SUMMIT AT POWDER MOUNTAIN
SUBDIVISION PHASE 1C AND D1
SUPPLIMENT TO MAY 2013 DRAINAGE SUMMARY

POWDER MOUNTAIN RESORT
EDEN, UTAH

DECEMBER 2013

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Site Description

The proposed development at Powder Mountain Resort east of Eden Utah is an extension of the planned communities that branch off of Summit Pass. These developments include Summit Pass, Copper Crest Road, Spring Park Road, Merdian Avenue, Rolling Drive, and Daybreak Ridge. Phase IC Subdivision includes 17 single family lots along the south and west side of Summit Pass, 19 single family lots along the south and west side of Copper Crest Road, and 24 single family lots on Spring Park. Phase 1D subdivision includes 20 single family lots along Rolling Drive and 1 nest cabin parcel on Daybreak Ridge. The nest parcel will contain approximately 20 small cabins, approximately 400 square feet each. The majority of storm drainage for the site has historically been conveyed overland in the southwesterly directing into Lefty's Canyon. With the usage of curb and gutter, roadside ditches, catch basins, and culverts drainage will be conveyed through the site.

Drainage Analysis

Analysis of the proposed developments has been carried out with the same method as was used for the Summit Pass and Spring Park Study dated May 2013. This analysis is intended as a supplement and update to that study, and in this report the hydrology will not be repeated. In summary of the May 2013 report, the hydrology for the proposed development was calculated using the SCS Method. This methodology was input into Haestad Method's PondPack to calculate storm discharge rates. Landuse consists of pavement, grass, meadows, forestry and gravel roads. Time of Concentration was calculated using the Technical Release 55 Method. Rainfall depths were determined using the National Oceanic and Atmospheric Administration (NOAA) website. Weber County requires drainage infrastructure to convey 10-year 2 hour storm events and discharge stormwater at a release rate such that post development discharge is less than pre development discharge. Soil maps for SCS Methodology have been provided by the *United States Department of Agriculture (USDA) Natural Resources Conservation Service (NCRC) Web Soil Survey.*

All hydrology for Phase 1C and 1D has been considered in the Summit Pass and Spring Park Drainage Study. The storm drain line from Summit Pass, which passes through Copper Crest Road, in Phase 1C, and connects to the middle of Spring Park from the initial study is intended to be utilized for Copper Crest Road. Copper Crest Road traverses the hill side between the two roads and although some of the runoff flows overland through the development it is either captured on Copper Crest Road or Spring Park. Two catch basins will be installed in the sag and approximate middle of Copper Crest Road and will tie into the existing connection which was already size to carry the existing flow of Copper Crest Road. The new nodes are noted in exhibits and tables as CB-Sub2-1 and CB-Sub2-2. The inlets were analyzed and it was determined that CB-Sub2-2 should be a double inlet. There is no other stormwater management infrastructure needed for Copper Crest Road.

Phase 1D has three locations of catchments the first being the south end of Rolling Drive as it intersects Summit Pass. There is an existing connection for the two catch basins, CB-Sub3-1 and CB- Sub4-1, for which the hydrology was previously analyzed in the May 2013 Study. In this analysis the size of the grates were analyzed for adequate capacity and to minimize spread. The inlets were analyzed and it

was determined that CB-Sub4-1 should be a double inlet. There is no other stormwater management infrastructure needed for Rolling Drive.

Daybreak Ridge has a sag in the roadway roughly the middle of this phase of the road. There is an existing connection for the two catch basins, CB-Sub4-2and CB- Sub4-3, for which the hydrology was previously analyzed in the May 2013 Study. The inlets were analyzed and it was determined that a single inlet is adequate for both catch basins. There is no other stormwater management infrastructure needed for Daybreak Ridge.

Meridian Ave is a short road leading off to the northeast from Summit Pass. There is an existing connection for the two catch basins however it is not part of this model since they were analyzed in the May 2013 report. These two inlets are shown on Sheet 2.00 of the Phase 1D Construction Plans in the appendix. The inlets were analyzed and it was determined that inlet F-1 should be a double inlet and F-2 could remain a single. There is no other stormwater management infrastructure needed for Rolling Drive.

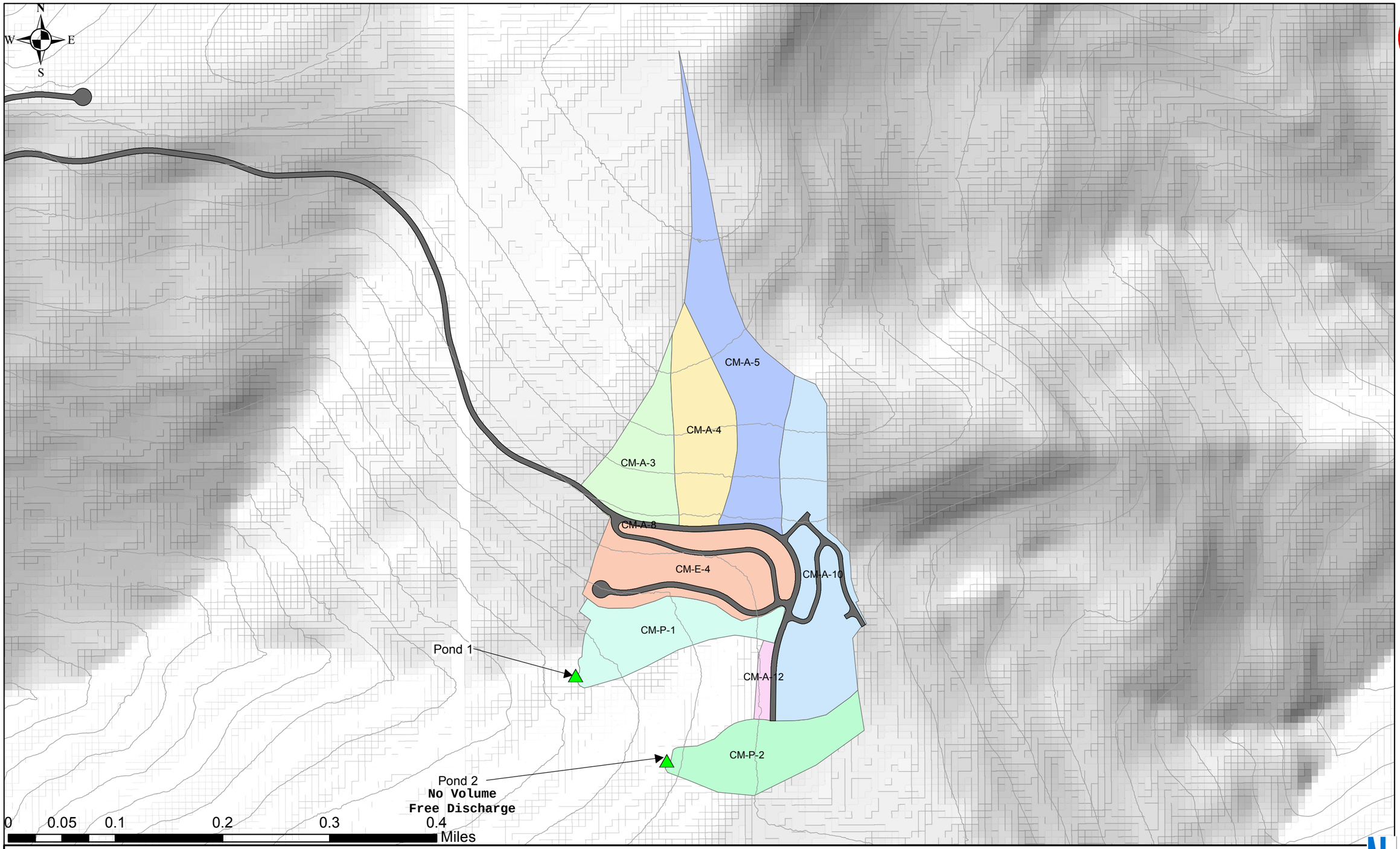
Pipe networks and culverts were sized using Haestad Method's StormCAD and FlowMaster.
In the May 2013 report detention ponds 1 and 2 were sized and designed to accommodate all area tributary to Phase 1C and Phase 1D. The results of this analysis identified the Detention Pond 2 required a small volume and orifice to meet discharge requirements. The development team and Weber County Engineering agreed that this condition is problematic to due the remoteness of the site and high probability of problems with the small orifice. Therefore, it was agreed that Pond 2 will have no volume and Pond 1 will over detain to compensate for the free release of the area tributary to Pond 2. See the May 2013 report for all design calculations associated with Pond 1 and Pond 2(no volume). Since the initial study shows that runoff volumes for all of this phase, there will be no need for any increased stormwater detention for the improvements of Summit Pass, Copper Crest Road, Spring Park Road, Merdian Avenue, Rolling Drive, and Daybreak Ridge.

APPENDICES

1. **Network Calculations**

    a. **Village Subareas (From May Report)**
    b. **Sheet 2.00 of the Phase 1C Construction Plans**
    c. **Sheet 2.00 through 2.01 of the Phase 1D Construction Plans**
    d. **Haestad Method's StormCAD Summary Report**
    e. **Haestad Method's StormCAD Network Layout (3 pages)**
    f. **Haestad Method's StormCAD Catch Basin Table**
    g. **Haestad Method's StormCAD Conduit Table**
    h. **Haestad Method's StormCAD Manhole Table**
    i. **Haestad Method's FlowMaster calculations for each inlet**

D



POWDER MOUNTAIN: SUMMIT PASS & SPRING PARK ROADWAYS

Village Storm Drain Tributary Areas

APRIL 2013

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PHASE 1C CONSTRUCTION

PLAN AND PROFILE
COPPER CREST ROAD

DATE SUBMITTED: 8/6/2013

PREPARED FOR: SUMMIT, LLC

NO.	BY	DATE	REVISIONS

CAUTION

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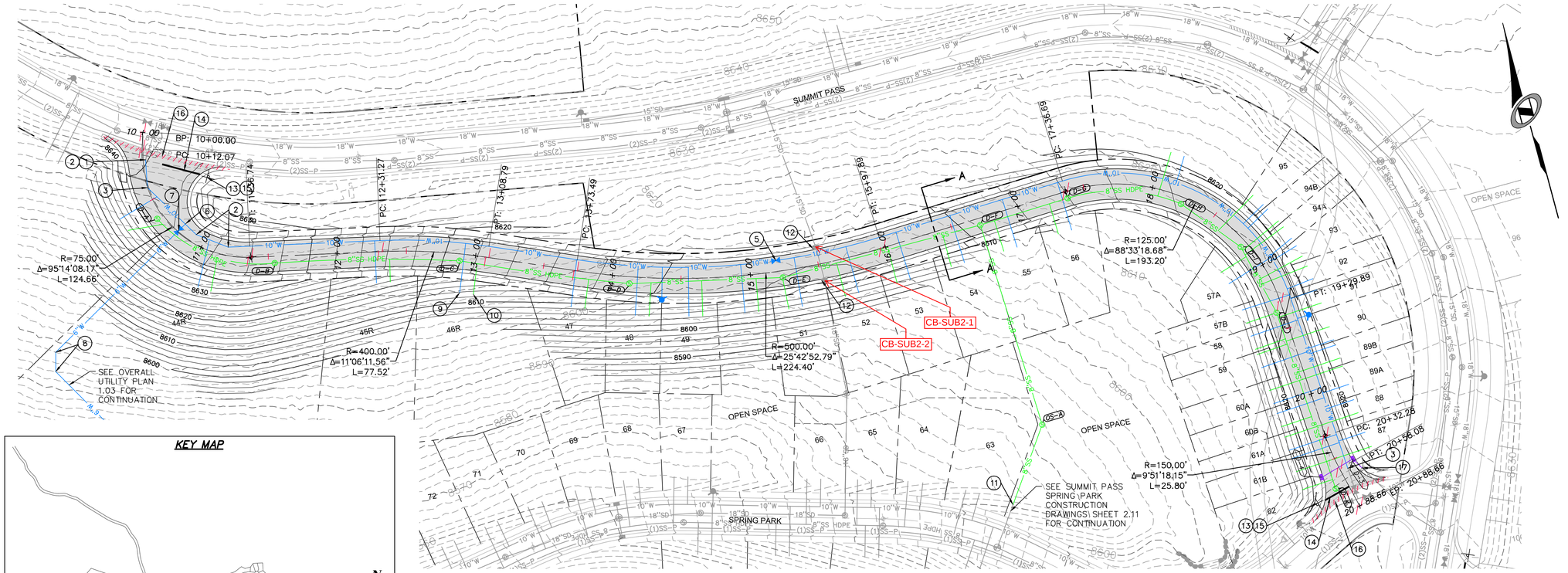

COPPER CREST ROAD
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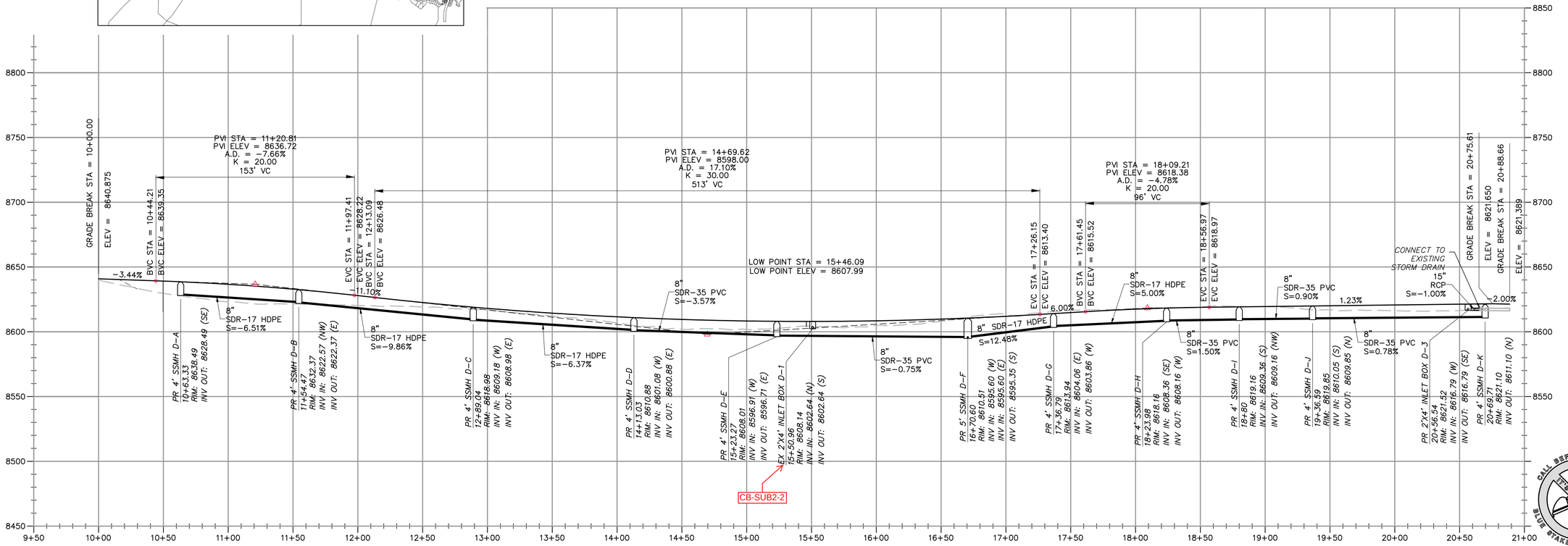

BOWLDEN KREFS

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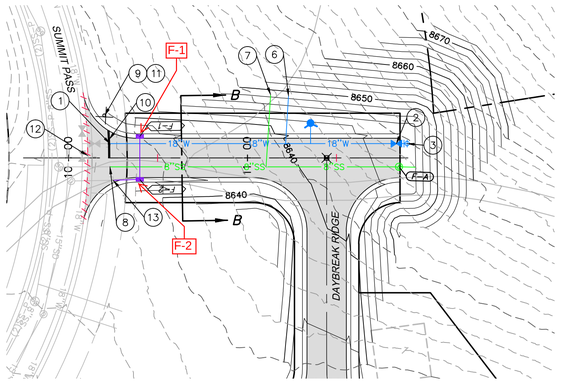

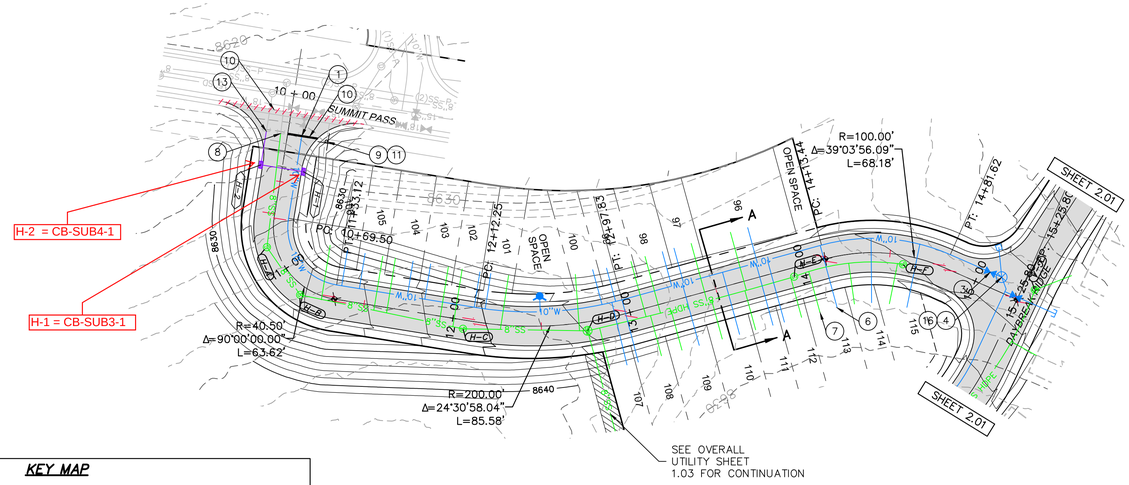

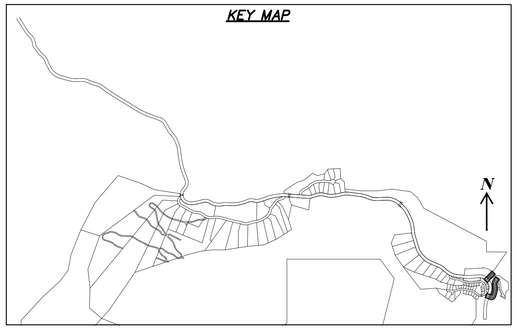

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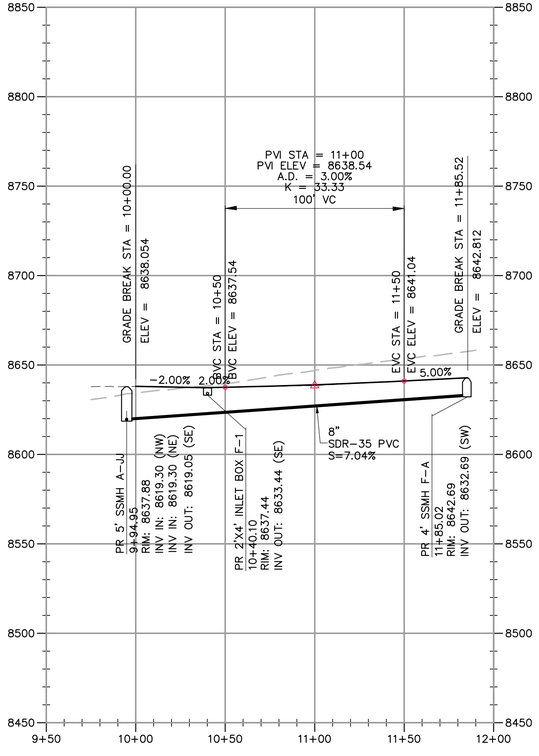

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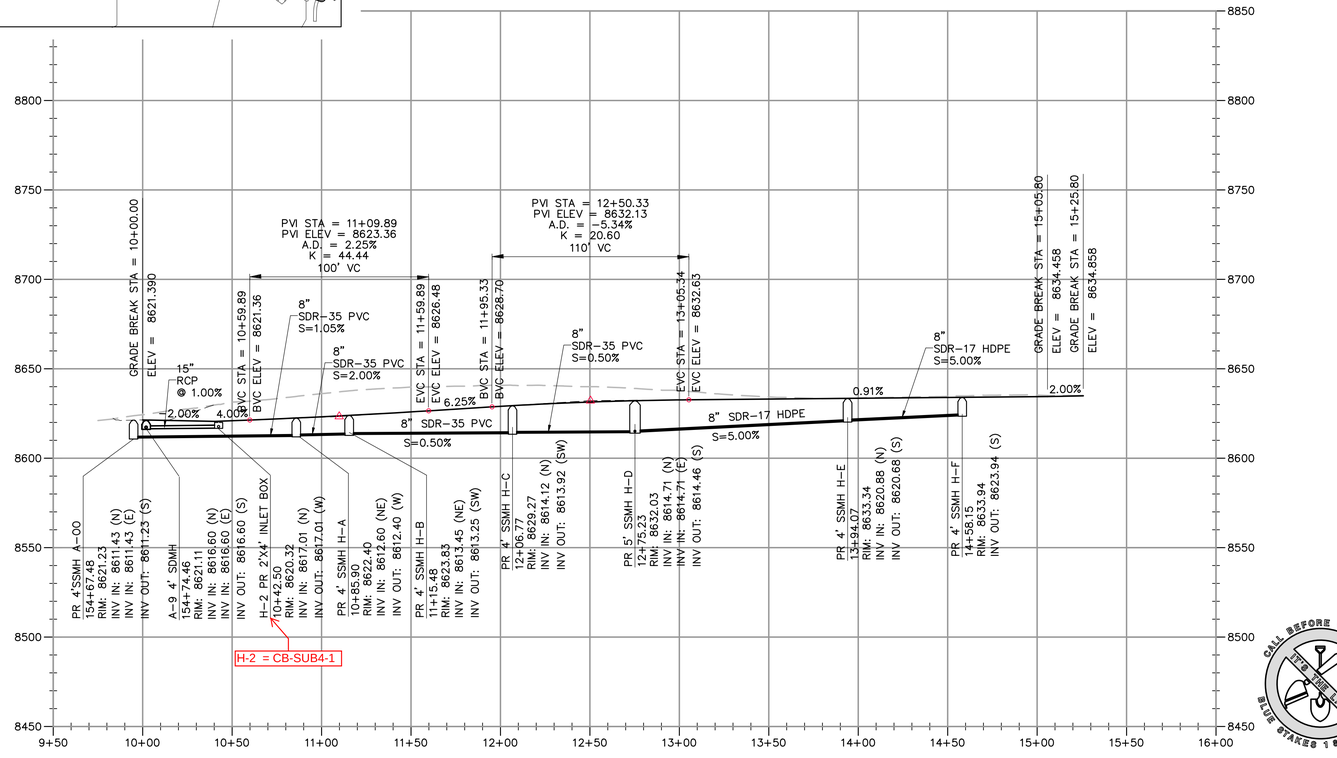

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CAUTION

PHASE 1D CONSTRUCTION
PLAN AND PROFILE
MERIDIAN AVE, ROLLING DRIVE

DATE SUBMITTED: 7/12/2013

PREPARED FOR: SUMMIT, LLC

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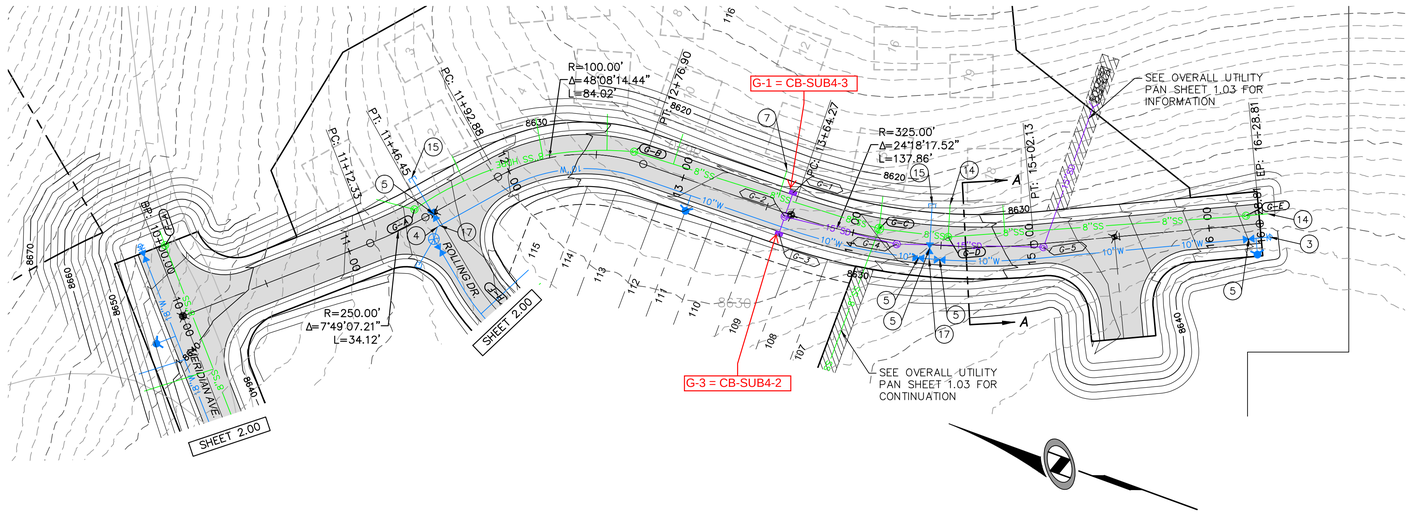
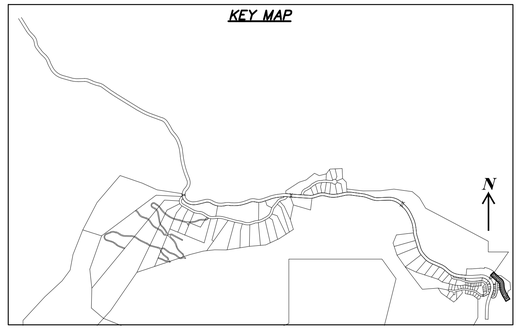


KEY MAP



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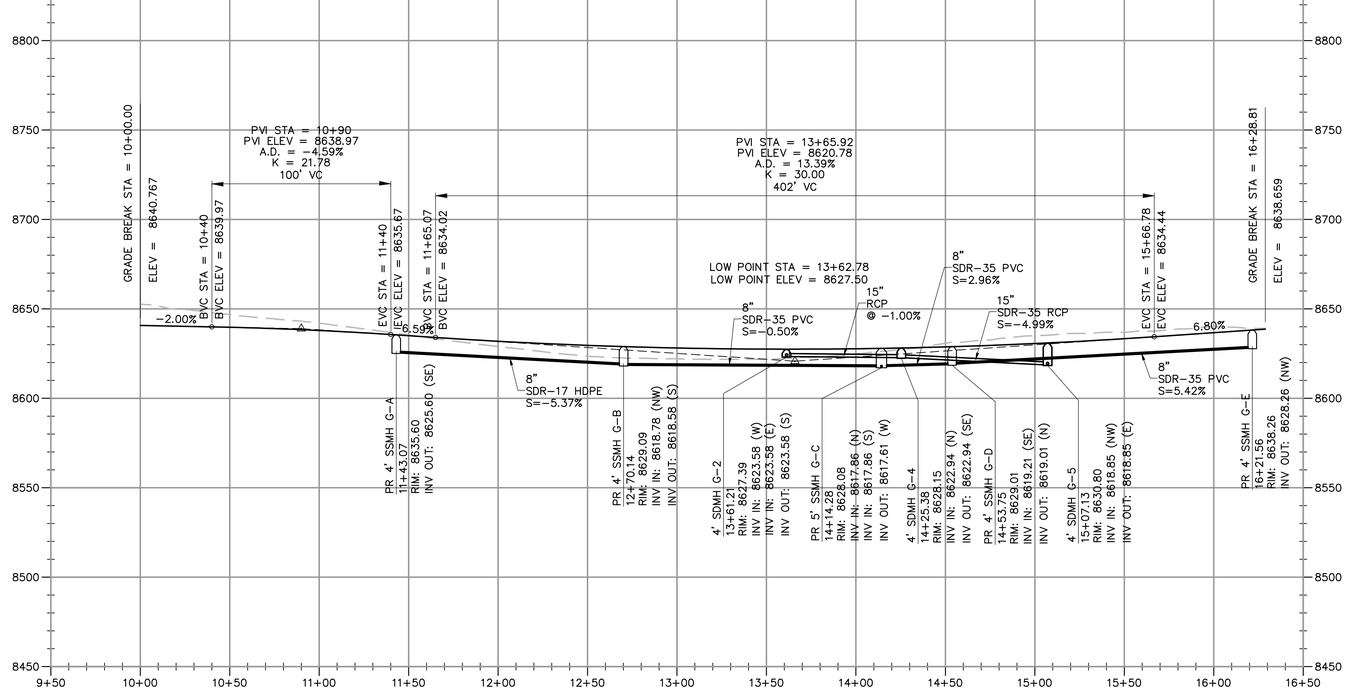

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PHASE 1D CONSTRUCTION

PLAN AND PROFILE
DAYBREAK RIDGE

DATE SUBMITTED: 7/12/2013

PREPARED FOR: SUMMIT, LLC

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Scenario Summary Report
Scenario: Base

Scenario Summary

ID	1
Label	Base
Notes	
Active Topology	Base Active Topology
User Data Extensions	Base User Data Extensions
Physical	Base Physical
Boundary Condition	Base Boundary Condition
Initial Settings	Base Initial Settings
Hydrology	Base Hydrologic
Output	Base Output
Infiltration and Inflow	Base Infiltration and Inflow
Rainfall Runoff	Base Rainfall Runoff
Water Quality	Base Water Quality
Sanitary Loading	Base Sanitary Loading
Headloss	Base Headloss
Operational	Base Operational
Design	Base Design
System Flows	Base System Flows
Solver Calculation Options	Base Calculation Options

Calculation Options

Calculation Type	Analysis	Minimum Time of Concentration	5.000 min

Gravity Hydraulics

Maximum Network Traversals	5	Governing Upstream Pipe Selection Method	Pipe with Maximum QV
Flow Convergence Test	0.001	Structure Loss Mode	Hydraulic Grade
Flow Profile Method	Backwater Analysis	Save Detailed Headloss Data?	False
Number of Flow Profile Steps	5	Gravity Friction Method	Manning's
Hydraulic Grade Convergence Test	0.00 ft	Use Explicit Depth and Slope Equations?	False
Average Velocity Method	Actual Uniform Flow Velocity	Ignore Travel Time in Carrier Pipes?	False
Minimum Structure Headloss	0.00 ft	Correct for Partial Area Effects?	False

Inlets

Active Components for Combination Inlets on Grade	Grate and Curb	Neglect Gutter Cross Slope For Side Flow?	False
Active Components for Combination Inlets In Sag	Grate and Curb	Neglect Side Flow?	False

Pressure Hydraulics

Scenario Summary Report
Scenario: Base

Pressure Hydraulics			
Liquid Label	Water at 20C (68F)	Pressure Friction Method	Hazen-Williams

Headloss (AASHTO)			
Expansion, Ke	0.350	Shaping Adjustment, Cs	0.500
Contraction, Kc	0.250	Non-Piped Flow Adjustment, Cn	1.300

Bend Angle vs. Bend Loss Curve

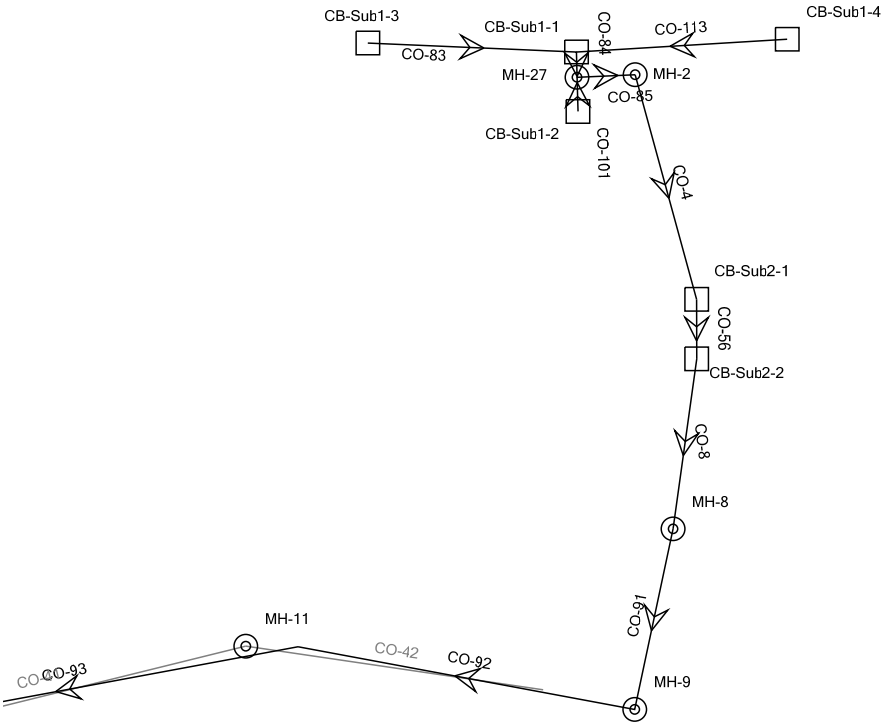
Bend Angle (degrees)	Bend Loss Coefficient, Kb

HEC-22 Energy Losses			
Elevations Considered Equal Within	0.50 ft	Consider Non-Piped Plunging Flow?	False

HEC-22 Energy Losses (Second Edition)			
Flat Unsubmerged Factor	1.000	Half Bench Submerged Factor	0.950
Flat Submerged Factor	1.000	Full Bench Unsubmerged Factor	0.070
Depressed Unsubmerged Factor	1.000	Full Bench Submerged Factor	0.750
Depressed Submerged Factor	1.000	Improved Bench Unsubmerged Factor	0.035
Half Bench Unsubmerged Factor	0.150	Improved Bench Submerged Factor	0.375

HEC-22 Energy Losses (Third Edition)			
Flat Submerged Coefficient	-0.050	Half Bench Unsubmerged Coefficient	-0.850
Flat Unsubmerged Coefficient	-0.050	Full Bench Submerged Coefficient	-0.250
Depressed Submerged Coefficient	0.000	Full Bench Unsubmerged Coefficient	-0.930
Depressed Unsubmerged Coefficient	0.000	Improved Submerged Coefficient	-0.600
Half Bench Submerged Coefficient	-0.050	Improved Unsubmerged Coefficient	-0.980

Scenario: Base



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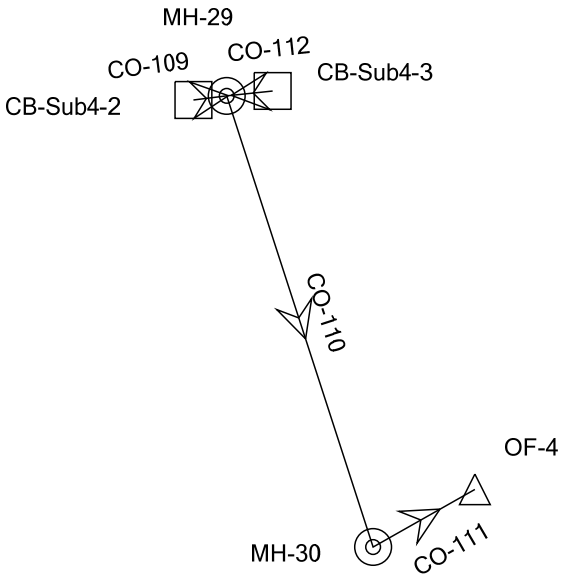

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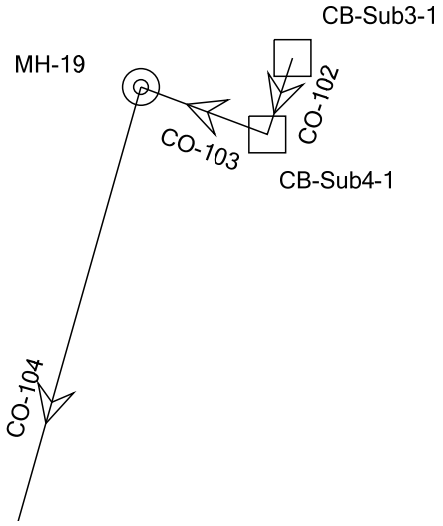

FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Capture Efficiency (%)	Flow (Additional Subsurface) (ft^3/s)	Flow (Total Out) (ft^3/s)	Hydraulic Grade Line (In) (ft)
18	CB-Sub1-2	8,631.61	8,631.61	8,628.36	100.0	0.37	0.37	8,629.31
30	CB-Sub2-2	8,607.80	8,607.80	8,604.35	100.0	2.42	10.36	8,605.54
48	CB-Sub6-1	8,548.62	8,548.62	8,545.54	100.0	0.24	0.24	8,545.73
50	CB-Sub6-2	8,545.69	8,545.69	8,542.44	100.0	0.96	0.96	8,542.83
75	CB-Sub5-1	8,608.00	8,608.00	8,604.20	100.0	0.91	0.91	8,604.82
79	CB-Sub5-2	8,608.00	8,608.00	8,604.20	100.0	0.10	0.10	8,604.83
81	CB-Sub4-1	8,620.76	8,620.76	8,616.88	100.0	1.86	3.14	8,617.59
83	CB-Sub3-1	8,620.32	8,620.32	8,617.07	100.0	1.28	1.28	8,617.56
87	CB-Sub2-1	8,608.02	8,608.02	8,604.77	100.0	0.61	7.94	8,605.88
88	CB-Sub1-1	8,631.62	8,631.62	8,628.53	100.0	3.31	6.96	8,629.59
136	CB-Sub6-4	8,543.75	8,543.75	8,540.50	100.0	2.25	2.25	8,543.75
137	CB-Sub6-3	8,544.19	8,544.19	8,540.31	100.0	0.56	2.81	8,544.19
140	CB-Sub1-3	8,632.53	8,632.53	8,629.28	100.0	1.84	1.84	8,629.82
142	CB-Sub1-4	8,632.74	8,632.74	8,629.49	100.0	1.81	1.81	8,630.02
144	CB-Sub4-2	8,626.62	8,626.62	8,623.37	100.0	0.23	0.23	8,623.56
152	CB-Sub4-3	8,627.06	8,627.06	8,623.81	100.0	0.23	0.23	8,624.00

FlexTable: Conduit Table

ID	Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (ft^3/s)	Velocity (ft/s)	Depth (Out) (ft)	Capacity (Full Flow) (ft^3/s)	Flow / Capacity (Design) (%)	Depth (Normal) / Rise (%)
23	CO-4	MH-2	8,627.50	CB-Sub2-1	8,604.77	111.5	0.203	15.0	7.33	19.75	1.11	29.10	25.2	34.2
32	CO-8	CB-Sub2-2	8,604.35	MH-8	8,571.60	82.2	0.399	15.0	10.36	27.77	0.43	40.82	25.4	34.3
90	CO-35	CB-Sub6-1	8,545.54	MH-23	8,538.30	11.9	0.603	15.0	(N/A)	(N/A)	(N/A)	50.17	(N/A)	(N/A)
91	CO-36	MH-23	8,538.30	CB-Sub6-2	8,542.44	12.3	-0.345	15.0	(N/A)	(N/A)	(N/A)	37.94	(N/A)	(N/A)
93	CO-37	MH-23	8,538.30	OF-1	8,537.80	40.1	0.013	15.0	(N/A)	(N/A)	(N/A)	7.22	(N/A)	(N/A)
98	CO-41	MH-13	8,539.71	MH-11	8,556.79	199.3	-0.086	15.0	(N/A)	(N/A)	(N/A)	18.92	(N/A)	(N/A)
99	CO-42	MH-11	8,556.79	MH-9	8,565.83	143.6	-0.063	15.0	(N/A)	(N/A)	(N/A)	16.18	(N/A)	(N/A)
100	CO-43	MH-23	8,538.30	MH-13	8,539.71	141.6	-0.010	15.0	(N/A)	(N/A)	(N/A)	6.44	(N/A)	(N/A)
115	CO-56	CB-Sub2-1	8,604.77	CB-Sub2-2	8,604.35	28.5	0.014	15.0	7.94	7.21	1.19	7.77	102.1	84.0
154	CO-83	CB-Sub1-3	8,629.28	CB-Sub1-1	8,628.53	99.8	0.008	15.0	1.84	4.09	1.06	5.59	32.9	39.5
155	CO-84	CB-Sub1-1	8,628.53	MH-27	8,628.23	12.1	0.025	15.0	6.96	8.95	1.08	10.21	68.1	60.6
156	CO-85	MH-27	8,628.23	MH-2	8,627.50	27.8	0.026	15.0	7.33	9.20	0.82	10.43	70.3	61.8
162	CO-91	MH-8	8,571.60	MH-9	8,565.83	88.4	0.066	15.0	10.36	14.23	0.72	16.54	62.6	57.4
163	CO-92	MH-9	8,565.83	MH-11	8,556.79	163.7	0.055	15.0	10.36	13.30	0.76	15.17	68.3	60.7
164	CO-93	MH-11	8,556.79	MH-13	8,539.71	224.2	0.076	15.0	10.36	15.08	4.41	17.84	58.1	54.7
165	CO-94	MH-13	8,539.71	MH-23	8,538.30	113.0	0.012	18.0	13.17	7.45	4.04	11.73	112.2	(N/A)
166	CO-95	MH-23	8,538.30	OF-1	8,537.80	164.8	0.003	18.0	14.37	8.13	1.39	5.78	248.5	(N/A)
167	CO-96	CB-Sub6-1	8,545.54	MH-23	8,538.30	26.0	0.278	15.0	0.24	8.05	4.04	34.09	0.7	6.0
168	CO-97	CB-Sub6-2	8,542.44	MH-23	8,538.30	42.1	0.099	15.0	0.96	8.47	4.04	20.28	4.7	14.8
169	CO-98	CB-Sub6-4	8,540.50	CB-Sub6-3	8,540.31	24.2	0.008	15.0	2.25	1.83	3.88	5.75	39.1	43.5

FlexTable: Conduit Table

ID	Label	Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Diameter (in)	Flow (ft^3/s)	Velocity (ft/s)	Depth (Out) (ft)	Capacity (Full Flow) (ft^3/s)	Flow / Capacity (Design) (%)	Depth (Normal) / Rise (%)
170	CO-99	CB-Sub6-3	8,540.31	MH-13	8,539.71	80.2	0.008	15.0	2.81	2.29	4.41	5.59	50.2	50.1
172	CO-101	CB-Sub1-2	8,628.36	MH-27	8,628.23	16.4	0.008	15.0	0.37	2.66	1.08	5.82	6.4	17.1
173	CO-102	CB-Sub3-1	8,617.07	CB-Sub4-1	8,616.88	24.7	0.008	15.0	1.28	3.71	0.71	5.63	22.7	32.4
174	CO-103	CB-Sub4-1	8,616.88	MH-19	8,616.58	41.3	0.007	15.0	3.14	4.65	0.67	5.53	56.8	54.0
175	CO-104	MH-19	8,616.58	MH-22	8,615.06	203.0	0.007	15.0	3.14	4.69	0.67	5.59	56.2	53.6
176	CO-105	MH-22	8,615.06	MH-25	8,604.00	308.0	0.036	15.0	3.14	8.35	0.82	12.24	25.7	34.5
177	CO-106	MH-25	8,604.00	OF-2	8,602.50	38.1	0.039	15.0	4.15	9.33	0.51	12.83	32.3	39.1
178	CO-107	CB-Sub5-1	8,604.20	MH-25	8,604.00	16.9	0.012	15.0	0.91	3.94	0.82	7.01	13.0	24.3
179	CO-108	CB-Sub5-2	8,604.20	MH-25	8,604.00	9.7	0.020	15.0	0.10	2.46	0.82	9.14	1.1	7.4
180	CO-109	CB-Sub4-2	8,623.37	MH-29	8,623.29	10.2	0.008	15.0	0.23	2.29	0.26	5.78	4.0	13.6
181	CO-110	MH-29	8,623.29	MH-30	8,621.80	145.3	0.010	15.0	0.46	3.08	0.22	6.55	7.0	17.9
182	CO-111	MH-30	8,621.80	OF-4	8,618.00	35.8	0.106	15.0	0.46	6.96	0.13	20.99	2.2	10.2
183	CO-112	CB-Sub4-3	8,623.81	MH-29	8,623.29	14.2	0.037	15.0	0.23	3.93	0.26	12.45	1.8	9.4
184	CO-113	CB-Sub1-4	8,629.49	CB-Sub1-1	8,628.53	100.9	0.010	15.0	1.81	4.43	1.06	6.30	28.7	36.7

FlexTable: Manhole Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert in 1) (ft)	Flow (Total Out) (ft³/s)	Depth (Out) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)
20	MH-2	8,632.01	8,632.01	8,627.50	7.33	1.08	8,628.58	8,628.58
34	MH-8	8,575.76	8,575.76	8,571.60	10.36	1.19	8,572.79	8,572.79
38	MH-9	8,575.68	8,575.68	8,565.83	10.36	1.19	8,567.02	8,567.02
42	MH-11	8,561.78	8,561.78	8,556.79	10.36	1.19	8,557.98	8,557.98
46	MH-13	8,548.30	8,548.30	8,539.71	13.17	4.41	8,544.12	8,544.12
67	MH-19	8,621.21	8,621.21	8,616.58	3.14	0.71	8,617.29	8,617.29
73	MH-22	8,618.86	8,618.86	8,615.06	3.14	0.71	8,615.77	8,615.77
89	MH-23	8,546.07	8,546.07	8,538.30	14.37	4.04	8,542.34	8,542.34
105	MH-25	8,608.00	8,608.00	8,604.00	4.15	0.82	8,604.83	8,604.83
120	MH-27	8,631.95	8,631.95	8,628.23	7.33	1.08	8,629.31	8,629.31
145	MH-29	8,626.92	8,626.92	8,623.29	0.46	0.26	8,623.55	8,623.55
147	MH-30	8,630.72	8,630.72	8,621.80	0.46	0.26	8,622.06	8,622.06

Worksheet for CB-Sub2-1 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		0.61	ft^3/s
Gutter Width		3.50	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		0.00	%

Results

Spread	1.37	ft
Depth	0.08	ft
Gutter Depression	0.14	ft
Total Depression	0.39	ft
Open Grate Area	6.39	ft^2
Active Grate Weir Length	8.08	ft

Worksheet for CB-Sub2-2 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		2.42	ft^3/s
Gutter Width		3.50	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		0.00	%

Results

Spread	4.06	ft
Depth	0.22	ft
Gutter Depression	0.14	ft
Total Depression	0.39	ft
Open Grate Area	6.39	ft^2
Active Grate Weir Length	8.08	ft

Worksheet for CB-Sub3-1 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		1.28	ft^3/s
Gutter Width		1.75	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	5.74	ft
Depth	0.18	ft
Gutter Depression	0.07	ft
Total Depression	0.32	ft
Open Grate Area	3.19	ft^2
Active Grate Weir Length	6.79	ft

Worksheet for CB-Sub4-1 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		1.86	ft^3/s
Gutter Width		3.50	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	4.53	ft
Depth	0.23	ft
Gutter Depression	0.14	ft
Total Depression	0.39	ft
Open Grate Area	3.19	ft^2
Active Grate Weir Length	6.79	ft

Worksheet for CB-Sub4-2 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		0.23	ft^3/s
Gutter Width		1.75	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		2.75	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	1.26	ft
Depth	0.05	ft
Gutter Depression	0.07	ft
Total Depression	0.32	ft
Open Grate Area	1.60	ft^2
Active Grate Weir Length	4.04	ft

Worksheet for CB-Sub4-3 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		0.23	ft³/s
Gutter Width		1.75	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		2.75	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%

Results

Spread	1.26	ft
Depth	0.05	ft
Gutter Depression	0.07	ft
Total Depression	0.32	ft
Open Grate Area	1.60	ft²
Active Grate Weir Length	4.04	ft

Worksheet for CB-Sub F-1 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		2.50	ft³/s
Gutter Width		3.00	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		0.00	%

Results

Spread	5.31	ft
Depth	0.23	ft
Gutter Depression	0.12	ft
Total Depression	0.37	ft
Open Grate Area	6.39	ft²
Active Grate Weir Length	8.08	ft

Worksheet for CB-Sub F-2 (Sag)

Project Description

Solve For	Spread

Input Data

Discharge		1.12	ft^3/s
Gutter Width		1.75	ft
Gutter Cross Slope		0.06	ft/ft
Road Cross Slope		0.02	ft/ft
Grate Width		1.29	ft
Grate Length		5.50	ft
Local Depression		3.00	in
Local Depression Width		1.38	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		0.00	%

Results

Spread	3.03	ft
Depth	0.13	ft
Gutter Depression	0.07	ft
Total Depression	0.32	ft
Open Grate Area	6.39	ft^2
Active Grate Weir Length	8.08	ft