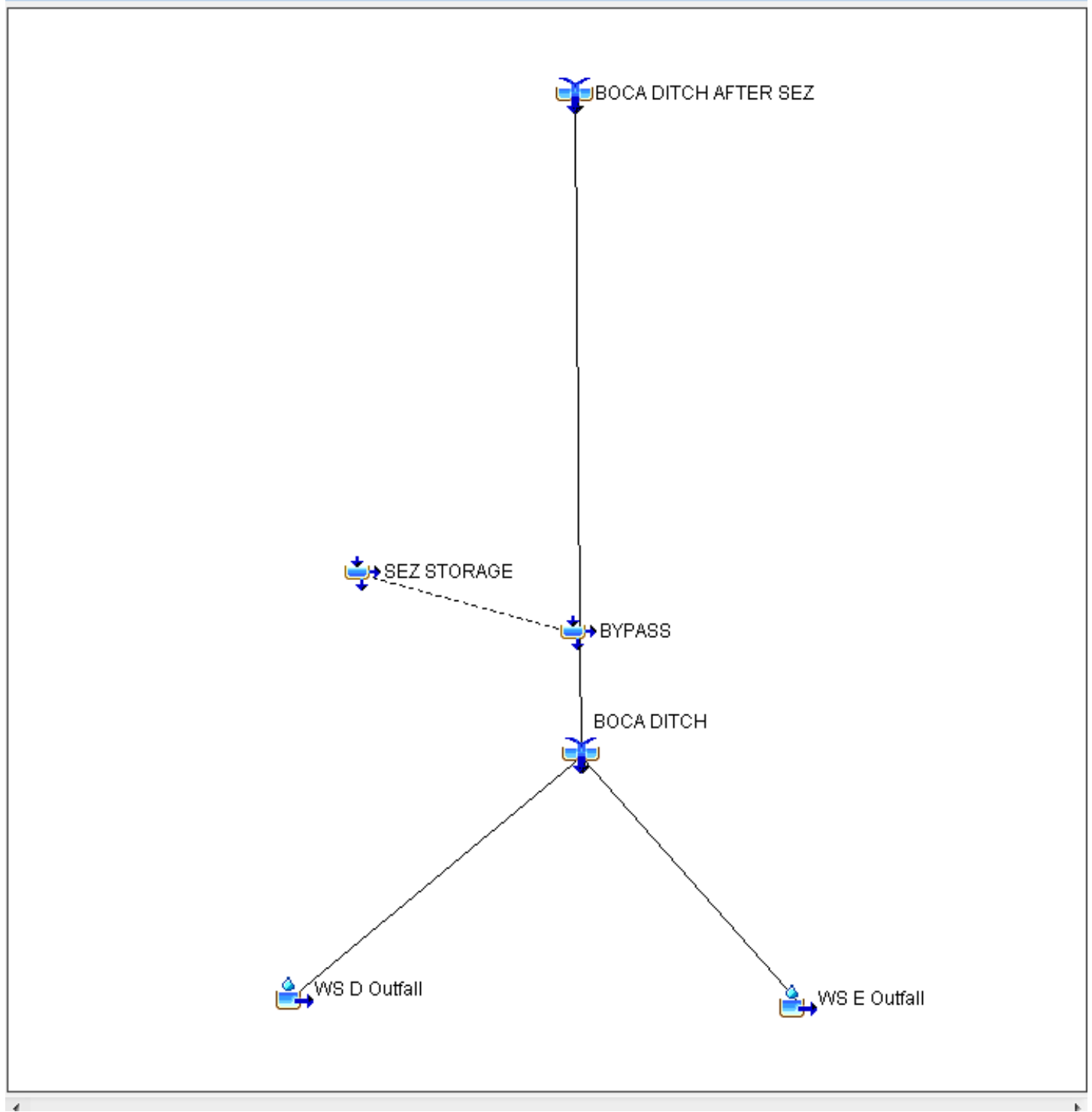


Appendix A

HYDROLOGY AND HYDRAULICS



Project: CCH III Simulation Run: 10 YR 6 HR

Start of Run: 01Jul2020, 12:00

Basin Model: ELKS SEZ Basin

End of Run: 02Jul2020, 00:00

Meteorologic Model: 10yr 6hr 20 Inch

Compute Time: 14Feb2019, 15:19:22

Control Specifications:6 Hour

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
WS D Outfall	0.1451563	8.33	01Jul2020, 15:40	1.59358
WS E Outfall	0.0225	2.58	01Jul2020, 15:31	0.43241
BOCA DITCH	0.1676563	10.77	01Jul2020, 15:37	2.02598
BYPASS	0.1676563	2.29	01Jul2020, 18:07	0.12595
BOCA DITCH AFTER SEZ	0.1676563	2.29	01Jul2020, 18:07	0.12595
SEZ STORAGE	0.0	10.11	01Jul2020, 15:32	1.71352

Project: CCH III Simulation Run: 25 YR 1 HR

Start of Run: 01Jul2020, 12:00

Basin Model: ELKS SEZ Basin

End of Run: 01Jul2020, 15:00

Meteorologic Model: 25yr 1hr 20 Inch

Compute Time: 14Feb2019, 15:19:35

Control Specifications: 1 Hour

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
WS D Outfall	0.1451563	9.16	01Jul2020, 13:11	0.77530
WS E Outfall	0.0225	2.93	01Jul2020, 13:02	0.21158
BOCA DITCH	0.1676563	11.90	01Jul2020, 13:08	0.98688
BYPASS	0.1676563	1.40	01Jul2020, 13:08	0.02905
BOCA DITCH AFTER SEZ	0.1676563	1.40	01Jul2020, 13:08	0.02905
SEZ STORAGE	0.0	10.11	01Jul2020, 12:58	0.87138

Project: CCH III Simulation Run: 100 YR 24 HR

Start of Run: 01Jul2020, 12:00

Basin Model: ELKS SEZ Basin

End of Run: 03Jul2020, 00:00

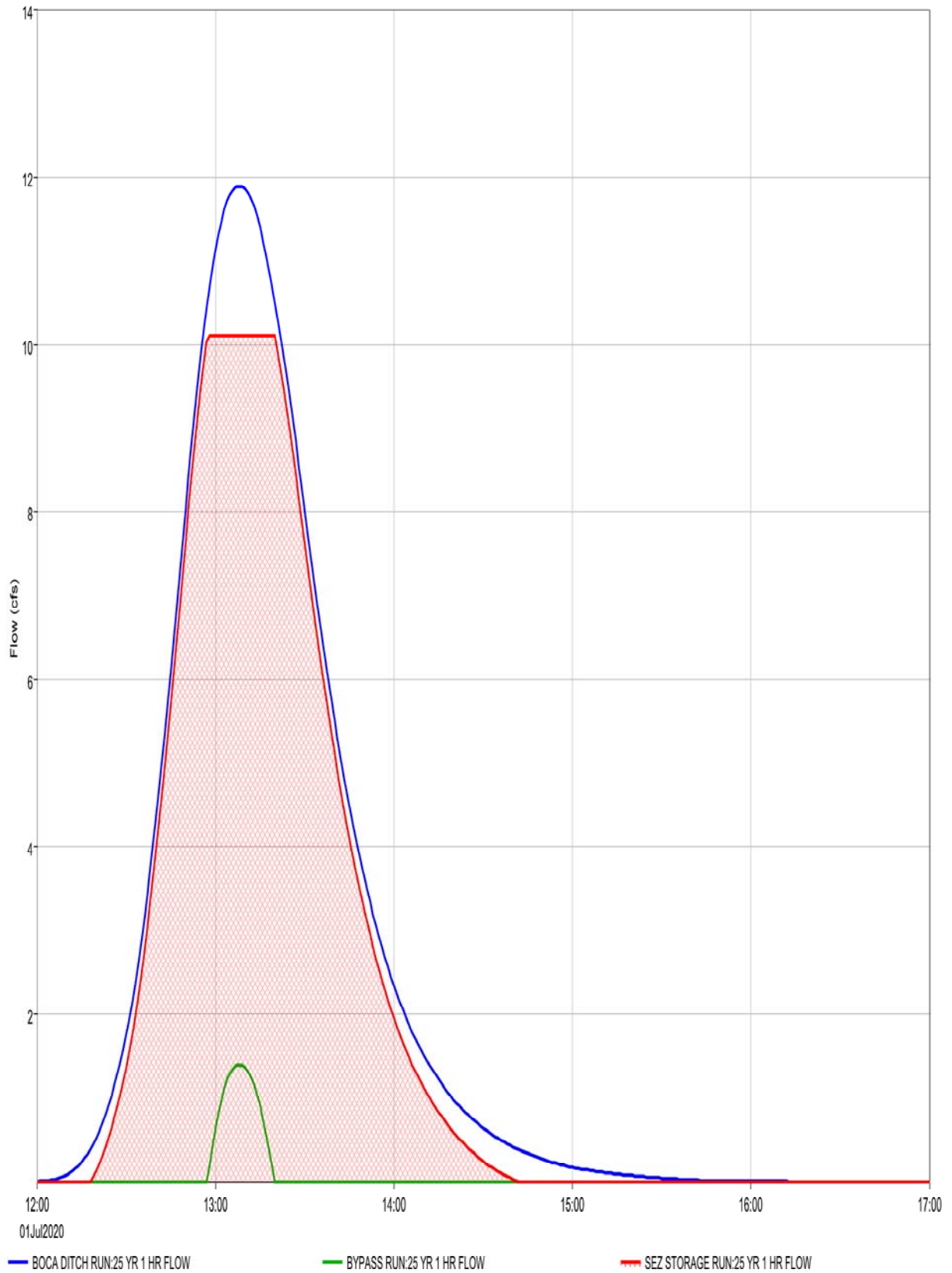
Meteorologic Model: 100yr 24hr 20 Inch

Compute Time: 14Feb2019, 15:19:32

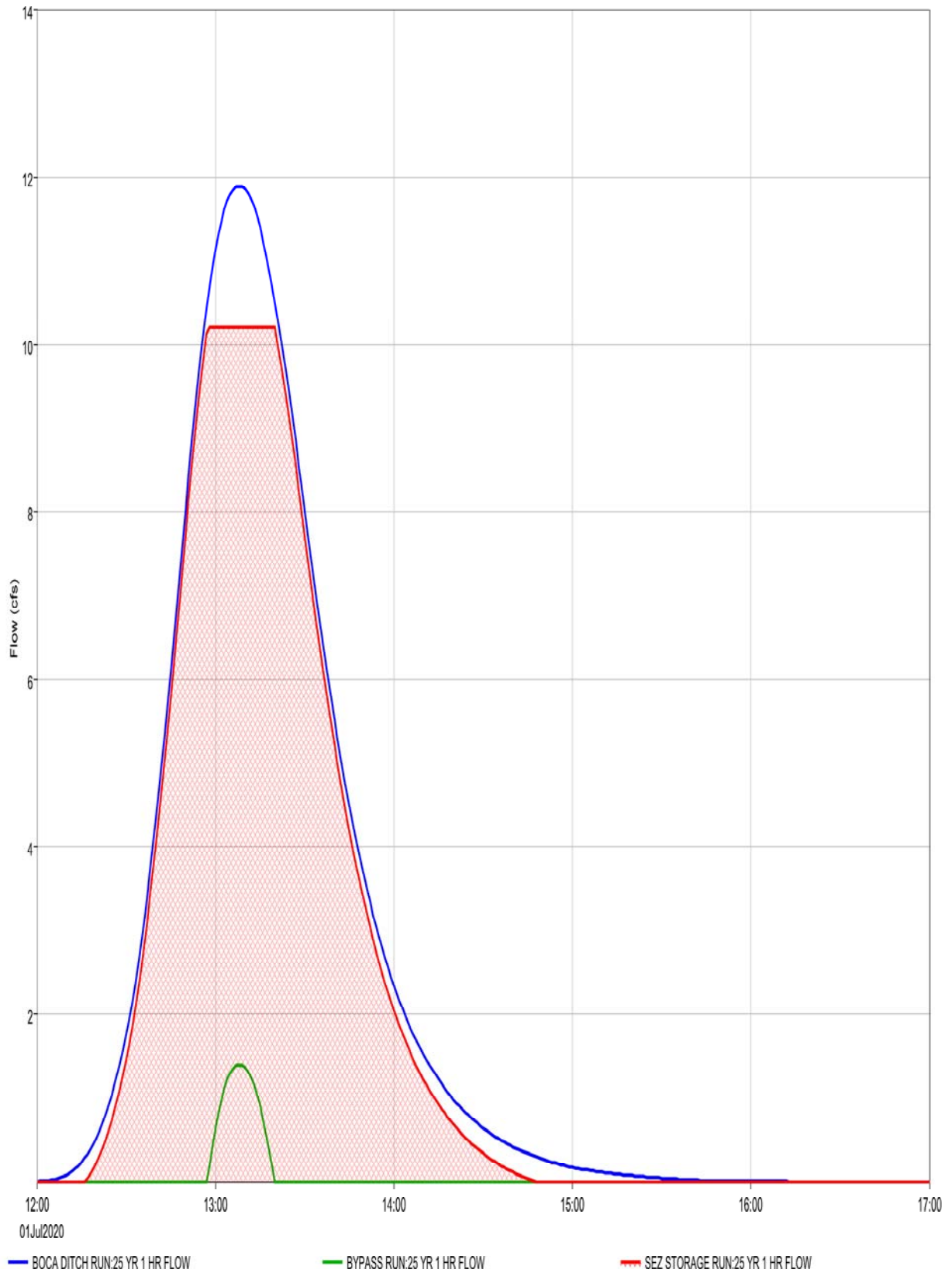
Control Specifications:24 Hour

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
WS D Outfall	0.1451563	11.84	02Jul2020, 00:40	4.52025
WS E Outfall	0.0225	3.66	02Jul2020, 00:31	1.22636
BOCA DITCH	0.1676563	15.31	02Jul2020, 00:37	5.74661
BYPASS	0.1676563	15.31	02Jul2020, 00:37	3.84658
BOCA DITCH AFTER SEZ	0.1676563	15.31	02Jul2020, 00:37	3.84658
SEZ STORAGE	0.0	4.03	01Jul2020, 23:24	1.54360

ELKS PROPERTY SEZ RESTORATION ALT 1
WATERSHEDS D & E



ELKS PROPERTY SEZ RESTORATION ALT 2
WATERSHEDS D & E





Tahoe Engineering
 924B Emerald Bay Road
 South Lake Tahoe, California 96150

Phone: (530) 573-7900
 FAX: (530) 541-7049

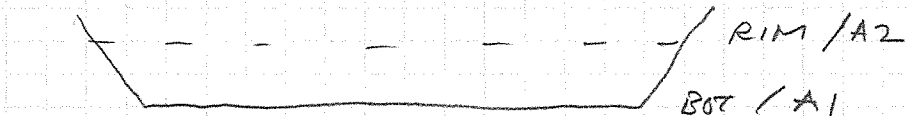
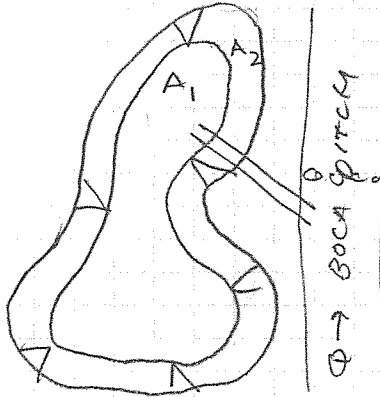


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 Checked By: _____
 Date: _____

Project Name: CCH III
 Project #: 95191
 Task Code: 1
 Sheet: _____ of _____

HYDRAULIC CALCULATIONS

ALT 2



BASIN

3:1 SIDE SLOPE

$$A = A_{AVG} = \frac{A_1 + A_2}{2} = \frac{18299 + 28133}{2} = 23216 \text{ ft}^2$$

d. depth = 2'
 INFILTRATION RATE = 0.4" / HR

$$Q = 11.9 \text{ CFS}, \psi = 0.98688 \text{ AC-FT}$$

PIPE

18" HDPE, D = 1.5'
 n = 0.013
 S = 0.01
 FULL

BASIN INFILTRATION, Q_B

$$v = \frac{0.4 \text{ IN}}{\text{HR}} \times \frac{1 \text{ FT}}{12 \text{ IN}} \times \frac{1 \text{ HR}}{3600 \text{ SEC}} = 9.26 \times 10^{-6} \text{ FT / SEC}$$

$$\therefore Q_B = vA = 9.26 \times 10^{-6} \frac{\text{FT}}{\text{SEC}} \times 23216 \text{ FT}^2 = 0.21 \frac{\text{FT}^3}{\text{SEC}}$$

BASIN VOLUME, V

$$V = dA = (2 \text{ FT}) \times (23216 \text{ SF}) = 46432 \text{ CF} \times \frac{1 \text{ AC-FT}}{43560 \text{ CF}} = 1.07 \text{ AC-FT}$$

PIPE Q, Q_P

$$Q_P = \frac{0.463 P^{8/3} S^{1/2}}{n} = \frac{0.463 (1.5)^{8/3} (0.01)^{1/2}}{0.013} = 10.5 \text{ CFS}$$



Tahoe Engineering
 924B Emerald Bay Road
 South Lake Tahoe, California 96150

Phone: (530) 573-7900
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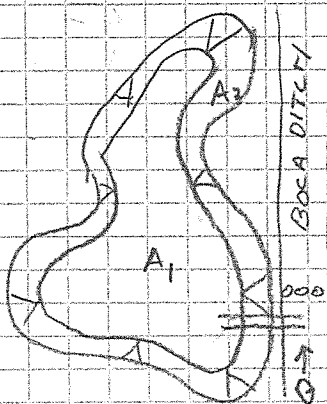


Designer: DG
 Checked By: _____
 Date: _____

Project Name: CCH III
 Project #: 95191
 Task Code: 1
 Sheet: _____ of _____

HYDRAULIC CALCULATIONS

ACT 1



BASIN

3:1 SIDE

$$A = A_{AVG} = \frac{A_1 + A_2}{2} = \frac{26613^{\text{sq}} + 38213^{\text{sq}}}{2} = 32413^{\text{sq}}$$

d, DEPTH = 2'

INFILTRATION RATE = 0.4" / HR

$$Q = 11.9 \text{ CFS}, \quad V = 0.98688 \text{ AC-FT}$$

PIPE

18" HDPE, D = 1.5'

n = 0.013

S = 0.01

FULL

BASIN INFILTRATION, Q_B

$$v = \frac{0.4 \text{ IN}}{\text{HR}} \times \frac{1 \text{ FT}}{12 \text{ IN}} \times \frac{1 \text{ HR}}{3600 \text{ SEC}} = 9.26 \times 10^{-6} \text{ FT/SEC}$$

$$\therefore Q_B = vA = 9.26 \times 10^{-6} \frac{\text{FT}}{\text{SEC}} \times 32413 \text{ FT}^2 = 0.30 \frac{\text{FT}^3}{\text{SEC}}$$

BASIN VOLUME, V

$$V = dA = (2 \text{ FT}) \times (32413 \text{ SF}) = 64826 \text{ CF} \times \frac{1 \text{ AC-FT}}{43560 \text{ CF}} = 1.49 \text{ AC-FT}$$

PIPE Q, Q_P

$$Q_P = \frac{0.463 \text{ D}^{8/3} \text{ S}^{1/2}}{n} = \frac{0.463 (1.5)^{8/3} (0.01)^{1/2}}{0.013} = 10.5 \text{ CFS}$$

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS C

NOTES
 1.710 = P₂ (2 yr, 24 hr rainfall depth based on 21 inches mean annual precip)
 6.0 Initial Time of Concentration for all areas
 0.90 Time of Concentration based on County of El Dorado Drainage Manual (Chapter 2)
 0.10 Time of Concentration determined using Longest Travel Path in Watershed
 c value a composite of pervious and impervious areas
 **100 Year Storm Assumes 25% increase in C

y=bx^m

	b	m
10 yrs	4.4759	-0.507
25 yrs	5.2711	-0.507
100 yrs	6.3124	-0.504

DATA RUN
 = Computed Automatically
 =Determined from Appendix 4.2 of County of El Dorado Drainage Manual
 =Determined from Previous Worksheets

WS C	0%		=Bulking'																	
SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ⁶⁰ S ⁵)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)	
1-2 C1	4.19	37.26%	10 Year	18.90	0.40	1.01	1.7													
			25 Year	18.90	0.40	1.19	2.0													
			100 Year	18.90	0.50	1.44	3.0	CMP Inlet												
				JUNCTION	19.53			18" CMP	Pipe 1489/1490	347	6506.10	6417.80	25.45%	0.024	1.50	0.0320	0.0961	0.216225	9.2	0.63
3-4 C2	4.35	15.07%	10 Year	50.28	0.22	0.61	0.6													
			25 Year	50.28	0.22	0.72	0.7													
			100 Year	50.28	0.28	0.88	1.1													
				JUNCTION	50.28															0.00
1-4 C1-C2	8.55	25.96%	10 Year	50.28	0.31	0.61	1.6													
			25 Year	50.28	0.31	0.72	1.9													
			100 Year	50.28	0.38	0.88	2.9													
				JUNCTION	50.85			18" CMP	Pipe 1491	260	6415.30	6376.50	14.92%	0.024	1.50	0.0401	0.1118	0.25155	7.6	0.57
1-6 C1-C3	11.64	23.48%	10 Year	50.85	0.29	0.61	2.0													
			25 Year	50.85	0.29	0.72	2.4													
			100 Year	50.85	0.36	0.87	3.6													
				JUNCTION	51.72			18" CMP	Pipe 1492/1493	316	6376.50	6355.60	6.61%	0.024	1.50	0.0762	0.1756	0.3949875	6.1	0.86
1-8 C1-C4	16.83	20.79%	10 Year	52.76	0.27	0.60	2.7													
			25 Year	52.76	0.27	0.71	3.2													
			100 Year	52.76	0.33	0.86	4.8													
				JUNCTION	52.76															0.00
9-10 C5	4.45	21.53%	10 Year	33.31	0.27	0.76	0.9													
			25 Year	33.31	0.27	0.89	1.1													
			100 Year	33.31	0.34	1.08	1.6	CMP Inlet												
				JUNCTION	33.92			18" CMP	Pipe1483	250	6417.25	6373.60	17.46%	0.024	1.50	0.0210	0.0704	0.1582875	6.8	0.61

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS C

SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ^{3/2} S ⁵)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)			
11-12 C6	0.17	21.84%	10 Year	27.48	0.27	0.83	0.0															
			25 Year	27.48	0.27	0.98	0.0															
			100 Year	27.48	0.34	1.19	0.1															
			JUNCTION	27.48																	0.00	
9-12 C5-C6	4.62	21.54%	10 Year	33.92	0.27	0.75	0.9															
			25 Year	33.92	0.27	0.88	1.1															
			100 Year	33.92	0.34	1.07	1.7	CMP Inlet														
			JUNCTION	34.08				18" CMP	Pipe1484	30	6373.60	6373.00	2.00%	0.024	1.50	0.0639	0.1535	0.345375	3.2	0.16		
13-12 C7	1.16	18.56%	10 Year	32.92	0.25	0.76	0.2															
			25 Year	32.92	0.25	0.90	0.3															
			100 Year	32.92	0.31	1.08	0.4															
			JUNCTION	32.92																	0.00	
9-13 C5-C7	5.78	20.94%	10 Year	34.08	0.27	0.75	1.2															
			25 Year	34.08	0.27	0.88	1.4															
			100 Year	34.08	0.33	1.07	2.1	CMP Inlet														
			JUNCTION	34.79				18" CMP	Pipe 1485/1486	292	6373.00	6328.00	15.41%	0.024	1.50	0.0282	0.0885	0.199125	6.8	0.71		
1-13 C1-C7	22.61	20.83%	10 Year	52.76	0.27	0.60	3.6															
			25 Year	52.76	0.27	0.71	4.3															
			100 Year	52.76	0.33	0.86	6.4	CMP Inlet														
			JUNCTION	52.96				18" CMP	Pipe 1487	48	6328.00	6327.00	2.08%	0.024	1.50	0.2399	0.4724	1.0629	4.0	0.20		
1-14 C1-C8	24.49	20.09%	10 Year	54.30	0.26	0.59	3.8															
			25 Year	54.30	0.26	0.70	4.4															
			100 Year	54.30	0.33	0.84	6.7															
			JUNCTION	54.30																	0.00	
1-15 C1-C9	32.33	17.88%	10 Year	61.66	0.24	0.55	4.4															
			25 Year	61.66	0.24	0.65	5.1															
			100 Year	61.66	0.30	0.79	7.8	FES														
			JUNCTION	61.82				18" HDPE	Pipe 1374	65	6278.03	6276.97	1.63%	0.013	1.50	0.1771	0.3229	0.726525	7.1	0.15		
1-16 C1-C10	48.39	15.32%	10 Year	82.81	0.22	0.48	5.1															
			25 Year	82.81	0.22	0.56	6.0															
			100 Year	82.81	0.28	0.68	9.2	FES														
			JUNCTION	82.92				18" HDPE	Pipe 1353	40			1.00%	0.013	1.50	0.2667	0.4426	0.99585	6.1	0.11		

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS D

NOTES
 1.630 = P₂ (2 yr, 24 hr rainfall depth based on 20 inches mean annual precip)
 6.0 Initial Time of Concentration for all areas
 0.90 Time of Concentration based on County of El Dorado Drainage Manual (Chapter 2)
 0.10 Time of Concentration determined using Longest Travel Path in Watershed
 c value a composite of pervious and impervious areas
 **100 Year Storm Assumes 25% increase in C

y=bx^m

	b	m
10 yrs	4.2681	-0.507
25 yrs	5.0264	-0.508
100 yrs	6.0429	-0.507

DATA RUN
 = Computed Automatically
 =Determined from Appendix 4.2 of County of El Dorado Drainage Manual
 =Determined from Previous Worksheets

WS D	0%		=Bulking'																	
SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ⁶⁰ S ⁵)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)	
1-2 D1	2.60	30.37%	10 Year	8.03	0.34	1.48	1.3													
			25 Year	8.03	0.34	1.74	1.6													
			100 Year	8.03	0.43	2.10	2.3													
				JUNCTION	8.25			18" CMP	Pipe 1337	54	6290.80	6289.10	3.15%	0.024	1.50	0.0714	0.1667	0.375075	4.1	0.22
3-4 D2	3.85	16.30%	10 Year	43.68	0.23	0.63	0.6													
			25 Year	43.68	0.23	0.74	0.7													
			100 Year	43.68	0.29	0.89	1.0													
				JUNCTION	43.68															0.00
1-4 D1-D2	6.45	21.97%	10 Year	43.68	0.28	0.63	1.1													
			25 Year	43.68	0.28	0.74	1.3													
			100 Year	43.68	0.34	0.89	2.0													
				JUNCTION	43.68															0.00
5-6 D3	1.72	53.00%	10 Year	12.07	0.52	1.21	1.1													
			25 Year	12.07	0.52	1.42	1.3													
			100 Year	12.07	0.66	1.71	1.9													
				JUNCTION	12.93			18" CMP	CMP Inlet Pipe 1410/1411	378	6502.70	6435.90	17.67%	0.024	1.50	0.0248	0.0775	0.174375	7.3	0.86
7-8 D4	7.09	10.22%	10 Year	29.79	0.18	0.76	1.0													
			25 Year	29.79	0.18	0.90	1.2													
			100 Year	29.79	0.23	1.08	1.7													
				JUNCTION	29.79															0.00
5-8 D3-D4	8.81	18.58%	10 Year	29.79	0.25	0.76	1.7													
			25 Year	29.79	0.25	0.90	2.0													
			100 Year	29.79	0.31	1.08	3.0													
				JUNCTION	30.19			18" CMP	CMP Inlet Pipe 1389/1390	185	6403.30	6376.30	14.59%	0.024	1.50	0.0418	0.1118	0.25155	7.8	0.40

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS D

SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ^{3/2} S ²)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)			
8-9 D5	6.99	12.23%	10 Year	3.10	0.20	2.41	3.3															
			25 Year	3.10	0.20	2.83	3.9															
			100 Year	3.10	0.25	3.41	5.9															
			JUNCTION	3.10																	0.00	
5-9 D3-D5	15.80	15.77%	10 Year	33.29	0.23	0.72	2.6															
			25 Year	33.29	0.23	0.85	3.0															
			100 Year	33.29	0.28	1.02	4.6															
			JUNCTION	33.55				15" CMP	Pipe 1380	82	6353.80	6350.95	3.48%	0.024	1.25	0.2149	0.3727	0.58234375	5.2	0.26		
9-10 D6	0.92	51.96%	10 Year	1.34	0.52	3.68	1.7															
			25 Year	1.34	0.52	4.33	2.0															
			100 Year	1.34	0.64	5.20	3.1															
			JUNCTION	1.34																	0.00	
5-10 D3-D6	16.71	17.75%	10 Year	34.89	0.24	0.70	2.9															
			25 Year	34.89	0.24	0.83	3.3															
			100 Year	34.89	0.30	1.00	5.0															
			JUNCTION	34.89																	0.00	
11-12 D7	0.52	22.12%	10 Year	7.11	0.28	1.58	0.2															
			25 Year	7.11	0.28	1.86	0.3															
			100 Year	7.11	0.35	2.24	0.4															
			JUNCTION	7.41				18" CMP	Pipe 1366	34	6364.70	6364.20	1.47%	0.024	1.50	0.0181	0.0634	0.14265	1.9	0.30		
12-13 D8	2.71	21.91%	10 Year	1.14	0.28	4.00	3.0															
			25 Year	1.14	0.28	4.71	3.5															
			100 Year	1.14	0.34	5.66	5.3															
			JUNCTION	1.14																	0.00	
11-13 D7-D8	3.23	21.95%	10 Year	8.55	0.28	1.44	1.3															
			25 Year	8.55	0.28	1.69	1.5															
			100 Year	8.55	0.34	2.04	2.3															
			JUNCTION	8.55																	0.00	

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS D

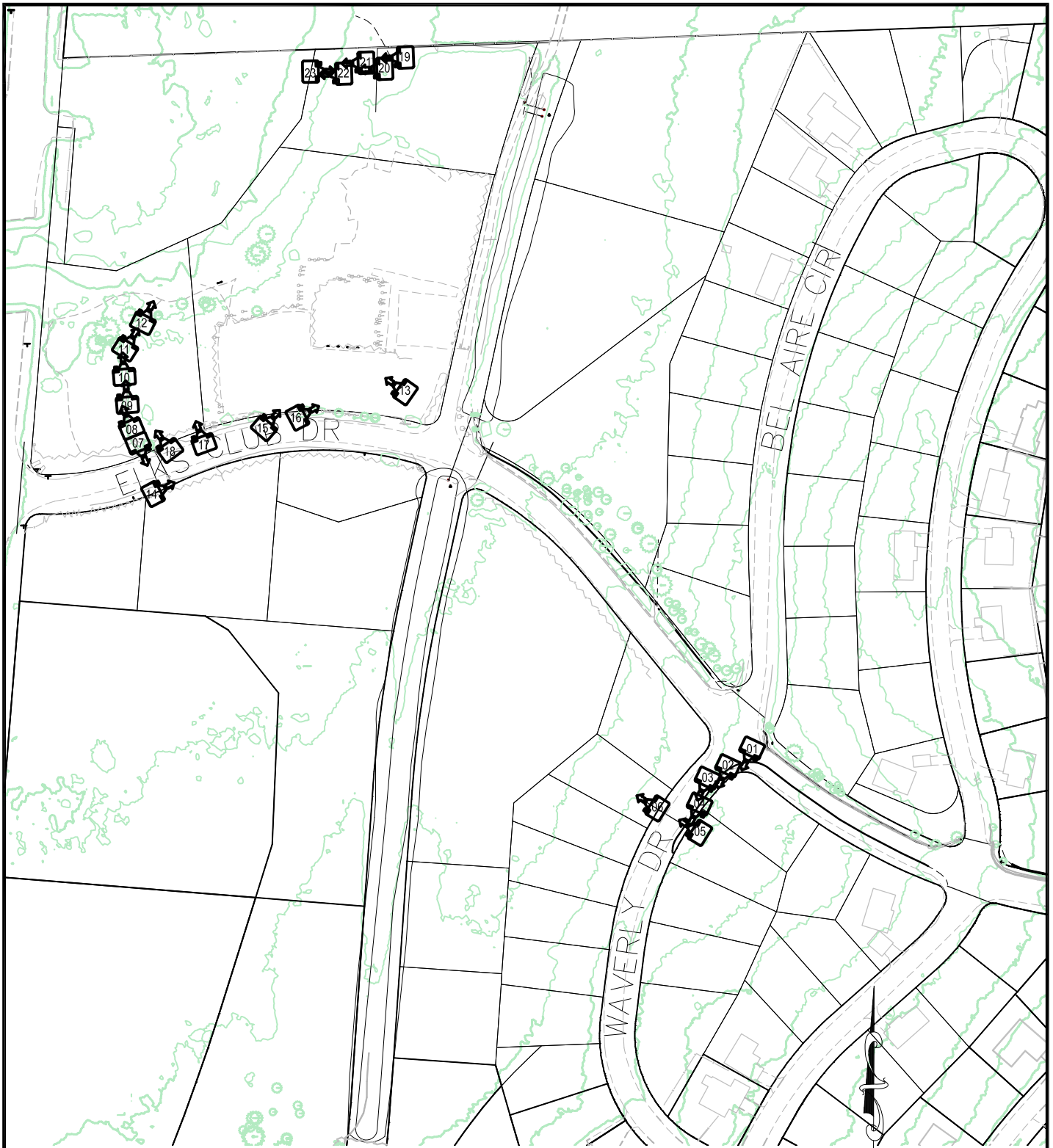
SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ^{3/2} S ²)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)			
14-15 D9	3.02	16.27%	10 Year	38.66	0.23	0.67	0.5															
			25 Year	38.66	0.23	0.79	0.5															
			100 Year	38.66	0.29	0.95	0.8															
			JUNCTION	38.82				12" CMP	Pipe 1365	38	6413.50	6411.57	5.08%	0.024	1.00	0.0580	0.1449	0.1449	3.8	0.17		
15-16 D10	6.65	18.60%	10 Year	3.97	0.25	2.12	3.5															
			25 Year	3.97	0.25	2.50	4.1															
			100 Year	3.97	0.31	3.00	6.2															0.00
			JUNCTION	3.97																		
14-16 D9-D10	9.67	17.87%	10 Year	42.79	0.24	0.64	1.5															
			25 Year	42.79	0.24	0.75	1.8															
			100 Year	42.79	0.30	0.90	2.6															
			JUNCTION	42.99				18" CMP	Pipe 1367	40	6357.60	6357.00	1.50%	0.024	1.50	0.1164	0.2355	0.529875	3.3	0.20		
16-13 D11	7.82	17.68%	10 Year	10.65	0.24	1.29	2.4															
			25 Year	10.65	0.24	1.51	2.9															
			100 Year	10.65	0.30	1.82	4.3															0.00
			JUNCTION	10.65																		
13-16 D9-D11	17.49	17.79%	10 Year	53.64	0.24	0.57	2.4															
			25 Year	53.64	0.24	0.66	2.8															
			100 Year	53.64	0.30	0.80	4.3															0.00
			JUNCTION	53.64																		
11-16 D7-D11	20.72	18.44%	10 Year	53.64	0.25	0.57	2.9															
			25 Year	53.64	0.25	0.66	3.4															
			100 Year	53.64	0.31	0.80	5.1															
			JUNCTION	53.80				18" CMP	Pipe 1379A	58	6314.00	6311.00	5.17%	0.024	1.50	0.1220	0.2450	0.55125	6.2	0.16		
5-16 D3-D11	37.44	18.13%	10 Year	53.80	0.25	0.57	5.2															
			25 Year	53.80	0.25	0.66	6.1															
			100 Year	53.80	0.31	0.80	9.2															
			JUNCTION	54.20				18" CMP	Pipe 1379B	200	6311.00	6295.00	8.00%	0.024	1.50	0.1753	0.3229	0.726525	8.4	0.40		

COUNTRY CLUB HEIGHTS-JN 95191
Rational Method
EWS D

SUBWS & NODES	Area (acres)	% Imperviousness		Tc (min)	Composite C	Rainfall Intensity (in/hr)	Peak Runoff (cfs)	Conveyance	Flow Length (ft)	High Elev (ft)	Low Elev (ft)	Slope (%)	n	Pipe Diameter (ft)	Qn/ (D ^{3/2} S ⁵)	A/D ²	Area (ft ²)	Velocity (ft/s)	Travel Time (min)
21-28 D16-D22	22.45	14.34%	10 Year	44.00	0.21	0.63	3.0												
			25 Year	44.00	0.21	0.74	3.5												
			100 Year	44.00	0.27	0.89	5.3												
			JUNCTION	44.20				24" CMP	Pipe 1372	66	6283.30	6280.80	3.79%	0.024	2.00	0.0688	0.1623	0.6492	5.5
28-29 D23	16.30	8.91%	10 Year	3.35	0.17	2.31	6.5												
			25 Year	3.35	0.17	2.72	7.6												
			100 Year	3.35	0.21	3.28	11.4												
			JUNCTION	3.35															
21-29 D1-D23	92.87	16.51%	10 Year	62.97	0.23	0.52	11.3												
			25 Year	62.97	0.23	0.61	13.2												
			100 Year	62.97	0.29	0.74	19.9												
			JUNCTION	63.59				30" ACMP	Pipe 1354	100	6265	6264.68	0.32%	0.024	2.50	0.4867	0.7854	4.90875	2.7

Appendix B

PHOTO INVENTORY



LEGEND

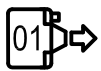
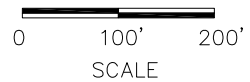



PHOTO POINT AND DIRECTION



 <p>COUNTY OF EL DORADO COMMUNITY DEVELOPMENT SERVICES DEPARTMENT OF TRANSPORTATION</p>	<p>COUNTRY CLUB HEIGHTS EROSION CONTROL PROJECT - PHASE III</p>		<p>FIGURE B1</p>
	<p>APPENDIX B - PHOTO POINTS</p>		
DATE: 03/2019	PROJECT NO.: 95191	BY: DMG	

Country Club Heights Erosion Control Projec - CIP 95191
Pre Project Area Photographs



Photo Pt #1



Photo Pt #2



Photo Pt #3



Photo Pt #4



Photo Pt #5



Photo Pt #6

Country Club Heights Erosion Control Projec - CIP 95191
Pre Project Area Photographs



Photo Pt #7



Photo Pt #8



Photo Pt #9



Photo Pt #10



Photo Pt #11



Photo Pt #12

Country Club Heights Erosion Control Projec - CIP 95191
Pre Project Area Photographs



Photo Pt #13



Photo Pt #14



Photo Pt #15



Photo Pt #16



Photo Pt #17



Photo Pt #18

Country Club Heights Erosion Control Projec - CIP 95191
Pre Project Area Photographs



Photo Pt #19



Photo Pt #20



Photo Pt #21



Photo Pt #22



Photo Pt #23

Appendix C

COST ESTIMATES

Country Club Heights Erosion Control Project
Alternative 1 Rough Order of Magnitude (ROM)
Preliminary Construction Cost Estimate

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT OF MEASURE	UNIT PRICE (in Figures)	ITEM TOTAL (in Figures)
Lower Elks Area					
1	Mobilization	1	LS	\$ 58,000	\$ 58,000
2	Traffic Control	1	LS	\$ 10,000	\$ 10,000
3	Sweeping	20	DAY	\$ 250	\$ 5,000
4	Install & Maintain Temporary BMPs	1	LS	\$ 30,000	\$ 30,000
5	Reconstruct Trail - DG (Trail)	94	CY	\$ 150	\$ 14,044
6	Boardwalk (Trail)	1	LS	\$ 50,000	\$ 50,000
7	Class 2 Aggregate Base (Bikeway)	436	CY	\$ 125	\$ 54,554
8	Hot Mix Asphalt (Type A) - (Bikeway)	229	TON	\$ 175	\$ 39,998
9	Paint Traffic Stripe (1-Coat) - Bike Trail	1,219	LF	\$ 2	\$ 2,438
10	Interpretive Signage	3	EA	\$ 1,000	\$ 3,000
12	Reconstruct Parking Lot	15,533	SF	\$ 9	\$ 139,797
11	Remove Asphalt Concrete Pavement - Parking lot	19,245	SF	\$ 4	\$ 76,980
13	Elks Club Wet Infiltration Basin	5,612	CY	\$ 60	\$ 336,720
14	Remove Fill	1,053	CY	\$ 60	\$ 63,180
15	18" Plastic Pipe	210	LF	\$ 225	\$ 47,250
16	18" Steel Flared End Section	4	EA	\$ 600	\$ 2,400
17	Rock Slope Protection	6	CY	\$ 300	\$ 1,667
18	Revegetation	1	LS	\$ 20,000	\$ 20,000
19	Zig Zag Fencing	903	LF	\$ 10	\$ 9,030
20	Bathroom Facility	1	LS	\$ 250,000	\$ 250,000
				Subtotal	\$ 1,214,059
Waverly Drive Area					
1	Mobilization	1	LS	\$ 9,000	\$ 9,000
2	Traffic Control	1	LS	\$ 10,000	\$ 10,000
3	Sweeping	10	DAY	\$ 250	\$ 2,500
4	Install & Maintain Temporary BMPs	1	LS	\$ 10,000	\$ 10,000
5	Remove Asphalt Concrete Pavement (Waverly)	11,784	SF	\$ 4	\$ 47,136
6	Roadway Restoration (Waverly)	11,784	SF	\$ 4	\$ 47,136
7	Remove Existing CMP	60	LF	\$ 10	\$ 600
8	Class 2 Aggregate Base (Waverly Culsedesac)	76	CY	\$ 125	\$ 9,500
9	Hot Mix Asphalt (Type A) - (Waverly Culsedesac)	51	TON	\$ 200	\$ 10,230
10	Rock Lined Channel	5	LF	\$ 150	\$ 750
10	Blanket Lined Channel	205	LF	\$ 75	\$ 15,375
11	Furnish and Install Gate	2	EA	\$ 10,000	\$ 20,000
				Subtotal	\$ 182,227
				Subtotal	\$ 1,396,286
Contingency (20%)				Contingency (20%)	\$ 279,258
				Total	\$ 1,675,544

Construction Management (25%) \$ 418,886

CON PHASE GRAND TOTAL \$ 2,094,430

Country Club Heights Erosion Control Project
Alternative 2 Rough Order of Magnitude (ROM)
Preliminary Construction Cost Estimate

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT OF MEASURE	UNIT PRICE (in Figures)	ITEM TOTAL (in Figures)
Lower Elks Area					
1	Mobilization	1	LS	\$ 44,000	\$ 44,000
2	Traffic Control	1	LS	\$ 10,000	\$ 10,000
3	Sweeping	20	DAY	\$ 250	\$ 5,000
4	Install & Maintain Temporary BMPs	1	LS	\$ 30,000	\$ 30,000
5	Reconstruct Trail - DG (Trail)	100	CY	\$ 150	\$ 15,000
6	Class 2 Aggregate Base (Bikeway)	68	CY	\$ 125	\$ 8,503
7	Hot Mix Asphalt (Type A) - (Bikeway)	36	TON	\$ 175	\$ 6,234
8	Paint Traffic Stripe (1-Coat) - Bike Trail	190	LF	\$ 2	\$ 380
9	Interpretive Signage	3	EA	\$ 1,000	\$ 3,000
10	Reconstruct Parking Lot	15,362	EA	\$ 9	\$ 138,258
11	Remove Asphalt Concrete Pavement - Parking lot	16,847	SF	\$ 4	\$ 67,388
12	Elks Club Wet Infiltration Basin	3,824	CY	\$ 60	\$ 229,440
13	Remove Fill	1,053	CY	\$ 60	\$ 63,180
14	18" Plastic Pipe	100	LF	\$ 225	\$ 22,500
15	18" Steel Flared End Section	4	EA	\$ 600	\$ 2,400
16	Rock Slope Protection	6	CY	\$ 300	\$ 1,667
17	Revegetation	1	LS	\$ 20,000	\$ 20,000
18	Zig Zag Fencing	814	LF	\$ 10	\$ 8,140
19	Bathroom Facility - 2 Unit	1	LS	\$ 250,000	\$ 250,000
				Subtotal	\$ 925,090
Waverly Drive Area					
1	Mobilization	1	LS	\$ 9,000	\$ 9,000
2	Traffic Control	1	LS	\$ 10,000	\$ 10,000
3	Sweeping	10	DAY	\$ 250	\$ 2,500
4	Install & Maintain Temporary BMPs	1	LS	\$ 10,000	\$ 10,000
5	Remove Asphalt Concrete Pavement (Waverly)	11,784	SF	\$ 4	\$ 47,136
6	Roadway Restoration (Waverly)	11,784	SF	\$ 4	\$ 47,136
7	Remove Existing CMP	60	LF	\$ 10	\$ 600
8	Class 2 Aggregate Base (Waverly Culdesac)	76	CY	\$ 125	\$ 9,500
9	Hot Mix Asphalt (Type A) - (Waverly Culdesac)	51	TON	\$ 200	\$ 10,230
10	Rock Lined Channel	5	LF	\$ 150	\$ 750
10	Blanket Lined Channel	205	LF	\$ 75	\$ 15,375
11	Furnish and Install Gate	2	EA	\$ 10,000	\$ 20,000
				Subtotal	\$ 182,227
				Subtotal	\$ 1,107,317
Contingency (20%)				Contingency (20%)	\$ 221,464
				Total	\$ 1,328,781
Construction Management (25%)				\$	332,196
CON PHASE GRAND TOTAL				\$	1,660,977

Country Club Heights Erosion Control Project
Alternative 3 Rough Order of Magnitude (ROM)
Preliminary Construction Cost Estimate

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT OF MEASURE	UNIT PRICE (in Figures)	ITEM TOTAL (in Figures)
Lower Elks Area					
1	Mobilization	1	LS	\$ 11,000	\$ 11,000
2	Traffic Control	1	LS	\$ 10,000	\$ 10,000
3	Sweeping	20	DAY	\$ 250	\$ 5,000
4	Install & Maintain Temporary BMPs	1	LS	\$ 30,000	\$ 30,000
5	Reconstruct Trail - DG (Trail)	94	CY	\$ 150	\$ 14,044
6	18" HDPE	10	LF	\$ 200	\$ 2,000
7	Interpretive Signage	1	EA	\$ 1,000	\$ 1,000
8	Remove Asphalt Concrete Pavement - Parking lot	3,195	SF	\$ 4	\$ 12,780
9	Hard Pack Restoration	30,000	SF	\$ 4	\$ 120,000
10	Revegetation	1	LS	\$ 20,000	\$ 20,000
				Subtotal	\$ 225,824
			Subtotal	\$	225,824
Contingency (20%)			Contingency (20%)	\$	45,165
			Total	\$	270,989

Construction Management (25%) **\$** **67,748**

CON PHASE GRAND TOTAL **\$** **338,737**

Appendix D

DRAFT FEASIBILITY REPORT COMMENTS AND RESPONSES

**NOT AVAILABLE
AT TIME OF PRINT**