6.52	1825.67	224.64	0.40
Williamson Ck	Lower	37146	10%	PROP	11862.60	588.21	605.33	600.19	605.99	0.003560	6.51	1820.82	224.41	0.40
Williamson Ck	Lower	37146	4%	EX	16991.80	588.21	607.91	602.09	608.66	0.003286	6.98	2432.66	250.55	0.40
Williamson Ck	Lower	37146	4%	PROP	16688.70	588.21	607.77	601.98	608.52	0.003294	6.96	2398.68	249.15	0.40
Williamson Ck	Lower	37146	1%	EX	25435.40	588.21	611.68	604.45	612.52	0.002890	7.35	3458.54	402.01	0.38
Williamson Ck	Lower	37146	1%	PROP	24843.70	588.21	611.43	604.32	612.27	0.002910	7.34	3386.46	390.14	0.38
Williamson Ck	Lower	37047	10%	EX	11901.10	588.41	605.33	598.07	605.82	0.000759	5.65	2107.98	193.37	0.30
Williamson Ck	Lower	37047	10%	PROP	11862.60	588.41	605.31	598.05	605.80	0.000759	5.64	2103.86	193.27	0.30
Williamson Ck	Lower	37047	4%	EX	16991.80	588.41	607.83	599.81	608.49	0.000805	6.54	2599.67	261.17	0.32
Williamson Ck	Lower	37047	4%	PROP	16688.70	588.41	607.70	599.75	608.35	0.000802	6.49	2573.22	258.21	0.32
Williamson Ck	Lower	37047	1%	EX	25435.40	588.41	611.58	602.21	612.37	0.000727	7.27	3756.61	453.34	0.32
Williamson Ck	Lower	37047	1%	PROP	24843.70	588.41	611.33	602.08	612.12	0.000734	7.24	3675.03	440.28	0.32
Williamson Ck	Lower	36982 SOUTH FIRST ST			Bridge									
Williamson Ck	Lower	36910	10%	EX	11901.10	590.14	604.66	599.79	605.46	0.006870	7.17	1658.69	181.50	0.42
Williamson Ck	Lower	36910	10%	PROP	11862.60	590.14	604.64	599.79	605.44	0.006869	7.17	1654.91	181.39	0.42
Williamson Ck	Lower	36910	4%	EX	16991.80	590.14	607.09	601.56	608.09	0.007143	8.04	2114.65	193.54	0.43
Williamson Ck	Lower	36910	4%	PROP	16688.70	590.14	606.96	601.47	607.95	0.007138	7.99	2089.89	192.91	0.43
Williamson Ck	Lower	36910	1%	EX	25435.40	590.14	610.13	603.92	611.47	0.007672	9.31	2787.95	370.25	0.45
Williamson Ck	Lower	36910	1%	PROP	24843.70	590.14	609.95	603.80	611.27	0.007669	9.23	2739.38	357.55	0.45
Williamson Ck	Lower	36816	10%	EX	11901.10	589.08	604.38	599.74	604.89	0.004003	5.74	2072.37	250.91	0.35
Williamson Ck	Lower	36816	10%	PROP	11862.60	589.08	604.35	599.71	604.87	0.004006	5.74	2066.95	250.79	0.35
Williamson Ck	Lower	36816	4%	EX	16991.80	589.08	606.88	601.06	607.49	0.003879	6.25	2718.18	263.69	0.34
Williamson Ck	Lower	36816	4%	PROP	16688.70	589.08	606.75	600.99	607.35	0.003879	6.22	2683.30	263.07	0.34

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	36816	1%	EX	25435.40	589.08	610.00	602.85	610.79	0.004063	7.14	3562.68	278.25	0.35
Williamson Ck	Lower	36816	1%	PROP	24843.70	589.08	609.82	602.73	610.59	0.004039	7.07	3511.60	277.43	0.35
Williamson Ck	Lower	36415	10%	EX	11901.10	587.32	603.33		603.66	0.002248	4.61	2579.24	271.05	0.26
Williamson Ck	Lower	36415	10%	PROP	11862.60	587.32	603.30		603.63	0.002246	4.61	2573.46	270.67	0.26
Williamson Ck	Lower	36415	4%	EX	16991.80	587.32	605.79		606.21	0.002477	5.14	3303.08	316.53	0.28
Williamson Ck	Lower	36415	4%	PROP	16688.70	587.32	605.66		606.07	0.002469	5.12	3261.65	314.15	0.28
Williamson Ck	Lower	36415	1%	EX	25435.40	587.32	608.86		609.39	0.002728	5.84	4353.03	375.05	0.30
Williamson Ck	Lower	36415	1%	PROP	24843.70	587.32	608.68		609.21	0.002703	5.80	4286.77	370.81	0.30
Williamson Ck	Lower	35967	10%	EX	11901.10	584.57	602.72	593.99	602.90	0.001188	3.38	3517.97	320.59	0.18
Williamson Ck	Lower	35967	10%	PROP	11862.60	584.57	602.70	593.99	602.87	0.001187	3.38	3511.26	320.44	0.18
Williamson Ck	Lower	35967	4%	EX	16991.80	584.57	605.13	595.13	605.37	0.001304	3.94	4311.67	338.53	0.19
Williamson Ck	Lower	35967	4%	PROP	16688.70	584.57	605.00	595.08	605.24	0.001296	3.91	4268.42	337.13	0.19
Williamson Ck	Lower	35967	1%	EX	25435.40	584.57	608.11	596.82	608.45	0.001489	4.71	5807.29	695.40	0.21
Williamson Ck	Lower	35967	1%	PROP	24843.70	584.57	607.94	596.71	608.27	0.001477	4.66	5688.50	686.73	0.21
Williamson Ck	Lower	35515	10%	EX	11901.10	581.82	602.03		602.28	0.001556	4.00	3063.13	369.19	0.20
Williamson Ck	Lower	35515	10%	PROP	11862.60	581.82	602.01		602.26	0.001555	3.99	3055.63	369.01	0.20
Williamson Ck	Lower	35515	4%	EX	16991.80	581.82	604.37		604.70	0.001684	4.65	3956.76	402.32	0.22
Williamson Ck	Lower	35515	4%	PROP	16688.70	581.82	604.25		604.57	0.001675	4.62	3907.49	397.07	0.22
Williamson Ck	Lower	35515	1%	EX	25435.40	581.82	607.28		607.71	0.001842	5.47	5827.26	806.94	0.23
Williamson Ck	Lower	35515	1%	PROP	24843.70	581.82	607.11		607.53	0.001837	5.43	5690.87	796.49	0.23
Williamson Ck	Lower	35187	10%	EX	11901.10	581.08	601.06	593.36	601.56	0.003119	5.79	2317.15	312.31	0.29
Williamson Ck	Lower	35187	10%	PROP	11862.60	581.08	601.04	593.33	601.54	0.003118	5.78	2310.99	311.98	0.29
Williamson Ck	Lower	35187	4%	EX	16991.80	581.08	603.32	595.50	603.94	0.003280	6.61	3213.99	450.80	0.31
Williamson Ck	Lower	35187	4%	PROP	16688.70	581.08	603.20	595.41	603.81	0.003281	6.57	3158.88	447.64	0.31
Williamson Ck	Lower	35187	1%	EX	25435.40	581.08	606.14	598.17	606.91	0.003497	7.62	4827.73	737.16	0.32
Williamson Ck	Lower	35187	1%	PROP	24843.70	581.08	605.97	598.02	606.73	0.003504	7.58	4700.74	723.85	0.32
Williamson Ck	Lower	34891	10%	EX	11901.10	579.96	600.13	592.69	600.61	0.003296	5.57	2340.52	425.87	0.29
Williamson Ck	Lower	34891	10%	PROP	11862.60	579.96	600.11	592.68	600.59	0.003296	5.57	2332.09	424.51	0.29
Williamson Ck	Lower	34891	4%	EX	16991.80	579.96	602.44	594.52	602.98	0.003170	6.12	3436.16	521.38	0.30
Williamson Ck	Lower	34891	4%	PROP	16688.70	579.96	602.31	594.42	602.85	0.003185	6.10	3369.71	517.87	0.30
Williamson Ck	Lower	34891	1%	EX	25435.40	579.96	605.31	597.11	605.91	0.003143	6.81	5283.36	785.53	0.30
Williamson Ck	Lower	34891	1%	PROP	24843.70	579.96	605.13	596.91	605.73	0.003159	6.79	5142.23	773.54	0.30
Williamson Ck	Lower	34501	10%	EX	11901.10	579.15	598.85	591.10	599.21	0.003736	4.83	2599.63	460.69	0.28
Williamson Ck	Lower	34501	10%	PROP	11862.60	579.15	598.83	591.09	599.19	0.003743	4.83	2589.74	460.04	0.28
Williamson Ck	Lower	34501	4%	EX	16991.80	579.15	601.35	592.97	601.72	0.003094	5.10	3899.93	572.87	0.26
Williamson Ck	Lower	34501	4%	PROP	16688.70	579.15	601.21	592.86	601.58	0.003128	5.09	3820.61	567.54	0.26
Williamson Ck	Lower	34501	1%	EX	25435.40	579.15	604.32	595.44	604.73	0.002801	5.55	5891.62	773.17	0.26
Williamson Ck	Lower	34501	1%	PROP	24843.70	579.15	604.13	595.29	604.54	0.002830	5.54	5744.59	765.11	0.26
Williamson Ck	Lower	34129	10%	EX	11901.10	578.71	597.03	591.02	597.52	0.005590	5.62	2118.44	321.59	0.34
Williamson Ck	Lower	34129	10%	PROP	11862.60	578.71	597.00	591.00	597.49	0.005595	5.62	2112.63	320.70	0.34
Williamson Ck	Lower	34129	4%	EX	16991.80	578.71	600.02	592.90	600.46	0.003844	5.51	3542.72	518.78	0.29
Williamson Ck	Lower	34129	4%	PROP	16688.70	578.71	599.85	592.80	600.30	0.003929	5.52	3457.67	514.94	0.29
Williamson Ck	Lower	34129	1%	EX	25435.40	578.71	603.19	595.04	603.66	0.003162	5.84	5307.17	598.39	0.27
Williamson Ck	Lower	34129	1%	PROP	24843.70	578.71	602.99	594.89	603.45	0.003200	5.81	5186.84	591.25	0.27
Williamson Ck	Lower	33533	10%	EX	11901.10	577.92	595.90	587.29	596.07	0.001219	3.23	3686.77	378.93	0.18
Williamson Ck	Lower	33533	10%	PROP	11862.60	577.92	595.88	587.29	596.04	0.001220	3.23	3677.33	378.61	0.18
Williamson Ck	Lower	33533	4%	EX	16991.80	577.92	599.09	588.48	599.27	0.001085	3.42	4975.92	442.22	0.18
Williamson Ck	Lower	33533	4%	PROP	16688.70	577.92	598.91	588.42	599.09	0.001099	3.41	4897.30	435.81	0.18
Williamson Ck	Lower	33533	1%	EX	25435.40	577.92	602.31	590.16	602.55	0.001092	3.95	6660.78	585.20	0.18
Williamson Ck	Lower	33533	1%	PROP	24843.70	577.92	602.10	590.04	602.34	0.001092	3.92	6540.89	578.94	0.18
Williamson Ck	Lower	32980	10%	EX	11901.10	573.44	594.41	587.65	594.87	0.004736	5.58	2351.40	352.38	0.31
Williamson Ck	Lower	32980	10%	PROP	11862.60	573.44	594.38	587.58	594.85	0.004757	5.58	2341.36	351.96	0.31
Williamson Ck	Lower	32980	4%	EX	16991.80	573.44	597.99	589.71	598.38	0.002900	5.31	3697.47	396.65	0.26
Williamson Ck	Lower	32980	4%	PROP	16688.70	573.44	597.79	589.63	598.18	0.002969	5.33	3618.30	394.73	0.26
Williamson Ck	Lower	32980	1%	EX	25435.40	573.44	601.22	592.63	601.69	0.002765	5.95	5037.18	433.12	0.26
Williamson Ck	Lower	32980	1%	PROP	24843.70	573.44	601.01	592.36	601.48	0.002772	5.91	4947.88	430.80	0.26
Williamson Ck	Lower	32908	10%	EX	11901.10	574.22	594.32	586.21	594.68	0.001374	4.71	2525.75	221.93	0.24
Williamson Ck	Lower	32908	10%	PROP	11862.60	574.22	594.30	586.22	594.65	0.001375	4.71	2519.91	221.77	0.24
Williamson Ck	Lower	32908	4%	EX	16991.80	574.22	597.86	587.68	598.24	0.001165	4.96	3544.71	343.32	0.23
Williamson Ck	Lower	32908	4%	PROP	16688.70	574.22	597.66	587.60	598.04	0.001185	4.96	3476.15	339.92	0.23
Williamson Ck	Lower	32908	1%	EX	25435.40	574.22	601.08	589.75	601.55	0.001165	5.66	4719.09	384.64	0.23
Williamson Ck	Lower	32908	1%	PROP	24843.70	574.22	600.88	589.59	601.34	0.001167	5.62	4640.15	381.76	0.23
Williamson Ck	Lower	32808 S. CONGRESS AVE			Bridge									
Williamson Ck	Lower	32695	10%	EX	11901.10	574.98	593.55	586.98	594.00	0.002114	5.41	2200.14	213.49	0.29
Williamson Ck	Lower	32695	10%	PROP	11862.60	574.98	593.53	586.98	593.98	0.002114	5.40	2195.77	213.37	0.29
Williamson Ck	Lower	32695	4%	EX	16991.80	574.98	596.09	588.45	596.67	0.002293	6.14	2768.11	234.54	0.31
Williamson Ck	Lower	32695	4%	PROP	16688.70	574.98	595.91	588.37	596.49	0.002318	6.12	2728.08	226.48	0.31
Williamson Ck	Lower	32695	1%	EX	25435.40	574.98	599.48	590.48	600.25	0.002212	7.10	3708.29	295.46	0.32
Williamson Ck	Lower	32695	1%	PROP	24843.70	574.98	599.24	590.38	600.00	0.002228	7.05	3638.12	293.06	0.32
Williamson Ck	Lower	32571	10%	EX	11901.10	576.34	593.64	586.77	593.83	0.000387	3.45	3453.37	409.12	0.21
Williamson Ck	Lower	32571	10%	PROP	11862.60	576.34	593.62	586.77	593.81	0.000387	3.44	3444.31	408.77	0.21
Williamson Ck	Lower	32571	4%	EX	16991.80	576.34	596.26	587.98	596.47	0.000350	3.71	4574.49	449.78	0.21
Williamson Ck	Lower	32571	4%	PROP	16688.70	576.34	596.08	587.91	596.29	0.000355	3.71	4494.57	446.94	0.21
Williamson Ck	Lower	32571	1%	EX	25435.40	576.34	599.77	589.53	600.02	0.000286	4.07	6467.19	599.85	0.19
Williamson Ck	Lower	32571	1%	PROP	24843.70	576.34	599.52	589.43	599.77	0.000291	4.05	6320.95	593.96	0.20
Williamson Ck	Lower	32556 WASSON RD			Culvert									
Williamson Ck	Lower	32536	10%	EX	11901.10	571.57	593.60	581.96	593.73	0.000506	2.99	4530.25	406.89	0.14
Williamson Ck	Lower	32536	10%	PROP	11862.60	571.57	593.58	581.96	593.71	0.000505	2.99	4521.47	406.54	0.14
Williamson Ck	Lower	32536	4%	EX	16991.80	571.57	596.13	583.30	596.31	0.000631	3.52	5618.58	458.74	0.15
Williamson Ck	Lower	32536	4%	PROP	16688.70	571.57	596.00	583.22	596.18	0.000622	3.49	5559.98	452.01	0.15
Williamson Ck	Lower	32536	1%	EX	25435.40	571.57	599.68	585.01	599.92	0.000731	4.15	7566.43	606.06	0.17
Williamson Ck	Lower	32536	1%	PROP	24843.70	571.57	599.47	584.92	599.70	0.000724	4.11	7439.70	595.81	0.17
Williamson Ck	Lower	32433	10%	EX	11901.10	571.16	593.41	584.90	593.63	0.002197	3.85	3281.24	410.29	0.21
Williamson Ck	Lower	32433	10%	PROP	11862.60	571.16	593.38	584.88	593.61	0.002199	3.85	3272.38	409.96	0.21

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	32433	4%	EX	16991.80	571.16	595.93	586.87	596.20	0.002062	4.25	4372.37	463.69	0.21
Williamson Ck	Lower	32433	4%	PROP	16688.70	571.16	595.80	586.77	596.07	0.002059	4.22	4313.22	458.45	0.21
Williamson Ck	Lower	32433	1%	EX	25435.40	571.16	599.50	589.19	599.80	0.001995	4.61	6285.79	596.89	0.21
Williamson Ck	Lower	32433	1%	PROP	24843.70	571.16	599.29	589.05	599.59	0.002006	4.58	6160.71	589.31	0.21
Williamson Ck	Lower	31941	10%	EX	11901.10	570.68	592.00		592.28	0.003510	4.31	2791.57	333.17	0.25
Williamson Ck	Lower	31941	10%	PROP	11862.60	570.68	591.97		592.26	0.003516	4.31	2783.81	332.56	0.25
Williamson Ck	Lower	31941	4%	EX	16991.80	570.68	594.64		594.98	0.003077	4.73	3740.58	373.58	0.24
Williamson Ck	Lower	31941	4%	PROP	16688.70	570.68	594.51		594.85	0.003080	4.70	3692.95	372.42	0.24
Williamson Ck	Lower	31941	1%	EX	25435.40	570.68	598.28		598.69	0.002719	5.25	5164.20	413.02	0.24
Williamson Ck	Lower	31941	1%	PROP	24843.70	570.68	598.06		598.47	0.002722	5.21	5076.28	409.26	0.24
Williamson Ck	Lower	31411	10%	EX	11901.10	569.44	590.22	582.20	590.52	0.003167	4.38	2723.30	278.66	0.24
Williamson Ck	Lower	31411	10%	PROP	11862.60	569.44	590.19	582.19	590.49	0.003174	4.37	2715.80	278.03	0.24
Williamson Ck	Lower	31411	4%	EX	16991.80	569.44	593.06	584.07	593.42	0.002848	4.84	3609.64	343.32	0.24
Williamson Ck	Lower	31411	4%	PROP	16688.70	569.44	592.93	583.99	593.29	0.002839	4.80	3566.97	341.05	0.24
Williamson Ck	Lower	31411	1%	EX	25435.40	569.44	596.85	585.99	597.29	0.002602	5.40	5091.04	433.36	0.24
Williamson Ck	Lower	31411	1%	PROP	24843.70	569.44	596.63	585.88	597.07	0.002601	5.36	4998.29	429.10	0.23
Williamson Ck	Lower	30927	10%	EX	11901.10	568.22	588.32	580.36	588.74	0.004228	5.23	2273.52	222.20	0.29
Williamson Ck	Lower	30927	10%	PROP	11862.60	568.22	588.29	580.38	588.71	0.004227	5.23	2267.08	221.79	0.29
Williamson Ck	Lower	30927	4%	EX	16991.80	568.22	591.16	582.08	591.67	0.004603	5.75	2955.79	257.19	0.30
Williamson Ck	Lower	30927	4%	PROP	16688.70	568.22	591.05	581.99	591.56	0.004539	5.70	2928.32	255.79	0.30
Williamson Ck	Lower	30927	1%	EX	25435.40	568.22	595.00	584.54	595.61	0.004741	6.28	4058.26	327.35	0.30
Williamson Ck	Lower	30927	1%	PROP	24843.70	568.22	594.78	584.36	595.39	0.004773	6.24	3987.69	321.28	0.30
Williamson Ck	Lower	30535	10%	EX	11901.10	565.71	586.68		587.07	0.004235	5.00	2378.92	255.38	0.29
Williamson Ck	Lower	30535	10%	PROP	11862.60	565.71	586.66		587.04	0.004236	5.00	2371.45	254.82	0.29
Williamson Ck	Lower	30535	4%	EX	16991.80	565.71	589.52		589.97	0.004031	5.38	3156.12	285.08	0.29
Williamson Ck	Lower	30535	4%	PROP	16688.70	565.71	589.44		589.88	0.003976	5.33	3132.31	284.56	0.28
Williamson Ck	Lower	30535	1%	EX	25435.40	565.71	593.51		594.04	0.003354	5.87	4402.56	353.39	0.27
Williamson Ck	Lower	30535	1%	PROP	24843.70	565.71	593.28		593.80	0.003367	5.82	4323.18	348.36	0.27
Williamson Ck	Lower	30000	10%	EX	12031.30	564.34	584.88	575.95	585.17	0.002944	4.37	2754.46	268.90	0.24
Williamson Ck	Lower	30000	10%	PROP	11983.70	564.34	584.85	575.94	585.14	0.002943	4.36	2746.66	268.62	0.24
Williamson Ck	Lower	30000	4%	EX	17072.30	564.34	587.74	578.06	588.09	0.002993	4.79	3565.97	299.18	0.24
Williamson Ck	Lower	30000	4%	PROP	16772.30	564.34	587.69	577.97	588.04	0.002919	4.72	3551.90	298.66	0.24
Williamson Ck	Lower	30000	1%	EX	25541.80	564.34	591.95	580.31	592.37	0.002795	5.20	4910.51	336.44	0.24
Williamson Ck	Lower	30000	1%	PROP	24922.30	564.34	591.72	580.18	592.14	0.002780	5.15	4835.10	334.80	0.24
Williamson Ck	Lower	29296	10%	EX	12031.30	563.83	582.55	575.14	582.91	0.003505	4.84	2487.57	249.12	0.27
Williamson Ck	Lower	29296	10%	PROP	11983.70	563.83	582.52	575.13	582.88	0.003505	4.83	2480.43	248.88	0.27
Williamson Ck	Lower	29296	4%	EX	17072.30	563.83	585.42	576.77	585.85	0.003377	5.27	3236.80	272.28	0.27
Williamson Ck	Lower	29296	4%	PROP	16772.30	563.83	585.45	576.68	585.87	0.003233	5.17	3246.13	272.55	0.26
Williamson Ck	Lower	29296	1%	EX	25541.80	563.83	589.84	578.90	590.34	0.002955	5.66	4511.63	302.71	0.26
Williamson Ck	Lower	29296	1%	PROP	24922.30	563.83	589.63	578.75	590.12	0.002928	5.60	4449.10	301.51	0.26
Williamson Ck	Lower	28549	10%	EX	12031.30	562.94	579.87	573.26	580.22	0.003681	4.77	2523.13	262.42	0.27
Williamson Ck	Lower	28549	10%	PROP	11983.70	562.94	579.84	573.25	580.19	0.003684	4.76	2515.27	262.13	0.27
Williamson Ck	Lower	28549	4%	EX	17072.30	562.94	582.94	574.56	583.34	0.003328	5.06	3374.19	292.90	0.26
Williamson Ck	Lower	28549	4%	PROP	16772.30	562.94	583.13	574.50	583.50	0.003065	4.89	3431.03	294.61	0.25
Williamson Ck	Lower	28549	1%	EX	25541.80	562.94	587.84	576.44	588.26	0.002561	5.19	4961.44	371.96	0.24
Williamson Ck	Lower	28549	1%	PROP	24922.30	562.94	587.66	576.31	588.07	0.002530	5.13	4892.81	366.56	0.24
Williamson Ck	Lower	28037	10%	EX	12031.30	561.10	578.50	570.20	578.76	0.002215	4.08	2945.52	266.16	0.22
Williamson Ck	Lower	28037	10%	PROP	11983.70	561.10	578.47	570.19	578.73	0.002215	4.08	2937.35	265.99	0.22
Williamson Ck	Lower	28037	4%	EX	17072.30	561.10	581.67	571.52	581.98	0.002088	4.47	3816.10	283.18	0.21
Williamson Ck	Lower	28037	4%	PROP	16772.30	561.10	581.98	571.44	582.26	0.001886	4.30	3904.21	284.88	0.20
Williamson Ck	Lower	28037	1%	EX	25541.80	561.10	586.80	573.39	587.15	0.001800	4.77	5356.76	327.90	0.20
Williamson Ck	Lower	28037	1%	PROP	24922.30	561.10	586.63	573.28	586.97	0.001765	4.70	5302.06	324.74	0.20
Williamson Ck	Lower	27529	10%	EX	12031.30	559.47	577.04	569.85	577.40	0.003241	4.79	2514.20	248.21	0.26
Williamson Ck	Lower	27529	10%	PROP	11983.70	559.47	577.01	569.84	577.37	0.003242	4.78	2506.48	247.95	0.27
Williamson Ck	Lower	27529	4%	EX	17072.30	559.47	580.32	571.27	580.72	0.002945	5.06	3373.65	275.06	0.25
Williamson Ck	Lower	27529	4%	PROP	16772.30	559.47	580.80	571.20	581.15	0.002543	4.79	3504.51	277.33	0.24
Williamson Ck	Lower	27529	1%	EX	25541.80	559.47	585.72	573.29	586.13	0.002235	5.13	5128.39	572.68	0.23
Williamson Ck	Lower	27529	1%	PROP	24922.30	559.47	585.58	573.15	585.97	0.002199	5.05	5058.57	568.32	0.22
Williamson Ck	Lower	27074	10%	EX	12031.30	556.04	575.74		576.04	0.002701	4.43	2713.24	249.97	0.24
Williamson Ck	Lower	27074	10%	PROP	11983.70	556.04	575.70		576.01	0.002703	4.43	2705.19	249.81	0.24
Williamson Ck	Lower	27074	4%	EX	17072.30	556.04	579.13		579.48	0.002487	4.74	3600.79	275.08	0.23
Williamson Ck	Lower	27074	4%	PROP	16772.30	556.04	579.78		580.09	0.002103	4.43	3782.47	280.31	0.21
Williamson Ck	Lower	27074	1%	EX	25541.80	556.04	584.80		585.16	0.001982	4.83	5295.48	333.03	0.21
Williamson Ck	Lower	27074	1%	PROP	24922.30	556.04	584.67		585.02	0.001930	4.75	5253.10	330.33	0.21
Williamson Ck	Lower	26911	10%	EX	12031.30	555.76	574.80	568.65	575.62	0.001913	7.29	1650.24	226.91	0.37
Williamson Ck	Lower	26911	10%	PROP	11983.70	555.76	574.77	568.64	575.59	0.001912	7.28	1646.19	226.76	0.37
Williamson Ck	Lower	26911	4%	EX	17072.30	555.76	578.03	570.36	579.06	0.001812	8.17	2090.69	253.29	0.37
Williamson Ck	Lower	26911	4%	PROP	16772.30	555.76	578.84	570.25	579.74	0.001471	7.62	2202.22	260.26	0.33
Williamson Ck	Lower	26911	1%	EX	25541.80	555.76	584.53	572.85	584.97	0.000710	5.35	4785.93	321.66	0.24
Williamson Ck	Lower	26911	1%	PROP	24922.30	555.76	584.41	572.68	584.84	0.000693	5.26	4747.41	319.23	0.23
Williamson Ck	Lower	26866 IH 35 (SOUTH-BOU			Bridge									
Williamson Ck	Lower	26844	10%	EX	12031.30	556.11	574.41	569.00	575.34	0.001408	7.75	1552.33	223.36	0.40
Williamson Ck	Lower	26844	10%	PROP	11983.70	556.11	574.38	569.00	575.31	0.001409	7.74	1548.33	223.22	0.40
Williamson Ck	Lower	26844	4%	EX	17072.30	556.11	577.27	570.69	578.47	0.001411	8.81	1938.22	243.77	0.41
Williamson Ck	Lower	26844	4%	PROP	16772.30	556.11	577.07	570.62	578.26	0.001427	8.78	1910.98	242.07	0.41
Williamson Ck	Lower	26844	1%	EX	25541.80	556.11	583.43	573.18	583.97	0.000572	5.88	4341.10	296.55	0.27
Williamson Ck	Lower	26844	1%	PROP	24922.30	556.11	583.35	573.04	583.87	0.000553	5.77	4316.44	295.84	0.27
Williamson Ck	Lower	26837	10%	EX	12031.30	556.38	574.57	568.07	575.27	0.001029	6.69	1798.12	153.62	0.34
Williamson Ck	Lower	26837	10%	PROP	11983.70	556.38	574.54	568.05	575.23	0.001029	6.68	1793.44	153.55	0.34
Williamson Ck	Lower	26837	4%	EX	17072.30	556.38	577.49	569.76	578.36	0.001321	7.47	2285.93	201.81	0.39
Williamson Ck	Lower	26837	4%	PROP	16772.30	556.38	577.29	569.66	578.15	0.001286	7.47	2245.40	193.79	0.39
Williamson Ck	Lower	26837	1%	EX	25541.80	556.38	583.11	572.21	583.93	0.000778	7.31	3498.25	569.25	0.32
Williamson Ck	Lower	26837	1%	PROP	24922.30	556.38	583.04	572.02	583.83	0.000751	7.17	3483.37	563.67	0.31
Williamson Ck	Lower	26743 INTERSTATE HWY 3			Bridge									

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	26644	10%	EX	12031.30	556.87	574.02	568.56	574.86	0.001360	7.34	1640.01	151.02	0.39
Williamson Ck	Lower	26644	10%	PROP	11983.70	556.87	573.99	568.53	574.83	0.001361	7.33	1635.46	150.94	0.39
Williamson Ck	Lower	26644	4%	EX	17072.30	556.87	576.85	570.24	577.90	0.001431	8.20	2080.88	167.55	0.41
Williamson Ck	Lower	26644	4%	PROP	16772.30	556.87	576.66	570.14	577.70	0.001418	8.19	2048.35	164.15	0.41
Williamson Ck	Lower	26644	1%	EX	25541.80	556.87	580.52	572.70	581.81	0.001436	9.17	2831.61	371.08	0.42
Williamson Ck	Lower	26644	1%	PROP	24922.30	556.87	580.21	572.52	581.50	0.001472	9.15	2764.97	338.46	0.43
Williamson Ck	Lower	26636	10%	EX	12031.30	556.79	574.17	567.59	574.78	0.000890	6.29	1912.12	175.07	0.32
Williamson Ck	Lower	26636	10%	PROP	11983.70	556.79	574.14	567.57	574.75	0.000891	6.28	1907.14	174.94	0.32
Williamson Ck	Lower	26636	4%	EX	17072.30	556.79	577.02	569.22	577.82	0.000896	7.14	2389.93	196.13	0.34
Williamson Ck	Lower	26636	4%	PROP	16772.30	556.79	576.83	569.13	577.61	0.000906	7.12	2356.82	194.42	0.34
Williamson Ck	Lower	26636	1%	EX	25541.80	556.79	580.75	571.55	581.70	0.001011	7.84	3354.14	337.64	0.36
Williamson Ck	Lower	26636	1%	PROP	24922.30	556.79	580.44	571.39	581.39	0.001027	7.83	3254.18	316.36	0.36
Williamson Ck	Lower	26615 IH 35 (NORTH-BOU			Bridge									
Williamson Ck	Lower	26569	10%	EX	12031.30	556.25	573.48	567.03	574.11	0.001211	6.37	1888.00	174.43	0.33
Williamson Ck	Lower	26569	10%	PROP	11983.70	556.25	573.45	567.01	574.08	0.001212	6.36	1883.04	174.30	0.33
Williamson Ck	Lower	26569	4%	EX	17072.30	556.25	576.19	568.68	577.02	0.001281	7.29	2341.38	193.56	0.35
Williamson Ck	Lower	26569	4%	PROP	16772.30	556.25	576.05	568.59	576.86	0.001281	7.24	2316.45	192.30	0.35
Williamson Ck	Lower	26569	1%	EX	25541.80	556.25	579.78	571.00	580.80	0.001453	8.11	3216.51	339.90	0.38
Williamson Ck	Lower	26569	1%	PROP	24922.30	556.25	579.53	570.86	580.54	0.001454	8.06	3139.51	301.78	0.38
Williamson Ck	Lower	26470	10%	EX	12031.30	554.87	573.42		573.87	0.003353	5.42	2218.48	351.23	0.32
Williamson Ck	Lower	26470	10%	PROP	11983.70	554.87	573.38		573.84	0.003353	5.42	2210.90	350.58	0.32
Williamson Ck	Lower	26470	4%	EX	17072.30	554.87	576.24		576.73	0.003001	5.69	3224.13	398.16	0.30
Williamson Ck	Lower	26470	4%	PROP	16772.30	554.87	576.09		576.58	0.003027	5.68	3163.91	394.98	0.30
Williamson Ck	Lower	26470	1%	EX	25541.80	554.87	579.93		580.46	0.002565	6.07	5056.86	623.51	0.28
Williamson Ck	Lower	26470	1%	PROP	24922.30	554.87	579.68		580.21	0.002606	6.07	4899.68	612.02	0.28
Williamson Ck	Lower	26034	10%	EX	12031.30	554.07	572.31		572.65	0.002258	4.67	2575.32	233.88	0.25
Williamson Ck	Lower	26034	10%	PROP	11983.70	554.07	572.28		572.62	0.002258	4.67	2568.10	233.65	0.25
Williamson Ck	Lower	26034	4%	EX	17072.30	554.07	575.10		575.52	0.002479	5.24	3258.74	257.56	0.26
Williamson Ck	Lower	26034	4%	PROP	16772.30	554.07	574.95		575.37	0.002464	5.21	3220.16	256.12	0.26
Williamson Ck	Lower	26034	1%	EX	25541.80	554.07	578.83		579.38	0.002379	6.00	4344.72	322.40	0.26
Williamson Ck	Lower	26034	1%	PROP	24922.30	554.07	578.57		579.12	0.002393	5.95	4262.69	320.49	0.26
Williamson Ck	Lower	25438	10%	EX	12031.30	551.28	571.03		571.43	0.001841	5.09	2388.45	251.68	0.27
Williamson Ck	Lower	25438	10%	PROP	11983.70	551.28	571.00		571.40	0.001841	5.09	2380.80	251.09	0.27
Williamson Ck	Lower	25438	4%	EX	17072.30	551.28	573.70		574.21	0.001958	5.75	3132.66	344.74	0.27
Williamson Ck	Lower	25438	4%	PROP	16772.30	551.28	573.56		574.06	0.001954	5.71	3089.17	340.67	0.27
Williamson Ck	Lower	25438	1%	EX	25541.80	551.28	577.50		578.10	0.001953	6.43	4396.68	429.57	0.27
Williamson Ck	Lower	25438	1%	PROP	24922.30	551.28	577.23		577.83	0.001961	6.39	4301.72	423.44	0.27
Williamson Ck	Lower	24911	10%	EX	12031.30	551.28	569.84		570.35	0.002231	5.79	2203.52	324.15	0.31
Williamson Ck	Lower	24911	10%	PROP	11983.70	551.28	569.81		570.32	0.002233	5.79	2195.09	322.98	0.31
Williamson Ck	Lower	24911	4%	EX	17072.30	551.28	572.53		573.13	0.002146	6.34	2988.46	396.10	0.31
Williamson Ck	Lower	24911	4%	PROP	16772.30	551.28	572.38		572.98	0.002151	6.31	2942.20	392.16	0.31
Williamson Ck	Lower	24911	1%	EX	25541.80	551.28	576.46		577.12	0.001826	6.83	4459.23	538.87	0.29
Williamson Ck	Lower	24911	1%	PROP	24922.30	551.28	576.18		576.84	0.001855	6.82	4338.02	528.34	0.29
Williamson Ck	Lower	24342	10%	EX	12031.30	545.98	568.10	561.15	568.78	0.003445	6.64	1813.29	178.41	0.37
Williamson Ck	Lower	24342	10%	PROP	11983.70	545.98	568.07	561.12	568.75	0.003444	6.63	1807.60	178.29	0.37
Williamson Ck	Lower	24342	4%	EX	17072.30	545.98	570.62	563.39	571.50	0.003924	7.50	2275.68	188.08	0.38
Williamson Ck	Lower	24342	4%	PROP	16772.30	545.98	570.48	563.27	571.35	0.003900	7.46	2249.75	187.55	0.38
Williamson Ck	Lower	24342	1%	EX	25541.80	545.98	574.50	566.25	575.62	0.004016	8.46	3018.21	463.16	0.38
Williamson Ck	Lower	24342	1%	PROP	24922.30	545.98	574.22	566.05	575.32	0.004035	8.41	2963.88	435.40	0.38
Williamson Ck	Lower	24214	10%	EX	12031.30	546.98	567.93	559.87	568.37	0.002157	5.32	2259.49	212.72	0.29
Williamson Ck	Lower	24214	10%	PROP	11983.70	546.98	567.89	559.84	568.33	0.002158	5.32	2252.64	212.47	0.29
Williamson Ck	Lower	24214	4%	EX	17072.30	546.98	570.46	561.83	571.02	0.002348	6.04	2826.84	235.48	0.31
Williamson Ck	Lower	24214	4%	PROP	16772.30	546.98	570.32	561.73	570.88	0.002340	6.00	2794.17	234.26	0.31
Williamson Ck	Lower	24214	1%	EX	25541.80	546.98	574.42	564.33	575.11	0.002290	6.67	3834.18	298.15	0.31
Williamson Ck	Lower	24214	1%	PROP	24922.30	546.98	574.12	564.17	574.81	0.002323	6.65	3749.68	278.50	0.31
Williamson Ck	Lower	24156 STASSNEY LN			Bridge									
Williamson Ck	Lower	24095	10%	EX	12031.30	548.34	567.40	561.21	568.04	0.003525	6.43	1871.78	197.65	0.37
Williamson Ck	Lower	24095	10%	PROP	11983.70	548.34	567.36	561.19	568.00	0.003527	6.42	1865.35	197.39	0.37
Williamson Ck	Lower	24095	4%	EX	17072.30	548.34	569.86	563.17	570.66	0.003924	7.16	2383.13	218.04	0.38
Williamson Ck	Lower	24095	4%	PROP	16772.30	548.34	569.72	563.08	570.51	0.003901	7.13	2353.60	216.75	0.38
Williamson Ck	Lower	24095	1%	EX	25541.80	548.34	573.05	565.70	574.09	0.004573	8.18	3124.02	246.37	0.40
Williamson Ck	Lower	24095	1%	PROP	24922.30	548.34	572.85	565.53	573.87	0.004525	8.10	3075.07	244.61	0.40
Williamson Ck	Lower	23956	10%	EX	12031.30	545.90	567.10	560.21	567.57	0.002574	5.51	2183.38	214.44	0.30
Williamson Ck	Lower	23956	10%	PROP	11983.70	545.90	567.07	560.19	567.54	0.002572	5.51	2176.42	214.10	0.30
Williamson Ck	Lower	23956	4%	EX	17072.30	545.90	569.51	561.79	570.11	0.003196	6.19	2757.11	272.19	0.34
Williamson Ck	Lower	23956	4%	PROP	16772.30	545.90	569.38	561.71	569.97	0.003166	6.16	2720.89	268.10	0.34
Williamson Ck	Lower	23956	1%	EX	25541.80	545.90	572.70	564.03	573.45	0.003456	6.96	3683.95	332.11	0.35
Williamson Ck	Lower	23956	1%	PROP	24922.30	545.90	572.50	563.88	573.24	0.003455	6.90	3620.40	313.24	0.35
Williamson Ck	Lower	23527	10%	EX	12141.20	546.40	566.07	559.45	566.40	0.002680	4.65	2610.45	366.14	0.26
Williamson Ck	Lower	23527	10%	PROP	12082.80	546.40	566.04	559.44	566.37	0.002680	4.64	2601.97	364.59	0.26
Williamson Ck	Lower	23527	4%	EX	17171.50	546.40	568.50	560.71	568.87	0.002347	5.01	3856.11	485.57	0.25
Williamson Ck	Lower	23527	4%	PROP	16870.00	546.40	568.36	560.65	568.73	0.002365	4.99	3790.17	482.07	0.25
Williamson Ck	Lower	23527	1%	EX	25736.40	546.40	571.79	562.48	572.22	0.002102	5.55	5583.14	601.28	0.25
Williamson Ck	Lower	23527	1%	PROP	25120.60	546.40	571.58	562.36	572.01	0.002107	5.51	5460.96	582.84	0.25
Williamson Ck	Lower	22999	10%	EX	12141.20	544.22	564.17	556.77	564.63	0.004259	5.46	2224.82	223.55	0.30
Williamson Ck	Lower	22999	10%	PROP	12082.80	544.22	564.14	556.73	564.60	0.004261	5.45	2217.79	223.00	0.30
Williamson Ck	Lower	22999	4%	EX	17171.50	544.22	566.64	558.47	567.24	0.004096	6.18	2827.18	260.04	0.31
Williamson Ck	Lower	22999	4%	PROP	16870.00	544.22	566.51	558.36	567.09	0.004105	6.15	2791.15	258.42	0.31
Williamson Ck	Lower	22999	1%	EX	25736.40	544.22	569.87	560.87	570.66	0.004145	7.23	3757.74	350.68	0.32
Williamson Ck	Lower	22999	1%	PROP	25120.60	544.22	569.67	560.73	570.45	0.004135	7.16	3690.35	330.14	0.32
Williamson Ck	Lower	22552	10%	EX	12141.20	543.50	561.63	556.67	562.35	0.006068	6.80	1784.90	202.87	0.40
Williamson Ck	Lower	22552	10%	PROP	12082.80	543.50	561.60	556.64	562.32	0.006068	6.79	1778.48	202.62	0.40
Williamson Ck	Lower	22552	4%	EX	17171.50	543.50	564.11	558.35	564.96	0.006323	7.42	2313.32	226.24	0.41
Williamson Ck	Lower	22552	4%	PROP	16870.00	543.50	563.97	558.27	564.82	0.006298	7.39	2282.32	224.60	0.41
Williamson Ck	Lower	22552	1%	EX	25736.40	543.50	567.32	560.64	568.38	0.006293	8.28	3251.19	381.32	0.41

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	22552	1%	PROP	25120.60	543.50	567.12	560.47	568.17	0.006313	8.23	3174.08	378.74	0.41
Williamson Ck	Lower	22019	10%	EX	12141.20	541.79	559.17	553.52	559.78	0.003833	6.30	1928.51	224.17	0.38
Williamson Ck	Lower	22019	10%	PROP	12082.80	541.79	559.14	553.50	559.75	0.003830	6.29	1921.66	223.76	0.38
Williamson Ck	Lower	22019	4%	EX	17171.50	541.79	561.52	555.25	562.26	0.004053	6.91	2486.26	249.28	0.39
Williamson Ck	Lower	22019	4%	PROP	16870.00	541.79	561.39	555.16	562.13	0.004041	6.87	2454.29	247.95	0.39
Williamson Ck	Lower	22019	1%	EX	25736.40	541.79	564.64	557.70	565.58	0.004356	7.78	3319.79	295.56	0.39
Williamson Ck	Lower	22019	1%	PROP	25120.60	541.79	564.44	557.54	565.37	0.004338	7.72	3261.97	289.07	0.39
Williamson Ck	Lower	21525	10%	EX	12141.20	539.02	557.30	552.43	557.90	0.003768	6.19	1961.17	239.01	0.38
Williamson Ck	Lower	21525	10%	PROP	12082.80	539.02	557.27	552.42	557.87	0.003763	6.18	1954.31	238.73	0.38
Williamson Ck	Lower	21525	4%	EX	17171.50	539.02	559.52	554.10	560.25	0.004075	6.83	2515.87	260.24	0.39
Williamson Ck	Lower	21525	4%	PROP	16870.00	539.02	559.40	554.02	560.12	0.004059	6.79	2484.26	259.05	0.39
Williamson Ck	Lower	21525	1%	EX	25736.40	539.02	562.47	556.08	563.41	0.004423	7.77	3331.92	301.13	0.39
Williamson Ck	Lower	21525	1%	PROP	25120.60	539.02	562.28	555.93	563.20	0.004405	7.70	3275.57	297.15	0.39
Williamson Ck	Lower	21091	10%	EX	12141.20	538.75	555.56		556.07	0.004587	5.75	2112.35	270.72	0.36
Williamson Ck	Lower	21091	10%	PROP	12082.80	538.75	555.53		556.04	0.004583	5.74	2105.06	270.47	0.36
Williamson Ck	Lower	21091	4%	EX	17171.50	538.75	557.65		558.28	0.004912	6.36	2701.03	291.56	0.37
Williamson Ck	Lower	21091	4%	PROP	16870.00	538.75	557.54		558.16	0.004895	6.32	2667.53	290.38	0.37
Williamson Ck	Lower	21091	1%	EX	25736.40	538.75	560.50		561.31	0.005118	7.24	3571.35	321.21	0.37
Williamson Ck	Lower	21091	1%	PROP	25120.60	538.75	560.31		561.11	0.005107	7.18	3512.67	319.27	0.37
Williamson Ck	Lower	20781	10%	EX	12141.20	536.80	553.91	550.20	554.61	0.004702	6.90	1932.37	283.64	0.43
Williamson Ck	Lower	20781	10%	PROP	12082.80	536.80	553.88	550.18	554.59	0.004706	6.89	1924.74	283.27	0.43
Williamson Ck	Lower	20781	4%	EX	17171.50	536.80	555.98	551.65	556.80	0.004526	7.52	2548.93	311.62	0.43
Williamson Ck	Lower	20781	4%	PROP	16870.00	536.80	555.86	551.58	556.68	0.004533	7.48	2513.58	310.10	0.43
Williamson Ck	Lower	20781	1%	EX	25736.40	536.80	558.81	553.64	559.81	0.004441	8.36	3481.28	341.39	0.43
Williamson Ck	Lower	20781	1%	PROP	25120.60	536.80	558.63	553.52	559.62	0.004440	8.30	3419.38	340.02	0.43
Williamson Ck	Lower	20661	10%	EX	12141.20	538.08	553.54		554.18	0.002596	6.46	2016.68	277.01	0.36
Williamson Ck	Lower	20661	10%	PROP	12082.80	538.08	553.52		554.15	0.002594	6.45	2009.43	276.28	0.36
Williamson Ck	Lower	20661	4%	EX	17171.50	538.08	555.56		556.39	0.002722	7.46	2628.89	326.66	0.37
Williamson Ck	Lower	20661	4%	PROP	16870.00	538.08	555.45		556.27	0.002716	7.40	2593.23	325.13	0.37
Williamson Ck	Lower	20661	1%	EX	25736.40	538.08	558.27		559.38	0.002886	8.77	3568.15	364.70	0.40
Williamson Ck	Lower	20661	1%	PROP	25120.60	538.08	558.10		559.19	0.002874	8.69	3504.72	362.26	0.40
Williamson Ck	Lower	20364	10%	EX	12141.20	537.08	553.01		553.44	0.002047	5.27	2352.92	281.00	0.30
Williamson Ck	Lower	20364	10%	PROP	12082.80	537.08	552.98		553.41	0.002047	5.26	2345.49	280.63	0.30
Williamson Ck	Lower	20364	4%	EX	17171.50	537.08	555.03		555.60	0.002124	6.10	2948.45	309.25	0.32
Williamson Ck	Lower	20364	4%	PROP	16870.00	537.08	554.92		555.48	0.002118	6.05	2914.82	307.73	0.32
Williamson Ck	Lower	20364	1%	EX	25736.40	537.08	557.72		558.53	0.002296	7.29	3843.84	354.94	0.34
Williamson Ck	Lower	20364	1%	PROP	25120.60	537.08	557.55		558.34	0.002283	7.21	3782.78	352.00	0.34
Williamson Ck	Lower	20056	10%	EX	12141.20	536.58	551.33		552.37	0.006012	8.61	1747.79	272.68	0.48
Williamson Ck	Lower	20056	10%	PROP	12082.80	536.58	551.30		552.34	0.006012	8.59	1740.95	272.26	0.48
Williamson Ck	Lower	20056	4%	EX	17171.50	536.58	553.20		554.48	0.006140	9.75	2287.72	303.77	0.50
Williamson Ck	Lower	20056	4%	PROP	16870.00	536.58	553.10		554.37	0.006126	9.69	2257.58	302.12	0.50
Williamson Ck	Lower	20056	1%	EX	25736.40	536.58	555.63		557.31	0.006593	11.45	3075.46	348.35	0.53
Williamson Ck	Lower	20056	1%	PROP	25120.60	536.58	555.47		557.13	0.006555	11.33	3022.65	344.63	0.53
Williamson Ck	Lower	19750	10%	EX	12141.20	535.58	550.76		551.22	0.002002	5.40	2263.68	268.73	0.30
Williamson Ck	Lower	19750	10%	PROP	12082.80	535.58	550.74		551.19	0.001999	5.38	2257.01	267.14	0.30
Williamson Ck	Lower	19750	4%	EX	17171.50	535.58	552.62		553.24	0.002226	6.37	2865.61	366.74	0.33
Williamson Ck	Lower	19750	4%	PROP	16870.00	535.58	552.52		553.13	0.002214	6.32	2829.63	364.21	0.32
Williamson Ck	Lower	19750	1%	EX	25736.40	535.58	555.02		555.91	0.002547	7.71	3823.66	428.57	0.36
Williamson Ck	Lower	19750	1%	PROP	25120.60	535.58	554.87		555.74	0.002525	7.63	3759.08	424.69	0.36
Williamson Ck	Lower	19416	10%	EX	12141.20	535.08	550.06		550.52	0.002197	5.40	2249.11	339.62	0.37
Williamson Ck	Lower	19416	10%	PROP	12082.80	535.08	550.04		550.49	0.002197	5.39	2240.41	339.05	0.37
Williamson Ck	Lower	19416	4%	EX	17171.50	535.08	551.93		552.47	0.002225	5.94	2941.77	403.89	0.36
Williamson Ck	Lower	19416	4%	PROP	16870.00	535.08	551.83		552.37	0.002220	5.91	2902.25	400.49	0.36
Williamson Ck	Lower	19416	1%	EX	25736.40	535.08	554.33		555.04	0.002369	6.85	4010.58	486.91	0.37
Williamson Ck	Lower	19416	1%	PROP	25120.60	535.08	554.18		554.88	0.002356	6.79	3937.86	481.72	0.37
Williamson Ck	Lower	19128	10%	EX	12141.20	534.08	548.76		549.59	0.004611	7.53	1926.23	368.23	0.43
Williamson Ck	Lower	19128	10%	PROP	12082.80	534.08	548.73		549.56	0.004610	7.51	1917.50	366.69	0.43
Williamson Ck	Lower	19128	4%	EX	17171.50	534.08	550.53		551.53	0.004624	8.46	2678.31	464.98	0.45
Williamson Ck	Lower	19128	4%	PROP	16870.00	534.08	550.44		551.43	0.004629	8.41	2633.44	462.59	0.45
Williamson Ck	Lower	19128	1%	EX	25736.40	534.08	552.88		554.07	0.004595	9.57	3839.20	523.02	0.46
Williamson Ck	Lower	19128	1%	PROP	25120.60	534.08	552.74		553.91	0.004584	9.50	3764.02	519.46	0.46
Williamson Ck	Lower	18857	10%	EX	12141.20	534.08	547.79		548.65	0.002684	7.61	1870.93	399.68	0.45
Williamson Ck	Lower	18857	10%	PROP	12082.80	534.08	547.77		548.62	0.002685	7.60	1860.83	398.20	0.45
Williamson Ck	Lower	18857	4%	EX	17171.50	534.08	549.67		550.58	0.002586	8.13	2713.63	498.00	0.44
Williamson Ck	Lower	18857	4%	PROP	16870.00	534.08	549.57		550.48	0.002592	8.11	2663.46	492.35	0.44
Williamson Ck	Lower	18857	1%	EX	25736.40	534.08	552.13		553.10	0.002476	8.80	4054.27	585.49	0.43
Williamson Ck	Lower	18857	1%	PROP	25120.60	534.08	551.98		552.94	0.002475	8.75	3967.92	580.81	0.43
Williamson Ck	Lower	18695	10%	EX	12141.20	532.88	547.47	543.26	548.16	0.002749	6.99	2118.98	483.82	0.40
Williamson Ck	Lower	18695	10%	PROP	12082.80	532.88	547.44	543.25	548.14	0.002757	6.98	2105.92	482.65	0.40
Williamson Ck	Lower	18695	4%	EX	17171.50	532.88	549.42	545.13	550.13	0.002359	7.34	3111.65	526.48	0.38
Williamson Ck	Lower	18695	4%	PROP	16870.00	532.88	549.32	545.02	550.02	0.002374	7.32	3056.76	526.03	0.39
Williamson Ck	Lower	18695	1%	EX	25736.40	532.88	551.90	547.84	552.68	0.002167	8.03	4429.50	537.33	0.38
Williamson Ck	Lower	18695	1%	PROP	25120.60	532.88	551.75	547.71	552.52	0.002166	7.97	4350.64	536.68	0.38
Williamson Ck	Lower	18587	10%	EX	12141.20	532.37	547.41	541.92	547.92	0.001311	5.96	2526.28	503.46	0.33
Williamson Ck	Lower	18587	10%	PROP	12082.80	532.37	547.38	541.89	547.89	0.001312	5.96	2512.59	502.76	0.33
Williamson Ck	Lower	18587	4%	EX	17171.50	532.37	549.37	543.52	549.92	0.001268	6.45	3557.98	547.25	0.33
Williamson Ck	Lower	18587	4%	PROP	16870.00	532.37	549.26	543.42	549.81	0.001269	6.42	3500.95	546.79	0.33
Williamson Ck	Lower	18587	1%	EX	25736.40	532.37	551.84	546.64	552.48	0.001290	7.23	4927.43	558.09	0.33
Williamson Ck	Lower	18587	1%	PROP	25120.60	532.37	551.70	546.52	552.33	0.001283	7.17	4845.56	557.45	0.33
Williamson Ck	Lower	18449	10%	EX	12141.20	530.73	547.31	540.61	547.73	0.001233	5.39	2744.27	494.40	0.29
Williamson Ck	Lower	18449	10%	PROP	12082.80	530.73	547.29	540.61	547.70	0.001235	5.38	2730.70	493.66	0.29
Williamson Ck	Lower	18449	4%	EX	17171.50	530.73	549.28	542.58	549.74	0.001205	5.90	3778.35	553.86	0.29
Williamson Ck	Lower	18449	4%	PROP	16870.00	530.73	549.17	542.49	549.63	0.001207	5.87	3720.37	553.40	0.29
Williamson Ck	Lower	18449	1%	EX	25736.40	530.73	551.76	544.96	552.31	0.001227	6.69	5167.36	564.72	0.30
Williamson Ck	Lower	18449	1%	PROP	25120.60	530.73	551.61	544.80	552.16	0.001220	6.63	5084.58	564.08	0.30

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	18287	10%	EX	12141.20	530.90	546.93	542.75	547.48	0.001733	6.66	2484.09	369.11	0.35
Williamson Ck	Lower	18287	10%	PROP	12082.80	530.90	546.90	542.73	547.45	0.001734	6.65	2474.11	368.82	0.35
Williamson Ck	Lower	18287	4%	EX	17171.50	530.90	548.82	544.30	549.48	0.001794	7.50	3208.50	408.26	0.36
Williamson Ck	Lower	18287	4%	PROP	16870.00	530.90	548.72	544.23	549.38	0.001789	7.45	3167.79	404.63	0.36
Williamson Ck	Lower	18287	1%	EX	25736.40	530.90	551.21	546.11	552.04	0.001925	8.67	4340.33	484.49	0.38
Williamson Ck	Lower	18287	1%	PROP	25120.60	530.90	551.07	546.01	551.89	0.001910	8.58	4272.83	484.01	0.38
Williamson Ck	Lower	18110	10%	EX	12141.20	530.49	546.27	541.72	547.07	0.002677	7.18	1750.70	249.25	0.43
Williamson Ck	Lower	18110	10%	PROP	12082.80	530.49	546.25	541.72	547.04	0.002678	7.17	1744.40	248.50	0.43
Williamson Ck	Lower	18110	4%	EX	17171.50	530.49	547.97	543.44	549.03	0.002875	8.37	2232.45	334.34	0.45
Williamson Ck	Lower	18110	4%	PROP	16870.00	530.49	547.88	543.33	548.93	0.002862	8.30	2202.89	328.21	0.45
Williamson Ck	Lower	18110	1%	EX	25736.40	530.49	550.16	545.89	551.55	0.003075	9.82	3108.64	442.23	0.49
Williamson Ck	Lower	18110	1%	PROP	25120.60	530.49	550.03	545.74	551.40	0.003062	9.73	3051.18	441.85	0.48
Williamson Ck	Lower	18082	10%	EX	12141.20	530.49	545.90	542.80	546.95	0.004227	8.26	1512.90	238.11	0.53
Williamson Ck	Lower	18082	10%	PROP	12082.80	530.49	545.87	542.77	546.92	0.004235	8.25	1506.88	237.37	0.53
Williamson Ck	Lower	18082	4%	EX	17171.50	530.49	547.55	544.57	548.91	0.004283	9.47	1949.86	304.94	0.55
Williamson Ck	Lower	18082	4%	PROP	16870.00	530.49	547.46	544.43	548.80	0.004270	9.40	1924.31	299.13	0.54
Williamson Ck	Lower	18082	1%	EX	25736.40	530.49	549.60	546.73	551.40	0.004520	11.11	2718.09	440.72	0.58
Williamson Ck	Lower	18082	1%	PROP	25120.60	530.49	549.47	546.60	551.25	0.004523	11.03	2660.30	440.37	0.58
Williamson Ck	Lower	17814	10%	EX	12180.60	529.59	545.01	541.62	546.08	0.002701	8.65	1650.93	257.06	0.47
Williamson Ck	Lower	17814	10%	PROP	12116.50	529.59	544.99	541.62	546.05	0.002697	8.63	1644.89	256.38	0.47
Williamson Ck	Lower	17814	4%	EX	17211.60	529.59	546.61	543.44	548.00	0.003017	10.06	2137.34	373.85	0.51
Williamson Ck	Lower	17814	4%	PROP	16908.20	529.59	546.52	543.34	547.89	0.003005	9.99	2105.26	364.29	0.51
Williamson Ck	Lower	17814	1%	EX	25753.10	529.59	548.87	545.85	550.45	0.002972	11.21	3187.32	553.72	0.52
Williamson Ck	Lower	17814	1%	PROP	25154.90	529.59	548.71	545.68	550.29	0.003000	11.18	3103.10	529.97	0.53
Williamson Ck	Lower	17667	10%	EX	12180.60	529.05	544.85	541.62	545.45	0.004275	6.62	2047.91	375.25	0.40
Williamson Ck	Lower	17667	10%	PROP	12116.50	529.05	544.82	541.59	545.43	0.004290	6.62	2037.82	374.36	0.40
Williamson Ck	Lower	17667	4%	EX	17211.60	529.05	546.67	543.08	547.30	0.003510	6.83	2803.72	432.79	0.37
Williamson Ck	Lower	17667	4%	PROP	16908.20	529.05	546.57	543.08	547.20	0.003540	6.81	2761.86	430.98	0.37
Williamson Ck	Lower	17667	1%	EX	25753.10	529.05	549.05	544.93	549.76	0.002923	7.15	3901.23	469.20	0.35
Williamson Ck	Lower	17667	1%	PROP	25154.90	529.05	548.90	544.82	549.60	0.002956	7.13	3829.61	468.77	0.35
Williamson Ck	Lower	17478	10%	EX	12180.60	527.96	543.39	540.66	544.63	0.004290	9.08	1452.86	250.09	0.55
Williamson Ck	Lower	17478	10%	PROP	12116.50	527.96	543.37	540.63	544.60	0.004293	9.07	1446.50	248.93	0.55
Williamson Ck	Lower	17478	4%	EX	17211.60	527.96	545.24	542.52	546.60	0.003845	9.81	2005.47	322.89	0.54
Williamson Ck	Lower	17478	4%	PROP	16908.20	527.96	545.14	542.42	546.50	0.003872	9.78	1972.73	321.92	0.54
Williamson Ck	Lower	17478	1%	EX	25753.10	527.96	547.74	545.18	549.20	0.003278	10.47	2888.04	369.44	0.52
Williamson Ck	Lower	17478	1%	PROP	25154.90	527.96	547.57	545.05	549.03	0.003328	10.46	2825.47	369.18	0.52
Williamson Ck	Lower	17355	10%	EX	12180.60	527.37	543.13	540.27	544.10	0.002774	8.58	1694.16	272.67	0.46
Williamson Ck	Lower	17355	10%	PROP	12116.50	527.37	543.10	540.25	544.07	0.002778	8.58	1686.64	272.32	0.46
Williamson Ck	Lower	17355	4%	EX	17211.60	527.37	545.03	542.29	546.08	0.002524	9.11	2244.53	301.40	0.45
Williamson Ck	Lower	17355	4%	PROP	16908.20	527.37	544.92	542.20	545.97	0.002534	9.08	2213.95	301.23	0.45
Williamson Ck	Lower	17355	1%	EX	25753.10	527.37	547.46	544.16	548.73	0.002415	10.01	2983.31	305.54	0.45
Williamson Ck	Lower	17355	1%	PROP	25154.90	527.37	547.30	544.01	548.56	0.002425	9.96	2934.08	305.27	0.45
Williamson Ck	Lower	17312	10%	EX	12180.60	526.73	542.97	541.17	543.98	0.002484	8.71	1682.46	290.45	0.50
Williamson Ck	Lower	17312	10%	PROP	12116.50	526.73	542.94	541.14	543.95	0.002490	8.71	1673.90	290.40	0.51
Williamson Ck	Lower	17312	4%	EX	17211.60	526.73	544.93	542.49	545.97	0.002271	9.01	2254.57	293.63	0.47
Williamson Ck	Lower	17312	4%	PROP	16908.20	526.73	544.83	542.44	545.86	0.002275	8.98	2224.65	293.46	0.47
Williamson Ck	Lower	17312	1%	EX	25753.10	526.73	547.36	544.10	548.62	0.002292	9.91	2972.42	297.58	0.47
Williamson Ck	Lower	17312	1%	PROP	25154.90	526.73	547.20	544.00	548.45	0.002294	9.85	2924.62	297.31	0.47
Williamson Ck	Lower	17155	10%	EX	12180.60	526.17	542.64	539.97	543.51	0.003037	7.59	1691.29	290.74	0.51
Williamson Ck	Lower	17155	10%	PROP	12116.50	526.17	542.61	539.95	543.48	0.003040	7.59	1682.82	290.64	0.51
Williamson Ck	Lower	17155	4%	EX	17211.60	526.17	544.57	541.43	545.56	0.002961	8.15	2258.19	296.77	0.48
Williamson Ck	Lower	17155	4%	PROP	16908.20	526.17	544.47	541.36	545.45	0.002957	8.11	2228.52	296.46	0.48
Williamson Ck	Lower	17155	1%	EX	25753.10	526.17	546.93	543.24	548.21	0.003176	9.33	2969.38	304.17	0.49
Williamson Ck	Lower	17155	1%	PROP	25154.90	526.17	546.78	543.13	548.03	0.003169	9.26	2921.67	303.68	0.49
Williamson Ck	Lower	16988	10%	EX	12180.60	524.62	541.98	539.73	542.92	0.004157	7.88	1619.77	266.64	0.53
Williamson Ck	Lower	16988	10%	PROP	12116.50	524.62	541.95	539.72	542.89	0.004166	7.88	1611.62	266.53	0.53
Williamson Ck	Lower	16988	4%	EX	17211.60	524.62	543.93	541.02	544.99	0.003864	8.43	2168.26	296.64	0.50
Williamson Ck	Lower	16988	4%	PROP	16908.20	524.62	543.84	540.94	544.88	0.003863	8.38	2139.22	295.07	0.50
Williamson Ck	Lower	16988	1%	EX	25753.10	524.62	546.22	542.72	547.60	0.004104	9.71	2887.06	332.36	0.51
Williamson Ck	Lower	16988	1%	PROP	25154.90	524.62	546.06	542.61	547.42	0.004104	9.64	2835.44	330.68	0.51
Williamson Ck	Lower	16838	10%	EX	12180.60	525.12	541.57	538.48	542.37	0.002754	7.61	1880.59	297.45	0.45
Williamson Ck	Lower	16838	10%	PROP	12116.50	525.12	541.54	538.45	542.34	0.002759	7.60	1871.13	297.29	0.45
Williamson Ck	Lower	16838	4%	EX	17211.60	525.12	543.59	540.07	544.43	0.002825	7.89	2529.10	365.57	0.46
Williamson Ck	Lower	16838	4%	PROP	16908.20	525.12	543.49	539.99	544.32	0.002831	7.86	2491.91	359.42	0.46
Williamson Ck	Lower	16838	1%	EX	25753.10	525.12	545.98	541.82	546.97	0.002814	8.69	3510.45	442.45	0.45
Williamson Ck	Lower	16838	1%	PROP	25154.90	525.12	545.81	541.88	546.80	0.002828	8.66	3437.66	438.32	0.46
Williamson Ck	Lower	16694	10%	EX	12180.60	524.37	541.01	538.18	541.95	0.002916	8.10	1754.44	314.46	0.50
Williamson Ck	Lower	16694	10%	PROP	12116.50	524.37	540.98	538.15	541.92	0.002924	8.10	1743.80	313.96	0.50
Williamson Ck	Lower	16694	4%	EX	17211.60	524.37	543.09	539.96	544.02	0.002732	8.27	2481.23	413.74	0.48
Williamson Ck	Lower	16694	4%	PROP	16908.20	524.37	542.98	539.87	543.91	0.002742	8.25	2437.59	405.90	0.48
Williamson Ck	Lower	16694	1%	EX	25753.10	524.37	545.55	542.08	546.58	0.002631	8.92	3588.07	474.31	0.46
Williamson Ck	Lower	16694	1%	PROP	25154.90	524.37	545.37	541.97	546.40	0.002652	8.90	3506.27	471.50	0.46
Williamson Ck	Lower	16525	10%	EX	12180.60	523.79	540.55		541.37	0.003741	7.45	1782.84	273.33	0.43
Williamson Ck	Lower	16525	10%	PROP	12116.50	523.79	540.52		541.33	0.003753	7.44	1773.54	271.33	0.43
Williamson Ck	Lower	16525	4%	EX	17211.60	523.79	542.61		543.51	0.003353	8.04	2584.02	498.07	0.42
Williamson Ck	Lower	16525	4%	PROP	16908.20	523.79	542.50		543.40	0.003381	8.02	2529.03	493.23	0.42
Williamson Ck	Lower	16525	1%	EX	25753.10	523.79	545.15		546.09	0.002980	8.65	3936.01	571.37	0.41
Williamson Ck	Lower	16525	1%	PROP	25154.90	523.79	544.97		545.91	0.003029	8.64	3832.26	560.27	0.41
Williamson Ck	Lower	16386	10%	EX	12180.60	522.05	540.27		540.93	0.002212	6.66	1987.44	308.30	0.36
Williamson Ck	Lower	16386	10%	PROP	12116.50	522.05	540.23		540.89	0.002215	6.65	1976.85	304.80	0.36
Williamson Ck	Lower	16386	4%	EX	17211.60	522.05	542.33		543.10	0.002180	7.42	2794.29	448.03	0.36
Williamson Ck	Lower	16386	4%	PROP	16908.20	522.05	542.22		542.99	0.002183	7.38	2745.59	442.99	0.36
Williamson Ck	Lower	16386	1%	EX	25753.10	522.05	544.81		545.73	0.002209	8.40	4045.15	545.61	0.38
Williamson Ck	Lower	16386	1%	PROP	25154.90	522.05	544.63		545.55	0.002228	8.37	3945.43	541.43	0.38
Williamson Ck	Lower	16266	10%	EX	12180.60	524.52	540.23		540.67	0.001207	5.34	2373.56	334.01	0.30
Williamson Ck	Lower	16266	10%	PROP	12116.50	524.52	540.20		540.64	0.001208	5.33	2361.93	331.05	0.30

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	16266	4%	EX	17211.60	524.52	542.31		542.84	0.001241	6.01	3216.30	457.71	0.31
Williamson Ck	Lower	16266	4%	PROP	16908.20	524.52	542.20		542.73	0.001242	5.97	3166.32	452.78	0.31
Williamson Ck	Lower	16266	1%	EX	25753.10	524.52	544.80		545.48	0.001281	6.94	4483.88	557.22	0.32
Williamson Ck	Lower	16266	1%	PROP	25154.90	524.52	544.61		545.29	0.001289	6.91	4382.39	550.25	0.33
Williamson Ck	Lower	16117	10%	EX	12180.60	522.20	540.10		540.49	0.001076	5.09	2572.59	359.80	0.27
Williamson Ck	Lower	16117	10%	PROP	12116.50	522.20	540.06		540.45	0.001076	5.09	2559.93	358.09	0.27
Williamson Ck	Lower	16117	4%	EX	17211.60	522.20	542.17		542.66	0.001148	5.79	3421.88	459.82	0.28
Williamson Ck	Lower	16117	4%	PROP	16908.20	522.20	542.06		542.54	0.001144	5.76	3371.68	454.52	0.28
Williamson Ck	Lower	16117	1%	EX	25753.10	522.20	544.66		545.28	0.001268	6.73	4693.50	549.54	0.30
Williamson Ck	Lower	16117	1%	PROP	25154.90	522.20	544.48		545.10	0.001272	6.70	4592.53	544.20	0.30
Williamson Ck	Lower	16027	10%	EX	12180.60	523.86	540.04		540.38	0.001033	4.70	2846.71	447.86	0.25
Williamson Ck	Lower	16027	10%	PROP	12116.50	523.86	540.01		540.34	0.001034	4.69	2830.87	444.11	0.25
Williamson Ck	Lower	16027	4%	EX	17211.60	523.86	542.14		542.53	0.001032	5.24	3864.69	528.03	0.25
Williamson Ck	Lower	16027	4%	PROP	16908.20	523.86	542.03		542.42	0.001031	5.21	3806.42	523.24	0.25
Williamson Ck	Lower	16027	1%	EX	25753.10	523.86	544.65		545.13	0.001081	5.99	5288.61	582.11	0.27
Williamson Ck	Lower	16027	1%	PROP	25154.90	523.86	544.47		544.95	0.001088	5.97	5180.09	581.21	0.27
Williamson Ck	Lower	15878	10%	EX	12180.60	522.81	539.90	531.51	540.25	0.000718	4.69	2594.64	211.77	0.24
Williamson Ck	Lower	15878	10%	PROP	12116.50	522.81	539.87	531.49	540.21	0.000717	4.68	2587.38	211.63	0.24
Williamson Ck	Lower	15878	4%	EX	17211.60	522.81	541.87	532.90	542.37	0.000901	5.70	3018.86	220.96	0.27
Williamson Ck	Lower	15878	4%	PROP	16908.20	522.81	541.77	532.80	542.26	0.000890	5.64	2996.34	220.44	0.27
Williamson Ck	Lower	15878	1%	EX	25753.10	522.81	544.08	534.94	544.92	0.001268	7.31	3521.21	232.15	0.33
Williamson Ck	Lower	15878	1%	PROP	25154.90	522.81	543.92	534.81	544.73	0.001250	7.22	3483.01	231.32	0.33
Williamson Ck	Lower	15830 NUCKOLS CROSSING			Bridge									
Williamson Ck	Lower	15782	10%	EX	12180.60	522.29	539.66		540.05	0.000976	5.02	2428.77	203.49	0.26
Williamson Ck	Lower	15782	10%	PROP	12116.50	522.29	539.62		540.01	0.000974	5.00	2421.96	203.36	0.26
Williamson Ck	Lower	15782	4%	EX	17211.60	522.29	541.52		542.10	0.001242	6.11	2815.10	210.55	0.29
Williamson Ck	Lower	15782	4%	PROP	16908.20	522.29	541.43		541.99	0.001225	6.05	2794.98	210.18	0.29
Williamson Ck	Lower	15782	1%	EX	25753.10	522.29	543.84		544.78	0.001746	7.76	3318.76	223.64	0.35
Williamson Ck	Lower	15782	1%	PROP	25154.90	522.29	543.70		544.61	0.001710	7.65	3288.12	222.87	0.35
Williamson Ck	Lower	15664	10%	EX	12180.60	522.08	539.67		539.91	0.000597	3.93	3100.19	260.35	0.20
Williamson Ck	Lower	15664	10%	PROP	12116.50	522.08	539.64		539.88	0.000596	3.92	3091.39	260.07	0.20
Williamson Ck	Lower	15664	4%	EX	17211.60	522.08	541.56		541.92	0.000807	4.77	3608.76	281.69	0.23
Williamson Ck	Lower	15664	4%	PROP	16908.20	522.08	541.47		541.81	0.000790	4.72	3581.50	279.73	0.23
Williamson Ck	Lower	15664	1%	EX	25753.10	522.08	543.95		544.49	0.001161	5.92	4432.96	510.64	0.28
Williamson Ck	Lower	15664	1%	PROP	25154.90	522.08	543.81		544.34	0.001149	5.85	4361.85	474.07	0.28
Williamson Ck	Lower	15585	10%	EX	12180.60	522.08	539.51		539.84	0.001161	4.63	2629.29	296.85	0.27
Williamson Ck	Lower	15585	10%	PROP	12116.50	522.08	539.47		539.80	0.001161	4.63	2619.22	296.37	0.27
Williamson Ck	Lower	15585	4%	EX	17211.60	522.08	541.38		541.83	0.001396	5.34	3221.77	336.31	0.30
Williamson Ck	Lower	15585	4%	PROP	16908.20	522.08	541.29		541.72	0.001385	5.30	3189.49	334.95	0.30
Williamson Ck	Lower	15585	1%	EX	25753.10	522.08	543.75		544.38	0.001666	6.37	4170.58	525.54	0.33
Williamson Ck	Lower	15585	1%	PROP	25154.90	522.08	543.61		544.22	0.001648	6.30	4097.86	489.27	0.32
Williamson Ck	Lower	15370	10%	EX	12180.60	520.89	539.20		539.54	0.001710	4.66	2614.99	320.77	0.29
Williamson Ck	Lower	15370	10%	PROP	12116.50	520.89	539.17		539.50	0.001716	4.65	2603.87	320.64	0.29
Williamson Ck	Lower	15370	4%	EX	17211.60	520.89	541.04		541.49	0.001751	5.36	3212.58	327.87	0.30
Williamson Ck	Lower	15370	4%	PROP	16908.20	520.89	540.95		541.39	0.001743	5.32	3181.96	327.51	0.30
Williamson Ck	Lower	15370	1%	EX	25753.10	520.89	543.34		543.99	0.001961	6.47	4106.45	539.74	0.33
Williamson Ck	Lower	15370	1%	PROP	25154.90	520.89	543.20		543.83	0.001950	6.40	4031.33	527.86	0.33
Williamson Ck	Lower	15249	10%	EX	12180.60	520.19	538.88		539.29	0.002377	5.11	2385.47	317.36	0.33
Williamson Ck	Lower	15249	10%	PROP	12116.50	520.19	538.85		539.25	0.002383	5.10	2374.17	316.61	0.33
Williamson Ck	Lower	15249	4%	EX	17211.60	520.19	540.73		541.23	0.002473	5.69	3042.09	388.68	0.34
Williamson Ck	Lower	15249	4%	PROP	16908.20	520.19	540.64		541.13	0.002476	5.65	3005.64	385.87	0.34
Williamson Ck	Lower	15249	1%	EX	25753.10	520.19	543.07		543.73	0.002418	6.55	4131.25	595.29	0.35
Williamson Ck	Lower	15249	1%	PROP	25154.90	520.19	542.93		543.57	0.002417	6.50	4047.26	583.26	0.35
Williamson Ck	Lower	15151	10%	EX	12180.60	519.38	538.68		539.05	0.002245	4.92	2473.92	331.28	0.32
Williamson Ck	Lower	15151	10%	PROP	12116.50	519.38	538.64		539.02	0.002254	4.92	2461.84	330.72	0.32
Williamson Ck	Lower	15151	4%	EX	17211.60	519.38	540.52		540.99	0.002367	5.50	3140.79	400.46	0.34
Williamson Ck	Lower	15151	4%	PROP	16908.20	519.38	540.42		540.89	0.002371	5.46	3102.94	397.23	0.33
Williamson Ck	Lower	15151	1%	EX	25753.10	519.38	542.87		543.49	0.002302	6.33	4221.40	585.01	0.34
Williamson Ck	Lower	15151	1%	PROP	25154.90	519.38	542.73		543.33	0.002305	6.28	4138.12	565.45	0.34
Williamson Ck	Lower	15019	10%	EX	12180.60	518.68	538.38		538.79	0.001757	5.23	2499.05	357.33	0.30
Williamson Ck	Lower	15019	10%	PROP	12116.50	518.68	538.35		538.75	0.001758	5.22	2486.36	352.14	0.30
Williamson Ck	Lower	15019	4%	EX	17211.60	518.68	540.21		540.71	0.001840	5.93	3255.89	448.87	0.31
Williamson Ck	Lower	15019	4%	PROP	16908.20	518.68	540.12		540.61	0.001834	5.89	3213.46	444.92	0.31
Williamson Ck	Lower	15019	1%	EX	25753.10	518.68	542.56		543.21	0.001996	6.88	4499.58	645.54	0.33
Williamson Ck	Lower	15019	1%	PROP	25154.90	518.68	542.42		543.05	0.001989	6.83	4406.75	629.23	0.33
Williamson Ck	Lower	14867	10%	EX	12180.60	520.67	538.18		538.52	0.001669	4.74	2714.35	417.53	0.28
Williamson Ck	Lower	14867	10%	PROP	12116.50	520.67	538.14		538.48	0.001676	4.74	2698.77	415.64	0.28
Williamson Ck	Lower	14867	4%	EX	17211.60	520.67	540.02		540.43	0.001658	5.30	3548.56	479.22	0.29
Williamson Ck	Lower	14867	4%	PROP	16908.20	520.67	539.93		540.33	0.001656	5.27	3502.85	476.51	0.29
Williamson Ck	Lower	14867	1%	EX	25753.10	520.67	542.38		542.91	0.001763	6.16	4870.84	683.77	0.30
Williamson Ck	Lower	14867	1%	PROP	25154.90	520.67	542.23		542.75	0.001761	6.11	4771.57	668.34	0.30
Williamson Ck	Lower	14700	10%	EX	12180.60	519.58	537.85		538.23	0.001833	4.99	2567.13	399.62	0.29
Williamson Ck	Lower	14700	10%	PROP	12116.50	519.58	537.81		538.19	0.001843	4.99	2551.52	398.09	0.29
Williamson Ck	Lower	14700	4%	EX	17211.60	519.58	539.68		540.15	0.001843	5.61	3388.85	508.18	0.30
Williamson Ck	Lower	14700	4%	PROP	16908.20	519.58	539.59		540.05	0.001839	5.57	3341.02	501.03	0.30
Williamson Ck	Lower	14700	1%	EX	25753.10	519.58	542.09		542.63	0.001803	6.27	4999.55	816.34	0.31
Williamson Ck	Lower	14700	1%	PROP	25154.90	519.58	541.94		542.47	0.001812	6.24	4876.40	795.97	0.31
Williamson Ck	Lower	14416	10%	EX	12180.60	520.58	536.90		537.50	0.003692	6.21	2014.37	360.04	0.40
Williamson Ck	Lower	14416	10%	PROP	12116.50	520.58	536.85		537.45	0.003734	6.22	1997.40	357.16	0.40
Williamson Ck	Lower	14416	4%	EX	17211.60	520.58	538.81		539.47	0.003231	6.68	2810.70	477.13	0.39
Williamson Ck	Lower	14416	4%	PROP	16908.20	520.58	538.72		539.37	0.003245	6.65	2764.58	470.49	0.39
Williamson Ck	Lower	14416	1%	EX	25753.10	520.58	541.33		542.04	0.002781	7.16	4267.54	713.75	0.37
Williamson Ck	Lower	14416	1%	PROP	25154.90	520.58	541.17		541.88	0.002812	7.14	4153.73	693.04	0.37
Williamson Ck	Lower	14106	10%	EX	12180.60	518.08	535.75		536.35	0.003733	6.17	1972.99	257.75	0.39
Williamson Ck	Lower	14106	10%	PROP	12116.50	518.08	535.70		536.29	0.003757	6.19	1958.13	256.30	0.39

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	14106	4%	EX	17211.60	518.08	537.79		538.47	0.003367	6.67	2773.41	537.51	0.38
Williamson Ck	Lower	14106	4%	PROP	16908.20	518.08	537.69		538.36	0.003395	6.65	2716.24	525.11	0.39
Williamson Ck	Lower	14106	1%	EX	25753.10	518.08	540.66		541.26	0.002395	6.64	4576.74	708.60	0.34
Williamson Ck	Lower	14106	1%	PROP	25154.90	518.08	540.48		541.09	0.002444	6.64	4451.09	695.17	0.34
Williamson Ck	Lower	13810	10%	EX	12207.80	518.08	534.70		535.36	0.002953	6.55	1954.14	266.65	0.37
Williamson Ck	Lower	13810	10%	PROP	12142.60	518.08	534.63		535.29	0.002990	6.57	1936.00	264.92	0.37
Williamson Ck	Lower	13810	4%	EX	17244.50	518.08	536.75		537.53	0.002932	7.27	2858.04	670.89	0.38
Williamson Ck	Lower	13810	4%	PROP	16942.20	518.08	536.63		537.41	0.002957	7.26	2778.28	668.78	0.38
Williamson Ck	Lower	13810	1%	EX	25795.70	518.08	539.96		540.58	0.002117	7.06	5186.10	816.59	0.33
Williamson Ck	Lower	13810	1%	PROP	25203.40	518.08	539.76		540.40	0.002155	7.07	5027.61	803.33	0.33
Williamson Ck	Lower	13477	10%	EX	12207.80	518.08	534.02		534.45	0.002216	5.35	2652.66	529.48	0.31
Williamson Ck	Lower	13477	10%	PROP	12142.60	518.08	533.94		534.37	0.002268	5.38	2607.79	518.52	0.31
Williamson Ck	Lower	13477	4%	EX	17244.50	518.08	536.27		536.68	0.001787	5.49	4159.88	731.41	0.29
Williamson Ck	Lower	13477	4%	PROP	16942.20	518.08	536.14		536.55	0.001820	5.50	4063.52	729.04	0.29
Williamson Ck	Lower	13477	1%	EX	25795.70	518.08	539.66		540.00	0.001193	5.33	6745.42	792.49	0.24
Williamson Ck	Lower	13477	1%	PROP	25203.40	518.08	539.46		539.80	0.001214	5.33	6586.50	788.88	0.24
Williamson Ck	Lower	13111	10%	EX	12207.80	517.08	533.08		533.60	0.002360	6.57	3092.73	761.16	0.34
Williamson Ck	Lower	13111	10%	PROP	12142.60	517.08	533.06		533.53	0.002224	6.37	3077.81	699.21	0.33
Williamson Ck	Lower	13111	4%	EX	17244.50	517.08	535.77		536.08	0.001336	5.67	5267.62	828.69	0.26
Williamson Ck	Lower	13111	4%	PROP	16942.20	517.08	535.62		535.94	0.001371	5.70	5146.02	827.47	0.27
Williamson Ck	Lower	13111	1%	EX	25795.70	517.08	539.38		539.60	0.000828	5.17	8308.27	858.57	0.21
Williamson Ck	Lower	13111	1%	PROP	25203.40	517.08	539.17		539.40	0.000842	5.18	8130.75	856.86	0.22
Williamson Ck	Lower	12966	10%	EX	12207.80	514.08	533.17		533.32	0.000484	3.59	5095.40	717.10	0.17
Williamson Ck	Lower	12966	10%	PROP	12142.60	514.08	533.13		533.29	0.000485	3.59	5069.15	716.45	0.17
Williamson Ck	Lower	12966	4%	EX	17244.50	514.08	535.74		535.91	0.000440	3.80	7002.61	761.93	0.16
Williamson Ck	Lower	12966	4%	PROP	16942.20	514.08	535.60		535.76	0.000442	3.78	6893.68	759.60	0.16
Williamson Ck	Lower	12966	1%	EX	25795.70	514.08	539.30		539.48	0.000405	4.11	9817.48	819.87	0.16
Williamson Ck	Lower	12966	1%	PROP	25203.40	514.08	539.10		539.27	0.000405	4.08	9649.49	816.52	0.16
Williamson Ck	Lower	12817	10%	EX	12207.80	514.08	533.02		533.24	0.000596	4.27	4528.11	710.59	0.20
Williamson Ck	Lower	12817	10%	PROP	12142.60	514.08	532.98		533.20	0.000597	4.26	4501.79	710.06	0.20
Williamson Ck	Lower	12817	4%	EX	17244.50	514.08	535.62		535.83	0.000506	4.39	6425.96	745.94	0.19
Williamson Ck	Lower	12817	4%	PROP	16942.20	514.08	535.48		535.68	0.000511	4.39	6318.35	744.35	0.19
Williamson Ck	Lower	12817	1%	EX	25795.70	514.08	539.20		539.41	0.000436	4.63	9166.01	785.30	0.18
Williamson Ck	Lower	12817	1%	PROP	25203.40	514.08	538.99		539.20	0.000438	4.61	9004.66	783.04	0.18
Williamson Ck	Lower	12675	10%	EX	12207.80	514.08	532.86		533.12	0.000895	4.54	3531.42	392.01	0.21
Williamson Ck	Lower	12675	10%	PROP	12142.60	514.08	532.82		533.09	0.000894	4.53	3517.21	391.74	0.21
Williamson Ck	Lower	12675	4%	EX	17244.50	514.08	535.41		535.72	0.000919	5.01	4554.24	410.36	0.22
Williamson Ck	Lower	12675	4%	PROP	16942.20	514.08	535.27		535.57	0.000918	4.98	4496.20	409.34	0.22
Williamson Ck	Lower	12675	1%	EX	25795.70	514.08	538.92		539.29	0.000960	5.64	6039.31	435.64	0.23
Williamson Ck	Lower	12675	1%	PROP	25203.40	514.08	538.72		539.09	0.000953	5.59	5952.00	434.19	0.23
Williamson Ck	Lower	12524	10%	EX	12207.80	514.08	532.53		532.94	0.001347	5.19	2425.64	249.62	0.27
Williamson Ck	Lower	12524	10%	PROP	12142.60	514.08	532.50		532.91	0.001347	5.18	2416.87	249.34	0.27
Williamson Ck	Lower	12524	4%	EX	17244.50	514.08	535.00		535.53	0.001344	5.91	3065.91	269.36	0.28
Williamson Ck	Lower	12524	4%	PROP	16942.20	514.08	534.86		535.38	0.001344	5.87	3029.10	268.26	0.28
Williamson Ck	Lower	12524	1%	EX	25795.70	514.08	538.38		539.09	0.001370	6.91	4023.09	296.43	0.29
Williamson Ck	Lower	12524	1%	PROP	25203.40	514.08	538.19		538.89	0.001362	6.84	3966.71	294.90	0.29
Williamson Ck	Lower	12284	10%	EX	12207.80	514.08	531.64		532.46	0.002813	7.58	1881.63	228.31	0.38
Williamson Ck	Lower	12284	10%	PROP	12142.60	514.08	531.60		532.43	0.002811	7.56	1873.75	228.12	0.38
Williamson Ck	Lower	12284	4%	EX	17244.50	514.08	534.08		535.05	0.002888	8.38	2455.68	241.34	0.39
Williamson Ck	Lower	12284	4%	PROP	16942.20	514.08	533.95		534.90	0.002886	8.34	2422.79	240.62	0.39
Williamson Ck	Lower	12284	1%	EX	25795.70	514.08	537.44		538.62	0.002843	9.45	3328.90	287.53	0.40
Williamson Ck	Lower	12284	1%	PROP	25203.40	514.08	537.25		538.41	0.002831	9.36	3276.49	284.36	0.40
Williamson Ck	Lower	12038	10%	EX	12207.80	513.08	531.66		531.95	0.000979	4.46	3166.28	351.18	0.22
Williamson Ck	Lower	12038	10%	PROP	12142.60	513.08	531.62		531.91	0.000979	4.46	3153.81	350.99	0.22
Williamson Ck	Lower	12038	4%	EX	17244.50	513.08	534.16		534.51	0.001020	5.01	4063.29	364.96	0.23
Williamson Ck	Lower	12038	4%	PROP	16942.20	513.08	534.02		534.37	0.001019	4.98	4012.34	364.19	0.23
Williamson Ck	Lower	12038	1%	EX	25795.70	513.08	537.62		538.06	0.001035	5.74	5381.01	403.00	0.24
Williamson Ck	Lower	12038	1%	PROP	25203.40	513.08	537.43		537.86	0.001029	5.68	5304.73	400.53	0.23
Williamson Ck	Lower	11796	10%	EX	12207.80	512.08	531.22		531.62	0.001880	5.12	2389.80	248.27	0.28
Williamson Ck	Lower	11796	10%	PROP	12142.60	512.08	531.18		531.59	0.001881	5.11	2381.14	247.86	0.28
Williamson Ck	Lower	11796	4%	EX	17244.50	512.08	533.67		534.19	0.001801	5.79	3034.06	276.89	0.29
Williamson Ck	Lower	11796	4%	PROP	16942.20	512.08	533.53		534.05	0.001804	5.76	2996.28	275.30	0.29
Williamson Ck	Lower	11796	1%	EX	25795.70	512.08	537.05		537.73	0.001766	6.72	4070.74	354.57	0.30
Williamson Ck	Lower	11796	1%	PROP	25203.40	512.08	536.87		537.54	0.001756	6.65	4006.63	348.43	0.30
Williamson Ck	Lower	11354	10%	EX	12207.80	511.08	529.49		530.36	0.004472	7.48	1632.42	174.43	0.43
Williamson Ck	Lower	11354	10%	PROP	12142.60	511.08	529.45		530.32	0.004466	7.46	1626.64	174.11	0.43
Williamson Ck	Lower	11354	4%	EX	17244.50	511.08	531.85		532.93	0.004619	8.35	2068.84	195.16	0.45
Williamson Ck	Lower	11354	4%	PROP	16942.20	511.08	531.71		532.78	0.004619	8.30	2042.98	194.02	0.45
Williamson Ck	Lower	11354	1%	EX	25795.70	511.08	535.19		536.52	0.004338	9.29	2965.59	408.07	0.45
Williamson Ck	Lower	11354	1%	PROP	25203.40	511.08	535.01		536.32	0.004358	9.23	2892.15	404.85	0.45
Williamson Ck	Lower	10934	10%	EX	12207.80	510.08	527.57	522.38	528.52	0.004232	7.84	1568.45	163.68	0.43
Williamson Ck	Lower	10934	10%	PROP	12142.60	510.08	527.54	522.34	528.49	0.004225	7.82	1563.75	163.49	0.43
Williamson Ck	Lower	10934	4%	EX	17244.50	510.08	529.73	524.48	530.99	0.004531	9.06	1936.71	177.70	0.46
Williamson Ck	Lower	10934	4%	PROP	16942.20	510.08	529.60	524.37	530.85	0.004523	9.00	1914.44	176.88	0.46
Williamson Ck	Lower	10934	1%	EX	25795.70	510.08	532.87	527.02	534.53	0.005001	10.47	2529.82	617.48	0.49
Williamson Ck	Lower	10934	1%	PROP	25203.40	510.08	532.72	526.86	534.35	0.004916	10.34	2501.59	578.31	0.49
Williamson Ck	Lower	10605	10%	EX	12207.80	509.08	526.22	521.48	527.00	0.004622	7.20	1930.27	510.21	0.44
Williamson Ck	Lower	10605	10%	PROP	12142.60	509.08	526.18	521.46	526.97	0.004653	7.21	1911.94	509.89	0.44
Williamson Ck	Lower	10605	4%	EX	17244.50	509.08	529.00	523.61	529.59	0.002694	6.65	3383.46	535.23	0.35
Williamson Ck	Lower	10605	4%	PROP	16942.20	509.08	528.84	523.50	529.44	0.002768	6.67	3299.36	533.82	0.35
Williamson Ck	Lower	10605	1%	EX	25795.70	509.08	532.72	526.92	533.19	0.001666	6.32	5911.87	1268.54	0.29
Williamson Ck	Lower	10605	1%	PROP	25203.40	509.08	532.54	526.80	533.02	0.001696	6.33	5690.87	1252.94	0.29
Williamson Ck	Lower	10410	10%	EX	12207.80	508.08	526.14	517.88	526.47	0.001196	4.82	3211.43	613.97	0.24
Williamson Ck	Lower	10410	10%	PROP	12142.60	508.08	526.10	517.86	526.43	0.001200	4.81	3188.77	613.07	0.24
Williamson Ck	Lower	10410	4%	EX	17244.50	508.08	528.96	519.68	529.26	0.000902	4.81	5040.53	682.45	0.22
Williamson Ck	Lower	10410	4%	PROP	16942.20	508.08	528.80	519.58	529.10	0.000915	4.81	4932.37	678.59	0.22

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	10410	1%	EX	25795.70	508.08	532.70	522.05	532.97	0.000691	4.89	8242.89	1462.10	0.20
Williamson Ck	Lower	10410	1%	PROP	25203.40	508.08	532.53	521.91	532.80	0.000695	4.88	7989.37	1444.65	0.20
Williamson Ck	Lower	9950	10%	EX	12207.80	506.08	525.65		525.91	0.001767	4.89	3838.53	688.62	0.25
Williamson Ck	Lower	9950	10%	PROP	12142.60	506.08	525.61		525.87	0.001783	4.90	3809.33	687.98	0.25
Williamson Ck	Lower	9950	4%	EX	17244.50	506.08	528.73		528.91	0.001032	4.34	6025.33	734.71	0.20
Williamson Ck	Lower	9950	4%	PROP	16942.20	506.08	528.56		528.74	0.001055	4.36	5902.89	732.20	0.20
Williamson Ck	Lower	9950	1%	EX	25795.70	506.08	532.57		532.73	0.000734	4.25	9322.09	1543.35	0.17
Williamson Ck	Lower	9950	1%	PROP	25203.40	506.08	532.39		532.56	0.000740	4.24	9051.29	1506.05	0.17
Williamson Ck	Lower	9378	10%	EX	12207.80	504.08	525.03		525.29	0.000715	4.17	3217.58	333.34	0.19
Williamson Ck	Lower	9378	10%	PROP	12142.60	504.08	524.99		525.25	0.000714	4.16	3203.93	332.07	0.19
Williamson Ck	Lower	9378	4%	EX	17244.50	504.08	528.07		528.39	0.000733	4.69	4316.33	387.83	0.19
Williamson Ck	Lower	9378	4%	PROP	16942.20	504.08	527.90		528.22	0.000732	4.66	4252.14	384.90	0.19
Williamson Ck	Lower	9378	1%	EX	25795.70	504.08	531.87		532.25	0.000836	5.31	6210.81	705.95	0.21
Williamson Ck	Lower	9378	1%	PROP	25203.40	504.08	531.70		532.08	0.000821	5.26	6093.42	682.71	0.21
Williamson Ck	Lower	9075	10%	EX	12207.80	503.08	524.14		524.90	0.002065	7.00	1826.94	196.88	0.35
Williamson Ck	Lower	9075	10%	PROP	12142.60	503.08	524.10		524.85	0.002064	6.99	1819.33	196.13	0.35
Williamson Ck	Lower	9075	4%	EX	17244.50	503.08	527.08		527.99	0.001983	7.77	2507.35	267.03	0.35
Williamson Ck	Lower	9075	4%	PROP	16942.20	503.08	526.92		527.82	0.001988	7.73	2464.43	263.63	0.35
Williamson Ck	Lower	9075	1%	EX	25795.70	503.08	530.66		531.80	0.002038	8.92	4264.44	1232.09	0.37
Williamson Ck	Lower	9075	1%	PROP	25203.40	503.08	530.49		531.63	0.002036	8.87	4065.81	1200.33	0.37
Williamson Ck	Lower	8707	10%	EX	12207.80	503.08	520.16		523.13	0.012606	13.85	881.70	98.78	0.81
Williamson Ck	Lower	8707	10%	PROP	12142.60	503.08	520.14		523.10	0.012526	13.79	880.38	98.55	0.81
Williamson Ck	Lower	8707	4%	EX	17244.50	503.08	521.14	521.14	525.94	0.018515	17.60	986.69	115.29	1.00
Williamson Ck	Lower	8707	4%	PROP	16942.20	503.08	521.02	520.99	525.77	0.018506	17.50	973.57	113.36	1.00
Williamson Ck	Lower	8707	1%	EX	25795.70	503.08	525.31	525.31	529.92	0.012998	17.48	1681.91	260.39	0.87
Williamson Ck	Lower	8707	1%	PROP	25203.40	503.08	524.92	524.92	529.70	0.013905	17.75	1583.30	238.87	0.90
Williamson Ck	Lower	8468	10%	EX	12207.80	502.87	520.38	515.13	520.88	0.003801	5.67	2154.21	409.50	0.34
Williamson Ck	Lower	8468	10%	PROP	12142.60	502.87	520.36	515.10	520.85	0.003788	5.65	2148.99	407.72	0.34
Williamson Ck	Lower	8468	4%	EX	17244.50	502.87	522.40	516.42	522.95	0.003576	6.10	3270.66	568.80	0.34
Williamson Ck	Lower	8468	4%	PROP	16942.20	502.87	522.28	516.36	522.83	0.003603	6.09	3202.50	563.07	0.34
Williamson Ck	Lower	8468	1%	EX	25795.70	502.87	524.99	518.34	525.59	0.003344	6.60	4933.13	696.72	0.33
Williamson Ck	Lower	8468	1%	PROP	25203.40	502.87	524.84	518.21	525.43	0.003360	6.58	4822.82	692.94	0.33
Williamson Ck	Lower	8021	10%	EX	12207.80	502.42	519.50		519.79	0.001531	4.41	2974.94	415.65	0.25
Williamson Ck	Lower	8021	10%	PROP	12142.60	502.42	519.48		519.77	0.001524	4.40	2967.95	415.08	0.25
Williamson Ck	Lower	8021	4%	EX	17244.50	502.42	521.50		521.88	0.001638	5.04	3856.99	459.43	0.26
Williamson Ck	Lower	8021	4%	PROP	16942.20	502.42	521.38		521.75	0.001639	5.01	3800.59	457.65	0.26
Williamson Ck	Lower	8021	1%	EX	25795.70	502.42	524.00		524.52	0.001862	5.97	5046.42	485.54	0.28
Williamson Ck	Lower	8021	1%	PROP	25203.40	502.42	523.85		524.36	0.001847	5.91	4972.61	484.64	0.28
Williamson Ck	Lower	7437	10%	EX	12207.80	498.36	517.90	511.68	518.48	0.003417	6.08	2008.65	260.36	0.36
Williamson Ck	Lower	7437	10%	PROP	12142.60	498.36	517.90	511.65	518.47	0.003385	6.05	2007.74	259.95	0.36
Williamson Ck	Lower	7437	4%	EX	17244.50	498.36	519.78	513.53	520.48	0.003609	6.82	2605.43	342.46	0.38
Williamson Ck	Lower	7437	4%	PROP	16942.20	498.36	519.64	513.45	520.35	0.003643	6.81	2560.25	338.62	0.38
Williamson Ck	Lower	7437	1%	EX	25795.70	498.36	522.18	516.04	523.04	0.003520	7.65	3560.82	454.72	0.39
Williamson Ck	Lower	7437	1%	PROP	25203.40	498.36	522.03	515.88	522.88	0.003552	7.61	3489.89	450.09	0.39
Williamson Ck	Lower	7377 JIMMY CLAY DR			Culvert									
Williamson Ck	Lower	7301	10%	EX	12262.80	498.00	516.87	509.85	517.46	0.002896	6.14	1997.01	229.07	0.37
Williamson Ck	Lower	7301	10%	PROP	12179.60	498.00	516.83	509.80	517.41	0.002888	6.13	1987.31	228.24	0.37
Williamson Ck	Lower	7301	4%	EX	17328.90	498.00	519.07	511.84	519.79	0.003341	6.80	2549.70	447.25	0.39
Williamson Ck	Lower	7301	4%	PROP	17028.50	498.00	518.96	511.74	519.67	0.003319	6.76	2519.97	433.00	0.39
Williamson Ck	Lower	7301	1%	EX	25925.90	498.00	521.65	514.94	522.58	0.003894	7.74	3429.36	1629.31	0.42
Williamson Ck	Lower	7301	1%	PROP	25344.20	498.00	521.51	514.78	522.42	0.003863	7.68	3367.59	1581.52	0.42
Williamson Ck	Lower	6847	10%	EX	12262.80	496.76	515.48	509.19	516.01	0.003437	5.83	2104.04	208.02	0.32
Williamson Ck	Lower	6847	10%	PROP	12179.60	496.76	515.45	509.15	515.97	0.003423	5.81	2096.19	207.68	0.32
Williamson Ck	Lower	6847	4%	EX	17328.90	496.76	517.42	510.68	518.13	0.004009	6.79	2670.99	409.99	0.35
Williamson Ck	Lower	6847	4%	PROP	17028.50	496.76	517.32	510.61	518.02	0.003997	6.75	2630.15	405.50	0.35
Williamson Ck	Lower	6847	1%	EX	25925.90	496.76	519.87	512.85	520.74	0.004151	7.78	3772.57	484.93	0.37
Williamson Ck	Lower	6847	1%	PROP	25344.20	496.76	519.73	512.71	520.59	0.004138	7.72	3705.84	481.27	0.37
Williamson Ck	Lower	6514	10%	EX	12262.80	497.44	514.65		514.96	0.002591	4.58	2837.55	399.49	0.27
Williamson Ck	Lower	6514	10%	PROP	12179.60	497.44	514.61		514.92	0.002592	4.57	2822.64	395.18	0.27
Williamson Ck	Lower	6514	4%	EX	17328.90	497.44	516.60		516.98	0.002558	5.12	3720.46	492.25	0.27
Williamson Ck	Lower	6514	4%	PROP	17028.50	497.44	516.50		516.88	0.002558	5.09	3670.22	488.10	0.27
Williamson Ck	Lower	6514	1%	EX	25925.90	497.44	519.10		519.57	0.002564	5.80	5071.39	594.95	0.28
Williamson Ck	Lower	6514	1%	PROP	25344.20	497.44	518.96		519.42	0.002558	5.75	4989.19	590.59	0.28
Williamson Ck	Lower	5825	10%	EX	12262.80	492.89	512.34	507.23	512.91	0.003466	6.06	2039.22	294.58	0.38
Williamson Ck	Lower	5825	10%	PROP	12179.60	492.89	512.30	507.20	512.87	0.003468	6.05	2028.01	293.28	0.38
Williamson Ck	Lower	5825	4%	EX	17328.90	492.89	514.24	509.02	514.94	0.003553	6.80	2662.00	361.11	0.38
Williamson Ck	Lower	5825	4%	PROP	17028.50	492.89	514.14	508.93	514.84	0.003543	6.76	2627.29	357.90	0.38
Williamson Ck	Lower	5825	1%	EX	25925.90	492.89	516.56	511.26	517.49	0.003846	7.93	3582.66	431.09	0.40
Williamson Ck	Lower	5825	1%	PROP	25344.20	492.89	516.44	511.14	517.36	0.003802	7.85	3533.50	427.63	0.40
Williamson Ck	Lower	5443	10%	EX	12262.80	492.88	511.59		511.87	0.001891	4.28	3026.73	420.19	0.24
Williamson Ck	Lower	5443	10%	PROP	12179.60	492.88	511.55		511.83	0.001889	4.27	3010.69	418.69	0.24
Williamson Ck	Lower	5443	4%	EX	17328.90	492.88	513.45		513.81	0.002130	4.94	3872.19	486.14	0.25
Williamson Ck	Lower	5443	4%	PROP	17028.50	492.88	513.35		513.71	0.002114	4.90	3826.82	482.86	0.25
Williamson Ck	Lower	5443	1%	EX	25925.90	492.88	515.69		516.18	0.002545	5.91	5065.13	582.24	0.28
Williamson Ck	Lower	5443	1%	PROP	25344.20	492.88	515.58		516.07	0.002502	5.84	5005.30	579.15	0.27
Williamson Ck	Lower	4948	10%	EX	12262.80	492.08	510.78		511.03	0.001509	4.11	3301.70	417.59	0.22
Williamson Ck	Lower	4948	10%	PROP	12179.60	492.08	510.74		510.99	0.001506	4.10	3286.33	416.66	0.22
Williamson Ck	Lower	4948	4%	EX	17328.90	492.08	512.49		512.84	0.001814	4.89	4061.34	488.27	0.24
Williamson Ck	Lower	4948	4%	PROP	17028.50	492.08	512.41		512.75	0.001796	4.84	4020.05	482.86	0.24
Williamson Ck	Lower	4948	1%	EX	25925.90	492.08	514.50		515.01	0.002287	6.02	5111.79	559.82	0.28
Williamson Ck	Lower	4948	1%	PROP	25344.20	492.08	514.42		514.92	0.002230	5.93	5070.43	556.69	0.28
Williamson Ck	Lower	4393	10%	EX	12284.00	490.77	509.34		509.77	0.003671	5.29	2440.27	1018.25	0.32
Williamson Ck	Lower	4393	10%	PROP	12193.70	490.77	509.30		509.73	0.003667	5.27	2425.42	1008.99	0.32
Williamson Ck	Lower	4393	4%	EX	17342.20	490.77	510.94		511.44	0.003631	5.90	3612.89	1347.71	0.33
Williamson Ck	Lower	4393	4%	PROP	17042.00	490.77	510.86		511.36	0.003634	5.87	3547.01	1328.61	0.33

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Williamson Ck	Lower	4393	1%	EX	25709.30	490.77	512.96		513.49	0.003375	6.42	6105.50	2128.80	0.33
Williamson Ck	Lower	4393	1%	PROP	25229.30	490.77	512.88		513.41	0.003392	6.41	5957.40	2108.15	0.33
Williamson Ck	Lower	3945	10%	EX	12284.00	490.12	507.48		507.91	0.004751	5.25	2416.63	1024.36	0.34
Williamson Ck	Lower	3945	10%	PROP	12193.70	490.12	507.45		507.87	0.004765	5.24	2398.19	1006.82	0.34
Williamson Ck	Lower	3945	4%	EX	17342.20	490.12	509.37		509.80	0.003821	5.48	3690.62	1782.44	0.32
Williamson Ck	Lower	3945	4%	PROP	17042.00	490.12	509.27		509.70	0.003867	5.47	3612.12	1757.57	0.32
Williamson Ck	Lower	3945	1%	EX	25709.30	490.12	511.85		512.20	0.002627	5.32	7461.03	2433.28	0.27
Williamson Ck	Lower	3945	1%	PROP	25229.30	490.12	511.73		512.09	0.002730	5.39	7176.86	2425.65	0.28
Williamson Ck	Lower	3440	10%	EX	12284.00	489.32	504.23		504.94	0.007327	6.76	1817.57	252.90	0.44
Williamson Ck	Lower	3440	10%	PROP	12193.70	489.32	504.18		504.89	0.007340	6.75	1806.89	252.47	0.44
Williamson Ck	Lower	3440	4%	EX	17342.20	489.32	506.49		507.29	0.006656	7.15	2451.79	522.20	0.43
Williamson Ck	Lower	3440	4%	PROP	17042.00	489.32	506.37		507.16	0.006736	7.13	2407.99	474.65	0.43
Williamson Ck	Lower	3440	1%	EX	25709.30	489.32	509.63		510.43	0.004839	7.36	3732.56	1500.84	0.38
Williamson Ck	Lower	3440	1%	PROP	25229.30	489.32	509.48		510.28	0.004872	7.33	3669.88	1453.02	0.38
Williamson Ck	Lower	3004	10%	EX	12284.00	488.28	503.34		503.60	0.001574	4.43	3132.25	427.13	0.25
Williamson Ck	Lower	3004	10%	PROP	12193.70	488.28	503.29		503.55	0.001582	4.43	3111.42	426.10	0.25
Williamson Ck	Lower	3004	4%	EX	17342.20	488.28	505.88		506.15	0.001260	4.57	4316.03	531.69	0.23
Williamson Ck	Lower	3004	4%	PROP	17042.00	488.28	505.74		506.01	0.001271	4.56	4244.99	523.62	0.23
Williamson Ck	Lower	3004	1%	EX	25709.30	488.28	509.28		509.54	0.000985	4.68	6545.49	1724.32	0.21
Williamson Ck	Lower	3004	1%	PROP	25229.30	488.28	509.12		509.39	0.000990	4.67	6438.27	1638.47	0.21
Williamson Ck	Lower	2454	10%	EX	12419.40	485.48	502.78		502.99	0.001280	4.15	3651.31	525.59	0.23
Williamson Ck	Lower	2454	10%	PROP	12330.70	485.48	502.72		502.94	0.001289	4.15	3623.07	524.51	0.23
Williamson Ck	Lower	2454	4%	EX	17511.30	485.48	505.49		505.69	0.000997	4.14	5203.39	647.11	0.21
Williamson Ck	Lower	2454	4%	PROP	17216.10	485.48	505.34		505.55	0.001009	4.14	5112.23	640.17	0.21
Williamson Ck	Lower	2454	1%	EX	25955.70	485.48	509.03		509.22	0.000770	4.08	8029.93	1955.26	0.19
Williamson Ck	Lower	2454	1%	PROP	25480.30	485.48	508.87		509.06	0.000775	4.08	7887.41	1889.89	0.19
Williamson Ck	Lower	1908	10%	EX	12419.40	483.01	501.92		502.22	0.001708	4.40	2829.25	278.68	0.23
Williamson Ck	Lower	1908	10%	PROP	12330.70	483.01	501.87		502.17	0.001707	4.39	2814.02	277.22	0.23
Williamson Ck	Lower	1908	4%	EX	17511.30	483.01	504.66		505.03	0.001640	4.90	3674.43	368.09	0.24
Williamson Ck	Lower	1908	4%	PROP	17216.10	483.01	504.52		504.89	0.001645	4.88	3622.63	358.55	0.24
Williamson Ck	Lower	1908	1%	EX	25955.70	483.01	508.22		508.67	0.001506	5.50	5415.52	777.82	0.24
Williamson Ck	Lower	1908	1%	PROP	25480.30	483.01	508.06		508.51	0.001513	5.48	5292.53	763.93	0.24
Williamson Ck	Lower	1310	10%	EX	12419.40	481.79	500.52		500.92	0.002819	5.08	2483.62	239.43	0.26
Williamson Ck	Lower	1310	10%	PROP	12330.70	481.79	500.47		500.86	0.002825	5.07	2470.42	238.89	0.26
Williamson Ck	Lower	1310	4%	EX	17511.30	481.79	503.29		503.79	0.002667	5.70	3188.50	270.05	0.27
Williamson Ck	Lower	1310	4%	PROP	17216.10	481.79	503.15		503.64	0.002672	5.67	3149.77	268.51	0.27
Williamson Ck	Lower	1310	1%	EX	25955.70	481.79	506.85		507.49	0.002598	6.54	4242.09	329.34	0.27
Williamson Ck	Lower	1310	1%	PROP	25480.30	481.79	506.69		507.33	0.002589	6.49	4192.29	326.23	0.27
Williamson Ck	Lower	618	10%	EX	12408.20	478.71	497.91	491.35	498.59	0.004003	6.60	1879.40	181.65	0.36
Williamson Ck	Lower	618	10%	PROP	12317.00	478.71	497.85	491.31	498.53	0.004003	6.59	1869.15	181.35	0.36
Williamson Ck	Lower	618	4%	EX	17493.60	478.71	500.70	493.32	501.52	0.004006	7.25	2437.32	220.58	0.36
Williamson Ck	Lower	618	4%	PROP	17198.00	478.71	500.56	493.18	501.36	0.004006	7.21	2405.99	218.45	0.36
Williamson Ck	Lower	618	1%	EX	25831.20	478.71	504.22	495.85	505.24	0.004008	8.17	3303.41	504.16	0.37
Williamson Ck	Lower	618	1%	PROP	25387.50	478.71	504.08	495.73	505.09	0.004001	8.11	3263.32	472.22	0.37
Sunset Valley Tr	Reach-1	4031	10%	EX	928.80	659.72	664.59	664.21	664.78	0.009506	3.94	369.16	443.10	0.60
Sunset Valley Tr	Reach-1	4031	10%	PROP	928.80	659.72	664.59	664.21	664.78	0.009506	3.94	369.16	443.10	0.60
Sunset Valley Tr	Reach-1	4031	4%	EX	1256.20	659.72	664.86	664.39	665.01	0.005854	3.49	541.90	463.52	0.48
Sunset Valley Tr	Reach-1	4031	4%	PROP	1256.20	659.72	664.86	664.39	665.01	0.005854	3.49	541.90	463.52	0.48
Sunset Valley Tr	Reach-1	4031	1%	EX	1758.40	659.72	665.08	664.54	665.29	0.007190	4.22	659.71	581.88	0.55
Sunset Valley Tr	Reach-1	4031	1%	PROP	1758.40	659.72	665.08	664.54	665.29	0.007190	4.22	659.71	581.88	0.55
Sunset Valley Tr	Reach-1	4012			Culvert									
Sunset Valley Tr	Reach-1	3994	10%	EX	928.80	659.52	664.43	664.06	664.60	0.008518	3.80	378.69	439.64	0.57
Sunset Valley Tr	Reach-1	3994	10%	PROP	928.80	659.52	664.43	664.06	664.60	0.008518	3.80	378.69	439.64	0.57
Sunset Valley Tr	Reach-1	3994	4%	EX	1256.20	659.52	664.64	664.23	664.80	0.006447	3.63	527.51	484.06	0.50
Sunset Valley Tr	Reach-1	3994	4%	PROP	1256.20	659.52	664.64	664.23	664.80	0.006447	3.63	527.51	484.06	0.50
Sunset Valley Tr	Reach-1	3994	1%	EX	1758.40	659.52	665.01	664.47	665.19	0.005708	3.93	736.70	602.11	0.49
Sunset Valley Tr	Reach-1	3994	1%	PROP	1758.40	659.52	665.01	664.47	665.19	0.005708	3.93	736.70	602.11	0.49
Sunset Valley Tr	Reach-1	3829	10%	EX	928.80	658.65	663.76	663.76	663.81	0.003130	2.56	740.82	584.57	0.35
Sunset Valley Tr	Reach-1	3829	10%	PROP	928.80	658.65	663.76	663.76	663.81	0.003130	2.56	740.82	584.57	0.35
Sunset Valley Tr	Reach-1	3829	4%	EX	1256.20	658.65	663.99	663.76	664.05	0.003469	2.93	875.75	599.56	0.38
Sunset Valley Tr	Reach-1	3829	4%	PROP	1256.20	658.65	663.99	663.76	664.05	0.003469	2.93	875.75	599.56	0.38
Sunset Valley Tr	Reach-1	3829	1%	EX	1758.40	658.65	664.48	663.76	664.55	0.002830	3.09	1181.23	647.06	0.35
Sunset Valley Tr	Reach-1	3829	1%	PROP	1758.40	658.65	664.48	663.76	664.55	0.002830	3.09	1181.23	647.06	0.35
Sunset Valley Tr	Reach-1	3347	10%	EX	928.80	656.93	662.05		662.21	0.002261	3.77	480.20	310.24	0.34
Sunset Valley Tr	Reach-1	3347	10%	PROP	928.80	656.93	662.05		662.21	0.002261	3.77	480.20	310.24	0.34
Sunset Valley Tr	Reach-1	3347	4%	EX	1256.20	656.93	662.43		662.62	0.002561	4.27	602.37	333.89	0.37
Sunset Valley Tr	Reach-1	3347	4%	PROP	1256.20	656.93	662.43		662.62	0.002561	4.27	602.37	333.89	0.37
Sunset Valley Tr	Reach-1	3347	1%	EX	1758.40	656.93	662.84		663.10	0.003155	5.06	748.66	372.53	0.42
Sunset Valley Tr	Reach-1	3347	1%	PROP	1758.40	656.93	662.84		663.10	0.003162	5.06	747.88	372.23	0.42
Sunset Valley Tr	Reach-1	3218	10%	EX	928.80	656.81	661.86	660.80	661.94	0.001325	2.35	516.58	307.07	0.25
Sunset Valley Tr	Reach-1	3218	10%	PROP	928.80	656.81	661.86	660.80	661.94	0.001325	2.35	516.58	307.07	0.25
Sunset Valley Tr	Reach-1	3218	4%	EX	1256.20	656.81	662.21	660.80	662.32	0.001528	2.73	629.33	333.34	0.27
Sunset Valley Tr	Reach-1	3218	4%	PROP	1256.20	656.81	662.21	660.80	662.32	0.001528	2.73	629.33	333.34	0.27
Sunset Valley Tr	Reach-1	3218	1%	EX	1758.40	656.81	662.57	660.96	662.72	0.001948	3.32	751.95	350.09	0.31
Sunset Valley Tr	Reach-1	3218	1%	PROP	1758.40	656.81	662.57	660.96	662.72	0.001954	3.32	750.91	349.97	0.32
Sunset Valley Tr	Reach-1	3202			Culvert									
Sunset Valley Tr	Reach-1	3185	10%	EX	928.80	656.00	661.19	660.25	661.28	0.001140	2.33	455.77	236.36	0.24
Sunset Valley Tr	Reach-1	3185	10%	PROP	928.80	656.00	661.19	660.25	661.28	0.001140	2.33	455.77	236.36	0.24
Sunset Valley Tr	Reach-1	3185	4%	EX	1256.20	656.00	661.78	660.26	661.88	0.001084	2.55	607.91	301.44	0.24
Sunset Valley Tr	Reach-1	3185	4%	PROP	1256.20	656.00	661.78	660.26	661.88	0.001084	2.55	607.91	301.44	0.24
Sunset Valley Tr	Reach-1	3185	1%	EX	1758.40	656.00	662.16	660.26	662.30	0.001447	3.15	730.45	334.46	0.28
Sunset Valley Tr	Reach-1	3185	1%	PROP	1758.40	656.00	662.16	660.26	662.30	0.001448	3.15	730.37	334.45	0.28
Sunset Valley Tr	Reach-1	3040	10%	EX	928.80	656.02	660.88	659.37	661.03	0.002190	3.33	402.42	268.17	0.33
Sunset Valley Tr	Reach-1	3040	10%	PROP	928.80	656.02	660.88	659.37	661.03	0.002190	3.33	402.42	268.17	0.33

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sunset Valley Tr	Reach-1	3040	4%	EX	1256.20	656.02	661.49	659.77	661.65	0.001921	3.51	582.99	347.52	0.32
Sunset Valley Tr	Reach-1	3040	4%	PROP	1256.20	656.02	661.49	659.77	661.65	0.001921	3.51	582.99	347.52	0.32
Sunset Valley Tr	Reach-1	3040	1%	EX	1758.40	656.02	661.74	660.41	661.99	0.002854	4.46	669.63	369.09	0.39
Sunset Valley Tr	Reach-1	3040	1%	PROP	1758.40	656.02	661.74	660.41	661.98	0.002855	4.46	669.47	369.01	0.39
Sunset Valley Tr	Reach-1	2760	10%	EX	928.80	652.00	659.30	658.08	659.82	0.010955	5.79	160.32	195.64	0.68
Sunset Valley Tr	Reach-1	2760	10%	PROP	928.80	652.00	659.30	658.08	659.82	0.010955	5.79	160.32	195.64	0.68
Sunset Valley Tr	Reach-1	2760	4%	EX	1256.20	652.00	660.25	659.13	660.71	0.006596	5.44	230.91	291.93	0.55
Sunset Valley Tr	Reach-1	2760	4%	PROP	1256.20	652.00	660.25	659.13	660.71	0.006596	5.44	230.91	291.93	0.55
Sunset Valley Tr	Reach-1	2760	1%	EX	1758.40	652.00	661.08	659.74	661.23	0.002321	3.77	883.54	422.83	0.34
Sunset Valley Tr	Reach-1	2760	1%	PROP	1758.40	652.00	661.08	659.74	661.23	0.002324	3.77	883.13	422.76	0.34
Sunset Valley Tr	Reach-1	2602	10%	EX	928.80	652.93	659.10	657.06	659.17	0.001191	2.24	439.33	200.86	0.24
Sunset Valley Tr	Reach-1	2602	10%	PROP	928.80	652.93	659.10	657.06	659.17	0.001191	2.24	439.33	200.86	0.24
Sunset Valley Tr	Reach-1	2602	4%	EX	1256.20	652.93	660.21	657.43	660.27	0.000655	2.07	720.11	310.25	0.18
Sunset Valley Tr	Reach-1	2602	4%	PROP	1256.20	652.93	660.21	657.43	660.27	0.000655	2.07	720.11	310.25	0.18
Sunset Valley Tr	Reach-1	2602	1%	EX	1758.40	652.93	660.93	657.86	661.01	0.000679	2.36	962.59	375.36	0.19
Sunset Valley Tr	Reach-1	2602	1%	PROP	1758.40	652.93	660.93	657.86	661.01	0.000679	2.36	962.20	375.18	0.19
Sunset Valley Tr	Reach-1	2588			Culvert									
Sunset Valley Tr	Reach-1	2565	10%	EX	928.80	651.86	659.08	656.80	659.13	0.000499	1.86	562.16	207.79	0.16
Sunset Valley Tr	Reach-1	2565	10%	PROP	928.80	651.86	659.08	656.80	659.13	0.000499	1.86	562.16	207.79	0.16
Sunset Valley Tr	Reach-1	2565	4%	EX	1256.20	651.86	660.21	656.81	660.26	0.000373	1.89	835.74	307.28	0.15
Sunset Valley Tr	Reach-1	2565	4%	PROP	1256.20	651.86	660.21	656.81	660.26	0.000373	1.89	835.74	307.28	0.15
Sunset Valley Tr	Reach-1	2565	1%	EX	1758.40	651.86	660.92	656.81	660.99	0.000441	2.24	1077.20	366.83	0.16
Sunset Valley Tr	Reach-1	2565	1%	PROP	1758.40	651.86	660.92	656.81	660.99	0.000441	2.24	1076.71	366.66	0.16
Sunset Valley Tr	Reach-1	2464	10%	EX	928.80	651.59	658.92		659.04	0.001028	2.81	374.33	156.14	0.23
Sunset Valley Tr	Reach-1	2464	10%	PROP	928.80	651.59	658.92		659.04	0.001028	2.81	374.33	156.14	0.23
Sunset Valley Tr	Reach-1	2464	4%	EX	1256.20	651.59	660.08		660.19	0.000745	2.78	651.50	309.15	0.21
Sunset Valley Tr	Reach-1	2464	4%	PROP	1256.20	651.59	660.08		660.19	0.000745	2.78	651.50	309.15	0.21
Sunset Valley Tr	Reach-1	2464	1%	EX	1758.40	651.59	660.77		660.91	0.000862	3.23	884.20	375.09	0.23
Sunset Valley Tr	Reach-1	2464	1%	PROP	1758.40	651.59	660.77		660.91	0.000863	3.23	883.67	374.38	0.23
Sunset Valley Tr	Reach-1	2331	10%	EX	928.80	652.02	658.39	655.38	658.78	0.002076	4.97	187.05	161.39	0.36
Sunset Valley Tr	Reach-1	2331	10%	PROP	928.80	652.02	658.39	655.38	658.78	0.002076	4.97	187.05	161.39	0.36
Sunset Valley Tr	Reach-1	2331	4%	EX	1256.20	652.02	659.94	656.05	660.08	0.000726	3.09	488.23	274.55	0.21
Sunset Valley Tr	Reach-1	2331	4%	PROP	1256.20	652.02	659.94	656.05	660.08	0.000726	3.09	488.23	274.55	0.21
Sunset Valley Tr	Reach-1	2331	1%	EX	1758.40	652.02	660.70	657.00	660.80	0.000586	2.79	970.45	359.43	0.19
Sunset Valley Tr	Reach-1	2331	1%	PROP	1758.40	652.02	660.70	657.00	660.80	0.000587	2.80	969.90	359.26	0.19
Sunset Valley Tr	Reach-1	2289			Culvert									
Sunset Valley Tr	Reach-1	2233	10%	EX	928.80	648.54	655.67	651.90	655.97	0.001403	4.41	210.39	177.69	0.30
Sunset Valley Tr	Reach-1	2233	10%	PROP	928.80	648.54	655.67	651.90	655.97	0.001403	4.41	210.39	177.69	0.30
Sunset Valley Tr	Reach-1	2233	4%	EX	1256.20	648.54	656.56	652.58	657.00	0.001700	5.28	238.06	178.09	0.34
Sunset Valley Tr	Reach-1	2233	4%	PROP	1256.20	648.54	656.57	652.58	657.00	0.001699	5.28	238.07	178.09	0.34
Sunset Valley Tr	Reach-1	2233	1%	EX	1758.40	648.54	657.72	653.50	657.81	0.000471	2.63	897.70	178.60	0.17
Sunset Valley Tr	Reach-1	2233	1%	PROP	1758.40	648.54	657.72	653.50	657.81	0.000471	2.63	897.60	178.60	0.17
Sunset Valley Tr	Reach-1	2096	10%	EX	928.80	648.91	655.32	652.97	655.66	0.004153	4.62	201.11	60.79	0.45
Sunset Valley Tr	Reach-1	2096	10%	PROP	928.80	648.91	655.32	652.97	655.66	0.004153	4.62	201.11	60.79	0.45
Sunset Valley Tr	Reach-1	2096	4%	EX	1256.20	648.91	656.28	653.68	656.62	0.003688	4.74	265.03	70.88	0.43
Sunset Valley Tr	Reach-1	2096	4%	PROP	1256.20	648.91	656.28	653.68	656.63	0.003686	4.74	265.06	70.89	0.43
Sunset Valley Tr	Reach-1	2096	1%	EX	1758.40	648.91	657.11	654.80	657.57	0.003807	5.39	329.39	137.04	0.45
Sunset Valley Tr	Reach-1	2096	1%	PROP	1758.40	648.91	657.11	654.80	657.57	0.003810	5.40	329.32	136.73	0.45
Sunset Valley Tr	Reach-1	1983	10%	EX	928.80	648.24	654.81	652.69	655.20	0.003899	4.97	187.03	47.23	0.44
Sunset Valley Tr	Reach-1	1983	10%	PROP	928.80	648.24	654.81	652.69	655.20	0.003899	4.97	187.03	47.23	0.44
Sunset Valley Tr	Reach-1	1983	4%	EX	1256.20	648.24	655.73	653.39	656.16	0.004366	5.34	262.34	137.17	0.45
Sunset Valley Tr	Reach-1	1983	4%	PROP	1256.20	648.24	655.73	653.39	656.16	0.004364	5.33	262.43	137.19	0.45
Sunset Valley Tr	Reach-1	1983	1%	EX	1758.40	648.24	656.67	654.28	657.13	0.003915	5.68	446.31	222.81	0.43
Sunset Valley Tr	Reach-1	1983	1%	PROP	1758.40	648.24	656.67	654.28	657.13	0.003920	5.69	445.97	222.62	0.43
Sunset Valley Tr	Reach-1	1718	10%	EX	928.80	647.17	653.75	651.70	654.14	0.004093	4.99	186.07	48.69	0.45
Sunset Valley Tr	Reach-1	1718	10%	PROP	928.80	647.17	653.75	651.70	654.14	0.004093	4.99	186.07	48.69	0.45
Sunset Valley Tr	Reach-1	1718	4%	EX	1256.20	647.17	654.64	652.38	655.08	0.003806	5.39	256.81	135.20	0.45
Sunset Valley Tr	Reach-1	1718	4%	PROP	1256.20	647.17	654.64	652.38	655.09	0.003799	5.39	257.09	135.26	0.45
Sunset Valley Tr	Reach-1	1718	1%	EX	1758.40	647.17	655.79	653.28	656.22	0.002973	5.54	492.59	340.49	0.41
Sunset Valley Tr	Reach-1	1718	1%	PROP	1758.40	647.17	655.78	653.28	656.22	0.002987	5.55	490.83	339.82	0.41
Sunset Valley Tr	Reach-1	1422	10%	EX	928.80	645.86	652.03	650.50	652.62	0.006442	6.16	150.67	39.45	0.56
Sunset Valley Tr	Reach-1	1422	10%	PROP	928.80	645.86	652.03	650.50	652.62	0.006443	6.16	150.66	39.45	0.56
Sunset Valley Tr	Reach-1	1422	4%	EX	1256.20	645.86	652.94	651.23	653.63	0.006360	6.65	188.78	43.58	0.56
Sunset Valley Tr	Reach-1	1422	4%	PROP	1256.20	645.86	652.94	651.23	653.63	0.006373	6.66	188.64	43.57	0.56
Sunset Valley Tr	Reach-1	1422	1%	EX	1758.40	645.86	654.17	652.18	654.97	0.006077	7.16	245.49	173.14	0.56
Sunset Valley Tr	Reach-1	1422	1%	PROP	1758.40	645.86	654.15	652.18	654.95	0.006135	7.19	244.64	172.65	0.57
Sunset Valley Tr	Reach-1	1165	10%	EX	928.80	644.38	650.27	648.84	650.90	0.006914	6.37	145.72	38.11	0.57
Sunset Valley Tr	Reach-1	1165	10%	PROP	928.80	644.38	650.26	648.84	650.90	0.006937	6.38	145.55	38.09	0.58
Sunset Valley Tr	Reach-1	1165	4%	EX	1256.20	644.38	651.30	649.57	652.00	0.006335	6.71	187.08	42.23	0.56
Sunset Valley Tr	Reach-1	1165	4%	PROP	1256.20	644.38	651.27	649.57	651.98	0.006439	6.75	185.98	42.13	0.57
Sunset Valley Tr	Reach-1	1165	1%	EX	1758.40	644.38	652.68	650.53	653.46	0.005620	7.05	249.46	47.66	0.54
Sunset Valley Tr	Reach-1	1165	1%	PROP	1758.40	644.38	652.63	650.53	653.42	0.005787	7.12	246.82	47.45	0.55
Sunset Valley Tr	Reach-1	1029	10%	EX	928.80	643.17	649.31	647.98	649.94	0.007216	6.34	146.39	40.35	0.59
Sunset Valley Tr	Reach-1	1029	10%	PROP	928.80	643.17	649.30	647.98	649.93	0.007284	6.37	145.89	40.30	0.59
Sunset Valley Tr	Reach-1	1029	4%	EX	1256.20	643.17	650.55	648.69	651.16	0.005596	6.29	199.86	46.05	0.53
Sunset Valley Tr	Reach-1	1029	4%	PROP	1256.20	643.17	650.50	648.69	651.13	0.005778	6.36	197.54	45.81	0.54
Sunset Valley Tr	Reach-1	1029	1%	EX	1758.40	643.17	652.12	649.62	652.74	0.004385	6.33	278.49	56.95	0.49
Sunset Valley Tr	Reach-1	1029	1%	PROP	1758.40	643.17	652.03	649.62	652.67	0.004600	6.44	273.68	55.85	0.50
Sunset Valley Tr	Reach-1	918	10%	EX	928.80	642.55	648.95	646.69	649.32	0.003485	4.90	189.46	43.86	0.42
Sunset Valley Tr	Reach-1	918	10%	PROP	928.80	642.55	648.93	646.69	649.31	0.003525	4.92	188.71	43.81	0.42
Sunset Valley Tr	Reach-1	918	4%	EX	1256.20	642.55	650.27	647.36	650.66	0.002898	5.02	250.37	48.35	0.39
Sunset Valley Tr	Reach-1	918	4%	PROP	1256.20	642.55	650.21	647.36	650.61	0.002997	5.08	247.40	48.14	0.39
Sunset Valley Tr	Reach-1	918	1%	EX	1758.40	642.55	651.92	648.22	652.34	0.002281	5.21	372.24	132.72	0.36
Sunset Valley Tr	Reach-1	918	1%	PROP	1758.40	642.55	651.82	648.22	652.25	0.002417	5.31	359.75	126.35	0.37

HEC-RAS (Continued)

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Sunset Valley Tr	Reach-1	758	10%	EX	928.80	641.90	648.69	645.55	648.87	0.001563	3.43	270.71	70.93	0.29
Sunset Valley Tr	Reach-1	758	10%	PROP	928.80	641.90	648.66	645.55	648.85	0.001586	3.45	269.40	67.67	0.29
Sunset Valley Tr	Reach-1	758	4%	EX	1256.20	641.90	650.16	646.15	650.30	0.000885	3.12	630.35	404.86	0.23
Sunset Valley Tr	Reach-1	758	4%	PROP	1256.20	641.90	650.09	646.15	650.23	0.000947	3.20	600.26	399.37	0.23
Sunset Valley Tr	Reach-1	758	1%	EX	1758.40	641.90	651.98	646.92	652.04	0.000373	2.43	1430.73	468.85	0.15
Sunset Valley Tr	Reach-1	758	1%	PROP	1758.40	641.90	651.87	646.92	651.94	0.000404	2.50	1381.93	466.34	0.16
Sunset Valley Tr	Reach-1	723			Culvert									
Sunset Valley Tr	Reach-1	681	10%	EX	928.80	640.03	648.13	643.67	648.21	0.000851	2.46	498.02	203.61	0.18
Sunset Valley Tr	Reach-1	681	10%	PROP	928.80	640.03	648.11	643.67	648.19	0.000864	2.47	493.86	203.54	0.18
Sunset Valley Tr	Reach-1	681	4%	EX	1256.20	640.03	650.13	644.27	650.18	0.000400	2.06	1042.68	330.42	0.13
Sunset Valley Tr	Reach-1	681	4%	PROP	1256.20	640.03	650.01	644.27	650.06	0.000434	2.12	1002.17	326.87	0.14
Sunset Valley Tr	Reach-1	681	1%	EX	1758.40	640.03	651.98	645.05	652.02	0.000263	1.93	1699.13	406.20	0.11
Sunset Valley Tr	Reach-1	681	1%	PROP	1758.40	640.03	651.88	645.05	651.92	0.000278	1.97	1659.08	397.66	0.11
Sunset Valley Tr	Reach-1	513	10%	EX	928.80	638.50	647.93	643.23	648.05	0.000922	3.01	469.46	161.70	0.20
Sunset Valley Tr	Reach-1	513	10%	PROP	928.80	638.50	647.91	643.23	648.03	0.000936	3.03	465.73	160.94	0.20
Sunset Valley Tr	Reach-1	513	4%	EX	1256.20	638.50	650.03	643.95	650.10	0.000488	2.59	905.26	230.33	0.15
Sunset Valley Tr	Reach-1	513	4%	PROP	1256.20	638.50	649.89	643.95	649.97	0.000526	2.66	875.12	229.39	0.15
Sunset Valley Tr	Reach-1	513	1%	EX	1758.40	638.50	651.90	644.93	651.96	0.000369	2.54	1348.31	243.52	0.13
Sunset Valley Tr	Reach-1	513	1%	PROP	1758.40	638.50	651.79	644.93	651.86	0.000388	2.59	1321.46	242.41	0.14
Sunset Valley Tr	Reach-1	349	10%	EX	928.80	638.46	647.85		647.92	0.000581	2.09	515.52	145.81	0.15
Sunset Valley Tr	Reach-1	349	10%	PROP	928.80	638.46	647.83		647.90	0.000590	2.10	511.96	145.70	0.15
Sunset Valley Tr	Reach-1	349	4%	EX	1256.20	638.46	649.98		650.03	0.000324	1.92	835.39	155.68	0.12
Sunset Valley Tr	Reach-1	349	4%	PROP	1256.20	638.46	649.84		649.90	0.000346	1.96	814.62	155.04	0.12
Sunset Valley Tr	Reach-1	349	1%	EX	1758.40	638.46	651.85		651.91	0.000282	2.06	1136.43	165.53	0.12
Sunset Valley Tr	Reach-1	349	1%	PROP	1758.40	638.46	651.74		651.80	0.000295	2.09	1117.88	164.91	0.12
Sunset Valley Tr	Reach-1	237	10%	EX	928.80	636.21	647.86		647.88	0.000139	1.30	1123.71	192.27	0.08
Sunset Valley Tr	Reach-1	237	10%	PROP	928.80	636.21	647.84		647.85	0.000140	1.31	1119.03	192.19	0.08
Sunset Valley Tr	Reach-1	237	4%	EX	1256.20	636.21	649.98		650.00	0.000103	1.30	1539.02	199.16	0.07
Sunset Valley Tr	Reach-1	237	4%	PROP	1256.20	636.21	649.85		649.87	0.000108	1.32	1512.45	198.69	0.07
Sunset Valley Tr	Reach-1	237	1%	EX	1758.40	636.21	651.86		651.88	0.000106	1.47	1919.03	205.88	0.07
Sunset Valley Tr	Reach-1	237	1%	PROP	1758.40	636.21	651.75		651.77	0.000110	1.49	1895.97	205.47	0.07
Sunset Valley Tr	Reach-1	172	10%	EX	928.80	635.04	647.86		647.87	0.000102	1.29	1316.56	168.63	0.07
Sunset Valley Tr	Reach-1	172	10%	PROP	928.80	635.04	647.83		647.84	0.000103	1.30	1312.44	168.54	0.07
Sunset Valley Tr	Reach-1	172	4%	EX	1256.20	635.04	649.98		649.99	0.000091	1.37	1683.05	176.81	0.07
Sunset Valley Tr	Reach-1	172	4%	PROP	1256.20	635.04	649.85		649.86	0.000094	1.39	1659.45	176.28	0.07
Sunset Valley Tr	Reach-1	172	1%	EX	1758.40	635.04	651.85		651.87	0.000104	1.61	2021.82	184.53	0.07
Sunset Valley Tr	Reach-1	172	1%	PROP	1758.40	635.04	651.74		651.76	0.000107	1.62	2001.15	184.08	0.07