Appendix B

HEC-RAS Analysis of Flood Wall – Parkville (November 20, 2012)

Memorandum

To: *Brenda Macke*

From: *Natalie Postel*

Date: *November 20, 2012*

Subject: *HEC-RAS Analysis of Flood Wall - Parkville*

CDM Smith revised the HEC-RAS model for White Aloe Branch to assess the impacts to water surface elevations from constructing a flood wall along the west bank of the stream. The assumed location of the flood wall extends from River Station 1709.2 which is approximately 572 feet downstream of East 6th Street to River Station 801.5 which is approximately 190 feet downstream of E 1st Street / Hwy 9. The flood wall was input into the HEC-RAS model as a "blocked obstruction". The right overbank was blocked as a normal obstruction starting at the station of the encroachment in the effective model. The height of the blocked obstruction was set at an elevation above the 100-year water surface elevation at each cross section. Figure 1 shows the White Aloe Branch stream channel, DFIRM floodplain boundaries, and River Stations.

Using HEC-RAS version 4.1.0, the model was run and water surface elevations were compared to the effective model. Table 1 presents the water surface elevations at each River Station for both the effective and flood wall model.

The largest decrease in water surface elevations as a result of the flood wall obstruction was at River Station 1406.9 with a decrease in 0.07 feet. The largest increase in water surface elevations was immediately upstream of the flood wall at River Station 1883 with an increase in water surface elevation of 0.03 feet. Small changes in water surface elevation were observed as far upstream as 5422.3 and as far downstream as River Station 801.5.

Figure 1 White Aloe Branch Flood Wall Concept

Table 1 Water Surface Elevation Comparison

	Water Surface Elevation, ft		Difference
River Station	Effective	Flood Wall	(Flood Wall - Eff)
5985.3 O	845.09	845.09	0.00
5963.1	842.5	842.5	0.00
5942.3	842.38	842.38	0.00
5912.3 N	841.95	841.95	0.00
5886.6	841.71	841.71	0.00
5860.3	841.12	841.12	0.00
5825.4	840.29	840.29	0.00
5791.1 M	839.73	839.73	0.00
5749.5	838.76	838.76	0.00
5709.7	837.64	837.64	0.00
5673.4	834.11	834.11	0.00
5628.9	830.92	830.92	0.00
5607.5 L	822.95	822.95	0.00
5594.2	814.13	814.13	0.00
5577.6	808.12	808.12	0.00
5550	800.79	800.79	0.00
5529.4 K	798.09	798.09	0.00
5502.5	797.22	797.22	0.00
5467.9	794.37	794.37	0.00
5422.3	787.52	787.51	-0.01
5357.4 J	786.6	786.61	0.01
5286.2	784.92	784.92	0.00
5216.3	784	784.01	0.01
5153.4	782.73	782.73	0.00
5068.3	781.74	781.74	0.00
5003 I	781.51	781.51	0.00
4891.1	781.15	781.16	0.01
4783.9	780.66	780.67	0.01
4698.3	780.43	780.45	0.02
4635.9 H	780.38	780.4	0.02
4531.8	780.32	780.34	0.02
4443.5	780.28	780.3	0.02

Table 1 cont. Water Surface Elevation Comparison

	Water Surface Elevation, ft		Difference
River Station	Effective	Flood Wall	(Flood Wall - Eff)
4399.9	780.29	780.29	0.00
4329.7	780.29	780.29	0.00
4273.7 G	780.29	780.29	0.00
4164.7	780.29	780.29	0.00
4081.6	779.9	779.9	0.00
3988.8	778.86	778.86	0.00
3925.2 F	778.64	778.64	0.00
3857.7	777.87	777.87	0.00
3776.2	777.84	777.84	0.00
3701.8	776.79	776.79	0.00
3618.4 E	776.29	776.29	0.00
3488.5	775.16	775.16	0.00
3342.8	773.11	773.11	0.00
3299	771.34	771.34	0.00
3123.7	770.52	770.51	-0.01
2911.1 D	769.3	769.28	-0.02
2703.4	768.74	768.71	-0.03
2592.1	768.41	768.37	-0.04
2555.3	768.4	768.4	0.00
2477.5 C	768.38	768.38	0.00
2377.9	767.84	767.84	0.00
2314.5	762.35	762.35	0.00
2210.8	760.6	760.6	0.00
2054.5 B	759.11	759.12	0.01
1883.4	757.32	757.35	0.03
1709.2	756.49	756.47	-0.02
1406.9 A	756.32	756.25	-0.07
1215.1	756.12	756.06	-0.06
1039.3	755.83	755.79	-0.04

Table 1 cont. Water Surface Elevation Comparison

	Water Surface Elevation, ft		Difference
River Station	Effective	Flood Wall	(Flood Wall - Eff)
961.6	755.65	755.62	-0.03
913.9	755.62	755.59	-0.03
801.5	755.31	755.29	-0.02
742.7	748.51	748.51	0.00
644.4	748.03	748.03	0.00

Note: Shaded River Stations denote locations of flood wall encroachment.