FINAL DRAINAGE REPORT
FOR

RETREAT AT PRAIRIERIDGE
FILINGS NO. 1, 2 & 3

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PCD File No. SF257

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ENGINEER'S STATEMENT:
The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

_____ _____

Marc A. Whorton Colorado P.E. #37155 Date

OWNER'S/DEVELOPER'S STATEMENT:
I, the owner/developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: CLASSIC COMPANIES

By: _____

Title: _____

Address: 2138 Flying Horse Club Drive

Colorado Springs, CO 80921

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

_____ _____

Joshua Palmer, P.E. Date
County Engineer / ECM Administrator

Conditions:

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PURPOSE

The intent of the owner/developer is to develop/construct the Retreat at PrairieRidge entire subdivision (all three filings) simultaneously. However, as presented in the approved Retreat at PrairieRidge Preliminary Plan Filings 1-3 (SP239) the individual Final Plat filings may be recorded based on market demand. The purpose of this Final Drainage Report is to identify all ultimate/full build-out drainage features and facilities and to estimate peak rates of stormwater runoff, from on-site and off-site sources. Also, the purpose is to outline the necessary improvements to safely route developed storm water runoff to adequate permanent outfall facilities. The drainage improvements proposed in this report are final in nature and account for the off-site flows as well as the anticipated future commercial and PUD development parcels within the Retreat at PrairieRidge overall property.

GENERAL DESCRIPTION

The Retreat at PrairieRidge Filing No. 1 includes 44.458 acres and 46 urban residential lots along with the extension of Briargate Pkwy., 2.6 ac. park, pond tract and future PUD Development Tract. The Retreat at PrairieRidge Filing No. 2 includes 80.646 acres and 141 urban residential lots, 5.5 ac. park and future commercial and PUD development tract. The Retreat at PrairieRidge Filing No. 3 includes 17.022 acres of six 2.5 ac. min. rural residential lots. These three Filings are located in a portion of sections 28 and 33, township 12 south, range 65 west of the sixth principal meridian. The overall property is bounded on the north by existing Poco Road (60' public Right-of-Way), to the south and east by Vollmer Road and to the west by existing platted large lot residential subdivisions. The site is within the upper portion of the Sand Creek drainage basin. The proposed uses as shown on the Sketch Plan (SKP225) and Preliminary Plan (SP239) for the overall property are as follows: Varying density single family residential developed as (17) 0.5-ac. urban lots, (170) RS-6000 zoned urban lots, (6) RR-2.5 ac. rural lots, (2) neighborhood parks, (2) pocket parks, open space/greenway buffer and detention pond. The total number of residential units proposed in these three final plats is 193. Roadway access will be from Vollmer Road and the proposed Briargate Parkway and Dines Blvd. extensions.

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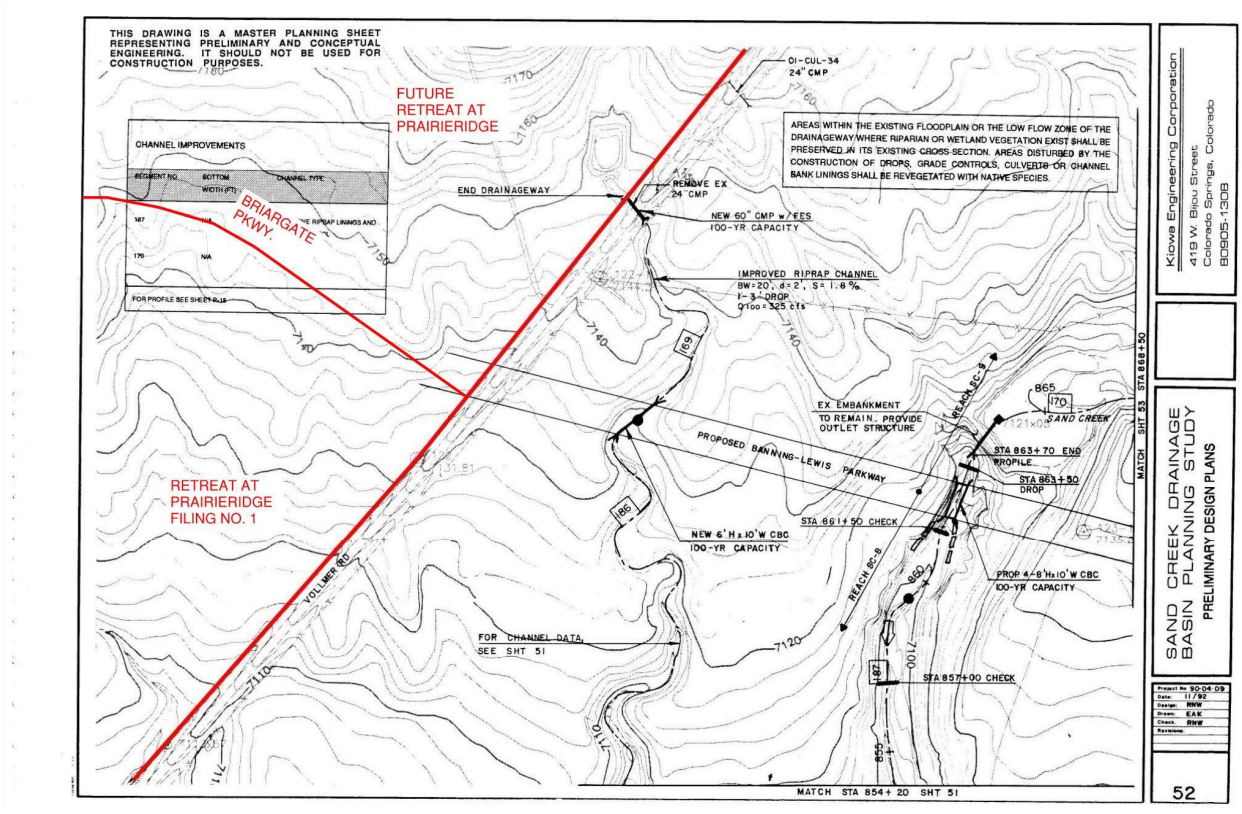
The average soil condition reflects Hydrologic Group "B" (Pring coarse sandy loam) as determined by the "Soil Survey of El Paso County Area," prepared by the Soil Conservation Service (see map in Appendix).

EXISTING DRAINAGE CONDITIONS

This property is located in the upper reaches of the Sand Creek Basin. Existing conditions in this basin are largely rolling hills vegetated with native grasses, yucca with natural ravines and swales with trees on the northern portion of the property. Existing slopes range from 2% to 15% across the site. The entire property generally drains in a southerly direction through numerous natural ravines created from the off-site flows north of Poco Road. This property is not specifically discussed in the Sand Creek DBPS (March 1996), however, improvements along Vollmer Road to handle flows from and through the property are detailed on the following excerpt from the DBPS. The culvert crossing Vollmer is shown to be replaced with a 60" CMP



for 100-yr capacity. This improvement along with the downstream channel improvements within the Sterling Ranch property have recently been constructed as a part of the adjacent Vollmer Road improvements (CDR 21-10) and Homestead North at Sterling Ranch Filing No. 1 development (SF 22-013). These plans also include the construction of public storm sewer within Vollmer Road to handle the anticipated developed flows from the urbanization of this stretch of the Vollmer Road corridor.

While there are three separate Final Plat filings proposed, based on the significant earth moving and overlot grading required to balance the material on-site, filings 1 and 2 will be graded at once as shown on the respective GEC plans. Filing 3 contains six individual 2.5 ac. min. lots that will require no overlot grading or roadway improvements as they will be accessed from the existing Poco Road (Public ROW). The GEC plan for Filing 2 will also include the rough grading of the future commercial parcel and the north PUD development parcel (both platted as Tract L). The GEC plan for Filing 1 includes the final design and construction of Pond 1, as represented in the "Preliminary Drainage Report for Retreat at PrairieRidge Filings 1-3 Preliminary Plan", prepared by Classic Consulting, approved 10/30/24. As previously described in this report, find the following upstream conditions that are all tributary to this property:

There are three major off-site basins north of Poco Road represented by EX-3, EX-4A and EX-4B. This nomenclature matches this same area as presented in the Sterling Ranch MDDP, the recently approved Jaynes Property MDDP (SKP-225) and the most recent Preliminary Drainage Report for Retreat at PrairieRidge Filings 1-3 Preliminary Plan (SP239). Currently there are multiple corrugated metal culverts within Poco Road allowing these off-site flows from the north to enter the site. However, a recent site investigation reports that these culverts are badly silted in with minimal flow able to be conveyed. They also appear to only be sized for the smaller storm events. As presented on the drainage map, it is recommended that El Paso County visually inspect these facilities and consider up-sizing for larger storm events based on the current basin hydrology or at a minimum clean out the current facilities to allow for better

conveyance. However, no evidence of the road overtopping at these crossing locations was found. This off-site property north of Poco Road seems to be all large lot rural residential with property sizes ranging from 5-acre to 35-acres. As this off-site basin stretches north it starts to get into the Black Forest north of Wildflower Road.

At the northern edge of the property there remains an out parcel with a home accessed from Poco Road that is not a part of the Retreat at PrairieRidge overall development. This area is also a highpoint in Poco Road and creates the two major natural ravines running north to south through the property. Near the corner of Poco Road and Vollmer Road there is also another existing home that also accesses Poco Road. This home is part of the development property and will eventually be abandoned and demolished. There are existing natural ravines on both sides of this existing home site that eventually combine into one and continue to travel in a southerly direction through the site towards an on-site stock pond near Vollmer Road. There are no records or design plans for this stock pond. For this existing condition analysis this pond was removed from the project model. In the central portion of the property exists several structures with gravel driveway access directly to Vollmer Road. These structures will also eventually be abandoned and demolished upon the proposed development. The natural ravine along the western portion of the property travels due south all the way to Vollmer Road. A few minor off-site basins (OS-1 and OS-2) from the neighboring large lot residential development to the west also drain onto the property. The entire site drains towards Vollmer Road and into the side road ditch along the west side of Vollmer. Only a very small portion of the site, represented by Basin EX-D, in the extreme northwest corner of the property sheet flows off-site. As mentioned earlier, the stretch of Vollmer Road is currently under construction with the storm facilities within this roadway already installed. Multiple storm sewer stubs have now been provided for this property and the off-site properties to the north of Poco Road. Please also reference the Appendix for the Homestead North drainage maps as reference material.

These ravines and stock pond areas contain some wetlands vegetation. These wetlands were field delineated by CORE Consultants, Inc. and provided on the drainage maps as shown. However, a Jurisdictional Determination (Action No. SPA-2022-00123) was provided by the Corps of Engineers finding that none of these wetland areas contain waters of the U.S. As such, these areas are NOT regulated by the U.S. Army Corps of Engineers under Section 404 of the Federal Clean Water Act. (See Appendix for JD) These wetland areas do appear to be within the site limits of Colorado State Waters per the CDPHE State Waters GIS data available and will be discussed further in the site specific SWMP. Given the non-jurisdictional status of these wetlands and the urban nature of this development, the majority of the wetlands within the urban lots will be removed with overlot grading, public roadway and utility construction.

The following descriptions represent the existing on and off-site basins and design points affecting this property as presented in the Preliminary Drainage Report for Retreat at PrairieRidge Filings 1-3 Preliminary Plan:

Design Point E1 (Q_5 = 14 cfs, Q_{100} = 82 cfs) consists of the approximated 77.0-acre off-site tributary area from Basin EX-4A. As mentioned earlier, this area is developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards Poco Road and the existing 24" CMP that is silted in. These off-site flows then enter the property within one of the natural ravines and convey the flows to the south towards the existing stock pond.

Design Point E2 (Q_5 = 10 cfs, Q_{100} = 58 cfs) consists of the approximated 70.0-acre off-site tributary area from Basin EX-4B. As mentioned earlier, this area is also developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards an off-site stock pond at the northwest corner of Poco Road and Vollmer Road. Verified visually in the field, this facility appears to have an 18" CMP outlet crossing Poco Road to the south. These off-site flows then enter the property within one of the natural ravines and convey the flows to the south towards the existing stock pond.

Design Point E3 (Q_5 = 1 cfs, Q_{100} = 7 cfs) consists of the 3.6-acre tributary area from Basins EX-A and EX-B. This on-site area drains in a southerly direction towards the side road ditch along Vollmer Road and then captured by a recently constructed Type D CDOT Inlet with a 24" RCP storm outfall. These facilities are detailed in the "Homestead North at Sterling Ranch Filing No. 1" Final Drainage Report and CDs, prepared by JR Engineering, approved Sept. 2022 (SF2213). The location of this facility is represented by Design Point 10 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 0.8 cfs, Q_{100} = 6.0 cfs).** (See Reference Material in Appendix) These improvements will be constructed with that development and the Vollmer Road improvements and are able to handle the minor additional flow based on capacity of the existing 24" pipe being 21.6 cfs. (See Appendix) The existing 24" CMP culvert near this location will be removed.

Design Point E4 (Q_5 = 25 cfs, Q_{100} = 155 cfs) consists of the 41.4-acre tributary area from on-site Basin EX-C along with the combined off-site flows from Design Points E1 and E2. These combined flows travel in the natural ravine towards the existing stock pond on-site. As mentioned earlier, this facility was removed for this existing drainage model. The total flows then travel towards Vollmer Road where they are then captured by a recently constructed 6' diameter overflow Manhole with grate and a 48" RCP storm outfall into the Vollmer storm system, also recently constructed. The location of this facility is represented by Design Point 20 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 27.1 cfs, Q_{100} = 190.9 cfs).** (See Reference Material in Appendix)

Design Point E5 (Q_5 = 12 cfs, Q_{100} = 70 cfs) consists of the approximated 44.3-acre off-site tributary area from Basin EX-3. As mentioned earlier, this area is developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards Poco Road and the existing 24" CMP that is silted in. These off-site flows then enter the property within the westerly natural ravine and convey the flows to the south through the property.

Design Point E6 (Q_5 = 2 cfs, Q_{100} = 13 cfs) consists of the 8.3-acre tributary area from the minor on-site Basin EX-G. These pre-developed flows travel in a southerly direction towards the road side ditch along the west side of Vollmer Road. A recently constructed existing CDOT Type D inlet captures these flows and routes them under Vollmer Road in a 24" RCP system. The location of the CDOT Type D Inlet facility is represented by Design Point 10 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 4.8 cfs, Q_{100} = 26.3 cfs).** (See Reference Material in Appendix)

Design Point E7 (Q_5 = 1 cfs, Q_{100} = 10 cfs) consists of the 6.5-acre tributary area from the minor on-site Basin EX-H. These pre-developed flows travel in a southerly direction towards the road side ditch along the west side of Vollmer Road. A recently constructed existing CDOT Type C inlet captures these flows and routes them under Vollmer Road in an 18" RCP system. The location of this CDOT Type C Inlet facility is represented by Design Point 11 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 2.2 cfs, Q_{100} = 12.3 cfs).** (See Reference Material in Appendix)

Design Point E8 (Q_5 = 20 cfs, Q_{100} = 125 cfs) consists of the 72.4-acre tributary area from the on-site Basin EX-E, the off-site basin OS-2 (5.3 ac.) along with the flows from Design Point E5. These combined flows travel in a southerly direction within the on-site natural ravines towards the side road ditch along Vollmer Road and a recently constructed existing 24" RCP culvert. This facility seems to be silted in and thus conveys little flow. Rather, the flows continue to be conveyed by the ditch in a southeasterly direction along the north side of Vollmer Road into basin EX-F.

Design Point E9 (Q_5 = 20 cfs, Q_{100} = 127 cfs) consists of the 8.7-acre tributary area from the on-site Basin EX-F, the off-site basin OS-1 (2.0 ac.) along with the flows from Design Point E8. These combined flows travel in a southeasterly direction within the side road ditch along Vollmer Road to the corner of the property. At this location, within the sideroad ditch and ROW for Vollmer Road, an exist. modified 4'x14' CDOT Type D Inlet was constructed along with the Homestead at

Sterling Ranch Filing No. 1 Development to capture these off-site flows. This facility has an existing 54" public RCP storm outfall that crosses Vollmer Road and passes through the Homestead at Sterling Ranch Filing No. 1 development and daylights directly into Sand Creek. The location of the CDOT Type D Inlet facility is represented by Design Point 12 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 18.9 cfs, Q_{100} = 133.7 cfs).** (See Reference Material in Appendix)

Design Point E10 (Q_5 = 0.4 cfs, Q_{100} = 3 cfs) consists of the 1.3-acre tributary area from the on-site Basin EX-D. This minor portion of the property sheet flows off-site into a natural ravine and then into a private stock pond on Lot 3A or Sunrise Meadow Subd. No. 2.

Unresolved:
This section should be ultimate or full-build condition. Provide "proposed" condition with only Filing 1 built. Depending on how far F2 is behind F1, will need to know who flows are conveyed thru F2 & 3 to F1.

PROPOSED DRAINAGE CONDITIONS

As mentioned earlier, all three Filings will be developed and constructed simultaneously and all calculations contained within are ultimate/full build-out condition and account for even the future PUD and Commercial developments within the overall Retreat at PrairieRidge development (Tract D in Filing No. 1 and Tract L within Filing No. 2). Overall stormwater quality design for this property includes proposed impervious areas that will sheet flow across yards and landscape areas to slow runoff and increase time of concentration. This will minimize the effects of impervious areas. The proposed detention facility (Pond 1) and the existing off-site detention facility (Pond C) within the Homestead North Filing No. 1 subd. will provide an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume with an outlet control device. Frequent and infrequent inflows are released at rates approximating undeveloped conditions. This concept provides some mitigation of increased runoff volume by releasing a portion of the increased runoff at a low rate over an extended period of time, up to 72 hours. This means that frequent storms, smaller than the 2-year event, will be reduced to very low flows near or below the sediment carrying threshold value for downstream drainage ways. Also, by incorporating an outlet structure that limits the 100-year runoff to the undeveloped condition

rate, the discharge hydrograph for storms between the 2-year and the 100-year event will approximate the hydrograph for the undeveloped conditions and will help effectively mitigate the effects of development.

Per the Sand Creek DBPS, this area was planned for both large lot residential and single family residential. There were no recommendations for detention facilities within the area but due to current drainage criteria, a detention/stormwater quality facility is proposed. The following are design points for developed conditions with descriptions of final and anticipated future basin areas and final storm systems:

As described in the recently approved Preliminary Drainage Report for Retreat at PrairieRidge Filings 1-3 Preliminary Plan and the Homestead North at Sterling Ranch Filing No. 1 FDR, the eastern portion of the overall property within Filings 2 & 3 and the existing rural large lots northeast of Poco Road have been accounted for in the off-site FSD Pond C, located just northeast of the intersection of Briargate Pkwy. and Wheatland Dr., recently constructed with the Homestead North at Sterling Ranch Filing No. 1 development. The existing storm systems, also recently constructed within the property and stubbed across Vollmer Road, collect these flows and convey them to this facility. The following basin descriptions are tributary to this facility:

Tributary area to Homestead North Filing No. 1 FSD Pond C (SF2213)

(These basins within the northeastern portion of Filing 2 are accounted in downstream storm systems and detention/stormwater quality facilities)

Design Point 1 (Q_5 = 11 cfs, Q_{100} = 76 cfs) consists of off-site flows from Basin EX-4A north of Poco Road and developed flows from Basin A. These combined flows will be collected by a proposed modified Type D CDOT inlet within a natural low point within drainage Tract I maintained by the Metro District. A private 42" RCP outfall will then route these flows further downstream into the proposed public storm system within the roadway. **Design Point 2 (Q_5 = 9 cfs, Q_{100} = 56 cfs)** consists of off-site flows from Basin EX-4B north of Poco Road and developed flows from Basin B.

These combined flows will be collected by a proposed modified Type D CDOT inlet within a natural low point within drainage Tract J maintained by the Metro District. A private 36" RCP outfall will then route these flows further downstream into the proposed public storm system within the roadway.

Design Point 3 (Q_5 = 5 cfs, Q_{100} = 22 cfs) consists of developed flows from Basins C1 and EX-4C. At this location, a 10' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via a public 18" RCP. The bypass flows (Q_5 = 0.3 cfs, Q_{100} = 11.7 cfs) will then travel to DP-4. **Design Point 4 (Q_5 = 2 cfs, Q_{100} = 17 cfs)** consists of developed flows from Basin C2 and the flow-by from DP-3. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 5 (Q_5 = 1.2 cfs, Q_{100} = 3 cfs)** consists of developed flows from Basin D. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is around the corner and south down Bluebell Meadow Way. **Pipe Run 8 (Q_5 = 21 cfs, Q_{100} = 129 cfs)** represents the total developed flows in the proposed public 48" RCP within Bluebell Meadow Way north of Sandstone Mesa Way.

Design Point 6 (Q_5 = 4 cfs, Q_{100} = 11 cfs) consists of developed flows from Basin E. At this location, a 10' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via a public 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 3.5 cfs) will enter Basin J and then travel to DP-11. **Design Point 7 (Q_5 = 1.8 cfs, Q_{100} = 5 cfs)** consists of developed flows from Basin F. At this location, a 10' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via a public 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 0.3 cfs) will also enter Basin J and travel to DP-11.

Design Point 8 (Q_5 = 3 cfs, Q_{100} = 6 cfs) consists of developed flows from Basin G. At this location, a 5' Type R sump inlet will completely collect these flows. With a max. 100-yr. ponding depth of

9", the emergency overflow route is over the curb to the south and into Dines Blvd. These collected flows will be routed further downstream via a private 18" RCP.

Design Point 9 (Q_5 = 4 cfs, Q_{100} = 9 cfs) consists of developed flows from Basin H. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 10 (Q_5 = 1.4 cfs, Q_{100} = 4 cfs)** consists of developed flows from Basin I. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the highpoint to the east within Sunlit Prairie Place.

Design Point 11 (Q_5 = 6 cfs, Q_{100} = 18 cfs) consists of developed flows from Basin J and flow-by from DP-6 and DP-7. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 12A (Q_5 = 3 cfs, Q_{100} = 5 cfs)** consists of developed flows from Basin K. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a private storm system through the park to the south. With a max. 100-yr. ponding depth of 12", the emergency overflow route is through the park to the south and into Basins M1 and M2. **Pipe Run 20 (Q_5 = 29 cfs, Q_{100} = 147 cfs)** represents the total developed flows in the proposed private 48" RCP storm system south of Dines Blvd. within the park.

Design Point 12B (Q_5 = 3 cfs, Q_{100} = 7 cfs) consists of developed flows from Basin N1 which accounts for a portion of the anticipated easterly portion of the future PUD development parcel. At this location, a future private 5' Type R sump inlet is planned with a private 18" RCP storm outfall. These flows will then directly connect to the large diameter private storm outfall through the park. **Design Point 12C (Q_5 = 1 cfs, Q_{100} = 2 cfs)** consists of developed flows from Basin M1 which accounts for a small portion of the park site including the proposed parking lot. At this location, a proposed private 5' Type R sump inlet is planned with a private 18" RCP storm outfall.

These flows will also then directly connect to the large diameter private storm outfall through the park.

Design Point 13 (Q_5 = 5 cfs, Q_{100} = 11 cfs) consists of developed flows from Basin N2 which accounts for the remaining easterly portion anticipated from the future PUD development parcel. At this location, a private 24" RCP storm stub is provided for these future flows.

Design Point 14 (Q_5 = 1 cfs, Q_{100} = 7 cfs) consists of developed flows from Basin M2. At this location, an existing manhole with grated lid was anticipated to and will collect these developed flows. **Pipe Run 23 (Q_5 = 32 cfs, Q_{100} = 156 cfs)** represents the total developed flows tributary to the existing 48" RCP storm outfall mentioned earlier at this location, represented by Design Point 2o within the Homestead North at Sterling Ranch Filing No. 1 development (SF2213) **(Q_5 = 27.1 cfs, Q_{100} = 190.9 cfs).**

Design Point 15 (Q_5 = 2 cfs, Q_{100} = 4 cfs) consists of developed flows from Basin Q1. At this location an existing Type D inlet collects the flows in a natural low point behind the roadside ditch. This facility was constructed along with the Vollmer Road improvements (CDR218) and has a 24" RCP storm outfall that routes the flows further south within Vollmer Road. This compares to the Homestead North Fil. No. 1 FDR represented by DP-1o **(Q_5 = 0.8 cfs, Q_{100} = 6 cfs).**

Design Point 16 (Q_5 = 4 cfs, Q_{100} = 7 cfs) consists of developed flows from Basins Q2 and Q3. At this location another existing Type D inlet collects the flows in a natural low point where the sideroad ditch ends and the curb and gutter along Vollmer starts. This facility was constructed along with the Vollmer Road improvements and has a 24" RCP storm outfall that routes the flows further south within Vollmer Road. This compares to the Homestead North Fil. No. 1 FDR represented by DP-1D **(Q_5 = 2.4 cfs, Q_{100} = 6 cfs).**

Design Point 17 (Q_5 = 0.9 cfs, Q_{100} = 2.2 cfs) consists of developed flows from Basin L2. At this location an existing 5' Type R at-grade inlet collects the majority of the flows. The bypass flows

(Q_5 = 0.0 cfs, Q_{100} = 0.3 cfs) will then travel further down Vollmer Road. This facility was constructed along with the Vollmer Road improvements and has an 18" RCP storm outfall that routes the flows further south within Basin L3 and the west half of Vollmer Road. This compares to the Homestead North Fil. No. 1 FDR represented by DP-4D **(Q_5 = 0.5 cfs, Q_{100} = 1.1 cfs).**

Design Point 18 (Q_5 = 3 cfs, Q_{100} = 8 cfs) consists of developed flows from Basins L1, L3 and the 100 yr. by-pass flows from DP-17. At this location an existing 10' Type R at-grade inlet collects the majority of the flows. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 1.7 cfs) will then travel further down Vollmer Road. This facility was constructed along with the Vollmer Road improvements. The existing 48" RCP storm system within Vollmer Road, mentioned earlier conveys the collected flows further downstream. This compares to the Homestead North Fil. No. 1 FDR represented by Basin D6 **(Q_5 = 2.5 cfs, Q_{100} = 5.2 cfs).**

Design Point 19 (Q_5 = 2 cfs, Q_{100} = 7 cfs) consists of developed flows from Basin P2 and the 100 yr. by-pass flows from DP-18. At this location an existing 15' Type R at-grade inlet collects 100% of the flows. This facility was constructed along with the Vollmer Road improvements. The existing 48" RCP storm system within Vollmer Road, mentioned earlier conveys the collected flows further downstream. This compares to the Homestead North Fil. No. 1 FDR represented by DP-8D **(Q_5 = 2.5 cfs, Q_{100} = 14.3 cfs).**

These total off-site flows, along with collected flows from the Vollmer Road improvements, then travel via an existing 60" RCP (Sterling Ranch designed) south down Vollmer then southeast down Briargate Parkway towards Pond C just north of Briargate Parkway and west of Sand Creek within the Homestead North Filing No. 1 development. (See Reference Material in Appendix) This is the maximum developed flows allowed to be released at this location and treated further downstream in Pond C with the Sterling Ranch Development. (See Appendix for applicable

reference material) The following represents a comparison of total acreage and imperviousness tributary to Pond C:

Retreat at PrairieRidge Fil. 1, 2 & 3 FDR:		**Homestead North Fil. 1 FDR:**	
Tributary Area	**197.4 ac.**	**Tributary Area**	**224.3 ac.**
Impervious %	**11.9%**	**Impervious %**	**10.3%**

The intent of this FDR is to maintain what was previously planned for the total off-site flows and imperviousness tributary to Pond C. Reference the Appendix for Pond C sizing verification based on the re-analyzed total tributary area and Imp. % as described above. This analysis shows that the current Pond C design intent is still met and no adjustments to the Pond C outlet structure/plate are required. Based on recent field investigation, this facility seems to be in good working order.

Tributary area to proposed on-site FSD Pond 1

(The following basins are within Filing 2 that are accounted in downstream storm systems and detention/stormwater quality facilities)

Design Point 20 (Q_5 = 2 cfs, Q_{100} = 12 cfs) consists of off-site flows from Basin EX-3A and developed flows from Basin R. These combined flows will travel within the public drainage easement and routed further downstream towards DP 21. **Design Point 21 (Q_5 = 14 cfs, Q_{100} = 84 cfs)** consists of off-site flows from Basin EX-3 north of Poco Road, developed flows from Basin S and then the previously described DP-20. These combined flows will be collected by a proposed modified Type D CDOT inlet within a natural low point within drainage Tract H maintained by the Metro District. A private 42" RCP outfall will then route these flows further downstream into the proposed public storm system within the roadway.

Design Point 22 (Q_5 = 3 cfs, Q_{100} = 12 cfs) consists of developed flows from Basin U. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 23 (Q_5 = 1.6 cfs, Q_{100} = 3 cfs)** consists of developed flows from Basin V. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is around the corner and south down Foxglove Field Dr. **Pipe Run 27 (Q_5 = 18 cfs, Q_{100} = 94 cfs)** represents the total developed flows within the public 42" RCP storm system at this point.

Design Point 24 (Q_5 = 6 cfs, Q_{100} = 16 cfs) consists of developed flows from Basin W. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 25 (Q_5 = 0.5 cfs, Q_{100} = 1.2 cfs)** consists of developed flows from Basin X. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the highpoint in the roadway and southwest down Sunlit Prairie Place. **Pipe Run 30 (Q_5 = 6 cfs, Q_{100} = 17 cfs)** represents the total developed flows within the public 30" RCP storm system at this point.

Design Point 26 (Q_5 = 4 cfs, Q_{100} = 12 cfs) consists of developed flows from Basin Y. At this location, a 10' Type R sump inlet will completely collect these flows. **Design Point 27 (Q_5 = 2 cfs, Q_{100} = 6 cfs)** consists of developed flows from Basin Z. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is due south within the open space tract towards Briargate Pkwy. **Pipe Run 34 (Q_5 = 27 cfs, Q_{100} = 118 cfs)** represents the total developed flows within the public 48" RCP storm system at this point.

Design Point 28 (Q_5 = 2 cfs, Q_{100} = 8 cfs) consists of developed flows from off-site basin OS-2A and Basin AA. At this location, a private CDOT Type C sump inlet within a drainage esmt. will completely collect these flows. A private 18" RCP storm will convey these flows further downstream. **Design Point 29 (Q_5 = 1 cfs, Q_{100} = 6 cfs)** consists of developed flows from off-site Basin OS-2B and Basin BB. At this location, another private CDOT Type C inlet will completely collect these flows. The collected flows from these sump conditions will then be routed further downstream within a private 24" RCP storm system within a drainage easement at the rear of these lots. With a max. 100-yr. ponding depth of 12", the emergency overflow route is due south within the associated drainage easements and then ultimate into Briargate Pkwy. **Pipe Run 36 (Q_5 = 3 cfs, Q_{100} = 13 cfs)** represents the total developed flows within the private 24" RCP storm system at this point.

Tributary area to proposed on-site FSD Pond 1

(The following basins are areas within Filing 1 and have accounted for the anticipated upstream Filing 2 development described above)

Design Point 30 (Q_5 = 4 cfs, Q_{100} = 8 cfs) consists of developed flows from Basin EE. At this location, a 5' Type R sump inlet will completely collect these flows. **Design Point 31 (Q_5 = 4 cfs, Q_{100} = 10 cfs)** consists of developed flows from Basin FF. At this location, a 10' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the highpoint to the west and then west in Briargate Pkwy. towards DP-33. **Pipe Run 40 (Q_5 = 7 cfs, Q_{100} = 16 cfs)** represents the total developed flows within the public 24" RCP storm system at this point, including the anticipated upstream future development.

Design Point 32 (Q_5 = 2 cfs, Q_{100} = 4 cfs) consists of developed flows from Basin DD. At this location, a 5' Type R sump inlet will completely collect these flows. **Design Point 33 (Q_5 = 2 cfs,**

Q_{100} = 6 cfs) consists of developed flows from Basin CC. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the highpoint in the roadway and south down Dines Blvd. **Pipe Run 42 (Q_5 = 4 cfs, Q_{100} = 9 cfs)** represents the total developed flows collected by these two inlets that then combine with the previously described upstream collected flows. **Pipe Run 44 (Q_5 = 36 cfs, Q_{100} = 144 cfs)** represents the total developed flows within the public 48" RCP storm system at this point.

Design Point 34 (Q_5 = 2 cfs, Q_{100} = 5 cfs) consists of developed flows from Basin JJ. At this location, a 5' Type R sump inlet will completely collect these flows. The collected flows from this sump condition within the cul-de-sac will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the curb and south down Dines Blvd. **Pipe Run 46 (Q_5 = 38 cfs, Q_{100} = 146 cfs)** represents the total developed flows within the public 48" RCP storm system as it heads south within Dines Blvd.

Design Point 35 (Q_5 = 4 cfs, Q_{100} = 9 cfs) consists of developed flows from Basin KK. At this location, a 10' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via an 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 2.2 cfs) will then travel towards DP-36. **Design Point 36 (Q_5 = 4 cfs, Q_{100} = 10 cfs)** consists of developed flows from Basin LL and flow-by from DP-35. At this location, a 10' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via an 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 2.8 cfs) will then travel to DP-38. **Pipe Run 50 (Q_5 = 43 cfs, Q_{100} = 155 cfs)** represents the total developed flows within the public 48" RCP storm system at this point.

Please provide this analysis in appendix

DP 43 per routing spreadsheet

Design Point 37 (Q_5 = 7 cfs, Q_{100} = 13 cfs) consists of developed flows from Basins NN1 and NN2 along with the 100-yr. flow-by from DP-41 and DP-42. However, it is assumed based on flow spread and road grade at the intersection of Vollmer and Dines that 50% of the developed flow from Basin NN2 and the 100-yr. flow-by will continue south down Vollmer rather than turning the corner towards DP-37. These flows are then accounted for further downstream at DP-47. At DP-37, a 10' Type R sump inlet will completely collect the developed flows. **Design Point 38 (Q_5 = 5 cfs, Q_{100} = 13 cfs)** consists of developed flows from Basin MM and the flow-by from DP-36. At this location, a 10' Type R sump inlet will completely collect these flows. The collected flows from this sump condition will then be routed further downstream within a public storm system within the roadway. With a max. 100-yr. ponding depth of 12", the emergency overflow route is over the highpoint to the southeast and then southwest down Vollmer Road. **Pipe Run 55 (Q_5 = 63 cfs, Q_{100} = 199 cfs)** represents the total developed flows within the public 60" RCP storm system at this point.

Design Point 39 (Q_5 = 15 cfs, Q_{100} = 32 cfs) consists of Basin II which represents the anticipated future PUD development parcel (65% imp.) south of Briargate Pkwy., platted as Tract D with Filing 1. Exact tributary area will be better defined with the future FDR for this PUD development. At this location, a proposed 30" RCP storm stub will be provided to handle the future PUD development.

Design Point 40 (Q_5 = 11 cfs, Q_{100} = 23 cfs) consists of Basin O which represents the anticipated future PUD development parcel north of Briargate Pkwy., platted as Tract L with Filing 2. This project has now formally been submitted as (Retreat at PrairieRidge North PUD – PUDSP253) The proposed Basin O remains consistent with Basins E&F found in that report. At this location, a proposed 30" RCP storm stub will be provided to handle the future PUD development.

Design Point 41 (Q_5 = 14 cfs, Q_{100} = 26 cfs) consists of Basin P1 which represents the anticipated future commercial development parcel (95% imp.) north of Briargate Pkwy., also platted as Tract

L with Filing 2. Exact tributary area will be better defined with the future FDR for this commercial development. At this location, a proposed 30" RCP storm stub will be provided to handle the future commercial development.

Indicate that flows to DP-37 are only 50% and other 50% continue to DP 47 (South along Vollmer) per provided analysis in appendix

Design Point 42 (Q_5 = 5 cfs, Q_{100} = 11 cfs) consists of developed flows from Basin GG. At this location, a 15' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via an 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 1.2 cfs) will then travel south down Vollmer towards DP-37. **Design Point 43 (Q_5 = 5 cfs, Q_{100} = 10 cfs)** consists of developed flows from Basin HH. At this location, a 15' Type R at-grade inlet will collect a portion of the flows. These collected flows will be routed further downstream via an 18" RCP. The bypass flows (Q_5 = 0.0 cfs, Q_{100} = 0.8 cfs) will then travel around the corner down Vollmer Road towards DP-37. **Pipe Run 62 (Q_5 = 31 cfs, Q_{100} = 62 cfs)** represents the total developed flows within the private 36" RCP storm system at this point, including the anticipated upstream future development.

Design Point 44 (Q_5 = 3 cfs, Q_{100} = 8 cfs) consists of developed flows from Basin OO. At this location, a 10' Type R sump inlet will completely collect these flows. The collected flows from this sump condition within the cul-de-sac will then be routed further downstream within a public storm system within the park tract. With a max. 100-yr. ponding depth of 9", the emergency overflow route is over the curb and south within the park. **Design Point 45 (Q_5 = 4 cfs, Q_{100} = 15 cfs)** consists of developed flows from off-site basin OS-2C and Basins PP, UU and TT. Developed runoff from these basins combine and will be conveyed within a proposed natural swale within a 30' private drainage esmt. at the rear of lots 30, 31, 41 and 42. (See Appendix for calculations) This swale will be maintained by each individual property owner. The private storm facilities within this esmt. will be maintained by the HOA. At Design Point 45, a private CDOT Type C sump inlet located within a drainage esmt. will completely collect these flows. A private 24" RCP storm will convey these flows further downstream. **Design Point 46 (Q_5 = 1 cfs, Q_{100} = 5 cfs)** consists of developed flows from off-site Basin OS-1A and Basin QQ. Developed runoff from these two

basins combine and will be conveyed within a proposed natural swale within a 30' private drainage esmt. at the rear of lots 7, 8 and 19. (See Appendix for calculations) This swale will also be maintained by each individual property owner, with the private storm facilities within this esmt. maintained by the HOA. At Design Point 46, another private CDOT Type C inlet will completely collect these flows. The collected flows from these sump conditions will then be routed further downstream within a private 24" RCP storm system within a drainage easement at the rear of these lots. With a max. 100-yr. ponding depth of 12", the emergency overflow route is due south within the associated drainage easements and then ultimate into the proposed pond.

Design Point 47 (Q_5 = 3 cfs, Q_{100} = 10 cfs) consists of developed flows from Basin VV1, VV2 and 50% of the 100-yr. flows that are anticipated to not turn the corner at Dines Blvd. and continue south down Vollmer Road from Basin NN2 and flow-by from DP-42 and DP-43. At this location, an existing 15' Type R sump inlet will collect the majority of these flows. The minimal bypass flows (Q_5 = 0.0 cfs, Q_{100} = 0.8 cfs) will then travel south down Vollmer into the existing sideroad ditch.

Design Point 48 (Q_5 = 95 cfs, Q_{100} = 278 cfs) consists of the total tributary area to Pond 1, including the following two basins that sheet flow directly into this facility: **Basin OS-1B** (Q_5 = 0.3 cfs, Q_{100} = 1.6 cfs) consists of an off-site basin made up of rear yards of the adjacent rural Wildridge Subd. that will continue to sheet flow onto this property into Basin RR. **Basin RR** (Q_5 = 3 cfs, Q_{100} = 15 cfs) consists of rear yards from the proposed lots, the proposed park and the detention pond area itself. This basin sheets flows directly into Pond 1.

Design Point 49 (Q_5 = 0.6 cfs, Q_{100} = 3 cfs) consists of the west 1/3 of the 3.2 ac. lot 1 within Filing No. 3, also known as Basin T. This area will continue to travel off-site as sheet flow based on the exclusion for large lot development per ECM I.7.1.B.5.

Design Point 50 (Q_5 = 0.2 cfs, Q_{100} = 1.1 cfs) consists of minor sheets flows from Basin SS. This basin is on the backside of the proposed Pond 1, with no proposed impervious area and will continue to sheet flow towards Vollmer Road and enter the existing sideroad ditch based on the exclusion for disturbance to undeveloped land that will remain undeveloped per ECM I.7.1.B.7.

Pipe Run 68 (Q_5 = 92 cfs, Q_{100} = 264 cfs) represents the total developed flows discharging into the proposed FSD Pond 1 via the proposed 66" RCP storm system. This outfall will include the design of the required impact structure and concrete forebay. (See Appendix for design)

DETENTION FACILITIES / STORMWATER QUALITY

Storm water quality measures will be utilized in order to reduce the amount of sediment, debris and pollutants that are allowed to enter Sand Creek. These features include Full Spectrum Extended Detention Basin Sedimentation Facilities. Site Planning and design techniques should limit impervious area, minimize directly impervious area, lengthen time of travel and increase infiltration in order to decrease the rate and volume of stormwater runoff. Facilities that require detention will provide an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume that will release the more frequent storms at a slower rate to help minimize the effects of development of this property.

The proposed Pond 1 is intended to provide detention and stormwater quality for nearly the entire western portion of the property, including the off-site basin EX-3 north of Poco Road and excluding Basin T (1.3 Ac.) and any area that is tributary and being treated by the off-site Pond C within the Sterling Ranch Development as described above. The total anticipated developed flows entering this facility are as follows:

(See Appendix for MHFD-Detention pond design sheets):

<u>Pond 1</u> (Full Spectrum EDB)

Total Tributary Acreage: 143.83 ac.

Total Site Impervious tributary to Pond 1: 32.2%

1.896 Ac.-ft. WQCV required

2.884 Ac.-ft. EURV required with 4:1 max. slopes

5.206 Ac.-ft. 100-yr. required storage

9.986 Ac.-ft. required total

15.768 Ac.-ft. provided

Total Peak In-flow: Q_5 = 95 cfs, Q_{100} = 278 cfs

Pond Peak Design Release: Q_5 = 14.3 cfs, Q_{100} = 112.5 cfs

Release per Homestead at Sterling Ranch Filing 1 (DP-12): Q_5 = 18.9 cfs, Q_{100} = 133.7 cfs

The following shows a comparison of the total developed flows tributary and released from the proposed FSD Pond 1 at Design Point 48, including Basin RR:

Proposed Developed Flows:	**Flows per Retreat at PrairieRidge PDR:**
Q_5 = 95 cfs, Q_{100} = 278 cfs	**Q_5 = 93 cfs, Q_{100} = 279 cfs**

(See Appendix for Area Runoff/effective imperviousness tributary to this off-site existing facility)

Proposed Release:	**Prop. Release per Homestead North Fil. 1 FDR:**
Q_5 = 14.3 cfs, Q_{100} = 112.5 cfs	**Q_5 = 18.9 cfs, Q_{100} = 133.7 cfs**

This proposed detention facility is to be private with maintenance by the PrairieRidge Metro District No. 1 with all drainage facilities within the public Right of Way to be public with maintenance by El Paso County. As mentioned previously in this report, just outside of the very southwest corner of the property, within the Vollmer Road ROW exists a (Sterling Ranch designed) 4'x14' modified CDOT Type D inlet with a 54" RCP storm outfall. This facility was

planned to accept and convey treated developed flows per the "Homestead at Sterling Ranch Filing No. 1" Final Drainage Report and CDs (SF1725), prepared by M&S Civil Consultants, Inc. approved Nov. 2018. It is anticipated that the proposed Pond 1 storm outfall will connect directly to this facility. These flows are then routed via the existing 54" RCP storm system (maintained by Sterling Ranch Metro. District) directly to Sand Creek.

Unresolved:
Include discussion on swales within the site & provide calculations in appendix.

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual basin design used for detention/SWQ basin sizing was calculated using the Rational Method. Runoff Coefficients are based on the imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. The average rainfall intensity, by recurrence interval found in the Intensity-Duration-Frequency (IDF) curves in Figure 6-5. FlowMaster Ver. 10.03 used for storm sewer and swale design, UD-Sewer 2009 Ver. 1.4.0.22 used for storm sewer HGL design, Mile High Flood District UD-BMP Ver. 3.07 used for EDB forebay sizing, Mile High Flood District UD-Inlet spreadsheet Ver. 4.05 used for inlet calculations and (MHFD)-Detention spreadsheet Ver. 4.06 used for Final Detention/SWQ design. (See Appendix)

The City of Colorado Springs/El Paso County DCM requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls. The Four Step Process pertains to management of smaller, frequently occurring storm events, as opposed to larger storms for which drainage and flood control infrastructure are sized. Implementation of these four steps helps to achieve storm water permit requirements.

This site adheres to this **Four Step Process** as follows:

1. **Employ Runoff Reduction Practices:** Proposed urban lot impervious areas (roof tops, patios, etc.) will sheet flow across landscaped yards and through open space areas to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets or detention facilities. This will minimize directly connected impervious areas within the project site.

Reference the Water Quality Treatment Plan Map in the Appendix for the following calculations:

Area treated in existing off-site permanent Pond C within Homestead North Filing 1 – SF2213 (Basins EX-4A, 4B, 4C, A-N, Q1, Q2, Q3)	197.40 ac.
Area treated in proposed on-site Pond 1 (Basins EX-3, 3A, OS-1A thru OS-2C, O-P2, R, S, U-RR, TT, UU)	143.83 ac.
Area with Exclusion I.7.1.B.5 (Large lot single family site – Basin T)	1.3 ac.
Area with Exclusion I.7.1.B.7 (Disturbance to undev. land to remain undeveloped) (Basins VV1 and SS)	1.1 ac.
Area with Exclusion I.7.1.B.9 (Trails – Basin VV2)	1.4 ac.
Filing No. 1 total platted area	**44.46 ac.**
Filing No. 2 total platted area	**80.65 ac.**
Filing No. 3 total platted area	**17.02 ac.**

2. **Stabilize Drainageways:** The two major natural drainageways on-site within basins A, G and J will be overlot graded and urbanized with the proposed residential development. Within this development, urban street sections will be constructed along with buried storm systems to handle the developed runoff. The larger residential lots towards the north portion of these basins (Filing 3) will be planned such to adequately accept these off-site flows within their natural corridors. After developed flows utilize the runoff reduction practices through the front and rear yards, developed flows will travel via curb and gutter within the public streets and eventually public storm systems. These collected flows are then routed directly to the proposed extended detention basin (full-spectrum facility).

3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV and excess urban runoff volume (EURV) in the proposed Full-Spectrum permanent Extended Detention Basin designed per current El Paso County drainage criteria. The few basins that are not able to be captured and routed to a permanent extended detention basin (T, SS, VV1 and VV2) qualify for exclusions I.7.1.B.5 – Large Lot 2.5 ac., I.7.1.B.7 – Undev. land to remain undev. and I.7.1.B.9 – Trails.

4. **Consider need for Industrial and Commercial BMPs**: No industrial uses are proposed within this development. However, a site-specific storm water quality and erosion control plan and narrative will be submitted along with the grading and erosion control plan. Details such as site-specific sediment and erosion control construction BMP's as well as temporary and permanent BMP's for commercial use will be detailed in this plan and narrative to protect receiving waters. Multiple temporary BMP's are anticipated based on specific phasing of the overall development. BMP's will be constructed and maintained as the development has been graded and erosion control methods employed.

FLOODPLAIN STATEMENT

No portion of this site is located within a floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Numbers 08041C0533G and 0841C0535G, effective date, December 7, 2018 (See Appendix).

DRAINAGE AND BRIDGE FEES

All three filings lie entirely within the Sand Creek Drainage Basin boundaries. The following are anticipated drainage and bridge fees (per filing) using the following impervious acreage method approved by El Paso County.

Retreat at PrairieRidge Filing No. 1 has a total area of 44.46 acres with the following different land uses proposed:

Per plat area for lots totals 11.59 acres

Per Plat ROW area is 10.28 acres

9.33 Ac.	Park/Open Space/Pond Tracts (Tracts A-C)
5.68 Ac.	Urban Lots (RR-0.5 zone with avg. Lot Size = 0.7 ac.)
8.92 Ac.	Urban Lots (RS-6000 zone with avg. Lot Size = 7,350 SF)
7.27 Ac.	Briargate Pkwy. and Dines Blvd. Right-of-Way
13.26 Ac.	**Future PUD Development Tract D (Not included in fees) Fees paid upon development and re-plat of Tract D)**
44.46 Ac.	**Total**

The percent imperviousness for this subdivision is calculated as follows:

Fees for Park/Open Space/Pond Tracts

(Per El Paso County Percent Impervious Chart: 7**%**)

9.33 Ac. x 7% = **0.65 Impervious Ac.**

Fees for Urban Lots (Avg. Lot Size of 0.7 Ac.)

(Per El Paso County Percent Impervious Chart: 23**%**)

5.68 Ac. x 23% = **1.31 Impervious Ac.**

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Fees for Urban Lots (Avg. Lot Size of 7,350 SF)

(Per El Paso County Percent Impervious Chart: 48**%**)

8.92 Ac. x 48% = **4.28 Impervious Ac.**

Fees for Briargate Pkwy and Dines Blvd. ROW

(Per El Paso County Percent Impervious Chart: 80**%**)

7.27 Ac. x 80% = **5.82 Impervious Ac.**

Total Impervious Acreage: **12.06 Imp. Ac.** (Drainage Fees)

Total Impervious Acreage: **12.06 Imp. Ac.** (Bridge Fees)

The following calculations are based on the 2025 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS (Filing No. 1):

Bridge Fees

$ 11,270.00 x 12.06 Impervious Ac. = **$ 135,916.20**

Drainage Fees

$ 27,554.00 x 12.06 Impervious Ac. = **$ 332,301.24**

Credits within the basin will be used. Please reference the "Pre-credits" table below.

<u>Retreat at PrairieRidge Filing No. 2</u> has a total area of 80.65 acres with the following different land uses proposed:

Per Filing 2 plat lot area is 38.35 acres

10.15 Ac.	Park/Open Space Tracts (Tracts A-K)
8.20 Ac.	Urban Lots (RR-0.5 zone with avg. Lot Size = 0.7 ac.)
42.32 Ac.	Urban Lots (RS-6000 zone with avg. Lot Size = 10,270 SF)
19.98 Ac.	**Future PUD Development Tract L (Not included in fees) Fees paid upon development and re-plat of Tract L)**
80.65 Ac.	**Total**

Per Plat ROW area is 12.17 acres

The percent imperviousness for this subdivision is calculated as follows:

<u>Fees for Park/Open Space Tracts</u>

(Per El Paso County Percent Impervious Chart: 7**%**)

10.15 Ac. x 7% = **0.71 Impervious Ac.**

<u>Fees for Urban Lots</u> (Avg. Lot Size of 0.7 Ac.)

(Per El Paso County Percent Impervious Chart: 23**%**)

8.20 Ac. x 23% = **1.89 Impervious Ac.**

<u>Fees for Urban Lots</u> (Avg. Lot Size of 10,270 SF)

(Per El Paso County Percent Impervious Chart: 40**%**)

42.32 Ac. x 40% = **16.93 Impervious Ac.**

Total Impervious Acreage: **19.53 Imp. Ac.** (Drainage Fees)

Total Impervious Acreage: **19.53 Imp. Ac.** (Bridge Fees)

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The following calculations are based on the 2025 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS (Filing No. 2):

Bridge Fees

$ 11,270.00 x 19.53 Impervious Ac. = **$ 220,103.10**

Drainage Fees

$ 27,554.00 x 19.53 Impervious Ac. = **$ 538,129.62**

Credits within the basin will be used. Please reference the "Pre-credits" table below.

Add note that credits are for drainage fees only. Bridge fees will need to be paid, for all 3 filings.

Retreat at PrairieRidge Filing No. 3 has a total area of 17.02 acres with the following land use:

17.02 Ac. Rural Residential 2.5 ac. min. (6 lots)

17.02 Ac. Total

The percent imperviousness for this subdivision is calculated as follows:

Fees for Rural Residential 2.5 ac. min. lots

(Per El Paso County Percent Impervious Chart: 11**%**)

17.02 Ac. x 11% = **1.87 Impervious Ac.**

Total Impervious Acreage: **1.87 Imp. Ac.** (Drainage Fees)

Total Impervious Acreage: **1.87 Imp. Ac.** (Bridge Fees)

However, per the ECM Appendix L 3.10.2a, this development requests a 25% reduction for low density lots.

The following calculations are based on the 2025 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS (Filing No. 3):

Bridge Fees

$ 11,270.00 x 1.87 Impervious Ac. = **$ 21,074.90**

Drainage Fees

$ 27,554.00 x 75% x 1.87 Impervious Ac. = **$ 38,644.49**

Credits within the basin will be used. Please reference the "Pre-credits" table below.

CONSTRUCTION COST OPINION

Private Full-Spectrum Detention Facility (Pond 1 in Tract A)

ITEM	DESCRIPTION	QUANTITY	UNIT COST	COST
1.	Impact/Forebay Structure	1 EA	$ 120,000.00	$ 120,000.00
2.	Concrete Outlet Structure	1 EA	$ 60,000.00	$ 60,000.00
3.	Concrete Trickle Channel	555 LF	$ 70.00/LF	$ 38,850.00
4.	Handrail	154 LF	$ 220.00/LF	$ 33,880.00
5.	Concrete Overflow Wall	102 LF	$150.00/LF	$ 15,300.00
6.	Rip-Rap Spillway	175 CY	$ 76/CY	$ 13,300.00
7.	Outlet pipe (42" RCP)	405 LF	$ 216/LF	$ 87,480.00
8.	Type I Storm MH	2 EA	$ 16,265.00	$ 32,530.00
9.	Connection to CDOT Inlet	1 EA	$ 5,000.00	$ 5,000.00
SUB-TOTAL				$ 406,340.00
10% ENGINEERING				$ 40,634.00
5% CONTINGENCY				$ 20,317.00
TOTAL				**$ 467,291.00**

Unresolved:
Provide estimate of proposed public storm infrstructure

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Sterling Ranch Drainage/Surety Fees and Drainage Fee Worksheet

Drainage Fees offsets (deferrals) for regional drainage improvements established in SIA (reception No. , PCD File)

EPC Proj #	Plat #	Resolution	Subdivision Name	Drainage Fee Paid	Drainage Fee offset used	pay out (disbursement)	Pre-Credits	Pre-Credit balance
SF 2015		21-402	Reimbursable Estimate Channel Segment 159 & 164 (SRF2)				$ 1,918,065.00	$ 1,918,065.00
SF 2213		RAA	Reimbursable Estimate Channel Segment 169 & 186 (HN F1)				$ 611,628.00	$ 2,529,693.00
CDR 2004			Reimbursable Estimate Mainstem Segment 170, 187 & 163 (SC Plans)				$ 7,910,175.90	$ 10,439,868.90
								$ 10,439,868.90
SF1613	14151	18-058	Sterling Ranch Filing 1		$ (232,075.77)			$ 10,207,793.13
SF1724	14262	18-474	Branding Iron at Sterling Ranch Filing 1		$ (85,783.58)			$ 10,122,009.55
SF1725	14279	18-475	Homestead at Sterling Ranch Filing 1		$ (133,756.97)			$ 9,988,252.58
SF194	14621	20-156	Homestead at Sterling Ranch Filing 2	$ (258,392.36)				$ 9,988,252.58
SF1918	14654	20-212	Branding Iron at Sterling Ranch Filing 2	$ (189,531.25)				$ 9,988,252.58
								$ 9,988,252.58
SF 2015	14894	21-402	Sterlilng Ranch Filing 2		$ (400,855.70)			$ 9,587,396.88
SF 2132	14995	RAA - 222087110	Sterling Ranch Filing 3		$ (214,430.37)			$ 9,372,966.51
SF2213	15150	RAA - 222146148	Homestead North Filing 1		$ (541,255.00)			$ 8,831,711.51
SF2218	15218	RAA - 222148335	Homestead North Filing 2		$ (310,413.22)			$ 8,521,298.29
SF 2229	15243	RAA - 223041868	Homestead North Filing 3		$ (399,632.48)			$ 8,121,665.81
SF2230		RAA - 223095323	Sterling Ranch Filing 4		$ (576,864.11)			$ 7,544,801.70
SF2316		RAA - 223103469	Copper Chase		$ (274,778.50)			$ 7,270,023.20
SF241		RAA - 224034514	Sterling Ranch Filing 5		$ (181,474.56)			$ 7,088,548.64
SF1909	14653	20-274	Timberridge Filing 1		$ (197,544.20)			$ 6,891,004.44
SF12121	15015	RAA - 222076210	Timberridge Filing 2	$ (34,665.50)	$ (228,326.80)			$ 6,662,677.64
SF2241	15418	23-420	Timberridge Filing 3		$ (40,297.76)			$ 6,622,379.88
SF1827	15427	24-272	Timberridge Filing 4		$ (52,966.76)			$ 6,569,413.12
SF2439			Villages at Sterling Ranch		$ (554,386.48)			$ 6,015,026.64
SF2235	15459	RAA - 223103470	Sterling Ranch East Filing 1		$ (820,315.47)			$ 5,194,711.17
SF2237		RAA - 223103468	Sterling Ranch East Filing 2		$ (126,584.79)			$ 5,068,126.38
SF2325	15466	24-390	Sterling Ranch Recycling Subd.		$ (517,494.34)			$ 4,550,632.04
SF2428			Sterling Ranch East Filing 3		$ (366,216.64)			$ 4,184,415.40
SF2236			Foursquare at Sterling Ranch East Filing 1					$ 4,184,415.40
SF2430			Sterling Ranch East Filing 5		$ (469,834.56)			$ 3,714,580.84
SF257			Retreat at PrairieRidge Filing No. 1		$ (332,301.24)			$ 3,382,279.60
SF259			Retreat at PrairieRidge Filing No. 2		$ (538,129.62)			$ 2,844,149.98
SF2520			Retreat at PrairieRidge Filing No. 3		$ (38,644.49)			$ 2,805,505.49
								$ 3,714,580.84
			totals	**$ (482,589.11)**	$ (7,634,363.41)	$ -	$ 10,439,868.90	**$ 2,805,505.49**

Plat Recorded

Did not come up with the same totals. Please verify

Sterling Ranch Bridge/Surety Fees and Bridge Fee Worksheet

Bridge Fees offsets (deferrals) for bridge improvements established in SIA (reception No. , PCD File)

EPC Proj #	Plat #	Resolution	Subdivision Name	Bridge Fee Paid	Bridge Fee offset used	pay out (disbursement)	Pre-Credits	Pre-Credit balance
CDR2113			Briargate Parkway Bridge				$ 1,546,676.98	$ 1,546,676.98
CDR226			Sterling Ranch Road Bridge				$ 990,016.80	$ 2,536,693.78
								$ 2,536,693.78
SF1613	14151	18-058	Sterling Ranch Filing 1		$ (70,301.83)			$ 2,466,391.95
SF1724	14262	18-474	Branding Iron at Sterling Ranch Filing 1		$ (85,783.58)			$ 2,380,608.37
SF1725	14279	18-475	Homestead at Sterling Ranch Filing 1		$ (40,521.70)			$ 2,340,086.67
SF194	14621	20-156	Homestead at Sterling Ranch Filing 2	$ (75,839.66)				$ 2,340,086.67
SF1918	14654	20-212	Branding Iron at Sterling Ranch Filing 2	$ (55,628.52)				$ 2,340,086.67
								$ 2,340,086.67
SF 2015	14894	21-402	Sterlilng Ranch Filing 2		$ (163,972.79)			$ 2,176,113.88
SF 2132	14995	RAA - 222087110	Sterling Ranch Filing 3		$ (87,709.60)			$ 2,088,404.28
SF2213	15150	RAA - 222146148	Homestead North Filing 1		$ (221,388.00)			$ 1,867,016.28
SF2218	15218	RAA - 222148335	Homestead North Filing 2		$ (126,974.00)			$ 1,740,042.28
SF 2229	15243	RAA - 223041868	Homestead North Filing 3		$ (163,469.36)			$ 1,576,572.92
SF2230		RAA - 223095323	Sterling Ranch Filing 4		$ (235,942.53)			$ 1,340,630.39
SF2316		RAA - 223103469	Copper Chase		$ (112,386.84)			$ 1,228,243.55
SF241		RAA - 224034514	Sterling Ranch Filing 5		$ (74,226.72)			$ 1,154,016.83
SF1909	14653	20-274	Timberridge Filing 1		$ (63,150.24)			$ 1,090,866.59
SF12121	15015	RAA - 222076210	Timberridge Filing 2		$ (115,411.76)			$ 975,454.83
SF2241	15418	23-420	Timberridge Filing 3		$ (63,390.24)			$ 912,064.59
SF1827	15427	24-272	Timberridge Filing 4		$ (20,110.60)			$ 891,953.99
SF2439			Villages at Sterling Ranch		$ (226,752.40)			$ 665,201.59
SF2235	15459	RAA - 223103470	Sterling Ranch East Filing 1		$ (335,549.42)			$ 329,652.17
SF2237		RAA - 223103468	Sterling Ranch East Filing 2	$ (51,774.30)				$ 329,652.17
SF2325	15466	24-390	Sterling Ranch Recycling Subd.		$ (211,659.77)			$ 117,992.40
SF2428			Sterling Ranch East Filing 3	$ (233,478.68)				$ 117,992.40
SF2236			Foursquare at Sterling Ranch East Filing 1					$ 117,992.40
SF2430			Sterling Ranch East Filing 5	$ (74,179.32)	$ (117,992.40)			$ -
SF257			Retreat at PrairieRidge Filing No. 1	$ (135,916.20)				
SF259			Retreat at PrairieRidge Filing No. 2	$ (220,103.10)				
SF2520			Retreat at PrairieRidge Filing No. 3	$ (21,074.90)				
								$ -
			totals	**$ (867,994.68)**	$ (2,536,693.78)	$ -	$ 2,536,693.78	**$ 0.00**

Plat Recorded

No credits left - Bridge fee req. to be paid

SUMMARY

The proposed Retreat at PrairieRidge Filings 1, 2 & 3 are within the Upper reach of the Sand Creek Drainage Basin. Recommendations are made within this report concerning necessary improvements that may be required as a result of development of this property. The points of storm water release from the proposed site are required to be at or below the calculated historic flow quantities. This development does not impact any downstream facility or property to an extent greater than that which currently exists in the 'historic' conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC

Marc A. Whorton, P.E.
Project Manager

maw/1305.11/130511 FDR.doc

REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014.

2. "Urban Storm Drainage Criteria Manual Volume 1, 2 & 3" Urban Drainage and Flood Control District, dated January 2016.

3. "Sand Creek Drainage Basin Planning Study," Kiowa Engineering Corporation, dated March 1996.

4. "2018 Sterling Ranch MDDP", M&S Civil Consultants, Inc., June 2018

5. "Final Drainage Report for Retreat at TimberRidge Filing No. 1", Classic Consulting, approved November, 2020.

6. "Final Drainage Report for Homestead North at Sterling Ranch Filing No. 1", JR Engineering, LLC, dated June 2022

7. "Final Drainage Report for Homestead at Sterling Ranch Filing No. 1", M&S Civil Consultants, Inc. dated Nov. 2018

8. "MDDP Amendment for Sterling Ranch", JR Engineering, LLC, dated June 2022

9. "MDDP for Jaynes Property, Classic Consulting, dated January 18, 2023

10. "Preliminary Drainage Report for Retreat at PrairieRidge Filings 1-3 Preliminary Plan", Classic Consulting, dated October 2024

APPENDIX

VICINITY MAP

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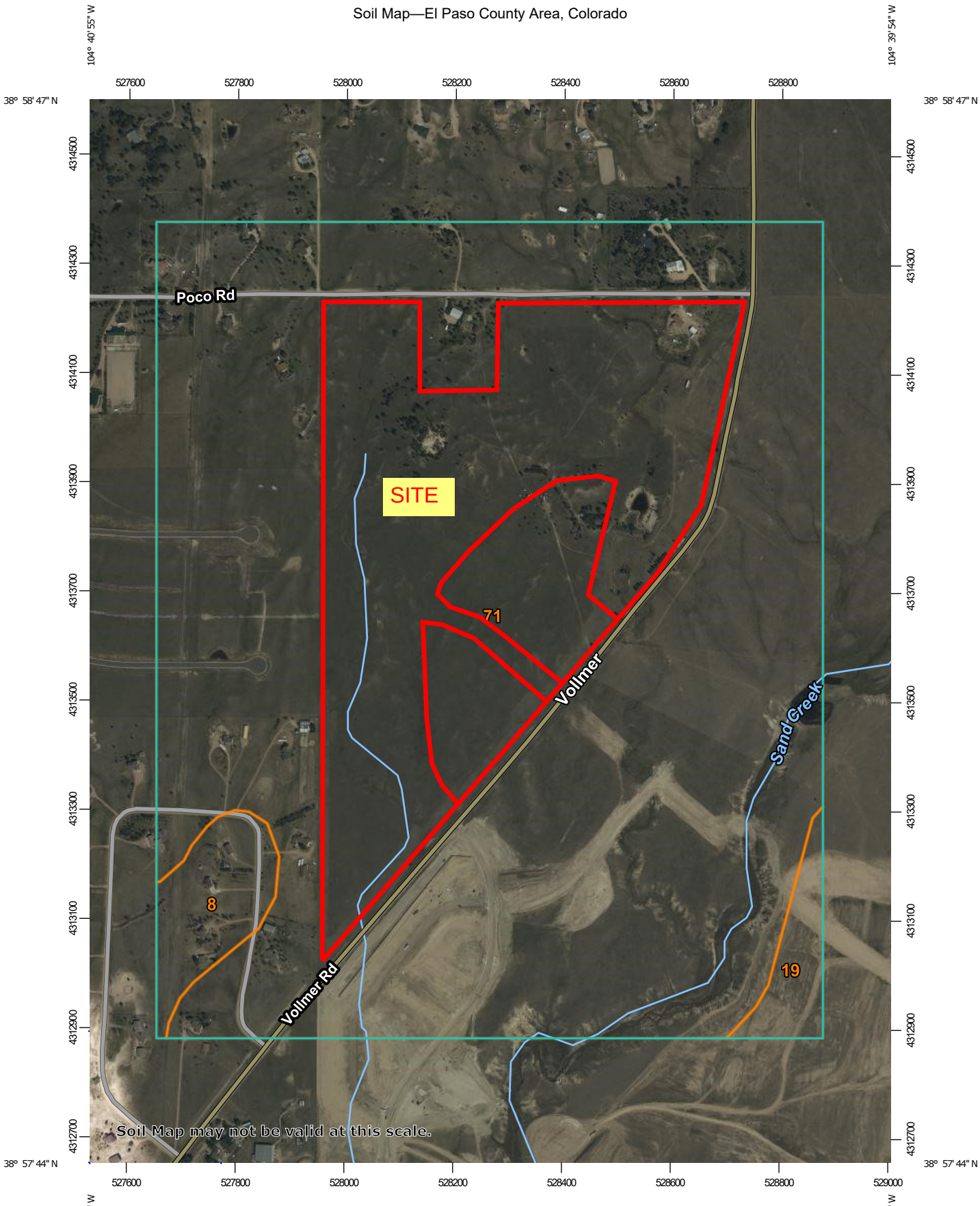
Google Maps Jaynes Property Vicinity Map

Imagery ©2022 CNES / Airbus, Maxar Technologies, USDA/FPAC/GEO, Map data ©2022 500 ft

SOILS MAP (S.C.S SURVEY)

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

Soil Map—El Paso County Area, Colorado



Map Scale: 1:9,490 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Aug 19, 2018—May 26, 2019

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	13.2	2.9%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	7.8	1.7%
71	Pring coarse sandy loam, 3 to 8 percent slopes	433.5	95.4%
Totals for Area of Interest		**454.5**	**100.0%**

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

F.E.M.A. MAP

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ENGINEERS & SURVEYORS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

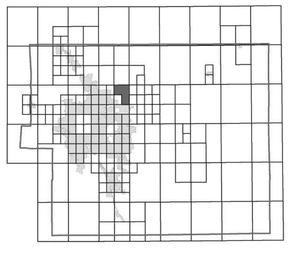
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)

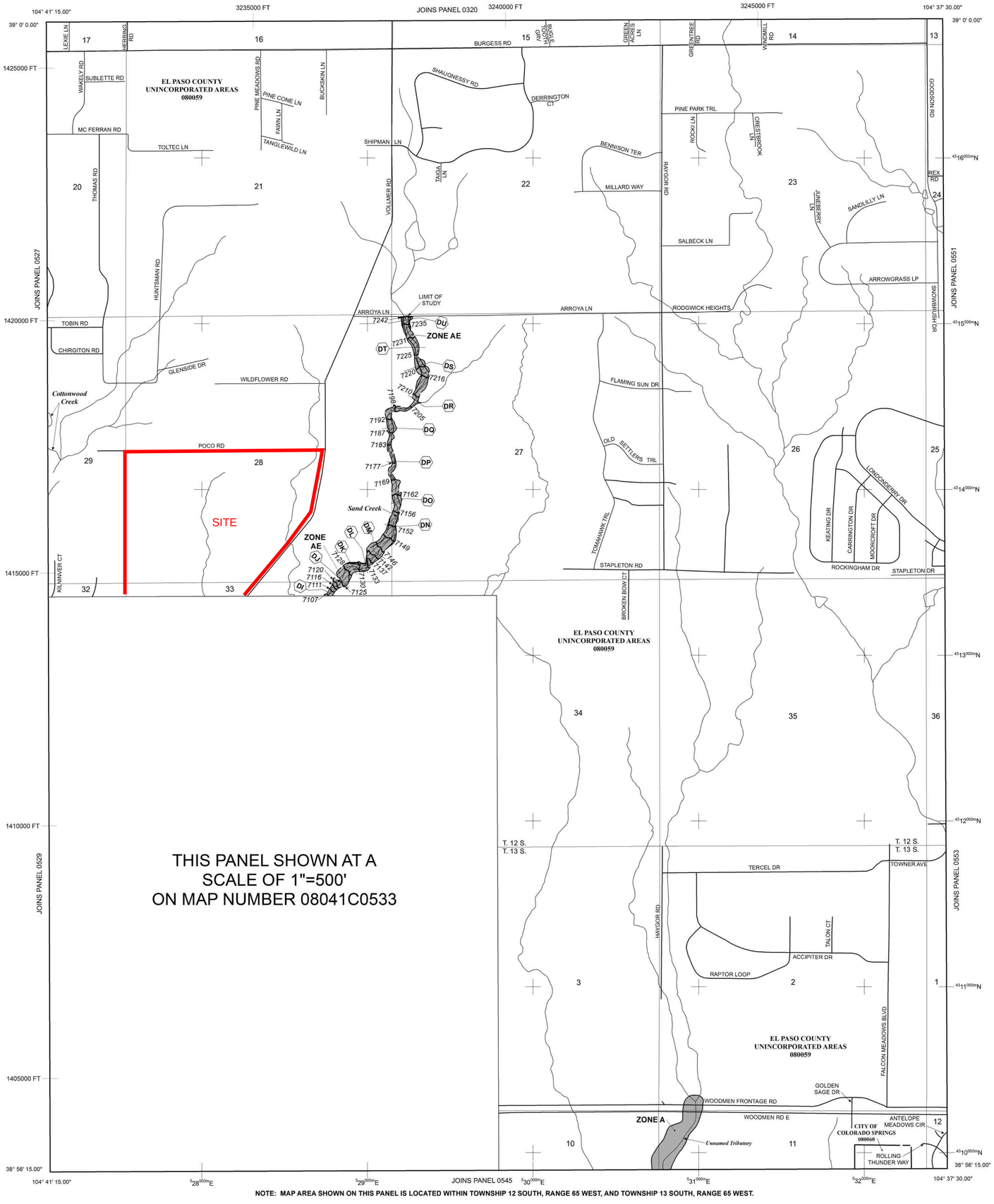
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 12 SOUTH, RANGE 65 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line
23 — 23 — Transect line
97° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

PANEL 0535G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 535 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0535	G
EL PASO COUNTY	080059	0535	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 08041C0535G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

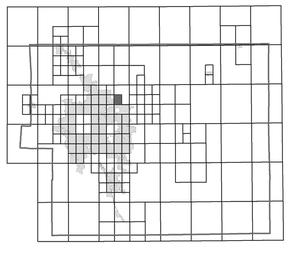
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)

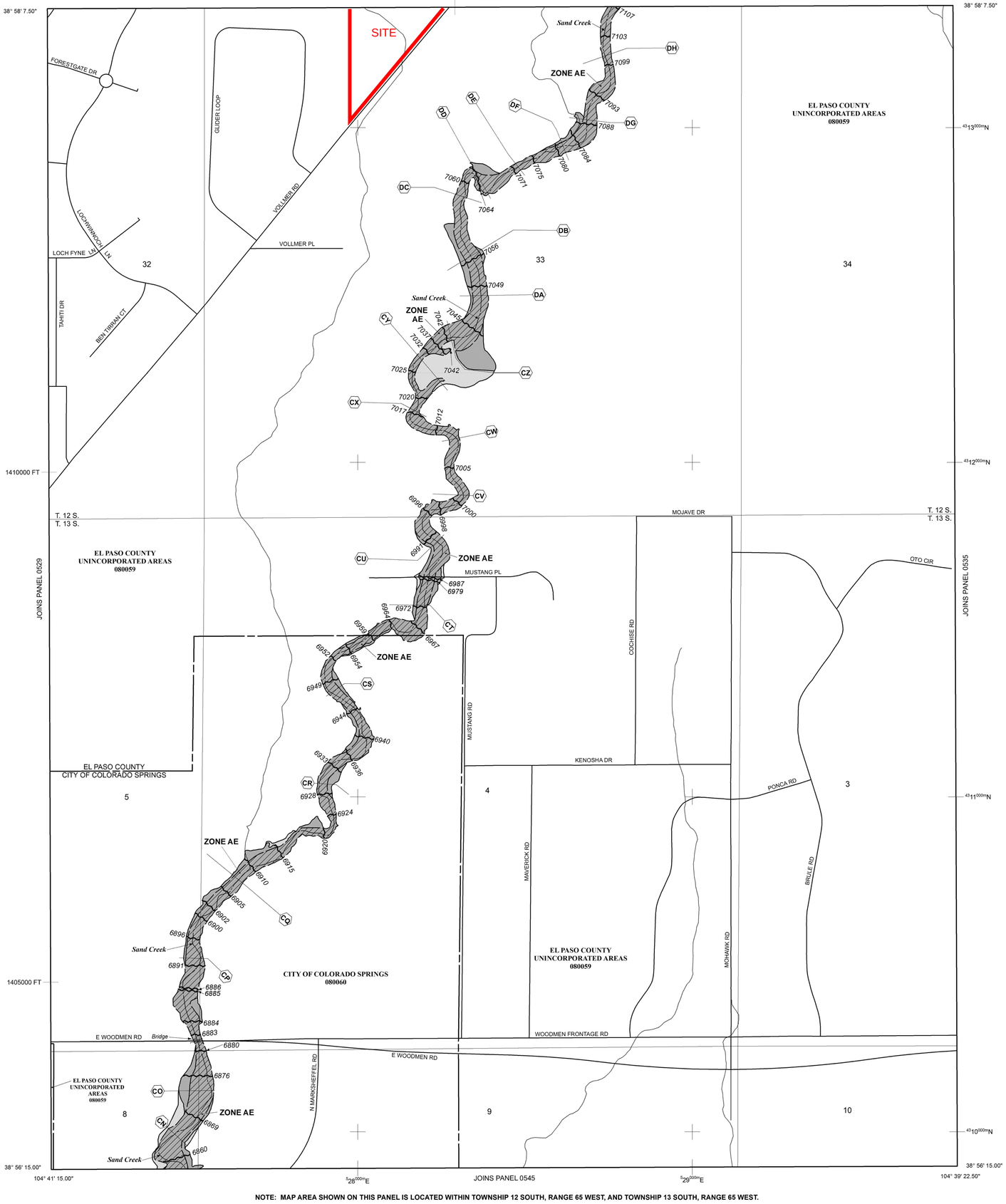
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 12 SOUTH, RANGE 65 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line
23 — 23 — Transect line
97° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0533G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 533 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0533	G
EL PASO COUNTY	080059	0533	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0533G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

WETLANDS JURISDICTIONAL DETERMINATION (JD)

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
SOUTHERN COLORADO REGULATORY BRANCH
201 WEST 8TH STREET, SUITE 350
PUEBLO, COLORADO 81003

June 30, 2022

Regulatory Division

SUBJECT: Jurisdictional Determination- Action No.SPA-2022-00123

Classic Communities
Attn: Loren Moreland
6385 Corporate Dr., Suite 200
Colorado Springs, Colorado 80919
lorenm@classichomes.com

Dear Mr. Moreland:

This letter responds to your request for a jurisdictional determination (JD) for forty (40) wetlands and one man-made pond associated with the *Classic Communities-Jayne's Parcel*, residential development. The approximately 141-acre project site is located near Sand Creek, centered at latitude 38.976682°, longitude -104.668357°, Colorado Springs, El Paso County, Colorado. We have assigned Action No. SPA-2022-00123 to your request. Please reference this number in all future correspondence concerning the site.

Based on the information provided, we concur with your aquatic resource delineation for the site, as depicted on the enclosed drawing labeled, *SPA-2022-00123, Figure 1*, prepared by Core Consultants, Inc. (enclosure 1). We have determined that the site does not contain waters of the United States that are subject to regulation under Section 404 of the Clean Water Act. The approximately 9.66-acres of aquatic resources identified as *Wetlands WT-A1* through *WT-A40* and one man-made pond, on the above drawing are intrastate isolated aquatic resources with no apparent interstate or foreign commerce connection. As such, these aquatic resources are not regulated by the U.S. Army Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act.

We are enclosing a copy of the *Approved Jurisdictional Determination Form* for your site (enclosure 2). A copy of this JD is also available at http://www.spa.usace.army.mil/reg/JD. This approved JD is valid for five years unless new information warrants revision of the determination before the expiration date.

You may accept or appeal this approved JD or provide new information in accordance with the attached Notification of Administration Appeal Options and Process and Request for Appeal (NAAOP-RFA) (enclosure 3). If you elect to appeal this approved JD, you must complete Section II of the form and return it to the Army Engineer Division, South Pacific, CESPD-PDS-O, Attn: Tom Cavanaugh, Administrative

Appeal Review Officer, P.O. Box 36023, 450 Golden Gate Ave, San Francisco, CA 94102 within 60 days of the date of this notice. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

If you have any questions, please contact Senior Project Manager Kyle Zibung by email at kyle.d.zibung@usace.army.mil, or telephone at (651) 290-5877. For program information or to complete our Customer Survey, visit our website at https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/.

Sincerely,

for Kara Hellige
Chief, Southern Colorado Branch

Enclosures

cc:
Natalie Graves, Core Consultants, Inc. (ngraves@liveyourcore.com)

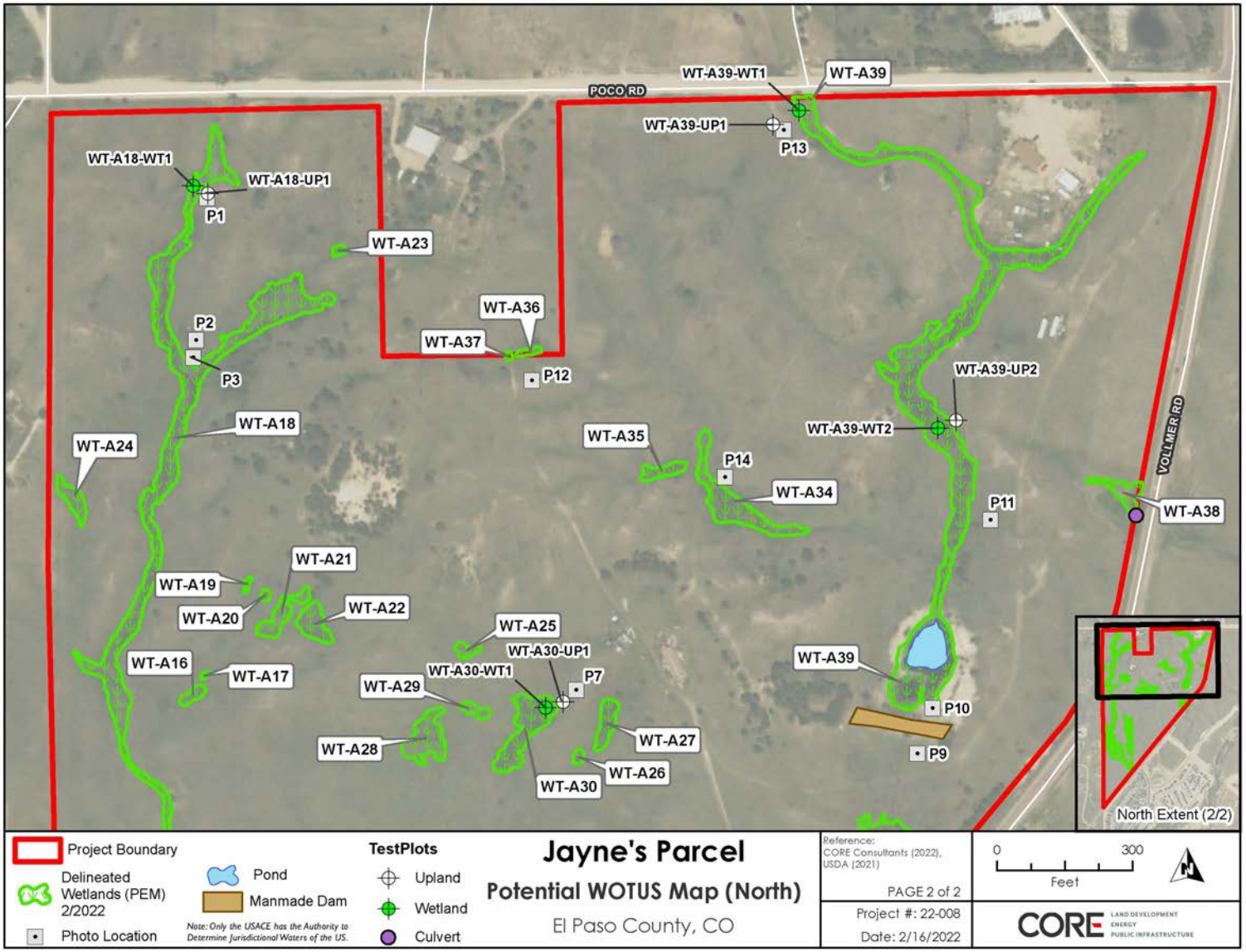


Figure 4.4 Potential WOTUS Location Map (North)

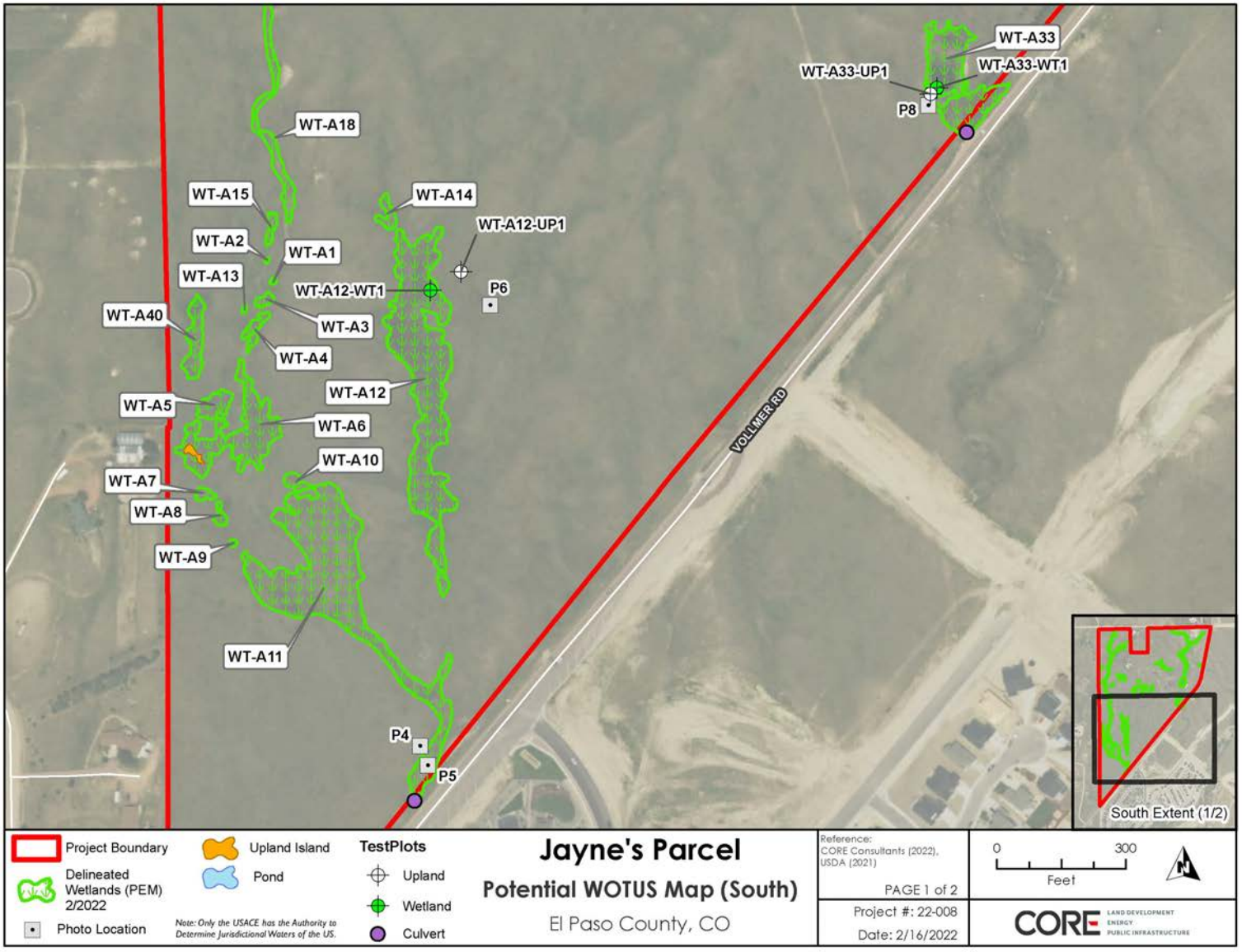


Figure 4.4 Potential WOTUS Location Map (South)

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): June 30, 2022

B. ST PAUL, MN DISTRICT OFFICE, FILE NAME, AND NUMBER: SPA-2022-00123, Classic Communities-Jayne's Parcel AJD

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Colorado County/parish/borough: El Paso City: Colorado Springs

Center coordinates of site (lat/long in degree decimal format): Lat. 38.976682° **N**, Long. -104.668357° **W**.

Universal Transverse Mercator: 13

Name of nearest waterbody: Sand Creek

Name of watershed or Hydrologic Unit Code (HUC): 11020003-Fountain

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: June 2, 2022

☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no"*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

1. **Waters of the U.S.:** N/A

2. **Non-regulated waters/wetlands (check if applicable):**[1]

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **The review area for this determination is comprised of 40 individual Wetlands (identified as WT A1 through WT-A40) totaling 9.51 acres and one man-made pond totaling 0.15 acre located on the approximately 141-acre tract. Based on a review of the National Hydrography Dataset (NHD) the nearest mapped potential relatively permanant water (RPW) is Sand Creek located approximately 1,500 feet southeast of the review area. The National Wetland Inventory (NWI) and NHD shows mapped wetland drainages with two mapped ephemeral streams in the eastern and western portion of the review area, however, the February 2022 Core Consultants, Inc., wetland delineation report (Core Report) did not find any defined bed/banks nor ordinary high water mark indicators within these two mapped features. The Core Report determined the mapping layers to be inaccurate and best characterized both features as multiple depressional wetlands seperated by upland swales. The upland swales sever a surface connection between the wetlands, pond, and Sand Creek. The Core Report notes that a culvert is present under Vollmer Road in the eastern portion of the review area near WT-A38, however, the outlet channel is comprised of a meandering upland swale with no observed surface connection to Sand Creek. Much of the land south of the JD review area has been previously graded for residential development resulting in altered surface hydrology patterns. Due to their small size and/or disturbed characteristics, Wetlands WT-A1 through WT-A40 and the man-made pond provide limited habitat functions to surrounding areas and exhibit tenuous ecological connections to nearby surface waters. Based on this information, the Corps has determined that Wetlands WT-A1 through WT-A40 and the man-made pond are isolated features with no surface or shallow subsurface hydrologic connection or ecological connection to a RPW or TNW. Wetlands WT-A1 through WT-A40 and the man-made pond do not border, neighbor, nor are contiguous with another water of the U.S. Wetlands WT-A1 through WT-A40 and the man-made pond are not seperated from other WOTUS by man-made dikes, barriers, or berms. Wetlands WT-A1 through WT-A40 and the man-made pond do not support a link to interstate or foreign commerce; they are not known to be used by interstate or foreign travelers for recreation or**

[1] Supporting documentation is presented in Section III.F.

other purposes; They do not produce fish or shellfish that could be taken and sold in interstate or foreign commerce; and they are not known to be used for industrial purposes by industries in interstate commerce. Therefore, the Corps has determined that Wetlands WT-A1 through WT-A40 and the man-made pond are isolated and therfore not regulated by the Corps under Section 404 of the CWA.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs: N/A

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY): N/A

C. SIGNIFICANT NEXUS DETERMINATION: N/A

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY): N/A

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): N/A

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☒ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- ☐ Other (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☒ Lakes/ponds: 0.15 acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☒ Wetlands: 9.51 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: February 2022 Core Consultants, Inc. Wetland Delineation Report
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☒ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☒ U.S. Geological Survey Hydrologic Atlas:
  - ☒ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24K Falcon NW
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: El Paso County Soil Survey
- ☒ National wetlands inventory map(s). Cite name: USFWS National Wetland Inventory
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date):2020, 2018, 2017, 2015, 2013, 2010 2008, 2006, 2005, 2000, 1994
or ☐ Other (Name & Date):
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:
☐ Applicable/supporting scientific literature:
☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Classic Communities c/o Loren Moreland	File No.: SPA-2022-00123	Date: June 30, 2022

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
→	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Kyle Zibung
U.S. Army Corps of Engineers
201 West 8th Street, Suite 350
Pueblo, Colorado 81003
Phone: 651-290-5877
Email: kyle.d.zibung@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Thomas J. Cavanaugh
Administrative Appeal Review Officer
U.S. Army Corps of Engineers
South Pacific Division
P.O. Box 36023, 450 Golden Gate Ave
San Francisco, California 94103-1399
Phone: 415-503-6574, FAX 415-503-6646)
Email: Thomas.J.Cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

HYDROLOGIC / STORMWATER QUALITY CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

For Colorado Springs and much of the Fountain Creek watershed, the 1-hour depths are fairly uniform and are summarized in Table 6-2. Depending on the location of the project, rainfall depths may be calculated using the described method and the NOAA Atlas maps shown in Figures 6-6 through 6-17.

Table 6-2. Rainfall Depths for Colorado Springs

Return Period	1-Hour Depth	6-Hour Depth	24-Hour Depth
2	1.19	1.70	2.10
5	1.50	2.10	2.70
10	1.75	2.40	3.20
25	2.00	2.90	3.60
50	2.25	3.20	4.20
100	2.52	3.50	4.60

Where Z= 6,840 ft/100

These depths can be applied to the design storms or converted to intensities (inches/hour) for the Rational Method as described below. However, as the basin area increases, it is unlikely that the reported point rainfalls will occur uniformly over the entire basin. To account for this characteristic of rain storms an adjustment factor, the Depth Area Reduction Factor (DARF) is applied. This adjustment to rainfall depth and its effect on design storms is also described below. The UDFCD UD-Rain spreadsheet, available on UDFCD's website, also provides tools to calculate point rainfall depths and Intensity-Duration-Frequency curves[2] and should produce similar depth calculation results.

2.2 Design Storms

Design storms are used as input into rainfall/runoff models and provide a representation of the typical temporal distribution of rainfall events when the creation or routing of runoff hydrographs is required. It has long been observed that rainstorms in the Front Range of Colorado tend to occur as either short-duration, high-intensity, localized, convective thunderstorms (cloud bursts) or longer-duration, lower-intensity, broader, frontal (general) storms. The significance of these two types of events is primarily determined by the size of the drainage basin being studied. Thunderstorms can create high rates of runoff within a relatively small area, quickly, but their influence may not be significant very far downstream. Frontal storms may not create high rates of runoff within smaller drainage basins due to their lower intensity, but tend to produce larger flood flows that can be hazardous over a broader area and extend further downstream.

- **Thunderstorms**: Based on the extensive evaluation of rain storms completed in the Carlton study (Carlton 2011), it was determined that typical thunderstorms have a duration of about 2 hours. The study evaluated over 300,000 storm cells using gage-adjusted NEXRAD data, collected over a 14-year period (1994 to 2008). Storms lasting longer than 3 hours were rarely found. Therefore, the results of the Carlton study have been used to define the shorter duration design storms.

  To determine the temporal distribution of thunderstorms, 22 gage-adjusted NEXRAD storm cells were studied in detail. Through a process described in a technical memorandum prepared by the City of Colorado Springs (City of Colorado Springs 2012), the results of this analysis were interpreted and normalized to the 1-hour rainfall depth to create the distribution shown in Table 6-3 with a 5 minute time interval for drainage basins up to 1 square mile in size. This distribution represents the rainfall

Table 6-6. Runoff Coefficients for Rational Method
(Source: UDFCD 2001)

Land Use or Surface Characteristics	Percent Impervious	Runoff Coefficients											
		2-year		5-year		10-year		25-year		50-year		100-year	
		HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D
Business													
Commercial Areas	95	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89
Neighborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68
Residential													
1/8 Acre or less	65	0.41	0.45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65
1/4 Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0.51	0.46	0.56
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0.40	0.50	0.44	0.55
Industrial													
Light Areas	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Heavy Areas	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Parks and Cemeteries	7	0.05	0.09	0.12	0.19	0.20	0.29	0.30	0.40	0.34	0.46	0.39	0.52
Playgrounds	13	0.07	0.13	0.16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
Undeveloped Areas													
Historic Flow Analysis--Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	0.51
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when landuse is undefined)	45	0.26	0.31	0.32	0.37	0.38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
Streets													
Paved	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Gravel	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Drive and Walks	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Roofs	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Lawns	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50

3.2 Time of Concentration

One of the basic assumptions underlying the Rational Method is that runoff is a function of the average rainfall rate during the time required for water to flow from the hydraulically most remote part of the drainage area under consideration to the design point. However, in practice, the time of concentration can be an empirical value that results in reasonable and acceptable peak flow calculations.

For urban areas, the time of concentration (t_c) consists of an initial time or overland flow time (t_i) plus the travel time (t_t) in the storm sewer, paved gutter, roadside drainage ditch, or drainage channel. For non-urban areas, the time of concentration consists of an overland flow time (t_i) plus the time of travel in a concentrated form, such as a swale or drainageway. The travel portion (t_t) of the time of concentration can be estimated from the hydraulic properties of the storm sewer, gutter, swale, ditch, or drainageway. Initial time, on the other hand, will vary with surface slope, depression storage, surface cover, antecedent rainfall, and infiltration capacity of the soil, as well as distance of surface flow. The time of concentration is represented by Equation 6-7 for both urban and non-urban areas.

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.

The travel time is calculated by dividing the flow distance (in feet) by the velocity calculated using Equation 6-9 and converting units to minutes.

The time of concentration (t_c) is then the sum of the overland flow time (t_i) and the travel time (t_t) per Equation 6-7.

3.2.3 First Design Point Time of Concentration in Urban Catchments

Using this procedure, the time of concentration at the first design point (typically the first inlet in the system) in an urbanized catchment should not exceed the time of concentration calculated using Equation 6-10. The first design point is defined as the point where runoff first enters the storm sewer system.

$$t_c = \frac{L}{180} + 10 \qquad \text{(Eq. 6-10)}$$

Where:

t_c = maximum time of concentration at the first design point in an urban watershed (min)

L = waterway length (ft)

Equation 6-10 was developed using the rainfall-runoff data collected in the Denver region and, in essence, represents regional "calibration" of the Rational Method. Normally, Equation 6-10 will result in a lesser time of concentration at the first design point and will govern in an urbanized watershed. For subsequent design points, the time of concentration is calculated by accumulating the travel times in downstream drainageway reaches.

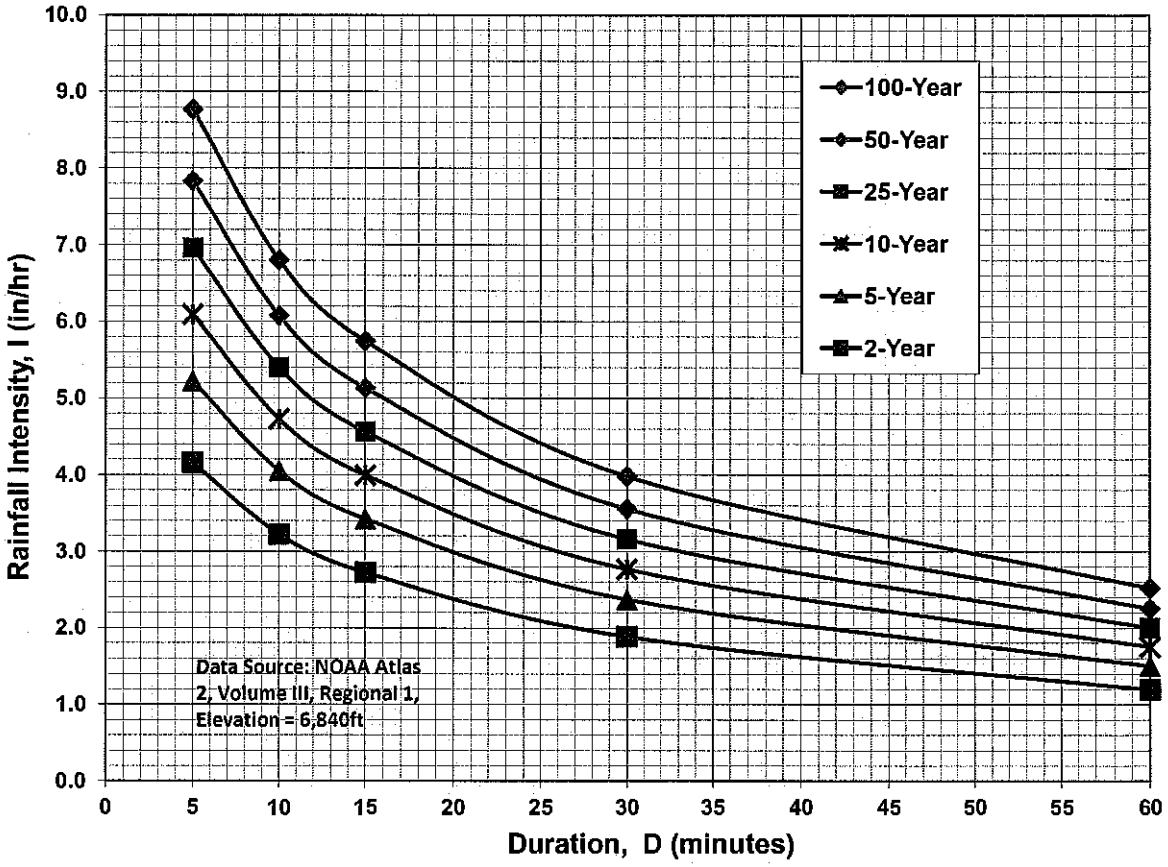
3.2.4 Minimum Time of Concentration

If the calculations result in a t_c of less than 10 minutes for undeveloped conditions, it is recommended that a minimum value of 10 minutes be used. The minimum t_c for urbanized areas is 5 minutes.

3.2.5 Post-Development Time of Concentration

As Equation 6-8 indicates, the time of concentration is a function of the 5-year runoff coefficient for a drainage basin. Typically, higher levels of imperviousness (higher 5-year runoff coefficients) correspond to shorter times of concentration, and lower levels of imperviousness correspond to longer times of

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$I_{100} = -2.52 \ln(D) + 12.735$

$I_{50} = -2.25 \ln(D) + 11.375$

$I_{25} = -2.00 \ln(D) + 10.111$

$I_{10} = -1.75 \ln(D) + 8.847$

$I_{5} = -1.50 \ln(D) + 7.583$

$I_{2} = -1.19 \ln(D) + 6.035$

Note: Values calculated by equations may not precisely duplicate values read from figure.

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***02/27/25***
CALCULATED BY: ***MAW***

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY (PRE-DEVELOPED)

		DEVELOPED AREA/IMPERVIOUS AREA				LANDSCAPE/UNDEVELOPED AREAS				WEIGHTED			WEIGHTED CA			IMPERVIOUSNESS
BASIN	TOTAL AREA (AC)	AREA (AC)	C(2)	C(5)	C(100)	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	%
EX-A	0.78	0.00	0.03	0.09	0.36	0.78	0.03	0.09	0.36	0.03	0.09	0.36	**0.02**	**0.07**	**0.28**	2%
EX-B	2.80	0.00	0.03	0.09	0.36	2.80	0.03	0.09	0.36	0.03	0.09	0.36	**0.08**	**0.25**	**1.01**	2%
EX-C	41.40	0.00	0.03	0.09	0.36	41.40	0.03	0.09	0.36	0.03	0.09	0.36	**1.24**	**3.73**	**14.90**	2%
EX-D	1.30	0.00	0.03	0.09	0.36	1.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.04**	**0.12**	**0.47**	2%
EX-E	72.40	0.00	0.03	0.09	0.36	72.40	0.03	0.09	0.36	0.03	0.09	0.36	**2.17**	**6.52**	**26.06**	2%
EX-F	8.70	0.00	0.03	0.09	0.36	8.70	0.03	0.09	0.36	0.03	0.09	0.36	**0.26**	**0.78**	**3.13**	2%
EX-G	8.30	0.00	0.03	0.09	0.36	8.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.25**	**0.75**	**2.99**	2%
EX-H	6.50	0.00	0.03	0.09	0.36	6.50	0.03	0.09	0.36	0.03	0.09	0.36	**0.20**	**0.59**	**2.34**	2%
OS-1	2.00	2.00	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.12**	**0.26**	**0.80**	10%
OS-2	5.30	5.30	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.32**	**0.69**	**2.12**	10%
EX-3	44.30	44.30	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.77**	**4.65**	**16.61**	5%
EX-4A	77.00	77.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**3.08**	**8.09**	**28.88**	5%
EX-4B	70.00	70.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**2.80**	**7.35**	**26.25**	5%

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
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CALC'D BY: ***MAW***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

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

$t_c = \frac{L}{180} + 10$

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

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (PRE-DEVELOPED)

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-A	0.02	0.07	0.28	0.09	240	9	18.3					18.3	2.58	3.23	5.41	0.1	**0.2**	**2**
EX-B	0.08	0.25	1.01	0.09	300	24	15.9	120	2.0%	1.0	2.0	17.9	2.60	3.25	5.46	0.2	**0.8**	**6**
EX-C	1.24	3.73	14.90	0.09	300	18	17.5	1300	2.9%	1.7	12.7	30.2	1.98	2.47	4.15	2	**9**	**62**
EX-D	0.04	0.12	0.47	0.09	225	10	16.7					16.7	2.68	3.36	5.64	0.1	**0.4**	**3**
EX-E	2.17	6.52	26.06	0.09	280	20	15.9	3400	2.5%	1.6	35.8	51.8	1.34	1.66	2.79	3	**11**	**73**
EX-F	0.26	0.78	3.13	0.09	300	12	20.0	560	2.0%	1.4	6.6	26.6	2.13	2.66	4.47	1	**2**	**14**
EX-G	0.25	0.75	2.99	0.09	300	10	21.2	420	2.0%	1.4	4.9	26.2	2.15	2.69	4.51	1	**2**	**13**
EX-H	0.20	0.59	2.34	0.09	300	10	21.2	800	2.0%	1.4	9.4	30.7	1.96	2.45	4.11	0.4	**1.4**	**10**
OS-1	0.12	0.26	0.80	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.8**	**4**
OS-2	0.32	0.69	2.12	0.08	300	12	20.2					20.2	2.46	3.08	5.16	1	**2**	**11**
EX-3	1.77	4.65	16.61	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	4	**12**	**70**
EX-4A	3.08	8.09	28.88	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	4	**14**	**82**
EX-4B	2.80	7.35	26.25	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	3	**10**	**58**

JOB NAME: *RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR*
JOB NUMBER: *1305.11*
DATE: *02/27/25*
CALCULATED BY: *MAW*

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (PRE-DEVELOPED)

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Inlet Size
					I(5)	I(100)	Q(5)	Q(100)	
E1	EX-4A	8.09	28.88	50.5	1.70	2.85	14	82	EX. 24" CMP CULVERT
E2	EX-4B	7.35	26.25	64.9	1.32	2.22	10	58	EX. STOCK OFF-SITE POND
E3	EX-A, EX-B	0.32	1.29	18.3	3.23	5.41	1	7	TYPE D CDOT INLET W/ 24" RCP
E4	EX-4A, EX-4B, EX-C	19.16	70.03	64.9	1.32	2.22	25	155	PLANNED 48" RCP W/ MH AND GRATE
E5	EX-3	4.65	16.61	29.1	2.53	4.24	12	70	EX. 24" CMP CULVERT
E6	EX-G	0.75	2.99	26.2	2.69	4.51	2	13	TYPE D CDOT INLET W/ 24" RCP
E7	EX-H	0.59	2.34	30.7	2.45	4.11	1	10	TYPE C CDOT INLET W/ 18" RCP
E8	EX-3, EX-E, OS-2	11.86	44.80	51.8	1.66	2.79	20	125	EX. 24" CMP CULVERT
E9	DP-E8, EX-F, OS-1	12.90	48.73	55.8	1.55	2.60	20	127	MODIFIED 4'X14' TYPE D CDOT INLET W/ 54" RCP
E10	EX-D	0.12	0.47	16.7	3.36	5.64	0.4	3	SHEET FLOW TO NATURAL RAVINE

JOB NAME: *RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR*
JOB NUMBER: *1305.11*
DATE: *06/12/25*
CALCULATED BY: *MAW*

BASIN RUNOFF COEFFICIENT SUMMARY

		C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						WEIGHTED "C" VALUE			WEIGHTED CA			WEIGHTED IMP.
BASIN	TOTAL AREA (AC)	LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	PERCENT
EX-3	41.80	RES. 5 AC,	5.0%	41.80	0.04	0.11	0.38			0.00	0.02	0.08	0.35	0.04	0.11	0.38	1.67	4.39	15.68	5.0%
EX-3A	2.50	RES. 5 AC.	5.0%	2.50	0.04	0.11	0.38			0.00	0.02	0.08	0.35	0.04	0.11	0.38	0.10	0.26	0.94	5.0%
EX-4A	74.20	RES. 5+ AC.	3.0%	74.20	0.03	0.09	0.36			0.00	0.02	0.08	0.35	0.03	0.09	0.36	2.23	6.68	26.71	3.0%
EX-4B	70.00	RES. 5+ AC.	3.0%	70.00	0.03	0.09	0.36			0.00	0.02	0.08	0.35	0.03	0.09	0.36	2.10	6.30	25.20	3.0%
EX-4C	2.80	RES. 5 AC.	5.0%	2.80	0.04	0.11	0.38			0.00	0.02	0.08	0.35	0.04	0.11	0.38	0.11	0.29	1.05	5.0%
OS-1A	0.30	RES. 2.5 AC.	10.0%	0.30	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.02	0.04	0.12	10.0%
OS-1B	0.80	RES. 2.5 AC.	10.0%	0.80	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.05	0.10	0.32	10.0%
OS-2A	1.20	RES. 2.5 AC.	10.0%	1.20	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.07	0.16	0.48	10.0%
OS-2B	0.53	RES. 2.5 AC.	10.0%	0.53	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.03	0.07	0.21	10.0%
OS-2C	3.60	RES. 2.5 AC.	10.0%	3.60	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.22	0.47	1.44	10.0%
A	3.00	RES. 2.5 AC.	10.0%	2.65	0.06	0.13	0.40	RES. 1/3 AC.	30.0%	0.35	0.18	0.25	0.47	0.07	0.14	0.41	0.22	0.43	1.22	12.3%
B	2.10	RES. 2.5 AC.	10.0%	1.68	0.06	0.13	0.40	RES. 1/3 AC.	30.0%	0.42	0.18	0.25	0.47	0.08	0.15	0.41	0.18	0.32	0.87	14.0%
C1	7.80	RES. 2.5 AC.	10.0%	3.80	0.06	0.13	0.40	RES. 1/3 AC.	30.0%	4.00	0.18	0.25	0.47	0.12	0.19	0.44	0.95	1.49	3.40	20.3%
C2	2.50	RES. 1/3 AC.	30.0%	2.50	0.18	0.25	0.47			0.00	0.08	0.08	0.08	0.18	0.25	0.47	0.45	0.63	1.18	30.0%
D	1.10	RES. 1/4 AC.	40.0%	1.10	0.23	0.30	0.50			0.00	0.02	0.08	0.35	0.23	0.30	0.50	0.25	0.33	0.55	40.0%
E	4.00	RES. 1/4 AC.	40.0%	3.75	0.23	0.30	0.50	POCKET PARK	7.0%	0.25	0.05	0.12	0.39	0.22	0.29	0.49	0.88	1.16	1.97	37.9%
F	1.70	RES. 1/4 AC.	40.0%	1.70	0.23	0.30	0.50			0.00	0.02	0.08	0.35	0.23	0.30	0.50	0.39	0.51	0.85	40.0%
G	1.70	RES. 1/8 AC.	65.0%	1.70	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	0.70	0.77	1.00	65.0%
H	3.30	RES. 1/5 AC.	46.0%	3.30	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.92	1.12	1.72	46.0%
I	1.10	RES. 1/5 AC.	46.0%	1.10	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.31	0.37	0.57	46.0%
J	5.40	RES. 1/5 AC.	46.0%	5.40	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	1.51	1.84	2.81	46.0%
K	1.20	ROADWAY	100.0%	0.70	0.89	0.90	0.96	PARK	7.0%	0.50	0.05	0.12	0.39	0.54	0.58	0.72	0.65	0.69	0.87	61.3%
L1	0.70	PARK	7.0%	0.70	0.05	0.12	0.39	PARK	7.0%	0.00	0.05	0.12	0.39	0.05	0.12	0.39	0.04	0.08	0.27	7.0%
L2	0.50	RES. 1/3 AC.	30.0%	0.40	0.18	0.25	0.47	ROADWAY	100.0%	0.10	0.89	0.90	0.96	0.32	0.38	0.57	0.16	0.19	0.28	44.0%
L3	1.20	ROADWAY	100.0%	0.85	0.89	0.90	0.96	OS BUFFER	7.0%	0.35	0.05	0.12	0.39	0.65	0.67	0.79	0.77	0.81	0.95	72.9%
M1	0.40	PARK	7.0%	0.20	0.05	0.12	0.39	ROADWAY	100.0%	0.20	0.89	0.90	0.96	0.47	0.51	0.68	0.19	0.20	0.27	53.5%
M2	4.00	PARK	7.0%	4.00	0.05	0.12	0.39			0.00	0.02	0.08	0.35	0.05	0.12	0.39	0.20	0.48	1.56	7.0%
N1	2.20	RES. 1/8 AC.	65.0%	2.00	0.41	0.45	0.59	LANDSCAPE	7.0%	0.20	0.05	0.12	0.39	0.38	0.42	0.57	0.83	0.92	1.26	59.7%
N2	3.40	RES. 1/8 AC.	65.0%	3.10	0.41	0.45	0.59	LANDSCAPE	7.0%	0.30	0.05	0.12	0.39	0.38	0.42	0.57	1.29	1.43	1.95	59.9%
O	7.40	RES. 1/8 AC.	65.0%	6.90	0.41	0.45	0.59	LANDSCAPE	7.0%	0.50	0.05	0.12	0.39	0.39	0.43	0.58	2.85	3.17	4.27	61.1%
P1	4.50	COMMERCIAL	95.0%	4.50	0.79	0.81	0.88			0.00	0.05	0.12	0.39	0.79	0.81	0.88	3.56	3.65	3.96	95.0%
P2	1.40	ROADWAY	100.0%	0.60	0.89	0.90	0.96	OS BUFFER	7.0%	0.80	0.05	0.12	0.39	0.41	0.45	0.63	0.57	0.64	0.89	46.9%
Q1	1.60	RES. 1/8 AC.	65.0%	0.90	0.41	0.45	0.59	OS BUFFER	7.0%	0.70	0.05	0.12	0.39	0.25	0.31	0.50	0.40	0.49	0.80	39.6%
Q2	1.20	ROADWAY	90.0%	1.20	0.71	0.73	0.81	OS BUFFER	7.0%	0.00	0.05	0.12	0.39	0.71	0.73	0.81	0.85	0.88	0.97	90.0%
Q3	0.30	RES. 1/8 AC.	65.0%	0.18	0.41	0.45	0.59	OS BUFFER	7.0%	0.12	0.05	0.12	0.39	0.27	0.32	0.51	0.08	0.10	0.15	41.8%
R	3.40	RES. 2.5 AC.	10.0%	3.40	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.20	0.44	1.36	10.0%
S	4.50	RES. 2.5 AC.	10.0%	4.22	0.06	0.13	0.40	RES. 1/3 AC.	30.0%	0.28	0.18	0.25	0.47	0.07	0.14	0.40	0.30	0.62	1.82	11.2%
T	1.30	RES. 2.5 AC.	10.0%	1.30	0.06	0.13	0.40			0.00	0.02	0.08	0.35	0.06	0.13	0.40	0.08	0.17	0.52	10.0%
U	5.00	RES. 1/2 AC.	25.0%	5.00	0.15	0.22	0.46			0.00	0.02	0.08	0.35	0.15	0.22	0.46	0.75	1.10	2.30	25.0%
V	0.90	RES. 1/8 AC.	65.0%	0.90	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	0.37	0.41	0.53	65.0%
W	5.20	RES. 1/5 AC.	46.0%	4.95	0.28	0.34	0.52	POCKET PARK	7.0%	0.25	0.05	0.12	0.39	0.27	0.33	0.51	1.40	1.71	2.67	44.1%
X	0.30	RES. 1/8 AC.	65.0%	0.30	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	0.12	0.14	0.18	65.0%
Y	4.20	RES. 1/5 AC.	46.0%	4.20	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	1.16	1.42	2.19	46.0%
Z	2.20	RES. 1/2 AC.	25.0%	2.20	0.15	0.22	0.46			0.00	0.02	0.08	0.35	0.15	0.22	0.46	0.33	0.48	1.01	25.0%

JOB NAME: *RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR*
JOB NUMBER: *1305.11*
DATE: *06/12/25*
CALCULATED BY: *MAW*

BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6 LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	C VALUE DCM TABLE 6-6 LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	WEIGHTED "C" VALUE C(2)	C(5)	C(100)	WEIGHTED CA CA(2)	CA(5)	CA(100)	WEIGHTED IMP. PERCENT
AA	2.00	RES. 1 AC.	20.0%	2.00	0.12	0.20	0.44			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.24**	**0.40**	**0.88**	**20.0%**
BB	1.80	RES. 1 AC.	20.0%	1.80	0.12	0.20	0.44			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.22**	**0.36**	**0.79**	**20.0%**
CC	1.50	RES. 1/4 AC.	40.0%	1.20	0.23	0.30	0.50	ROADWAY	100.0%	0.30	0.89	0.90	0.96	0.36	0.42	0.59	**0.54**	**0.63**	**0.89**	**52.0%**
DD	0.60	ROADWAY	100.0%	0.45	0.89	0.90	0.96	PARKWAY	7.0%	0.15	0.05	0.12	0.39	0.68	0.71	0.82	**0.41**	**0.42**	**0.49**	**76.8%**
EE	1.30	ROADWAY	100.0%	0.60	0.89	0.90	0.96	RES. 1/8 AC.	65.0%	0.70	0.41	0.45	0.59	0.63	0.66	0.76	**0.82**	**0.86**	**0.99**	**81.2%**
FF	3.20	RES. 1/5 AC.	46.0%	3.20	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**0.90**	**1.09**	**1.66**	**46.0%**
GG	2.50	ROADWAY	100.0%	1.35	0.89	0.90	0.96	PARKWAY	7.0%	1.15	0.05	0.12	0.39	0.50	0.54	0.70	**1.26**	**1.35**	**1.74**	**57.2%**
HH	2.00	ROADWAY	100.0%	1.35	0.89	0.90	0.96	PARKWAY	7.0%	0.65	0.05	0.12	0.39	0.62	0.65	0.77	**1.23**	**1.29**	**1.55**	**69.8%**
II	10.40	RES. 1/8 AC.	65.0%	10.40	0.41	0.45	0.59	OS BUFFER	7.0%	0.00	0.05	0.12	0.39	0.41	0.45	0.59	**4.26**	**4.68**	**6.14**	**65.0%**
JJ	1.20	RES. 1/6 AC.	52.5%	0.80	0.32	0.38	0.55	ROADWAY	100.0%	0.40	0.89	0.90	0.96	0.51	0.55	0.68	**0.61**	**0.66**	**0.82**	**68.3%**
KK	2.60	RES. 1/8 AC.	65.0%	2.60	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**1.07**	**1.17**	**1.53**	**65.0%**
LL	2.40	RES. 1/8 AC.	65.0%	2.40	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**0.98**	**1.08**	**1.42**	**65.0%**
MM	3.30	RES. 1/8 AC.	65.0%	3.30	0.41	0.45	0.59			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**1.35**	**1.49**	**1.95**	**65.0%**
NN1	2.40	ROADWAY	100.0%	0.80	0.89	0.90	0.96	RES. 1/8 AC.	65.0%	1.60	0.41	0.45	0.59	0.57	0.60	0.71	**1.37**	**1.44**	**1.71**	**76.7%**
NN2	2.50	ROADWAY	100.0%	0.80	0.89	0.90	0.96	OS BUFFER	7.0%	1.70	0.05	0.12	0.39	0.32	0.37	0.57	**0.80**	**0.92**	**1.43**	**36.8%**
OO	2.30	RES. 1 AC.	20.0%	1.60	0.12	0.20	0.44	ROADWAY	100.0%	0.70	0.89	0.90	0.96	0.35	0.41	0.60	**0.82**	**0.95**	**1.38**	**44.3%**
PP	2.40	RES. 1 AC.	20.0%	2.40	0.12	0.20	0.44			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.29**	**0.48**	**1.06**	**20.0%**
QQ	1.50	RES. 1 AC.	20.0%	1.50	0.12	0.20	0.44			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.18**	**0.30**	**0.66**	**20.0%**
RR	7.70	RES. 1/8 AC.	65.0%	0.50	0.41	0.45	0.59	PARK/POND	7.0%	7.20	0.05	0.12	0.39	0.07	0.14	0.40	**0.57**	**1.09**	**3.10**	**10.8%**
SS	0.40	OPEN SPACE	7.0%	0.40	0.05	0.12	0.39			0.00	0.02	0.08	0.35	0.05	0.12	0.39	**0.02**	**0.05**	**0.16**	**7.0%**
TT	0.30	ROADWAY	100.0%	0.24	0.89	0.90	0.96	PARKWAY	7.0%	0.06	0.05	0.12	0.39	0.72	0.74	0.85	**0.22**	**0.22**	**0.25**	**81.4%**
UU	0.20	ROADWAY	100.0%	0.14	0.89	0.90	0.96	PARKWAY	7.0%	0.06	0.05	0.12	0.39	0.64	0.67	0.79	**0.13**	**0.13**	**0.16**	**72.1%**
VV1	0.70	ROADWAY	100.0%	0.00	0.89	0.90	0.96	OPEN SPACE	7.0%	0.70	0.05	0.12	0.39	0.05	0.12	0.39	**0.04**	**0.08**	**0.27**	**7.0%**
VV2	1.40	ROADWAY	100.0%	0.70	0.89	0.90	0.96	OPEN SPACE	7.0%	0.70	0.05	0.12	0.39	0.47	0.51	0.68	**0.66**	**0.71**	**0.95**	**53.5%**

TOTAL AREA TRIBUTARY TO OFF-SITE POND C	**197.40**	**11.0%**

TOTAL AREA TRIBUTARY TO PROP. ON-SITE POND 1	**143.83**	**32.2%**

TOTAL AREA TRIBUTARY TO 66" OUTFALL	135.33	33.4%

Basins tributaty to off-site Pond C constructed within Homestead North Filing No. 1 (SF-2213)
Basins tributaty to proposed on-site Pond 1
Basin w/ exclusion I.7.1.B.5 (Large lot 2.5 ac. min)
Basin w/ exclusion I.7.1.B.7 (Undev. land to remain undev.)
Basin w/ exclusion I.7.1.B.9 (Trails)

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALC'D BY: ***MAW***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

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

$t_c = \frac{L}{180} + 10$

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

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-3	1.67	4.39	15.68	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	3	**11**	**66**
EX-3A	0.10	0.26	0.94	0.08	300	17	18.0					18.0	2.60	3.25	5.45	0.3	**0.9**	**5**
EX-4A	2.23	6.68	26.71	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	3	**11**	**76**
EX-4B	2.10	6.30	25.20	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	2	**8**	**56**
EX-4C	0.11	0.29	1.05	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.9**	**5**
OS-1A	0.02	0.04	0.12	0.08	140	5	14.3					14.3	2.87	3.59	6.03	0.1	**0.1**	**0.7**
OS-1B	0.05	0.10	0.32	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.1	**0.3**	**1.6**
OS-2A	0.07	0.16	0.48	0.08	300	14	19.2					19.2	2.52	3.15	5.29	0.2	**0.5**	**2.5**
OS-2B	0.03	0.07	0.21	0.08	100	4	11.7					11.7	3.11	3.90	6.55	0.1	**0.3**	**1.4**
OS-2C	0.22	0.47	1.44	0.08	300	12	20.2					20.2	2.46	3.08	5.16	0.5	**1.4**	**7**
A	0.22	0.43	1.22	0.08	200	12	14.4	150	2.0%	1.4	1.8	16.2	2.72	3.41	5.72	0.6	**1.5**	**7**
B	0.18	0.32	0.87	0.08	220	12	15.6	180	3.5%	1.9	1.6	17.2	2.65	3.31	5.56	0.5	**1.1**	**5**
C1	0.95	1.49	3.40	0.08	300	10	21.4	150	3.0%	1.7	1.4	22.9	2.31	2.89	4.85	2	**4**	**16**

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
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Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

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

$t_c = \frac{L}{180} + 10$

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

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
C2	0.45	0.63	1.18	0.08	100	2	14.7	300	2.0%	2.8	1.8	16.4	2.70	3.39	5.68	1	**2**	**7**
D	0.25	0.33	0.55	0.08	100	2	14.7	100	1.5%	2.4	0.7	15.3	2.79	3.49	5.86	0.7	**1.2**	**3**
E	0.88	1.16	1.97	0.08	100	2	14.7	600	2.0%	2.8	3.5	18.2	2.58	3.23	5.43	2	**4**	**11**
F	0.39	0.51	0.85	0.08	100	2	14.7	180	5.0%	4.5	0.7	15.3	2.79	3.49	5.86	1.1	**1.8**	**5**
G	0.70	0.77	1.00	0.08	50	1	10.4	475	4.0%	4.0	2.0	12.3	3.04	3.81	6.40	2	**3**	**6**
H	0.92	1.12	1.72	0.08	100	2	14.7	500	1.5%	2.4	3.4	18.1	2.59	3.24	5.44	2	**4**	**9**
I	0.31	0.37	0.57	0.08	50	1	10.4	500	1.5%	2.4	3.4	13.8	2.91	3.65	6.13	0.9	**1.4**	**4**
J	1.51	1.84	2.81	0.08	60	1.2	11.3	650	1.5%	2.4	4.4	15.8	2.75	3.45	5.78	4	**6**	**16**
K	0.65	0.69	0.87	0.12	100	2.5	13.1	100	1.5%	2.4	0.7	13.8	2.92	3.65	6.13	2	**3**	**5**
L1	0.04	0.08	0.27	0.08	100	3	12.8					12.8	3.00	3.76	6.31	0.1	**0.3**	**1.7**
L2	0.16	0.19	0.28	0.08	25	0.75	6.4	120	3.5%	3.7	0.5	6.9	3.73	4.68	7.85	0.6	**0.9**	**2.2**
L3	0.77	0.81	0.95	0.08	25	0.6	6.9	450	3.0%	3.5	2.2	9.1	3.41	4.28	7.18	3	**3**	**7**
M1	0.19	0.20	0.27	0.12	70	2.8	9.4	40	2.0%	1.0	0.7	10.0	3.29	4.12	6.92	0.6	**1**	**2**
M2	0.20	0.48	1.56	0.08	300	9	22.2	200	8.0%	2.0	1.7	23.9	2.26	2.82	4.74	0.5	**1**	**7**
N1	0.83	0.92	1.26	0.12	80	2	11.7	575	1.5%	2.4	3.9	15.6	2.77	3.46	5.81	2	**3**	**7**

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
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Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

Table 6-7. Conveyance Coefficient, C_v

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Grassed waterway	15
Paved areas and shallow paved swales	20

$t_c = \frac{L}{180} + 10$

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

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
N2	1.29	1.43	1.95	0.12	100	2	14.1	500	1.5%	2.4	3.4	17.5	2.63	3.29	5.53	3	5	11
O	2.85	3.17	4.27	0.12	100	2	14.1	400	1.8%	2.7	2.5	16.6	2.69	3.37	5.66	8	11	23
P1	3.56	3.65	3.96	0.12	30	0.6	7.7	650	2.0%	2.8	3.8	11.5	3.12	3.91	6.57	11	14	26
P2	0.57	0.64	0.89	0.12	100	3	12.3	350	2.0%	2.8	2.1	14.4	2.86	3.58	6.02	2	2	5
Q1	0.40	0.49	0.80	0.12	250	12	16.7	100	4.0%	2.0	0.8	17.5	2.63	3.29	5.52	1	2	4
Q2	0.85	0.88	0.97	0.12	20	0.4	6.3	700	3.5%	1.9	6.2	12.5	3.03	3.79	6.36	3	3	6
Q3	0.08	0.10	0.15	0.12	100	3	12.3					12.3	3.05	3.82	6.41	0.2	0.4	1.0
R	0.20	0.44	1.36	0.08	300	20	17.1	200	4.0%	2.0	1.7	18.7	2.55	3.19	5.35	0.5	1.4	7
S	0.30	0.62	1.82	0.25	300	20	14.2	250	4.0%	2.0	2.1	16.3	2.71	3.40	5.70	0.8	2.1	10
T	0.08	0.17	0.52	0.08	200	9	15.9					15.9	2.75	3.44	5.77	0.2	0.6	3
U	0.75	1.10	2.30	0.08	100	2	14.7	800	2.0%	2.8	4.7	19.4	2.51	3.14	5.27	2	3	12
V	0.37	0.41	0.53	0.08	50	1	10.4	275	4.0%	4.0	1.1	11.5	3.13	3.92	6.58	1.2	1.6	3
W	1.40	1.71	2.67	0.12	50	1	10.0	900	2.5%	3.2	4.7	14.7	2.84	3.55	5.96	4	6	16
X	0.12	0.14	0.18	0.08	50	1	10.4	100	1.5%	2.4	0.7	11.0	3.18	3.98	6.68	0.4	0.5	1.2
Y	1.16	1.42	2.19	0.08	100	2	14.7	650	1.5%	2.4	4.4	19.1	2.53	3.16	5.31	3	4	12

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALC'D BY: ***MAW***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

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

$t_c = \frac{L}{180} + 10$

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

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
Z	0.33	0.48	1.01	0.08	50	1	10.4	650	1.5%	2.4	4.4	14.8	2.83	3.54	5.95	1	**2**	**6**
AA	0.24	0.40	0.88	0.08	100	3	12.8	375	3.5%	1.9	3.3	16.2	2.72	3.41	5.72	0.7	**1.4**	**5**
BB	0.22	0.36	0.79	0.08	80	3	10.6	430	1.5%	1.2	5.9	16.5	2.70	3.38	5.67	0.6	**1.2**	**4**
CC	0.54	0.63	0.89	0.08	100	6	10.2	150	1.5%	2.4	1.0	11.2	3.16	3.96	6.64	2	**2**	**6**
DD	0.41	0.42	0.49	0.12	30	0.9	6.7	70	1.5%	2.4	0.5	7.2	3.68	4.62	7.75	2	**2**	**4**
EE	0.82	0.86	0.99	0.45	10	0.2	3.0	550	4.0%	4.0	2.3	5.2	4.06	5.10	8.56	3	**4**	**8**
FF	0.90	1.09	1.66	0.08	85	2.5	11.9	550	4.0%	4.0	2.3	14.2	2.88	3.60	6.05	3	**4**	**10**
GG	1.26	1.35	1.74	0.12	40	1.2	7.8	750	2.0%	2.8	4.4	12.2	3.06	3.83	6.43	4	**5**	**11**
HH	1.23	1.29	1.55	0.12	30	0.9	6.7	750	2.0%	2.8	4.4	11.2	3.16	3.96	6.66	4	**5**	**10**
II	4.26	4.68	6.14	0.12	100	2	14.1	800	1.5%	2.4	5.4	19.5	2.50	3.13	5.25	11	**15**	**32**
JJ	0.61	0.66	0.82	0.08	100	2	14.7	180	1.5%	2.4	1.2	15.9	2.74	3.44	5.77	2	**2**	**5**
KK	1.07	1.17	1.53	0.08	100	2	14.7	300	4.0%	4.0	1.3	15.9	2.74	3.43	5.76	3	**4**	**9**
LL	0.98	1.08	1.42	0.08	100	2	14.7	300	4.0%	4.0	1.3	15.9	2.74	3.43	5.76	3	**4**	**8**
MM	1.35	1.49	1.95	0.08	100	2	14.7	450	4.0%	4.0	1.9	16.5	2.70	3.38	5.67	4	**5**	**11**

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***

JOB NUMBER: ***1305.11***

DATE: ***06/12/25***

CALC'D BY: ***MAW***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

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

$t_c = \frac{L}{180} + 10$

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

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
NN1	1.37	1.44	1.71	0.45	80	2.4	7.3	1000	4.0%	4.0	4.2	11.5	3.13	3.92	6.59	4	**6**	**11**
NN2	0.80	0.92	1.43	0.12	150	4	15.7	700	1.8%	2.7	4.3	20.0	2.47	3.09	5.18	2	**3**	**7**
OO	0.82	0.95	1.38	0.08	60	1.2	11.3	1100	4.0%	4.0	4.6	15.9	2.74	3.43	5.76	2	**3**	**8**
PP	0.29	0.48	1.06	0.08	100	6	10.2	450	2.0%	1.4	5.3	15.5	2.77	3.47	5.83	0.8	**1.7**	**6**
QQ	0.18	0.30	0.66	0.08	100	4	11.7	350	2.0%	1.4	4.1	15.8	2.75	3.44	5.78	0.5	**1.0**	**4**
RR	0.57	1.09	3.10	0.12	100	3	12.3	600	1.0%	1.0	10.0	22.3	2.34	2.93	4.91	1	**3**	**15**
SS	0.02	0.05	0.16	0.08	100	6	10.2					10.2	3.27	4.10	6.88	0.1	**0.2**	**1.1**
TT	0.22	0.22	0.25	0.12	40	1.2	7.8	80	1.5%	2.4	0.5	8.3	3.51	4.40	7.39	0.8	**1.0**	**1.9**
UU	0.13	0.13	0.16	0.12	15	0.45	4.8	80	1.5%	2.4	0.5	5.3	4.05	5.08	8.53	0.5	**0.7**	**1.3**
VV1	0.04	0.08	0.27	0.12	100	2	14.1					14.1	2.89	3.62	6.07	0.1	**0.3**	**1.7**
VV2	0.66	0.71	0.95	0.12	46	8	4.7	200	2.0%	2.8	1.2	5.9	3.93	4.93	8.28	3	**4**	**8**

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALCULATED BY: ***MAW***

*ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED

SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Facility/ Inlet Size*
					I(5)	I(100)	Q(5)	Q(100)	
1	EX-4A, A	7.11	27.94	53.5	1.61	2.71	11	76	PROP. TYPE D CDOT INLET
2	EX-4B, B	6.62	25.52	65.9	1.30	2.18	9	56	PROP. TYPE D CDOT INLET
3	C1, EX-4C	1.79	4.45	22.9	2.89	4.85	5	22	10' TYPE R AT-GRADE INLET
4	C2, Flowby from DP-3	0.73	3.53	23.4	2.86	4.79	2	17	10' TYPE R SUMP INLET
5	D	0.33	0.55	15.3	3.49	5.86	1.2	3	5' TYPE R SUMP INLET
6	E	1.16	1.97	18.2	3.23	5.43	4	11	10' TYPE R AT-GRADE INLET
7	F	0.51	0.85	15.3	3.49	5.86	1.8	5	10' TYPE R AT-GRADE INLET
8	G	0.77	1.00	12.3	3.81	6.40	3	6	5' TYPE R SUMP INLET
9	H	1.12	1.72	18.1	3.24	5.44	4	9	10' TYPE R SUMP INLET
10	I	0.37	0.57	13.8	3.65	6.13	1.4	4	5' TYPE R SUMP INLET
11	J, Flowby from DP-6 & DP-7	1.85	3.49	19.7	3.11	5.23	6	18	10' TYPE R SUMP INLET
12A	K	0.69	0.87	13.8	3.65	6.13	3	5	5' TYPE R SUMP INLET
12B	N1	0.92	1.26	15.6	3.46	5.81	3	7	FUTURE 5' TYPE R SUMP INLET
12C	M1	0.20	0.27	10.0	4.12	6.92	1	2	5' TYPE R SUMP INLET

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
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*ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED

SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Facility/ Inlet Size*
					I(5)	I(100)	Q(5)	Q(100)	
13	N2	1.43	1.95	17.5	3.29	5.53	5	11	PROP. 24" RCP STUB
14	M2	0.48	1.56	23.9	2.82	4.74	1	7	EXIST. 48" MH WITH GRATE
15	Q1	0.49	0.80	17.5	3.29	5.52	2	4	EXIST. TYPE D AREA INLET
16	Q2, Q3	0.97	1.13	12.5	3.79	6.36	4	7	EXIST. TYPE D AREA INLET
17	L2	0.19	0.28	6.9	4.68	7.85	0.9	2.2	EX. 5' TYPE R ATGRADE INLET
18	L1, L3 Flow-by from DP-17	0.89	1.27	14.8	3.54	5.94	3	8	EX. 10' TYPE R ATGRADE INLET
19	P2, 100-yr. Flowby from DP-18	0.64	1.15	14.4	3.58	6.02	2	7	EX. 15' TYPE R ATGRADE INLET
20	EX-3A, R	0.70	2.30	18.7	3.19	5.35	2	12	
21	EX-3, S, DP-20	5.71	19.79	29.1	2.53	4.24	14	84	PROP. TYPE D CDOT INLET
22	U	1.10	2.30	19.4	3.14	5.27	3	12	10' TYPE R SUMP INLET
23	V	0.41	0.53	11.5	3.92	6.58	1.6	3	5' TYPE R SUMP INLET
24	W	1.71	2.67	14.7	3.55	5.96	6	16	10' TYPE R SUMP INLET
25	X	0.14	0.18	11.0	3.98	6.68	0.5	1.2	5' TYPE R SUMP INLET

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
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SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Facility/ Inlet Size*
					I(5)	I(100)	Q(5)	Q(100)	
26	Y	1.42	2.19	19.1	3.16	5.31	4	12	10' TYPE R SUMP INLET
27	Z	0.48	1.01	14.8	3.54	5.95	2	6	5' TYPE R SUMP INLET
28	AA, OS-2A	0.56	1.36	16.2	3.41	5.72	2	8	CDOT TYPE C INLET
29	BB, OS-2B	0.43	1.00	16.5	3.38	5.67	1	6	CDOT TYPE C INLET
30	EE	0.86	0.99	5.2	5.10	8.56	4	8	5' TYPE R SUMP INLET
31	FF	1.09	1.66	14.2	3.60	6.05	4	10	10' TYPE R SUMP INLET
32	DD	0.42	0.49	7.2	4.62	7.75	2	4	5' TYPE R SUMP INLET
33	CC	0.63	0.89	11.2	3.96	6.64	2	6	5' TYPE R SUMP INLET
34	JJ	0.66	0.82	15.9	3.44	5.77	2	5	5' TYPE R SUMP INLET
35	KK	1.17	1.53	15.9	3.43	5.76	4	9	10' TYPE R AT-GRADE INLET
36	LL, Flowby from DP-35	1.09	1.80	17.2	3.32	5.57	4	10	10' TYPE R AT-GRADE INLET
37	NN1, NN2, 50% of (100yr. NN2 & Flowby from DP-42 & DP-43)	2.36	2.59	20.0	3.09	5.18	7	13	10' TYPE R SUMP INLET
38	MM, Flowby from DP-36	1.50	2.45	19.0	3.17	5.31	5	13	10' TYPE R SUMP INLET

JOB NAME: *RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR*
JOB NUMBER: *1305.11*
DATE: *06/12/25*
CALCULATED BY: *MAW*

*ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED

SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Facility/ Inlet Size*
					I(5)	I(100)	Q(5)	Q(100)	
39	II	4.68	6.14	19.5	3.13	5.25	15	32	PROP. 30" RCP
40	O	3.17	4.27	16.6	3.37	5.66	11	23	PROP. 30" RCP STUB
41	P1	3.65	3.96	11.5	3.91	6.57	14	26	PROP. 30" RCP STUB
42	GG	1.35	1.74	12.2	3.83	6.43	5	11	15' TYPE R AT-GRADE INLET
43	HH	1.29	1.55	11.2	3.96	6.66	5	10	15' TYPE R AT-GRADE INLET
44	OO	0.95	1.38	15.9	3.43	5.76	3	8	10' TYPE R SUMP INLET
45	OS-2C, PP, TT, UU	1.30	2.91	20.2	3.08	5.16	4	15	CDOT TYPE C INLET
46	OS-1A, QQ	0.34	0.78	14.3	3.59	6.03	1	5	CDOT TYPE C INLET
47	VV1, VV2, 50% of (100-yr. NN2 & Flowby from DP-42 & DP-43)	0.80	2.09	22.7	2.90	4.87	3	10	EX. 15' TYPE R ATGRADE INLET
48	**TOTAL TRIBUTARY AREA TO ON-SITE POND (Incl. Basins OS-1B and RR)**	**39.63**	**69.20**	**31.8**	**2.39**	**4.02**	**95**	**278**	**PROP. ON-SITE POND 1**
49	T	0.17	0.52	15.9	3.44	5.77	0.6	3	Sheet flow off-site
50	SS	0.05	0.16	10.2	4.10	6.88	0.2	1.1	Sheet flow into roadside ditch

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
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* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
1	DP-1	7.11	27.94	53.5	1.61	2.71	11	76	PROP. 42" RCP
2	DP-2	6.62	25.52	65.9	1.30	2.18	9	56	PROP. 36" RCP
3	DP-4	0.73	3.53	23.4	2.86	4.79	2	17	PROP. 24" RCP
4	DP-5	0.33	0.55	15.3	3.49	5.86	1.2	3	PROP. 18" RCP
5	PR-2, PR-3, PR-4	7.69	29.60	65.9	1.30	2.18	10	65	PROP. 42" RCP
6	PR-1, PR-5	14.80	57.54	65.9	1.30	2.18	19	125	PROP. 48" RCP
7	DP-3 Collected	1.68	2.09	22.9	2.89	4.85	5	10	PROP. 18" RCP
8	PR-6, PR-7	16.48	59.63	66.4	1.29	2.16	21	129	PROP. 48" RCP
9	DP-6 Collected	1.14	1.34	18.2	3.23	5.43	4	7	PROP. 24" RCP
10	DP-7 Collected	0.51	0.80	15.3	3.49	5.86	1.8	5	PROP. 18" RCP
11	PR-8. PR-9, PR-10	18.13	61.77	66.9	1.28	2.14	23	132	PROP. 48" RCP
12	DP-9	1.12	1.72	18.1	3.24	5.44	4	9	PROP. 24" RCP
13	DP-10	0.37	0.57	13.8	3.65	6.13	1.4	4	PROP. 18" RCP

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
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* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
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ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
14	PR-12, PR-13	1.50	2.29	18.6	3.20	5.38	5	12	PROP. 24" RCP
15	PR-11, PR-14	19.63	64.06	67.2	1.27	2.13	25	137	PROP. 48" RCP
16	DP-8	0.77	1.00	12.3	3.81	6.40	3	6	PROP. 18" RCP
17	DP-11	1.85	3.49	19.7	3.11	5.23	6	18	PROP. 30" RCP
18	DP-12	0.69	0.87	13.8	3.65	6.13	3	5	PROP. 18" RCP
19	PR-17, PR-18	2.54	4.36	19.9	3.10	5.20	8	23	PROP. 30" RCP
20	PR-15, PR-16, PR-19	22.93	69.42	67.5	1.26	2.12	29	147	PROP. 48" RCP
20A	DP-12B	0.92	1.26	15.6	3.46	5.81	3	7	PROP. 18" RCP
20B	DP-12C	0.20	0.27	10.0	4.12	6.92	1	2	PROP. 18" RCP
20C	PR-20, PR-20A, PR-20B	24.06	70.95	68.0	1.25	2.10	30	149	PROP. 48" RCP
21	DP-13	1.43	1.95	17.5	3.29	5.53	5	11	PROP. 24" RCP STUB
22	**PR-20C, PR-21**	**25.49**	**72.89**	**68.2**	**1.25**	**2.09**	**32**	**153**	**PROP. 48" RCP**
23	**DP-14, PR-22**	**25.97**	**74.45**	**68.2**	**1.25**	**2.09**	**32**	**156**	**PROP. 48" RCP**

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALCULATED BY: ***MAW***

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
24	DP-21	5.71	19.79	29.1	2.53	4.24	14	84	PROP. 42" RCP
25	DP-22	1.10	2.30	19.4	3.14	5.27	3	12	PROP. 24" RCP
26	DP-23, PR-25	1.51	2.83	19.4	3.14	5.27	5	15	PROP. 24" RCP
27	PR-24, PR-26	7.22	22.62	30.3	2.47	4.14	18	94	PROP. 42" RCP
28	DP-24	1.71	2.67	14.7	3.55	5.96	6	16	PROP. 24" RCP
29	DP-25	0.14	0.18	11.0	3.98	6.68	0.5	1.2	PROP. 18" RCP
30	PR-28, PR-29	1.85	2.85	15.5	3.47	5.83	6	17	PROP. 30" RCP
31	DP-26	1.42	2.19	19.1	3.16	5.31	4	12	PROP. 24" RCP
32	DP-27	0.48	1.01	14.8	3.54	5.95	2	6	PROP. 18" RCP
33	PR-30, PR-31, PR-32	3.75	6.06	19.1	3.16	5.31	12	32	PROP. 30" RCP
34	PR-27, PR-33	10.97	28.68	30.5	2.46	4.12	27	118	PROP. 48" RCP

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALCULATED BY: ***MAW***

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
35	DP-28	0.56	1.36	16.2	3.41	5.72	2	8	PROP. 18" RCP
36	DP-29, PR-35	0.98	2.36	16.7	3.36	5.64	3	13	PROP. 24" RCP
37	PR-34, PR-36	11.95	31.04	30.6	2.45	4.11	29	128	PROP. 48" RCP
38	DP-30	0.86	0.99	5.2	5.10	8.56	4	8	PROP. 18" RCP
39	DP-31	1.09	1.66	14.2	3.60	6.05	4	10	PROP. 24" RCP
40	PR-38, PR-39	1.94	2.65	14.2	3.60	6.05	7	16	PROP. 24" RCP
41	DP-32	0.42	0.49	7.2	4.62	7.75	2	4	PROP. 18" RCP
42	DP-33, PR-41	1.05	1.38	11.2	3.96	6.64	4	9	PROP. 24" RCP
43	PR-37, PR-42	13.00	32.42	30.6	2.45	4.11	32	133	PROP. 48" RCP
44	PR-40, PR-43	14.95	35.07	30.8	2.44	4.10	36	144	PROP. 48" RCP
45	DP-34	0.66	0.82	15.9	3.44	5.77	2	5	PROP. 18" RCP

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALCULATED BY: ***MAW***

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
46	PR-44, PR-45	15.61	35.89	31.1	2.43	4.07	38	146	PROP. 48" RCP
47	DP-35 Collected	1.16	1.15	15.9	3.43	5.76	4	7	PROP. 18" RCP
48	PR-46, PR-47	16.77	37.04	31.3	2.42	4.06	41	150	PROP. 48" RCP
49	DP-36 Collected	1.08	1.30	17.2	3.32	5.57	4	7	PROP. 18" RCP
50	PR-48, PR-49	17.85	38.34	31.5	2.41	4.04	43	155	PROP. 48" RCP
51	DP-39	4.68	6.14	19.5	3.13	5.25	15	32	PROP. 30" RCP
52	PR-50, PR-51	22.53	44.48	31.7	2.40	4.03	54	179	PROP. 54" RCP
53	DP-37	2.36	2.59	20.0	3.09	5.18	7	13	PROP. 24" RCP
54	DP-38, PR-53	3.86	5.04	20.0	3.09	5.18	12	26	PROP. 30" RCP
55	PR-52, PR-54	26.39	49.51	31.7	2.40	4.03	63	199	PROP. 60" RCP
56	DP-40	3.17	4.27	16.6	3.37	5.66	11	23	PROP. 30" RCP STUB

JOB NAME: ***RETREAT AT PRAIRIERIDGE FILINGS 1-3 FDR***
JOB NUMBER: ***1305.11***
DATE: ***06/12/25***
CALCULATED BY: ***MAW***

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM SEWER OUTSIDE OF PUBLIC RIGHT-OF-WAY TO BE PRIVATE UNLESS OTHERWISE NOTED
PRIVATE STORM MATERIALS TO BE RCP OR DOUBLE WALL POLYPROPYLENE (DWPP) TO BE SELECTED BY CONTRACTOR

PIPE ROUTING SUMMARY

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
57	DP-42 Collected	1.35	1.55	12.2	3.83	6.43	5	10	PROP. 24" RCP
58	PR-56, PR-57	4.52	5.82	16.9	3.35	5.62	15	33	PROP. 30" RCP
59	DP-41	3.65	3.96	11.5	3.91	6.57	14	26	PROP. 30" RCP
60	PR-58, PR-59	8.16	9.78	16.9	3.35	5.62	27	55	PROP. 36" RCP
61	DP-43 Collected	1.29	1.43	11.2	3.96	6.66	5	9	PROP. 24" RCP
62	PR-60, PR-61	9.46	11.20	17.4	3.30	5.54	31	62	PROP. 36" RCP
63	PR-55, PR-62	35.84	60.72	31.8	2.39	4.02	86	244	PROP. 66" RCP
64	DP-45	1.30	2.91	21.0	3.02	5.06	4	15	PROP. 24" RCP
65	PR-64, DP-46	1.64	3.69	21.2	3.00	5.04	5	19	PROP. 24" RCP
66	DP-44	0.95	1.38	15.9	3.43	5.76	3	8	PROP. 18" RCP
67	PR-65-PR-66	2.59	5.06	21.7	2.97	4.98	8	25	PROP. 30" RCP
68	**PR-63-PR-67**	**38.44**	**65.78**	**31.8**	**2.39**	**4.02**	**92**	**264**	**PROP. 66" RCP**

Missing DP 12c, Please provide

Version 4.05 Released March 2017

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-4	DP-5	DP-6	DP-7	DP-8	DP-9
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	On Grade	On Grade	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.0	1.2	4.0	1.8	3.0	4.0
Major Q_{Known} (cfs)	17.0	3.0	11.0	5.0	6.0	9.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**2.0**	**1.2**	**4.0**	**1.8**	**3.0**	**4.0**
Major Total Design Peak Flow, Q (cfs)	**17.0**	**3.0**	**11.0**	**5.0**	**6.0**	**9.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	0.0	0.0	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	3.5	0.3	N/A	N/A

Minor Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow Time

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-10	DP-11	DP-12A	DP-3	DP-22	DP-23
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump	On Grade	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.4	6.0	3.0	5.0	3.0	1.6
Major Q_{Known} (cfs)	4.0	18.0	5.0	22.0	12.0	3.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0		0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0		0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**1.4**	**6.0**	**3.0**	**5.0**	**3.0**	**1.6**
Major Total Design Peak Flow, Q (cfs)	**4.0**	**18.0**	**5.0**	**22.0**	**12.0**	**3.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	0.3	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	11.7	N/A	N/A

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-24	DP-25	DP-26	DP-27	DP-28	DP-29
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	RURAL	RURAL
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	AREA	AREA
Hydraulic Condition	In Sump	In Sump	In Sump	In Sump	Swale	Swale
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type C	CDOT Type C

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	6.0	0.5	4.0	2.0	2.0	1.0
Major Q_{Known} (cfs)	16.0	1.2	12.0	6.0	8.0	6.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**6.0**	**0.5**	**4.0**	**2.0**	**2.0**	**1.0**
Major Total Design Peak Flow, Q (cfs)	**16.0**	**1.2**	**12.0**	**6.0**	**8.0**	**6.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	N/A	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	N/A	0.0	0.0

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-30	DP-31	DP-33	DP-32	DP-34	DP-35
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump	In Sump	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	4.0	4.0	2.0	2.0	2.0	4.0
Major Q_{Known} (cfs)	8.0	10.0	6.0	4.0	5.0	9.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**4.0**	**4.0**	**2.0**	**2.0**	**2.0**	**4.0**
Major Total Design Peak Flow, Q (cfs)	**8.0**	**10.0**	**6.0**	**4.0**	**5.0**	**9.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	N/A	N/A	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A	N/A	N/A	2.2

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-36	DP-37	DP-38	DP-42	DP-43	DP-44
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	In Sump	In Sump	On Grade	On Grade	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	4.0	7.0	5.0	5.0	5.0	3.0
Major Q_{Known} (cfs)	10.0	13.0	13.0	11.0	10.0	8.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**4.0**	**7.0**	**5.0**	**5.0**	**5.0**	**3.0**
Major Total Design Peak Flow, Q (cfs)	**10.0**	**13.0**	**13.0**	**11.0**	**10.0**	**8.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	N/A	N/A	0.0	0.0	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	2.8	N/A	N/A	1.2	0.8	N/A

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-15	DP-16	DP-17	DP-18	DP-19	DP-45
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	AREA	AREA	STREET	STREET	STREET	AREA
Hydraulic Condition	Swale	Swale	On Grade	On Grade	On Grade	Swale
Inlet Type	CDOT Type D (In Series)	CDOT Type D (In Series)	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type C

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	2.0	4.0	0.9	3.0	2.0	4.0
Major Q_{Known} (cfs)	4.0	7.0	2.2	8.0	7.0	15.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**2.0**	**4.0**	**0.9**	**3.0**	**2.0**	**4.0**
Major Total Design Peak Flow, Q (cfs)	**4.0**	**7.0**	**2.2**	**8.0**	**7.0**	**15.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.3	1.7	0.0	0.0

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-46	DP-47	DP-1	DP-2	DP-21	DP-12B
Site Type (Urban or Rural)	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	AREA	STREET	AREA	AREA	AREA	STREET
Hydraulic Condition	Swale	On Grade	Swale	Swale	Swale	In Sump
Inlet Type	CDOT Type C	CDOT Type R Curb Opening	CDOT Type D (In Series & Depressed)	CDOT Type D (In Series & Depressed)	CDOT Type D (In Series & Depressed)	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.0	3.0	11.0	9.0	14.0	3.0
Major Q_{Known} (cfs)	5.0	10.0	76.0	56.0	84.0	7.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)						
Percent Impervious						
NRCS Soil Type						

Watershed Profile

Overland Slope (ft/ft)						
Overland Length (ft)						
Channel Slope (ft/ft)						
Channel Length (ft)						

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)						
One-Hour Precipitation, P_1 (inches)						

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**1.0**	**3.0**	**11.0**	**9.0**	**14.0**	**3.0**
Major Total Design Peak Flow, Q (cfs)	**5.0**	**10.0**	**76.0**	**56.0**	**84.0**	**7.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	0.0	0.0	0.0	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.8	0.0	0.0	0.0	N/A

Minor Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A	N/A	N/A	N/A	N/A	N/A
C_5	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Velocity, Vi	N/A	N/A	N/A	N/A	N/A	N/A
Channel Flow Velocity, Vt	N/A	N/A	N/A	N/A	N/A	N/A
Overland Flow Time, Ti	N/A	N/A	N/A	N/A	N/A	N/A
Channel Travel Time, Tt	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Time of Concentration, T_c	N/A	N/A	N/A	N/A	N/A	N/A
Regional T_c	N/A	N/A	N/A	N/A	N/A	N/A
Recommended T_c	N/A	N/A	N/A	N/A	N/A	N/A
T_c selected by User	N/A	N/A	N/A	N/A	N/A	N/A
Design Rainfall Intensity, I	N/A	N/A	N/A	N/A	N/A	N/A
Calculated Local Peak Flow, Q_p	N/A	N/A	N/A	N/A	N/A	N/A

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INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-12C
Site Type (Urban or Rural)	URBAN
Inlet Application (Street or Area)	STREET
Hydraulic Condition	In Sump
Inlet Type	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	1.0
Major Q_{Known} (cfs)	2.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0

Watershed Characteristics

Subcatchment Area (acres)	
Percent Impervious	
NRCS Soil Type	

Watershed Profile

Overland Slope (ft/ft)	
Overland Length (ft)	
Channel Slope (ft/ft)	
Channel Length (ft)	

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)	
One-Hour Precipitation, P_1 (inches)	

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	**1.0**
Major Total Design Peak Flow, Q (cfs)	**2.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A

Minor Storm (Calculated) Analysis of Flow T

C	N/A
C_5	N/A
Overland Flow Velocity, Vi	N/A
Channel Flow Velocity, Vt	N/A
Overland Flow Time, Ti	N/A
Channel Travel Time, Tt	N/A
Calculated Time of Concentration, T_c	N/A
Regional T_c	N/A
Recommended T_c	N/A
T_c selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, Q_p	N/A

Major Storm (Calculated) Analysis of Flow T

C	N/A
C_5	N/A
Overland Flow Velocity, Vi	N/A
Channel Flow Velocity, Vt	N/A
Overland Flow Time, Ti	N/A
Channel Travel Time, Tt	N/A
Calculated Time of Concentration, T_c	N/A
Regional T_c	N/A
Recommended T_c	N/A
T_c selected by User	N/A
Design Rainfall Intensity, I	N/A
Calculated Local Peak Flow, Q_p	N/A

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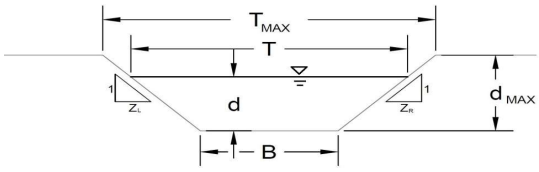
AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-1



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.041	
Channel Invert Slope	S_O =	0.0100	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	26.00	26.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	4.00	4.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	267.3	267.3	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	4.00	4.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	11.0	76.0	cfs
Water Depth	d =	1.21	2.50	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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AREA INLET IN A SWALE

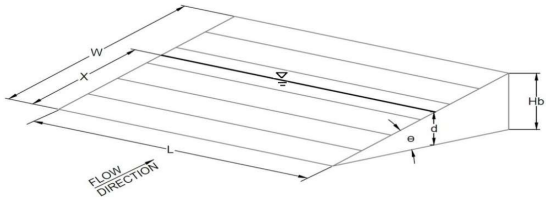
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-1

Inlet Design Information (Input)

Type of Inlet: CDOT Type D (In Series & Depressed)

Inlet Type = CDOT Type D (In Series & Depressed)



Angle of Inclined Grate (must be <= 30 degrees)	θ =	30.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	6.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	3.00	feet
Clogging Factor	C_f =	0.38	
Grate Discharge Coefficient	C_d =	0.78	
Orifice Coefficient	C_o =	0.52	
Weir Coefficient	C_w =	1.67	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	2.21	3.50	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**31.1**	**76.0**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

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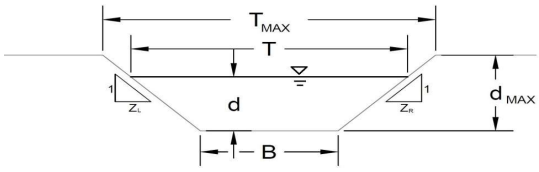
AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-2



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.041	
Channel Invert Slope	S_O =	0.0100	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	24.00	24.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	2.00	4.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	42.1	267.3	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	2.00	4.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	9.0	56.0	cfs
Water Depth	d =	1.12	2.23	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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AREA INLET IN A SWALE

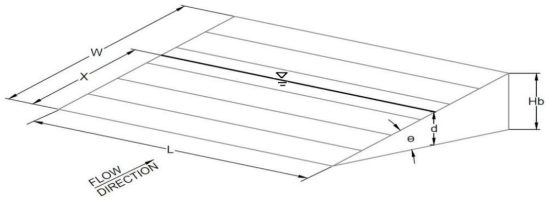
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-2

Inlet Design Information (Input)

Type of Inlet: CDOT Type D (In Series & Depressed)

Inlet Type = CDOT Type D (In Series & Depressed)



Angle of Inclined Grade (must be <= 30 degrees)	θ =	30.00	degrees
Width of Grade	W =	3.00	feet
Length of Grade	L =	6.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	3.00	feet
Clogging Factor	C_f =	0.38	
Grade Discharge Coefficient	C_d =	0.78	
Orifice Coefficient	C_o =	0.52	
Weir Coefficient	C_w =	1.67	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	2.12	3.23	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**29.3**	**73.0**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

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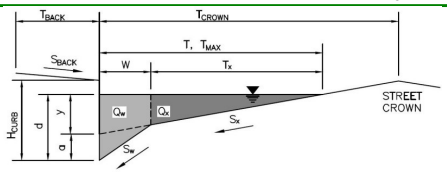
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-3



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.015	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.3**	**13.3**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

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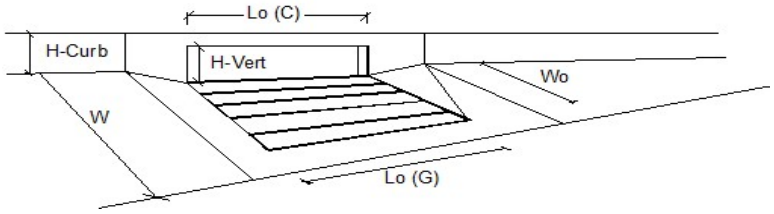


Design Information (Input)			MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MAJOR STORM		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.7**	**10.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.3**	**11.7**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**94**	**47**	**%**

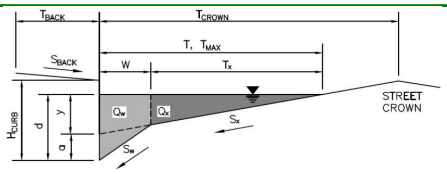
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-4



Gutter Geometry (Enter data in the blue cells)

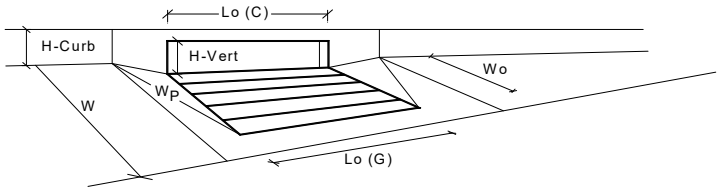
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	12.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	2.0	17.0	cfs

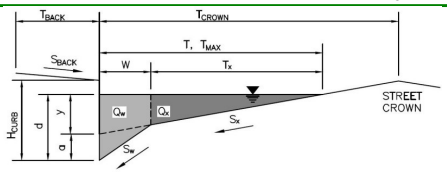
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-5



Gutter Geometry (Enter data in the blue cells)

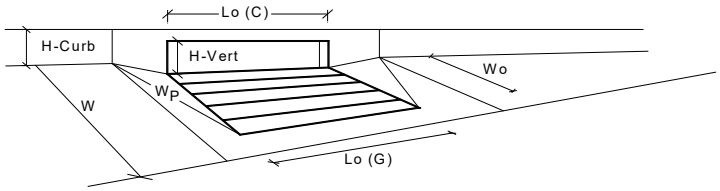
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	12.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	1.2	3.0	cfs

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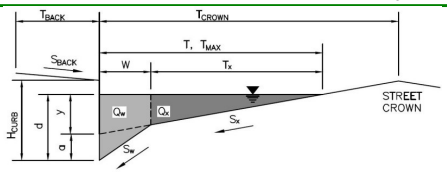
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-6



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.030	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

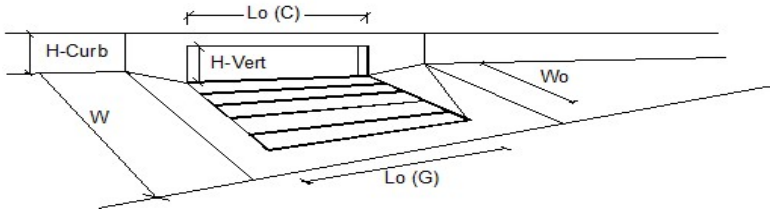
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**17.7**	**18.8**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.0**	**7.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**3.5**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**99**	**68**	**%**

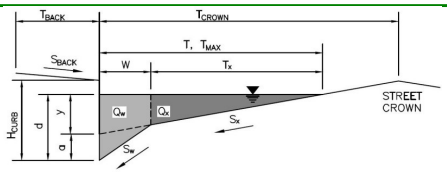
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-7



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.030	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**17.7**	**18.8**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

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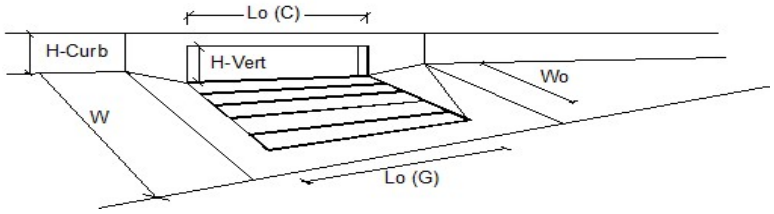


Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.8**	**4.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.3**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**94**	**%**

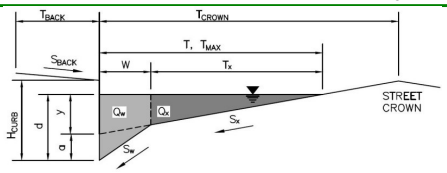
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-8



Gutter Geometry (Enter data in the blue cells)

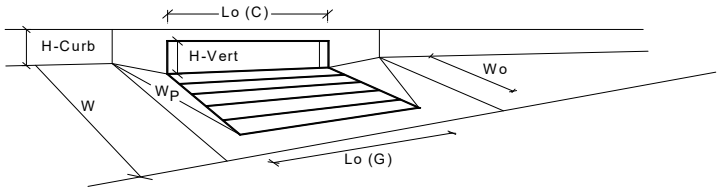
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.0	6.0	cfs

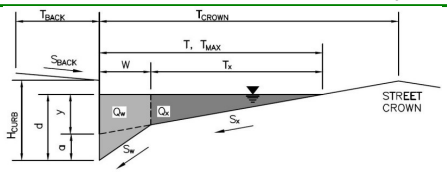
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-9



Gutter Geometry (Enter data in the blue cells)

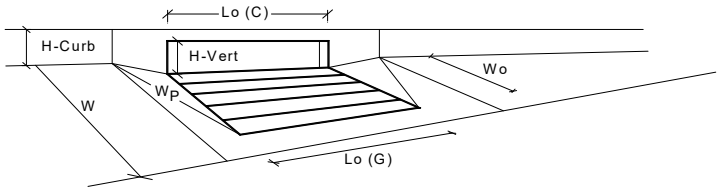
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	4.0	9.0	cfs

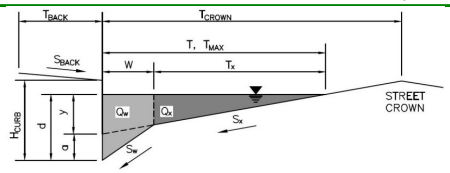
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-10



Gutter Geometry (Enter data in the blue cells)

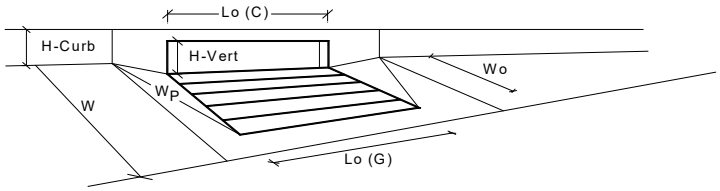
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	1.4	4.0	cfs

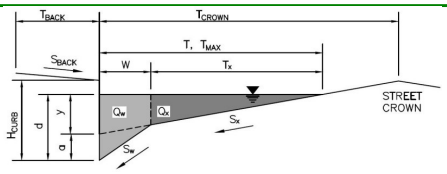
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-11



Gutter Geometry (Enter data in the blue cells)

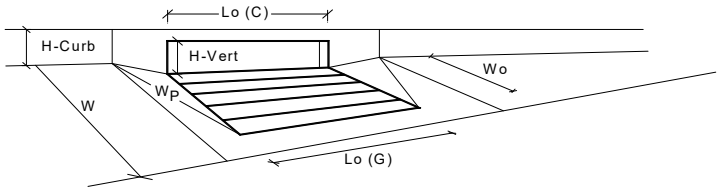
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	6.0	18.0	cfs

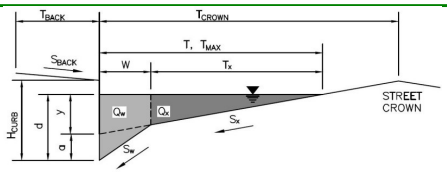
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-12A



Gutter Geometry (Enter data in the blue cells)

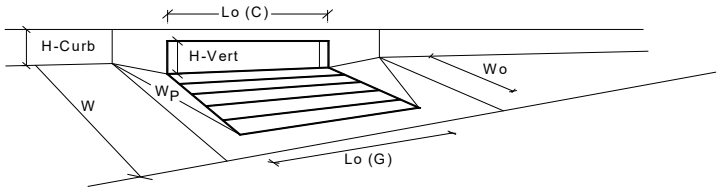
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.0	5.0	cfs

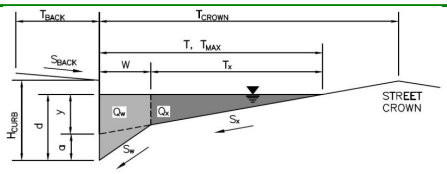
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-12B



Gutter Geometry (Enter data in the blue cells)

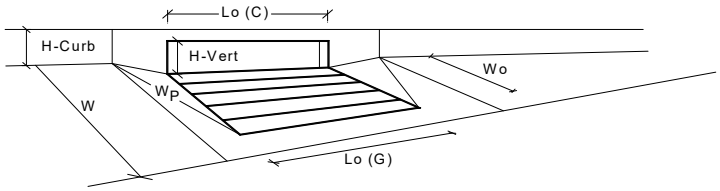
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	15.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	15.0	15.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.33	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	0.57	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	0.93	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**8.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.0	7.0	cfs

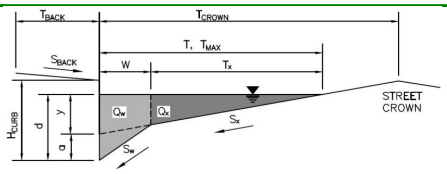
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-12C



Gutter Geometry (Enter data in the blue cells)

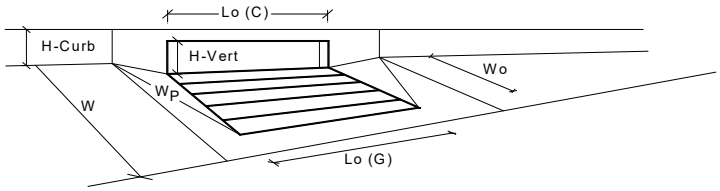
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	12.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	12.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017

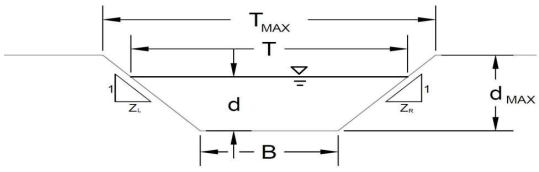


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	6.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.33	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	0.77	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**5.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	1.0	2.0	cfs

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-15



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E	C	
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	see details below	
Channel Invert Slope	S_O =	0.1000	ft/ft
Bottom Width	B =	5.00	ft
Left Side Slope	Z1 =	10.00	ft/ft
Right Side Slope	Z2 =	10.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	1.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	11.3	11.3	cfs
MAJOR STORM Allowable Capacity is based on Top Width Criterion	d_{allow} =	0.50	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	2.0	4.0	cfs
Water Depth	d =	0.38	0.41	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.05 Released March 2017

AREA INLET IN A SWALE

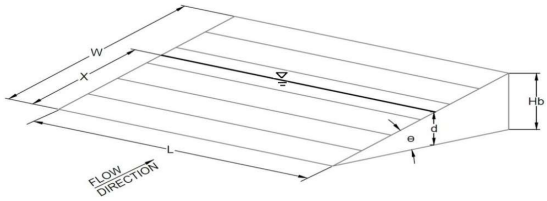
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-15

Inlet Design Information (Input)

Type of Inlet: CDOT Type D (In Series)

Inlet Type = CDOT Type D (In Series)



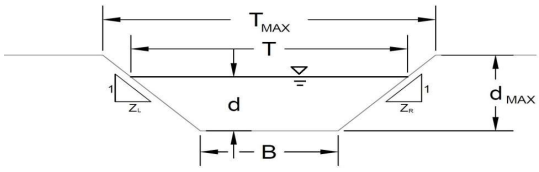
Angle of Inclined Grade (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grade	W =	3.00	feet
Length of Grade	L =	6.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	0.00	feet
Clogging Factor	C_f =	0.38	
Grade Discharge Coefficient	C_d =	0.78	
Orifice Coefficient	C_o =	0.52	
Weir Coefficient	C_w =	1.67	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.38	0.41	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**7.0**	**7.8**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-16



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E	C	
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	see details below	
Channel Invert Slope	S_O =	0.1000	ft/ft
Bottom Width	B =	5.00	ft
Left Side Slope	Z1 =	10.00	ft/ft
Right Side Slope	Z2 =	10.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	0.50	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	11.3	11.3	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.50	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	4.0	7.0	cfs
Water Depth	d =	0.41	0.46	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.05 Released March 2017

AREA INLET IN A SWALE

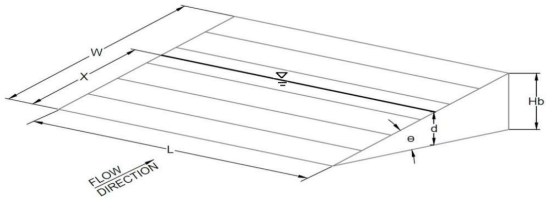
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-16

Inlet Design Information (Input)

Type of Inlet: CDOT Type D (In Series)

Inlet Type = CDOT Type D (In Series)



Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	6.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	feet
Clogging Factor	C_f =	0.38	
Grate Discharge Coefficient	C_d =	0.78	
Orifice Coefficient	C_o =	0.52	
Weir Coefficient	C_w =	1.67	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.41	0.46	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**7.8**	**9.3**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

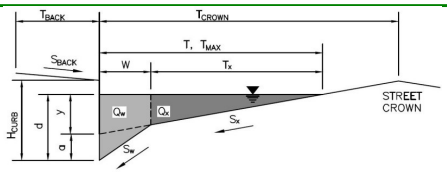
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-17



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.016	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	32.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.028	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**7.9**	**18.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

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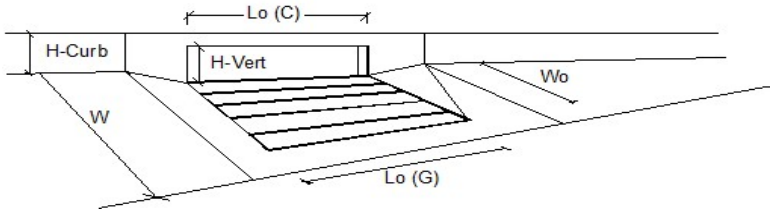

Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**0.9**	**1.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.3**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**84**	**%**

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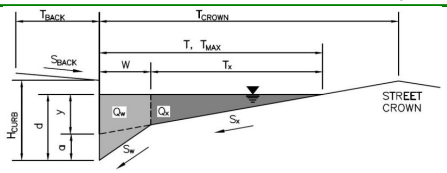
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-18



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	12.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.016	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	44.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.024	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	6.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

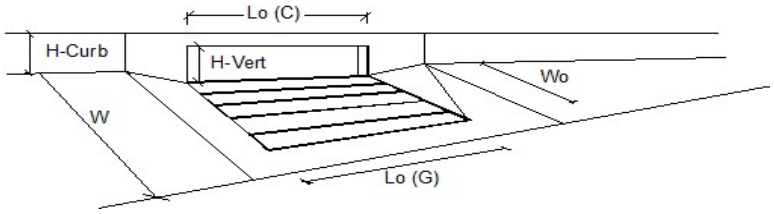
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**7.3**	**19.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**3.0**	**6.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**1.7**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**79**	**%**

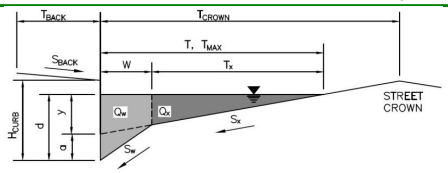
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-19



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	38.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.017	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

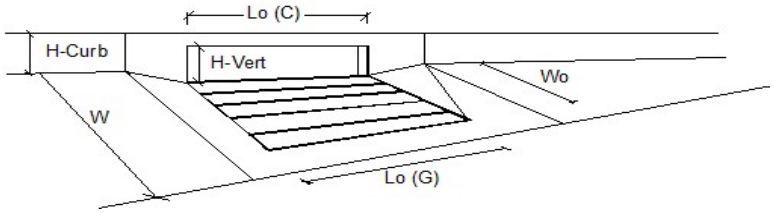
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**6.1**	**34.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

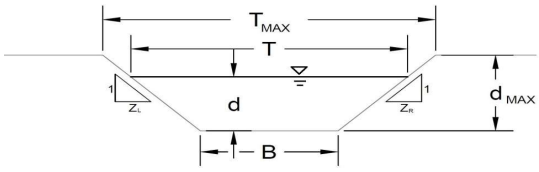
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**2.0**	**7.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**100**	**%**

Version 4.05 Released March 2017

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-21



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.054	
Channel Invert Slope	S_O =	0.0050	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	24.00	24.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	2.00	4.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	22.6	143.5	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	2.00	4.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	14.0	84.0	cfs
Water Depth	d =	1.67	3.27	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.05 Released March 2017

AREA INLET IN A SWALE

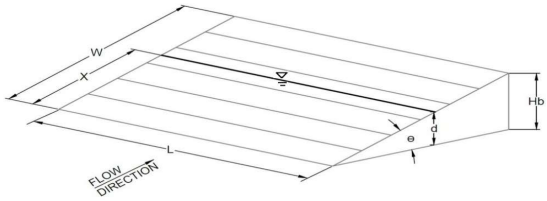
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-21

Inlet Design Information (Input)

Type of Inlet: CDOT Type D (In Series & Depressed)

Inlet Type = CDOT Type D (In Series & Depressed)



Angle of Inclined Grade (must be <= 30 degrees)	θ =	30.00	degrees
Width of Grade	W =	3.00	feet
Length of Grade	L =	6.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	3.00	feet
Clogging Factor	C_f =	0.38	
Grade Discharge Coefficient	C_d =	0.78	
Orifice Coefficient	C_o =	0.52	
Weir Coefficient	C_w =	1.67	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	2.67	4.27	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**41.4**	**84.0**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

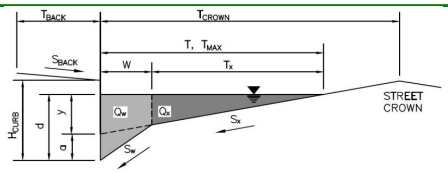
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-22



Gutter Geometry (Enter data in the blue cells)

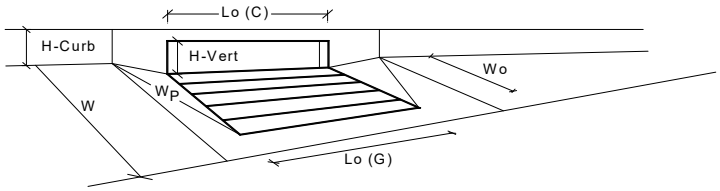
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.0	12.0	cfs

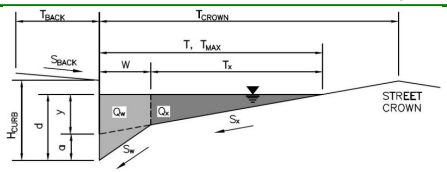
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-23



Gutter Geometry (Enter data in the blue cells)

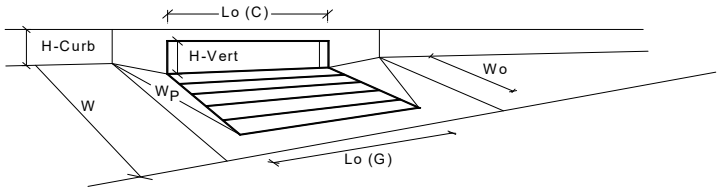
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	1.6	3.0	cfs

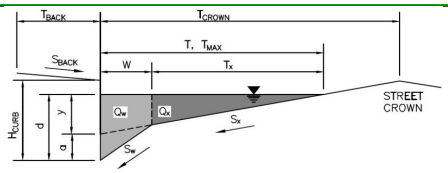
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-24



Gutter Geometry (Enter data in the blue cells)

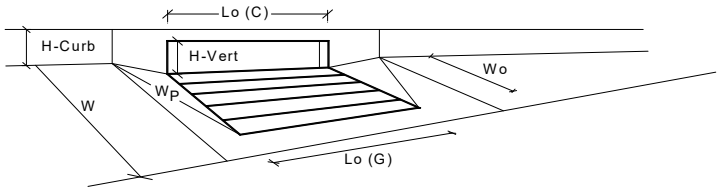
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	6.0	16.0	cfs

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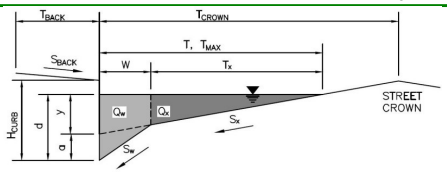
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-25



Gutter Geometry (Enter data in the blue cells)

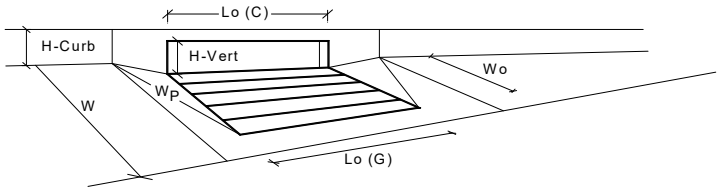
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	0.5	1.2	cfs

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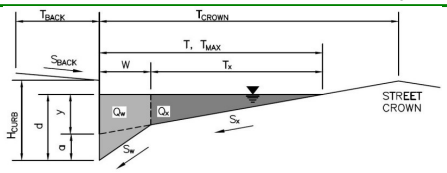
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-26



Gutter Geometry (Enter data in the blue cells)

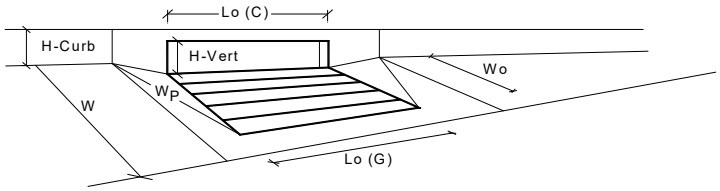
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	4.0	12.0	cfs

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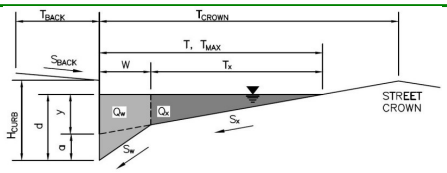
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-27



Gutter Geometry (Enter data in the blue cells)

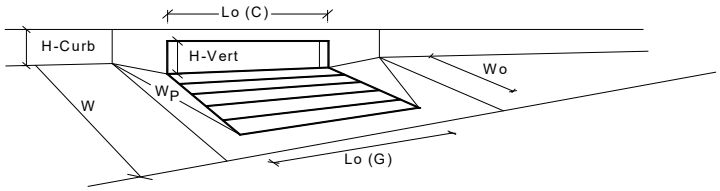
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



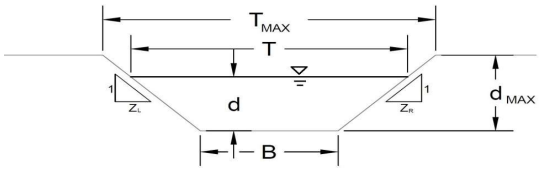
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	2.0	6.0	cfs

Version 4.05 Released March 2017

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-28



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.035	
Channel Invert Slope	S_O =	0.0350	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Slope	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	4.00	8.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	1.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	3.1	19.7	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.50	1.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	2.0	8.0	cfs
Water Depth	d =	0.42	0.71	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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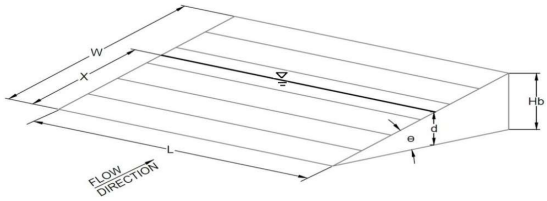
AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-28

Inlet Design Information (Input)

Type of Inlet: CDOT Type C — Inlet Type = CDOT Type C



Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.42	0.71	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.1**	**11.1**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

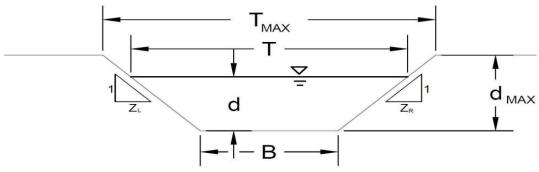
Previous submittal had a warning for high Froude number. Could not see any changes in the design data that would have addressed warning. Please provide more information/data to show how the warning was fixed, or add note addressing the warning. (This inlet & DP29)

Version 4.05 Released March 2017

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-29



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.035	
Channel Invert Slope	S_O =	0.0150	ft/ft
Bottom Width	B =	0.00	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Slope	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	4.00	8.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	1.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	2.0	12.9	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.50	1.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	1.0	6.0	cfs
Water Depth	d =	0.38	0.75	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.05 Released March 2017

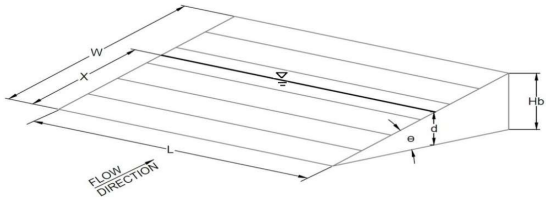
AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-29

Inlet Design Information (Input)

Type of Inlet: CDOT Type C — Inlet Type = CDOT Type C



Angle of Inclined Grade (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grade	W =	3.00	feet
Length of Grade	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grade Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.38	0.75	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.4**	**12.0**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

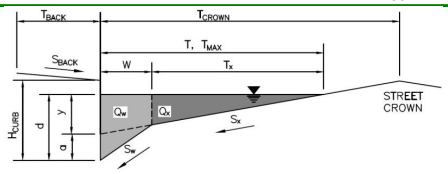
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-30



Gutter Geometry (Enter data in the blue cells)

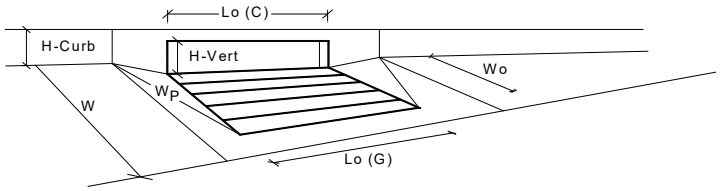
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	4.0	8.0	cfs

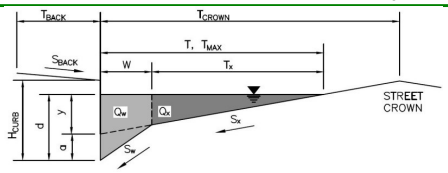
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-31



Gutter Geometry (Enter data in the blue cells)

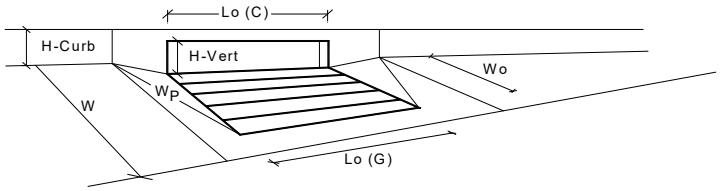
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	18.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	4.0	10.0	cfs

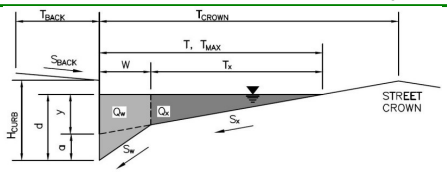
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-32



Gutter Geometry (Enter data in the blue cells)

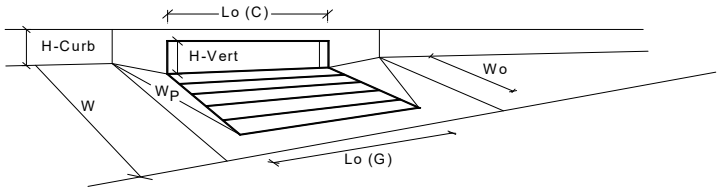
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	32.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	2.0	4.0	cfs

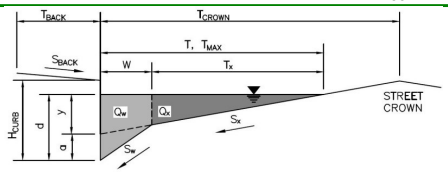
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-33



Gutter Geometry (Enter data in the blue cells)

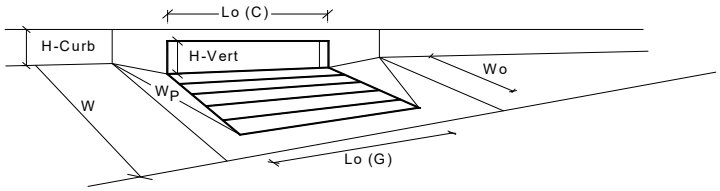
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	27.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	2.0	6.0	cfs

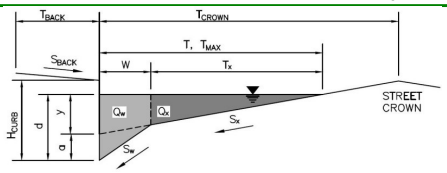
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-34



Gutter Geometry (Enter data in the blue cells)

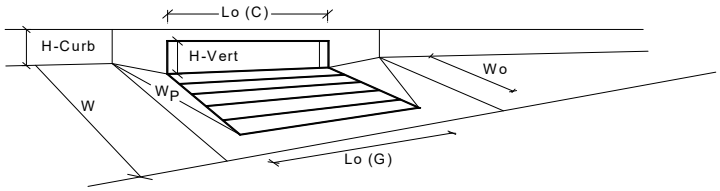
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**5.4**	**9.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	2.0	5.0	cfs

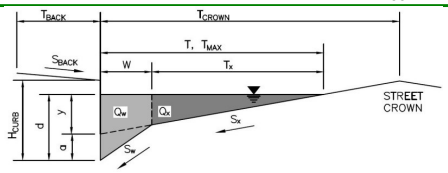
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-35



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.040	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

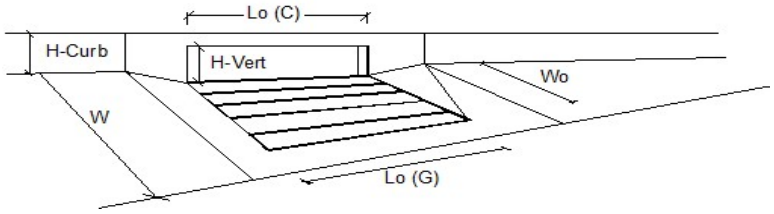
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.5**	**13.5**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.0**	**6.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**2.2**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**99**	**75**	**%**

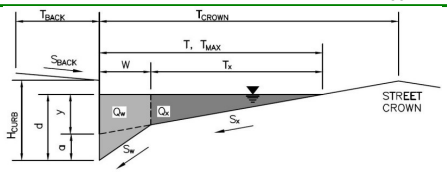
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-36



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.040	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

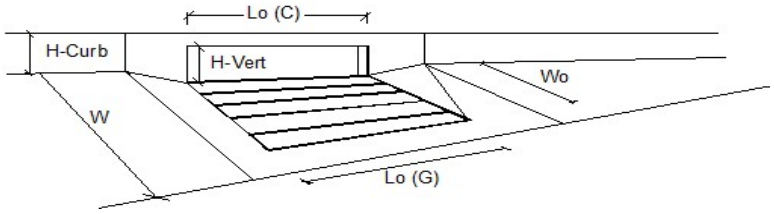
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.5**	**13.5**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.0**	**7.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**2.8**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**99**	**72**	**%**

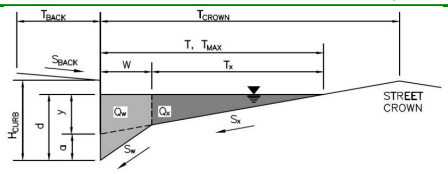
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-37



Gutter Geometry (Enter data in the blue cells)

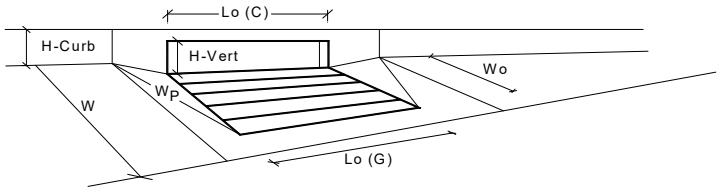
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	7.0	13.0	cfs

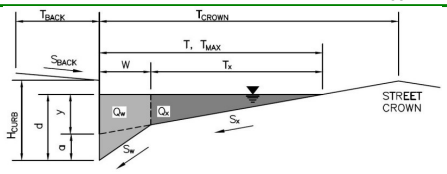
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-38



Gutter Geometry (Enter data in the blue cells)

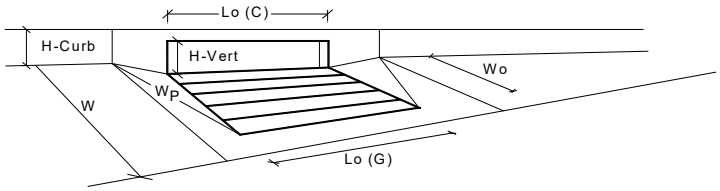
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	9.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.83	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	1.00	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	5.0	13.0	cfs

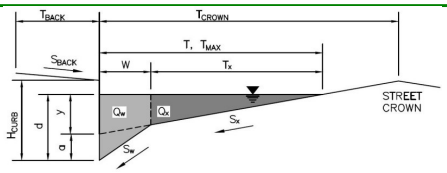
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-42



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	40.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	22.0	22.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

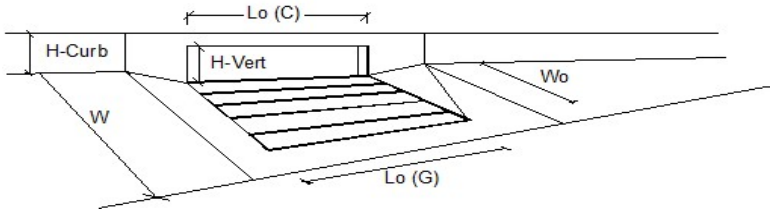
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.8**	**20.9**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**5.0**	**9.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**1.2**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**89**	**%**

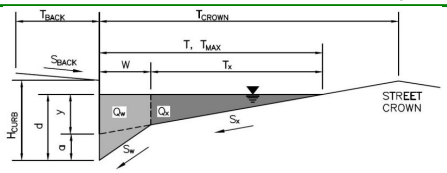
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-43



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	75.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.020	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	34.0	34.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**19.5**	**102.9**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

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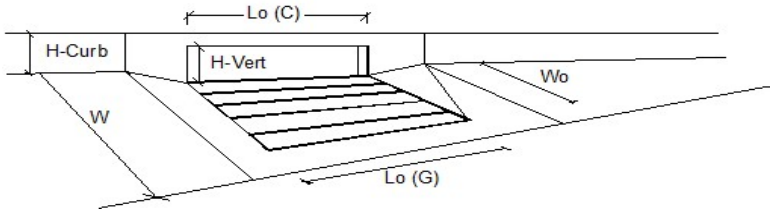

Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**5.0**	**9.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.8**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**92**	**%**

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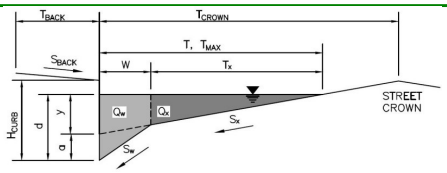
ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-44



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.012	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

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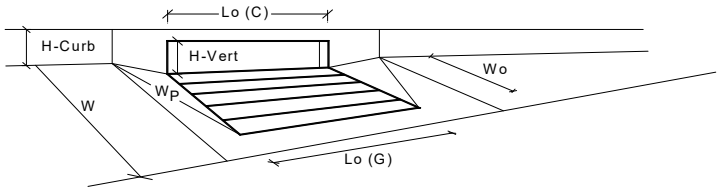

Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**8.3**	**16.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	3.0	8.0	cfs

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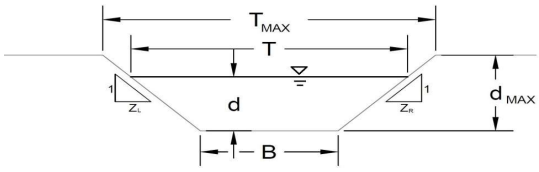
AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-45



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E	C	
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	see details below	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	5.00	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Slope	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.67	1.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	4.8	25.5	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.67	1.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	4.0	15.0	cfs
Water Depth	d =	0.65	0.88	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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AREA INLET IN A SWALE

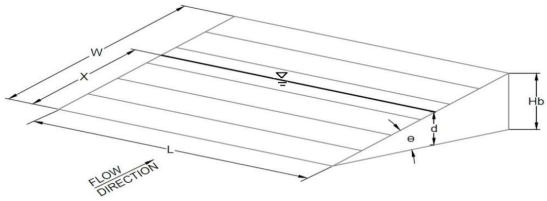
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-45

Inlet Design Information (Input)

Type of Inlet: CDOT Type C

Inlet Type = CDOT Type C



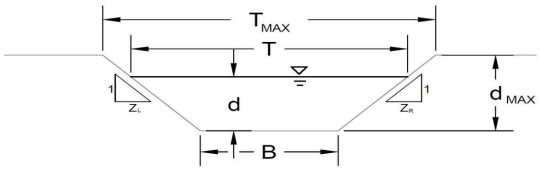
Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.65	0.88	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**9.7**	**15.1**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

AREA INLET IN A SWALE

RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-46



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E	C	
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	see details below	
Channel Invert Slope	S_O =	0.0200	ft/ft
Bottom Width	B =	5.00	ft
Left Side Slope	Z1 =	4.00	ft/ft
Right Side Slope	Z2 =	4.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ◉ Cohesive
- ○ Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.67	1.00	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	4.8	25.5	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.67	1.00	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	1.0	5.0	cfs
Water Depth	d =	0.52	0.68	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

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AREA INLET IN A SWALE

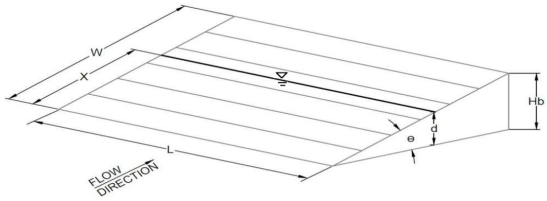
RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

DP-46

Inlet Design Information (Input)

Type of Inlet: CDOT Type C

Inlet Type = CDOT Type C



Angle of Inclined Grade (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grade	W =	3.00	feet
Length of Grade	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grade Discharge Coefficient	C_d =	0.96	
Orifice Coefficient	C_o =	0.64	
Weir Coefficient	C_w =	2.05	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	0.52	0.68	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.9**	**10.3**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

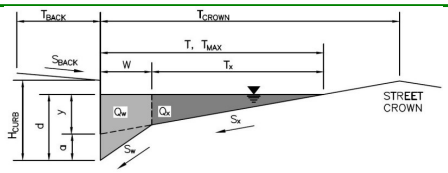
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: RETREAT AT PRAIRIERIDGE FILINGS 1-3 FINAL DRAINAGE REPORT

Inlet ID: DP-47



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	15.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.016	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	28.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.013	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	12.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☐	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**5.4**	**30.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

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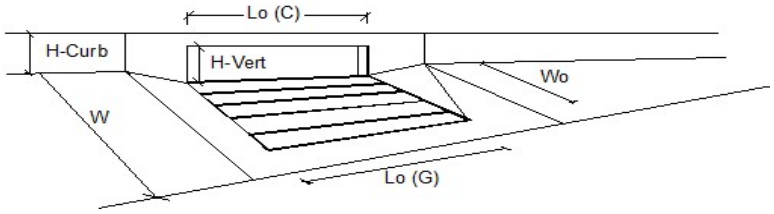


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening	
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0 inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00 ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10

Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**3.0**	**9.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.8**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**92**	**%**

66" RCP Storm Outfall (Pipe Run 68)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.014 ft/ft
Diameter	66.0 in
Discharge	264.00 cfs

Results	
Normal Depth	39.3 in
Flow Area	14.8 ft²
Wetted Perimeter	9.7 ft
Hydraulic Radius	18.3 in
Top Width	5.40 ft
Critical Depth	54.2 in
Percent Full	59.6 %
Critical Slope	0.006 ft/ft
Velocity	17.89 ft/s
Velocity Head	4.97 ft
Specific Energy	8.25 ft
Froude Number	1.908
Maximum Discharge	427.39 cfs
Discharge Full	397.31 cfs
Slope Full	0.006 ft/ft
Flow Type	Supercritical

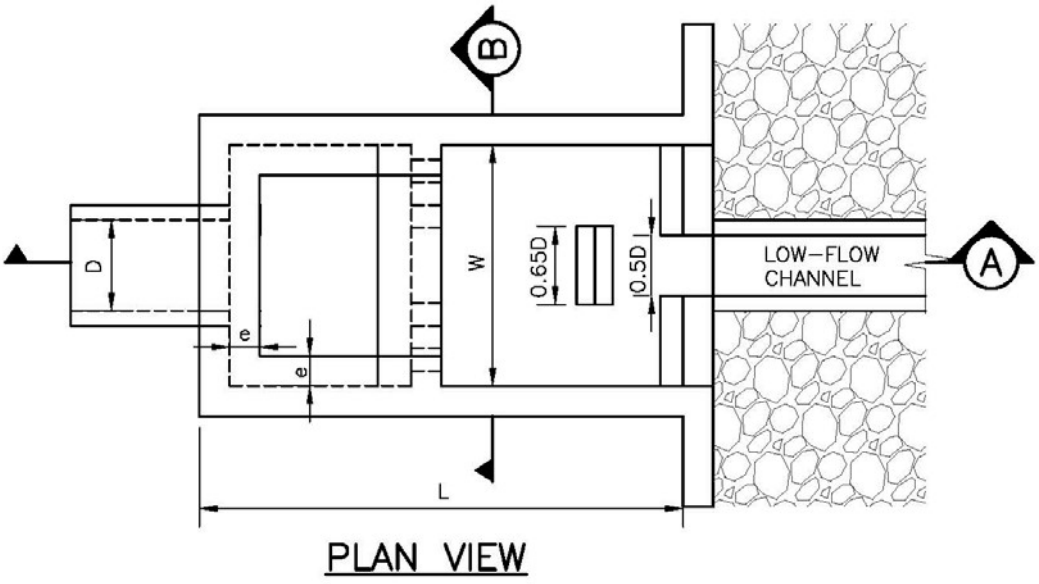
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	59.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	39.3 in
Critical Depth	54.2 in
Channel Slope	0.014 ft/ft
Critical Slope	0.006 ft/ft

66 " RCP OUTFALL INTO POND 1
IMPACT STRUCTURE CALCULATIONS

Flowmaster calcs.
A = 14.8 sf
V = 17.89 ft/s

Using the above:
W = 14.73 use 15.0'
D = 3.85



PLAN VIEW

$W=2.94D\left[\frac{V}{(gD)^{0.5}}\right]^{0.556}$

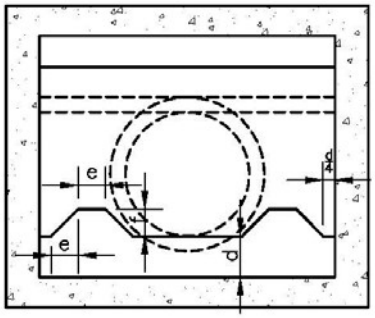
V=VELOCITY, [FT/S]

$D=(A)^{0.5}$

A=AREA OF FLOW [SF]

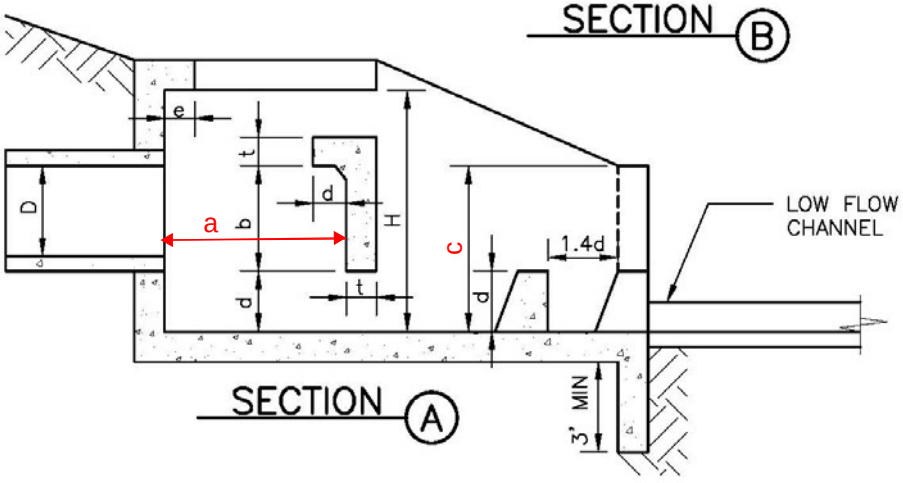
H=3/4 W c=1/2 W
L=4/3 W d=1/6 W
a=1/2 W e=1/12 W
b=3/8 W f=1/8 W

t=1/12 W (SUGGESTED MIN)



SECTION B

Based on the determined
W and D above:
H = 11.25'
L = 20.0'
a = 7.5'
b = 5.63'
c = 7.5'
d = 2.5'
e = 1.25'
f = 1.88'
t = 1.25'



SECTION A

Figure 9-45. UDFCD modified USBR type VI impacts stilling basin (general design dimensions)

48" Wide Conc. Trickle Channel

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.009 ft/ft
Normal Depth	5.5 in
Bottom Width	4.00 ft

Results	
Discharge	10.30 cfs
Flow Area	1.8 ft²
Wetted Perimeter	4.9 ft
Hydraulic Radius	4.5 in
Top Width	4.00 ft
Critical Depth	7.1 in
Critical Slope	0.004 ft/ft
Velocity	5.62 ft/s
Velocity Head	0.49 ft
Specific Energy	0.95 ft
Froude Number	1.463
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.5 in
Critical Depth	7.1 in
Channel Slope	0.009 ft/ft
Critical Slope	0.004 ft/ft

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: June 12, 2025
Project: Retreat at PrairieRidge Filings 1-3 - FDR
Location: Pond 1 - 66" Outfall

1. Basin Storage Volume		
A) Effective Imperviousness of Tributary Area, I_a	I_a = 33.4	%
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.334	
C) Contributing Watershed Area	Area = 135.330	ac
D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = 0.42	in
E) Design Concept (Select EURV when also designing for flood control)	Choose One: ○ Water Quality Capture Volume (WQCV) ◉ Excess Urban Runoff Volume (EURV)	
F) Design Volume (WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area$)	V_{DESIGN}=	ac-ft
G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$)	$V_{DESIGN\ OTHER}$= 1.781	ac-ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{DESIGN\ USER}$=	ac-ft
I) NRCS Hydrologic Soil Groups of Tributary Watershed		
i) Percentage of Watershed consisting of Type A Soils	HSG_A = 0	%
ii) Percentage of Watershed consisting of Type B Soils	HSG_B = 100	%
iii) Percentage of Watershed consisting of Type C/D Soils	$HSG_{C/D}$ = 0	%
J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURV_A = 1.68 * i^{1.28}$ For HSG B: $EURV_B = 1.36 * i^{1.08}$ For HSG C/D: $EURV_{C/D} = 1.20 * i^{1.08}$	$EURV_{DESIGN}$ = 4.692	ac-f t
K) User Input of Excess Urban Runoff Volume (EURV) Design Volume (Only if a different EURV Design Volume is desired)	$EURV_{DESIGN\ USER}$=	ac-f t
2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)	L : W = 2.0	: 1
3. Basin Side Slopes		
A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z = 4.00	ft / ft
4. Inlet	Concrete Impact Structure and Forebay	
A) Describe means of providing energy dissipation at concentrated inflow locations:		
5. Forebay		
A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)	V_{FMIN} = 0.053	ac-ft
B) Actual Forebay Volume	V_F = 0.053	ac-ft
C) Forebay Depth (D_F = 30 inch maximum)	D_F = 30.0	in
D) Forebay Discharge		
i) Undetained 100-year Peak Discharge	Q_{100} = 264.00	cfs
ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)	Q_F = 5.28	cfs
E) Forebay Discharge Design	Choose One: ○ Berm With Pipe ◉ Wall with Rect. Notch ○ Wall with V-Notch Weir	
F) Discharge Pipe Size (minimum 8-inches)	Calculated D_P =	in
G) Rectangular Notch Width	Calculated W_N = 10.8	in

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: June 12, 2025
Project: Retreat at PrairieRidge Filings 1-3 - FDR
Location: Pond 1 - 66" Outfall

6. Trickle Channel

A) Type of Trickle Channel — Choose One: (●) Concrete ( ) Soft Bottom

F) Slope of Trickle Channel — S = 0.0070 ft / ft

7. Micropool and Outlet Structure

A) Depth of Micropool (2.5-feet minimum) — D_M = 2.5 ft

B) Surface Area of Micropool (10 ft^2 minimum) — A_M = 170 sq ft

C) Outlet Type — Choose One: (●) Orifice Plate ( ) Other (Describe):

D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention) — $D_{orifice}$ = 2.88 inches

E) Total Outlet Area — A_{ot} = 19.50 square inches

8. Initial Surcharge Volume

A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches) — D_{IS} = 6 in

B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV) — V_{IS} = 233 cu ft

C) Initial Surcharge Provided Above Micropool — V_s = 85.0 cu ft

9. Trash Rack

A) Water Quality Screen Open Area: $A_t = A_{ot} * 38.5*(e^{-0.095D})$ — A_t = 571 square inches

B) Type of Screen (If specifying an alternative to the materials recommended in the USDCM, indicate "other" and enter the ratio of the total open are to the total screen are for the material specified.) — *Aluminum Amico-Klemp SR Series with Cross Rods 2" O.C.*

Other (Y/N): N

C) Ratio of Total Open Area to Total Area (only for type 'Other') — User Ratio =

D) Total Water Quality Screen Area (based on screen type) — A_{total} = 804 sq. in.

E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E) — H= 6.25 feet

F) Height of Water Quality Screen (H_{TR}) — H_{TR}= 103 inches

G) Width of Water Quality Screen Opening ($W_{opening}$) (Minimum of 12 inches is recommended) — $W_{opening}$ = 12.0 inches **VALUE LESS THAN RECOMMENDED MIN. WIDTH. WIDTH HAS BEEN SET TO 12 INCHES.**

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: June 12, 2025
Project: Retreat at PrairieRidge Filings 1-3 - FDR
Location: Pond 1 - 66" Outfall

10. Overflow Embankment

A) Describe embankment protection for 100-year and greater overtopping: Buried Rip-Rap

B) Slope of Overflow Embankment
(Horizontal distance per unit vertical, 4:1 or flatter preferred)
Ze = 4.00 ft / ft

11. Vegetation

Choose One
- ○ Irrigated
- ◉ Not Irrigated

12. Access

A) Describe Sediment Removal Procedures: Per Maintenance Manual

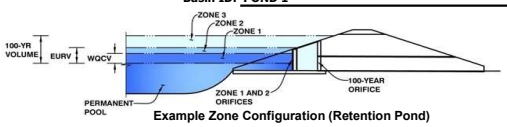
Notes:

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **RETREAT AT PRAIRIERIDGE FILING NO. 1 - FDR**

Basin ID: **POND 1**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	143.83	acres
Watershed Length =	3,800	ft
Watershed Length to Centroid =	1,900	ft
Watershed Slope =	0.037	ft/ft
Watershed Imperviousness =	32.20%	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) =	1.896	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	4.780	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	4.800	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	7.634	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	10.231	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	14.095	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	17.049	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	20.959	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.48 in.) =	32.831	acre-feet	3.48	inches
Approximate 2-yr Detention Volume =	3.445	acre-feet		
Approximate 5-yr Detention Volume =	4.900	acre-feet		
Approximate 10-yr Detention Volume =	7.038	acre-feet		
Approximate 25-yr Detention Volume =	8.083	acre-feet		
Approximate 50-yr Detention Volume =	8.509	acre-feet		
Approximate 100-yr Detention Volume =	9.986	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.896	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.884	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	5.206	acre-feet
Total Detention Basin Volume =	9.986	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	

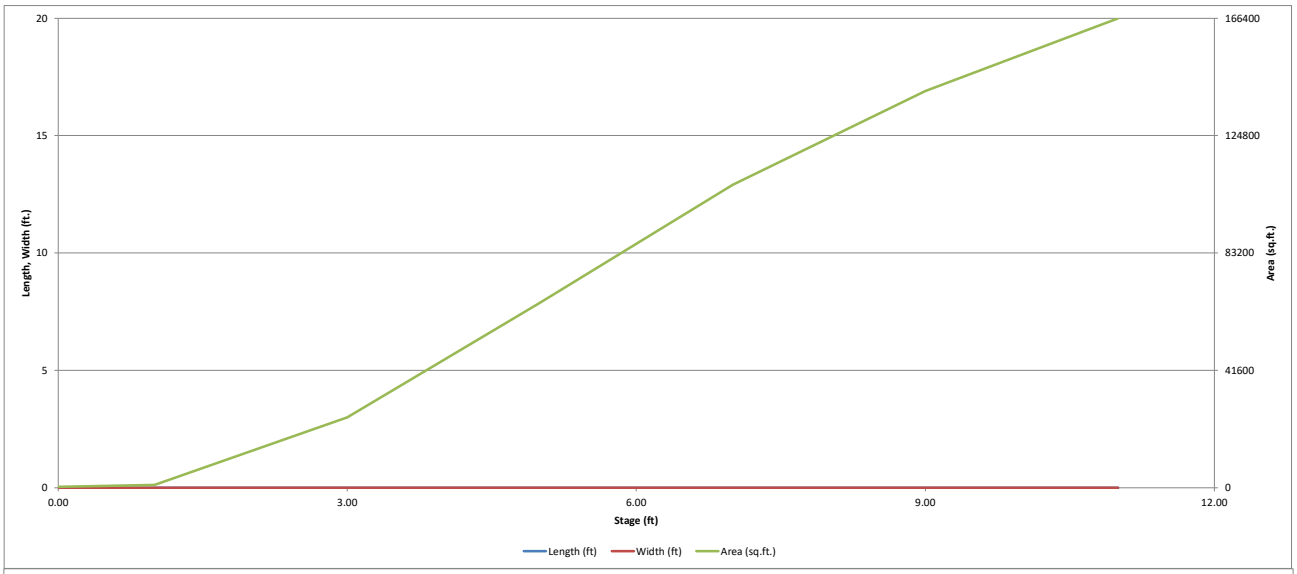
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	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

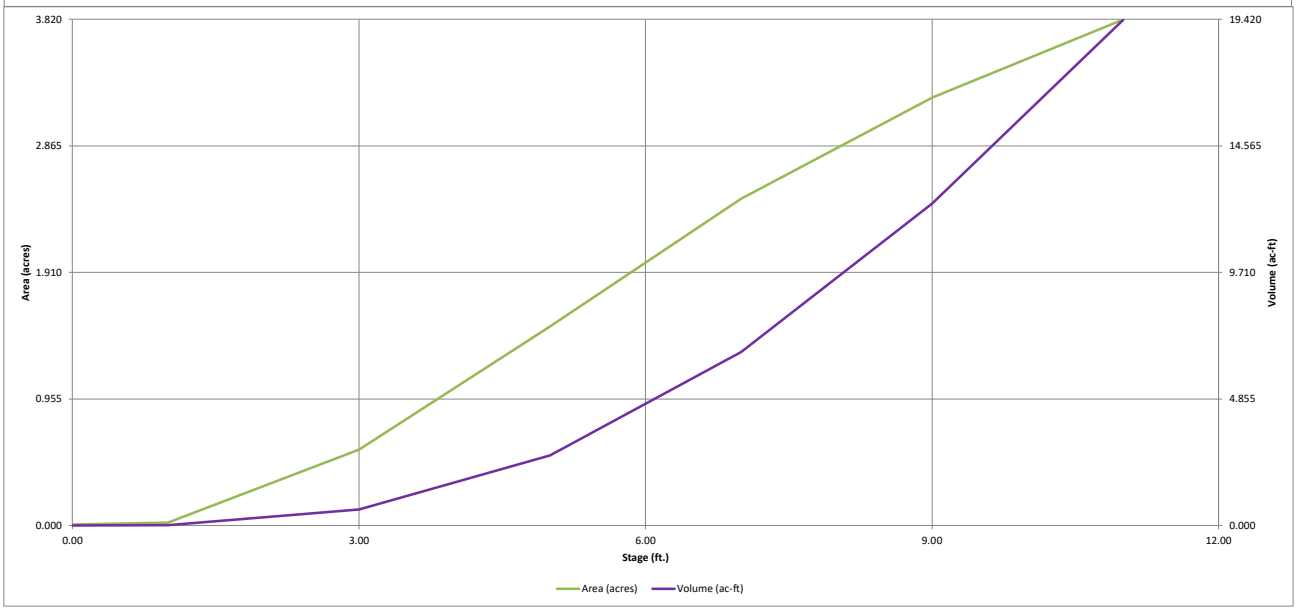
Depth Increment = 1.00 ft

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	--	--	--	300	0.007		
7090	--	1.00	--	--	--	992	0.023	646	0.015
7092	--	3.00	--	--	--	24,968	0.573	26,606	0.611
7094	--	5.00	--	--	--	65,509	1.504	117,083	2.688
7096	--	7.00	--	--	--	107,439	2.466	290,031	6.658
7098	--	9.00	--	--	--	140,663	3.229	538,133	12.354
7100	--	11.00	--	--	--	166,370	3.819	845,166	19.402

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)





✓ = calcs match details in plans

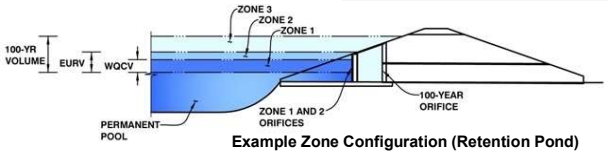
X = calcs do not match details in plans

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: **RETREAT AT PRAIRIERIDGE FILING NO. 1 - FDR**

Basin ID: **POND 1**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	4.43	1.896	Orifice Plate
Zone 2 (EURV)	6.18	2.884	Orifice Plate
Zone 3 (100-year)	8.24	5.206	Weir&Pipe (Restrict)
Total (all zones)		9.986	

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

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

Calculated Parameters for Underdrain

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

Centroid of Lowest Orifice =	✓ 0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	4.514E-02	ft^2
Depth at top of Zone using Orifice Plate =	✓ 6.25	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	✓ 25.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	✓ 6.50	sq. inches (use rectangular openings)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	✓ 0.00	✓ 2.10	✓ 4.20					
Orifice Area (sq. inches)	✓ 6.50	✓ 6.50	✓ 6.50					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	✓ 6.25	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	7.25	N/A	feet
Overflow Weir Front Edge Length =	✓ 17.00	N/A	feet	Overflow Weir Slope Length =	4.12	N/A	feet
Overflow Weir Grate Slope =	✓ 4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	7.54	N/A	
Horiz. Length of Weir Sides =	✓ 4.00	N/A	feet	Overflow Grate Open Area w/o Debris =	55.44	N/A	ft^2
Overflow Grate Type =	Close Mesh Grate	N/A		Overflow Grate Open Area w/ Debris =	27.72	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	✓ 2.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	7.35	N/A	ft^2
Outlet Pipe Diameter =	✓ 42.00	N/A	inches	Outlet Orifice Centroid =	1.39	N/A	feet
Restrictor Plate Height Above Pipe Invert =	X 30.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	2.01	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	✓ 9.00	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	1.00	feet
Spillway Crest Length =	✓ 90.00	feet	Stage at Top of Freeboard =	11.00	feet
Spillway End Slopes =	✓ 3.00	H:V	Basin Area at Top of Freeboard =	3.82	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	19.40	acre-ft

Calculated Parameters for Spillway

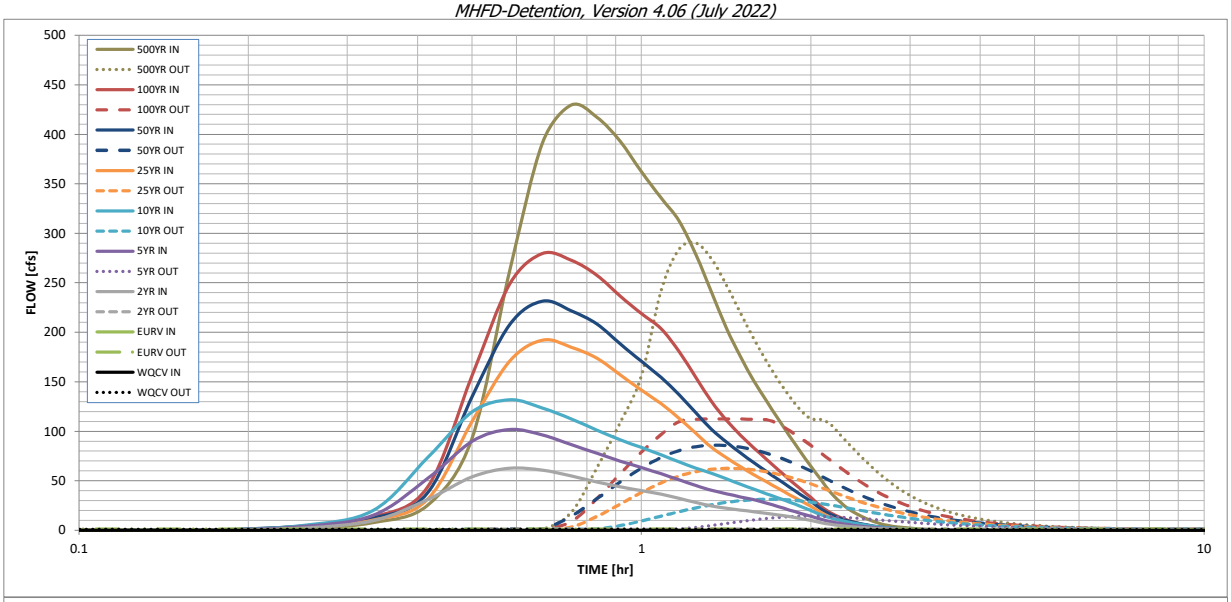
Routed Hydrograph Results

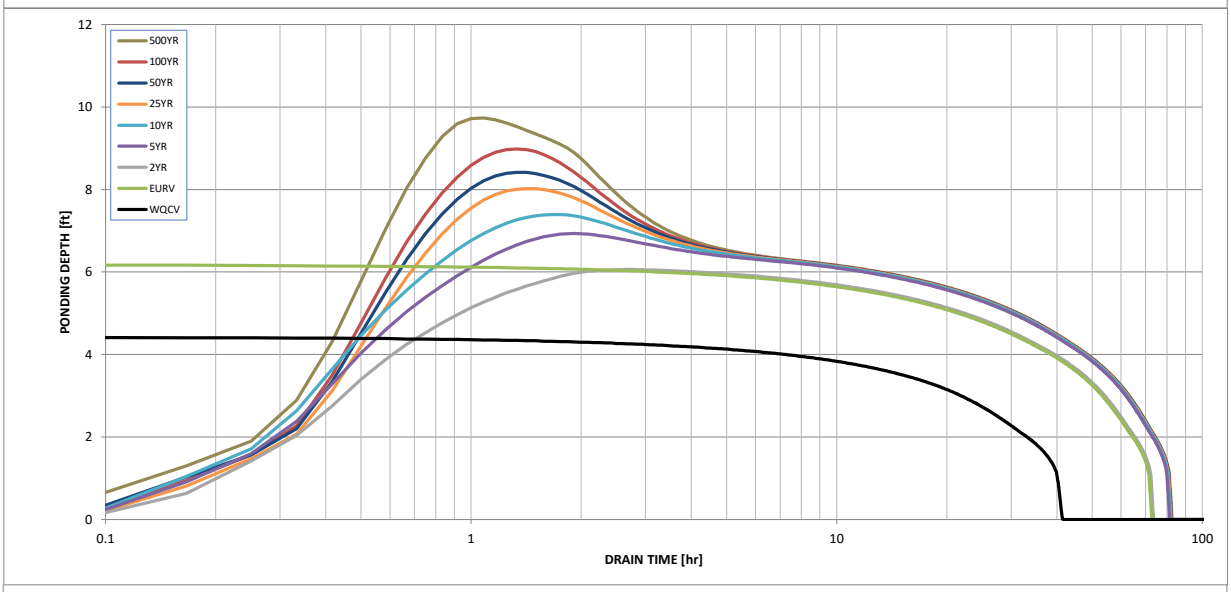
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

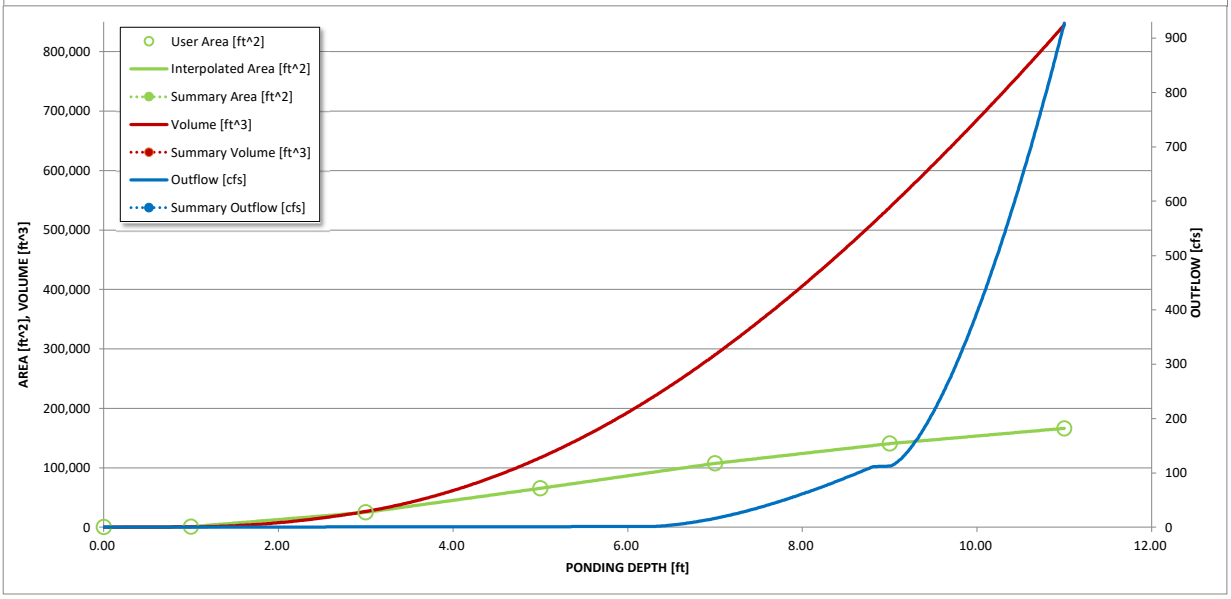
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.48
CUHP Runoff Volume (acre-ft) =	1.896	4.780	4.800	7.634	10.231	14.095	17.049	20.959	32.831
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	4.800	7.634	10.231	14.095	17.049	20.959	32.831
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	15.5	43.9	66.8	118.9	149.4	189.5	307.7
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A		18.9				133.7	
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.11	0.13	0.46	0.83	1.04	0.93	2.14
Peak Inflow Q (cfs) =	N/A	N/A	62.7	101.8	131.7	192.1	231.4	279.5	429.5
Peak Outflow Q (cfs) =	0.9	1.3	1.3	14.3	31.3	62.6	86.0	112.5	290.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.8	0.5	0.5	0.6	0.8	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.2	0.5	1.1	1.5	2.0	2.1
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	66	67	71	69	67	65	63	56
Time to Drain 99% of Inflow Volume (hours) =	**40**	70	71	77	77	75	74	73	70
Maximum Ponding Depth (ft) =	4.43	6.18	6.06	6.94	7.40	8.02	8.42	8.99	9.74
Area at Maximum Ponding Depth (acres) =	1.24	2.07	2.01	2.43	2.62	2.86	3.00	3.22	3.44
Maximum Volume Stored (acre-ft) =	1.906	4.798	4.552	6.487	7.649	9.372	10.515	12.289	14.790

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.

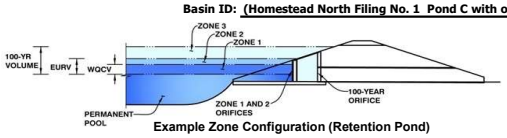
	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.03	1.40
	0:15:00	0.00	0.00	2.39	3.97	4.95	3.35	4.35	4.13	7.72
	0:20:00	0.00	0.00	9.82	15.31	20.07	10.35	12.31	13.37	25.35
	0:25:00	0.00	0.00	31.07	52.25	73.29	31.23	37.72	43.64	92.85
	0:30:00	0.00	0.00	54.02	89.86	119.43	109.77	134.94	156.24	262.57
	0:35:00	0.00	0.00	62.69	101.83	131.71	170.88	207.80	248.76	391.23
	0:40:00	0.00	0.00	60.73	96.23	123.50	192.14	231.45	279.45	429.52
	0:45:00	0.00	0.00	54.81	86.50	112.58	184.92	221.80	272.85	417.33
	0:50:00	0.00	0.00	48.86	77.74	101.08	173.84	208.32	257.56	392.91
	0:55:00	0.00	0.00	43.85	69.95	91.47	157.07	188.41	236.60	362.01
	1:00:00	0.00	0.00	39.96	63.34	83.56	141.65	170.56	218.89	335.66
	1:05:00	0.00	0.00	36.41	57.07	76.19	127.85	154.45	203.72	312.57
	1:10:00	0.00	0.00	32.24	51.14	69.09	113.13	136.97	180.66	278.26
	1:15:00	0.00	0.00	27.99	45.15	62.84	97.82	118.73	154.29	240.14
	1:20:00	0.00	0.00	24.67	40.41	57.52	83.65	101.80	129.77	204.20
	1:25:00	0.00	0.00	22.38	36.87	51.99	73.25	89.17	111.25	175.39
	1:30:00	0.00	0.00	20.49	33.76	46.51	64.21	78.13	96.13	151.32
	1:35:00	0.00	0.00	18.81	30.90	41.56	56.26	68.40	83.40	130.97
	1:40:00	0.00	0.00	17.17	27.53	37.00	48.98	59.48	71.88	112.49
	1:45:00	0.00	0.00	15.55	23.97	32.68	42.36	51.37	61.24	95.47
	1:50:00	0.00	0.00	13.95	20.49	28.52	36.01	43.60	51.19	79.47
	1:55:00	0.00	0.00	11.99	17.24	24.28	29.98	36.25	41.87	64.68
	2:00:00	0.00	0.00	9.95	14.20	19.95	24.30	29.32	33.21	51.31
	2:05:00	0.00	0.00	7.77	11.16	15.86	18.11	21.81	24.22	38.51
	2:10:00	0.00	0.00	6.04	8.78	12.69	13.35	16.30	17.86	28.96
	2:15:00	0.00	0.00	4.83	7.03	10.24	10.02	12.33	13.30	21.81
	2:20:00	0.00	0.00	3.92	5.67	8.30	7.69	9.51	9.91	16.41
	2:25:00	0.00	0.00	3.19	4.57	6.68	5.89	7.29	7.32	12.23
	2:30:00	0.00	0.00	2.58	3.69	5.34	4.57	5.66	5.39	9.05
	2:35:00	0.00	0.00	2.06	2.94	4.19	3.51	4.33	3.89	6.57
	2:40:00	0.00	0.00	1.64	2.30	3.24	2.67	3.28	2.82	4.81
	2:45:00	0.00	0.00	1.31	1.78	2.48	2.04	2.50	2.18	3.66
	2:50:00	0.00	0.00	1.05	1.38	1.91	1.57	1.93	1.70	2.84
	2:55:00	0.00	0.00	0.84	1.07	1.48	1.23	1.51	1.36	2.26
	3:00:00	0.00	0.00	0.65	0.81	1.14	0.95	1.16	1.06	1.75
	3:05:00	0.00	0.00	0.49	0.59	0.85	0.72	0.87	0.79	1.30
	3:10:00	0.00	0.00	0.35	0.41	0.60	0.52	0.63	0.57	0.92
	3:15:00	0.00	0.00	0.24	0.28	0.40	0.35	0.42	0.38	0.60
	3:20:00	0.00	0.00	0.14	0.18	0.24	0.22	0.26	0.23	0.35
	3:25:00	0.00	0.00	0.08	0.10	0.12	0.12	0.13	0.11	0.17
	3:30:00	0.00	0.00	0.03	0.04	0.04	0.05	0.05	0.04	0.05
	3:35:00	0.00	0.00	0.01	0.01	0.01	0.01	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 STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **RETREAT AT PRAIRIERIDGE FILING NO. 1**

Basin ID: **(Homestead North Filing No. 1 Pond C with off-site flow) sizing verification**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	197.40	acres
Watershed Length =	5,645	ft
Watershed Length to Centroid =	3,387	ft
Watershed Slope =	0.034	ft/ft
Watershed Imperviousness =	11.90%	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) =	1.275	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	2.239	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.947	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	6.213	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	9.438	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	15.079	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	18.965	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	24.518	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.48 in.) =	40.426	acre-feet	3.48	inches
Approximate 2-yr Detention Volume =	1.455	acre-feet		
Approximate 5-yr Detention Volume =	2.250	acre-feet		
Approximate 10-yr Detention Volume =	4.343	acre-feet		
Approximate 25-yr Detention Volume =	5.891	acre-feet		
Approximate 50-yr Detention Volume =	6.189	acre-feet		
Approximate 100-yr Detention Volume =	7.914	acre-feet		

Define Zones and Basin Geometry

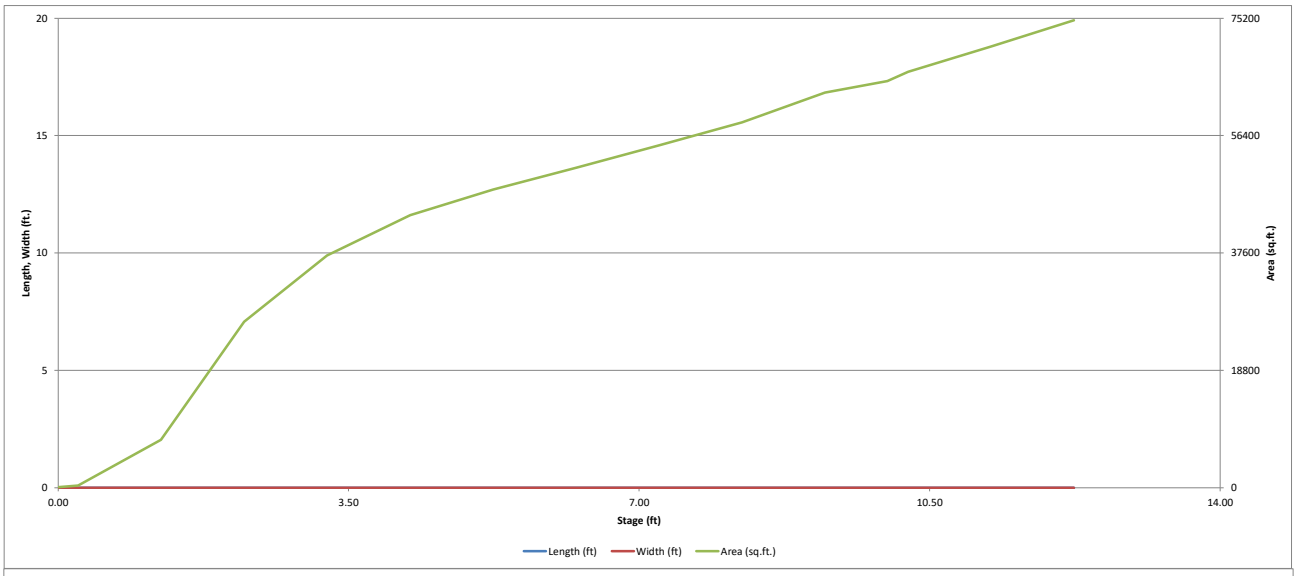
Zone 1 Volume (WQCV) =	1.275	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.964	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	5.676	acre-feet
Total Detention Basin Volume =	7.914	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (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

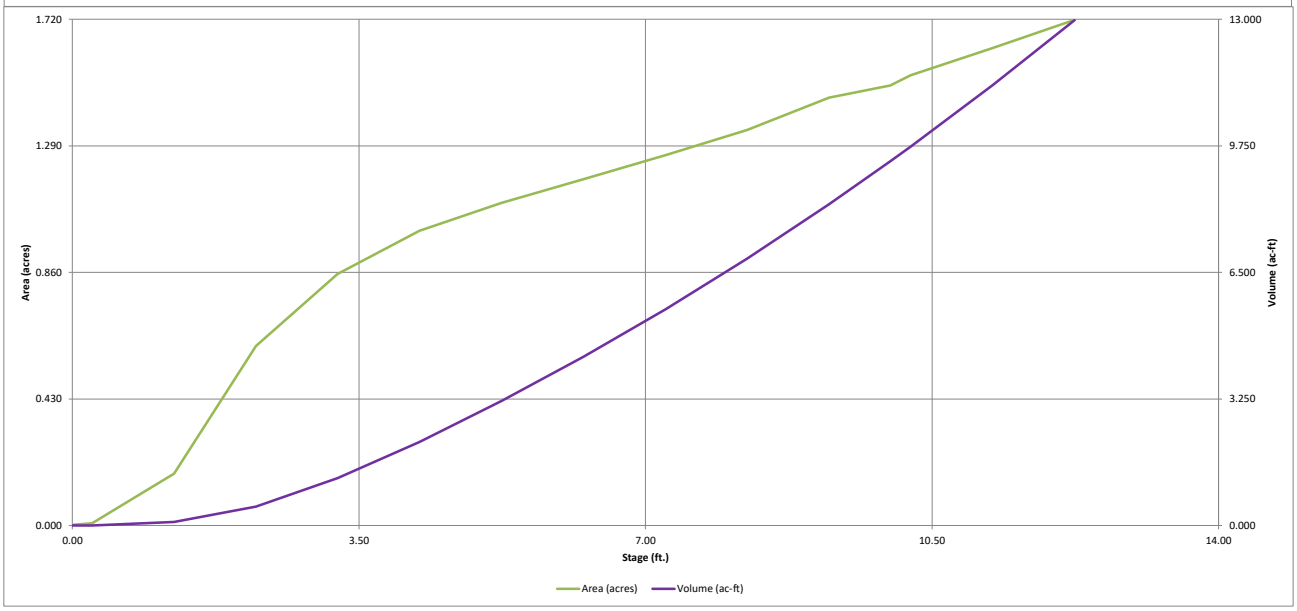
Depth Increment = 1.00 ft

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	--	--	--	90	0.002		
7107	--	0.24	--	--	--	331	0.008	51	0.001
7108	--	1.24	--	--	--	7,689	0.177	4,060	0.093
7109	--	2.24	--	--	--	26,604	0.611	21,207	0.487
7110	--	3.24	--	--	--	37,234	0.855	53,126	1.220
7111	--	4.24	--	--	--	43,658	1.002	93,572	2.148
7112	--	5.24	--	--	--	47,762	1.096	139,282	3.197
7113	--	6.24	--	--	--	51,250	1.177	188,788	4.334
7114	--	7.24	--	--	--	54,827	1.259	241,826	5.552
7115	--	8.24	--	--	--	58,544	1.344	298,512	6.853
7116	--	9.24	--	--	--	63,316	1.454	359,442	8.252
7116.75* Spillway	--	9.99	--	--	--	65,152	1.496	407,617	9.358
7117	--	10.24	--	--	--	66,643	1.530	424,092	9.736
7118	--	11.24	--	--	--	70,696	1.623	492,761	11.312
7119	--	12.24	--	--	--	74,859	1.719	565,539	12.983

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



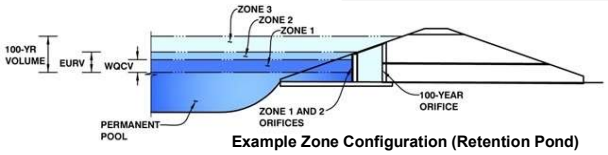


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: RETREAT AT PRAIRIERIDGE FILING NO. 1

Basin ID: (Homestead North Filing No. 1 Pond C with off-site flow) sizing verification



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.31	1.275	Orifice Plate
Zone 2 (EURV)	4.34	0.964	Orifice Plate
Zone 3 (100-year)	9.01	5.676	Weir&Pipe (Restrict)
Total (all zones)		7.914	

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

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

Calculated Parameters for Underdrain

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

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 =	4.27	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

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.25	2.50					
Orifice Area (sq. inches)	4.69	2.35	4.69					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.36	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	7.47	N/A	feet
Overflow Weir Front Edge Length =	7.00	N/A	feet	Overflow Weir Slope Length =	12.80	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	5.64	N/A	
Horiz. Length of Weir Sides =	12.42	N/A	feet	Overflow Grate Open Area w/o Debris =	70.89	N/A	ft^2
Overflow Grate Type =	Close Mesh Grate	N/A		Overflow Grate Open Area w/ Debris =	17.72	N/A	ft^2
Debris Clogging % =	75%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	6.29	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	12.57	N/A	ft^2
Outlet Pipe Diameter =	48.00	N/A	inches	Outlet Orifice Centroid =	2.00	N/A	feet
Restrictor Plate Height Above Pipe Invert =	48.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	9.99	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.67	feet
Spillway Crest Length =	123.00	feet	Stage at Top of Freeboard =	11.66	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	1.66	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	12.00	acre-ft

Calculated Parameters for Spillway

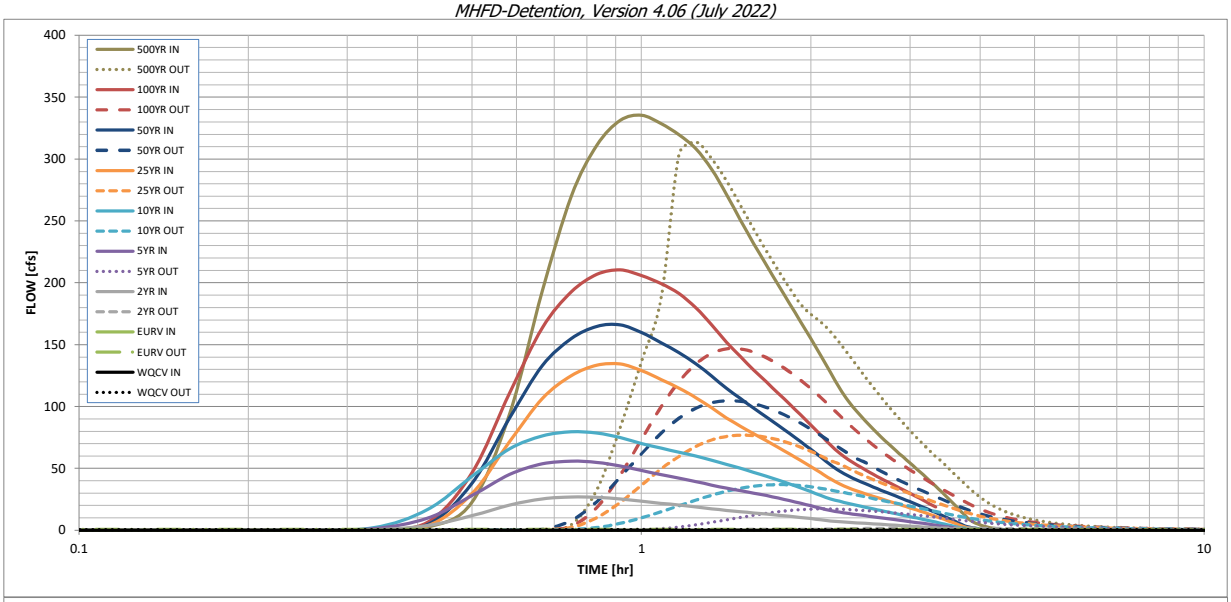
Routed Hydrograph Results

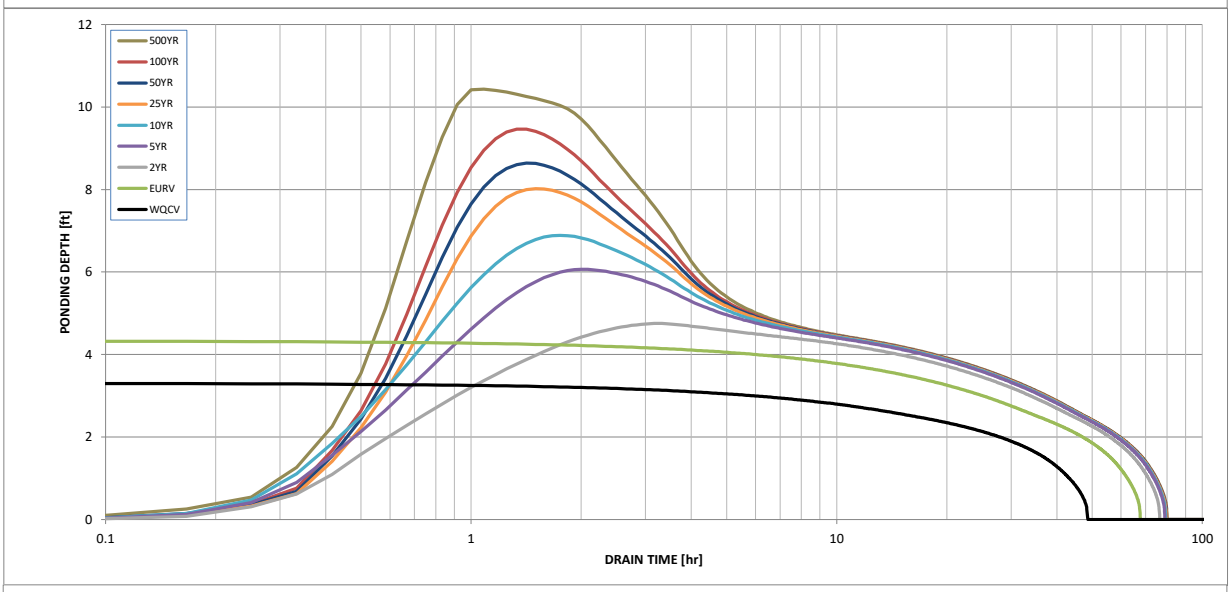
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

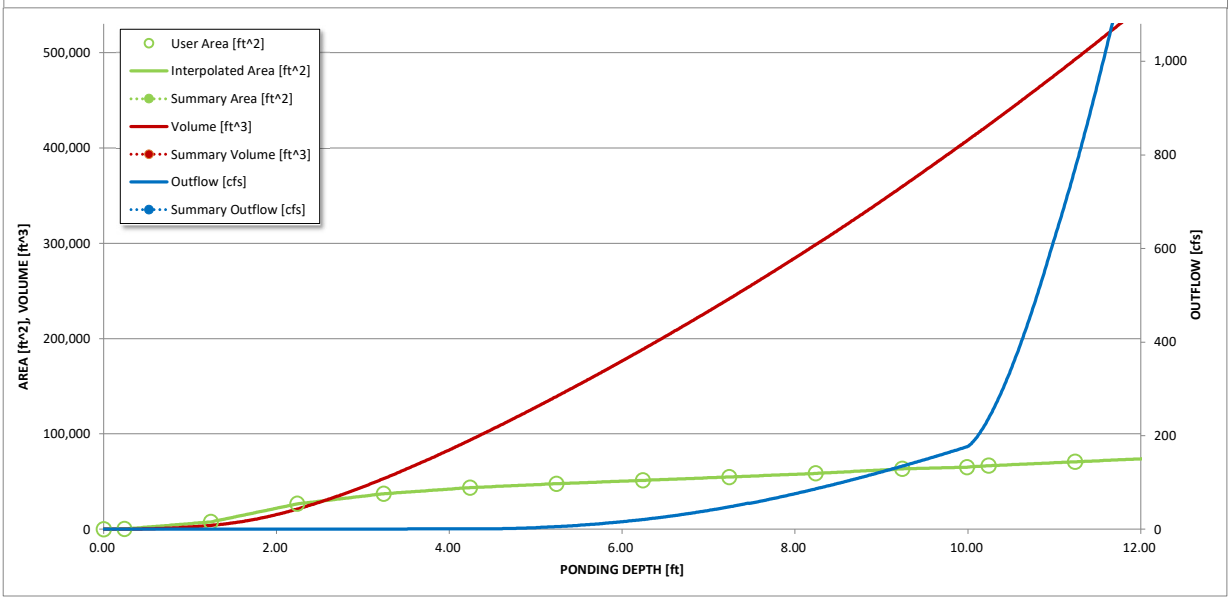
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.48
CUHP Runoff Volume (acre-ft) =	1.275	2.239	2.947	6.213	9.438	15.079	18.965	24.518	40.426
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	2.947	6.213	9.438	15.079	18.965	24.518	40.426
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	14.9	42.1	65.6	121.0	152.2	195.5	319.5
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.21	0.33	0.61	0.77	0.99	1.62
Peak Inflow Q (cfs) =	N/A	N/A	26.9	55.8	79.5	134.3	166.0	210.4	335.4
Peak Outflow Q (cfs) =	0.5	0.7	1.9	17.3	36.9	76.9	104.7	146.6	313.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.6	0.6	0.7	0.8	1.0
Structure Controlling Flow =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	0.02	0.2	0.5	1.1	1.5	2.1	2.8
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) =	45	62	69	66	62	55	51	45	33
Time to Drain 99% of Inflow Volume (hours) =	**47**	65	73	73	71	68	67	64	58
Maximum Ponding Depth (ft) =	3.31	4.34	4.75	6.07	6.89	8.02	8.64	9.46	10.44
Area at Maximum Ponding Depth (acres) =	0.87	1.01	1.05	1.16	1.23	1.33	1.39	1.47	1.55
Maximum Volume Stored (acre-ft) =	1.280	2.249	2.672	4.123	5.116	6.559	7.385	8.558	10.028

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

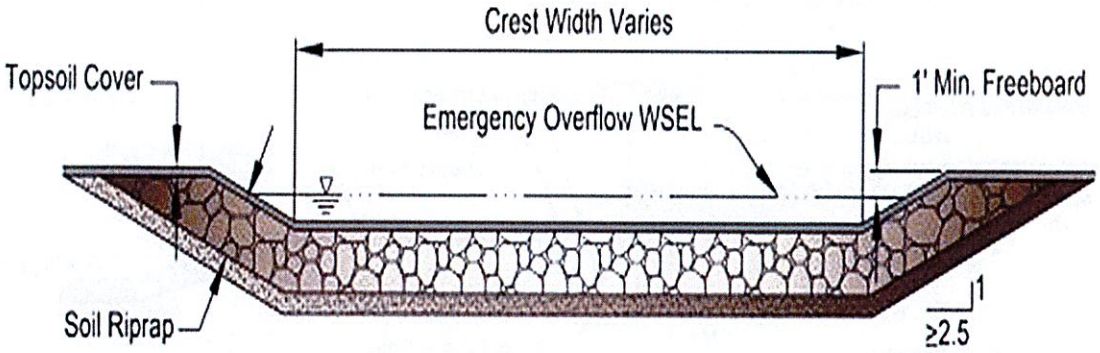
Outflow Hydrograph Workbook Filename:

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	0.01	0.00	0.06
	0:15:00	0.00	0.00	0.11	0.18	0.22	0.15	0.21	0.19	0.40
	0:20:00	0.00	0.00	0.54	1.26	1.97	0.60	0.73	0.87	2.62
	0:25:00	0.00	0.00	3.76	9.87	16.84	3.70	4.70	6.49	22.67
	0:30:00	0.00	0.00	11.80	28.08	43.61	29.62	38.08	46.48	94.48
	0:35:00	0.00	0.00	20.44	45.14	65.86	71.85	91.02	111.25	193.68
	0:40:00	0.00	0.00	25.43	53.68	76.32	106.55	133.08	163.79	269.71
	0:45:00	0.00	0.00	26.92	55.78	79.53	124.93	154.79	192.54	311.14
	0:50:00	0.00	0.00	26.60	54.88	78.72	133.36	164.79	206.74	331.17
	0:55:00	0.00	0.00	25.25	51.99	74.86	134.35	166.00	210.40	335.40
	1:00:00	0.00	0.00	23.46	48.23	70.17	129.12	159.84	205.91	328.57
	1:05:00	0.00	0.00	21.84	44.91	66.40	121.91	151.56	199.36	319.55
	1:10:00	0.00	0.00	20.44	42.13	63.16	114.85	143.50	191.27	308.18
	1:15:00	0.00	0.00	18.96	39.37	60.02	107.14	134.50	179.66	291.76
	1:20:00	0.00	0.00	17.45	36.50	56.60	98.93	124.64	165.95	271.56
	1:25:00	0.00	0.00	16.10	34.01	53.33	90.85	114.71	152.14	250.63
	1:30:00	0.00	0.00	15.04	32.00	50.11	84.16	106.41	140.28	231.76
	1:35:00	0.00	0.00	14.06	30.08	46.87	78.04	98.76	129.61	214.45
	1:40:00	0.00	0.00	13.13	28.12	43.65	72.37	91.61	119.87	198.42
	1:45:00	0.00	0.00	12.22	26.06	40.50	66.94	84.79	110.78	183.35
	1:50:00	0.00	0.00	11.31	23.96	37.41	61.73	78.23	102.02	168.90
	1:55:00	0.00	0.00	10.38	21.87	34.35	56.60	71.80	93.49	154.89
	2:00:00	0.00	0.00	9.44	19.78	31.23	51.55	65.49	85.18	141.24
	2:05:00	0.00	0.00	8.49	17.71	28.07	46.53	59.17	77.00	127.77
	2:10:00	0.00	0.00	7.61	15.93	25.41	41.54	52.89	68.93	114.90
	2:15:00	0.00	0.00	6.95	14.63	23.40	37.51	47.87	62.36	104.43
	2:20:00	0.00	0.00	6.45	13.60	21.71	34.42	43.97	57.20	95.92
	2:25:00	0.00	0.00	6.01	12.67	20.15	31.84	40.66	52.78	88.47
	2:30:00	0.00	0.00	5.60	11.79	18.69	29.54	37.68	48.81	81.73
	2:35:00	0.00	0.00	5.20	10.94	17.30	27.44	34.97	45.19	75.55
	2:40:00	0.00	0.00	4.82	10.12	15.96	25.47	32.42	41.82	69.79
	2:45:00	0.00	0.00	4.44	9.32	14.67	23.58	29.98	38.66	64.39
	2:50:00	0.00	0.00	4.08	8.54	13.42	21.75	27.64	35.71	59.35
	2:55:00	0.00	0.00	3.73	7.78	12.23	19.97	25.37	32.85	54.50
	3:00:00	0.00	0.00	3.38	7.04	11.08	18.22	23.14	30.02	49.75
	3:05:00	0.00	0.00	3.03	6.30	9.95	16.47	20.94	27.20	45.04
	3:10:00	0.00	0.00	2.69	5.58	8.84	14.74	18.74	24.38	40.35
	3:15:00	0.00	0.00	2.35	4.86	7.73	13.02	16.56	21.57	35.67
	3:20:00	0.00	0.00	2.01	4.15	6.64	11.29	14.38	18.77	31.00
	3:25:00	0.00	0.00	1.67	3.44	5.55	9.58	12.21	15.97	26.35
	3:30:00	0.00	0.00	1.33	2.73	4.47	7.86	10.04	13.18	21.71
	3:35:00	0.00	0.00	1.00	2.04	3.40	6.16	7.89	10.40	17.10
	3:40:00	0.00	0.00	0.68	1.36	2.38	4.46	5.75	7.63	12.56
	3:45:00	0.00	0.00	0.42	0.87	1.69	2.84	3.72	5.02	8.57
	3:50:00	0.00	0.00	0.28	0.62	1.31	1.82	2.48	3.36	6.04
	3:55:00	0.00	0.00	0.21	0.49	1.05	1.22	1.72	2.31	4.35
	4:00:00	0.00	0.00	0.17	0.39	0.84	0.83	1.22	1.57	3.10
	4:05:00	0.00	0.00	0.14	0.32	0.68	0.57	0.86	1.04	2.17
	4:10:00	0.00	0.00	0.11	0.25	0.54	0.40	0.62	0.67	1.48
	4:15:00	0.00	0.00	0.09	0.20	0.41	0.28	0.44	0.40	0.96
	4:20:00	0.00	0.00	0.07	0.15	0.31	0.19	0.31	0.23	0.62
	4:25:00	0.00	0.00	0.06	0.11	0.22	0.14	0.23	0.17	0.45
	4:30:00	0.00	0.00	0.05	0.08	0.16	0.11	0.17	0.14	0.34
	4:35:00	0.00	0.00	0.04	0.06	0.12	0.08	0.13	0.11	0.27
	4:40:00	0.00	0.00	0.03	0.04	0.09	0.06	0.10	0.08	0.21
	4:45:00	0.00	0.00	0.02	0.03	0.07	0.05	0.08	0.06	0.16
	4:50:00	0.00	0.00	0.01	0.02	0.05	0.03	0.05	0.05	0.11
	4:55:00	0.00	0.00	0.01	0.01	0.03	0.02	0.04	0.03	0.08
	5:00:00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.02	0.05
	5:05:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	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

Figure 13-12c. Emergency Spillway Protection



Pond 1 Design Info:

Total Inflow = 278 cfs

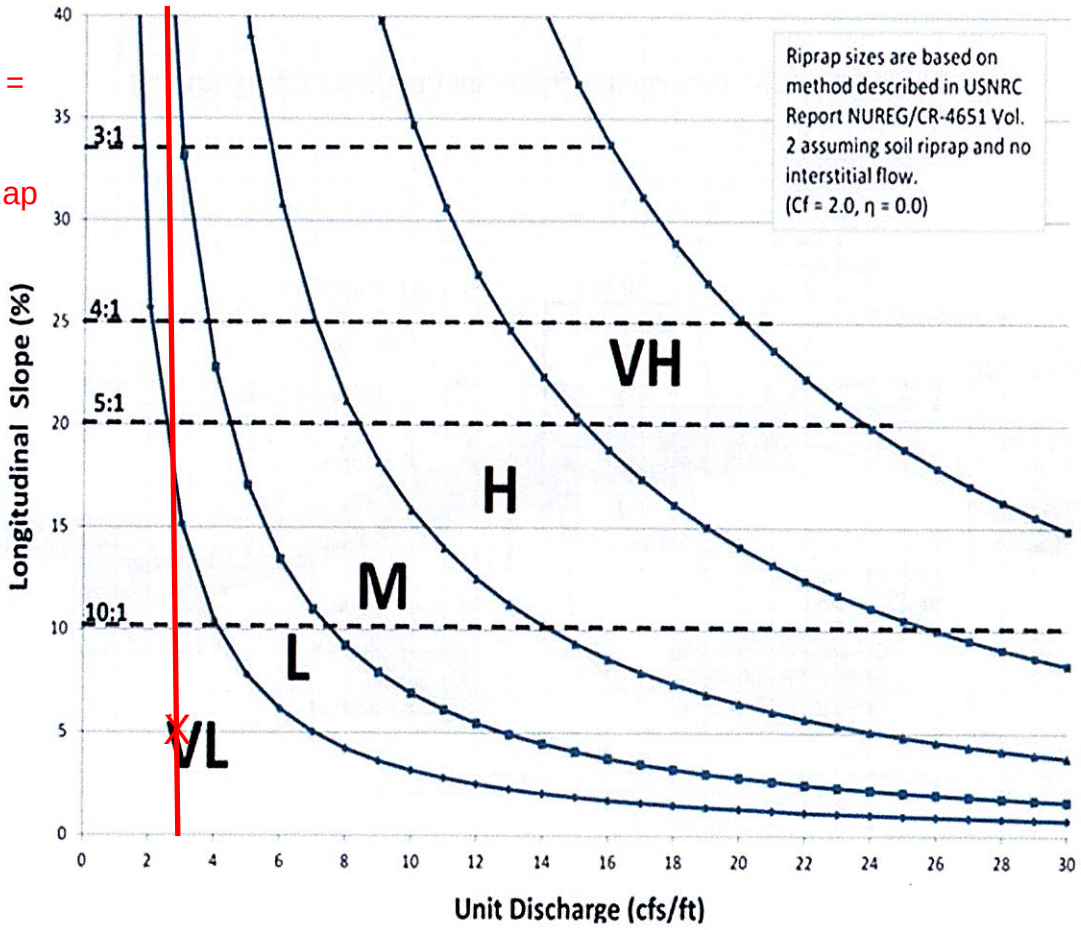
Spillway slope = 5%

Spillway width = 90'

Unit discharge = 3.1 cfs/ft.

Type VL Rip-Rap Required

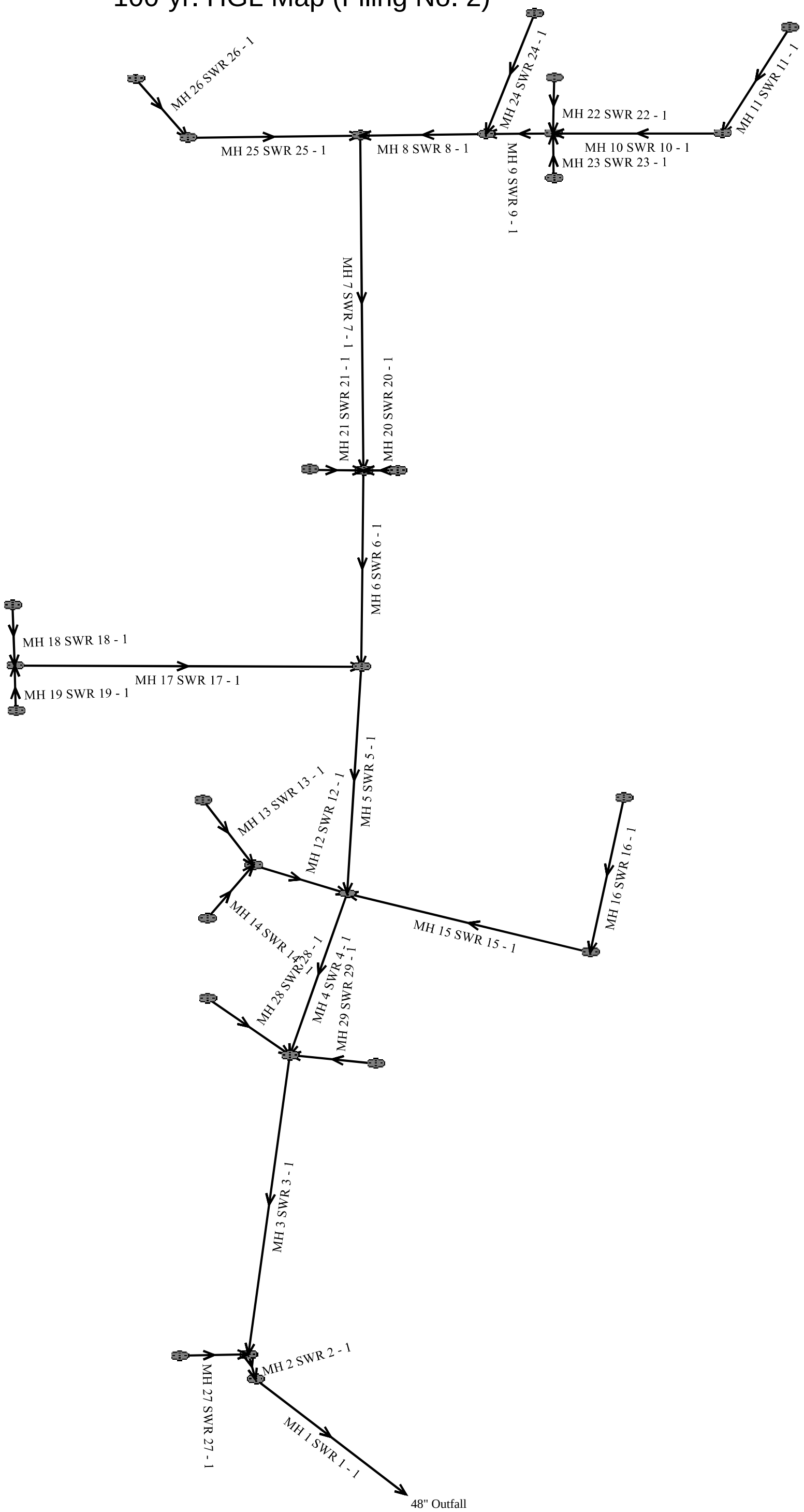
Figure 13-12d. Riprap Types for Emergency Spillway Protection



HGL CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

48" RCP Storm Outfall
100-yr. HGL Map (Filing No. 2)



100-yr. HGL Calculations (48” RCP Storm Outfall)

System Input Summary

Rainfall Parameters

Rainfall Return Period: 100
Rainfall Calculation Method: Formula

One Hour Depth (in): 0.42
Rainfall Constant "A": 28.5
Rainfall Constant "B": 10
Rainfall Constant "C": 0.786

Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.20
Maximum Rural Overland Len. (ft): 500
Maximum Urban Overland Len. (ft): 300
Used UDFCD Tc. Maximum: Yes

Sizer Constraints

Minimum Sewer Size (in): 18.00
Maximum Depth to Rise Ratio: 0.90
Maximum Flow Velocity (fps): 18.0
Minimum Flow Velocity (fps): 2.0

Backwater Calculations:

Tailwater Elevation (ft): 7146.00

Manhole Input Summary:

		Given Flow		Sub Basin Information						
Element Name	**Ground Elevation (ft)**	**Total Known Flow (cfs)**	**Local Contribution (cfs)**	**Drainage Area (Ac.)**	**Runoff Coefficient**	**5yr Coefficient**	**Overland Length (ft)**	**Overland Slope (%)**	**Gutter Length (ft)**	**Gutter Velocity (fps)**
48 IN. OUTFALL	7145.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 1 SWR 1 - 1	7160.75	153.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 2 SWR 2 - 1	7160.50	153.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 27 SWR 27 - 1	7160.30	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 3 SWR 3 - 1	7167.50	149.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 4 SWR 4 - 1	7167.11	147.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 15 SWR 15 - 1	7170.30	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 16 SWR 16 - 1	7177.94	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 12 SWR 12 - 1	7166.80	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 13 SWR 13 - 1	7166.93	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 14 SWR 14 - 1	7166.93	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 5 SWR 5 - 1	7173.78	137.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 17 SWR 17 - 1	7178.40	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 18 SWR 18 - 1	7178.61	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 19 SWR 19 - 1	7178.61	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 6 SWR 6 - 1	7180.00	132.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MH 20 SWR 20 - 1	7180.20	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 7 SWR 7 - 1	7185.00	129.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 25 SWR 25 - 1	7186.45	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 26 SWR 26 - 1	7187.30	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 8 SWR 8 - 1	7184.00	125.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 24 SWR 24 - 1	7181.00	76.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 9 SWR 9 - 1	7183.75	65.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 23 SWR 23 - 1	7184.16	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 22 SWR 22 - 1	7184.16	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 10 SWR 10 - 1	7186.00	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 11 SWR 11 - 1	7184.00	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 21 SWR 21 - 1	7180.20	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 29 SWR 29 - 1	7165.80	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 28 SWR 28 - 1	7166.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manhole Output Summary:

	Local Contribution					Total Design Flow				
Element Name	**Overland Time (min)**	**Gutter Time (min)**	**Basin Tc (min)**	**Intensity (in/hr)**	**Local Contrib (cfs)**	**Coeff. Area**	**Intensity (in/hr)**	**Manhole Tc (min)**	**Peak Flow (cfs)**	**Comment**
48 IN. OUTFALL	0.00	0.00	0.00	0.00	0.00	79.32	1.93	0.20	153.00	Surface Water Present (Upstream)
MH 1 SWR 1 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	153.00	Surface Water Present (Downstream)

MH 2 SWR 2 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	153.00	
MH 27 SWR 27 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	
MH 3 SWR 3 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	149.00	
MH 4 SWR 4 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	147.00	
MH 15 SWR 15 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
MH 16 SWR 16 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
MH 12 SWR 12 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.00	
MH 13 SWR 13 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	
MH 14 SWR 14 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
MH 5 SWR 5 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	137.00	
MH 17 SWR 17 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	
MH 18 SWR 18 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	
MH 19 SWR 19 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	
MH 6 SWR 6 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	132.00	

MH 20 SWR 20 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
MH 7 SWR 7 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	129.00	
MH 25 SWR 25 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	
MH 26 SWR 26 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	
MH 8 SWR 8 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	125.00	
MH 24 SWR 24 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.00	
MH 9 SWR 9 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.00	
MH 23 SWR 23 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	
MH 22 SWR 22 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 10 SWR 10 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.00	
MH 11 SWR 11 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.00	
MH 21 SWR 21 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
MH 29 SWR 29 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	
MH 28 SWR 28 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	

Sewer Input Summary:

		Elevation			Loss Coefficients			Given Dimensions		
Element Name	Sewer Length (ft)	Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MH 1 SWR 1 - 1	146.83	7139.00	4.6	7145.75	0.013	0.03	1.00	CIRCULAR	48.00 in	48.00 in
MH 2 SWR 2 - 1	4.03	7145.75	4.6	7145.94	0.013	0.38	1.00	CIRCULAR	48.00 in	48.00 in
MH 27 SWR 27 - 1	24.00	7148.44	3.4	7149.25	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 3 SWR 3 - 1	432.35	7146.44	2.0	7154.91	0.013	0.05	0.25	CIRCULAR	48.00 in	48.00 in
MH 4 SWR 4 - 1	184.67	7155.41	1.5	7158.18	0.013	0.05	0.58	CIRCULAR	48.00 in	48.00 in
MH 15 SWR 15 - 1	180.50	7160.68	1.4	7163.29	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 16 SWR 16 - 1	124.63	7163.84	5.7	7170.94	0.013	1.32	1.00	CIRCULAR	18.00 in	18.00 in
MH 12 SWR 12 - 1	45.94	7159.68	1.0	7160.14	0.013	1.32	0.00	CIRCULAR	30.00 in	30.00 in
MH 13 SWR 13 - 1	22.37	7160.64	1.0	7160.86	0.013	0.31	1.00	CIRCULAR	30.00 in	30.00 in
MH 14 SWR 14 - 1	21.60	7161.64	1.0	7161.86	0.013	1.06	0.00	CIRCULAR	18.00 in	18.00 in
MH 5 SWR 5 - 1	237.67	7158.68	2.0	7163.43	0.013	0.05	1.00	CIRCULAR	48.00 in	48.00 in
MH 17 SWR 17 - 1	333.98	7165.79	2.1	7172.80	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 18 SWR 18 - 1	25.66	7173.30	1.0	7173.56	0.013	1.32	1.00	CIRCULAR	24.00 in	24.00 in
MH 19 SWR 19 - 1	5.68	7173.30	2.0	7173.41	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 6 SWR 6 - 1	158.96	7163.93	2.0	7167.11	0.013	0.05	0.25	CIRCULAR	48.00 in	48.00 in
MH 20 SWR 20 - 1	8.00	7170.11	15.3	7171.33	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 7 SWR 7 - 1	331.37	7167.61	1.8	7173.57	0.013	0.05	1.00	CIRCULAR	48.00 in	48.00 in
MH 25 SWR 25 - 1	99.73	7176.07	4.0	7180.06	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 26 SWR 26 - 1	29.95	7180.56	4.0	7181.76	0.013	0.38	0.00	CIRCULAR	18.00 in	18.00 in
MH 8 SWR 8 - 1	58.23	7174.07	1.5	7174.94	0.013	1.00	1.00	CIRCULAR	48.00 in	48.00 in

MH 24 SWR 24 - 1	57.28	7175.44	0.9	7175.98	0.013	0.35	0.00	CIRCULAR	42.00 in	42.00 in
MH 9 SWR 9 - 1	25.50	7175.44	1.5	7175.82	0.013	0.05	1.00	CIRCULAR	42.00 in	42.00 in
MH 23 SWR 23 - 1	4.67	7177.82	2.0	7177.91	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 22 SWR 22 - 1	24.67	7177.32	4.0	7178.31	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 10 SWR 10 - 1	162.71	7176.32	1.1	7178.04	0.013	0.05	1.00	CIRCULAR	36.00 in	36.00 in
MH 11 SWR 11 - 1	90.41	7178.04	1.1	7179.00	0.013	0.35	1.00	CIRCULAR	36.00 in	36.00 in
MH 21 SWR 21 - 1	24.67	7170.69	8.0	7172.66	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 29 SWR 29 - 1	47.48	7157.39	5.5	7160.00	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 28 SWR 28 - 1	71.73	7157.41	5.0	7161.00	0.013	1.06	0.00	CIRCULAR	18.00 in	18.00 in

Sewer Flow Summary:

	Full Flow Capacity		Critical Flow		Normal Flow							
Element Name	**Flow (cfs)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Froude Number**	**Flow Condition**	**Flow (cfs)**	**Surcharged Length (ft)**	**Comment**	
MH 1 SWR 1 - 1	308.91	24.58	43.42	12.80	23.87	24.52	3.46	Supercritical Jump	153.00	86.54	Velocity is Too High	*
MH 2 SWR 2 - 1	308.91	24.58	43.42	12.80	23.87	24.52	3.46	Pressurized	153.00	4.03	Velocity is Too High	*
MH 27 SWR 27 - 1	41.67	13.27	14.27	5.65	8.42	11.19	2.75	Pressurized	11.00	24.00		
MH 3 SWR 3 - 1	201.60	16.04	43.05	12.54	30.70	17.55	2.08	Supercritical Jump	149.00	233.31		

* Pipe velocity exceeds 18 fps. Proposed storm pipe to be Class IV

Unresolved:
If not meeting criteria, a deviation will need to be provided with justification for higher velocity.

MH 4 SWR 4 - 1	176.40	14.04	42.86	12.41	33.48	15.71	1.73	Supercritical Jump	147.00	100.66	
MH 15 SWR 15 - 1	12.67	7.17	11.35	5.11	8.72	7.07	1.66	Pressurized	6.00	180.23	
MH 16 SWR 16 - 1	25.15	14.23	11.35	5.11	5.99	11.68	3.41	Supercritical	6.00	0.00	
MH 12 SWR 12 - 1	41.13	8.38	19.58	6.78	16.04	8.61	1.47	Pressurized	23.00	45.94	
MH 13 SWR 13 - 1	41.13	8.38	17.24	6.17	13.89	8.10	1.51	Pressurized	18.00	22.37	
MH 14 SWR 14 - 1	10.53	5.96	10.32	4.77	8.73	5.88	1.38	Pressurized	5.00	21.60	
MH 5 SWR 5 - 1	203.69	16.21	41.78	11.80	28.82	17.39	2.16	Supercritical	137.00	0.00	
MH 17 SWR 17 - 1	32.87	10.46	14.93	5.84	10.03	9.64	2.14	Supercritical Jump	12.00	74.70	
MH 18 SWR 18 - 1	22.68	7.22	12.85	5.26	10.51	6.80	1.47	Supercritical	9.00	0.00	
MH 19 SWR 19 - 1	14.90	8.43	9.18	4.41	6.37	7.15	2.02	Supercritical	4.00	0.00	
MH 6 SWR 6 - 1	203.69	16.21	41.18	11.50	28.14	17.24	2.18	Supercritical Jump	132.00	80.37	
MH 20 SWR 20 - 1	41.20	23.31	10.32	4.77	4.23	15.77	5.57	Supercritical	5.00	0.00	
MH 7 SWR 7 - 1	193.24	15.38	40.80	11.33	28.68	16.47	2.05	Supercritical	129.00	0.00	
MH 25 SWR 25 - 1	21.07	11.92	14.63	6.50	8.73	11.77	2.75	Supercritical Jump	10.00	50.09	

MH 26 SWR 26 - 1	21.07	11.92	14.63	6.50	8.73	11.77	2.75	Supercritical	10.00	0.00	
MH 8 SWR 8 - 1	176.40	14.04	40.27	11.10	29.83	15.23	1.84	Pressurized	125.00	58.23	
MH 24 SWR 24 - 1	97.95	10.18	32.73	9.45	27.79	11.25	1.39	Pressurized	76.00	57.28	
MH 9 SWR 9 - 1	123.55	12.84	30.32	8.74	21.64	13.00	1.92	Pressurized	65.00	25.50	
MH 23 SWR 23 - 1	14.90	8.43	7.90	4.02	5.48	6.59	2.02	Pressurized	3.00	4.67	
MH 22 SWR 22 - 1	45.37	14.44	17.83	6.79	10.18	13.40	2.95	Pressurized	17.00	24.67	
MH 10 SWR 10 - 1	68.76	9.73	29.12	9.14	24.68	10.84	1.40	Pressurized	56.00	162.71	
MH 11 SWR 11 - 1	68.91	9.75	29.12	9.14	24.64	10.86	1.41	Pressurized	56.00	90.41	
MH 21 SWR 21 - 1	64.16	20.42	11.26	4.83	5.35	13.40	4.21	Supercritical	7.00	0.00	
MH 29 SWR 29 - 1	24.70	13.98	6.40	3.55	3.46	8.40	3.30	Supercritical Jump	2.00	37.65	
MH 28 SWR 28 - 1	23.55	13.33	12.29	5.45	6.73	11.62	3.18	Supercritical Jump	7.00	44.76	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

Sewer Sizing Summary:

			Existing		Calculated		Used			
Element Name	Peak Flow (cfs)	Cross Section	Rise	Span	Rise	Span	Rise	Span	Area (ft^2)	Comment
MH 1 SWR 1 - 1	153.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 2 SWR 2 - 1	153.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 27 SWR 27 - 1	11.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 3 SWR 3 - 1	149.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
MH 4 SWR 4 - 1	147.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
MH 15 SWR 15 - 1	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 16 SWR 16 - 1	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 12 SWR 12 - 1	23.00	CIRCULAR	30.00 in	30.00 in	27.00 in	27.00 in	30.00 in	30.00 in	4.91	
MH 13 SWR 13 - 1	18.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 14 SWR 14 - 1	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 5 SWR 5 - 1	137.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 17 SWR 17 - 1	12.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 18 SWR 18 - 1	9.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 19 SWR 19 - 1	4.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 6 SWR 6 - 1	132.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 20 SWR 20 - 1	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 7 SWR 7 - 1	129.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 25 SWR 25 - 1	10.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 26 SWR 26 - 1	10.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 8 SWR 8 - 1	125.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	

MH 24 SWR 24 - 1	76.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
MH 9 SWR 9 - 1	65.00	CIRCULAR	42.00 in	42.00 in	36.00 in	36.00 in	42.00 in	42.00 in	9.62	
MH 23 SWR 23 - 1	3.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 22 SWR 22 - 1	17.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 10 SWR 10 - 1	56.00	CIRCULAR	36.00 in	36.00 in	36.00 in	36.00 in	36.00 in	36.00 in	7.07	
MH 11 SWR 11 - 1	56.00	CIRCULAR	36.00 in	36.00 in	36.00 in	36.00 in	36.00 in	36.00 in	7.07	
MH 21 SWR 21 - 1	7.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 29 SWR 29 - 1	2.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 28 SWR 28 - 1	7.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics where calculated using the 'Used' parameters.

Grade Line Summary:

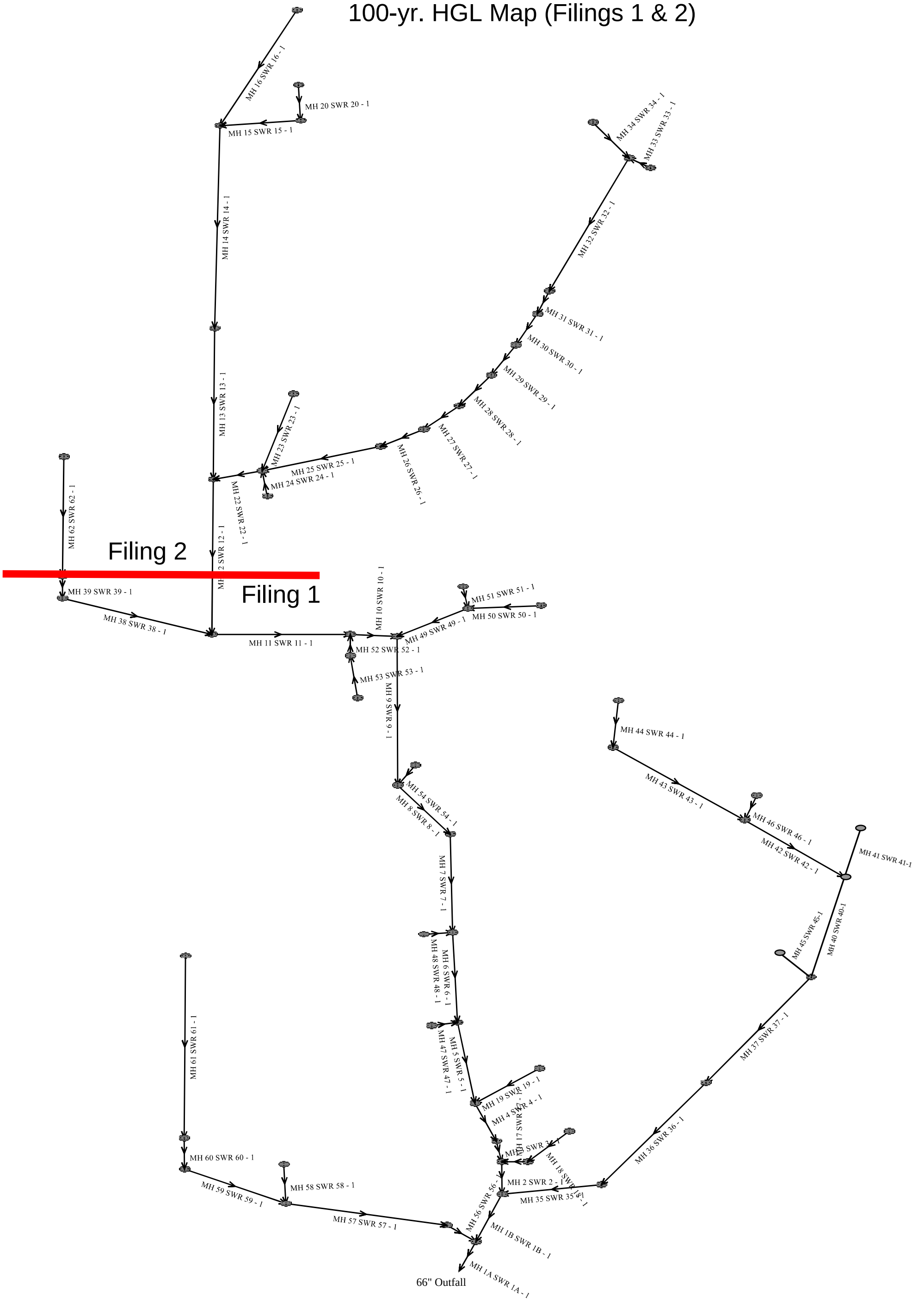
Tailwater Elevation (ft): 7146.00

	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
Element Name	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MH 1 SWR 1 - 1	7139.00	7145.75	0.00	0.00	7146.00	7149.37	7148.30	3.61	7151.91
MH 2 SWR 2 - 1	7145.75	7145.94	0.87	0.00	7150.48	7150.53	7152.79	0.05	7152.83
MH 27 SWR 27 - 1	7148.44	7149.25	0.25	0.00	7152.89	7152.95	7153.08	0.06	7153.14
MH 3 SWR 3 - 1	7146.44	7154.91	0.11	1.76	7152.51	7158.50	7154.70	6.24	7160.94
MH 4 SWR 4 - 1	7155.41	7158.18	0.11	0.95	7159.87	7161.75	7162.00	2.15	7164.14
MH 15 SWR 15 - 1	7160.68	7163.29	0.24	0.00	7164.20	7164.79	7164.38	0.58	7164.97
MH 16 SWR 16 - 1	7163.84	7170.94	0.24	0.00	7165.02	7171.89	7166.45	5.84	7172.29
MH 12 SWR 12 - 1	7159.68	7160.14	0.45	0.00	7164.25	7164.40	7164.59	0.14	7164.74
MH 13 SWR 13 - 1	7160.64	7160.86	0.06	0.13	7164.73	7164.77	7164.93	0.04	7164.98
MH 14 SWR 14 - 1	7161.64	7161.86	0.13	0.00	7164.75	7164.79	7164.87	0.05	7164.92
MH 5 SWR 5 - 1	7158.68	7163.43	0.09	0.28	7162.12	7166.91	7165.77	3.30	7169.07
MH 17 SWR 17 - 1	7165.79	7172.80	0.30	0.00	7169.15	7174.04	7169.37	5.20	7174.57
MH 18 SWR 18 - 1	7173.30	7173.56	0.17	0.10	7174.31	7174.63	7174.90	0.16	7175.06
MH 19 SWR 19 - 1	7173.30	7173.41	0.11	0.00	7174.58	7174.58	7174.68	0.02	7174.70
MH 6 SWR 6 - 1	7163.93	7167.11	0.09	1.42	7168.86	7170.54	7170.58	2.02	7172.60
MH 20 SWR 20 - 1	7170.11	7171.33	0.16	0.00	7170.71	7174.20	7174.32	0.00	7174.32
MH 7 SWR 7 - 1	7167.61	7173.57	0.08	0.08	7170.70	7176.97	7174.21	4.76	7178.96

MH 25 SWR 25 - 1	7176.07	7180.06	0.66	0.00	7179.12	7181.28	7179.62	2.32	7181.94
MH 26 SWR 26 - 1	7180.56	7181.76	0.19	0.00	7181.47	7182.98	7183.44	0.20	7183.64
MH 8 SWR 8 - 1	7174.07	7174.94	1.54	0.10	7179.06	7179.50	7180.60	0.44	7181.04
MH 24 SWR 24 - 1	7175.44	7175.98	0.34	0.00	7180.41	7180.73	7181.38	0.33	7181.70
MH 9 SWR 9 - 1	7175.44	7175.82	0.04	0.83	7181.19	7181.30	7181.90	0.11	7182.01
MH 23 SWR 23 - 1	7177.82	7177.91	0.06	0.00	7182.02	7182.03	7182.07	0.00	7182.07
MH 22 SWR 22 - 1	7177.32	7178.31	0.60	0.00	7182.15	7182.29	7182.61	0.14	7182.75
MH 10 SWR 10 - 1	7176.32	7178.04	0.05	0.00	7181.35	7182.49	7182.32	1.14	7183.46
MH 11 SWR 11 - 1	7178.04	7179.00	0.34	0.00	7182.83	7183.46	7183.80	0.63	7184.44
MH 21 SWR 21 - 1	7170.69	7172.66	0.10	0.00	7171.13	7173.60	7173.92	0.04	7173.96
MH 29 SWR 29 - 1	7157.39	7160.00	0.03	0.00	7160.95	7160.95	7160.97	0.03	7160.99
MH 28 SWR 28 - 1	7157.41	7161.00	0.26	0.00	7160.95	7162.02	7161.20	1.29	7162.48

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K * V_fi ^ 2/(2*g)
- Lateral loss = V_fo ^ 2/(2*g)- Junction Loss K * V_fi ^ 2/(2*g).
- Friction loss is always Upstream EGL - Downstream EGL.

66" RCP Storm Outfall into Pond 1
100-yr. HGL Map (Filings 1 & 2)



100-yr. HGL Calculations (66” RCP Storm Outfall into Pond 1)

System Input Summary

Rainfall Parameters

Rainfall Return Period: 100
Rainfall Calculation Method: Formula

One Hour Depth (in): 0.42
Rainfall Constant "A": 28.5
Rainfall Constant "B": 10
Rainfall Constant "C": 0.786

Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.20
Maximum Rural Overland Len. (ft): 500
Maximum Urban Overland Len. (ft): 300
Used UDFCD Tc. Maximum: Yes

Sizer Constraints

Minimum Sewer Size (in): 18.00
Maximum Depth to Rise Ratio: 0.90
Maximum Flow Velocity (fps): 18.0
Minimum Flow Velocity (fps): 2.0

Backwater Calculations:

Tailwater Elevation (ft): 7097.99

Manhole Input Summary:

		Given Flow		Sub Basin Information						
Element Name	**Ground Elevation (ft)**	**Total Known Flow (cfs)**	**Local Contribution (cfs)**	**Drainage Area (Ac.)**	**Runoff Coefficient**	**5yr Coefficient**	**Overland Length (ft)**	**Overland Slope (%)**	**Gutter Length (ft)**	**Gutter Velocity (fps)**
66 IN. OUTFALL	7107.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 1A SWR 1A - 1	7110.00	264.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 1B SWR 1B - 1	7112.14	244.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 35 SWR 35 - 1	7111.80	62.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 36 SWR 36 - 1	7122.50	62.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 37 SWR 37 - 1	7135.00	62.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 40 SWR 40 - 1	7135.80	55.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 41 SWR 41 - 1	7137.60	26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 42 SWR 42 - 1	7137.80	33.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 43 SWR 43 - 1	7146.20	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 44 SWR 44 - 1	7148.30	23.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 46 SWR 46 - 1	7137.80	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 45 SWR 45 - 1	7135.50	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 2 SWR 2 - 1	7112.00	199.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MH 17 SWR 17 - 1	7111.34	26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 18 SWR 18 - 1	7111.50	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 3 SWR 3 - 1	7111.00	179.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 4 SWR 4 - 1	7113.29	179.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 5 SWR 5 - 1	7122.10	155.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 6 SWR 6 - 1	7133.85	151.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 7 SWR 7 - 1	7148.20	146.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 8 SWR 8 - 1	7153.44	146.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 54 SWR 54 - 1	7153.90	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 9 SWR 9 - 1	7157.80	144.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 10 SWR 10 - 1	7156.70	133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 52 SWR 52 - 1	7156.30	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 53 SWR 53 - 1	7156.30	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 11 SWR 11 - 1	7158.70	128.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 38 SWR 38 - 1	7158.50	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 39 SWR 39 - 1	7155.50	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 62 SWR 62 - 1	7163.50	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 12 SWR 12 - 1	7169.70	118.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 22 SWR 22 - 1	7168.90	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 24 SWR 24 - 1	7169.18	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 25 SWR 25 - 1	7170.75	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 26 SWR 26 - 1	7171.40	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 27 SWR 27 - 1	7172.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 28 SWR 28 - 1	7172.50	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 29 SWR 29 - 1	7173.10	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MH 30 SWR 30 - 1	7173.70	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 31 SWR 31 - 1	7173.90	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 32 SWR 32 - 1	7174.30	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 34 SWR 34 - 1	7174.62	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 33 SWR 33 - 1	7174.62	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 23 SWR 23 - 1	7169.18	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 13 SWR 13 - 1	7174.20	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 14 SWR 14 - 1	7179.70	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 15 SWR 15 - 1	7179.20	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 20 SWR 20 - 1	7179.20	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 16 SWR 16 - 1	7177.00	84.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 49 SWR 49 - 1	7156.20	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 50 SWR 50 - 1	7156.30	9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 51 SWR 51 - 1	7156.30	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 48 SWR 48 - 1	7134.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 47 SWR 47 - 1	7122.00	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 19 SWR 19 - 1	7114.20	32.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 56 SWR 56 - 1	7111.50	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 57 SWR 57 - 1	7121.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 59 SWR 59 - 1	7121.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 60 SWR 60 - 1	7119.00	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 61 SWR 61 - 1	7131.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 58 SWR 58 - 1	7127.09	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manhole Output Summary:

	Local Contribution					Total Design Flow				
Element Name	**Overland Time (min)**	**Gutter Time (min)**	**Basin Tc (min)**	**Intensity (in/hr)**	**Local Contrib (cfs)**	**Coeff. Area**	**Intensity (in/hr)**	**Manhole Tc (min)**	**Peak Flow (cfs)**	**Comment**
66 IN. OUTFALL	0.00	0.00	0.00	0.00	0.00	135.49	1.95	0.07	264.00	
MH 1A SWR 1A - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	264.00	
MH 1B SWR 1B - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	244.00	
MH 35 SWR 35 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.00	
MH 36 SWR 36 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.00	
MH 37 SWR 37 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.00	
MH 40 SWR 40 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.00	
MH 41 SWR 41 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.00	
MH 42 SWR 42 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.00	
MH 43 SWR 43 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.00	
MH 44 SWR 44 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.00	
MH 46 SWR 46 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	
MH 45 SWR 45 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	
MH 2 SWR 2 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	199.00	
MH 17 SWR 17 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.00	
MH 18 SWR 18 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	
MH 3 SWR 3 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.00	
MH 4 SWR 4 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	179.00	
MH 5 SWR 5 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	155.00	
MH 6 SWR 6 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	151.00	

MH 7 SWR 7 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	146.00	
MH 8 SWR 8 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	146.00	
MH 54 SWR 54 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
MH 9 SWR 9 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.00	
MH 10 SWR 10 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.00	
MH 52 SWR 52 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	
MH 53 SWR 53 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	
MH 11 SWR 11 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	128.00	
MH 38 SWR 38 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	
MH 39 SWR 39 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	
MH 62 SWR 62 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	
MH 12 SWR 12 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118.00	
MH 22 SWR 22 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.00	
MH 24 SWR 24 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
MH 25 SWR 25 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 26 SWR 26 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 27 SWR 27 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 28 SWR 28 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 29 SWR 29 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 30 SWR 30 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 31 SWR 31 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 32 SWR 32 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	
MH 34 SWR 34 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	
MH 33 SWR 33 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	
MH 23 SWR 23 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	

MH 13 SWR 13 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.00	
MH 14 SWR 14 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.00	
MH 15 SWR 15 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	
MH 20 SWR 20 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	
MH 16 SWR 16 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.00	
MH 49 SWR 49 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	
MH 50 SWR 50 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	
MH 51 SWR 51 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	
MH 48 SWR 48 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
MH 47 SWR 47 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
MH 19 SWR 19 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.00	
MH 56 SWR 56 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	
MH 57 SWR 57 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	
MH 59 SWR 59 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00	
MH 60 SWR 60 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00	
MH 61 SWR 61 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	
MH 58 SWR 58 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	

Sewer Input Summary:

		Elevation			Loss Coefficients			Given Dimensions		
Element Name	Sewer Length (ft)	Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MH 1A SWR 1A - 1	47.03	7097.00	1.4	7097.66	0.013	0.05	1.00	CIRCULAR	66.00 in	66.00 in
MH 1B SWR 1B - 1	91.53	7098.16	1.4	7099.44	0.013	0.05	0.70	CIRCULAR	66.00 in	66.00 in
MH 35 SWR 35 - 1	123.10	7101.90	1.7	7104.00	0.013	0.24	0.00	CIRCULAR	36.00 in	36.00 in
MH 36 SWR 36 - 1	477.05	7104.50	1.5	7111.66	0.013	0.20	1.00	CIRCULAR	36.00 in	36.00 in
MH 37 SWR 37 - 1	460.75	7112.17	3.1	7126.45	0.013	0.05	1.00	CIRCULAR	36.00 in	36.00 in
MH 40 SWR 40 - 1	109.61	7126.95	2.0	7129.14	0.013	0.25	0.25	CIRCULAR	36.00 in	36.00 in
MH 41 SWR 41 - 1	58.96	7129.64	1.5	7130.52	0.013	0.05	0.00	CIRCULAR	30.00 in	30.00 in
MH 42 SWR 42 - 1	86.67	7129.64	2.0	7131.37	0.013	0.48	0.25	CIRCULAR	30.00 in	30.00 in
MH 43 SWR 43 - 1	402.33	7132.37	2.0	7140.42	0.013	0.05	0.25	CIRCULAR	30.00 in	30.00 in
MH 44 SWR 44 - 1	62.36	7140.92	2.5	7142.48	0.013	0.29	1.00	CIRCULAR	30.00 in	30.00 in
MH 46 SWR 46 - 1	21.32	7132.87	2.0	7133.30	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 45 SWR 45 - 1	12.63	7127.95	5.0	7128.58	0.013	1.00	0.00	CIRCULAR	24.00 in	24.00 in
MH 2 SWR 2 - 1	86.88	7099.94	1.4	7101.16	0.013	0.20	0.58	CIRCULAR	60.00 in	60.00 in
MH 17 SWR 17 - 1	22.31	7103.67	5.8	7104.96	0.013	0.80	0.00	CIRCULAR	30.00 in	30.00 in
MH 18 SWR 18 - 1	42.44	7105.16	2.0	7106.01	0.013	0.38	0.00	CIRCULAR	24.00 in	24.00 in
MH 3 SWR 3 - 1	48.96	7101.66	1.2	7102.25	0.013	0.09	0.27	CIRCULAR	54.00 in	54.00 in
MH 4 SWR 4 - 1	113.13	7102.30	1.2	7103.66	0.013	0.20	1.00	CIRCULAR	54.00 in	54.00 in
MH 5 SWR 5 - 1	235.33	7104.07	3.9	7113.25	0.013	0.05	0.70	CIRCULAR	48.00 in	48.00 in
MH 6 SWR 6 - 1	291.01	7114.25	3.5	7124.44	0.013	0.05	0.25	CIRCULAR	48.00 in	48.00 in
MH 7 SWR 7 - 1	296.08	7125.44	3.0	7134.32	0.013	0.05	0.25	CIRCULAR	48.00 in	48.00 in

MH 8 SWR 8 - 1	90.43	7134.32	3.0	7137.03	0.013	0.16	1.00	CIRCULAR	48.00 in	48.00 in
MH 54 SWR 54 - 1	17.58	7140.03	10.6	7141.89	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 9 SWR 9 - 1	270.89	7137.53	1.5	7141.59	0.013	0.24	0.44	CIRCULAR	48.00 in	48.00 in
MH 10 SWR 10 - 1	79.36	7142.09	1.0	7142.88	0.013	1.00	0.84	CIRCULAR	48.00 in	48.00 in
MH 52 SWR 52 - 1	7.66	7146.38	12.0	7147.30	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 53 SWR 53 - 1	70.10	7147.50	5.1	7151.08	0.013	0.05	0.00	CIRCULAR	18.00 in	18.00 in
MH 11 SWR 11 - 1	181.32	7143.38	1.0	7145.19	0.013	0.05	0.44	CIRCULAR	48.00 in	48.00 in
MH 38 SWR 38 - 1	179.00	7147.69	1.0	7149.48	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in
MH 39 SWR 39 - 1	24.00	7149.99	1.3	7150.30	0.013	0.38	0.00	CIRCULAR	24.00 in	24.00 in
MH 62 SWR 62 - 1	500.00	7150.50	1.6	7158.50	0.013	0.05	0.00	CIRCULAR	18.00 in	18.00 in
MH 12 SWR 12 - 1	169.86	7145.74	8.1	7159.50	0.013	1.00	1.00	CIRCULAR	48.00 in	48.00 in
MH 22 SWR 22 - 1	27.06	7161.00	3.0	7161.81	0.013	1.06	1.00	CIRCULAR	30.00 in	30.00 in
MH 24 SWR 24 - 1	6.88	7163.31	5.0	7163.65	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 25 SWR 25 - 1	103.73	7162.31	1.0	7163.35	0.013	0.05	0.25	CIRCULAR	30.00 in	30.00 in
MH 26 SWR 26 - 1	38.29	7163.35	1.0	7163.73	0.013	0.06	1.00	CIRCULAR	30.00 in	30.00 in
MH 27 SWR 27 - 1	41.04	7163.73	1.0	7164.14	0.013	0.13	1.00	CIRCULAR	30.00 in	30.00 in
MH 28 SWR 28 - 1	32.52	7164.14	1.0	7164.47	0.013	0.11	1.00	CIRCULAR	30.00 in	30.00 in
MH 29 SWR 29 - 1	41.04	7164.47	1.0	7164.88	0.013	0.11	1.00	CIRCULAR	30.00 in	30.00 in
MH 30 SWR 30 - 1	32.52	7164.88	1.0	7165.21	0.013	0.11	1.00	CIRCULAR	30.00 in	30.00 in
MH 31 SWR 31 - 1	18.52	7165.20	1.0	7165.39	0.013	0.11	1.00	CIRCULAR	30.00 in	30.00 in
MH 32 SWR 32 - 1	218.88	7165.89	1.0	7168.08	0.013	0.05	1.00	CIRCULAR	30.00 in	30.00 in
MH 34 SWR 34 - 1	25.53	7168.58	2.0	7169.09	0.013	4.96	0.00	CIRCULAR	24.00 in	24.00 in
MH 33 SWR 33 - 1	6.35	7169.08	5.0	7169.40	0.013	0.83	0.00	CIRCULAR	18.00 in	18.00 in
MH 23 SWR 23 - 1	38.92	7162.79	3.1	7164.00	0.013	0.46	0.00	CIRCULAR	24.00 in	24.00 in
MH 13 SWR 13 - 1	375.00	7160.00	1.2	7164.50	0.013	0.05	0.27	CIRCULAR	42.00 in	42.00 in

MH 14 SWR 14 - 1	469.78	7165.00	0.9	7169.23	0.013	0.05	1.00	CIRCULAR	42.00 in	42.00 in
MH 15 SWR 15 - 1	60.83	7171.23	3.0	7173.05	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 20 SWR 20 - 1	37.59	7173.25	2.0	7174.00	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 16 SWR 16 - 1	93.87	7169.73	2.0	7171.61	0.013	0.05	0.44	CIRCULAR	42.00 in	42.00 in
MH 49 SWR 49 - 1	99.90	7144.12	4.9	7149.02	0.013	0.48	0.00	CIRCULAR	24.00 in	24.00 in
MH 50 SWR 50 - 1	56.99	7150.50	1.4	7151.30	0.013	0.05	0.25	CIRCULAR	18.00 in	18.00 in
MH 51 SWR 51 - 1	13.04	7150.02	2.0	7150.28	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
MH 48 SWR 48 - 1	7.17	7127.94	7.8	7128.50	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 47 SWR 47 - 1	7.17	7117.25	3.5	7117.50	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
MH 19 SWR 19 - 1	63.48	7105.66	1.0	7106.29	0.013	1.00	0.00	CIRCULAR	30.00 in	30.00 in
MH 56 SWR 56 - 1	30.24	7101.17	4.4	7102.50	0.013	1.00	0.00	CIRCULAR	30.00 in	30.00 in
MH 57 SWR 57 - 1	341.65	7103.00	2.1	7110.17	0.013	0.20	0.00	CIRCULAR	30.00 in	30.00 in
MH 59 SWR 59 - 1	201.37	7110.67	1.0	7112.68	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in
MH 60 SWR 60 - 1	16.00	7113.18	1.0	7113.34	0.013	0.63	0.00	CIRCULAR	24.00 in	24.00 in
MH 61 SWR 61 - 1	512.50	7113.54	2.5	7126.35	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in
MH 58 SWR 58 - 1	42.21	7112.16	15.0	7118.49	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in

Sewer Flow Summary:

	Full Flow Capacity		Critical Flow		Normal Flow						
Element Name	**Flow (cfs)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Froude Number**	**Flow Condition**	**Flow (cfs)**	**Surcharged Length (ft)**	**Comment**
MH 1A SWR 1A - 1	398.40	16.77	54.23	12.64	39.25	17.93	1.91	Supercritical	264.00	0.00	
MH 1B SWR 1B - 1	398.40	16.77	52.33	12.08	37.32	17.61	1.95	Pressurized	244.00	91.53	
MH 35 SWR 35 - 1	87.35	12.36	30.43	9.73	22.40	13.41	1.87	Supercritical Jump	62.00	93.21	
MH 36 SWR 36 - 1	81.91	11.59	30.43	9.73	23.41	12.74	1.72	Supercritical	62.00	0.00	
MH 37 SWR 37 - 1	117.75	16.66	30.43	9.73	18.56	16.87	2.69	Supercritical	62.00	0.00	
MH 40 SWR 40 - 1	94.58	13.38	28.88	9.05	19.71	13.88	2.12	Supercritical Jump	55.00	57.58	
MH 41 SWR 41 - 1	50.37	10.26	20.85	7.14	15.29	10.34	1.82	Supercritical Jump	26.00	24.42	
MH 42 SWR 42 - 1	58.16	11.85	23.46	8.01	16.18	12.22	2.07	Supercritical Jump	33.00	79.73	
MH 43 SWR 43 - 1	58.16	11.85	19.58	6.78	13.11	11.16	2.16	Supercritical	23.00	0.00	
MH 44 SWR 44 - 1	65.03	13.25	19.58	6.78	12.32	12.11	2.43	Supercritical	23.00	0.00	

MH 46 SWR 46 - 1	32.08	10.21	13.58	5.46	9.20	9.02	2.11	Supercritical	10.00	0.00		
MH 45 SWR 45 - 1	50.72	16.15	12.85	5.26	6.84	12.18	3.36	Supercritical	9.00	0.00		
MH 2 SWR 2 - 1	308.99	15.74	48.33	11.74	35.03	16.72	1.90	Pressurized	199.00	86.88		
MH 17 SWR 17 - 1	99.05	20.18	20.85	7.14	10.49	17.00	3.74	Pressurized	26.00	22.31		
MH 18 SWR 18 - 1	32.08	10.21	15.56	6.03	10.63	9.68	2.07	Pressurized	13.00	42.44		
MH 3 SWR 3 - 1	216.00	13.58	46.52	12.28	37.51	15.18	1.59	Pressurized	179.00	48.96		
MH 4 SWR 4 - 1	216.00	13.58	46.52	12.28	37.51	15.18	1.59	Pressurized	179.00	113.13		
MH 5 SWR 5 - 1	284.44	22.63	43.59	12.93	25.26	23.12	3.15	Supercritical Jump	155.00	68.11	Velocity is Too High	*
MH 6 SWR 6 - 1	269.46	21.44	43.24	12.67	25.69	22.05	2.97	Supercritical Jump	151.00	37.29	Velocity is Too High	*
MH 7 SWR 7 - 1	249.47	19.85	42.76	12.35	26.39	20.63	2.73	Supercritical Jump	146.00	41.79	Velocity is Too High	*
MH 8 SWR 8 - 1	249.47	19.85	42.76	12.35	26.39	20.63	2.73	Supercritical	146.00	0.00	Velocity is Too High	*
MH 54 SWR 54 - 1	34.29	19.41	10.32	4.77	4.64	13.84	4.65	Supercritical	5.00	0.00		
MH 9 SWR 9 - 1	176.40	14.04	42.55	12.23	32.96	15.65	1.75	Supercritical Jump	144.00	249.08		
MH 10 SWR 10 - 1	144.03	11.46	41.31	11.56	36.40	13.01	1.33	Pressurized	133.00	79.36		

Unresolved:
If not meeting criteria, a deviation will need to be provided with justification for higher velocity.

* Pipe velocity exceeds 18 fps. Proposed storm pipe to be Class IV

MH 52 SWR 52 - 1	78.58	25.01	12.85	5.26	5.48	16.64	5.17	Pressurized	9.00	7.66	
MH 53 SWR 53 - 1	23.79	13.46	9.18	4.41	4.99	10.00	3.23	Supercritical Jump	4.00	31.29	
MH 11 SWR 11 - 1	144.03	11.46	40.67	11.27	35.23	12.95	1.36	Pressurized	128.00	181.32	
MH 38 SWR 38 - 1	22.68	7.22	15.56	6.03	13.02	7.47	1.41	Pressurized	13.00	179.00	
MH 39 SWR 39 - 1	25.86	8.23	15.56	6.03	12.04	8.24	1.64	Pressurized	13.00	24.00	
MH 62 SWR 62 - 1	13.32	7.54	13.15	5.78	10.05	7.88	1.68	Supercritical Jump	8.00	149.07	
MH 12 SWR 12 - 1	409.92	32.62	39.28	10.72	17.63	28.19	4.77	Supercritical Jump	118.00	47.04	Velocity is Too High *
MH 22 SWR 22 - 1	71.24	14.51	23.12	7.88	14.09	14.12	2.61	Pressurized	32.00	27.06	
MH 24 SWR 24 - 1	23.55	13.33	11.35	5.11	6.20	11.14	3.19	Pressurized	6.00	6.88	
MH 25 SWR 25 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Pressurized	17.00	103.73	
MH 26 SWR 26 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Pressurized	17.00	38.29	
MH 27 SWR 27 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Pressurized	17.00	41.04	
MH 28 SWR 28 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Pressurized	17.00	32.52	
MH 29 SWR 29 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Supercritical Jump	17.00	5.04	

* Pipe velocity exceeds 18 fps. Proposed storm pipe to be Class IV

MH 30 SWR 30 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Supercritical	17.00	0.00	
MH 31 SWR 31 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Supercritical	17.00	0.00	
MH 32 SWR 32 - 1	41.13	8.38	16.73	6.04	13.44	7.98	1.52	Supercritical	17.00	0.00	
MH 34 SWR 34 - 1	32.08	10.21	17.30	6.60	11.98	10.20	2.03	Pressurized	16.00	25.53	
MH 33 SWR 33 - 1	23.55	13.33	4.91	3.07	2.76	6.98	3.09	Supercritical	1.20	0.00	
MH 23 SWR 23 - 1	39.94	12.71	14.93	5.84	9.02	11.12	2.62	Pressurized	12.00	38.92	
MH 13 SWR 13 - 1	110.51	11.49	35.96	10.72	29.76	12.89	1.50	Supercritical Jump	94.00	186.47	
MH 14 SWR 14 - 1	95.70	9.95	35.96	10.72	33.77	11.34	1.16	Supercritical	94.00	0.00	
MH 15 SWR 15 - 1	39.23	12.49	16.75	6.41	10.29	11.65	2.55	Supercritical Jump	15.00	34.91	
MH 20 SWR 20 - 1	32.08	10.21	14.93	5.84	10.17	9.47	2.09	Supercritical	12.00	0.00	
MH 16 SWR 16 - 1	142.67	14.83	34.28	9.99	23.17	15.43	2.17	Supercritical Jump	84.00	47.12	
MH 49 SWR 49 - 1	50.21	15.98	17.30	6.60	9.31	14.20	3.29	Supercritical	16.00	0.00	
MH 50 SWR 50 - 1	12.46	7.05	13.93	6.13	11.33	7.68	1.50	Supercritical	9.00	0.00	
MH 51 SWR 51 - 1	32.08	10.21	13.58	5.46	9.20	9.02	2.11	Supercritical	10.00	0.00	

MH 48 SWR 48 - 1	29.42	16.65	12.29	5.45	5.98	13.65	3.99	Supercritical	7.00	0.00	
MH 47 SWR 47 - 1	19.70	11.15	12.29	5.45	7.41	10.20	2.64	Supercritical	7.00	0.00	
MH 19 SWR 19 - 1	41.13	8.38	23.12	7.88	19.89	9.26	1.35	Pressurized	32.00	63.48	
MH 56 SWR 56 - 1	86.27	17.57	20.44	7.02	11.06	15.22	3.25	Pressurized	25.00	30.24	
MH 57 SWR 57 - 1	59.60	12.14	20.44	7.02	13.55	11.61	2.20	Supercritical	25.00	0.00	
MH 59 SWR 59 - 1	22.68	7.22	18.82	7.19	16.81	8.09	1.26	Supercritical	19.00	0.00	
MH 60 SWR 60 - 1	22.68	7.22	18.82	7.19	16.81	8.09	1.26	Supercritical	19.00	0.00	
MH 61 SWR 61 - 1	35.87	11.42	16.75	6.41	10.82	10.91	2.31	Supercritical	15.00	0.00	
MH 58 SWR 58 - 1	40.79	23.08	13.15	5.78	5.40	17.92	5.54	Supercritical	8.00	0.00	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

Sewer Sizing Summary:

			Existing		Calculated		Used			
Element Name	**Peak Flow (cfs)**	**Cross Section**	**Rise**	**Span**	**Rise**	**Span**	**Rise**	**Span**	**Area (ft^2)**	**Comment**
MH 1A SWR 1A - 1	264.00	CIRCULAR	66.00 in	66.00 in	60.00 in	60.00 in	66.00 in	66.00 in	23.76	
MH 1B SWR 1B - 1	244.00	CIRCULAR	66.00 in	66.00 in	60.00 in	60.00 in	66.00 in	66.00 in	23.76	
MH 35 SWR 35 - 1	62.00	CIRCULAR	36.00 in	36.00 in	33.00 in	33.00 in	36.00 in	36.00 in	7.07	
MH 36 SWR 36 - 1	62.00	CIRCULAR	36.00 in	36.00 in	33.00 in	33.00 in	36.00 in	36.00 in	7.07	
MH 37 SWR 37 - 1	62.00	CIRCULAR	36.00 in	36.00 in	30.00 in	30.00 in	36.00 in	36.00 in	7.07	
MH 40 SWR 40 - 1	55.00	CIRCULAR	36.00 in	36.00 in	30.00 in	30.00 in	36.00 in	36.00 in	7.07	
MH 41 SWR 41 - 1	26.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 42 SWR 42 - 1	33.00	CIRCULAR	30.00 in	30.00 in	27.00 in	27.00 in	30.00 in	30.00 in	4.91	
MH 43 SWR 43 - 1	23.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 44 SWR 44 - 1	23.00	CIRCULAR	30.00 in	30.00 in	21.00 in	21.00 in	30.00 in	30.00 in	4.91	
MH 46 SWR 46 - 1	10.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 45 SWR 45 - 1	9.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 2 SWR 2 - 1	199.00	CIRCULAR	60.00 in	60.00 in	54.00 in	54.00 in	60.00 in	60.00 in	19.63	
MH 17 SWR 17 - 1	26.00	CIRCULAR	30.00 in	30.00 in	21.00 in	21.00 in	30.00 in	30.00 in	4.91	
MH 18 SWR 18 - 1	13.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 3 SWR 3 - 1	179.00	CIRCULAR	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	15.90	
MH 4 SWR 4 - 1	179.00	CIRCULAR	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	15.90	
MH 5 SWR 5 - 1	155.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 6 SWR 6 - 1	151.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 7 SWR 7 - 1	146.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	

MH 8 SWR 8 - 1	146.00	CIRCULAR	48.00 in	48.00 in	42.00 in	42.00 in	48.00 in	48.00 in	12.57	
MH 54 SWR 54 - 1	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 9 SWR 9 - 1	144.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
MH 10 SWR 10 - 1	133.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
MH 52 SWR 52 - 1	9.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 53 SWR 53 - 1	4.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 11 SWR 11 - 1	128.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
MH 38 SWR 38 - 1	13.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
MH 39 SWR 39 - 1	13.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
MH 62 SWR 62 - 1	8.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 12 SWR 12 - 1	118.00	CIRCULAR	48.00 in	48.00 in	33.00 in	33.00 in	48.00 in	48.00 in	12.57	
MH 22 SWR 22 - 1	32.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 24 SWR 24 - 1	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 25 SWR 25 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 26 SWR 26 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 27 SWR 27 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 28 SWR 28 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 29 SWR 29 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 30 SWR 30 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 31 SWR 31 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 32 SWR 32 - 1	17.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 34 SWR 34 - 1	16.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
MH 33 SWR 33 - 1	1.20	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 23 SWR 23 - 1	12.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 13 SWR 13 - 1	94.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	

MH 14 SWR 14 - 1	94.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
MH 15 SWR 15 - 1	15.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 20 SWR 20 - 1	12.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 16 SWR 16 - 1	84.00	CIRCULAR	42.00 in	42.00 in	36.00 in	36.00 in	42.00 in	42.00 in	9.62	
MH 49 SWR 49 - 1	16.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 50 SWR 50 - 1	9.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 51 SWR 51 - 1	10.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 48 SWR 48 - 1	7.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 47 SWR 47 - 1	7.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
MH 19 SWR 19 - 1	32.00	CIRCULAR	30.00 in	30.00 in	30.00 in	30.00 in	30.00 in	30.00 in	4.91	
MH 56 SWR 56 - 1	25.00	CIRCULAR	30.00 in	30.00 in	21.00 in	21.00 in	30.00 in	30.00 in	4.91	
MH 57 SWR 57 - 1	25.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
MH 59 SWR 59 - 1	19.00	CIRCULAR	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	3.14	
MH 60 SWR 60 - 1	19.00	CIRCULAR	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	3.14	
MH 61 SWR 61 - 1	15.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
MH 58 SWR 58 - 1	8.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics where calculated using the 'Used' parameters.

Grade Line Summary:

Tailwater Elevation (ft): 7097.99

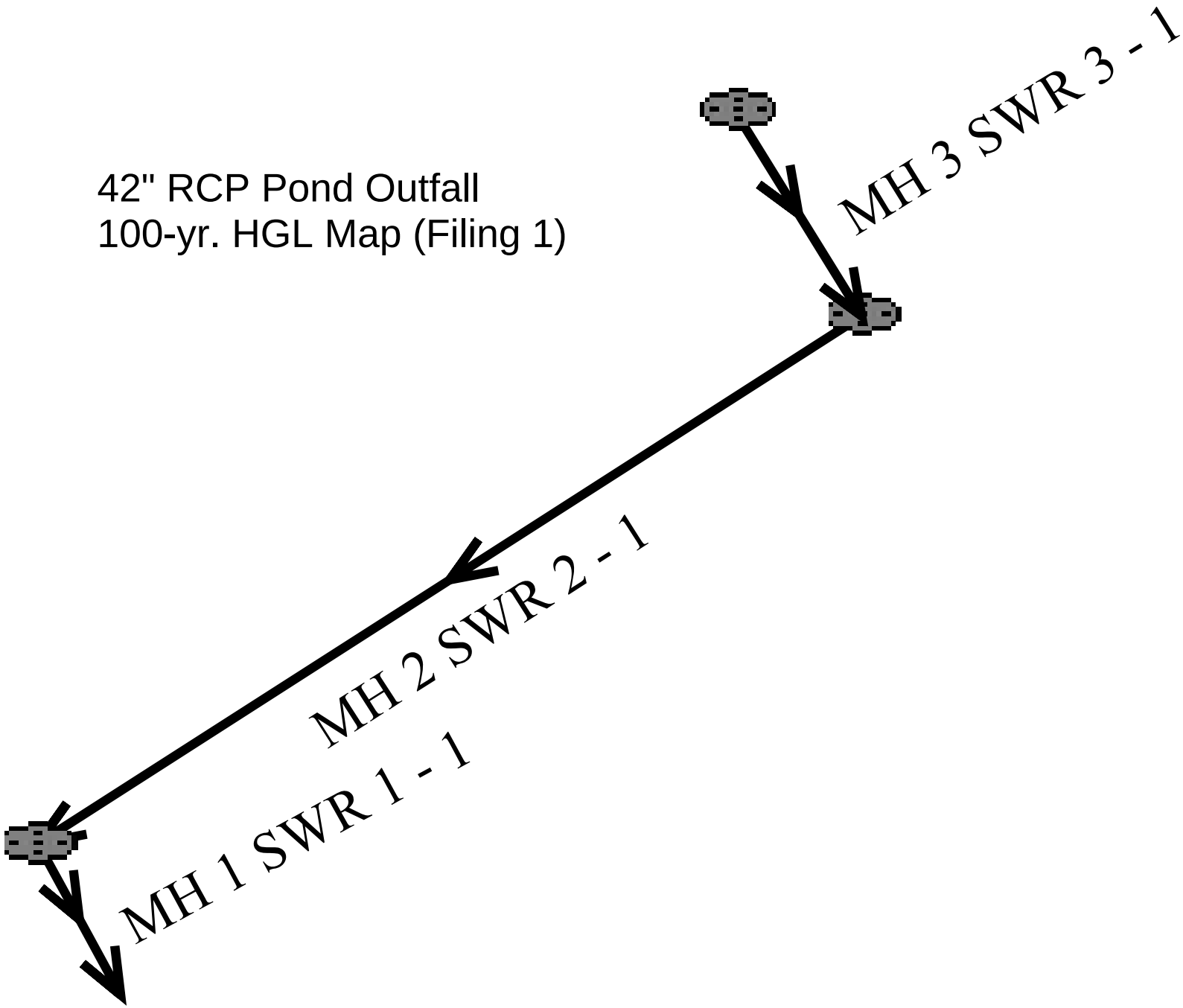
	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
Element Name	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MH 1A SWR 1A - 1	7097.00	7097.66	0.00	0.00	7100.27	7103.35	7105.26	0.00	7105.26
MH 1B SWR 1B - 1	7098.16	7099.44	0.08	0.77	7104.48	7104.96	7106.12	0.48	7106.60
MH 35 SWR 35 - 1	7101.90	7104.00	0.29	0.00	7105.69	7106.54	7106.88	1.12	7108.01
MH 36 SWR 36 - 1	7104.50	7111.66	0.24	0.00	7106.78	7114.20	7108.98	6.69	7115.67
MH 37 SWR 37 - 1	7112.17	7126.45	0.06	0.00	7114.26	7128.99	7118.13	12.32	7130.46
MH 40 SWR 40 - 1	7126.95	7129.14	0.24	0.96	7130.71	7131.55	7131.65	1.17	7132.82
MH 41 SWR 41 - 1	7129.64	7130.52	0.02	0.00	7132.40	7132.40	7132.84	0.23	7133.07
MH 42 SWR 42 - 1	7129.64	7131.37	0.34	0.76	7133.22	7133.68	7133.92	0.51	7134.43
MH 43 SWR 43 - 1	7132.37	7140.42	0.02	0.62	7134.31	7142.05	7135.40	7.37	7142.76
MH 44 SWR 44 - 1	7140.92	7142.48	0.10	0.00	7142.15	7144.11	7144.22	0.60	7144.82
MH 46 SWR 46 - 1	7132.87	7133.30	0.21	0.00	7133.89	7134.51	7134.90	0.00	7134.90
MH 45 SWR 45 - 1	7127.95	7128.58	0.13	0.00	7129.11	7130.70	7130.82	0.00	7130.82
MH 2 SWR 2 - 1	7099.94	7101.16	0.32	0.71	7106.03	7106.54	7107.63	0.50	7108.13
MH 17 SWR 17 - 1	7103.67	7104.96	0.35	0.00	7108.05	7108.14	7108.48	0.09	7108.57
MH 18 SWR 18 - 1	7105.16	7106.01	0.10	0.00	7108.41	7108.55	7108.67	0.14	7108.81
MH 3 SWR 3 - 1	7101.66	7102.25	0.18	1.06	7107.78	7108.18	7109.75	0.40	7110.15
MH 4 SWR 4 - 1	7102.30	7103.66	0.39	0.00	7108.58	7109.51	7110.54	0.93	7111.48

MH 5 SWR 5 - 1	7104.07	7113.25	0.12	0.31	7109.94	7116.88	7112.30	7.18	7119.48
MH 6 SWR 6 - 1	7114.25	7124.44	0.11	1.80	7119.15	7128.04	7121.39	9.14	7130.53
MH 7 SWR 7 - 1	7125.44	7134.32	0.10	1.72	7130.26	7137.88	7132.36	7.89	7140.25
MH 8 SWR 8 - 1	7134.32	7137.03	0.34	0.00	7138.22	7141.03	7143.12	0.00	7143.12
MH 54 SWR 54 - 1	7140.03	7141.89	0.16	0.00	7141.19	7143.25	7143.39	0.00	7143.39
MH 9 SWR 9 - 1	7137.53	7141.59	0.49	1.20	7142.77	7145.14	7144.81	2.64	7147.46
MH 10 SWR 10 - 1	7142.09	7142.88	1.74	0.58	7148.03	7148.71	7149.77	0.68	7150.45
MH 52 SWR 52 - 1	7146.38	7147.30	0.17	0.00	7150.49	7150.50	7150.62	0.01	7150.63
MH 53 SWR 53 - 1	7147.50	7151.08	0.00	0.00	7150.56	7151.85	7150.64	1.51	7152.15
MH 11 SWR 11 - 1	7143.38	7145.19	0.08	1.03	7149.95	7151.38	7151.56	1.43	7152.99
MH 38 SWR 38 - 1	7147.69	7149.48	0.01	0.00	7152.74	7153.33	7153.01	0.59	7153.60
MH 39 SWR 39 - 1	7149.99	7150.30	0.10	0.00	7153.43	7153.51	7153.70	0.08	7153.78
MH 62 SWR 62 - 1	7150.50	7158.50	0.02	0.00	7153.53	7159.60	7153.84	6.27	7160.12
MH 12 SWR 12 - 1	7145.74	7159.50	1.37	0.24	7153.24	7162.77	7154.61	9.95	7164.56
MH 22 SWR 22 - 1	7161.00	7161.81	0.70	0.71	7165.31	7165.47	7165.97	0.16	7166.13
MH 24 SWR 24 - 1	7163.31	7163.65	0.24	0.00	7166.19	7166.21	7166.37	0.02	7166.39
MH 25 SWR 25 - 1	7162.31	7163.35	0.01	0.61	7166.57	7166.74	7166.75	0.18	7166.93
MH 26 SWR 26 - 1	7163.35	7163.73	0.01	0.00	7166.76	7166.82	7166.94	0.07	7167.01
MH 27 SWR 27 - 1	7163.73	7164.14	0.02	0.00	7166.84	7166.91	7167.03	0.07	7167.10
MH 28 SWR 28 - 1	7164.14	7164.47	0.02	0.00	7166.94	7166.99	7167.12	0.06	7167.18
MH 29 SWR 29 - 1	7164.47	7164.88	0.02	0.00	7167.01	7167.01	7167.20	0.04	7167.24
MH 30 SWR 30 - 1	7164.88	7165.21	0.02	0.00	7167.04	7167.04	7167.26	0.08	7167.34
MH 31 SWR 31 - 1	7165.20	7165.39	0.02	0.00	7167.07	7167.07	7167.36	0.07	7167.43
MH 32 SWR 32 - 1	7165.89	7168.08	0.01	0.00	7167.08	7169.47	7168.00	2.04	7170.04
MH 34 SWR 34 - 1	7168.58	7169.09	2.00	0.00	7171.64	7171.76	7172.04	0.13	7172.17

MH 33 SWR 33 - 1	7169.08	7169.40	0.01	0.00	7169.48	7170.02	7170.07	0.00	7170.07
MH 23 SWR 23 - 1	7162.79	7164.00	0.10	0.00	7166.01	7166.12	7166.23	0.11	7166.34
MH 13 SWR 13 - 1	7160.00	7164.50	0.07	0.97	7164.12	7167.50	7165.60	3.68	7169.28
MH 14 SWR 14 - 1	7165.00	7169.23	0.07	0.00	7167.81	7172.22	7169.81	4.20	7174.01
MH 15 SWR 15 - 1	7171.23	7173.05	0.47	0.00	7174.12	7174.45	7174.48	0.61	7175.08
MH 20 SWR 20 - 1	7173.25	7174.00	0.30	0.00	7174.74	7175.24	7175.49	0.28	7175.77
MH 16 SWR 16 - 1	7169.73	7171.61	0.06	0.96	7173.85	7174.46	7175.03	0.98	7176.01
MH 49 SWR 49 - 1	7144.12	7149.02	0.19	0.00	7145.33	7150.46	7148.03	3.10	7151.14
MH 50 SWR 50 - 1	7150.50	7151.30	0.02	0.30	7151.45	7152.46	7152.36	0.68	7153.04
MH 51 SWR 51 - 1	7150.02	7150.28	0.21	0.00	7150.79	7151.82	7152.05	0.00	7152.05
MH 48 SWR 48 - 1	7127.94	7128.50	0.32	0.00	7128.62	7129.52	7129.86	0.12	7129.98
MH 47 SWR 47 - 1	7117.25	7117.50	0.32	0.00	7118.04	7118.52	7118.90	0.09	7118.98
MH 19 SWR 19 - 1	7105.66	7106.29	0.66	0.00	7111.48	7111.86	7112.14	0.38	7112.52
MH 56 SWR 56 - 1	7101.17	7102.50	0.40	0.00	7105.26	7105.38	7105.67	0.11	7105.78
MH 57 SWR 57 - 1	7103.00	7110.17	0.08	0.00	7105.46	7111.87	7106.22	6.42	7112.64
MH 59 SWR 59 - 1	7110.67	7112.68	0.03	0.00	7112.07	7114.25	7113.08	1.97	7115.05
MH 60 SWR 60 - 1	7113.18	7113.34	0.36	0.00	7114.61	7114.91	7115.60	0.12	7115.71
MH 61 SWR 61 - 1	7113.54	7126.35	0.02	0.00	7114.93	7127.75	7116.29	12.10	7128.38
MH 58 SWR 58 - 1	7112.16	7118.49	0.42	0.00	7112.61	7119.59	7117.60	2.51	7120.11

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K * V_fi ^ 2/(2*g)
- Lateral loss = V_fo ^ 2/(2*g)- Junction Loss K * V_fi ^ 2/(2*g).
- Friction loss is always Upstream EGL - Downstream EGL.

42" RCP Pond Outfall
100-yr. HGL Map (Filing 1)



100-yr. HGL Calculations – 42” RCP Pond Outfall

System Input Summary

Rainfall Parameters

Rainfall Return Period: 100
Rainfall Calculation Method: Formula

One Hour Depth (in): 0.42
Rainfall Constant "A": 28.5
Rainfall Constant "B": 10
Rainfall Constant "C": 0.786

Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.20
Maximum Rural Overland Len. (ft): 500
Maximum Urban Overland Len. (ft): 300
Used UDFCD Tc. Maximum: Yes

Sizer Constraints

Minimum Sewer Size (in): 18.00
Maximum Depth to Rise Ratio: 0.90
Maximum Flow Velocity (fps): 18.0
Minimum Flow Velocity (fps): 2.0

Backwater Calculations:

Tailwater Elevation (ft): 7081.19

Manhole Input Summary:

		Given Flow		Sub Basin Information						
Element Name	**Ground Elevation (ft)**	**Total Known Flow (cfs)**	**Local Contribution (cfs)**	**Drainage Area (Ac.)**	**Runoff Coefficient**	**5yr Coefficient**	**Overland Length (ft)**	**Overland Slope (%)**	**Gutter Length (ft)**	**Gutter Velocity (fps)**
42 IN. POND OUTFALL	7105.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 1 SWR 1 - 1	7119.00	112.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 2 SWR 2 - 1	7094.30	112.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH 3 SWR 3 - 1	7095.25	112.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manhole Output Summary:

	Local Contribution					Total Design Flow				
Element Name	**Overland Time (min)**	**Gutter Time (min)**	**Basin Tc (min)**	**Intensity (in/hr)**	**Local Contrib (cfs)**	**Coeff. Area**	**Intensity (in/hr)**	**Manhole Tc (min)**	**Peak Flow (cfs)**	**Comment**
42 IN. POND OUTFALL	0.00	0.00	0.00	0.00	0.00	57.46	1.96	0.01	112.50	
MH 1 SWR 1 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.50	
MH 2 SWR 2 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.50	
MH 3 SWR 3 - 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.50	

Sewer Input Summary:

		Elevation			Loss Coefficients			Given Dimensions		
Element Name	Sewer Length (ft)	Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MH 1 SWR 1 - 1	5.69	7078.20	2.0	7078.31	0.013	0.05	1.00	CIRCULAR	42.00 in	42.00 in
MH 2 SWR 2 - 1	334.83	7078.81	1.8	7084.78	0.013	1.00	1.00	CIRCULAR	42.00 in	42.00 in
MH 3 SWR 3 - 1	60.80	7085.28	2.0	7086.50	0.013	1.00	1.00	CIRCULAR	42.00 in	42.00 in

Sewer Flow Summary:

	Full Flow Capacity		Critical Flow		Normal Flow						
Element Name	Flow (cfs)	Velocity (fps)	Depth (in)	Velocity (fps)	Depth (in)	Velocity (fps)	Froude Number	Flow Condition	Flow (cfs)	Surcharged Length (ft)	Comment
MH 1 SWR 1 - 1	142.67	14.83	38.30	12.22	28.12	16.43	2.01	Supercritical	112.50	0.00	
MH 2 SWR 2 - 1	134.70	14.00	38.30	12.22	29.34	15.67	1.85	Pressurized	112.50	334.83	
MH 3 SWR 3 - 1	142.67	14.83	38.30	12.22	28.12	16.43	2.01	Pressurized	112.50	60.80	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

Sewer Sizing Summary:

			Existing		Calculated		Used			
Element Name	**Peak Flow (cfs)**	**Cross Section**	**Rise**	**Span**	**Rise**	**Span**	**Rise**	**Span**	**Area (ft^2)**	**Comment**
MH 1 SWR 1 - 1	112.50	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
MH 2 SWR 2 - 1	112.50	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
MH 3 SWR 3 - 1	112.50	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics where calculated using the 'Used' parameters.

Grade Line Summary:

Tailwater Elevation (ft): 7081.19

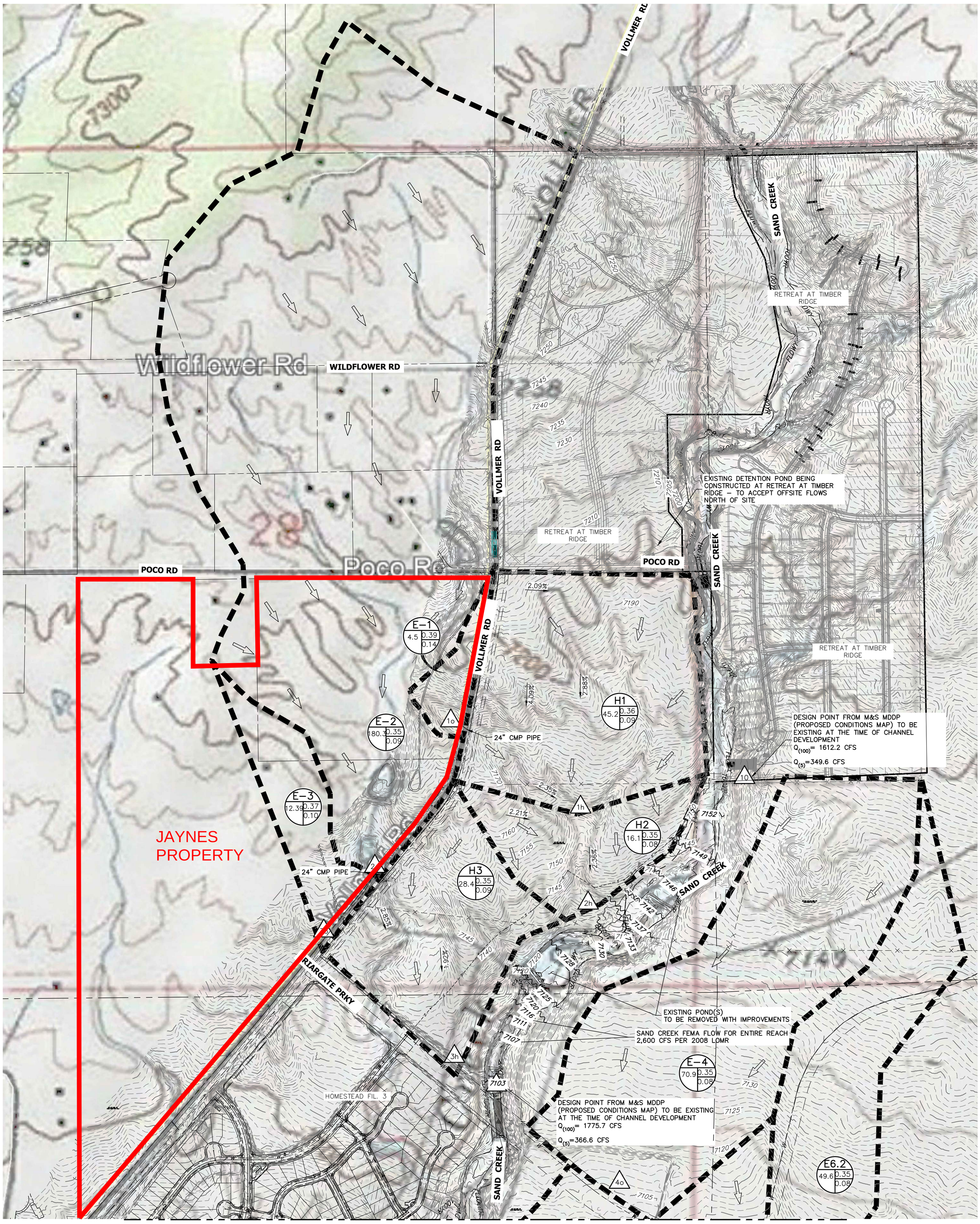
	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
Element Name	**Downstream (ft)**	**Upstream (ft)**	**Bend Loss (ft)**	**Lateral Loss (ft)**	**Downstream (ft)**	**Upstream (ft)**	**Downstream (ft)**	**Friction Loss (ft)**	**Upstream (ft)**
MH 1 SWR 1 - 1	7078.20	7078.31	0.00	0.00	7081.19	7082.61	7084.74	0.00	7084.74
MH 2 SWR 2 - 1	7078.81	7084.78	2.12	0.00	7084.74	7088.90	7086.86	4.16	7091.02
MH 3 SWR 3 - 1	7085.28	7086.50	2.12	0.00	7091.02	7091.78	7093.15	0.76	7093.90

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K * V_fi ^ 2/(2*g)
- Lateral loss = V_fo ^ 2/(2*g)- Junction Loss K * V_fi ^ 2/(2*g).
- Friction loss is always Upstream EGL - Downstream EGL.

REFERENCE MATERIAL

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

EXISTING DRAINAGE MAP
HOMESTEAD NORTH



SEE SHEET 2

BASIN SUMMARY TABLE

Tributary Sub-basin	Area (acres)	Percent Impervious	C_5	C_{100}	t_c (min)	Q_5 (cfs)	Q_{100} (cfs)
E-1	4.50	9%	0.14	0.39	48.7	1.1	5.2
E-2	180.30	3%	0.09	0.35	47.4	28.1	192.9
E-3	12.39	4%	0.10	0.37	46.9	2.2	13.7
E-4	70.90	2%	0.08	0.35	49.0	9.9	72.7
E-5	18.80	2%	0.08	0.35	34.9	3.4	24.9
E6.1	124.90	2%	0.08	0.35	48.1	17.7	130.0
E6.2	49.61	2%	0.08	0.35	44.2	7.5	55.4
H1	45.20	3%	0.09	0.36	34.7	8.9	61.0
H2	16.10	2%	0.08	0.35	25.1	3.5	26.0
H3	28.40	3%	0.09	0.35	31.3	5.9	40.8

DESIGN POINT	Q5 Total	Q100 Total
1h	8.0	52.4
2h	10.2	69.0
3h	32.5	223.2
1o	1.1	5.2
2o	28.1	192.9
3o	2.2	13.7
4o	9.9	72.7
5o	12.5	92.0
6.2o	7.5	55.4
6.1o	36.9	270.9

LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C –100 YR
D: C–5 YR

DESIGN POINT

EXISTING FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING

6100

300 150 0 300 600

ORIGINAL SCALE: 1" = 300'

EX DRAINAGE MAP
HOMESTEAD NORTH
JOB NO. 25188.00
1–4–2022
SHEET 1 OF 2

J·R ENGINEERING
A Westrian Company

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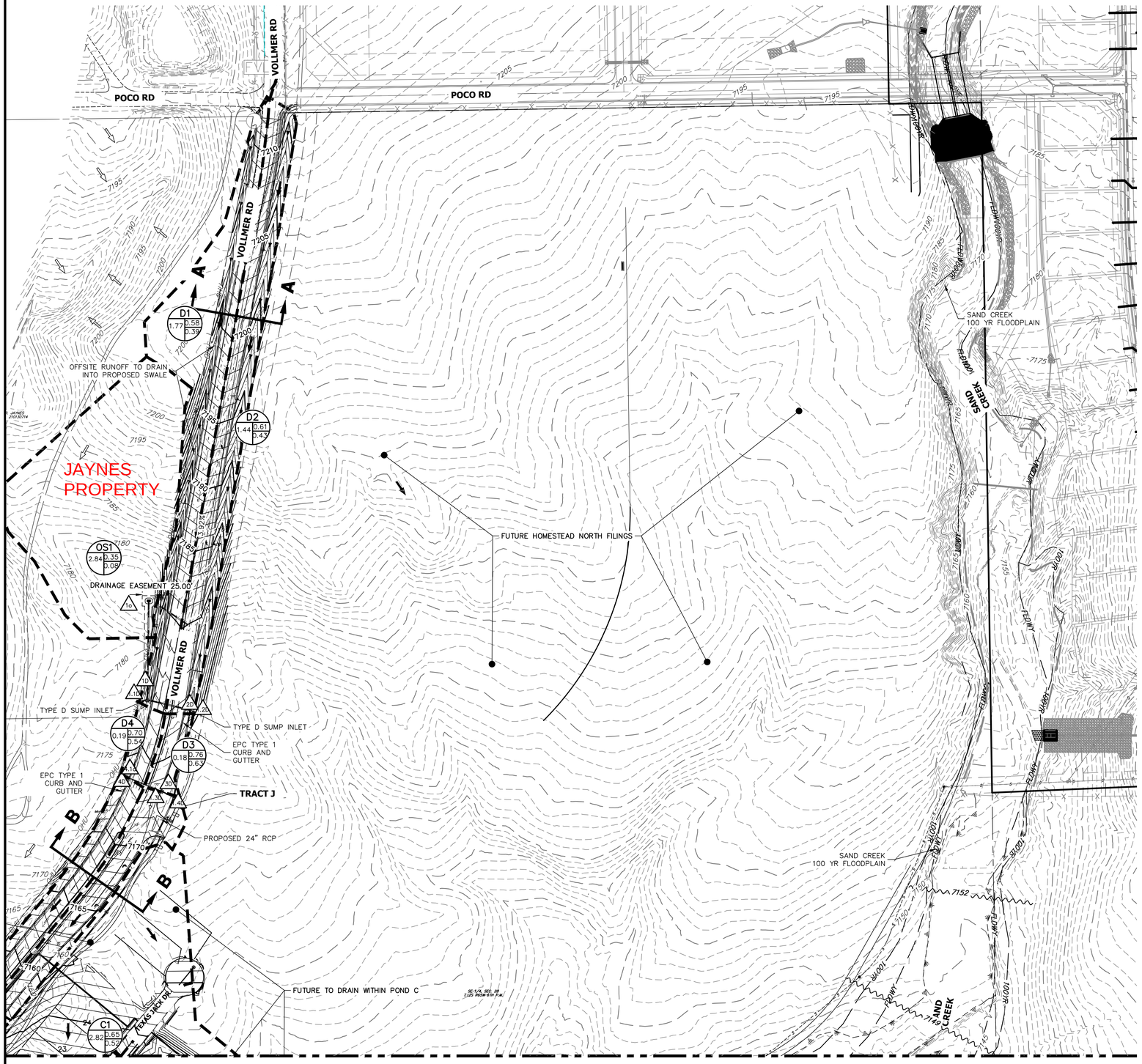
Fort Collins 970–491–9888 • www.jrengineering.com

DRAINAGE MAP



LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C –100 YR
D: C–5 YR

DESIGN POINT

PROPOSED FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

STORM SEWER PROPOSED

PROPOSED R.O.W

PROPOSED PROPERTY LINES

PROPOSED SIDEWALK

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING 6100

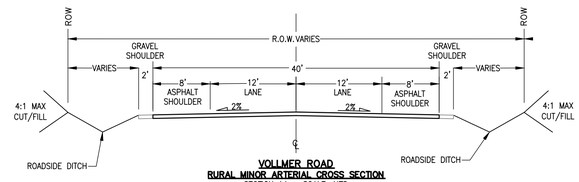
PROPOSED 6100

BASIN SUMMARY TABLE

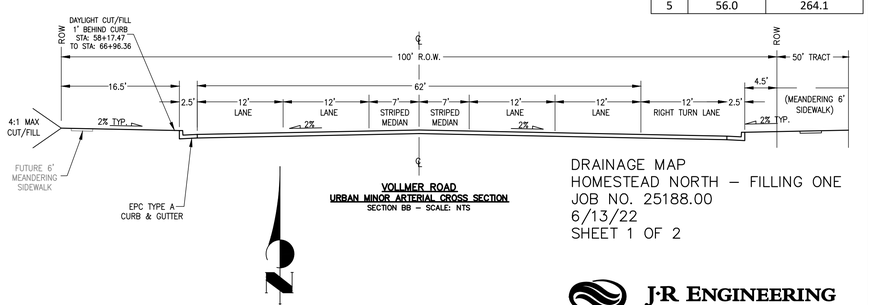
Tributary Sub-basin	Area (acres)	Percent Impervious	C5	C100	tc (min)	Q5 (cfs)	Q100 (cfs)
C1	2.82	69%	0.52	0.65	13.1	5.4	11.4
C2.1	0.20	91%	0.82	0.90	5.0	0.8	1.6
C2.2	4.69	73%	0.56	0.68	12.8	9.9	20.3
C2.3	0.83	67%	0.54	0.68	10.1	1.9	3.9
C3.1	0.35	73%	0.68	0.79	5.0	1.2	2.4
C3.2	1.46	71%	0.56	0.68	8.4	3.6	7.4
C4.1	6.34	65%	0.49	0.63	12.0	12.1	25.9
C4.2	3.59	57%	0.44	0.58	12.9	5.9	13.1
C5	0.16	81%	0.74	0.84	6.4	0.6	1.0
C6	2.59	20%	0.21	0.43	6.8	2.5	8.8
D1	1.77	40%	0.40	0.60	16.5	2.4	6.0
D2	1.44	56%	0.55	0.78	15.0	2.8	6.6
D3	0.18	68%	0.63	0.76	5.4	0.6	1.2
D4	0.19	57%	0.54	0.70	6.3	0.5	1.1
D5	0.91	77%	0.71	0.82	6.0	3.1	6.1
D6	0.83	69%	0.64	0.77	6.4	2.5	5.2
D7	0.75	79%	0.72	0.82	5.0	2.8	5.3
D8	0.72	69%	0.64	0.74	5.0	2.4	4.6
OS1	2.84	2%	0.08	0.35	14.5	0.8	6.0
OS2	179.61	2%	0.08	0.35	47.4	27.1	190.9
OS3	11.98	2%	0.08	0.35	47.6	1.7	12.6

DESIGN POINT SUMMARY TABLE

DP	Q5 Total	Q100 Total
1c	5.4	11.4
2.3c	7.1	14.9
2.3i	7.0	11.5
2.1c	0.8	1.6
2.1i	0.8	1.5
2.2C	9.8	20.1
4.2c	5.9	13.1
4.2i	5.9	10.5
4C	18.8	41.8
3.1	4.7	11.6
3.1c	1.2	2.4
3.1i	1.2	1.9
3.2	7.9	12.9
3.3	9.1	17.6
3.4	26.0	54.9
3.2c	3.6	7.8
5C	4.1	8.7
6C	2.5	8.8
3.5	30.7	65.0
o1	0.8	6.0
1d	2.4	6.0
1.1d	3.2	11.7
2d	2.8	6.6
1.2d	5.8	18.0
3d	0.6	1.2
4d	0.5	1.1
4.1d	0.5	1.1
1.3d	1.0	2.2
1.4d	6.6	19.6
2o	27.1	190.9
6d	2.1	4.3
6.1d	28.1	192.5
1.5d	29.2	195.0
5d	3.1	6.1
1.6d	32.7	205.4
1.7d	36.1	221.0
3o	1.7	12.6
8d	2.5	14.3
2.1d	2.5	13.2
7d	2.4	5.3
2.2d	3.5	16.0
1.7d	36.1	221.0
5	56.0	264.1



VOLLMER ROAD
RURAL MINOR ARTERIAL CROSS SECTION
SECTION AA – SCALE: NTS



VOLLMER ROAD
URBAN MINOR ARTERIAL CROSS SECTION
SECTION BB – SCALE: NTS

N

100 50 0 100 200

ORIGINAL SCALE: 1" = 100'

DRAINAGE MAP
HOMESTEAD NORTH – FILLING ONE
JOB NO. 25188.00
6/13/22
SHEET 1 OF 2

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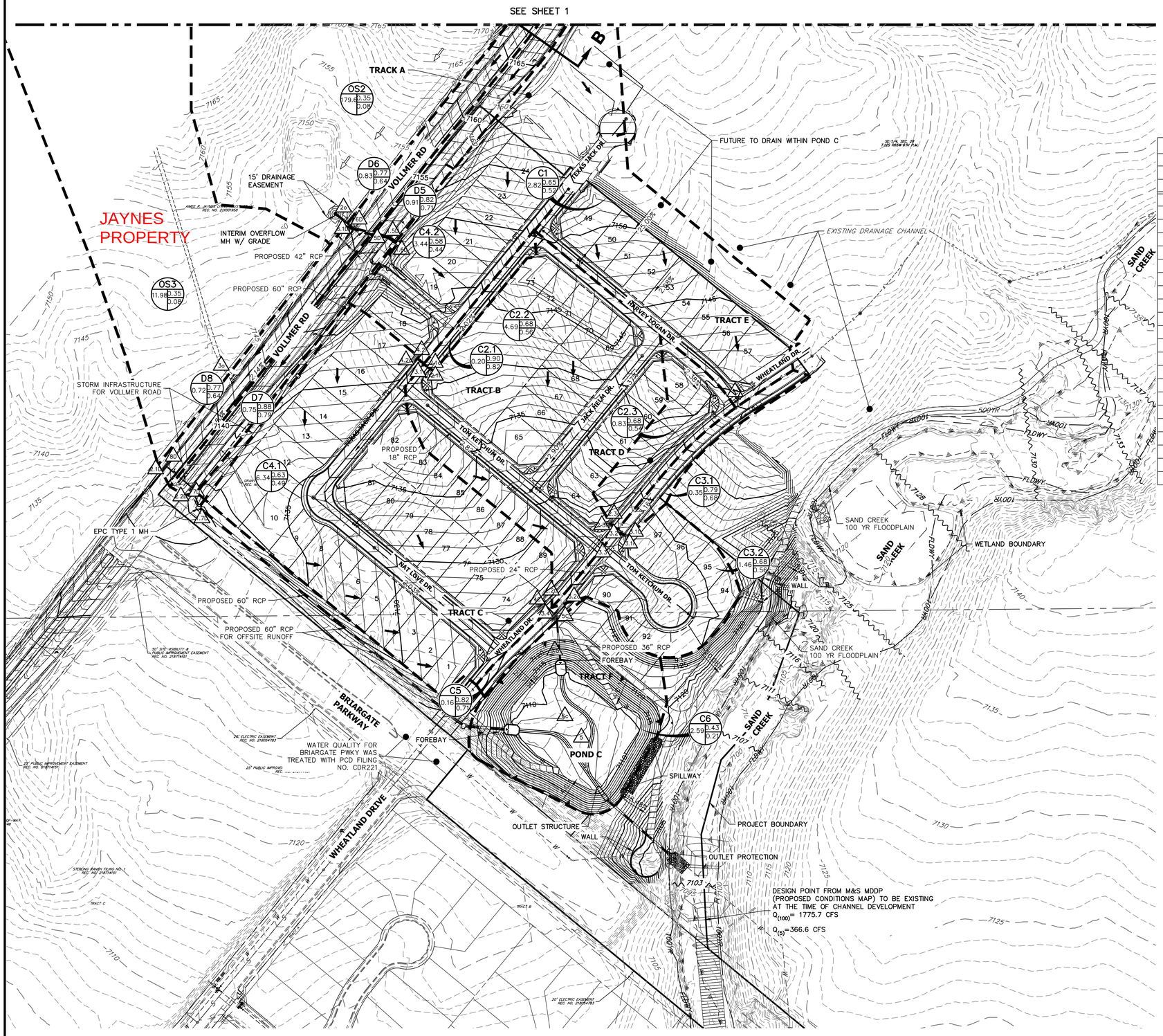
DRAINAGE MAP



LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C -100 YR
D: C-5 YR

DESIGN POINT

PROPOSED FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

STORM SEWER PROPOSED

PROPOSED R.O.W

PROPOSED PROPERTY LINES

PROPOSED SIDEWALK

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING 6100

PROPOSED 6100

BASIN SUMMARY TABLE

Tributary Sub-basin	Area (acres)	Percent Impervious	C5	C100	tc (min)	Q5 (cfs)	Q100 (cfs)
C1	2.82	69%	0.52	0.65	13.1	5.4	11.4
C2.1	0.20	91%	0.82	0.90	5.0	0.8	1.6
C2.2	4.69	73%	0.56	0.68	12.8	9.9	20.3
C2.3	0.83	67%	0.54	0.68	10.1	1.9	3.9
C3.1	0.35	73%	0.68	0.79	5.0	1.2	2.4
C3.2	1.46	71%	0.56	0.68	8.4	3.6	7.4
C4.1	6.34	65%	0.49	0.63	12.0	12.1	25.9
C4.2	3.59	57%	0.44	0.58	12.9	5.9	13.1
C5	0.16	81%	0.74	0.84	6.4	0.6	1.0
C6	2.59	20%	0.21	0.43	6.8	2.5	8.8
D1	1.77	40%	0.40	0.60	16.5	2.4	6.0
D2	1.44	56%	0.55	0.78	15.0	2.8	6.6
D3	0.18	68%	0.63	0.76	5.4	0.6	1.2
D4	0.19	57%	0.54	0.70	6.3	0.5	1.1
D5	0.91	77%	0.71	0.82	6.0	3.1	6.1
D6	0.83	69%	0.64	0.77	6.4	2.5	5.2
D7	0.75	79%	0.72	0.82	5.0	2.8	5.3
D8	0.72	69%	0.64	0.74	5.0	2.4	4.6
OS1	2.84	2%	0.08	0.35	14.5	0.8	6.0
OS2	179.61	2%	0.08	0.35	47.4	27.1	190.9
OS3	11.98	2%	0.08	0.35	47.6	1.7	12.6

Design Point	Inlet Size
Inlet DP 2.3C	15' Type R
Inlet DP 2.1C	5' Type R
Inlet DP 4.2C	15' Type R
Inlet DP 3.1C	5' Type R
Inlet DP 4C	15' Type R
Inlet DP 5C	15' Type R
Inlet DP 3D	5' Type R
Inlet DP 4D	5' Type R
Inlet DP 5D	10' Type R
Inlet DP 6D	10' Type R
Inlet DP 7D	10' Type R
Inlet DP 8D	20' Type R
Inlet DP 1D	Type D Inlet
Inlet DP 2D	Type D Inlet

DESIGN POINT SUMMARY TABLE

DP	Q5 Total	Q100 Total
1c	5.4	11.4
2.3c	7.1	14.9
2.3i	7.0	11.5
2.1c	0.8	1.6
2.1i	0.8	1.5
2.2C	9.8	20.1
4.2c	5.9	13.1
4.2i	5.9	10.5
4C	18.8	41.8
3.1	4.7	11.6
3.1c	1.2	2.4
3.1i	1.2	1.9
3.2	7.9	12.9
3.3	9.1	17.6
3.4	26.0	54.9
3.2c	3.6	7.8
5C	4.1	8.7
6C	2.5	8.8
3.5	30.7	65.0
o1	0.8	6.0
1d	2.4	6.0
1.1d	3.2	11.7
2d	2.8	6.6
1.2d	5.8	18.0
3d	0.6	1.2
4d	0.5	1.1
4.1d	0.5	1.1
1.3d	1.0	2.2
1.4d	6.6	19.6
2o	27.1	190.9
6d	2.1	4.3
6.1d	28.1	192.5
1.5d	29.2	195.0
5d	3.1	6.1
1.6d	32.7	205.4
1.7d	36.1	221.0
3o	1.7	12.6
8d	2.5	14.3
2.1d	2.5	13.2
7d	2.4	5.3
2.2d	3.5	16.0
1.7d	36.1	221.0
5	56.0	264.1

100 50 0 100 200
ORIGINAL SCALE: 1" = 100'

DRAINAGE MAP
HOMESTEAD NORTH FILLING NO. 1
JOB NO. 25188.00
6/13/22
SHEET 2 OF 2

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
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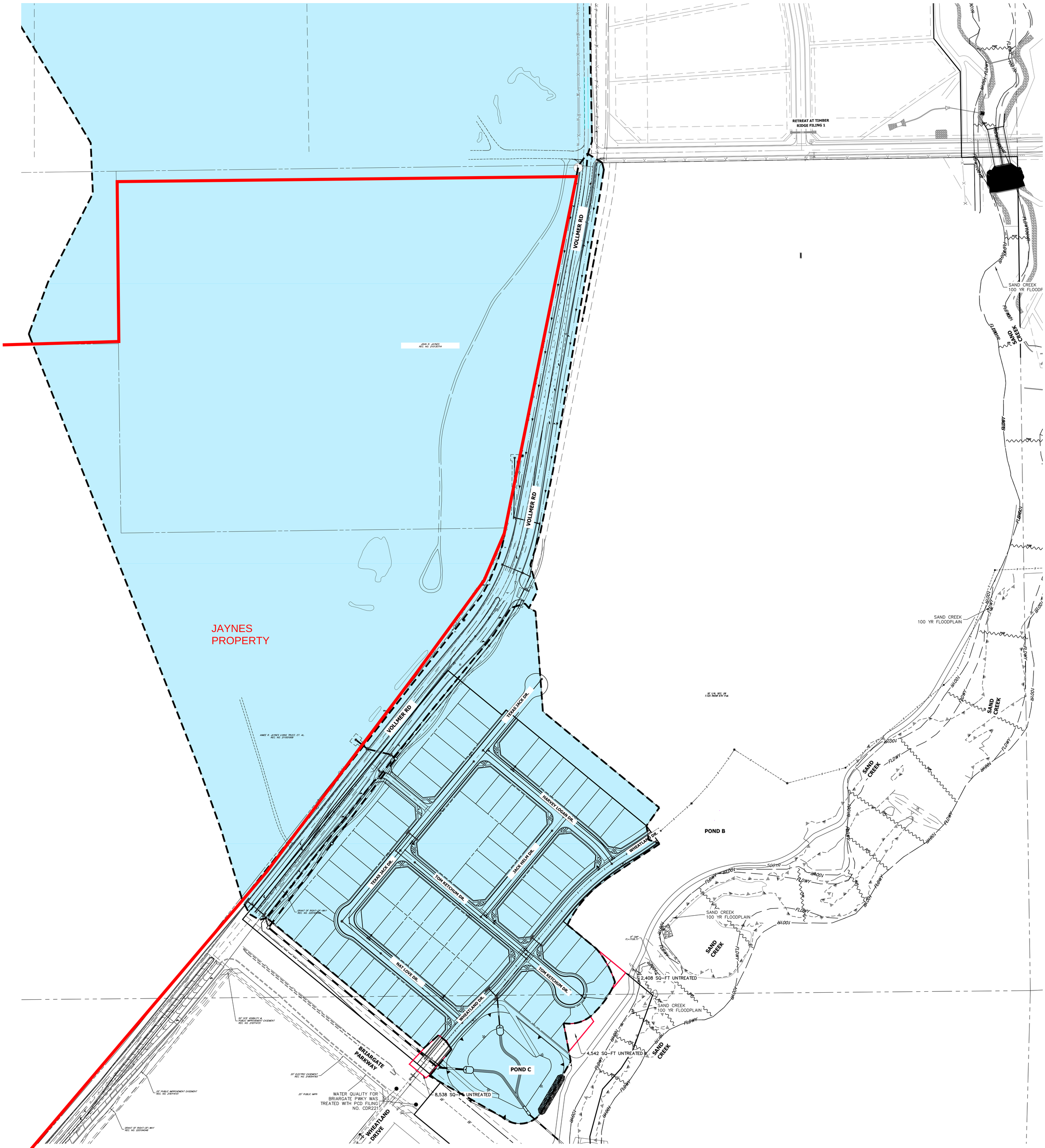
WATER QUALITY CAPTURE PLAN

HOMESTEAD NORTH



NOTE:

1. **A SEPARATE PLAN FOR STERLING RANCH ROAD AND BRIARGATE PKWY WILL BE PROVIDED IN A THE SEPARATE FDR REQUIRED FOR CONSTRUCTION OF THESE ROADWAYS.**
2. **A TOTAL OF 15,488 SQ-FT ON SITE IS LEFT UNTREATED.**
3. **POND C TREATS THE IMPROVEMENTS TO VOLLMER ROAD AND THE OFFSITE TRIBUTARY AREA**

POND C 224.3 ACRES, 10.3% IMPERVIOUS

N

100 50 0 100 200

ORIGINAL SCALE: 1" = 100'

WQ – POND C
HOMESTEAD NORTH – FILING ONE
JOB NO. 25188.00
06–13–2022
SHEET 1 OF 1

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COMPOSITE % IMPERVIOUS & COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Homestead North Fil. 1
Location: El Paso County

Project Name: Homestead North-Filing 1
Project No.: 25188.00
Calculated By: ARJ
Checked By:
Date: 6/15/22

Basin ID	Total Area (ac)	Streets/Paved (100% Impervious)				Residential (45%-65% Impervious)				Lawns (2% Impervious)				Basins Total Weighted C Values		Basins Total Weighted % Imp.
		C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	
C1	2.82	0.90	0.96	0.49	17.2%	0.45	0.59	2.25	51.7%	0.08	0.35	0.09	0.1%	0.52	0.65	69.0%
C2.1	0.20	0.90	0.96	0.18	90.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.02	0.2%	0.82	0.90	90.7%
C2.2	4.69	0.90	0.96	1.26	26.9%	0.45	0.59	3.33	46.1%	0.08	0.35	0.10	0.0%	0.56	0.68	73.0%
C2.3	0.83	0.90	0.96	0.28	34.1%	0.45	0.59	0.41	32.4%	0.08	0.35	0.13	0.3%	0.54	0.68	66.9%
C3.1	0.35	0.90	0.96	0.25	72.8%	0.45	0.59	0.00	0.0%	0.08	0.35	0.09	0.5%	0.68	0.79	73.3%
C3.2	1.66	0.90	0.96	0.42	25.1%	0.45	0.59	0.96	37.7%	0.08	0.35	0.28	0.3%	0.50	0.64	63.2%
C4.1	6.34	0.90	0.96	1.04	16.4%	0.45	0.59	4.76	48.8%	0.08	0.35	0.55	0.2%	0.49	0.63	65.5%
C4.2	3.59	0.90	0.96	0.59	16.4%	0.45	0.59	2.20	39.8%	0.08	0.35	0.65	0.4%	0.44	0.58	56.6%
C5	0.16	0.90	0.96	0.13	80.9%	0.45	0.59	0.00	0.0%	0.08	0.35	0.03	0.4%	0.74	0.84	81.3%
C6	2.59	0.90	0.96	0.27	10.6%	0.45	0.59	0.32	8.1%	0.08	0.35	1.89	1.5%	0.21	0.43	20.2%
36" Pipe w/ Forebay	23.23															61.3%
D1	1.77	0.90	0.96	0.69	38.8%	0.45	0.59	0.00	0.0%	0.08	0.35	1.14	1.3%	0.40	0.60	40.1%
D2	1.44	0.90	0.96	0.79	54.9%	0.45	0.59	0.00	0.0%	0.08	0.35	1.02	1.4%	0.55	0.78	56.4%
D3	0.18	0.90	0.96	0.12	67.0%	0.45	0.59	0.00	0.0%	0.08	0.35	0.06	0.7%	0.63	0.76	67.6%
D4	0.19	0.90	0.96	0.11	56.6%	0.45	0.59	0.00	0.0%	0.08	0.35	0.08	0.9%	0.54	0.70	57.5%
D5	0.91	0.90	0.96	0.70	76.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.21	0.5%	0.71	0.82	77.0%
D6	0.83	0.90	0.96	0.57	68.4%	0.45	0.59	0.00	0.0%	0.08	0.35	0.26	0.6%	0.64	0.77	69.0%
D7	0.75	0.90	0.96	0.59	78.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.14	0.4%	0.72	0.82	78.9%
D8	0.72	0.90	0.96	0.49	68.8%	0.45	0.59	0.00	0.0%	0.08	0.35	0.17	0.5%	0.64	0.74	69.3%
OffSite Basins																
OS1	2.84	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.08	0.35	2.85	2.0%	0.08	0.35	2.0%
OS2	179.61	0.90	0.96	0.91	0.5%	0.45	0.59	0.00	0.0%	0.08	0.35	178.71	2.0%	0.08	0.35	2.5%
OS3	11.98	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.08	0.35	11.99	2.0%	0.08	0.35	2.0%
60" Pipe w/ Forebay	201.22															4.4%
Pond C	224.4															10.3%

point 5C, a 15' type R sump inlet. Basin C5 collects runoff from basin C3.2 and C5. The runoff from basin C ultimately outfalls into pond C. In the event the inlet clogs at Basin C5 the runoff will overflow to pond C. A berm has been graded to ensure that the overflow path will go into pond C.

Basin C6 2.59 acres and 20% percent impervious, is comprised of pond C and some single-family residential area. Runoff (Q_5=2.5 cfs, Q_{100}=8.8 cfs) generated in Basin B11 sheet flows into Pond C where it is treated for water-quality and is detained up until the 100 year-event. The MHFD Detention sheet for pond C is shown in Appendix C of this report.

Pond C has a tributary area of 224.3 acres and is 10.3 % impervious. Pond C has been graded in to fit the design volume, as shown in Appendix C of this report. This pond will be built in phase 1 of Homestead North at Sterling Ranch. The Pond C overflow emergency spillway will overflow into Sand Creek. The WQCV, 5 year and 100 year volumes, releases rates and stages for pond C are shown in Table 2.3 below. These results correspond to the Routed Hydrograph results, as shown in Appendix C of this report.

	TABLE 2.3 Pond C		
	Stage –ft	Volume (Acres)	Release Rate (cfs)
WQCV	3.32	1.288	0.7
5 Year	6.22	4.310	20.6
100 Year	9.94	9.263	173.8

The following basins are tributary to the adjacent portion of Vollmer Road being designed by JR Engineering. Runoff will be detained within pond C and the runoff will then be released into Sand Creek adjacent to the crossing of Briargate road and Sand Creek.

Basin D1 has a tributary area of 1.77 acres and is 40.1% impervious. Basin D1 consists of the northwest portion of Vollmer road (Rural Cross Section). Runoff from basin D1 (Q_5=2.4 cfs, Q_{100}=6.0 cfs) drains to an adjacent roadside swale and drains into a type C inlet at design point 1D runoff is then piped at design point 1.1D in confluence with upstream runoff from the inlet collect at design point 1o. From here on the runoff is piped with upstream runoff from basin OS1 into the Vollmer storm sewer system.

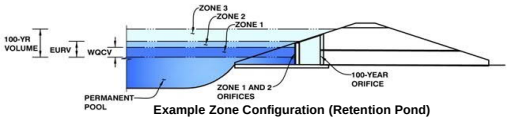
Basin D2 has a tributary area of 1.44 acres and is 56.4% impervious. Basin D2 consists of the northeast portion of Vollmer road (Rural Cross Section). Runoff from basin D2 (Q_5=2.8 cfs, Q_{100}=6.6 cfs) drains to an adjacent roadside swale and drains into a type C inlet at design point 2D. From here

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: Pond C with offsite flow

Basin ID:



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	224.3	acres
Watershed Length =	5,645	ft
Watershed Length to Centroid =	3,387	ft
Watershed Slope =	0.034	ft/ft
Watershed Imperviousness =	10.30%	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) =	1.285	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	2.177	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	3.053	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	6.690	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	10.314	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	16.752	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	21.154	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	27.479	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 4 in.) =	55.481	acre-feet	4.00	inches
Approximate 2-yr Detention Volume =	1.394	acre-feet		
Approximate 5-yr Detention Volume =	2.181	acre-feet		
Approximate 10-yr Detention Volume =	4.470	acre-feet		
Approximate 25-yr Detention Volume =	6.213	acre-feet		
Approximate 50-yr Detention Volume =	6.504	acre-feet		
Approximate 100-yr Detention Volume =	8.393	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.285	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.892	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	6.216	acre-feet
Total Detention Basin Volume =	8.393	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 = 1.00 ft

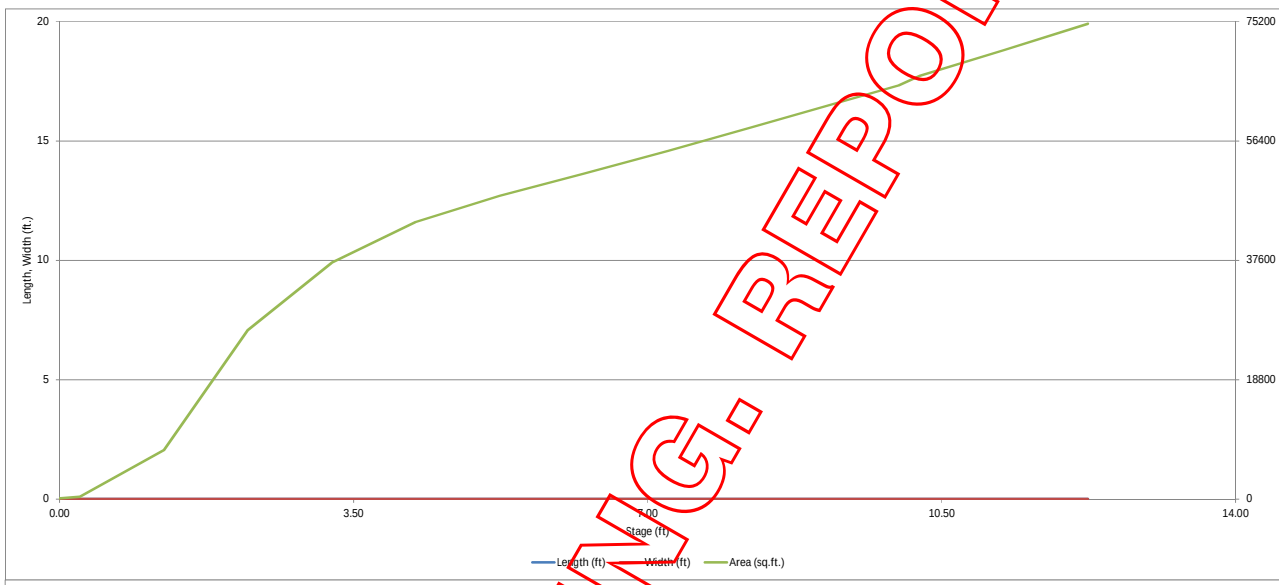
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	90	0.002		
7107	--	0.24	--	--	--	331	0.008	51	0.001
7108	--	1.24	--	--	--	7,689	0.177	4,061	0.093
7109	--	2.24	--	--	--	26,604	0.611	21,207	0.487
7110	--	3.24	--	--	--	37,234	0.855	53,126	1.220
7111	--	4.24	--	--	--	43,658	1.002	93,573	2.148
7112	--	5.24	--	--	--	47,762	1.096	139,282	3.197
7113	--	6.24	--	--	--	51,250	1.177	188,788	4.334
7114	--	7.24	--	--	--	54,827	1.259	241,827	5.552
7115	--	8.24	--	--	--	58,544	1.344	298,513	6.853
7116	--	9.24	--	--	--	62,316	1.431	358,943	8.240
7116.75* Spillway	--	9.99	--	--	--	65,152	1.496	406,744	9.338
7117	--	10.24	--	--	--	66,643	1.530	423,218	9.716
7118	--	11.24	--	--	--	70,696	1.623	491,888	11.292
7119	--	12.24	--	--	--	74,859	1.719	564,665	12.963

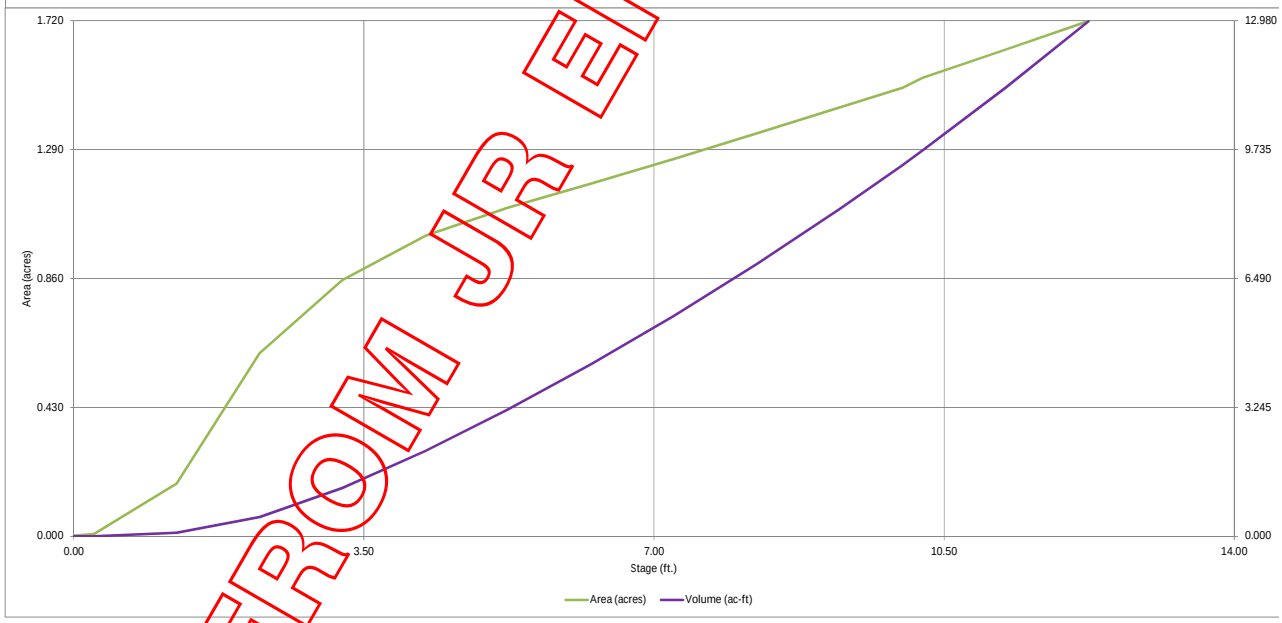
FROM JR ENG REPORT

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

FROM JR ENG. REPORT



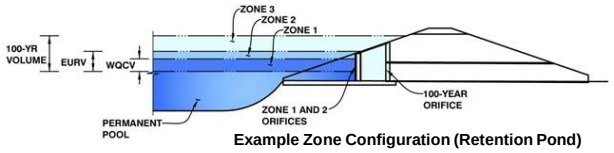


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: Pond C with offsite flow

Basin ID:



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.32	1.285	Orifice Plate
Zone 2 (EURV)	4.27	0.892	Orifice Plate
Zone 3 (100-year)	9.35	6.216	Weir&Pipe (Restrict)
Total (all zones)		8.393	

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

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

Calculated Parameters for Underdrain

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

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	3.257E-02	ft²
Depth at top of Zone using Orifice Plate =	4.27	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 =	4.69	sq. inches (use rectangular openings)	Elliptical Slot Area =	N/A	ft²

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.25	2.50					
Orifice Area (sq. inches)	4.69	4.69	4.69					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orif

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected
Overflow Weir Front Edge Height, Ho =	4.36	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	7.47	N/A
Overflow Weir Front Edge Length =	7.00	N/A	feet	Overflow Weir Slope Length =	12.80	N/A
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	5.64	N/A
Horiz. Length of Weir Sides =	12.42	N/A	feet	Overflow Grate Open Area w/o Debris =	70.89	N/A
Overflow Grate Type =	Close Mesh Grate	N/A		Overflow Grate Open Area w/ Debris =	17.72	N/A
Debris Clogging % =	75%	N/A	%			

Calculated Parameters for Overflow W

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected
Depth to Invert of Outlet Pipe =	6.29	0.00	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	12.57	
Outlet Pipe Diameter =	48.00		inches	Outlet Orifice Centroid =	2.00	
Restrictor Plate Height Above Pipe Invert =	48.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	3.14	

Calculated Parameters for Outlet Pipe w/ Flow Restriction Pla

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	9.99	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.74	feet
Spillway Crest Length =	123.00	feet	Stage at Top of Freeboard =	11.73	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	1.67	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	12.10	acre-ft

Calculated Parameters for Spillway

Routed Hydrograph Results *The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AI*

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52
CUHP Runoff Volume (acre-ft) =	1.285	2.177	3.053	6.690	10.314	16.752	21.154	27.479
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	3.053	6.690	10.314	16.752	21.154	27.479
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	17.6	49.5	77.1	142.3	179.0	229.8
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A						
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.22	0.34	0.63	0.80	1.02
Peak Inflow Q (cfs) =	N/A	N/A	29.2	62.9	90.7	154.6	191.5	243.2
Peak Outflow Q (cfs) =	0.7	0.8	2.3	20.6	43.8	91.5	124.0	173.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.6	0.6	0.7	0.8
Structure Controlling Flow =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	0.02	0.3	0.6	1.3	1.7	2.4
Max Velocity through Grate 2 (fps) =	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	50	58	55	51	45	41	37
Time to Drain 99% of Inflow Volume (hours) =	40	54	62	62	60	57	55	53
Maximum Ponding Depth (ft) =	3.32	4.27	4.80	6.22	7.11	8.35	9.02	9.94
Area at Maximum Ponding Depth (acres) =	0.87	1.01	1.06	1.17	1.25	1.35	1.41	1.49
Maximum Volume Stored (acre-ft) =	1.288	2.178	2.724	4.310	5.376	7.001	7.928	9.263

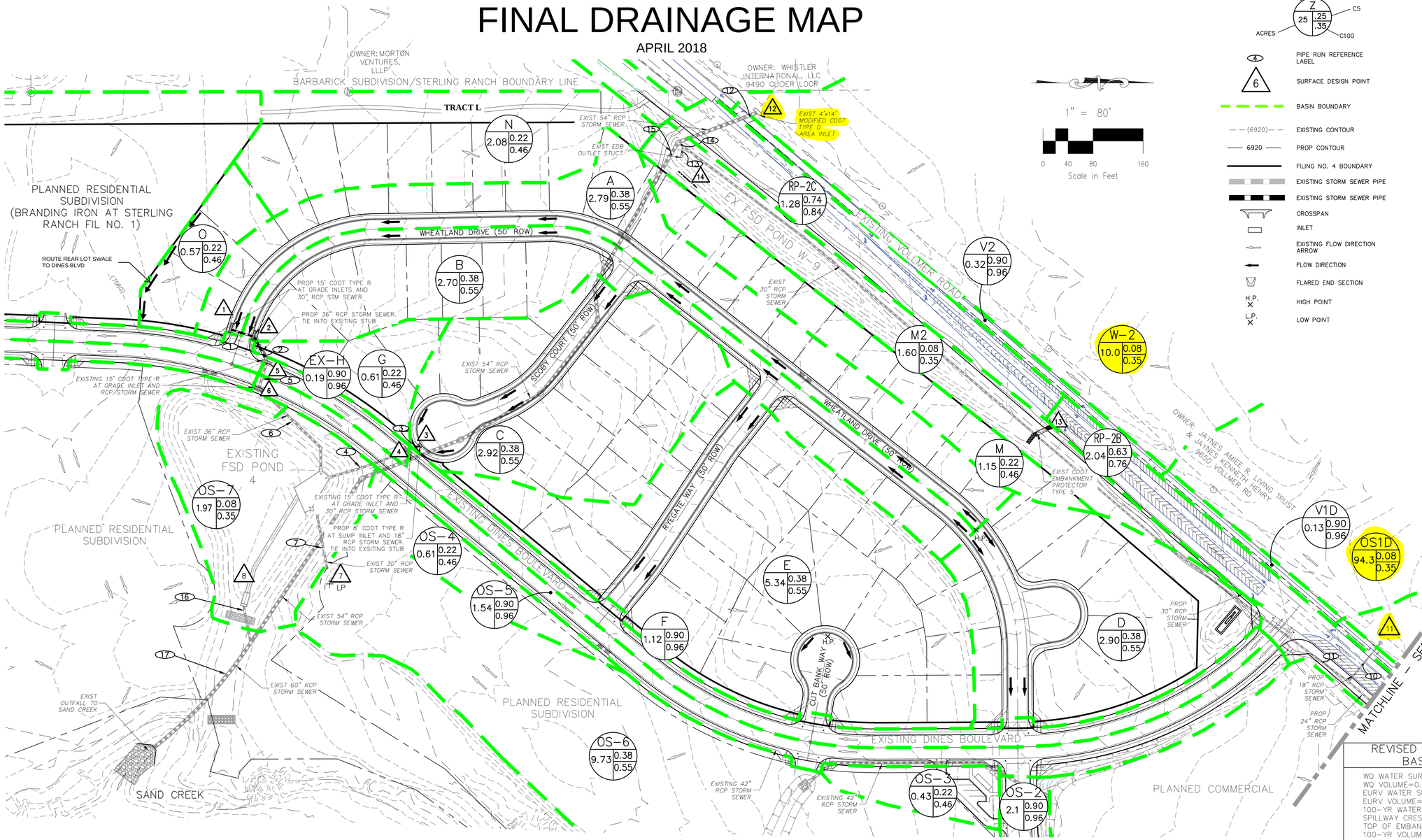
REVIEW ENG. REPORT

HOMESTEAD AT STERLING RANCH FILING NO. 1

COUNTY OF EL PASO, STATE OF COLORADO

FINAL DRAINAGE MAP

APRIL 2018



LEGEND

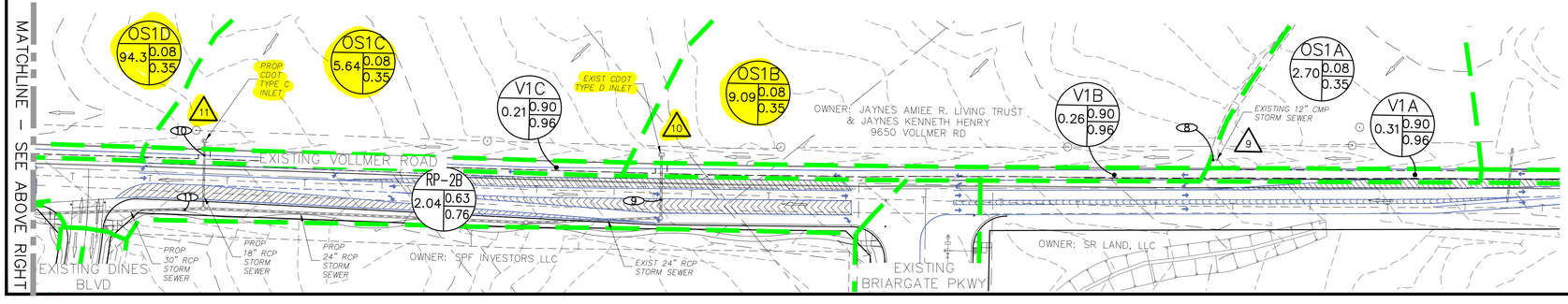
- BASIN DESIGNATION (Z / 25 / .25 / .35 / C5 / C100 / ACRES)
- 4 — PIPE RUN REFERENCE LABEL
- 6 — SURFACE DESIGN POINT
- BASIN BOUNDARY
- (6920) — EXISTING CONTOUR
- 6920 — PROP CONTOUR
- FILING NO. 4 BOUNDARY
- EXISTING STORM SEWER PIPE
- EXISTING STORM SEWER PIPE
- CROSSPAN
- INLET
- EXISTING FLOW DIRECTION ARROW
- FLOW DIRECTION
- FLARED END SECTION
- H.P. — HIGH POINT
- L.P. — LOW POINT

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
OS2	2.10	8.9	15.9
OS3	0.43	0.4	1.3
OS4	0.61	0.5	1.9
OS5	1.54	5.6	10.0
OS6	9.73	12.5	30.4
OS7	1.97	0.7	5.3
A	2.79	3.6	8.7
B	2.70	3.6	8.6
C	2.92	4.2	10.1
D	2.90	4.3	10.4
E	5.34	8.2	19.9
F	1.12	4.3	7.7
G	0.61	0.5	1.9
EX–H	0.19	0.9	1.6
M	1.15	1.0	3.6
M2	1.60	0.4	3.2
N	2.08	1.6	5.7
O	0.57	0.5	1.8
W–2	10.00	2.7	19.7
OS1 HISTORIC	111.70	18.9	136.8
SUB–BASIN OS1A	2.70	0.7	5.3
SUB–BASIN OS1B	9.09	2.4	17.8
SUB–BASIN OS1C	5.64	1.5	11.1
SUB–BASIN OS1D	94.3	16.3	119.5
V1A	0.31	1.4	2.6
V1B	0.26	1.2	2.2
V1C	0.21	1.0	1.7
V1D	0.13	0.6	1.1
V2	0.32	1.5	2.7
RP–2B	2.04	4.9	9.9
RP–2C	1.28	4.3	8.2

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	3.6	8.7	A	15' AT–GRADE INLET
2	3.6	8.6	B	15' AT–GRADE INLET
3	4.2	10.1	C	8' SUMP INLET
4	16.1	36.7	D, E, F	15' AT–GRADE INLET
5	4.2	19.7	G, EX–H, FLOWBY DP4	EX 15' AT–GRADE INLET
6	14.1	26.7	OS2, OS3, OS4, OS5	EX 15' AT–GRADE INLET
7	12.6	30.5	OS6	EX 18' RCP
8	49.2	105.3	OS7, PR4, PR6, PR7	EX FDS POND 4
9	1.6	7.0	OS1A, V1A	EX 12" CMP CULVERT
10	4.8	26.3	OS1B, V1B, DP6	EX 2.9'x5.7' CDOT TYPE D INLET
11	2.2	12.3	OS1C, V1C,	EX 2.9'x2.9' CDOT TYPE C INLET
12	18.9	133.7	OS1D, V1D, W–2, V2	EX 4'x14' MOD CDOT TYPE D INLET
13	2.8	5.6	RP–2B	EX CDOT EMBANKMENT PROTECTOR TYPE 5
14	8.9	21.2	M, M2, RP2C, DP13	EX FSD POND W–9

STORM SEWER SUMMARY				
PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DP'S
1	3.6	8.7	30" RCP	DP1
2	7.1	17.2	36" RCP	DP2, PR1
3	4.2	10.1	18" RCP	DP3
4	16.8	29.4	30" RCP	DP4, PR3
5	10.8	30.0	36" RCP	DP5, PR2
6	21.0	44.6	36" RCP	DP6, PR5
7	12.6	30.5	24" RCP	DP7
8	1.6	7.0	12" CMP	DP9
9	4.8	26.3	24" RCP	DP10
10	2.2	12.3	18" RCP	DP11
11	7.0	38.6	30" RCP	PR5, PR6
12	18.9	133.7	54" RCP	DP12
13	0.6	8.7	18" RCP	OUTFLOW EDB POND W–9
14	7.6	47.2	30" RCP	PR7, PR9
15	23.8	164.1	54" RCP	PR8, PR10
16	2.7	36.2	30" RCP	OUTFLOW EDB POND 4
17	26.5	200.3	60" RCP	PR11, PR12

REVISED POND 4 FSD BASIN DATA	REVISED POND W–9 FSD BASIN DATA
WQ WATER SURFACE EL = 7056.39	WQ WATER SURFACE EL = 7086.59
WQ VOLUME=0.046 AC–FT	WQ VOLUME=0.092 AC–FT
EURV WATER SURFACE EL = 7058.46	EURV WATER SURFACE EL = 7087.99
EURV VOLUME=1.510 AC–FT	EURV VOLUME=0.390 AC–FT
100–YR WATER SURFACE EL=7059.98	100–YR WATER SURFACE EL=7088.84
SPILLWAY CREST EL=7060.0	SPILLWAY CREST EL=7088.84
TOP OF EMBANKMENT EL=7063.0	TOP OF EMBANKMENT EL=7090.5
100–YR VOLUME=2.915 AC–FT	100–YR VOLUME=0.638 AC–FT
100–YR INFLOW = 105.3 CFS	100–YR INFLOW = 21.2 CFS
100–YR RELEASE = 36.8 CFS	100–YR RELEASE = 8.7 CFS



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HOMESTEAD AT STERLING RANCH FIL NO. 1

FINAL DRAINAGE MAP

PROJECT NO. 09–005

DESIGNED BY: CMN
DRAWN BY: CMN
CHECKED BY: VAS

SCALE: HORIZONTAL: 1"=80' VERTICAL: N/A

DATE: 4/12/2018

SHEET 1 OF 1

FDM01

File: C:\Users\emoffett\VpsData\Local\Temp\Proposed Drainage Map_1_1_5096.dwg Plotstamp: 4/24/2018 10:06 AM

DRAINAGE MAPS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

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Scale in Feet

LEGEND

BASIN ID – SC3–77

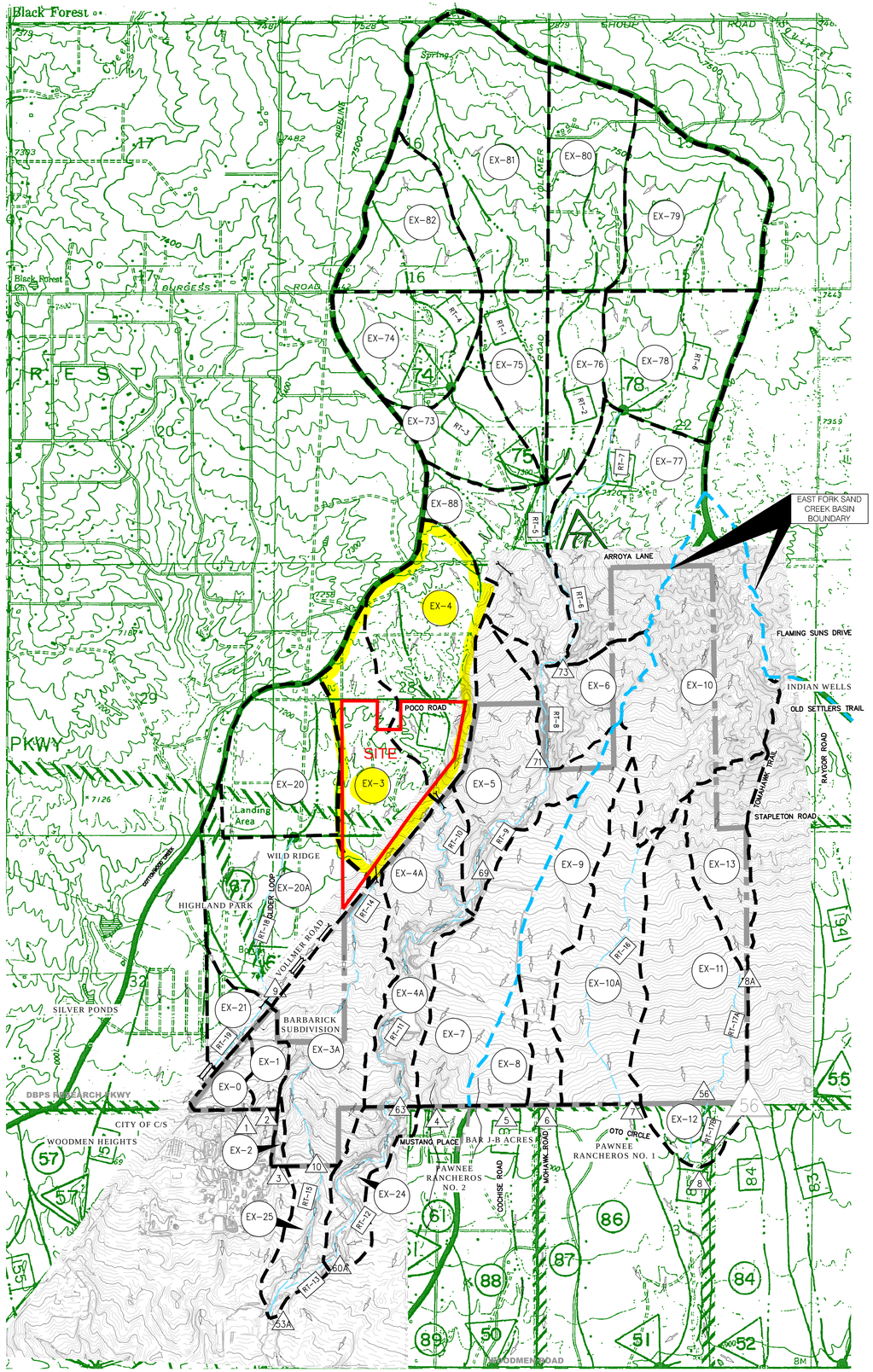
DESIGN POINT – 87

REACH IDENTIFIER – RT–17A

BASIN BOUNDARY –

EAST FORK SAND CREEK BASIN BOUNDARY –

FLOW DIRECTION –



BASIN SUMMARY

BASIN	CN	AREA (ACRES)	AREA (SQ MI)	Q_2 (CFS)	Q_5 (CFS)	Q_{10} (CFS)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
EX–0	62	23.8	0.037	5.0	8.2	13.0	19.6	25.7	32.2
EX–1	62	25.7	0.040	4.8	7.9	12.4	18.7	24.5	30.9
EX–2	62	5.5	0.009	1.1	1.8	2.8	4.3	5.6	7.1
EX–3	62	136.8	0.214	22.0	36.4	57.6	86.9	114.0	143.1
EX–3A	61	188.1	0.294	28.3	47.4	75.7	115.1	152.2	192.6
EX–4	62	192.0	0.300	30.1	49.9	79.1	119.5	157.0	197.3
EX–4A	62	151.5	0.237	24.7	40.8	64.4	97.0	127.2	160.1
EX–5	62	153.9	0.240	24.2	40.0	63.4	95.9	125.9	158.2
EX–6	62	90.2	0.141	15.3	25.5	40.1	60.7	79.9	100.5
EX–7	56	165.0	0.258	11.6	21.5	37.5	60.9	83.1	107.4
EX–8	45	42.0	0.066	0.5	1.7	4.5	9.4	14.5	20.5
EX–9	54	131.9	0.206	12.2	23.9	43.1	70.9	97.0	125.2
EX–10	60	270.7	0.423	32.7	56.0	91.1	140.1	185.9	236.1
EX–10A	41	179.3	0.280	0.6	2.2	7.3	17.4	29.1	43.1
EX–11	43	209.3	0.327	18.0	29.8	47.7	73.4	98.3	126.1
EX–12	51	39.5	0.062	2.2	5.1	10.1	17.7	25.1	33.3
EX–13	55	89.3	0.139	7.7	15.2	27.1	44.2	60.5	78.4
EX–20	62	143.4	0.224	25.4	42.1	66.7	100.7	132.3	166.2
EX–20A	64	179.7	0.281	32.2	51.9	80.5	119.8	155.9	194.6
EX–21	65	33.3	0.052	8.6	13.5	20.7	30.5	39.4	49.0
EX–24	59	63.1	0.099	9.5	16.6	27.5	42.9	57.4	73.0
EX–25	43	54.4	0.085	0.3	1.5	4.8	10.7	17.2	25.1
EX–73	63	90.0	0.141	16.4	26.4	41.3	62.1	81.3	102.0
EX–74	63	119.7	0.187	22.3	36.5	57.3	85.9	112.3	140.7
EX–75	63	79.3	0.124	13.1	21.5	33.7	50.5	66.1	82.8
EX–76	63	86.4	0.135	14.2	23.1	36.4	54.6	71.4	89.6
EX–77	62	230.6	0.360	34.7	56.9	90.6	137.5	180.9	227.7
EX–78	63	155.6	0.243	28.1	45.3	70.6	106.2	139.1	174.5
EX–79	63	189.0	0.295	34.9	57.0	89.5	134.3	175.6	220.1
EX–80	63	147.7	0.231	27.3	44.3	69.6	104.5	136.8	171.4
EX–81	62	262.9	0.411	42.6	70.2	111.0	167.4	219.6	275.7
EX–82	62	117.8	0.184	20.0	33.2	52.8	80.0	105.1	132.3
EX–88	62	139.2	0.217	22.2	36.7	58.0	87.6	115.0	144.4

DESIGN POINT SUMMARY (PEAK FLOW)

DESIGN POINT	AREA (SQ MI)	Q_2 (CFS)	Q_5 (CFS)	Q_{10} (CFS)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)	LOCATION
DP–74	0.371	39.3	65.3	104.8	158.9	209.1	262.8	
DP–75	1.413	141.2	235.1	376.6	566.6	750.9	950.5	
DP–78	0.538	59.7	98.4	154.0	232.6	306.2	385.3	
DP–73	2.528	225.9	380.7	618.0	957.0	1260.4	1582.3	
DP–71	2.669	229.3	388.9	629.7	978.8	1277.3	1637.9	STERLING RANCH NORTHERN BNDRY
DP–69	3.209	253.0	434.8	707.7	1100.0	1453.3	1870.4	
DP–63	3.446	251.4	430.7	713.1	1113.2	1496.2	1911.5	STERLING RANCH SOUTHERN BNDRY
DP–10	0.508	36.5	56.0	106.4	162.9	220.6	287.2	COLORADO SPRINGS/EL PASO BNDRY
DP–9A	0.557	55.3	94.3	150.3	227.7	299.5	380.5	VOLLMER/TAHITI DRIVE
DP–9	0.505	52.8	88.8	142.1	214.2	281.0	351.4	VOLLMER/LOCHWINNOCH LN
DP–8A	0.139	7.7	15.2	27.1	44.2	60.5	78.4	D/S STERLING RANCH EASTERN BNDRY
DP–8	0.528	24.2	45.1	77.8	124.4	169.5	220.9	D/S STERLING RANCH SOUTHERN BNDRY
DP–7	0.703	32.4	57.1	97.3	156.1	213.8	277.9	STERLING RANCH SOUTHERN BNDRY
DP–6	0.206	12.2	23.9	43.1	70.9	97.0	125.2	STERLING RANCH SOUTHERN BNDRY
DP–5	0.066	0.5	1.7	4.5	9.4	14.5	20.5	STERLING RANCH SOUTHERN BNDRY
DP–4	0.258	11.6	21.5	37.5	60.9	83.1	107.4	STERLING RANCH SOUTHERN BNDRY
DP–3	0.009	1.1	1.8	2.8	4.3	5.6	7.1	STERLING RANCH SOUTHERN BNDRY
DP–2	0.040	4.8	7.9	12.4	18.7	24.5	30.9	STERLING RANCH SOUTHERN BNDRY
DP–1	0.037	5.0	8.2	13.0	19.6	25.7	32.2	STERLING RANCH SOUTHERN BNDRY
DP–60A	3.545	247.7	430.2	707.1	1113.0	1496.6	1913.5	FUTURE MARKSHEFFEL X–ING
DP–56	0.466	23.2	42.5	71.9	115.6	157.4	202.9	STERLING RANCH SOUTHERN BNDRY
DP–53A	4.138	262.1	454.0	763.2	1196.5	1609.8	2061.5	SAND CREEK AND POND 3

DESIGN POINT SUMMARY (VOLUME)

DESIGN POINT	AREA (SQ MI)	V_2 (AC–FT)	V_5 (AC–FT)	V_{10} (AC–FT)	V_{25} (AC–FT)	V_{50} (AC–FT)	V_{100} (AC–FT)	LOCATION
DP–74	0.371	5.9	9.0	13.6	19.8	25.5	31.6	
DP–75	1.413	22.7	34.5	51.7	75.4	97.1	120.5	
DP–78	0.538	8.9	13.5	20.1	29.3	37.7	46.7	
DP–73	2.528	40.4	61.5	92.1	134.3	173.1	214.9	
DP–71	2.669	42.5	64.9	97.1	141.6	182.5	226.6	STERLING RANCH NORTHERN BNDRY
DP–69	3.209	50.7	77.4	116.1	169.4	218.6	271.4	
DP–63	3.446	54.1	82.5	123.8	180.8	233.3	289.9	STERLING RANCH SOUTHERN BNDRY
DP–10	0.508	7.6	11.7	17.6	25.8	33.4	41.6	COLORADO SPRINGS/EL PASO BNDRY
DP–9A	0.557	9.3	14.1	21.1	30.7	39.4	48.8	VOLLMER/TAHITI DRIVE
DP–9	0.505	8.4	12.7	19.0	27.6	35.5	44.0	VOLLMER/LOCHWINNOCH LN
DP–8A	0.139	1.3	2.1	3.4	5.2	7.0	8.9	D/S STERLING RANCH EASTERN BNDRY
DP–8	0.528	4.4	7.0	11.1	16.8	22.3	28.4	D/S STERLING RANCH SOUTHERN BNDRY
DP–7	0.703	6.1	10.0	15.9	24.3	32.4	41.3	STERLING RANCH SOUTHERN BNDRY
DP–6	0.206	2.4	4.0	6.3	9.6	12.7	16.0	STERLING RANCH SOUTHERN BNDRY
DP–5	0.066	0.2	0.4	0.8	1.4	1.9	2.6	STERLING RANCH SOUTHERN BNDRY
DP–4	0.258	2.6	4.2	6.7	10.2	13.5	17.2	STERLING RANCH SOUTHERN BNDRY
DP–3	0.009	0.1	0.2	0.3	0.5	0.6	0.8	STERLING RANCH SOUTHERN BNDRY
DP–2	0.040	0.6	0.9	1.4	2.1	2.7	3.4	STERLING RANCH SOUTHERN BNDRY
DP–1	0.037	0.6	0.9	1.3	1.9	2.5	3.1	STERLING RANCH SOUTHERN BNDRY
DP–60A	3.545	55.3	84.4	126.4	184.8	238.5	296.6	FUTURE MARKSHEFFEL X–ING
DP–56	0.466	4.0	6.3	9.9	14.9	19.8	25.1	SAND CREEK AND POND 3
DP–53A	4.138	63.0	96.4	144.7	211.8	273.9	340.9	SAND CREEK AND POND 3

EFSC DBPS DESIGN POINT SUMMARY (PEAK FLOW)

DBPS DESIGN POINT	AREA (SQ MI)	Q_{10} (CFS)	Q_{100} (CFS)
DP–50	0.32	47.0	195.7
DP–51 (BASIN 86)	0.33	17.7	74.1
DP–52	1.67	80.5	456.5
DP–56	0.79	63.6	265.0

Values reported from SCDBPS
(DP 50, 51, 52 Not analyzed as a part of this study)
DBPS Reach 85(Basin91)=Q10=28.8cfs Q100=115.2cfs

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2018 STERLING RANCH MDDP

EXISTING HYDROLOGIC CONDITIONS MAP

PROJECT NO. 09–002
FILE: \dwg\Eng Exhibits\2018–MDDP–ExistCondWSWkMap.dwg
DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: VAS
SCALE
HORIZ: NTS
VERT: NTS
DATE: 08–22–18

DM1

File: Q:\09002A\Sterling Ranch District\dwg\Eng Exhibits\2018 MDDP\2018–MDDP–ExistCondWSWkMap.dwg Plotstamp: 11/13/2018 1:52 PM

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY (PRE-DEVELOPED)

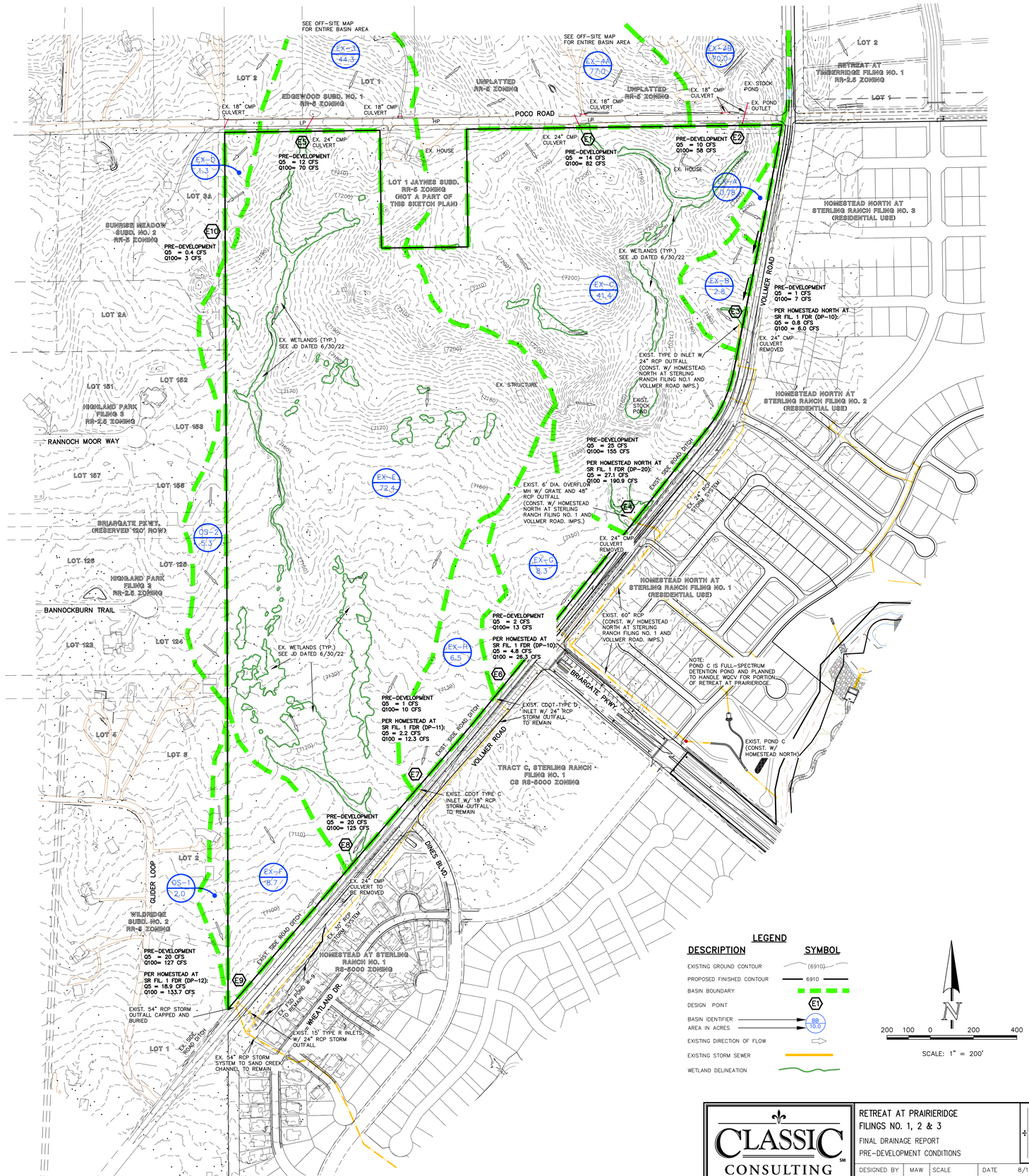
BASIN	TOTAL AREA (AC)	DEVELOPED AREA/IMPERVIOUS AREA AREA (AC)	C(2)	C(5)	C(100)	LANDSCAPE/UNDEVELOPED AREAS AREA (AC)	C(2)	C(5)	C(100)	WEIGHTED C(2)	C(5)	C(100)	WEIGHTED CA CA(2)	CA(5)	CA(100)	IMPERVIOUSNESS %
EX-A	0.78	0.00	0.03	0.09	0.36	0.78	0.03	0.09	0.36	0.03	0.09	0.36	**0.02**	**0.07**	**0.28**	2%
EX-B	2.80	0.00	0.03	0.09	0.36	2.80	0.03	0.09	0.36	0.03	0.09	0.36	**0.08**	**0.25**	**1.01**	2%
EX-C	41.40	0.00	0.03	0.09	0.36	41.40	0.03	0.09	0.36	0.03	0.09	0.36	**1.24**	**3.73**	**14.90**	2%
EX-D	1.30	0.00	0.03	0.09	0.36	1.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.04**	**0.12**	**0.47**	2%
EX-E	72.40	0.00	0.03	0.09	0.36	72.40	0.03	0.09	0.36	0.03	0.09	0.36	**2.17**	**6.52**	**26.06**	2%
EX-F	8.70	0.00	0.03	0.09	0.36	8.70	0.03	0.09	0.36	0.03	0.09	0.36	**0.26**	**0.78**	**3.13**	2%
EX-G	8.30	0.00	0.03	0.09	0.36	8.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.25**	**0.75**	**2.99**	2%
EX-H	6.50	0.00	0.03	0.09	0.36	6.50	0.03	0.09	0.36	0.03	0.09	0.36	**0.20**	**0.59**	**2.34**	2%
OS-1	2.00	2.00	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.12**	**0.26**	**0.80**	10%
OS-2	5.30	5.30	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.32**	**0.69**	**2.12**	10%
EX-3	44.30	44.30	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.77**	**4.65**	**16.61**	5%
EX-4A	77.00	77.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**3.08**	**8.09**	**28.88**	5%
EX-4B	70.00	70.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**2.80**	**7.35**	**26.25**	5%

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (PRE-DEVELOPED)

BASIN	WEIGHTED CA(2)	CA(5)	CA(100)	OVERLAND C(5)	Length (ft)	Height (ft)	Tc (min)	STREET / CHANNEL FLOW Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-A	0.02	0.07	0.28	0.09	240	9	18.3					18.3	2.58	3.23	5.41	0.1	**0.2**	**2**
EX-B	0.08	0.25	1.01	0.09	300	24	15.9	120	2.0%	1.0	2.0	17.9	2.60	3.25	5.46	0.2	**0.8**	**6**
EX-C	1.24	3.73	14.90	0.09	300	18	17.5	1300	2.9%	1.7	12.7	30.2	1.98	2.47	4.15	2	**9**	**62**
EX-D	0.04	0.12	0.47	0.09	225	10	16.7					16.7	2.68	3.36	5.64	0.1	**0.4**	**3**
EX-E	2.17	6.52	26.06	0.09	280	20	15.9	3400	2.5%	1.6	35.8	51.8	1.34	1.66	2.79	3	**11**	**73**
EX-F	0.26	0.78	3.13	0.09	300	12	20.0	560	2.0%	1.4	6.6	26.6	2.13	2.66	4.47	1	**2**	**14**
EX-G	0.25	0.75	2.99	0.09	300	10	21.2	420	2.0%	1.4	4.9	26.2	2.15	2.69	4.51	1	**2**	**13**
EX-H	0.20	0.59	2.34	0.09	300	10	21.2	800	2.0%	1.4	9.4	30.7	1.96	2.45	4.11	0.4	**1.4**	**10**
OS-1	0.12	0.26	0.80	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.8**	**4**
OS-2	0.32	0.69	2.12	0.08	300	12	20.2					20.2	2.46	3.08	5.16	1	**2**	**11**
EX-3	1.77	4.65	16.61	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	4	**12**	**70**
EX-4A	3.08	8.09	28.88	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	4	**14**	**82**
EX-4B	2.80	7.35	26.25	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	3	**10**	**58**

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (PRE-DEVELOPED)

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Inlet Size
E1	EX-4A	8.09	28.88	50.5	1.70	2.85	14	82	EX. 24" CMP CULVERT
E2	EX-4B	7.35	26.25	64.9	1.32	2.22	10	58	EX. STOCK OFF-SITE POND
E3	EX-A, EX-B	0.32	1.29	18.3	3.23	5.41	1	7	TYPE D CDOT INLET W/ 24" RCP
E4	EX-4A, EX-4B, EX-C	19.16	70.03	64.9	1.32	2.22	25	155	PLANNED 48" RCP W/ MH AND GRATE
E5	EX-3	4.65	16.61	29.1	2.53	4.24	12	70	EX. 24" CMP CULVERT
E6	EX-G	0.75	2.99	26.2	2.69	4.51	2	13	TYPE D CDOT INLET W/ 24" RCP
E7	EX-H	0.59	2.34	30.7	2.45	4.11	1	10	TYPE C CDOT INLET W/ 18" RCP
E8	EX-3, EX-E, OS-2	11.86	44.80	51.8	1.66	2.79	20	125	EX. 24" CMP CULVERT
E9	DP-E8, EX-F, OS-1	12.90	48.73	55.8	1.55	2.60	20	127	MODIFIED 4'X14' TYPE D CDOT INLET W/ 54" RCP
E10	EX-D	0.12	0.47	16.7	3.36	5.64	0.4	3	SHEET FLOW TO NATURAL RAVINE



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RETREAT AT PRAIRIERIDGE
FILINGS NO. 1, 2 & 3
FINAL DRAINAGE REPORT
PRE-DEVELOPMENT CONDITIONS

DESIGNED BY	MAW	SCALE		DATE	8/14/24
DRAWN BY	MAW	(H) 1"= 200'		SHEET	1 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	1305.11

N:\1305\11\REPORTS\FINAL DRAINAGE REPORT\1305111 FDR HDM.dwg, 2/27/2025 1:39:06 PM, 1:1

* NOTE:
EXISTING PUBLIC CULVERTS CROSSING POCO ROAD ADJACENT TO THE PRAIRIERIDGE PROPERTY APPEAR TO BE SILTED IN AND UNDERSIZED FOR THE 100-YR EVENT.

IT IS RECOMMENDED THAT EL PASO COUNTY VISUALLY INSPECT THESE FACILITIES AND CONSIDER UP-SIZING FOR LARGER STORM EVENTS BASED ON THE CURRENT BASIN HYDROLOGY OR AT MINIMUM CLEAN OUT THE CURRENT FACILITIES TO ALLOW FOR BETTER CONVEYANCE.

Unresolved:
Provide calculations for all swales (existing & proposed). Show flowlines.

BASIN RUNOFF SUMMARY

BASIN	WEIGHTED CA(2)	WEIGHTED C(5)	WEIGHTED CA(100)	OVERLAND C(5)	OVERLAND Length (ft)	OVERLAND Height (ft)	OVERLAND Tc (min)	STREET / CHANNEL FLOW Length (ft)	STREET / CHANNEL FLOW Slope (%)	STREET / CHANNEL FLOW Velocity (fps)	STREET / CHANNEL FLOW Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	INTENSITY I(5) (in/hr)	INTENSITY I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	TOTAL FLOWS Q(5) (cfs)	TOTAL FLOWS Q(100) (cfs)
EX-3	1.97	4.39	19.66	0.09	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.34	3	**11**	**86**
EX-3A	0.10	0.26	0.94	0.09	300	17	18.0					18.0	2.60	3.25	5.48	0.3	**0.9**	5
EX-4A	2.23	5.69	20.71	0.09	300	6	20.3	3400	2.0%	1.4	39.3	60.5	1.37	1.72	2.90	3	**11**	**76**
EX-4B	2.10	6.50	20.20	0.09	300	10	21.4	3600	1.9%	1.3	43.5	64.9	1.27	1.59	2.72	2	**8**	**56**
EX-4C	0.11	0.29	1.06	0.09	300	10	21.4					21.4	2.35	2.95	5.01	0.3	**0.9**	5
OS-1A	0.02	0.04	0.12	0.09	140	5	14.3					14.3	2.87	3.59	6.03	0.1	**0.1**	**0.7**
OS-1B	0.05	0.10	0.32	0.09	300	10	21.4					21.4	2.35	2.95	5.01	0.1	**0.3**	**1.6**
OS-2A	0.07	0.16	0.48	0.09	300	14	19.2					19.2	2.52	3.15	5.35	0.2	**0.5**	**2.5**
OS-2B	0.03	0.07	0.21	0.09	100	4	11.7					11.7	3.11	3.90	6.66	0.1	**0.3**	**1.4**
OS-2C	0.22	0.47	1.44	0.09	300	12	20.2					20.2	2.46	3.08	5.16	0.5	**1.4**	**7**
A	0.22	0.43	1.22	0.09	200	12	14.4	150	2.0%	1.4	1.8	16.2	2.72	3.41	5.72	0.6	**1.5**	**7**
B	0.16	0.32	0.87	0.09	200	12	15.6	180	3.0%	1.7	1.8	17.3	2.65	3.31	5.56	0.5	**1.1**	**5**
C1	0.95	1.40	3.40	0.09	300	10	21.4	150	3.0%	1.7	1.4	22.8	2.31	2.89	4.85	2	**4**	**16**
C2	0.45	0.63	1.18	0.09	100	2	14.7	300	2.0%	2.8	1.8	16.4	2.70	3.39	5.68	1	**2**	**7**
D	0.25	0.33	0.55	0.09	100	2	14.7	100	1.0%	2.4	0.7	15.3	2.79	3.49	5.86	0.7	**1.2**	**3**
E	0.88	1.18	1.97	0.09	100	2	14.7	600	2.0%	2.8	3.5	18.2	2.58	3.23	5.42	2	**4**	**11**
F	0.39	0.51	0.86	0.09	100	2	14.7	180	5.0%	4.5	0.7	15.3	2.79	3.49	5.86	1.1	**1.8**	**5**
G	0.70	0.77	1.00	0.09	50	1	10.4	475	4.0%	4.0	2.0	12.3	3.04	3.81	6.40	2	**3**	**6**
H	0.92	1.12	1.72	0.09	100	2	14.7	500	1.0%	2.4	3.4	18.1	2.59	3.24	5.44	2	**4**	**9**
I	0.31	0.37	0.57	0.09	50	1	10.4	500	1.0%	2.4	3.4	13.8	2.91	3.65	6.12	0.9	**1.3**	**3**
J	1.51	1.94	2.98	0.09	80	7.2	11.0	600	1.0%	2.4	4.4	15.4	2.76	3.46	5.79	4	**5**	**16**
K	0.65	0.69	0.87	0.12	100	2.5	13.1	100	1.0%	2.4	0.7	13.8	2.92	3.66	6.13	2	**3**	**5**
L1	0.04	0.08	0.27	0.09	100	3	12.8					12.8	3.00	3.76	6.31	0.1	**0.3**	**1.7**
L2	0.16	0.19	0.28	0.09	25	0.75	0.4	120	3.0%	3.7	0.5	0.9	5.73	7.18	12.05	0.9	**1.3**	**3.3**
L3	0.77	0.91	1.45	0.09	25	0.5	0.4	450	3.0%	3.7	2.0	2.4	3.41	4.28	7.18	3	**3**	**7**
M1	0.19	0.20	0.27	0.12	70	2.8	3.4	40	2.0%	1.0	0.7	10.0	3.29	4.12	6.92	0.6	**1**	**2**
M2	0.20	0.48	1.56	0.09	300	9	22.2	200	6.0%	2.0	1.7	23.9	2.35	2.93	4.74	0.5	**1**	**7**
N1	0.83	0.92	1.35	0.12	80	2	11.7	575	1.0%	2.4	3.9	15.6	2.77	3.46	5.81	2	**3**	**7**
N2	1.29	1.43	1.95	0.12	100	2	14.1	550	1.0%	2.4	3.8	17.9	2.63	3.29	5.53	3	**5**	**11**
O	2.85	3.77	4.27	0.12	100	2	14.1	450	1.0%	2.4	3.1	17.2	2.67	3.34	5.61	8	**13**	**24**
P1	3.90	3.93	3.96	0.12	30	0.6	7.7	650	2.0%	2.8	3.8	11.5	3.12	3.91	6.57	15	**16**	**26**
P2	0.57	0.64	0.89	0.12	100	3	12.3	350	2.0%	2.8	2.1	14.4	2.85	3.56	6.00	2	**2**	**5**
Q1	0.40	0.49	0.60	0.12	250	12	16.7	100	4.0%	2.0	0.8	17.5	2.63	3.29	5.52	1	**2**	**4**
Q2	0.60	0.68	0.87	0.12	20	0.4	4.3	700	3.0%	1.9	6.2	12.5	3.03	3.79	6.36	2	**3**	**6**
Q3	0.58	0.70	0.75	0.12	100	2.5	13.1	100	4.0%	4.0	0.4	13.5	2.95	3.69	6.22	2	**3**	**5**
R	0.20	0.44	1.36	0.09	300	20	17.1	200	4.0%	2.0	1.7	18.7	2.60	3.19	5.36	0.5	**1.4**	**7**
S	0.30	0.62	1.82	0.25	300	30	14.2	250	4.0%	2.0	2.1	16.3	2.71	3.40	5.70	0.8	**2.1**	**10**
T	0.08	0.17	0.52	0.09	200	9	10.9					10.9	2.75	3.44	5.77	0.2	**0.6**	**3**
U	0.75	1.10	2.30	0.09	100	2	14.1	900	2.0%	2.8	4.7	18.8	2.55	3.20	5.37	2	**3**	**12**
V	0.37	0.41	0.55	0.09	50	1	10.4	375	1.0%	2.4	2.6	13.0	2.98	3.74	6.28	1	**1**	**3**
W	1.40	1.71	2.67	0.12	50	1	10.0	900	2.0%	3.2	4.7	14.7	2.80	3.51	5.90	4	**6**	**16**
X	0.12	0.14	0.18	0.09	50	1	10.4	100	1.0%	2.4	0.7	11.0	3.16	3.96	6.66	0.4	**0.5**	**1.2**
Y	1.16	1.42	2.19	0.09	100	2	14.7	650	1.0%	2.4	4.4	19.1	2.53	3.18	5.35	3	**4**	**12**
Z	0.33	0.46	1.01	0.09	50	1	10.4	650	1.0%	2.4	4.4	14.8	2.85	3.57	6.01	1	**2**	**6**
AA	0.24	0.40	0.88	0.09	100	3	12.8	375	3.0%	1.9	3.3	16.2	2.72	3.41	5.72	0.7	**1.4**	**5**
BB	0.22	0.38	0.79	0.09	80	3	10.6	400	1.0%	1.2	5.9	16.5	2.70	3.39	5.67	0.6	**1.2**	**4**
CC	0.54	0.63	0.99	0.09	100	6	10.2	150	1.0%	2.4	1.0	11.2	3.15	3.96	6.64	2	**2**	**6**
DD	0.41	0.42	0.49	0.12	30	0.9	6.7	70	1.0%	2.4	0.5	7.2	3.68	4.62	7.75	2	**2**	**4**
EE	0.62	0.86	0.98	0.09	80	7.2	9.2	150	4.0%	4.0	0.6	9.8	3.26	4.09	6.86	2	**3**	**7**
FF	0.90	1.09	1.98	0.09	80	2.5	11.9	550	4.0%	4.0	2.3	14.2	2.88	3.59	6.05	3	**4**	**12**
GG	1.26	1.35	1.74	0.12	40	1.2	7.8	750	2.0%	2.8	4.4	12.2	3.05	3.83	6.42	4	**5**	**11**
HH	1.25	1.29	1.55	0.12	30	0.9	6.7	750	2.0%	2.8	4.4	11.2	3.15	3.96	6.64	4	**5**	**10**
II	4.26	4.58	6.14	0.12	100	2	14.1	850	1.0%	2.4	5.4	19.5	2.50	3.13	5.25	11	**15**	**32**
JJ	0.61	0.66	0.82	0.09	100	2	14.7	350	1.0%	2.4	2.4	17.1	2.65	3.32	5.57	2	**3**	**5**
KK	1.07	1.17	1.53	0.09	100	2	14.7	300	4.0%	4.0	1.5	16.2	2.74	3.43	5.75	3	**4**	**9**
LL	0.98	1.08	1.42	0.09	100	2	14.7	300	4.0%	4.0	1.5	16.2	2.74	3.43	5.75	3	**4**	**8**
MM	1.35	1.49	1.95	0.09	100	2	14.7	450	4.0%	4.0	1.9	16.5	2.70	3.38	5.67	4	**5**	**11**
NN1	1.37	1.44	1.71	0.45	80	2.4	7.3	1000	4.0%	4.0	4.2	11.5	3.13	3.92	6.58	4	**6**	**11**
NN2	0.80	0.82	0.98	0.45	50	1.5	4.8	1000	4.0%	4.0	4.2	9.0	3.47	4.34	7.28	3	**4**	**7**
OO	0.82	0.95	1.38	0.09	80	1.2	11.3	1100	4.0%	4.0	4.6	15.9	2.74	3.43	5.75	2	**3**	**8**
PP	0.29	0.48	1.06	0.09	100	6	10.2	450	2.0%	1.4	5.5	15.5	2.77	3.47	5.81	0.8	**1.7**	**6**
QQ	0.18	0.30	0.66	0.09	100	4	11.7	350	2.0%	1.4	4.1	15.9	2.75	3.44	5.78	0.5	**1.0**	**4**
RR	0.57	1.09	3.10	0.12	100	6	12.3	600	1.0%	1.0	10.0	22.3	2.34	2.93	4.91	1	**3**	**15**
SS	0.08	0.18	0.51	0.12	100	4	12.3					12.3	3.00	3.76	6.31	0.2	**0.7**	**3.2**
TT	0.02	0.02	0.05	0.12	40	1.2	7.8	80	1.0%	2.4	0.5	8.3	3.61	4.60	7.58	0.1	**0.1**	**0.4**
UU	0.13	0.13	0.16	0.12	15	0.45	4.8	80	1.0%	2.4	0.5	5.3	4.05	5.08	8.55	0.5	**0.7**	**1.3**
VV1	0.04	0.08	0.27	0.12	100	2	14.1					14.1	2.89	3.62	6.07	0.1	**0.3**	**1.7**
VV2	0.66	0.71	0.96	0.12	40	1.2	4.7	200	2.0%	2.8	1.2	5.9	3.93	4.93	8.28	3	**4**	**8**

SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Facility/ Inlet Size*
1	EX-4A, A	7.11	27.94	53.5	1.61	2.71	11	76	PROP. TYPE D CDOT INLET
2	EX-4B, B	6.62	25.52	65.9	1.30	2.18	9	56	PROP. TYPE D CDOT INLET
3	C1, EX-4C	1.79	4.45	22.9	2.69	4.85	5	22	10' TYPE R AT-GRADE INLET
4	C2, Flowby from DP-3	0.73	3.53	23.4	2.68	4.79	2	17	10' TYPE R SUMP INLET
5	D	0.33	0.55	15.3	3.49	5.86	1.2	3	5' TYPE R SUMP INLET
6	E	1.16	1.97	18.2	3.23	5.43	4	11	10' TYPE R AT-GRADE INLET
7	F	0.51	0.85	15.3	3.49	5.86	1.8	5	10' TYPE R AT-GRADE INLET
8	G	0.77	1.00	12.3	3.81	6.40	3	6	5' TYPE R SUMP INLET
9	H	1.12	1.72	18.1	3.24	5.44	4	9	10' TYPE R SUMP INLET
10	I	0.37	0.57	13.8	3.65	6.13	1.4	4	5' TYPE R SUMP INLET
11	J Flowby from DP-6 & DP-7	1.85	3.49	19.7	3.11	5.23	6	18	10' TYPE R SUMP INLET
12A	K	0.69	0.87	13.8	3.65	6.13	3	5	5' TYPE R SUMP INLET
12B	N1	0.92	1.26	15.6	3.46	5.81	3	7	FUTURE 5' TYPE R SUMP INLET
12C	M1	0.20	0.27	10.0	4.12	6.92	1	2	5' TYPE R SUMP INLET
13	N2	1.43	1.95	17.5	3.29	5.53	5	11	PROP 24" RCP STUB
14	M2	0.48	1.56	23.9	2.82	4.74	1	7	EXIST. 48" MH WITH GRATE
15	O1	0.49	0.80	17.5	3.29	5.52	2	4	EXIST. TYPE D AREA INLET
16	Q2, Q3	0.97	1.13	12.5	3.79	6.36	4	7	EXIST. TYPE D AREA INLET
17	L2	0.19	0.28	6.9	4.68	7.85	0.9	2.2	EX. 5' TYPE R AT-GRADE INLET
18	L1, L3 Flow by from DP-17	0.89	1.27	14.8	3.54	5.94	3	8	EX. 10' TYPE R AT-GRADE INLET
19	P2, 100-yr Flowby from DP-18	0.64	1.15	14.4	3.58	6.02	2	7	EX. 10' TYPE R AT-GRADE INLET
20	EX-3A, R	0.70	2.30	18.7	3.19	5.35	2	12	
21	EX-3, S, DP-20	5.71	19.79	29.1	2.53	4.24	14	84	PROP. TYPE D CDOT INLET
22	U	1.10	2.30	19.4	3.14	5.27	3	12	10' TYPE R SUMP INLET
23	Y	0.41	0.53	11.5	3.92	6.58	1.6	3	5' TYPE R SUMP INLET
24	W	1.71	2.67	14.7	3.55	5.96	6	16	10' TYPE R SUMP INLET
25	X	0.14	0.18	11.0	3.88	6.68	0.5	1.2	5' TYPE R SUMP INLET
26	Y	1.42	2.19	19.1	3.18	5.31	4	12	10' TYPE R SUMP INLET
27	Z	0.48	1.01	14.8	3.54	5.95	2	6	10' TYPE R SUMP INLET
28	AA, OS-2A	0.56	1.36	16.2	3.41	5.72	2	8	CDOT TYPE C INLET
29	BB, OS-2B	0.43	1.00	16.5	3.38	5.67	1	6	CDOT TYPE C INLET
30	EE	0.86	0.99	5.2	5.10	8.56	4	8	5' TYPE R SUMP INLET
31	FF	1.09	1.98	14.2	3.60	6.05	4	10	10' TYPE R SUMP INLET
32	DD	0.42	0.49	7.2	4.62	7.75	2	4	5' TYPE R SUMP INLET
33	CC	0.63	0.99	11.2	3.96	6.64	2	6	5' TYPE R SUMP INLET
34	JJ	0.66	0.82	15.9	3.44	5.77	2	5	10' TYPE R SUMP INLET
35	KK	1.17	1.53	15.9	3.43	5.76	4	9	10' TYPE R AT-GRADE INLET
36	LL, Flowby from DP-35	1.09	1.80	17.2	3.32	5.57	4	10	10' TYPE R AT-GRADE INLET
37	NN1, NN2, 50% of (100yr- NN2 & Flowby from DP-42 & DP-43)	2.36	2.59	20.0	3.09	5.18	7	13	10' TYPE R SUMP INLET
38	MM, Flowby from DP-36	1.50	2.45	19.0	3.17	5.31	5	13	10' TYPE R SUMP INLET
39		4.66	6.14	19.5	3.13	5.25	15	32	PROP. 30" RCP
40	O	3.17	4.27	16.6	3.37	5.66	11	23	PROP. 30" RCP STUB
41	P1	3.65	3.96	11.5	3.91	6.57	14	26	PROP. 30" RCP STUB
42	GG	1.35	1.74	12.2	3.83	6.43	5	11	10' TYPE R AT-GRADE INLET
43	HH	1.29	1.55	11.2	3.96	6.66	5	10	10' TYPE R AT-GRADE INLET
44	OO	0.95	1.38	15.9	3.43	5.76	3	8	10' TYPE R SUMP INLET
45	OS-2C, PP, TT, UU	1.30	2.91	20.2	3.08	5.16	4	15	CDOT TYPE C INLET
46	OS-1A, QQ	0.34	0.78	14.3	3.59	6.03	1	5	CDOT TYPE C INLET
47	VV1, VV2, 50% of (100-yr: NN2 & Flowby from DP-42 & DP-43)	0.80	2.09	22.7	2.90	4.87	3	10	EX. 10' TYPE R AT-GRADE INLET
48	**TOTAL TRIBUTARY AREA TO ON-SITE POND (Incl. Basins OS-1B and RR)**	**39.63**	**89.20**	**31.8**	**2.39**	**4.02**	**95**	**278**	**PROP. ON-SITE POND 1**
49	T	0.17	0.52	15.9	3.44	5.77	0.6	3	Sheet flow off-site
50	SS	0.05	0.16	10.2	4.16	6.88	0.2	1.1	Sheet flow into roadside ditch

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	(6910)
PROPOSED FINISHED CONTOUR	6910
BASIN BOUNDARY	
DESIGN POINT	1
PIPE ROUTING	8
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
EXISTING DIRECTION OF FLOW	
EXISTING STORM SEWER	
PROPOSED STORM SEWER	
WETLAND DELINEATION	
DETENTION/STORMWATER QUALITY HANDLED IN FSD POND C WITHIN HOMESTEAD NORTH FILING NO. 1	

STORM SEWER NOTE:

ALL PROPOSED STORM FACILITIES WITHIN THE PUBLIC ROW/PUBLIC DRAINAGE ESMT. TO BE PUBLIC WITH OWNERSHIP AND MAINTENANCE BY EL PASO COUNTY.

ALL PROPOSED STORM FACILITIES OUTSIDE OF PUBLIC ROW/PUBLIC DRAINAGE ESMT. TO BE PRIVATE WITH OWNERSHIP AND MAINTENANCE BY THE METRO DISTRICT.

SCALE: 1" = 100'

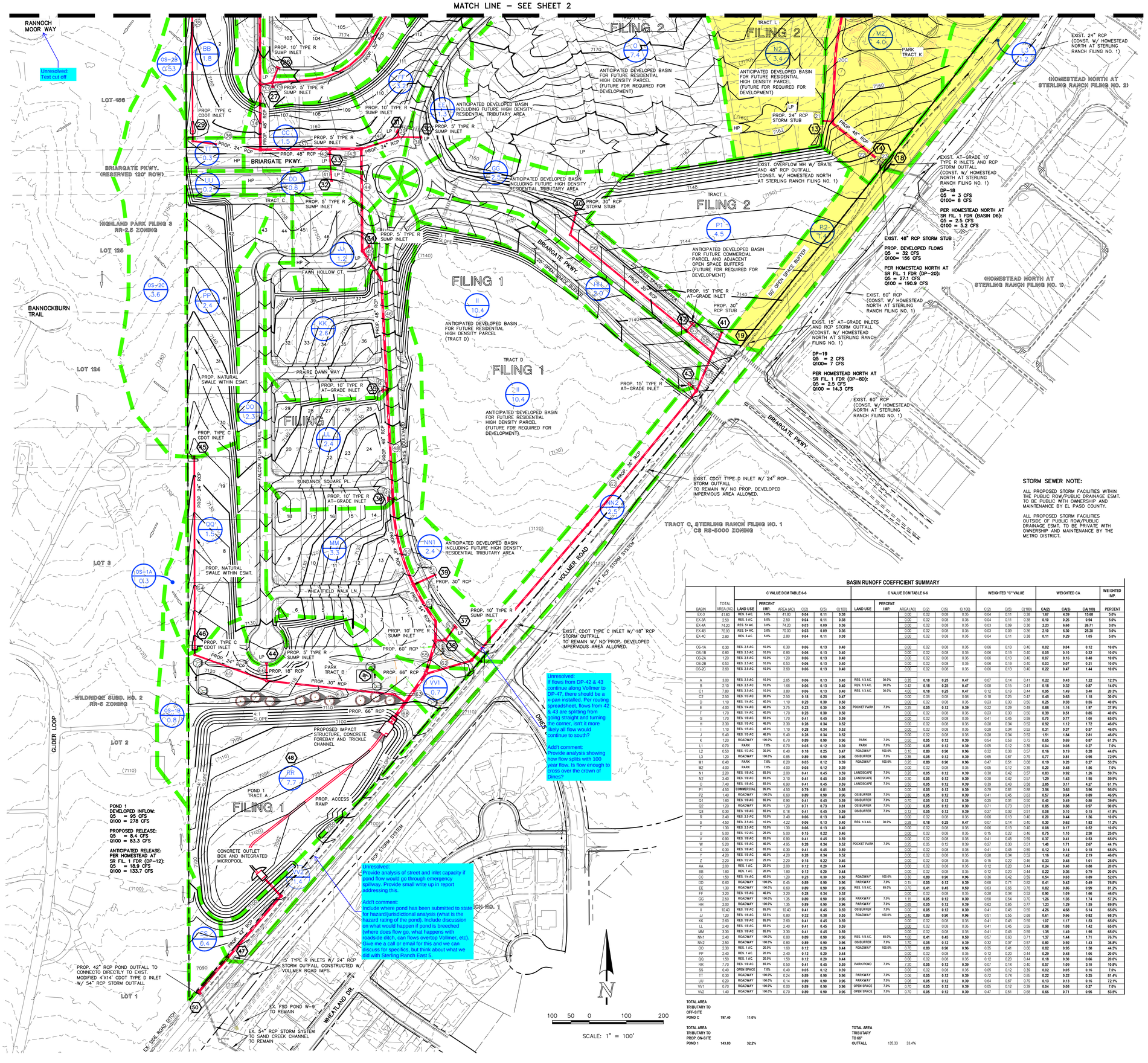
MATCH LINE – SEE SHEET 3

CLASSIC CONSULTING SM
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799 (Fax)

RETREAT AT PRAIRIERIDGE
FILINGS 1-3
FINAL DRAINAGE REPORT
DEVELOPED CONDITIONS

DESIGNED BY	MAW	SCALE		DATE	8/14/24
DRAWN BY	MAW	(H) 1"= 100'		SHEET	2 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	1305.11

N:\1305\1\REPORTS\FINAL DRAINAGE REPORT\1305fil FDR (RM.dwg, 8/14/2024, 10:49:24 AM, 1:1



PIPE ROUTING SUMMARY

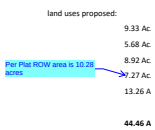
Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Pipe Size*
1	DP-1	7.11	27.94	53.5	1.61	2.71	11	76	PROP. 42" RCP
2	DP-2	6.62	25.52	65.9	1.30	2.18	9	56	PROP. 36" RCP
3	DP-4	0.73	3.53	23.4	2.86	4.79	2	17	PROP. 24" RCP
4	DP-5	0.33	0.55	15.3	3.49	5.86	1.2	3	PROP. 18" RCP
5	PR-2, PR-3, PR-4	7.69	29.60	65.9	1.30	2.18	10	65	PROP. 42" RCP
6	PR-1, PR-5	14.80	57.54	65.9	1.30	2.18	19	125	PROP. 48" RCP
7	DP-3 Collected	1.68	2.09	22.9	2.89	4.85	5	10	PROP. 18" RCP
8	PR-6, PR-7	16.48	59.63	66.4	1.29	2.16	21	129	PROP. 48" RCP
9	DP-6 Collected	1.14	1.34	18.2	3.23	5.43	4	7	PROP. 24" RCP
10	DP-7 Collected	0.51	0.80	15.3	3.49	5.86	1.8	5	PROP. 18" RCP
11	PR-8, PR-9, PR-10	18.13	61.77	66.9	1.28	2.14	23	132	PROP. 48" RCP
12	DP-9	1.12	1.72	18.1	3.24	5.44	4	9	PROP. 24" RCP
13	DP-10	0.37	0.57	13.8	3.65	6.13	1.4	4	PROP. 18" RCP
14	PR-12, PR-13	1.50	2.29	18.6	3.20	5.38	5	12	PROP. 24" RCP
15	PR-11, PR-14	19.63	64.06	67.2	1.27	2.13	25	137	PROP. 48" RCP
16	DP-8	0.77	1.00	12.3	3.81	6.40	3	6	PROP. 18" RCP
17	DP-11	1.85	3.49	19.7	3.11	5.23	6	18	PROP. 30" RCP
18	DP-12	0.69	0.87	13.8	3.65	6.13	3	5	PROP. 18" RCP
19	PR-17, PR-18	2.54	4.36	19.9	3.10	5.20	8	23	PROP. 30" RCP
20	PR-15, PR-16, PR-19	22.93	69.42	67.5	1.26	2.12	29	147	PROP. 48" RCP
20A	DP-12B	0.92	1.26	15.6	3.46	5.81	3	7	PROP. 18" RCP
20B	DP-12C	0.20	0.27	10.0	4.12	6.92	1	2	PROP. 18" RCP
20C	PR-20, PR-20A, PR-20B	24.06	70.95	68.0	1.25	2.10	30	149	PROP. 48" RCP
21	DP-13	1.43	1.95	17.5	3.29	5.53	5	11	PROP. 24" RCP STUB
22	**PR-20C, PR-21**	**25.49**	**72.89**	**68.2**	**1.25**	**2.09**	**32**	**153**	**PROP. 48" RCP**
23	**DP-14, PR-22**	**25.97**	**74.45**	**68.2**	**1.25**	**2.09**	**32**	**156**	**PROP. 48" RCP**
24	DP-21	5.71	19.79	29.1	2.53	4.24	14	84	PROP. 42" RCP
25	DP-22	1.10	2.30	19.4	3.14	5.27	3	12	PROP. 24" RCP
26	DP-23, PR-25	1.51	2.83	19.4	3.14	5.27	5	15	PROP. 24" RCP
27	PR-24, PR-26	7.22	22.62	30.3	2.47	4.14	18	94	PROP. 42" RCP
28	DP-24	1.71	2.67	14.7	3.55	5.96	6	16	PROP. 24" RCP
29	DP-25	0.14	0.18	11.0	3.98	6.68	0.5	1.2	PROP. 18" RCP
30	PR-28, PR-29	1.85	2.85	15.5	3.47	5.83	6	17	PROP. 30" RCP
31	DP-26	1.42	2.19	19.1	3.16	5.31	4	12	PROP. 24" RCP
32	DP-27	0.48	1.01	14.8	3.54	5.95	2	6	PROP. 18" RCP
33	PR-30, PR-31, PR-32	3.75	6.06	19.1	3.16	5.31	12	32	PROP. 30" RCP
34	PR-27, PR-33	10.97	28.68	30.5	2.46	4.12	27	118	PROP. 48" RCP
35	DP-28	0.56	1.36	16.2	3.41	5.72	2	8	PROP. 18" RCP
36	DP-29, PR-35	0.98	2.36	16.7	3.36	5.64	3	13	PROP. 24" RCP
37	PR-34, PR-36	11.95	31.04	30.6	2.45	4.11	29	128	PROP. 48" RCP
38	DP-30	0.86	0.99	5.2	5.10	8.56	4	8	PROP. 18" RCP
39	DP-31	1.09	1.66	14.2	3.60	6.05	4	10	PROP. 24" RCP
40	PR-38, PR-39	1.94	2.65	14.2	3.60	6.05	7	16	PROP. 24" RCP
41	DP-32	0.42	0.49	7.2	4.62	7.75	2	4	PROP. 18" RCP
42	DP-33, PR-41	1.05	1.38	11.2	3.96	6.64	4	9	PROP. 24" RCP
43	PR-37, PR-42	13.00	32.42	30.6	2.45	4.11	32	133	PROP. 48" RCP
44	PR-40, PR-43	14.95	35.07	30.8	2.44	4.10	36	144	PROP. 48" RCP
45	DP-34	0.66	0.82	15.9	3.44	5.77	2	5	PROP. 18" RCP
46	PR-44, PR-45	15.61	35.89	31.1	2.43	4.07	38	146	PROP. 48" RCP
47	DP-35 Collected	1.16	1.15	15.9	3.43	5.76	4	7	PROP. 18" RCP
48	PR-46, PR-47	16.77	37.04	31.3	2.42	4.06	41	150	PROP. 48" RCP
49	DP-36 Collected	1.08	1.30	17.2	3.32	5.57	4	7	PROP. 18" RCP
50	PR-48, PR-49	17.85	38.34	31.5	2.41	4.04	43	155	PROP. 48" RCP
51	DP-39	4.68	6.14	19.5	3.13	5.25	15	32	PROP. 30" RCP
52	PR-50, PR-51	22.53	44.48	31.7	2.40	4.03	54	179	PROP. 54" RCP
53	DP-37	2.36	2.59	20.0	3.09	5.18	7	13	PROP. 24" RCP
54	DP-38, PR-53	3.86	5.04	20.0	3.09	5.18	12	26	PROP. 30" RCP
55	PR-52, PR-54	26.39	49.51	31.7	2.40	4.03	63	199	PROP. 60" RCP
56	DP-40	3.17	4.27	16.6	3.37	5.66	11	23	PROP. 30" RCP STUB
57	DP-42 Collected	1.35	1.55	12.2	3.83	6.43	5	10	PROP. 24" RCP
58	PR-56, PR-57	4.52	5.82	16.9	3.35	5.62	15	33	PROP. 30" RCP
59	DP-41	3.65	3.96	11.5	3.91	6.57	14	26	PROP. 30" RCP
60	PR-58, PR-59	8.16	9.78	16.9	3.35	5.62	27	55	PROP. 36" RCP
61	DP-43 Collected	1.29	1.43	11.2	3.96	6.66	5	9	PROP. 24" RCP
62	PR-60, PR-61	9.46	11.20	17.4	3.30	5.54	31	62	PROP. 36" RCP
63	PR-55, PR-62	35.84	60.72	31.8	2.39	4.02	86	244	PROP. 66" RCP
64	DP-45	1.30	2.91	21.0	3.02	5.06	4	15	PROP. 24" RCP
65	PR-64, DP-46	1.64	3.69	21.2	3.00	5.04	5	19	PROP. 24" RCP
66	DP-44	0.95	1.38	15.9	3.43	5.76	3	8	PROP. 18" RCP
67	PR-65-PR-66	2.59	5.06	21.7	2.97	4.98	8	25	PROP. 30" RCP
68	**PR-63-PR-67**	**38.44**	**65.78**	**31.8**	**2.39**	**4.02**	**92**	**264**	**PROP. 66" RCP**

BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6 LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	C VALUE DCM TABLE 6-6 LAND USE	PERCENT IMP.	AREA (AC)	C(2)	C(5)	C(100)	WEIGHTED "C" VALUE C(2)	C(5)	C(100)	WEIGHTED CA CA(2)	CA(5)	CA(100)	WEIGHTED IMP. PERCENT
EX-3	41.80	RES 5 AC.	5.0%	41.80	**0.04**	**0.11**	**0.38**			0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.67**	**4.39**	**15.68**	**5.0%**
EX-3A	2.50	RES 5 AC.	5.0%	2.50	**0.04**	**0.11**	**0.38**			0.00	0.02	0.08	0.35	0.04	0.11	0.38	**0.10**	**0.26**	**0.94**	**5.0%**
EX-4A	74.20	RES 5+ AC.	3.0%	74.20	**0.03**	**0.09**	**0.36**			0.00	0.02	0.08	0.35	0.03	0.09	0.36	**2.23**	**6.68**	**26.71**	**3.0%**
EX-4B	70.00	RES 5+ AC.	3.0%	70.00	**0.03**	**0.09**	**0.36**			0.00	0.02	0.08	0.35	0.03	0.09	0.36	**2.10**	**6.30**	**25.20**	**3.0%**
EX-4C	2.80	RES 5 AC.	5.0%	2.80	**0.04**	**0.11**	**0.38**			0.00	0.02	0.08	0.35	0.04	0.11	0.38	**0.11**	**0.29**	**1.05**	**5.0%**
OS-1A	0.30	RES 2.5 AC.	10.0%	0.30	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.02**	**0.04**	**0.12**	**10.0%**
OS-1B	0.80	RES 2.5 AC.	10.0%	0.80	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.05**	**0.10**	**0.32**	**10.0%**
OS-2A	1.20	RES 2.5 AC.	10.0%	1.20	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.07**	**0.16**	**0.48**	**10.0%**
OS-2B	0.53	RES 2.5 AC.	10.0%	0.53	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.03**	**0.07**	**0.21**	**10.0%**
OS-2C	3.60	RES 2.5 AC.	10.0%	3.60	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.22**	**0.47**	**1.44**	**10.0%**
A	3.00	RES 2.5 AC.	10.0%	2.65	**0.06**	**0.13**	**0.40**	RES. 1/3 AC.	30.0%	0.35	**0.18**	**0.25**	**0.47**	0.07	0.14	0.41	**0.22**	**0.43**	**1.22**	**12.3%**
B	2.10	RES 2.5 AC.	10.0%	1.68	**0.06**	**0.13**	**0.40**	RES. 1/3 AC.	30.0%	0.42	**0.18**	**0.25**	**0.47**	0.08	0.15	0.41	**0.18**	**0.32**	**0.87**	**14.0%**
C1	7.80	RES 2.5 AC.	10.0%	3.80	**0.06**	**0.13**	**0.40**	RES. 1/3 AC.	30.0%	4.00	**0.18**	**0.25**	**0.47**	0.12	0.19	0.44	**0.95**	**1.49**	**3.40**	**20.3%**
C2	2.50	RES 1/3 AC.	30.0%	2.50	**0.18**	**0.25**	**0.47**			0.00	0.02	0.08	0.35	0.18	0.25	0.47	**0.45**	**0.63**	**1.18**	**30.0%**
D	1.10	RES. 1/4 AC.	40.0%	1.10	**0.23**	**0.30**	**0.50**			0.00	0.02	0.08	0.35	0.23	0.30	0.50	**0.25**	**0.33**	**0.55**	**40.0%**
E	4.00	RES. 1/4 AC.	40.0%	3.75	**0.23**	**0.30**	**0.50**	POCKET PARK	7.0%	0.25	**0.05**	**0.12**	**0.39**	0.22	0.29	0.49	**0.88**	**1.16**	**1.97**	**37.9%**
F	1.70	RES. 1/4 AC.	40.0%	1.70	**0.23**	**0.30**	**0.50**			0.00	0.02	0.08	0.35	0.23	0.30	0.50	**0.39**	**0.51**	**0.85**	**40.0%**
G	1.70	RES. 1/8 AC.	65.0%	1.70	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**0.70**	**0.77**	**1.00**	**65.0%**
H	3.30	RES. 1/3 AC.	46.0%	3.30	**0.28**	**0.34**	**0.52**			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**0.92**	**1.12**	**1.72**	**46.0%**
I	1.10	RES 1/3 AC.	46.0%	1.10	**0.28**	**0.34**	**0.52**			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**0.31**	**0.37**	**0.57**	**46.0%**
J	5.40	RES. 1/3 AC.	46.0%	5.40	**0.28**	**0.34**	**0.52**			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**1.51**	**1.84**	**2.81**	**46.0%**
K	1.20	ROADWAY	100.0%	0.70	**0.89**	**0.90**	**0.96**	PARK	7.0%	0.50	**0.05**	**0.12**	**0.39**	0.54	0.58	0.72	**0.65**	**0.69**	**0.87**	**61.3%**
L1	0.70	PARK	7.0%	0.70	**0.05**	**0.12**	**0.39**	PARK	7.0%	0.00	**0.05**	**0.12**	**0.39**	0.05	0.12	0.39	**0.04**	**0.08**	**0.27**	**7.0%**
L2	0.50	RES 1/3 AC.	30.0%	0.40	**0.18**	**0.25**	**0.47**	ROADWAY	100.0%	0.10	**0.89**	**0.90**	**0.96**	0.32	0.58	0.57	**0.16**	**0.19**	**0.28**	**44.0%**
L3	1.20	ROADWAY	100.0%	0.85	**0.89**	**0.90**	**0.96**	OS BUFFER	7.0%	0.35	**0.05**	**0.12**	**0.39**	0.65	0.67	0.79	**0.77**	**0.81**	**0.95**	**72.9%**
M1	0.40	PARK	7.0%	0.20	**0.05**	**0.12**	**0.39**	ROADWAY	100.0%	0.20	**0.89**	**0.90**	**0.96**	0.47	0.51	0.68	**0.19**	**0.20**	**0.27**	**53.5%**
M2	4.00	PARK	7.0%	4.00	**0.05**	**0.12**	**0.39**			0.00	0.02	0.08	0.35	0.05	0.12	0.39	**0.20**	**0.48**	**1.56**	**7.9%**
N1	2.20	RES. 1/4 AC.	40.0%	2.00	**0.41**	**0.45**	**0.59**	LANDSCAPE	7.0%	0.20	**0.05**	**0.12**	**0.39**	0.39	0.42	0.57	**0.83**	**0.92**	**1.26**	**59.7%**
N2	3.40	RES. 1/8 AC.	65.0%	3.10	**0.41**	**0.45**	**0.59**	LANDSCAPE	7.0%	0.30	**0.05**	**0.12**	**0.39**	0.38	0.42	0.57	**1.29**	**1.43**	**1.95**	**59.9%**
O	7.40	RES. 1/8 AC.	65.0%	6.90	**0.41**	**0.45**	**0.59**	LANDSCAPE	7.0%	0.50	**0.05**	**0.12**	**0.39**	0.39	0.43	0.58	**2.85**	**3.17**	**4.27**	**61.1%**
P1	4.50	COMMERCIAL	95.0%	4.50	**0.79**	**0.81**	**0.88**			0.00	**0.05**	**0.12**	**0.39**	0.79	0.81	0.88	**3.56**	**3.65**	**3.96**	**95.0%**
P2	1.40	ROADWAY	100.0%	0.60	**0.89**	**0.90**	**0.96**	OS BUFFER	7.0%	0.80	**0.05**	**0.12**	**0.39**	0.41	0.45	0.63	**0.57**	**0.64**	**0.89**	**46.9%**
Q1	1.60	RES. 1/8 AC.	65.0%	0.90	**0.41**	**0.45**	**0.59**	OS BUFFER	7.0%	0.70	**0.05**	**0.12**	**0.39**	0.25	0.31	0.50	**0.40**	**0.49**	**0.80**	**39.6%**
Q2	1.20	ROADWAY	90.0%	1.20	**0.71**	**0.73**	**0.81**	OS BUFFER	7.0%	0.00	**0.05**	**0.12**	**0.39**	0.71	0.73	0.81	**0.85**	**0.88**	**0.97**	**90.0%**
Q3	0.30	RES. 1/8 AC.	65.0%	0.18	**0.41**	**0.45**	**0.59**	OS BUFFER	7.0%	0.12	**0.05**	**0.12**	**0.39**	0.27	0.32	0.51	**0.08**	**0.10**	**0.15**	**41.8%**
R	3.40	RES 2.5 AC.	10.0%	3.40	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.20**	**0.44**	**1.36**	**10.0%**
S	4.50	RES 2.5 AC.	10.0%	4.22	**0.06**	**0.13**	**0.40**	RES. 1/3 AC.	30.0%	0.28	**0.18**	**0.25**	**0.47**	0.07	0.14	0.40	**0.30**	**0.62**	**1.82**	**11.2%**
T	1.30	RES 2.5 AC.	10.0%	1.30	**0.06**	**0.13**	**0.40**			0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.08**	**0.17**	**0.52**	**10.0%**
U	5.00	RES. 1/2 AC.	25.0%	5.00	**0.15**	**0.22**	**0.46**			0.00	0.02	0.08	0.35	0.15	0.22	0.46	**0.75**	**1.10**	**2.30**	**25.0%**
V	0.90	RES. 1/8 AC.	65.0%	0.90	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**0.37**	**0.41**	**0.53**	**65.0%**
W	5.20	RES. 1/8 AC.	46.0%	4.95	**0.28**	**0.34**	**0.52**	POCKET PARK	7.0%	0.25	0.05	0.12	0.39	0.27	0.33	0.51	**1.40**	**1.71**	**2.67**	**44.1%**
X	0.30	RES. 1/8 AC.	65.0%	0.30	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**0.12**	**0.14**	**0.18**	**65.0%**
Y	4.20	RES. 1/2 AC.	46.0%	4.20	**0.28**	**0.34**	**0.52**			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**1.16**	**1.42**	**2.19**	**46.0%**
Z	2.20	RES. 1/2 AC.	25.0%	2.20	**0.15**	**0.22**	**0.46**			0.00	0.02	0.08	0.35	0.15	0.22	0.46	**0.33**	**0.48**	**1.01**	**25.0%**
AA	2.00	RES 1 AC.	20.0%	2.00	**0.12**	**0.20**	**0.44**			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.24**	**0.40**	**0.88**	**20.0%**
BB	1.80	RES. 1 AC.	20.0%	1.80	**0.12**	**0.20**	**0.44**			0.00	0.02	0.08	0.35	0.12	0.20	0.44	**0.22**	**0.36**	**0.79**	**20.0%**
CC	1.50	RES. 1/4 AC.	40.0%	1.20	**0.23**	**0.30**	**0.50**	ROADWAY	100.0%	0.30	**0.89**	**0.90**	**0.96**	0.36	0.42	0.59	**0.54**	**0.63**	**0.89**	**52.0%**
DD	0.60	ROADWAY	100.0%	0.45	**0.89**	**0.90**	**0.96**	PARKWAY	7.0%	0.15	**0.05**	**0.12**	**0.39**	0.68	0.71	0.82	**0.41**	**0.42**	**0.49**	**76.8%**
EE	1.30	ROADWAY	100.0%	0.60	**0.89**	**0.90**	**0.96**	RES. 1/8 AC.	65.0%	0.70	**0.41**	**0.45**	**0.59**	0.63	0.66	0.76	**0.82**	**0.86**	**0.99**	**81.2%**
FF	3.20	RES 1/8 AC.	46.0%	3.20	**0.28**	**0.34**	**0.52**			0.00	0.02	0.08	0.35	0.28	0.34	0.52	**0.90**	**1.09**	**1.66**	**46.0%**
GG	2.50	ROADWAY	100.0%	1.35	**0.89**	**0.90**	**0.96**	PARKWAY	7.0%	1.15	**0.05**	**0.12**	**0.39**	0.50	0.54	0.70	**1.26**	**1.35**	**1.74**	**57.2%**
HH	2.00	ROADWAY	100.0%	1.35	**0.89**	**0.90**	**0.96**	PARKWAY	7.0%	0.65	**0.05**	**0.12**	**0.39**	0.62	0.65	0.77	**1.23**	**1.29**	**1.55**	**69.8%**
II	10.40	RES. 1/8 AC.	65.0%	10.40	**0.41**	**0.45**	**0.59**	OS BUFFER	7.0%	0.00	**0.05**	**0.12**	**0.39**	0.41	0.45	0.59	**4.26**	**4.68**	**6.14**	**65.0%**
JJ	1.20	RES 1/4 AC.	32.5%	0.80	**0.32**	**0.40**	**0.55**	ROADWAY	100.0%	0.40	**0.89**	**0.90**	**0.96**	0.51	0.55	0.68	**0.61**	**0.66**	**0.82**	**68.3%**
KK	2.60	RES. 1/8 AC.	65.0%	2.60	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**1.07**	**1.17**	**1.53**	**65.0%**
LL	2.40	RES 1/8 AC.	65.0%	2.40	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**0.98**	**1.08**	**1.42**	**65.0%**
MM	3.30	RES 1/8 AC.	65.0%	3.30	**0.41**	**0.45**	**0.59**			0.00	0.02	0.08	0.35	0.41	0.45	0.59	**1.35**	**1.49**	**1.95**	**65.0%**
NN1	2.40	ROADWAY	100.0%	0.80	**0.89**	**0.90**	**0.96**	RES. 1/8 AC.	65.0%	1.60	**0.41**	**0.45**	**0.59**	0.57	0.60	0.71	**1.37**	**1.44**	**1.71**	**76.7%**
NN2	2.50	ROADWAY	100.0%	0.80	**0.89**	**0.90**	**0.96**	OS BUFFER	7.0%	1.70	**0.05**	**0.12**	**0.39**	0.32	0.37	0.57	**0.80**	**0.92**	**1.43**	**36.8%**
OO	2.30	RES 1 AC.	20.0%	1.60	**0.12**	**0.20**	**0.44**	ROADWAY	100.0%	0.70	**0.89**	**0.90**	**0.96**	0.35	0.41	0.60	**0.82**	**0.95**	**1.38**	**44.3%**
PP	2.40	RES 1 AC.	20

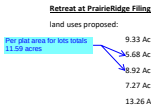
V2_Drainage Report - Final.pdf Markup Summary

Callout (11)



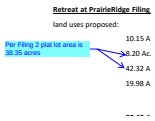
Subject: Callout
Page Label: 29
Author: CDurham
Date: 7/2/2025 3:40:49 PM
Status:
Color:
Layer:
Space:

Per Plat ROW area is 10.28 acres



Subject: Callout
Page Label: 29
Author: CDurham
Date: 7/2/2025 3:41:18 PM
Status:
Color:
Layer:
Space:

Per plat area for lots totals 11.59 acres

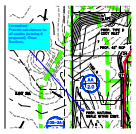


Subject: Callout
Page Label: 31
Author: CDurham
Date: 7/2/2025 3:49:51 PM
Status:
Color:
Layer:
Space:

Per Filing 2 plat lot area is 38.35 acres

Subject: Callout
Page Label: 34
Author: CDurham
Date: 7/2/2025 4:01:02 PM
Status:
Color:
Layer:
Space:

Did not come up with the same totals. Please verify

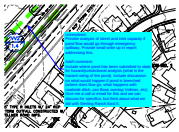


Subject: Callout
Page Label: [1] Layout1
Author: CDurham
Date: 7/2/2025 5:39:13 PM
Status:
Color:
Layer:
Space:

Unresolved:
Provide calculations for all swales (existing & proposed). Show flowlines.

Subject: Callout
Page Label: [1] Layout2
Author: CDurham
Date: 7/2/2025 5:43:38 PM
Status:
Color:
Layer:
Space:

Unresolved:
Text cut off



Subject: Callout
Page Label: [1] Layout2
Author: CDurham
Date: 7/2/2025 5:49:04 PM
Status:
Color:
Layer:
Space:

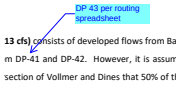
Unresolved:
Provide analysis of street and inlet capacity if pond flow would go through emergency spillway. Provide small write up in report addressing this.

Add't comment:
Include where pond has been submitted to state for hazard/jurisdictional analysis (what is the hazard rating of the pond). Include discussion on what would happen if pond is breeched (where does flow go, what happens with roadside ditch, can flows overtop Vollmer, etc). Give me a call or email for this and we can discuss for specifics, but think about what we did with Sterling Ranch East 5.

Subject: Callout
Page Label: [1] Layout2
Author: CDurham
Date: 7/2/2025 5:56:58 PM
Status:
Color:
Layer:
Space:

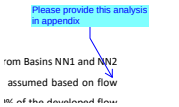
Unresolved:
If flows from DP-42 & 43 continue along Vollmer to DP-47, there should be a x-pan installed. Per routing spreadsheet, flows from 42 & 43 are splitting from going straight and turning the corner, isn't it more likely all flow would continue to south?

Add't comment:
Provide analysis showing how flow splits with 100 year flow. Is flow enough to cross over the crown of Dines?



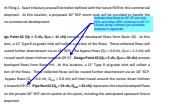
Subject: Callout
Page Label: 21
Author: CDurham
Date: 7/2/2025 6:00:00 PM
Status:
Color:
Layer:
Space:

DP 43 per routing spreadsheet



Subject: Callout
Page Label: 21
Author: CDurham
Date: 7/2/2025 5:59:50 PM
Status:
Color:
Layer:
Space:

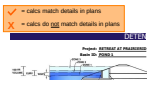
Please provide this analysis in appendix



Subject: Callout
Page Label: 22
Author: CDurham
Date: 7/2/2025 6:02:32 PM
Status:
Color:
Layer:
Space:

Indicate that flows to DP-37 are only 50% and other 50% continue to DP 47 (South along Vollmer) per provided analysis in appendix

Group (2)



Subject: Group
Page Label: 187
Author: Mikayla Hartford
Date: 7/2/2025 4:06:11 PM
Status:
Color:
Layer:
Space:

X

Subject: Group
Page Label: 187
Author: Mikayla Hartford
Date: 7/2/2025 4:22:59 PM
Status:
Color:
Layer:
Space:

Highlight (5)

8.92 Ac.
7.27 Ac.
13.26 Ac.

Subject: Highlight
Page Label: 29
Author: CDurham
Date: 7/2/2025 3:39:43 PM
Status:
Color:
Layer:
Space:

7.27 Ac.

9.33 Ac.
5.68 Ac.
8.92 Ac.

Subject: Highlight
Page Label: 29
Author: CDurham
Date: 7/2/2025 3:40:52 PM
Status:
Color:
Layer:
Space:

5.68 Ac

5.68 Ac.
8.92 Ac.
7.27 Ac.

Subject: Highlight
Page Label: 29
Author: CDurham
Date: 7/2/2025 3:40:53 PM
Status:
Color:
Layer:
Space:

8.92 Ac.

10.15 Ac.
8.20 Ac.
42.32 Ac.

Subject: Highlight
Page Label: 31
Author: CDurham
Date: 7/2/2025 3:44:54 PM
Status:
Color:
Layer:
Space:

8.20 Ac.

8.20 Ac.

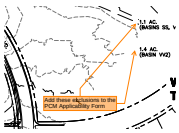
42.32 Ac.

19.98 Ac.

Subject: Highlight
Page Label: 31
Author: CDurham
Date: 7/2/2025 3:44:56 PM
Status:
Color:
Layer:
Space:

42.32 Ac.

SW - Textbox with Arrow (1)



Subject: SW - Textbox with Arrow
Page Label: [1] Model
Author: Mikayla Hartford
Date: 7/2/2025 3:42:19 PM
Status:
Color:
Layer:
Space:

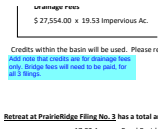
Add these exclusions to the PCM Applicability Form

Text Box (9)

Per Plat ROW area is 12.17 acres

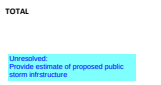
Subject: Text Box
Page Label: 31
Author: CDurham
Date: 7/2/2025 3:51:54 PM
Status:
Color:
Layer:
Space:

Per Plat ROW area is 12.17 acres



Subject: Text Box
Page Label: 32
Author: CDurham
Date: 7/2/2025 4:03:03 PM
Status:
Color:
Layer:
Space:

Add note that credits are for drainage fees only. Bridge fees will need to be paid, for all 3 filings.



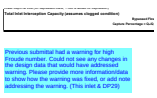
Subject: Text Box
Page Label: 33
Author: CDurham
Date: 7/2/2025 4:07:44 PM
Status:
Color:
Layer:
Space:

Unresolved:
Provide estimate of proposed public storm infrstructure

Missing DP 12c, Please provide

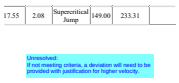
Subject: Text Box
Page Label: 85
Author: CDurham
Date: 7/2/2025 4:57:59 PM
Status:
Color:
Layer:
Space:

Missing DP 12c, Please provide



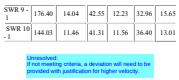
Subject: Text Box
Page Label: 146
Author: CDurham
Date: 7/2/2025 5:07:52 PM
Status:
Color:
Layer:
Space:

Previous submittal had a warning for high Froude number. Could not see any changes in the design data that would have addressed warning. Please provide more information/data to show how the warning was fixed, or add note addressing the warning. (This inlet & DP29)



Subject: Text Box
Page Label: 204
Author: CDurham
Date: 7/2/2025 5:35:07 PM
Status:
Color:
Layer:
Space:

Unresolved:
If not meeting criteria, a deviation will need to be provided with justification for higher velocity.

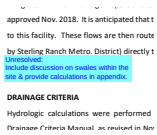


Subject: Text Box
Page Label: 223
Author: CDurham
Date: 7/2/2025 5:36:47 PM
Status:
Color:
Layer:
Space:

Unresolved:
If not meeting criteria, a deviation will need to be provided with justification for higher velocity.

Subject: Text Box
Page Label: 11
Author: CDurham
Date: 7/2/2025 5:58:11 PM
Status:
Color:
Layer:
Space:

Unresolved:
This section should be ultimate or full-build condition. Provide "proposed" condition with only Filing 1 built. Depending on how far F2 is behind F1, will need to know who flows are conveyed thru F2 & 3 to F1.



Subject: Text Box
Page Label: 26
Author: CDurham
Date: 7/2/2025 6:03:36 PM
Status:
Color:
Layer:
Space:

Unresolved:
Include discussion on swales within the site & provide calculations in appendix.