Final Drainage Report Amendment

Compark Village South, Filing No. 1
Parker, Colorado

P.N. CLCPKC3

Prepared for:
470 Compark, LLC
1001 Bannock Street, Suite 240
Denver, CO 80204

Prepared by:
Manhard Consulting
7600 E Orchard Road, Suite 150N
Greenwood Village, Colorado 80111
Contact: Rick Moore, P.E.
303-708-0500

Initially Submitted September 30, 2019
Revised March 2, 2020
Revised May 5, 2020
Revised July 31, 2020

July 31, 2020

This final drainage report amendment for the Compark Village South project was prepared by me or under my direct supervision in accordance with the provisions of the *Town of Parker Storm Drainage and Environmental Criteria Manual*. I understand that the Town of Parker and its designated town authority do not and will not assume liability for drainage facilities designed by others.

Prepared by:

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Registered Professional Engineer
State of Colorado No. 49038

COLORADO REGISTERED AMIE S. DRUCKER 49038 11/17/20 PROFESSIONAL ENGINEER

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State of Colorado No. 30877

COLORADO REGISTERED RICKY J. MOORE 30877 11-17-20 PROFESSIONAL ENGINEER

TABLE OF CONTENTS

I. GENERAL LOCATION AND DESCRIPTION

A. Scope

This is an amendment to the "Final Drainage Report, Compark Village South, Filing No. 1", prepared by Manhard Consulting, dated November 20, 2015, last revised October 21, 2016. The original scope of this project included realignment of the Green Acres Tributary and construction of an on-line regional detention pond. Since preparation of the previous design, it has been determined by a consultant for Mile High Flood Control District that the on-line regional detention basin is not required for this area. The realignment and improvements to the Green Acres Tributary will now be designed and permitted by RESPEC, the MHFD's consultant.

This amendment is to design an off-line detention basin to control the runoff and provide water quality treatment for the proposed stormwater runoff from Compark Village South Filing No. 1 Belford Avenue improvements and the Compark Village South Filing No. 2 residential subdivision, as well as, a portion of the Compark Village South Filing No. 3 project. Drainage criteria utilized for the design are in accordance with the *Town of Parker Storm Drainage and Environmental Criteria Manual and Urban Drainage and Flood Control District*.

II. DRAINAGE BASINS AND SUB-BASINS

A. Basin Description

The basins and sub-basins utilized to size the proposed detention basin were taken from the "Final Drainage Report, Compark Village South Filing No. 1", prepared by Manhard Consulting, dated November 20, 2015, last revised October 21, 2016. The areas include Belford Avenue from a high point at station 35+15 to the next high point at station 77+41, the 47 acres that comprise the CVS F2 project 11.5 acres of future multi-family development in CVS F3, the 15 acres of future commercial land between the Green Acres Tributary and Belford Avenue and 20 acres of off-site Grand View Estates property that currently drains through this property (H180).

In the original design, there were three direct discharges to the Green Acres Tributary and one discharge to the regional detention pond. The direct

discharge into the proposed arch culvert crossing of Belford Avenue will remain unchanged with this amendment. The other direct discharges into the Green Acres Tributary will remain, but baffle walls will be added to the structures upstream of the GAT to direct the 2 year storm runoff to a drainage pipe that will convey the runoff to the proposed off-line detention basin for water quality treatment. The elevations of the tops of the baffle walls were set at the 2 yr design storm HGL taken from the StormCAD model. The model includes rating tables in the diversion manholes to reflect the proposed diversion of the 2 yr storm flows from the pipes to the GAT. Flows greater than the 2 year storm will overtop the baffle walls and directly discharge to the Green Acres Tributary. The previous discharge to the regional detention pond will be upsized from a 42" RCP to a 60" RCP to convey the runoff from the original design plus the flows from a 2 year storm from the upstream drainage basins that previously discharged directly to the GAT. The drainage system has been revised to route the runoff from STMH 11-12 across the future commercial tract, along Green Acres Tributary and into the proposed off-line detention basin. Although runoff from portions of Belford Avenue and CVS F2 will be directly discharged to the GAT, storage and water quality treatment for these areas will be provided in the proposed detention basin. That is, compensatory storage and treatment will be provided in the proposed detention basin.

Sizing of the proposed Forebay A includes 40 acres of Grandview Estates in addition to the 93.5 acres utilized to size the detention basin. This property drains into the CVS system and was included in the calculations for the 2 year runoff being directed to the detention basin. Flows greater than the 2 year design storm will pass over the baffle wall in the diversion manhole and will discharge directly to the Green Acres Tributary, therefore, this area was not included in the sizing of the proposed detention basin.

III. DRAINAGE DESIGN CRITERIA

A. Regulations

The regulations, guidelines, and drainage design criteria to be used are those contained within the *Town of Parker Storm Drainage Design and Environmental Criteria* and the *Urban Storm Drainage Criteria Manual*. The general drainage concept is to construct a full spectrum extended detention

basin to provide detention and water quality treatment for the proposed stormwater runoff from a portion of Belford Avenue, the entire Compark Village South Filing No. 2 subdivision, a portion of the Compark Village South Filing No. 3 tract and the portion of the commercial tract between the Green Acres Tributary and Belford Avenue.

B. Hydrologic Criteria

The stormwater system associated with Belford Avenue (major collector) was designed for a 5 yr minor storm and the 100 yr major storm. Detailed design information for the system can be found in "Final Drainage Report, Compark Village South, Filing No. 1", prepared by Manhard Consulting, dated November 20, 2015, last revised October 21, 2016. The UDFCD UD Detention worksheet was utilized to design the proposed extended detention basin, the proposed outlet structure, emergency overflow weir, as well as, to calculate the direct runoff from the Grand View Estates property that currently drains across this property.

The UD Detention workbook was completed for the portions of Belford Avenue, all of Compark Village South Filing No. 2, an 11.5 acre portion of Compark Village South Filing No. 3 and 15 acres of commercial area north of Belford Avenue to calculate the allowable release rates for the proposed development without the Grand View Estates area. Then the workbook was utilized to calculate the runoff from the Grand View Estates drainage basin. The 100-year runoff from Grand View Estates will be "passed through" the detention basin, i.e. the allowable 90% of the 100-year discharge from the CVS F2 basin, 42.7 cfs, was increased to include the runoff of 26.8 cfs as calculated by the UD Worksheet for the 20 acre drainage basin.

Drainage Areas to Proposed Detention Basin (See Appendix A):

- 15 ac Commercial (South of Green Acres Trib) @ 90% Impervious (assumed)
- 47 ac CVS Filing No. 2 Residential @ 48% Impervious (calculated)
- 11.5 ac CVS Filing No. 3 Multi-Family @ 75% Impervious (assumed)
- 20 ac Grandview Estates (H180) @ 15% Impervious

Total DA=93.5 ac @ 51% Impervious

Use UD Detention to Calculate Allowable Release of Developed Areas (No Grandview Estates)

Total DA=73.5 ac @ 61% Impervious
From Spreadsheet 100 yr Predeveloped = 65.3 cfs

90% Predeveloped = 58.8 cfs
Direct Discharge to GAT - 26 cfs (Calculated using UD Detention)
32.8 cfs

Allowable 100 yr Release from Detention Basin:

32.8 cfs (Developed runoff) + 26.8 cfs (H180 Undetained Grand View runoff) = **59.6 cfs**

Summary of Predeveloped vs. Postdeveloped Discharges to Green Acres Tributary:

Design Storm Event	Predeveloped Flows to GAT (cfs) H170 + H180 (Grand View Estates)	Predeveloped Flows to GAT (cfs) CVS	Total Predeveloped Flow to GAT (cfs)	Developed Detained Flows (cfs)	Bypass Flows to GAT (cfs)	Total Postdeveloped Flow to GAT (cfs)
2 year	6.2	0.5	6.7	0.9	0.0	0.9
5 year	11.6	1.8	13.4	1.1	12.1	13.2
10 year	21.8	9.7	31.5	7.4	23.1	30.5
25 year	48.9	32.9	81.8	43.5	49.5	93.0
50 year	67.8	46.9	114.7	53.4	68.1	121.5
100 year	92.2	65.3	157.5	57.3	92.0	149.3
500 year	144.9	104.1	249.0	187.8	144.3	332.1

*See Appendix C for supporting runoff calculations

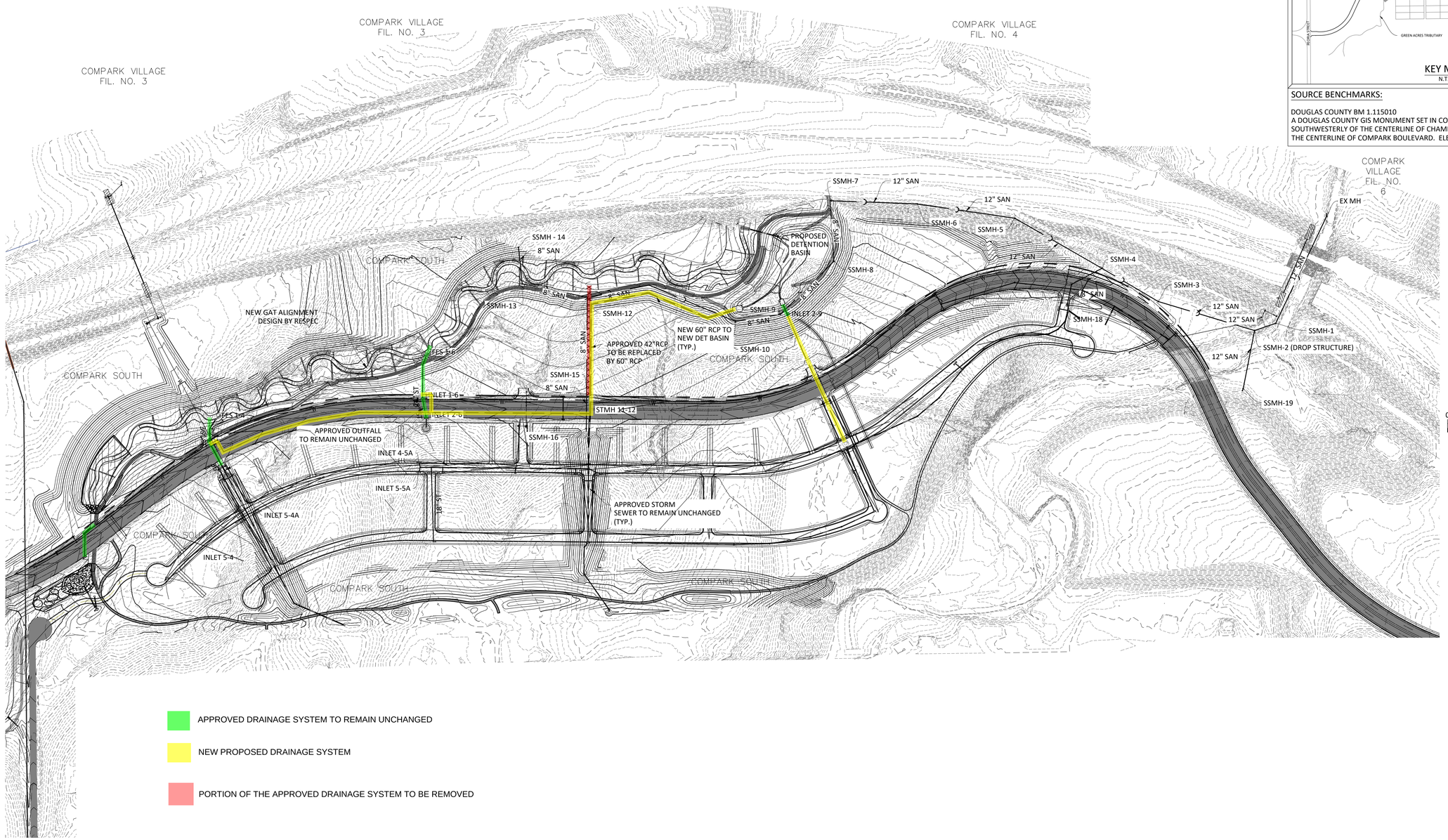
C. Variance from Criteria

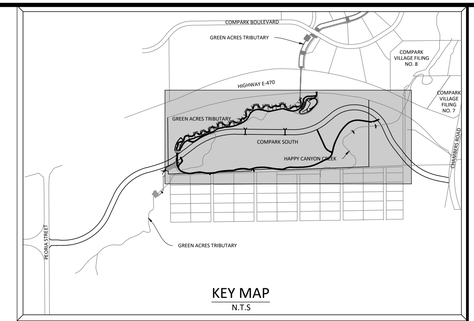
No variance is required.

IV. CONCLUSION

This final drainage report amendment complies with all major standards of the Town of Parker and the Urban Drainage Flood Control District. This overall plan for the site's drainage design is effective and economical for controlling damage due to excess storm runoff and minimizing erosive discharges.

Appendix A





KEY MAP
N.T.S

SOURCE BENCHMARKS:

DOUGLAS COUNTY BM 1.115010
A DOUGLAS COUNTY GIS MONUMENT SET IN CONCRETE LOCATED APPROXIMATELY 130 FEET SOUTHWESTERLY OF THE CENTERLINE OF CHAMBERS ROAD AND 95 FEET NORTHWESTERLY OF THE CENTERLINE OF COMPARK BOULEVARD. ELEVATION = 5752.84 (NAVD 88)

APPROVED DRAINAGE SYSTEM TO REMAIN UNCHANGED

NEW PROPOSED DRAINAGE SYSTEM

PORTION OF THE APPROVED DRAINAGE SYSTEM TO BE REMOVED

811 Know what's below. Call before you dig.

DRAWN BY | REVISIONS | DATE

Manhard CONSULTING
7600 East Orchard Road, Suite 150-N, Greenwood Village, CO 80111 ph: 303.708.0500 manhard.com
Civil Engineering & Surveying | Water Resource Management | Construction Management

PRELIMINARY COMPARK VILLAGE SOUTH, F1 - BELFORD AVENUE

TOWN OF PARKER, COLORADO

DRAINAGE AMENDMENT EXHIBIT

PROJ. MGR.: GTI
PROJ. ASSOC.: ASD
DRAWN BY: ASD
DATE: 09/2019

SHEET 1 OF 1

CLCPKC3

Plotted: 3/7/2020 7:28 AM Dwg Name: P:\Clcpkc3\ComSouth02-GreenAcresTrib\dwg\Engr\Work Area\ASD\2019 Detention Basin\Drainage Amendment Exhibit.dwg Updated By: ADucker

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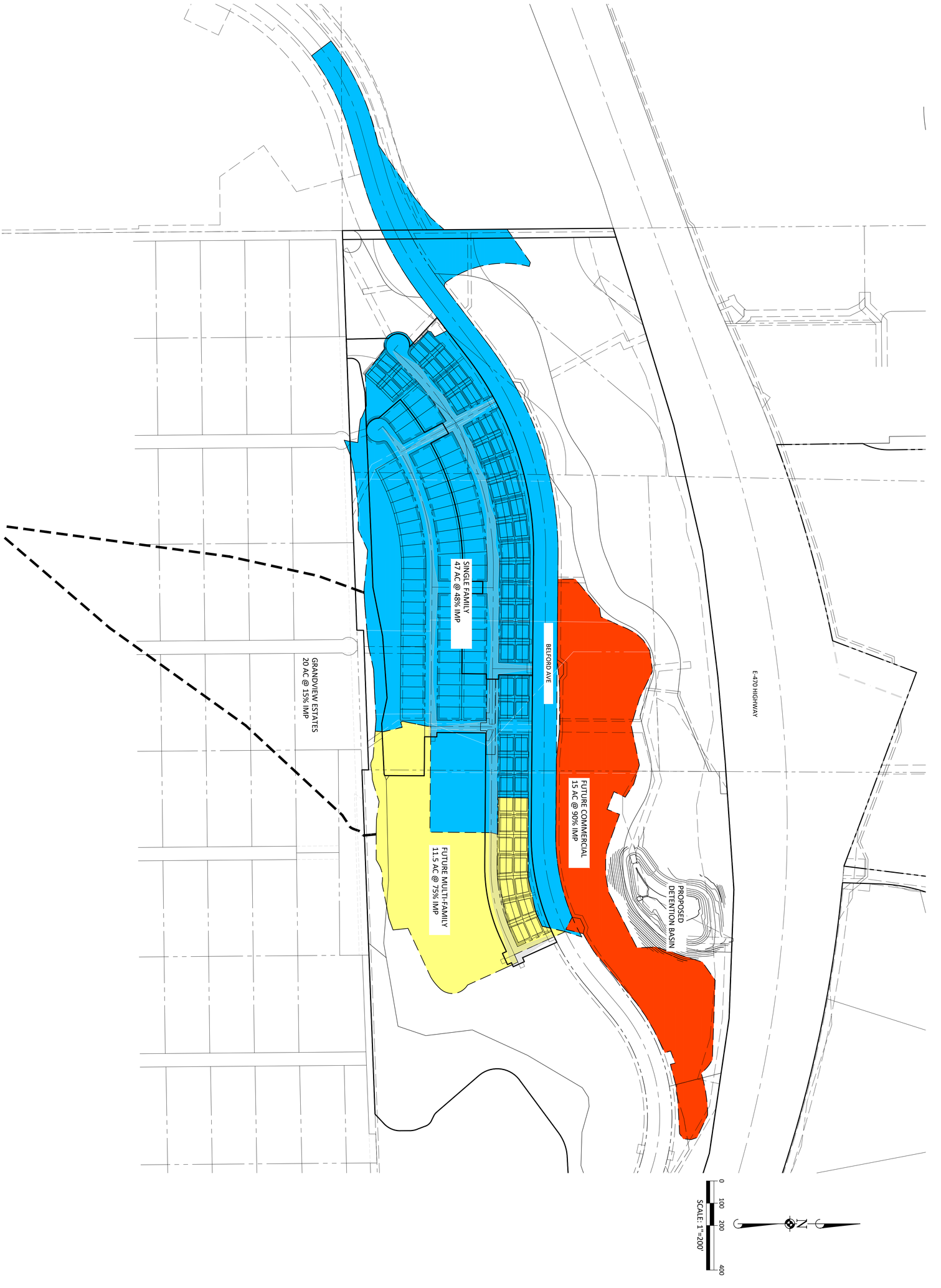

SHEET 1 OF 1
CLCPKC3

DATE: 3-2-20
DRAWN BY: ASD
PROJ. MGR.: JE
PROJ. ANDOC.: GTI

COMPARK VILLAGE SOUTH FILING NO. 1

TOWN OF PARKER, CO

CONTRIBUTORY DRAINAGE AREAS TO DET BASIN EXHIBIT

Manhard CONSULTING™
7600 East Orchard Road, Suite 150-N, Greenwood Village, CO 80111 ph:303.708.0500 manhard.com
Civil Engineering | Surveying & Geospatial Services | GIS
Water Resource Management | Construction Management

DATE	REVISIONS	DRAWN BY

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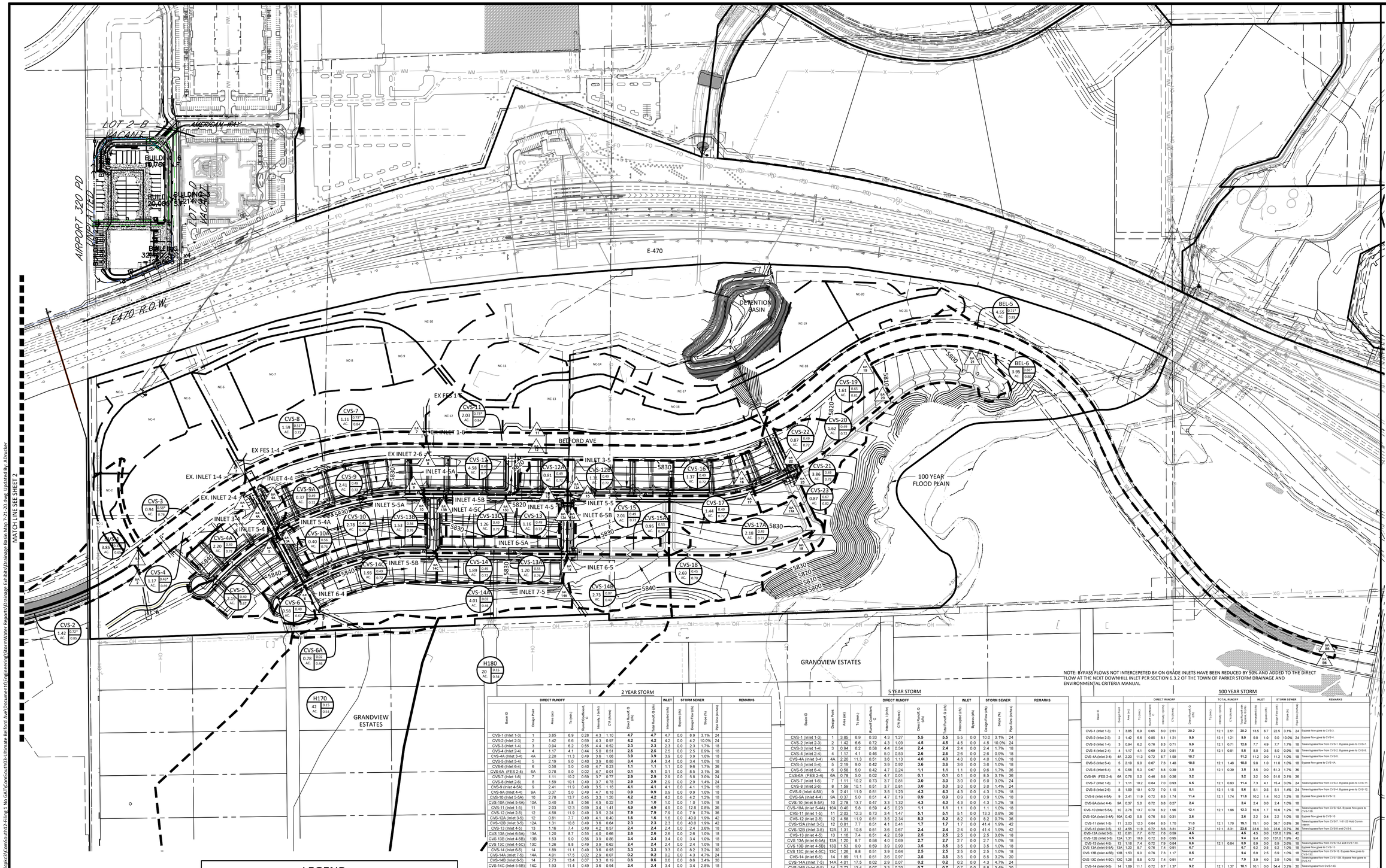
Appendix B



LEGEND

- SUB-BASIN #
- 2/5-YEAR RUNOFF COEFFICIENT (*DENOTES 5-YEAR RUNOFF)
- 100-YEAR RUNOFF COEFFICIENT
- AREA (ACRES)
- PROPOSED SUB-BASIN BOUNDARY

MATCH LINE SEE SHEET 2

2 YEAR STORM

DIRECT RUNOFF								INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	T_c (min.)	Runoff Coefficient	Intensity, I (in/hr)	CrA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.28	4.3	1.10	**4.7**	**4.7**	0.0	8.9	3.1%	24		
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.69	4.3	0.97	**4.2**	**4.2**	4.2	0.0	4.2	10.0%	24	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.55	4.4	0.52	**2.3**	**2.3**	0.0	2.3	1.7%	18		
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.44	5.0	0.51	**2.5**	**2.5**	2.5	0.0	2.5	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.49	3.6	1.08	**3.9**	**3.9**	3.9	0.0	3.9	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.40	3.9	0.88	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.40	4.7	0.23	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.69	3.7	0.77	**2.9**	**2.9**	2.9	0.0	5.8	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.49	3.7	0.78	**2.9**	**2.9**	2.9	0.0	2.9	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.49	3.5	1.18	**4.1**	**4.1**	4.1	0.0	4.1	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.49	4.7	0.18	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.45	3.3	1.26	**4.2**	**4.2**	4.2	0.0	4.2	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.56	4.5	0.22	**1.0**	**1.0**	1.0	0.0	1.0	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.69	3.4	1.41	**4.9**	**4.9**	4.9	0.0	12.8	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.49	3.5	2.24	**7.9**	**7.9**	7.9	0.0	7.9	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.49	4.1	0.40	**1.6**	**1.6**	1.6	0.0	40.0	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.49	3.6	0.64	**2.3**	**2.3**	2.3	0.0	40.0	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.49	4.2	0.57	**2.4**	**2.4**	2.4	0.0	2.4	3.6%	18	
CVS-13A (Inlet 6-5A)	13A	1.20	8.7	0.55	4.0	0.66	**2.6**	**2.6**	2.6	0.0	2.6	1.0%	18	
CVS-13B (Inlet 4-5B)	13B	1.53	9.0	0.56	3.9	0.86	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-13C (Inlet 4-5C)	13C	1.26	8.8	0.49	3.9	0.62	**2.4**	**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.49	3.6	0.93	**3.3**	**3.3**	3.3	0.0	8.2	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.07	3.3	0.19	**0.6**	**0.6**	0.6	0.0	8.6	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.49	3.6	0.94	**3.4**	**3.4**	3.4	0.0	3.4	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.49	3.3	1.00	**3.3**	**3.3**	3.3	0.0	3.3	1.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.53	4.1	0.50	**2.0**	**2.0**	2.0	0.0	2.0	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.49	3.8	0.67	**2.5**	**2.5**	6.4	0.0	2.5	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.49	4.0	0.70	**1.9**	**1.9**	6.8	0.0	1.9	5.2%	18	
CVS-17A	17A	2.18	13.6	0.49	3.3	1.07	**3.5**	**3.5**	-	-	-	-	-	
CVS-18	18	2.69	10.0	0.45	3.8	1.20	**4.5**	**4.5**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.65	4.5	1.05	**4.7**	**4.7**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.49	3.7	0.88	**3.3**	**3.3**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.98	**5.8**	**5.8**	-	-	-	-	-	
CVS-22 (Inlet 2-10A)	22	0.87	6.2	0.51	4.4	0.43	**1.9**	**1.9**	5.6	0.0	1.9	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.67	4.6	0.58	**2.7**	**2.7**	7.1	0.0	2.7	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.30	3.4	1.13	**3.8**	**3.8**	3.8	0.0	5.9	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.69	4.2	0.95	**3.9**	**3.9**	3.9	0.0	8.4	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.19	3.2	1.26	**4.1**	**4.1**	4.1	0.0	6.6	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.69	4.1	1.21	**5.0**	**5.0**	5.0	0.0	11.6	2.9%	36	
BEL-5	B5	4.55	11.0	0.68	3.6	3.08	**11.1**	**11.1**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.63	4.2	2.50	**10.5**	**10.5**	-	-	-	-	-	

5 YEAR STORM

DIRECT RUNOFF								INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	T_c (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	CrA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.33	4.3	1.27	**5.5**	**5.5**	0.0	10.0	3.1%	24		
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.72	4.3	1.03	**4.5**	**4.5**	4.5	0.0	10.0%	24		
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.58	4.4	0.54	**2.4**	**2.4**	0.0	2.4	1.7%	18		
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.46	5.0	0.53	**2.6**	**2.6**	2.6	0.0	0.9%	18		
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.51	3.6	1.13	**4.0**	**4.0**	4.0	0.0	1.0%	18		
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.42	3.9	0.92	**3.6**	**3.6**	3.6	0.0	1.0%	18		
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.42	4.7	0.24	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.73	3.7	0.81	**3.0**	**3.0**	3.0	0.0	6.0	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.51	3.7	0.81	**3.0**	**3.0**	3.0	0.0	3.0	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.51	3.5	1.23	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.51	4.7	0.19	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.47	3.3	1.32	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.59	4.5	0.23	**1.1**	**1.1**	1.1	0.0	1.1	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.73	3.4	1.47	**5.1**	**5.1**	5.1	0.0	13.3	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.51	3.5	2.34	**8.2**	**8.2**	8.2	0.0	8.2	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.51	4.1	0.41	**1.7**	**1.7**	1.7	0.0	41.4	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.51	3.6	0.67	**2.4**	**2.4**	2.4	0.0	41.4	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.51	4.2	0.59	**2.5**	**2.5**	2.5	0.0	2.5	3.6%	18	
CVS-13A (Inlet 6-5A)	13A	1.20	8.7	0.58	4.0	0.69	**2.7**	**2.7**	2.7	0.0	2.7	1.0%	18	
CVS-13B (Inlet 4-5B)	13B	1.53	9.0	0.59	3.9	0.90	**3.5**	**3.5**	3.5	0.0	3.5	1.0%	18	
CVS-13C (Inlet 4-5C)	13C	1.26	8.8	0.51	3.9	0.64	**2.5**	**2.5**	2.5	0.0	2.5	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.51	3.6	0.97	**3.5**	**3.5**	3.5	0.0	8.5	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.07	3.3	0.19	**0.6**	**0.6**	0.6	0.0	8.8	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.49	3.6	0.94	**3.4**	**3.4**	3.4	0.0	3.4	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.51	3.3	1.03	**3.4**	**3.4**	3.4	0.0	3.4	5.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.55	4.1	0.52	**2.1**	**2.1**	2.1	0.0	2.1	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.51	3.8	0.70	**2.6**	**2.6**	6.4	0.0	2.6	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.51	4.0	0.74	**3.0**	**3.0**	6.8	0.0	3.0	5.2%	18	
CVS-17A	17A	2.18	13.6	0.51	3.3	1.11	**3.7**	**3.7**	-	-	-	-	-	
CVS-18	18	2.69	10.0	0.47	3.8	1.25	**4.7**	**4.7**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.68	4.5	1.09	**4.9**	**4.9**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.51	3.7	0.92	**3.4**	**3.4**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.98	**6.1**	**6.1**	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.51	4.4	0.45	**2.0**	**2.0**	5.6	0.0	2.0	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.70	4.6	0.61	**2.8**	**2.8**	7.1	0.0	2.8	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.32	3.4	1.18	**4.0**	**4.0**	4.0	0.0	6.1	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.72	4.2	0.99	**4.1**	**4.1**	4.1	0.0	8.8	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.20	3.2	1.32	**4.2**	**4.2**	4.2	0.0	6.9	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.72	4.1	1.27	**5.2**	**5.2**	5.2	0.0	12.1	2.9%	36	
BEL-5	B5	4.55	11.0	0.71	3.6	3.22	**11.6**	**11.6**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.66	4.2	2.61	**10.9**	**10.9**	-	-	-	-	-	

100 YEAR STORM

DIRECT RUNOFF								TOTAL RUNOFF			INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	T_c (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	CrA (Acres)	Direct Runoff, Q (cfs)	T_c (min.)	Intensity, I (in/hr)	CrA (Acres)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.65	8.0	2.51	**20.2**	12.1	2.51	**20.2**	13.5	6.7	22.5	3.1%	24	Bypass flow goes to CVS-3	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.85	8.1	1.21	**9.9**	12.1	1.21	**9.9**	9.0	1.0	9.0	10.0%	24	Bypass flow goes to CVS-4	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.76	8.3	0.71	**5.9**	12.1	0.71	**12.6**	7.7	4.9	7.7	1.7%	18	Takes bypass flow from CVS-1. Bypass goes to CVS-7	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.69	9.3	0.81	**7.5**	12.1	0.81	**8.5**	8.0	0.0	8.0	0.9%	18	Takes bypass flow from CVS-2. Bypass goes to CVS-8.	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.72	6.7	1.59	**10.7**			**11.2**	11.2	0.0	11.2	1.0%	18	Takes bypass flow from CVS-5	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.42	3.9	0.92	**3.6**	12.1	1.48	**10.8**	10.8	0.0	10.8	1.0%	18	Bypass flow goes to CVS-4A	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.42	4.7	0.24	**1.1**	12.1	0.39	**3.6**	3.5	0.0	51.3	1.7%	36		
CVS-6A (FES 2-4)	6A	0.78	5.0	0.46	8.8	0.36	**3.2**			**3.2**	3.2	0.0	51.0	3.1%	36		
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.84	7.0	0.93	**6.5**	12.1	0.93	**11.4**	7.3	4.1	15.4	3.0%	24	Takes bypass flow from CVS-3. Bypass goes to CVS-11	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.72	7.0	1.15	**8.1**	12.1	1.15	**8.6**	8.1	0.5	8.1	1.4%	24	Takes bypass flow from CVS-4. Bypass goes to CVS-12	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.72	6.5	1.74	**11.4**	12.1	1.74	**11.6**	10.2	1.4	10.2	1.2%	18	Bypass flow goes to CVS-12	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.72	8.8	0.27	**2.4**			**2.4**	2.4	0.0	2.4	1.0%	18		
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.70	6.2	1.96	**12.1**	12.1	1.96	**12.3**	10.6	1.7	10.6	1.2%	18	Takes bypass flow from CVS-10A. Bypass flow goes to CVS-10B	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.76	8.5	0.31	**2.6**			**2.6**	2.2	0.4	2.2	1.0%	18	Bypass flow goes to CVS-10	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.84	6.5	1.70	**11.0**	12.1	1.70	**15.1**	15.1	0.0	38.7	0.8%	36	Takes bypass flow from CVS-7. 1-31-20 Add Comm Interim	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.72	6.6	3.31	**21.7**	12.1	3.31	**23.6**	23.6	0.0	23.6	0.7%	36	Takes bypass flow from CVS-8 and CVS-9	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.72	7.8	0.59	**4.5**			**4.5**	4.5	0.0	137.0	1.9%	42		
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.72	7.2	0.95	**6.5**			**9.4**	9.4	0.0	137.0	1.9%	42		
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.72	7.9	0.84	**6.6**	12.1	0.84	**8.9**	8.9	0.0	8.9	3.6%	18	Takes bypass flow from CVS-13A and CVS 13C	
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.78	7.4	0.91	**6.7**			**6.7**	6.2	0.5	6.2	1.0%	18	Takes bypass flow from CVS-13.	
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.76	7.3	1.17	**8.5**			**9.4**	6.9	2.5	6.9	1.0%	18	Takes bypass flow from CVS-10. Bypass flow goes to CVS-13C	
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.72	7.4	0.91	**6.7**			**7.9**	3.9	4.0	3.9	1.0%	18	Takes bypass flow from CVS 10B. Bypass flow goes to CVS-13	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.72	6.7	1.37	**9.2**	12.1	1.37	**10.1**	10.1	0.0	54.4	3.2%	30	Takes bypass from CVS-14C	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.46	6.5	1.86	**10.2**			**10.2**	10.2	0.0	34.8	4.7%	24		
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.49	6.2	1.35	**8.4**			**9.5**	9.5	0.0	54.4	3.4%	30		
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.72	6.7	1.40	**9.3**			**9.3**	7.5	1.8	7.5	2.8%	18	Takes bypass flow from CVS-14	
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.72	6.2	1.45	**9.0**	12.1	1.45	**9.1**	9.1	0.0	9.1	5.0%	18	Takes bypass flow from CVS-15A	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.74	7.7	0.71	**5.4**			**5.4**	5.3	0.1	5.3	1.0%	18		
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.72	7.0	0.99	**7.0**			**7.0**	6.4	0.6	6.4	5.2%	18		
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.72	7.7	1.04	**7.8**			**7.8**	6.8	1.0	6.8	5.2%	18		
CVS-17A	17A	2.18	13.6	0.72	6.2	1.58	**9.7**										
CVS-18	18	2.69	10.0	0.70	7.0	1.88	**15.2**	12.1	1.88	-	-	-	-	-	-		
CVS-19	19	1.61	6.0	0.81	8.4	1.31	**11.0**	12.1	1.31	-	-	-	-	-	-		
CVS-20	20	1.80	10.4	0.72	6.9	1.30	**9.0**	12.1	1.30	-	-	-	-	-	-		
CVS-21	21	3.88	16.1	0.72	5.7	2.81	**16.0**	12.1	2.81	-	-	-	-	-	-		
CVS-22 (2-10A)	22	0.87	6.2	0.72	8.3	0.63	**5.2**			**5.2**	5.6	0.2	5.6	1.0%	18	Takes bypass flow from CVS-16	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.82	8.6	0.71	**6.1**			**6.1**	7.1	0.5	6.1	1.0%	18	Takes bypass flow from CVS-17	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.62	6.3	2.31	**14.7**			**14.7**	8.3	6.4	63.6	3.3%	36	Bypass flow goes to BEL-3	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.83	7.8	1.15	**8.9**			**8.9**	6.5	2.4	69.5	0.9%	36	Bypass flow goes to BEL-4	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.56	5.9	3.76	**22.3**			**29.0**	29.0	0.0	95.6	3.2%	36	Takes bypass from BEL-1	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.84	7.7	1.46	**11.2**			**13.6**	13.6	0.0	110.8	2.9%	36	Takes bypass from BEL-2	
BEL-5	B5	4.55	11.0	0.83	6.8	3.76	**25.5**	12.1	3.76	-	-	-	-	-	-		
BEL-6	B6	3.95	7.4	0.80	7.9	3.17	**24.9**	12.1	3.17	-	-	-	-	-	-		

REVISIONS	DATE	DRAWN BY
REVISED TO ADD OFF-LINE DET BASIN	07/20/2020	ASD
REVISED PER TOWN COMMENTS	11/21/2016	RAK

Manhard CONSULTING
7600 East Orchard Road, Suite 150-N, Greenwood Village, CO 80111 P:303.228.6500 manhard.com
Civil Engineering | Surveying & Geospatial Services | GIS
Water Resource Management | Construction Management

COMPARK VILLAGE SOUTH
TOWN OF PARKER, CO
PROPOSED DRAINAGE AREA MAP

PROJ. MGR.: RLB
PROJ. ASSOC.: ASD
DRAWN BY: RAK
DATE: 6-30-16

SHEET 1 OF 3
CLCPKC3

Plotted: 7/30/2020 4:05 PM By: Dug Nampi: P:\Cptac\3 Com\South\12 Filing 1 No GAT\Com\South\3-Ultimate Belford Ave\Documents\Engineering\Storm\Water Reports\Drainage Exhibits\Drainage Basin Map 7-21-20.dwg Updated By: Abucker

LEGEND

- XX — SUB-BASIN #
- AREA (ACRES): X.XX AC
- X.XXX — 2/5-YEAR RUNOFF COEFFICIENT (*DENOTES 5-YEAR RUNOFF)
- X.XX — 100-YEAR RUNOFF COEFFICIENT
- PROPOSED SUB-BASIN BOUNDARY

0 50 100 200
SCALE: 1"=200'

2 YEAR STORM

DIRECT RUNOFF								INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	CfA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.28	4.3	1.10	**4.7**	**4.7**	4.7	0.0	8.9	3.1%	24	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.69	4.3	0.97	**4.2**	**4.2**	4.2	0.0	4.2	10.0%	24	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.55	4.4	0.52	**2.3**	**2.3**	2.3	0.0	2.3	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.46	5.0	0.51	**2.5**	**2.5**	2.5	0.0	2.5	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.49	3.6	1.08	**3.9**	**3.9**	3.9	0.0	3.9	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.40	3.9	0.85	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.40	4.7	0.23	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.69	3.7	0.77	**2.9**	**2.9**	2.9	0.0	5.8	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.49	3.7	0.78	**2.9**	**2.9**	2.9	0.0	2.9	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.49	3.5	1.18	**4.1**	**4.1**	4.1	0.0	4.1	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.49	4.7	0.18	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.45	3.3	1.26	**4.2**	**4.2**	4.2	0.0	4.2	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.56	4.5	0.22	**1.0**	**1.0**	1.0	0.0	1.0	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.69	3.4	1.41	**4.9**	**4.9**	4.9	0.0	12.8	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.56	11.9	0.49	3.5	2.24	**7.9**	**7.9**	7.9	0.0	7.9	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.49	4.1	0.40	**1.6**	**1.6**	1.6	0.0	40.0	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.49	3.6	0.64	**2.3**	**2.3**	2.3	0.0	40.0	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.49	4.2	0.57	**2.4**	**2.4**	2.4	0.0	2.4	3.6%	18	
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.55	4.0	0.66	**2.6**	**2.6**	2.6	0.0	2.6	1.0%	18	
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.56	3.9	0.86	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.49	3.9	0.62	**2.4**	**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.49	3.6	0.93	**3.3**	**3.3**	3.3	0.0	8.2	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.49	3.3	0.19	**0.6**	**0.6**	0.6	0.0	8.6	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.49	3.6	0.94	**3.4**	**3.4**	3.4	0.0	3.4	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.49	3.3	1.00	**3.3**	**3.3**	3.3	0.0	3.3	5.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.53	4.1	0.50	**2.0**	**2.0**	2.0	0.0	2.0	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.49	3.8	0.67	**2.5**	**2.5**	6.4	0.0	2.5	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.49	4.0	0.70	**1.9**	**1.9**	6.8	0.0	1.9	5.2%	18	
CVS-17A	17A	2.18	13.6	0.49	3.3	1.07	**3.5**	**3.5**						
CVS-18	18	2.69	10.0	0.45	3.8	1.20	**4.5**	**4.5**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.65	4.5	1.05	**4.7**	**4.7**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.49	3.7	0.88	**3.3**	**3.3**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.49	3.1	1.90	**5.8**	**5.8**	-	-	-	-	-	
CVS-22 (2nd 2-10A)	22	0.87	6.2	0.49	4.4	0.43	**1.9**	**1.9**	5.6	0.0	1.9	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.67	4.6	0.58	**2.7**	**2.7**	7.1	0.0	2.7	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.30	3.4	1.13	**3.8**	**3.8**	3.8	0.0	5.9	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.69	4.2	0.95	**3.9**	**3.9**	3.9	0.0	8.4	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.19	3.2	1.26	**4.1**	**4.1**	4.1	0.0	6.6	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.69	4.1	1.21	**5.0**	**5.0**	5.0	0.0	11.6	2.9%	36	
BEL-5	B5	4.55	11.0	0.66	3.6	3.08	**11.1**	**11.1**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.63	4.2	2.50	**10.5**	**10.5**	-	-	-	-	-	

5 YEAR STORM

DIRECT RUNOFF								INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	CfA (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.33	4.3	1.27	**5.5**	**5.5**	5.5	0.0	10.0	3.1%	24	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.72	4.3	1.03	**4.5**	**4.5**	4.5	0.0	4.5	10.0%	24	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.58	4.4	0.54	**2.4**	**2.4**	2.4	0.0	2.4	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.48	5.0	0.53	**2.6**	**2.6**	2.6	0.0	2.6	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.51	3.6	1.13	**4.0**	**4.0**	4.0	0.0	4.0	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.42	3.9	0.92	**3.6**	**3.6**	3.6	0.0	3.6	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.42	4.7	0.24	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.73	3.7	0.81	**3.0**	**3.0**	3.0	0.0	6.0	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.51	3.7	0.81	**3.0**	**3.0**	3.0	0.0	3.0	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.51	3.5	1.23	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.51	4.7	0.19	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.47	3.3	1.32	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.59	4.5	0.23	**1.1**	**1.1**	1.1	0.0	1.1	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.73	3.4	1.47	**5.1**	**5.1**	5.1	0.0	13.3	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.56	11.9	0.51	3.5	2.34	**8.2**	**8.2**	8.2	0.0	8.2	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.51	4.1	0.41	**1.7**	**1.7**	1.7	0.0	41.4	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.51	3.6	0.67	**2.4**	**2.4**	2.4	0.0	41.4	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.51	4.2	0.59	**2.5**	**2.5**	2.5	0.0	2.5	3.6%	18	
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.58	4.0	0.69	**2.7**	**2.7**	2.7	0.0	2.7	1.0%	18	
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.59	3.9	0.90	**3.5**	**3.5**	3.5	0.0	3.5	1.0%	18	
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.51	3.9	0.64	**2.5**	**2.5**	2.5	0.0	2.5	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.51	3.6	0.97	**3.5**	**3.5**	3.5	0.0	8.5	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.07	3.3	0.20	**0.7**	**0.7**	0.7	0.0	8.8	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.51	3.6	0.99	**3.5**	**3.5**	3.5	0.0	3.5	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.51	3.3	1.03	**3.4**	**3.4**	3.4	0.0	3.4	5.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.55	4.1	0.52	**2.1**	**2.1**	2.1	0.0	2.1	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.51	3.8	0.70	**2.6**	**2.6**	6.4	0.0	2.6	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.49	4.0	0.74	**3.0**	**3.0**	6.8	0.0	3.0	5.2%	18	
CVS-18	18	2.69	10.0	0.47	3.8	1.25	**4.7**	**4.7**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.68	4.5	1.09	**4.9**	**4.9**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.51	3.7	0.92	**3.4**	**3.4**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.98	**6.1**	**6.1**	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.51	4.4	0.45	**2.0**	**2.0**	5.6	0.0	2.0	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.70	4.6	0.61	**2.8**	**2.8**	7.1	0.0	2.8	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.32	3.4	1.18	**4.0**	**4.0**	4.0	0.0	6.1	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.72	4.2	0.99	**4.1**	**4.1**	4.1	0.0	8.8	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.20	3.2	1.32	**4.2**	**4.2**	4.2	0.0	6.9	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.73	4.1	1.27	**5.2**	**5.2**	5.2	0.0	12.1	2.9%	36	
BEL-5	B5	4.55	11.0	0.71	3.6	3.22	**11.6**	**11.6**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.66	4.2	2.61	**10.9**	**10.9**	-	-	-	-	-	

100 YEAR STORM

DIRECT RUNOFF								TOTAL RUNOFF			INLET	STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	CfA (Acres)	Direct Runoff, Q (cfs)	Tc (min.)	Intensity, I (in/hr)	CfA (Acres)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.65	8.0	2.51	**20.2**		12.1	2.51	**20.2**	13.5	6.7	22.5	3.1%	24	Bypass flow goes to CVS-3.
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.85	8.1	1.21	**9.9**		12.1	1.21	**9.9**	9.0	1.0	9.0	10.0%	24	Bypass flow goes to CVS-4.
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.76	8.3	0.71	**5.9**		12.1	0.71	**12.6**	7.7	4.9	7.7	1.7%	18	Takes bypass flow from CVS-1. Bypass goes to CVS-7.
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.69	9.3	0.81	**7.5**		12.1	0.81	**8.5**	8.0	0.5	8.0	0.9%	18	Takes bypass flow from CVS-2. Bypass goes to CVS-8.
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.72	6.7	1.59	**10.7**				**11.2**	11.2	0.0	11.2	1.0%	18	Takes bypass flow from CVS-5.
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.67	7.3	1.48	**10.8**	12.1	1.48	**10.8**	9.8	1.0	11.0	1.0%	18	Bypass flow goes to CVS-4A.
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.67	8.8	0.39	**3.5**	12.1	0.39	**3.5**	3.5	0.0	51.3	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.46	8.8	0.36	**3.2**				**3.2**	3.2	0.0	51.0	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.84	7.0	0.93	**6.5**		12.1	0.93	**11.4**	7.3	4.1	15.4	3.0%	24	Takes bypass flow from CVS-3. Bypass goes to CVS-11.
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.72	7.0	1.15	**8.1**		12.1	1.15	**8.6**	8.1	0.5	8.1	1.4%	24	Takes bypass flow from CVS-4. Bypass goes to CVS-12.
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.72	6.5	1.74	**11.4**		12.1	1.74	**11.6**	10.2	1.4	10.2	1.2%	18	Bypass flow goes to CVS-12.
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.72	8.8	0.27	**2.4**				**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.70	6.2	1.96	**12.1**		12.1	1.96	**12.3**	10.6	1.7	10.6	1.2%	18	Takes bypass flow from CVS-10A. Bypass flow goes to CVS-13B.
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.76	8.5	0.31	**2.6**				**2.6**	2.2	0.4	2.2	1.0%	18	Bypass flow goes to CVS-10
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.84	6.5	1.70	**11.0**	12.1	1.70	**15.1**	15.1	0.0	36.7	0.8%	36	Takes bypass flow from CVS-7. 1-31-20 Add Comm
CVS-12 (Inlet 2-5)	12	4.56	11.9	0.72	6.6	3.31	**21.7**	12.1	3.31	**23.6**	23.6	0.0	23.6	0.7%	36	Takes bypass flow from CVS-8 and CVS-9.
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.72	7.8	0.59	**4.5**				**4.5**	4.5	0.0	137.0	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.72	6.8	0.95	**6.5**				**9.4**	9.4	0.0	137.0	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.72	7.9	0.84	**6.6**	12.1	0.84	**8.9**	8.9	0.0	8.9	3.6%	18	Takes bypass flow from CVS-13A and CVS-13C
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.78	7.4	0.91	**6.7**				**6.7**	6.2	0.5	6.2	1.0%	18	Bypass flow goes to CVS-13
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.76	7.3	1.17	**8.5**				**9.4**	6.9	2.5	6.9	1.0%	18	Takes bypass flow from CVS-10. Bypass flow goes to CVS-13
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.72	7.4	0.91	**6.7**				**7.9**	3.9	4.0	3.9	1.0%	18	Takes bypass flow from CVS-13A and CVS-13
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.72	6.7	1.37	**9.2**	12.1	1.37	**10.1**	10.1	0.0	54.4	3.2%	30	Takes bypass from CVS-14C
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.46	5.5	1.86	**10.2**				**10.2**	10.2	0.0	34.8	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.49	6.2	1.35	**8.4**				**9.5**	9.5	0.0	54.4	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.72	6.7	1.40	**9.3**				**9.3**	7.5	1.8	7.5	2.8%	18	Bypass flow goes to CVS-14
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.72	6.2	1.45	**9.0**	12.1	1.45	**9.1**	9.1	0.0	9.1	5.0%	18	Takes bypass flow from CVS-15A
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.74	7.7	0.71	**5.4**				**5.4**	5.3	0.1	5.3	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.72	7.0	0.99	**7.0**				**7.0**	6.4	0.5	6.4	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.72	7.5	1.04	**7.9**				**7.9**	6.8	1.0	6.8	5.2%	18	
CVS-17A	17A	2.18	13.6	0.72	6.2	1.56	**9.7**										
CVS-18	18	2.69	10.0	0.70	7.0	1.88	**13.2**	12.1	1.88	-	-	-	-	-			
CVS-19	19	1.61	6.0	0.81	8.4	1.31	**11.0**	12.1	1.31	-	-	-	-	-			
CVS-20	20	1.80	10.4	0.72	6.9	1.30	**9.0**	12.1	1.30	-	-	-	-	-			
CVS-21	21	3.88	16.1	0.72	5.7	2.81	**16.0**	12.1	2.81	-	-	-	-	-			
CVS-22 (2-10A)	22	0.87	6.2	0.72	8.3	0.63	**5.2**				**5.2**	5.6	0.2	5.6	1.0%	18	Takes bypass flow from CVS-16
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.82	8.6	0.71	**6.1**				**6.1**	7.1	0.5	8.1	1.0%	18	Takes bypass flow from CVS-17
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.62	6.3	2.31	**14.7**				**14.7**	8.3	6.4	63.6	3.3%	36	Takes bypass flow from BEL-6
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.83	7.8	1.15	**8.9**				**8.9**	6.5	2.4	69.5	0.9%	36	Takes bypass flow from BEL-4
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.56	6.0	3.76	**22.6**				**29.0**	29.0	0.0	95.6	3.2%	36	Takes bypass from BEL-1
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.84	7.7	1.46	**11.2**				**13.6**	13.6	0.0	110.8	2.9%	36	Takes bypass from BEL-2
BEL-5	B5	4.55	11.0	0.83	6.8	3.76	**20.5**	12.1	3.76	-	-	-	-	-			
BEL-6	B6	3.95	7.4	0.80	7.9	3.17	**24.9**	12.1	3.17	-	-	-	-	-			

DATE	REVISIONS	DRAWN BY
07/20/2020	B REVISED TO ADD OFF-LINE DET BASIN	ASD
11/21/2016	A REVISED PER TOWN COMMENTS	RAK

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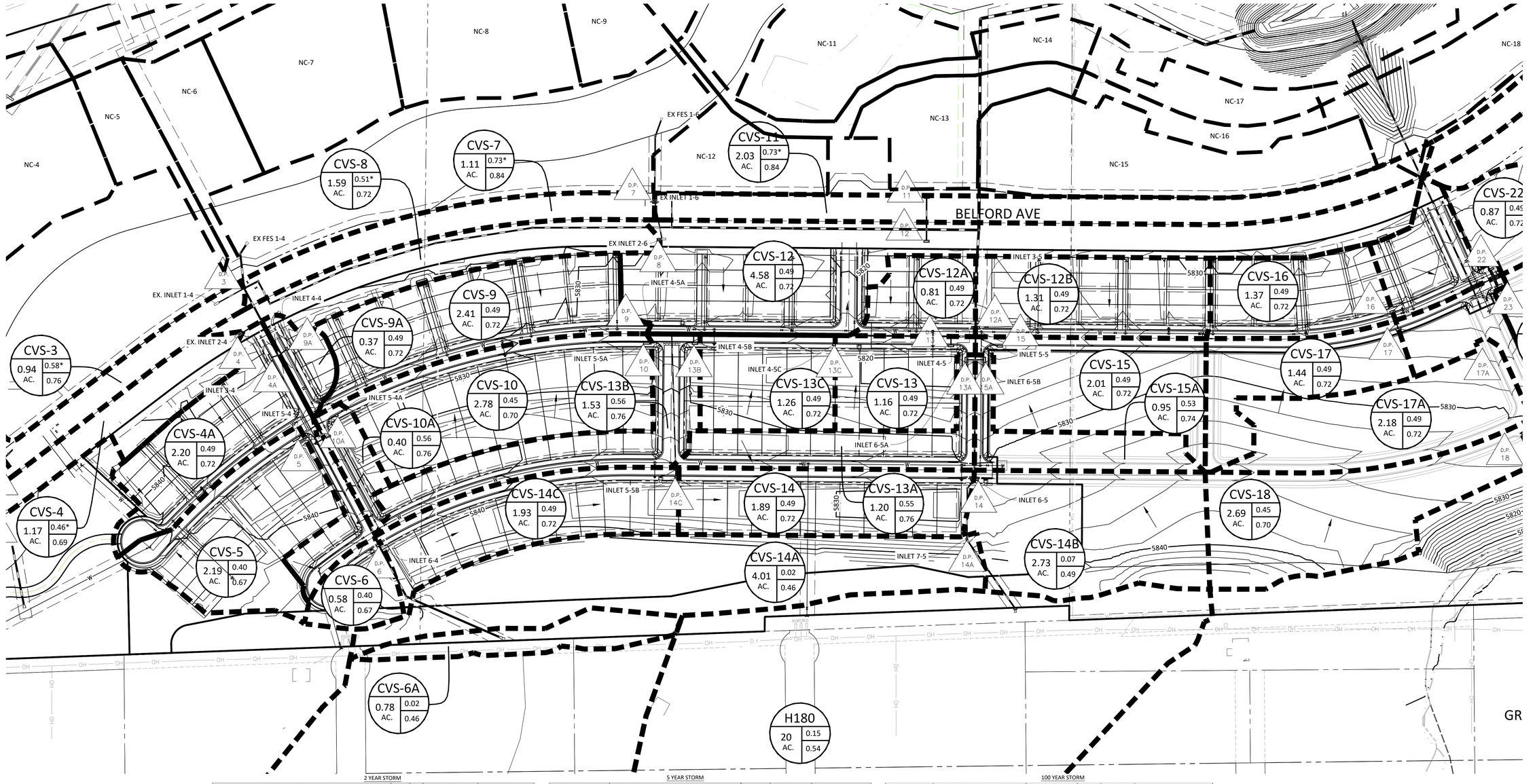
COMPARK SOUTH
TOWN OF PARKER, CO
PROPOSED DRAINAGE AREA MAP

PROJ. MGR.: RLB
PROJ. ASSOC.: ASD
DRAWN BY: RAK
DATE: 6-30-16

SHEET 2 OF 3
CLCPKC3

Plotted: 7/30/2020 4:05 PM Dwg Name: P:\Clpk23\Com\South12-Filing 1 No GAT\Com\South03-Ultimate Belford Ave\Documents\Engineering\Storm Water Reports\Drainage Exhibits\Drainage Basin Map 7-21-20.dwg Updated By: ADrucker



Plotted: 7/30/2020 4:05 PM Dwg Name: P:\Clpkc3\ComSouth\12-Filing 1 No GAT\ComSouth03-Ultimate Belford Ave\Documents\Engineering\Storm Water Reports\Drainage Exhibits\Drainage Basin Map 7-21-20.dwg Updated By: ADrucker

2 YEAR STORM

DIRECT RUNOFF									INLET		STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	C*A (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.28	4.3	1.10	**4.7**	**4.7**	4.7	0.0	8.9	3.1%	24	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.69	4.3	0.97	**4.2**	**4.2**	0.0	4.2	10.0%	24		
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.55	4.4	0.52	**2.3**	**2.3**	2.3	0.0	2.3	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.44	5.0	0.51	**2.5**	**2.5**	2.5	0.0	2.5	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.49	3.6	1.08	**3.9**	**3.9**	3.9	0.0	3.9	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.40	3.9	0.88	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.40	4.7	0.23	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.69	3.7	0.77	**2.9**	**2.9**	2.9	0.0	5.8	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.49	3.7	0.78	**2.9**	**2.9**	2.9	0.0	2.9	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.49	3.5	1.18	**4.1**	**4.1**	4.1	0.0	4.1	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.49	4.7	0.18	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.45	3.3	1.26	**4.2**	**4.2**	4.2	0.0	4.2	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.56	4.5	0.22	**1.0**	**1.0**	1.0	0.0	1.0	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.69	3.4	1.41	**4.9**	**4.9**	4.9	0.0	12.8	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.49	3.5	2.24	**7.9**	**7.9**	7.9	0.0	7.9	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.49	4.1	0.40	**1.6**	**1.6**	1.6	0.0	40.0	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.49	3.6	0.64	**2.3**	**2.3**	2.3	0.0	40.0	1.5%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.49	4.2	0.57	**2.4**	**2.4**	2.4	0.0	2.4	3.6%	18	
CVS-13A (Inlet 6-5A)	13A	1.20	8.7	0.55	4.0	0.66	**2.6**	**2.6**	2.6	0.0	2.6	1.0%	18	
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.56	3.9	0.86	**3.4**	**3.4**	3.4	0.0	3.4	1.0%	18	
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.49	3.9	0.62	**2.4**	**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.49	3.6	0.83	**3.3**	**3.3**	3.3	0.0	8.2	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.07	3.3	0.19	**0.6**	**0.6**	0.6	0.0	8.6	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.49	3.6	0.94	**3.4**	**3.4**	3.4	0.0	3.4	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.05	13.4	0.49	3.3	1.00	**3.3**	**3.3**	3.3	0.0	3.3	5.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.53	4.1	0.50	**2.0**	**2.0**	2.0	0.0	2.0	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.49	3.8	0.67	**2.5**	**2.5**	6.4	0.0	2.5	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.49	4.0	0.70	**1.9**	**1.9**	6.8	0.0	1.9	5.2%	18	
CVS-17A	17A	2.18	13.6	0.49	3.3	1.07	**3.5**	**3.5**	-	-	-	-	-	
CVS-18	18	2.69	10.0	0.45	3.8	1.20	**4.5**	**4.5**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.65	4.5	1.05	**4.7**	**4.7**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.49	3.7	0.88	**3.3**	**3.3**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.90	**5.8**	**5.8**	-	-	-	-	-	
CVS-22 (Inlet 2-10A)	22	0.87	6.2	0.49	4.4	0.43	**1.9**	**1.9**	5.6	0.0	1.9	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.70	4.6	0.58	**2.7**	**2.7**	7.1	0.0	2.7	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.32	3.4	1.13	**3.8**	**3.8**	3.8	0.0	5.9	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.69	4.2	0.95	**3.9**	**3.9**	3.9	0.0	8.4	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.19	3.2	1.26	**4.1**	**4.1**	4.1	0.0	6.6	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.69	4.1	1.21	**5.0**	**5.0**	5.0	0.0	12.1	2.9%	36	
BEL-5	B5	4.55	11.0	0.68	3.6	3.08	**11.1**	**11.1**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.63	4.2	2.50	**10.5**	**10.5**	-	-	-	-	-	

5 YEAR STORM

DIRECT RUNOFF									INLET		STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	C*A (Acres)	Direct Runoff, Q (cfs)	Total Runoff, Q (cfs)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.33	4.3	1.27	**5.5**	**5.5**	5.5	0.0	10.0	3.1%	24	
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.72	4.3	1.03	**4.5**	**4.5**	4.5	0.0	4.5	10.0%	24	
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.58	4.4	0.54	**2.4**	**2.4**	2.4	0.0	2.4	1.7%	18	
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.46	5.0	0.53	**2.6**	**2.6**	2.6	0.0	2.6	0.9%	18	
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.51	3.6	1.13	**4.0**	**4.0**	4.0	0.0	4.0	1.0%	18	
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.42	3.9	0.92	**3.6**	**3.6**	3.6	0.0	3.6	1.0%	18	
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.42	4.7	0.24	**1.1**	**1.1**	1.1	0.0	9.6	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.02	4.7	0.01	**0.1**	**0.1**	0.1	0.0	8.5	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.73	3.7	0.81	**3.0**	**3.0**	3.0	0.0	6.0	3.0%	24	
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.51	3.7	0.81	**3.0**	**3.0**	3.0	0.0	3.0	1.4%	24	
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.51	3.5	1.23	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.51	4.7	0.19	**0.9**	**0.9**	0.9	0.0	0.9	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.47	3.3	1.32	**4.3**	**4.3**	4.3	0.0	4.3	1.2%	18	
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.59	4.5	0.23	**1.1**	**1.1**	1.1	0.0	1.1	1.0%	18	
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.73	3.4	1.47	**5.1**	**5.1**	5.1	0.0	13.3	0.8%	36	
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.51	3.5	2.34	**8.2**	**8.2**	8.2	0.0	8.2	0.7%	36	
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.51	4.1	0.41	**1.7**	**1.7**	1.7	0.0	41.4	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.51	3.6	0.67	**2.4**	**2.4**	2.4	0.0	41.4	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.51	4.2	0.59	**2.5**	**2.5**	2.5	0.0	2.5	3.6%	18	
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.58	4.0	0.69	**2.7**	**2.7**	2.7	0.0	2.7	1.0%	18	
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.59	3.9	0.90	**3.5**	**3.5**	3.5	0.0	3.5	1.0%	18	
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.51	3.9	0.64	**2.5**	**2.5**	2.5	0.0	2.5	1.0%	18	
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.51	3.6	0.87	**3.5**	**3.5**	3.5	0.0	8.5	3.2%	30	
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.02	2.9	0.07	**0.2**	**0.2**	0.2	0.0	4.3	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.07	3.3	0.20	**0.7**	**0.7**	0.7	0.0	8.8	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.51	3.6	0.99	**3.5**	**3.5**	3.5	0.0	3.5	2.8%	18	
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.51	3.3	1.03	**3.4**	**3.4**	3.4	0.0	3.4	5.0%	18	
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.55	4.1	0.52	**2.1**	**2.1**	2.1	0.0	2.1	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.51	3.8	0.70	**2.6**	**2.6**	6.4	0.0	2.6	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.51	4.0	0.74	**3.0**	**3.0**	6.8	0.0	3.0	5.2%	18	
CVS-17A	17A	2.18	13.6	0.51	3.3	1.11	**3.7**	**3.7**	-	-	-	-	-	
CVS-18	18	2.69	10.0	0.47	3.8	1.25	**4.7**	**4.7**	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.68	4.5	1.09	**4.9**	**4.9**	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.51	3.7	0.92	**3.4**	**3.4**	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.51	3.1	1.98	**6.1**	**6.1**	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.51	4.4	0.45	**2.0**	**2.0**	5.6	0.0	2.0	1.0%	18	
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.70	4.6	0.61	**2.8**	**2.8**	7.1	0.0	2.8	1.0%	18	
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.32	3.4	1.18	**4.0**	**4.0**	4.0	0.0	6.1	3.3%	36	
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.72	4.2	0.99	**4.1**	**4.1**	4.1	0.0	8.8	0.9%	36	
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.20	3.2	1.32	**4.2**	**4.2**	4.2	0.0	6.9	3.2%	36	
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.73	4.1	1.27	**5.2**	**5.2**	5.2	0.0	12.1	2.9%	36	
BEL-5	B5	4.55	11.0	0.71	3.6	3.22	**11.6**	**11.6**	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.66	4.2	2.61	**10.9**	**10.9**	-	-	-	-	-	

100 YEAR STORM

DIRECT RUNOFF								TOTAL RUNOFF			INLET		STORM SEWER			REMARKS
Basin ID	Design Point	Area (ac)	Tc (min.)	Runoff Coefficient, C	Intensity, I (in/hr)	C*A (Acres)	Direct Runoff, Q (cfs)	Tc (min.)	Intensity, I (in/hr)	Total Runoff (max. C=1.00)	Intercepted (cfs)	Bypass (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	
CVS-1 (Inlet 1-3)	1	3.85	6.9	0.65	8.0	2.51	**20.2**	12.1	2.51	**20.2**	13.5	6.7	22.5	3.1%	24	Bypass flow goes to CVS-3.
CVS-2 (Inlet 2-3)	2	1.42	6.6	0.85	8.1	1.21	**9.9**	12.1	1.21	**9.9**	9.0	1.0	9.0	10.0%	24	Takes bypass flow from CVS-4.
CVS-3 (Inlet 1-4)	3	0.94	6.2	0.76	8.3	0.71	**6.9**	12.1	0.71	**12.6**	7.7	4.9	7.7	1.7%	18	Takes bypass flow from CVS-1. Bypass goes to CVS-7.
CVS-4 (Inlet 2-4)	4	1.17	4.1	0.69	9.3	0.81	**7.5**	12.1	0.81	**8.5**	8.0	0.5	8.0	0.9%	18	Takes bypass flow from CVS-2. Bypass goes to CVS-8.
CVS-4A (Inlet 3-4)	4A	2.20	11.3	0.72	6.7	1.59	**10.7**	-	-	**11.2**	11.2	0.0	11.2	1.0%	18	Takes bypass flow from CVS-5.
CVS-5 (Inlet 5-4)	5	2.19	9.0	0.67	7.3	1.48	**10.8**	12.1	1.48	**10.8**	9.8	1.0	11.0	1.0%	18	Bypass flow goes to CVS-4A.
CVS-6 (Inlet 6-4)	6	0.58	5.0	0.67	8.8	0.39	**3.5**	12.1	0.39	**3.5**	3.5	0.0	51.3	1.7%	36	
CVS-6A (FES 2-4)	6A	0.78	5.0	0.46	8.8	0.36	**3.2**	-	-	**3.2**	3.2	0.0	51.0	3.1%	36	
CVS-7 (Inlet 1-6)	7	1.11	10.2	0.84	7.0	0.93	**6.5**	12.1	0.93	**11.4**	7.3	4.1	15.4	3.0%	24	Takes bypass flow from CVS-3. Bypass goes to CVS-11.
CVS-8 (Inlet 2-6)	8	1.59	10.1	0.72	7.0	1.15	**8.1**	12.1	1.15	**8.6**	8.1	0.5	8.1	1.4%	24	Takes bypass flow from CVS-8. Bypass goes to CVS-12.
CVS-9 (Inlet 4-5A)	9	2.41	11.9	0.72	6.5	1.74	**11.4**	12.1	1.74	**11.6**	10.2	1.4	10.2	1.2%	18	Bypass flow goes to CVS-12.
CVS-9A (Inlet 4-4)	9A	0.37	5.0	0.72	8.8	0.27	**2.4**	-	-	**2.4**	2.4	0.0	2.4	1.0%	18	
CVS-10 (Inlet 5-5A)	10	2.78	13.7	0.70	6.2	1.96	**12.1**	12.1	1.96	**12.3**	10.6	1.7	10.6	1.2%	18	Takes bypass flow from CVS-10A. Bypass flow goes to CVS-13B.
CVS-10A (Inlet 5-4A)	10A	0.40	5.8	0.76	8.5	0.31	**2.6**	-	-	**2.6**	2.2	0.4	2.2	1.0%	18	Bypass flow goes to CVS-10.
CVS-11 (Inlet 1-5)	11	2.03	12.3	0.84	6.5	1.70	**11.0**	12.1	1.70	**15.1**	15.1	0.0	38.7	0.8%	36	Takes bypass flow from CVS-7. 1-31-20 Add Comm Memo.
CVS-12 (Inlet 2-5)	12	4.58	11.9	0.72	6.6	3.31	**21.7**	12.1	3.31	**23.6**	23.6	0.0	23.6	0.7%	36	Takes bypass flow from CVS-8 and CVS-9.
CVS-12A (Inlet 3-5)	12	0.81	7.7	0.72	7.8	0.59	**4.5**	-	-	**4.5**	4.5	0.0	137.0	1.9%	42	
CVS-12B (Inlet 3-5)	12A	1.31	10.8	0.72	6.8	0.95	**6.5**	-	-	**9.4**	9.4	0.0	137.0	1.9%	42	
CVS-13 (Inlet 4-5)	13	1.16	7.4	0.72	7.9	0.84	**6.6**	12.1	0.84	**8.9**	8.9	0.0	8.9	3.6%	18	Takes bypass flow from CVS-13A and CVS 13C.
CVS 13A (Inlet 6-5A)	13A	1.20	8.7	0.78	7.4	0.91	**6.7**	-	-	**6.7**	6.2	0.5	6.2	1.0%	18	Bypass flow goes to CVS-13.
CVS 13B (Inlet 4-5B)	13B	1.53	9.0	0.76	7.3	1.17	**8.5**	-	-	**9.4**	6.9	2.5	6.9	1.0%	18	Takes bypass flow from CVS-10. Bypass flow goes to CVS-13.
CVS 13C (Inlet 4-5C)	13C	1.26	8.8	0.72	7.4	0.91	**6.7**	-	-	**7.9**	3.9	4.0	3.9	1.0%	18	Takes bypass flow from CVS 13B. Bypass flow goes to CVS-13.
CVS-14 (Inlet 6-5)	14	1.89	11.1	0.72	6.7	1.37	**9.2**	12.1	1.37	**10.1**	10.1	0.0	54.4	3.2%	30	Takes bypass from CVS-14C
CVS-14A (Inlet 7-5)	14A	4.01	17.5	0.46	5.5	1.86	**10.2**	-	-	**10.2**	10.2	0.0	34.8	4.7%	24	
CVS-14B (Inlet 6-5)	14	2.73	13.4	0.49	6.2	1.35	**8.4**	-	-	**9.5**	9.5	0.0	54.4	3.4%	30	
CVS-14C (Inlet 5-5B)	14C	1.93	11.4	0.72	6.7	1.40	**9.3**	-	-	**9.3**	7.5	1.8	7.5	2.8%	18	Bypass flow goes to CVS-14
CVS-15 (Inlet 5-5)	15	2.01	13.4	0.72	6.2	1.45	**9.1**	12.1	1.45	**9.1**	9.1	0.0	9.1	5.0%	18	Takes bypass flow from CVS-15A
CVS-15A (Inlet 6-5B)	15A	0.95	7.9	0.74	7.7	0.71	**5.4**	-	-	**5.4**	5.3	0.1	5.3	1.0%	18	
CVS-16 (Inlet 2-11A)	16	1.37	10.0	0.72	7.0	0.98	**7.0**	-	-	**7.0**	6.4	0.6	6.4	5.2%	18	
CVS-17 (Inlet 2-11)	17	1.44	8.4	0.72	7.5	1.04	**7.8**	-	-	**7.8**	6.8	1.0	6.8	5.2%	18	
CVS-17A	17A	2.18	13.6	0.72	6.2	1.58	**9.7**	-	-	-	-	-	-	-	-	
CVS-18	18	2.69	10.0	0.70	7.0	1.88	**13.2**	12.1	1.88	-	-	-	-	-	-	
CVS-19	19	1.61	6.0	0.81	8.4	1.35	**11.3**	12.1	1.31	-	-	-	-	-	-	
CVS-20	20	1.80	10.4	0.72	6.9	1.30	**9.0**	12.1	1.30	-	-	-	-	-	-	
CVS-21	21	3.88	16.1	0.72	5.7	2.81	**16.0**	12.1	2.81	-	-	-	-	-	-	
CVS-22 (2-10A)	22	0.87	6.2	0.72	8.3	0.63	**5.2**			**5.2**	5.6	0.2	5.6	1.0%	18	Takes bypass flow from CVS-10
CVS-23 (Inlet 2-10)	23	0.87	5.5	0.82	8.6	0.71	**6.1**			**6.1**	4.5	1.6	6.1	1.0%	18	Takes bypass flow from CVS-17
BEL-1 (Inlet 2-1)	B1	3.73	12.8	0.62	6.3	2.31	**14.7**			**14.7**	8.3	6.4	60.6	3.3%	36	Bypass flow goes to BEL-3
BEL-2 (Inlet 1-1)	B2	1.38	7.6	0.83	7.8	1.15	**8.9**			**8.9**	6.5	2.4	69.5	0.9%	36	Bypass flow goes to BEL-4
BEL-3 (Inlet 2-2)	B3	6.76	14.4	0.56	6.0	2.26	**22.6**			**22.6**	15.8	6.8	75.8	3.2%	36	Takes bypass from BEL-1
BEL-4 (Inlet 1-2)	B4	1.75	7.9	0.84	7.7	1.46	**11.2**			**13.6**	13.6	0.0	110.8	2.9%	36	Takes bypass from BEL-2
BEL-5	B5	4.55	11.0	0.83	6.8	3.76	**26.6**	12.1	3.76	-	-	-	-	-	-	
BEL-6	B6	3.95	7.4	0.80	7.9	3.17	**24.9**	12.1	3.17	-	-	-	-	-	-	

NOTE: BYPASS FLOWS NOT INTERCEPTED BY ON GRADE INLETS HAVE BEEN REDUCED BY 50% AND ADDED TO THE DIRECT FLOW AT THE NEXT DOWNHILL INLET PER SECTION 6.3.2 OF THE TOWN OF PARKER STORM DRAINAGE AND ENVIRONMENTAL CRITERIA MANUAL

LEGEND

- SUB-BASIN #
- 2/5-YEAR RUNOFF COEFFICIENT (*DENOTES 5-YEAR RUNOFF)
- 100-YEAR RUNOFF COEFFICIENT
- AREA (ACRES)
- PROPOSED SUB-BASIN BOUNDARY

DRAWN BY	DATE	REVISIONS
ASD		
RAK		
ASD	B 07/20/2020	REVISED TO ADD OFF-LINE DET BASIN
RAK	A 11/21/2016	REVISED PER TOWN COMMENTS

Manhard CONSULTING
7600 East Orchard Road, Suite 150-N, Greenwood Village, CO 80111 ph 303.708.0500 manhard.com
Civil Engineering & Consulting | Surveying | Water Resource Management | Construction Management

PROPOSED DRAINAGE AREA MAP - FILING NO. 2

TOWN OF PARKER, CO

COMPARK SOUTH

PROJ. MGR.:	RLB
PROJ. ASSOC.:	ASD
DRAWN BY:	RAK
DATE:	6-30-16

SHEET 3 OF 3

CLCPKC3

Compark Villge South Filing No. 2
Proposed Sub-Basins to Detention Basin
9-27-19

	Design Pt	DA (ac)	% Imp	DA x % Imp
CVS-4A (Inlet 3-4)	4A	2.2	0.55	1.21
CVS-5 (Inlet 5-4)	5	2.19	0.45	0.9855
CVS-6 (Inlet 6-4)	6	0.58	0.45	0.261
CVS-6A (FES 2-4)	6A	0.78	0.02	0.0156
CVS-9 (Inlet 4-5A)	9	2.41	0.55	1.3255
CVS-9A (Inlet 4-4)	9A	0.37	0.55	0.2035
CVS-10 (Inlet 5-5A)	10	2.78	0.51	1.4178
CVS-10A (Inlet 5-4A)	10A	0.4	0.63	0.252
CVS-12 (Inlet 2-5)	12	4.58	0.55	2.519
CVS-12A (Inlet 3-5)	12	0.81	0.55	0.4455
CVS-12B (Inlet 3-5)	12A	1.31	0.55	0.7205
CVS-13 (Inlet 4-5)	13	1.16	0.55	0.638
CVS 13A (Inlet 6-5A)	13A	1.2	0.62	0.744
CVS 13B (Inlet 4-5B)	13B	1.53	0.63	0.9639
CVS 13C (Inlet 4-5C)	13C	1.26	0.55	0.693
CVS-14 (Inlet 6-5)	14	1.89	0.55	1.0395
CVS-14A (Inlet 7-5)	14A	4.01	0.02	0.0802
CVS-14B (Inlet 6-5)	14	2.73	0.08	0.2184
CVS-14C (Inlet 5-5B)	14C	1.93	0.55	1.0615
CVS-15 (Inlet 5-5)	15	2.05	0.55	1.1275
CVS-15A (Inlet 6-5B)	15A	0.95	0.59	0.5605
CVS-16	16	2.58	0.55	1.419
CVS-17	17	4.1	0.55	2.255
CVS-18	18	3.06	0.5	1.53
		46.86		21.6864

Overall % Imp = 21.69/46.86= 46.27913

Compark Village South
Belford Ave Proposed Sub-Basins to Det Basin
9-28-19

	Design Pt	DA	% Imp	DA x % Imp
CVS-1 (Inlet 1-3)	1	3.85	0.32	1.232
CVS-2 (Inlet 2-3)	2	1.42	0.77	1.0934
CVS-3 (Inlet 1-4)	3	0.94	0.62	0.5828
CVS-4 (Inlet 2-4)	4	1.17	0.49	0.5733
CVS-7 (Inlet 1-6)	7	1.11	0.78	0.8658
CVS-8 (Inlet 2-6)	8	1.59	0.55	0.8745
CVS-11 (Inlet 1-5)	11	2.03	0.78	1.5834
		12.11		6.8052

Total % Imp= 0.561949

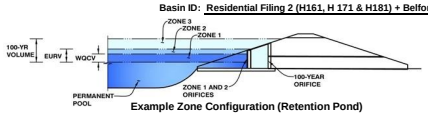
Appendix C

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark South

Basin ID: Residential Filing 2 (H161, H 171 & H181) + Belford Ave + 15 ac Commercial + 11.5 ac F3



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB		
Watershed Area =	73.50	acres	
Watershed Length =	3,100	ft	
Watershed Slope =	0.010	ft/ft	
Watershed Imperviousness =	61.00%	percent	
Percentage Hydrologic Soil Group A =	0.0%	percent	
Percentage Hydrologic Soil Group B =	75.0%	percent	
Percentage Hydrologic Soil Groups C/D =	25.0%	percent	
Desired WQCV Drain Time =	40.0	hours	
Location for 1-hr Rainfall Depths =	Parker - Town Hall		
Water Quality Capture Volume (WQCV) =	1.467	acre-feet	Optional User Override 1-hr Precipitation
Excess Urban Runoff Volume (EURV) =	4.730	acre-feet	
2-yr Runoff Volume (P1 = 0.82 in.) =	2.782	acre-feet	inches
5-yr Runoff Volume (P1 = 1.1 in.) =	4.032	acre-feet	inches
10-yr Runoff Volume (P1 = 1.34 in.) =	5.411	acre-feet	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	7.808	acre-feet	inches
50-yr Runoff Volume (P1 = 1.98 in.) =	9.536	acre-feet	inches
100-yr Runoff Volume (P1 = 2.29 in.) =	11.722	acre-feet	inches
500-yr Runoff Volume (P1 = 3.08 in.) =	16.853	acre-feet	inches
Approximate 2-yr Detention Volume =	2.607	acre-feet	
Approximate 5-yr Detention Volume =	3.791	acre-feet	
Approximate 10-yr Detention Volume =	4.938	acre-feet	
Approximate 25-yr Detention Volume =	5.874	acre-feet	
Approximate 50-yr Detention Volume =	6.358	acre-feet	
Approximate 100-yr Detention Volume =	7.176	acre-feet	

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	1.467	acre-feet
Zone 2 Volume (EURV - Zone 1) =	3.263	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	2.446	acre-feet
Total Detention Basin Volume =	7.176	acre-feet
Initial Surcharge Volume (ISV) =		ft^3
Initial Surcharge Depth (ISD) =		ft
Total Available Detention Depth (H_{total}) =		ft
Depth of Trickle Channel (H_{TC}) =		ft
Slope of Trickle Channel (S_{TC}) =		ft/ft
Slopes of Main Basin Sides (S_{main}) =		H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =		
Initial Surcharge Area (A_{ISV}) =		ft^2
Surcharge Volume Length (L_{ISV}) =		ft
Surcharge Volume Width (W_{ISV}) =		ft
Depth of Basin Floor (H_{FLOOR}) =		ft
Length of Basin Floor (L_{FLOOR}) =		ft
Width of Basin Floor (W_{FLOOR}) =		ft
Area of Basin Floor (A_{FLOOR}) =		ft^2
Volume of Basin Floor (V_{FLOOR}) =		ft^3
Depth of Main Basin (H_{MAIN}) =		ft
Length of Main Basin (L_{MAIN}) =		ft
Width of Main Basin (W_{MAIN}) =		ft
Area of Main Basin (A_{MAIN}) =		ft^2
Volume of Main Basin (V_{MAIN}) =		ft^3
Calculated Total Basin Volume (V_{total}) =		acre-feet

Depth Increment = ft

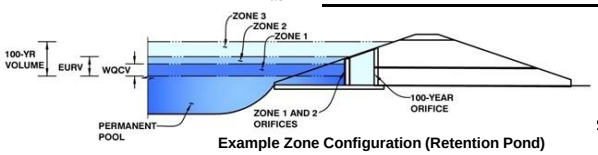
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool									

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark South

Basin ID:



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)			Orifice Plate
Zone 2 (EURV)			Orifice Plate
Zone 3 (100-year)			Weir&Pipe (Restrict)
			Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft²
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft²
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =		inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =		sq. inches	Elliptical Slot Area =	N/A	ft²

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft²
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =		N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =		N/A	feet
Overflow Weir Slope =		N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =		N/A	feet
Overflow Grate Open Area % =		N/A	%, grate open area/total area
Debris Clogging % =		N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =		N/A	feet
Over Flow Weir Slope Length =		N/A	feet
Grate Open Area / 100-yr Orifice Area =		N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =		N/A	ft²
Overflow Grate Open Area w/ Debris =		N/A	ft²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =		N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =		N/A	inches
Restrictor Plate Height Above Pipe Invert =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =		N/A	ft²
Outlet Orifice Centroid =		N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =		N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =		feet
Spillway End Slopes =		H:V
Freeboard above Max Water Surface =		feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=		feet
Stage at Top of Freeboard =		feet
Basin Area at Top of Freeboard =		acres

Routed Hydrograph Results

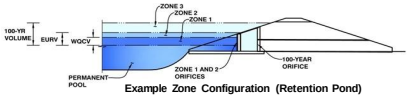
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	1.467	4.730	2.782	4.032	5.411	7.808	9.536	11.722	16.853
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	1.467	4.730	2.782	4.032	5.402	7.800	9.533	11.717	16.848
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.03	0.13	0.45	0.64	0.89	1.42
Predevelopment Peak Q (cfs) =	0.0	0.0	0.5	1.8	9.7	32.9	46.9	65.3	104.1
Peak Inflow Q (cfs) =	19.0	60.3	35.8	51.5	68.6	98.2	119.3	145.6	207.3
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark South

Basin ID: Residential Filing 2 to Inlet 1-3



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	5.27	acres
Watershed Length =	1,172	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	44.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	75.0%	percent
Percentage Hydrologic Soil Groups C/D =	25.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	
Water Quality Capture Volume (WQCV) =	0.084	acre-feet
Excess Urban Runoff Volume (EURV) =	0.238	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.136	acre-feet
5-yr Runoff Volume (P1 = 1.1 in.) =	0.205	acre-feet
10-yr Runoff Volume (P1 = 1.34 in.) =	0.293	acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	0.467	acre-feet
50-yr Runoff Volume (P1 = 1.98 in.) =	0.591	acre-feet
100-yr Runoff Volume (P1 = 2.29 in.) =	0.749	acre-feet
500-yr Runoff Volume (P1 = 3.08 in.) =	1.113	acre-feet
Approximate 2-yr Detention Volume =	0.128	acre-feet
Approximate 5-yr Detention Volume =	0.193	acre-feet
Approximate 10-yr Detention Volume =	0.260	acre-feet
Approximate 25-yr Detention Volume =	0.317	acre-feet
Approximate 50-yr Detention Volume =	0.345	acre-feet
Approximate 100-yr Detention Volume =	0.406	acre-feet

Optional User Override 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.084	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.155	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.168	acre-feet
Total Detention Basin Volume =	0.406	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = ft

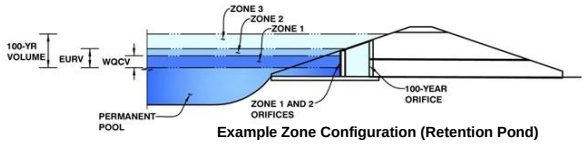
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	42	0.001		
5789	--	0.39	--	--	--	42	0.001	16	0.000
5790	--	1.39	--	--	--	1,078	0.025	566	0.013
5791	--	2.39	--	--	--	10,051	0.231	6,141	0.141
5792	--	3.39	--	--	--	38,742	0.889	30,537	0.701
5793	--	4.39	--	--	--	44,833	1.029	72,325	1.660
5794	--	5.39	--	--	--	48,989	1.125	119,236	2.737
5795	--	6.39	--	--	--	52,725	1.210	170,093	3.905
5796	--	7.39	--	--	--	56,510	1.297	224,710	5.159
5797	--	8.39	--	--	--	60,000	1.377	282,965	6.496

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Filing 2 to Inlet 1-3



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.11	0.084	
Zone 2 (EURV)	2.69	0.155	
Zone 3 (100-year)	3.01	0.168	
		0.406	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = ft (distance below the filtration media surface)

Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft^2

Underdrain Orifice Centroid = feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = inches

Orifice Plate: Orifice Area per Row = inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =			ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =			feet
Overflow Weir Slope =			H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =			feet
Overflow Grate Open Area % =			%, grate open area/total area
Debris Clogging % =			%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =			feet
Over Flow Weir Slope Length =			feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =			ft^2
Overflow Grate Open Area w/ Debris =			ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = feet

Spillway End Slopes = H:V

Freeboard above Max Water Surface = feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= feet

Stage at Top of Freeboard = feet

Basin Area at Top of Freeboard = acres

Routed Hydrograph Results

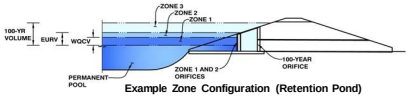
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	0.084	0.238	0.136	0.205	0.293	0.467	0.591	0.749	1.113
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.083	0.238	0.136	0.204	0.292	0.467	0.590	0.749	1.111
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.11	0.39	0.56	0.78	1.25
Predevelopment Peak Q (cfs) =	0.0	0.0	0.0	0.1	0.6	2.1	2.9	4.1	6.6
Peak Inflow Q (cfs) =	1.0	2.9	1.6	2.5	3.5	5.5	7.0	8.9	13.1
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark South

Basin ID: Residential Filing 2 to Inlet 1-4



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	8.63	acres
Watershed Length =	954	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	47.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	75.0%	percent
Percentage Hydrologic Soil Groups C/D =	25.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	
Water Quality Capture Volume (WQCV) =	0.143	acre-feet
Excess Urban Runoff Volume (EURV) =	0.419	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.241	acre-feet
5-yr Runoff Volume (P1 = 1.1 in.) =	0.360	acre-feet
10-yr Runoff Volume (P1 = 1.34 in.) =	0.507	acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	0.792	acre-feet
50-yr Runoff Volume (P1 = 1.98 in.) =	0.994	acre-feet
100-yr Runoff Volume (P1 = 2.29 in.) =	1.253	acre-feet
500-yr Runoff Volume (P1 = 3.08 in.) =	1.850	acre-feet
Approximate 2-yr Detention Volume =	0.226	acre-feet
Approximate 5-yr Detention Volume =	0.338	acre-feet
Approximate 10-yr Detention Volume =	0.453	acre-feet
Approximate 25-yr Detention Volume =	0.549	acre-feet
Approximate 50-yr Detention Volume =	0.597	acre-feet
Approximate 100-yr Detention Volume =	0.696	acre-feet

Optional User Override 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.143	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.277	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.277	acre-feet
Total Detention Basin Volume =	0.696	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = ft

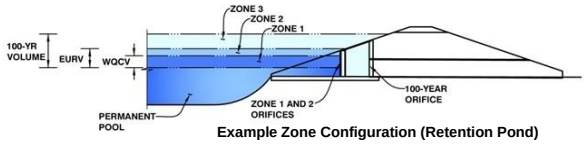
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	42	0.001		
5789	--	0.39	--	--	--	42	0.001	16	0.000
5790	--	1.39	--	--	--	1,078	0.025	566	0.013
5791	--	2.39	--	--	--	10,051	0.231	6,141	0.141
5792	--	3.39	--	--	--	38,742	0.889	30,537	0.701
5793	--	4.39	--	--	--	44,833	1.029	72,325	1.660
5794	--	5.39	--	--	--	48,989	1.125	119,236	2.737
5795	--	6.39	--	--	--	52,725	1.210	170,093	3.905
5796	--	7.39	--	--	--	56,510	1.297	224,710	5.159
5797	--	8.39	--	--	--	60,000	1.377	282,965	6.496

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Filing 2 to Inlet 1-4



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.40	0.143	
Zone 2 (EURV)	3.03	0.277	
Zone 3 (100-year)	3.39	0.277	
		0.696	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = ft (distance below the filtration media surface)

Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft^2

Underdrain Orifice Centroid = feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = inches

Orifice Plate: Orifice Area per Row = inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =			ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =			feet
Overflow Weir Slope =			H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =			feet
Overflow Grate Open Area % =			%, grate open area/total area
Debris Clogging % =			%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =			feet
Over Flow Weir Slope Length =			feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =			ft^2
Overflow Grate Open Area w/ Debris =			ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = feet

Spillway End Slopes = H:V

Freeboard above Max Water Surface = feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= feet

Stage at Top of Freeboard = feet

Basin Area at Top of Freeboard = acres

Routed Hydrograph Results

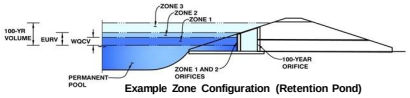
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	0.143	0.419	0.241	0.360	0.507	0.792	0.994	1.253	1.850
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.142	0.419	0.241	0.359	0.507	0.792	0.994	1.254	1.851
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.03	0.17	0.55	0.78	1.08	1.71
Predevelopment Peak Q (cfs) =	0.0	0.0	0.1	0.3	1.4	4.7	6.7	9.3	14.7
Peak Inflow Q (cfs) =	2.3	6.6	3.8	5.7	8.0	12.4	15.5	19.4	28.6
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark South

Basin ID: Residential Filing 2 to Inlet 1-6



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	2.70	acres
Watershed Length =	900	ft
Watershed Slope =	0.006	ft/ft
Watershed Imperviousness =	64.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	75.0%	percent
Percentage Hydrologic Soil Groups C/D =	25.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	
Water Quality Capture Volume (WQCV) =	0.056	acre-feet
Excess Urban Runoff Volume (EURV) =	0.183	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.108	acre-feet
5-yr Runoff Volume (P1 = 1.1 in.) =	0.156	acre-feet
10-yr Runoff Volume (P1 = 1.34 in.) =	0.207	acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	0.295	acre-feet
50-yr Runoff Volume (P1 = 1.98 in.) =	0.359	acre-feet
100-yr Runoff Volume (P1 = 2.29 in.) =	0.439	acre-feet
500-yr Runoff Volume (P1 = 3.08 in.) =	0.628	acre-feet
Approximate 2-yr Detention Volume =	0.101	acre-feet
Approximate 5-yr Detention Volume =	0.147	acre-feet
Approximate 10-yr Detention Volume =	0.190	acre-feet
Approximate 25-yr Detention Volume =	0.225	acre-feet
Approximate 50-yr Detention Volume =	0.244	acre-feet
Approximate 100-yr Detention Volume =	0.273	acre-feet

Optional User Override 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.056	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.127	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.090	acre-feet
Total Detention Basin Volume =	0.273	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = ft

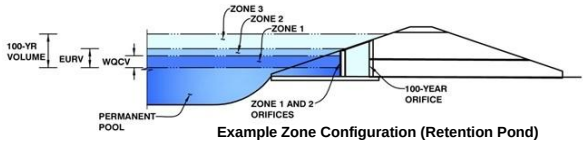
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	42	0.001		
5789	--	0.39	--	--	--	42	0.001	16	0.000
5790	--	1.39	--	--	--	1,078	0.025	566	0.013
5791	--	2.39	--	--	--	10,051	0.231	6,141	0.141
5792	--	3.39	--	--	--	38,742	0.889	30,537	0.701
5793	--	4.39	--	--	--	44,833	1.029	72,325	1.660
5794	--	5.39	--	--	--	48,989	1.125	119,236	2.737
5795	--	6.39	--	--	--	52,725	1.210	170,093	3.905
5796	--	7.39	--	--	--	56,510	1.297	224,710	5.159
5797	--	8.39	--	--	--	60,000	1.377	282,965	6.496

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Filing 2 to Inlet 1-6



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.93	0.056	
Zone 2 (EURV)	2.55	0.127	
Zone 3 (100-year)	2.77	0.090	
		0.273	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth = ft (distance below the filtration media surface)

Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft^2

Underdrain Orifice Centroid = feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice = ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = inches

Orifice Plate: Orifice Area per Row = inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =			ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =			feet
Overflow Weir Slope =			H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =			feet
Overflow Grate Open Area % =			%, grate open area/total area
Debris Clogging % =			%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =			feet
Over Flow Weir Slope Length =			feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =			ft^2
Overflow Grate Open Area w/ Debris =			ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = feet

Spillway End Slopes = H:V

Freeboard above Max Water Surface = feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= feet

Stage at Top of Freeboard = feet

Basin Area at Top of Freeboard = acres

Routed Hydrograph Results

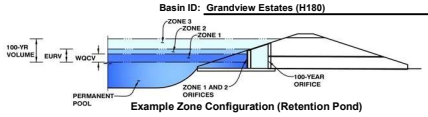
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	0.056	0.183	0.108	0.156	0.207	0.295	0.359	0.439	0.628
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.056	0.182	0.108	0.156	0.207	0.294	0.358	0.438	0.628
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.00	0.02	0.10	0.35	0.49	0.70	1.11
Predevelopment Peak Q (cfs) =	0.0	0.0	0.0	0.1	0.3	0.9	1.3	1.9	3.0
Peak Inflow Q (cfs) =	0.5	1.7	1.0	1.5	1.9	2.7	3.3	4.1	5.8
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Grandview Estates (H180)



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	20.00	acres
Watershed Length =	1,907	ft
Watershed Slope =	0.010	ft/ft
Watershed Imperviousness =	15.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	50.0%	percent
Percentage Hydrologic Soil Groups C/D =	50.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	
Water Quality Capture Volume (WQCV) =	0.155	acre-feet
Excess Urban Runoff Volume (EURV) =	0.275	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.151	acre-feet
5-yr Runoff Volume (P1 = 1.1 in.) =	0.283	acre-feet
10-yr Runoff Volume (P1 = 1.34 in.) =	0.537	acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	1.214	acre-feet
50-yr Runoff Volume (P1 = 1.98 in.) =	1.689	acre-feet
100-yr Runoff Volume (P1 = 2.29 in.) =	2.311	acre-feet
500-yr Runoff Volume (P1 = 3.08 in.) =	3.667	acre-feet
Approximate 2-yr Detention Volume =	0.141	acre-feet
Approximate 5-yr Detention Volume =	0.268	acre-feet
Approximate 10-yr Detention Volume =	0.408	acre-feet
Approximate 25-yr Detention Volume =	0.558	acre-feet
Approximate 50-yr Detention Volume =	0.611	acre-feet
Approximate 100-yr Detention Volume =	0.816	acre-feet

Optional User Override 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

Select Zone 1 Storage Volume (Required) =		acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =		acre-feet
Initial Surcharge Volume (ISV) =	20	ft^3
Initial Surcharge Depth (ISD) =		ft
Total Available Detention Depth (H_{total}) =		ft
Depth of Trickle Channel (H_{TC}) =		ft
Slope of Trickle Channel (S_{TC}) =		ft/ft
Slopes of Main Basin Sides (S_{main}) =		H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =		

Initial Surcharge Area (A_{ISV}) =		ft^2
Surcharge Volume Length (L_{ISV}) =		ft
Surcharge Volume Width (W_{ISV}) =		ft
Depth of Basin Floor (H_{FLOOR}) =		ft
Length of Basin Floor (L_{FLOOR}) =		ft
Width of Basin Floor (W_{FLOOR}) =		ft
Area of Basin Floor (A_{FLOOR}) =		ft^2
Volume of Basin Floor (V_{FLOOR}) =		ft^3
Depth of Main Basin (H_{MAIN}) =		ft
Length of Main Basin (L_{MAIN}) =		ft
Width of Main Basin (W_{MAIN}) =		ft
Area of Main Basin (A_{MAIN}) =		ft^2
Volume of Main Basin (V_{MAIN}) =		ft^3
Calculated Total Basin Volume (V_{total}) =		acre-feet

Depth Increment = ft

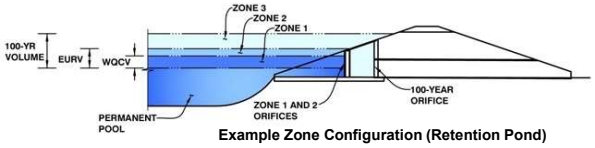
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool									

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Grandview Estates (H180)



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1			
Zone 2			
Zone 3			
		Total	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)
Underdrain Orifice Diameter =		inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =		ft^2
Underdrain Orifice Centroid =		feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =		ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =		inches
Orifice Plate: Orifice Area per Row =		inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =			ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =			feet
Overflow Weir Slope =			H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =			feet
Overflow Grate Open Area % =			%, grate open area/total area
Debris Clogging % =			%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =			feet
Over Flow Weir Slope Length =			feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =			ft^2
Overflow Grate Open Area w/ Debris =			ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =		feet
Spillway End Slopes =		H:V
Freeboard above Max Water Surface =		feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=		feet
Stage at Top of Freeboard =		feet
Basin Area at Top of Freeboard =		acres

Routed Hydrograph Results

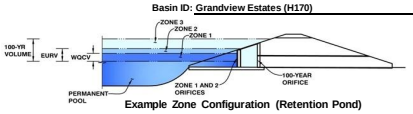
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	0.155	0.275	0.151	0.283	0.537	1.214	1.689	2.311	3.667
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.155	0.274	0.150	0.283	0.536	1.214	1.688	2.309	3.664
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.03	0.13	0.41	0.58	0.81	1.29
Predevelopment Peak Q (cfs) =	0.0	0.0	0.1	0.7	2.6	8.3	11.7	16.2	25.7
Peak Inflow Q (cfs) =	1.9	3.3	1.8	3.4	6.3	14.2	19.7	26.8	42.3
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Grandview Estates (H170)



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	42.00	acres
Watershed Length =	2,378	ft
Watershed Slope =	0.015	ft/ft
Watershed Imperviousness =	15.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	50.0%	percent
Percentage Hydrologic Soil Groups C/D =	50.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	
Water Quality Capture Volume (WQCV) =	0.327	acre-feet
Excess Urban Runoff Volume (EURV) =	0.576	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	0.316	acre-feet
5-yr Runoff Volume (P1 = 1.1 in.) =	0.595	acre-feet
10-yr Runoff Volume (P1 = 1.34 in.) =	1.128	acre-feet
25-yr Runoff Volume (P1 = 1.69 in.) =	2.550	acre-feet
50-yr Runoff Volume (P1 = 1.98 in.) =	3.547	acre-feet
100-yr Runoff Volume (P1 = 2.29 in.) =	4.852	acre-feet
500-yr Runoff Volume (P1 = 3.08 in.) =	7.700	acre-feet
Approximate 2-yr Detention Volume =	0.295	acre-feet
Approximate 5-yr Detention Volume =	0.562	acre-feet
Approximate 10-yr Detention Volume =	0.856	acre-feet
Approximate 25-yr Detention Volume =	1.173	acre-feet
Approximate 50-yr Detention Volume =	1.282	acre-feet
Approximate 100-yr Detention Volume =	1.714	acre-feet

Optional User Override 1-hr Precipitation

	inches
	inches
	inches
	inches
	inches
	inches

Stage-Storage Calculation

Select Zone 1 Storage Volume (Required) =		acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =		acre-feet
Initial Surcharge Volume (ISV) =	43	ft^3
Initial Surcharge Depth (ISD) =		ft
Total Available Detention Depth (H_{total}) =		ft
Depth of Trickle Channel (H_{TC}) =		ft
Slope of Trickle Channel (S_{TC}) =		ft/ft
Slopes of Main Basin Sides (S_{main}) =		H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =		
Initial Surcharge Area (A_{ISV}) =		ft^2
Surcharge Volume Length (L_{ISV}) =		ft
Surcharge Volume Width (W_{ISV}) =		ft
Depth of Basin Floor (H_{FLOOR}) =		ft
Length of Basin Floor (L_{FLOOR}) =		ft
Width of Basin Floor (W_{FLOOR}) =		ft
Area of Basin Floor (A_{FLOOR}) =		ft^2
Volume of Basin Floor (V_{FLOOR}) =		ft^3
Depth of Main Basin (H_{MAIN}) =		ft
Length of Main Basin (L_{MAIN}) =		ft
Width of Main Basin (W_{MAIN}) =		ft
Area of Main Basin (A_{MAIN}) =		ft^2
Volume of Main Basin (V_{MAIN}) =		ft^3
Calculated Total Basin Volume (V_{total}) =		acre-feet

Depth Increment = ft

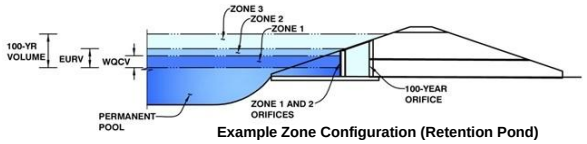
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool									

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Compark Village South

Basin ID: Grandview Estates (H170)



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1			
Zone 2			
Zone 3			
		Total	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)
Underdrain Orifice Diameter =		inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =		ft^2
Underdrain Orifice Centroid =		feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =		ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =		inches
Orifice Plate: Orifice Area per Row =		inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =			ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =			feet
Overflow Weir Slope =			H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =			feet
Overflow Grate Open Area % =			%, grate open area/total area
Debris Clogging % =			%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =			feet
Over Flow Weir Slope Length =			feet
Grate Open Area / 100-yr Orifice Area =			should be ≥ 4
Overflow Grate Open Area w/o Debris =			ft^2
Overflow Grate Open Area w/ Debris =			ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Orifice Area =			ft^2
Outlet Orifice Centroid =			feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=		ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =		feet
Spillway End Slopes =		H:V
Freeboard above Max Water Surface =		feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=		feet
Stage at Top of Freeboard =		feet
Basin Area at Top of Freeboard =		acres

Routed Hydrograph Results

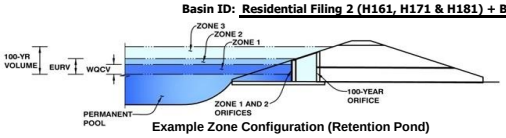
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
Calculated Runoff Volume (acre-ft) =	0.327	0.576	0.316	0.595	1.128	2.550	3.547	4.852	7.700
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.326	0.576	0.315	0.594	1.127	2.548	3.545	4.850	7.696
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.04	0.16	0.50	0.70	0.96	1.53
Predevelopment Peak Q (cfs) =	0.0	0.0	0.3	1.7	6.8	20.9	29.3	40.4	64.1
Peak Inflow Q (cfs) =	4.6	8.0	4.4	8.2	15.5	34.7	48.1	65.4	102.6
Peak Outflow Q (cfs) =									
Ratio Peak Outflow to Predevelopment Q =									
Structure Controlling Flow =									
Max Velocity through Grate 1 (fps) =									
Max Velocity through Grate 2 (fps) =									
Time to Drain 97% of Inflow Volume (hours) =									
Time to Drain 99% of Inflow Volume (hours) =									
Maximum Ponding Depth (ft) =									
Area at Maximum Ponding Depth (acres) =									
Maximum Volume Stored (acre-ft) =									

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.00 (December 2019)

Project: **Compark Village South**

Basin ID: **Residential Filing 2 (H161, H171 & H181) + Belford Ave + 15 ac Commercial + Grand View Estates (H180) + 11 ac Residential Filing 3**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	93.50	acres
Watershed Length =	3,100	ft
Watershed Length to Centroid =	1,550	ft
Watershed Slope =	0.010	ft/ft
Watershed Imperviousness =	51.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	75.0%	percent
Percentage Hydrologic Soil Groups C/D =	25.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides
Water Quality Capture Volume (WQCV) =	1.628	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	4.959	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 0.82 in.) =	2.911	acre-feet	inches
5-yr Runoff Volume (P1 = 1.1 in.) =	4.244	acre-feet	inches
10-yr Runoff Volume (P1 = 1.34 in.) =	5.827	acre-feet	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	8.888	acre-feet	inches
50-yr Runoff Volume (P1 = 1.98 in.) =	11.140	acre-feet	inches
100-yr Runoff Volume (P1 = 2.29 in.) =	13.928	acre-feet	inches
500-yr Runoff Volume (P1 = 3.08 in.) =	20.373	acre-feet	inches
Approximate 2-yr Detention Volume =	2.689	acre-feet	
Approximate 5-yr Detention Volume =	3.992	acre-feet	
Approximate 10-yr Detention Volume =	5.299	acre-feet	
Approximate 25-yr Detention Volume =	6.373	acre-feet	
Approximate 50-yr Detention Volume =	6.921	acre-feet	
Approximate 100-yr Detention Volume =	7.994	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.628	acre-feet
Zone 2 Volume (EURV - Zone 1) =	3.331	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	3.035	acre-feet
Total Detention Basin Volume =	7.994	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

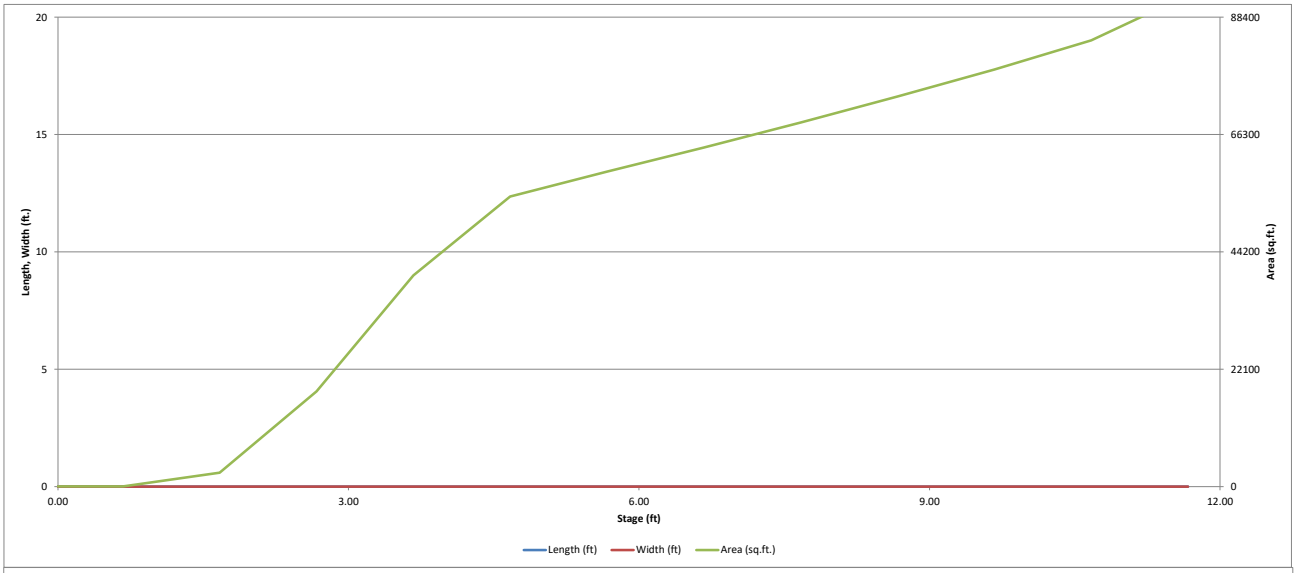
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

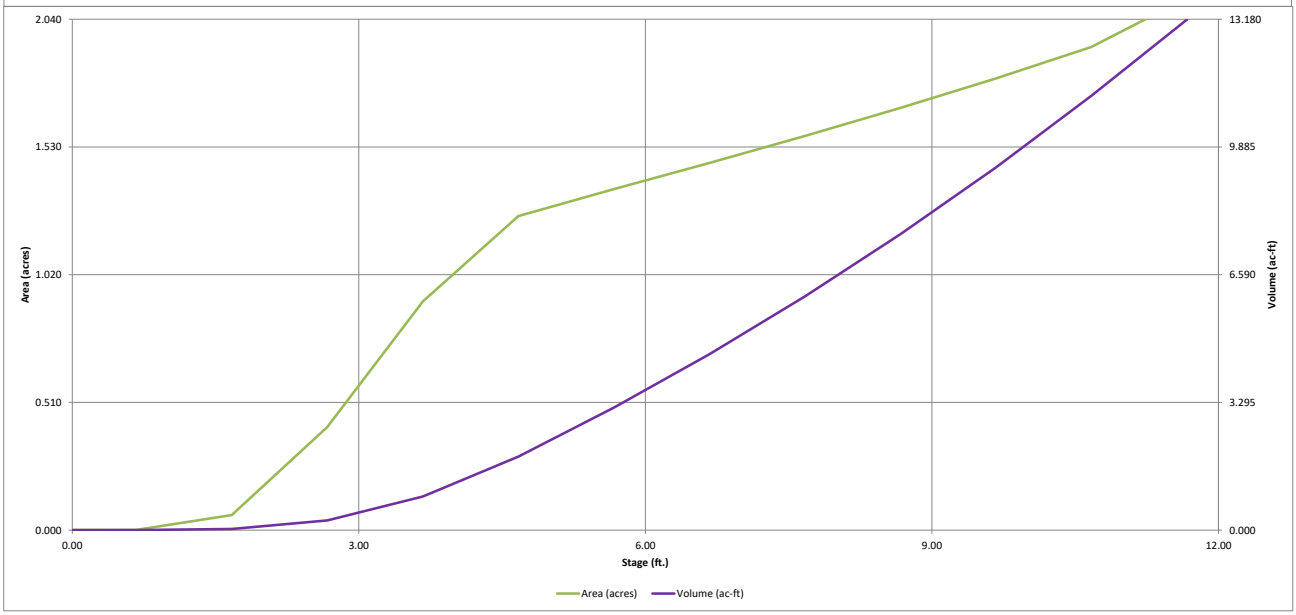
Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	42	0.001		
5788	--	0.67	--	--	--	42	0.001	28	0.001
5789	--	1.67	--	--	--	2,629	0.060	1,361	0.031
5790	--	2.67	--	--	--	17,937	0.412	10,899	0.250
5791	--	3.67	--	--	--	39,784	0.913	37,754	0.867
5792	--	4.67	--	--	--	54,629	1.254	82,640	1.897
5793	--	5.67	--	--	--	59,323	1.362	137,703	3.161
5794	--	6.67	--	--	--	63,858	1.466	197,710	4.539
5795	--	7.67	--	--	--	68,566	1.574	262,573	6.028
5796	--	8.67	--	--	--	73,449	1.686	332,452	7.632
5797	--	9.67	--	--	--	78,549	1.803	407,534	9.356
5798	--	10.67	--	--	--	84,042	1.929	488,019	11.203
5799	--	11.67	--	--	--	92,571	2.125	573,719	13.171

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.00 (December 2019)



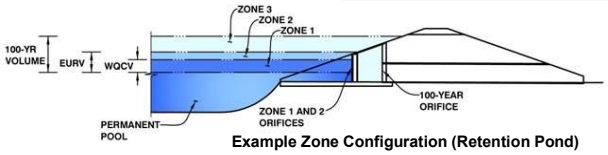


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)

Project: **Compark Village South**

Basin ID: **Residential Filing 2 (H161, H171 & H181) + Belford Ave + 15 ac Commercial + Grand View Estates (H180) + 11 ac Residential Filing 3**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	4.44	1.628	Orifice Plate
Zone 2 (EURV)	6.96	3.331	Orifice Plate
Zone 3 (100-year)	8.89	3.035	Weir&Pipe (Restrict)
Total (all zones)		7.994	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	3.819E-02	ft^2
Depth at top of Zone using Orifice Plate =	7.00	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	28.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	5.50	sq. inches (use rectangular openings)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	2.30	4.60	6.90				
Orifice Area (sq. inches)	5.50	5.50	5.50	5.50				

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected			Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	7.00	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	7.00	N/A	feet
Overflow Weir Front Edge Length =	11.33	N/A	feet	Overflow Weir Slope Length =	3.42	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	6.73	N/A	
Horiz. Length of Weir Sides =	3.42	N/A	feet	Overflow Grate Open Area w/o Debris =	27.12	N/A	ft^2
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	13.56	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.23	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	4.03	N/A	ft^2
Outlet Pipe Diameter =	36.00	N/A	inches	Outlet Orifice Centroid =	0.95	N/A	feet
Restrictor Plate Height Above Pipe Invert =	20.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.68	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	9.67	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.56	feet
Spillway Crest Length =	150.00	feet	Stage at Top of Freeboard =	11.23	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	1.97	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	12.29	acre-ft

Calculated Parameters for Spillway

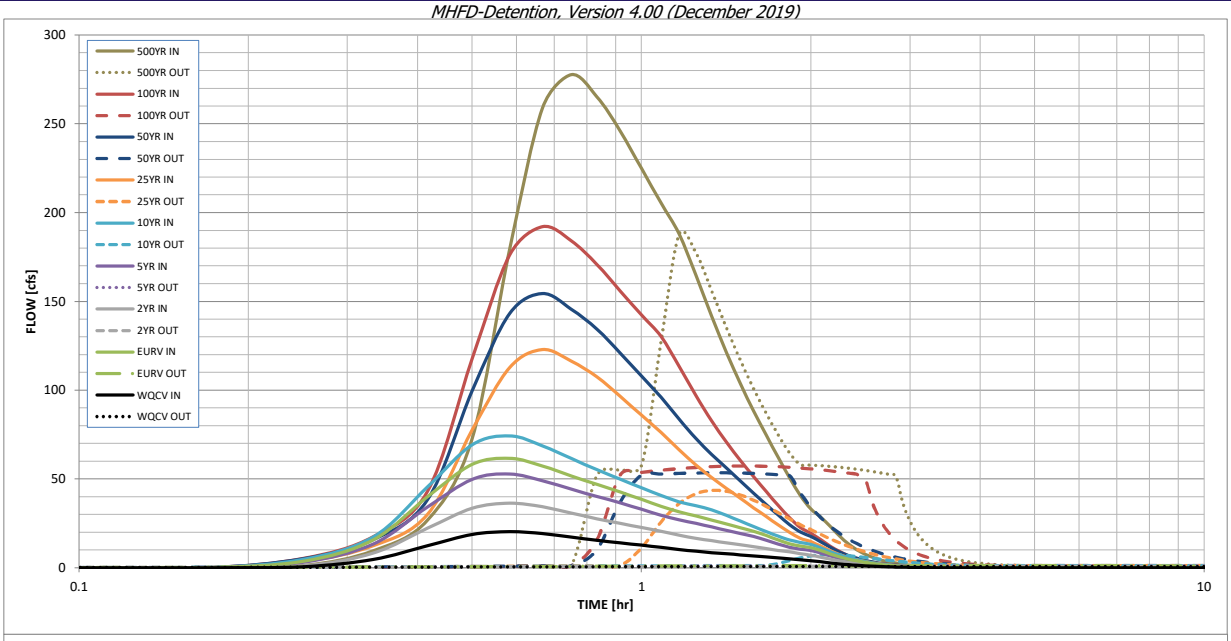
Routed Hydrograph Results

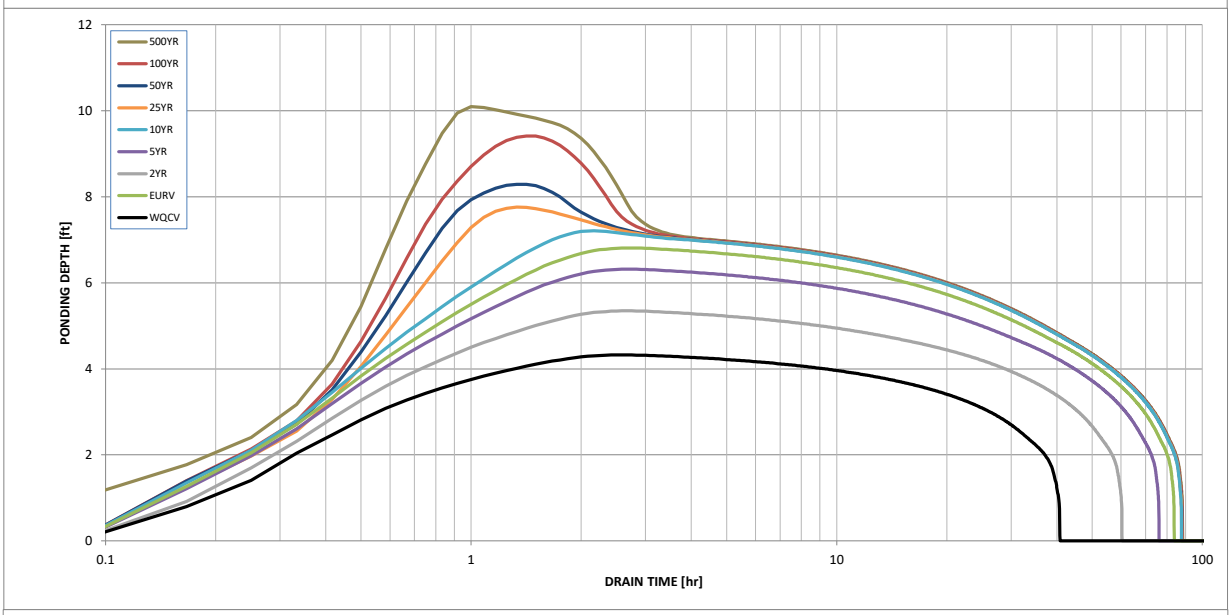
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

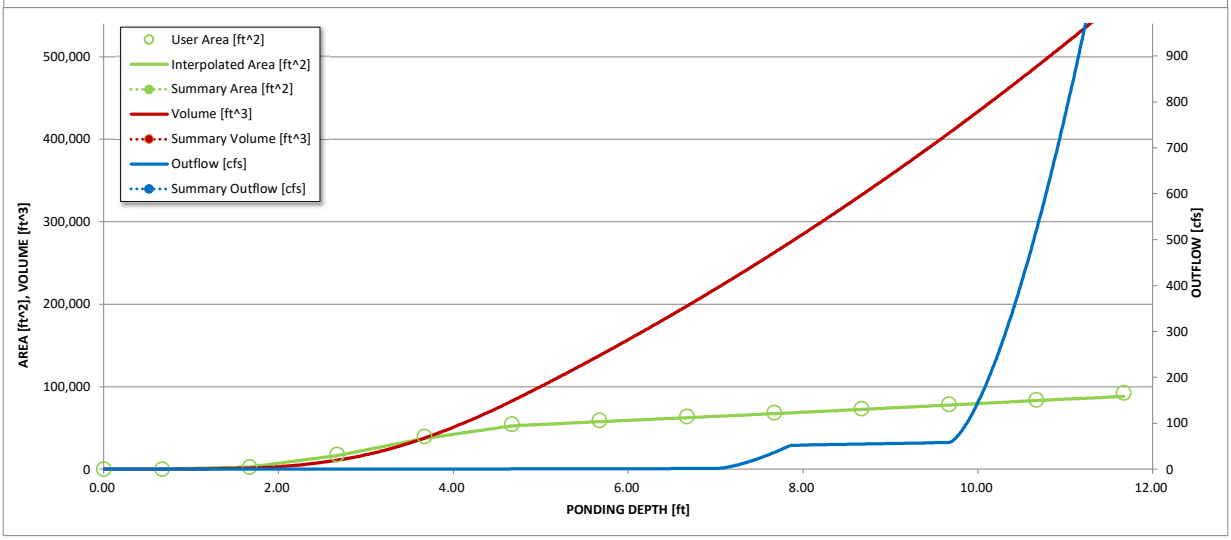
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	0.82	1.10	1.34	1.69	1.98	2.29	3.08
CUHP Runoff Volume (acre-ft) =	1.628	4.959	2.911	4.244	5.827	8.888	11.140	13.928	20.373
Inflow Hydrograph Volume (acre-ft) =	1.628	4.959	2.911	4.244	5.827	8.888	11.140	13.928	20.373
CUHP Predevelopment Peak Q (cfs) =	0.0	0.0	0.6	2.1	13.3	44.6	63.1	87.2	139.0
OPTIONAL Override Predevelopment Peak Q (cfs) =	0.0	0.0							
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.01	0.02	0.14	0.48	0.68	0.93	1.49
Peak Inflow Q (cfs) =	20.3	61.7	36.3	52.8	74.3	122.8	154.4	192.0	277.7
Peak Outflow Q (cfs) =	0.6	1.1	0.9	1.1	7.4	43.5	53.4	57.3	187.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.6	1.0	0.8	0.7	1.4
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.2	1.6	1.9	2.0	2.1
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	77	56	70	80	77	75	73	69
Time to Drain 99% of Inflow Volume (hours) =	**40**	81	59	74	85	83	82	81	79
Maximum Ponding Depth (ft) =	4.33	6.81	5.35	6.32	7.21	7.76	8.30	9.42	10.10
Area at Maximum Ponding Depth (acres) =	1.08	1.45	1.28	1.39	1.49	1.55	1.62	1.75	1.84
Maximum Volume Stored (acre-ft) =	1.497	4.740	2.731	4.030	5.314	6.152	7.009	8.896	10.135

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26
	0:15:00	0.54	3.62	0.96	3.10	4.60	3.52	5.07	5.24	9.50
	0:20:00	4.62	15.61	8.25	13.36	17.31	12.30	15.78	17.38	26.77
	0:25:00	12.42	40.01	22.21	34.24	45.51	30.06	38.26	43.03	72.45
	0:30:00	18.76	58.15	33.54	49.76	69.17	77.41	99.46	117.45	179.61
	0:35:00	20.28	61.65	36.26	52.76	74.25	112.72	143.21	176.21	258.78
	0:40:00	19.17	57.27	34.28	49.01	68.63	122.82	154.40	192.00	277.68
	0:45:00	17.23	51.66	30.81	44.21	61.54	116.36	145.61	184.13	265.26
	0:50:00	15.43	46.95	27.59	40.18	55.19	107.48	134.36	170.87	245.96
	0:55:00	13.96	42.64	24.95	36.49	49.81	96.52	120.88	155.89	224.77
	1:00:00	12.67	38.44	22.66	32.90	45.01	85.85	107.86	142.33	205.44
	1:05:00	11.46	34.57	20.48	29.58	40.65	76.19	96.02	130.22	188.01
	1:10:00	10.25	31.53	18.32	26.98	37.16	66.44	83.67	113.56	164.59
	1:15:00	9.26	29.12	16.55	24.92	34.90	57.83	72.71	96.86	141.61
	1:20:00	8.49	26.81	15.19	22.95	32.53	50.80	63.82	82.71	121.31
	1:25:00	7.83	24.58	14.01	21.03	29.42	44.71	56.11	70.73	103.59
	1:30:00	7.23	22.49	12.92	19.25	26.17	39.01	48.78	60.37	88.16
	1:35:00	6.63	20.51	11.86	17.55	23.15	33.68	41.88	51.23	74.57
	1:40:00	6.04	18.11	10.80	15.49	20.31	28.73	35.48	42.78	62.09
	1:45:00	5.45	15.61	9.75	13.36	17.75	24.15	29.60	35.04	50.69
	1:50:00	4.97	13.52	8.89	11.57	15.63	20.00	24.31	28.18	40.70
	1:55:00	4.44	12.23	7.93	10.46	14.24	16.60	20.07	22.69	33.08
	2:00:00	3.94	11.30	7.05	9.67	13.08	14.65	17.64	19.39	28.42
	2:05:00	3.31	9.65	5.92	8.26	11.12	12.16	14.60	15.76	23.16
	2:10:00	2.68	7.76	4.79	6.64	8.95	9.56	11.44	12.10	17.80
	2:15:00	2.13	6.14	3.82	5.25	7.09	7.39	8.83	9.12	13.42
	2:20:00	1.70	4.87	3.04	4.17	5.62	5.78	6.87	6.88	10.11
	2:25:00	1.35	3.86	2.41	3.30	4.41	4.49	5.31	5.16	7.57
	2:30:00	1.06	3.02	1.90	2.58	3.42	3.47	4.09	3.89	5.70
	2:35:00	0.83	2.32	1.49	1.99	2.61	2.66	3.12	2.99	4.35
	2:40:00	0.65	1.77	1.16	1.52	1.98	2.02	2.37	2.28	3.31
	2:45:00	0.50	1.35	0.90	1.16	1.52	1.55	1.81	1.77	2.57
	2:50:00	0.38	1.02	0.68	0.87	1.17	1.20	1.39	1.37	1.98
	2:55:00	0.28	0.74	0.50	0.64	0.86	0.89	1.04	1.02	1.47
	3:00:00	0.19	0.52	0.35	0.44	0.60	0.63	0.73	0.72	1.03
	3:05:00	0.12	0.34	0.22	0.29	0.39	0.42	0.48	0.47	0.67
	3:10:00	0.07	0.21	0.13	0.18	0.22	0.25	0.28	0.28	0.39
	3:15:00	0.03	0.10	0.06	0.09	0.10	0.12	0.14	0.13	0.18
	3:20:00	0.01	0.04	0.02	0.03	0.03	0.04	0.04	0.04	0.05
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PROJECT: **Compark South**
CODE: CLCPKC3
DESIGN BY: Michael McGuire
DATE: 2/27/2020
REV. :

DETENTION POND FOREBAY A VOLUME

Detention Pond Forebay

FOREBAY OUTLET ELEVATION = 5790.10

WQCV (in)	V (ACRE-FT)	V (FT^3)	Forebay at 3% (FT^3)	Forebay Area at 2.5'$_{DEPTH}$
0.182	1.581	68,889.51	2,066.69	826.67

WQCV Designed from Urban Drainage Criteria Manual Volume 3 (Pgs 3-5 through 3-9)

WQCV=a(0.91i^3-1.19i^2+0.78i)

a=1.0 40-hr drain time

V=(WQCV/12)A

http://www.udfcd.org/downloads/pdf/critmanual/Volume%203%20PDFs/Chapter%203%20Calculating%20the%20WQCV%20and%20Volume%20Reduction.pdf

Forbay Sizing Designed from Urban Drainage Criteria Manual Volume 3 (Pg EDB-12 table EDB-4)

http://www.udfcd.org/downloads/pdf/critmanual/Volume%203%20PDFs/Chapter%204%20Treatment%20BMPs.pdf

Ground Coverage

Weighted I (%):	**41.00%**
Total Acerage:	**104.00**

Forebay A Outlet Weir

Project Description

Solve For	Crest Length

Input Data

Discharge	3.71	ft³/s	2% Undetained 100 Yr Runoff
Headwater Elevation	2.50	ft	
Crest Elevation	0.00	ft	
Tailwater Elevation	0.00	ft	
Weir Coefficient	3.00	US	
Number Of Contractions	0		

Results

Crest Length	0.31	ft	Use 0.33'
Headwater Height Above Crest	2.50	ft	
Tailwater Height Above Crest	0.00	ft	
Flow Area	0.78	ft²	
Velocity	4.74	ft/s	
Wetted Perimeter	5.31	ft	
Top Width	0.31	ft	

PROJECT: **Compark South**
CODE: CLCPKC3
DESIGN BY: Michael McGuire
DATE: 2/27/2020
REV. :

DETENTION POND FOREBAY B VOLUME

Detention Pond Forebay

FOREBAY OUTLET ELEVATION =5789.72

WQCV (in)	V (ACRE-FT)	V (FT^3)	Forebay at 2% (FT^3)	Forebay Area at 2.0'$_{DEPTH}$
0.217	0.843	36,710.93	734.22	293.69

WQCV Designed from Urban Drainage Criteria Manual Volume 3 (Pgs 3-5 through 3-9)

WQCV=a(0.91i^3-1.19i^2+0.78i)

a=1.0 40-hr drain time

V=(WQCV/12)A

http://www.udfcd.org/downloads/pdf/critmanual/Volume%203%20PDFs/Chapter%203%20Calculating%20the%20WQCV%20and%20Volume%20Reduction.pdf

Forbay Sizing Designed from Urban Drainage Criteria Manual Volume 3 (Pg EDB-12 table EDB-4)

http://www.udfcd.org/downloads/pdf/critmanual/Volume%203%20PDFs/Chapter%204%20Treatment%20BMPs.pdf

Ground Coverage

Weighted I (%):	**54.00%**
Total Acerage:	**46.50**

Forebay B Weir

Project Description

Solve For	Crest Length

Input Data

Discharge	1.58	ft³/s	2% Undetained 100 yr Runoff
Headwater Elevation	2.00	ft	
Crest Elevation	0.00	ft	
Tailwater Elevation	0.00	ft	
Weir Coefficient	3.00	US	
Number Of Contractions	0		

Results

Crest Length	0.19	ft	Use 3" Minimum
Headwater Height Above Crest	2.00	ft	
Tailwater Height Above Crest	0.00	ft	
Flow Area	0.37	ft²	
Velocity	4.24	ft/s	
Wetted Perimeter	4.19	ft	
Top Width	0.19	ft	

Appendix D

COMPARK VILLAGE SOUTH - 2 YR STORM

FlexTable: Conduit Table

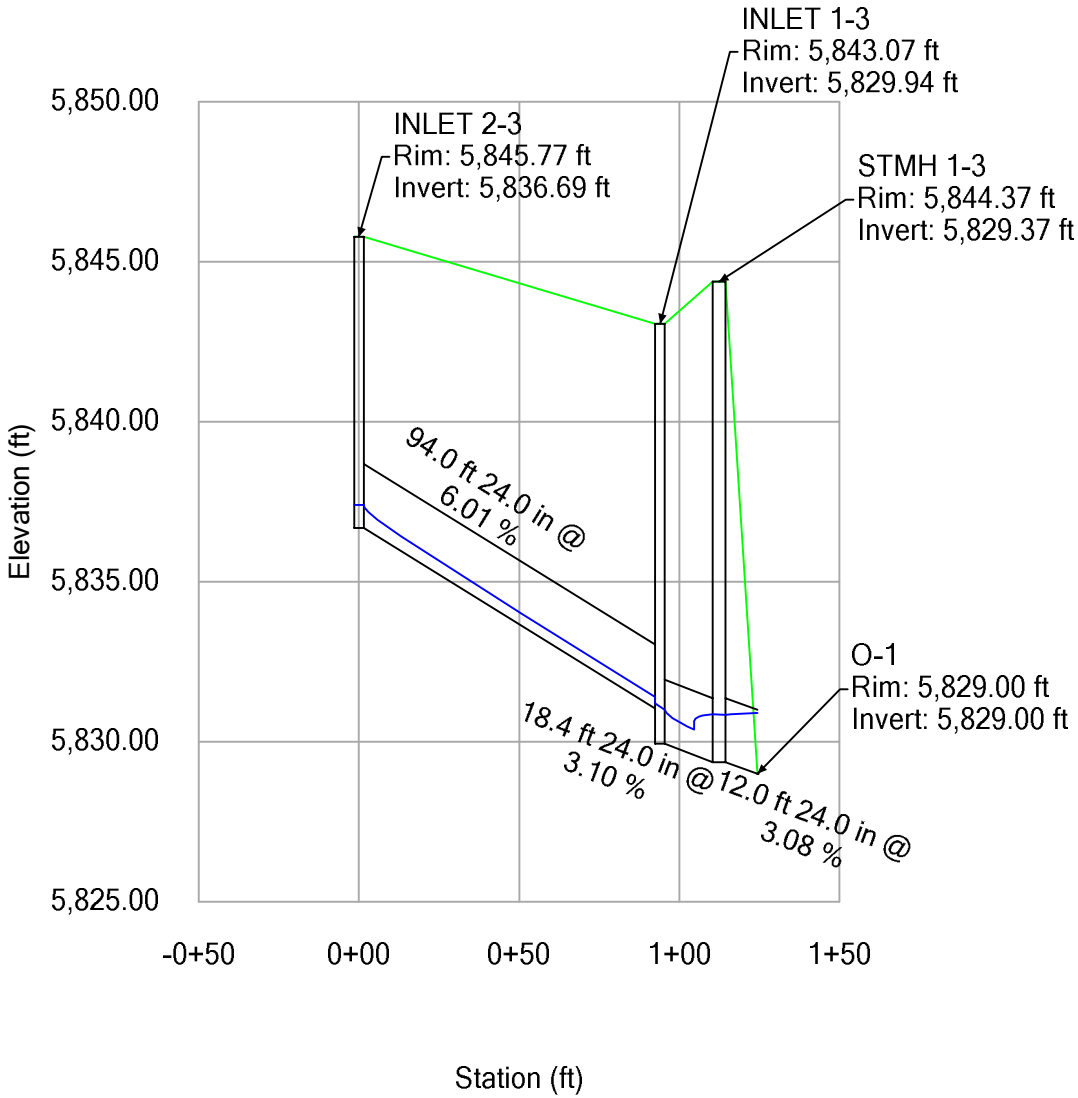
Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
STMH 6-4	5,834.91	INLET 6-4	5,832.53	120.0	1.98	Circle	36.0	0.013	8.50	8.25	5,835.83	5,833.14
INLET 6-4	5,832.33	STMH 5-4	5,827.71	278.0	1.66	Circle	36.0	0.013	9.60	8.03	5,833.31	5,828.39
FES 2-5	5,834.54	INLET 8-5	5,834.00	7.7	7.01	Circle	24.0	0.013	4.10	10.91	5,835.25	5,834.45
INLET 5-4	5,829.34	STMH 5-4	5,828.83	52.0	0.99	Circle	18.0	0.013	3.40	5.28	5,830.05	5,829.42
INLET 3-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18.0	0.013	3.90	5.40	5,826.18	5,825.89
INLET 1-4	5,823.04	STMH 2-4	5,821.92	65.0	1.72	Circle	18.0	0.013	2.30	5.79	5,823.61	5,822.33
INLET 4-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18.0	0.013	0.90	3.57	5,825.77	5,825.53
INLET 2-6	5,814.55	INLET 1-6	5,814.15	80.0	0.50	Circle	18.0	0.013	2.90	3.94	5,815.20	5,814.96
INLET 2-3	5,836.69	INLET 1-3	5,831.04	94.0	6.01	Circle	24.0	0.013	4.20	10.40	5,837.41	5,831.41
FES 2-4	5,842.00	STMH 6-4	5,835.11	221.0	3.12	Circle	36.0	0.013	8.50	9.68	5,842.92	5,835.66
STMH 5-4	5,827.41	STMH 4-4	5,822.96	163.0	2.73	Circle	36.0	0.013	14.00	10.69	5,828.60	5,823.68
INLET 4-5	5,812.96	STMH 2-5A	5,812.27	19.0	3.63	Circle	18.0	0.013	2.40	7.64	5,813.55	5,813.63
INLET 5-5	5,813.90	STMH 2-5	5,811.47	49.0	4.96	Circle	18.0	0.013	3.30	9.35	5,814.59	5,813.40
STMH 4-4	5,822.16	STMH 3-4	5,821.56	79.0	0.76	Circle	36.0	0.013	18.80	7.34	5,823.55	5,822.99
STMH 3-4	5,821.46	STMH 2-4	5,820.65	76.0	1.07	Circle	36.0	0.013	21.30	8.59	5,822.94	5,821.82
INLET 2-4	5,822.07	STMH 3-4	5,821.56	56.0	0.91	Circle	18.0	0.013	2.50	4.71	5,822.96	5,822.97
STMH 1-6	5,806.20	FES1-6	5,806.00	40.0	0.50	Circle	24.0	0.013	0.00	0.00	5,806.20	5,806.00
INLET 8-5	5,833.51	INLET 7-5	5,827.49	173.0	3.48	Circle	24.0	0.013	4.10	8.52	5,834.22	5,827.91
INLET 4-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18.0	0.013	4.10	5.96	5,821.92	5,821.91
INLET 5-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18.0	0.013	4.20	6.00	5,821.93	5,821.91
STMH 2-5	5,811.37	INLET 3-5	5,810.99	16.0	2.38	Circle	42.0	0.013	36.10	13.13	5,813.23	5,812.45
INLET 7-5	5,827.14	STMH 4-5	5,822.27	104.6	4.66	Circle	24.0	0.013	4.30	9.57	5,827.87	5,823.07
STMH 4-5	5,822.27	INLET 6-5	5,821.44	23.0	3.61	Circle	24.0	0.013	4.30	8.75	5,823.00	5,822.20
STMH 2-5A	5,812.17	STMH 2-5	5,811.47	50.0	1.40	Circle	36.0	0.013	20.00	9.32	5,813.60	5,813.41
STMH 2-5B	5,815.51	STMH 2-5A	5,812.17	241.0	1.39	Circle	30.0	0.013	17.60	9.06	5,816.93	5,813.65
STMH 1-4	5,818.23	FES 1-4	5,818.00	46.0	0.50	Circle	36.0	0.013	0.00	0.00	5,818.23	5,818.00
INLET 1-3	5,829.94	STMH 1-3	5,829.37	18.4	3.10	Circle	24.0	0.013	8.90	10.21	5,831.00	5,830.87
STMH 1-3	5,829.37	O-1	5,829.00	12.0	3.08	Circle	24.0	0.013	8.90	10.19	5,830.85	5,830.90
INLET 5-4A	5,829.26	STMH 5-4	5,828.83	43.0	1.00	Circle	18.0	0.013	1.00	3.75	5,829.63	5,829.14
STMH 2-5E	5,820.80	STMH 2-5D	5,820.12	44.0	1.55	Circle	24.0	0.013	8.30	7.79	5,821.83	5,821.42
STMH 2-5D	5,820.12	STMH 2-5C	5,819.49	45.0	1.40	Circle	24.0	0.013	11.80	8.25	5,821.35	5,820.86
STMH 2-5C	5,819.49	STMH 2-5B	5,815.51	289.0	1.38	Circle	30.0	0.013	15.20	8.69	5,820.81	5,816.97
INLET 4-5B	5,819.70	STMH 2-5C	5,819.52	18.0	1.00	Circle	18.0	0.013	3.40	5.30	5,820.85	5,820.85
INLET 5-5B	5,828.30	STMH 2-5D	5,820.22	293.0	2.76	Circle	18.0	0.013	3.50	7.71	5,829.01	5,821.43
INLET 4-5C	5,815.79	STMH 2-5B	5,815.61	18.0	1.00	Circle	18.0	0.013	2.40	4.82	5,816.96	5,816.96
INLET 6-5	5,821.14	STMH 3-5A	5,812.67	247.0	3.43	Circle	30.0	0.013	8.20	10.12	5,822.09	5,813.92
STMH 3-5A	5,812.67	STMH 2-5	5,811.37	48.0	2.71	Circle	30.0	0.013	12.80	10.58	5,813.87	5,813.31
INLET 6-5A	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18.0	0.013	2.60	4.93	5,813.90	5,813.91
INLET 6-5B	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18.0	0.013	2.00	4.58	5,813.90	5,813.90
INLET 1-6	5,814.05	DIVERSION - STMH 8-12	5,813.06	16.0	6.19	Circle	24.0	0.013	5.80	11.56	5,814.90	5,813.57
STMH 1-12	5,820.16	STMH 2-12	5,819.90	52.0	0.50	Circle	30.0	0.013	23.60	6.58	5,822.55	5,822.40
STMH 2-12	5,819.80	STMH 3-12	5,818.95	168.0	0.51	Circle	30.0	0.013	23.60	6.62	5,821.51	5,820.65
STMH 3-12	5,818.85	STMH 4-12	5,817.87	196.0	0.50	Circle	30.0	0.013	23.60	6.58	5,820.56	5,819.57
STMH 4-12	5,817.77	STMH 5-12	5,816.76	202.0	0.50	Circle	30.0	0.013	23.60	6.58	5,819.48	5,818.41
STMH 5-12	5,816.66	STMH 6-12	5,808.94	286.0	2.70	Circle	30.0	0.013	23.60	12.51	5,818.31	5,811.37
STMH 7-12	5,812.68	STMH 6-12	5,812.33	70.0	0.50	Circle	18.0	0.013	5.80	4.65	5,813.68	5,813.26
INLET 2-5	5,808.00	STMH 10-12	5,807.36	27.0	2.37	Circle	24.0	0.013	7.90	8.97	5,809.29	5,809.36
STMH 10-12	5,807.36	INLET 1-5	5,808.34	67.9	-1.44	Circle	24.0	0.013	4.90	6.56	5,809.28	5,809.36

FlexTable: Conduit Table

Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
STMH 6-12	5,808.84	STMH 9-12	5,807.59	249.0	0.50	Circle	42.0	0.013	29.40	7.05	5,810.51	5,809.35
STMH 9-12	5,807.49	STMH 10-12	5,806.11	275.0	0.50	Circle	48.0	0.013	29.40	7.01	5,809.30	5,809.36
STMH 10-12	5,806.01	STMH 11-12	5,805.48	108.0	0.49	Circle	48.0	0.013	42.20	7.66	5,809.34	5,809.29
MH 14-12	5,790.84	FES 1-5	5,790.00	126.0	0.67	Circle	60.0	0.013	83.21	10.17	5,793.87	5,794.00
STMH 12-12	5,795.80	MH 13-12	5,792.31	233.0	1.50	Circle	60.0	0.013	83.21	13.66	5,798.39	5,795.44
MH 13-12	5,792.21	MH 14-12	5,790.94	255.0	0.50	Circle	60.0	0.013	83.21	9.13	5,794.80	5,794.31
STMH 2-4	5,820.42	STMH 1-12	5,820.26	32.0	0.50	Circle	30.0	0.013	23.60	0.00	5,823.64	5,823.53
DIVERSION - STMH 8-12	5,812.96	STMH 7-12	5,812.78	35.0	0.51	Circle	18.0	0.013	5.80	0.00	5,814.67	5,814.56
STMH 11-12	5,805.38	STMH 11A-12	5,802.37	114.0	2.64	Circle	60.0	0.013	82.20	16.69	5,807.95	5,804.97
STMH 11A-12	5,802.27	STMH 12-12	5,795.90	318.0	2.00	Circle	60.0	0.013	82.20	15.11	5,804.84	5,799.74
STMH 2-4	5,820.42	STMH 1-4	5,818.85	60.0	2.61	Circle	36.0	0.013	0.00	0.00	5,820.42	5,818.85
DIVERSION - STMH 8-12	5,812.96	STMH 1-6	5,806.30	116.0	5.74	Circle	24.0	0.013	0.00	0.00	5,812.96	5,806.30
INLET 3-5	5,810.89	MH-1-5A	5,808.93	105.5	1.86	Circle	48.0	0.013	40.00	12.24	5,812.78	5,810.21
MH-1-5A	5,808.83	STMH 11-12	5,805.47	95.1	3.53	Circle	48.0	0.013	40.00	15.40	5,810.72	5,809.29
OUTLET STRUCTURE	5,787.19	O-2	5,785.30	127.9	1.48	Circle	36.0	0.013	0.90	3.80	5,787.48	5,785.52
CB-13	5,792.34	FOREBAY B	5,790.35	32.3	6.16	Circle	30.0	0.013	36.30	19.00	5,794.38	5,792.68

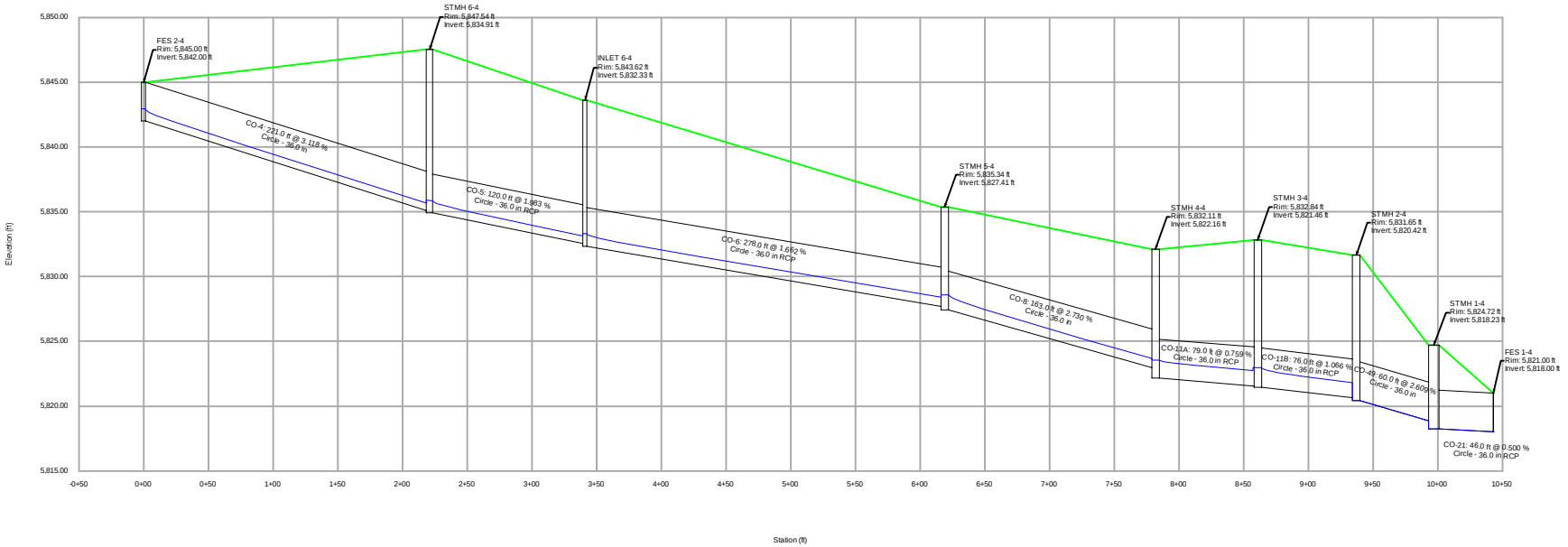
Profile Report

Engineering Profile - Profile - Storm Line 03 (Compark Village South StormCAD [2 year].stsw)



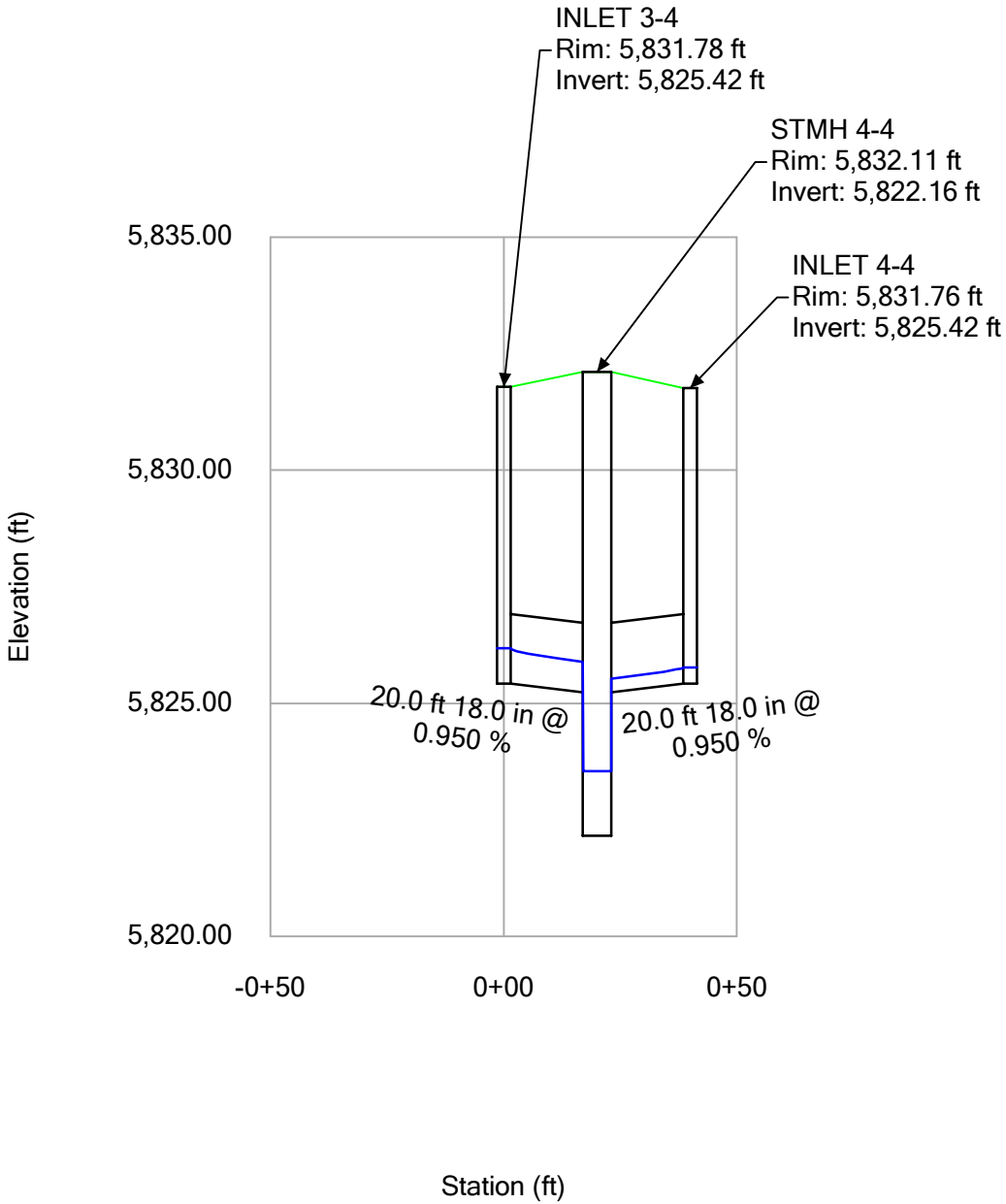
Profile Report

Engineering Profile - Profile - Storm Line 04 (Compark Village South StormCAD [2 year].stsw)



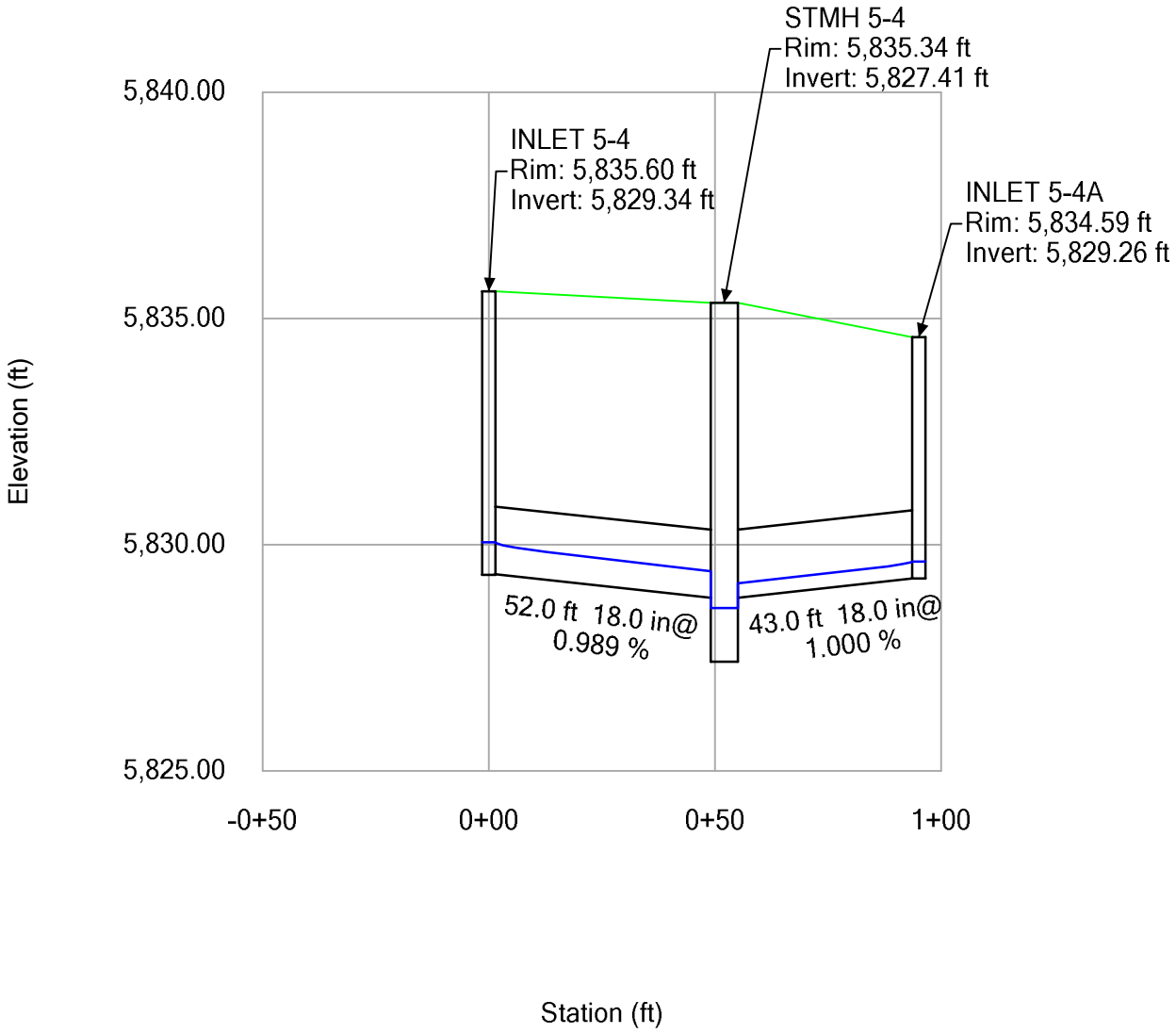
Profile Report

Engineering Profile - Profile - Storm Line 04A (Compark Village South StormCAD [2 year].stsw)



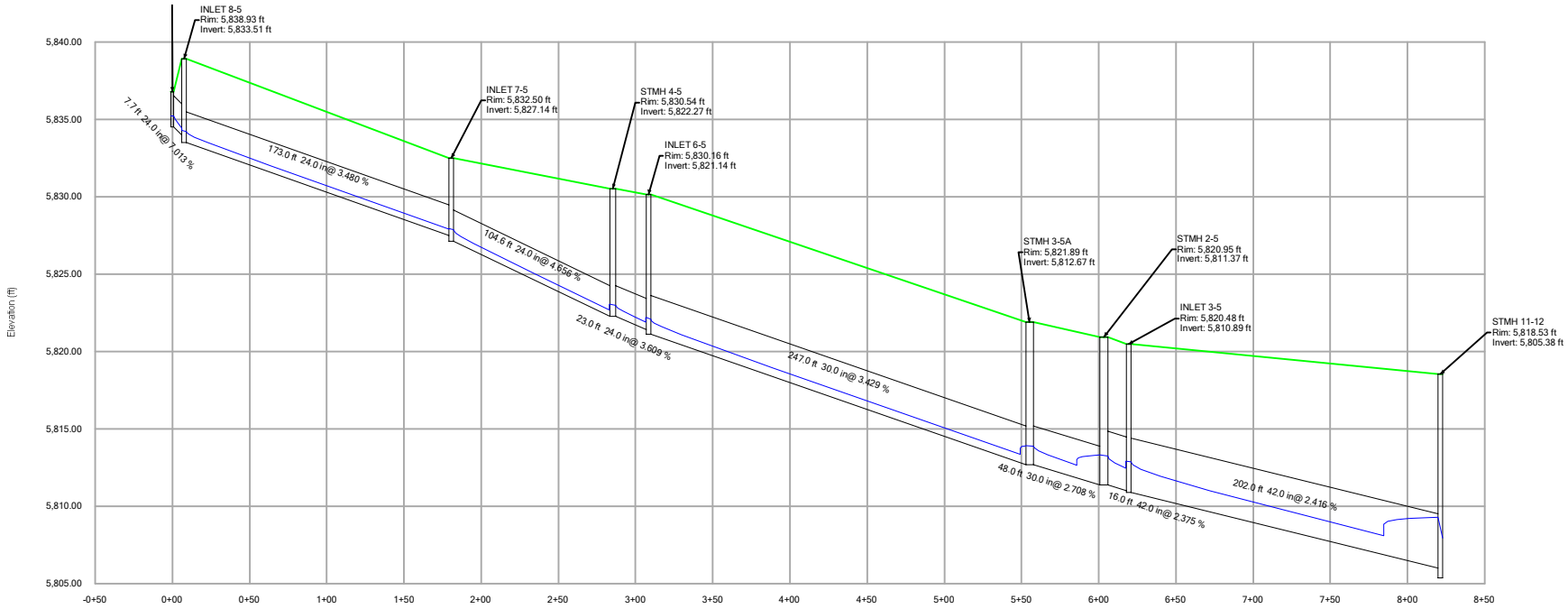
Profile Report

Engineering Profile - Profile - Storm Line 04B (Compark Village South StormCAD [2 year].stsw)



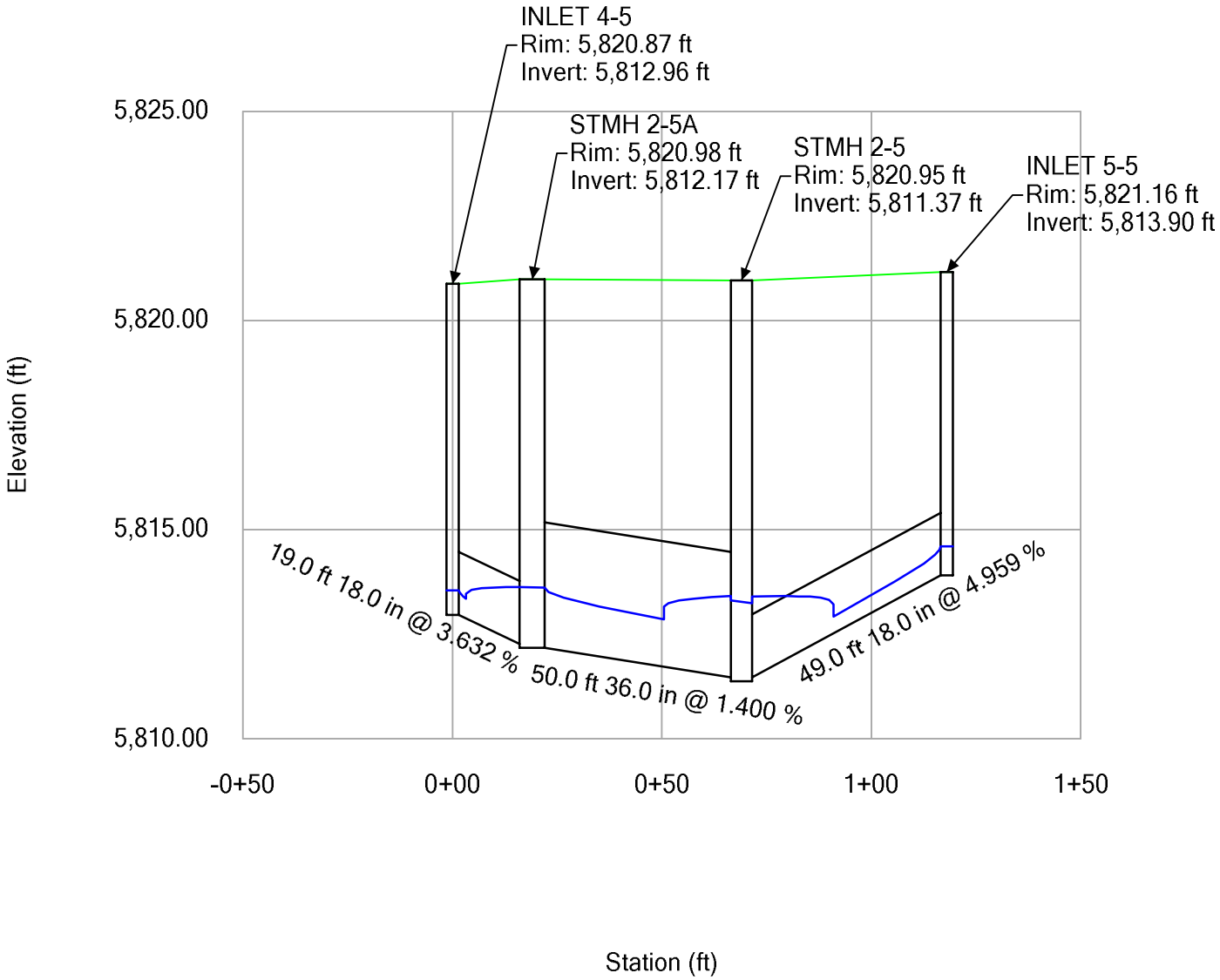
Profile Report

Engineering Profile - Profile - Storm Line 05 (Compark Village South StormCAD [2 year].stsw)



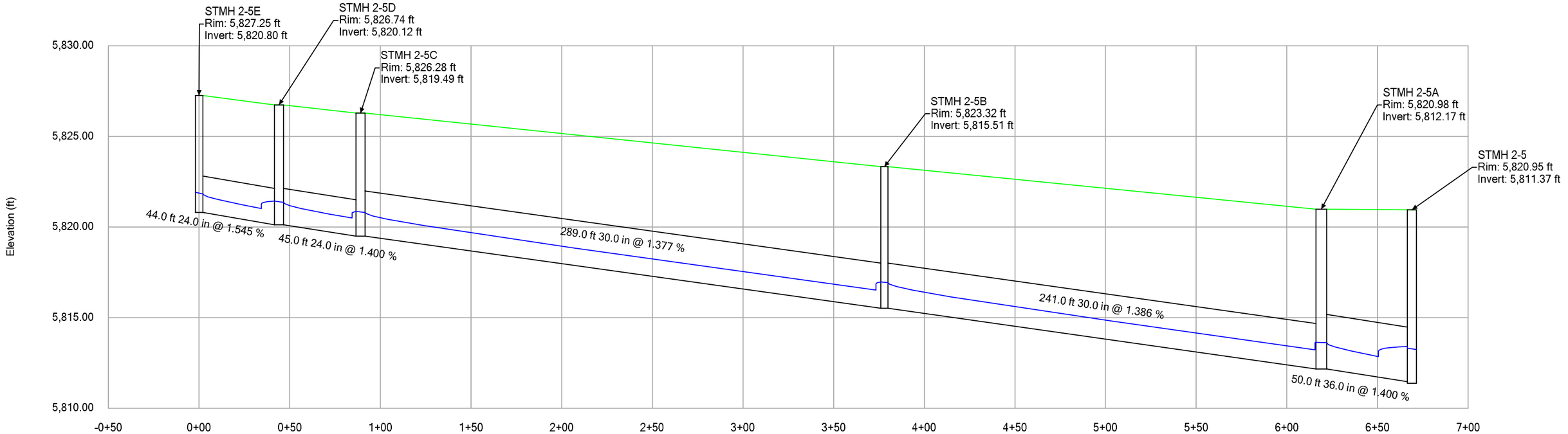
Profile Report

Engineering Profile - Profile - Storm Line 05B (Compark Village South StormCAD [2 year].stsw)



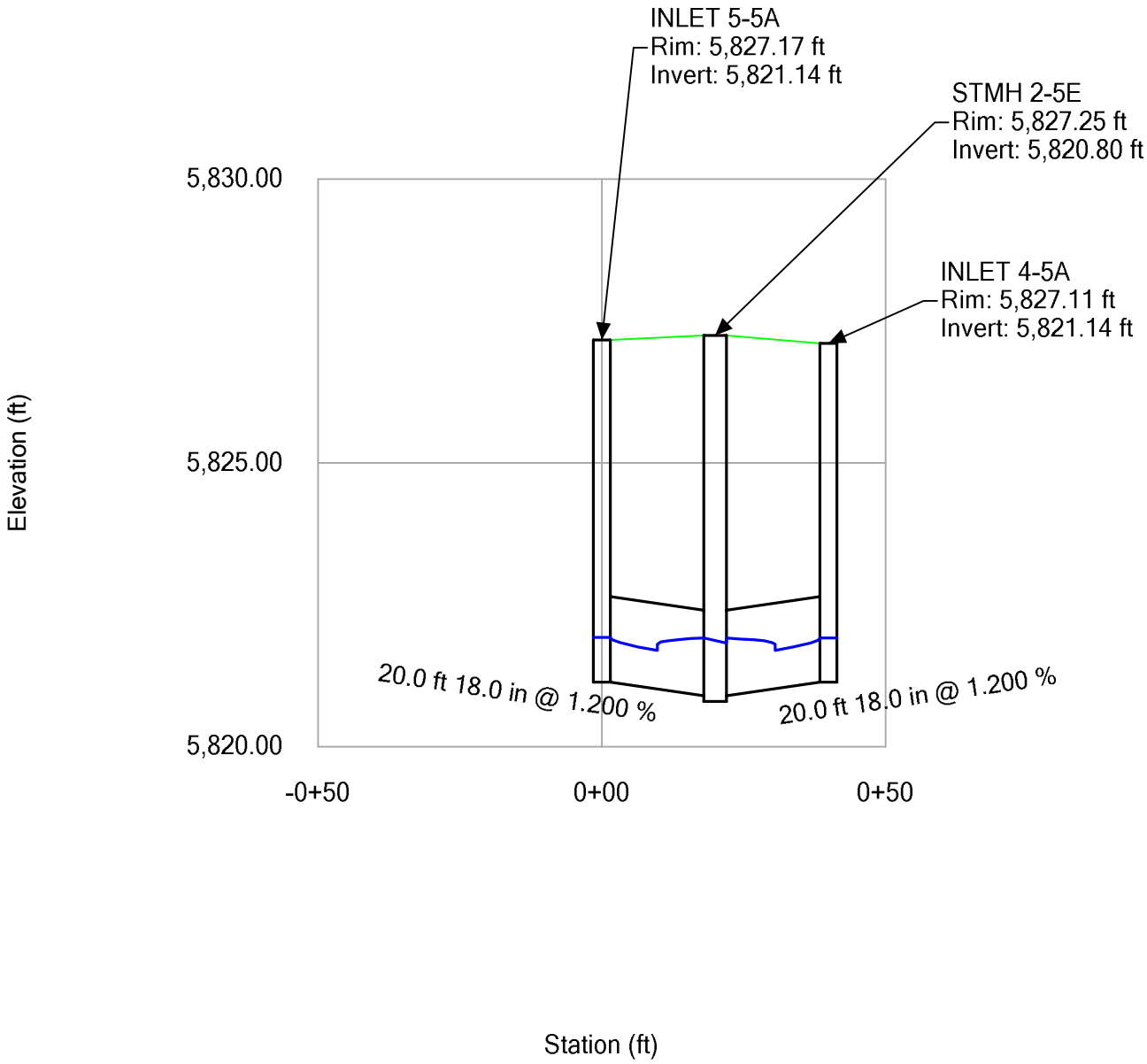
Profile Report

Engineering Profile - Profile - Storm Line 05C (Compark Village South StormCAD [2 year].stsw)



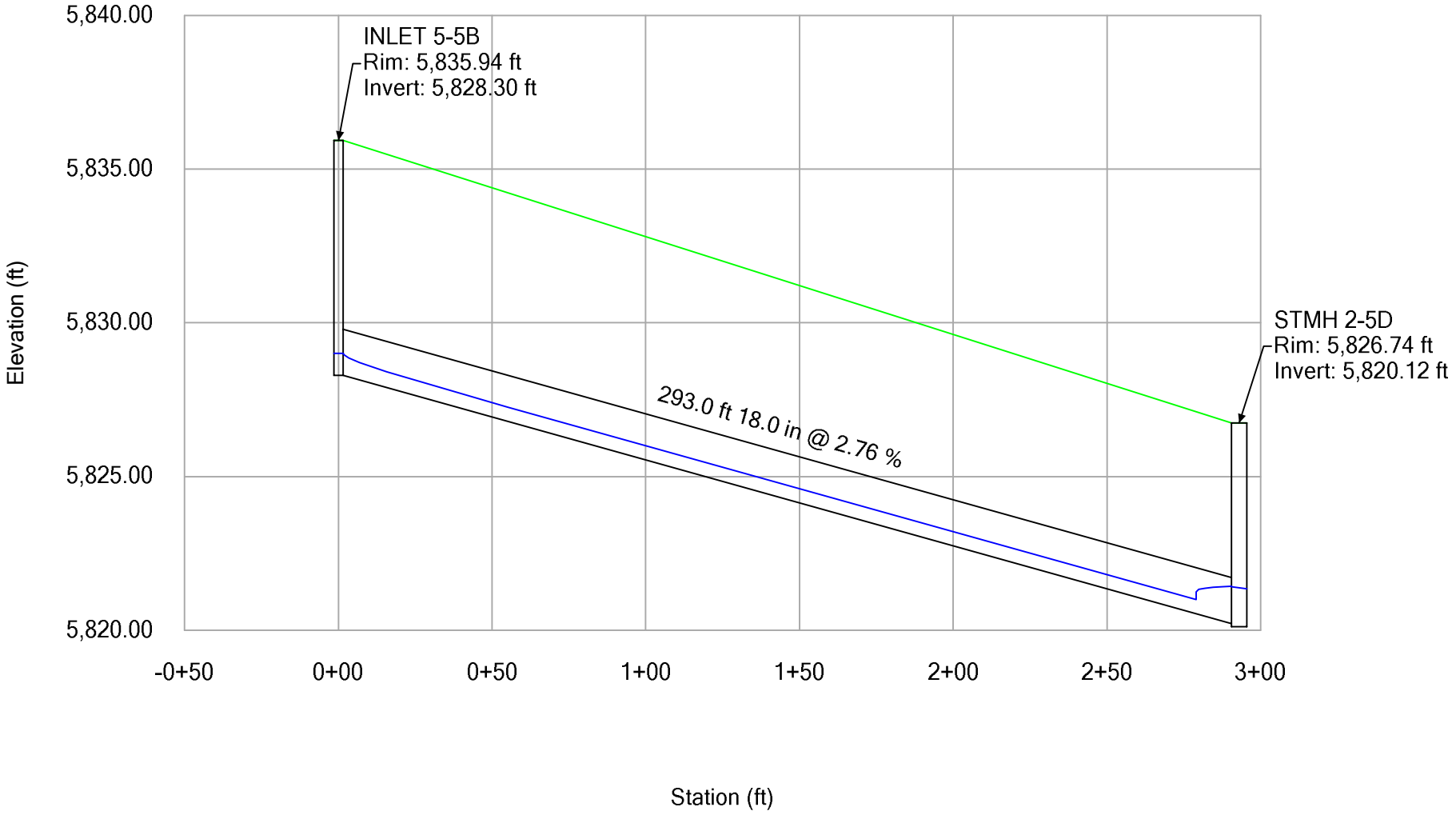
Profile Report

Engineering Profile - Profile - Storm Line 05D (Compark Village South StormCAD [2 year].stsw)



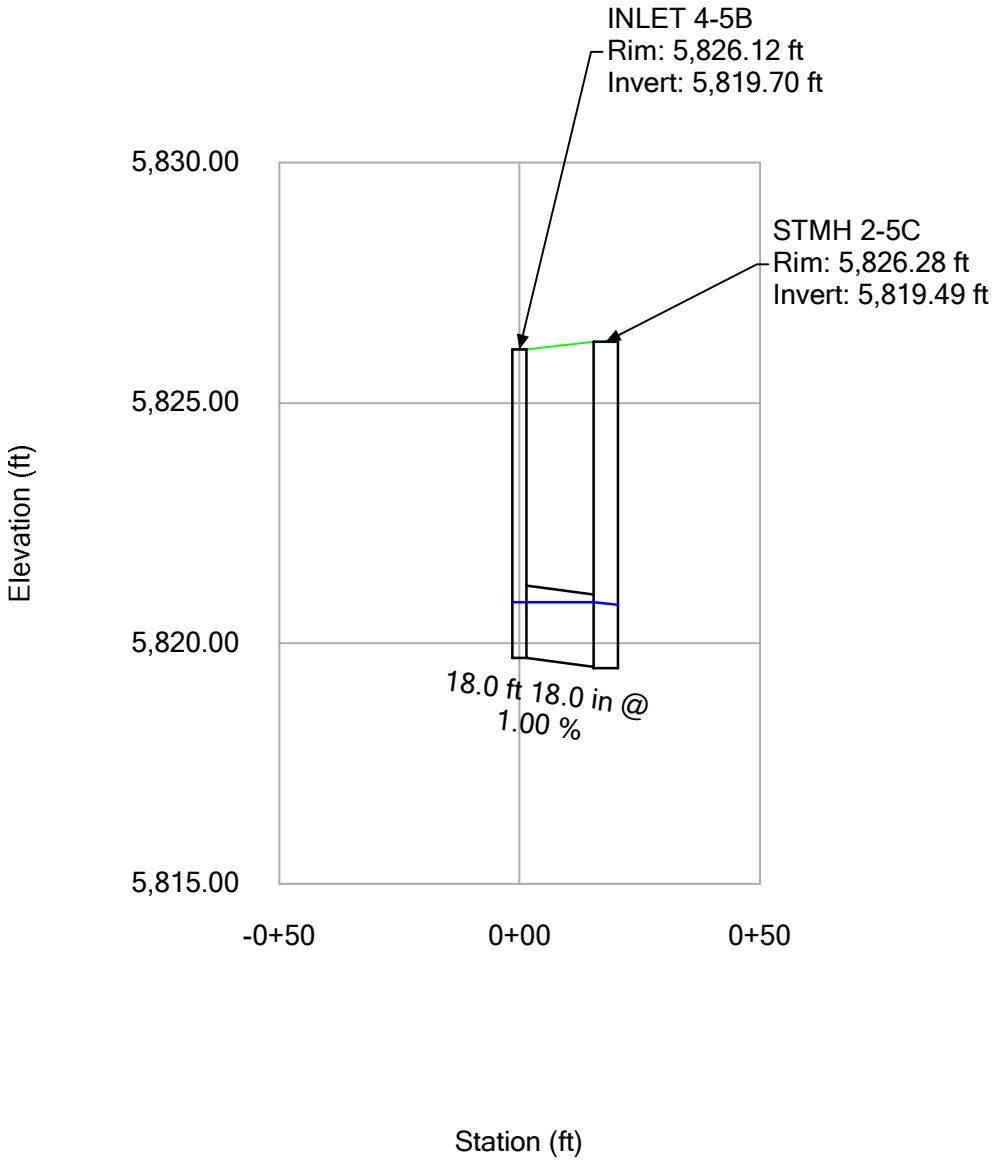
Profile Report

Engineering Profile - Profile - Storm Line 05E (Compark Village South StormCAD [2 year].stsw)



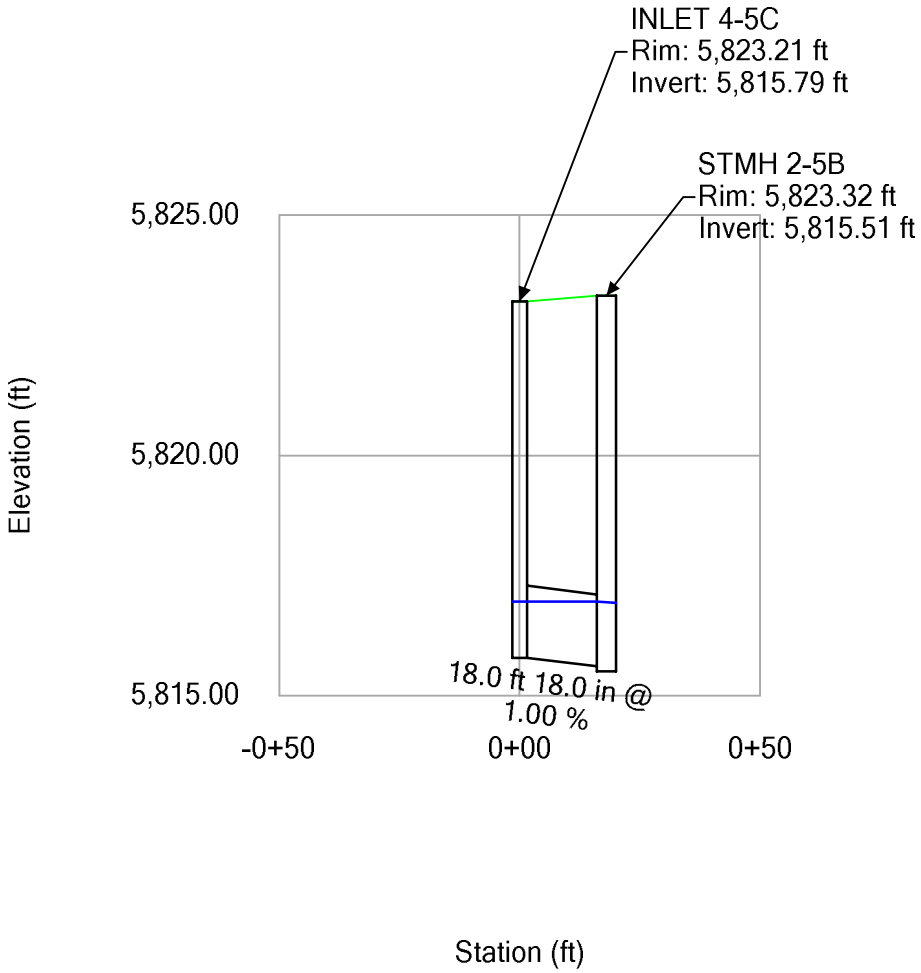
Profile Report

Engineering Profile - Profile - Storm Line 05F (Compark Village South StormCAD [2 year].stsw)



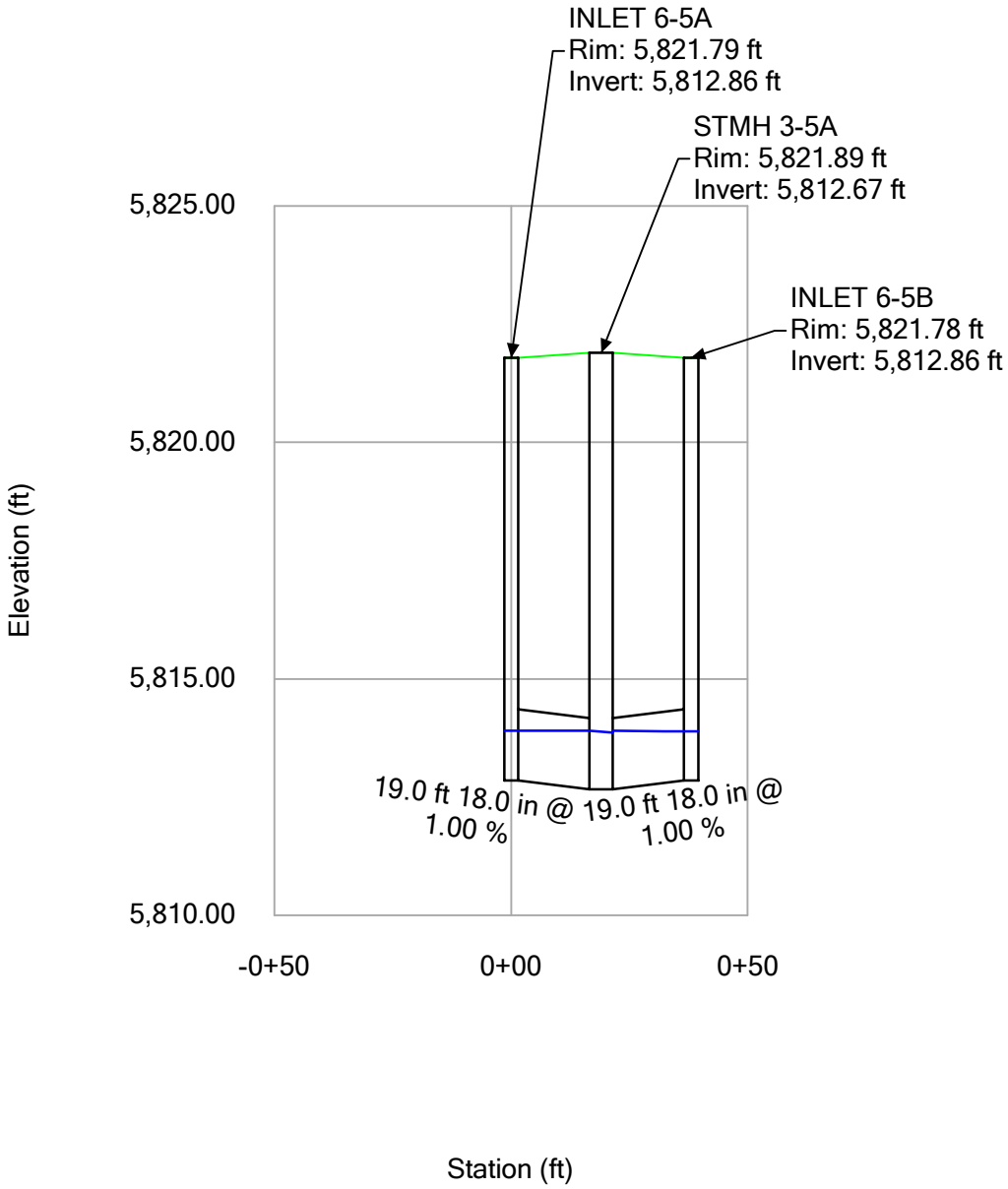
Profile Report

Engineering Profile - Profile - Storm Line 05G (Compark Village South StormCAD [2 year].stsw)



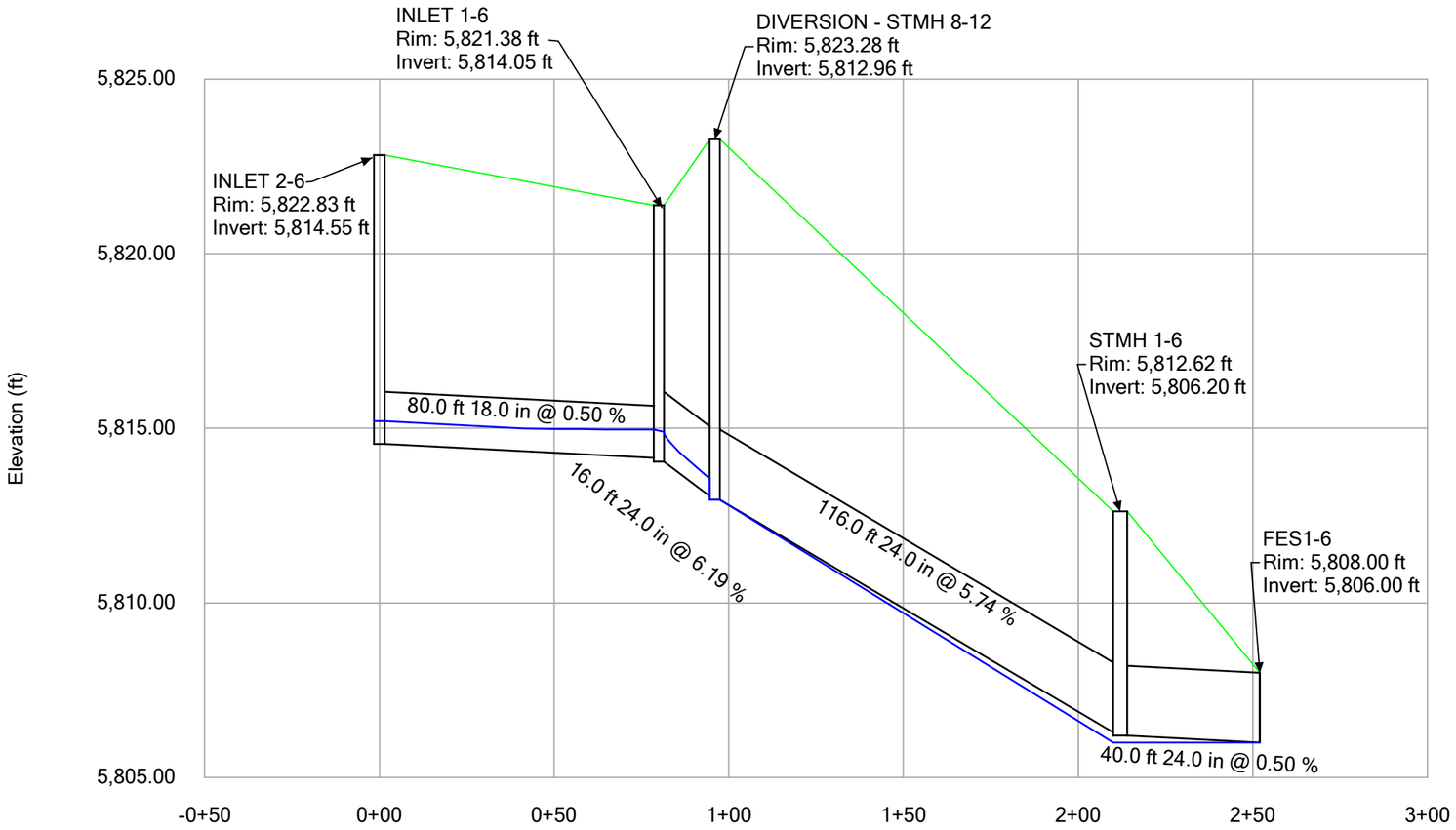
Profile Report

Engineering Profile - Profile - Storm Line 05H (Compark Village South StormCAD [2 year].stsw)

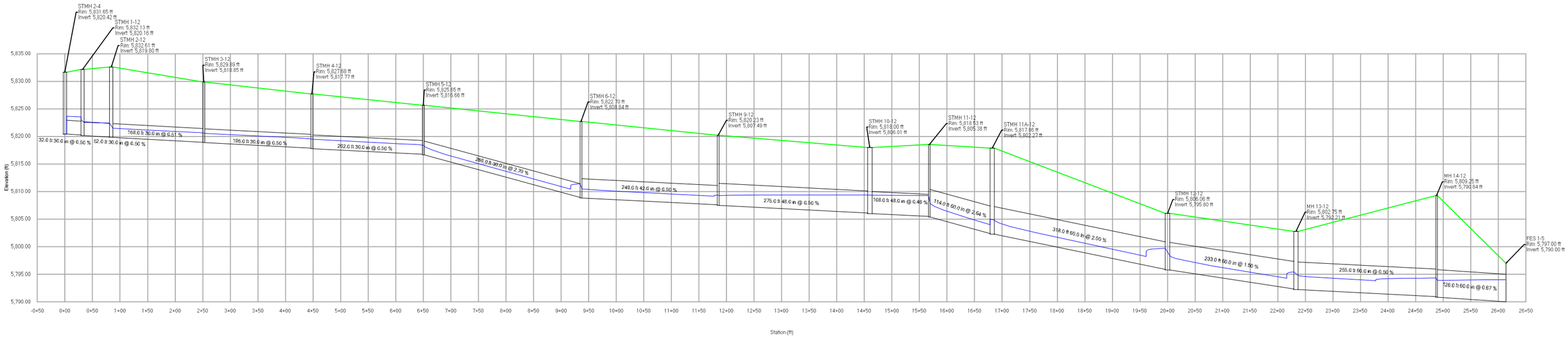


Profile Report

Engineering Profile - Profile - Storm Line 06 (Compark Village South StormCAD [2 year].stsw)

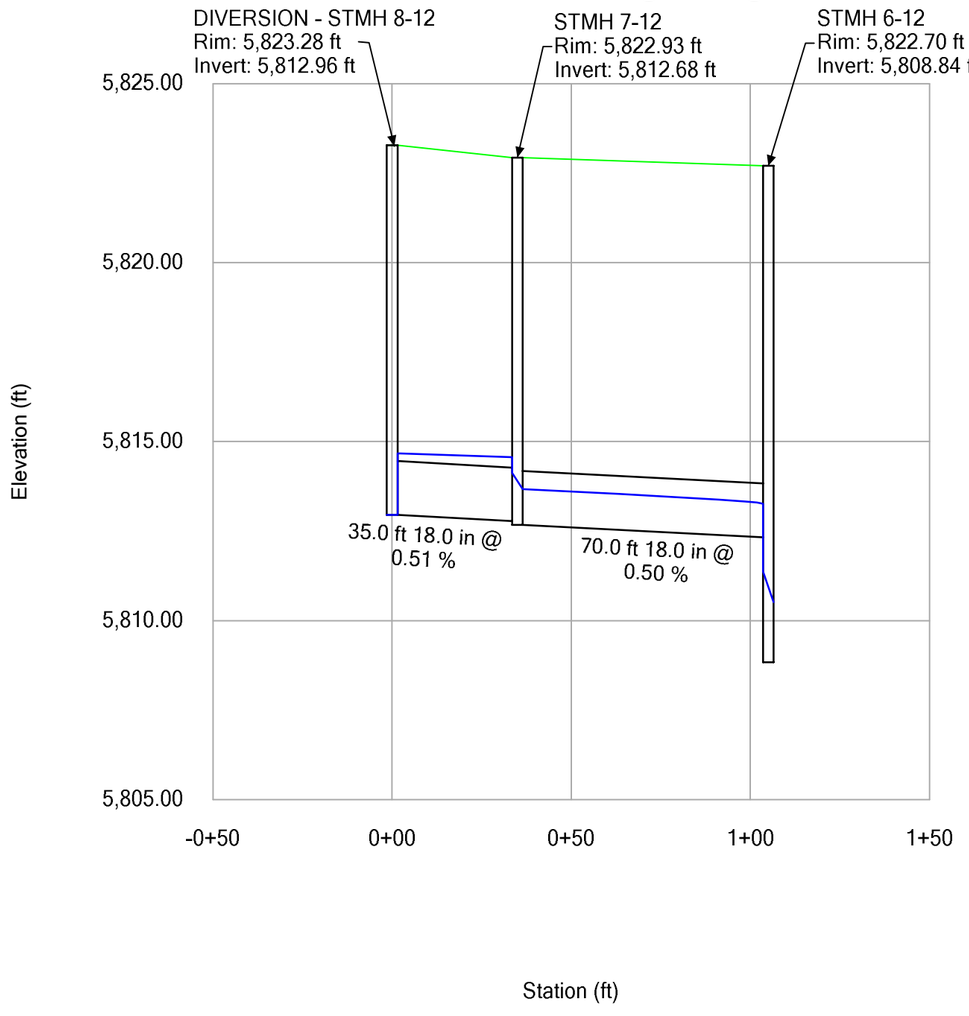


Profile Report
Engineering Profile - Profile - Storm Line 12 (Compark Village South StormCAD [2 year].stsw)



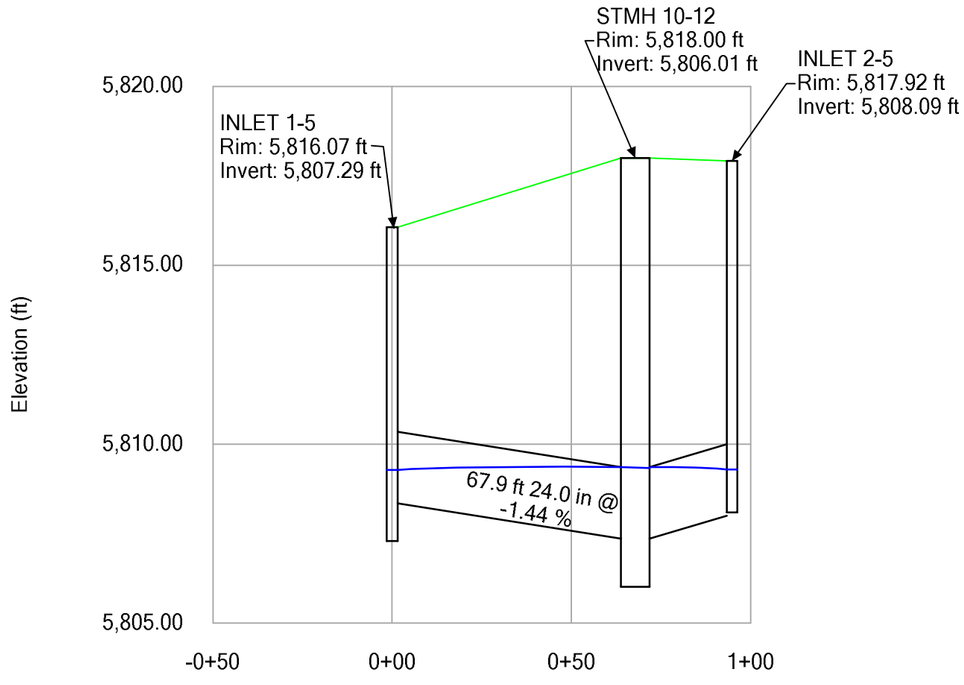
Profile Report

Engineering Profile - Profile - Storm Line 12A (Compark Village South StormCAD [2 year].stsw)



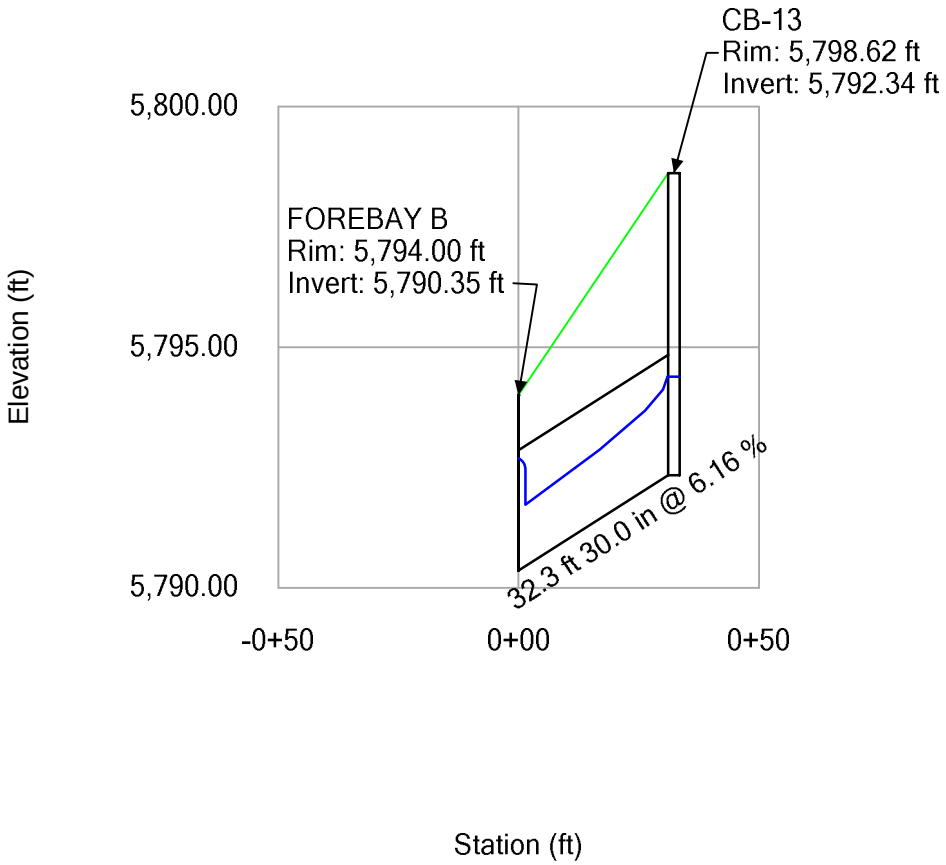
Profile Report

Engineering Profile - Profile - Storm Line 12B (Compark Village South StormCAD [2 year].stsw)



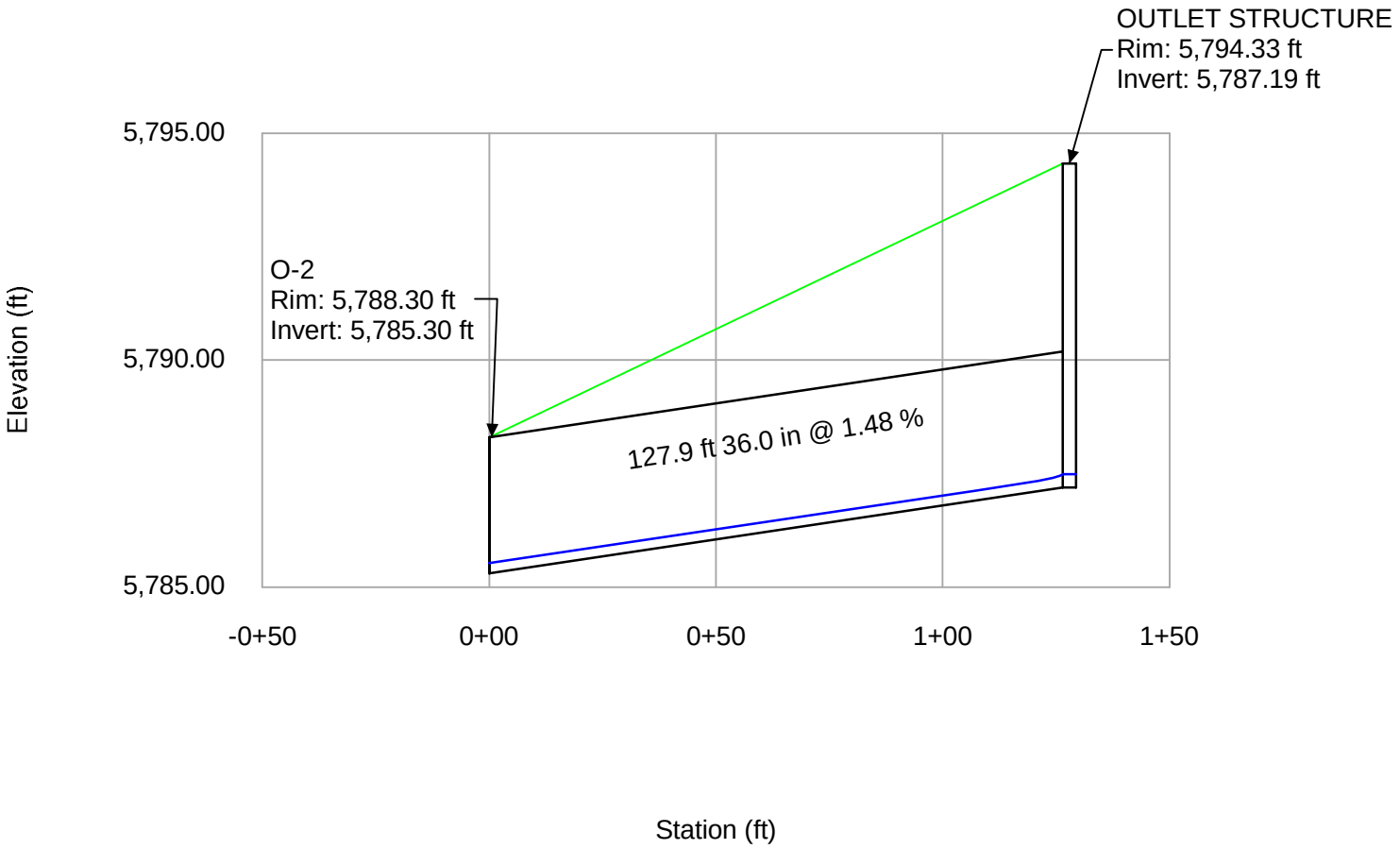
Profile Report

Engineering Profile - Profile - inlet to pond (Compark Village South StormCAD [2 year].stsw)



Profile Report

Engineering Profile - Profile - OUTLET (Compark Village South StormCAD [2 year].stsw)



COMPARK VILLAGE SOUTH - 5 YR STORM

FlexTable: Conduit Table

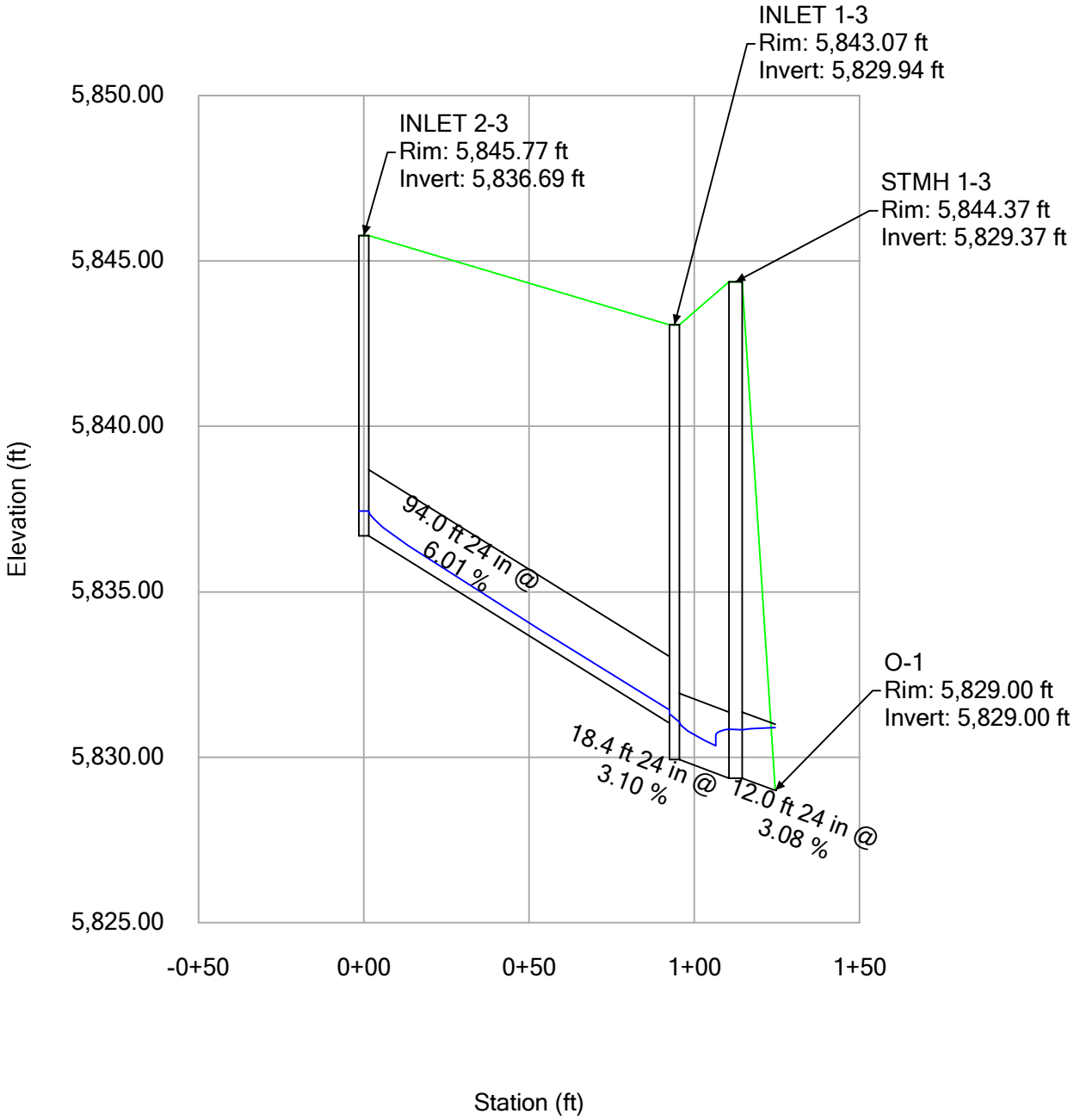
Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
STMH 6-4	5,834.91	INLET 6-4	5,832.53	120.0	1.98	Circle	36	0.013	8.50	8.25	5,835.83	5,833.14
INLET 6-4	5,832.33	STMH 5-4	5,827.71	278.0	1.66	Circle	36	0.013	9.60	8.03	5,833.31	5,828.39
FES 2-5	5,834.54	INLET 8-5	5,834.00	7.7	7.01	Circle	24	0.013	4.10	10.91	5,835.25	5,834.45
INLET 5-4	5,829.34	STMH 5-4	5,828.83	52.0	0.99	Circle	18	0.013	3.60	5.37	5,830.07	5,829.44
INLET 3-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18	0.013	4.00	5.44	5,826.19	5,825.89
INLET 1-4	5,823.04	STMH 2-4	5,821.92	65.0	1.72	Circle	18	0.013	2.40	5.86	5,823.63	5,822.34
INLET 4-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18	0.013	0.90	3.57	5,825.77	5,825.53
INLET 2-6	5,814.55	INLET 1-6	5,814.15	80.0	0.50	Circle	18	0.013	3.00	3.98	5,815.21	5,814.96
INLET 2-3	5,836.69	INLET 1-3	5,831.04	94.0	6.01	Circle	24	0.013	4.50	10.62	5,837.44	5,831.43
FES 2-4	5,842.00	STMH 6-4	5,835.11	221.0	3.12	Circle	36	0.013	8.50	9.68	5,842.92	5,835.66
STMH 5-4	5,827.41	STMH 4-4	5,822.96	163.0	2.73	Circle	36	0.013	14.30	10.75	5,828.61	5,823.69
INLET 4-5	5,812.96	STMH 2-5A	5,812.27	19.0	3.63	Circle	18	0.013	2.50	7.73	5,813.56	5,813.65
INLET 5-5	5,813.90	STMH 2-5	5,811.47	49.0	4.96	Circle	18	0.013	3.40	9.43	5,814.60	5,813.44
STMH 4-4	5,822.16	STMH 3-4	5,821.56	79.0	0.76	Circle	36	0.013	19.20	7.38	5,823.56	5,823.01
STMH 3-4	5,821.46	STMH 2-4	5,820.65	76.0	1.07	Circle	36	0.013	21.80	8.64	5,822.96	5,821.84
INLET 2-4	5,822.07	STMH 3-4	5,821.56	56.0	0.91	Circle	18	0.013	2.60	4.76	5,822.98	5,822.99
STMH 1-6	5,806.20	FES1-6	5,806.00	40.0	0.50	Circle	24	0.013	0.20	1.75	5,806.50	5,806.50
INLET 8-5	5,833.51	INLET 7-5	5,827.49	173.0	3.48	Circle	24	0.013	4.10	8.52	5,834.22	5,827.91
INLET 4-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18	0.013	4.30	6.04	5,821.94	5,821.93
INLET 5-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18	0.013	4.30	6.04	5,821.94	5,821.93
STMH 2-5	5,811.37	INLET 3-5	5,810.99	16.0	2.38	Circle	42	0.013	37.30	13.25	5,813.27	5,812.47
INLET 7-5	5,827.14	STMH 4-5	5,822.27	104.6	4.66	Circle	24	0.013	4.30	9.57	5,827.87	5,823.07
STMH 4-5	5,822.27	INLET 6-5	5,821.44	23.0	3.61	Circle	24	0.013	4.30	8.75	5,823.00	5,822.22
STMH 2-5A	5,812.17	STMH 2-5	5,811.47	50.0	1.40	Circle	36	0.013	20.60	9.39	5,813.63	5,813.44
STMH 2-5B	5,815.51	STMH 2-5A	5,812.17	241.0	1.39	Circle	30	0.013	18.10	9.13	5,816.95	5,813.67
STMH 2-4	5,820.42	STMH 1-4	5,818.85	60.0	2.61	Circle	36	0.013	0.60	4.09	5,820.65	5,819.01
STMH 1-4	5,818.23	FES 1-4	5,818.00	46.0	0.50	Circle	36	0.013	0.60	2.30	5,818.70	5,818.70
INLET 1-3	5,829.94	STMH 1-3	5,829.37	18.4	3.10	Circle	24	0.013	10.00	10.55	5,831.07	5,830.85
STMH 1-3	5,829.37	O-1	5,829.00	12.0	3.08	Circle	24	0.013	10.00	10.53	5,830.83	5,830.90
INLET 5-4A	5,829.26	STMH 5-4	5,828.83	43.0	1.00	Circle	18	0.013	1.10	3.85	5,829.65	5,829.16
STMH 2-5E	5,820.80	STMH 2-5D	5,820.12	44.0	1.55	Circle	24	0.013	8.60	7.86	5,821.85	5,821.44
STMH 2-5D	5,820.12	STMH 2-5C	5,819.49	45.0	1.40	Circle	24	0.013	12.10	8.31	5,821.37	5,820.88
STMH 2-5C	5,819.49	STMH 2-5B	5,815.51	289.0	1.38	Circle	30	0.013	15.60	8.75	5,820.82	5,816.99
INLET 4-5B	5,819.70	STMH 2-5C	5,819.52	18.0	1.00	Circle	18	0.013	3.50	5.35	5,820.87	5,820.87
INLET 5-5B	5,828.30	STMH 2-5D	5,820.22	293.0	2.76	Circle	18	0.013	3.50	7.71	5,829.01	5,821.44
INLET 4-5C	5,815.79	STMH 2-5B	5,815.61	18.0	1.00	Circle	18	0.013	2.50	4.88	5,816.99	5,816.98
INLET 6-5	5,821.14	STMH 3-5A	5,812.67	247.0	3.43	Circle	30	0.013	8.50	10.23	5,822.11	5,813.94
STMH 3-5A	5,812.67	STMH 2-5	5,811.37	48.0	2.71	Circle	30	0.013	13.30	10.69	5,813.90	5,813.34
INLET 6-5A	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18	0.013	2.70	4.98	5,813.93	5,813.93
INLET 6-5B	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18	0.013	2.10	4.64	5,813.92	5,813.93
STMH 1-12	5,820.16	STMH 2-12	5,819.90	52.0	0.50	Circle	30	0.013	23.60	6.58	5,822.55	5,822.40
STMH 2-12	5,819.80	STMH 3-12	5,818.95	168.0	0.51	Circle	30	0.013	23.60	6.62	5,821.51	5,820.65
STMH 3-12	5,818.85	STMH 4-12	5,817.87	196.0	0.50	Circle	30	0.013	23.60	6.58	5,820.56	5,819.57
STMH 4-12	5,817.77	STMH 5-12	5,816.76	202.0	0.50	Circle	30	0.013	23.60	6.58	5,819.48	5,818.41
STMH 5-12	5,816.66	STMH 6-12	5,808.94	286.0	2.70	Circle	30	0.013	23.60	12.51	5,818.31	5,811.37
STMH 6-12	5,808.84	STMH 9-12	5,807.59	249.0	0.50	Circle	42	0.013	29.40	7.05	5,810.51	5,809.72
INLET 2-5	5,808.58	STMH 10-12	5,808.11	24.0	1.96	Circle	24	0.013	8.20	8.46	5,809.60	5,809.68
STMH 10-12	5,806.11	INLET 1-5	5,808.34	66.0	-3.38	Circle	24	0.013	5.10	8.98	5,809.68	5,809.68
STMH 9-12	5,807.49	STMH 10-12	5,806.11	275.0	0.50	Circle	48	0.013	29.40	7.01	5,809.68	5,809.68

FlexTable: Conduit Table

Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
STMH 10-12	5,806.01	STMH 11-12	5,805.48	108.0	0.49	Circle	48	0.013	42.70	7.68	5,809.39	5,809.34
STMH 7-12	5,812.68	STMH 6-12	5,812.33	71.0	0.49	Circle	18	0.013	5.80	4.62	5,813.68	5,813.26
STMH 12-12	5,795.80	STMH 13-12	5,792.31	233.0	1.50	Circle	60	0.013	85.11	13.74	5,798.42	5,794.96
STMH 14-12	5,790.84	FES 1-5	5,790.00	126.0	0.67	Circle	60	0.013	85.11	10.23	5,793.46	5,793.65
STMH 13-12	5,792.21	STMH 14-12	5,790.94	255.0	0.50	Circle	60	0.013	85.11	9.18	5,794.83	5,793.59
STMH 2-4	5,820.42	STMH 1-12	5,820.26	32.0	0.50	Circle	30	0.013	23.60	0.00	5,823.64	5,823.53
INLET 1-6	5,814.05	DIVERSION - STMH 8-12	5,813.06	16.0	6.19	Circle	24	0.013	6.00	11.67	5,814.92	5,813.58
DIVERSION - STMH 8-12	5,812.96	STMH 1-6	5,806.30	116.0	5.74	Circle	24	0.013	0.20	4.10	5,813.11	5,806.50
DIVERSION - STMH 8-12	5,812.96	STMH 7-12	5,812.78	35.0	0.51	Circle	18	0.013	5.80	0.00	5,814.67	5,814.56
STMH 11-12	5,805.38	STMH 11A-12	5,802.37	117.0	2.57	Circle	60	0.013	84.10	16.64	5,807.98	5,805.00
STMH 11A-12	5,802.27	STMH 12-12	5,795.90	318.0	2.00	Circle	60	0.013	84.10	15.21	5,804.87	5,799.79
INLET 3-5	5,810.89	MH-1-5A	5,808.93	105.5	1.86	Circle	48	0.013	41.40	12.36	5,812.81	5,810.24
MH-1-5A	5,808.83	STMH 11-12	5,805.47	95.1	3.53	Circle	48	0.013	41.40	15.55	5,810.75	5,809.34

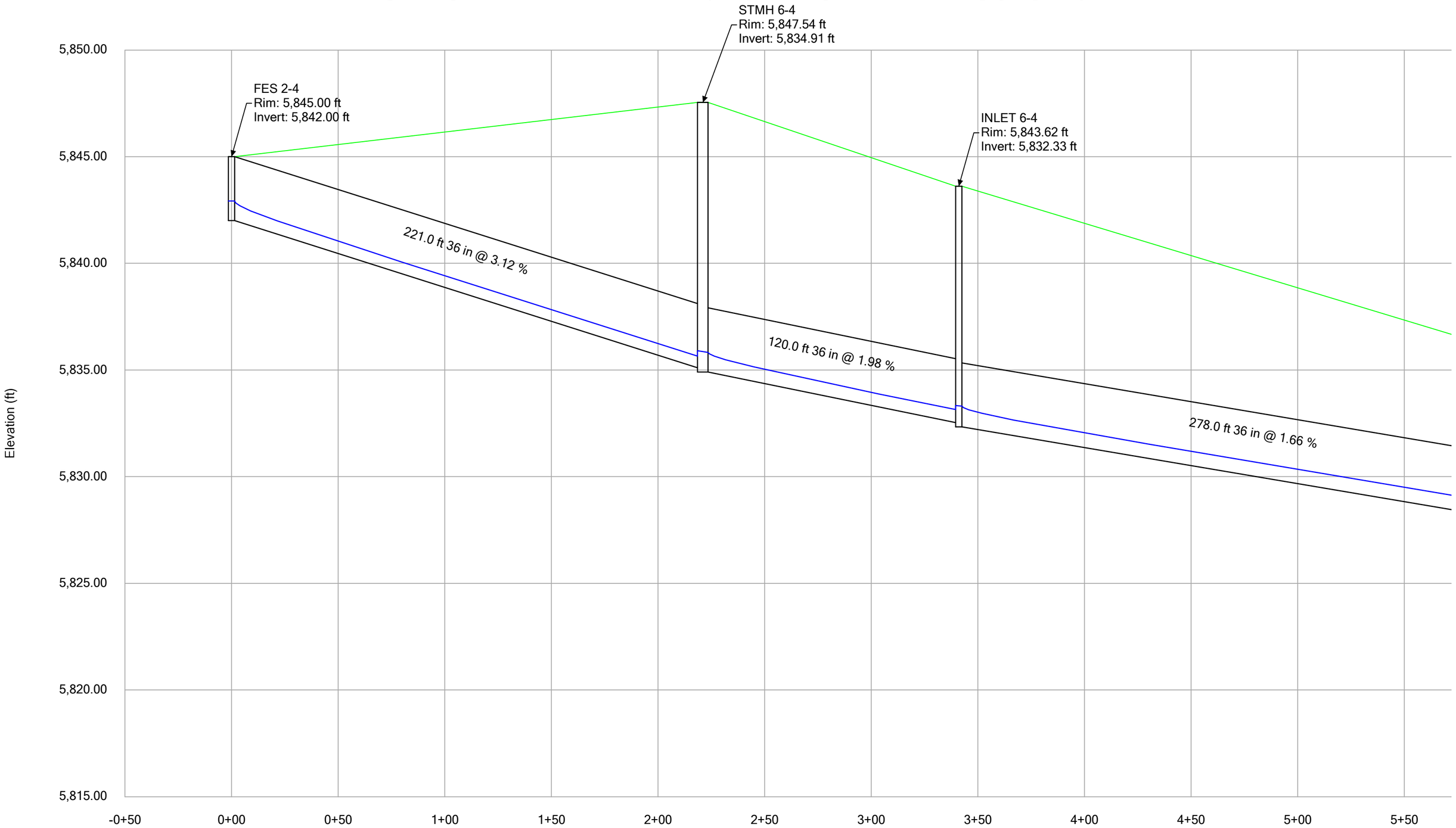
Profile Report

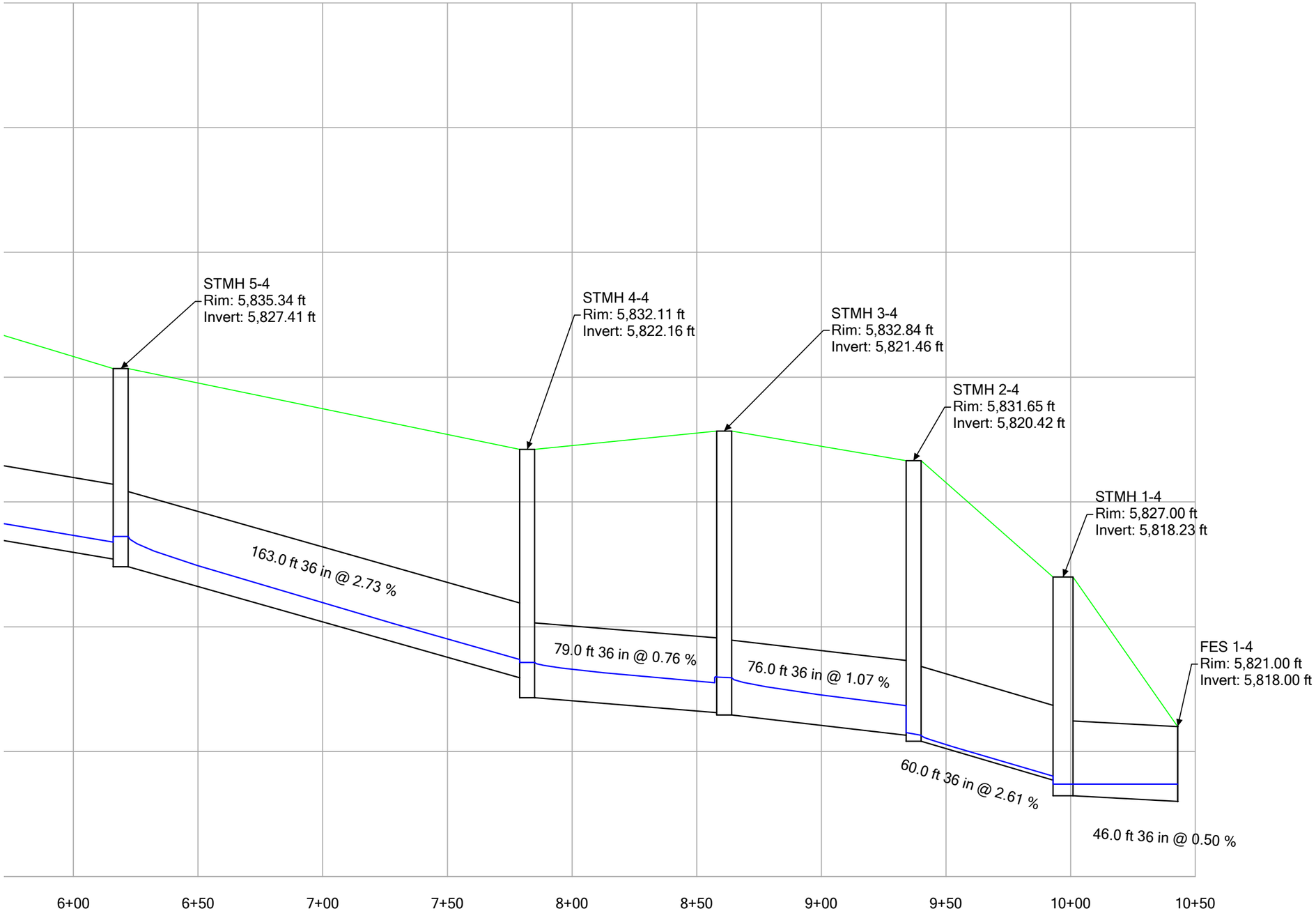
Engineering Profile - Profile - Storm Line 03 (Compark Village South StormCAD [5 year].stsw)



Profile Report

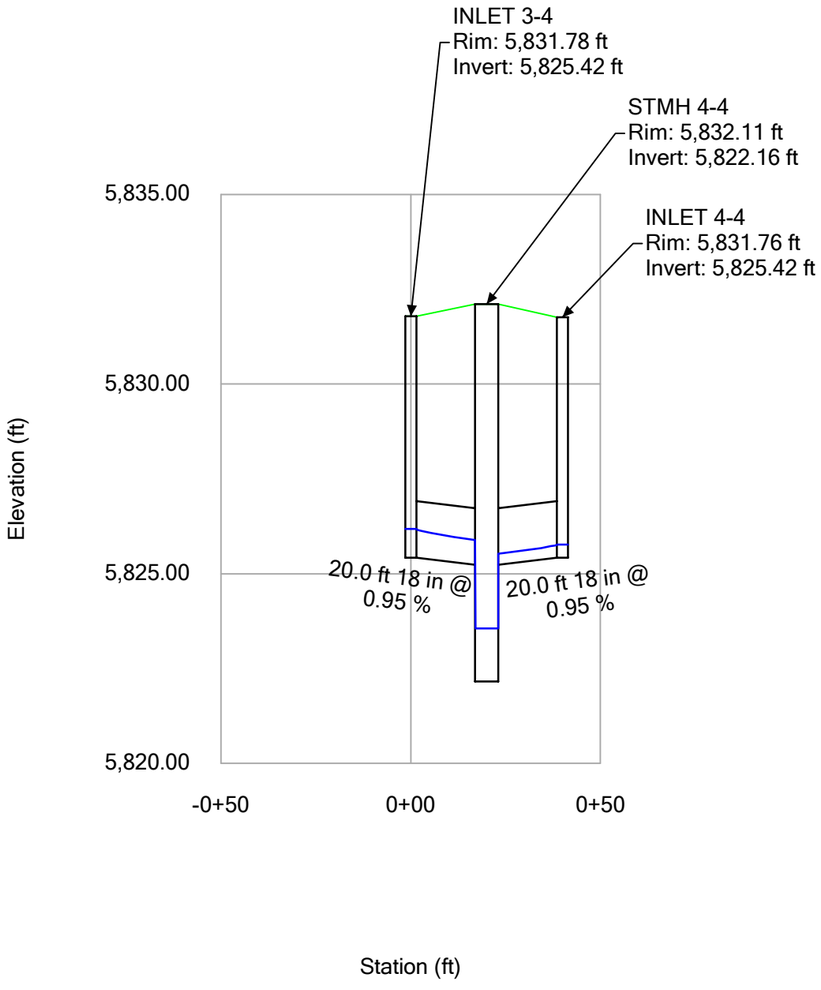
Engineering Profile - Profile - Storm Line 04 (Compark Village South StormCAD [5 year].stsw)




STMH 5-4
Rim: 5,835.34 ft
Invert: 5,827.41 ft
STMH 4-4
Rim: 5,832.11 ft
Invert: 5,822.16 ft
STMH 3-4
Rim: 5,832.84 ft
Invert: 5,821.46 ft
STMH 2-4
Rim: 5,831.65 ft
Invert: 5,820.42 ft
STMH 1-4
Rim: 5,827.00 ft
Invert: 5,818.23 ft
FES 1-4
Rim: 5,821.00 ft
Invert: 5,818.00 ft
163.0 ft 36 in @ 2.73 %
79.0 ft 36 in @ 0.76 %
76.0 ft 36 in @ 1.07 %
60.0 ft 36 in @ 2.61 %
46.0 ft 36 in @ 0.50 %
6+00
6+50
7+00
7+50
8+00
8+50
9+00
9+50
10+00
10+50

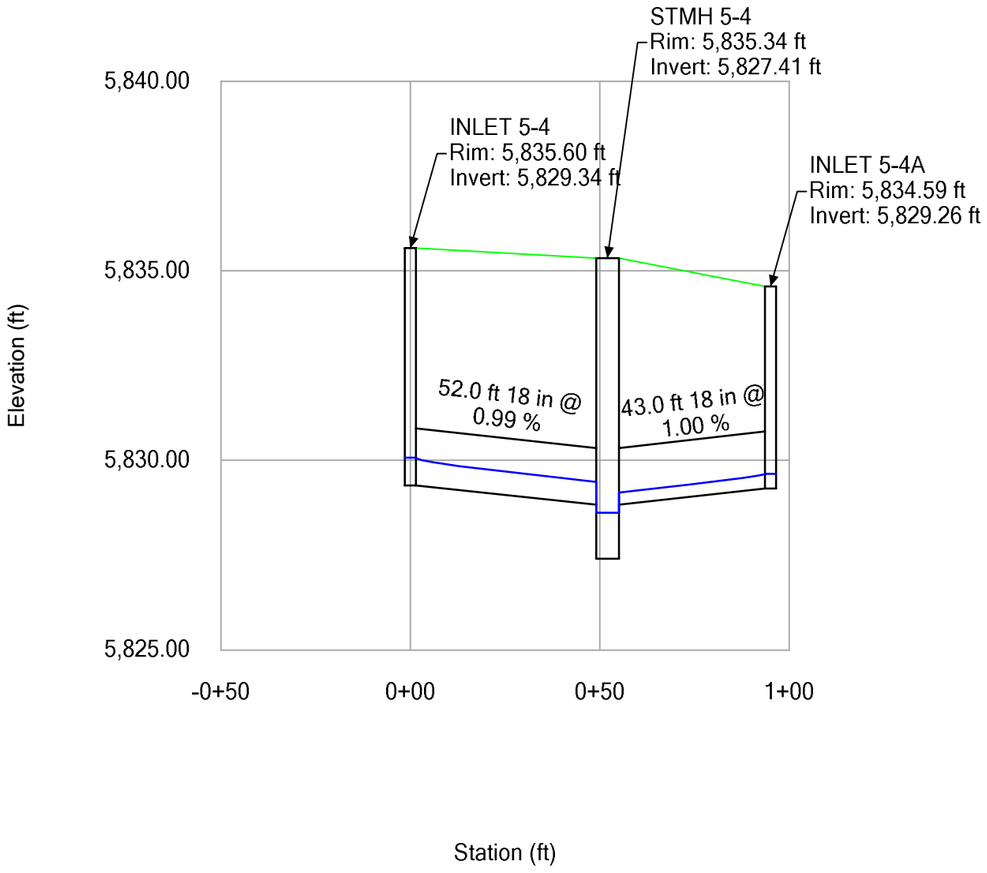
Profile Report

Engineering Profile - Profile - Storm Line 04A (Compark Village South StormCAD [5 year].stsw)



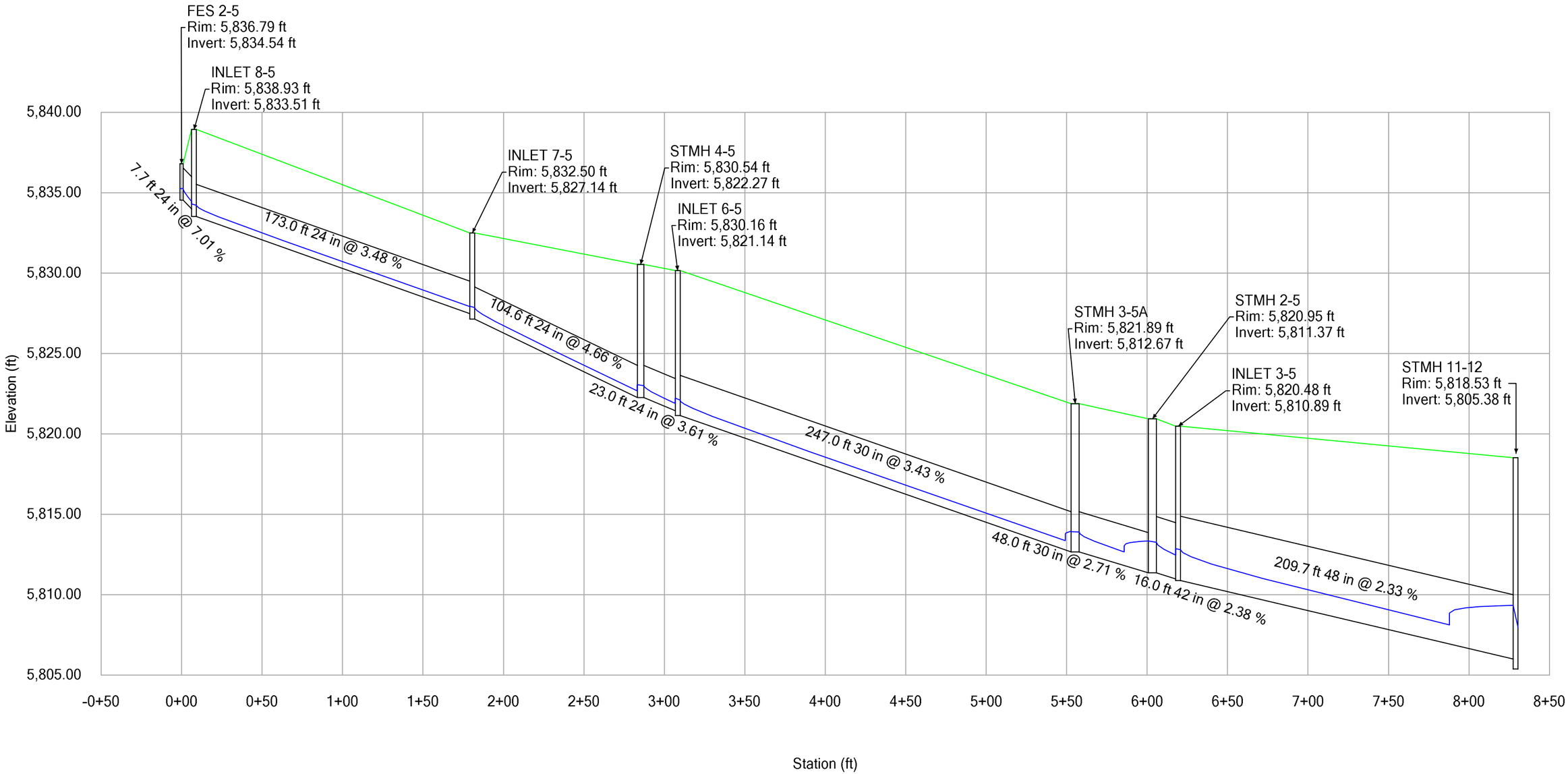
Profile Report

Engineering Profile - Profile - Storm Line 04B (Compark Village South StormCAD [5 year].stsw)



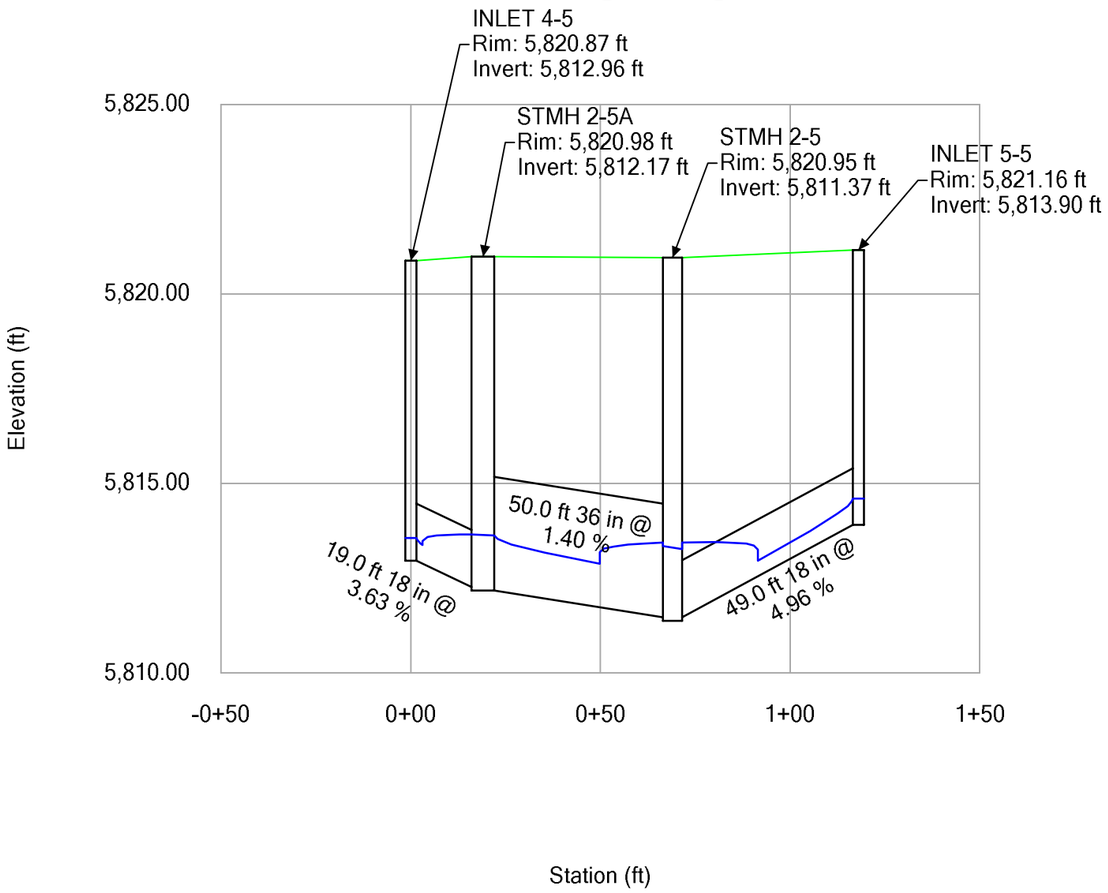
Profile Report

Engineering Profile - Profile - Storm Line 05 (Compark Village South StormCAD [5 year].stsw)



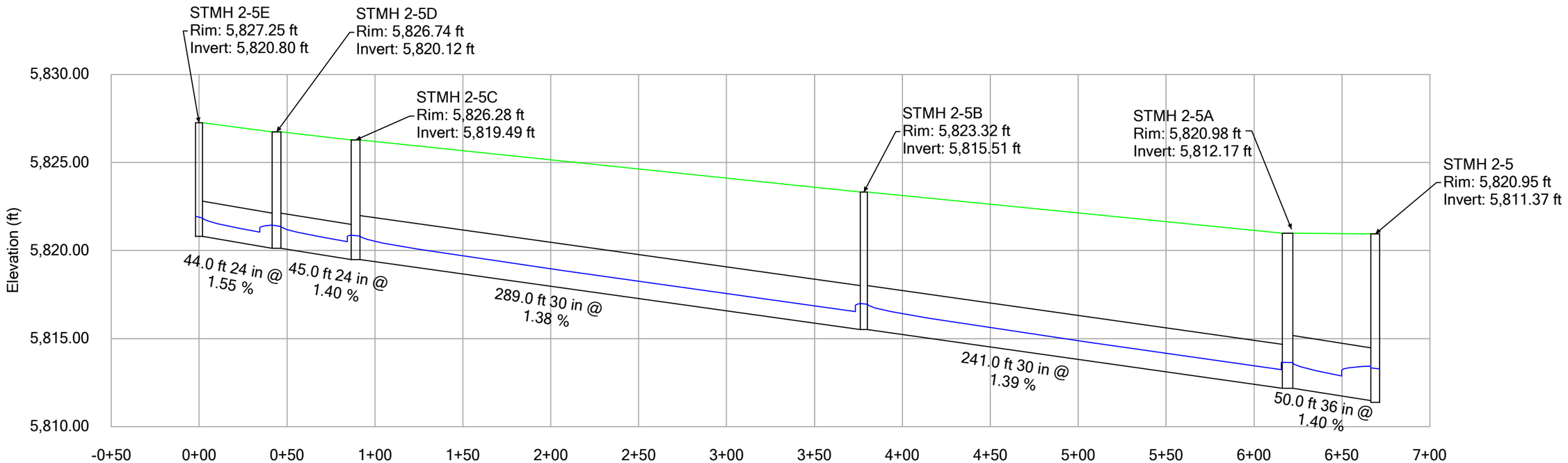
Profile Report

Engineering Profile - Profile - Storm Line 05B (Compark Village South StormCAD [5 year].stsw)



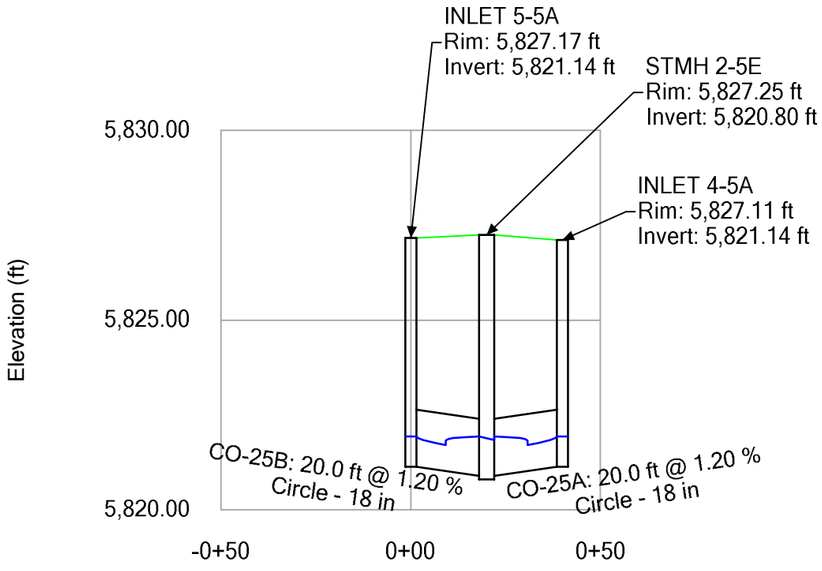
Profile Report

Engineering Profile - Profile - Storm Line 05C (Compark Village South StormCAD [5 year].stsw)



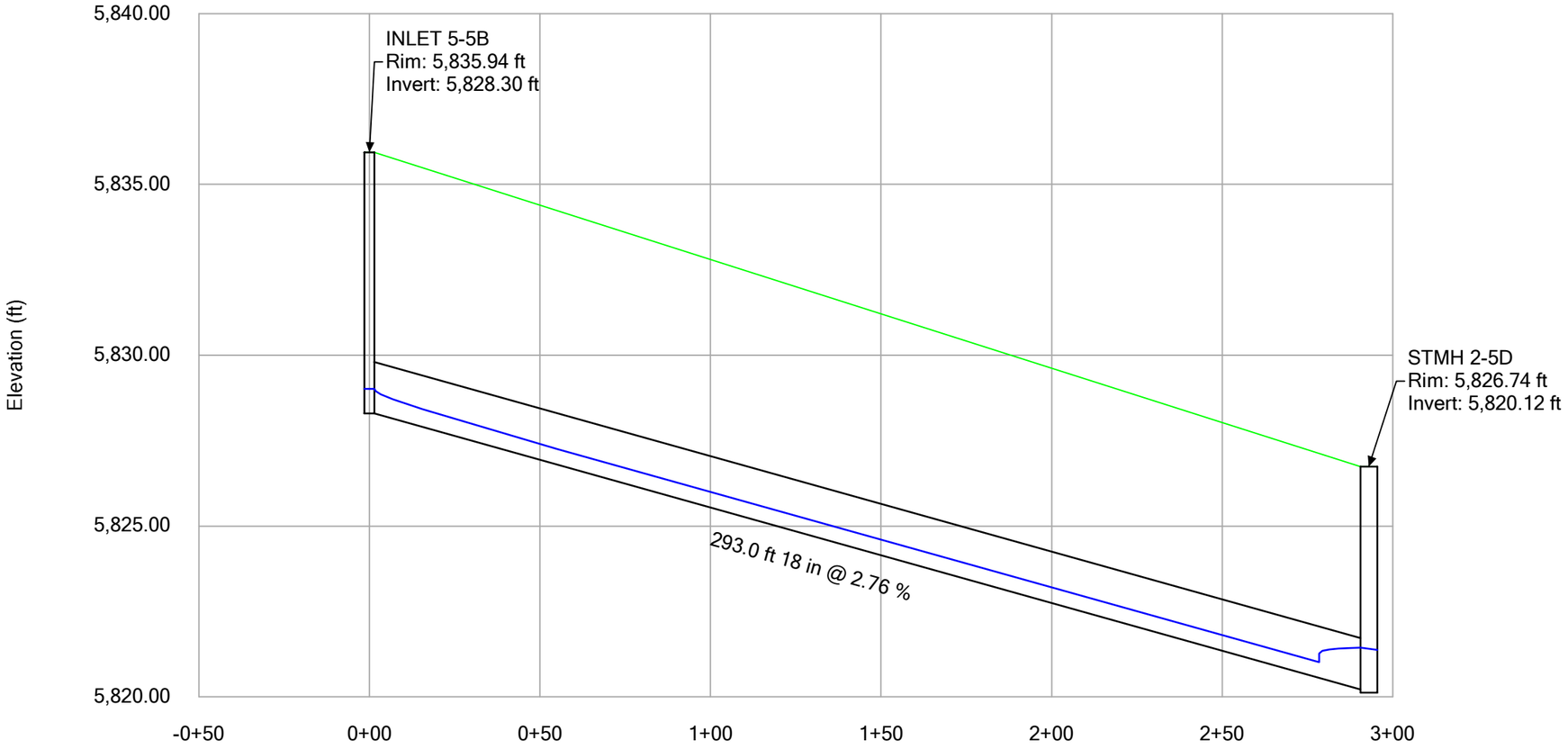
Profile Report

Engineering Profile - Profile - Storm Line 05D (Compark Village South StormCAD [5 year].stsw)



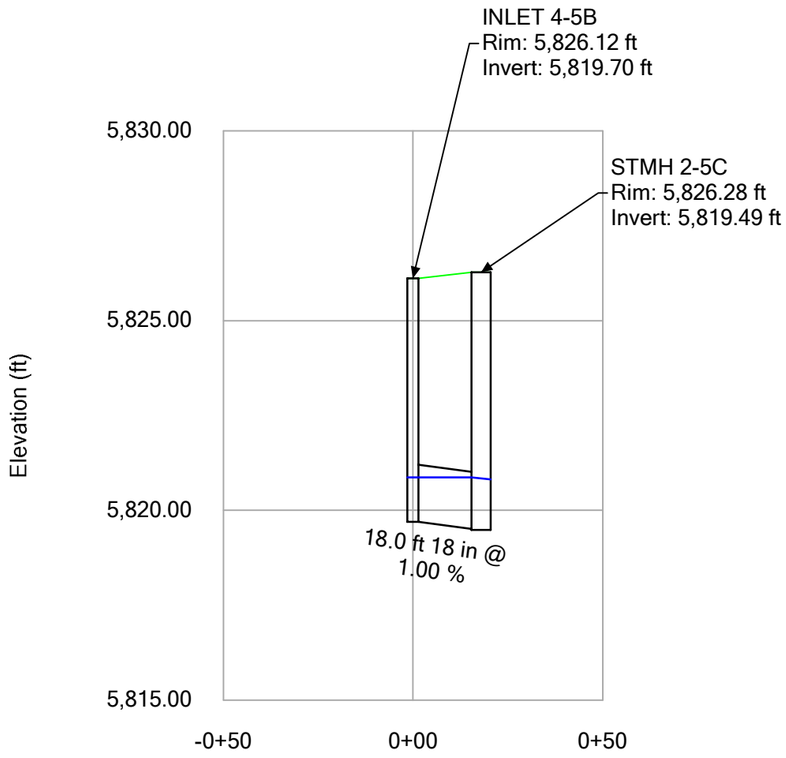
Profile Report

Engineering Profile - Profile - Storm Line 05E (Compark Village South StormCAD [5 year].stsw)



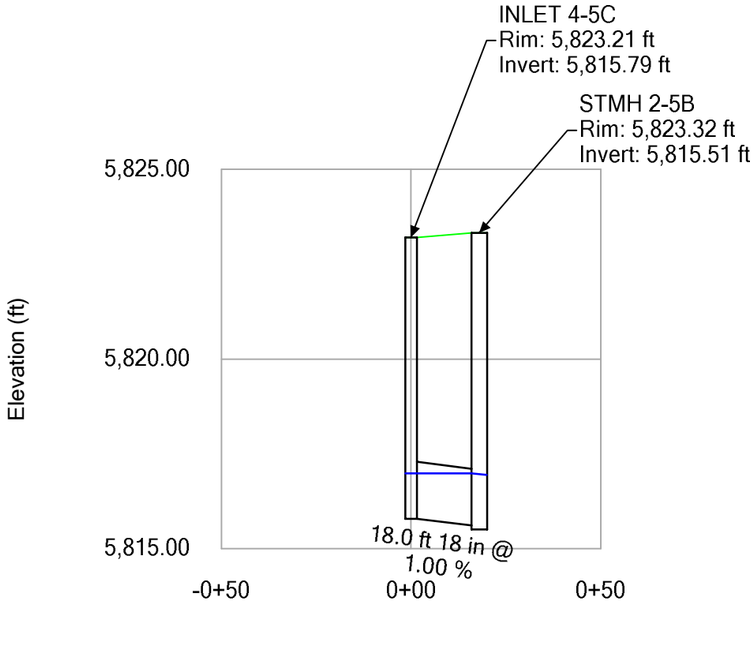
Profile Report

Engineering Profile - Profile - Storm Line 05F (Compark Village South StormCAD [5 year].stsw)



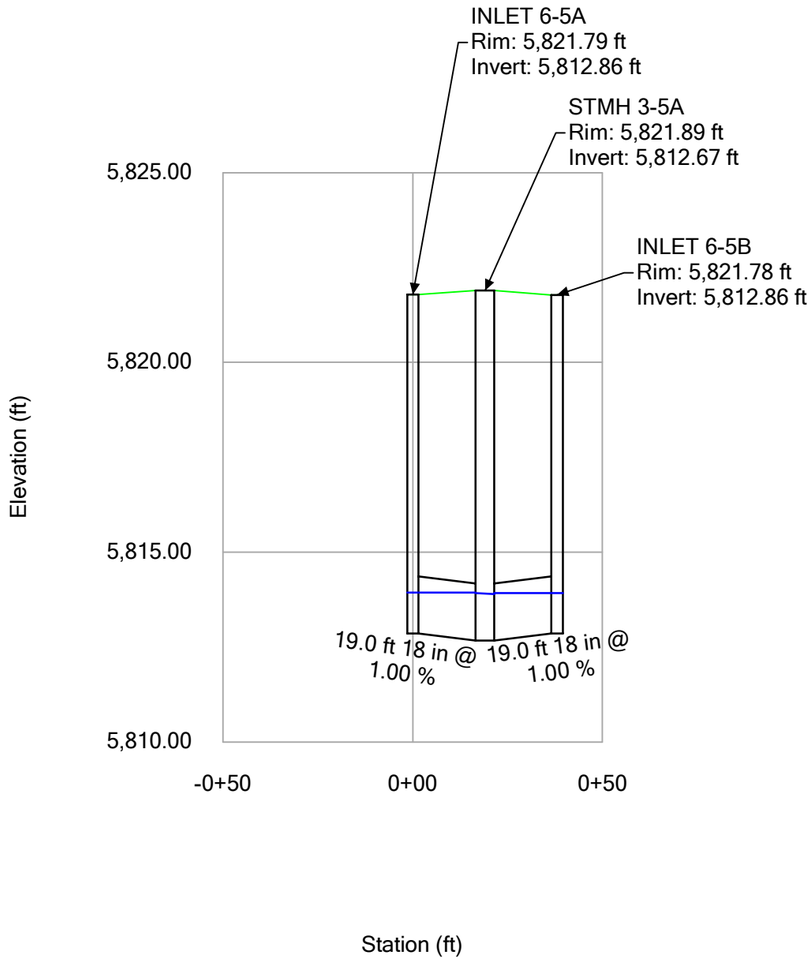
Profile Report

Engineering Profile - Profile - Storm Line 05G (Compark Village South StormCAD [5 year].stsw)



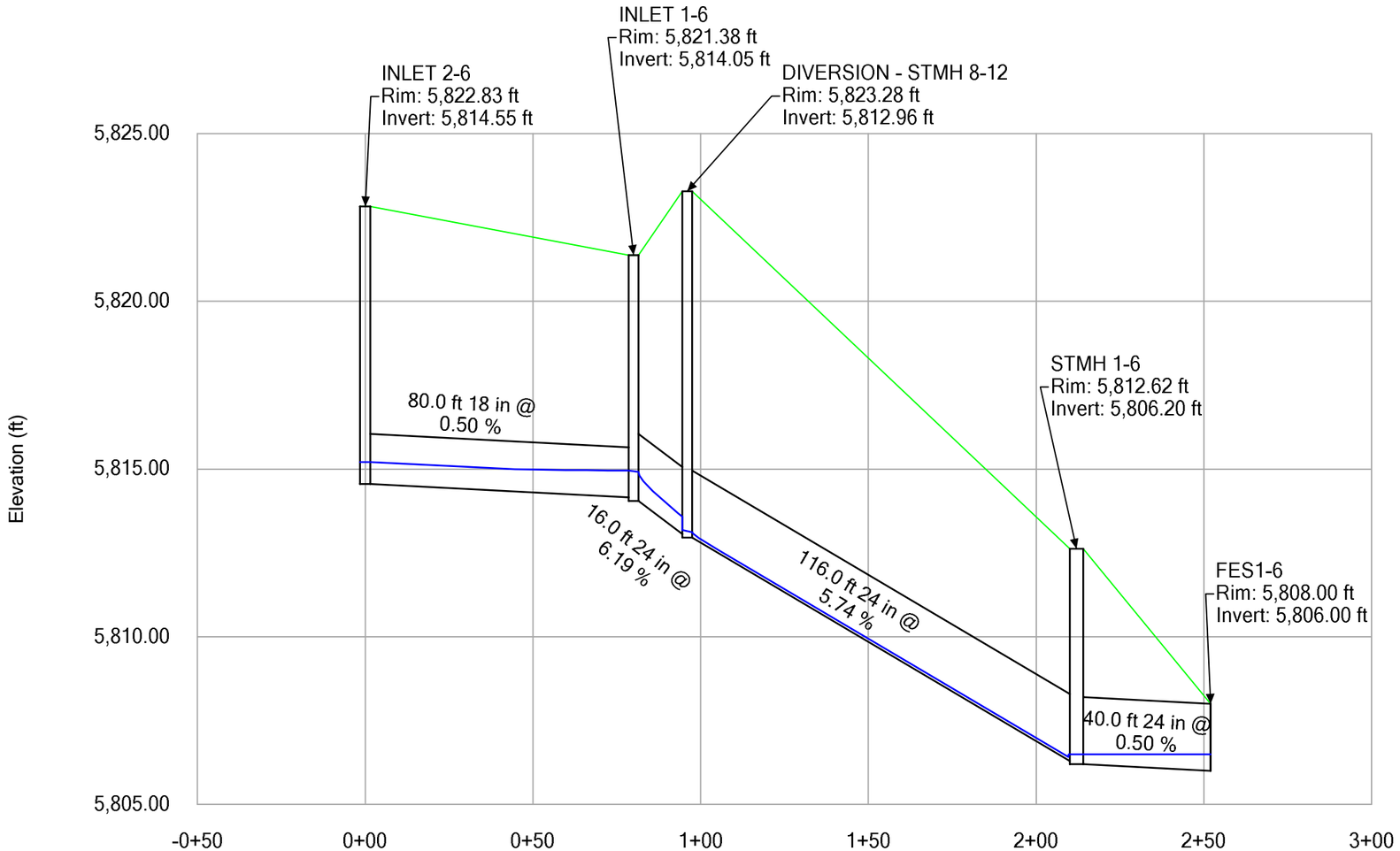
Profile Report

Engineering Profile - Profile - Storm Line 05H (Compark Village South StormCAD [5 year].stsw)



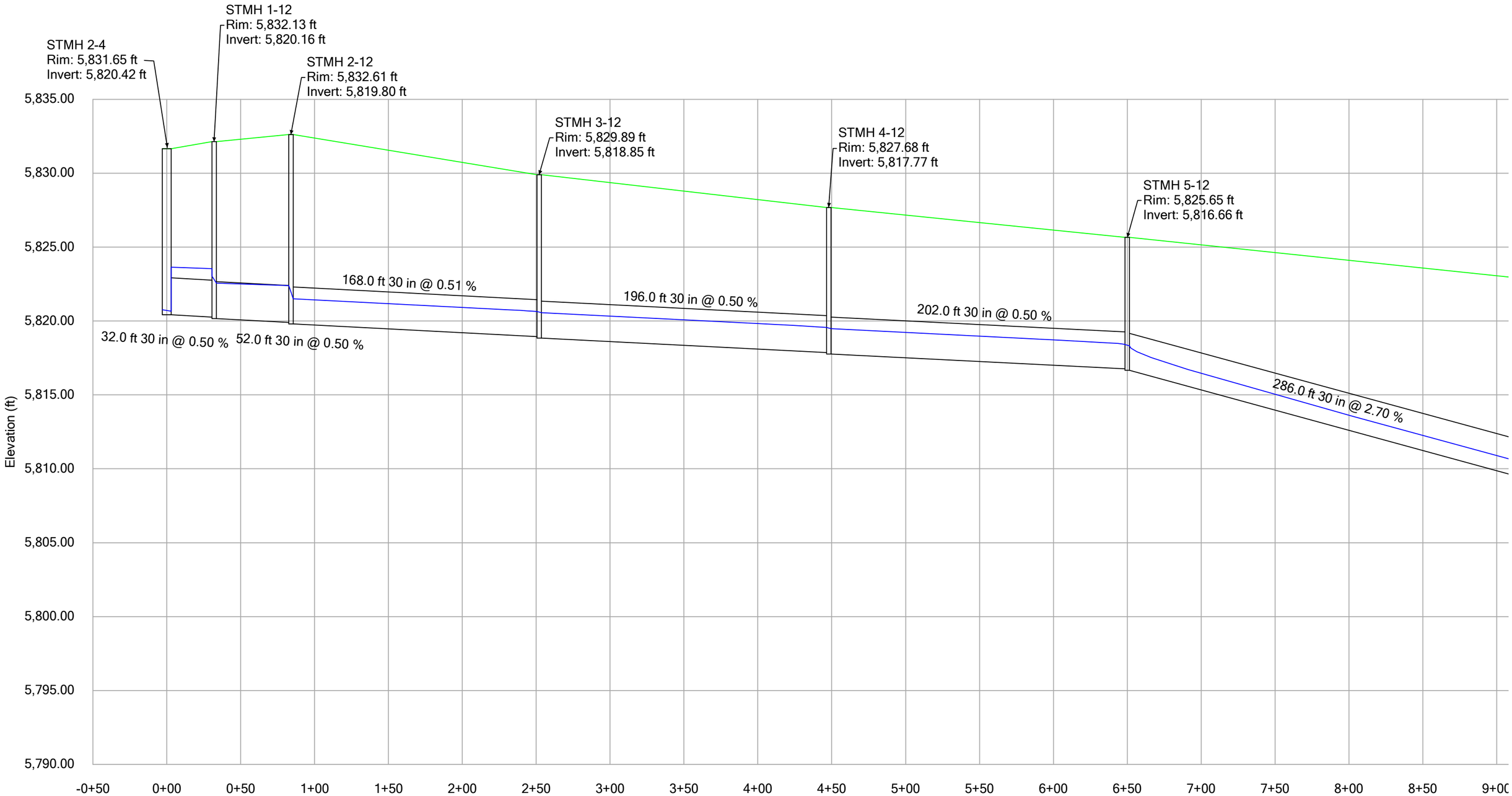
Profile Report

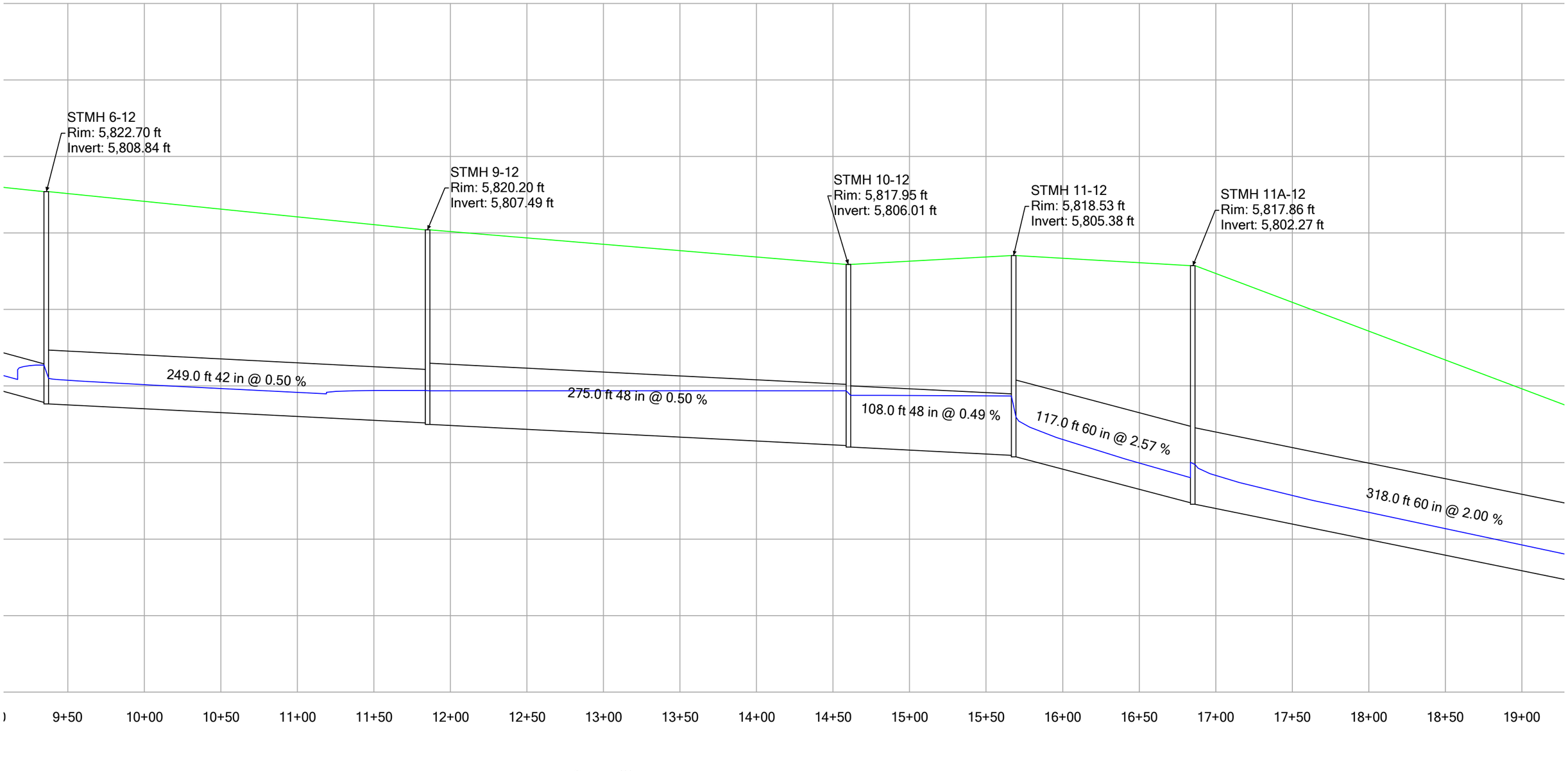
Engineering Profile - Profile - Storm Line 06 (Compark Village South StormCAD [5 year].stsw)



Profile Report

Engineering Profile - Profile - Storm Line 12 (Compark Village South StormCAD [5 year].stsw)




STMH 6-12
Rim: 5,822.70 ft
Invert: 5,808.84 ft
STMH 9-12
Rim: 5,820.20 ft
Invert: 5,807.49 ft
STMH 10-12
Rim: 5,817.95 ft
Invert: 5,806.01 ft
STMH 11-12
Rim: 5,818.53 ft
Invert: 5,805.38 ft
STMH 11A-12
Rim: 5,817.86 ft
Invert: 5,802.27 ft
249.0 ft 42 in @ 0.50 %
275.0 ft 48 in @ 0.50 %
108.0 ft 48 in @ 0.49 %
117.0 ft 60 in @ 2.57 %
318.0 ft 60 in @ 2.00 %
9+50
10+00
10+50
11+00
11+50
12+00
12+50
13+00
13+50
14+00
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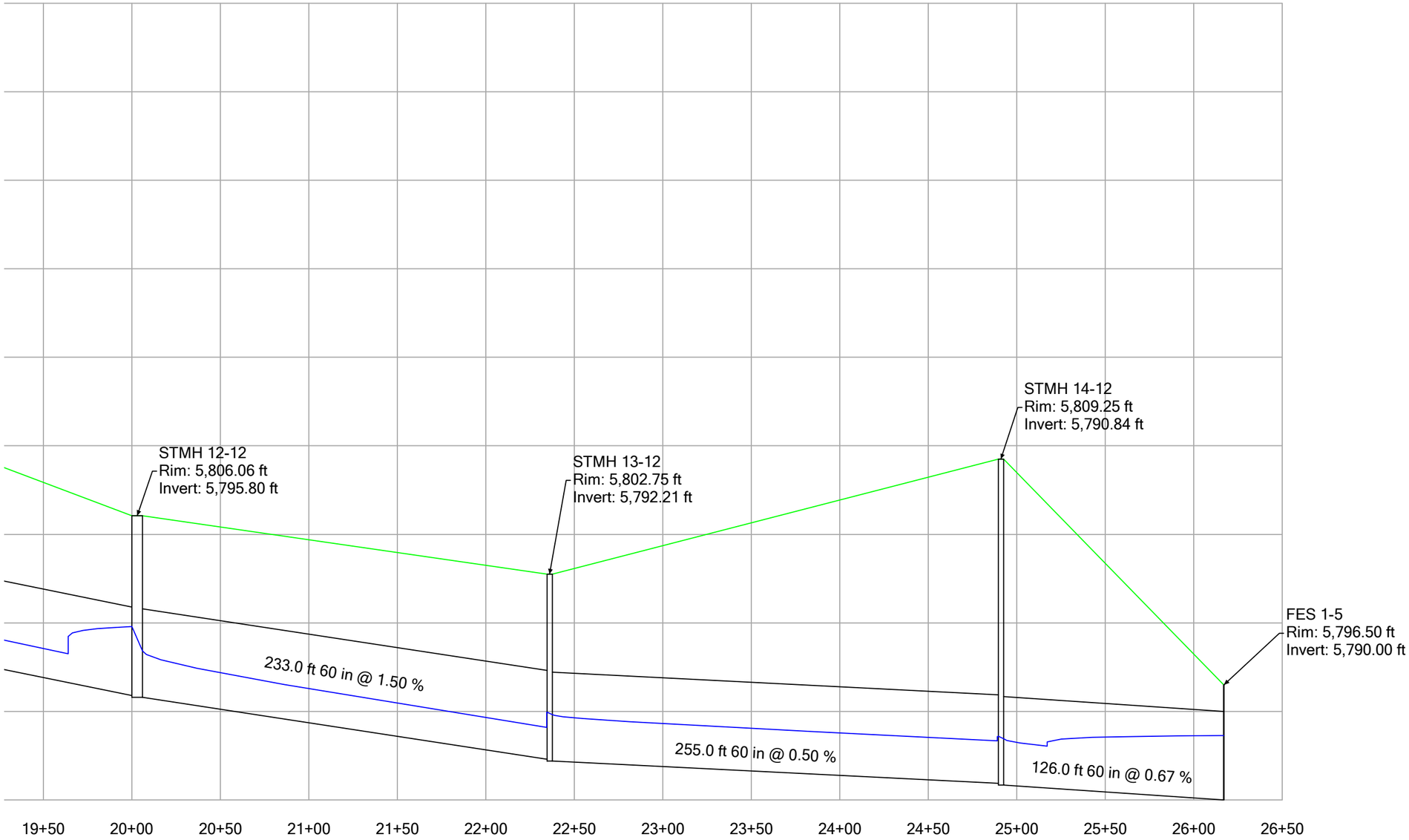
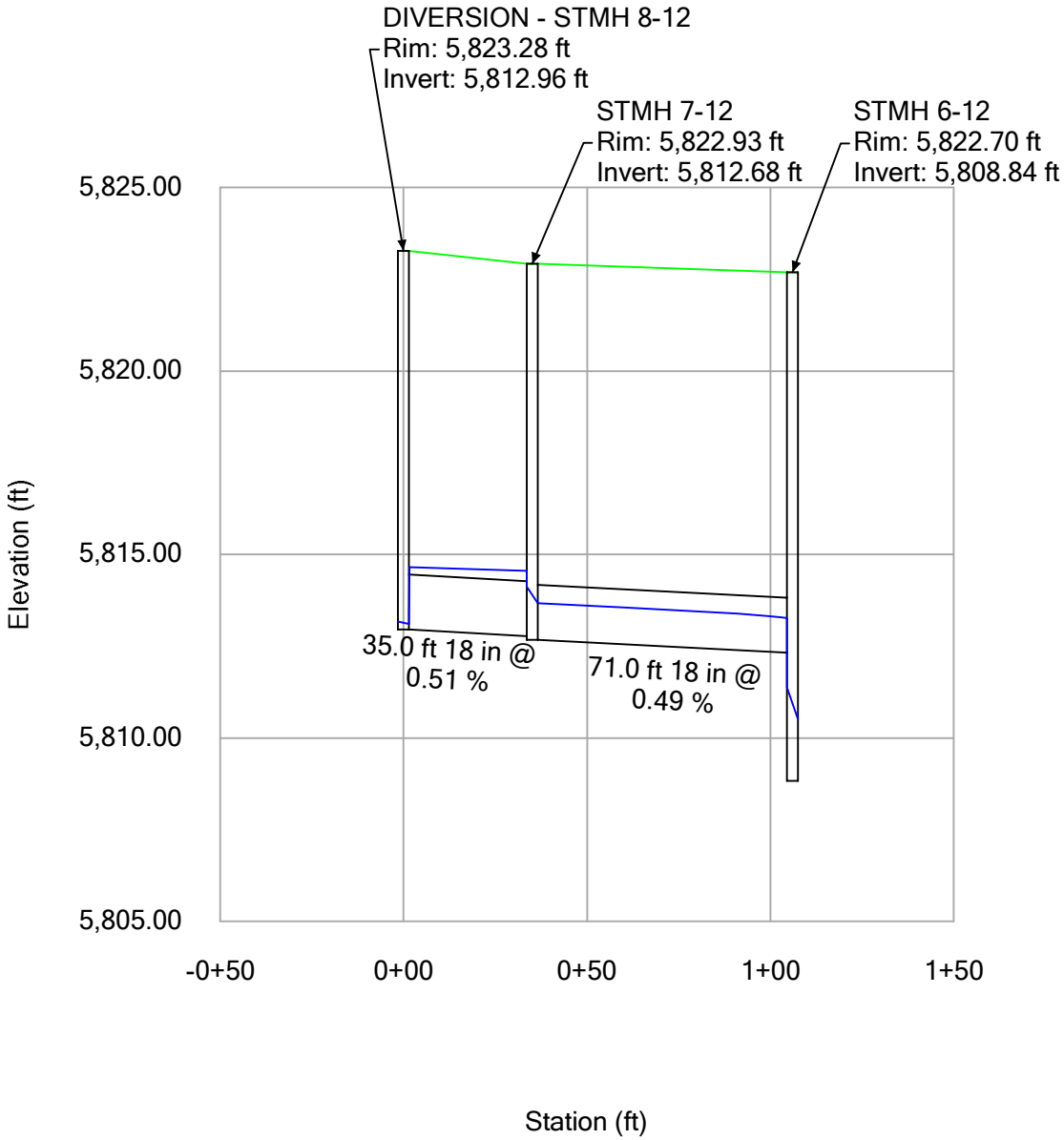
15+50
16+00
16+50
17+00
17+50
18+00
18+50
19+00
Station (ft)


STMH 12-12
Rim: 5,806.06 ft
Invert: 5,795.80 ft
STMH 13-12
Rim: 5,802.75 ft
Invert: 5,792.21 ft
STMH 14-12
Rim: 5,809.25 ft
Invert: 5,790.84 ft
FES 1-5
Rim: 5,796.50 ft
Invert: 5,790.00 ft
233.0 ft 60 in @ 1.50 %
255.0 ft 60 in @ 0.50 %
126.0 ft 60 in @ 0.67 %
19+50
20+00
20+50
21+00
21+50
22+00
22+50
23+00
23+50
24+00
24+50
25+00
25+50
26+00
26+50

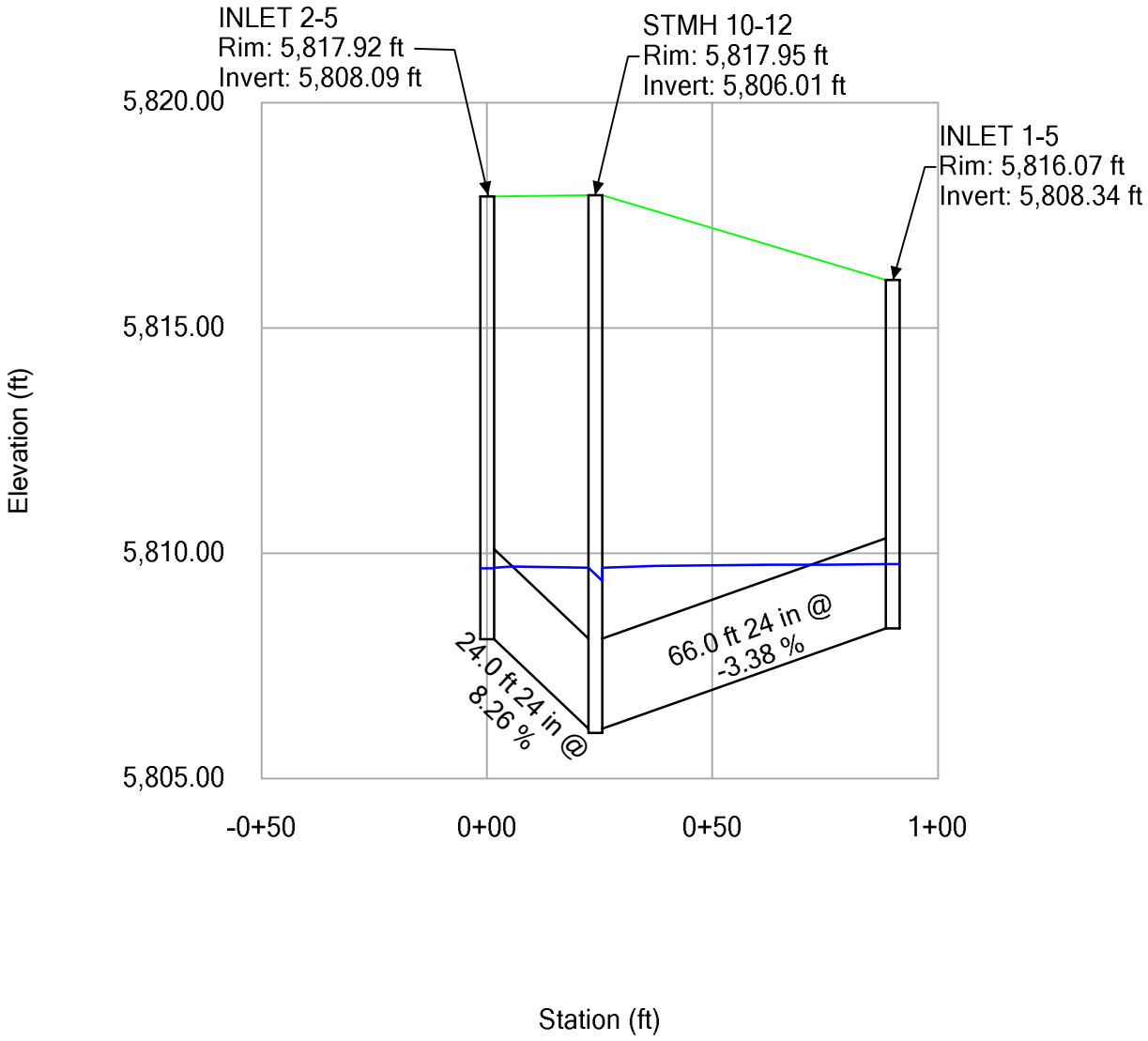
Profile Report

Engineering Profile - Profile - Storm Line 12A (Compark Village South StormCAD [5 year].stsw)



Profile Report

Engineering Profile - Profile - Storm Line 12B (Compark Village South StormCAD [5 year].stsw)



FlexTable: Conduit Table

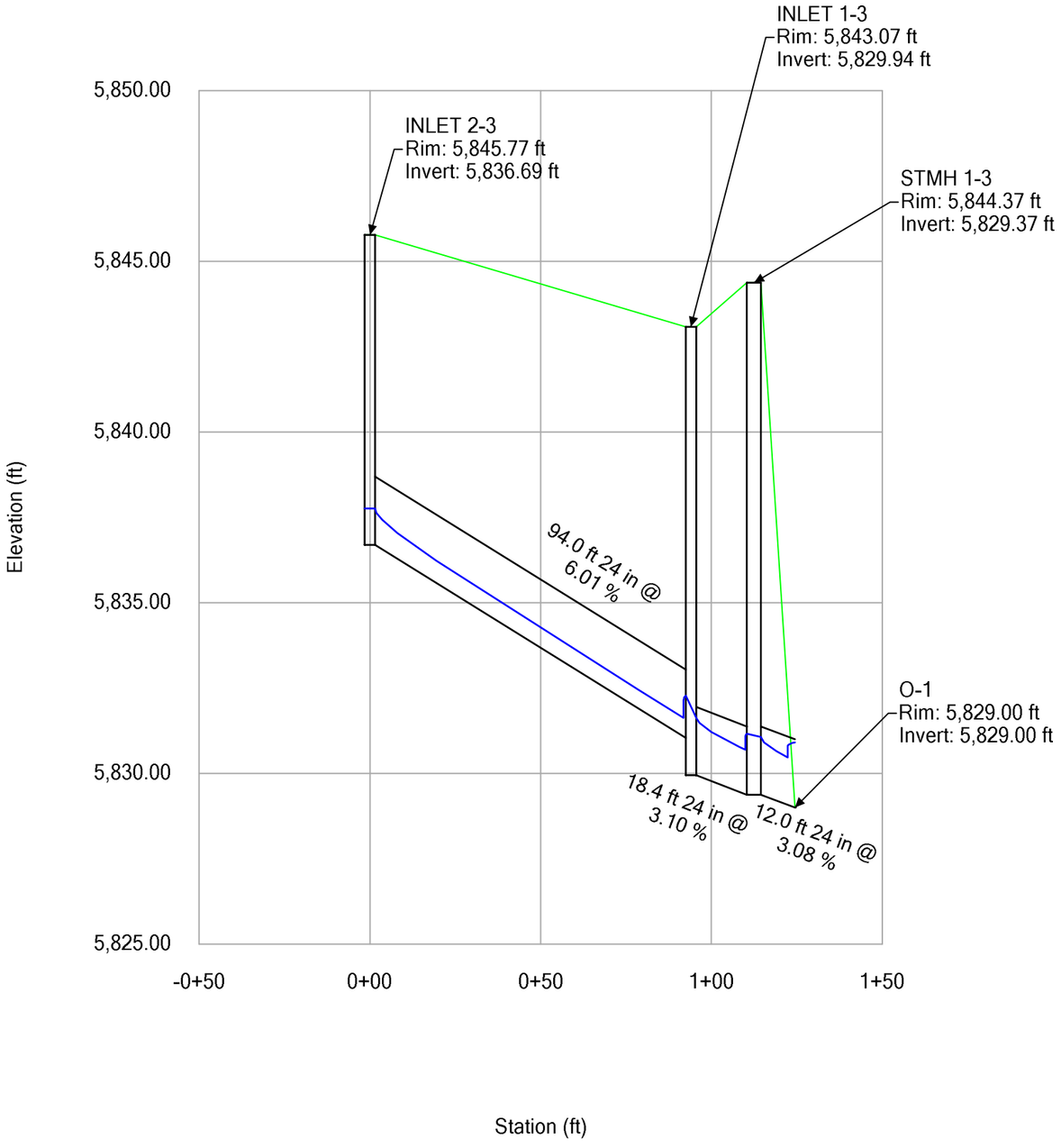
Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
STMH 6-4	5,834.91	INLET 6-4	5,832.53	120.0	1.98	Circle	36	0.013	47.81	13.34	5,837.16	5,834.11
INLET 6-4	5,832.33	STMH 5-4	5,827.71	278.0	1.66	Circle	36	0.013	51.31	12.70	5,834.66	5,829.38
FES 2-5	5,834.54	INLET 8-5	5,834.00	7.7	7.01	Circle	24	0.013	24.64	18.14	5,836.29	5,835.76
INLET 5-4	5,829.34	STMH 5-4	5,828.83	52.0	0.99	Circle	18	0.013	9.80	6.72	5,830.55	5,829.98
INLET 3-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18	0.013	11.20	6.34	5,828.21	5,827.98
INLET 1-4	5,823.04	DIVERSION - STMH 2-4	5,821.92	65.0	1.72	Circle	18	0.013	7.70	4.36	5,825.66	5,825.31
INLET 4-4	5,825.42	STMH 4-4	5,825.23	20.0	0.95	Circle	18	0.013	2.40	1.36	5,827.99	5,827.98
INLET 2-6	5,814.55	INLET 1-6	5,814.15	80.0	0.50	Circle	18	0.013	8.10	4.58	5,816.12	5,815.65
INLET 2-3	5,836.69	INLET 1-3	5,831.04	94.0	6.01	Circle	24	0.013	9.00	12.99	5,837.76	5,832.27
FES 2-4	5,842.00	STMH 6-4	5,835.11	221.0	3.12	Circle	36	0.013	47.81	15.79	5,844.25	5,837.57
STMH 5-4	5,827.41	STMH 4-4	5,822.96	163.0	2.73	Circle	36	0.013	63.33	16.13	5,829.97	5,827.98
INLET 4-5	5,812.96	STMH 2-5A	5,812.27	19.0	3.63	Circle	18	0.013	8.90	5.04	5,815.78	5,815.64
INLET 5-5	5,813.90	STMH 2-5	5,811.47	49.0	4.96	Circle	18	0.013	9.10	5.15	5,815.90	5,815.53
STMH 4-4	5,822.16	STMH 3-4	5,821.56	79.0	0.76	Circle	36	0.013	76.93	10.88	5,827.98	5,826.93
STMH 3-4	5,821.46	DIVERSION - STMH 2-4	5,820.65	76.0	1.07	Circle	36	0.013	84.93	12.02	5,826.54	5,825.31
INLET 2-4	5,822.07	STMH 3-4	5,821.56	56.0	0.91	Circle	18	0.013	8.00	4.53	5,827.03	5,826.71
INLET 8-5	5,833.51	INLET 7-5	5,827.49	173.0	3.48	Circle	24	0.013	24.64	13.95	5,835.26	5,830.99
INLET 4-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18	0.013	10.20	5.77	5,823.36	5,823.17
INLET 5-5A	5,821.14	STMH 2-5E	5,820.90	20.0	1.20	Circle	18	0.013	10.62	6.01	5,823.38	5,823.18
STMH 2-5	5,811.37	INLET 3-5	5,810.99	16.0	2.38	Circle	42	0.013	123.06	17.88	5,814.71	5,814.57
INLET 7-5	5,827.14	STMH 4-5	5,822.27	104.6	4.66	Circle	24	0.013	34.84	11.09	5,829.88	5,827.40
STMH 4-5	5,822.27	INLET 6-5	5,821.44	23.0	3.61	Circle	24	0.013	34.84	11.09	5,826.05	5,825.51
STMH 2-5A	5,812.17	STMH 2-5	5,811.47	50.0	1.40	Circle	36	0.013	48.02	6.79	5,815.56	5,815.30
STMH 2-5B	5,815.51	STMH 2-5A	5,812.17	241.0	1.39	Circle	30	0.013	39.12	10.95	5,817.62	5,815.66
DIVERSION - STMH 2-4	5,820.42	STMH 1-4	5,818.85	72.0	2.17	Circle	36	0.013	69.03	15.06	5,823.06	5,820.88
STMH 1-4	5,818.23	FES 1-4	5,818.00	28.0	0.82	Circle	36	0.013	69.03	9.77	5,821.05	5,820.64
INLET 1-3	5,829.94	STMH 1-3	5,829.37	18.4	3.10	Circle	24	0.013	22.50	13.06	5,831.63	5,831.16
STMH 1-3	5,829.37	O-1	5,829.00	12.0	3.08	Circle	24	0.013	22.50	13.04	5,831.06	5,830.90
INLET 5-4A	5,829.26	STMH 5-4	5,828.83	43.0	1.00	Circle	18	0.013	2.22	4.71	5,829.92	5,829.97
STMH 2-5E	5,820.80	STMH 2-5D	5,820.12	44.0	1.55	Circle	24	0.013	20.82	6.63	5,822.95	5,822.58
STMH 2-5D	5,820.12	STMH 2-5C	5,819.49	45.0	1.40	Circle	24	0.013	28.32	9.01	5,822.34	5,821.64
STMH 2-5C	5,819.49	STMH 2-5B	5,815.51	289.0	1.38	Circle	30	0.013	35.22	10.71	5,821.51	5,817.73
INLET 4-5B	5,819.70	STMH 2-5C	5,819.52	18.0	1.00	Circle	18	0.013	6.90	3.90	5,821.69	5,821.62
INLET 5-5B	5,828.30	STMH 2-5D	5,820.22	293.0	2.76	Circle	18	0.013	7.50	9.49	5,829.36	5,822.56
INLET 4-5C	5,815.79	STMH 2-5B	5,815.61	18.0	1.00	Circle	18	0.013	3.90	2.21	5,817.71	5,817.68
INLET 6-5	5,821.14	STMH 3-5A	5,812.67	247.0	3.43	Circle	30	0.013	54.44	11.09	5,824.34	5,819.99
STMH 3-5A	5,812.67	STMH 2-5	5,811.37	48.0	2.71	Circle	30	0.013	65.94	13.43	5,816.29	5,815.04
INLET 6-5A	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18	0.013	6.20	3.51	5,820.05	5,819.99
INLET 6-5B	5,812.86	STMH 3-5A	5,812.67	19.0	1.00	Circle	18	0.013	5.30	3.00	5,820.04	5,819.99
DIVERSION - STMH 2-4	5,820.42	STMH 1-12	5,820.26	32.0	0.49	Circle	30	0.013	23.60	0.00	5,823.64	5,823.53
STMH 1-12	5,820.16	STMH 2-12	5,819.90	52.0	0.50	Circle	30	0.013	23.60	6.58	5,822.55	5,822.40
STMH 2-12	5,819.80	STMH 3-12	5,818.95	168.0	0.51	Circle	30	0.013	23.60	6.62	5,821.51	5,820.65
STMH 3-12	5,818.85	STMH 4-12	5,817.87	196.0	0.50	Circle	30	0.013	23.60	6.58	5,820.56	5,819.52
STMH 4-12	5,817.77	STMH 5-12	5,816.66	202.0	0.55	Circle	30	0.013	23.60	6.84	5,819.42	5,818.41
STMH 5-12	5,816.66	STMH 6-12	5,808.94	286.0	2.70	Circle	30	0.013	23.60	12.51	5,818.31	5,813.17
STMH 6-12	5,812.33	STMH 7-12	5,812.68	71.0	-0.49	Circle	18	0.013	5.80	4.62	5,813.68	5,813.26

FlexTable: Conduit Table

Start Node	Invert (Start) (ft)	Stop Node	Invert (Stop) (ft)	Length (User Defined) (ft)	Slope (Calculated) (%)	Section Type	Diameter (in)	Manning's n	Flow (cfs)	Velocity (ft/s)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
INLET 1-6	5,814.05	DIVERSION - STMH 8-12	5,813.06	16.0	6.19	Circle	24	0.013	15.40	15.27	5,815.46	5,813.98
STMH 6-12	5,808.84	STMH 9-12	5,807.59	249.0	0.50	Circle	42	0.013	29.40	3.06	5,812.98	5,812.77
INLET 2-5	5,808.45	STMH 10-12	5,806.11	24.0	9.75	Circle	24	0.013	23.50	7.48	5,812.90	5,812.64
STMH 10-12	5,806.11	INLET 1-5	5,808.34	66.0	-3.38	Circle	24	0.013	15.10	4.81	5,812.94	5,812.64
STMH 9-12	5,807.49	STMH 10-12	5,806.11	275.0	0.50	Circle	48	0.013	29.40	2.34	5,812.76	5,812.64
STMH 10-12	5,806.01	STMH 11-12	5,805.50	103.0	0.50	Circle	48	0.013	68.00	5.41	5,812.62	5,812.39
STMH 13-12	5,792.21	STMH 14-12	5,790.94	255.0	0.50	Circle	60	0.013	185.43	9.44	5,798.76	5,797.47
STMH 14-12	5,790.84	FES 1-5	5,790.21	126.0	0.50	Circle	60	0.013	185.43	9.44	5,797.29	5,796.65
STMH 12-12	5,795.80	STMH 13-12	5,792.31	233.0	1.50	Circle	60	0.013	185.43	16.85	5,799.70	5,798.94
DIVERSION - STMH 8-12	5,812.96	STMH 7-12	5,812.78	35.0	0.51	Circle	18	0.013	5.80	0.00	5,814.67	5,814.56
STMH 11-12	5,805.38	STMH 11A-12	5,802.37	117.0	2.57	Circle	60	0.013	204.96	21.17	5,809.46	5,806.46
STMH 11A-12	5,802.27	STMH 12-12	5,795.90	318.0	2.00	Circle	60	0.013	204.96	19.27	5,806.35	5,802.31
DIVERSION - STMH 8-12	5,812.96	STMH-8A	5,806.30	116.0	5.74	Circle	24	0.013	9.60	13.01	5,814.07	5,808.33
STMH-8A	5,806.20	FES1-6	5,806.00	40.0	0.50	Circle	24	0.013	9.60	3.06	5,808.33	5,808.26
INLET 3-5	5,810.89	MH-1-5A	5,808.93	105.5	1.86	Circle	48	0.013	136.96	16.85	5,814.37	5,813.25
MH-1-5A	5,808.93	STMH 11-12	5,805.47	95.1	3.64	Circle	48	0.013	136.96	10.90	5,813.25	5,812.39
OUTLET STRUCTURE	5,787.19	O-2	5,785.30	127.9	1.48	Circle	36	0.013	57.30	12.44	5,789.64	5,787.21
CB-12	5,792.34	FOREBAY B	5,790.35	32.3	6.16	Circle	30	0.013	33.00	6.72	5,796.88	5,796.67

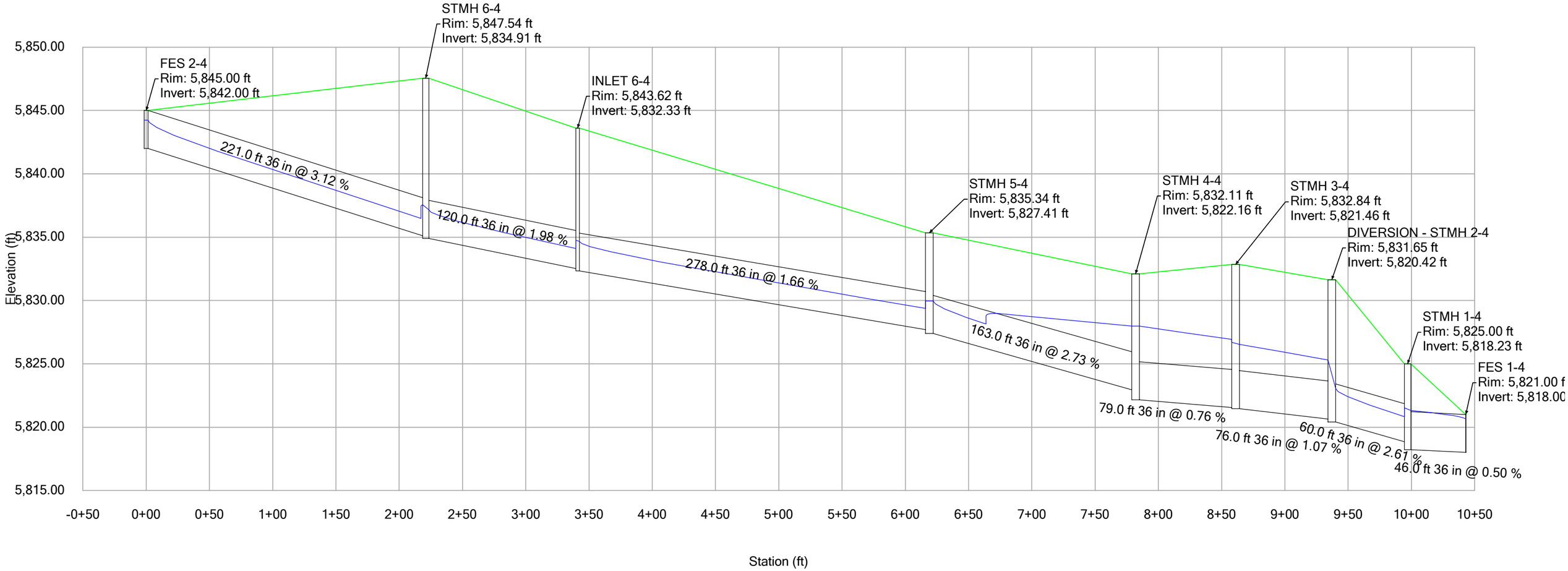
Profile Report

Engineering Profile - Profile - Storm Line 03 (Compark Village South StormCAD [100 year].stsw)



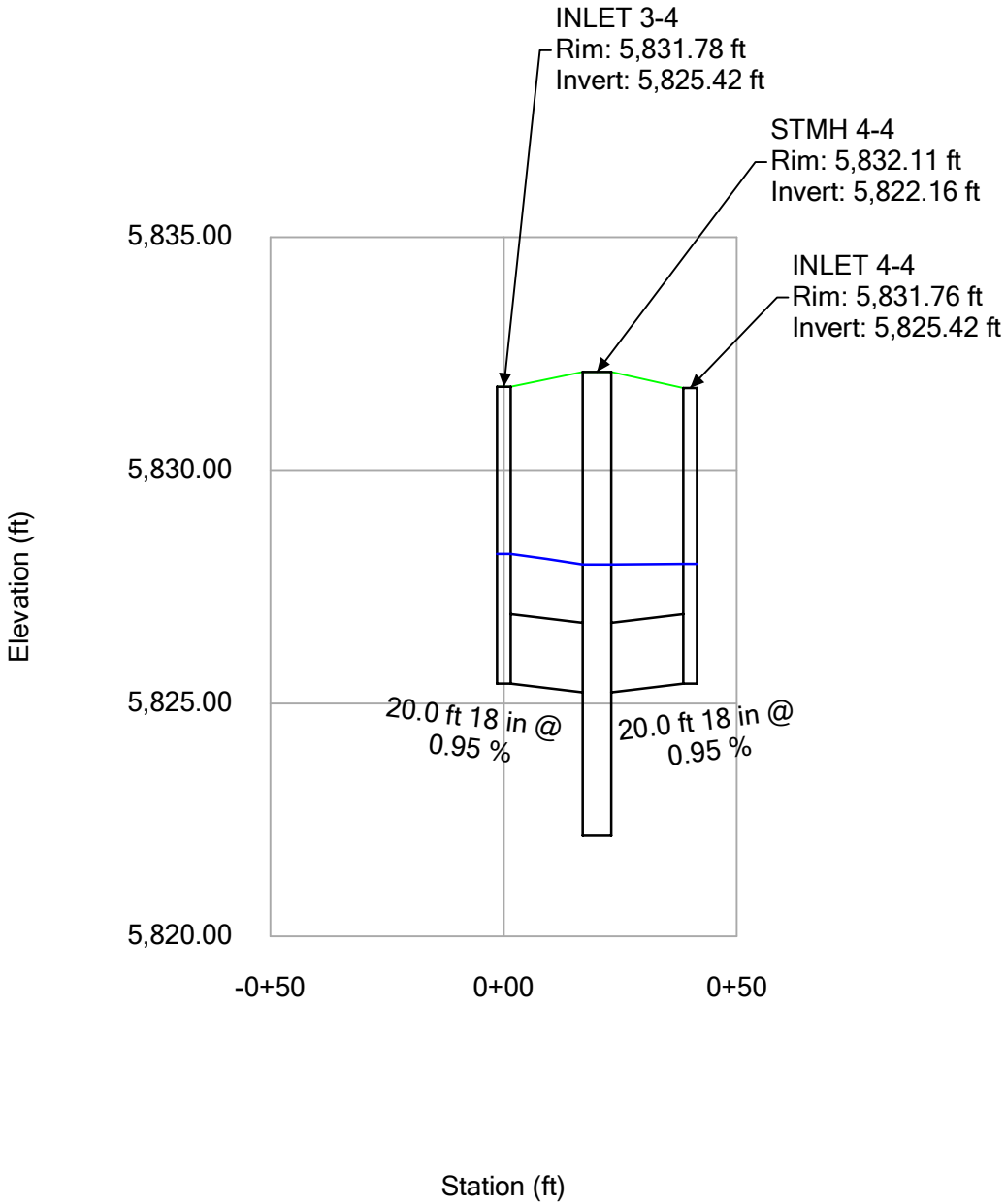
Profile Report

Engineering Profile - Profile - Storm Line 04 (Compark Village South StormCAD [100 year].stsw)



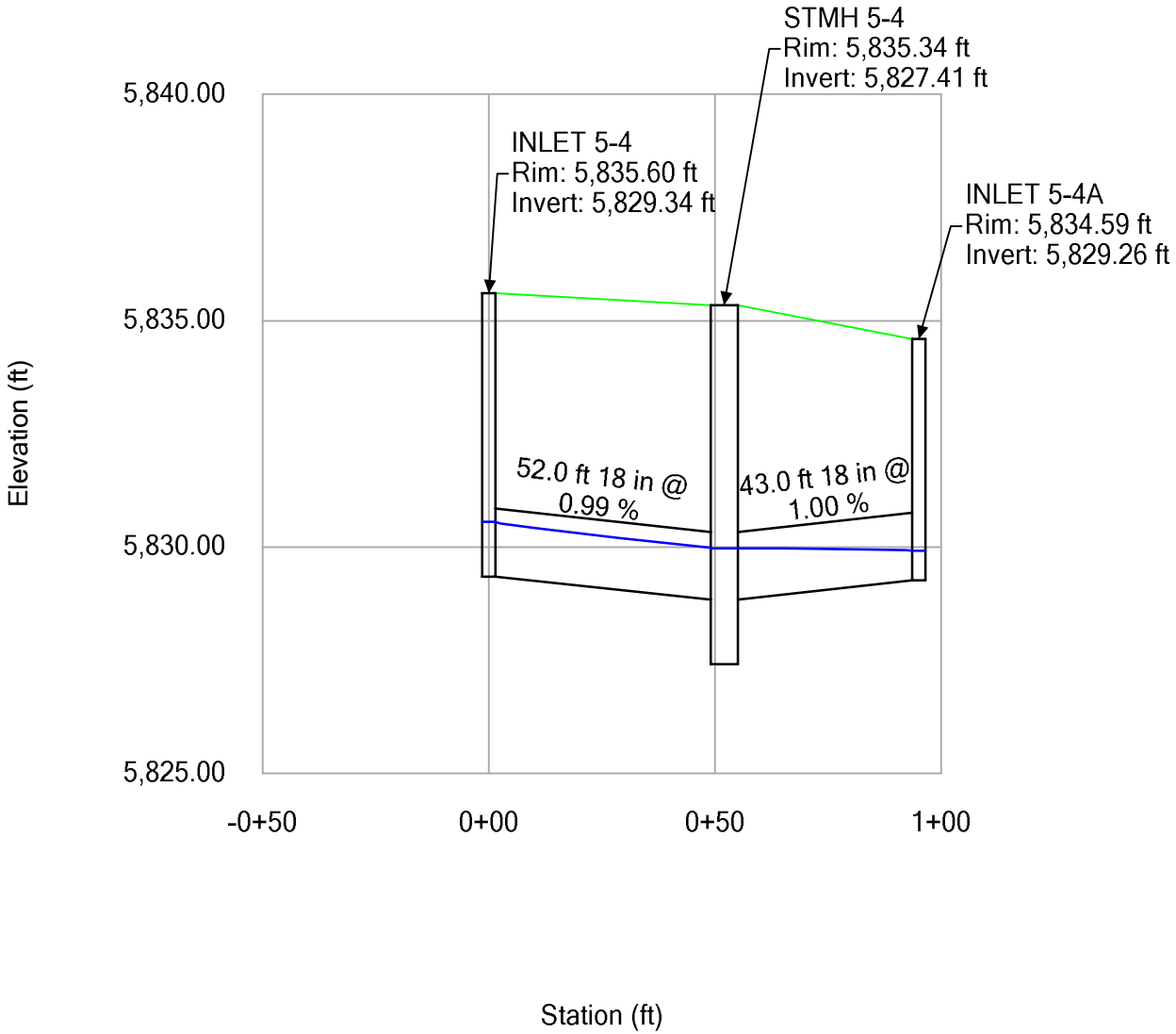
Profile Report

Engineering Profile - Profile - Storm Line 04A (Compark Village South StormCAD [100 year].stsw)



Profile Report

Engineering Profile - Profile - Storm Line 04B (Compark Village South StormCAD [100 year].stsw)



Profile Report

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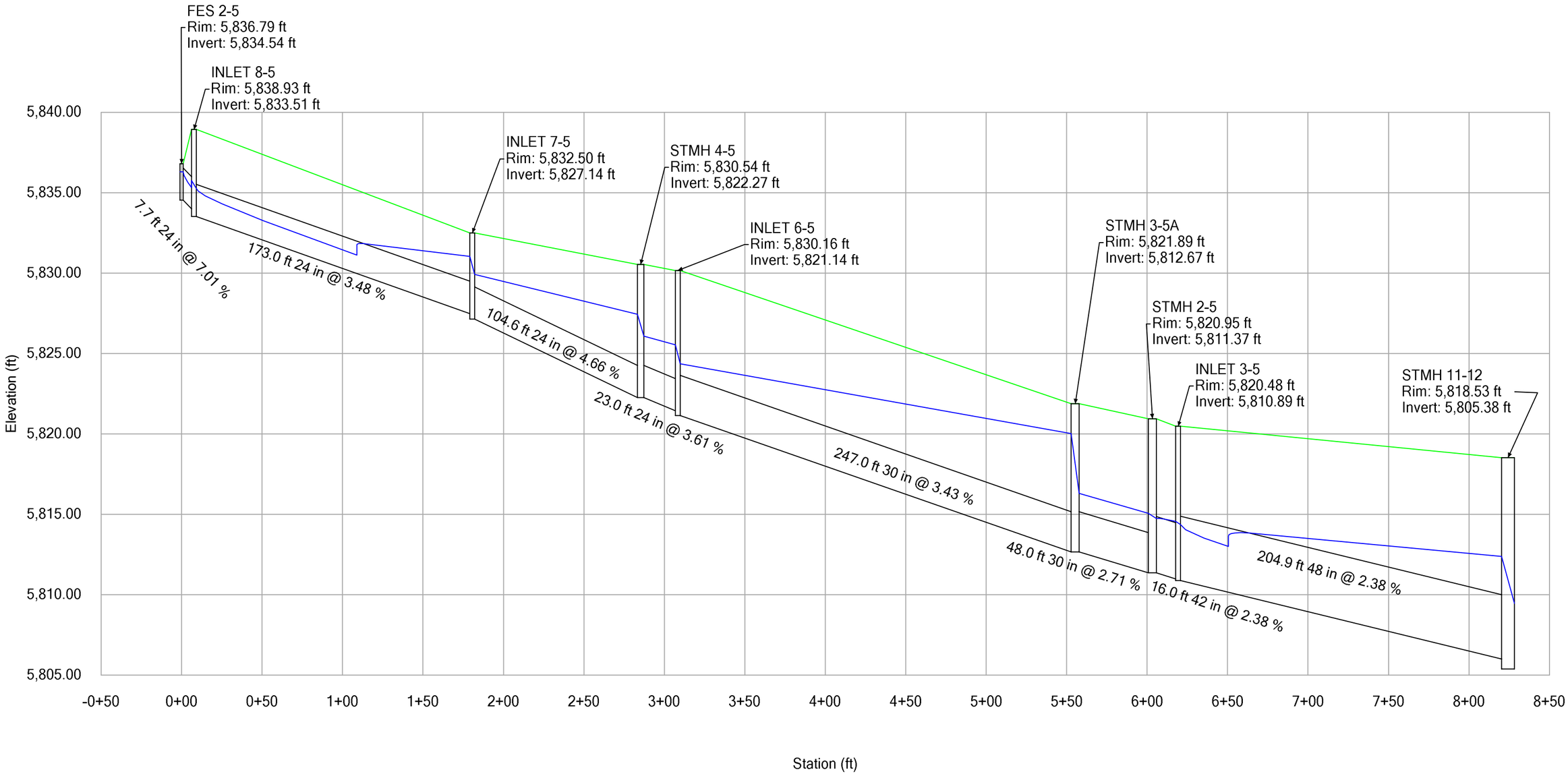
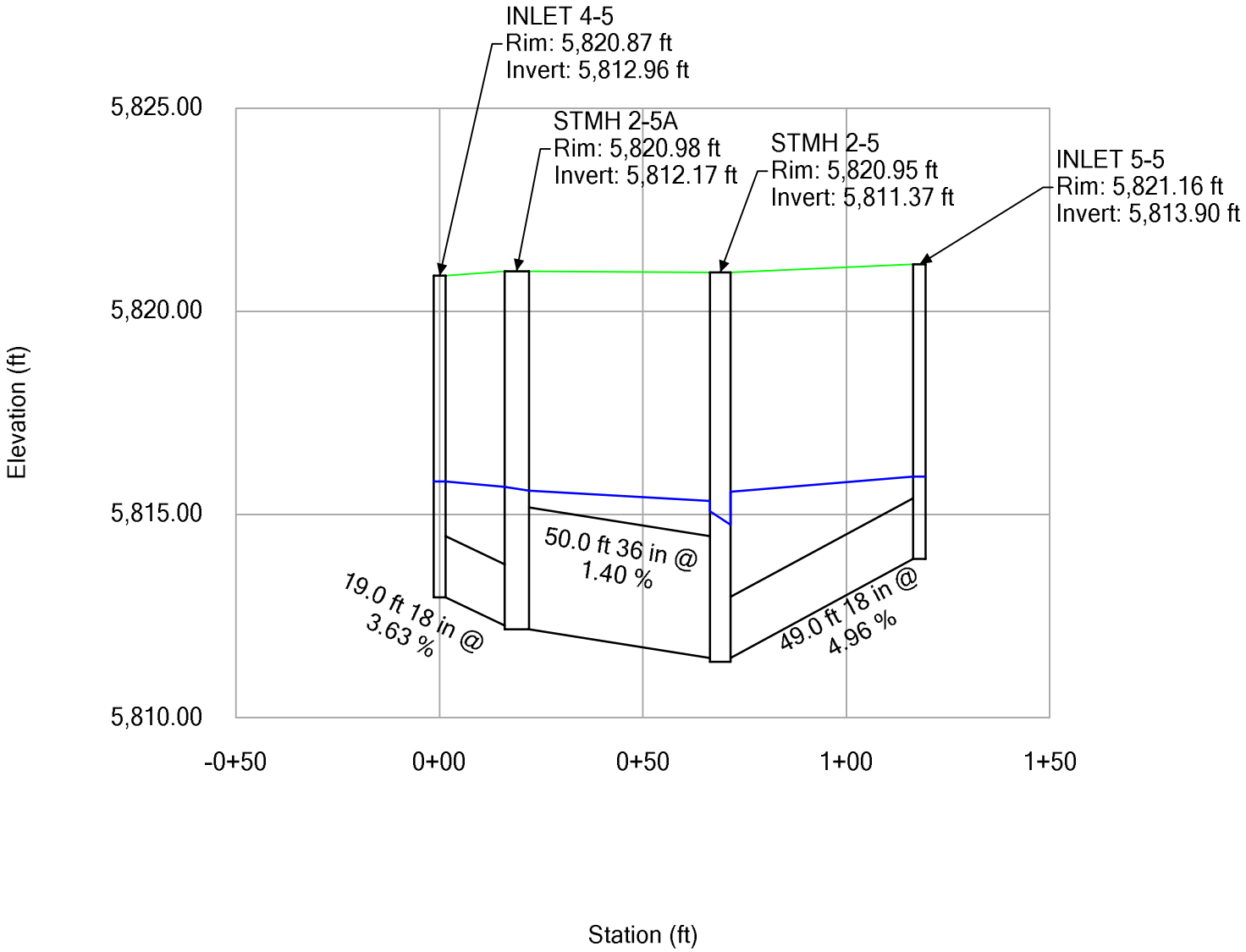


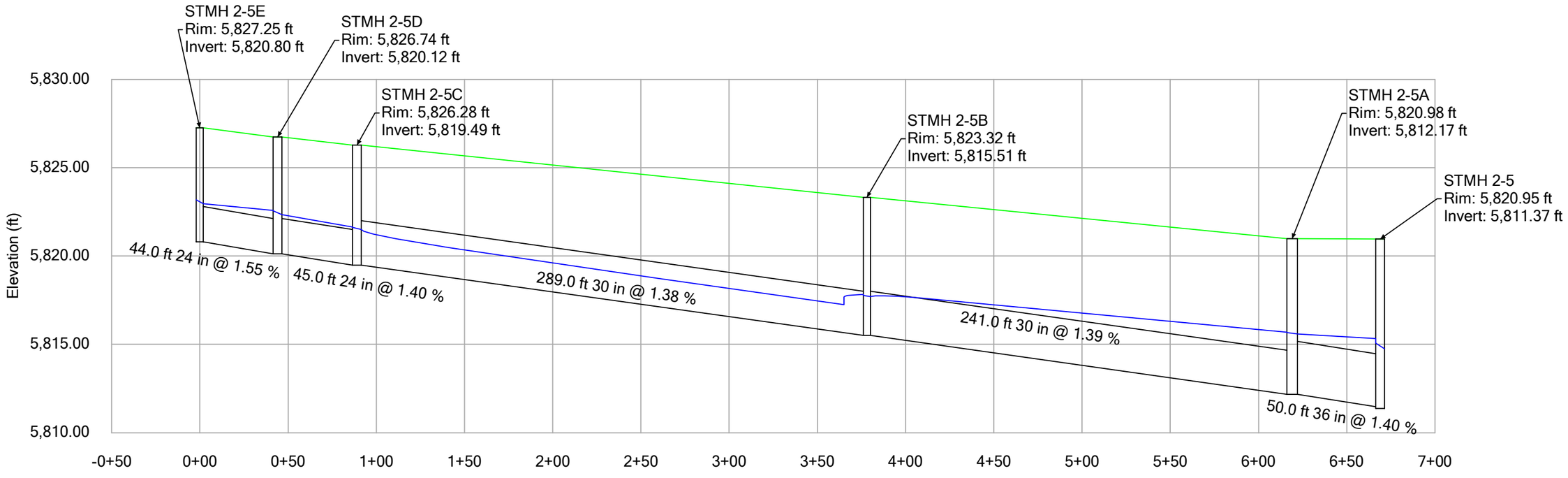
Profile Report

Engineering Profile - Profile - Storm Line 05B (Compark Village South StormCAD [100 year].stsw)



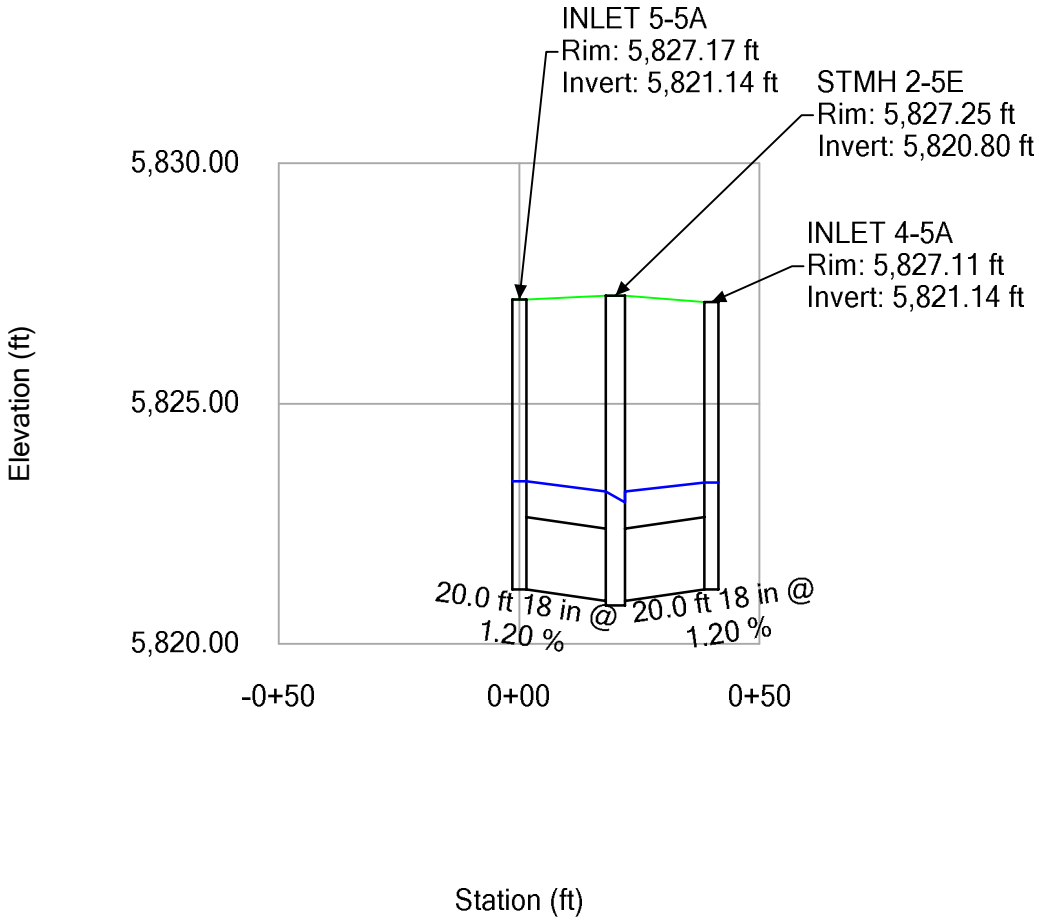
Profile Report

Engineering Profile - Profile - Storm Line 05C (Compark Village South StormCAD [100 year].stsw)



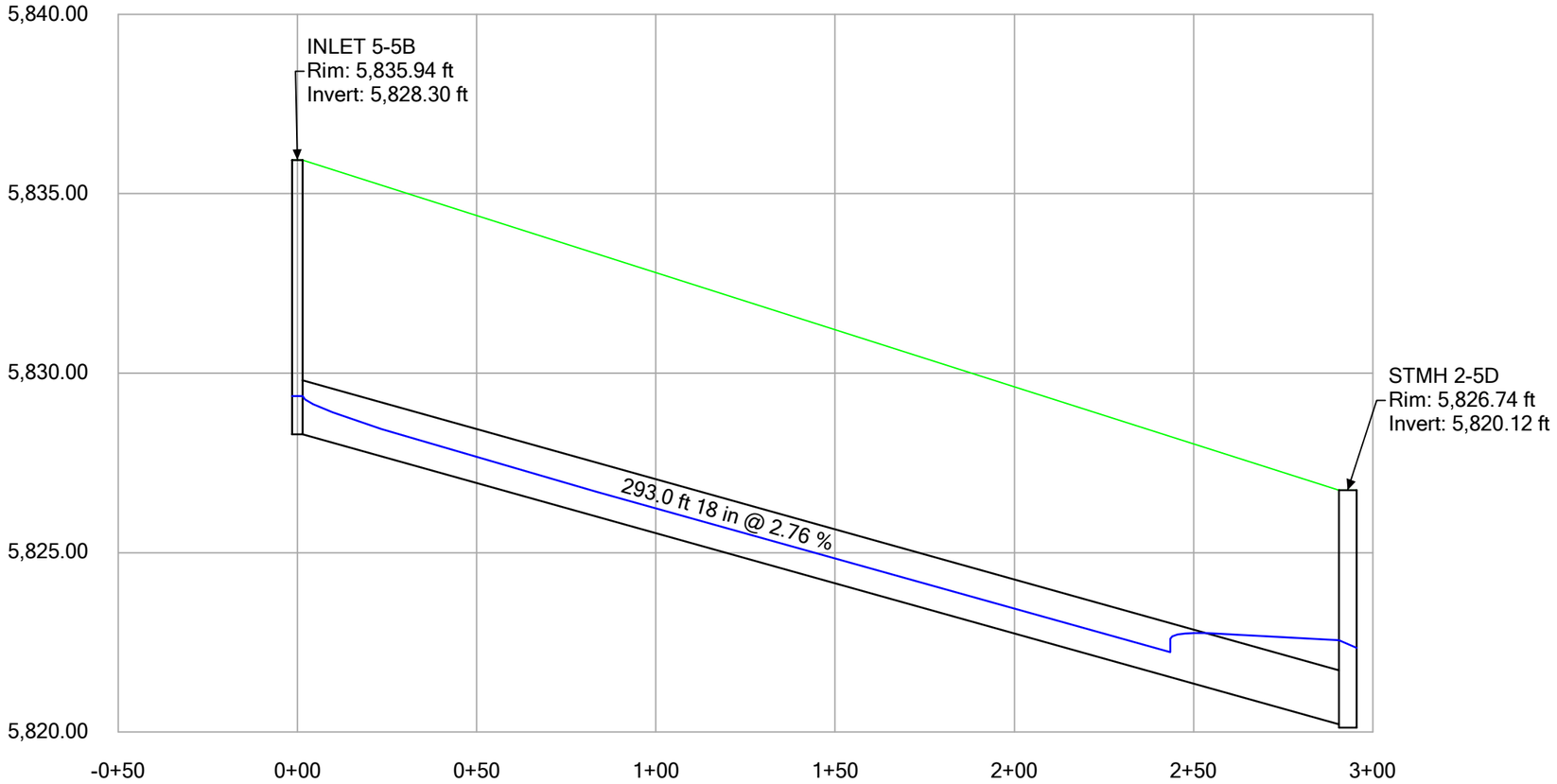
Profile Report

Engineering Profile - Profile - Storm Line 05D (Compark Village South StormCAD [100 year].stsw)



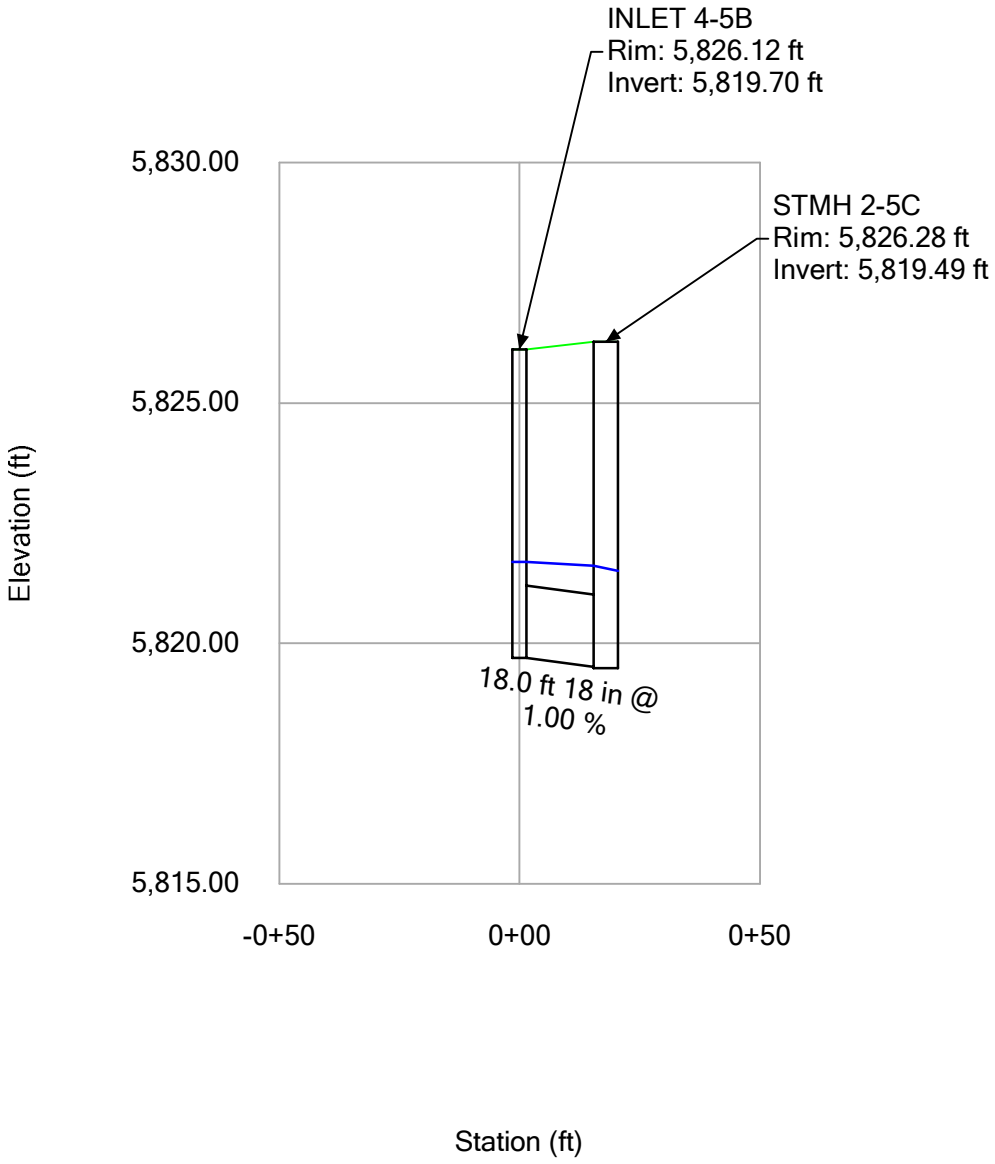
Profile Report

Engineering Profile - Profile - Storm Line 05E (Compark Village South StormCAD [100 year].stsw)



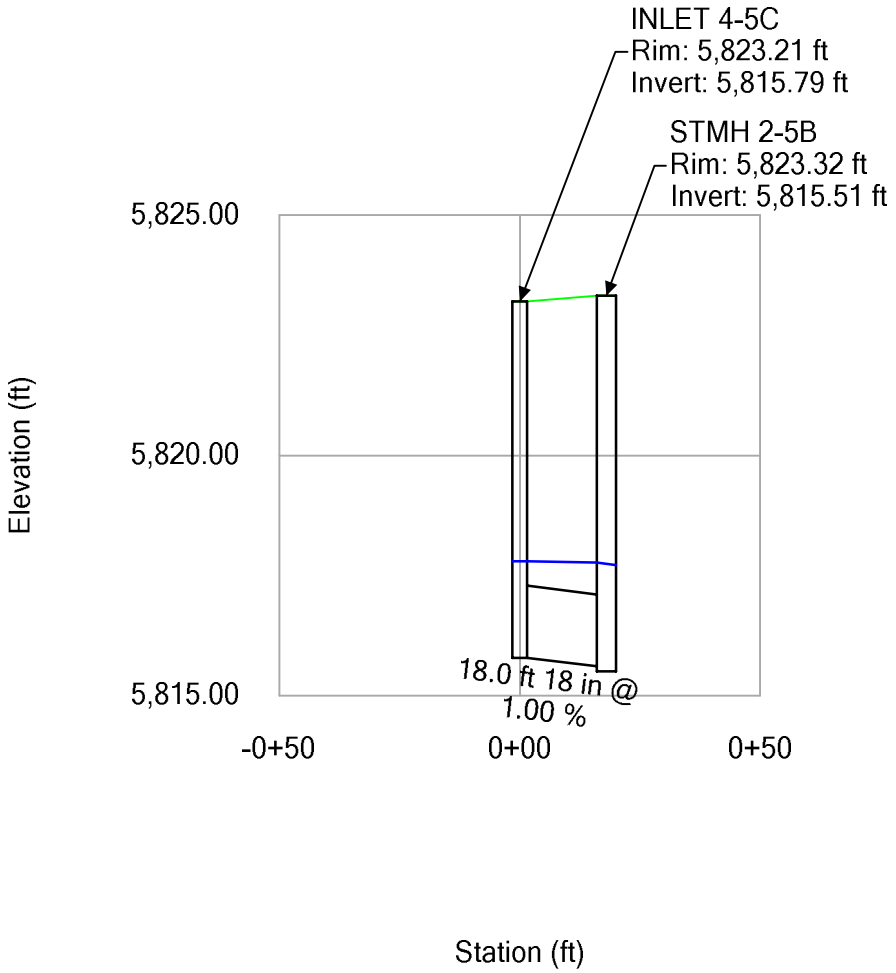
Profile Report

Engineering Profile - Profile - Storm Line 05F (Compark Village South StormCAD [100 year].stsw)



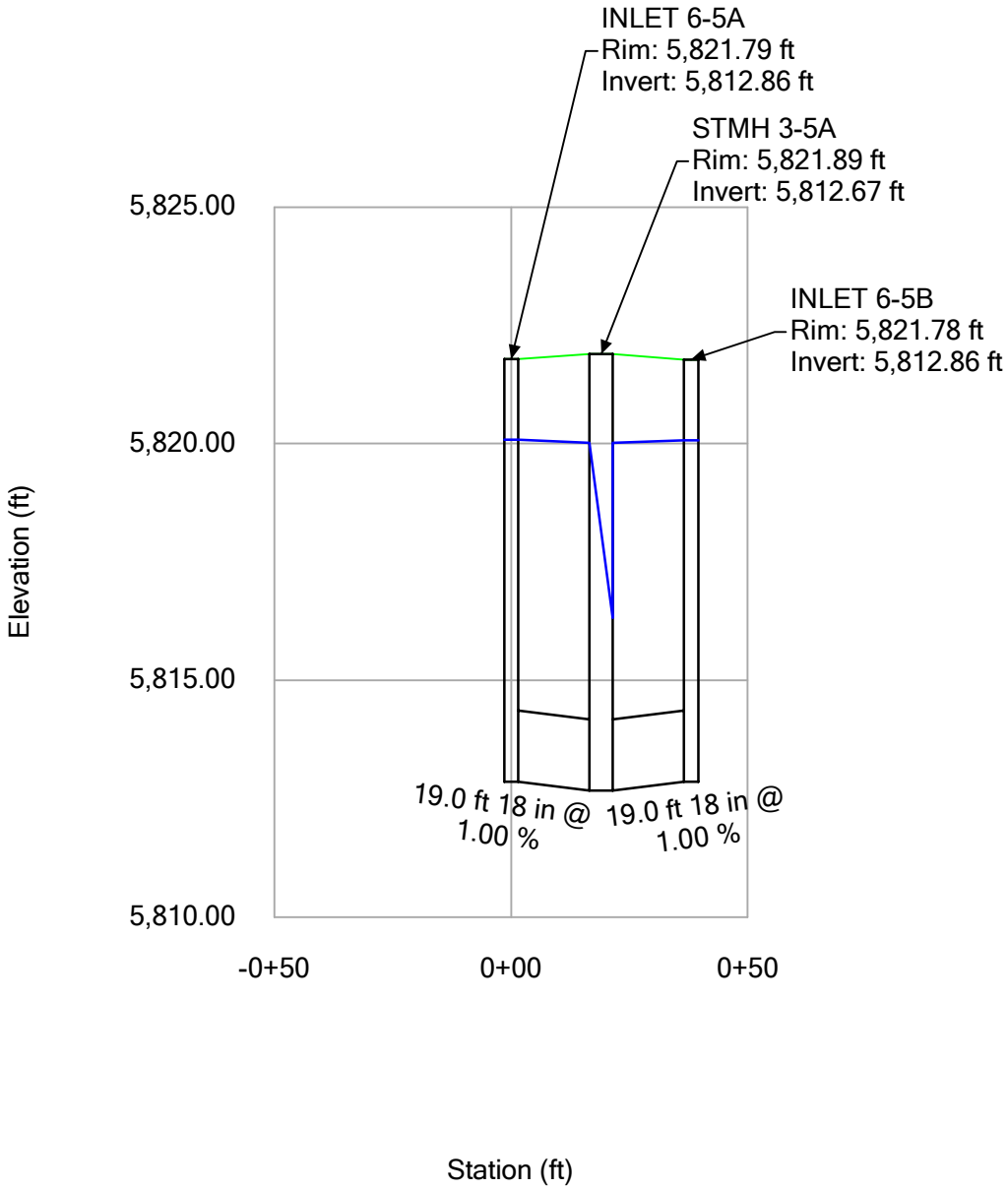
Profile Report

Engineering Profile - Profile - Storm Line 05G (Compark Village South StormCAD [100 year].stsw)



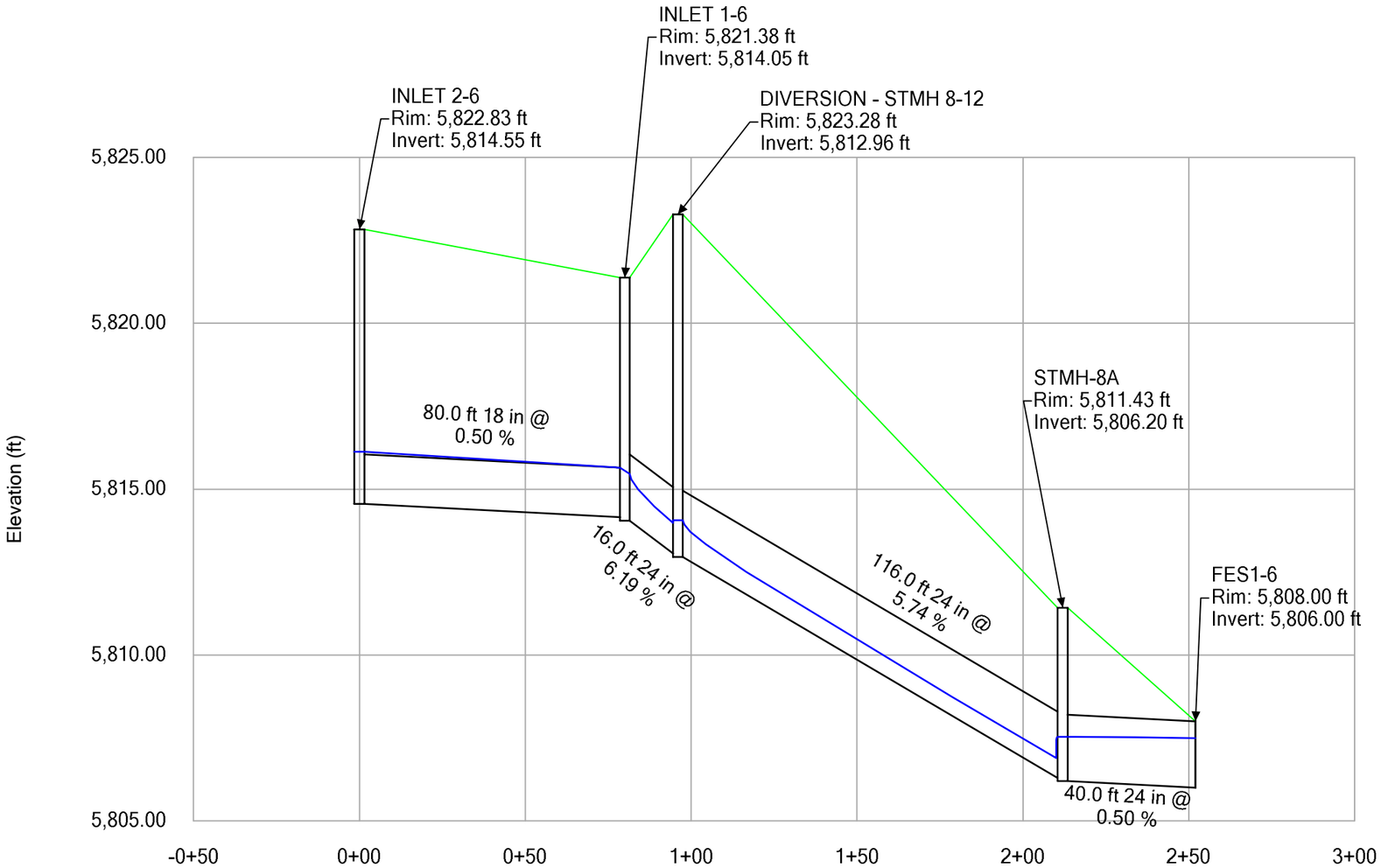
Profile Report

Engineering Profile - Profile - Storm Line 05H (Compark Village South StormCAD [100 year].stsw)



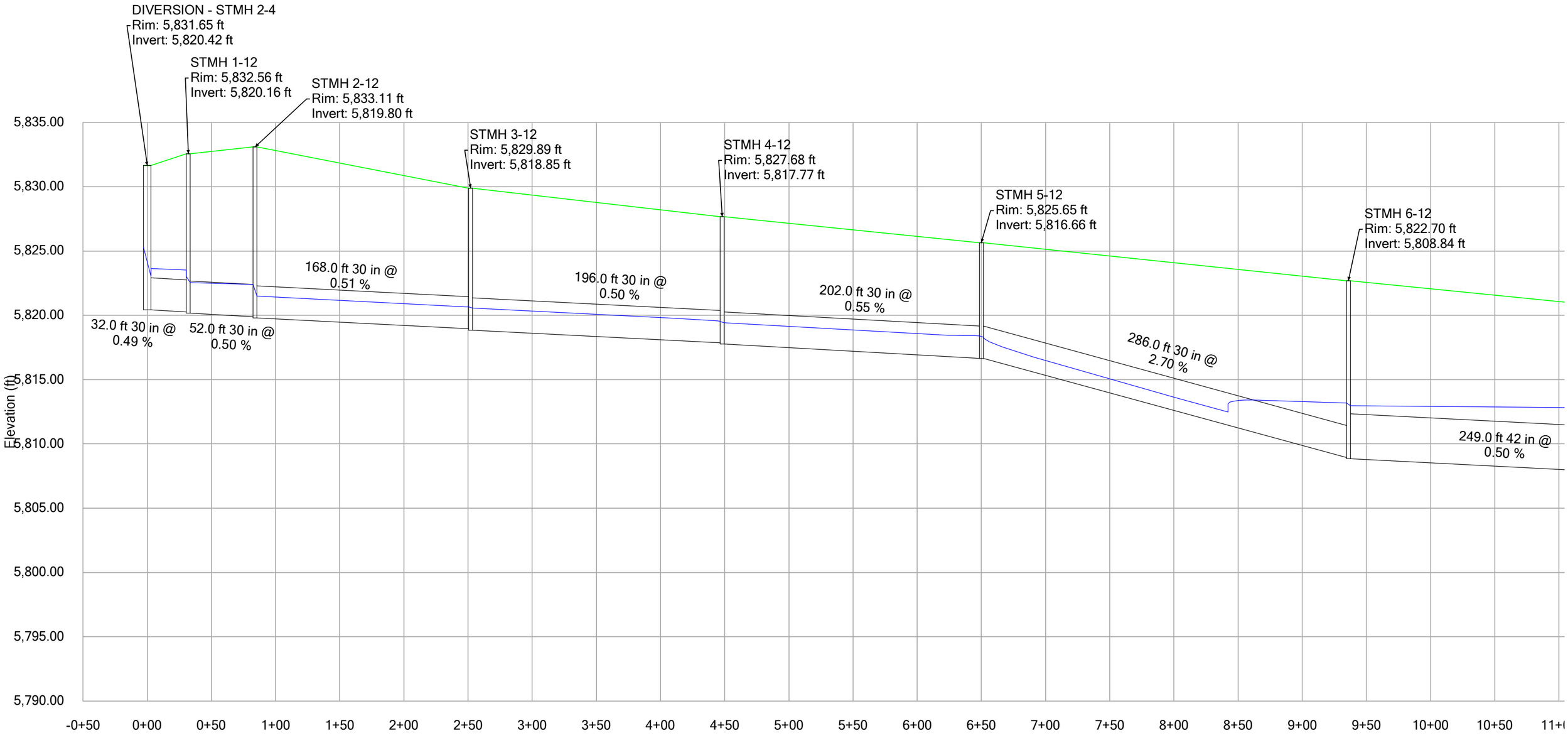
Profile Report

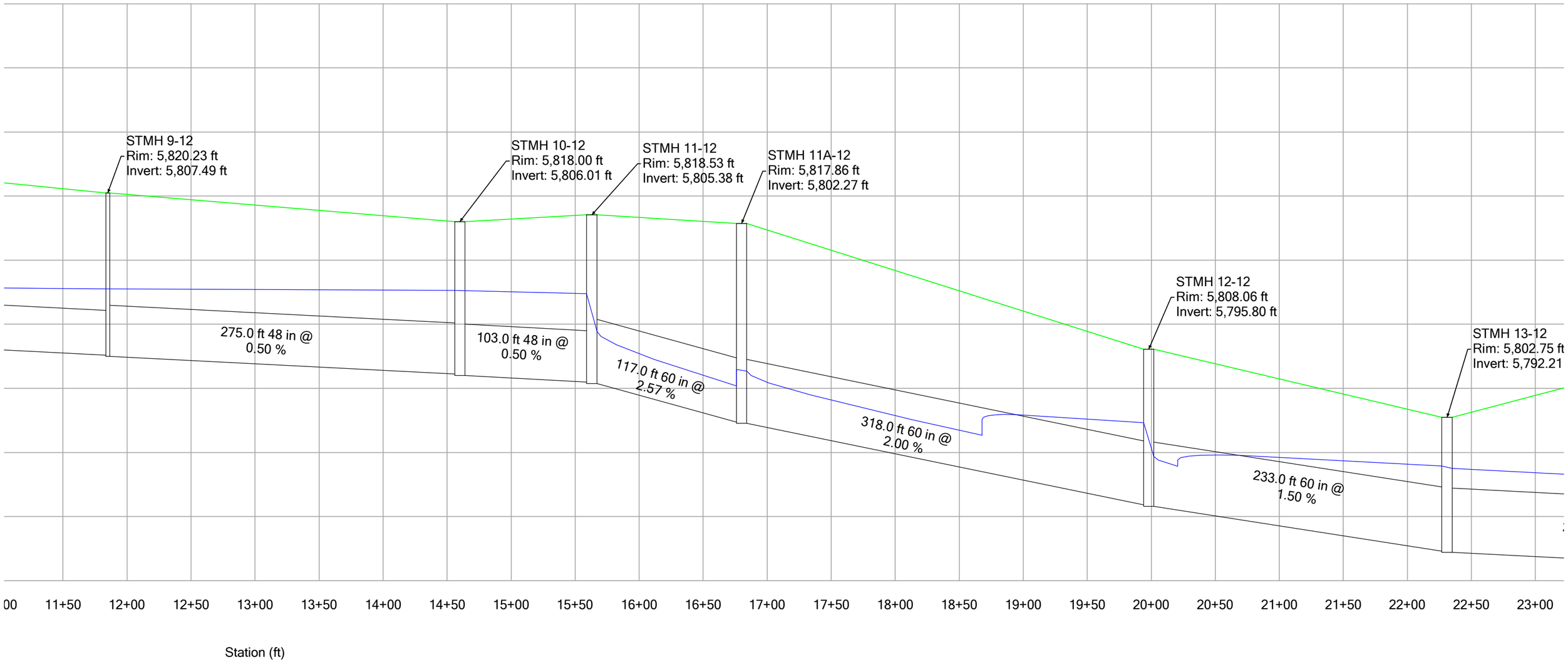
Engineering Profile - Profile - Storm Line 06 (Compark Village South StormCAD [100 year].stsw)



Profile Report

Engineering Profile - Profile - Storm Line 12 (Compark Village South StormCAD [100 year].stsw)




STMH 9-12
Rim: 5,820.23 ft
Invert: 5,807.49 ft
STMH 10-12
Rim: 5,818.00 ft
Invert: 5,806.01 ft
STMH 11-12
Rim: 5,818.53 ft
Invert: 5,805.38 ft
STMH 11A-12
Rim: 5,817.86 ft
Invert: 5,802.27 ft
STMH 12-12
Rim: 5,808.06 ft
Invert: 5,795.80 ft
STMH 13-12
Rim: 5,802.75 ft
Invert: 5,792.21
275.0 ft 48 in @ 0.50 %
103.0 ft 48 in @ 0.50 %
117.0 ft 60 in @ 2.57 %
318.0 ft 60 in @ 2.00 %
233.0 ft 60 in @ 1.50 %
00
11+50
12+00
12+50
13+00
13+50
14+00
14+50
15+00
15+50
16+00
16+50
17+00
17+50
18+00
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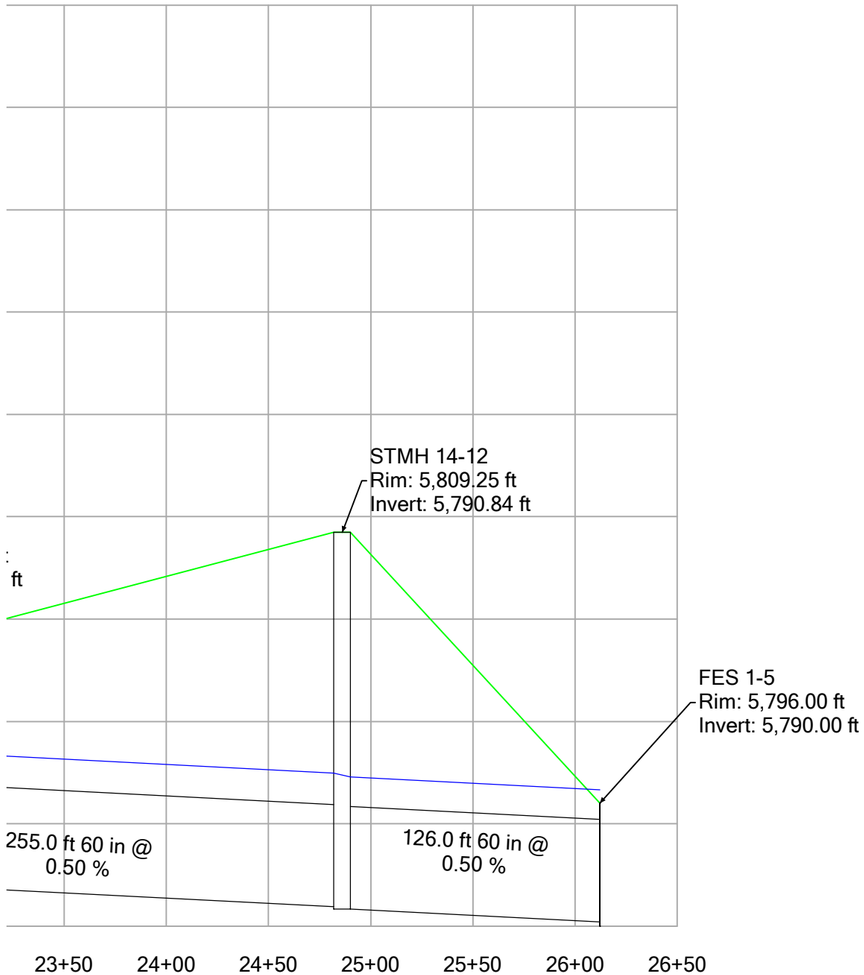
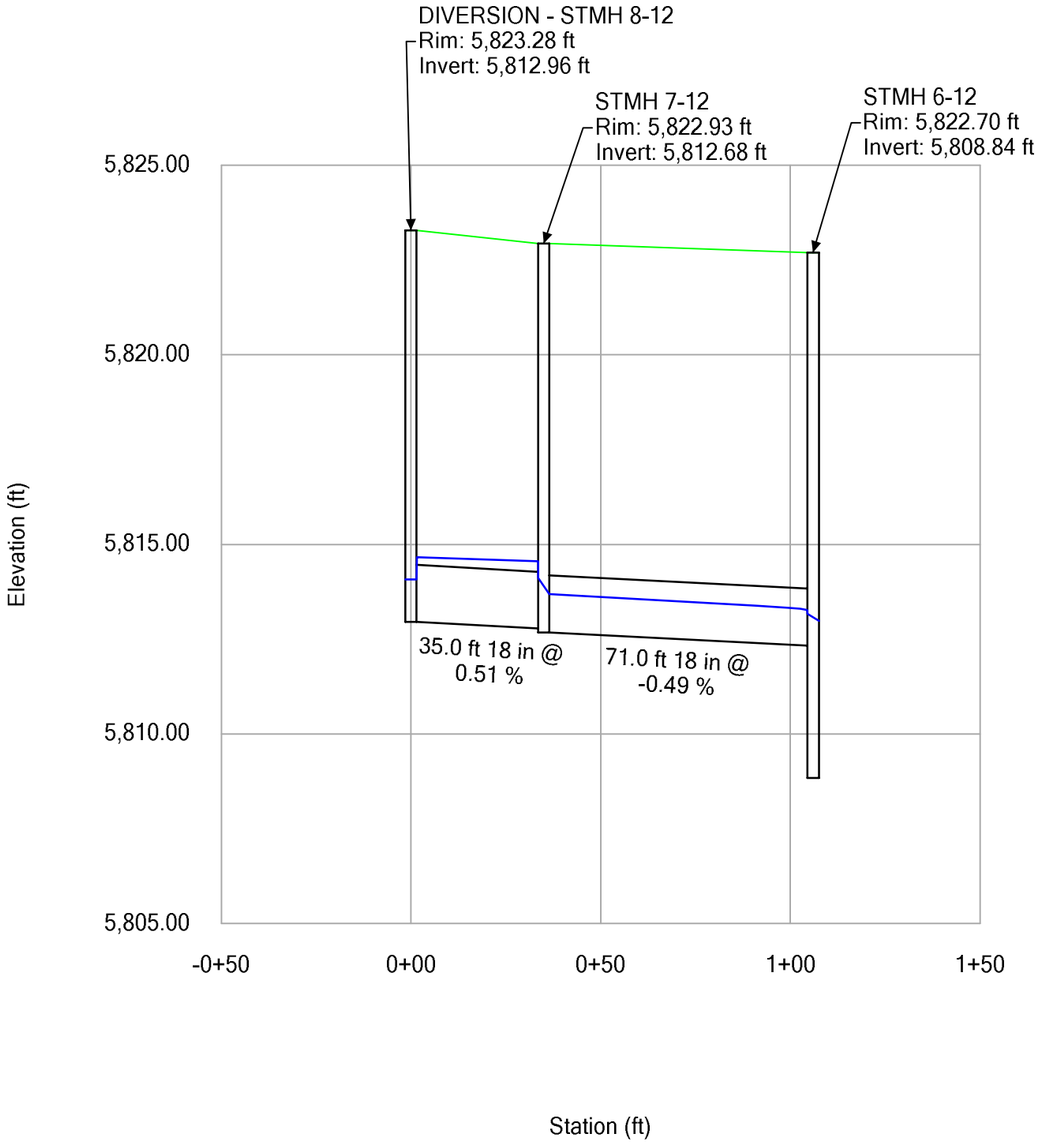
19+50
20+00
20+50
21+00
21+50
22+00
22+50
23+00
Station (ft)


STMH 14-12
Rim: 5,809.25 ft
Invert: 5,790.84 ft
ft
FES 1-5
Rim: 5,796.00 ft
Invert: 5,790.00 ft
255.0 ft 60 in @
0.50 %
126.0 ft 60 in @
0.50 %
23+50
24+00
24+50
25+00
25+50
26+00
26+50

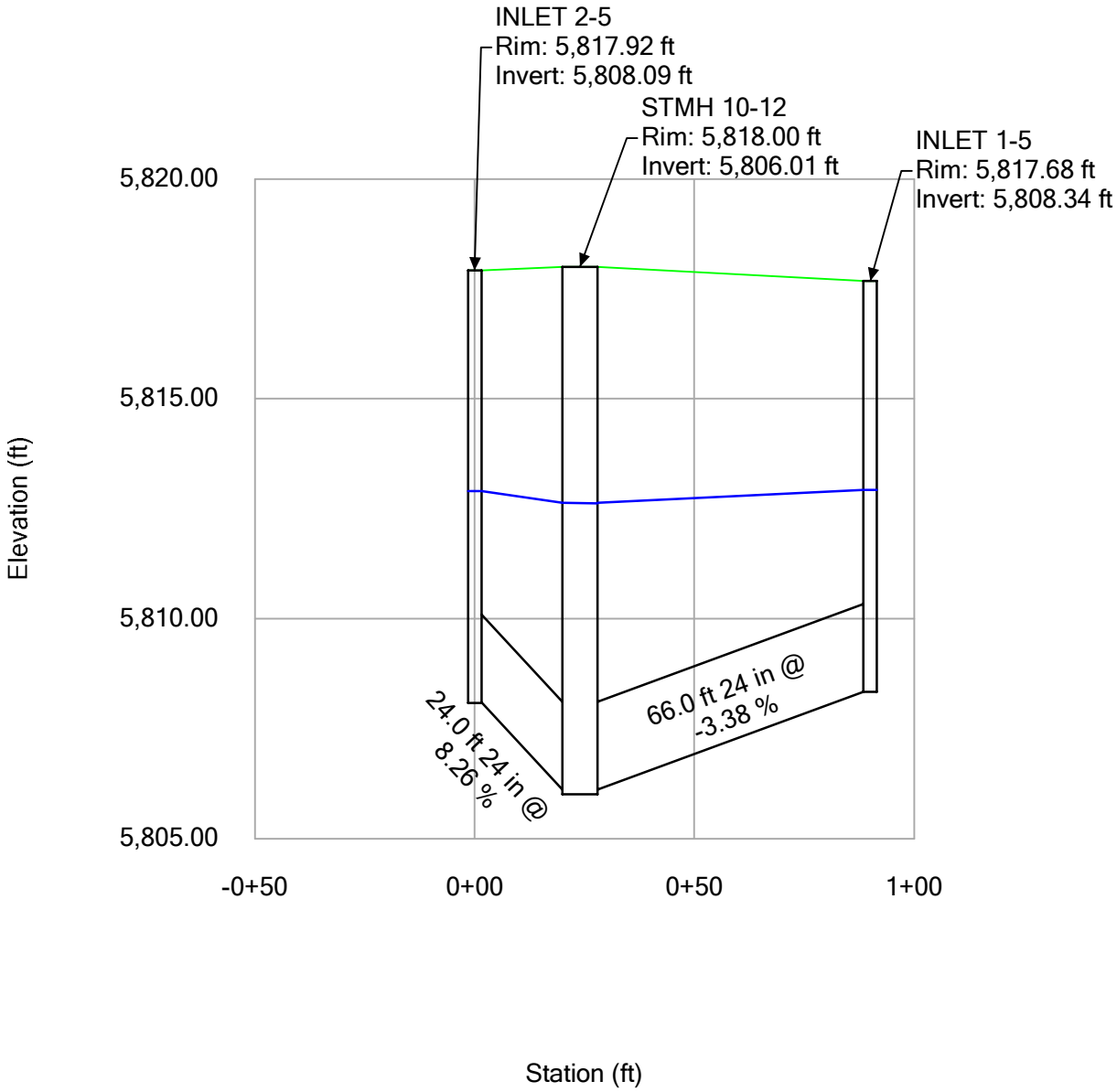
Profile Report

Engineering Profile - Profile - Storm Line 12A (Compark Village South StormCAD [100 year].stsw)



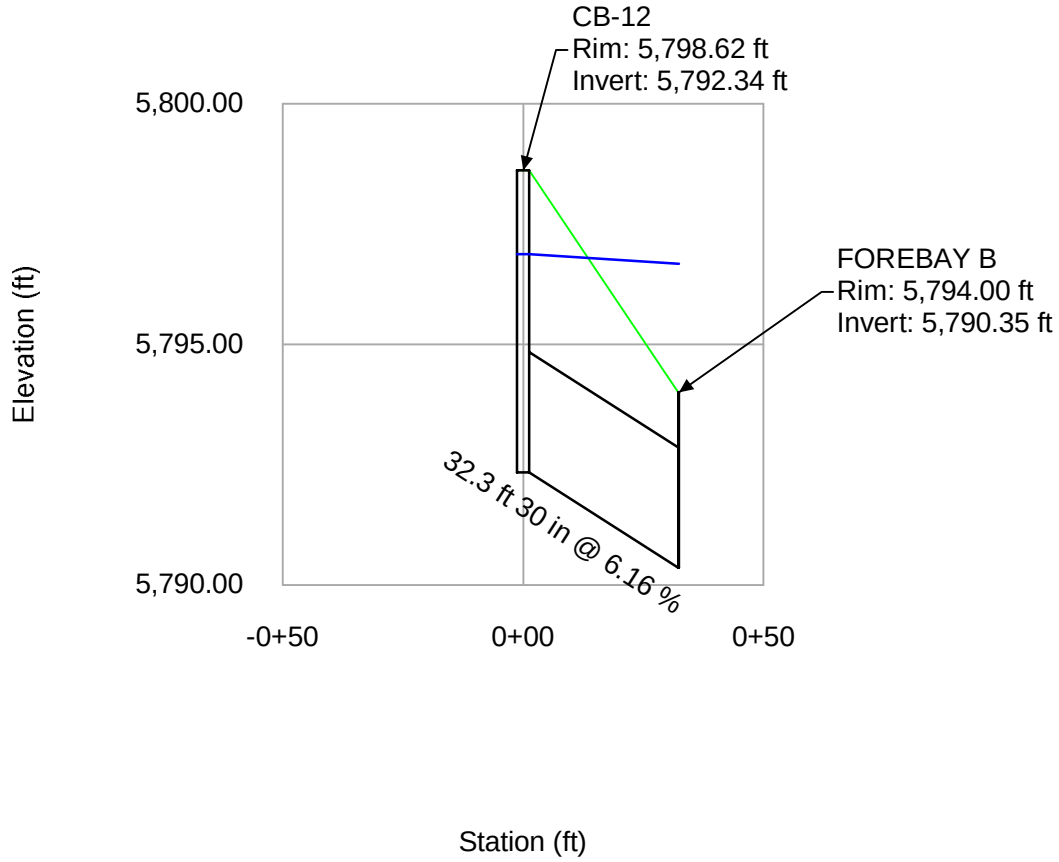
Profile Report

Engineering Profile - Profile - Storm Line 12B (Compark Village South StormCAD [100 year].stsw)



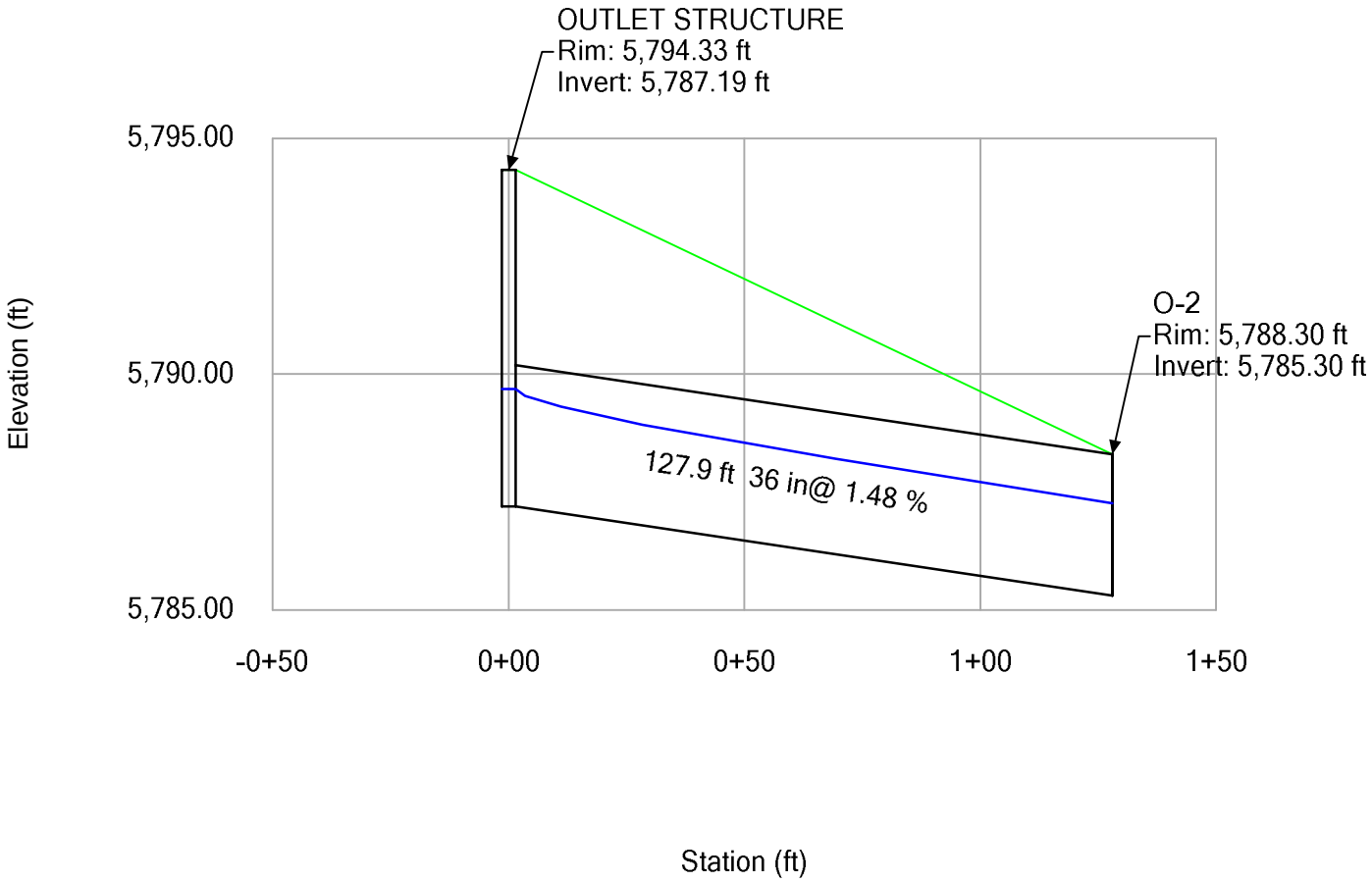
Profile Report

Engineering Profile - Profile -CB 12 to Det Basin (Compark Village South StormCAD [100 year].stsw)



Profile Report

Engineering Profile - Profile - Det Basin Outfall (Compark Village South StormCAD [100 year].stsw)



Appendix E

Job Name.: Compark Village South- Filing 1
Proj. No.: CLCPKC3
Crew: MM
Sheet(s): 1 / 1 Date: 3/3/20

Manhard CONSULTING
7600 E. Orchard Rd. Ste. 150-N
Greenwood Village, CO 80111
303-708-0500

See UDFCD Figure 9-38 Riprap Sizing Graph

Outfall 1 - FES 1-4

Q_{100} = 69.03 cfs D = 3.0' Y_T = 1.7' → Based on Respec 60% GAT Design flow depths

$\frac{Q_{100}}{D^{1.5}} = \frac{69.03}{3.0^{1.5}} = 13.3$ $\frac{Y_T}{D} = \frac{1.7}{3.0} = 0.57$

Figure 9-38 → Type L Required

Town of Parker - Type M minimum

Outfall 2 - FES 1-6

Q_{100} = 9.60 cfs D = 2.0' Y_T = 1.5' → Based on Respec 60% GAT Design Flow Depths

$\frac{Q_{100}}{D^{1.5}} = \frac{9.60}{2.0^{1.5}} = 3.4$ $\frac{Y_T}{D} = \frac{1.5}{2.0} = 0.75$

Figure 9-38 → Type L Required

Town of Parker - Type M minimum

Outfall 3 - FES 1-10

Q_{100} = 59.3 cfs D = 3.0' Y_T = 1.0'

$\frac{Q_{100}}{D^{1.5}} = \frac{59.3}{3.0^{1.5}} = 11.4$ $\frac{Y_T}{D} = \frac{1.0}{3.0'} = 0.33$

Figure 9-38 → Type M required

$$H_a = \frac{(H + Y_n)}{2}$$ Equation 9-19

Where the maximum value of H_a shall not exceed H, and:

D_a = parameter to use in place of D in Figure 9-38 when flow is supercritical (ft)

D_c = diameter of circular culvert (ft)

H_a = parameter to use in place of H in Figure 9-39 when flow is supercritical (ft)

H = height of rectangular culvert (ft)

Y_n = normal depth of supercritical flow in the culvert (ft)

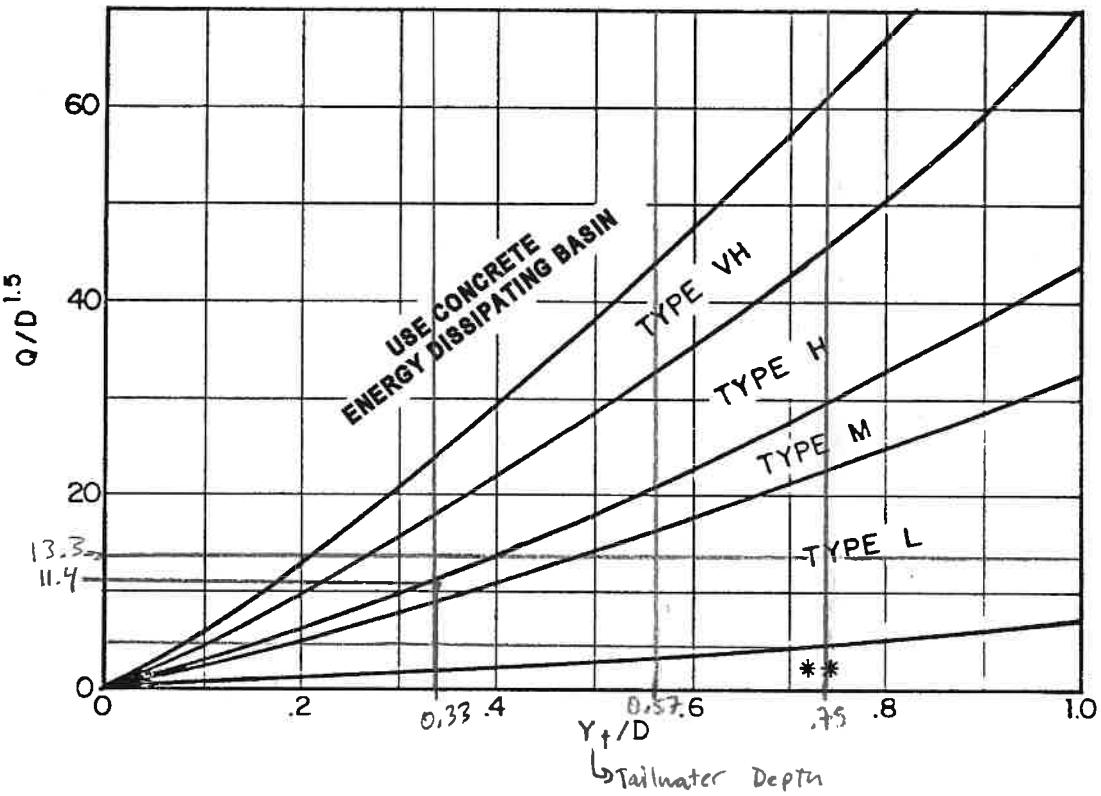


Figure 9-38. Riprap erosion protection at circular conduit outlet (valid for Q/D2.5 ≤ 6.0)