

APPENDIX B

HYDRAULIC CALCULATIONS

PROJECT
Job No.

Kapolei Interchange Phase 2

Hydraulic Calculations - Proposed Conditions

DATE: 11/17/2011
COMPUTED BY:
CHECKED BY:

Inlet	Q Accum.	dn	Vf	Size of Pipe	Length of Seg.	Sf	S	Lower Invert	Upper Invert	Hf	Manhole Losses				Ent. Cont.	Hydraulic Grade Elevation		Finished Grade Elevation
											A	B	C	D		Down	Up	
DRAINLINE "GDI-31"																		
OUTFALL 1								98.30	98.30								98.50	101.50
	14.25	0.61	4.54	24	85.00	0.34%	8.12%			0.29						105.81		
GDI-44								105.20	105.20		0.11	0.07	0.07	0.00	1.40		106.67	109.26
	12.49	0.61	3.98	24	134.00	0.26%	6.19%			0.35						114.11		
GDI-43								113.50	113.50		0.09	0.12	0.05	0.00	1.40		114.95	117.92
	8.98	0.51	2.86	24	107.00	0.13%	6.82%			0.14						121.31		
GDI-42								120.80	120.80		0.04	0.08	0.01	0.00	1.40		122.21	124.88
	5.33	0.39	1.70	24	115.00	0.05%	6.70%			0.05						128.89		
GDI-41								128.50	128.50		0.01	0.02	0.00	0.00	1.40		129.90	132.50
	4.20	0.35	1.34	24	66.00	0.03%	6.67%			0.02						133.25		
GDI-40								132.90	132.90		0.00	0.02	0.00	1.00	0.00		134.27	136.90
	2.82	0.33	0.90	24	49.00	0.01%	3.88%			0.01						135.13		
GDI-36								134.80	134.80		0.00	0.01	0.00	0.00	1.40		136.20	140.82
	0.41	0.20	0.13	24	63.00	0.00%	0.63%			0.00						136.20		
GDI-26								135.20	135.20		0.00	0.00	0.00	1.00	1.40		137.60	139.20
DRAINLINE "GDI-35"																		
GDI-41								128.50	128.50								128.80	132.50
	0.43	0.11	0.14	24	50.00	0.00%	8.00%			0.00						132.61		
GDI-35								132.50	132.50		0.00	0.00	0.00	0.00	1.40		133.90	136.66
DRAINLINE "GDI-25"																		
GDI-42								120.80	120.80								121.20	124.88
	2.31	0.26	0.74	24	50.00	0.01%	6.80%			0.00						124.46		
GDI-34								124.20	124.20		0.00	0.01	0.00	0.00	1.40		125.60	128.75
	1.42	0.37	0.45	24	50.00	0.00%	0.60%			0.00						125.60		
GDI-25								124.50	124.50		0.00	0.00	0.00	0.00	1.40		125.90	128.54
DRAINLINE "GDI-24"																		
GDI-43								113.50	113.50								113.80	117.92
	2.20	0.35	0.70	24	65.00	0.01%	1.85%			0.01						115.05		
GDI-33								114.70	114.70		0.00	0.00	0.00	0.00	1.40		116.10	121.52
	2.02	0.46	0.64	24	59.00	0.01%	0.51%			0.00						116.10		
GDI-24								115.00	115.00		0.00	0.01	0.00	1.00	1.40		117.40	119.15

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											A	B	C	D		Down	Up	
DRAINLINE "GDI-00"																		
OUTFALL 2								89.40	89.40								91.00	94.39
	153.14	2.54	7.80	60	125.00	0.29%	1.12%			0.37						93.34		
GDI-45								90.80	90.80		0.16	0.11	0.32	0.00	3.50		94.62	97.85
	144.04	1.59	7.34	60	163.00	0.26%	5.46%			0.42						101.29		
GDI-51								99.70	99.70		0.14	0.05	0.28	0.00	3.50		103.48	108.21
	139.53	1.40	7.11	60	215.00	0.24%	8.28%			0.53						118.90		
GDI-31								117.50	117.50		0.13	0.03	0.25	0.00	3.50		121.25	129.41
	136.42	1.30	6.95	60	58.00	0.23%	10.69%			0.14						125.00		
GDI-30.								123.70	123.70		0.12	0.02	0.24	0.00	3.50		127.44	132.18
	134.67	2.93	6.86	60	129.00	0.23%	0.54%			0.29						127.73		
GDI-38								124.40	124.40		0.12	0.02	0.23	0.00	3.50		128.13	135.34
	132.57	2.39	6.75	60	58.00	0.22%	1.03%			0.13						128.26		
GDI-32								125.00	125.00		0.11	0.10	0.07	0.00	3.50		128.57	132.60
	122.65	2.13	6.25	60	76.00	0.19%	1.32%			0.14						128.72		
SDMH-29								126.00	134.00		0.09	0.07	0.18	0.00	3.50		134.00	141.86
	115.13	1.13	5.86	60	192.00	0.17%	13.49%			0.32						161.03		
SDMH-54								159.90	159.90		0.07	0.02	0.05	0.00	3.50		163.45	169.23
	113.17	1.18	5.76	60	250.00	0.16%	10.64%			0.40						179.78		
SDMH-53								178.60	180.60		0.07	0.00	0.14	0.00	3.50		182.24	188.83
	113.17	0.96	5.76	60	63.00	0.16%	24.35%			0.10						187.46		
SDMH-52								186.50	190.00		0.07	0.00	0.05	0.00	3.50		190.05	197.52
	113.17	1.02	5.76	60	31.00	0.16%	19.16%			0.05						196.96		
GDI-00								195.94	195.94		0.07	0.51	0.05	0.00	3.50		199.49	195.94
DRAINLINE "GDI-27"																		
SDMH-54								159.90	165.00								165.30	169.23
	1.95	0.29	0.62	24	32.00	0.01%	3.13%			0.00						166.29		
GDI-27								166.00	166.00		0.00	0.01	0.00	0.00	1.40		167.40	170.36
DRAINLINE "GDI-28"																		
SDMH-29								126.00	135.00								135.90	141.86
	7.52	0.57	2.39	24	17.00	0.09%	2.94%			0.02						136.07		
GDI-28								135.50	135.50		0.03	0.09	0.00	0.00	1.40		136.90	139.51
DRAINLINE "GDI-37"																		
GDI-38								124.40	131.30								131.70	135.34
	1.45	0.24	0.46	24	171.00	0.00%	3.57%			0.01						137.64		
GDI-37								137.40	137.40		0.00	0.02	0.00	0.00	1.40		138.80	142.42

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											A	B	C	D		Elevation Down	Up	
DRAINLINE "GDI-39"																		
GDI-31	1.82	0.25	0.58	24	132.00	0.01%	5.00%	117.50	125.00	0.01						131.85	125.50	129.41
GDI-39								131.60	131.60		0.00	0.01	0.00	0.00	1.40		133.00	135.65
DRAINLINE "CB-50"																		
GDI-51	1.33	0.16	0.42	24	128.00	0.00%	15.63%	99.70	104.00	0.00						124.16	104.60	108.21
CB-50								124.00	124.00		0.00	0.00	0.00	0.00	1.40		125.40	128.19
DRAINLINE "GDI-46"																		
GDI-45	5.35	0.59	0.76	36	108.00	0.01%	0.77%	90.80	90.80	0.01						92.22	91.20	97.85
GDI-46								91.63	91.63		0.00	0.01	0.00	0.00	2.10		93.73	95.63
DRAINLINE "GDI-2"																		
EX-1	2.11	0.22	0.67	24	7.00	0.01%	11.29%	108.71	108.71	0.00						109.72	109.13	115.06
GDI-2								109.50	109.50		0.00	0.01	0.00	0.00	1.40		110.90	114.04
DRAINLINE "GDI-3"																		
EX-2	1.98	0.24	0.63	24	11.00	0.01%	7.18%	107.21	107.21	0.00						108.24	107.63	113.43
GDI-3								108.00	108.00		0.00	0.01	0.00	0.00	1.40		109.40	112.20
DRAINLINE "GDI-4"																		
EX-3	1.92	0.44	0.61	24	11.00	0.01%	0.55%	105.71	105.71	0.00						106.21	106.13	111.57
GDI-4								105.77	105.77		0.00	0.01	0.00	0.00	1.40		107.17	110.41
DRAINLINE "GDI-5"																		
EX-4	1.80	0.29	0.57	24	11.00	0.01%	2.64%	104.21	104.21	0.00						104.79	104.62	109.74
GDI-5								104.50	104.50		0.00	0.01	0.00	0.00	1.40		105.90	108.57

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											A	B	C	D		Down	Up	
DRAINLINE "GDI-6"																		
EX-5								102.71	102.71								103.10	107.90
	1.67	0.41	0.53	24	11.00	0.00%	0.55%											
GDI-6								102.77	102.77		0.00	0.01	0.00	0.00	1.40	103.18	104.17	106.73
DRAINLINE "GDI-7"																		
EX-6								101.21	101.21								101.58	106.03
	1.49	0.37	0.47	24	9.00	0.00%	0.67%											
GDI-7								101.27	101.27		0.00	0.01	0.00	0.00	1.40	101.64	102.67	104.86
DRAINLINE "GDI-8"																		
EX-7								99.71	99.71								99.92	104.21
	1.43	0.39	0.45	24	12.00	0.00%	0.50%											
GDI-8								99.77	99.77		0.00	0.00	0.00	0.00	1.40	100.16	101.17	103.36
DRAINLINE "GDI-9"																		
EX-8								98.21	98.21								98.41	102.29
	1.30	0.35	0.41	24	20.00	0.00%	0.60%											
GDI-9								98.33	98.33		0.00	0.00	0.00	0.00	1.40	98.68	99.73	100.69
DRAINLINE "GDI-10"																		
EX-9								78.28	78.28								79.00	85.77
	3.87	0.30	0.02	214	21.00	0.00%	1.00%											
GDI-10								78.49	78.49		0.00	0.00	0.00	0.00	12.48	79.00	90.97	84.15
DRAINLINE "GDI-12"																		
OUTFALL 3								75.70	75.70								76.31	82.00
	4.24	0.60	1.35	24	79.00	0.03%	0.76%			0.02							76.90	
GDI-11								76.30	76.30		0.00	0.02	0.00	0.00	1.40	77.71	77.70	80.61
	1.76	0.43	0.56	24	107.00	0.01%	0.51%			0.01								
GDI-12								76.85	76.85		0.00	0.01	0.00	0.00	1.40		78.25	80.70

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											A	B	C	D		Down	Up	
DRAINLINE "GDI-13"																		
OUTFALL 4								77.40	77.40								77.80	82.00
	2.39	0.40	0.76	24	75.00	0.01%	1.27%											
GDI-13								78.35	78.35		0.00	0.01	0.00	0.00	1.40		78.75	82.37
DRAINLINE "GDI-14"																		
OUTFALL 5								77.06	77.06								77.40	81.06
	5.16	0.60	1.64	24	92.00	0.04%	1.15%											
GDI-14								78.12	78.12		0.01	0.05	0.00	0.00	1.40		78.72	82.12
DRAINLINE "GDI-15"																		
DMH-16								80.23	80.23								80.40	86.65
	0.99	0.24	0.31	24	32.00	0.00%	1.00%											
GDI-15								80.55	80.55		0.00	0.00	0.00	0.00	1.40		80.79	84.55
DRAINLINE "GDI-17"																		
DMH-18								83.25	83.50								84.02	90.19
	1.37	0.23	0.44	24	25.00	0.00%	4.00%											
GDI-17								84.50	84.50		0.00	0.00	0.00	0.00	1.40		84.73	88.58
DRAINLINE "GDI-20"																		
DMH-21								81.92	86.88								87.10	93.51
	2.09	0.36	0.66	24	37.00	0.01%	1.41%											
GDI-20								87.40	87.40		0.00	0.01	0.00	0.00	1.40		87.76	91.42
DRAINLINE "CB-47"																		
GDI-48								110.00	110.00		0.00	0.00	0.00	0.00	0.00		110.30	114.00
	2.68	0.35	0.85	24	72.00	0.01%	2.78%											
CB-47								112.00	112.00		0.00	0.01	0.00	0.00	1.40		112.35	116.43

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											A	B	C	D		Down	Up	
DRAINLINE "SDMH-56"																		
OUTFALL 6								88.75	88.75								90.00	91.83
	3.13	0.29	1.00	24	70.00	0.02%	7.50%			0.01						94.29		
SDMH-56								94.00	94.00		0.00	0.02	0.00	0.00	1.40		95.40	103.02
DRAINLINE "GDI-22"																		
SDMH-23								94.00	94.00								94.30	103.02
	1.47	0.35	0.47	24	60.00	0.00%	0.83%			0.00						94.85		
GDI-22								94.50	94.50		0.00	0.00	0.00	0.00	1.40		95.90	98.75
DRAINLINE "GDI-49"																		
SDMH-56								99.00	99.00								99.40	103.02
	1.66	0.22	0.53	24	89.00	0.00%	6.48%			0.00						104.99		
GDI-49								104.77	104.77		0.00	0.01	0.00	0.00	1.40		106.17	108.77