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Final Drainage Report
for Hillpointe Apartments at Peterson

August 2026

HR Green Project No: 2502477

Prepared For:

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Engineer's Statement

This report and plan for the drainage design of the development, Hillpointe Apartments at Peterson, was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the *El Paso County Drainage Criteria* Manual and is in conformity with the master plan of the drainage basin. I understand that El Paso County does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Richard D Lyon _____ 10/13/2026

Richie Lyon, PE — Date

State of Colorado No. 53921

For and on behalf of HR Green Development, LLC



Developer's Statement

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

_____ 10/13/2026

Hillpointe, LLC — Date

El Paso County:

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volumes 1 and 2 and the Engineering Criteria Manual, as amended.

_____ _____

Joshua J. Palmer, P.E. — Date

County Engineer/ECM Administrator

I. General Purpose, Location and Description

a. Purpose

This Final Drainage Report (FDR) aims to identify specific solutions to drainage concerns resulting from the development of the site. The report outlines the onsite and offsite drainage patterns, details the existing and proposed storm infrastructure, and proposes a solution for effectively routing developed stormwater to an adequate detention facility. An existing full-spectrum detention pond within the subdivision (see PCD File SF2420) is proposed as the permanent control measure. Hydrologic and hydraulic calculations for onsite areas, along with an assessment of the existing downstream stormwater infrastructure, are provided to demonstrate compliance with County stormwater criteria and ensure that existing infrastructure is not negatively impacted by this development.

b. Location

The Hillpointe Apartments at Peterson, legally described as Lot 1 Cimarron Hills Southeast Mixed Use Filing No. 1, totals 14.09 acres and referred to as 'the site' herein, is a portion of the west half of the southwest quarter of Section 8, Township 14 South, Range 65 West of the 6th P.M., El Paso County, Colorado. The subdivision is described in the *Cimmaron Hills Southeast Mixed Use Filing No. 1 Final Drainage Report* prepared by Matrix Design Group dated September 2025. The site is bound to the north by the 80' wide public right-of-way of Meadowbrook Parkway and across the roadway is Tract A which is designated as future development. To the east of the site is the Aura Crossroads apartment complex, legally described as Lot 1 Crossroads Mixed Use Filing No. 1. To the south of the site is the public right-of-way of US Highway 24 which varies in width. Adjacent to the southwest corner of the site is Tract C, which is dedicated to detention facilities. Immediately west of the site is Tract B which is designated as future development and further west is the 100' wide public right-of-way of Peterson Road. There are no existing or proposed public roadways internal to the site. All of county assessor parcel number 5408007004 and portions of parcel numbers 5408007008 and 5408007001 are within the development limits. The property is not within a Streamside Zone or Hillside Zone. There are no no-build or preservation easements or areas within the platted parcel.

A vicinity map is presented in Appendix A.

c. Description of Existing Conditions

The undeveloped site (zoned RM-30) contains few site improvements which include unpaved trails, abandoned softball fields, and a small concrete pad. The overall on-site imperviousness is approximately 2% and the site is sparsely vegetated by grass, shrubs, and trees. There are no structures or impervious areas on site. The site generally slopes from the northeast down to the southwest.

The site consists of 88.3% Blakeland loamy sand and 11.7% Blendon sandy loam per the USDA, NRCS web soil survey. This soil is categorized as Hydrologic Soil Group A and Group B. The NRCS soil survey is presented in Appendix A.

d. Description of Proposed Conditions

The developed site includes apartment buildings, garages, recreational facilities, paved drive aisles, parking areas, and private utilities and storm sewer network. The nine apartment buildings are spread throughout the site, and parking spaces are provided along drive aisles. Landscape areas surround apartment buildings and are dispersed throughout the islands in parking areas. Screening along adjacent rights-of-way is provided by

landscape areas at the northern and southern edges of the site. The site is accessed by an entry on the adjacent public right-of-way of Meadowbrook Parkway to the north and an entry originating from the public right-of-way of Peterson Road to the west.

The on-site private storm includes private Type R sump and on-grate grate inlets within the drive aisles and parking areas. Roof drains and dome inlets are tied directly into secondary drainage systems surrounding apartment buildings which connect to the main storm system. The storm system is made up of two main branches that ultimately outfall into forebays within the full spectrum detention pond within Tract C. The existing private water quality and detention pond (by others, SF2420) includes an outlet structure with orifice plate and micropool that is designed to provide detention and release the stormwater at or below historic rates.

The entirety of the 14.09 acre site will be disturbed for development. Offsite disturbances for the development include connecting the site to existing public utilities owned and maintained by Cherokee Metropolitan District within Tract B, the shared entry within the Meadowbrook Parkway right-of-way, and the secondary access within the 50 foot utility easement platted in Cimmaron Hills Southeast Mixed Use Filing No. 1.

e. Floodplain Statement

Based on FEMA Firm map 08041C0754G dated December 7, 2018, the site is Zone X, which are areas determined to be outside the 0.2% annual chance flood. No portion of the site is within a designated FEMA floodplain. The site is approximately 145’ away from a FEMA Flood Zone AE at the nearest boundary, located to the west and north of the site. The nearby flood zone has no bearing on the design within Lot 1.

A map is provided in Appendix A.

II. Drainage Basins and Subbasins

a. Major Basin Description

The site’s drainage characteristics were previously studied in the following reports:

1. *Sand Creek Drainage Basin Planning Study, Preliminary Design Report* dated January 1993, revised March 1996 by Kiowa Engineering Corporation
2. *Cimmaron Hills Southeast Mixed Use Filing No. 1 Final Drainage Report,* dated September 2025, prepared by Matrix Design Group

The site is located within the Sand Creek East Fork Subbasin in the Sand Creek Drainage Basin. The East Fork Sand Creek is tributary to Sand Creek which ultimately drains to Fountain Creek. Site flows released from the offsite existing private full spectrum detention pond run west along the public roadside ditch on the north side of US Highway 24 Off Ramp to an inlet that conveys the flows under Peterson Road and to East Fork Sand Creek. Per the FDR for Cimmaron Hills Mixed Use Filing No. 1, the full spectrum detention pond releases flows from the site at or below historic rates and the downstream East Fork Sand Creek is stable with no recommendations for improvement in the DBPS. Therefore, no downstream infrastructure or detention alterations are required.

b. Existing Subbasin Description

The existing subbasins were delineated based on existing drainage patterns. The on-site basins are comprised of undeveloped land. 2% imperviousness was assumed for each on site basin for analysis of historical flow.

The following basins and sub-basins have been delineated.

Existing Basin A has a tributary area of **0.08 acres with a minor (5-year event) runoff of 0.11 cfs and major (100-year event) runoff of 0.20 cfs**. The basin lies on the western edge of the site. Within the basin is an existing storm system and associated easement. The vegetation in the basin includes sparse grass, shrubs, and trees. Runoff generated within the basin flows west to Tract B Cimarron Hills Southeast Mixed Use Filing No. 1, designated as **Design Point 1,** as sheet flow.

Existing Basin B has a total tributary area of **14.01 acres with a total minor (5-year event) runoff of 3.95 cfs and major (100-year event) runoff of 26.05 cfs**. The basin includes all the on-site area except for the area in Existing Basin A. The basin contains abandoned softball fields, unpaved trails, and a single concrete pad and is analyzed as undeveloped land. The vegetation in the basin includes sparse grass, shrubs, and trees. Runoff generated within the basin flows southwest to Tract C Cimarron Hills Southeast Mixed Use Filing No. 1, designated as **Design Point 2,** as channelized flow. The basin flows ultimately flow west within the roadside ditch at the north side of U.S. Highway 24 and the offramp.

Existing Basin OS has a total tributary area of **0.87 acres with a total minor (5-year event) runoff of 0.29 cfs and major (100-year event) runoff of 1.94 cfs**. The basin is located south of the site and is delineated to include area draining to the analyzed cross section of the ditch. The basin accepts flows from the upstream roadside ditch and flows released from the existing private full spectrum detention pond within Tract A Crossroads Mixed Use Filing No. 1 at **Design Point 5**, Q_5 = 10.8 cfs, Q_{100} = 19.6 cfs. Basin OS also accepts flows from portions of U.S. Highway 24 a culvert at **Design Point 4.** The flows at **Design Point 4** were not studied in this report as they are unchanged in the developed condition, and cumulative flows within Basin OS are decreased in the developed condition. The vegetation in the basin includes sparse grass, shrubs, and trees. Runoff within the basin flows from east to west. The basin drains to **Design Point 3**, the roadside ditch north of the U.S. Highway 24 offramp to Peterson Road.

Reference maps are included in Appendix G.

c. Proposed Subbasin Description

The Hillpointe Apartments at Peterson developed area basins and subbasins vary from the historical basins due to changes in site layout and drainage conveyance.

The following basins were delineated per the revised site layout. The on-site basins are to be zoned RM-30. Existing **Basin OS** remains unchanged.

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A1.1	0.30	96.2	1.34	2.42
A1.2	0.07	78.1	0.23	0.45
A2	0.49	80.2	1.69	3.24
A3	0.28	75.8	1.01	1.98
A4.1	0.49	77.4	1.77	3.44
A4.2	0.17	85.5	0.69	1.30

A5.1	0.56	78.6	1.92	3.73
A5.2	0.66	76.0	2.30	4.51
A6.1	0.32	60.8	0.90	1.93
A6.2	0.46	81.7	1.60	3.06
A7	0.40	77.1	1.28	2.49
AR1	0.16	90.0	0.59	1.10
AR2	0.10	90.0	0.39	0.72
AR3	0.12	90.0	0.44	0.83
BR7.5	0.16	90.0	0.59	1.10
AR5	0.17	90.0	0.65	1.21
AR6	0.16	90.0	0.59	1.10
B1.1	0.96	79.7	3.13	6.03
B1.2	0.71	75.3	2.27	4.45
B2.1	0.31	81.1	1.19	2.29
B2.2	0.25	82.2	0.96	1.83
B3.1	0.41	76.8	1.44	2.81
B3.2	0.61	76.5	2.15	4.20
B4	0.42	69.7	1.38	2.78
B5	0.57	61.3	1.52	3.22
B6	0.70	80.1	2.39	4.60
B7	0.88	44.2	1.46	3.56
BL1	0.36	21.6	0.36	1.27
BR1	0.10	90.0	0.38	0.72
BR2	0.12	90.0	0.44	0.83
BR3	0.16	90.0	0.59	1.10
BR4	0.17	90.0	0.65	1.21
BR5	0.17	90.0	0.65	1.21
BR6	0.17	90.0	0.65	1.21
BR7	0.16	90.0	0.59	1.10
BR8	0.33	90.0	1.24	2.31
BR9	0.17	90.0	0.65	1.21
BR10	0.33	90.0	1.24	2.31
O1	0.18	20.0	0.18	0.68
O2	0.20	20.0	0.21	0.77
O3	0.15	69.2	0.48	0.97
O4	0.47	28.2	0.67	2.03
O5	0.27	78.4	1.01	1.95
O6	0.28	69.1	0.91	1.84
P1	0.20	20.0	0.20	0.74

Design Point 1: Runoff generated within Basin A1.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream pond. Q_5 = 1.34 cfs, Q_{100} = 2.42 cfs

Design Point 2: Runoff generated within Basin A1.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 0.23 cfs, Q_{100} = 0.45 cfs

Design Point 3: Runoff generated within Basin A2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Ground runoff and runoff from the directly connected apartment building roof area, Basin AR1, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.28 cfs, Q_{100} = 4.34 cfs

Design Point 4: Runoff generated within Basin A3 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.01 cfs, Q_{100} = 1.98 cfs

Design Point 5: Runoff generated within Basin A4.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. This inlet accepts flows from Design Point 6, the upstream inlet within Basin A4.2. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.46 cfs, Q_{100} = 4.74 cfs

Design Point 6: Runoff generated within Basin A4.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet which is directly connected to Design Point 5, a downstream private 5' CDOT Type R Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 0.69 cfs, Q_{100} = 1.30 cfs

Design Point 7: Runoff generated within Basin A5.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from garage roof area to the surrounding landscape areas or pavement. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.92 cfs, Q_{100} = 3.73 cfs

Design Point 8: Runoff generated within Basin A5.2 sheet flows across amenity and landscape areas, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from the roofs of the mail kiosk, and community center outfall to the surrounding landscape areas. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.30 cfs, Q_{100} = 4.51 cfs

Design Point 9: Runoff generated within Basin A6.1 sheet flows across amenity and landscape areas, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from the roofs of the fitness center and community center outfall to the surrounding landscape areas. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 0.90 cfs, Q_{100} = 1.93 cfs

Design Point 10: Runoff generated within Basin A6.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from garage roof area to the surrounding landscape areas or pavement. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.60 cfs, Q_{100} = 3.06 cfs

Design Point 11: Runoff generated within Basin A7 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.28 cfs, Q_{100} = 2.49 cfs

Design Point 12: Runoff generated within Basin B1.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from garage roof area to the surrounding landscape areas or pavement. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream pickleball court and into the downstream pond. Q_5 = 3.13 cfs, Q_{100} = 6.03 cfs

Design Point 13: Runoff generated within Basin B1.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from garage roof area to the surrounding landscape areas or pavement. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR5, ultimately enter a proposed private 10' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 3.10 cfs, Q_{100} = 6.00 cfs

Design Point 14: Runoff generated within Basin B2.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.19 cfs, Q_{100} = 2.29 cfs

Design Point 15: Runoff generated within Basin B2.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 0.96 cfs, Q_{100} = 1.83 cfs

Design Point 16: Runoff generated within Basin B3.1 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR5, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.09 cfs, Q_{100} = 4.02 cfs

Design Point 17: Runoff generated within Basin B3.2 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR3, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.15 cfs, Q_{100} = 4.20 cfs

Design Point 18: Runoff generated within Basin B4 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff ultimately enters a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 1.38 cfs, Q_{100} = 2.78 cfs

Design Point 19: Runoff generated within Basin B5 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR8, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.76 cfs, Q_{100} = 5.54 cfs

Design Point 20: Runoff generated within Basin B6 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Runoff generated from garage roof area to the surrounding landscape areas or pavement. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR9, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 3.04 cfs, Q_{100} = 5.81 cfs

Design Point 21: Runoff generated within Basin B7 sheet flows across landscape area, internal drive aisles, and parking spaces until concentrating within gutters along the drive isles. Ground runoff and runoff from the directly connected apartment building roof area, Basin BR10, ultimately enter a proposed private 5' CDOT Type R Sump Inlet. The inlet's emergency overflow route is to the downstream street. Q_5 = 2.70 cfs, Q_{100} = 5.88 cfs

The following basins are roof area that is routed directly into the proposed private storm network through secondary drainage, and not through storm inlets: AR2, AR3, BR7.5, AR5, AR6, BR3, BR4, BR6, and BR7. Basin BL1 is landscape area that also is routed directly into the proposed private storm network through secondary drainage. The flows from these basins are considered in the StormCAD analysis of the storm network, provided in Appendix C.

The following inlets do not enter the proposed private storm network, and flow directly offsite.

Basin O1 – Landscape Area (0.18 acres), Q_5 = 0.18 cfs, Q_{100} = 0.68 cfs

Runoff generated within this basin sheet flows drains directly offsite into the existing public roadside ditch on the north side of the westbound exit from U.S. Highway 24 which flows to the east and ultimately under Peterson Road. Flows from developed Basin O1 into the roadside ditch are significantly less than the flows in the existing condition to the roadside ditch from existing Basin B (Q_5 = 3.95 cfs, Q_{100} = 25.05 cfs).

Basin O2 – Landscape Area (0.20 acres), Q_5 = 0.21 cfs, Q_{100} = 0.77 cfs

Runoff generated within this basin sheet flows directly offsite onto the adjacent Tract B within the Cimmarron Hills Southeast Mixed Use Filing No. 1 subdivision. Runoff is detained and treated by the downstream existing full spectrum detention pond (SF2420).

Basin O3 – Landscape/Pavement Area (0.15 acres), Q_5 = 0.48 cfs, Q_{100} = 0.97 cfs

Runoff generated within this basin sheet flows directly offsite onto the adjacent Tract B within the Cimmarron Hills Southeast Mixed Use Filing No. 1 subdivision. Runoff is detained and treated by the downstream existing full spectrum detention pond (SF2420).

Basin O4 – Landscape/Pavement Area (0.47 acres), Q_5 = 0.67 cfs, Q_{100} = 2.03 cfs

Runoff generated within this basin initially sheet flows directly offsite onto the adjacent public right of way of Meadowbrook Parkway, where it then concentrates in the curb and gutter and is collected by public curb inlets. The public storm network conveys flows to the public/private storm network connection located at the site entry, which ultimately directs runoff to the existing private full spectrum detention pond. Runoff is detained and treated by this downstream facility (SF2420).

Basin O5 – Secondary Access/Maintenance Path (0.27 acres), Q_5 = 1.01 cfs, Q_{100} = 1.95 cfs

Runoff generated within this basin sheet flows directly offsite to the southwest, where it is ultimately conveyed under Peterson Road. This area is excluded from water quality treatment requirement per ECM App I.7.1.C.1 as the areas used in this exclusion do not exceed 20 percent of the development site or 1 acre total.

Basin O6 – Secondary Access/Maintenance Path (0.28 acres), Q_5 = 0.91 cfs, Q_{100} = 1.84 cfs

Runoff generated within this basin sheet flows directly offsite to the southwest, where it is ultimately conveyed under Peterson Road. This area is excluded from water quality treatment requirement per ECM App I.7.1.C.1 as the areas used in this exclusion do not exceed 20 percent of the development site or 1 acre total.

Basin P1 – Landscape Area (0.20 acres), Q_5 = 0.20 cfs, Q_{100} = 0.74 cfs

This basin sheet flows directly offsite into the adjacent existing private full spectrum detention pond in Tract C within the Cimmarron Hills Southeast Mixed Use Filing No. 1 subdivision where the runoff is detained and treated.

d. Downstream Drainage

This development drains to an existing private off-site full spectrum detention facility that provides treatment and detention of stormwater runoff. The actual site area and imperviousness differ slightly from the values used to size for the private pond in the *Cimarron Hills Southeast Mixed Use Filing No. 1 Final Drainage Report* prepared by Matrix Design Group as part of the Final Plat application SF2420, and so modifications are necessary for it to continue functioning as intended. Additional infrastructure is required to connect the private storm within this project to the private pond offsite. This is discussed further in Section IV of this report. The private off-site pond includes an outlet pipe that drains to the roadside drainage ditch within the public right-of-way of U.S. Highway 24. The public ditch conveys stormwater due west, ultimately to East Fork Sand Creek. Per the FDR by Matrix, the detention pond releases flows at or below historical rates and therefore no improvements to East Fork Sand Creek are proposed. It is anticipated that there will be no negative impacts to downstream properties, developments, or infrastructure due to this development.

III. Drainage Design Criteria

a. Development Criteria Reference

The drainage analysis of existing and proposed storm sewer system follows the criteria from the *El Paso County Drainage Criteria Manual Volumes 1 and 2* (EPC DCM, latest revision October 2018).

b. Hydrologic Criteria

Hydrologic data was obtained from the *El Paso County, Colorado Drainage Criteria Manual – Chapter 5 Storm Runoff Methods of Analysis.* Runoff was calculated per *El Paso County, Colorado Drainage Criteria Manual – Section 5.2 - Rational Method.* Onsite drainage improvements are designed for the 5-year storm (minor event) and 100-year storm (major event) using rainfall values from NOAA Atlas 14 below.

Rainfall Depths for Site Location		
Return Period (yr)	5	100
1-hr Rainfall Depth (in)	1.50	2.52

Private, full spectrum pond design was completed using the latest version of Mile High Flood District's (MHFD) UD-Detention per EPCDCM guidelines. Detention pond allowable release rate are limited to less than historic rates.

c. Hydraulic Criteria

Hydraulic criteria for inlet sizing was obtained from the *El Paso County, Colorado Drainage Criteria Manual – Chapter 7 Street Drainage and Storm Water Inlets* and the UD-Inlet calculator. Hydraulic criteria for storm sewer culverts were obtained from the *El Paso County, Colorado Drainage Criteria Manual – Chapter 9 Culvert Design.* Hydraulic criteria for swale sizing was obtained from the *El Paso County, Colorado Drainage Criteria Manual – Chapter 10 Open Channels and Structures.*

Proposed drive aisle capacities are analyzed utilizing hydraulic modeling (AutoCAD Civil 3D channel analysis tool) by designing the pavement sections as user-defined channels with the proper Manning's coefficient, geometry of designed sections, and slopes. These user-defined capacity calculations are provided to determine the minor 5-year storm and major 100-year storm capacities in various areas of interest.

Storm sewer system modeling is provided in Appendix C. The hydraulic model was developed using Bentley StormCAD to assess and size private inlets and pipes, ensuring that both minor and major hydraulic grade lines comply with applicable stormwater design criteria. Table 9-4 StormCAD Standard Method Coefficients from *City of Colorado Springs, Drainage Criteria Manual, Volume 1* were used for the analysis. All proposed storm pipes are within 80% capacity for the minor storm event and do not surcharge the system to within 1' of all storm manhole rim elevations for the major storm event. The hydraulic grade lines for the minor and major storm at the outfall point of pipes that drain to the proposed private pond are set at the appropriate detention water surface elevations for tailwater conditions.

IV. Drainage Facility Design

a. General Concept

Overland runoff areas include roof runoff from apartment buildings as well as initial overland sheet flow within paved drive aisles and across landscaped areas. On-site stormwater runoff is conveyed as channelized flow within on-site curb and gutter and drainage pans that drain to proposed curb inlets at sump locations. Runoff continues downstream as channelized flow within the two main branches of proposed private on-site storm sewer system. The west branch drains to an existing on-site storm manhole upstream of the existing private off-site full spectrum detention pond, and the east branch drains directly to the forebay on the east side of the existing pond. The existing private off-site pond was assessed for the proposed site area and imperviousness to meet stormwater criteria and treats runoff from the site and releases it at or below historical rates.

b. Basin Design Criteria

The MHFD-Detention spreadsheet was used to design the existing private basin and outlet structure. The 1-hour rainfall depths for the 2, 5, 10, 25, 50, and 100 year storm events used in the spreadsheet were obtained from Table 6-2 Rainfall Depths for Colorado Springs within the EPC DCM. These rainfall depths are 1.19, 1.50, 1.75, 2.00, 2.25, and 2.52 inches, respectively.

c. Water Quality & Detention

Water quality treatment is provided for all applicable areas of the site excluded areas which do not exceed 20 percent of the development site or 1 acre per the El Paso County base design standard requirements. The development area within Basin O1 and Basin O2 is excluded from water quality treatment, per the El Paso County PCM Exclusions (ECM App I.6.1.B.7), as it is disturbance to undeveloped land that will remain undeveloped. The existing private off-site full spectrum detention pond provides water quality treatment by facilitating the settling of suspended sediments and the capture of pollutants prior to controlled discharge from the site.

Full spectrum detention is provided by the existing private off-site full spectrum detention basin, which is maintained by the tract owner. The total site area tributary to the detention basin is 14.10 acres and has 72.9% effective imperviousness. Included in Appendix E are the Rational Method hydrologic calculations and drainage maps from the FDR by Matrix which include the full site area (Basin P-5) at an assumed imperviousness of 85% for neighborhood areas. An adjusted MHFD-Detention spreadsheet with modified orifice plate is provided in Appendix D to account for the lower developed site imperviousness than assumed. Additional pond infrastructure required for the development includes a proposed forebay, trickle channel and maintenance access path on the east side of the pond, and an orifice plate swap within the outlet structure. The calculations for the forebay and trickle channel dimensions are provided in Appendix D. The design follows stormwater criteria for full spectrum detention, and the release rate is 40 hours for WQCV, 72 hours for the EURV and 72 hours for the 100-year storm events.

d. Major Drainageways

There are no formal major drainageways within the project boundary. The development lies within the Sand Creek East Fork Subbasin in the Sand Creek Drainage Basin, previously studied in the *Sand Creek Drainage Basin Planning Study, Preliminary Design Report* dated January 1993, revised March 1996 by Kiowa Engineering Corporation. The East Fork Sand Creek is tributary to Sand Creek which ultimately drains to Fountain Creek. Stormwater from the site is released from the off-site existing private full spectrum detention pond and runs west along the public roadside ditch on the north side of US Highway 24 Off Ramp under Peterson Road and ultimately to East Fork Sand Creek. Per the FDR for Cimmaron Hills Mixed Use Filing No. 1, the full spectrum detention pond releases flows from the site at or below historic rates and the downstream East Fork Sand Creek is stable with no recommendations for improvement in the DBPS. There are no anticipated negative impacts to surrounding and downstream developments, stormwater infrastructure, or drainageways. Therefore, no downstream infrastructure or detention alterations are required.

e. Grading and Erosion Control Plan

Due to the project disturbance area, a separate Grading and Erosion Control plan will be required. The Grading and Erosion Control Plan will be submitted for review and approval with subsequent submittals of this FDR.

f. Four Step Method to Minimize Adverse Impacts of Urbanization

Step 1 – Reducing Runoff Volumes: Roof drains and sidewalks will route across landscaped areas whenever possible to slow runoff and promote infiltration prior to entering landscape drains and the main storm sewer system. Landscape areas are stabilized with permanent seeding for lawn areas, shrubbery and trees, and ornamental landscaping. Landscape buffers are provided along the border of the property to provide runoff reduction to areas of the site that flow directly off-site.

Step 2 – Treat and slowly release the WQCV: The runoff from the site is treated through the capture and slow WQCV via the existing private off-site full spectrum detention Pond 1 (SF2420).

A table summarizing the water quality treatment within the site is provided below:

Water Quality Treatment Summary Table					
Basin ID	**Total Area (ac)**	**Total Proposed Disturbed Area (ac)**	**Area Trib to Pond 1 (SF2420) (ac)**	**Disturbed Area Excluded from WQ per ECM App I.6.3.A.1.a (ac)**	**Disturbed Area Excluded from WQ per ECM App I.6.1.B.7 (ac)**
A1.1	0.30	0.30	0.30		
A1.2	0.07	0.07	0.07		
A2	0.49	0.49	0.49		
A3	0.28	0.28	0.28		
A4.1	0.49	0.49	0.49		
A4.2	0.17	0.17	0.17		
A5.1	0.56	0.56	0.56		
A5.2	0.66	0.66	0.66		
A6.1	0.32	0.32	0.32		
A6.2	0.46	0.46	0.46		
A7	0.40	0.40	0.40		
AR1	0.16	0.16	0.16		
AR2	0.10	0.10	0.10		
AR3	0.12	0.12	0.12		
BR7.5	0.16	0.16	0.16		
AR5	0.17	0.17	0.17		
AR6	0.16	0.16	0.16		
B1.1	0.96	0.96	0.96		
B1.2	0.71	0.71	0.71		
B2.1	0.31	0.31	0.31		
B2.2	0.25	0.25	0.25		
B3.1	0.41	0.41	0.41		
B3.2	0.61	0.61	0.61		
B4	0.42	0.42	0.42		
B5	0.57	0.57	0.57		
B6	0.70	0.70	0.70		
B7	0.88	0.88	0.88		
BL1	0.36	0.36	0.36		
BR1	0.10	0.10	0.10		
BR2	0.12	0.12	0.12		

BR3	0.16	0.16	0.16		
BR4	0.17	0.17	0.17		
BR5	0.17	0.17	0.17		
BR6	0.17	0.17	0.17		
BR7	0.16	0.16	0.16		
BR8	0.33	0.33	0.33		
BR9	0.17	0.17	0.17		
BR10	0.33	0.33	0.33		
O1	0.18	0.18	0.00		0.18
O2	0.20	0.20	0.00		0.20
O3	0.15	0.15	0.00	0.15	
O4	0.47	0.47	0.47		
O5	0.27	0.27	0.00	0.27	
O6	0.28	0.28	0.00	0.28	
P1	0.20	0.20	0.20		
Total	14.89	14.89	13.81	0.70	0.38

Min Required Area to Receive WQ (ac)	Total Proposed Disturbed Area (ac)	Total Proposed Treated Area (ac)	Total Proposed Disturbed Area Excluded from WQ (ac)	Net Treatment (ac)
13.81	14.89	13.81	1.08	0.00

Step 3 – Stabilize stream channels: On-site stormwater is released by the existing off-site private full spectrum detention pond into the public roadside ditch at the south of the site at rates less than or equal to historical rates. The development decreases runoff released directly off-site into the public roadside ditch at the south of the site compared to historical rates, which helps to stabilize the channelized flow.

All new and redevelopment projects are required to construct or participate in the funding of channel stabilization measures. Drainage basin fees were paid at the time of platting to go towards channel stabilization within the drainage basin, therefore there are no public drainageway improvements required or proposed as a part of this development.

Step 4 – Consider the need for source controls: No industrial uses are proposed within this development and therefore no industrial source controls are proposed. The developed area is not anticipated to have uses that would require commercial source controls such as a grease trap/interceptor at this time. Should the uses of that building change, the appropriate source controls will be implemented to meet code requirements.

g. Drainage and Bridge Fees

For the Sand Creek Drainage Basin, the 2026 Drainage Fee is $28,160 per impervious acre and the 2026 Bridge Fee is $11,518 per impervious acre. The fees are to be paid at the time of final plat recording.

14.09 acres x 72.9% imperviousness = 10.24 Impervious Acres

$28,160 x 10.24 Impervious Acres = $288,358.40 (2026 Drainage Fee)

$11,518 x 10.24 Impervious Acres = $117,944.32 (2026 Bridge Fee)

h. Hydraulic Grade Line Calculations

Hydraulic Grade Line analysis for the storm network is presented in Appendix C.

V. Permanent Control Measure Cost Estimate

Pond 1 (SF2420) Improvements Cost Estimate				
Item	**Unit**	**Qty.**	**Unit Estimate**	**Total Estimate**
Orifice Plate	EA	1	$500.00	$500.00
Forebay	EA	1	$22,500.00	$22,500.00
Concrete Trickle Channel	LF	134	$105.00	$14,070.00
Handrail	LF	39	$100.50	$3,919.50
Stabilization Bedding	TN	50	$37.50	$1,875.00
Concrete Pump Truck	EA	3	$875.00	$2,625.00
Road Base	CY	169	$71.00	$11,999.00
36" RCP	LF	96	$191.00	$18,336.00
			Total	**$75,824.50**

VI. Summary

The Hillpointe Apartments at Peterson development remains consistent with drainage patterns and site area imperviousness used for calculations and design in the *Cimarron Hills Southeast Filing No. 1 Final Drainage Report* by Matrix Design Group. The proposed development will not adversely affect downstream stormwater infrastructure or surrounding developments. This report meets the latest El Paso County Drainage criteria and is in accordance with previous reports. This Final Drainage Report presents the amended site layout and the resultant drainage changes with design solutions for these revisions.

VII. Drawings

Please refer to the appendices for vicinity and drainage basin maps.

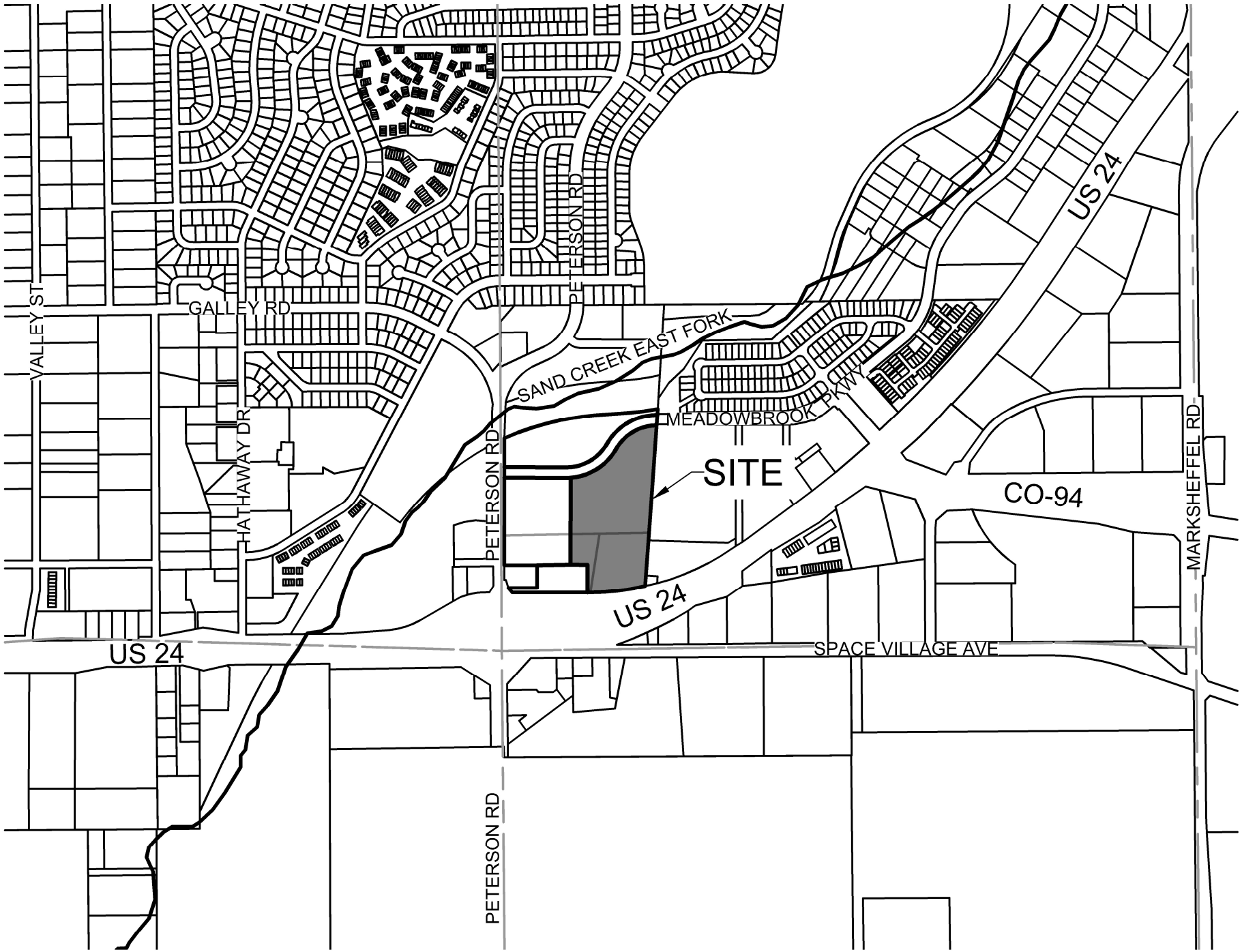
VIII. References

1. El Paso County – Drainage Criteria Manual Volume 1, Revised October 2018.
2. El Paso County – Drainage Criteria Manual Volume 2, Revised October 2018.
3. Urban Storm Drainage Criteria Manual, Urban Drainage Flood Control District, January 2018.
4. Cimmaron Hills Southeast Mixed Use Filing No. 1 Final Drainage Report, Matrix Design Group, September 2025 (SF2420)
5. Final Drainage Report for Crossroads Mixed Use Filing No. 1, MS Civil Consultants, Inc., April 2022 (SF21-029)
6. Sand Creek Drainage Basin Planning Study, Preliminary Design Report, Kiowa Engineering Corporation, January 1993, revised March 1996

APPENDIX A – VICINITY MAP, SOIL MAP, FEMA MAP

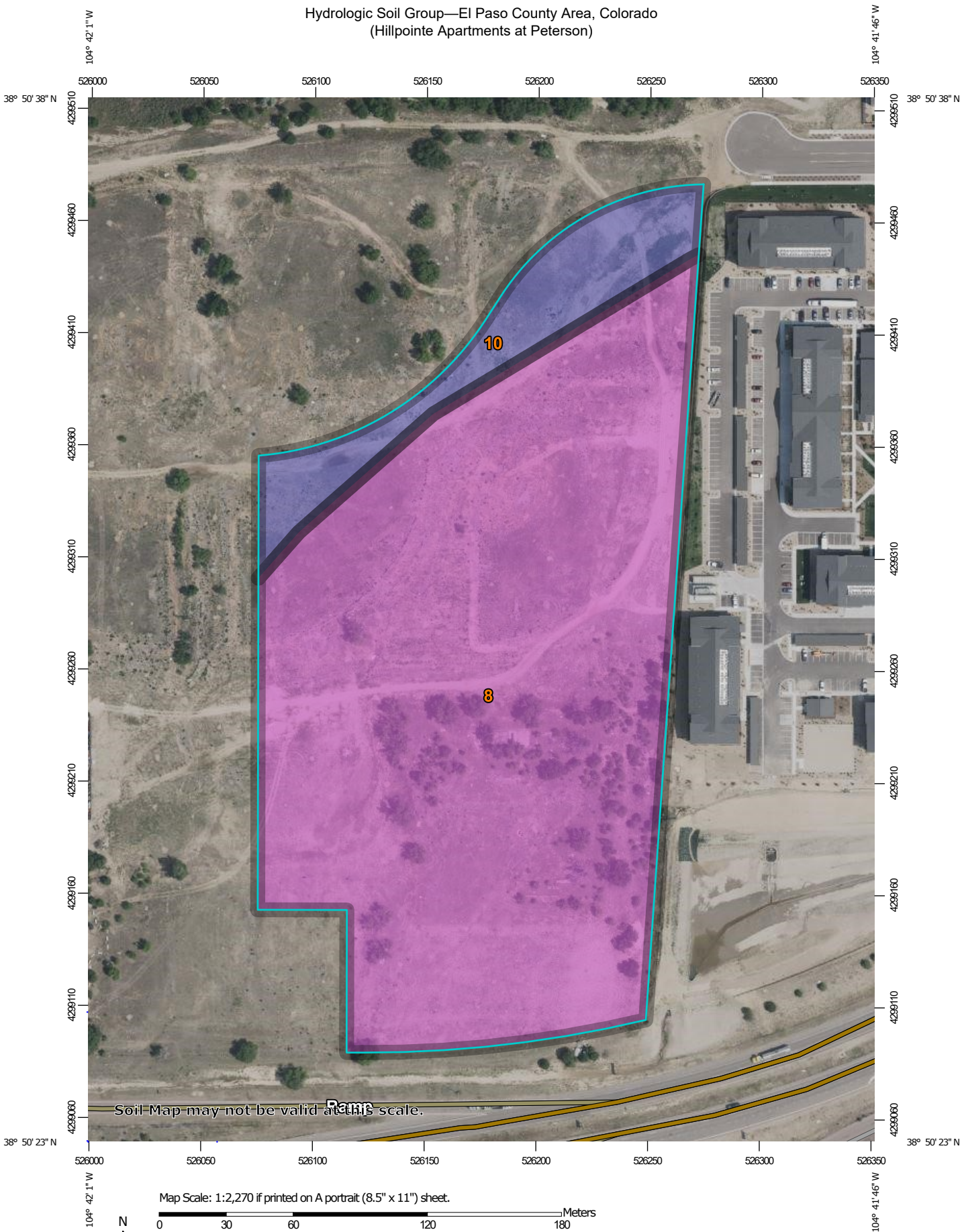
VICINITY MAP

HILLPOINTE APARTMENTS AT PETERSON



SCALE: 1" = 1000'

Hydrologic Soil Group—El Paso County Area, Colorado
(Hillpointe Apartments at Peterson)



Map Scale: 1:2,270 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 23, Aug 29, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	12.4	88.3%
10	Blendon sandy loam, 0 to 3 percent slopes	B	1.6	11.7%
Totals for Area of Interest			**14.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B – HYDROLOGIC CALCULATIONS

HRGreen	**HILLPOINTE AT PETERSON**	**Calc'd by:**	**CMD**
	EXISTING CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**6/4/2026**

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A	0.08	2	0.03	0.20
B	14.01	2	3.95	26.05
OS	0.87	2	0.29	1.94

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	A	0.03	0.20
2	B	3.95	26.05
3	OS, DP2, DP4, DP5	15.04	47.59
4	OFFSITE US HWY 24	-	-
5	OS-2, POND 1 OUT (SF-21-029)	10.8	19.6

HILLPOINTE AT PETERSON
EXISTING CONDITIONS
EL PASO COUNTY, CO

Calc'd by: CMD

Checked by: RDL

Date: 6/4/2026

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS

BASIN	LAND USE TYPE: Roofs			Drive and Walks			Historic Flow Analysis--Greenbelts,			TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}				
	90	0.73	0.81	100	0.90	0.96	2	0.09	0.36				
	ACRES			ACRES			ACRES			ACRES	%I	C_5	C_{100}
A	0.00			0.00			0.08			0.08	2.00	0.09	0.36
B	0.00			0.03			13.97			14.01	2.24	0.09	0.36
OS	0.00			0.00			0.87			0.87	2.00	0.09	0.36
ON-SITE	0.00			0.03			14.06			14.09	2.24	0.09	0.36
OFF-SITE	0.00			0.00			0.87			0.87	2.00	0.09	0.36
TOTAL	0.00			0.03			14.93			14.96	2.22	0.09	0.36

HRGreen	**HILLPOINTE AT PETERSON**	**Calc'd by:**	**CMD**
	EXISTING CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**6/4/2026**

TIME OF CONCENTRATION

BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	*tc=(L/180)+10*	Design tc
DESIGNATION	C_5	AREA (ac)	LENGTH (ft)	SLOPE %	t_i (min)	C_V	LENGTH (ft)	SLOPE %	V (ft/s)	t_t (min)	t_c (min)	*tc max*	*tc design (min)*
A	0.09	0.08	120	2.1	15.7	7	150	2.1	1.0	2.4	18.2	11.5	11.5
B	0.09	14.01	300	1.7	26.9	7	1558	1.7	0.9	28.6	55.6	20.3	20.3
OS	0.09	0.87	70	1.5	13.7	7	532	1.5	0.8	10.5	24.2	13.3	13.3

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \qquad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

* For buried riprap, select C_v value based on type of vegetative cover.

HRGreen

HILLPOINTE AT PETERSON	Calc'd by:	CMD
EXISTING CONDITIONS	Checked by:	RDL
DESIGN STORM: 5-YEAR	Date:	6/4/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_5	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_5*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_5*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
	1	A	0.08	0.09	11.5	0.01	3.92	0.03															
	2	B	14.01	0.09	20.3	1.29	3.07	3.95															
	3	OS	0.87	0.09	13.3	0.08	3.70	0.29															

HRGreen

HILLPOINTE AT PETERSON
EXISTING CONDITIONS
DESIGN STORM: 100-YEAR

Calc'd by:	CMD
Checked by:	RDL
Date:	6/4/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_{100}	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_{100}*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_{100}*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
	1	A	0.08	0.36	11.5	0.03	6.58	0.20															
	2	B	14.01	0.36	20.3	5.06	5.15	26.05															
	3	OS	0.87	0.36	13.3	0.31	6.21	1.94															

HRGreen	HILLPOINTE APARTMENTS AT PETERSON	Calc'd by:	CMD
	PROPOSED CONDITIONS	Checked by:	RDL
	EL PASO COUNTY, CO	Date:	8/11/2026

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A1.1	0.30	96.2	1.34	2.42
A1.2	0.07	78.1	0.23	0.45
A2	0.49	80.2	1.69	3.24
A3	0.28	75.8	1.01	1.98
A4.1	0.49	77.4	1.77	3.44
A4.2	0.17	85.5	0.69	1.30
A5.1	0.56	78.6	1.92	3.73
A5.2	0.66	76.0	2.30	4.51
A6.1	0.32	60.8	0.90	1.93
A6.2	0.46	81.7	1.60	3.06
A7	0.40	77.1	1.28	2.49
AR1	0.16	90.0	0.59	1.10
AR2	0.10	90.0	0.39	0.72
AR3	0.12	90.0	0.44	0.83
BR7.5	0.16	90.0	0.59	1.10
AR5	0.17	90.0	0.65	1.21
AR6	0.16	90.0	0.59	1.10
B1.1	0.96	79.7	3.13	6.03
B1.2	0.71	75.3	2.27	4.45
B2.1	0.31	81.1	1.19	2.29
B2.2	0.25	82.2	0.96	1.83
B3.1	0.41	76.8	1.44	2.81
B3.2	0.61	76.5	2.15	4.20
B4	0.42	69.7	1.38	2.78
B5	0.57	61.3	1.52	3.22
B6	0.70	80.1	2.39	4.60
B7	0.88	44.2	1.46	3.56
BL1	0.36	21.6	0.36	1.27

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	A1.1	1.34	2.42
2	A1.2	0.23	0.45
3	A2, AR1	2.28	4.34
4	A3	1.01	1.98
5	A4.1, A4.2	2.46	4.74
6	A4.2	0.69	1.30
7	A5.1	1.92	3.73
8	A5.2	2.30	4.51
9	A6.1	0.90	1.93
10	A6.2	1.60	3.06
11	A7	1.28	2.49
12	B1.1	3.13	6.03
13	B1.2, BR1, BR2	3.10	6.00
14	B2.1	1.19	2.29
15	B2.2	0.96	1.83
16	B3.1, BR5	2.09	4.02
17	B3.2	2.15	4.20
18	B4	1.38	2.78
19	B5, BR8	2.76	5.54
20	B6, BR9	3.04	5.81
21	B7, BR10	2.70	5.88

BR1	0.10	90.0	0.38	0.72
BR2	0.12	90.0	0.44	0.83
BR3	0.16	90.0	0.59	1.10
BR4	0.17	90.0	0.65	1.21
BR5	0.17	90.0	0.65	1.21
BR6	0.17	90.0	0.65	1.21
BR7	0.16	90.0	0.59	1.10
BR8	0.33	90.0	1.24	2.31
BR9	0.17	90.0	0.65	1.21
BR10	0.33	90.0	1.24	2.31
O1	0.18	20.0	0.18	0.68
O2	0.20	20.0	0.21	0.77
O3	0.15	69.2	0.48	0.97
O4	0.47	28.2	0.67	2.03
O5	0.27	78.4	1.01	1.95
O6	0.28	69.1	0.91	1.84
P1	0.20	20.0	0.20	0.74

HRGreen	**HILLPOINTE AT PETERSON**	**Calc'd by:**	**CMD**
	PROPOSED CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**8/11/2026**

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS

BASIN	LAND USE TYPE									TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	Roofs			Drive and Walks			Landscape Area						
	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}				
	90	0.73	0.81	100	0.90	0.96	20	0.20	0.44				
	ACRES			ACRES			ACRES			ACRES	%I	C_5	C_{100}
A1.1	0.00			0.28			0.01			0.30	96.2	0.87	0.94
A1.2	0.00			0.05			0.02			0.07	78.1	0.71	0.82
A2	0.00			0.37			0.12			0.49	80.2	0.73	0.83
A3	0.00			0.20			0.09			0.28	75.8	0.69	0.80
A4.1	0.00			0.35			0.14			0.49	77.4	0.70	0.81
A4.2	0.00			0.14			0.03			0.17	85.5	0.77	0.87
A5.1	0.04			0.38			0.15			0.56	78.6	0.71	0.82
A5.2	0.06			0.41			0.19			0.66	76.0	0.68	0.80
A6.1	0.07			0.10			0.15			0.32	60.8	0.54	0.69
A6.2	0.04			0.32			0.10			0.46	81.7	0.73	0.83
A7	0.00			0.29			0.12			0.40	77.1	0.70	0.81
AR1	0.16			0.00			0.00			0.16	90.0	0.73	0.81
AR2	0.10			0.00			0.00			0.10	90.0	0.73	0.81
AR3	0.12			0.00			0.00			0.12	90.0	0.73	0.81
BR7.5	0.16			0.00			0.00			0.16	90.0	0.73	0.81
AR5	0.17			0.00			0.00			0.17	90.0	0.73	0.81
AR6	0.16			0.00			0.00			0.16	90.0	0.73	0.81
B1.1	0.05			0.68			0.24			0.96	79.7	0.72	0.82
B1.2	0.04			0.46			0.22			0.71	75.3	0.68	0.80
B2.1	0.00			0.24			0.07			0.31	81.1	0.73	0.84
B2.2	0.00			0.20			0.06			0.25	82.2	0.74	0.84
B3.1	0.00			0.29			0.12			0.41	76.8	0.70	0.81
B3.2	0.00			0.43			0.18			0.61	76.5	0.69	0.81
B4	0.00			0.26			0.16			0.42	69.7	0.63	0.76
B5	0.00			0.30			0.28			0.57	61.3	0.56	0.71

COMPOSITE 'C' FACTORS

BASIN	LAND USE TYPE									TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	Roofs			Drive and Walks			Landscape Area						
	%I	C_5	C_{100}	%I	C_5	C_{100}	%I	C_5	C_{100}				
	90	0.73	0.81	100	0.90	0.96	20	0.20	0.44				
	ACRES			ACRES			ACRES			ACRES	%I	C_5	C_{100}
B6	0.04			0.49			0.17			0.70	80.1	0.72	0.83
B7	0.00			0.26			0.61			0.88	44.2	0.41	0.60
BL1	0.00			0.01			0.36			0.36	21.6	0.21	0.45
BR1	0.10			0.00			0.00			0.10	90.0	0.73	0.81
BR2	0.12			0.00			0.00			0.12	90.0	0.73	0.81
BR3	0.16			0.00			0.00			0.16	90.0	0.73	0.81
BR4	0.17			0.00			0.00			0.17	90.0	0.73	0.81
BR5	0.17			0.00			0.00			0.17	90.0	0.73	0.81
BR6	0.17			0.00			0.00			0.17	90.0	0.73	0.81
BR7	0.16			0.00			0.00			0.16	90.0	0.73	0.81
BR8	0.33			0.00			0.00			0.33	90.0	0.73	0.81
BR9	0.17			0.00			0.00			0.17	90.0	0.73	0.81
BR10	0.33			0.00			0.00			0.33	90.0	0.73	0.81
O1	0.00			0.00			0.18			0.18	20.0	0.20	0.44
O2	0.00			0.00			0.20			0.20	20.0	0.20	0.44
O3	0.00			0.09			0.06			0.15	69.2	0.63	0.76
O4	0.00			0.05			0.43			0.47	28.2	0.27	0.49
O5	0.00			0.20			0.07			0.27	78.4	0.71	0.82
O6	0.00			0.17			0.11			0.28	69.1	0.63	0.76
P1	0.00			0.00			0.20			0.20	20.0	0.20	0.44
ON-SITE	3.07			6.64			4.45			14.16	72.7	0.64	0.76
OFF-SITE	0.00			0.25			0.68			0.93	41.5	0.39	0.58
TOTAL	3.07			7.02			4.81			14.89	72.1	0.64	0.76

HRGreen	HILLPOINTE AT PETERSON	Calc'd by:	CMD
	PROPOSED CONDITIONS	Checked by:	RDL
	EL PASO COUNTY, CO	Date:	8/11/2026

TIME OF CONCENTRATION

BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	tc=(L/180)+10	Design tc
DESIGNATION	C_5	AREA (ac)	LENGTH (ft)	SLOPE %	t_i (min)	C_V	LENGTH (ft)	SLOPE %	V (ft/s)	t_t (min)	t_c (min)	tc max	tc design (min)
A1.1	0.87	0.30	15	2.0	1.3	20	365	1.3	2.3	2.7	5.0	12.1	5.0
A1.2	0.71	0.07	28	2.0	3.0	20	304	1.0	2.0	2.6	5.6	11.8	5.6
A2	0.73	0.49	28	2.0	2.9	20	417	0.9	1.9	3.7	6.6	12.5	6.6
A3	0.69	0.28	20	5.0	2.0	20	285	1.3	2.3	2.1	5.0	11.7	5.0
A4.1	0.70	0.49	18	2.0	2.5	20	179	1.3	2.2	1.3	5.0	11.1	5.0
A4.2	0.77	0.17	54	2.0	3.5	20	179	1.1	2.1	1.4	5.0	11.3	5.0
A5.1	0.71	0.56	50	2.0	4.0	20	327	1.6	2.5	2.2	6.2	12.1	6.2
A5.2	0.68	0.66	42	2.0	3.9	20	167	1.3	2.3	1.2	5.1	11.2	5.1
A6.1	0.54	0.32	24	5.0	3.0	20	148	2.3	3.0	0.8	5.0	11.0	5.0
A6.2	0.73	0.46	42	2.0	3.5	20	447	1.5	2.4	3.1	6.5	12.7	6.5
A7	0.70	0.40	72	2.0	4.9	20	475	2.1	2.9	2.8	7.7	13.0	7.7
AR1	0.73	0.16	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
AR2	0.73	0.10	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
AR3	0.73	0.12	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR7.5	0.73	0.16	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
AR5	0.73	0.17	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
AR6	0.73	0.16	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
B1.1	0.72	0.96	44	12.0	2.0	20	824	1.5	2.4	5.6	7.6	14.8	7.6
B1.2	0.68	0.71	30	2.0	3.3	20	451	1.1	2.1	3.6	7.0	12.7	7.0
B2.1	0.73	0.31	30	2.0	2.9	20	301	1.8	2.6	1.9	5.0	11.8	5.0
B2.2	0.74	0.25	44	2.0	3.4	20	248	1.3	2.3	1.8	5.3	11.6	5.3
B3.1	0.70	0.41	32	2.0	3.3	20	281	1.3	2.2	2.1	5.4	11.7	5.4
B3.2	0.69	0.61	32	2.0	3.3	20	269	1.2	2.2	2.1	5.4	11.7	5.4
B4	0.63	0.42	14	2.0	2.5	20	300	1.4	2.3	2.1	5.0	11.7	5.0
B5	0.56	0.57	37	2.0	4.8	20	224	1.0	2.0	1.9	6.7	11.5	6.7
B6	0.72	0.70	44	2.0	3.7	20	375	1.2	2.2	2.9	6.5	12.3	6.5
B7	0.41	0.88	95	3.0	8.5	20	403	3.1	3.5	1.9	10.4	12.8	10.4
BL1	0.21	0.36	48	10.0	5.2	20	280	1.5	2.4	1.9	7.2	11.8	7.2
BR1	0.73	0.10	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR2	0.73	0.12	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR3	0.73	0.16	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR4	0.73	0.17	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR5	0.73	0.17	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR6	0.73	0.17	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0

HRGreen	**HILLPOINTE AT PETERSON**	**Calc'd by:**	**CMD**
	PROPOSED CONDITIONS	**Checked by:**	**RDL**
	EL PASO COUNTY, CO	**Date:**	**8/11/2026**

TIME OF CONCENTRATION

BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	*tc=(L/180)+10*	Design tc
DESIGNATION	C_5	AREA (ac)	LENGTH (ft)	SLOPE %	t_i (min)	C_V	LENGTH (ft)	SLOPE %	V (ft/s)	t_t (min)	t_c (min)	*tc max*	*tc design (min)*
BR7	0.73	0.16	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR8	0.73	0.33	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR9	0.73	0.17	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
BR10	0.73	0.33	28	45.8	1.0	20	50	45.8	13.5	0.1	5.0	10.4	5.0
O1	0.20	0.18	27	10.0	4.0	7	0	10.0	2.2	0.0	5.0	10.2	5.0
O2	0.20	0.20	26	33.3	2.6	7	0	33.3	4.0	0.0	5.0	10.1	5.0
O3	0.63	0.15	46	15.0	2.4	7	0	15.0	2.7	0.0	5.0	10.3	5.0
O4	0.27	0.47	37	7.0	4.8	7	0	7.0	1.9	0.0	5.0	10.2	5.0
O5	0.71	0.27	14	20.0	1.0	7	0	20.0	3.1	0.0	5.0	10.1	5.0
O6	0.63	0.28	25	9.0	2.1	7	0	9.0	2.1	0.0	5.0	10.1	5.0
P1	0.20	0.20	32	5.0	5.5	15	32	5.0	3.4	0.2	5.6	10.4	5.6

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \qquad V = C_v S_w^{0.5}$$

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

* For buried riprap, select C_v value based on type of vegetative cover.

HRGreen

HILLPOINTE AT PETERSON
PROPOSED CONDITIONS
DESIGN STORM: 5-YEAR

Calc'd by:	CMD
Checked by:	RDL
Date:	8/11/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_5	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_5*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_5*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
	1	A1.1	0.30	0.87	5.0	0.26	5.17	1.34															
	2	A1.2	0.07	0.71	5.6	0.05	5.00	0.23															
		A2	0.49	0.73	6.6	0.35	4.75	1.69															
	3 4	A3	0.28	0.69	5.0	0.20	5.17	1.01				2.28											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
		A4.1	0.49	0.70	5.0	0.34	5.17	1.77															
	6	A4.2	0.17	0.77	5.0	0.13	5.17	0.69															
	5 7	A5.1	0.56	0.71	6.2	0.40	4.84	1.92				3.05											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	8	A5.2	0.66	0.68	5.1	0.45	5.13	2.30															
	9	A6.1	0.32	0.54	5.0	0.17	5.17	0.90															
	10	A6.2	0.46	0.73	6.5	0.34	4.76	1.60															
	11	A7	0.40	0.70	7.7	0.28	4.52	1.28															
		AR1	0.16	0.73	5.0	0.11	5.17	0.59															
		AR2	0.10	0.73	5.0	0.08	5.17	0.39															
		AR3	0.12	0.73	5.0	0.09	5.17	0.44															
		BR7.5	0.16	0.73	5.0	0.11	5.17	0.59															
		AR5	0.17	0.73	5.0	0.13	5.17	0.65															
		AR6	0.16	0.73	5.0	0.11	5.17	0.59															
	12	B1.1	0.96	0.72	7.6	0.69	4.53	3.13															
	13	B1.2	0.71	0.68	7.0	0.49	4.67	2.27				3.10											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	14	B2.1	0.31	0.73	5.0	0.23	5.17	1.19															
	15	B2.2	0.25	0.74	5.3	0.19	5.10	0.96															
		B3.1	0.41	0.70	5.4	0.29	5.05	1.44															
	16 17	B3.2	0.61	0.69	5.4	0.43	5.05	2.15				2.09											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	18	B4	0.42	0.63	5.0	0.27	5.17	1.38															
		B5	0.57	0.56	6.7	0.32	4.74	1.52															
	19	B6	0.70	0.72	6.5	0.50	4.77	2.39				2.76											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	20	B7	0.88	0.41	10.4	0.36	4.06	1.46				3.04											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	21											2.70											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION

HRGreen

HILLPOINTE AT PETERSON
PROPOSED CONDITIONS
DESIGN STORM: 5-YEAR

Calc'd by:	CMD
Checked by:	RDL
Date:	8/11/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_5	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_5*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_5*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_5*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
		BL1	0.36	0.21	7.2	0.08	4.63	0.36															
		BR1	0.10	0.73	5.0	0.07	5.17	0.38															
		BR2	0.12	0.73	5.0	0.09	5.17	0.44															
		BR3	0.16	0.73	5.0	0.11	5.17	0.59															
		BR4	0.17	0.73	5.0	0.13	5.17	0.65															
		BR5	0.17	0.73	5.0	0.13	5.17	0.65															
		BR6	0.17	0.73	5.0	0.13	5.17	0.65															
		BR7	0.16	0.73	5.0	0.11	5.17	0.59															
		BR8	0.33	0.73	5.0	0.24	5.17	1.24															
		BR9	0.17	0.73	5.0	0.13	5.17	0.65															
		BR10	0.33	0.73	5.0	0.24	5.17	1.24															
		O1	0.18	0.20	5.0	0.04	5.17	0.18															
		O2	0.20	0.20	5.0	0.04	5.17	0.21															
		O3	0.15	0.63	5.0	0.09	5.17	0.48															
		O4	0.47	0.27	5.0	0.13	5.17	0.67															
		O5	0.27	0.71	5.0	0.19	5.17	1.01															
		O6	0.28	0.63	5.0	0.18	5.17	0.91															
		P1	0.20	0.20	5.6	0.04	4.99	0.20															

HRGreen

HILLPOINTE AT PETERSON
PROPOSED CONDITIONS
DESIGN STORM: 100-YEAR

Calc'd by:	CMD
Checked by:	RDL
Date:	8/11/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_{100}	t_c / (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	t_c / (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_{100}*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_{100}*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
	1	A1.1	0.30	0.94	5.0	0.28	8.68	2.42															
	2	A1.2	0.07	0.82	5.6	0.05	8.40	0.45															
		A2	0.49	0.83	6.6	0.41	7.97	3.24															
	3 4	A3	0.28	0.80	5.0	0.23	8.68	1.98				4.34											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
		A4.1	0.49	0.81	5.0	0.40	8.68	3.44															
	6	A4.2	0.17	0.87	5.0	0.15	8.68	1.30															
	5 7	A5.1	0.56	0.82	6.2	0.46	8.13	3.73				5.84											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	8	A5.2	0.66	0.80	5.1	0.52	8.61	4.51															
	9	A6.1	0.32	0.69	5.0	0.22	8.68	1.93															
	10	A6.2	0.46	0.83	6.5	0.38	8.00	3.06															
	11	A7	0.40	0.81	7.7	0.33	7.59	2.49															
		AR1	0.16	0.81	5.0	0.13	8.68	1.10															
		AR2	0.10	0.81	5.0	0.08	8.68	0.72															
		AR3	0.12	0.81	5.0	0.10	8.68	0.83															
		BR7.5	0.16	0.81	5.0	0.13	8.68	1.10															
		AR5	0.17	0.81	5.0	0.14	8.68	1.21															
		AR6	0.16	0.81	5.0	0.13	8.68	1.10															
	12	B1.1	0.96	0.82	7.6	0.79	7.61	6.03															
	13	B1.2	0.71	0.80	7.0	0.57	7.85	4.45				6.00											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	14	B2.1	0.31	0.84	5.0	0.26	8.68	2.29															
	15	B2.2	0.25	0.84	5.3	0.21	8.56	1.83															
		B3.1	0.41	0.81	5.4	0.33	8.48	2.81															
	16 17	B3.2	0.61	0.81	5.4	0.50	8.48	4.20				4.02											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	18	B4	0.42	0.76	5.0	0.32	8.68	2.78															
		B5	0.57	0.71	6.7	0.41	7.96	3.22															
	19	B6	0.70	0.83	6.5	0.57	8.00	4.60				5.54											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
	20	B7	0.88	0.60	10.4	0.52	6.82	3.56				5.81											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION

HRGreen

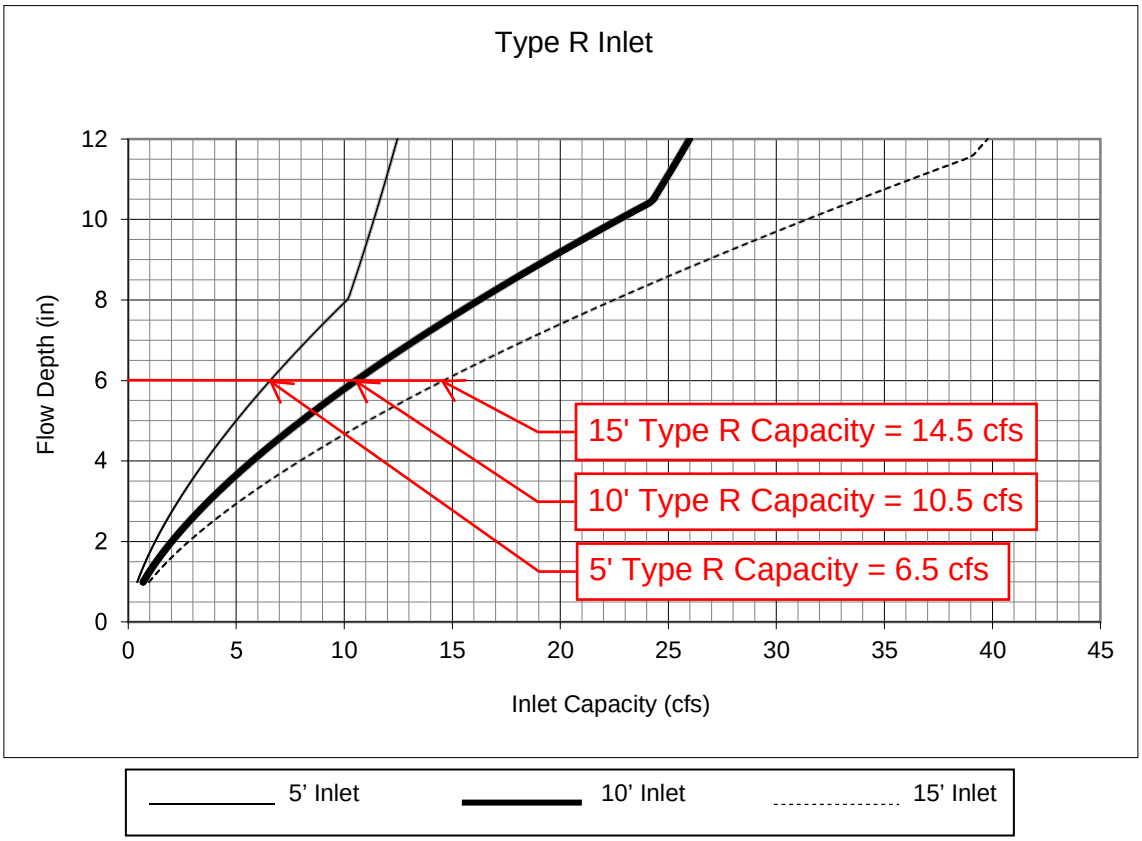
HILLPOINTE AT PETERSON
PROPOSED CONDITIONS
DESIGN STORM: 100-YEAR

Calc'd by:	CMD
Checked by:	RDL
Date:	8/11/2026

			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
STRUCTURE	DESIGN POINT	BASIN ID	AREA (ac)	C_{100}	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	t_c (min)	C_{100}*A (ac)	I (in./ hr.)	Q (cfs)	Q_{street} (cfs)	C_{100}*A (ac)	SLOPE %	Q_{PIPE} (cfs)	C_{100}*A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
	21	BL1	0.36	0.45	7.2	0.16	7.77	1.27				5.88											COMBINED FLOW TO INLET AT DESIGN POINT LOCATION
		BR1	0.10	0.81	5.0	0.08	8.68	0.72															
		BR2	0.12	0.81	5.0	0.10	8.68	0.83															
		BR3	0.16	0.81	5.0	0.13	8.68	1.10															
		BR4	0.17	0.81	5.0	0.14	8.68	1.21															
		BR5	0.17	0.81	5.0	0.14	8.68	1.21															
		BR6	0.17	0.81	5.0	0.14	8.68	1.21															
		BR7	0.16	0.81	5.0	0.13	8.68	1.10															
		BR8	0.33	0.81	5.0	0.27	8.68	2.31															
		BR9	0.17	0.81	5.0	0.14	8.68	1.21															
		BR10	0.33	0.81	5.0	0.27	8.68	2.31															
		O1	0.18	0.44	5.0	0.08	8.68	0.68															
		O2	0.20	0.44	5.0	0.09	8.68	0.77															
		O3	0.15	0.76	5.0	0.11	8.68	0.97															
		O4	0.47	0.49	5.0	0.23	8.68	2.03															
		O5	0.27	0.82	5.0	0.22	8.68	1.95															
		O6	0.28	0.76	5.0	0.21	8.68	1.84															
		P1	0.20	0.44	5.6	0.09	8.39	0.74															

APPENDIX C – HYDRAULIC CALCULATIONS

Figure 8-11. Inlet Capacity Chart Sump Conditions , Curb Opening (Type R) Inlet



Note: All proposed inlets are sump inlets

Notes:

1. The standard inlet parameters must apply to use this chart.

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Apr 20 2026

Typical Street Section - Maximum Capacity

User-defined

Invert Elev (ft)	= 6289.59
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

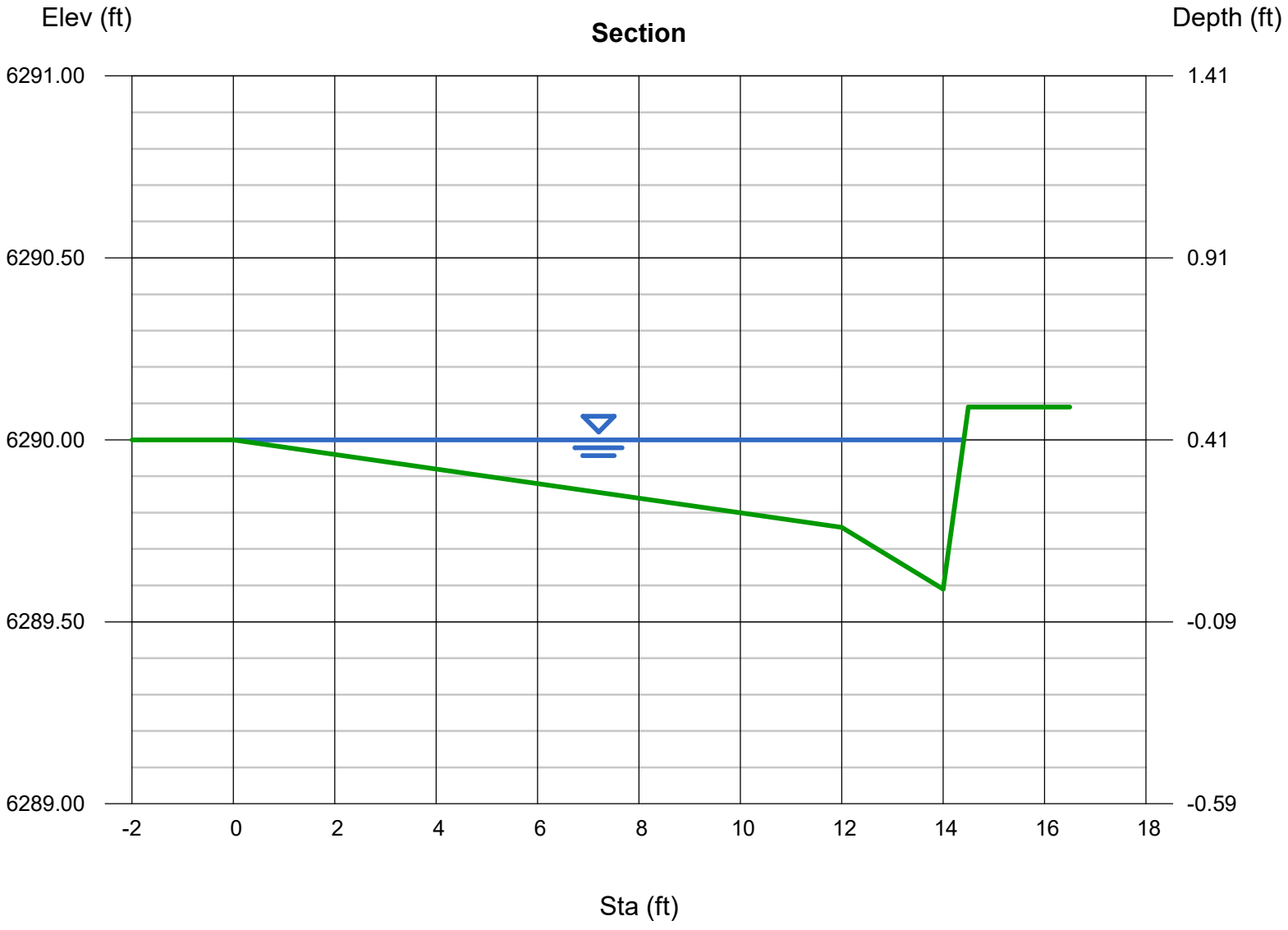
Compute by:	Known Q
Known Q (cfs)	= 4.95

Highlighted

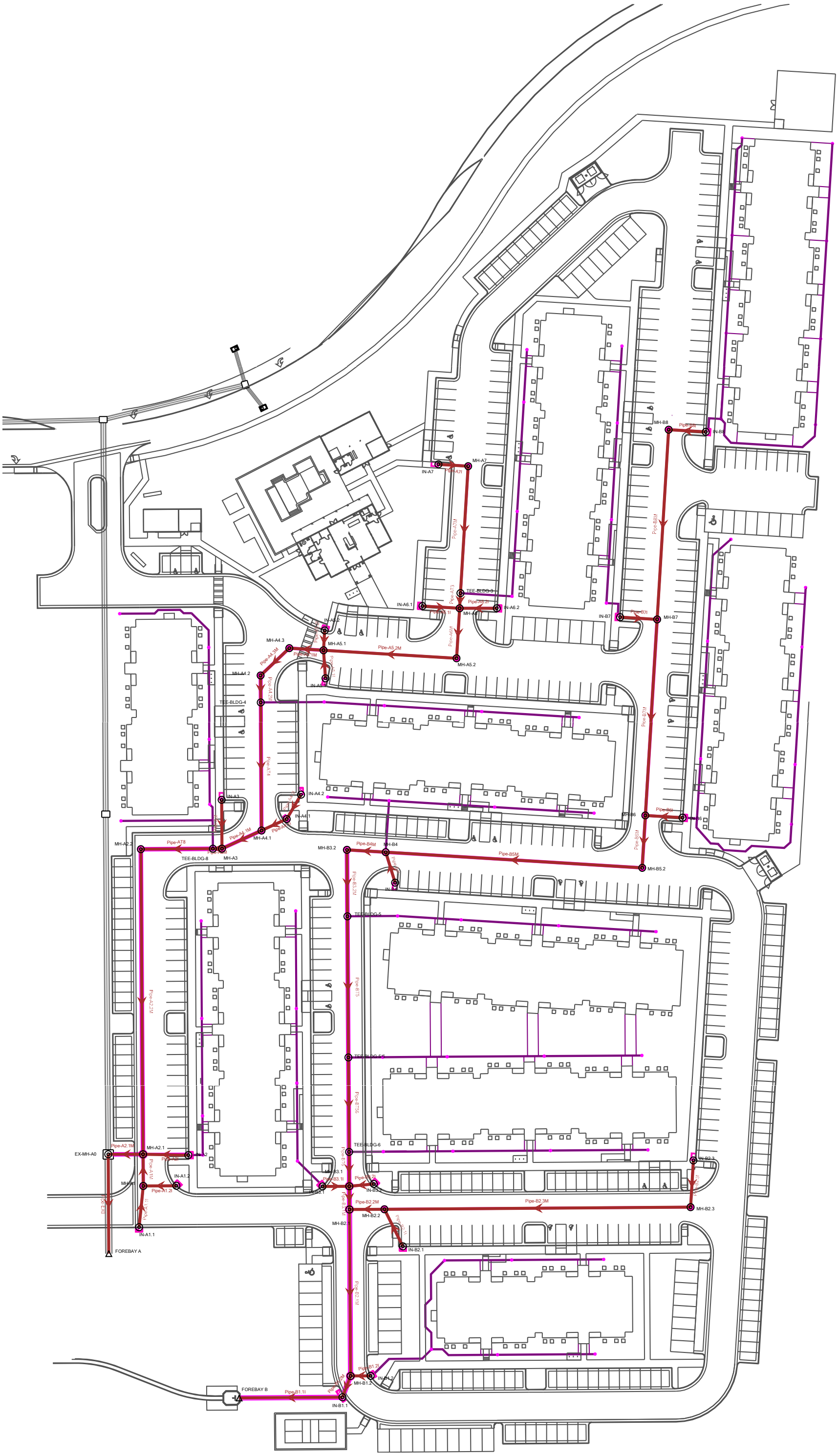
Depth (ft)	= 0.41
Q (cfs)	= 4.950
Area (sqft)	= 2.18
Velocity (ft/s)	= 2.27
Wetted Perim (ft)	= 14.59
Crit Depth, Yc (ft)	= 0.42
Top Width (ft)	= 14.41
EGL (ft)	= 0.49

(Sta, El, n)-(Sta, El, n)...

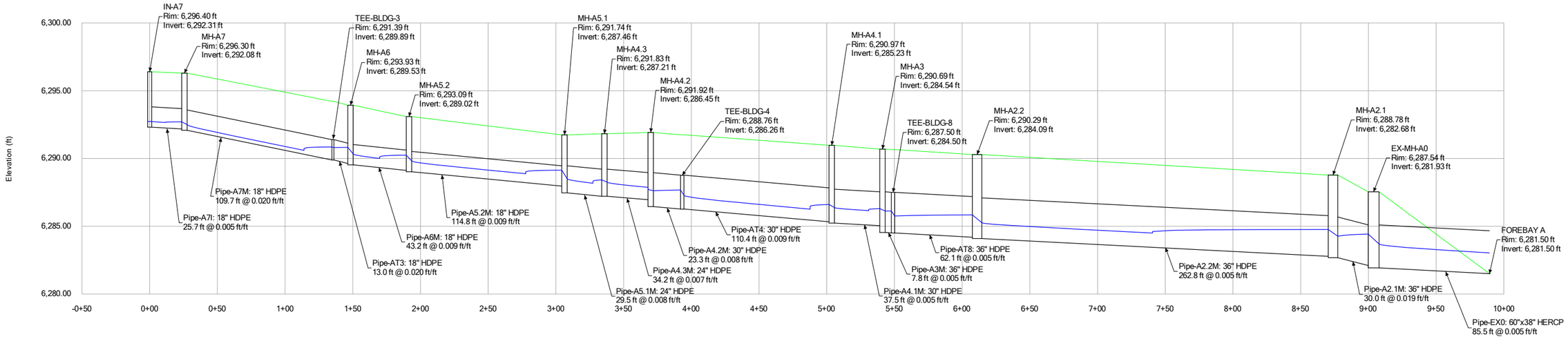
(0.00, 6290.00)-(12.00, 6289.76, 0.013)-(14.00, 6289.59, 0.013)-(14.50, 6290.09, 0.013)



STORMCAD LAYOUT
HILLPOINTE APARTMENTS AT PETERSON



Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main A



Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main A

Manhole Table - Time: 0.00 hours

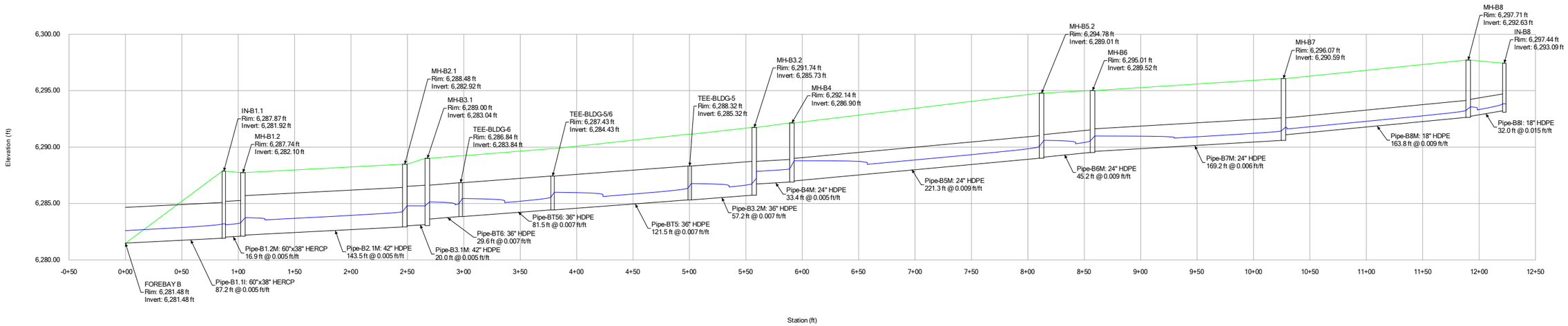
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
EX-MH-A0	6,287.54	6,281.93	48.30	1.020	6,284.42	6,283.69	SDMH
IN-A1.1	6,288.70	6,284.75	1.34	0.000	6,285.18	6,285.18	5' TYPE-R INLET
IN-A1.2	6,288.56	6,284.69	0.23	0.000	6,284.87	6,284.87	5' TYPE-R INLET
IN-A2	6,288.65	6,284.67	2.28	0.000	6,285.24	6,285.24	5' TYPE-R INLET
IN-A3	6,290.91	6,286.81	1.01	0.000	6,287.06	6,287.06	5' TYPE-R INLET
IN-A4.1	6,291.15	6,287.10	2.46	0.400	6,287.43	6,287.34	5' TYPE-R INLET
IN-A4.2	6,290.94	6,287.31	0.69	0.000	6,287.61	6,287.61	5' TYPE-R INLET
IN-A5.1	6,291.60	6,288.38	1.92	0.000	6,289.11	6,289.11	5' TYPE-R INLET
IN-A5.2	6,291.89	6,288.35	2.30	0.000	6,289.12	6,289.12	5' TYPE-R INLET
IN-A6.1	6,293.66	6,289.79	0.90	0.000	6,290.82	6,290.82	5' TYPE-R INLET
IN-A6.2	6,293.70	6,289.79	1.60	0.000	6,290.82	6,290.82	5' TYPE-R INLET
IN-A7	6,296.40	6,292.31	1.28	0.000	6,292.73	6,292.73	5' TYPE-R INLET
MH-A1	6,288.59	6,283.98	1.57	1.020	6,284.79	6,284.76	SDMH
MH-A2.1	6,288.78	6,282.68	17.41	1.520	6,284.76	6,284.26	SDMH
MH-A2.2	6,290.29	6,284.09	13.54	1.320	6,285.84	6,285.26	SDMH
MH-A3	6,290.69	6,284.54	12.71	1.020	6,286.30	6,286.12	SDMH
MH-A4.1	6,290.97	6,285.23	11.70	0.520	6,286.61	6,286.38	SDMH
MH-A4.2	6,291.92	6,286.45	8.59	0.400	6,287.71	6,287.62	SDMH
MH-A4.3	6,291.83	6,287.21	8.59	0.400	6,288.42	6,288.25	SDMH
MH-A5.1	6,291.74	6,287.46	8.59	1.520	6,289.14	6,288.50	SDMH
MH-A5.2	6,293.09	6,289.02	4.37	1.320	6,290.25	6,289.82	SDMH
MH-A6	6,293.93	6,289.53	4.37	1.520	6,290.82	6,290.33	SDMH
MH-A7	6,296.30	6,292.08	1.28	1.320	6,292.70	6,292.50	SDMH
TEE-BLDG-3	6,291.39	6,289.89	1.87	1.020	6,290.85	6,290.81	18" X 12" HDPE TEE
TEE-BLDG-4	6,288.76	6,286.26	9.24	1.020	6,287.67	6,287.28	30" X 12" HDPE TEE
TEE-BLDG-8	6,287.50	6,284.50	13.54	1.020	6,286.12	6,285.75	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main A

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-A1.1I	IN-A1.1	MH-A1	18.0	35.7	0.012	0.008	1.34	3.91	6,284.75	6,284.48	6,285.18	6,284.85
Pipe-A1.2I	IN-A1.2	MH-A1	18.0	28.5	0.012	0.007	0.23	2.30	6,284.69	6,284.48	6,284.87	6,284.79
Pipe-A1M	MH-A1	MH-A2.1	24.0	27.3	0.012	0.007	1.57	3.92	6,283.98	6,283.78	6,284.76	6,284.76
Pipe-A2.1M	MH-A2.1	EX-MH-A0	36.0	30.0	0.012	0.019	17.41	10.66	6,282.68	6,282.10	6,284.26	6,284.42
Pipe-A2.2M	MH-A2.2	MH-A2.1	36.0	262.8	0.012	0.005	13.54	6.10	6,284.09	6,282.78	6,285.26	6,284.76
Pipe-A2I	IN-A2	MH-A2.1	18.0	39.0	0.012	0.010	2.28	5.03	6,284.67	6,284.28	6,285.24	6,284.74
Pipe-A3I	IN-A3	MH-A3	18.0	42.0	0.012	0.015	1.01	4.61	6,286.68	6,286.04	6,287.06	6,286.31
Pipe-A3M	MH-A3	TEE-BLDG-8	36.0	7.8	0.012	0.005	12.71	6.05	6,284.54	6,284.50	6,286.12	6,286.12
Pipe-A4.1I	IN-A4.1	MH-A4.1	18.0	21.1	0.012	0.020	2.46	6.58	6,286.75	6,286.33	6,287.34	6,286.75
Pipe-A4.1M	MH-A4.1	MH-A3	30.0	37.5	0.012	0.005	11.70	5.96	6,285.23	6,285.04	6,286.38	6,286.30
Pipe-A4.2I	IN-A4.2	IN-A4.1	18.0	22.5	0.012	0.020	0.69	4.53	6,287.30	6,286.85	6,287.61	6,287.43
Pipe-A4.2M	MH-A4.2	TEE-BLDG-4	30.0	23.3	0.012	0.008	8.59	6.38	6,286.45	6,286.27	6,287.62	6,287.67
Pipe-A4.3M	MH-A4.3	MH-A4.2	24.0	34.2	0.012	0.007	8.59	6.34	6,287.21	6,286.96	6,288.25	6,287.87
Pipe-A5.1I	IN-A5.1	MH-A5.1	18.0	24.3	0.012	0.015	1.92	5.51	6,288.32	6,287.96	6,289.11	6,289.14
Pipe-A5.1M	MH-A5.1	MH-A4.3	24.0	29.5	0.012	0.008	8.59	6.69	6,287.46	6,287.21	6,288.50	6,288.42
Pipe-A5.2I	IN-A5.2	MH-A5.1	18.0	17.1	0.012	0.015	2.30	5.86	6,288.22	6,287.96	6,289.12	6,289.14
Pipe-A5.2M	MH-A5.2	MH-A5.1	18.0	114.8	0.012	0.009	4.37	5.84	6,289.02	6,287.96	6,289.82	6,289.14
Pipe-A6.1I	IN-A6.1	MH-A6	18.0	32.0	0.012	0.005	0.90	3.01	6,289.79	6,289.63	6,290.82	6,290.82
Pipe-A6.2I	IN-A6.2	MH-A6	18.0	32.1	0.012	0.005	1.60	3.55	6,289.79	6,289.63	6,290.82	6,290.82
Pipe-A6M	MH-A6	MH-A5.2	18.0	43.2	0.012	0.009	4.37	5.90	6,289.53	6,289.12	6,290.33	6,290.25
Pipe-A7I	IN-A7	MH-A7	18.0	25.7	0.012	0.005	1.28	3.33	6,292.31	6,292.18	6,292.73	6,292.70
Pipe-A7M	MH-A7	TEE-BLDG-3	18.0	109.7	0.012	0.020	1.28	5.44	6,292.08	6,289.89	6,292.50	6,290.85
Pipe-AT3	TEE-BLDG-3	MH-A6	18.0	13.0	0.012	0.020	1.87	6.08	6,289.89	6,289.63	6,290.81	6,290.82
Pipe-AT4	TEE-BLDG-4	MH-A4.1	30.0	110.4	0.012	0.009	9.24	6.74	6,286.27	6,285.33	6,287.28	6,286.61
Pipe-AT8	TEE-BLDG-8	MH-A2.2	36.0	62.1	0.012	0.005	13.54	6.10	6,284.50	6,284.19	6,285.75	6,285.84
Pipe-EX0	EX-MH-A0	FOREBAY A	48.0	85.5	0.012	0.005	48.30	8.28	6,281.93	6,281.50	6,283.69	6,283.03

Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main B



Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main B

Manhole Table - Time: 0.00 hours

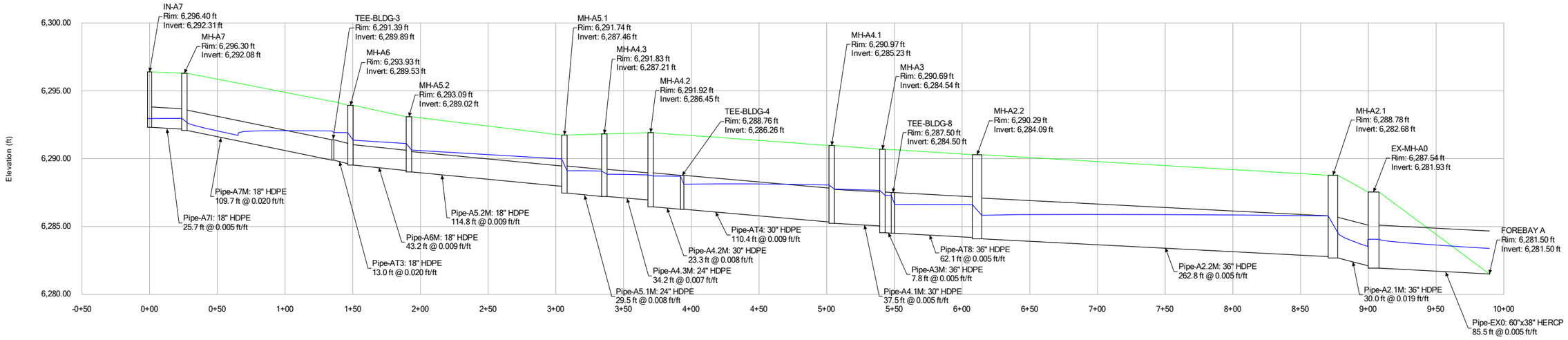
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
IN-B1.1	6,287.87	6,281.92	25.94	0.000	6,283.19	6,283.19	10' TYPE-R INLET
IN-B1.2	6,287.87	6,283.58	3.10	0.000	6,284.86	6,284.86	5' TYPE-R INLET
IN-B2.1	6,288.38	6,284.89	1.19	0.000	6,285.72	6,285.72	5' TYPE-R INLET
IN-B2.3	6,292.94	6,287.90	0.96	0.000	6,288.26	6,288.26	5' TYPE-R INLET
IN-B3.1	6,288.73	6,284.85	2.09	0.000	6,285.79	6,285.79	5' TYPE-R INLET
IN-B3.2	6,288.52	6,284.40	2.15	0.000	6,285.78	6,285.78	5' TYPE-R INLET
IN-B4	6,292.10	6,287.35	1.38	0.000	6,288.71	6,288.71	5' TYPE-R INLET
IN-B6	6,294.74	6,289.76	2.76	0.000	6,291.20	6,291.20	5' TYPE-R INLET
IN-B7	6,295.80	6,290.31	3.04	0.000	6,292.07	6,292.07	5' TYPE-R INLET
IN-B8	6,297.44	6,293.09	2.70	0.000	6,293.83	6,293.83	5' TYPE-R INLET
MH-B1.2	6,287.74	6,282.10	22.80	1.020	6,283.74	6,283.29	SDMH
MH-B2.1	6,288.48	6,282.92	19.70	1.020	6,284.79	6,284.28	SDMH
MH-B2.2	6,288.62	6,285.07	2.15	0.520	6,285.73	6,285.62	SDMH
MH-B2.3	6,292.25	6,286.49	0.96	1.320	6,287.03	6,286.85	SDMH
MH-B3.1	6,289.00	6,283.04	17.55	1.520	6,285.14	6,284.79	SDMH
MH-B3.2	6,291.74	6,285.73	10.47	1.320	6,287.25	6,286.75	SDMH
MH-B4	6,292.14	6,286.90	10.47	1.520	6,288.79	6,288.06	SDMH
MH-B5.2	6,294.78	6,289.01	8.50	1.320	6,290.59	6,290.05	SDMH
MH-B6	6,295.01	6,289.52	8.50	1.020	6,290.98	6,290.56	SDMH
MH-B7	6,296.07	6,290.59	5.74	1.020	6,291.76	6,291.44	SDMH
MH-B8	6,297.71	6,292.63	2.70	1.320	6,293.56	6,293.25	SDMH
TEE-BLDG-5	6,288.32	6,285.32	11.06	1.020	6,286.77	6,286.37	36" X 12" HDPE TEE
TEE-BLDG-5/6	6,287.43	6,284.43	12.72	1.020	6,285.99	6,285.56	36" X 12" HDPE TEE
TEE-BLDG-6	6,286.84	6,283.84	13.31	1.020	6,285.44	6,285.00	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
5-Year Storm Free Outfall - Main B

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-B1.1I	IN-B1.1	FOREBAY B	48.0	87.2	0.012	0.005	25.94	6.77	6,281.92	6,281.49	6,283.19	6,282.59
Pipe-B1.2I	IN-B1.2	MH-B1.2	18.0	17.3	0.012	0.005	3.10	4.32	6,284.19	6,284.10	6,284.86	6,284.74
Pipe-B1.2M	MH-B1.2	IN-B1.1	42.0	16.9	0.012	0.005	22.80	6.41	6,282.10	6,282.02	6,283.29	6,283.11
Pipe-B2.1I	IN-B2.1	MH-B2.2	18.0	35.6	0.012	0.005	1.19	3.27	6,285.25	6,285.07	6,285.72	6,285.73
Pipe-B2.2M	MH-B2.2	MH-B2.1	18.0	30.1	0.012	0.005	2.15	3.85	6,285.07	6,284.92	6,285.62	6,285.45
Pipe-B2.3I	IN-B2.3	MH-B2.3	18.0	40.3	0.012	0.032	0.96	5.91	6,287.89	6,286.59	6,288.26	6,287.03
Pipe-B2.3M	MH-B2.3	MH-B2.2	18.0	263.8	0.012	0.005	0.96	3.07	6,286.49	6,285.17	6,286.85	6,285.73
Pipe-B3.1I	IN-B3.1	MH-B3.1	18.0	23.0	0.012	0.005	2.09	3.88	6,285.24	6,285.12	6,285.79	6,285.64
Pipe-B3.1M	MH-B3.1	MH-B2.1	42.0	20.0	0.013	0.005	17.55	6.12	6,283.12	6,283.02	6,284.79	6,284.79
Pipe-B3.2I	IN-B3.2	MH-B3.1	18.0	21.2	0.012	0.005	2.15	3.90	6,285.23	6,285.12	6,285.78	6,285.64
Pipe-B3.2M	MH-B3.2	TEE-BLDG-5	36.0	57.2	0.012	0.007	10.47	6.46	6,285.73	6,285.32	6,286.75	6,286.77
Pipe-B4I	IN-B4	MH-B4	18.0	27.4	0.012	0.025	1.38	6.04	6,288.19	6,287.50	6,288.71	6,288.79
Pipe-B4M	MH-B4	MH-B3.2	24.0	33.4	0.012	0.005	10.47	5.81	6,286.90	6,286.73	6,288.06	6,287.85
Pipe-B5M	MH-B5.2	MH-B4	24.0	221.3	0.013	0.009	8.50	6.46	6,289.01	6,287.00	6,290.05	6,288.79
Pipe-B6I	IN-B6	MH-B6	18.0	32.0	0.012	0.014	2.76	6.00	6,290.57	6,290.12	6,291.20	6,290.98
Pipe-B6M	MH-B6	MH-B5.2	24.0	45.2	0.012	0.009	8.50	6.84	6,289.52	6,289.11	6,290.56	6,290.59
Pipe-B7I	IN-B7	MH-B7	18.0	32.0	0.012	0.010	3.04	5.45	6,291.41	6,291.09	6,292.07	6,291.76
Pipe-B7M	MH-B7	MH-B6	24.0	169.2	0.012	0.006	5.74	5.21	6,290.59	6,289.62	6,291.44	6,290.98
Pipe-B8I	IN-B8	MH-B8	18.0	32.0	0.012	0.015	2.70	6.10	6,293.21	6,292.73	6,293.83	6,293.56
Pipe-B8M	MH-B8	MH-B7	18.0	163.8	0.012	0.009	2.70	5.16	6,292.63	6,291.09	6,293.25	6,291.76
Pipe-BT5	TEE-BLDG-5	TEE-BLDG-5/6	36.0	121.5	0.012	0.007	11.06	6.62	6,285.32	6,284.43	6,286.37	6,285.99
Pipe-BT6	TEE-BLDG-6	MH-B3.1	36.0	29.6	0.012	0.007	13.31	7.01	6,283.84	6,283.62	6,285.00	6,285.14
Pipe-BT56	TEE-BLDG-5/6	TEE-BLDG-6	36.0	81.5	0.012	0.007	12.72	6.86	6,284.43	6,283.84	6,285.56	6,285.44

Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main A



Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main A

Manhole Table - Time: 0.00 hours

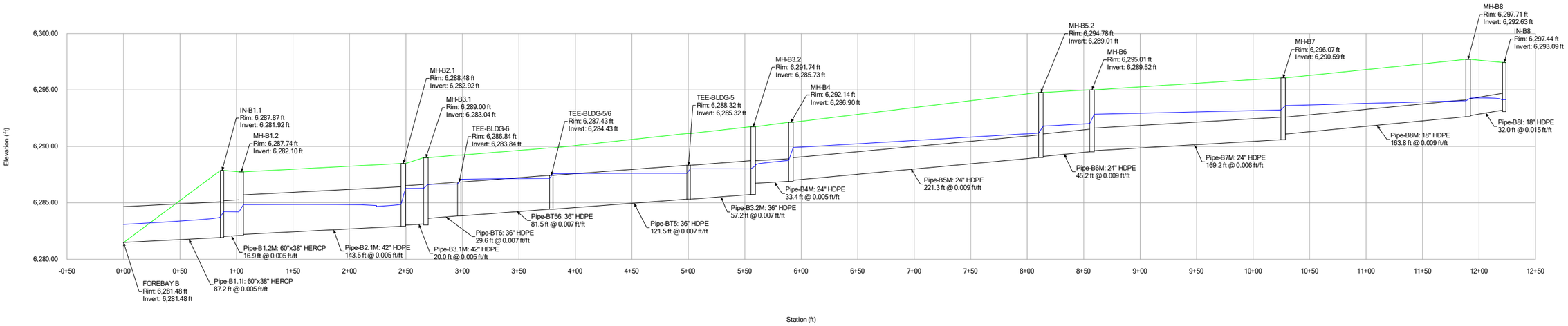
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
EX-MH-A0	6,287.54	6,281.93	69.31	0.000	6,284.06	6,284.06	SDMH
IN-A1.1	6,288.70	6,284.75	2.42	0.000	6,285.81	6,285.81	5' TYPE-R INLET
IN-A1.2	6,288.56	6,284.69	0.45	0.000	6,285.81	6,285.81	5' TYPE-R INLET
IN-A2	6,288.65	6,284.67	4.34	0.000	6,285.78	6,285.78	5' TYPE-R INLET
IN-A3	6,290.91	6,286.81	1.98	0.000	6,287.65	6,287.65	5' TYPE-R INLET
IN-A4.1	6,291.15	6,287.10	4.74	0.400	6,288.13	6,288.08	5' TYPE-R INLET
IN-A4.2	6,290.94	6,287.31	1.30	0.000	6,288.12	6,288.12	5' TYPE-R INLET
IN-A5.1	6,291.60	6,288.38	3.73	0.000	6,290.01	6,290.01	5' TYPE-R INLET
IN-A5.2	6,291.89	6,288.35	4.51	0.000	6,290.01	6,290.01	5' TYPE-R INLET
IN-A6.1	6,293.66	6,289.79	1.93	0.000	6,291.93	6,291.93	5' TYPE-R INLET
IN-A6.2	6,293.70	6,289.79	3.06	0.000	6,291.94	6,291.94	5' TYPE-R INLET
IN-A7	6,296.40	6,292.31	2.49	0.000	6,292.96	6,292.96	5' TYPE-R INLET
MH-A1	6,288.59	6,283.98	2.87	1.770	6,285.81	6,285.78	SDMH
MH-A2.1	6,288.78	6,282.68	33.51	1.520	6,285.78	6,284.56	SDMH
MH-A2.2	6,290.29	6,284.09	26.30	1.320	6,286.62	6,285.82	SDMH
MH-A3	6,290.69	6,284.54	24.75	1.770	6,287.66	6,287.29	SDMH
MH-A4.1	6,290.97	6,285.23	22.77	0.900	6,288.06	6,287.76	SDMH
MH-A4.2	6,291.92	6,286.45	16.82	0.400	6,288.80	6,288.72	SDMH
MH-A4.3	6,291.83	6,287.21	16.82	0.400	6,289.08	6,288.85	SDMH
MH-A5.1	6,291.74	6,287.46	16.82	1.520	6,289.98	6,289.10	SDMH
MH-A5.2	6,293.09	6,289.02	8.58	1.320	6,291.12	6,290.63	SDMH
MH-A6	6,293.93	6,289.53	8.58	1.520	6,291.92	6,291.36	SDMH
MH-A7	6,296.30	6,292.08	2.49	1.320	6,292.97	6,292.68	SDMH
TEE-BLDG-3	6,291.39	6,289.89	3.59	1.770	6,292.04	6,291.93	18" X 12" HDPE TEE
TEE-BLDG-4	6,288.76	6,286.26	18.03	1.770	6,288.71	6,288.11	30" X 12" HDPE TEE
TEE-BLDG-8	6,287.50	6,284.50	26.30	1.770	6,287.29	6,286.63	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main A

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-A1.1I	IN-A1.1	MH-A1	18.0	35.7	0.012	0.008	2.42	4.63	6,284.75	6,284.48	6,285.81	6,285.81
Pipe-A1.2I	IN-A1.2	MH-A1	18.0	28.5	0.012	0.007	0.45	2.81	6,284.69	6,284.48	6,285.81	6,285.81
Pipe-A1M	MH-A1	MH-A2.1	24.0	27.3	0.012	0.007	2.87	4.68	6,283.98	6,283.78	6,285.78	6,285.78
Pipe-A2.1M	MH-A2.1	EX-MH-A0	36.0	30.0	0.012	0.019	33.51	12.79	6,282.68	6,282.10	6,284.56	6,284.06
Pipe-A2.2M	MH-A2.2	MH-A2.1	36.0	262.8	0.012	0.005	26.30	7.27	6,284.09	6,282.78	6,285.82	6,285.78
Pipe-A2I	IN-A2	MH-A2.1	18.0	39.0	0.012	0.010	4.34	6.01	6,284.67	6,284.28	6,285.78	6,285.78
Pipe-A3I	IN-A3	MH-A3	18.0	42.0	0.012	0.015	1.98	5.62	6,286.68	6,286.04	6,287.65	6,287.66
Pipe-A3M	MH-A3	TEE-BLDG-8	36.0	7.8	0.012	0.005	24.75	7.23	6,284.54	6,284.50	6,287.29	6,287.29
Pipe-A4.1I	IN-A4.1	MH-A4.1	18.0	21.1	0.012	0.020	4.74	7.92	6,286.75	6,286.33	6,288.08	6,288.06
Pipe-A4.1M	MH-A4.1	MH-A3	30.0	37.5	0.012	0.005	22.77	4.64	6,285.23	6,285.04	6,287.76	6,287.66
Pipe-A4.2I	IN-A4.2	IN-A4.1	18.0	22.5	0.012	0.020	1.30	5.47	6,287.30	6,286.85	6,288.12	6,288.13
Pipe-A4.2M	MH-A4.2	TEE-BLDG-4	30.0	23.3	0.012	0.008	16.82	7.66	6,286.45	6,286.27	6,288.72	6,288.71
Pipe-A4.3M	MH-A4.3	MH-A4.2	24.0	34.2	0.012	0.007	16.82	7.42	6,287.21	6,286.96	6,288.85	6,288.80
Pipe-A5.1I	IN-A5.1	MH-A5.1	18.0	24.3	0.012	0.015	3.73	2.11	6,288.32	6,287.96	6,290.01	6,289.98
Pipe-A5.1M	MH-A5.1	MH-A4.3	24.0	29.5	0.012	0.008	16.82	7.87	6,287.46	6,287.21	6,289.10	6,289.08
Pipe-A5.2I	IN-A5.2	MH-A5.1	18.0	17.1	0.012	0.015	4.51	2.55	6,288.22	6,287.96	6,290.01	6,289.98
Pipe-A5.2M	MH-A5.2	MH-A5.1	18.0	114.8	0.012	0.009	8.58	4.86	6,289.02	6,287.96	6,290.63	6,289.98
Pipe-A6.1I	IN-A6.1	MH-A6	18.0	32.0	0.012	0.005	1.93	1.09	6,289.79	6,289.63	6,291.93	6,291.92
Pipe-A6.2I	IN-A6.2	MH-A6	18.0	32.1	0.012	0.005	3.06	1.73	6,289.79	6,289.63	6,291.94	6,291.92
Pipe-A6M	MH-A6	MH-A5.2	18.0	43.2	0.012	0.009	8.58	4.86	6,289.53	6,289.12	6,291.36	6,291.12
Pipe-A7I	IN-A7	MH-A7	18.0	25.7	0.012	0.005	2.49	4.01	6,292.31	6,292.18	6,292.96	6,292.97
Pipe-A7M	MH-A7	TEE-BLDG-3	18.0	109.7	0.012	0.020	2.49	6.61	6,292.08	6,289.89	6,292.68	6,292.04
Pipe-AT3	TEE-BLDG-3	MH-A6	18.0	13.0	0.012	0.020	3.59	2.03	6,289.89	6,289.63	6,291.93	6,291.92
Pipe-AT4	TEE-BLDG-4	MH-A4.1	30.0	110.4	0.012	0.009	18.03	8.09	6,286.27	6,285.33	6,288.11	6,288.06
Pipe-AT8	TEE-BLDG-8	MH-A2.2	36.0	62.1	0.012	0.005	26.30	7.28	6,284.50	6,284.19	6,286.63	6,286.62
Pipe-EX0	EX-MH-A0	FOREBAY A	48.0	85.5	0.012	0.005	69.31	9.23	6,281.93	6,281.50	6,284.06	6,283.38

Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main B



Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main B

Manhole Table - Time: 0.00 hours

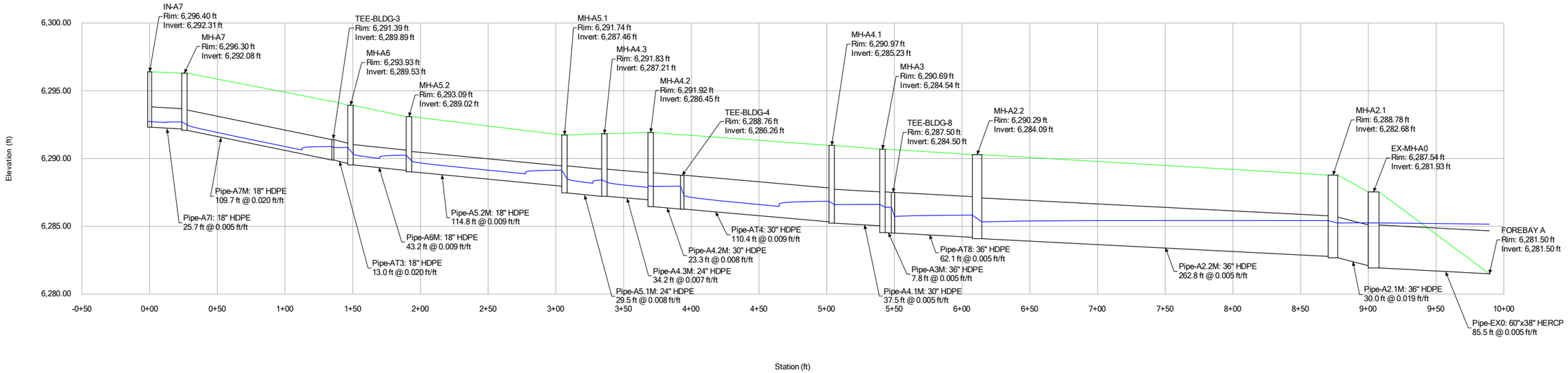
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
IN-B1.1	6,287.87	6,281.92	51.36	0.640	6,284.22	6,283.74	10' TYPE-R INLET
IN-B1.2	6,287.87	6,283.58	6.00	0.000	6,285.14	6,285.14	5' TYPE-R INLET
IN-B2.1	6,288.38	6,284.89	2.29	0.000	6,286.40	6,286.40	5' TYPE-R INLET
IN-B2.3	6,292.94	6,287.90	1.83	0.000	6,288.40	6,288.40	5' TYPE-R INLET
IN-B3.1	6,288.73	6,284.85	4.02	0.000	6,286.66	6,286.66	5' TYPE-R INLET
IN-B3.2	6,288.52	6,284.40	4.20	0.000	6,286.66	6,286.66	5' TYPE-R INLET
IN-B4	6,292.10	6,287.35	2.78	0.000	6,289.91	6,289.91	5' TYPE-R INLET
IN-B6	6,294.74	6,289.76	5.54	0.000	6,292.92	6,292.92	5' TYPE-R INLET
IN-B7	6,295.80	6,290.31	5.81	0.000	6,293.69	6,293.69	5' TYPE-R INLET
IN-B8	6,297.44	6,293.09	5.88	0.000	6,294.15	6,294.15	5' TYPE-R INLET
MH-B1.2	6,287.74	6,282.10	45.34	1.520	6,284.83	6,284.20	SDMH
MH-B2.1	6,288.48	6,282.92	39.34	1.770	6,286.27	6,284.87	SDMH
MH-B2.2	6,288.62	6,285.07	4.12	0.900	6,286.39	6,286.29	SDMH
MH-B2.3	6,292.25	6,286.49	1.83	1.320	6,287.25	6,287.00	SDMH
MH-B3.1	6,289.00	6,283.04	35.22	1.520	6,286.64	6,286.29	SDMH
MH-B3.2	6,291.74	6,285.73	21.11	1.320	6,288.28	6,288.01	SDMH
MH-B4	6,292.14	6,286.90	21.11	1.520	6,289.89	6,288.75	SDMH
MH-B5.2	6,294.78	6,289.01	17.23	1.320	6,291.79	6,291.18	SDMH
MH-B6	6,295.01	6,289.52	17.23	1.770	6,292.85	6,292.02	SDMH
MH-B7	6,296.07	6,290.59	11.69	1.770	6,293.61	6,293.23	SDMH
MH-B8	6,297.71	6,292.63	5.88	1.320	6,294.28	6,294.04	SDMH
TEE-BLDG-5	6,288.32	6,285.32	22.21	1.770	6,288.01	6,287.61	36" X 12" HDPE TEE
TEE-BLDG-5/6	6,287.43	6,284.43	25.90	1.770	6,287.57	6,287.17	36" X 12" HDPE TEE
TEE-BLDG-6	6,286.84	6,283.84	27.00	1.770	6,287.08	6,286.66	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
100-Yr Storm Free Outfall - Main B

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-B1.1I	IN-B1.1	FOREBAY B	48.0	87.2	0.012	0.005	51.36	8.39	6,281.92	6,281.49	6,283.74	6,283.08
Pipe-B1.2I	IN-B1.2	MH-B1.2	18.0	17.3	0.012	0.005	6.00	5.07	6,284.19	6,284.10	6,285.14	6,285.05
Pipe-B1.2M	MH-B1.2	IN-B1.1	42.0	16.9	0.012	0.005	45.34	7.95	6,282.10	6,282.02	6,284.20	6,284.22
Pipe-B2.1I	IN-B2.1	MH-B2.2	18.0	35.6	0.012	0.005	2.29	3.94	6,285.25	6,285.07	6,286.40	6,286.39
Pipe-B2.2M	MH-B2.2	MH-B2.1	18.0	30.1	0.012	0.005	4.12	4.57	6,285.07	6,284.92	6,286.29	6,286.27
Pipe-B2.3I	IN-B2.3	MH-B2.3	18.0	40.3	0.012	0.032	1.83	7.16	6,287.89	6,286.59	6,288.40	6,287.25
Pipe-B2.3M	MH-B2.3	MH-B2.2	18.0	263.8	0.012	0.005	1.83	3.69	6,286.49	6,285.17	6,287.00	6,286.39
Pipe-B3.1I	IN-B3.1	MH-B3.1	18.0	23.0	0.012	0.005	4.02	4.63	6,285.24	6,285.12	6,286.66	6,286.64
Pipe-B3.1M	MH-B3.1	MH-B2.1	42.0	20.0	0.013	0.005	35.22	7.37	6,283.12	6,283.02	6,286.29	6,286.27
Pipe-B3.2I	IN-B3.2	MH-B3.1	18.0	21.2	0.012	0.005	4.20	4.66	6,285.23	6,285.12	6,286.66	6,286.64
Pipe-B3.2M	MH-B3.2	TEE-BLDG-5	36.0	57.2	0.012	0.007	21.11	7.86	6,285.73	6,285.32	6,288.01	6,288.01
Pipe-B4I	IN-B4	MH-B4	18.0	27.4	0.012	0.025	2.78	1.57	6,288.19	6,287.50	6,289.91	6,289.89
Pipe-B4M	MH-B4	MH-B3.2	24.0	33.4	0.012	0.005	21.11	6.72	6,286.90	6,286.73	6,288.75	6,288.38
Pipe-B5M	MH-B5.2	MH-B4	24.0	221.3	0.013	0.009	17.23	5.48	6,289.01	6,287.00	6,291.18	6,289.89
Pipe-B6I	IN-B6	MH-B6	18.0	32.0	0.012	0.014	5.54	3.13	6,290.57	6,290.12	6,292.92	6,292.85
Pipe-B6M	MH-B6	MH-B5.2	24.0	45.2	0.012	0.009	17.23	5.48	6,289.52	6,289.11	6,292.02	6,291.79
Pipe-B7I	IN-B7	MH-B7	18.0	32.0	0.012	0.010	5.81	3.29	6,291.41	6,291.09	6,293.69	6,293.61
Pipe-B7M	MH-B7	MH-B6	24.0	169.2	0.012	0.006	11.69	3.72	6,290.59	6,289.62	6,293.23	6,292.85
Pipe-B8I	IN-B8	MH-B8	18.0	32.0	0.012	0.015	5.88	7.55	6,293.21	6,292.73	6,294.15	6,294.28
Pipe-B8M	MH-B8	MH-B7	18.0	163.8	0.012	0.009	5.88	6.34	6,292.63	6,291.09	6,294.04	6,293.61
Pipe-BT5	TEE-BLDG-5	TEE-BLDG-5/6	36.0	121.5	0.012	0.007	22.21	8.03	6,285.32	6,284.43	6,287.61	6,287.57
Pipe-BT6	TEE-BLDG-6	MH-B3.1	36.0	29.6	0.012	0.007	27.00	8.50	6,283.84	6,283.62	6,286.66	6,286.64
Pipe-BT56	TEE-BLDG-5/6	TEE-BLDG-6	36.0	81.5	0.012	0.007	25.90	8.32	6,284.43	6,283.84	6,287.17	6,287.08

Hillpointe Apartments at Peterson
5-Yr Storm w/ Tailwater - Main A



Hillpointe Apartments at Peterson
5-Yr Storm w/ Tailwater - Main A

Manhole Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
EX-MH-A0	6,287.54	6,281.93	48.30	0.000	6,285.25	6,285.25	SDMH
IN-A1.1	6,288.70	6,284.75	1.34	0.000	6,285.42	6,285.42	5' TYPE-R INLET
IN-A1.2	6,288.56	6,284.69	0.23	0.000	6,285.43	6,285.43	5' TYPE-R INLET
IN-A2	6,288.65	6,284.67	2.28	0.000	6,285.37	6,285.37	5' TYPE-R INLET
IN-A3	6,290.91	6,286.81	1.01	0.000	6,287.06	6,287.06	5' TYPE-R INLET
IN-A4.1	6,291.15	6,287.10	2.46	0.400	6,287.43	6,287.34	5' TYPE-R INLET
IN-A4.2	6,290.94	6,287.31	0.69	0.000	6,287.61	6,287.61	5' TYPE-R INLET
IN-A5.1	6,291.60	6,288.38	1.92	0.000	6,289.11	6,289.11	5' TYPE-R INLET
IN-A5.2	6,291.89	6,288.35	2.30	0.000	6,289.12	6,289.12	5' TYPE-R INLET
IN-A6.1	6,293.66	6,289.79	0.90	0.000	6,290.82	6,290.82	5' TYPE-R INLET
IN-A6.2	6,293.70	6,289.79	1.60	0.000	6,290.82	6,290.82	5' TYPE-R INLET
IN-A7	6,296.40	6,292.31	1.28	0.000	6,292.73	6,292.73	5' TYPE-R INLET
MH-A1	6,288.59	6,283.98	1.57	1.770	6,285.43	6,285.42	SDMH
MH-A2.1	6,288.78	6,282.68	17.41	1.520	6,285.42	6,285.25	SDMH
MH-A2.2	6,290.29	6,284.09	13.54	1.320	6,285.82	6,285.33	SDMH
MH-A3	6,290.69	6,284.54	12.71	1.770	6,286.62	6,286.41	SDMH
MH-A4.1	6,290.97	6,285.23	11.70	0.900	6,286.85	6,286.59	SDMH
MH-A4.2	6,291.92	6,286.45	8.59	0.400	6,287.99	6,287.94	SDMH
MH-A4.3	6,291.83	6,287.21	8.59	0.400	6,288.42	6,288.25	SDMH
MH-A5.1	6,291.74	6,287.46	8.59	1.520	6,289.14	6,288.50	SDMH
MH-A5.2	6,293.09	6,289.02	4.37	1.320	6,290.25	6,289.82	SDMH
MH-A6	6,293.93	6,289.53	4.37	1.520	6,290.82	6,290.33	SDMH
MH-A7	6,296.30	6,292.08	1.28	1.320	6,292.70	6,292.50	SDMH
TEE-BLDG-3	6,291.39	6,289.89	1.87	1.770	6,290.88	6,290.81	18" X 12" HDPE TEE
TEE-BLDG-4	6,288.76	6,286.26	9.24	1.770	6,287.96	6,287.28	30" X 12" HDPE TEE
TEE-BLDG-8	6,287.50	6,284.50	13.54	1.770	6,286.41	6,285.73	36" X 12" HDPE TEE

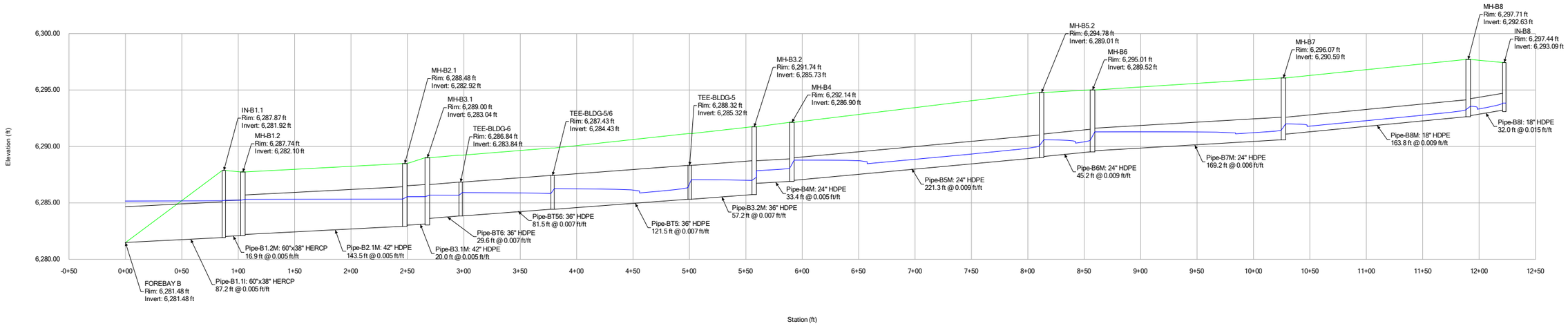
Hillpointe Apartments at Peterson

5-Yr Storm w/ Tailwater - Main A

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-A1.1I	IN-A1.1	MH-A1	18.0	35.7	0.012	0.008	1.34	3.91	6,284.75	6,284.48	6,285.42	6,285.43
Pipe-A1.2I	IN-A1.2	MH-A1	18.0	28.5	0.012	0.007	0.23	2.30	6,284.69	6,284.48	6,285.43	6,285.43
Pipe-A1M	MH-A1	MH-A2.1	24.0	27.3	0.012	0.007	1.57	3.92	6,283.98	6,283.78	6,285.42	6,285.42
Pipe-A2.1M	MH-A2.1	EX-MH-A0	36.0	30.0	0.012	0.019	17.41	10.66	6,282.68	6,282.10	6,285.25	6,285.25
Pipe-A2.2M	MH-A2.2	MH-A2.1	36.0	262.8	0.012	0.005	13.54	6.10	6,284.09	6,282.78	6,285.33	6,285.42
Pipe-A2I	IN-A2	MH-A2.1	18.0	39.0	0.012	0.010	2.28	5.03	6,284.67	6,284.28	6,285.37	6,285.42
Pipe-A3I	IN-A3	MH-A3	18.0	42.0	0.012	0.015	1.01	4.61	6,286.68	6,286.04	6,287.06	6,286.62
Pipe-A3M	MH-A3	TEE-BLDG-8	36.0	7.8	0.012	0.005	12.71	6.05	6,284.54	6,284.50	6,286.41	6,286.41
Pipe-A4.1I	IN-A4.1	MH-A4.1	18.0	21.1	0.012	0.020	2.46	6.58	6,286.75	6,286.33	6,287.34	6,286.75
Pipe-A4.1M	MH-A4.1	MH-A3	30.0	37.5	0.012	0.005	11.70	5.96	6,285.23	6,285.04	6,286.59	6,286.62
Pipe-A4.2I	IN-A4.2	IN-A4.1	18.0	22.5	0.012	0.020	0.69	4.53	6,287.30	6,286.85	6,287.61	6,287.43
Pipe-A4.2M	MH-A4.2	TEE-BLDG-4	30.0	23.3	0.012	0.008	8.59	6.38	6,286.45	6,286.27	6,287.94	6,287.96
Pipe-A4.3M	MH-A4.3	MH-A4.2	24.0	34.2	0.012	0.007	8.59	6.34	6,287.21	6,286.96	6,288.25	6,287.87
Pipe-A5.1I	IN-A5.1	MH-A5.1	18.0	24.3	0.012	0.015	1.92	5.51	6,288.32	6,287.96	6,289.11	6,289.14
Pipe-A5.1M	MH-A5.1	MH-A4.3	24.0	29.5	0.012	0.008	8.59	6.69	6,287.46	6,287.21	6,288.50	6,288.42
Pipe-A5.2I	IN-A5.2	MH-A5.1	18.0	17.1	0.012	0.015	2.30	5.86	6,288.22	6,287.96	6,289.12	6,289.14
Pipe-A5.2M	MH-A5.2	MH-A5.1	18.0	114.8	0.012	0.009	4.37	5.84	6,289.02	6,287.96	6,289.82	6,289.14
Pipe-A6.1I	IN-A6.1	MH-A6	18.0	32.0	0.012	0.005	0.90	3.01	6,289.79	6,289.63	6,290.82	6,290.82
Pipe-A6.2I	IN-A6.2	MH-A6	18.0	32.1	0.012	0.005	1.60	3.55	6,289.79	6,289.63	6,290.82	6,290.82
Pipe-A6M	MH-A6	MH-A5.2	18.0	43.2	0.012	0.009	4.37	5.90	6,289.53	6,289.12	6,290.33	6,290.25
Pipe-A7I	IN-A7	MH-A7	18.0	25.7	0.012	0.005	1.28	3.33	6,292.31	6,292.18	6,292.73	6,292.70
Pipe-A7M	MH-A7	TEE-BLDG-3	18.0	109.7	0.012	0.020	1.28	5.44	6,292.08	6,289.89	6,292.50	6,290.88
Pipe-AT3	TEE-BLDG-3	MH-A6	18.0	13.0	0.012	0.020	1.87	6.08	6,289.89	6,289.63	6,290.81	6,290.82
Pipe-AT4	TEE-BLDG-4	MH-A4.1	30.0	110.4	0.012	0.009	9.24	6.74	6,286.27	6,285.33	6,287.28	6,286.85
Pipe-AT8	TEE-BLDG-8	MH-A2.2	36.0	62.1	0.012	0.005	13.54	6.10	6,284.50	6,284.19	6,285.73	6,285.82
Pipe-EX0	EX-MH-A0	FOREBAY A	48.0	85.5	0.012	0.005	48.30	3.88	6,281.93	6,281.50	6,285.25	6,285.16

Hillpointe Apartments at Peterson
5-Yr Storm w/ Tailwater - Main B



Hillpointe Apartments at Peterson
5-Yr Storm w/ Tailwater - Main B

Manhole Table - Time: 0.00 hours

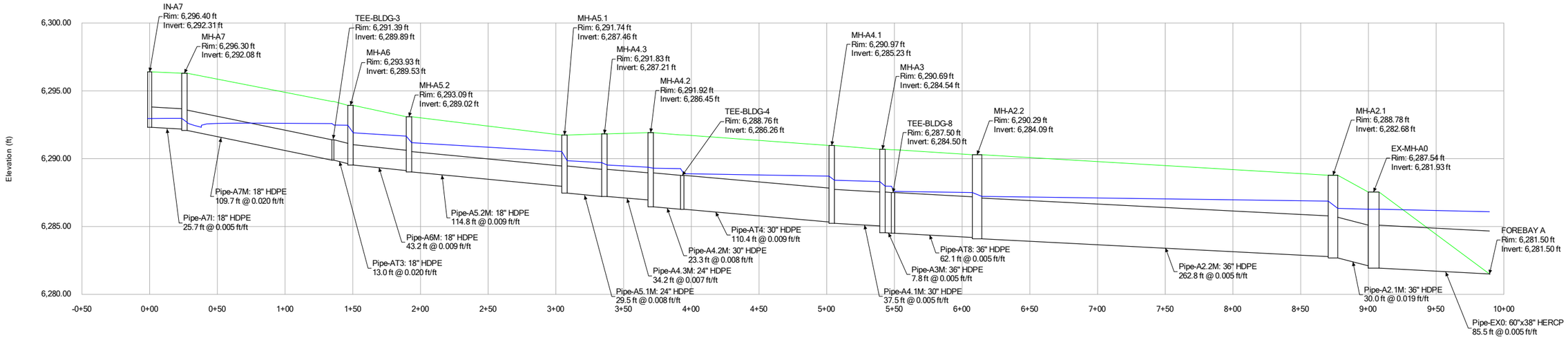
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
IN-B1.1	6,287.87	6,281.92	25.94	0.640	6,285.23	6,285.19	10' TYPE-R INLET
IN-B1.2	6,287.87	6,283.58	3.10	0.000	6,285.32	6,285.32	5' TYPE-R INLET
IN-B2.1	6,288.38	6,284.89	1.19	0.000	6,285.80	6,285.80	5' TYPE-R INLET
IN-B2.3	6,292.94	6,287.90	0.96	0.000	6,288.26	6,288.26	5' TYPE-R INLET
IN-B3.1	6,288.73	6,284.85	2.09	0.000	6,285.79	6,285.79	5' TYPE-R INLET
IN-B3.2	6,288.52	6,284.40	2.15	0.000	6,285.78	6,285.78	5' TYPE-R INLET
IN-B4	6,292.10	6,287.35	1.38	0.000	6,288.71	6,288.71	5' TYPE-R INLET
IN-B6	6,294.74	6,289.76	2.76	0.000	6,291.20	6,291.20	5' TYPE-R INLET
IN-B7	6,295.80	6,290.31	3.04	0.000	6,292.07	6,292.07	5' TYPE-R INLET
IN-B8	6,297.44	6,293.09	2.70	0.000	6,293.83	6,293.83	5' TYPE-R INLET
MH-B1.2	6,287.74	6,282.10	22.80	1.520	6,285.31	6,285.23	SDMH
MH-B2.1	6,288.48	6,282.92	19.70	1.770	6,285.54	6,285.33	SDMH
MH-B2.2	6,288.62	6,285.07	2.15	0.900	6,285.81	6,285.62	SDMH
MH-B2.3	6,292.25	6,286.49	0.96	1.320	6,287.03	6,286.85	SDMH
MH-B3.1	6,289.00	6,283.04	17.55	1.520	6,285.69	6,285.54	SDMH
MH-B3.2	6,291.74	6,285.73	10.47	1.320	6,287.27	6,286.99	SDMH
MH-B4	6,292.14	6,286.90	10.47	1.520	6,288.79	6,288.06	SDMH
MH-B5.2	6,294.78	6,289.01	8.50	1.320	6,290.59	6,290.05	SDMH
MH-B6	6,295.01	6,289.52	8.50	1.770	6,291.29	6,290.56	SDMH
MH-B7	6,296.07	6,290.59	5.74	1.770	6,292.00	6,291.44	SDMH
MH-B8	6,297.71	6,292.63	2.70	1.320	6,293.56	6,293.25	SDMH
TEE-BLDG-5	6,288.32	6,285.32	11.06	1.770	6,287.06	6,286.37	36" X 12" HDPE TEE
TEE-BLDG-5/6	6,287.43	6,284.43	12.72	1.770	6,286.26	6,285.83	36" X 12" HDPE TEE
TEE-BLDG-6	6,286.84	6,283.84	13.31	1.770	6,285.91	6,285.67	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
5-Yr Storm w/ Tailwater - Main B

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-B1.1I	IN-B1.1	FOREBAY B	48.0	87.2	0.012	0.005	25.94	2.09	6,281.92	6,281.49	6,285.19	6,285.16
Pipe-B1.2I	IN-B1.2	MH-B1.2	18.0	17.3	0.012	0.005	3.10	4.32	6,284.19	6,284.10	6,285.32	6,285.31
Pipe-B1.2M	MH-B1.2	IN-B1.1	42.0	16.9	0.012	0.005	22.80	6.41	6,282.10	6,282.02	6,285.23	6,285.23
Pipe-B2.1I	IN-B2.1	MH-B2.2	18.0	35.6	0.012	0.005	1.19	3.27	6,285.25	6,285.07	6,285.80	6,285.81
Pipe-B2.2M	MH-B2.2	MH-B2.1	18.0	30.1	0.012	0.005	2.15	3.85	6,285.07	6,284.92	6,285.62	6,285.54
Pipe-B2.3I	IN-B2.3	MH-B2.3	18.0	40.3	0.012	0.032	0.96	5.91	6,287.89	6,286.59	6,288.26	6,287.03
Pipe-B2.3M	MH-B2.3	MH-B2.2	18.0	263.8	0.012	0.005	0.96	3.07	6,286.49	6,285.17	6,286.85	6,285.81
Pipe-B3.1I	IN-B3.1	MH-B3.1	18.0	23.0	0.012	0.005	2.09	3.88	6,285.24	6,285.12	6,285.79	6,285.69
Pipe-B3.1M	MH-B3.1	MH-B2.1	42.0	20.0	0.013	0.005	17.55	6.12	6,283.12	6,283.02	6,285.54	6,285.54
Pipe-B3.2I	IN-B3.2	MH-B3.1	18.0	21.2	0.012	0.005	2.15	3.90	6,285.23	6,285.12	6,285.78	6,285.69
Pipe-B3.2M	MH-B3.2	TEE-BLDG-5	36.0	57.2	0.012	0.007	10.47	6.46	6,285.73	6,285.32	6,286.99	6,287.06
Pipe-B4I	IN-B4	MH-B4	18.0	27.4	0.012	0.025	1.38	6.04	6,288.19	6,287.50	6,288.71	6,288.79
Pipe-B4M	MH-B4	MH-B3.2	24.0	33.4	0.012	0.005	10.47	5.81	6,286.90	6,286.73	6,288.06	6,287.85
Pipe-B5M	MH-B5.2	MH-B4	24.0	221.3	0.013	0.009	8.50	6.46	6,289.01	6,287.00	6,290.05	6,288.79
Pipe-B6I	IN-B6	MH-B6	18.0	32.0	0.012	0.014	2.76	6.00	6,290.57	6,290.12	6,291.20	6,291.29
Pipe-B6M	MH-B6	MH-B5.2	24.0	45.2	0.012	0.009	8.50	6.84	6,289.52	6,289.11	6,290.56	6,290.59
Pipe-B7I	IN-B7	MH-B7	18.0	32.0	0.012	0.010	3.04	5.45	6,291.41	6,291.09	6,292.07	6,292.00
Pipe-B7M	MH-B7	MH-B6	24.0	169.2	0.012	0.006	5.74	5.21	6,290.59	6,289.62	6,291.44	6,291.29
Pipe-B8I	IN-B8	MH-B8	18.0	32.0	0.012	0.015	2.70	6.10	6,293.21	6,292.73	6,293.83	6,293.56
Pipe-B8M	MH-B8	MH-B7	18.0	163.8	0.012	0.009	2.70	5.16	6,292.63	6,291.09	6,293.25	6,292.00
Pipe-BT5	TEE-BLDG-5	TEE-BLDG-5/6	36.0	121.5	0.012	0.007	11.06	6.62	6,285.32	6,284.43	6,286.37	6,286.26
Pipe-BT6	TEE-BLDG-6	MH-B3.1	36.0	29.6	0.012	0.007	13.31	7.01	6,283.84	6,283.62	6,285.67	6,285.69
Pipe-BT56	TEE-BLDG-5/6	TEE-BLDG-6	36.0	81.5	0.012	0.007	12.72	6.86	6,284.43	6,283.84	6,285.83	6,285.91

Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main A



Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main A

Manhole Table - Time: 0.00 hours

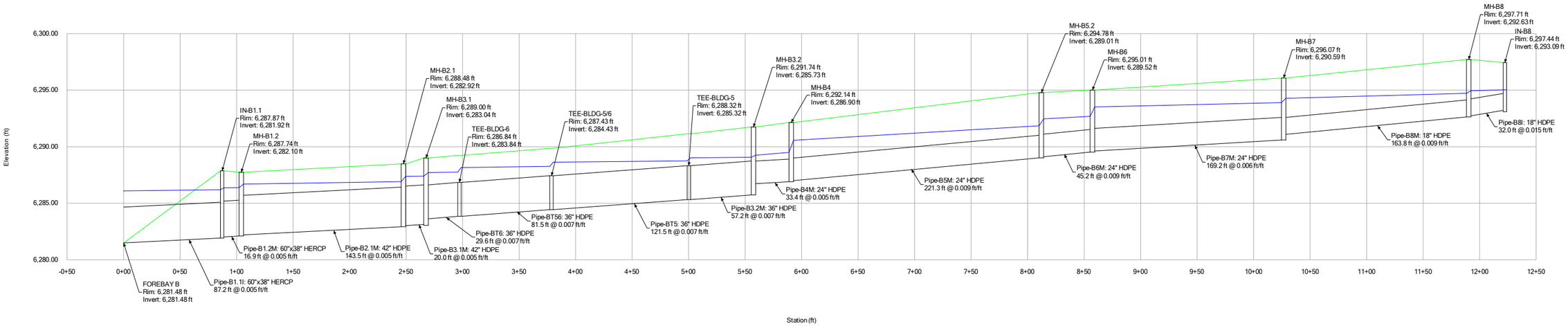
Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
EX-MH-A0	6,287.54	6,281.93	69.31	0.000	6,286.27	6,286.27	SDMH
IN-A1.1	6,288.70	6,284.75	2.42	0.000	6,286.91	6,286.91	5' TYPE-R INLET
IN-A1.2	6,288.56	6,284.69	0.45	0.000	6,286.90	6,286.90	5' TYPE-R INLET
IN-A2	6,288.65	6,284.67	4.34	0.000	6,286.93	6,286.93	5' TYPE-R INLET
IN-A3	6,290.91	6,286.81	1.98	0.000	6,288.32	6,288.32	5' TYPE-R INLET
IN-A4.1	6,291.15	6,287.10	4.74	0.400	6,288.79	6,288.75	5' TYPE-R INLET
IN-A4.2	6,290.94	6,287.31	1.30	0.000	6,288.79	6,288.79	5' TYPE-R INLET
IN-A5.1	6,291.60	6,288.38	3.73	0.000	6,290.55	6,290.55	5' TYPE-R INLET
IN-A5.2	6,291.89	6,288.35	4.51	0.000	6,290.55	6,290.55	5' TYPE-R INLET
IN-A6.1	6,293.66	6,289.79	1.93	0.000	6,292.47	6,292.47	5' TYPE-R INLET
IN-A6.2	6,293.70	6,289.79	3.06	0.000	6,292.49	6,292.49	5' TYPE-R INLET
IN-A7	6,296.40	6,292.31	2.49	0.000	6,292.96	6,292.96	5' TYPE-R INLET
MH-A1	6,288.59	6,283.98	2.87	1.770	6,286.90	6,286.87	SDMH
MH-A2.1	6,288.78	6,282.68	33.51	1.520	6,286.87	6,286.34	SDMH
MH-A2.2	6,290.29	6,284.09	26.30	1.320	6,287.50	6,287.22	SDMH
MH-A3	6,290.69	6,284.54	24.75	1.770	6,288.31	6,287.97	SDMH
MH-A4.1	6,290.97	6,285.23	22.77	0.900	6,288.71	6,288.41	SDMH
MH-A4.2	6,291.92	6,286.45	16.82	0.400	6,289.37	6,289.30	SDMH
MH-A4.3	6,291.83	6,287.21	16.82	0.400	6,289.71	6,289.53	SDMH
MH-A5.1	6,291.74	6,287.46	16.82	1.520	6,290.52	6,289.85	SDMH
MH-A5.2	6,293.09	6,289.02	8.58	1.320	6,291.66	6,291.18	SDMH
MH-A6	6,293.93	6,289.53	8.58	1.520	6,292.46	6,291.91	SDMH
MH-A7	6,296.30	6,292.08	2.49	1.320	6,292.97	6,292.68	SDMH
TEE-BLDG-3	6,291.39	6,289.89	3.59	1.770	6,292.59	6,292.48	18" X 12" HDPE TEE
TEE-BLDG-4	6,288.76	6,286.26	18.03	1.770	6,289.26	6,288.89	30" X 12" HDPE TEE
TEE-BLDG-8	6,287.50	6,284.50	26.30	1.770	6,287.96	6,287.58	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main A

Conduit Table - Time: 0.00 hours

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
Pipe-A1.1I	IN-A1.1	MH-A1	18.0	35.7	0.012	0.008	2.42	1.37	6,284.75	6,284.48	6,286.91	6,286.90
Pipe-A1.2I	IN-A1.2	MH-A1	18.0	28.5	0.012	0.007	0.45	0.25	6,284.69	6,284.48	6,286.90	6,286.90
Pipe-A1M	MH-A1	MH-A2.1	24.0	27.3	0.012	0.007	2.87	0.91	6,283.98	6,283.78	6,286.87	6,286.87
Pipe-A2.1M	MH-A2.1	EX-MH-A0	36.0	30.0	0.012	0.019	33.51	4.74	6,282.68	6,282.10	6,286.34	6,286.27
Pipe-A2.2M	MH-A2.2	MH-A2.1	36.0	262.8	0.012	0.005	26.30	3.72	6,284.09	6,282.78	6,287.22	6,286.87
Pipe-A2I	IN-A2	MH-A2.1	18.0	39.0	0.012	0.010	4.34	2.46	6,284.67	6,284.28	6,286.93	6,286.87
Pipe-A3I	IN-A3	MH-A3	18.0	42.0	0.012	0.015	1.98	1.12	6,286.68	6,286.04	6,288.32	6,288.31
Pipe-A3M	MH-A3	TEE-BLDG-8	36.0	7.8	0.012	0.005	24.75	3.50	6,284.54	6,284.50	6,287.97	6,287.96
Pipe-A4.1I	IN-A4.1	MH-A4.1	18.0	21.1	0.012	0.020	4.74	2.68	6,286.75	6,286.33	6,288.75	6,288.71
Pipe-A4.1M	MH-A4.1	MH-A3	30.0	37.5	0.012	0.005	22.77	4.64	6,285.23	6,285.04	6,288.41	6,288.31
Pipe-A4.2I	IN-A4.2	IN-A4.1	18.0	22.5	0.012	0.020	1.30	5.47	6,287.30	6,286.85	6,288.79	6,288.79
Pipe-A4.2M	MH-A4.2	TEE-BLDG-4	30.0	23.3	0.012	0.008	16.82	3.43	6,286.45	6,286.27	6,289.30	6,289.26
Pipe-A4.3M	MH-A4.3	MH-A4.2	24.0	34.2	0.012	0.007	16.82	5.35	6,287.21	6,286.96	6,289.53	6,289.37
Pipe-A5.1I	IN-A5.1	MH-A5.1	18.0	24.3	0.012	0.015	3.73	2.11	6,288.32	6,287.96	6,290.55	6,290.52
Pipe-A5.1M	MH-A5.1	MH-A4.3	24.0	29.5	0.012	0.008	16.82	5.35	6,287.46	6,287.21	6,289.85	6,289.71
Pipe-A5.2I	IN-A5.2	MH-A5.1	18.0	17.1	0.012	0.015	4.51	2.55	6,288.22	6,287.96	6,290.55	6,290.52
Pipe-A5.2M	MH-A5.2	MH-A5.1	18.0	114.8	0.012	0.009	8.58	4.86	6,289.02	6,287.96	6,291.18	6,290.52
Pipe-A6.1I	IN-A6.1	MH-A6	18.0	32.0	0.012	0.005	1.93	1.09	6,289.79	6,289.63	6,292.47	6,292.46
Pipe-A6.2I	IN-A6.2	MH-A6	18.0	32.1	0.012	0.005	3.06	1.73	6,289.79	6,289.63	6,292.49	6,292.46
Pipe-A6M	MH-A6	MH-A5.2	18.0	43.2	0.012	0.009	8.58	4.86	6,289.53	6,289.12	6,291.91	6,291.66
Pipe-A7I	IN-A7	MH-A7	18.0	25.7	0.012	0.005	2.49	4.01	6,292.31	6,292.18	6,292.96	6,292.97
Pipe-A7M	MH-A7	TEE-BLDG-3	18.0	109.7	0.012	0.020	2.49	6.61	6,292.08	6,289.89	6,292.68	6,292.59
Pipe-AT3	TEE-BLDG-3	MH-A6	18.0	13.0	0.012	0.020	3.59	2.03	6,289.89	6,289.63	6,292.48	6,292.46
Pipe-AT4	TEE-BLDG-4	MH-A4.1	30.0	110.4	0.012	0.009	18.03	3.67	6,286.27	6,285.33	6,288.89	6,288.71
Pipe-AT8	TEE-BLDG-8	MH-A2.2	36.0	62.1	0.012	0.005	26.30	3.72	6,284.50	6,284.19	6,287.58	6,287.50
Pipe-EX0	EX-MH-A0	FOREBAY A	48.0	85.5	0.012	0.005	69.31	5.57	6,281.93	6,281.50	6,286.27	6,286.09

Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main B



Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main B

Manhole Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Flow (Known) (cfs)	Headloss Coefficient (Standard)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Notes
IN-B1.1	6,287.87	6,281.92	51.36	0.640	6,286.36	6,286.19	10' TYPE-R INLET
IN-B1.2	6,287.87	6,283.58	6.00	0.000	6,286.74	6,286.74	5' TYPE-R INLET
IN-B2.1	6,288.38	6,284.89	2.29	0.000	6,287.50	6,287.50	5' TYPE-R INLET
IN-B2.3	6,292.94	6,287.90	1.83	0.000	6,288.40	6,288.40	5' TYPE-R INLET
IN-B3.1	6,288.73	6,284.85	4.02	0.000	6,287.74	6,287.74	5' TYPE-R INLET
IN-B3.2	6,288.52	6,284.40	4.20	0.000	6,287.74	6,287.74	5' TYPE-R INLET
IN-B4	6,292.10	6,287.35	2.78	0.000	6,290.58	6,290.58	5' TYPE-R INLET
IN-B6	6,294.74	6,289.76	5.54	0.000	6,293.59	6,293.59	5' TYPE-R INLET
IN-B7	6,295.80	6,290.31	5.81	0.000	6,294.36	6,294.36	5' TYPE-R INLET
IN-B8	6,297.44	6,293.09	5.88	0.000	6,295.03	6,295.03	5' TYPE-R INLET
MH-B1.2	6,287.74	6,282.10	45.34	1.520	6,286.69	6,286.38	SDMH
MH-B2.1	6,288.48	6,282.92	39.34	1.770	6,287.37	6,286.91	SDMH
MH-B2.2	6,288.62	6,285.07	4.12	0.900	6,287.49	6,287.41	SDMH
MH-B2.3	6,292.25	6,286.49	1.83	1.320	6,287.58	6,287.54	SDMH
MH-B3.1	6,289.00	6,283.04	35.22	1.520	6,287.71	6,287.40	SDMH
MH-B3.2	6,291.74	6,285.73	21.11	1.320	6,289.25	6,289.06	SDMH
MH-B4	6,292.14	6,286.90	21.11	1.520	6,290.56	6,289.50	SDMH
MH-B5.2	6,294.78	6,289.01	17.23	1.320	6,292.46	6,291.85	SDMH
MH-B6	6,295.01	6,289.52	17.23	1.770	6,293.51	6,292.69	SDMH
MH-B7	6,296.07	6,290.59	11.69	1.770	6,294.28	6,293.90	SDMH
MH-B8	6,297.71	6,292.63	5.88	1.320	6,294.94	6,294.72	SDMH
TEE-BLDG-5	6,288.32	6,285.32	22.21	1.770	6,289.02	6,288.74	36" X 12" HDPE TEE
TEE-BLDG-5/6	6,287.43	6,284.43	25.90	1.770	6,288.63	6,288.26	36" X 12" HDPE TEE
TEE-BLDG-6	6,286.84	6,283.84	27.00	1.770	6,288.15	6,287.75	36" X 12" HDPE TEE

Hillpointe Apartments at Peterson
100-Yr Storm w/ Tailwater - Main B

Conduit Table - Time: 0.00 hours

Label	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Manning's n	Slope (Calculated) (ft/ft)	Flow (cfs)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)
Pipe-B1.1I	6,286.19	6,286.09	IN-B1.1	FOREBAY B	48.0	87.2	0.012	0.005	51.36	4.13	6,281.92	6,281.49
Pipe-B1.2I	6,286.74	6,286.69	IN-B1.2	MH-B1.2	18.0	17.3	0.012	0.005	6.00	3.40	6,284.19	6,284.10
Pipe-B1.2M	6,286.38	6,286.36	MH-B1.2	IN-B1.1	42.0	16.9	0.012	0.005	45.34	3.65	6,282.10	6,282.02
Pipe-B2.1I	6,287.50	6,287.49	IN-B2.1	MH-B2.2	18.0	35.6	0.012	0.005	2.29	1.30	6,285.25	6,285.07
Pipe-B2.2M	6,287.41	6,287.37	MH-B2.2	MH-B2.1	18.0	30.1	0.012	0.005	4.12	2.33	6,285.07	6,284.92
Pipe-B2.3I	6,288.40	6,287.58	IN-B2.3	MH-B2.3	18.0	40.3	0.012	0.032	1.83	7.16	6,287.89	6,286.59
Pipe-B2.3M	6,287.54	6,287.49	MH-B2.3	MH-B2.2	18.0	263.8	0.012	0.005	1.83	3.69	6,286.49	6,285.17
Pipe-B3.1I	6,287.74	6,287.71	IN-B3.1	MH-B3.1	18.0	23.0	0.012	0.005	4.02	2.27	6,285.24	6,285.12
Pipe-B3.1M	6,287.40	6,287.37	MH-B3.1	MH-B2.1	42.0	20.0	0.013	0.005	35.22	3.66	6,283.12	6,283.02
Pipe-B3.2I	6,287.74	6,287.71	IN-B3.2	MH-B3.1	18.0	21.2	0.012	0.005	4.20	2.38	6,285.23	6,285.12
Pipe-B3.2M	6,289.06	6,289.02	MH-B3.2	TEE-BLDG-5	36.0	57.2	0.012	0.007	21.11	2.99	6,285.73	6,285.32
Pipe-B4I	6,290.58	6,290.56	IN-B4	MH-B4	18.0	27.4	0.012	0.025	2.78	1.57	6,288.19	6,287.50
Pipe-B4M	6,289.50	6,289.25	MH-B4	MH-B3.2	24.0	33.4	0.012	0.005	21.11	6.72	6,286.90	6,286.73
Pipe-B5M	6,291.85	6,290.56	MH-B5.2	MH-B4	24.0	221.3	0.013	0.009	17.23	5.48	6,289.01	6,287.00
Pipe-B6I	6,293.59	6,293.51	IN-B6	MH-B6	18.0	32.0	0.012	0.014	5.54	3.13	6,290.57	6,290.12
Pipe-B6M	6,292.69	6,292.46	MH-B6	MH-B5.2	24.0	45.2	0.012	0.009	17.23	5.48	6,289.52	6,289.11
Pipe-B7I	6,294.36	6,294.28	IN-B7	MH-B7	18.0	32.0	0.012	0.010	5.81	3.29	6,291.41	6,291.09
Pipe-B7M	6,293.90	6,293.51	MH-B7	MH-B6	24.0	169.2	0.012	0.006	11.69	3.72	6,290.59	6,289.62
Pipe-B8I	6,295.03	6,294.94	IN-B8	MH-B8	18.0	32.0	0.012	0.015	5.88	3.33	6,293.21	6,292.73
Pipe-B8M	6,294.72	6,294.28	MH-B8	MH-B7	18.0	163.8	0.012	0.009	5.88	3.33	6,292.63	6,291.09
Pipe-BT5	6,288.74	6,288.63	TEE-BLDG-5	TEE-BLDG-5/6	36.0	121.5	0.012	0.007	22.21	3.14	6,285.32	6,284.43
Pipe-BT6	6,287.75	6,287.71	TEE-BLDG-6	MH-B3.1	36.0	29.6	0.012	0.007	27.00	3.82	6,283.84	6,283.62
Pipe-BT56	6,288.26	6,288.15	TEE-BLDG-5/6	TEE-BLDG-6	36.0	81.5	0.012	0.007	25.90	3.66	6,284.43	6,283.84

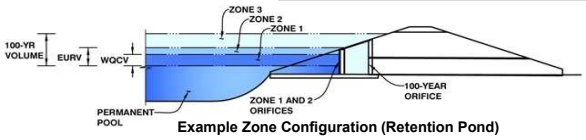
APPENDIX D – WATER QUALITY AND DETENTION CALCULATIONS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **Hillpointe Apartments at Peterson**

Basin ID: **Pond 1 (SF2420) w/ Apartment Buildout**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	31.71	acres
Watershed Length =	1,750	ft
Watershed Length to Centroid =	800	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	67.49%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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) =	0.698	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	2.343	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.132	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	2.891	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	3.533	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	4.306	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	4.981	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	5.793	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	7.511	acre-feet		inches
Approximate 2-yr Detention Volume =	1.824	acre-feet		
Approximate 5-yr Detention Volume =	2.438	acre-feet		
Approximate 10-yr Detention Volume =	3.092	acre-feet		
Approximate 25-yr Detention Volume =	3.327	acre-feet		
Approximate 50-yr Detention Volume =	3.462	acre-feet		
Approximate 100-yr Detention Volume =	3.726	acre-feet		

Define Zones and Basin Geometry

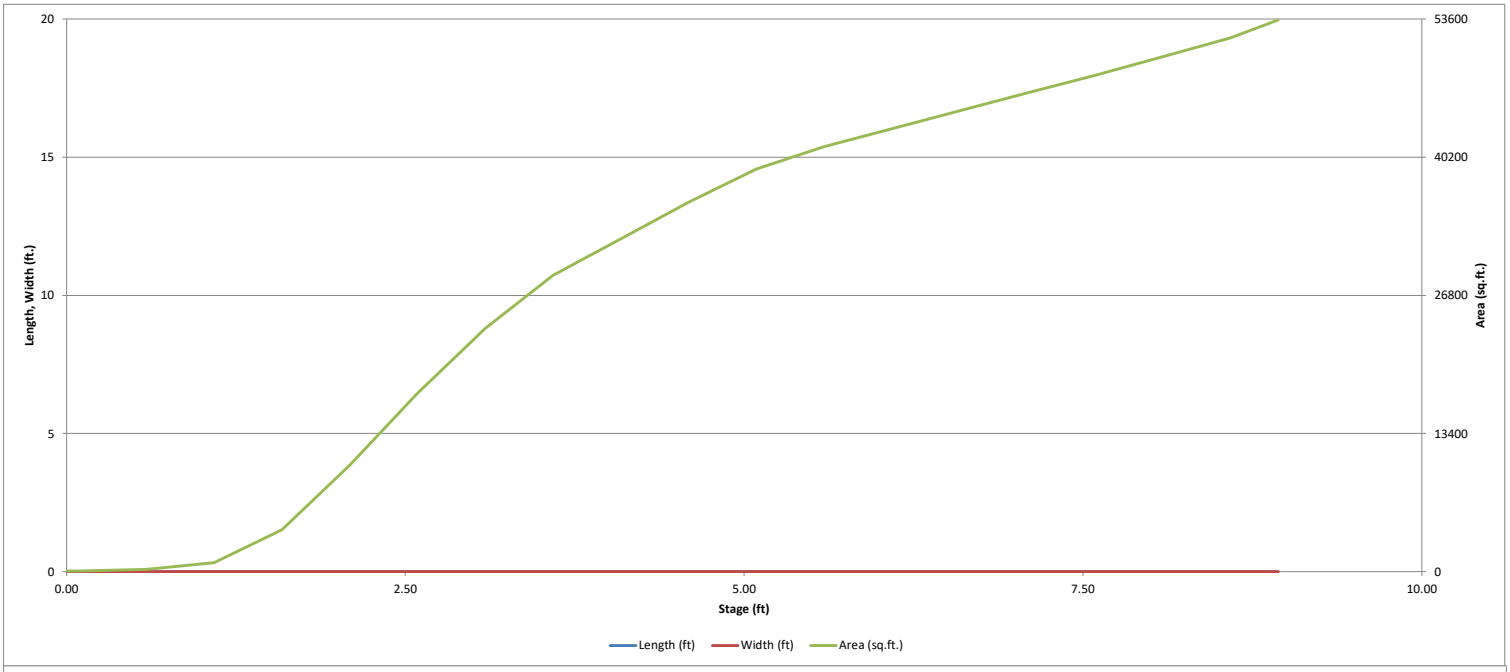
Zone 1 Volume (WQCV) =	0.698	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.645	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.382	acre-feet
Total Detention Basin Volume =	3.726	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (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

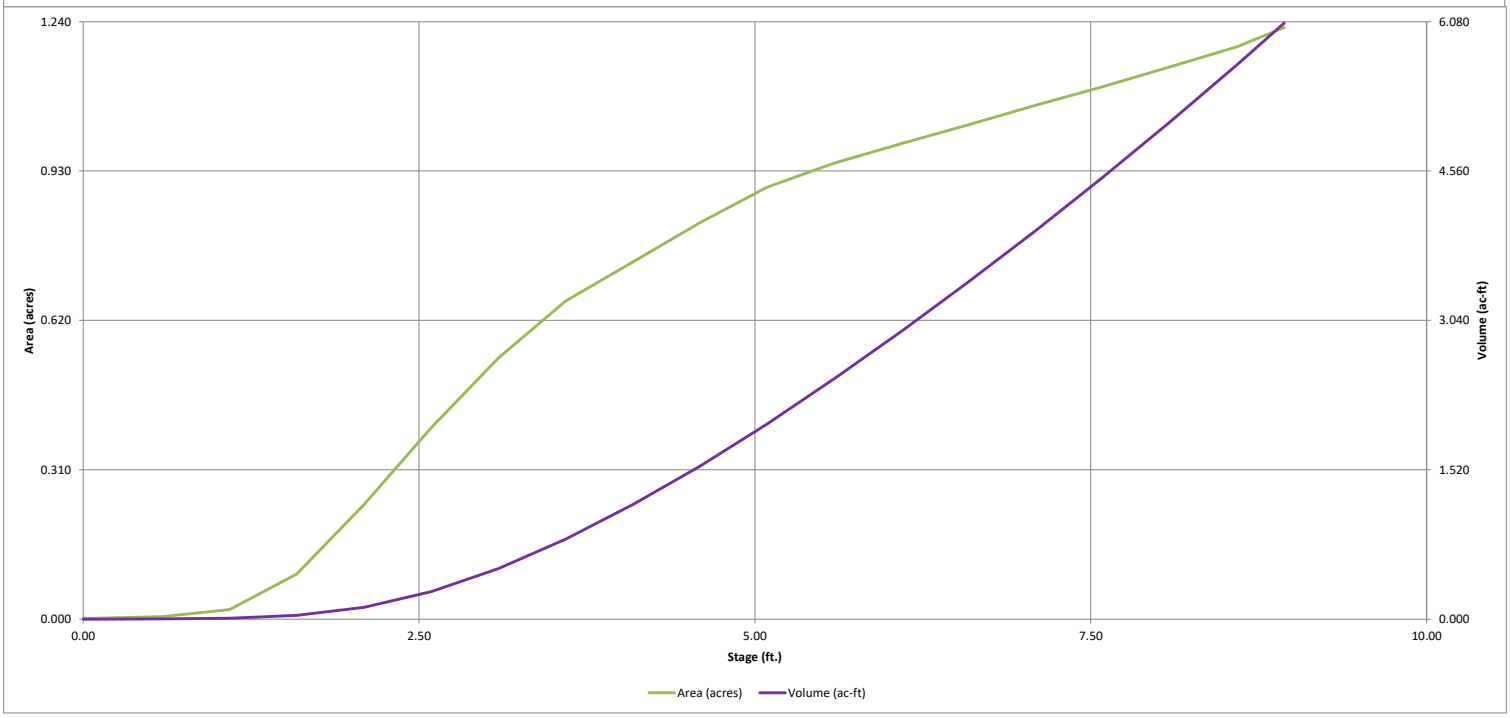
Depth Increment = 0.50 ft

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	--	--	--	76	0.002		
6279.5	--	0.09	--	--	--	76	0.002	7	0.000
6280	--	0.59	--	--	--	219	0.005	81	0.002
	--	1.09	--	--	--	863	0.020	351	0.008
	--	1.59	--	--	--	4,074	0.094	1,585	0.036
	--	2.09	--	--	--	10,349	0.238	5,191	0.119
	--	2.59	--	--	--	17,287	0.397	12,100	0.278
	--	3.09	--	--	--	23,596	0.542	22,321	0.512
	--	3.59	--	--	--	28,748	0.660	35,407	0.813
	--	4.09	--	--	--	32,277	0.741	50,663	1.163
	--	4.59	--	--	--	35,822	0.822	67,688	1.554
	--	5.09	--	--	--	39,046	0.896	86,405	1.984
	--	5.59	--	--	--	41,212	0.946	106,469	2.444
	--	6.09	--	--	--	42,963	0.986	127,513	2.927
	--	6.59	--	--	--	44,690	1.026	149,426	3.430
	--	7.09	--	--	--	46,440	1.066	172,209	3.953
	--	7.59	--	--	--	48,134	1.105	195,852	4.496
	--	8.09	--	--	--	49,925	1.146	220,367	5.059
6288	--	8.59	--	--	--	51,750	1.188	245,786	5.642
	--	8.94	--	--	--	53,496	1.228	264,204	6.065

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



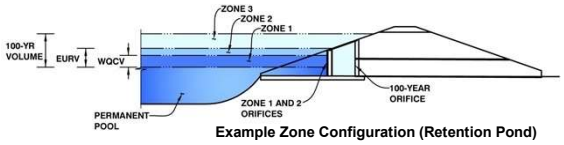


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: **Hillpointe Apartments at Peterson**

Basin ID: **Pond 1 (SF2420) w/ Apartment Buildout**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.42	0.698	Orifice Plate
Zone 2 (EURV)	5.49	1.645	Circular Orifice
Zone 3 (100-year)	6.88	1.382	Weir&Pipe (Restrict)
Total (all zones)		3.726	

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

			Calculated Parameters for Underdrain		
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

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)

			Calculated Parameters for Plate		
Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	3.36	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	sq. inches	Elliptical Slot Area =	N/A	ft^2

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	1.50	3.00					
Orifice Area (sq. inches)	2.41	2.41	2.24					

	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)

	Zone 2 Circular	Not Selected		Calculated Parameters for Vertical Orifice	Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	3.53	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	0.07	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	5.36	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	0.15	N/A	feet
Vertical Orifice Diameter =	3.50	N/A	inches				

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		Calculated Parameters for Overflow Weir	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	5.61	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	5.61	N/A	feet
Overflow Weir Front Edge Length =	6.00	N/A	feet	Overflow Weir Slope Length =	6.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	8.15	N/A	
Horiz. Length of Weir Sides =	6.00	N/A	feet	Overflow Grate Open Area w/o Debris =	25.06	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	25.06	N/A	ft^2
Debris Clogging % =	0%	N/A	%				

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

	Zone 3 Restrictor	Not Selected		Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	3.08	N/A	ft^2
Outlet Pipe Diameter =	30.00	N/A	inches	Outlet Orifice Centroid =	0.85	N/A	feet
Restrictor Plate Height Above Pipe Invert =	18.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.77	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

			Calculated Parameters for Spillway		
Spillway Invert Stage=	7.00	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.87	feet
Spillway Crest Length =	38.00	feet	Stage at Top of Freeboard =	8.87	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	1.22	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	5.98	acre-ft

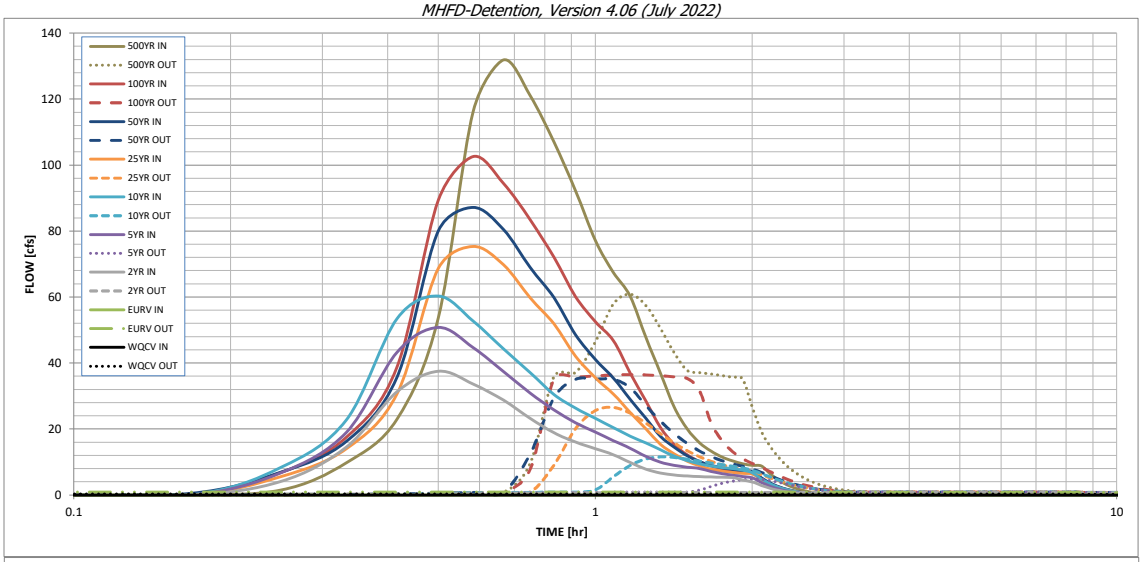
Routed Hydrograph Results

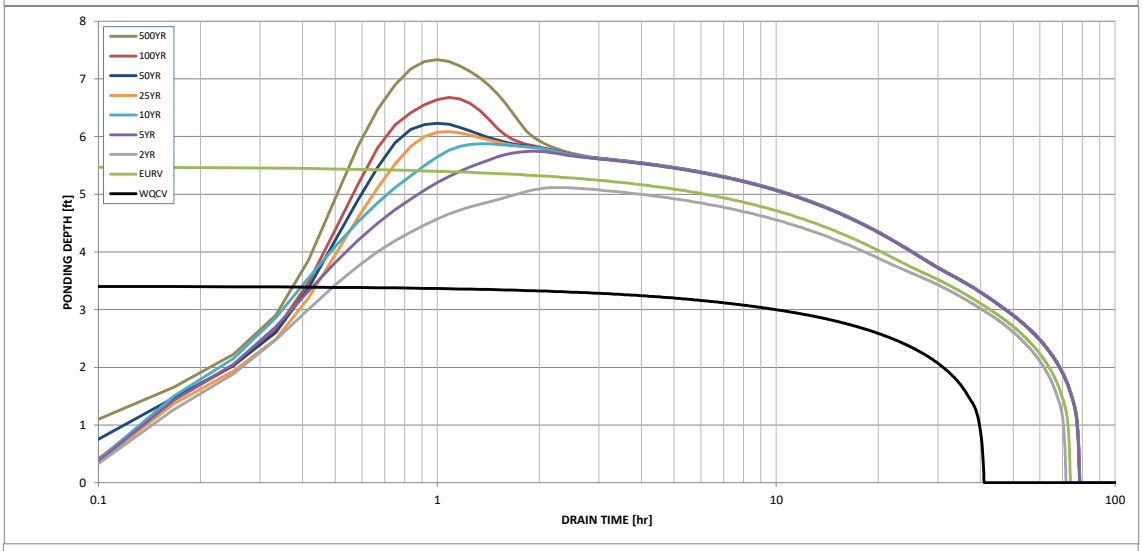
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

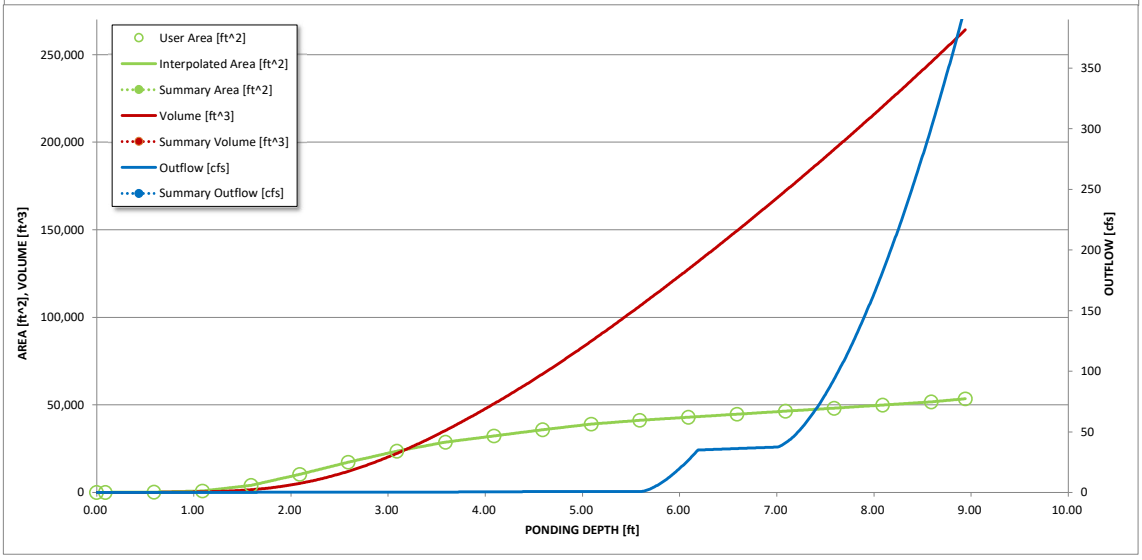
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.698	2.343	2.132	2.891	3.533	4.306	4.981	5.793	7.511
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.132	2.891	3.533	4.306	4.981	5.793	7.511
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	3.4	9.4	14.2	25.6	32.1	41.1	57.2
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.11	0.30	0.45	0.81	1.01	1.29	1.80
Peak Inflow Q (cfs) =	N/A	N/A	37.5	50.8	60.3	75.3	87.2	102.6	131.9
Peak Outflow Q (cfs) =	0.3	0.9	0.8	4.9	11.6	26.6	35.1	36.5	60.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.8	1.0	1.1	0.9	1.1
Structure Controlling Flow =	Plate	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	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	0.2	0.4	1.0	1.4	1.4	1.5
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	66	64	69	68	67	65	64	61
Time to Drain 99% of Inflow Volume (hours) =	**40**	70	68	74	74	73	72	72	71
Maximum Ponding Depth (ft) =	3.42	5.49	5.12	5.75	5.88	6.09	6.23	6.68	7.33
Area at Maximum Ponding Depth (acres) =	0.62	0.94	0.90	0.96	0.97	0.99	1.00	1.03	1.08
Maximum Volume Stored (acre-ft) =	0.704	2.350	2.002	2.587	2.712	2.917	3.066	3.513	4.211

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)







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	0.47	0.05	1.51
	0:15:00	0.00	0.00	4.16	6.78	8.39	5.63	6.99	6.85	9.74
	0:20:00	0.00	0.00	14.55	19.04	22.80	14.04	16.30	17.50	23.01
	0:25:00	0.00	0.00	31.28	43.27	53.47	30.65	35.69	38.75	53.64
	0:30:00	0.00	0.00	37.48	50.78	60.35	68.62	80.00	89.28	116.20
	0:35:00	0.00	0.00	33.62	44.68	52.72	75.35	87.19	102.61	131.87
	0:40:00	0.00	0.00	28.74	37.45	44.29	69.77	80.47	94.45	121.14
	0:45:00	0.00	0.00	23.22	30.96	37.17	59.84	69.02	83.49	106.99
	0:50:00	0.00	0.00	18.86	25.81	30.48	51.87	59.78	72.02	92.19
	0:55:00	0.00	0.00	16.05	21.94	26.33	42.08	48.55	60.16	77.22
	1:00:00	0.00	0.00	14.07	19.10	23.30	35.57	41.13	52.53	67.50
	1:05:00	0.00	0.00	12.24	16.51	20.45	30.62	35.46	46.83	60.21
	1:10:00	0.00	0.00	9.86	14.19	17.86	25.00	28.99	36.98	47.75
	1:15:00	0.00	0.00	7.88	11.73	15.76	20.07	23.30	28.51	37.01
	1:20:00	0.00	0.00	6.69	9.98	13.74	15.40	17.86	20.53	26.71
	1:25:00	0.00	0.00	6.09	9.03	11.78	12.53	14.53	15.35	20.03
	1:30:00	0.00	0.00	5.76	8.45	10.42	10.30	11.90	12.17	15.90
	1:35:00	0.00	0.00	5.60	8.07	9.48	8.86	10.18	10.22	13.34
	1:40:00	0.00	0.00	5.48	7.20	8.82	7.88	9.01	8.85	11.54
	1:45:00	0.00	0.00	5.38	6.51	8.37	7.27	8.28	7.95	10.36
	1:50:00	0.00	0.00	5.32	6.02	8.05	6.84	7.75	7.31	9.51
	1:55:00	0.00	0.00	4.59	5.66	7.57	6.56	7.41	6.92	8.99
	2:00:00	0.00	0.00	4.01	5.23	6.79	6.39	7.20	6.77	8.79
	2:05:00	0.00	0.00	2.91	3.80	4.87	4.64	5.23	4.93	6.39
	2:10:00	0.00	0.00	2.03	2.64	3.39	3.23	3.64	3.46	4.47
	2:15:00	0.00	0.00	1.40	1.82	2.35	2.25	2.53	2.42	3.13
	2:20:00	0.00	0.00	0.96	1.22	1.60	1.54	1.72	1.65	2.14
	2:25:00	0.00	0.00	0.62	0.79	1.06	1.02	1.14	1.09	1.41
	2:30:00	0.00	0.00	0.40	0.53	0.70	0.69	0.77	0.74	0.95
	2:35:00	0.00	0.00	0.22	0.32	0.41	0.42	0.47	0.45	0.58
	2:40:00	0.00	0.00	0.10	0.17	0.20	0.22	0.25	0.23	0.30
	2:45:00	0.00	0.00	0.04	0.06	0.07	0.08	0.09	0.09	0.11
	2:50:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	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

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage	Area	Area	Volume	Volume	Total Outflow
	[ft]	[ft^2]	[acres]	[ft^3]	[ac-ft]	[cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

HRGreen	HILLPOINTE APTS AT PETERSON	Calc'd by:	CMD
	2502477	Checked by:	RDL
	FOREBAY B WQCV CALCULATION	Date:	7/28/2026

Input Parameters			
Basin	***a***	**I (%)**	**A (acres)**
B	1.0	73.5%	8.23

Calculated Parameters		
Basin	**WQCV (watershed-inches)**	**V (acre-feet)**
B	0.292	0.200

WQCV was calculated using Equation 3-1 and Equation 3-2 in the MHFD USDCM V3.

$$WQCV = a(0.91I^3 - 1.19I^2 + 0.78I)$$ **Equation 3-1**

Where:

WQCV = Water Quality Capture Volume (watershed-inches)

a = Coefficient corresponding to BMP type and based on WQCV design drain time (Table 3-2)

I = Imperviousness (percent expressed as a decimal) Note: At a planning level, the watershed imperviousness can be estimated based on the zoned density. When finalizing design, calculate imperviousness based on the site plan.

Table 3-2. Drain Time Coefficients for WQCV Calculations

Drain Time (hours)	Coefficient, a
12 hours (filtration BMPs and retention ponds)	0.8
24 hours (constructed wetland ponds)	0.9
40 hours (extended detention)	1.0
No attenuation (e.g., grass buffer or swale)	1.0

$$V = \frac{WQCV}{12} A$$ **Equation 3-2**

Where:

V = required storage volume (acre-feet)

A = watershed tributary area upstream (acres)

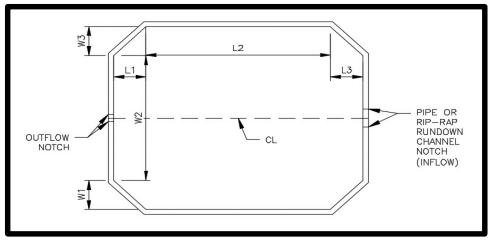
WQCV = Water Quality Capture Volume (watershed-inches)

HR GREEN FOREBAY SIZING

PROJECT: HILLPOINTE APARTMENTS AT PETERSON
DATE: 7/28/2026
DESIGNED BY: CMD
CHECKED BY: RDL
POND OR DP: BASIN B

		INNER DIMENSIONS			OUTER DIMENSIONS	
LENGTH						
	L1	2	FT		2.83	FT
	L2	9.167	FT		10.000	FT
	L3	2	FT		2.83	FT
	INNER L	13.167	FT	OUTER TOTAL L	14.833	FT
WIDTH						
	W1	2	FT		2.83	FT
	W2	6.875	FT (75% of L2)		7.71	FT
	W3	2	FT		2.83	FT
	INNER W	10.875	FT	OUTER TOTAL W	12.541	FT
BAFFLE		(W2'x0.83' + 2.5'x0.83')				
	AREA	7.81	SF			

TRIANGLES	8	
RECTANGLE	63.0	
BAFFLE	7.8	
TOTAL SURFACE AREA	**63.2**	**SQ FT**



FOREBAY HT.	**1.5**	**FT**		
FOREBAY VOLUME	**94.8**	**CF**	SUFFICIENT VOLUME?	**YES**
	3.5	**CY**		
	0.0	**AC-FT**		

REQ'D VOL (1% WQCV)	0.002001346	AC-FT
	87.17862387	CF
Notch Width per Eq. 4-1	1.8	in

$$w = 9.23\ (A_{FB} / t)\ (1 / \sqrt{h_{max}})$$ **Equation 4-1**

Where:

w = width of the rectangular vertical notch (inches)

A_{FB} = surface area of the forebay (square feet)

t = emptying time of the brim-full forebay (seconds)

h_{max} = maximum depth of the forebay (feet)

TABLE 4-12. FOREBAY SIZING CRITERIA

FOREBAY SIZING CRITERIA	WATERSHED IMPERVIOUS AREA (IA)				
	IA UP TO 2 ACRES	IA 2 UP TO 5 ACRES	IA 5 UP TO 10 ACRES	IA 10 UP TO 20 ACRES	IA GREATER THAN 20 ACRES
Forebay Release Rate and Configuration	Concrete sediment pad with dense grasses surrounding, concrete pad with slotted metal edge, or similar design	Size to drain in 4 to 5 minutes using Equation 4-1			
Minimum Forebay Volume [1]		1% of WQCV			
Forebay Depth [1]		12 to 15 inches	15 to 18 inches	18 to 24 inches	24 to 30 inches

[1] Appropriate volume and depth should consider maintenance and access needs. The values provided are approximate and provide a starting point for design.

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jun 3 2026

Trickle Channel Sizing - Forebay B

Rectangular

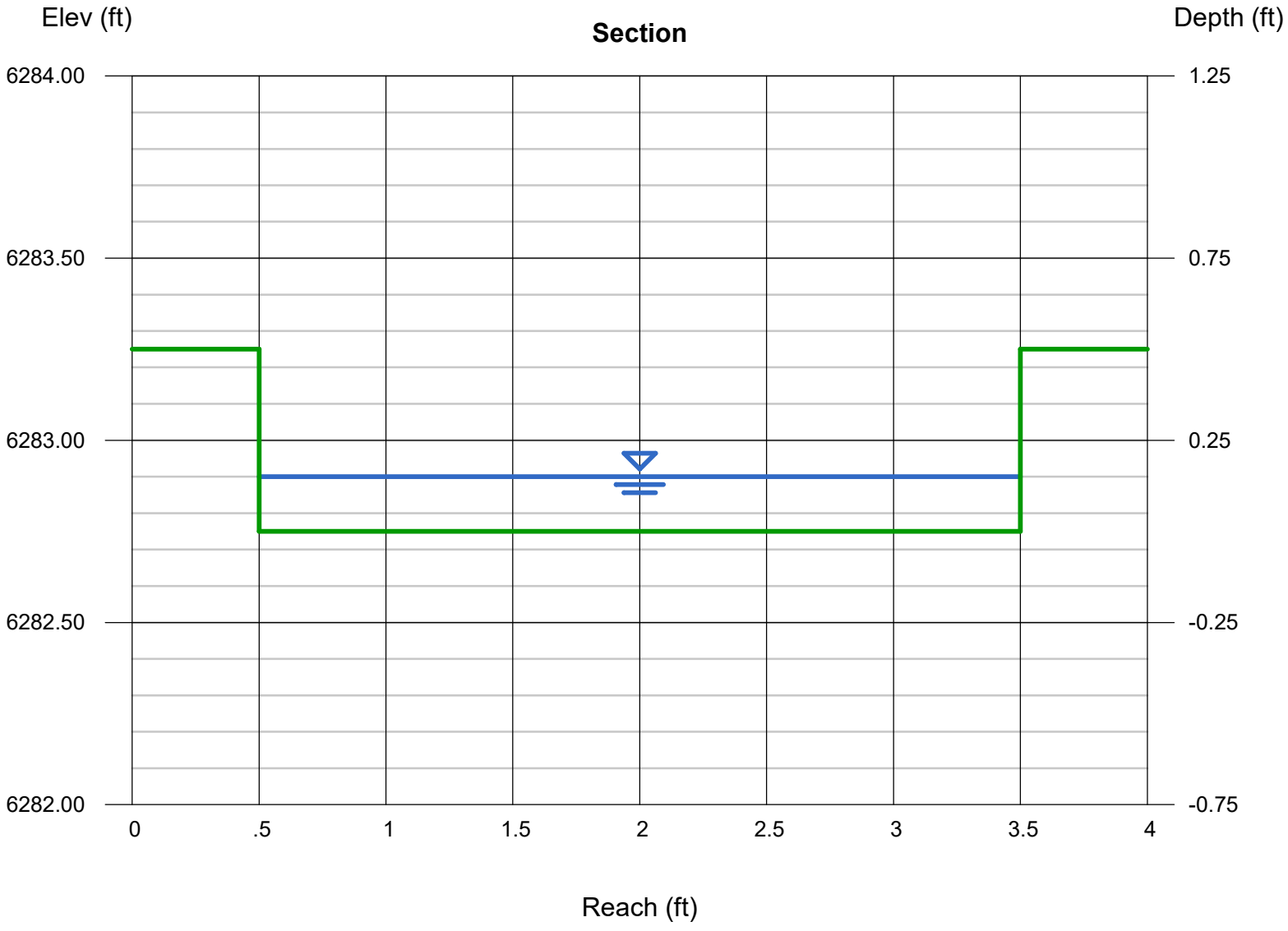
Bottom Width (ft)	= 3.00
Total Depth (ft)	= 0.50
Invert Elev (ft)	= 6282.75
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.00

Highlighted

Depth (ft)	= 0.15
Q (cfs)	= 1.000
Area (sqft)	= 0.45
Velocity (ft/s)	= 2.22
Wetted Perim (ft)	= 3.30
Crit Depth, Yc (ft)	= 0.16
Top Width (ft)	= 3.00
EGL (ft)	= 0.23



APPENDIX E – REFERENCE MATERIAL

Rational Method - Proposed Conditions

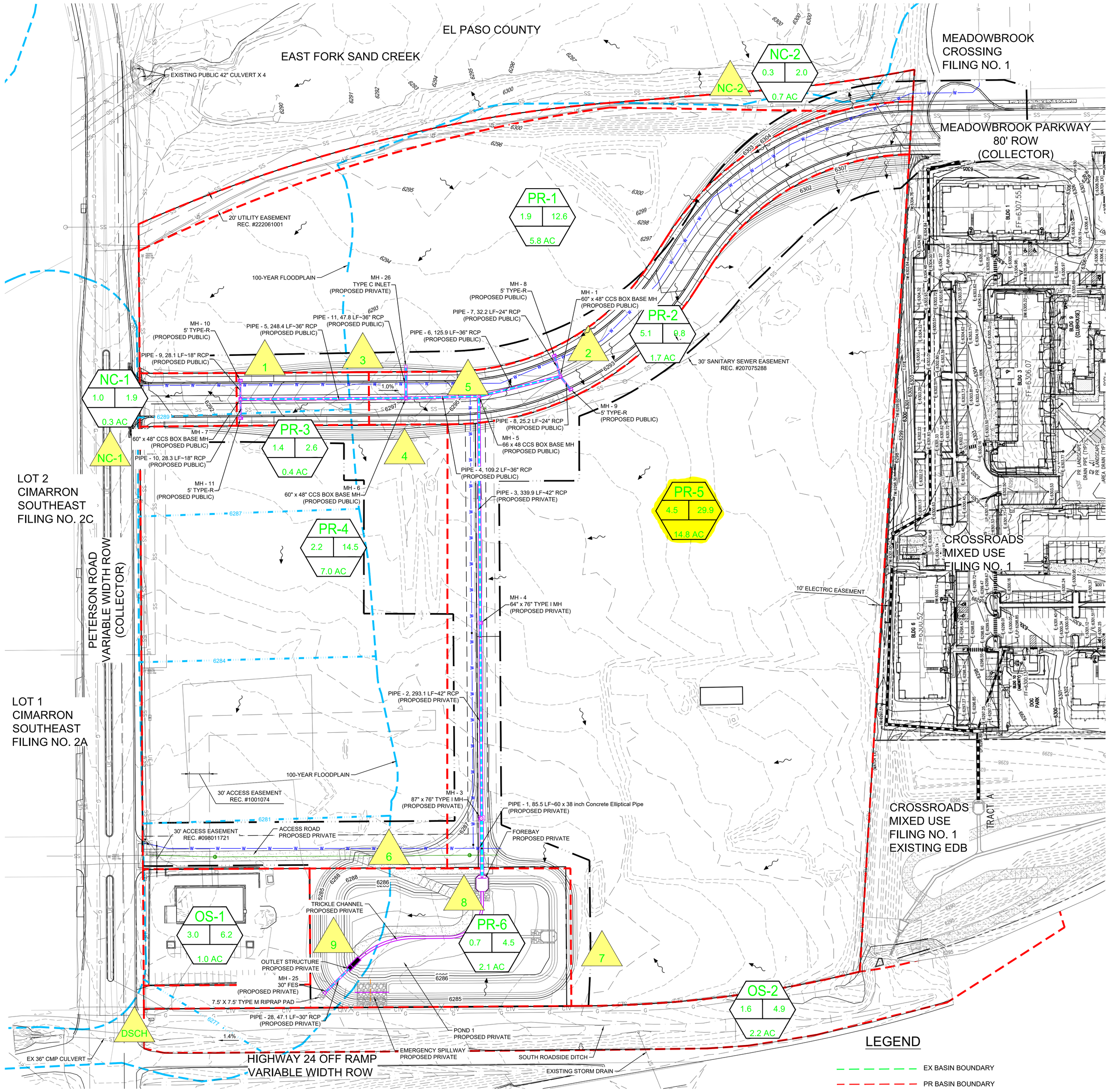
Project Name:	CIMARRON HILLS SOUTHEAST MIXED USE FILING NO. 1
Project Location:	EL PASO COUNTY
Designer	WCG
Notes:	PROPOSED CONDITIONS

Average Channel Velocity 4.00 ft/s (If specific channel vel is used, this will be ignored)
Average Slope for Initial Flow 0.04 ft/ft (If Elevations are used, this will be ignored)

Channel Flow Type Key

Heavy Meadow	2
Tillage/Field	3
Short Pasture and Lawns	4
Nearly Bare Ground	5
Grassed Waterway	6
Paved Areas	7

		Area			Rational 'C' Values														Flow Lengths										Tc	Rainfall Intensity & Rational Flow Rate				
					95%			100%			70%			2%																					
Sub-basin	**Comments**			Soil Group	Commercial Areas (95% Impervious)			Pavement (100% Impervious)			Neighborhoods/Multi-Family (70% Impervious)			Undeveloped/Pervious Areas (2% Impervious)			Composite		Percent Impervious	Initial	True Initial	Channel	True Channel	Average (decimal)	Initial	Average (%)	Channel Flow Type (See Key above)	Velocity	Channel	Total	i5	Q5	i100	Q100	**Sub-basin**
		sf	acres		C5	C100		C5	C100	Area (SF)	C5	C100	Area	C5	C100	Area	C5	C100		ft	Length ft	ft	Length ft	Slope	Tc (min)	Slope	Ground Type	(ft/s)	Tc (min)	(min)	in/hr	cfs	in/hr	cfs	
PR-1	***NORTH OF MEADOWBROOK PKWY UNDEVELOPED***	252158	5.79	B	0.81	0.88		0.90	0.96		0.49	0.62		0.09	0.36	252158	0.09	0.36	2.00%	100	100	640	640	0.05	10.63	2.0	7	2.83	3.77	14.40	3.58	**1.9**	6.01	**12.6**	***PR-1***
PR-1 (FUTURE)	***MULTI FAMILY***	252158	5.79	B	0.81	0.88		0.90	0.96		0.49	0.62	252158	0.09	0.36		0.49	0.62	70.00%	100	100	640	640	0.05	6.42	2.0	7	2.83	3.77	10.19	4.10	**11.7**	6.89	**24.9**	***PR-1 (FUTURE)***
PR-2	***MEADOWBROOK PKWY***	75883	1.74	B	0.81	0.88		0.90	0.96	60512	0.49	0.62		0.09	0.36	15371	0.74	0.84	80.15%	50	50	1024	1024	0.03	3.18	1.1	7	2.10	8.14	11.31	3.94	**5.1**	6.62	**9.8**	***PR-2***
PR-3	***MEADOWBROOK PKWY***	15685	0.36	B	0.81	0.88		0.90	0.96	12508	0.49	0.62		0.09	0.36	3177	0.74	0.84	80.15%	50	50	136	136	0.02	3.68	1.1	7	2.10	1.08	5.00	5.17	**1.4**	8.68	**2.6**	***PR-3***
PR-4	***UNDEVELOPED***	305176	7.01	B	0.81	0.88		0.90	0.96		0.49	0.62		0.09	0.36	305176	0.09	0.36	2.00%	100	100	960	960	0.05	10.63	2.0	7	2.83	5.66	16.28	3.40	**2.2**	5.70	**14.5**	***PR-4***
PR-4 (FUTURE)	***MULTI FAMILY***	305176	7.01	B	0.81	0.88		0.90	0.96		0.49	0.62	305176	0.09	0.36		0.49	0.62	70.00%	100	100	960	960	0.05	6.42	2.0	7	2.83	5.66	12.07	3.85	**13.3**	6.46	**28.3**	***PR-4 (FUTURE)***
PR-5	***MULTI FAMILY***	642552	14.75	B	0.81	0.88	573478	0.90	0.96		0.49	0.62		0.09	0.36	69074	0.73	0.82	85.00%	100	100	1460	1460	0.10	3.07	3.0	7	3.46	7.02	10.09	4.12	**44.8**	6.91	**84.7**	***PR-5***
PR-6	***DETENTION TRACT***	90049	2.07	B	0.81	0.88		0.90	0.96		0.49	0.62		0.09	0.36	90049	0.09	0.36	2.00%	25	25	330	330	0.25	3.11	0.5	4	0.49	11.11	14.22	3.60	**0.7**	6.05	**4.5**	***PR-6***
NC-1	***PORTION OF MEADOWBROOK PKWY IMPRACTICABLE TO DETAIN***	11541	0.26	B	0.81	0.88		0.90	0.96	9235	0.49	0.62		0.09	0.36	2306	0.74	0.84	80.42%	25	25	136	136	0.02	2.58	1.0	7	2.00	1.13	5.00	5.17	**1.0**	8.68	**1.9**	***NC-1***
NC-2	***UNDEVELOPABLE AREA DRAINING TO THE NORTH.***	30590	0.70	B	0.81	0.88		0.90	0.96		0.49	0.62		0.09	0.36	30590	0.09	0.36	2.00%	25	25	188	188	0.05	5.32	12.0	4	2.42	1.29	6.60	4.75	**0.3**	7.98	**2.0**	***NC-2***
OS-1	***OFFSITE BASIN SOUTHWEST OF SITE. CONTAINS EXISTING HOTEL.***	43567	1.00	B	0.81	0.88	29246	0.90	0.96		0.49	0.62		0.09	0.36	14321	0.57	0.71	64.43%	25	25	350	350	0.10	2.20	2.0	7	2.83	2.06	5.00	5.17	**3.0**	8.68	**6.2**	***OS-1***
OS-2	***South Roadside Ditch***	94892	2.18	B	0.81	0.88		0.90	0.96	19435	0.49	0.62		0.09	0.36	75457	0.26	0.48	22.07%	50	50	1073	1073	0.12	4.69	1.6	4	0.89	20.20	24.88	2.76	**1.6**	4.64	**4.9**	***OS-2***
DESIGN POINTS	***Sub-basins***																																	***DESIGN POINTS***
DP1	***MEADOWBROOK PKWY- AT GRADE INLETS***	15685	0.36	B	0.81	0.88	0	0.90	0.96	12508	0.49	0.62	0	0.09	0.36	3177	0.74	0.84	80.15%	50	50	136	136	0.02	3.68	1.1	7	2.10	1.08	5.00	5.17	**1.4**	8.68	**2.6**	***DP1***
DP2	***MEADOWBROOK PKWY- SUMP INLETS***	75883	1.74	B	0.81	0.88	0	0.90	0.96	60512	0.49	0.62	0	0.09	0.36	15371	0.74	0.84	80.15%	50	50	1024	1024	0.03	3.18	1.1	7	2.10	8.14	11.31	3.94	**5.1**	6.62	**9.8**	***DP2***
DP3	***LOT 2***	252158	5.79	B	0.81	0.88	0	0.90	0.96	0	0.49	0.62	0	0.09	0.36	252158	0.09	0.36	2.00%	100	100	640	640	0.05	10.63	2.0	7	2.83	3.77	14.40	3.58	**1.9**	6.01	**12.6**	***DP3***
DP3 (FUTURE)	***LOT 2***	252158	5.79	B	0.81	0.88	0	0.90	0.96	0	0.49	0.62	252158	0.09	0.36	0	0.49	0.62	70.00%	100	100	640	640	0.05	6.42	2.0	7	2.83	3.77	10.19	4.10	**11.7**	6.89	**24.9**	***DP3 (FUTURE)***
DP4	***DP1, DP3***	267842	6.15	B	0.81	0.88	0	0.90	0.96	12508	0.49	0.62	0	0.09	0.36	255335	0.13	0.39	6.58%	50	50	1024	1024	0.05	7.24	2.0	7	2.83	6.03	13.27	3.70	**2.9**	6.22	**15.0**	***DP4***
DP4 (FUTURE)	***DP1, DP3***	267842	6.15	B	0.81	0.88	0	0.90	0.96	12508	0.49	0.62	252158	0.09	0.36	3177	0.50	0.63	70.59%	50	50	1024	1024	0.05	4.43	2.0	7	2.83	6.03	10.46	4.06	**12.7**	6.82	**26.7**	***DP4 (FUTURE)***
DP5	***DP 2, DP3, & DP 1***	343725	7.89	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	0	0.09	0.36	270705	0.26	0.49	22.82%	100	100	640	640	0.05	8.82	2.0	7	2.83	3.77	12.59	3.78	**7.9**	6.35	**24.6**	***DP5***
DP5 (FUTURE)	***DP2, DP3, & DP1***	343725	7.89	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	252158	0.09	0.36	18547	0.56	0.68	72.70%	100	100	640	640	0.05	5.73	2.0	7	2.83	3.77	9.50	4.21	**18.6**	7.06	**38.1**	***DP5 (FUTURE)***
DP6	***DP5 & LOT 3***	648901	14.90	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	0	0.09	0.36	575881	0.18	0.43	13.03%	100	100	1375	1375	0.05	9.67	2.0	7	2.83	8.10	17.77	3.27	**8.9**	5.48	**35.2**	***DP6***
DP6 (FUTURE)	***DP5 & LOT 3***	648901	14.90	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	557334	0.09	0.36	18547	0.52	0.65	71.43%	100	100	1375	1375	0.05	6.06	2.0	7	2.83	8.10	14.15	3.61	**28.4**	6.06	**59.2**	***DP6 (FUTURE)***
DP7	***PR-5***	642552	14.75	B	0.81	0.88	0	0.90	0.96	0	0.49	0.62	0	0.09	0.36	642552	0.09	0.36	2.00%	100	100	1460	1460	0.10	8.44	2.0	7	2.83	8.60	17.04	3.33	**4.5**	5.59	**29.9**	***DP7***
DP7 (FUTURE)	***PR-5***	642552	14.75	B	0.81	0.88	573478	0.90	0.96	0	0.49	0.62	0	0.09	0.36	69074	0.73	0.82	85.00%	100	100	1460	1460	0.10	3.07	3.0	7	3.46	7.02	10.09	4.12	**44.8**	6.91	**84.7**	***DP7 (FUTURE)***
DP8	***INTO DETENTION POND***	1381503	31.71	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	0	0.09	0.36	1308483	0.13	0.39	7.18%	100	100	1460	1460	0.10	8.08	2.0	7	2.83	8.60	16.68	3.36	**14.3**	5.64	**70.7**	***DP8***
DP9	***OUT OF DETENTION POND***	1381503	31.71	B	0.81	0.88	0	0.90	0.96	73020	0.49	0.62	0	0.09	0.36	1308483	0.13	0.39	7.18%	100	100	1460	1460	0.10	8.08	2.0	7	2.83	8.60	16.68	3.36	**2.7**	5.64	**14.7**	***DP9***
DP8 (FUTURE)	***INTO DETENTION POND***	1381503	31.71	B	0.81	0.88	573478	0.90	0.96	73020	0.49	0.62	557334	0.09	0.36	177671	0.59	0.71	73.22%	100	100	1460	1460	0.10	4.24	2.0	7	2.83	8.60	12.83	3.76	**71.2**	6.30	**143.6**	***DP8 (FUTURE)***
DP9 (FUTURE)	***OUT OF DETENTION POND***	1381503	31.71	B	0.81	0.88	573478	0.90	0.96	73020	0.49	0.62	557334	0.09	0.36	177671	0.59	0.71	73.22%	100	100	1460	1460	0.10	4.24	2.0	7	2.83	8.60	12.83	3.76	**5.7**	6.30	**37.1**	***DP9 (FUTURE)***
DSCH	***SITE DISCHARGE***	1423634	32.68	B	0.81	0.88	29246	0.90	0.96	82255	0.49	0.62	0	0.09	0.36	1325110	0.15	0.41	9.59%	100	100	1810	1810	0.10	7.92	2.0	7	2.83	10.67	18.58	3.20	**4.0**	5.37	**18.7**	***DSCH***
NC-1	***UNDETAINED DISCHARGE INTO PETERSON ROAD***	11541	0.26	B	0.81	0.88	0	0.90	0.96	9235	0.49	0.62	0	0.09	0.36	2306	0.74	0.84	80.42%	25	25	136	136	0.02	2.58	1.0	7	2.00	1.13	5.00	5.17	**1.0**	8.68	**1.9**	***NC-1***
NC-2	***UNDETAINED DISCHARGE INTO EAST FORK SAND CREEK***	30590	0.70	B	0.81	0.88	0	0.90	0.96	0	0.49	0.62	0	0.09	0.36	30590	0.09	0.36	2.00%	25	25	188	188	0.05	5.32	12.0	4	2.42	1.29	6.60	4.75	**0.3**	7.98	**2.0**	***NC-2***



CIMARRON HILLS SOUTHEAST MIXED USE FILING NO. 1

Proposed Conditions
Sub-basin Summary

Basin	Area	Q5	Q100
	acres	cfs	cfs
PR-1	5.79	1.9	12.6
PR-1 (FURTURE)	5.79	11.7	24.9
PR-2	1.74	5.1	9.8
PR-3	0.36	1.4	2.6
PR-4	7.01	2.2	14.5
PR-4 (FUTURE)	7.01	13.3	28.3
PR-5	14.75	4.5	29.9
PR-5 (FUTURE)	14.75	44.8	84.7
PR-6	2.07	0.7	4.5
NC-1	0.26	1.0	1.9
NC-2	32.68	0.3	2.0
OS-1	32.68	3.0	6.2
OS-2	32.68	1.6	4.9

Proposed Design Point Summary

CIMARRON HILLS SOUTHEAST MIXED USE FILING NO. 1

Design Point	DESCRIPTION	Total Area (ac.)	Q(5) (cfs)	Q(100) (cfs)
DP1	MEADOWBROOK PKWY- AT GRADE INLETS	0.36	1.4	2.6
DP2	MEADOWBROOK PKWY- SUMP INLETS	1.74	5.1	9.8
DP3	LOT 2	5.79	1.9	12.6
DP4	DP1, DP3	6.15	2.9	15.0
DP5	DP 2, DP3, & DP 1	7.89	7.9	24.6
DP6	DP5 & LOT 3	14.90	8.9	35.2
DP6 (FUTURE)	DP5 & LOT 3	14.90	28.4	59.2
DP7	PR-5	14.75	4.5	29.9
DP8	INTO DETENTION POND	31.71	14.3	70.7
DP9	OUT OF DETENTION POND	31.71	2.7	14.7
DP8 (FUTURE)	INTO DETENTION POND	31.71	71.2	143.6
DP9 (FUTURE)	OUT OF DETENTION POND	31.71	5.7	37.1
DSCH	SITE DISCHARGE	32.68	4.0	18.7
NC-1	PORTION OF MEADOWBROOK PKWY IMPRACTICABLE TO DETAIN	0.26	1.0	1.9
NC-2	UNDEVELOPABLE AREA DRAINING TO THE NORTH.	0.70	0.3	2.0

NOTES:
1. THE PROPOSED FOREBAY AT DP-6 HAS BEEN SIZED TO HANDLE FULLY DEVELOPED FLOWS FROM SUB-BASINS PR-1, PR-2, PR-3, AND PR-4. FUTURE DEVELOPMENTS LOCATED WITHIN SUB-BASINS PR-1, AND PR-4 WILL BE REQUIRED TO PROVIDE A CONNECTION TO THE PROPOSED STORM SEWER SYSTEM.
2. FUTURE DEVELOPMENTS LOCATED WITHIN SUB-BASIN PR-5 WILL BE REQUIRED TO PROVIDE CONVEYANCE TO THE PROPOSED DETENTION FACILITY INCLUDING AN ADDITIONAL FOREBAY AND TRICKLE CHANNEL CONNECTION.

N

GRAPHIC SCALE
60' 0' 60' 120'
(IN FEET)
1 inch = 60 ft.

LEGEND

- EX BASIN BOUNDARY
- PR BASIN BOUNDARY
- 5975 EXISTING CONTOUR
- 7050 PROPOSED CONTOUR
- PROPOSED STORM DRAIN PIPE
- EXISTING STORM DRAIN PIPE
- PROPOSED PROPERTY LINE
- LIMITS OF DISTURBANCE
- PROPOSED FLOW DIRECTION
- PROPOSED STORM STRUCTURES
- BASE FLOOD ELEVATION
- 2 DESIGN POINT
- PROPOSED MAINTENANCE ACCESS ROAD
- PROPOSED RIP RAP
- PW12 PROPOSED WATER LINE
- PROPOSED SANITARY SEWER
- EMERGENCY FLOW PATHS

BASIN (SUB BASIN DESIGNATION)
Q5 (5-YEAR STORM EVENT PEAK FLOW (CFS))
Q100 (100-YEAR STORM EVENT PEAK FLOW (CFS))
AREA (SUB BASIN AREA (AC.))

REFERENCE DRAWINGS
X-1382-PR-UTIL
X-1382-EX-SITE
X-1382-PR-SITE
X-1382-EX-MAP
X-1382-EX-UTIL
X-MDG30x42
X-1382-PR-MAP

No.	DATE	DESCRIPTION	BY

REVISIONS

COMPUTER FILE MANAGEMENT
FILE NAME: S:\24.1382.003 Peterson Road and Meadowbrook Parkway Overall Development\200 Design\220 Drainage-WR\222 Reports\FDR\DWG\DR-Venezia.dwg
CTB FILE: ----
PLOT DATE: April 9, 2026 1:50:22 PM
THIS DRAWING IS CURRENT AS OF PLOT DATE AND MAY BE SUBJECT TO CHANGE.

SHEET KEY

PREPARED BY: Matrix Excellence by Design

SEAL
PRELIMINARY
THIS DRAWING HAS NOT BEEN APPROVED BY GOVERNING AGENCIES AND IS SUBJECT TO CHANGE

FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.
PROJECT No. 24.1382.003

EL PASO COUNTY

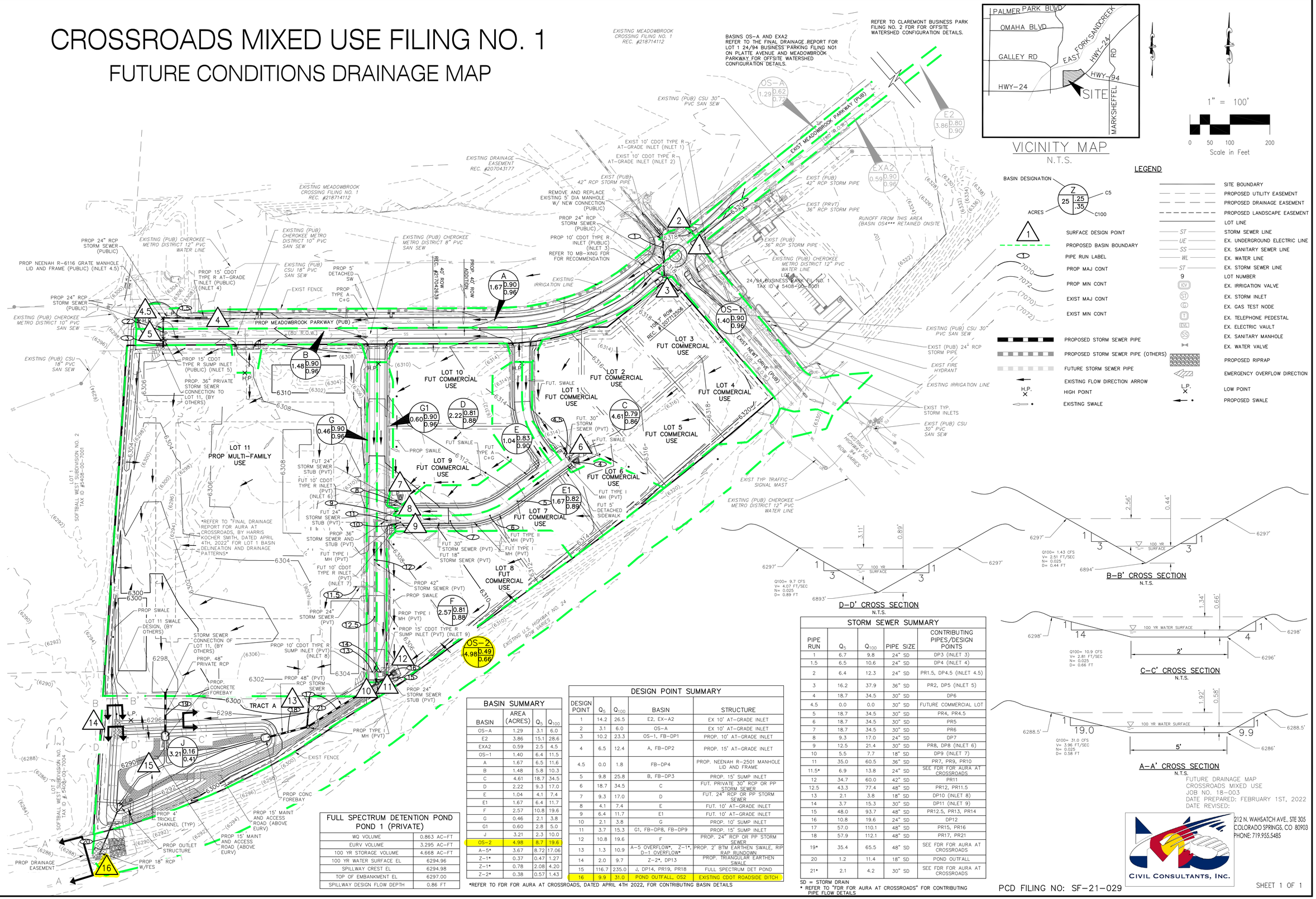
CIMARRON HILLS SOUTHEAST MIXED USE FILING NO. 1
FINAL DRAINAGE REPORT

PROPOSED CONDITIONS DRAINAGE MAP

DESIGNED BY: WCG
DRAWN BY: WCG
CHECKED BY: JTS
SCALE HORIZ. 1" = 60' VERT. N/A
DATE ISSUED: APRIL 2026
SHEET 2 OF 2
DRAWING No. DR02

CROSSROADS MIXED USE FILING NO. 1

FUTURE CONDITIONS DRAINAGE MAP



BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
OS-A	1.29	3.1	6.0
E2	3.86	15.1	28.6
EXA2	0.59	2.5	4.5
OS-1	1.40	6.4	11.5
A	1.67	6.5	11.6
B	1.48	5.8	10.3
C	4.61	18.7	34.5
D	2.22	9.3	17.0
E	1.04	4.1	7.4
E1	1.67	6.4	11.7
F	2.57	10.8	19.6
G	0.46	2.1	3.8
G1	0.60	2.8	5.0
J	3.21	2.3	10.0
OS-2	4.98	8.7	19.6
A-5*	3.67	8.72	17.06
Z-1*	0.37	0.47	1.27
Z-1*	0.78	2.08	4.20
Z-2*	0.38	0.57	1.43

*REFER TO FDR FOR AURA AT CROSSROADS, DATED APRIL 4TH 2022, FOR CONTRIBUTING BASIN DETAILS

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	14.2	26.5	E2, EX-A2	EX 10' AT-GRADE INLET
2	3.1	6.0	OS-A	EX 10' AT-GRADE INLET
3	10.2	23.3	OS-1, FB-DP1	PROP. 10' AT-GRADE INLET
4	6.5	12.4	A, FB-DP2	PROP. 15' AT-GRADE INLET
4.5	0.0	1.8	FB-DP4	PROP. NEENAH R-2501 MANHOLE LID AND FRAME
5	9.8	25.8	B, FB-DP3	PROP. 15' SUMP INLET
6	18.7	34.5	C	FUT. PRIVATE 30" RCP OR PP STORM SEWER
7	9.3	17.0	D	FUT. 24" RCP OR PP STORM SEWER
8	4.1	7.4	E	FUT. 10' AT-GRADE INLET
9	6.4	11.7	E1	FUT. 10' AT-GRADE INLET
10	2.1	3.8	G	PROP. 10' SUMP INLET
11	3.7	15.3	G1, FB-DP8, FB-DP9	PROP. 15' SUMP INLET
12	10.8	19.6	F	PROP. 24" RCP OR PP STORM SEWER
13	1.3	10.9	A-5 OVERFLOW*, Z-1*, D-1 OVERFLOW*	PROP. 2' BTM EARTHEN SWALE, RIP RAP RUNDOWN
14	2.0	9.7	Z-2*, DP13	PROP. TRIANGULAR EARTHEN SWALE
15	116.7	235.0	J, DP14, PR19, PR18	FULL SPECTRUM DET POND
16	9.9	31.0	POND OUTFALL, OS2	EXISTING CDOT ROADSIDE DITCH

STORM SEWER SUMMARY				
PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DESIGN POINTS
1	6.7	9.8	24" SD	DP3 (INLET 3)
1.5	6.5	10.6	24" SD	DP4 (INLET 4)
2	6.4	12.3	24" SD	PR1.5, DP4.5 (INLET 4.5)
3	16.2	37.9	36" SD	PR2, DP5 (INLET 5)
4	18.7	34.5	30" SD	DP6
4.5	0.0	0.0	30" SD	FUTURE COMMERCIAL LOT
5	18.7	34.5	30" SD	PR4, PR4.5
6	18.7	34.5	30" SD	PR5
7	18.7	34.5	30" SD	PR6
8	9.3	17.0	24" SD	DP7
9	12.5	21.4	30" SD	PR8, DP8 (INLET 6)
10	5.5	7.7	18" SD	DP9 (INLET 7)
11	35.0	60.5	36" SD	PR7, PR9, PR10
11.5*	6.9	13.8	24" SD	SEE FDR FOR AURA AT CROSSROADS
12	34.7	60.0	42" SD	PR11
12.5	43.3	77.4	48" SD	PR12, PR11.5
13	2.1	3.8	18" SD	DP10 (INLET 8)
14	3.7	15.3	30" SD	DP11 (INLET 9)
15	48.0	93.7	48" SD	PR12.5, PR13, PR14
16	10.8	19.6	24" SD	DP12
17	57.0	110.1	48" SD	PR15, PR16
18	57.9	112.1	48" SD	PR17, PR21
19*	35.4	65.5	48" SD	SEE FDR FOR AURA AT CROSSROADS
20	1.2	11.4	18" SD	POND OUTFALL
21*	2.1	4.2	30" SD	SEE FDR FOR AURA AT CROSSROADS

SD = STORM DRAIN
* REFER TO "FDR FOR AURA AT CROSSROADS" FOR CONTRIBUTING PIPE FLOW DETAILS

FULL SPECTRUM DETENTION POND POND 1 (PRIVATE)	
WQ VOLUME	0.863 AC-FT
EURV VOLUME	3.295 AC-FT
100 YR STORAGE VOLUME	4.668 AC-FT
100 YR WATER SURFACE EL	6294.96
SPILLWAY CREST EL	6294.98
TOP OF EMBANKMENT EL	6297.00
SPILLWAY DESIGN FLOW DEPTH	0.86 FT

FUTURE DRAINAGE MAP
CROSSROADS MIXED USE
JOB NO. 18-003
DATE PREPARED: FEBRUARY 1ST, 2022
DATE REVISED:

CIVIL CONSULTANTS, INC.
212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

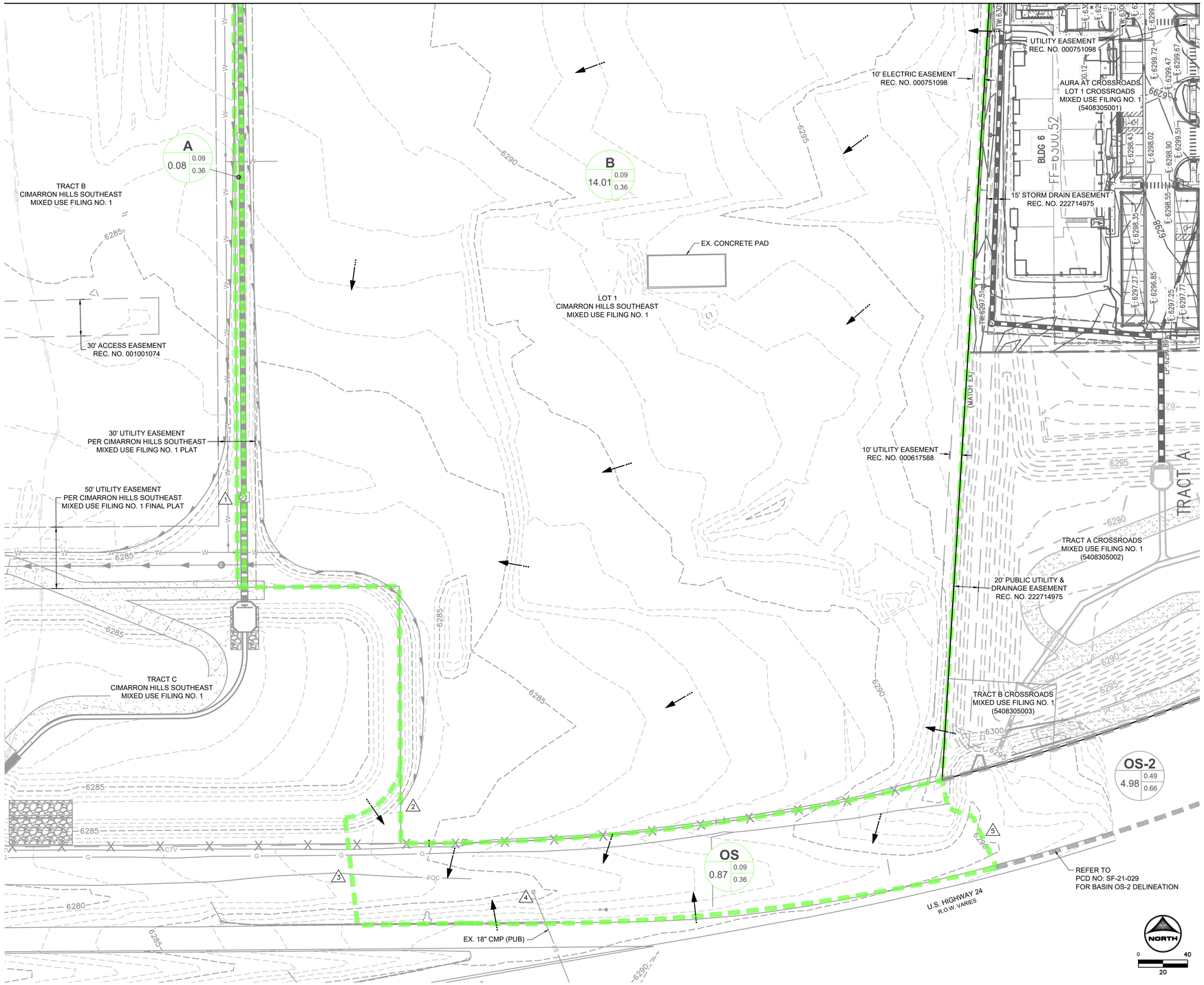
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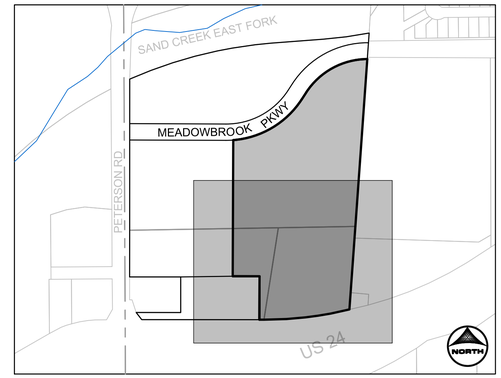
SHEET 1 OF 1

APPENDIX F – DRAINAGE MAPS

DOMBROWSKI, COLIN, 6/19/2026 10:35 AM

MATCHLINE: SEE SHEET 2





KEY MAP
SCALE: 1" = 350'

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
EASEMENT LINE		
RIGHT OF WAY		
CENTERLINE		
CURB & GUTTER		
DRAINAGE BASIN		
MAJOR CONTOUR	5900	5900
MINOR CONTOUR	5902	5902
STORM SEWER		
RETAINING WALL		
FLOW DIRECTION		
DESIGN POINT		X

BASIN LABEL — BASIN DESIGNATION: A1; AREA (AC.): 1.00; MINOR 5-YR RUNOFF COEF.: 0.40; MAJOR 100-YR RUNOFF COEF.: 0.60

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A	0.08	2	0.03	0.20
B	14.01	2	3.95	26.05
OS	0.87	2	0.29	1.94

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	A	0.03	0.20
2	B	3.95	26.05
3	OS, DP2, DP4, DP5	15.04	47.59
4	OFFSITE US HWY 24	-	-
5	OS-2, POND 1 OUT (SF-21-029)	10.8	19.6

PCD FILE NO.:

DRAWN BY: CMD — JOB DATE: 6/4/2026
APPROVED: RDL — JOB NUMBER: ----
CAD DATE: 6/19/2026
CAD FILE: J:\2025\2502477\CAD\Dwgs\C\Drainage\Ex_Drainage_Map

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen
HR GREEN - COLORADO SPRINGS
1975 RESEARCH PARKWAY SUITE 160
COLORADO SPRINGS, CO 80920
PHONE: 719.300.4140
FAX: 713.965.0044

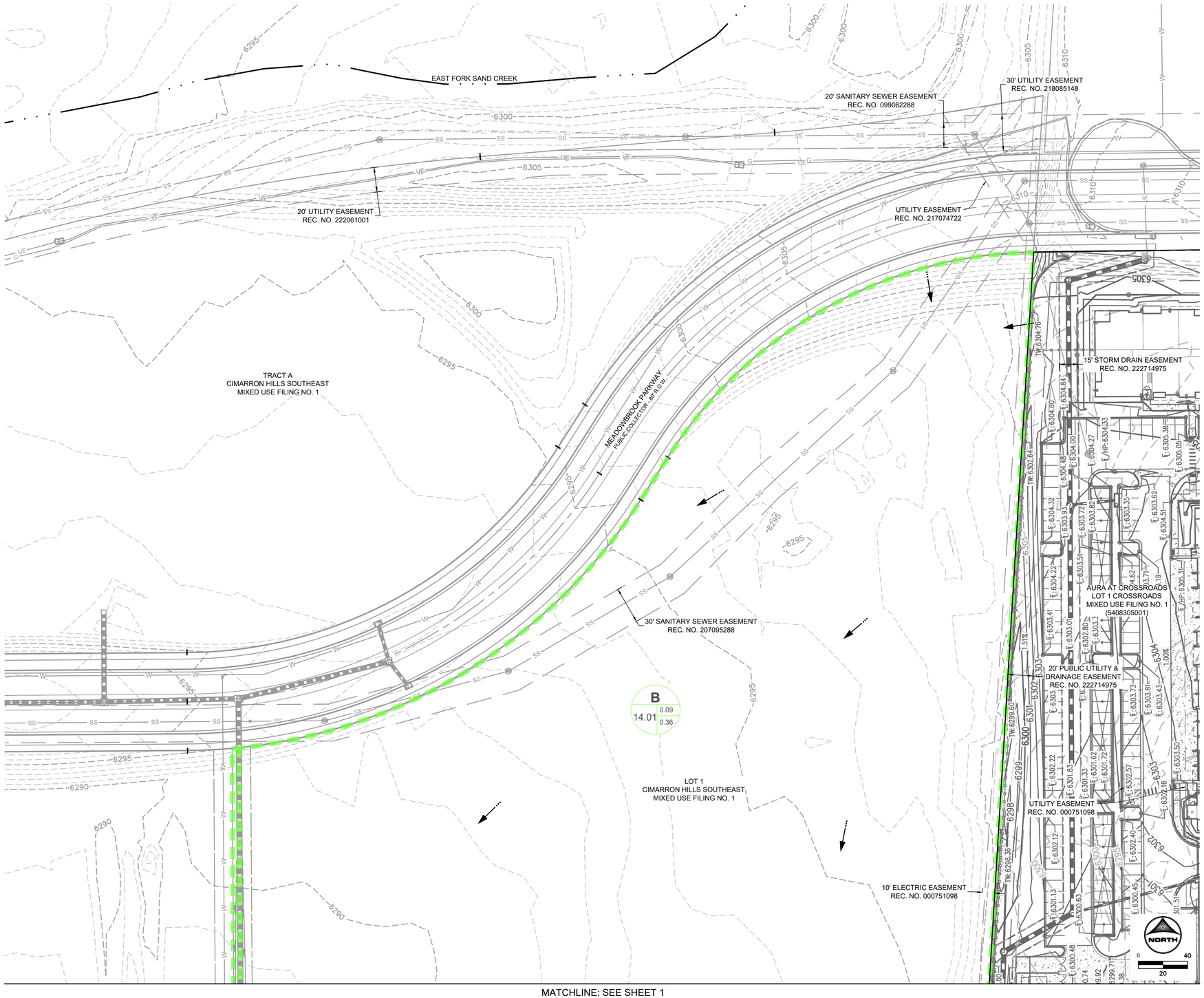
HILLPOINTE APARTMENTS AT PETERSON
HILLPOINTE, LLC.
COLORADO SPRINGS, EL PASO COUNTY, COLORADO

FINAL DRAINAGE REPORT
EXISTING DRAINAGE MAP

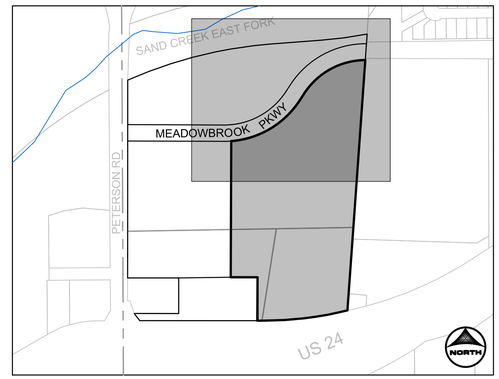
SHEET DR 1

HR GREEN Xrefs: 00-XC-DSGN; 00-XC-ROW; 00-XC-UTL; 00-XV-ROW; 00-XV-UTL; KEY-MAP; TB_24x36_2502477-FDR; 00-XV-SURVEY

DOMBROWSKI, COLIN, 7/27/2026 9:23 AM



MATCHLINE: SEE SHEET 1



KEY MAP
SCALE: 1" = 350'

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
EASEMENT LINE		
RIGHT OF WAY		
CENTERLINE		
CURB & GUTTER		
DRAINAGE BASIN		
MAJOR CONTOUR	5900	5900
MINOR CONTOUR	5902	5902
STORM SEWER		
RETAINING WALL		
FLOW DIRECTION		
DESIGN POINT		X

BASIN LABEL — BASIN DESIGNATION: A1; AREA (AC.): 1.00; 0.40 MINOR 5-YR RUNOFF COEF.; 0.60 MAJOR 100-YR RUNOFF COEF.

SUMMARY RUNOFF TABLE

BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A	0.08	2	0.03	0.20
B	14.01	2	3.95	26.05
OS	0.87	2	0.29	1.94

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	A	0.03	0.20
2	B	3.95	26.05
3	OS, DP2, DP4, DP5	15.04	47.59
4	OFFSITE US HWY 24	-	-
5	OS-2, POND 1 OUT (SF-21-029)	10.8	19.6

PCD FILE NO.: _____

DRAWN BY: CMD JOB DATE: 6/19/2026
APPROVED: RDL JOB NUMBER: ----
CAD DATE: 7/27/2026
CAD FILE: J:\2025\2502477\CAD\Dwgs\C\Drainage\Ex_Drainage_Map

BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - COLORADO SPRINGS
1975 RESEARCH PARKWAY SUITE 160
COLORADO SPRINGS, CO 80920
PHONE: 719.300.4140
FAX: 713.965.0044

HILLPOINTE APARTMENTS AT PETERSON
HILLPOINTE, LLC.
COLORADO SPRINGS, EL PASO COUNTY, COLORADO

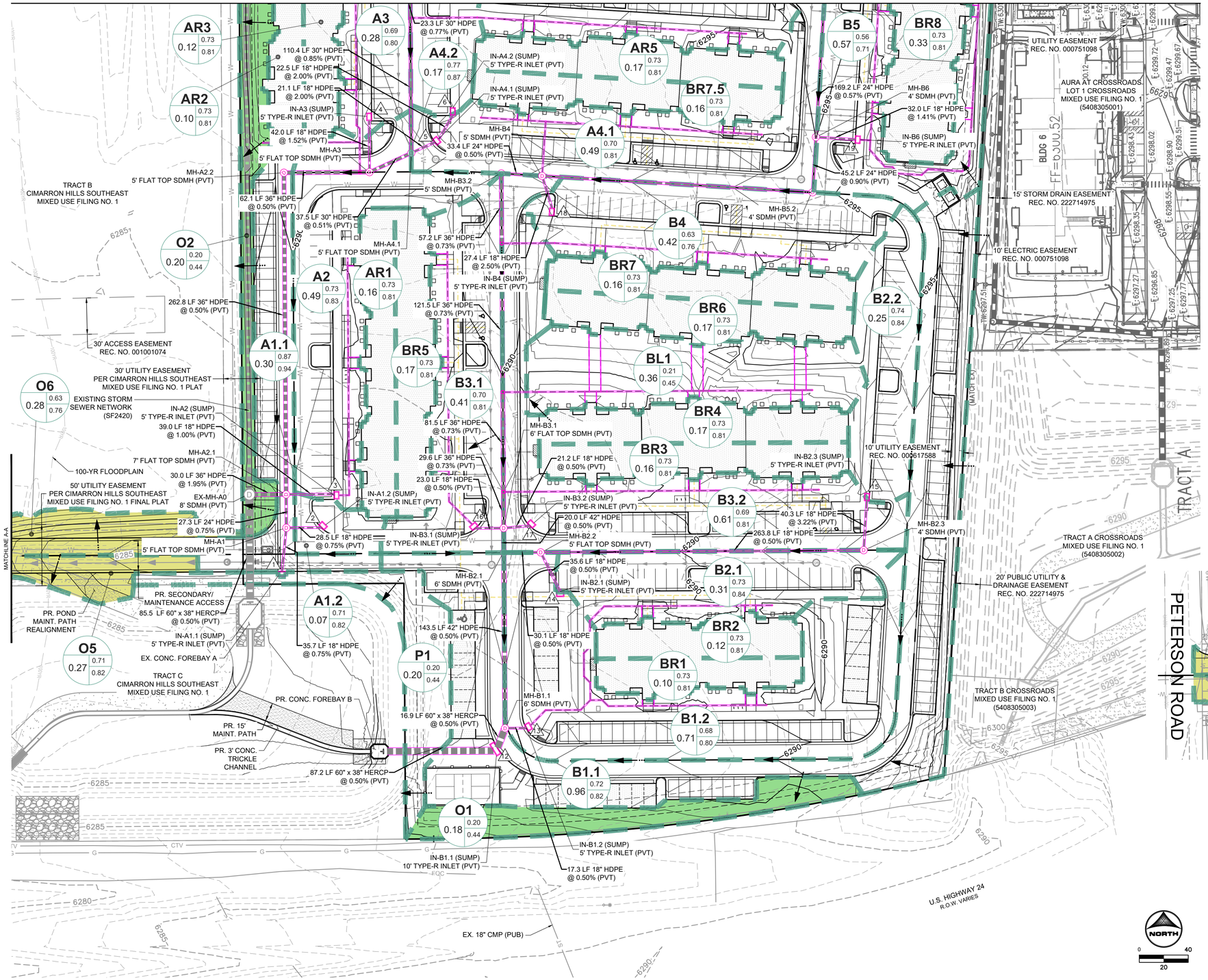
FINAL DRAINAGE REPORT
EXISTING DRAINAGE MAP

SHEET DR 2

HR GREEN Xrefs: 00-XC-DSGN; 00-XC-ROW; 00-XC-UTIL; 00-XV-ROW; 00-XV-UTIL; KEY-MAP; TB_24x36_2502477-FDR; 00-XV-SURVEY

DOMBROWSKI, COLIN, 8/11/2026 11:52 AM

MATCHLINE: SEE SHEET 4



KEY MAP
SCALE: 1" = 350'

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
EASEMENT LINE		
RIGHT OF WAY		
CENTERLINE		
CURB & GUTTER		
DRAINAGE BASIN		
MAJOR CONTOUR	5900	5900
MINOR CONTOUR	5902	5902
STORM SEWER		
RETAINING WALL		
FLOW DIRECTION		
DESIGN POINT		X
BASIN LABEL		BASIN DESIGNATION: A1; AREA (AC.): 1.00; 0.40 MINOR 5-YR RUNOFF COEF.; 0.60 MAJOR 100-YR RUNOFF COEF.

AREA EXCLUDED FROM WQ TREATMENT PER ECM APP I.6.1.B.7, TOTAL AREA = 0.38 AC.

AREA EXCLUDED FROM WQ TREATMENT PER ECM APP I.6.3.A.1.a, TOTAL AREA = 0.70 AC.

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ_5 (cfs)	ΣQ_{100} (cfs)
1	A1.1	1.34	2.42
2	A1.2	0.23	0.45
3	A2, AR1	2.28	4.34
4	A3	1.01	1.98
5	A4.1, A4.2	2.46	4.74
6	A4.2	0.69	1.30
7	A5.1	1.92	3.73
8	A5.2	2.30	4.51
9	A6.1	0.90	1.93
10	A6.2	1.60	3.06
11	A7	1.28	2.49
12	B1.1	3.13	6.03
13	B1.2, BR1, BR2	3.10	6.00
14	B2.1	1.19	2.29
15	B2.2	0.96	1.83
16	B3.1, BR5	2.09	4.02
17	B3.2	2.15	4.20
18	B4	1.38	2.78
19	B5, BR8	2.76	5.54
20	B6, BR9	3.04	5.81
21	B7, BR10	2.70	5.88

PCD FILE NO.: PPR2613

HR GREEN Xrefs: 01-XC-UTIL; 00-XC-DSGN; 00-XC-ROW; 00-XV-UTIL; 00-XV-ROW; 00-XV-UTIL; 01-XC-DSGN; 01-XC-ROW; KEY-MAP; TB_24x36_2502477-FDR; 00-XV-SURVEY

DRAWN BY: CMD	JOB DATE: 8/10/2026	BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 1" IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.	
APPROVED: RDL	JOB NUMBER: ----		
CAD DATE: 8/11/2026			
CAD FILE: J:\2025\2502477\CAD\Dwgs\C\Drainage\Pr_Drainage_Map			

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - COLORADO SPRINGS
1975 RESEARCH PARKWAY SUITE 160
COLORADO SPRINGS, CO 80920
PHONE: 719.300.4140
FAX: 713.965.0044

HILLPOINTE APARTMENTS AT PETERSON
HILLPOINTE, LLC.
COLORADO SPRINGS, EL PASO COUNTY, COLORADO

FINAL DRAINAGE REPORT
PROPOSED DRAINAGE MAP

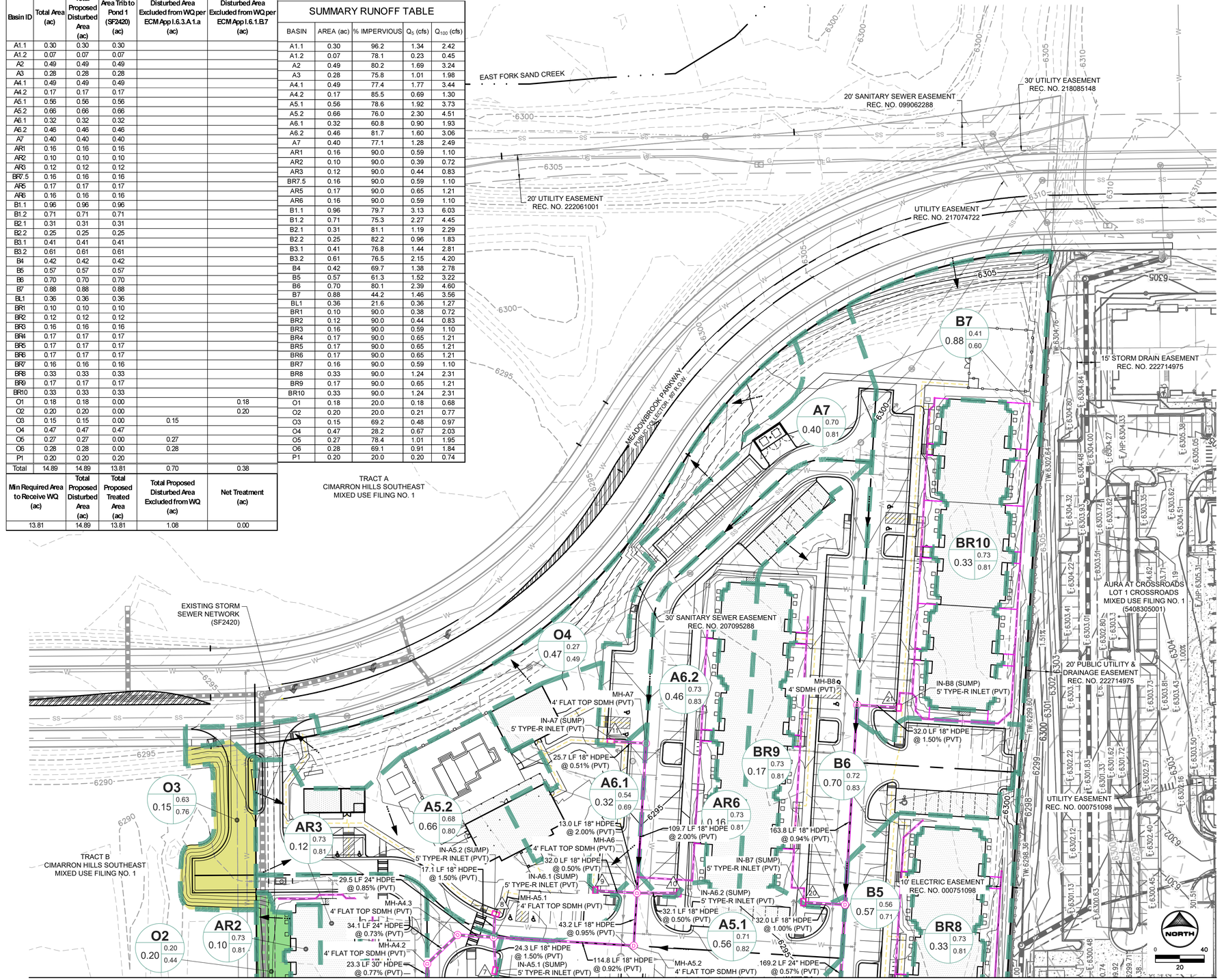
SHEET DR 3

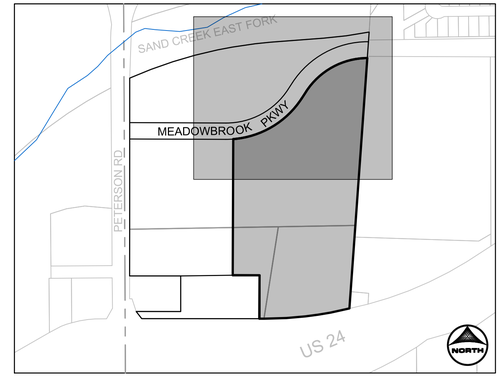
DOMBROWSKI, COLIN, 8/11/2026 11:52 AM

Water Quality Treatment Summary Table					
Basin ID	Total Area (ac)	Total Proposed Disturbed Area (ac)	Area Trib to Pond 1 (SF2420) (ac)	Disturbed Area Excluded from WQ per ECM App I.6.3.A.1.a (ac)	Disturbed Area Excluded from WQ per ECM App I.6.1.B.7 (ac)
A1.1	0.30	0.30	0.30		
A1.2	0.07	0.07	0.07		
A2	0.49	0.49	0.49		
A3	0.28	0.28	0.28		
A4.1	0.49	0.49	0.49		
A4.2	0.17	0.17	0.17		
A5.1	0.56	0.56	0.56		
A5.2	0.66	0.66	0.66		
A6.1	0.32	0.32	0.32		
A6.2	0.46	0.46	0.46		
A7	0.40	0.40	0.40		
AR1	0.16	0.16	0.16		
AR2	0.10	0.10	0.10		
AR3	0.12	0.12	0.12		
BR7.5	0.16	0.16	0.16		
AR5	0.17	0.17	0.17		
AR6	0.16	0.16	0.16		
B1.1	0.96	0.96	0.96		
B1.2	0.71	0.71	0.71		
B2.1	0.31	0.31	0.31		
B2.2	0.25	0.25	0.25		
B3.1	0.41	0.41	0.41		
B3.2	0.61	0.61	0.61		
B4	0.42	0.42	0.42		
B5	0.57	0.57	0.57		
B6	0.70	0.70	0.70		
B7	0.88	0.88	0.88		
BL1	0.36	0.36	0.36		
BR1	0.10	0.10	0.10		
BR2	0.12	0.12	0.12		
BR3	0.16	0.16	0.16		
BR4	0.17	0.17	0.17		
BR5	0.17	0.17	0.17		
BR6	0.17	0.17	0.17		
BR7	0.16	0.16	0.16		
BR8	0.33	0.33	0.33		
BR9	0.17	0.17	0.17		
BR10	0.33	0.33	0.33		
O1	0.18	0.18	0.00		0.18
O2	0.20	0.20	0.00		0.20
O3	0.15	0.15	0.00	0.15	
O4	0.47	0.47	0.47		
O5	0.27	0.27	0.00	0.27	
O6	0.28	0.28	0.00	0.28	
P1	0.20	0.20	0.20		
Total	14.89	14.89	13.81	0.70	0.38

Min Required Area to Receive WQ (ac)	Total Proposed Disturbed Area (ac)	Total Proposed Treated Area (ac)	Total Proposed Disturbed Area Excluded from WQ (ac)	Net Treatment (ac)
13.81	14.89	13.81	1.08	0.00

SUMMARY RUNOFF TABLE				
BASIN	AREA (ac)	% IMPERVIOUS	Q_5 (cfs)	Q_{100} (cfs)
A1.1	0.30	96.2	1.34	2.42
A1.2	0.07	78.1	0.23	0.45
A2	0.49	80.2	1.69	3.24
A3	0.28	75.8	1.01	1.98
A4.1	0.49	77.4	1.77	3.44
A4.2	0.17	85.5	0.69	1.30
A5.1	0.56	78.6	1.92	3.73
A5.2	0.66	76.0	2.30	4.51
A6.1	0.32	60.8	0.90	1.93
A6.2	0.46	81.7	1.60	3.06
A7	0.40	77.1	1.28	2.49
AR1	0.16	90.0	0.59	1.10
AR2	0.10	90.0	0.39	0.72
AR3	0.12	90.0	0.44	0.83
BR7.5	0.16	90.0	0.59	1.10
AR5	0.17	90.0	0.65	1.21
AR6	0.16	90.0	0.59	1.10
B1.1	0.96	79.7	3.13	6.03
B1.2	0.71	75.3	2.27	4.45
B2.1	0.31	81.1	1.19	2.29
B2.2	0.25	82.2	0.96	1.83
B3.1	0.41	76.8	1.44	2.81
B3.2	0.61	76.5	2.15	4.20
B4	0.42	69.7	1.38	2.78
B5	0.57	61.3	1.52	3.22
B6	0.70	80.1	2.39	4.60
B7	0.88	44.2	1.46	3.56
BL1	0.36	21.6	0.36	1.27
BR1	0.10	90.0	0.38	0.72
BR2	0.12	90.0	0.44	0.83
BR3	0.16	90.0	0.59	1.10
BR4	0.17	90.0	0.65	1.21
BR5	0.17	90.0	0.65	1.21
BR6	0.17	90.0	0.65	1.21
BR7	0.16	90.0	0.59	1.10
BR8	0.33	90.0	1.24	2.31
BR9	0.17	90.0	0.65	1.21
BR10	0.33	90.0	1.24	2.31
O1	0.18	20.0	0.18	0.68
O2	0.20	20.0	0.21	0.77
O3	0.15	69.2	0.48	0.97
O4	0.47	28.2	0.67	2.03
O5	0.27	78.4	1.01	1.95
O6	0.28	69.1	0.91	1.84
P1	0.20	20.0	0.20	0.74





KEY MAP
SCALE: 1" = 350'

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
EASEMENT LINE		
RIGHT OF WAY		
CENTERLINE		
CURB & GUTTER		
DRAINAGE BASIN		
MAJOR CONTOUR	5900	5900
MINOR CONTOUR	5902	5902
STORM SEWER		
RETAINING WALL		
FLOW DIRECTION		
DESIGN POINT		X

BASIN LABEL
BASIN DESIGNATION: A1
AREA (AC.): 1.00
0.40 MINOR 5-YR RUNOFF COEF.
0.60 MAJOR 100-YR RUNOFF COEF.

AREA EXCLUDED FROM WQ TREATMENT PER ECM APP I.6.1.B.7, TOTAL AREA = 0.38 AC.

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19	B5, BR8	2.76	5.54
20	B6, BR9	3.04	5.81
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PCD FILE NO.: PPR2613

DRAWN BY: CMD JOB DATE: 8/10/2026
APPROVED: RDL JOB NUMBER: ----
CAD DATE: 8/11/2026
CAD FILE: J:\2025\2502477\CAD\Dwgs\C\Drainage\Pr_Drainage_Map

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IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

HR GREEN - COLORADO SPRINGS
1975 RESEARCH PARKWAY SUITE 160
COLORADO SPRINGS, CO 80920
PHONE: 719.300.4140
FAX: 713.965.0044

HILLPOINTE APARTMENTS AT PETERSON
HILLPOINTE, LLC.
COLORADO SPRINGS, EL PASO COUNTY, COLORADO

FINAL DRAINAGE REPORT
PROPOSED DRAINAGE MAP

SHEET DR 4

HR GREEN Xrefs: 01-XC-UTIL; 00-XC-DSGN; 00-XC-ROW; 00-XV-UTIL; 01-XC-DSGN; 00-XV-ROW; 00-XV-UTIL; 01-XC-ROW; KEY-MAP; TB_24x36_2502477-FDR; 00-XV-SURVEY