PRELIMINARY DRAINAGE REPORT FOR BANNING LEWIS RANCH FILING NOS. 67, 68, AND 69 & AMENDMENT TO PHASES I AND II BANNING LEWIS RANCH MASTER DEVELOPMENT DRAINAGE PLAN UPDATE

October 2026

Prepared for:
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Engineer's Statement

This report and plan for the drainage design of **Banning Lewis Ranch Filing Nos. 67, 68, and 69** was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Criteria Manual and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal):_____

Kyle R. Campbell, Colorado P.E. No. 29794 Date

Developer's Statement

Clayton Properties Group Inc. a Tennessee Corporation, dba Oakwood Homes Colorado Springs hereby certifies that the drainage facilities for **Banning Lewis Ranch Filing Nos. 67, 68, and 69** shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.4.701 of the City Code; and cannot, on behalf of **Clayton Properties Group Inc. a Tennessee Corporation, dba Oakwood Homes Colorado Springs** guarantee that final drainage design review will absolve **Clayton Properties Group Inc. a Tennessee Corporation, dba Oakwood Homes Colorado Springs** and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the Final Plat does not imply approval of my engineer's drainage design.

Clayton Properties Group Inc. a Tennessee Corporation, dba Oakwood Homes Colorado Springs
Name of Developer

_____
Signed Name

Tyler Jones
Printed Name

Assistant Secretary
Title

9215 Mayflower Gulch Way
Colorado Springs, CO 80927
Address:

City of Colorado Springs Statement:

Filed in accordance with Section 7.4.701 of the Code of the City of Colorado Springs, 2023, as amended.

_____ _____
For SWENT Manager Date

Conditions:

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PURPOSE

This document is the Preliminary Drainage Report for Banning Lewis Ranch Filing Nos. 67, 68, and 69. The purpose of this report is to identify onsite and offsite drainage patterns, storm sewer, inlet locations, and areas tributary to the site, and to safely route developed storm water runoff to adequate outfall facilities. A Development Plan and Final Plats for Filings 67, 68, & 69 have been submitted concurrently with this report. This report is also an Amendment to Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update with the purpose to provide a public detention and water quality facility for the development area.

GENERAL DESCRIPTION

Banning Lewis Ranch Filing 67 has a total area of 24.039 acres and consists of 98 single-family home lots, public residential and collector roadways, neighborhood park site (Tract B), and detention pond drainage tract (Tract A). Banning Lewis Ranch Filing 68 has a total area of 7.542 acres and consists of 58 single-family home lots and public residential roadways. Banning Lewis Ranch Filing 69 is 9.375 acres and consists of 100 single-family home lots and public residential roadways. The proposed development is east of Banning Lewis Parkway and Vista Prado Blvd. and the natural drainage channel (East Fork Sand Creek), south of Dublin Blvd., and surrounded to the south and east by undeveloped land/future Banning Lewis Ranch development. The site is located in Sections 10, 11, 14, & 15, Township 13 South, Range 65 West of the 6th principal meridian in the City of Colorado Springs, El Paso County, Colorado. The site is within the Sand Creek Drainage Basin, which is a closed basin within Oakwood Homes and Norwood Developments properties.

The land disturbance associated with this project and Preliminary Drainage Report is 52.663 acres, including portions of Dublin Blvd. extending from west of the drainage channel - Banning Lewis Ranch Filing 59. One proposed permanent public full-spectrum detention facility (Pond 400) and an existing public full-spectrum detention facility (Pond 300) will handle and treat the developed runoff from the majority of the disturbed area. The adjacent East Fork Sand Creek tributary drainage channel has associated streamside overlay limits but are located outside of the proposed development. No Portions of this project is within Hillside Overlay.

The average soil condition of the Banning Lewis Ranch Filings 67-69 area reflects Hydrologic Group “A” (Blakeland Loamy Sand & Blakeland-Fluvaquentic Haplaquolls) as determined by the “Web Soil Survey of El Paso County Area,” prepared by the National Resources Conservation Service (see map in Appendix). Per the

DCM Group “A” soil coeffiecients are not to be used when overlot grading has occurred. Per the “Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update,” by Kiowa Engineering Corporation and all subsequent MDDP Amendments; Group “B” soil coefficients were used in the calculations as well as for sizing the full-spectrum detention facility. There are no jurisdictional wetlands or Preble’s Meadows Jumping Mouse habitat within the project limits. The adjacent channel has jurisdictional wetlands, located outside of the proposed development limits of disturbance.

PREVIOUS DRAINAGE STUDIES

The proposed development is within the Sand Creek Drainage Basin (East Fork) and as such was studied within the “Sand Creek Drainage Basin Planning Study (DBPS) Preliminary Design Report,” by Kiowa Engineering Corporation last revised March 1996. A DBPS Update was completed by the City of Colorado Springs and Stantec Consulting Services Inc. “Sand Creek Drainage Basin Planning Study Final Report January 2021.” A “Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update,” by Kiowa Engineering Corporation, revised March 19, 2013 provides the general drainage parameters for the Clayton Properties Group and H20 Sub BLR Village 4 LLC land holdings (referred to as ‘Kiowa MDDP’ throughout report). A subsequent “Final Drainage Report for Banning Lewis Ranch Filings 51, 52, 53, 54, 55, & 56 (Village A1), Preliminary Drainage Report for Banning Lewis Ranch Filing 50, and Amendment to Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update,” by Classic Consulting Engineers & Surveyors, LLC dated October 2021 was completed to further define the drainage patterns and pond locations for the portion of BLR west of the East Fork Sand Creek Channel. A “Final Drainage Report for Banning Lewis Ranch Filing Nos. 58, 59, and 60,” by Classic Consulting Engineers & Surveyors, LLC dated June 2025 includes Dublin Blvd. and a portion of the current development plan. This report and development are in direct accordance with the latest MDDP Update by Classic Consulting and further Amend the MDDP Update with a new detention/water quality facility.

EXISTING DRAINAGE CONDITIONS

The proposed site is within the Sand Creek Drainage Basin (East Fork). An Existing Conditions analysis is presented in this report along with existing drainage basin calculations and drainage map (See Appendix).

The Existing Conditions Map from the Kiowa MDDP is included in the Appendix with the Filings 67-69 boundary shown. The site sits within Existing Basins 156, 160, 161, 191, and 193 of the Kiowa MDDP.

Basin EX-A (Q_5 = 30.2 cfs, Q_{100} = 202.6 cfs) is 158.09 acres of undeveloped land within Oakwood Home's overall land holdings north of future Dublin Blvd. This land drains into and contains a large portion of the East Fork Sand Creek channel. The entirety of this basin is undeveloped and drains as sheet flow into and south within the natural drainage channel – Reach 161 (to be dedicated to City upon Final Platting).

Basin EX-B (Q_5 = 18.1 cfs, Q_{100} = 121.8 cfs) is 86.84 acres of undeveloped land south of Basin EX-A and future Dublin Blvd. This land drains into and contains a large portion of the East Fork Sand Creek channel. The entirety of this basin is undeveloped and drains as sheet flow into and south within the natural drainage channel – Reach 161 (to be dedicated to City upon Final Platting). The majority of the Filings 67-69 boundary are within this existing basin.

Basin EX-C (Q_5 = 38.5 cfs, Q_{100} = 258.2 cfs) is 233.86 acres of undeveloped land east of Basins EX-A & EX-B. This land drains into and contains a portion of a small natural drainage channel that eventually reaches a main segment of the West Bierstadt Creek channel (tributary to Sand Creek). The entirety of this basin is undeveloped and drains south and east as sheet flow into and south within the natural drainage path – Reach 191; differing location and direction than Basins EX-A & EX-B.

DEVELOPED DRAINAGE CONDITIONS

The proposed development is in accordance with all applicable master drainage development plans and drainage studies. One proposed public full spectrum detention pond (Pond 400) and one existing public facility (Pond 300) serve the development limits of Filings 67-69, including extension of Dublin Blvd. The proposed Pond 400is designed to serve future Banning Lewis Ranch development and thus some basins are modeled as completely developed, although not included in the current development plan limits. As such, an Interim Runoff model has been included to describe the flow within storm system and proposed Pond 400 with just the Filings 67-69 development. Unless otherwise noted, all storm sewer is PUBLIC and RCP (reinforced concrete pipe), all inlets are City Type 2 curb inlets (formally called CDOT Type R) and fit 6" vertical curb.

The Proposed Facilities Plan/Map from the Kiowa MDDP is included in the Appendix, showing the Filings 67-69 development. The proposed site is within Basins 156, 160, 161, 191, & 193, with the majority within Basin 160 of the Kiowa MDDP. Incorrectly, this MDDP does not show a detention/water quality facility(s) for Basins 160 & 161. As such, this report will fully detail a proposed Public Pond 400, which captures developed runoff and discharges into the natural East Fork Sand Creek channel per all Drainage Criteria requirements.

Reference 'Developed Conditions' Drainage Maps and Calculations in appendix.

Design Point 1 (Q_5 = 2.2 cfs, Q_{100} = 4.1 cfs) is the developed runoff from Basin OS-B, 0.67 acres of future Dublin Blvd. located east of the proposed roundabout at Dublin Blvd. and Rolling Sky Road. This portion of future Dublin Blvd. is planned to drain west and a proposed 10' Type 2 at-grade inlet at this design point (east of channel) will intercept the majority of this runoff, while the remaining flow continues west into the proposed roundabout limits and to the sump inlet at Design Point 4. Pipe 1 will convey the intercepted runoff to a manhole combining with Pipe 2 and draining west within Dublin Blvd. and Pipe 6. This runoff is tributary to proposed Public Pond 400.

Design Point 2 (Q_5 = 2.0 cfs, Q_{100} = 3.9 cfs) is the developed runoff from Basin OS-C, 0.69 acres of future Dublin Blvd. located east of the proposed roundabout at Dublin Blvd. and Rolling Sky Road. This portion of future Dublin Blvd. is planned to drain west and a proposed 10' Type 2 at-grade inlet at this design point (east of channel) will intercept the majority of this runoff, while the remaining flow continues west into the proposed roundabout limits, then south down Rolling Sky Road and to the inlet at Design Point 13. Pipe 2 will convey the intercepted runoff to a manhole combining with Pipe 1 and draining west within Dublin Blvd. and Pipe 6. This runoff is tributary to proposed Public Pond 400.

Design Point 3 (Q_5 = 12.9 cfs, Q_{100} = 28.6 cfs) is the future developed runoff from Basin OS-A, 6.99 acres of future single-family development NE of Dublin Blvd. & Rolling Sky Road. A future Final Drainage Report will be completed with the development of Basin OS-A and will detail the future storm system connecting to the proposed Public 30" RCP stub (Pipe 7). The downstream Public Pond 400 is sized to handle detention and water quality requirements for development of Basin OS-A. Pipe 7 conveys this future runoff into the back of the sump inlet at DP-4. This runoff is tributary to proposed Public Pond 400.

Design Point 4 (Q_5 = 3.5 cfs, Q_{100} = 7.2 cfs) is the developed runoff from Basin A, 1.25 acres of Dublin Blvd. and Rolling Sky Road (including future Rolling Sky) as well as the flow-by from Design Point 1. This runoff drains to a proposed 5' Type 2 sump inlet. Pipe 8 takes the entirety of this runoff plus Pipe 7, to a junction manhole with Pipe 9. Pipe 10 conveys the combined runoff south within Rolling Sky Road, combining with Pipe 6. The emergency overflow path for this inlet is to overtop the crown of Rolling Sky Road to DP-5. This runoff is tributary to proposed Public Pond 400. A variance is being proposed for using this inlet as a junction box.

Design Point 5 (Q_5 = 2.1 cfs, Q_{100} = 4.2 cfs) is the developed runoff from Basin B, 0.75 acres of Rolling Sky Road (including future roadway to the north). This runoff drains to a proposed 5' Type 2 sump inlet. Pipe 9 takes the entirety of this runoff to a junction manhole with Pipe 8. Pipe 10 conveys the combined runoff south within Rolling Sky Road, combining with Pipe 6 and Pipe 11 routing west within Dublin Blvd. The emergency overflow path for this inlet is to overtop the roadway highpoint at the NW corner of the roundabout and drain west onto Dublin Blvd. This runoff is tributary to proposed Public Pond 400. This runoff is tributary to proposed Public Pond 400.

Design Point 6 (Q_5 = 3.6 cfs, Q_{100} = 7.0 cfs) is the developed runoff from Basin C, 1.30 acres of proposed Dublin Blvd. located west of the proposed roundabout at Dublin Blvd. and Rolling Sky Road. This portion of Dublin Blvd. drains west and a proposed 15' Type 2 at-grade inlet at this design point will intercept the majority of this runoff, while the remaining flow continues west along Dublin Blvd. to the existing sump inlet at Design Point 8B. Pipe 12 will convey the intercepted runoff to the inlet at DP-13 with Pipe 13 connecting with Pipe 11 from Dublin Blvd. This runoff is tributary to proposed Public Pond 400.

Design Point 7 (Q_5 = 3.3 cfs, Q_{100} = 6.3 cfs) is the developed runoff from Basin D, 1.14 acres of proposed Dublin Blvd. located west of the proposed roundabout at Dublin Blvd. and Rolling Sky Road. This portion of Dublin Blvd. drains west and a proposed 15' Type 2 at-grade inlet at this design point will intercept the majority of this runoff, while the remaining flow continues west along Dublin Blvd. to the existing sump inlet at Design Point 9. Pipe 13 will convey the intercepted runoff and that from Pipe 12, connecting with Pipe 11 from Dublin Blvd. Pipe 14 conveys the combined runoff into the proposed Filing 69 subdivision. This runoff is tributary to proposed Public Pond 400. A variance is being proposed for using this inlet as a junction box.

Design Point 8A (Q_5 = 9.4 cfs, Q_{100} = 17.5 cfs) is the developed runoff from Basin DU-C, 2.98 acres of existing Dublin Blvd. located west of the East Fork Sand Creek channel crossing. Basin DU-C differs from the approved "Final Drainage Report for Banning Lewis Ranch Filing Nos. 58, 59, and 60," by Classic Consulting Engineers & Surveyors, approved September 2025. Additional analysis was completed for the future commercial development north of this section of existing Dublin Blvd. and it was determined that the original report did not account for enough of the future development draining onto Dublin Blvd. Therefore, the sump inlet at Design Point 8B was reaching capacity without the addition of a Type 2 at-grade inlet at this Design Point 8A. A proposed 10' Type 2 at-grade inlet intercepts a portion of Basin DU-C runoff, while the flow-by continues along Dublin Blvd. to the sump inlet at DP-8B. Pipe 3A will convey the intercepted runoff from this inlet to the sump inlet at DP-8B. This runoff is tributary to existing Public Pond 300 (BLR Filing 59).

Design Point 8B (Q_5 = 6.0 cfs, Q_{100} = 17.5 cfs) is the developed runoff from Basin E, 0.96 acres of existing and proposed Dublin Blvd. at the East Fork Sand Creek channel crossing. The flow-by from inlets at DP-6 & DP-8A also drain to this proposed 10' Type 2 sump inlet. This inlet and storm system were originally designed with the approved "Final Drainage Report for Banning Lewis Ranch Filing Nos. 58, 59, and 60," by Classic Consulting Engineers & Surveyors, approved September 2025. A re-analysis was completed with this report in order to properly quantify the exact runoff to the storm system. Pipe 3B will convey the entirety of this runoff, and that from Pipe 3A, to a junction manhole with Pipe 4. The emergency overflow path for this inlet is to overtop the crown of Dublin Blvd. to DP-9. This runoff is tributary to proposed Public Pond 400. This runoff is tributary to existing Public Pond 300 (BLR Filing 59).

Design Point 9 (Q_5 = 2.6 cfs, Q_{100} = 5.0 cfs) is the developed runoff from Basin DU-E, 0.30 acres of existing Dublin Blvd., Basin F, 0.50 acres of proposed Dublin at the East Fork Sand Creek channel crossing, and the flow-by from inlet at DP-7. A 5' Type 2 sump inlet will intercept the entirety of this runoff. This inlet and storm system were originally designed with the approved "Final Drainage Report for Banning Lewis Ranch Filing Nos. 58, 59, and 60," by Classic Consulting Engineers & Surveyors, approved September 2025. A re-analysis was completed with this report in order to properly quantify the exact runoff to the storm system with the extension of Dublin Blvd. to the east. Pipe 4 will convey the entirety of this runoff, and that from Pipe 3B, to the existing system designed and described with the Filings 58-60 FDR. The emergency overflow path for this inlet is to overtop the southern curb and walk and drain directly into the East Fork Sand Creek

channel. This runoff is tributary to proposed Public Pond 400. This runoff is tributary to existing Public Pond 300 (BLR Filing 59).

Design Point 10 (Q_5 = 6.2 cfs, Q_{100} = 11.7 cfs) is the developed runoff from Basin OS-D, 2.00 acres of future Dublin Blvd. located east of the proposed roundabout at Dublin Blvd. and Rolling Sky Road and east of Basin OS-B. This portion of future Dublin Blvd. is planned to drain to a future sump inlet at this location. A future drainage report will detail this inlet and storm system draining through Basin J and to the pipe stub provided off Rolling Sky Road (Pipe 35 – Design Point 12). This runoff is tributary to proposed Public Pond 400.

Design Point 11 (Q_5 = 5.7 cfs, Q_{100} = 11.2 cfs) is the developed runoff from Basin OS-E, 2.08 acres of future Dublin Blvd. located east of the proposed roundabout at Dublin Blvd. and Rolling Sky Road and east of Basin OS-C. This portion of future Dublin Blvd. is planned to drain to a future sump inlet at this location. A future drainage report will detail this inlet and storm system draining through Basin J and to the pipe stub provided off Rolling Sky Road (Pipe 35 – Design Point 12). This runoff is tributary to proposed Public Pond 400.

Design Point 12 (Q_5 = 41.5 cfs, Q_{100} = 89.5 cfs) is the developed runoff from Basin J, 19.77 acres of future single-family subdivision located SE of Dublin Blvd. and Rolling Sky Road, and that from Design Points 10 & 11. A future drainage report will detail this future subdivision and storm system draining through Basin J and to the 48" RCP pipe stub provided off Rolling Sky Road (Pipe 35). This runoff is tributary to proposed Public Pond 400.

Design Point 13 (Q_5 = 3.7 cfs, Q_{100} = 7.4 cfs) is the developed runoff from Basin H, 1.36 acres of proposed Dublin Blvd. and mostly Rolling Sky Road, and the flow-by from Design Point 2. This runoff drains south along Rolling Sky Road to the proposed 15' Type 2 at-grade inlet at this location, intercepting the majority of this runoff. The flow-by continues south along Rolling Sky Road to the sump inlet at Design Point 17. This runoff is tributary to proposed Public Pond 400.

Design Point 14 (Q_5 = 3.0 cfs, Q_{100} = 5.4 cfs) is the developed runoff from Basin G, 0.83 acres of proposed Rolling Sky Road. This runoff drains south along Rolling Sky Road and onto Kingbird Street (Filing 67) to the proposed 10' Type 2 at-grade inlet at this location, intercepting the majority of this runoff. The flow-by continues west along Kingbird Street to the sump inlet at Design Point 22. Pipe 36 conveys the intercepted

runoff to a manhole in Rolling Sky Road, combining with Pipes 34 & 35. This runoff is tributary to proposed Public Pond 400.

Design Point 15 (Q_5 = 36.9 cfs, Q_{100} = 89.5 cfs) is the developed runoff from Basin Y, 22.93 acres of future single-family subdivision located south of Basin J, east of Rolling Sky Road. A future drainage report will detail this future subdivision and storm system draining through Basin Y and to the 48" RCP pipe stub provided off Rolling Sky Road (Pipe 38). Pipe 38 combines with Pipe 37 at a manhole within Rolling Sky Road, draining south. This runoff is tributary to proposed Public Pond 400.

Design Point 16 (Q_5 = 4.1 cfs, Q_{100} = 8.9 cfs) is the developed runoff from Basin W, 1.89 acres of proposed Rolling Sky Road and a portion of proposed single-family home lots of Filing 67. A proposed 10' Type 2 sump inlet will intercept this runoff in its entirety and proposed Pipe 40 will convey the runoff to a junction manhole, combining with Pipes 39 & 41. The emergency overflow path for this inlet is to overtop the roadway high point of Rolling Sky Road to the south. This runoff is tributary to proposed Public Pond 400.

Design Point 17 (Q_5 = 2.8 cfs, Q_{100} = 6.8 cfs) is the developed runoff from Basin X, 1.69 acres of proposed Rolling Sky Road and the flow-by from Design Point 13. A proposed 5' Type 2 sump inlet will intercept this runoff in its entirety and proposed Pipe 41 will convey the runoff to a junction manhole, combining with Pipes 39 & 40. The emergency overflow path for this inlet is to overtop the roadway high point of Rolling Sky Road to the south. This runoff is tributary to proposed Public Pond 400.

Design Point 18 (Q_5 = 5.5 cfs, Q_{100} = 13.5 cfs) is the developed runoff from Basin P, 4.03 acres of proposed Horned Lark Drive and proposed single-family home lots of Filing 67 & 69. A proposed 10' Type 2 sump inlet will intercept this runoff in its entirety and proposed Pipe 15 will convey the runoff to a manhole combining with Pipe 16. The emergency overflow path for this inlet is to overtop the roadway high point of Horned Lark Drive to the south. This runoff is tributary to proposed Public Pond 400.

Design Point 19 (Q_5 = 6.3 cfs, Q_{100} = 14.1 cfs) is the developed runoff from Basin N, 3.33 acres of proposed Horned Lark Drive, private drives, and proposed single-family home lots of Filing 67 & 69. A proposed 15' Type 2 sump inlet will intercept this runoff in its entirety and proposed Pipe 16 will convey the runoff to a

manhole combining with Pipe 15. The emergency overflow path for this inlet is to overtop the roadway high point of Horned Lark Drive to the south. This runoff is tributary to proposed Public Pond 400.

Design Point 20 (Q_5 = 4.4 cfs, Q_{100} = 12.3 cfs) is the developed runoff from Basin K, 3.52 acres of proposed Horned Lark Drive and proposed single-family home lots of Filing 69. This runoff drains south along Horned Lark Drive to the proposed 10' Type 2 at-grade inlet at this location, intercepting a portion of this runoff. The flow-by continues south onto Kingbird Street and to the sump inlet at Design Point 21. This runoff is tributary to proposed Public Pond 400.

Design Point 21 (Q_5 = 4.5 cfs, Q_{100} = 14.3 cfs) is the developed runoff from Basin L, 2.19 acres of proposed Horned Lark Drive, Kingbird Street, and proposed single-family home lots of Filing 69. The flow-by from Design Point 20 also reaches the proposed 10' Type 2 sump inlet at this location. The inlet intercepts this runoff in its entirety and proposed Pipe 19 will convey the runoff to a junction manhole, combining with Pipes 18 & 20. The emergency overflow path for this inlet is to overtop the roadway highpoint at Kingbird Street and Wide Horizon Drive, draining south. This runoff is tributary to proposed Public Pond 400.

Design Point 22 (Q_5 = 1.1 cfs, Q_{100} = 3.3 cfs) is the developed runoff from Basin M, 0.49 acres of proposed Kingbird Street, and proposed single-family home lots of Filing 67. The flow-by from Design Point 14 also reaches the proposed 5' Type 2 sump inlet at this location. The inlet intercepts this runoff in its entirety and proposed Pipe 20 will convey the runoff to a junction manhole, combining with Pipes 18 & 19. The emergency overflow path for this inlet is to overtop the roadway highpoint at Kingbird Street and Wide Horizon Drive, draining south. This runoff is tributary to proposed Public Pond 400.

Design Point 23 (Q_5 = 4.7 cfs, Q_{100} = 10.4 cfs) is the developed runoff from Basin R, 2.65 acres of proposed Horned Lark Drive and proposed single-family home lots of Filing 68. This runoff drains south then east along Horned Lark Drive to the proposed 10' Type 2 at-grade inlet at this location, intercepting a portion of this runoff. The flow-by continues east onto Wide Horizon Drive and to the inlet at Design Point 24. This runoff is tributary to proposed Public Pond 400.

Design Point 24 (Q_5 = 6.1 cfs, Q_{100} = 16.3 cfs) is the developed runoff from Basin Q, 3.10 acres of proposed Horned Lark Drive, Wide Horizon Drive, and proposed single-family home lots of Filing 68. This runoff drains

south along Wide Horizon Drive to the proposed 10' Type 2 at-grade inlet at this location, intercepting a portion of this runoff. The flow-by continues south along Wide Horizon Drive and to the sump inlet at Design Point 28. This runoff is tributary to proposed Public Pond 400.

Design Point 25 (Q_5 = 4.5 cfs, Q_{100} = 10.0 cfs) is the developed runoff from Basin S, 2.24 acres of proposed Wide Horizon Drive and proposed single-family home lots of Filing 67. This runoff drains south along Wide Horizon Drive to the proposed 10' Type 2 at-grade inlet at this location, intercepting a portion of this runoff. The flow-by continues south along Wide Horizon Drive and to the sump inlet at Design Point 27. This runoff is tributary to proposed Public Pond 400.

Design Point 27 (Q_5 = 4.5 cfs, Q_{100} = 12.3 cfs) is the developed runoff from Basin T, 2.24 acres of proposed Wide Horizon Drive and proposed single-family home lots of Filing 67. The flow-by from Design Point 25 also reaches the proposed 10' Type 2 sump inlet at this location. The inlet intercepts this runoff in its entirety and proposed Pipe 28 will convey the runoff to a manhole combining with Pipe 29. The emergency overflow path for this inlet is to overtop the curb and walk on the south side of Wide Horizon Drive and into the open space/park tract then into the adjacent drainage channel to the southwest. This runoff is tributary to proposed Public Pond 400.

Design Point 28 (Q_5 = 3.3 cfs, Q_{100} = 13.0 cfs) is the developed runoff from Basin V, 1.23 acres of proposed Wide Horizon Drive and proposed single-family home lots of Filing 67. The flow-by from Design Point 24 also reaches the proposed 10' Type 2 sump inlet at this location. The inlet intercepts this runoff in its entirety and proposed Pipe 29 will convey the runoff to a manhole combining with Pipe 28. The emergency overflow path for this inlet is to overtop the curb and walk on the south side of Wide Horizon Drive and into the open space/park tract then into the adjacent drainage channel to the southwest. This runoff is tributary to proposed Public Pond 400.

Design Point 29 (Q_5 = 2.8 cfs, Q_{100} = 9.7 cfs) is the developed runoff from Basin AA, 3.25 acres of proposed Filing 67 Park site. A proposed PRIVATE 24" RCP storm stub (Pipe 32) is extended into this park site for connection of a private park drainage system. The layout of the park and therefore private drainage specifics are not known at this time. This runoff/pipe connects to the public main coming from the north prior to

discharging directly into the proposed Public Detention Facility (Pond 400) at Design Point 30. This runoff is tributary to proposed Public Pond 400.

Design Point 30/Detention/Storm Water Quality Facility 'Pond 400' (Q_5 = 148.8 cfs, Q_{100}= 331.4 cfs) is the fully developed runoff into the Proposed public Detention/Storm Water Quality Facility Pond 400, including Basin BB, 3.69 acres of the detention facility and surrounding slope area. Pipes 33 and 42 drain into the facility and concrete impact structures and forebays are proposed at each entry point (See Appendix for MHFD sizing).

A total of 97.30 acres of tributary area (ultimate build-out) drains to this facility, with a composite impervious value of 60.40%. The composite impervious value was determined using DCM Table 6-6 and the following breakdown of the tributary area:

Single Family Residential (1/8 D.U./acres – 65% impervious)	*72.96 Acres*
Pavement (roads outside of lot development) – 100% impervious)	*10.72 Acres*
Landscaped area (outside of lot development – 2% impervious)	*6.68 Acres*
Neighborhood Park Site and Detention Facility Area (7% impervious)	*6.94 Acres*

A proposed public 42" RCP outlet (Pipe 42) will convey the detained release (Q_5 = 2.4 cfs, Q_{100}= 81.4 cfs) to the west directly into the existing East Fork Sand Creek drainage channel – Reach 161. A 'Fee in Lieu of Channel Improvements Agreement' is in place with the City of Colorado Springs that allows for channel improvements to be constructed as needed by the City. At this time, the downstream channel is very stable and established with native vegetation. The overflow path for the pond spillway (emergency event) is to drain west directly into the adjacent East Fork Sand Creek tributary channel (City property). The entirety of the pond (spillway and pipe outfall) and grading improvements are higher than and outside of the channel FEMA 100-year floodplain limits. The uncertainty of the ultimate channel improvements by the City of Colorado Springs and desire to avoid FEMA permitting is dictating the pond outfall design and the proposed disturbance will not extend to the channel bottom, nor disturb the jurisdictional wetlands located in the channel bottom. Extension of the outfall pipe may be done by the City of Colorado Springs at the time of channel improvements as needed.

Maintenance of the Public detention/water quality structures is by the City of Colorado Springs. Aesthetic maintenance of the facility is by the Banning Lewis Ranch Metro District No. 8. The proposed facility will be within a platted Tract A of proposed Banning Lewis Ranch Filing 67.

FILING 67-69 INTERIM DEVELOPED CONDITIONS

Since all of the tributary area to Pond 400 is not being built with the proposed Filing 67-69 development, an Interim Conditions analysis was completed to accurately build the Pond 400 outlet structure to required release rates.

Basins OS-A, OS-B, OS-C, OS-D, OS-E, J, and Y have been removed from the tributary area and thus the Interim Conditions Pond 400 is as follows:

A total of 42.17 acres of tributary area (interim build-out) drains to this facility, with a composite impervious value of 52.60%. The composite impervious value was determined using DCM Table 6-6 and the following breakdown of the tributary area:

Single Family Residential (1/8 D.U./acres – 65% impervious)	*23.27 Acres*
Pavement (roads outside of lot development) – 100% impervious)	*6.45 Acres*
Landscaped area (outside of lot development – 2% impervious)	*5.51 Acres*
Neighborhood Park Site and Detention Facility Area (7% impervious)	*6.94 Acres*

MHFD-Detention Pond Modeling is included in the Appendix for both the Ultimate and Interim drainage conditions. A proposed public 42" RCP outlet (Pipe 42) will convey the Filing 67-69 – Interim detained release (Q_5 = 0.7 cfs, Q_{100}= 2.0 cfs) to the west directly into the existing East Fork Sand Creek drainage channel – Reach 161. The only modification made to the outlet structure of Pond 400 between the Ultimate and Interim conditions is the orifice plate hole sizing.

EROSION CONTROL PLAN

The Grading and Erosion Control Plan and associated cost estimate will be submitted separately to the City of Colorado Springs and construction assurances must be posted prior to obtaining a grading permit.

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs Drainage Criteria Manuals (Vol. 1 – revised January 2021, Vol. 2 – revised December 2020). Stormwater quality analysis and Extended Detention Basin (EDB) design for the proposed public full-spectrum detention facility is per the Mile High Flood District (MHFD) Manual software and criteria. The Rational Method was used to estimate stormwater runoff (5-year and 100-year recurrence interval) to the proposed inlets, storm sewer pipes, and outfall locations. The MHFD UD-Inlet Excel workbook was used to verify street capacities, calculate at-grade inlet interceptions, and size sump inlets. Hydraulic grade lines (HGLs) for minor and major storm events will be completed using UD-Sewer software program in a future Final Drainage Report. Financial assurances will be collected for the cost of the Public Permanent PCM and Public storm sewer system.

Rainfall depths per NOAA Atlas 14, Volume 8, Version 2 – Colorado Springs, CO were utilized for the MH-Detention (Pond Modeling) runoff calculations (see Appendix) and equate to the following 1-hour rainfall depths: 2yr = 1.03”, 5yr = 1.32”, 10yr = 1.59”, 25yr = 2.01”, 50yr = 2.38”, 100yr = 2.77”, 500yr = 3.84”. Basin, inlet, & pipe calculations using the Rational Method utilized DCM 1-hour rainfall depths: 2yr = 1.19”, 5yr = 1.50”, 10yr = 1.75”, 25yr = 2.00”, 50yr = 2.25”, and 100yr = 2.52”. Rainfall intensity is calculated using DCM Vol 1 Chapter 6 (Figure 6-5). Runoff coefficients from Table 6-6, DCM Vol. 1 used.

FOUR STEP PROCESS

Total disturbance area is 52.663 acres (2,294,006 SF) and the 4-step process and detention criteria will apply.

Detention will be provided in proposed and existing public full spectrum extended detention permanent control measures (Ponds). All future developments discussed within this FDR must also meet the 4-step process.

The exclusions for this development (6.854 acres) are areas to be disturbed but will remain undeveloped. Total Disturbance Area with exclusions is 45.809 acres (1,995,461 SF).

The site adheres to this Four Step Process as follows:

1. **Employ Runoff Reduction Practices:** The site is in compliance with the Green Infrastructure Manual and Policy Clarification for WQCV Reduction, see Appendix for calculations and exhibit. A planned infiltration area will be located in the proposed permanent control measures in the wetted area during the water quality storm event.
    - **Pond '300'** = 49,615 SF (1.139 AC) 100% Treated at 20% Reduction
      Total Pond '300' area includes off-site RPA (6,284 SF)
    - **Pond '400' =** 1,932,027 SF (44.353 AC) 100% Treated @ 20% Reduction
    - **Direct Release** = 13,819 SF (0.317 AC) 0.69% of disturbance area (less than 5%)

      A cumulative 11% WQCV reduction is being provided for 99.31% of the applicable disturbance area. The meets the required 10% reduction. See Appendix for Green Infrastructure Exhibit, Runoff Reduction Worksheet (COS-ICM Tool), and summary table of combined cumulative reduction.

2. **Implement control measures that provide a Water Quality Capture Volume with slow release:**

STEP 2 SUMMARY TABLE			
AREA ID	**ASSOCIATED DISTURBANCE AREA (AC.)**	**TREATMENT METHOD**	**OWNERSHIP/MAINTENANCE**
BASINS: E & F	1.139	Extended Detention Basin (Pond 300)	Public (City of Colorado Springs)
BASINS: A, B, C, D, G, H, K, L, M, N, P, Q, R, S, T, V, W, X, AA, BB	44.353	Extended Detention Basin (Pond 400)	Public (City of Colorado Springs)
BASINS: JJ, UN-1, UN-2	6.854	Undeveloped Land Exclusion	N/A
BASINS: CC & DD	0.317	Not Treated (less than 5% and not more than 1 acre)	N/A
TOTAL DISTURBANCE	52.663		
TOTAL DISTURBANCE WITH EXCLUSIONS	45.809	2,351,346 (SF)	
TOTAL TREATED AREA	45.492	Total Distrurbance with Exclusions Minus Not Treated Areas	
% TREATED	99.31%		

Overflow spillway routing will direct stormwater into the natural, historic drainage path of the undeveloped land.

Pond '300' is an existing sub-regional facility with an ultimate tributary area of 49.45 acres and a total available Planned Infiltration Area (PIA) or (RPA) of 31,713 sf. Previous developments have used portions of this available PIA, of which 21,713 sf remains for future development subject to GI requirements and tributary to Pond '300'. The proposed Filings 67-69 (specifically Dublin Blvd.) require 2,167 sf of this remaining PIA; leaving a total of 19,546 sf for future development use.

Pond '400' is a proposed sub-regional facility with an ultimate tributary area of 97.30 acres and a total available Planned Infiltration Area (PIA) or (RPA) of 63,736 sf. The proposed disturbance tributary to Pond '400' is 44.353 acres (45.58% of tributary area) and requires an RPA of 24,022 sf (37.69% of available). This leaves an RPA of 39,714 sf for future developments tributary to Pond '400'.

3. **Stabilize Drainageways:** Stormwater drainage from the subject property is being routed through permanent control measure facilities prior to being released to the historic drainage path as previously described. The site is adjacent to existing channels that require improvements. All released stormwater is protected with appropriate energy dissipation riprap. All new and re-development projects are required to participate in funding of channel stabilization measures. Drainage basin fees, paid at the time of plat recording, go toward channel stabilization within the drainage basin. Also, Oakwood Homes has developed a 'Fee in lieu of Channel Improvements' agreement with the City of Colorado Springs for the East Fork Sand Creek channel through the Oakwood Homes holdings.

4. **Implement Site Specific and Other Source Control Measures:** The subject site will be required to implement Source Control Measures applicable to Commercial and Industrial Operations as recommended in MHFD Volume 3 Chapter 5 listed as:

    a. Covering outdoor storage and handling areas.
    b. Spill prevention containment and control.
    c. Street sweeping.
    d. Good housekeeping.
    e. Preventative maintenance.
    f. Vehicle maintenance, fueling & storage
    g. Snow and Ice Management

    The site development plan includes a final landscape plan (provided by others) that will provide the final site stabilization of all disturbed areas within the development.

FLOODPLAIN STATEMENT

No portion of Banning Lewis Ranch Filings 57-59 is within the adjacent floodplain limits as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C 0545G effective date, December 7, 2018 (See Appendix). Specifically, an Existing Conditions LOMR 22-08-0717P effective 02/06/2025 was completed to define the adjacent floodplain limits. As no portion of the grading is disturbing the existing jurisdictional wetlands (channel bottom), no permit or coordination with the United States Corps of Engineers is required.

DRAINAGE AND BRIDGE FEES

This site is within the Sand Creek Drainage Basin boundaries. Per the Sand Creek DBPS Update, the basin fee calculations have been revised. There are no longer Bridge, Pond Land, Pond Facility, Surcharge fees, only a Drainage Fee of $27,850 per acre of land (2026). However, the portions of Sand Creek Basin that are Norwood Development and Oakwood Homes holdings have been 'closed', and therefore basin fees are NOT required for the proposed Banning Lewis Ranch Filings 67-69.

This portion of Banning Lewis Ranch is subject to a City Channel Fee for the East Fork Sand Creek in the amount of $32,216.50/acre for the year 2026. The total channel fee must be paid prior to plat recordation. The **Channel Fees** are as follows:

Fil. 67	**24.039 acres x $32,216.50/acre**	**=**	**$ 774,452.44**
Fil. 68	**7.542 acres x $32,216.50/acre**	**=**	**$ 242,976.84**
Fil. 69	**9.375 acres x $32,216.50/acre**	**=**	**$ 302,029.69**
Total	**40.956 acres x $32,216.50/acre**	**=**	**$1,319,458.97**

SUMMARY

Runoff from the proposed Banning Lewis Ranch Filings 67-69 and surrounding infrastructure is collected in proposed public storm sewer systems and routed to permanent public detention/storm water quality facilities (Existing Pond 300, Proposed Pond 400). The treated runoff from these facilities is to be released into the adjacent downstream drainage channels. This report is in general conformance with all applicable master drainage studies and previous reports for Banning Lewis Ranch, as well as the City of Colorado Springs Drainage Criteria Manuals. Site runoff, storm drains and appurtenances will not adversely affect the downstream and surrounding developments.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC
Matthew Larson
Project Manager

db/257080/REPORTS/FDR-BLR-58-59-60.docx

REFERENCES

1. City of Colorado Springs Drainage Criteria Manual Volume 1, May 2014, revised January 2021.

2. City of Colorado Springs Drainage Criteria Manual Volume 2, May 2014, revised December 2020.

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

4. "Sand Creek Drainage Basin Planning Study Final Report January 2021," Stantec Consulting Services, Inc.

5. "Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update," by Kiowa Engineering Corporation dated December 6, 2012, revised March 19, 2013.

6. Urban Storm Drainage Criteria Manual: Volume 3 Best Management Practices, updated November 2010, Urban Drainage and Flood Criteria District (now known as Mile High Flood District).

7. "Final Drainage Report for Banning Lewis Ranch Filings 51, 52, 53, 54, 55 & 56 (Village A1), Preliminary Drainage Report for Banning Lewis Ranch Filing 50, & Amendment to Phases I and II Banning Lewis Ranch Master Development Drainage Plan Update," by Classic Consulting Engineers & Surveyors, LLC, dated October 2021.

8. FEMA Firmette by USGS National Map, msc.fema.gov/portal/home

9. Soils Map by Natural Resources Conservation Service – Web Soil Survey National Cooperative Soil Survey. Websoilsurvey.nrcs.usda.gov/app/

10. NOAA Atlas 14, Volume 8, Version 2 – US Department of Commerce national Oceanic and Atmospheric Administration National Weather Service.

11. "Final Drainage Report for Banning Lewis Ranch Filing Nos. 58, 59, and 60," by Classic Consulting Engineers & Surveyors, LLC, dated June 2025 (STM-REV25-0647)

12. "Final Drainage Report for Banning Lewis Ranch Filing Nos. 62, 63, 64, 65, and 66," by Classic Consulting Engineers & Surveyors, LLC, dated April 2026 (STM-REV26-0334)

APPENDIX

NOAA Atlas 14, Volume 8, Version 2
Location name: Colorado Springs, Colorado, USA*
Latitude: 38.81°, Longitude: -104.6883°
Elevation: 6172 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.239 (0.202-0.286)	0.289 (0.244-0.346)	0.377 (0.317-0.453)	0.456 (0.380-0.549)	0.572 (0.462-0.723)	0.668 (0.525-0.854)	0.770 (0.581-1.01)	0.879 (0.633-1.18)	1.03 (0.711-1.43)	1.16 (0.770-1.62)
10-min	0.350 (0.295-0.419)	0.424 (0.357-0.507)	0.552 (0.464-0.663)	0.667 (0.557-0.804)	0.837 (0.677-1.06)	0.978 (0.768-1.25)	1.13 (0.851-1.48)	1.29 (0.927-1.74)	1.51 (1.04-2.10)	1.69 (1.13-2.37)
15-min	0.427 (0.360-0.510)	0.516 (0.435-0.618)	0.673 (0.566-0.808)	0.814 (0.679-0.981)	1.02 (0.826-1.29)	1.19 (0.937-1.53)	1.38 (1.04-1.80)	1.57 (1.13-2.12)	1.84 (1.27-2.56)	2.06 (1.38-2.89)
30-min	0.656 (0.554-0.784)	0.791 (0.667-0.947)	1.03 (0.864-1.24)	1.24 (1.04-1.50)	1.56 (1.26-1.97)	1.82 (1.43-2.32)	2.09 (1.58-2.75)	2.39 (1.72-3.22)	2.81 (1.94-3.90)	3.14 (2.10-4.40)
60-min	0.878 (0.741-1.05)	1.03 (0.870-1.24)	1.32 (1.11-1.58)	1.59 (1.32-1.92)	2.01 (1.64-2.57)	2.38 (1.87-3.06)	2.77 (2.10-3.66)	3.21 (2.32-4.36)	3.84 (2.66-5.36)	4.36 (2.91-6.11)
2-hr	1.10 (0.937-1.31)	1.27 (1.08-1.51)	1.61 (1.36-1.92)	1.94 (1.63-2.32)	2.46 (2.03-3.14)	2.93 (2.34-3.77)	3.45 (2.64-4.54)	4.03 (2.94-5.45)	4.88 (3.40-6.78)	5.59 (3.75-7.78)
3-hr	1.22 (1.04-1.44)	1.38 (1.18-1.64)	1.72 (1.47-2.05)	2.08 (1.76-2.48)	2.66 (2.22-3.41)	3.20 (2.57-4.11)	3.80 (2.93-5.00)	4.48 (3.29-6.05)	5.49 (3.85-7.61)	6.34 (4.28-8.79)
6-hr	1.38 (1.19-1.63)	1.56 (1.34-1.83)	1.93 (1.66-2.28)	2.33 (1.99-2.76)	3.00 (2.53-3.84)	3.63 (2.94-4.65)	4.34 (3.37-5.69)	5.14 (3.81-6.92)	6.35 (4.49-8.76)	7.37 (5.01-10.2)
12-hr	1.52 (1.32-1.77)	1.74 (1.51-2.04)	2.19 (1.90-2.57)	2.65 (2.28-3.12)	3.39 (2.86-4.27)	4.06 (3.31-5.15)	4.81 (3.76-6.24)	5.66 (4.21-7.54)	6.90 (4.91-9.43)	7.94 (5.44-10.9)
24-hr	1.68 (1.47-1.95)	1.96 (1.71-2.27)	2.48 (2.16-2.89)	2.99 (2.59-3.50)	3.79 (3.21-4.70)	4.48 (3.67-5.62)	5.25 (4.13-6.74)	6.10 (4.57-8.05)	7.34 (5.25-9.94)	8.36 (5.76-11.4)
2-day	1.91 (1.69-2.20)	2.23 (1.97-2.57)	2.81 (2.48-3.26)	3.36 (2.94-3.90)	4.20 (3.57-5.15)	4.92 (4.06-6.10)	5.70 (4.51-7.24)	6.56 (4.94-8.56)	7.79 (5.60-10.4)	8.79 (6.11-11.9)
3-day	2.08 (1.85-2.39)	2.43 (2.15-2.79)	3.04 (2.69-3.51)	3.61 (3.17-4.18)	4.48 (3.82-5.45)	5.21 (4.31-6.41)	6.00 (4.76-7.57)	6.86 (5.18-8.90)	8.08 (5.84-10.8)	9.07 (6.33-12.2)
4-day	2.23 (1.99-2.55)	2.59 (2.31-2.97)	3.23 (2.87-3.72)	3.82 (3.37-4.41)	4.70 (4.02-5.70)	5.45 (4.52-6.68)	6.24 (4.97-7.85)	7.10 (5.39-9.19)	8.33 (6.03-11.1)	9.31 (6.52-12.5)
7-day	2.58 (2.32-2.94)	2.99 (2.68-3.41)	3.70 (3.31-4.23)	4.34 (3.86-4.98)	5.28 (4.54-6.34)	6.06 (5.05-7.36)	6.88 (5.51-8.58)	7.76 (5.91-9.95)	8.99 (6.55-11.9)	9.98 (7.03-13.3)
10-day	2.90 (2.61-3.28)	3.34 (3.02-3.80)	4.12 (3.70-4.69)	4.80 (4.28-5.49)	5.79 (4.99-6.91)	6.60 (5.52-7.98)	7.45 (5.98-9.24)	8.35 (6.39-10.7)	9.60 (7.02-12.6)	10.6 (7.49-14.1)
20-day	3.80 (3.46-4.29)	4.37 (3.98-4.93)	5.32 (4.82-6.02)	6.13 (5.52-6.97)	7.28 (6.30-8.57)	8.19 (6.89-9.78)	9.12 (7.37-11.2)	10.1 (7.76-12.7)	11.4 (8.38-14.8)	12.4 (8.85-16.4)
30-day	4.57 (4.18-5.13)	5.24 (4.79-5.89)	6.36 (5.79-7.16)	7.28 (6.59-8.24)	8.56 (7.44-10.0)	9.56 (8.08-11.3)	10.6 (8.56-12.9)	11.6 (8.94-14.5)	12.9 (9.54-16.7)	14.0 (9.99-18.4)
45-day	5.54 (5.10-6.19)	6.37 (5.85-7.13)	7.70 (7.05-8.64)	8.79 (7.99-9.91)	10.3 (8.92-11.9)	11.4 (9.63-13.4)	12.4 (10.1-15.0)	13.5 (10.5-16.8)	14.9 (11.0-19.1)	15.9 (11.4-20.9)
60-day	6.37 (5.88-7.10)	7.34 (6.77-8.19)	8.88 (8.16-9.94)	10.1 (9.23-11.4)	11.7 (10.2-13.5)	12.9 (11.0-15.2)	14.1 (11.5-16.9)	15.2 (11.8-18.8)	16.6 (12.3-21.2)	17.6 (12.7-23.0)

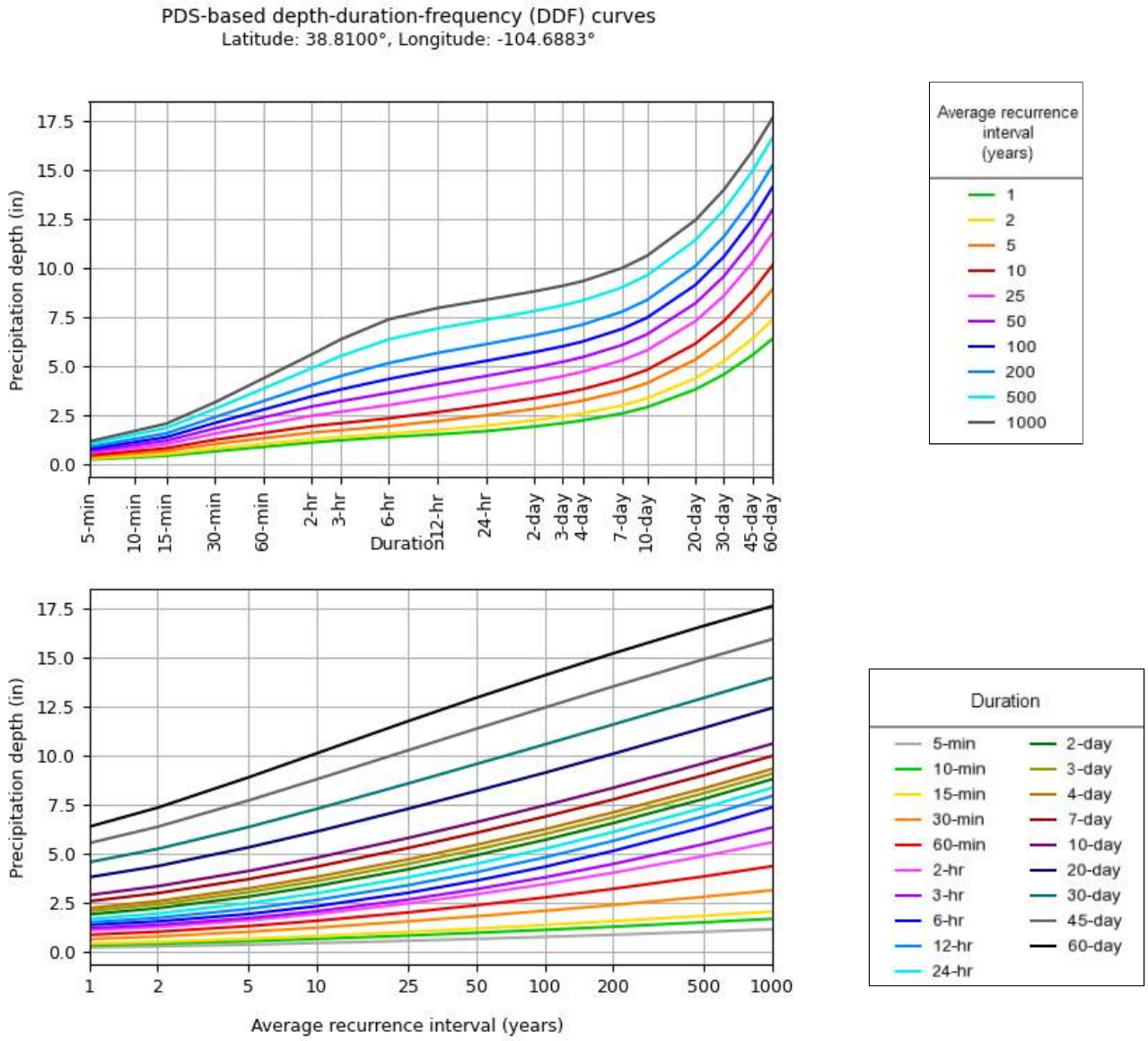
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



NOAA Atlas 14, Volume 8, Version 2

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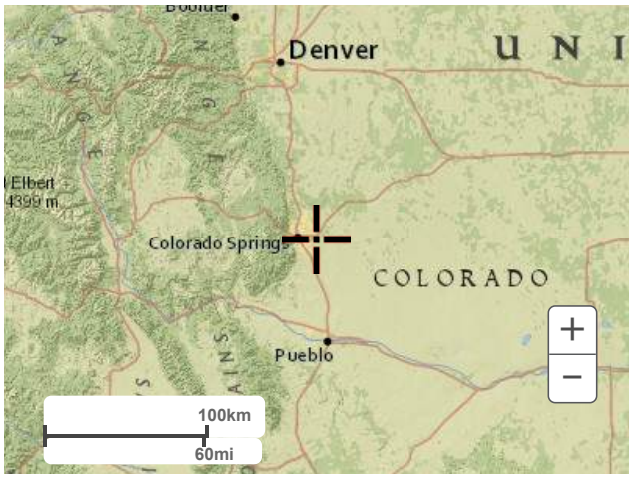
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Maps & aerials

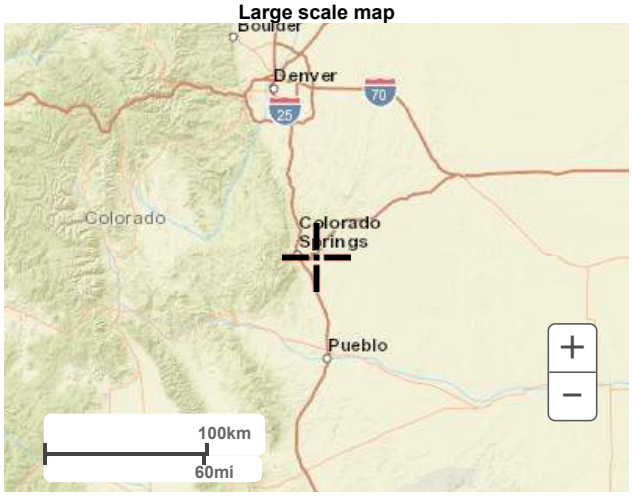
Small scale terrain



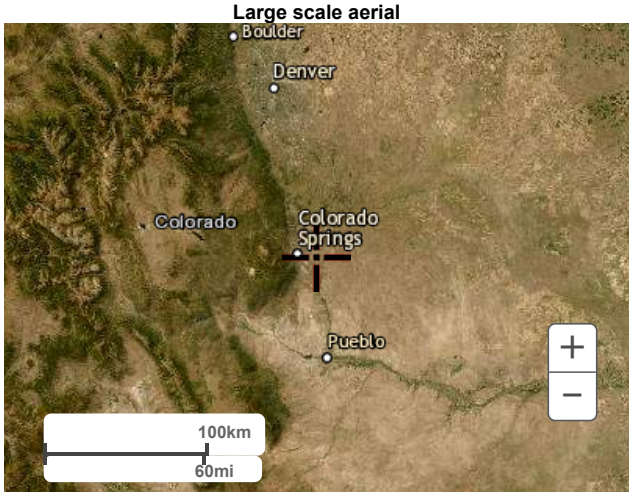
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

October 15, 2026

City of Colorado Springs
Water Resources Engineering Division
30 S. Nevada Avenue, Suite 401
Colorado Springs, CO 80903

ATTN: Mr. Jonathan Scherer
RE: Banning Lewis Ranch Filings 67-69 Storm Sewer – Junction Inlets

Dear Mr. Scherer:

Classic Consulting Engineers & Surveyors, LLC (CCES), on behalf of our client, Clayton Properties Group Inc. a Tennessee Corporation, dba Oakwood Homes Colorado Springs, respectfully requests the City's consideration of the following variances:

1. Inlets being used as junctions - Drainage Criteria Manual Volume 1 (Chapter 9, Section 6.2)

Background:

The Banning Lewis Ranch Filings 67-69 development is located in completely undeveloped land, east of the East Fork Sand Creek Channel and the currently under construction intersection of Dublin Blvd. and Vista Prado Blvd. (BLR Filing 59). There are no existing developments directly adjacent, with Banning Lewis Ranch Filings 58-60 to the west, across the natural drainage channel (City Owned). Dublin Blvd. (already platted) is to be extended east, across the channel, with a roundabout installed at Dublin Blvd. and Rolling Sky Road. Access into Filings 67-69 is off the collector roadway – Rolling Sky Road. The site is located in Sections 10, 11, 14, & 15, Township 13 South, Range 65 west, of the 6th Principal Meridian, City of Colorado Springs, County of El Paso, and State of Colorado. The topography generally slopes from north to south and east to west and directly into the East Fork Sand Creek drainage channel. This development consists of single-family residential, neighborhood park, open space, and detention facility.

The (3) inlets being proposed to be used as 'junctions' are along Dublin Blvd. The estimated land disturbance associated with construction is 52.663 acres.

1. **Manhole Types (City of Colorado Springs Drainage Criteria Manual, Vol. 1, Chapter 9, Section 6.2, May 2014 revised January 2021)** – Inlets may be used as junction structures in place of manholes to connect adjacent inlets if the interconnecting pipe can be fit within the standard inlet dimensions without modification to the inlet and if the additional flow can be passed through the structure in accordance

with standard hydraulic criteria. Inlets may not be used as junction along trunk lines larger than 24" in diameter on public systems, subject to limitations on individual structure details. On private systems, inlets may be used as junctions along trunk lines as long as 6" of wall space is left between the outer wall of the connecting pipe and an adjacent structure wall.

As previously mentioned, there are (3) inlet/locations along Dublin Blvd. where inlets are being proposed as junctions. There are as follows from west to east:

1) An at-grade inlet is needed at the north-east corner of Dublin Blvd. and Vista Prado Blvd. intersection (Design Point 8A) in order to maintain sump inlet capacity at Design Point 8B. Pipe 3A is a Public 18" pipe that will exit the side of the Type 2 at-grade inlet and enter the side of the Type 2 sump inlet at DP-8B. Pipe 3B is a Public 30" and will exit the front of the 10' wide sump inlet connecting to a public manhole in the roadway. The entry and exiting of the Type 2 inlets can be done without modifications. The alternative alignment to run Pipe 3A south and connecting with the downstream storm system is not possible due to the numerous utility crossing conflicts within Dublin, specifically the 24" and 8" water mains within the roadway (water lowerings required). Pipe 3B and the water crossings it makes, have been designed to provide the required vertical clearances with water pipe deflections (not lowerings) and the 24" is approved and under construction. There is approximately 130 LF of 18" pipe between the two inlets, and 100 LF of 30" pipe between the sump inlet and the manhole within Dublin Blvd.

2) Two at-grade inlets are located along Dublin Blvd. (north and south side, Design Points 6 & 7), just east of the channel crossing. These inlets are necessary to intercept runoff prior to draining across the box culvert structure and to route the developed runoff to a pond on the east side of the channel, rather than have the runoff continue west and exceed capacities of the storm sewer and pond infrastructure. The Pipe 12 between the inlets is a proposed Public 18" pipe and can adequately fit within the front of these 10' wide Type 2 inlets without modifications. Pipe 13 – Public 24", will exit out the back of the southern inlet and connect at a manhole with a larger trunk main from Dublin. There is approximately 91 LF of 18" between the two inlets, and 31 LF of 24" between the southern inlet and the junction manhole.

3) A storm sewer stub (Pipe 7) is provided into a future development parcel (Design Point 3/Basin OS-A) for future connection of a storm system and draining to a downstream stormwater quality and detention facility. This 30" pipe is proposed to connect the back of the 5' wide Type 2 sump inlet (Design Point 4) and another 30" Public Storm (Pipe 8) exiting the inlet and connecting to an adjacent manhole within the roadway. Both pipes adequately fit within the 5' wide inlet, leaving over 6" of wall space between the outer pipe wall and inside box dimension. There is approximately 32 LF of 30" storm pipe between the inlet and the manhole.

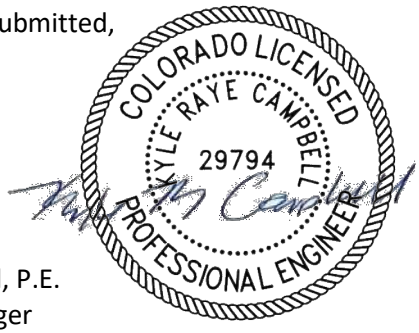
Justification:

We feel variances are justified at these locations as utilizing the public inlets as junction boxes eliminates additional structures and water main lowerings. This allows for more efficient construction, reduces long term maintenance issues and provides a more efficient hydraulic system. The Type 2 inlets can adequately accommodate the pipe sizes without structural modifications.

It is our professional engineering opinion that this variance is justified. If granted, this variance will not result in any increase in flows nor will it result in any decrease in water quality in Fountain Creek. This variance will not negate the minimum requirements of the City of Colorado Springs Drainage Criteria Manual Four Step Process.

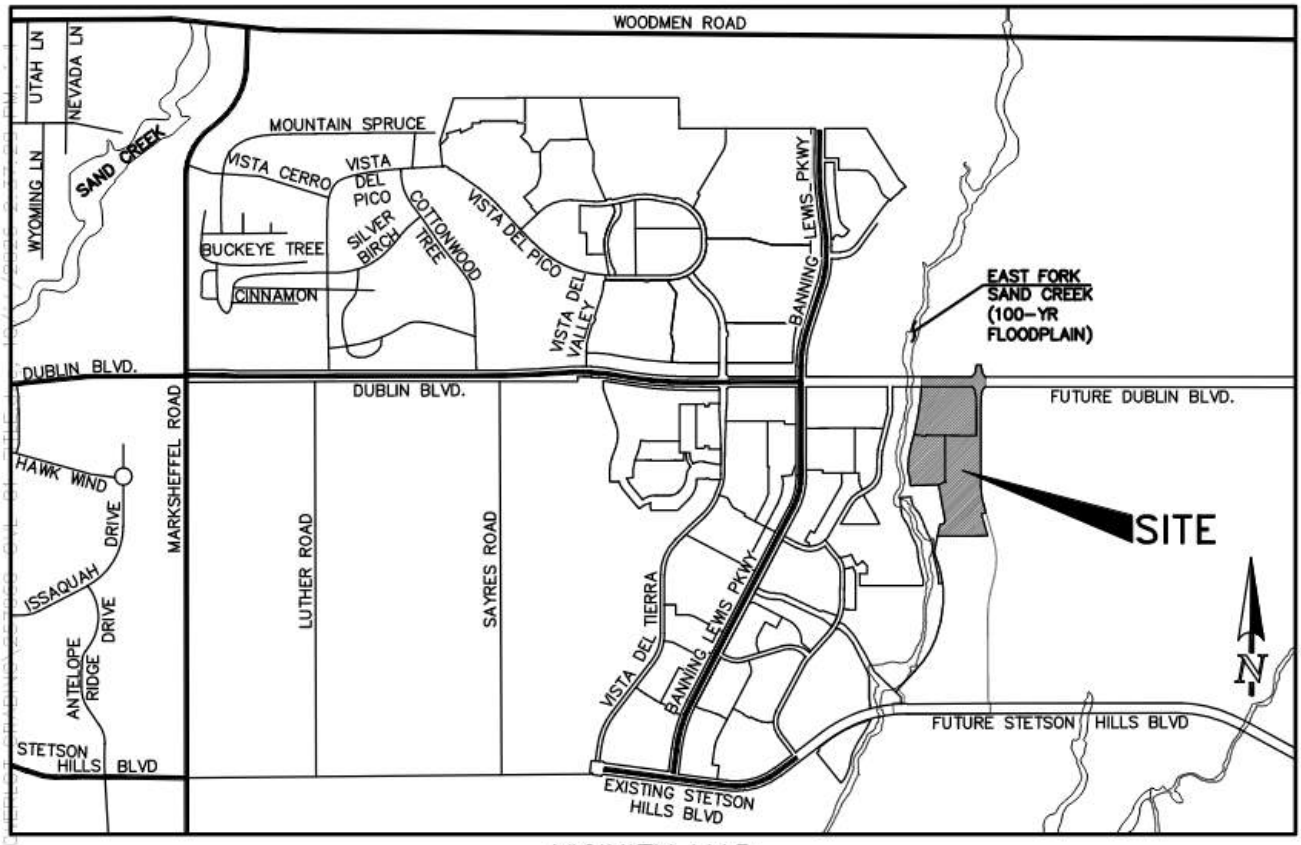
We respectfully request your favorable consideration of this request.

Respectfully submitted,



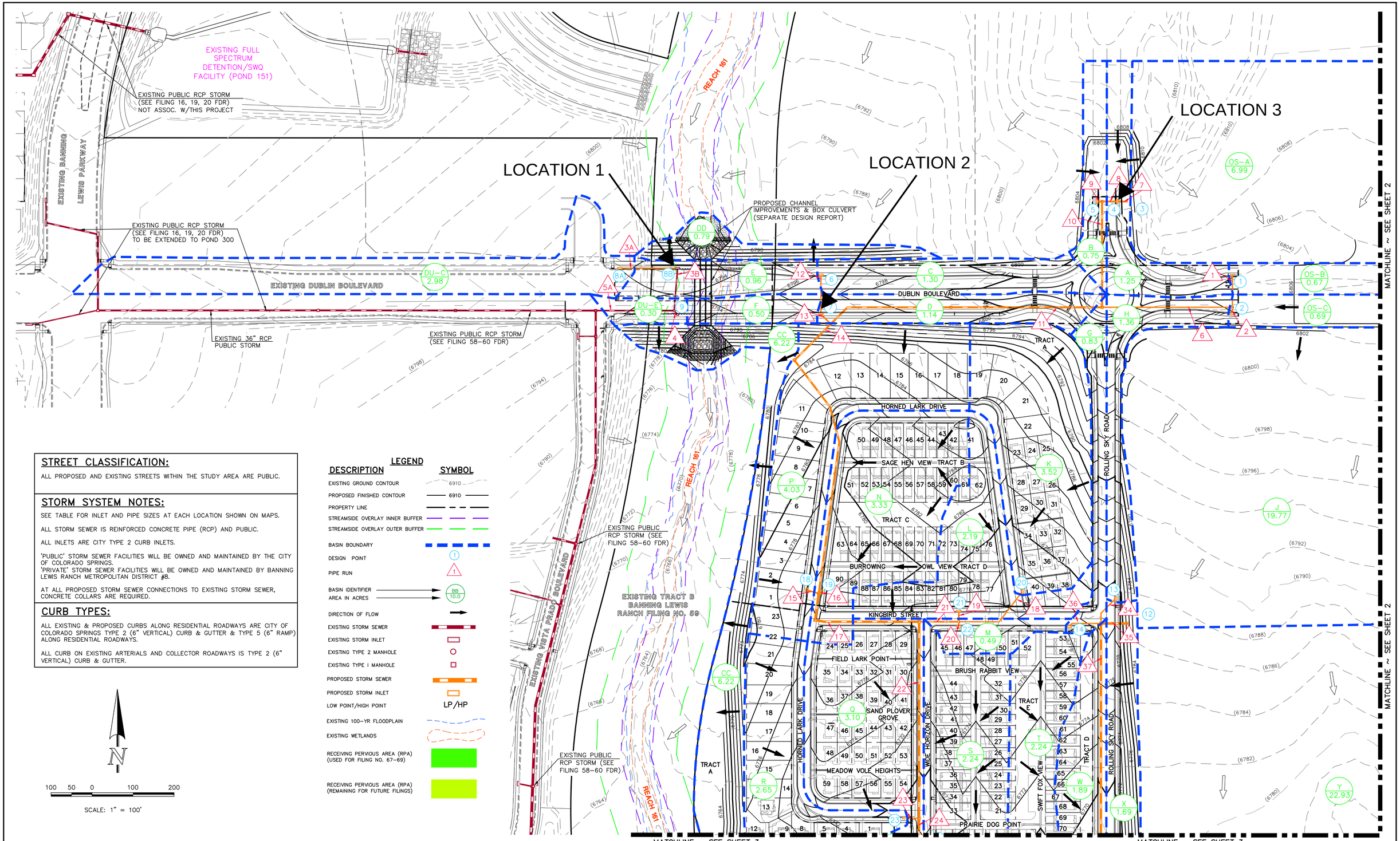
Kyle Campbell, P.E.
Project Manager

N:\257060\REPORTS\PRELIMINARY DRAINAGE REPORT\Variance Request Junc Inlets.docx.



VICINITY MAP
NOT TO SCALE

CLASSIC CONSULTING



STREET CLASSIFICATION:

ALL PROPOSED AND EXISTING STREETS WITHIN THE STUDY AREA ARE PUBLIC.

STORM SYSTEM NOTES:

SEE TABLE FOR INLET AND PIPE SIZES AT EACH LOCATION SHOWN ON MAPS.

ALL STORM SEWER IS REINFORCED CONCRETE PIPE (RCP) AND PUBLIC.

ALL INLETS ARE CITY TYPE 2 CURB INLETS.

'PUBLIC' STORM SEWER FACILITIES WILL BE OWNED AND MAINTAINED BY THE CITY OF COLORADO SPRINGS.
'PRIVATE' STORM SEWER FACILITIES WILL BE OWNED AND MAINTAINED BY BANNING LEWIS RANCH METROPOLITAN DISTRICT #8.

AT ALL PROPOSED STORM SEWER CONNECTIONS TO EXISTING STORM SEWER, CONCRETE COLLARS ARE REQUIRED.

CURB TYPES:

ALL EXISTING & PROPOSED CURBS ALONG RESIDENTIAL ROADWAYS ARE CITY OF COLORADO SPRINGS TYPE 2 (6" VERTICAL) CURB & GUTTER & TYPE 5 (6" RAMP) ALONG RESIDENTIAL ROADWAYS.

ALL CURB ON EXISTING ARTERIALS AND COLLECTOR ROADWAYS IS TYPE 2 (6" VERTICAL) CURB & GUTTER.

N

100 50 0 100 200

SCALE: 1" = 100'

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910
PROPOSED FINISHED CONTOUR	6910
PROPERTY LINE	
STREAMSIDE OVERLAY INNER BUFFER	
STREAMSIDE OVERLAY OUTER BUFFER	
BASIN BOUNDARY	
DESIGN POINT	1
PIPE RUN	1
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
DIRECTION OF FLOW	
EXISTING STORM SEWER	
EXISTING STORM INLET	
EXISTING TYPE 2 MANHOLE	
EXISTING TYPE I MANHOLE	
PROPOSED STORM SEWER	
PROPOSED STORM INLET	
LOW POINT/HIGH POINT	LP/HP
EXISTING 100-YR FLOODPLAIN	
EXISTING WETLANDS	
RECEIVING PERVIOUS AREA (RPA) (USED FOR FILING NO. 67-69)	
RECEIVING PERVIOUS AREA (RPA) (REMAINING FOR FUTURE FILINGS)	

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION CENTER OF COLORADO
IT'S THE LAW

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

KYLE R. CAMPBELL, COLORADO P.E. #29794 — DATE

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799(Fax)

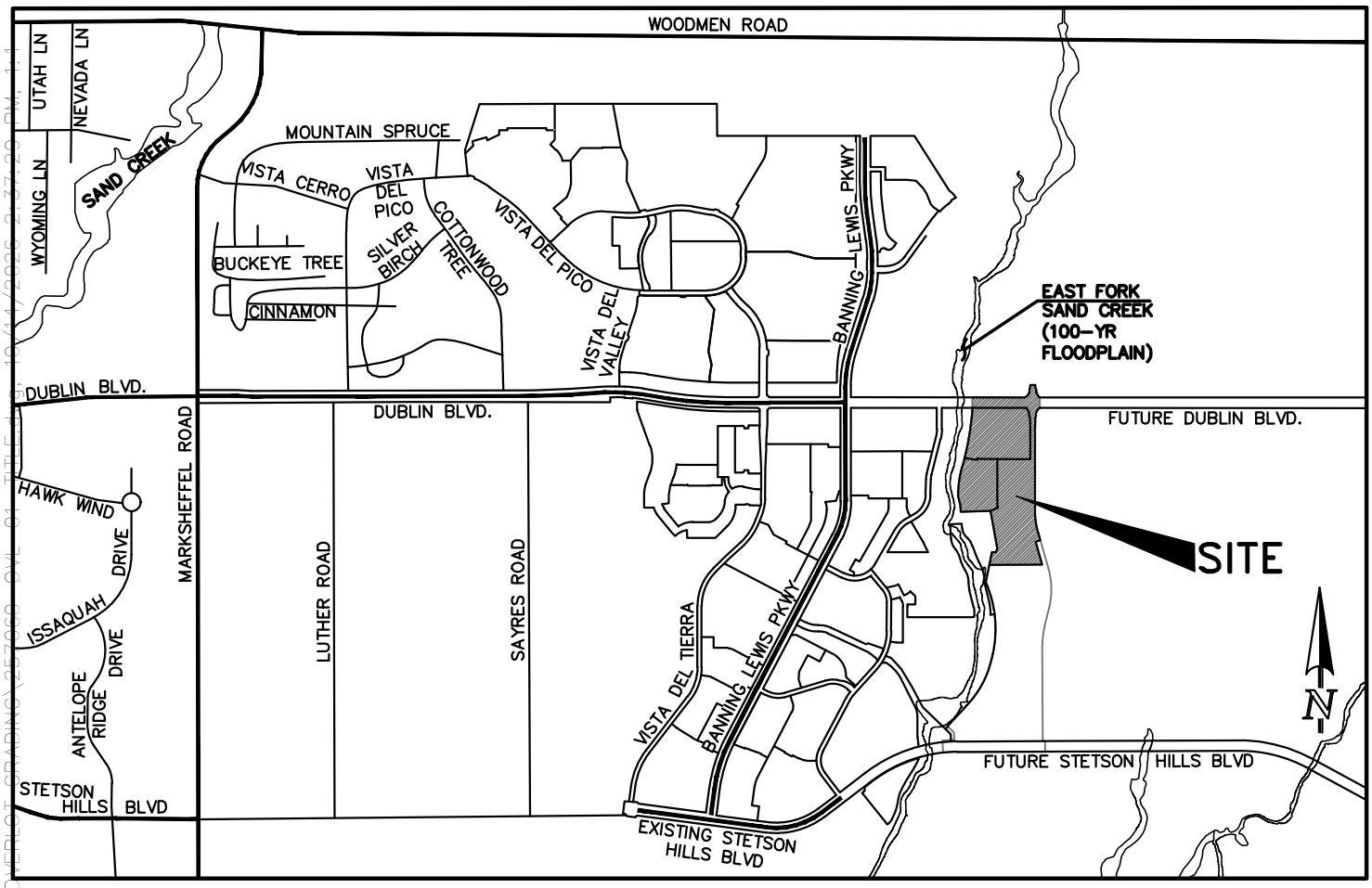
BANNING LEWIS RANCH FIL. 67, 68, & 69

PRELIMINARY DRAINAGE REPORT
DEVELOPED CONDITIONS MAP

DESIGNED BY	MAL	SCALE	DATE 09/30/26
DRAWN BY	MAL	(H) 1"= 100'	SHEET 1 OF 3
CHECKED BY		(V) 1"= N/A	JOB NO. 2570.60

VICINITY MAP

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS



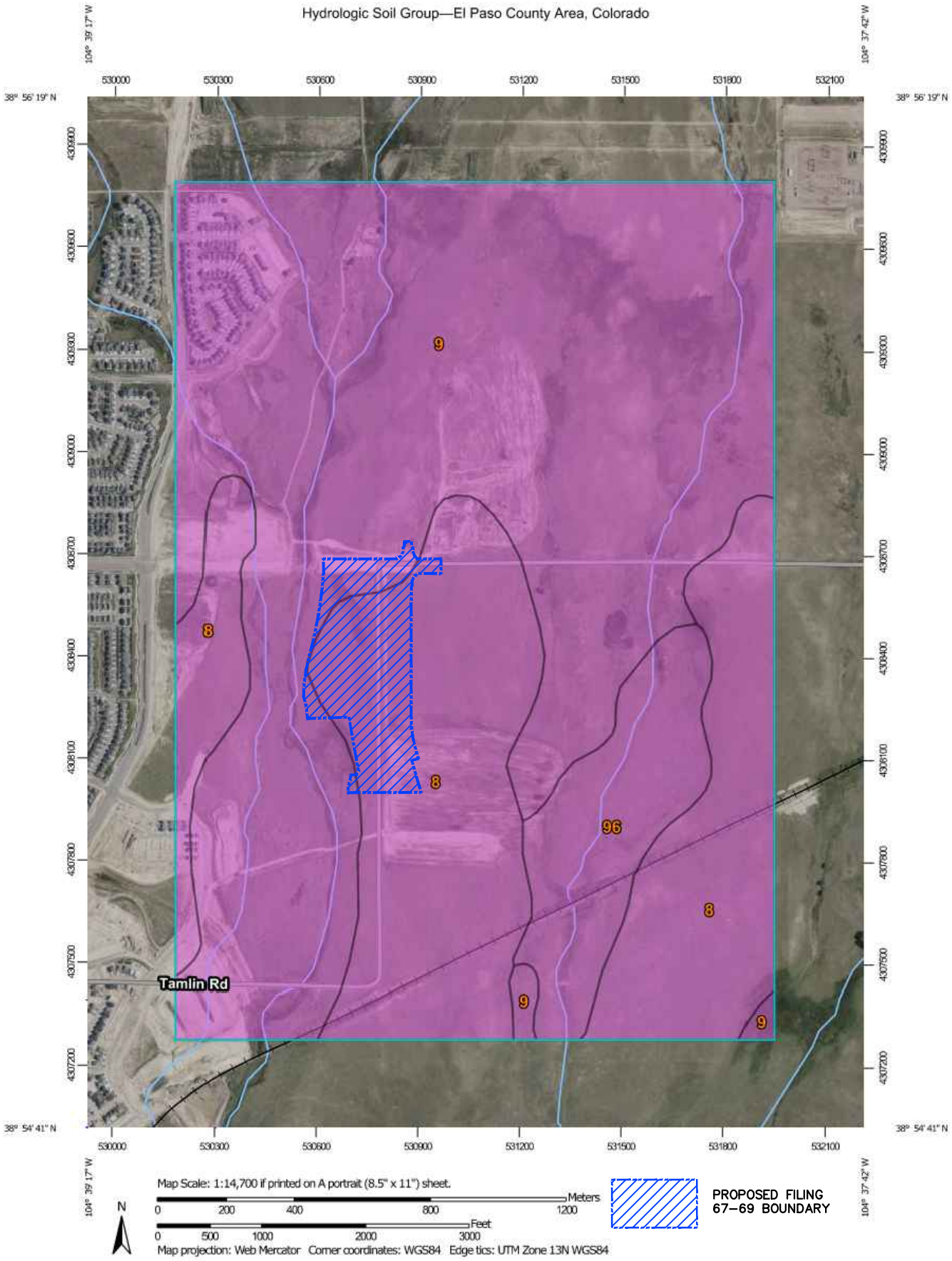
VICINITY MAP

NOT TO SCALE

N:\257060\DRAWINGS\CONSTRUCTION\CERLOT GRADING 257060 SVE 01 FILE 1 of 5 10/1/2025 2:37:29 PM, 1:1

SOILS MAP (S.C.S SURVEY)

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS



N:\257060\DRAWINGS\EXHIBITS\DRAINAGE REPORTS\SOILS MAP-OVERLAY.dwg, 10/9/2026 1:30:40 PM, 1:1323.94

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	351.1	31.9%
9	Blakeland-Fluvaquentic Haplaquolls	A	663.0	60.3%
96	Truckton sandy loam, 0 to 3 percent slopes	A	85.5	7.8%
Totals for Area of Interest			**1,099.5**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

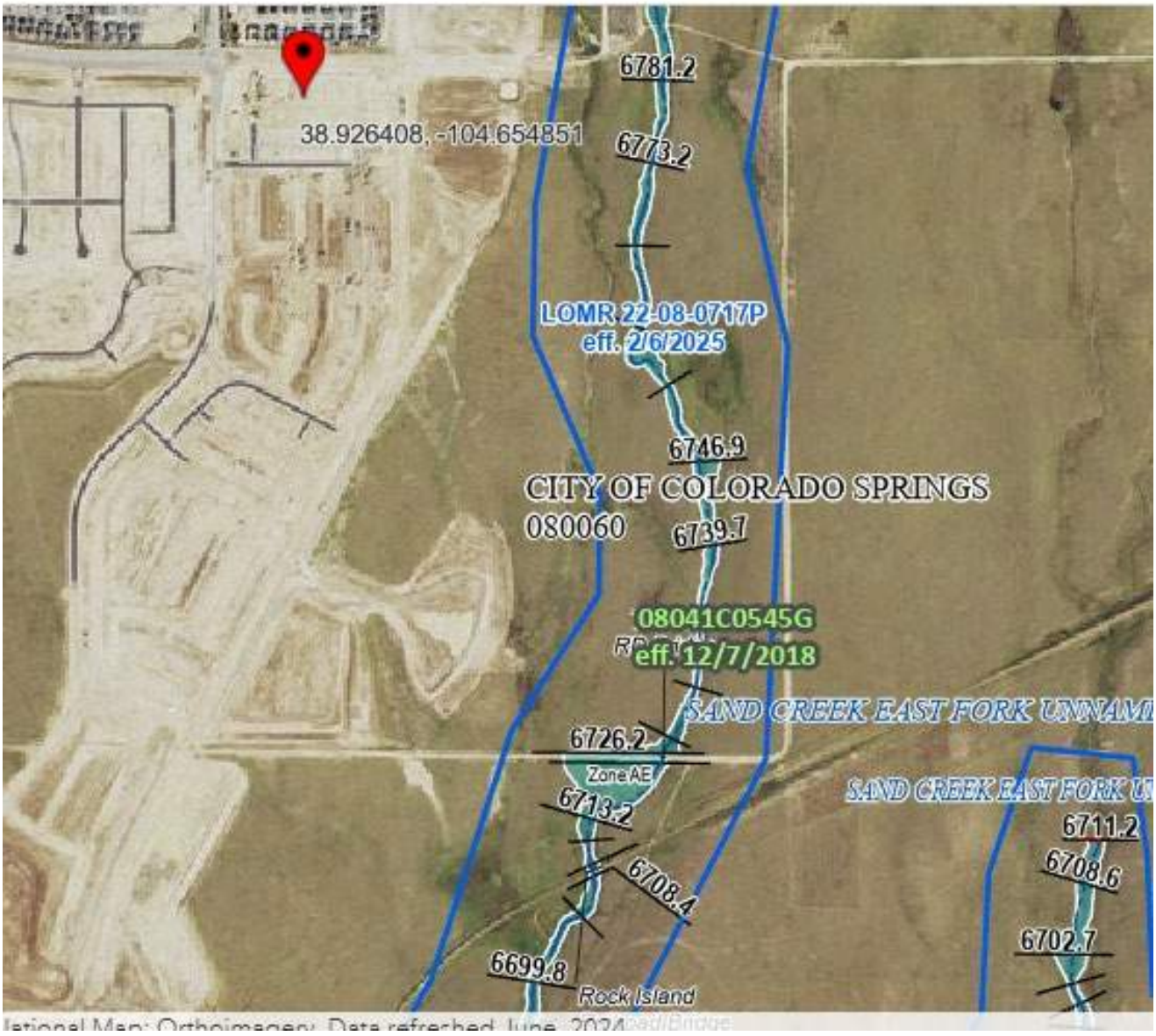
Aggregation Method: Dominant Condition

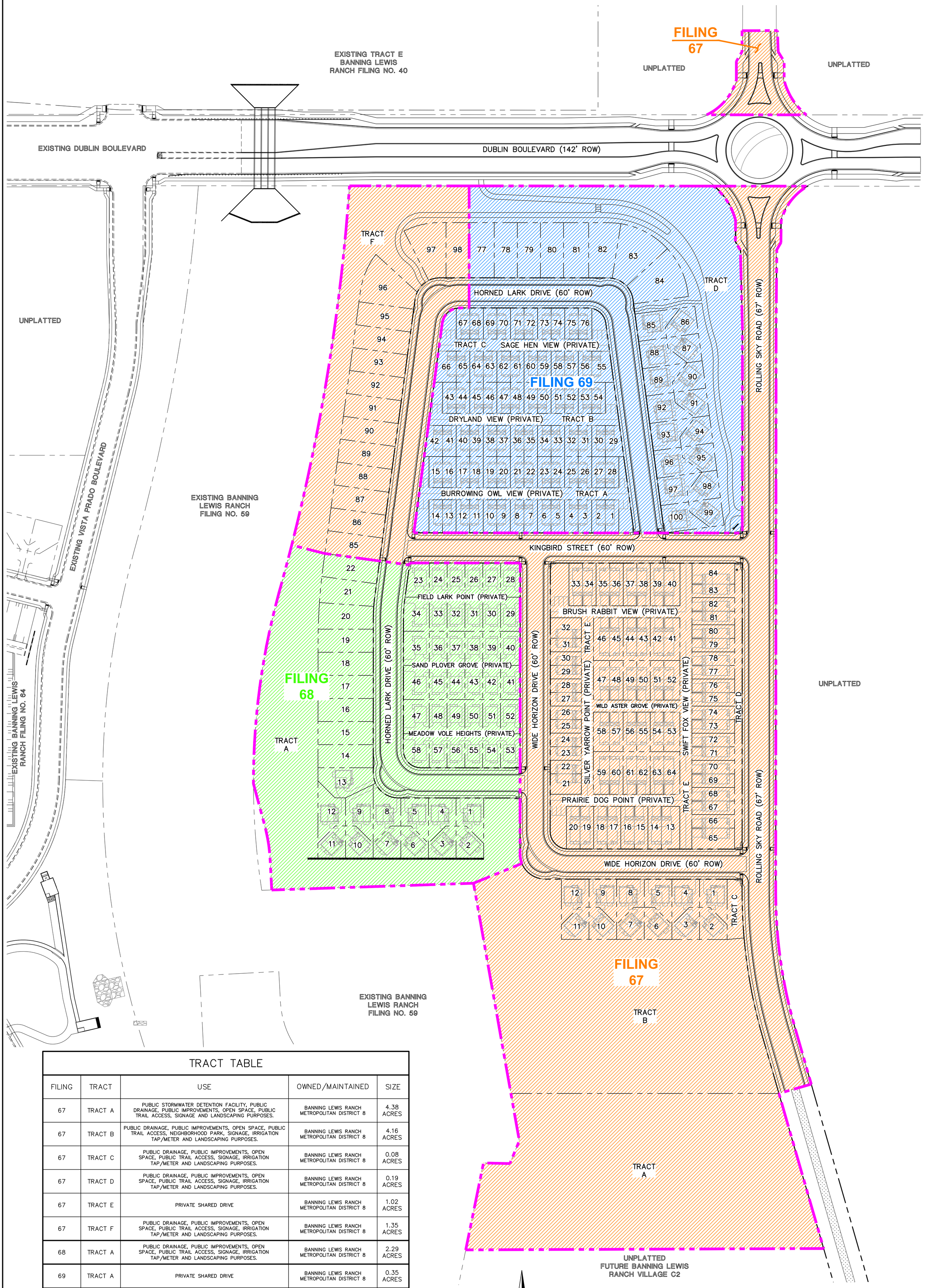
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

F.E.M.A. MAP

CLASSIC℠
CONSULTING
ENGINEERS & SURVEYORS


38.926408, -104.654851
6781.2
6773.2
LOMR 22-08-0717P
eff. 2/6/2025
6746.9
CITY OF COLORADO SPRINGS
080060
6739.7
08041C0545G
eff. 12/7/2018
SAND CREEK EAST FORK UNNAM
6726.2
Zone AE
SAND CREEK EAST FORK U
6713.2
6711.2
6708.6
6708.4
6702.7
6699.8
Rock Island
National Map: Orthoimagery. Data refreshed June 2024



TRACT TABLE

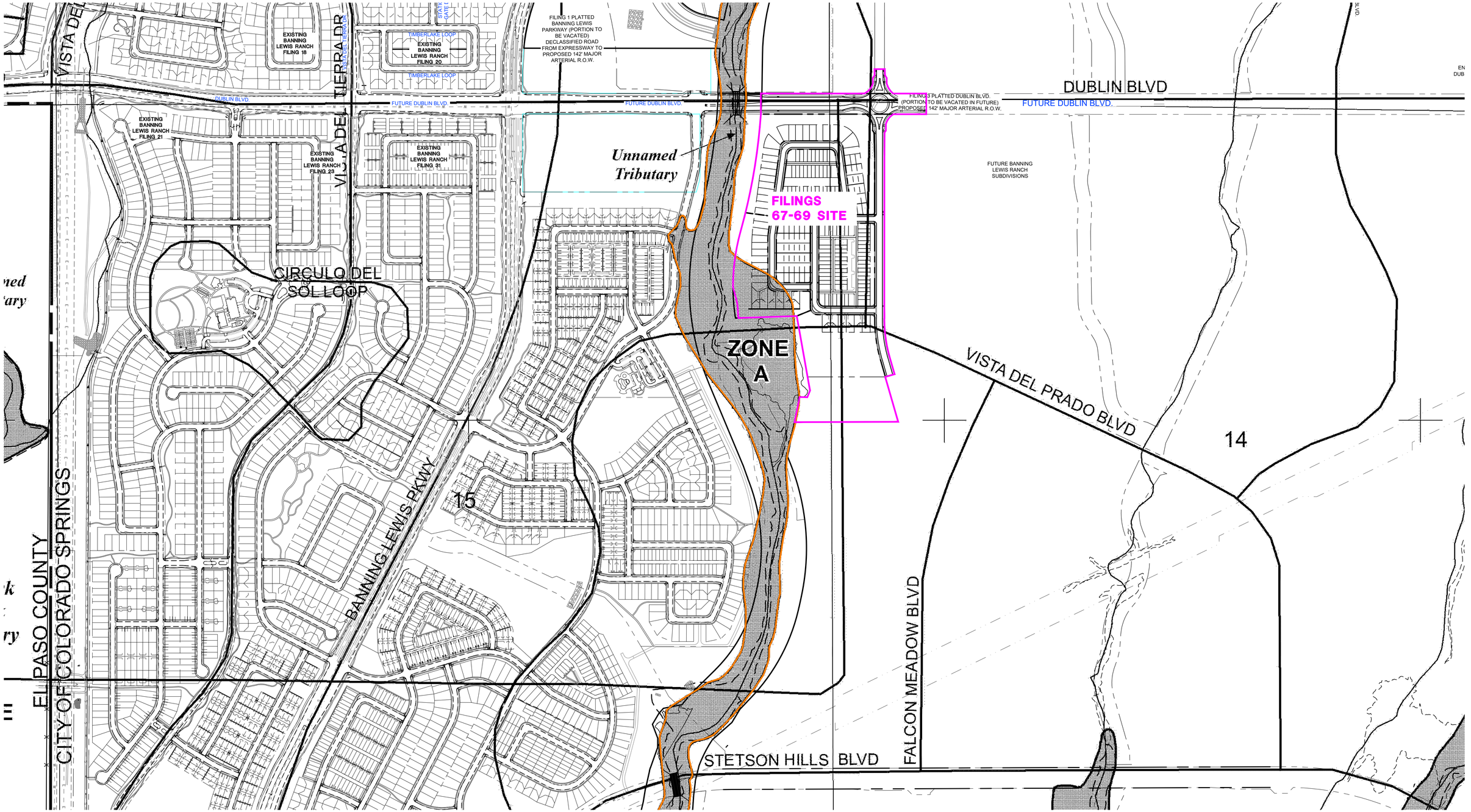
FILING	TRACT	USE	OWNED/MAINTAINED	SIZE
67	TRACT A	PUBLIC STORMWATER DETENTION FACILITY, PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	4.38 ACRES
67	TRACT B	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, NEIGHBORHOOD PARK, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	4.16 ACRES
67	TRACT C	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	0.08 ACRES
67	TRACT D	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	0.19 ACRES
67	TRACT E	PRIVATE SHARED DRIVE	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	1.02 ACRES
67	TRACT F	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	1.35 ACRES
68	TRACT A	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	2.29 ACRES
69	TRACT A	PRIVATE SHARED DRIVE	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	0.35 ACRES
69	TRACT B	PRIVATE SHARED DRIVE	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	0.27 ACRES
69	TRACT C	PRIVATE SHARED DRIVE	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	0.26 ACRES
69	TRACT D	PUBLIC DRAINAGE, PUBLIC IMPROVEMENTS, OPEN SPACE, PUBLIC TRAIL ACCESS, SIGNAGE, IRRIGATION TAP/METER AND LANDSCAPING PURPOSES.	BANNING LEWIS RANCH METROPOLITAN DISTRICT 8	2.12 ACRES
TOTAL FILINGS 67, 68, 69				16.47 ACRES

CLASSIC CONSULTING SM
619 N. Cascase Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790

BANNING LEWIS RANCH
VILLAGE A6 – FILING NO. 67–69
SITE EXHIBIT

CLASSIC CONSULTING

DESIGNED BY		SCALE	DATE 10/29/26
DRAWN BY	BB	(H) 1"= 80'	SHEET 1 OF 1
CHECKED BY		(V) 1"= N/A	JOB NO. 2570.60



FEMA FLOODPLAIN
LIMITS SHOWN ARE FROM FIRM 'FLOOD INSURANCE RATE MAP' NUMBER 08041C0545G MAP REVISED DECEMBER 7, 2018

N

300 200 0 300 600

SCALE: 1" = 300'

48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION CENTER OF COLORADO
IT'S THE LAW

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

CLASSIC CONSULTING SM
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799(Fax)

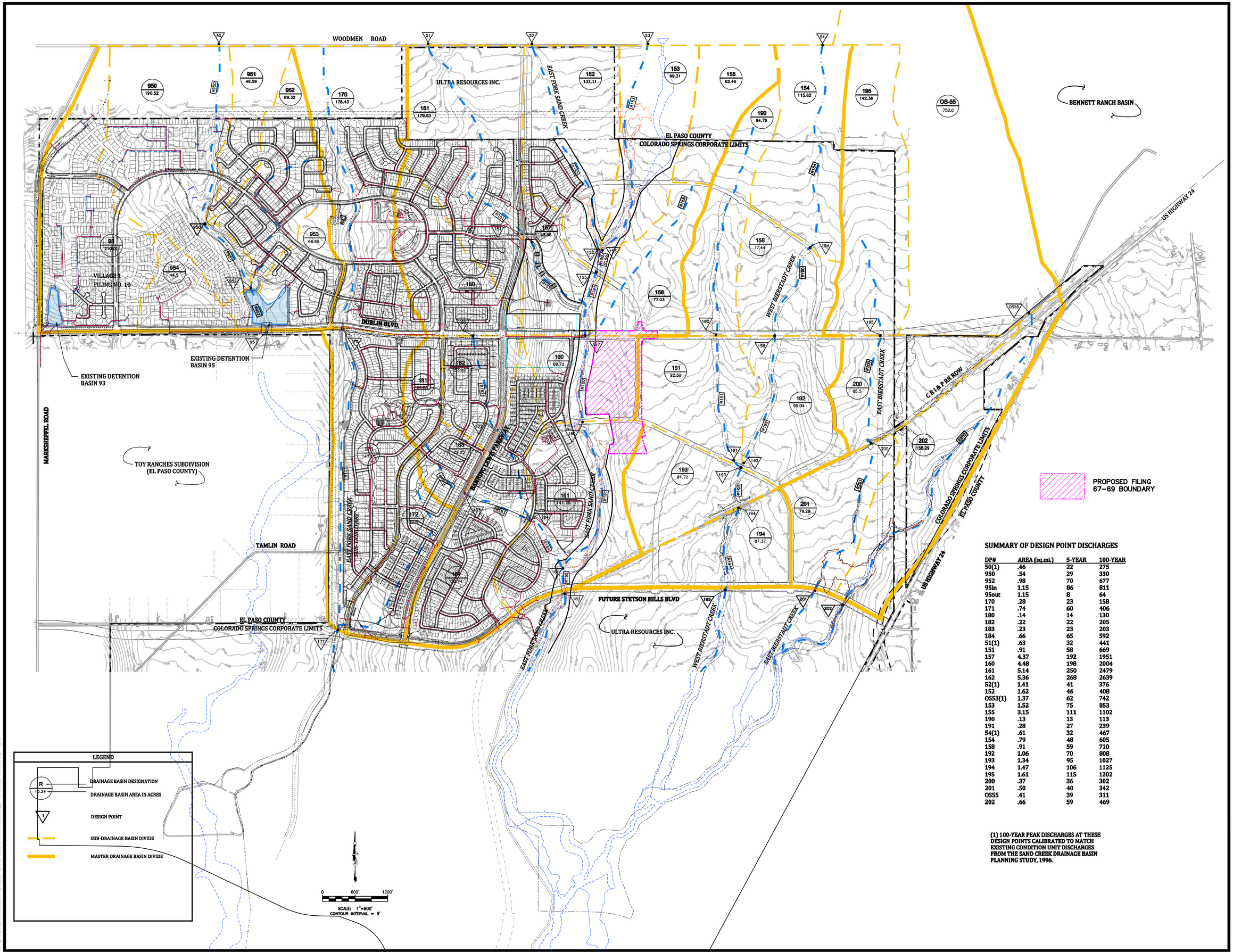
BANNING LEWIS RANCH
FILING 67,68, & 69
FLOODPLAIN OVERLAY MAP

CLASSIC CONSULTING

DESIGNED BY	MAL	SCALE		DATE	10/13/26
DRAWN BY	MAL	(H) 1"=	200'	SHEET	1 OF 1
CHECKED BY		(V) 1"=	N/A	JOB NO.	2570.23

N:\2570\01\DRAWINGS\EXHIBITS\FloodplainMapOverlay-F67-69.dwg, 10/13/2026 4:51:06 PM, 1:1

PREVIOUS REPORT MAPS



SUMMARY OF DESIGN POINT DISCHARGES

DP#	AREA (sq.mi.)	5-YEAR	100-YEAR
50(1)	.46	22	275
950	.54	29	330
952	.98	70	677
95in	1.15	86	811
95out	1.15	8	64
170	.28	23	158
171	.74	60	406
180	.14	14	130
182	.22	22	205
183	.23	23	203
184	.66	65	592
51(1)	.63	32	441
151	.91	58	669
157	4.37	192	1951
160	4.48	198	2004
161	5.14	250	2479
162	5.36	268	2639
52(1)	1.41	41	376
152	1.62	46	408
OS53(1)	1.37	62	742
153	1.52	75	853
155	3.15	111	1102
190	.13	13	113
191	.28	27	239
54(1)	.61	32	467
154	.79	48	605
158	.91	59	710
192	1.06	70	808
193	1.34	95	1027
194	1.47	106	1125
195	1.61	115	1202
200	.37	36	302
201	.50	40	342
OS55	.41	39	311
202	.66	59	469

(1) 100-YEAR PEAK DISCHARGES AT THESE DESIGN POINTS CALIBRATED TO MATCH EXISTING CONDITION UNIT DISCHARGES FROM THE SAND CREEK DRAINAGE BASIN PLANNING STUDY, 1996.

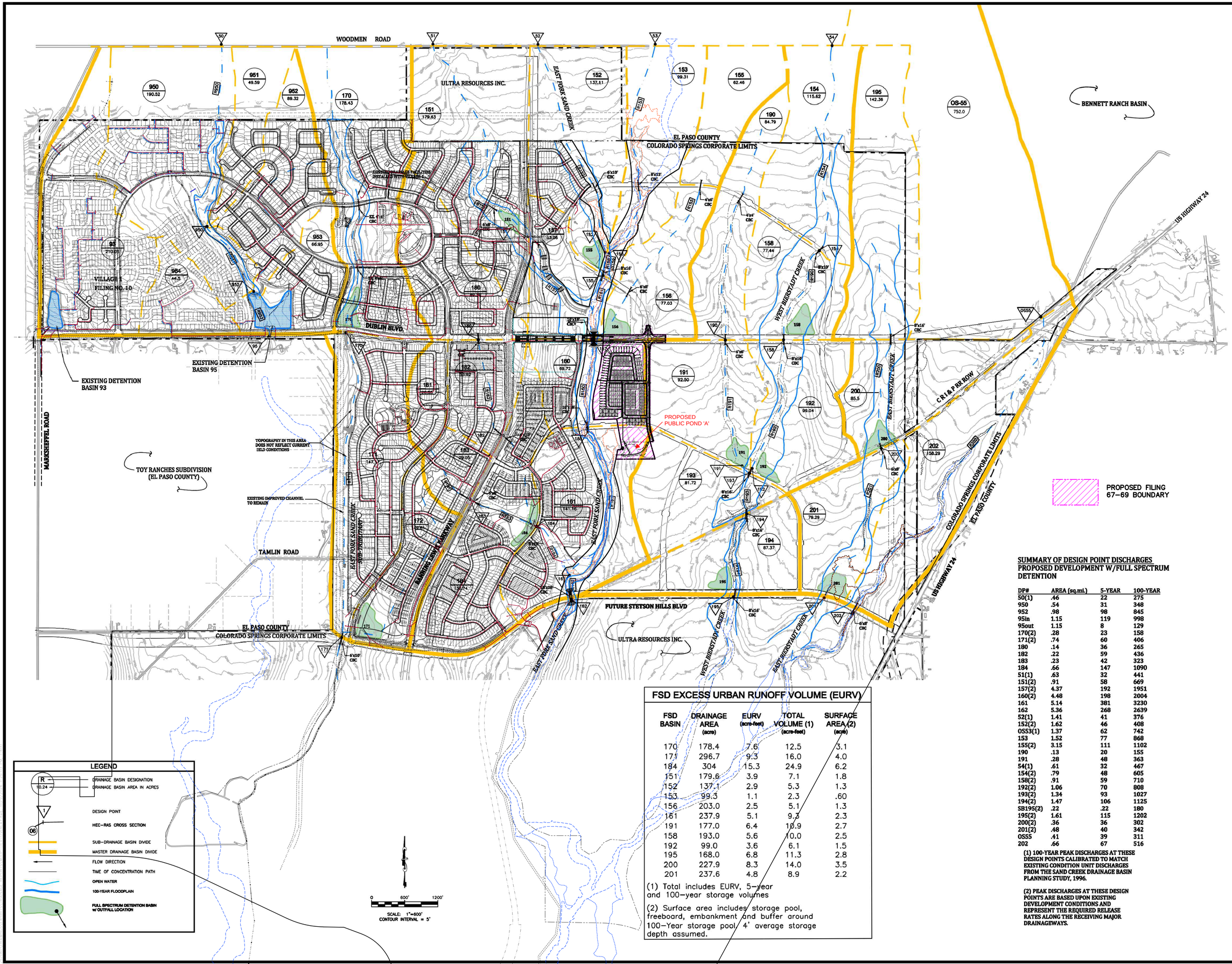
Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado 80904
(719) 630-7342

BANNING LEWIS RANCH
MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
EXISTING CONDITION HYDROLOGIC BASIN MAP
COLORADO SPRINGS, COLORADO

Project No.:	12042
Date:	December 6, 2012
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	

DP1

12042 DP1 EX HYDROLOGY.dwg/Apr 02, 2013



LEGEND

- R / 10.24 — DRAINAGE BASIN DESIGNATION / DRAINAGE BASIN AREA IN ACRES
- DESIGN POINT
- HEC-RAS CROSS SECTION
- SUB-DRAINAGE BASIN DIVIDE
- MASTER DRAINAGE BASIN DIVIDE
- FLOW DIRECTION
- TIME OF CONCENTRATION PATH
- OPEN WATER
- 100-YEAR FLOODPLAIN
- FULL SPECTRUM DETENTION BASIN w/ OUTFALL LOCATION

FSD EXCESS URBAN RUNOFF VOLUME (EURV)

FSD BASIN	DRAINAGE AREA (acre)	EURV (acre-feet)	TOTAL VOLUME (1) (acre-feet)	SURFACE AREA (2) (acre)
170	178.4	7.6	12.5	3.1
171	296.7	9.3	16.0	4.0
184	304	15.3	24.9	6.2
151	179.6	3.9	7.1	1.8
152	137.1	2.9	5.3	1.3
153	99.3	1.1	2.3	.60
156	203.0	2.5	5.1	1.3
161	237.9	5.1	9.3	2.3
191	177.0	6.4	10.9	2.7
158	193.0	5.6	10.0	2.5
192	99.0	3.6	6.1	1.5
195	168.0	6.8	11.3	2.8
200	227.9	8.3	14.0	3.5
201	237.6	4.8	8.9	2.2

(1) Total includes EURV, 5-year and 100-year storage volumes

(2) Surface area includes storage pool, freeboard, embankment and buffer around 100-Year storage pool. 4' average storage depth assumed.

SUMMARY OF DESIGN POINT DISCHARGES
PROPOSED DEVELOPMENT W/FULL SPECTRUM DETENTION

DP#	AREA (sq.mi.)	5-YEAR	100-YEAR
50(1)	.46	22	275
950	.54	31	348
952	.98	98	845
95in	1.15	119	998
95out	1.15	8	129
170(2)	.28	23	158
171(2)	.74	60	406
180	.14	36	265
182	.22	59	436
183	.23	42	323
184	.66	147	1090
51(1)	.63	32	441
151(2)	.91	58	669
157(2)	4.37	192	1951
160(2)	4.48	198	2004
161	5.14	381	3230
162	5.36	268	2639
52(1)	1.41	41	376
152(2)	1.62	46	408
OS53(1)	1.37	62	742
153	1.52	77	868
155(2)	3.15	111	1102
190	.13	20	155
191	.28	48	363
54(1)	.61	32	467
154(2)	.79	48	605
158(2)	91	59	710
192(2)	1.06	70	808
193(2)	1.34	93	1027
194(2)	1.47	106	1125
SB195(2)	.22	.22	180
195(2)	1.61	115	1202
200(2)	.36	36	302
201(2)	.48	40	342
OS55	.41	39	311
202	.66	67	516

(1) 100-YEAR PEAK DISCHARGES AT THESE DESIGN POINTS CALIBRATED TO MATCH EXISTING CONDITION UNIT DISCHARGES FROM THE SAND CREEK DRAINAGE BASIN PLANNING STUDY, 1996.

(2) PEAK DISCHARGES AT THESE DESIGN POINTS ARE BASED UPON EXISTING DEVELOPMENT CONDITIONS AND REPRESENT THE REQUIRED RELEASE RATES ALONG THE RECEIVING MAJOR DRAINAGEWAYS.

Kiowa Engineering Corporation
1604 South 21st Street
Colorado Springs, Colorado 80904
(719) 630-7342

BANNING LEWIS RANCH
MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
PROPOSED FACILITIES PLAN
COLORADO SPRINGS, COLORADO

Project No.:	12042
Date:	MARCH 19, 2013
Design:	RNW
Drawn:	EAK
Check:	RNW
Revisions:	

DP3

N:\12042\DRAWINGS\EXHIBITS\DRAINAGE REPORTS\MDDP_DP3\DP3 PROP FACILITIES.dwg, 10/3/2013 1:24:01 PM, 1:400

EXISTING CONDITIONS CALCULATIONS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

BASIN RUNOFF COEFFICIENT SUMMARY (EXISTING CONDITIONS)

\		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(5)	C(100)	LAND USE	PERCENT IMP.	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	PERCENT
EX-A	158.09	UNDEV	2.0%	158.09	0.09	0.36	LANDSCAPE	2.0%	0.00	0.09	0.36	0.09	0.36	**14.23**	**56.91**	**2.0%**
EX-B	86.84	UNDEV	2.0%	86.84	0.09	0.36	LANDSCAPE	2.0%	0.00	0.09	0.36	0.09	0.36	**7.82**	**31.26**	**2.0%**
EX-C	233.86	UNDEV	2.0%	233.86	0.09	0.36	LANDSCAPE	2.0%	0.00	0.09	0.36	0.09	0.36	**21.05**	**84.19**	**2.0%**

JOB NAME:	***BANNING LEWIS RANCH FILINGS 62-66***
JOB NUMBER:	***2570.90***
DATE:	***01/13/07***
CALC'D BY:	***MAL***

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

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

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

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.

BASIN RUNOFF SUMMARY (EXISTING)

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	4.74	14.23	56.91	0.09	200	6	17.9	3250	1.8%	2.7	20.2	38.1	1.70	2.12	3.56	8.1	**30.2**	**202.6**
EX-B	2.61	7.82	31.26	0.09	150	14	10.7	3220	1.4%	2.4	22.7	33.4	1.86	2.32	3.90	4.8	**18.1**	**121.8**
EX-C	7.02	21.05	84.19	0.09	200	6	17.9	4700	1.9%	2.8	28.4	46.4	1.47	1.83	3.07	10.3	**38.5**	**258.2**

DEVELOPED CONDITIONS CALCULATIONS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

BASIN RUNOFF COEFFICIENT SUMMARY (DEVELOPED CONDITIONS)

		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(5)	C(100)	LAND USE	PERCENT IMP.	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	PERCENT
A	1.25	PAVEMENT	100.0%	0.88	0.90	0.96	LANDSCAPE	2.0%	0.37	0.09	0.36	0.66	0.78	0.83	0.98	71.0%
B	0.75	PAVEMENT	100.0%	0.50	0.90	0.96	LANDSCAPE	2.0%	0.25	0.09	0.36	0.63	0.76	0.47	0.57	67.3%
C	1.30	PAVEMENT	100.0%	0.98	0.90	0.96	LANDSCAPE	2.0%	0.32	0.09	0.36	0.70	0.81	0.91	1.06	75.9%
D	1.14	PAVEMENT	100.0%	0.91	0.90	0.96	LANDSCAPE	2.0%	0.23	0.09	0.36	0.74	0.84	0.84	0.96	80.2%
E	0.96	PAVEMENT	100.0%	0.88	0.90	0.96	LANDSCAPE	2.0%	0.08	0.09	0.36	0.83	0.91	0.80	0.87	91.8%
F	0.50	PAVEMENT	100.0%	0.41	0.90	0.96	LANDSCAPE	2.0%	0.09	0.09	0.36	0.75	0.85	0.38	0.43	82.4%
G	0.83	PAVEMENT	100.0%	0.77	0.90	0.96	LANDSCAPE	2.0%	0.06	0.09	0.36	0.84	0.92	0.70	0.76	92.9%
H	1.36	PAVEMENT	100.0%	0.99	0.90	0.96	LANDSCAPE	2.0%	0.37	0.09	0.36	0.68	0.80	0.92	1.08	73.3%
J (FUT)	19.77	HD S/F	65.0%	19.77	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	9.69	12.85	65.0%
K	3.52	HD S/F	65.0%	1.94	0.49	0.65	LANDSCAPE	2.0%	1.58	0.09	0.36	0.31	0.52	1.09	1.83	36.7%
L	2.19	HD S/F	65.0%	2.19	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	1.07	1.42	65.0%
M	0.49	HD S/F	65.0%	0.49	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	0.24	0.32	65.0%
N	3.33	HD S/F	65.0%	3.33	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	1.63	2.16	65.0%
P	4.03	S/F	65.0%	3.13	0.45	0.59	LANDSCAPE	2.0%	0.90	0.09	0.36	0.37	0.54	1.49	2.17	50.9%
Q	3.10	HD S/F	65.0%	3.10	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	1.52	2.02	65.0%
R	2.65	HD S/F	65.0%	1.34	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.47	0.62	1.25	1.64	65.0%
		S/F	65.0%	1.31	0.45	0.59										

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

BASIN RUNOFF COEFFICIENT SUMMARY (DEVELOPED CONDITIONS)

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6					C VALUE DCM TABLE 6-6					WEIGHTED "C" VALUE		WEIGHTED CA		WEIGHTED IMP.
		LAND USE	PERCENT IMP.	AREA (AC)	C(5)	C(100)	LAND USE	PERCENT IMP.	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	PERCENT
S	2.24	HD S/F	65.0%	2.24	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	1.10	1.46	65.0%
T	2.24	HD S/F	65.0%	2.24	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	1.10	1.46	65.0%
V	1.23	HD S/F	65.0%	1.23	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	0.60	0.80	65.0%
W	1.89	HD S/F	65.0%	0.73	0.49	0.65	LANDSCAPE	2.0%	0.46	0.09	0.36	0.54	0.69	1.03	1.31	62.6%
		PAVEMENT	100.0%	0.70	0.90	0.96										
X	1.69	PAVEMENT	100.0%	0.72	0.90	0.96	LANDSCAPE	2.0%	0.97	0.09	0.36	0.44	0.62	0.74	1.04	43.8%
Y (FUT)	22.93	HD S/F	65.0%	22.93	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	11.24	14.90	65.0%
Z	0.35	PAVEMENT	100.0%	0.32	0.90	0.96	LANDSCAPE	2.0%	0.03	0.09	0.36	0.83	0.91	0.29	0.32	91.6%
AA	3.25	PARK	7.0%	3.25	0.19	0.39	LANDSCAPE	2.0%	0.00	0.09	0.36	0.19	0.39	0.62	1.27	7.0%
BB	3.69	POND	7.0%	3.69	0.19	0.39	LANDSCAPE	2.0%	0.00	0.09	0.36	0.19	0.39	0.70	1.44	7.0%
OS-A (FUT)	6.99	HD S/F	65.0%	6.99	0.49	0.65	LANDSCAPE	2.0%	0.00	0.09	0.36	0.49	0.65	3.43	4.54	65.0%
OS-B	0.67	PAVEMENT	100.0%	0.56	0.90	0.96	LANDSCAPE	2.0%	0.11	0.09	0.36	0.77	0.86	0.51	0.58	83.9%
OS-C	0.69	PAVEMENT	100.0%	0.51	0.90	0.96	LANDSCAPE	2.0%	0.18	0.09	0.36	0.69	0.80	0.48	0.55	74.4%
OS-D	2.00	PAVEMENT	100.0%	1.68	0.90	0.96	LANDSCAPE	2.0%	0.32	0.09	0.36	0.77	0.86	1.54	1.73	84.3%
OS-E	2.08	PAVEMENT	100.0%	1.52	0.90	0.96	LANDSCAPE	2.0%	0.56	0.09	0.36	0.68	0.80	1.42	1.66	73.6%
DU-C	2.98	PAVEMENT	100.0%	2.56	0.90	0.96	LANDSCAPE	2.0%	0.42	0.09	0.36	0.79	0.88	2.34	2.61	86.2%
DU-E	0.30	PAVEMENT	100.0%	0.25	0.90	0.96	LANDSCAPE	2.0%	0.05	0.09	0.36	0.77	0.86	0.23	0.26	83.7%

JOB NAME:	***BANNING LEWIS RANCH FILINGS 62-66***
JOB NUMBER:	***2570.90***
DATE:	***01/13/07***
CALC'D BY:	***MAL***

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)* $t_c = \frac{L}{180} + 10$	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.

BASIN RUNOFF SUMMARY (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)
A	0.79	0.83	0.98	0.09	20	0.4	6.5	400	1.5%	2.4	2.7	9.2	3.39	4.25	7.14	2.7	**3.5**	**7.0**
B	0.45	0.47	0.57	0.09	20	0.4	6.5	320	1.5%	2.4	2.2	8.7	3.47	4.34	7.29	1.6	**2.1**	**4.2**
C	0.88	0.91	1.06	0.09	20	0.4	6.5	600	1.0%	2.0	5.0	11.5	3.13	3.92	6.58	2.8	**3.6**	**7.0**
D	0.82	0.84	0.96	0.09	20	0.4	6.5	600	1.0%	2.0	5.0	11.5	3.13	3.92	6.58	2.6	**3.3**	**6.3**
E	0.79	0.80	0.87	0.09	20	0.4	6.5	300	1.0%	2.0	2.5	9.0	3.42	4.29	7.20	2.7	**3.4**	**6.3**
F	0.37	0.38	0.43	0.09	20	0.4	6.5	300	1.0%	2.0	2.5	9.0	3.42	4.29	7.20	1.3	**1.6**	**3.1**
G	0.69	0.70	0.76	0.09	20	0.4	6.5	640	4.0%	4.0	2.7	9.2	3.40	4.26	7.16	2.3	**3.0**	**5.4**
H	0.89	0.92	1.08	0.09	20	0.4	6.5	920	2.6%	3.2	4.8	11.2	3.16	3.95	6.64	2.8	**3.7**	**7.2**
J (FUT)	8.90	9.69	12.85	0.49	110	3.3	8.0	1400	1.5%	2.4	9.5	17.6	2.62	3.28	5.51	23.3	**31.8**	**70.8**
K	0.92	1.09	1.83	0.49	110	3.3	8.0	480	2.0%	2.8	2.8	10.9	3.20	4.00	6.72	2.9	**4.4**	**12.3**
L	0.99	1.07	1.42	0.54	100	2	8.0	550	2.0%	2.8	3.2	11.3	3.15	3.95	6.63	3.1	**4.2**	**9.4**
M	0.22	0.24	0.32	0.54	50	1	5.7	150	1.0%	2.0	1.3	6.9	3.73	4.68	7.85	0.8	**1.1**	**2.5**
N	1.50	1.63	2.16	0.54	80	1.6	7.2	620	1.2%	2.2	4.7	11.9	3.09	3.87	6.49	4.6	**6.3**	**14.1**
P	1.31	1.49	2.17	0.49	110	3.3	8.0	740	1.4%	2.4	5.2	13.3	2.96	3.71	6.22	3.9	**5.5**	**13.5**
Q	1.40	1.52	2.02	0.54	50	1	5.7	660	1.4%	2.4	4.6	10.3	3.26	4.08	6.85	4.5	**6.2**	**13.8**
R	1.14	1.25	1.64	0.49	110	3.3	8.0	620	1.2%	2.2	4.7	12.8	3.01	3.76	6.32	3.4	**4.7**	**10.4**

JOB NAME:	***BANNING LEWIS RANCH FILINGS 62-66***
JOB NUMBER:	***2570.90***
DATE:	***01/13/07***
CALC'D BY:	***MAL***

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)* $t_c = \frac{L}{180} + 10$	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.

BASIN RUNOFF SUMMARY (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)
S	1.01	1.10	1.46	0.54	50	1	5.7	610	1.2%	2.2	4.6	10.3	3.26	4.08	6.85	3.3	**4.5**	**10.0**
T	1.01	1.10	1.46	0.54	80	1.6	7.2	770	1.5%	2.4	5.2	12.4	3.04	3.80	6.38	3.1	**4.2**	**9.3**
V	0.55	0.60	0.80	0.54	110	2.2	8.4	240	1.5%	2.4	1.6	10.1	3.29	4.12	6.92	1.8	**2.5**	**5.5**
W	0.97	1.03	1.31	0.09	20	0.4	6.5	680	1.8%	2.7	4.2	10.7	3.21	4.03	6.76	3.1	**4.1**	**8.9**
X	0.67	0.74	1.04	0.09	30	0.6	7.9	710	1.8%	2.7	4.4	12.4	3.04	3.81	6.40	2.0	**2.8**	**6.7**
Y (FUT)	10.32	11.24	14.90	0.49	110	3.3	8.0	1400	1.5%	2.4	9.5	17.6	2.62	3.28	5.51	27.1	**36.9**	**82.2**
Z	0.29	0.29	0.32	0.09	20	0.4	6.5	190	1.5%	2.4	1.3	7.8	3.59	4.51	7.56	1.0	**1.3**	**2.4**
AA	0.29	0.62	1.27	0.19	20	0.4	5.8	280	2.0%	2.8	1.6	7.5	3.64	4.56	7.66	1.1	**2.8**	**9.7**
BB	0.33	0.70	1.44	0.19	40	8	3.9	460	0.5%	1.4	5.4	9.3	3.38	4.24	7.12	1.1	**3.0**	**10.2**
OS-A (FUT)	3.15	3.43	4.54	0.54	110	2.2	8.4	650	1.5%	2.4	4.4	12.9	3.00	3.75	6.30	9.4	**12.9**	**28.6**
OS-B	0.50	0.51	0.58	0.09	20	0.4	6.5	350	1.0%	2.0	2.9	9.4	3.37	4.22	7.09	1.7	**2.2**	**4.1**
OS-C	0.46	0.48	0.55	0.09	20	0.4	6.5	350	1.0%	2.0	2.9	9.4	3.37	4.22	7.09	1.5	**2.0**	**3.9**
OS-D	1.50	1.54	1.73	0.09	20	0.4	6.5	500	1.0%	2.0	4.2	10.7	3.22	4.03	6.77	4.8	**6.2**	**11.7**
OS-E	1.37	1.42	1.66	0.09	20	0.4	6.5	500	1.0%	2.0	4.2	10.7	3.22	4.03	6.77	4.4	**5.7**	**11.2**
DU-C	2.29	2.34	2.61	0.90	25	0.25	1.8	1240	1.3%	2.3	9.1	10.9	3.20	4.00	6.72	7.3	**9.4**	**17.5**
DU-E	0.22	0.23	0.26	0.90	25	0.25	1.8	165	1.3%	2.3	1.2	5.0	4.12	5.17	8.68	0.9	**1.2**	**2.2**

JOB NAME:	*BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER:	*2570.90*
DATE:	*10/13/26*
CALCULATED BY:	*MAL*

*ALL STORM SEWER TO BE PUBLIC UNLESS OTHERWISE NOTED

SURFACE ROUTING SUMMARY (DEVELOPED)

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	BASIN OS-B	0.51	0.58	9.4	4.22	7.09	2.2	4.1	10' TYPE 2 AT-GRADE
2	BASIN OS-C	0.48	0.55	9.4	4.22	7.09	2.0	3.9	10' TYPE 2 AT-GRADE
3	BASIN OS-A	3.43	4.54	12.9	3.75	6.30	12.9	28.6	FUTURE STORM
4	BASIN A + FLOW-BY DP-1	0.82	1.01	9.2	4.25	7.14	3.5	7.2	5' TYPE 2 SUMP
5	BASIN B	0.47	0.57	8.7	4.34	7.29	2.1	4.2	5' TYPE 2 SUMP
6	BASIN C	0.91	1.06	11.5	3.92	6.58	3.6	7.0	15' TYPE 2 AT-GRADE
7	BASIN D	0.84	0.96	11.5	3.92	6.58	3.3	6.3	15' TYPE 2 AT-GRADE
8A	BASIN DU-C	2.34	2.61	10.9	4.00	6.72	9.4	17.5	10' TYPE 2 AT-GRADE
8B	BASIN E + FLOW-BY DP-6 + FLOW-BY DP-8A	1.54	2.22	11.5	3.92	6.58	6.0	14.6	10' TYPE 2 SUMP
9	BASIN DU-E + BASIN F + FLOW-BY DP-7	0.61	0.69	9.0	4.29	7.20	2.6	5.0	5' TYPE 2 SUMP

JOB NAME:	*BANNING LEWIS RANCH FILINGS 62-66*
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SURFACE ROUTING SUMMARY (DEVELOPED)

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Facility/ Inlet Size*
10	BASIN OS-D	1.54	1.73	10.7	4.03	6.77	6.2	11.7	FUTURE SUMP INLET
11	BASIN OS-E	1.42	1.66	10.7	4.03	6.77	5.7	11.2	FUTURE SUMP INLET
12	BASIN J + DP-10 + DP-11	12.65	16.24	17.6	3.28	5.51	41.5	89.5	FUTURE STORM
13	BASIN H + FLOW-BY DP-2	0.92	1.11	11.2	3.95	6.64	3.7	7.4	15' TYPE 2 AT-GRADE
14	BASIN G	0.70	0.76	9.2	4.26	7.16	3.0	5.4	10' TYPE 2 AT-GRADE
15	BASIN Y	11.24	14.90	17.6	3.28	5.51	36.9	82.2	FUTURE STORM
16	BASIN W	1.03	1.31	10.7	4.03	6.76	4.1	8.9	10' TYPE 2 SUMP
17	BASIN X + FLOW-BY DP-13	0.74	1.07	12.4	3.81	6.40	2.8	6.8	5' TYPE 2 SUMP
18	BASIN P	1.49	2.17	13.3	3.71	6.22	5.5	13.5	10' TYPE 2 SUMP
19	BASIN N	1.63	2.16	11.9	3.87	6.49	6.3	14.1	15' TYPE 2 SUMP

JOB NAME:	*BANNING LEWIS RANCH FILINGS 62-66*
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SURFACE ROUTING SUMMARY (DEVELOPED)

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)	
20	BASIN K	1.09	1.83	10.9	4.00	6.72	4.4	12.3	10' TYPE 2 AT-GRADE
21	BASIN L + FLOW-BY DP-20	1.15	2.15	11.3	3.95	6.63	4.5	14.3	10' TYPE 2 SUMP
22	BASIN M + FLOW-BY DP-14	0.24	0.42	6.9	4.68	7.85	1.1	3.3	5' TYPE 2 SUMP
23	BASIN R	1.25	1.64	12.8	3.76	6.32	4.7	10.4	10' TYPE 2 AT-GRADE
24	BASIN Q + FLOW-BY DP-23	1.63	2.58	12.8	3.76	6.32	6.1	16.3	10' TYPE 2 AT-GRADE
25	BASIN S	1.10	1.46	10.3	4.08	6.85	4.5	10.0	10' TYPE 2 AT-GRADE
27	BASIN T + FLOW-BY DP-25	1.17	1.93	12.4	3.80	6.38	4.5	12.3	10' TYPE 2 SUMP
28	BASIN V + FLOW-BY DP-24	0.88	2.05	12.8	3.76	6.32	3.3	13.0	10' TYPE 2 SUMP
29	BASIN AA	0.62	1.27	7.5	4.56	7.66	2.8	9.7	PRIVATE STORM (PARK)
30	BASIN BB + PIPE 33 + PIPE 42	47.14	62.53	19.1	3.16	5.30	148.8	331.4	POND 400
31	BASIN Z	0.29	0.32	7.8	4.51	7.56	1.3	2.4	SURFACE RUNOFF

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

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

PIPE ROUTING SUMMARY (DEVELOPED)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Pipe Size*
					I(5)	I(100)	Q(5)	Q(100)	
1	DP-1 (Intercepted)	0.51	0.55	9.4	4.22	7.09	2.2	3.9	18"
2	DP-2 (Intercepted)	0.48	0.53	9.4	4.22	7.09	2.0	3.7	18"
3A	DP-8A (Intercepted)	1.60	1.29	10.9	4.00	6.72	6.4	8.7	18"
3B	PIPE 3A + DP-8B	3.14	3.51	11.5	3.92	6.58	12.3	23.1	EX. 24"
4	DP-9	0.61	0.69	9.0	4.29	7.20	2.6	5.0	EX. 18"
5A	PIPE 3B + PIPE 4	3.75	4.20	11.5	3.92	6.58	14.7	27.6	EX. 30"
6	PIPE 1 + PIPE 2	0.99	1.08	9.4	4.22	7.09	4.2	7.6	18"
7	DP-3	3.43	4.54	12.9	3.75	6.30	12.9	28.6	30"
8	PIPE 7 + DP-4	4.25	5.55	12.9	3.75	6.30	15.9	35.0	30"
9	DP-5	0.47	0.57	8.7	4.34	7.29	2.1	4.2	18"
10	PIPE 8 + PIPE 9	4.72	6.12	12.9	3.75	6.30	17.7	38.5	36"
11	PIPE 6 + PIPE 10	5.71	7.19	13.5	3.68	6.18	21.0	44.5	36"
12	DP-6 (Intercepted)	0.91	1.03	11.5	3.92	6.58	3.6	6.8	18"
13	PIPE 12 + DP-7 (Intercepted)	1.75	1.98	11.5	3.92	6.58	6.9	13.0	24"

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

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

PIPE ROUTING SUMMARY (DEVELOPED)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Pipe Size*
					I(5)	I(100)	Q(5)	Q(100)	
14	PIPE 11 + PIPE 13	7.46	9.17	14.7	3.56	5.97	26.5	54.8	36"
15	DP-18	1.49	2.17	13.3	3.71	6.22	5.5	13.5	24"
16	DP-19	1.63	2.16	11.9	3.87	6.49	6.3	14.1	24"
17	PIPE 14 + PIPE 15 + PIPE 16	10.58	13.51	15.9	3.43	5.76	36.3	77.8	48"
18	DP-20 (Intercepted)	1.02	1.10	10.9	4.00	6.72	4.1	7.4	18"
19	DP-21	1.15	2.15	11.3	3.95	6.63	4.5	14.3	24"
20	DP-22	0.24	0.42	6.9	4.68	7.85	1.1	3.3	18"
21	PIPE 18 + PIPE 19 + PIPE 20	2.41	3.67	11.3	3.95	6.63	9.5	24.3	30"
22	PIPE 17 + PIPE 21	12.99	17.18	16.6	3.37	5.66	43.8	97.3	48"
23	DP-23 (Intercepted)	1.14	1.08	12.8	3.76	6.32	4.3	6.8	18"
24	PIPE 22 + PIPE 23	14.13	18.26	17.3	3.31	5.56	46.8	101.5	48"
25	DP-24 (Intercepted)	1.35	1.33	12.8	3.76	6.32	5.1	8.4	18"
26	DP-25 (Intercepted)	1.02	0.98	10.3	4.08	6.85	4.2	6.7	18"
27	PIPE 24 + PIPE 25 + PIPE 26	16.50	20.57	17.4	3.30	5.54	54.5	114.0	48"

JOB NAME: *BANNING LEWIS RANCH FILINGS 62-66*
JOB NUMBER: *2570.90*
DATE: *10/13/26*
CALCULATED BY: *MAL*

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

PIPE ROUTING SUMMARY (DEVELOPED)

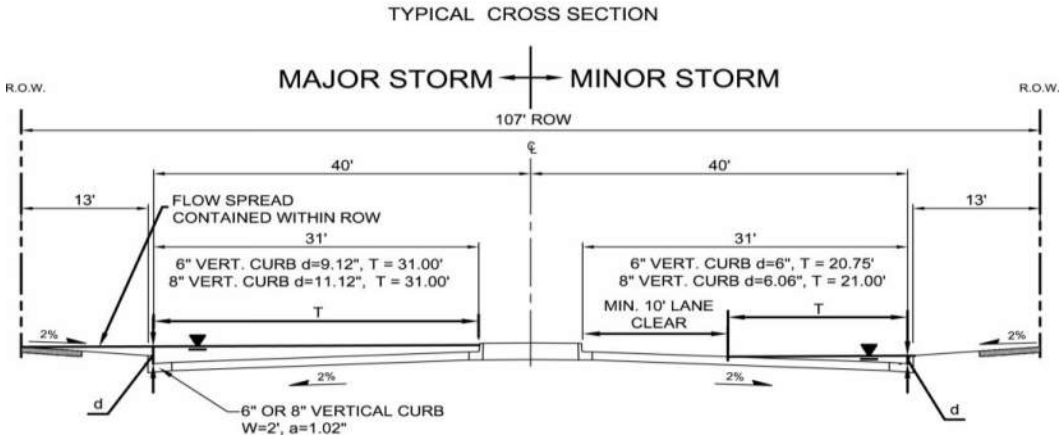
Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Pipe Size*
					I(5)	I(100)	Q(5)	Q(100)	
28	DP-27	1.17	1.93	12.4	3.80	6.38	4.5	12.3	24"
29	DP-28	0.88	2.05	12.8	3.76	6.32	3.3	13.0	24"
30	PIPE 28 + PIPE 29	2.05	3.98	12.8	3.76	6.32	7.7	25.2	30"
31	PIPE 27 + PIPE 30	18.55	24.55	17.6	3.28	5.51	60.9	135.3	54"
32	DP-29	0.62	1.27	7.5	4.56	7.66	2.8	9.7	24"
33	PIPE 31 + PIPE 32	19.17	25.82	18.1	3.24	5.44	62.1	140.4	54"
34	DP-13 (Intercepted)	0.92	1.08	11.2	3.95	6.64	3.7	7.2	18"
35	DP-12	12.65	16.24	17.6	3.28	5.51	41.5	89.5	48"
36	DP-14 (Intercepted)	0.70	0.66	9.2	4.26	7.16	3.0	4.7	18"
37	PIPE 32 + PIPE 33 + PIPE 34	14.27	17.98	17.6	3.28	5.51	46.9	99.1	48"
38	DP-15	11.24	14.90	17.6	3.28	5.51	36.9	82.2	48"
39	PIPE 35 + PIPE 36	25.50	32.89	18.3	3.22	5.41	82.2	177.9	60"
40	DP-16	1.03	1.31	10.7	4.03	6.76	4.1	8.9	18"
41	DP-17	0.74	1.07	12.4	3.81	6.40	2.8	6.8	18"
42	PIPE 37 + PIPE 38 + PIPE 39	27.27	35.27	18.5	3.21	5.39	87.5	189.9	60"
43	POND 400 OUTFALL	0.75	15.35	19.1	3.16	5.30	2.4	81.4	42"

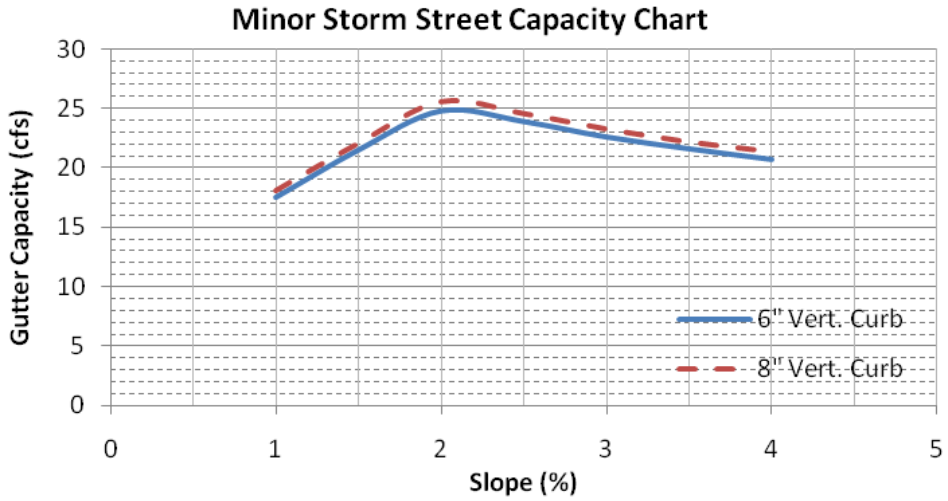
JOB NAME:	***BANNING LEWIS RANCH FILINGS 62-66***
JOB NUMBER:	***2570.90***
DATE:	***10/13/26***
CALCULATED BY:	***MAL***

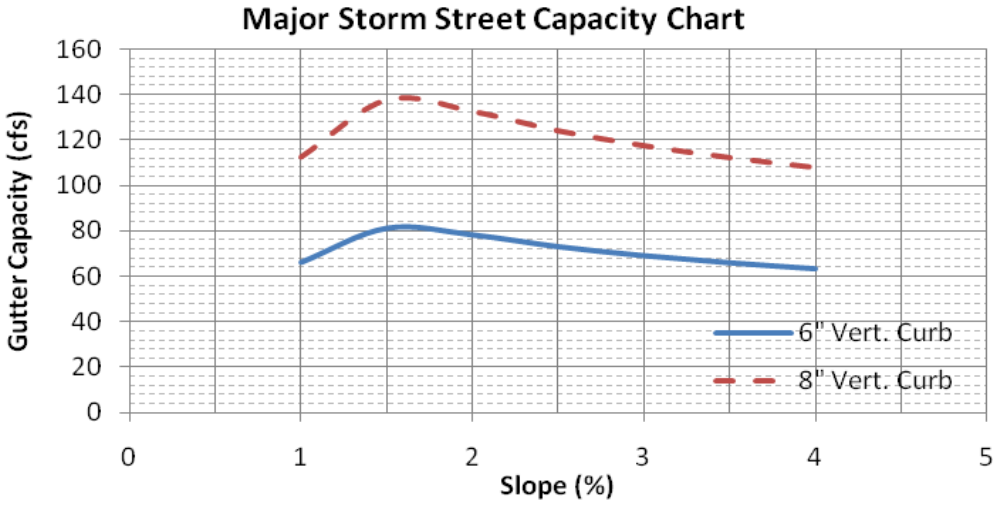
PIPE TRAVEL TIMES (DEVELOPED)

PIPE RUN	STREET / CHANNEL FLOW				
	Pipe Diameter (ft)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)
10	3.0	250	0.5%	6.7	0.6
11	3.0	670	1.0%	9.5	1.2
14	3.0	720	1.0%	9.5	1.3
17	4.0	310	0.5%	8.1	0.6
22	4.0	470	1.0%	11.5	0.7
24	4.0	60	0.5%	8.1	0.1
27	4.0	95	0.5%	8.1	0.2
31	4.5	400	1.0%	12.4	0.5
37	4.0	620	1.5%	14.0	0.7
39	5.0	100	0.5%	9.4	0.2
42	5.0	360	0.5%	9.4	0.6

Figure 7-1. Street Capacity Charts Principal Arterial Type I

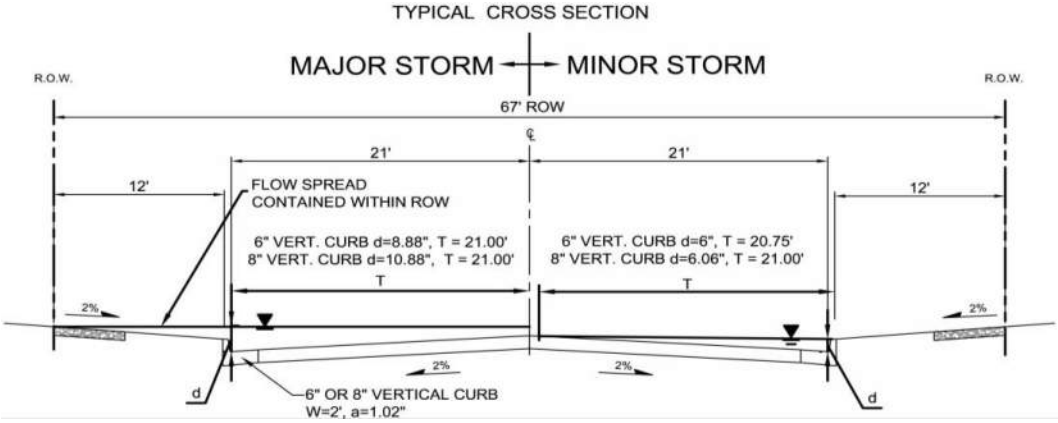


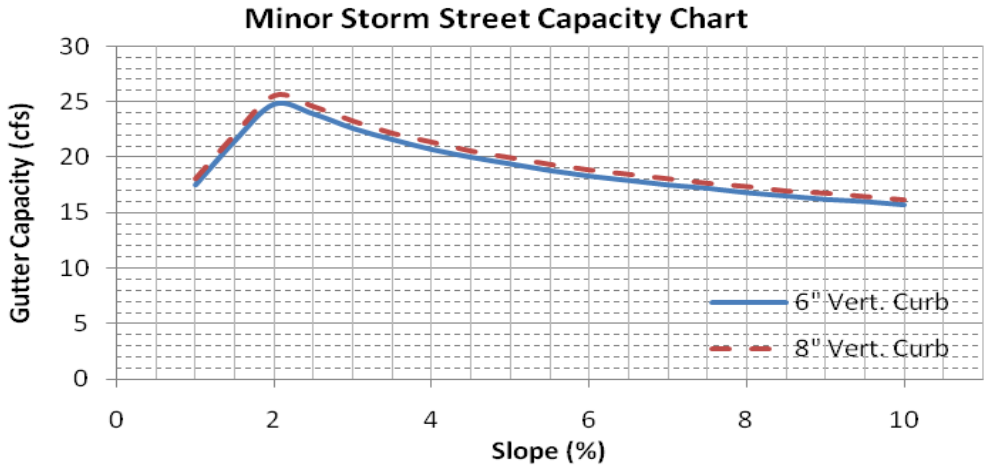


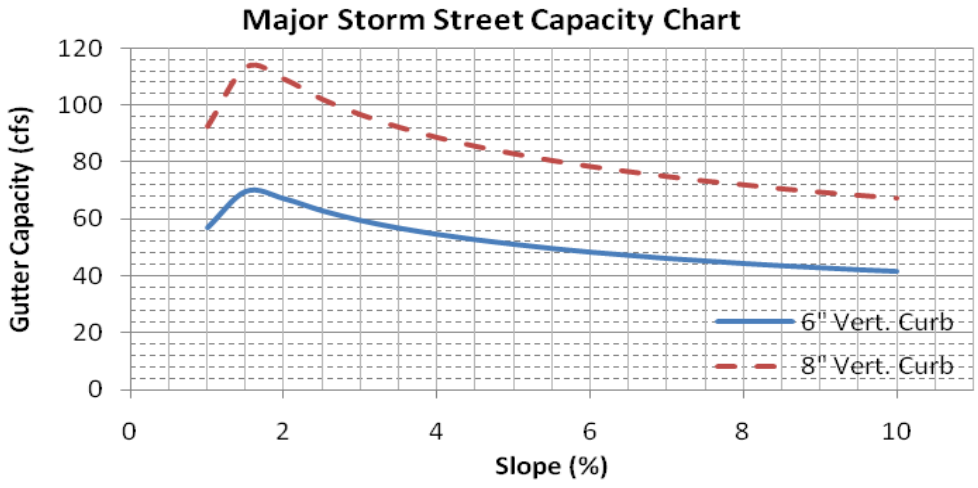


These charts shall only be used for the standard street sections as shown. The capacity shown is based on ½ the street section as calculated by the UD-Inlet spreadsheets. Minor storm capacities are based on no crown overtopping, curb height or maximum allowable spread widths. Major storm capacities are based on flow being containing within the public right-of-way, including conveyance capacity behind the curb. The UDFCD Safety Reduction Factor was applied. An 'n_{STREET}' of 0.016 and 'n_{BACK}' of 0.020 was used. Calculations were done using UD-Inlet 3.00.xls, March, 2011.

Figure 7-5. Street Capacity Charts Collector (with Parking)

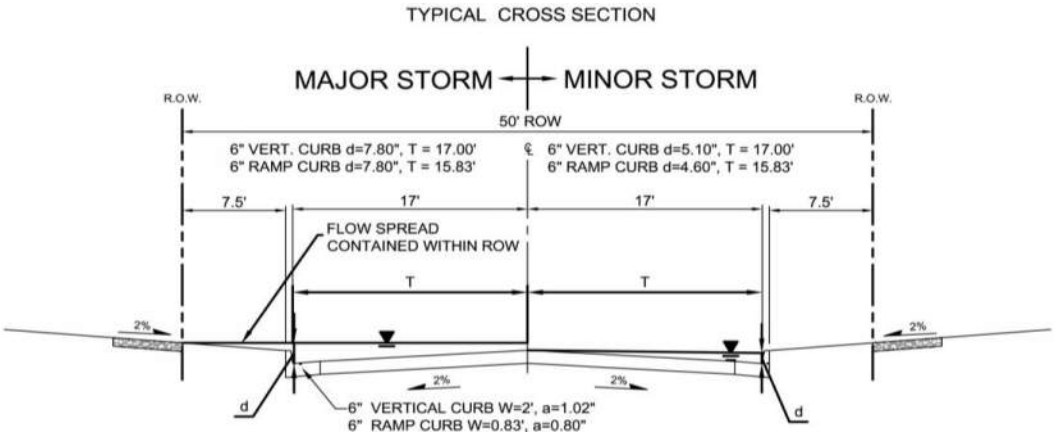


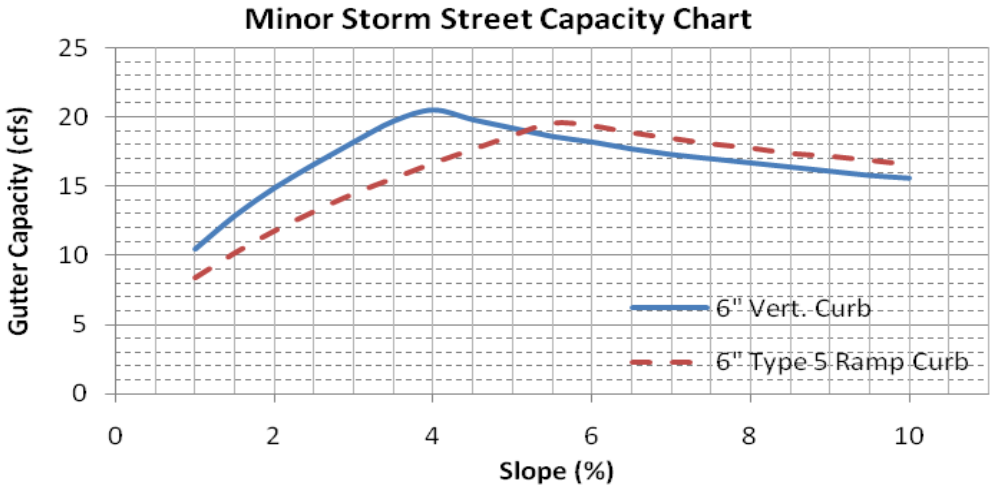


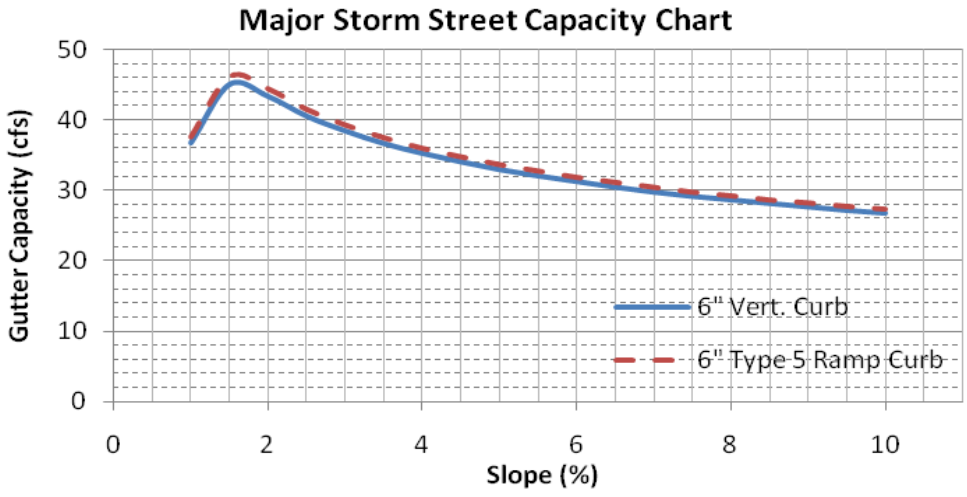


These charts shall only be used for the standard street sections as shown. The capacity shown is based on ½ the street section as calculated by the UD-Inlet spreadsheets. Minor storm capacities are based on no crown overtopping, curb height or maximum allowable spread widths. Major storm capacities are based on flow being containing within the public right-of-way, including conveyance capacity behind the curb. The UDFCD Safety Reduction Factor was applied. An 'n_{STREET}' of 0.016 and 'n_{BACK}' of 0.020 was used. Calculations were done using UD-Inlet 3.00.xls, March, 2011.

Figure 7-7. Street Capacity Charts Residential (Detached Sidewalk)







These charts shall only be used for the standard street sections as shown. The capacity shown is based on ½ the street section as calculated by the UD-Inlet spreadsheets. Minor storm capacities are based on no crown overtopping, curb height or maximum allowable spread widths. Major storm capacities are based on flow being containing within the public right-of-way, including conveyance capacity behind the curb. The UDFCD Safety Reduction Factor was applied. An 'n_{STREET}' of 0.016 and 'n_{BACK}' of 0.020 was used. Calculations were done using UD-Inlet 3.00.xls, March, 2011.

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED FROM DP-1

INLET NAME	DP-1	DP-2	DP-4
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	In Sump
Inlet Type	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)	2.2	2.0	3.5
Major Q_{Known} (cfs)	4.1	3.9	7.0

Bypass (Carry-Over) Flow from Upstream Inlets must be organized from upstream (left) to downstream (right) in order for bypass flows to be linked.

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.2

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)	**2.2**	**2.0**	**3.5**
Major Total Design Peak Flow, Q (cfs)	**4.1**	**3.9**	**7.2**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.2	0.2	N/A

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	DP-5	DP-6	DP-7
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	On Grade	On Grade
Inlet Type	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)	2.1	3.6	3.3
Major Q_{Known} (cfs)	4.2	7.0	6.3

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	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
Major Bypass Flow Received, Q_b (cfs)	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)	**2.1**	**3.6**	**3.3**
Major Total Design Peak Flow, Q (cfs)	**4.2**	**7.0**	**6.3**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	0.2	0.0

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED FROM DP-6 & DP-8A

BYPASS RECEIVED FROM DP-7

INLET NAME	DP-8A	DP-8B	DP-9
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	In Sump	In Sump
Inlet Type	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)	9.4	3.0	2.6
Major Q_{Known} (cfs)	17.5	5.6	4.9

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.0	3.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	9.0	0.1

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)	**9.4**	**6.0**	**2.6**
Major Total Design Peak Flow, Q (cfs)	**17.5**	**14.6**	**5.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	3.0	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	8.8	N/A	N/A

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED
FROM DP-2

INLET NAME	DP-13	DP-14	DP-16
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	In Sump
Inlet Type	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)	3.7	3.0	4.1
Major Q_{Known} (cfs)	7.2	5.4	8.9

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.2	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)	**3.7**	**3.0**	**4.1**
Major Total Design Peak Flow, Q (cfs)	**7.4**	**5.4**	**8.9**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	0.2	0.7	N/A

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED
FROM DP-13

INLET NAME	DP-17	DP-18	DP-19
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump
Inlet Type	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)	2.8	5.5	6.3
Major Q_{Known} (cfs)	6.6	13.5	14.1

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.2	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)	**2.8**	**5.5**	**6.3**
Major Total Design Peak Flow, Q (cfs)	**6.8**	**13.5**	**14.1**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A	N/A

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED FROM DP-20

BYPASS RECEIVED FROM DP-14

INLET NAME	DP-20	DP-21	DP-22
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	In Sump	In Sump
Inlet Type	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)	4.4	4.2	1.1
Major Q_{Known} (cfs)	12.3	9.4	2.6

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.3	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	4.9	0.7

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)	**4.4**	**4.5**	**1.1**
Major Total Design Peak Flow, Q (cfs)	**12.3**	**14.3**	**3.3**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.3	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	4.9	N/A	N/A

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED
FROM DP-23

INLET NAME	DP-23	DP-24	DP-25
Site Type (Urban or Rural)	URBAN	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade
Inlet Type	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)	4.7	5.7	4.5
Major Q_{Known} (cfs)	10.4	12.7	10.0

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	User-Defined	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.4	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	3.6	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)	**4.7**	**6.1**	**4.5**
Major Total Design Peak Flow, Q (cfs)	**10.4**	**16.3**	**10.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	0.4	1.0	0.3
Major Flow Bypassed Downstream, Q_b (cfs)	3.6	7.9	3.3

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

BYPASS RECEIVED FROM DP-25

BYPASS RECEIVED FROM DP-24

INLET NAME	DP-27	DP-28
Site Type (Urban or Rural)	URBAN	URBAN
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{Known} (cfs)	4.2	2.3
Major Q_{Known} (cfs)	9.0	5.1

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined	User-Defined
Minor Bypass Flow Received, Q_b (cfs)	0.3	1.0
Major Bypass Flow Received, Q_b (cfs)	3.3	7.9

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

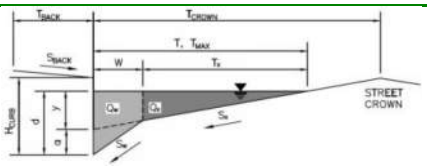
Minor Total Design Peak Flow, Q (cfs)	**4.5**	**3.3**
Major Total Design Peak Flow, Q (cfs)	**12.3**	**13.0**
Minor Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A
Major Flow Bypassed Downstream, Q_b (cfs)	N/A	N/A

MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: BLR FIL. 67-69
Inlet ID: DP-1



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.008	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

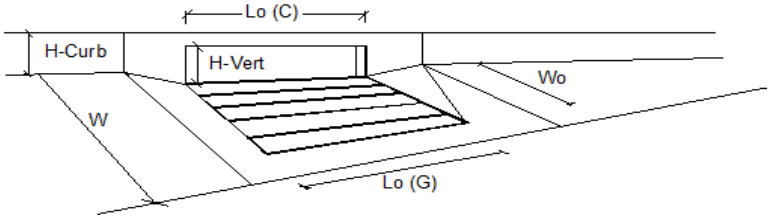
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**15.2**	**57.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.20 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 4.10 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



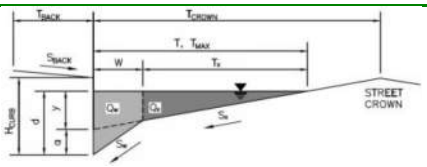
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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 =**	**2.2**	**3.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.2**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**95**	**%**

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-2**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.008	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

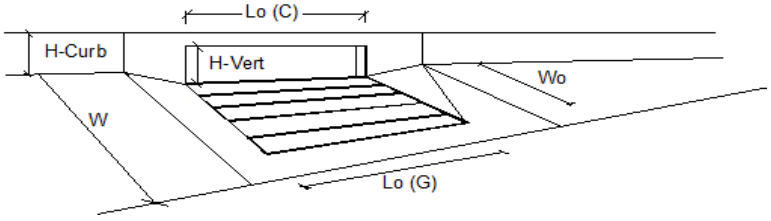
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**15.2**	**57.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.00 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 3.90 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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 =**	**2.0**	**3.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.2**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**96**	**%**

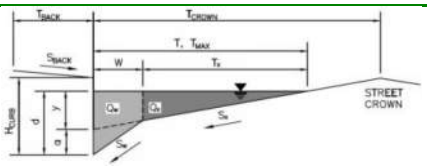
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ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-4**



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	21.0	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 =	0.063	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} =	21.0	21.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.9	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

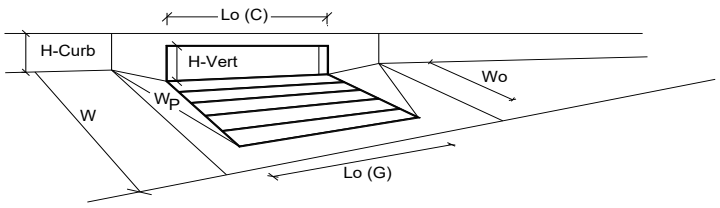
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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	8.9	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
Open Area 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	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} =	0.38	0.62	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.4**	**10.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.5	7.2	cfs

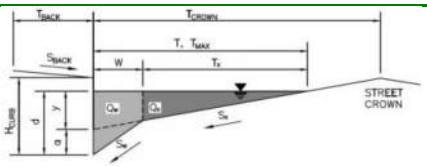
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ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-5**



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	21.0	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 =	0.063	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} =	21.0	21.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.9	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

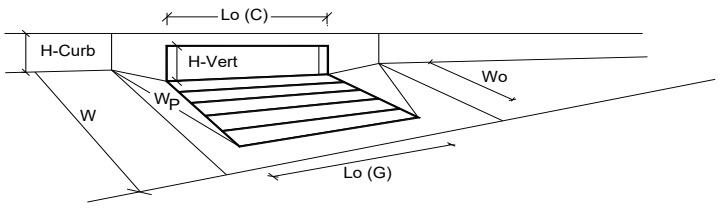
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



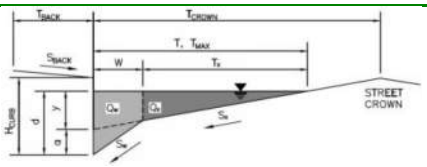
Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	8.9	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
Open Area 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	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} =	0.38	0.62	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.4**	**10.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.1	4.2	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: BLR FIL. 67-69
Inlet ID: DP-6



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

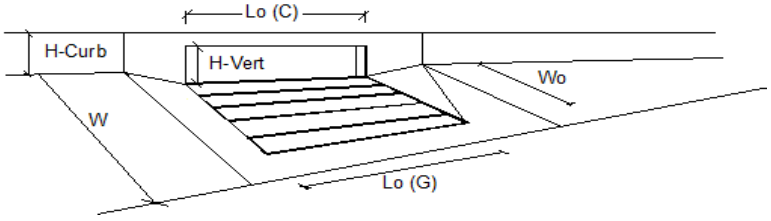
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**17.5**	**65.8**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.60 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 7.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



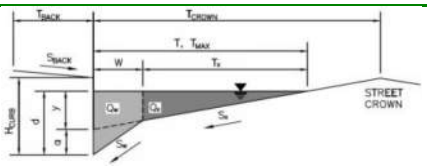
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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 =**	**3.6**	**6.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.2**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**98**	**%**

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-7**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

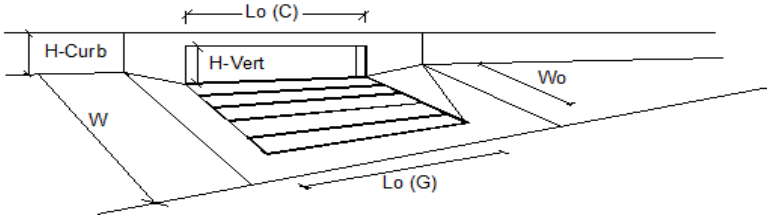
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**17.5**	**65.8**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.30 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 6.30 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



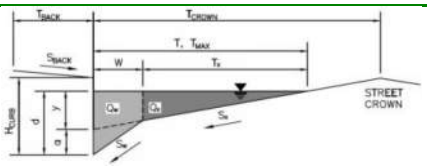
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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 =**	**3.3**	**6.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**99**	**%**

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-8A**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

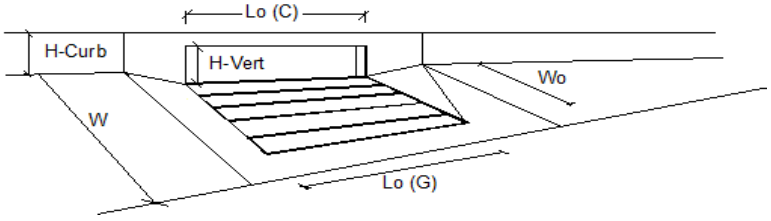
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**21.5**	**80.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 9.40 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 17.50 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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	

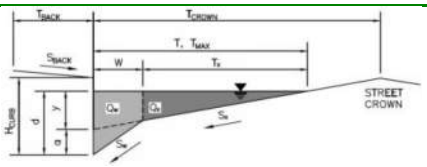
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**6.4**	**8.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**3.0**	**8.8**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**69**	**50**	**%**

MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-8B**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	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	

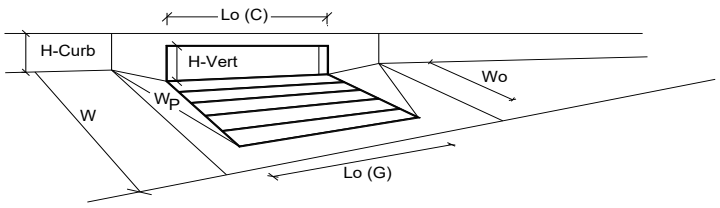
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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	9.1	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
Open Area 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	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} =	0.38	0.63	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**9.9**	**21.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.0	14.6	cfs

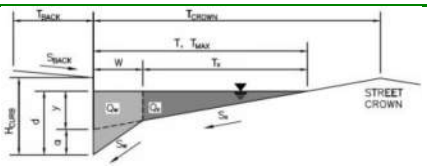
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-9**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.0	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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	43.0	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 =	0.063	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} =	43.0	43.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	9.1	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

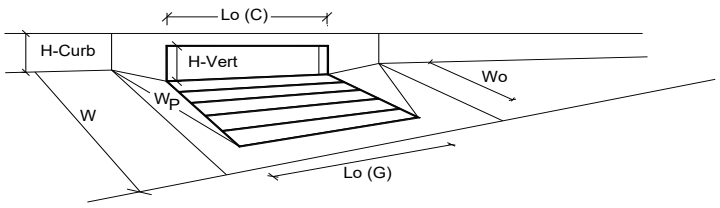
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)

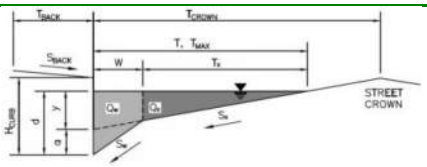


Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	9.1	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
Open Area 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	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} =	0.38	0.63	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.4**	**10.7**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.6	5.0	cfs

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-13**



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	21.0	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 =	0.063	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} =	21.0	21.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.9	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

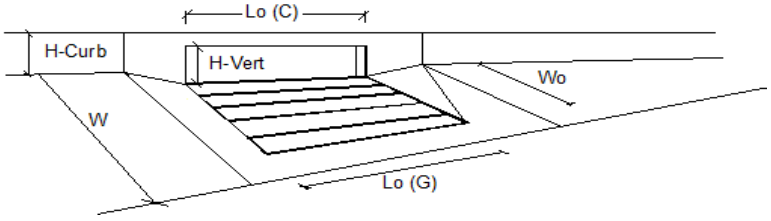
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**24.8**	**67.8**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.70 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 7.40 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



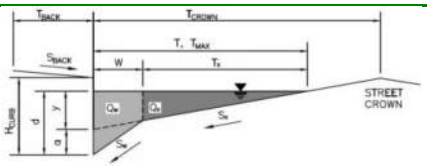
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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 =**	**3.7**	**7.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.2**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**97**	**%**

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-14**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.1	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

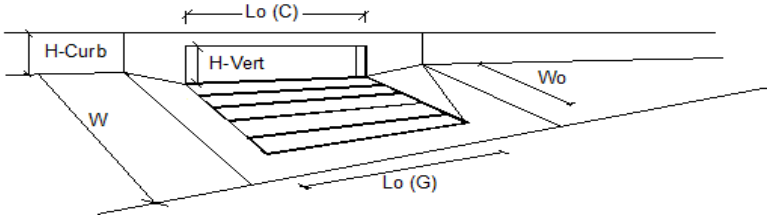
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**12.0**	**41.9**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.00 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 5.40 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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**	**4.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.7**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**87**	**%**

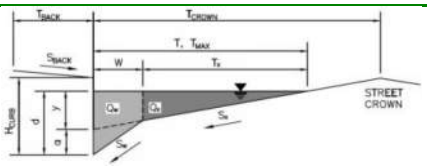
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-16**



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	21.0	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 =	0.063	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} =	21.0	21.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.9	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

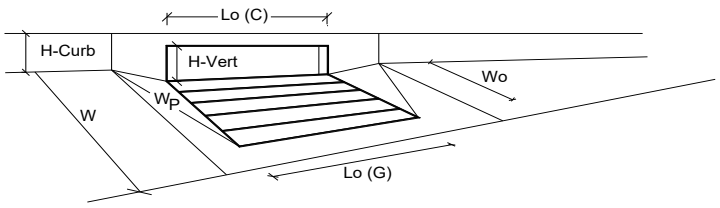
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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	8.9	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
Open Area 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	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} =	0.38	0.62	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.93	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**9.9**	**20.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.1	8.9	cfs

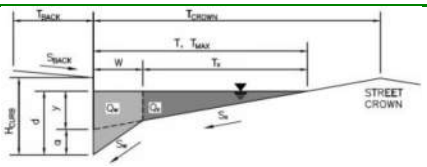
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-17**



Gutter Geometry:

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} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	21.0	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 =	0.063	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} =	21.0	21.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	8.9	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

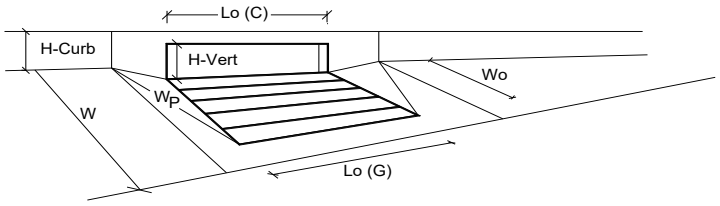
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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	8.9	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
Open Area 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	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} =	0.38	0.62	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.4**	**10.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.8	6.8	cfs

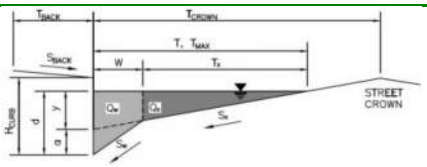
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-18**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

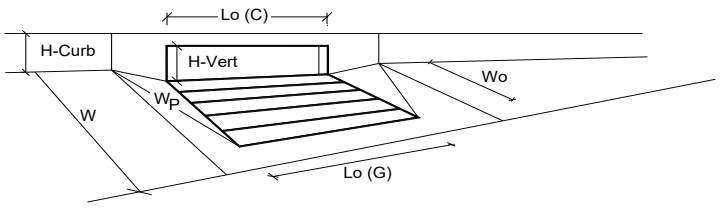
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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 =	5.1	7.8	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
Open Area 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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.88	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**17.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	5.5	13.5	cfs

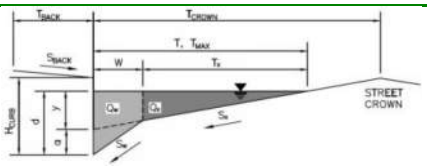
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-19**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

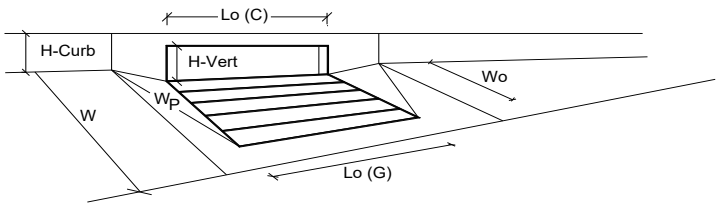
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)

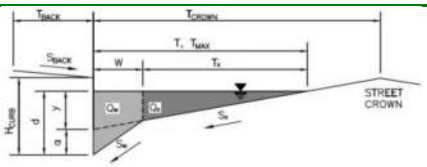


Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.1	7.8	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
Open Area 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) =	15.00	15.00	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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.73	0.88	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**7.6**	**21.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.3	14.1	cfs

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-20**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

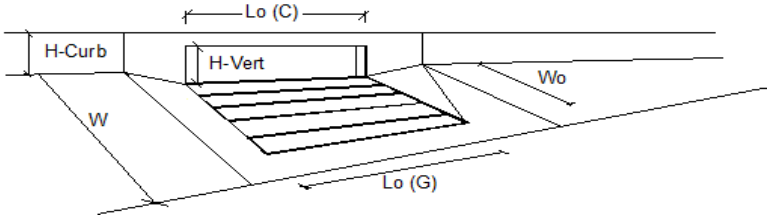
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**12.9**	**45.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.40 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 12.30 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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 =**	**4.1**	**7.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.3**	**4.9**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**93**	**60**	**%**

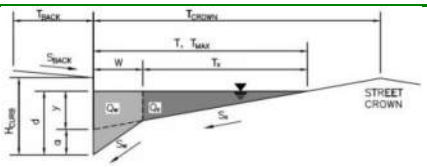
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-21**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

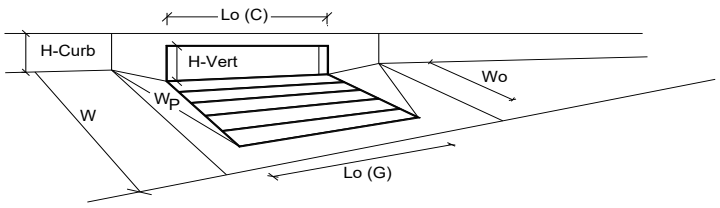
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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' 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 =	5.1	7.8	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
Open Area 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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.88	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**17.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.5	14.3	cfs

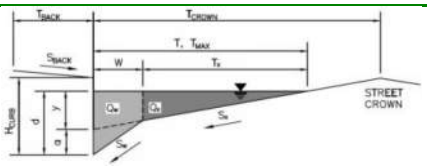
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-22**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

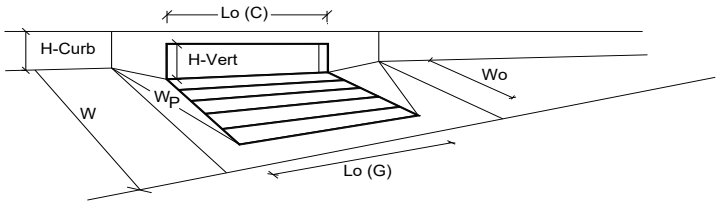
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)

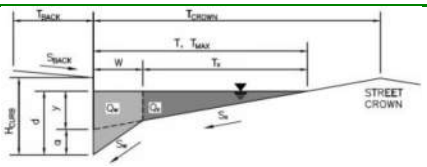


Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.1	7.8	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
Open Area 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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**4.6**	**9.6**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.1	3.3	cfs

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-23**



Gutter Geometry:

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} =	0.020	
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 =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.018	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} =	5.1	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

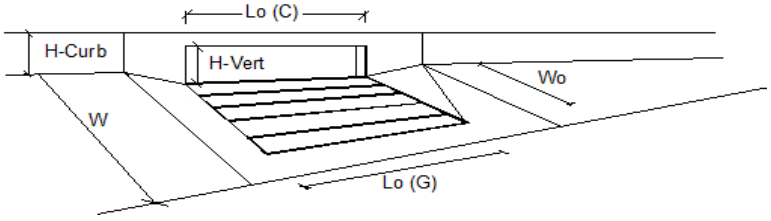
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**14.0**	**45.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.70 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 10.40 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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	

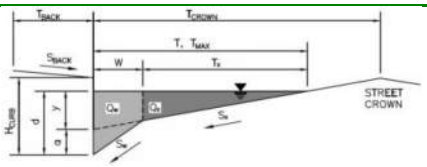
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.3**	**6.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.4**	**3.6**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**91**	**65**	**%**

MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: BLR FIL. 67-69
Inlet ID: DP-24



Gutter Geometry:

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} =	0.020	
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 =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.014	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} =	5.1	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

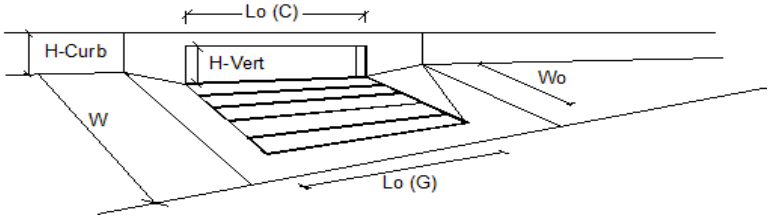
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
Q_{allow} =	**12.4**	**43.4**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 6.10 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 16.30 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



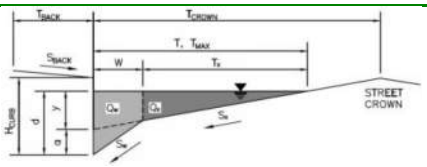
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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 =**	**5.1**	**8.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.0**	**7.9**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**83**	**52**	**%**

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

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

Project: **BLR FIL. 67-69**
Inlet ID: **DP-25**



Gutter Geometry:

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} =	0.020	
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 =	0.063	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.014	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

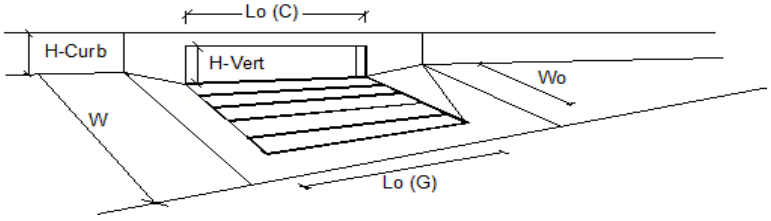
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.1	7.8	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion MAJOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	**12.4**	**43.4**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.50 cfs on sheet 'Inlet Management'
Major storm max. allowable capacity GOOD - greater than the design peak flow of 10.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 5.03 (August 2023)



Design Information (Input)		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	

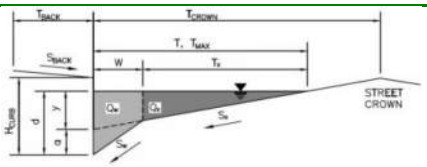
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.2**	**6.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.3**	**3.3**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**93**	**67**	**%**

MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: BLR FIL. 67-69
Inlet ID: DP-27



Gutter Geometry:

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} =	0.020	
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 =	0.063	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	

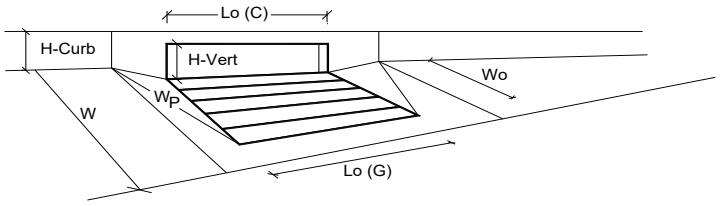
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

MINOR STORM Allowable Capacity is not applicable to Sump Condition
MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



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 =	5.1	7.8	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
Open Area 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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.88	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**17.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.5	12.3	cfs

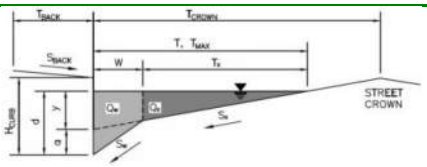
MHFD-Inlet, Version 5.03 (August 2023)

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

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

Project: **BLR FIL. 67-69**

Inlet ID: **DP-28**



Gutter Geometry:

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} =	0.020	
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 =	0.063	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} =	5.1	7.8	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

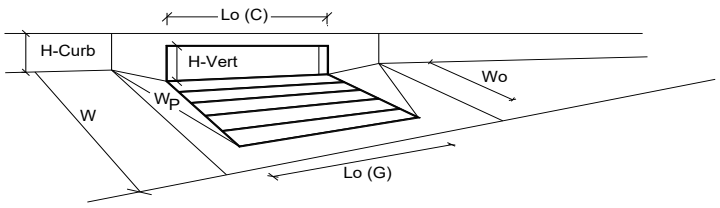
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 5.03 (August 2023)



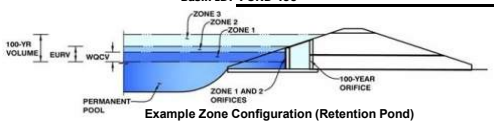
Design Information (Input)		MINOR	MAJOR	
Type of Inlet (CDOT Type R Curb Opening)	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.1	7.8	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
Open Area 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	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} =	0.30	0.53	ft
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.88	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**6.6**	**17.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.3	13.0	cfs

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: BLR VILLAGE A6

Basin ID: POND 400



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	97.30	acres
Watershed Length =	3,600	ft
Watershed Length to Centroid =	1,800	ft
Watershed Slope =	0.016	ft/ft
Watershed Imperviousness =	60.40%	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) =	1.926	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	6.378	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.03 in.) =	4.852	acre-feet	1.03 inches
5-yr Runoff Volume (P1 = 1.32 in.) =	6.843	acre-feet	1.32 inches
10-yr Runoff Volume (P1 = 1.59 in.) =	8.848	acre-feet	1.59 inches
25-yr Runoff Volume (P1 = 2.01 in.) =	12.700	acre-feet	2.01 inches
50-yr Runoff Volume (P1 = 2.38 in.) =	15.782	acre-feet	2.38 inches
100-yr Runoff Volume (P1 = 2.77 in.) =	19.360	acre-feet	2.77 inches
500-yr Runoff Volume (P1 = 3.84 in.) =	28.617	acre-feet	3.84 inches
Approximate 2-yr Detention Volume =	4.248	acre-feet	
Approximate 5-yr Detention Volume =	5.827	acre-feet	
Approximate 10-yr Detention Volume =	7.747	acre-feet	
Approximate 25-yr Detention Volume =	9.264	acre-feet	
Approximate 50-yr Detention Volume =	10.163	acre-feet	
Approximate 100-yr Detention Volume =	11.520	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.926	acre-feet
Zone 2 Volume (EURV - Zone 1) =	4.453	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	5.142	acre-feet
Total Detention Basin Volume =	11.520	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

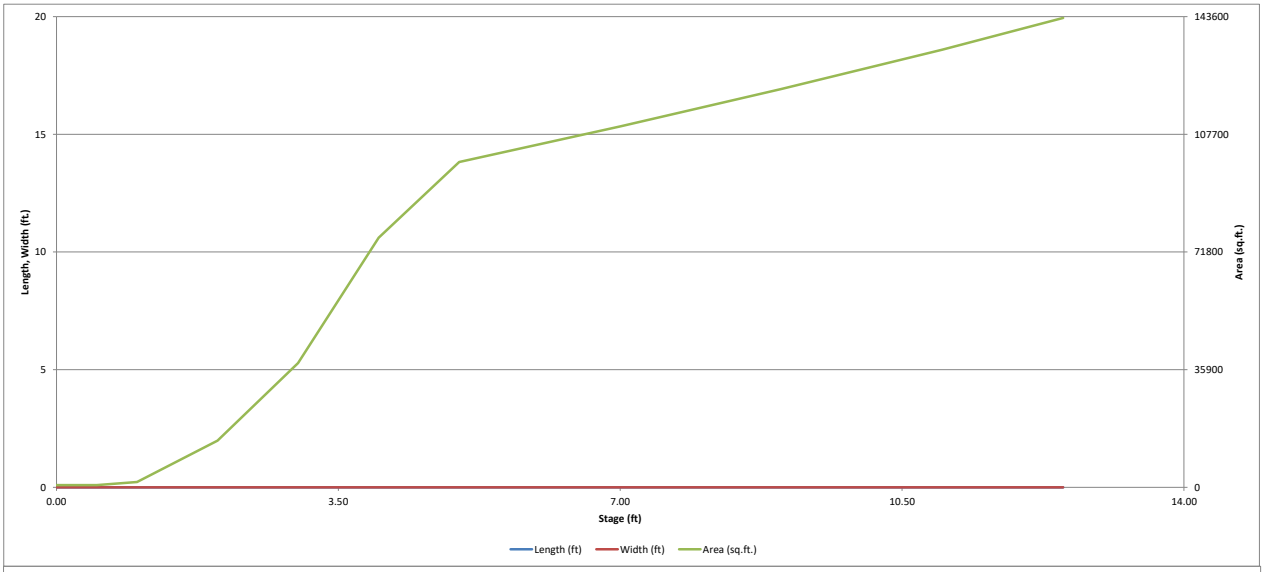
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user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

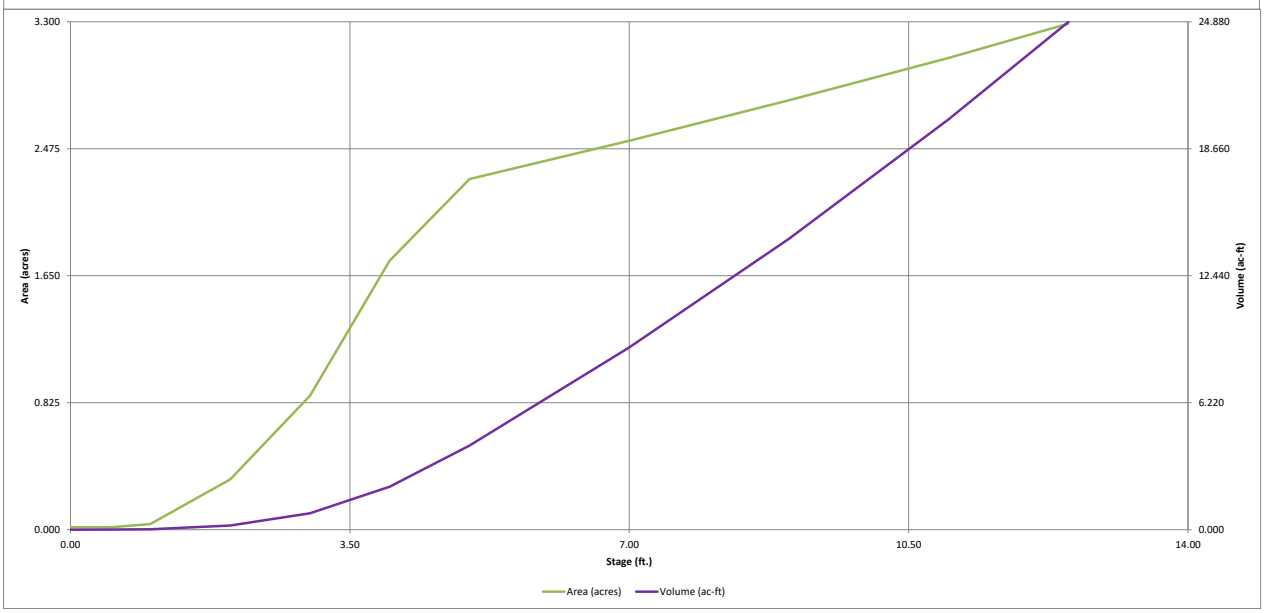
Depth Increment = 0.20 ft

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	--	--	--	680	0.016		
	--	0.50	--	--	--	680	0.016	340	0.008
	--	1.00	--	--	--	1,608	0.037	912	0.021
	--	2.00	--	--	--	14,230	0.327	8,831	0.203
	--	3.00	--	--	--	37,908	0.870	34,900	0.801
	--	4.00	--	--	--	76,142	1.748	91,925	2.110
	--	5.00	--	--	--	99,233	2.278	179,612	4.123
	--	7.00	--	--	--	110,092	2.527	388,937	8.929
	--	9.00	--	--	--	121,516	2.790	620,545	14.246
	--	11.00	--	--	--	133,527	3.065	875,588	20.101
	--	12.50	--	--	--	143,205	3.288	1,083,137	24.865
	--		--	--	--				
	--		--	--	--				
	--		--	--	--			

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



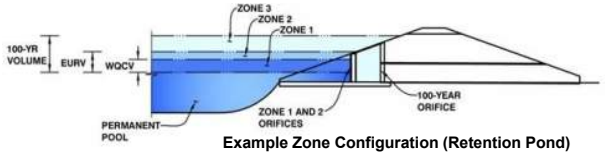


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: BLR VILLAGE A6

Basin ID: POND 400



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.90	1.926	Orifice Plate
Zone 2 (EURV)	5.97	4.453	Orifice Plate
Zone 3 (100-year)	8.00	5.142	Weir&Pipe (Circular)
Total (all zones)		11.520	

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

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

Underdrain Orifice Diameter = [ ] inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = [ ] ft²

Underdrain Orifice Centroid = [ ] feet

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

Centroid of Lowest Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = 6.50 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = 16.90 inches

Orifice Plate: Orifice Area per Row = N/A sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row = N/A ft²

Elliptical Half-Width = N/A feet

Elliptical Slot Centroid = N/A feet

Elliptical Slot Area = N/A ft²

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	2.17	4.33					
Orifice Area (sq. inches)	5.00	14.00	26.00					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice

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

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	6.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	20.00	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	7.50	N/A	feet
Overflow Weir Slope Length =	4.12	N/A	feet
Grate Open Area / 100-yr Orifice Area =	5.97	N/A	
Overflow Grate Open Area w/o Debris =	57.39	N/A	ft²
Overflow Grate Open Area w/ Debris =	28.70	N/A	ft²

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

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	42.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	9.62	N/A	ft²
Outlet Orifice Centroid =	1.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= 9.50 ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = 40.00 feet

Spillway End Slopes = 4.00 H:V

Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= 0.86 feet

Stage at Top of Freeboard = 11.36 feet

Basin Area at Top of Freeboard = 3.12 acres

Basin Volume at Top of Freeboard = 21.21 acre-ft

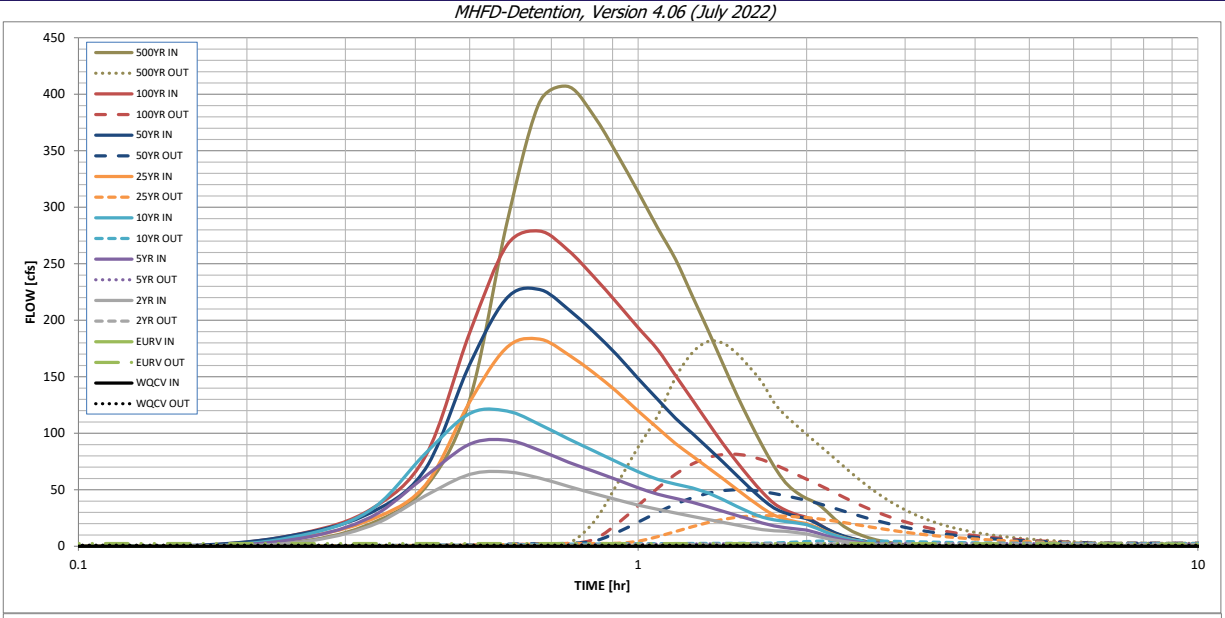
Routed Hydrograph Results

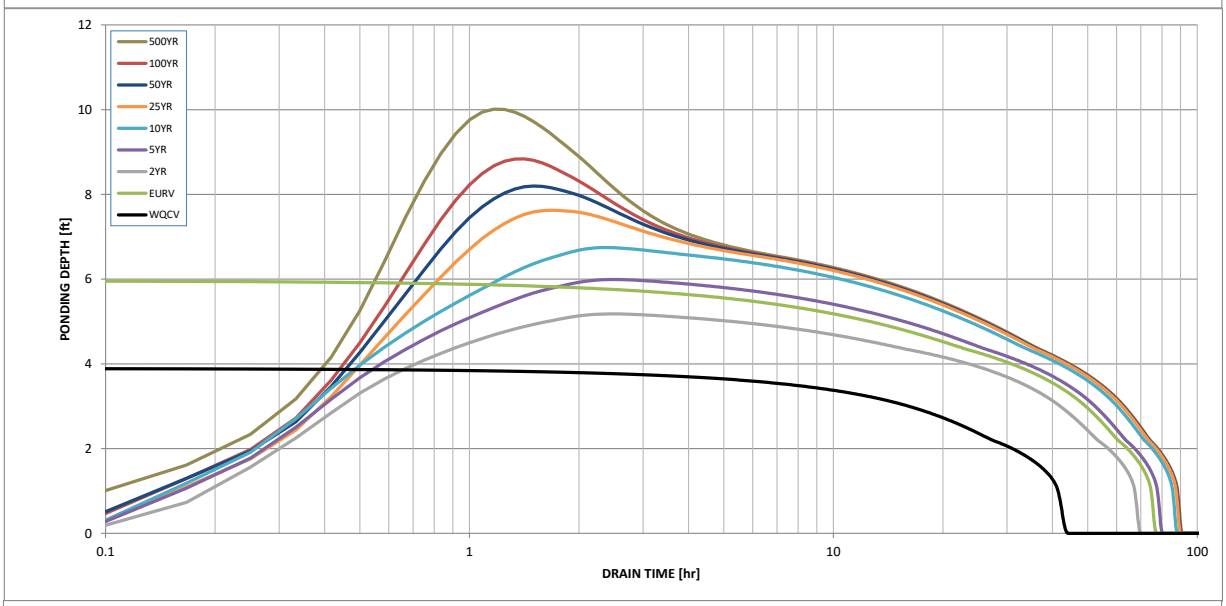
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

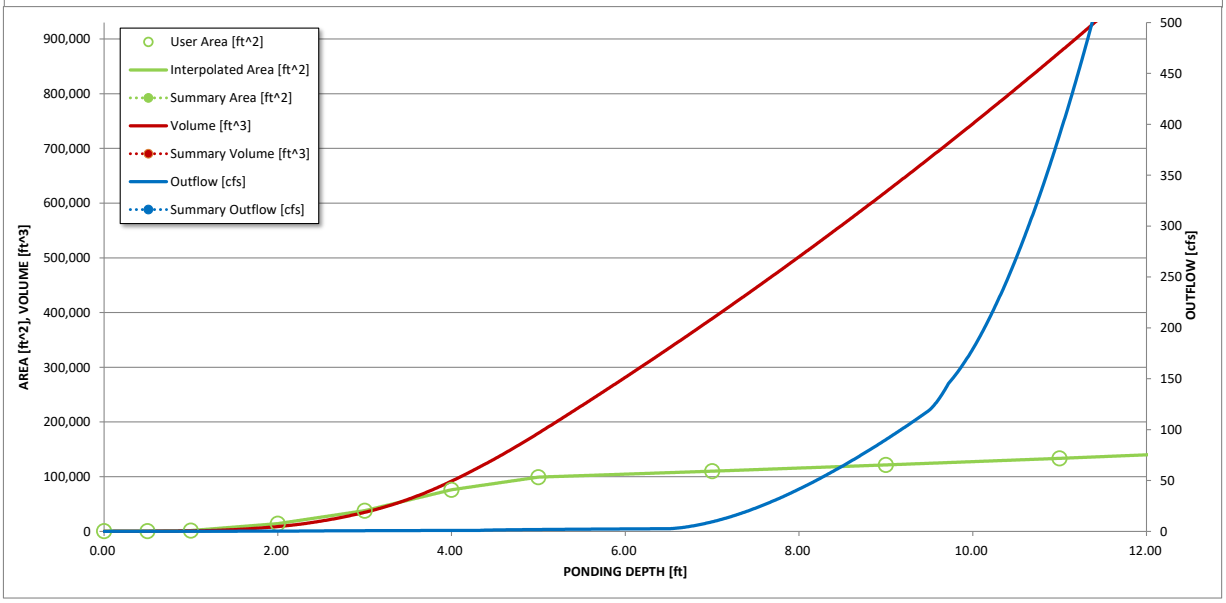
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.03	1.32	1.59	2.01	2.38	2.77	3.84
CUHP Runoff Volume (acre-ft) =	1.926	6.378	4.852	6.843	8.848	12.700	15.782	19.360	28.617
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	4.852	6.843	8.848	12.700	15.782	19.360	28.617
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.1	12.7	25.8	64.9	89.2	119.6	193.2
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.13	0.26	0.67	0.92	1.23	1.99
Peak Inflow Q (cfs) =	N/A	N/A	65.8	93.9	119.7	183.4	227.3	278.9	406.9
Peak Outflow Q (cfs) =	0.9	2.4	2.0	2.4	4.9	27.1	50.1	81.4	181.3
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.2	0.2	0.4	0.6	0.7	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.0	0.4	0.8	1.4	2.3
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) =	39	65	60	67	72	71	69	67	62
Time to Drain 99% of Inflow Volume (hours) =	**42**	72	66	75	81	81	80	78	74
Maximum Ponding Depth (ft) =	3.90	5.97	5.18	5.99	6.74	7.62	8.20	8.84	10.01
Area at Maximum Ponding Depth (acres) =	1.66	2.40	2.30	2.40	2.49	2.61	2.68	2.77	2.93
Maximum Volume Stored (acre-ft) =	1.940	6.392	4.512	6.440	8.276	10.521	12.029	13.773	17.134

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	1.13	0.86	4.28
	0:15:00	0.00	0.00	3.78	7.09	9.56	7.69	11.05	11.35	20.13
	0:20:00	0.00	0.00	18.22	25.89	32.30	23.57	29.76	32.92	51.90
	0:25:00	0.00	0.00	44.71	61.87	82.06	54.05	68.34	79.46	129.41
	0:30:00	0.00	0.00	63.65	90.36	117.45	127.67	160.84	188.80	286.89
	0:35:00	0.00	0.00	65.80	93.93	119.67	176.20	219.93	266.68	392.99
	0:40:00	0.00	0.00	60.34	84.88	107.76	183.36	227.25	278.93	406.94
	0:45:00	0.00	0.00	53.06	74.48	95.12	169.70	209.79	261.90	381.01
	0:50:00	0.00	0.00	46.64	66.34	84.42	153.46	189.67	238.52	347.19
	0:55:00	0.00	0.00	41.19	58.87	74.67	136.77	169.31	215.43	313.72
	1:00:00	0.00	0.00	36.40	51.78	65.98	119.72	148.47	193.55	281.87
	1:05:00	0.00	0.00	32.71	46.13	59.25	104.74	130.12	174.15	253.94
	1:10:00	0.00	0.00	29.43	42.36	54.98	90.84	113.22	151.08	221.48
	1:15:00	0.00	0.00	26.41	38.88	51.65	79.88	99.88	129.68	191.25
	1:20:00	0.00	0.00	23.70	34.95	47.26	69.57	87.00	109.49	161.79
	1:25:00	0.00	0.00	21.23	31.04	41.42	59.94	74.80	91.01	134.32
	1:30:00	0.00	0.00	18.83	27.31	35.37	50.51	62.83	74.90	110.41
	1:35:00	0.00	0.00	16.56	24.00	30.05	41.71	51.63	60.52	89.13
	1:40:00	0.00	0.00	14.75	20.57	25.80	33.87	41.70	47.89	70.63
	1:45:00	0.00	0.00	13.74	18.02	23.38	27.53	33.78	37.89	56.39
	1:50:00	0.00	0.00	13.27	16.44	21.96	23.95	29.30	31.99	47.87
	1:55:00	0.00	0.00	12.19	15.34	20.72	21.66	26.38	28.16	42.29
	2:00:00	0.00	0.00	10.89	14.32	19.17	20.15	24.44	25.47	38.34
	2:05:00	0.00	0.00	9.00	12.01	16.02	16.84	20.37	20.85	31.43
	2:10:00	0.00	0.00	7.03	9.35	12.46	13.01	15.70	15.71	23.69
	2:15:00	0.00	0.00	5.43	7.17	9.54	9.86	11.87	11.61	17.51
	2:20:00	0.00	0.00	4.19	5.51	7.28	7.48	8.97	8.64	13.04
	2:25:00	0.00	0.00	3.23	4.22	5.52	5.72	6.83	6.60	9.92
	2:30:00	0.00	0.00	2.46	3.17	4.12	4.28	5.10	4.97	7.45
	2:35:00	0.00	0.00	1.85	2.34	3.07	3.18	3.78	3.73	5.58
	2:40:00	0.00	0.00	1.37	1.72	2.30	2.37	2.81	2.79	4.19
	2:45:00	0.00	0.00	0.99	1.25	1.70	1.77	2.10	2.09	3.12
	2:50:00	0.00	0.00	0.68	0.87	1.19	1.26	1.49	1.48	2.21
	2:55:00	0.00	0.00	0.43	0.57	0.77	0.84	0.99	0.98	1.46
	3:00:00	0.00	0.00	0.23	0.34	0.44	0.50	0.59	0.58	0.86
	3:05:00	0.00	0.00	0.11	0.17	0.20	0.25	0.29	0.28	0.42
	3:10:00	0.00	0.00	0.04	0.05	0.06	0.08	0.09	0.09	0.13
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: M. LARSON
Company: CLASSIC CONSULTING
Date: October 13, 2026
Project: POND 400 TOTAL
Location: BLR VILLAGE A6

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a	I_a = 60.4 %
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.604
C) Contributing Watershed Area	Area = 97.300 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 ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$)	$V_{DESIGN\ OTHER}$= 1.881 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: $EURV_{C/D} = 1.20 * i^{1.08}$	$EURV_{DESIGN}$ = 6.397 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	
A) Describe means of providing energy dissipation at concentrated inflow locations:	CONCRETE IMPACT STRUCTURE & FOREBAY
5. Forebay	
A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)	V_{FMIN} = 0.056 ac-ft
B) Actual Forebay Volume	V_F = ac-ft
C) Forebay Depth (D_F = 30 inch maximum)	D_F = in
D) Forebay Discharge	
i) Undetained 100-year Peak Discharge	Q_{100} = cfs
ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)	Q_F = 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 = in

SEE INDIVIDUAL FOREBAY SIZING

Design Procedure Form: Extended Detention Basin (EDB)

Designer: M. LARSON
Company: CLASSIC CONSULTING
Date: October 13, 2026
Project: POND 400 TOTAL
Location: BLR VILLAGE A6

6. Trickle Channel

A) Type of Trickle Channel — Choose One: (•) Concrete ( ) Soft Bottom

F) Slope of Trickle Channel — S = 0.0050 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 = 680 sq ft

C) Outlet Type — Choose One: (•) Orifice Plate ( ) Other (Describe):

D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention) — $D_{orifice}$ = 5.00 inches

E) Total Outlet Area — A_{ot} = 45.00 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} = 246 cu ft

C) Initial Surcharge Provided Above Micropool — V_s = 340.0 cu ft

9. Trash Rack

A) Water Quality Screen Open Area: $A_t = A_{ot} * 38.5*(e^{-0.095D})$ — A_t = 1,077 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 4" 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} = 1399 sq. in.

E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E) — H= 6.5 feet

F) Height of Water Quality Screen (H_{TR}) — H_{TR}= 106 inches

G) Width of Water Quality Screen Opening ($W_{opening}$) (Minimum of 12 inches is recommended) — $W_{opening}$ = 13.2 inches

Design Procedure Form: Extended Detention Basin (EDB)

Designer: M. LARSON
Company: CLASSIC CONSULTING
Date: October 13, 2026
Project: POND 400 TOTAL
Location: BLR VILLAGE A6

10. Overflow Embankment

A) Describe embankment protection for 100-year and greater overtopping: Buried riprap emergency spillway.

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

AVOID PLACING IRRIGATION HEADS IN THE BOTTOM OF THE BASIN

12. Access

A) Describe Sediment Removal Procedures: ACCESS ROAD TO BOTTOM OF FACILITY AND EACH STRUCTURE

Notes:

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: M. LARSON
Company: CLASSIC CONSULTING
Date: October 7, 2026
Project: PIPE 33
Location: VILLAGE A6

PIPE 33 (54" RCP)
FOREBAY
DESIGN ONLY

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 58.0 %

4.34 ac. 100% ROAD
29.53 ac. 65% SINGLE FAMILY
3.25 ac. 7% PARK-POND
3.94 ac. 2% LANDSCAPE

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.580

C) Contributing Watershed Area — Area = 41.060 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
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} / 0.43))$) — $V_{DESIGN\ OTHER}$ = 0.767 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: $EURV_{C/D} = 1.20 * i^{1.08}$
— $EURV_{DESIGN}$ = 2.584 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

A) Describe means of providing energy dissipation at concentrated inflow locations: CONCRETE IMPACT STRUCTURE & FOREBAY

5. Forebay

A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV) — V_{FMIN} = 0.023 ac-ft

B) Actual Forebay Volume — V_F = 0.027 ac-ft

C) Forebay Depth (D_F = 30 inch maximum) — D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge — Q_{100} = 140.40 cfs

ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$) — Q_F = 2.81 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 = 9.1 in

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: M. LARSON
Company: CLASSIC CONSULTING
Date: October 7, 2026
Project: PIPE 42
Location: VILLAGE A6

PIPE 42 (60" RCP)
FOREBAY
DESIGN ONLY

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 66.0 %

6.38 ac. 100% ROAD
43.43 ac. 65% SINGLE FAMILY
2.74 ac. 2% LANDSCAPE

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.660

C) Contributing Watershed Area — Area = 52.550 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
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} / 0.43))$)
$V_{DESIGN\ OTHER}$ = 1.104 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: $EURV_{C/D} = 1.20 * i^{1.08}$
$EURV_{DESIGN}$ = 3.802 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

A) Describe means of providing energy dissipation at concentrated inflow locations:
CONCRETE IMPACT STRUCTURE & FOREBAY

5. Forebay

A) Minimum Forebay Volume
(V_{FMIN} = 3% of the WQCV)
V_{FMIN} = 0.033 ac-ft

B) Actual Forebay Volume
V_F = 0.033 ac-ft

C) Forebay Depth
(D_F = 30 inch maximum)
D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge
Q_{100} = 189.90 cfs

ii) Forebay Discharge Design Flow
($Q_F = 0.02 * Q_{100}$)
Q_F = 3.80 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 = 11.0 in

Figure 13-12c. Emergency Spillway Protection

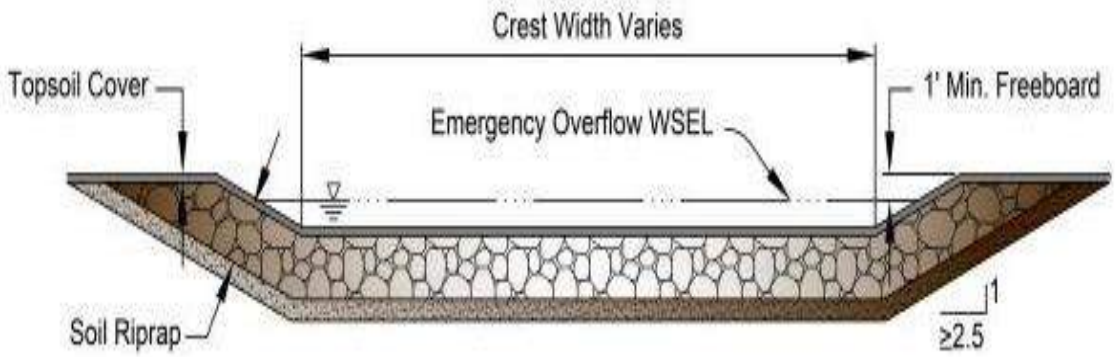
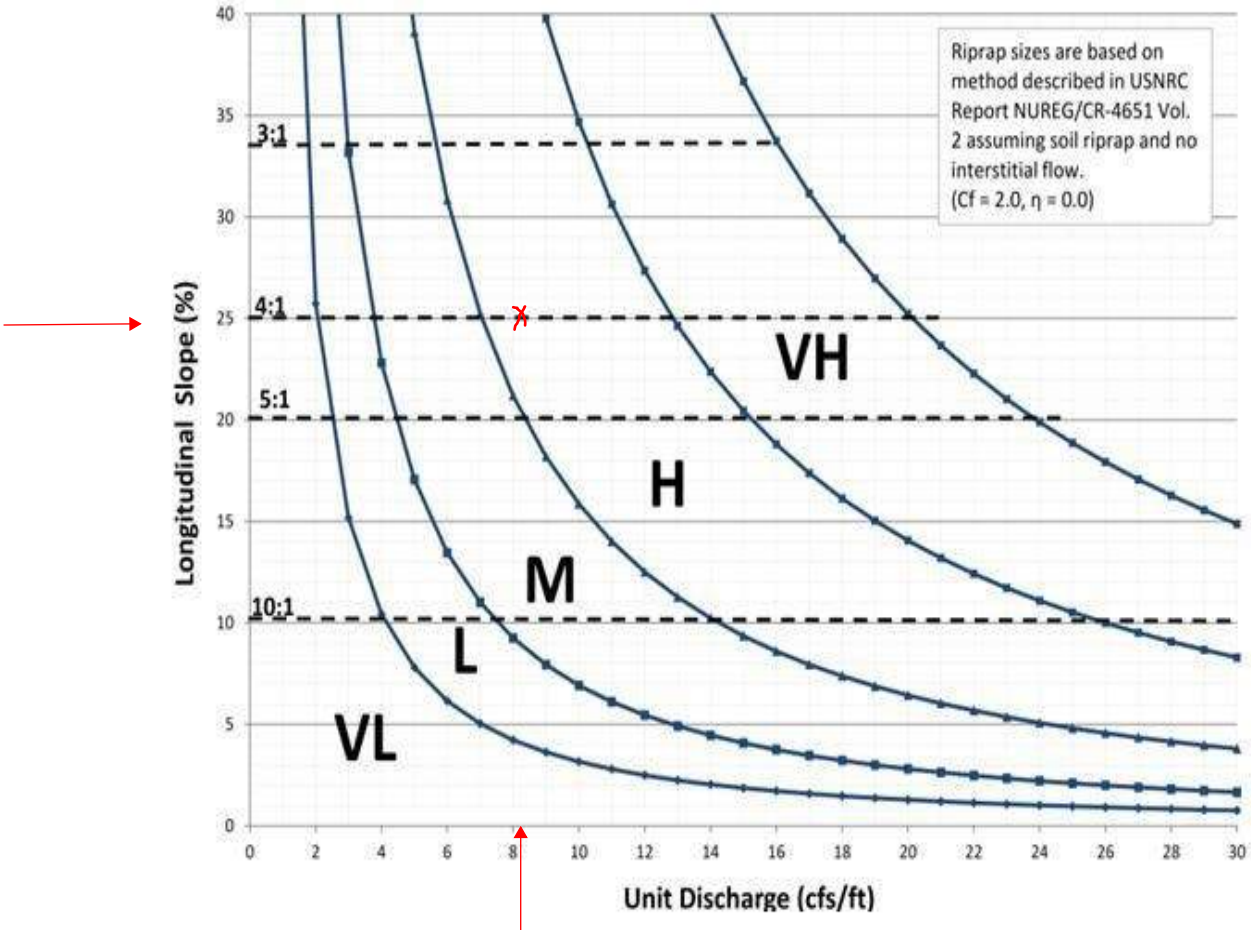


Figure 13-12d. Riprap Types for Emergency Spillway Protection



331 CFS/ 40 LF = 8.3

TYPE H RIPRAP REQUIRED
D50 = 18"

Worksheet for POND 400 TRICKLE CHANNEL

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.005 ft/ft	
Bottom Width	7.00 ft	
Discharge	3.31 cfs	1% OF Q100

Results	
Normal Depth	2.2 in
Flow Area	1.3 ft²
Wetted Perimeter	7.4 ft
Hydraulic Radius	2.1 in
Top Width	7.00 ft
Critical Depth	2.3 in
Critical Slope	0.005 ft/ft
Velocity	2.54 ft/s
Velocity Head	0.10 ft
Specific Energy	0.29 ft
Froude Number	1.040
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	2.2 in
Critical Depth	2.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.005 ft/ft

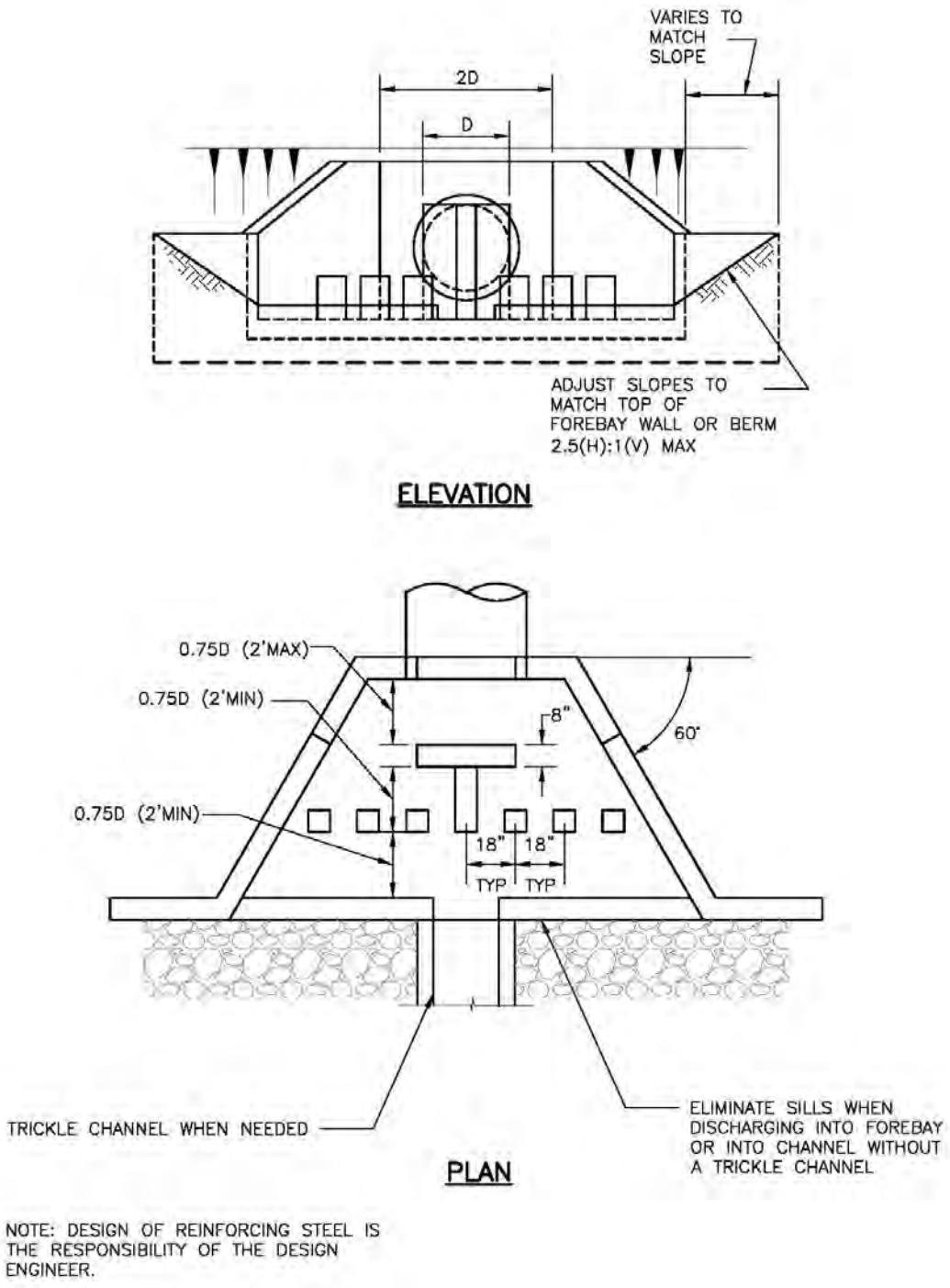


Figure 9-43. Modified impact stilling basin for conduits 18” to 48” in diameter (Part 1 of 2)

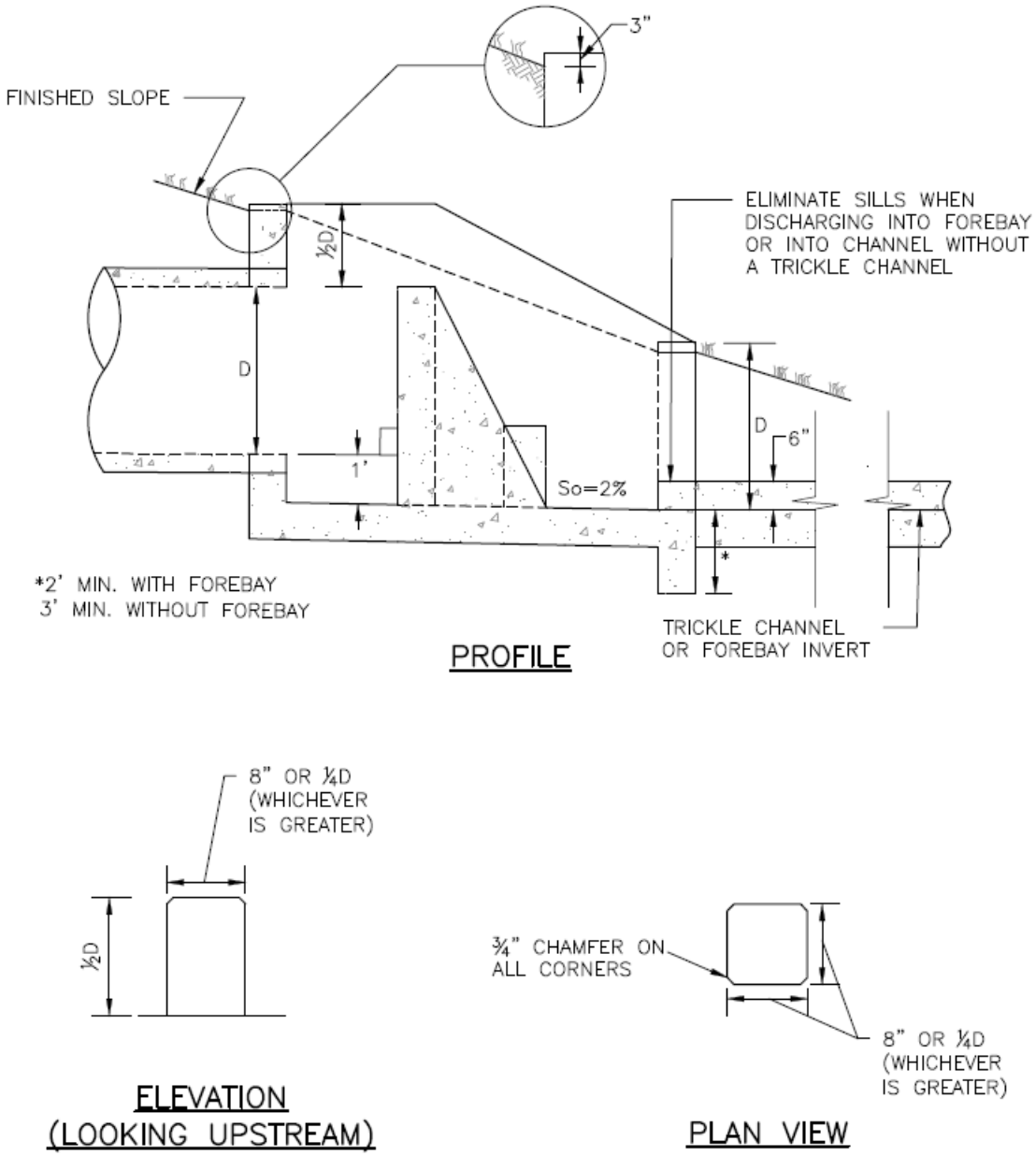


Figure 9-44. Modified impact stilling basin for conduits 18" to 48" in diameter (Part 2 of 2)

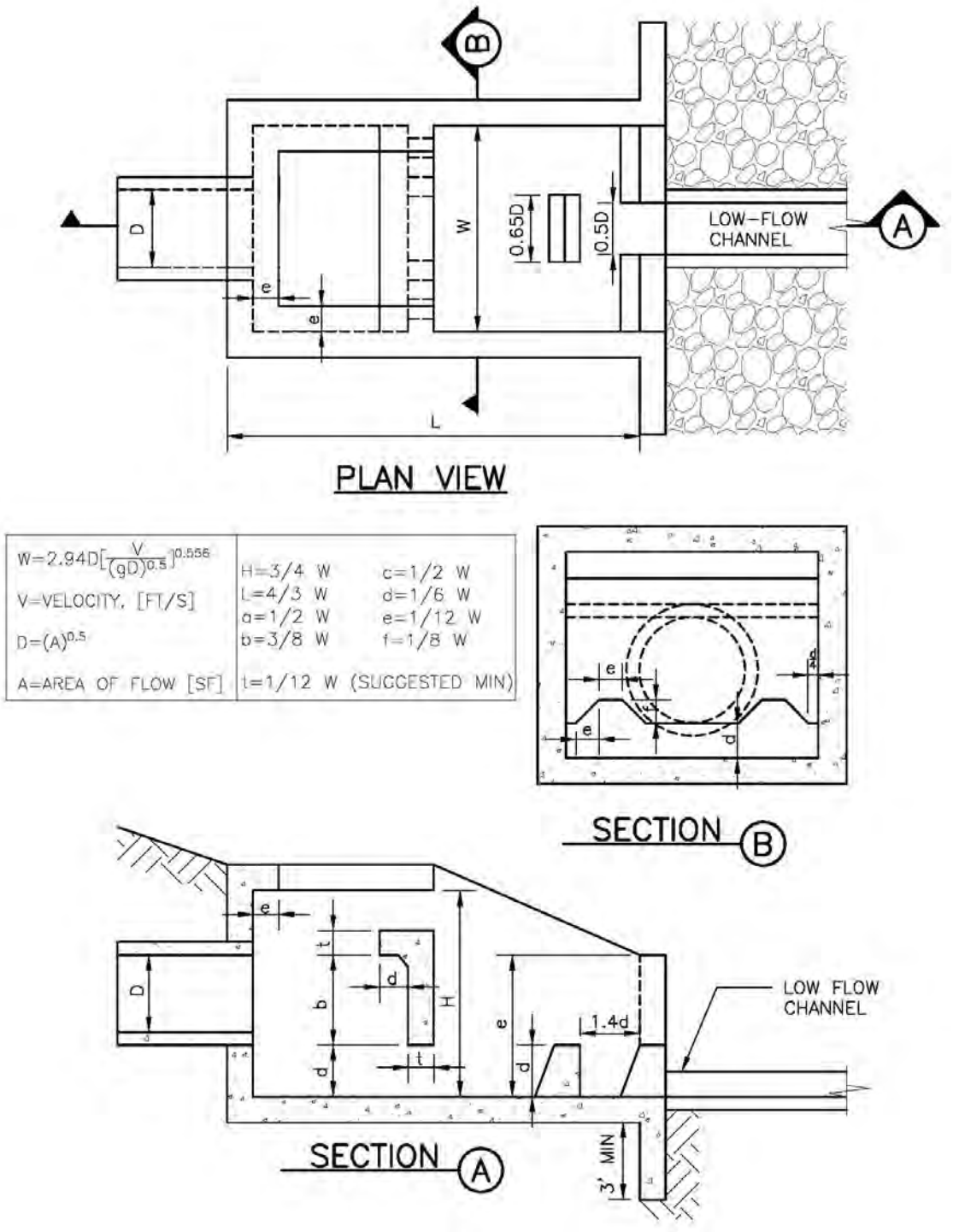


Figure 9-45. UDFCD modified USBR type VI impacts stilling basin (general design dimensions)

PRELIMINARY PIPE CALCULATIONS
PIPE SLOPE AT 0.50% TO SHOW MAXIMUM FLOW WITHIN EACH SIZE

Worksheet for 18"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	18.0 in
Diameter	18.0 in
Discharge	7.50 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	18.0 in
Flow Area	1.8 ft²
Wetted Perimeter	4.7 ft
Hydraulic Radius	4.5 in
Top Width	0.00 ft
Critical Depth	12.7 in
Percent Full	100.0 %
Critical Slope	0.007 ft/ft
Velocity	4.24 ft/s
Velocity Head	0.28 ft
Specific Energy	1.78 ft
Froude Number	(N/A)
Maximum Discharge	8.07 cfs
Discharge Full	7.50 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	18.0 in
Critical Depth	12.7 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 24"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	24.0 in
Diameter	24.0 in
Discharge	16.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	24.0 in
Flow Area	3.1 ft²
Wetted Perimeter	6.3 ft
Hydraulic Radius	6.0 in
Top Width	0.00 ft
Critical Depth	17.3 in
Percent Full	100.0 %
Critical Slope	0.007 ft/ft
Velocity	5.09 ft/s
Velocity Head	0.40 ft
Specific Energy	2.40 ft
Froude Number	(N/A)
Maximum Discharge	17.21 cfs
Discharge Full	16.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	24.0 in
Critical Depth	17.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 30"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	30.0 in
Diameter	30.0 in
Discharge	30.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	30.0 in
Flow Area	4.9 ft²
Wetted Perimeter	7.9 ft
Hydraulic Radius	7.5 in
Top Width	0.00 ft
Critical Depth	22.4 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	6.11 ft/s
Velocity Head	0.58 ft
Specific Energy	3.08 ft
Froude Number	(N/A)
Maximum Discharge	32.27 cfs
Discharge Full	30.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	30.0 in
Critical Depth	22.4 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 36"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	36.0 in
Diameter	36.0 in
Discharge	48.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	36.0 in
Flow Area	7.1 ft²
Wetted Perimeter	9.4 ft
Hydraulic Radius	9.0 in
Top Width	0.00 ft
Critical Depth	27.1 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	6.79 ft/s
Velocity Head	0.72 ft
Specific Energy	3.72 ft
Froude Number	(N/A)
Maximum Discharge	51.63 cfs
Discharge Full	48.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	36.0 in
Critical Depth	27.1 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 42"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	42.0 in
Diameter	42.0 in
Discharge	72.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	42.0 in
Flow Area	9.6 ft²
Wetted Perimeter	11.0 ft
Hydraulic Radius	10.5 in
Top Width	0.00 ft
Critical Depth	31.9 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	7.48 ft/s
Velocity Head	0.87 ft
Specific Energy	4.37 ft
Froude Number	(N/A)
Maximum Discharge	77.45 cfs
Discharge Full	72.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	42.0 in
Critical Depth	31.9 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 48"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	48.0 in
Diameter	48.0 in
Discharge	106.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	48.0 in
Flow Area	12.6 ft²
Wetted Perimeter	12.6 ft
Hydraulic Radius	12.0 in
Top Width	0.00 ft
Critical Depth	37.4 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	8.44 ft/s
Velocity Head	1.11 ft
Specific Energy	5.11 ft
Froude Number	(N/A)
Maximum Discharge	114.02 cfs
Discharge Full	106.00 cfs
Slope Full	0.005 ft/ft
Flow Type	Critical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	48.0 in
Critical Depth	37.4 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 54"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	54.0 in
Diameter	54.0 in
Discharge	145.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	54.0 in
Flow Area	15.9 ft²
Wetted Perimeter	14.1 ft
Hydraulic Radius	13.5 in
Top Width	0.00 ft
Critical Depth	42.4 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	9.12 ft/s
Velocity Head	1.29 ft
Specific Energy	5.79 ft
Froude Number	(N/A)
Maximum Discharge	155.98 cfs
Discharge Full	145.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	54.0 in
Critical Depth	42.4 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 60"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Slope

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.005 ft/ft
Normal Depth	60.0 in
Diameter	60.0 in
Discharge	190.00 cfs

Results	
Channel Slope	0.005 ft/ft
Normal Depth	60.0 in
Flow Area	19.6 ft²
Wetted Perimeter	15.7 ft
Hydraulic Radius	15.0 in
Top Width	0.00 ft
Critical Depth	47.3 in
Percent Full	100.0 %
Critical Slope	0.006 ft/ft
Velocity	9.68 ft/s
Velocity Head	1.46 ft
Specific Energy	6.46 ft
Froude Number	(N/A)
Maximum Discharge	204.38 cfs
Discharge Full	190.00 cfs
Slope Full	0.005 ft/ft
Flow Type	SubCritical

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	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	100.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	60.0 in
Critical Depth	47.3 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

INTERIM DEVELOPED CALCULATIONS

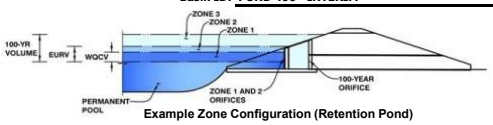
CLASSIC
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DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: BLR VILLAGE A6

Basin ID: POND 400 - INTERIM



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	42.17	acres
Watershed Length =	3,600	ft
Watershed Length to Centroid =	1,800	ft
Watershed Slope =	0.016	ft/ft
Watershed Imperviousness =	52.60%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

			Optional User Overrides
Water Quality Capture Volume (WQCV) =	0.750	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	2.381	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.03 in.) =	1.805	acre-feet	1.03 inches
5-yr Runoff Volume (P1 = 1.32 in.) =	2.623	acre-feet	1.32 inches
10-yr Runoff Volume (P1 = 1.59 in.) =	3.456	acre-feet	1.59 inches
25-yr Runoff Volume (P1 = 2.01 in.) =	5.142	acre-feet	2.01 inches
50-yr Runoff Volume (P1 = 2.38 in.) =	6.468	acre-feet	2.38 inches
100-yr Runoff Volume (P1 = 2.77 in.) =	8.031	acre-feet	2.77 inches
500-yr Runoff Volume (P1 = 3.84 in.) =	12.022	acre-feet	3.84 inches
Approximate 2-yr Detention Volume =	1.563	acre-feet	
Approximate 5-yr Detention Volume =	2.169	acre-feet	
Approximate 10-yr Detention Volume =	2.943	acre-feet	
Approximate 25-yr Detention Volume =	3.550	acre-feet	
Approximate 50-yr Detention Volume =	3.903	acre-feet	
Approximate 100-yr Detention Volume =	4.499	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.750	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.631	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	2.118	acre-feet
Total Detention Basin Volume =	4.499	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

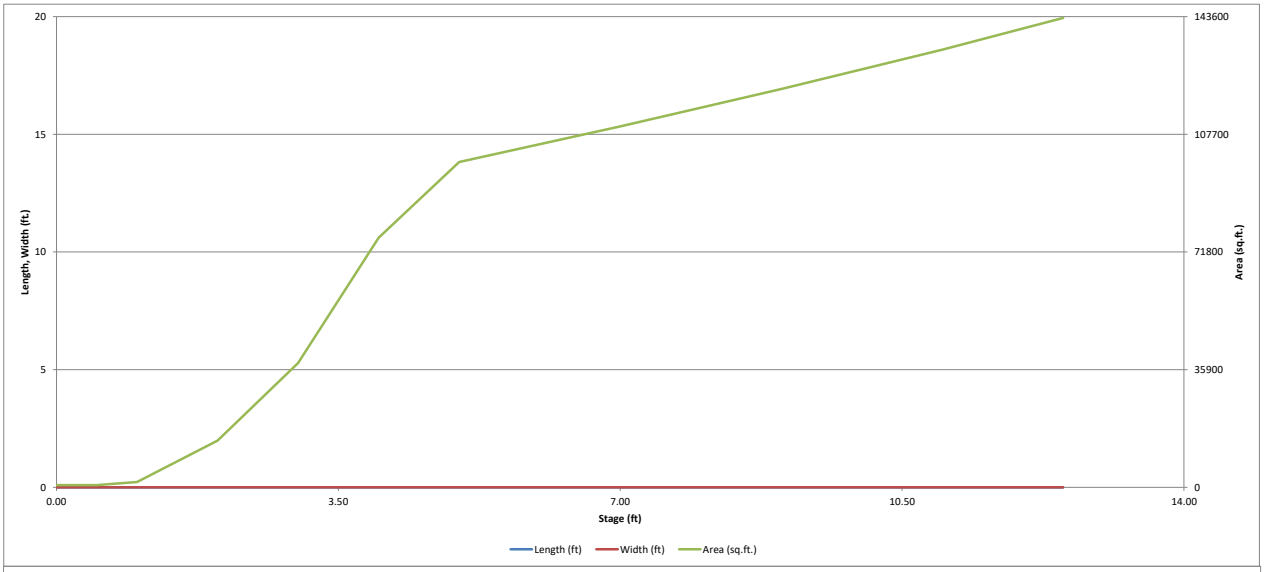
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user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

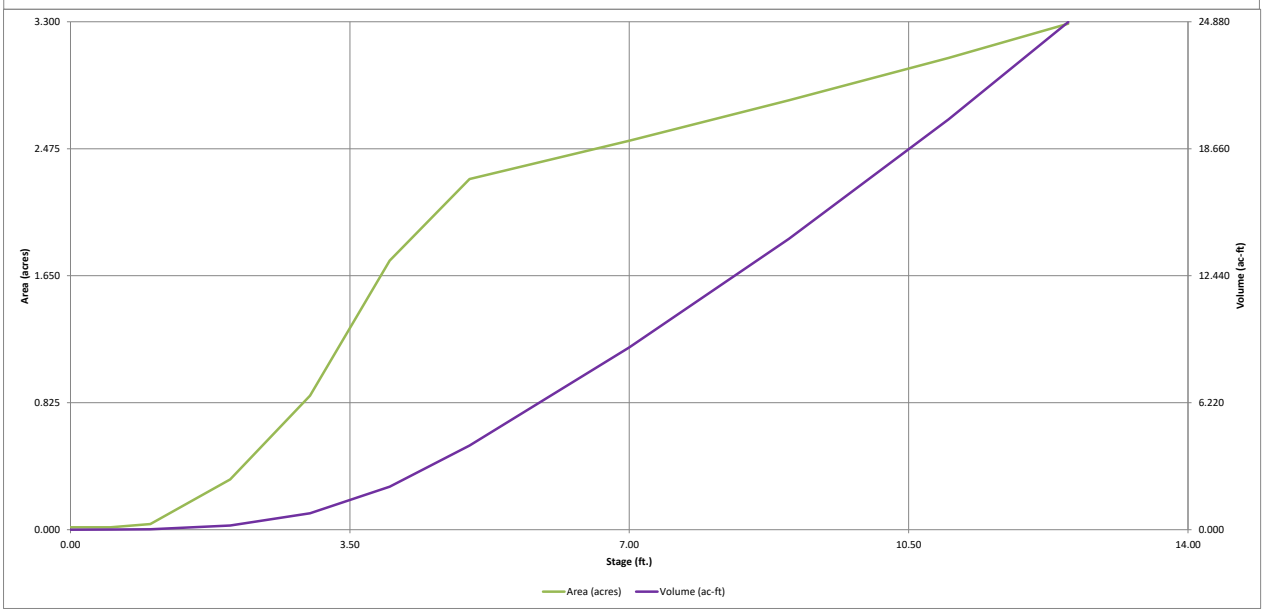
Depth Increment = 0.20 ft

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	--	--	--	680	0.016		
	--	0.50	--	--	--	680	0.016	340	0.008
	--	1.00	--	--	--	1,608	0.037	912	0.021
	--	2.00	--	--	--	14,230	0.327	8,831	0.203
	--	3.00	--	--	--	37,908	0.870	34,900	0.801
	--	4.00	--	--	--	76,142	1.748	91,925	2.110
	--	5.00	--	--	--	99,233	2.278	179,612	4.123
	--	7.00	--	--	--	110,092	2.527	388,937	8.929
	--	9.00	--	--	--	121,516	2.790	620,545	14.246
	--	11.00	--	--	--	133,527	3.065	875,588	20.101
	--	12.50	--	--	--	143,205	3.288	1,083,137	24.865
	--		--	--	--				
	--		--	--	--				
	--		--	--	--			

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



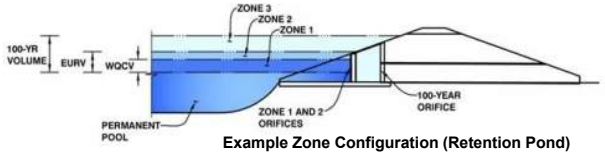


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: BLR VILLAGE A6

Basin ID: POND 400 - INTERIM



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.95	0.750	Orifice Plate
Zone 2 (EURV)	4.16	1.631	Orifice Plate
Zone 3 (100-year)	5.17	2.118	Weir&Pipe (Circular)
Total (all zones)		4.499	

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

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

Underdrain Orifice Diameter = inches

Calculated Parameters for Underdrain

Underdrain Orifice Area = ft^2

Underdrain Orifice Centroid = feet

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

Centroid of Lowest Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)

Depth at top of Zone using Orifice Plate = 6.50 ft (relative to basin bottom at Stage = 0 ft)

Orifice Plate: Orifice Vertical Spacing = 16.90 inches

Orifice Plate: Orifice Area per Row = N/A sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row = N/A ft^2

Elliptical Half-Width = N/A feet

Elliptical Slot Centroid = N/A feet

Elliptical Slot Area = N/A ft^2

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

	Row 1 (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	2.17	4.33					
Orifice Area (sq. inches)	3.00	11.00	20.00					

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

User Input: Vertical Orifice (Circular or Rectangular)

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

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

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	
Overflow Weir Front Edge Height, Ho =	6.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	20.00	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	4.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	7.50	N/A	feet
Overflow Weir Slope Length =	4.12	N/A	feet
Grate Open Area / 100-yr Orifice Area =	5.97	N/A	
Overflow Grate Open Area w/o Debris =	57.39	N/A	ft^2
Overflow Grate Open Area w/ Debris =	28.70	N/A	ft^2

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

	Zone 3 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	42.00	N/A	inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Circular	Not Selected	
Outlet Orifice Area =	9.62	N/A	ft^2
Outlet Orifice Centroid =	1.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage= 9.50 ft (relative to basin bottom at Stage = 0 ft)

Spillway Crest Length = 40.00 feet

Spillway End Slopes = 4.00 H:V

Freeboard above Max Water Surface = 1.00 feet

Calculated Parameters for Spillway

Spillway Design Flow Depth= 0.86 feet

Stage at Top of Freeboard = 11.36 feet

Basin Area at Top of Freeboard = 3.12 acres

Basin Volume at Top of Freeboard = 21.21 acre-ft

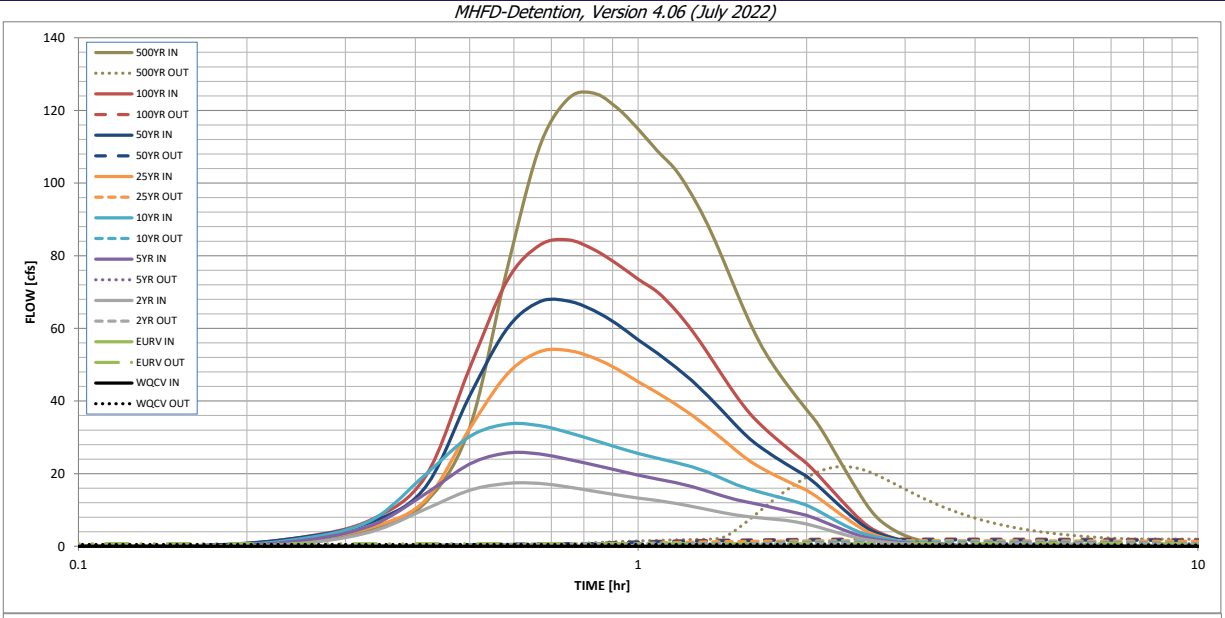
Routed Hydrograph Results

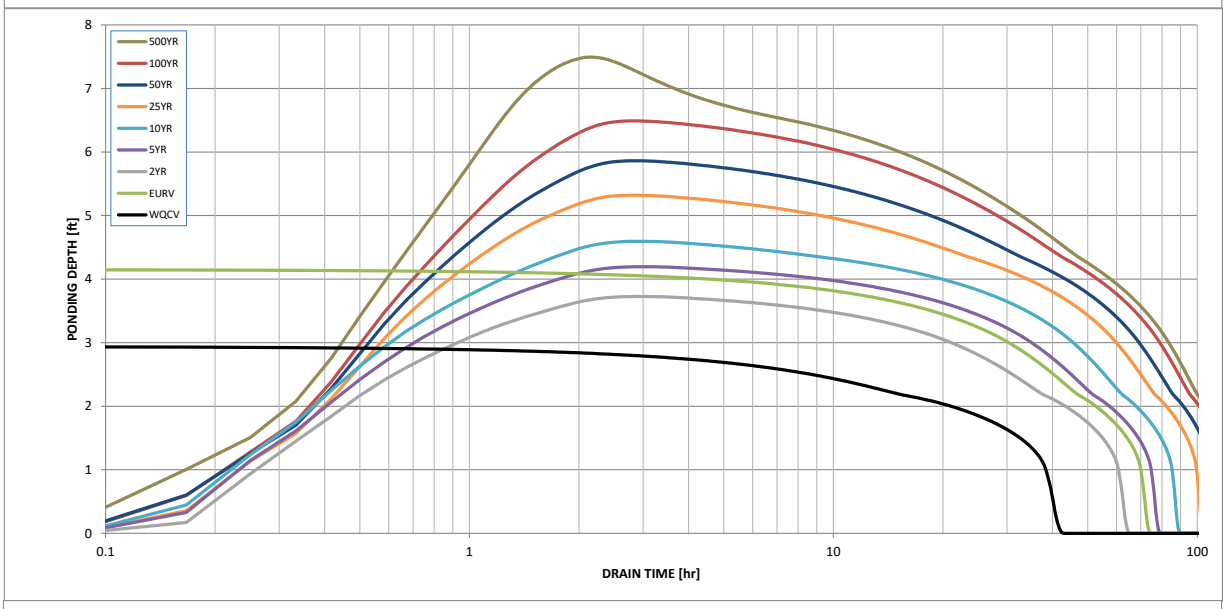
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

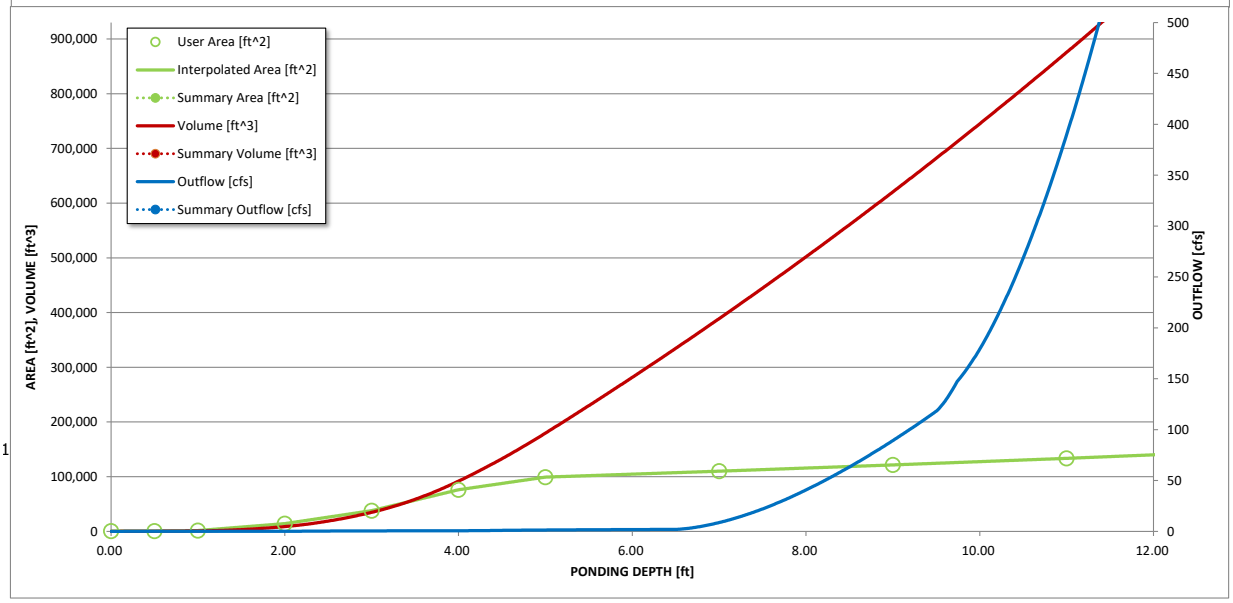
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.03	1.32	1.59	2.01	2.38	2.77	3.84
CUHP Runoff Volume (acre-ft) =	0.750	2.381	1.805	2.623	3.456	5.142	6.468	8.031	12.022
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.805	2.623	3.456	5.142	6.468	8.031	12.022
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.3	3.8	7.8	20.3	28.0	38.5	62.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.09	0.19	0.48	0.66	0.91	1.48
Peak Inflow Q (cfs) =	N/A	N/A	17.3	25.7	33.7	53.9	67.5	84.4	124.8
Peak Outflow Q (cfs) =	0.5	0.7	0.7	0.7	1.1	1.5	1.8	2.0	22.0
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.2	0.1	0.1	0.1	0.1	0.4
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3
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	65	57	69	77	87	92	98	96
Time to Drain 99% of Inflow Volume (hours) =	**40**	70	61	74	84	96	104	112	113
Maximum Ponding Depth (ft) =	2.95	4.16	3.73	4.20	4.60	5.32	5.86	6.49	7.49
Area at Maximum Ponding Depth (acres) =	0.84	1.83	1.50	1.85	2.06	2.32	2.39	2.46	2.59
Maximum Volume Stored (acre-ft) =	0.758	2.397	1.655	2.452	3.234	4.859	6.129	7.656	10.183

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:

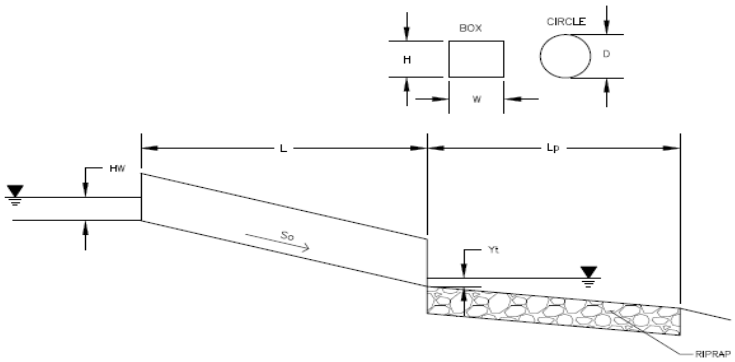
Inflow Hydrographs

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	0.25	0.19	0.94
	0:15:00	0.00	0.00	0.82	1.54	2.08	1.68	2.42	2.49	4.44
	0:20:00	0.00	0.00	3.99	5.69	7.12	5.21	6.64	7.33	12.00
	0:25:00	0.00	0.00	10.23	14.43	19.72	12.63	16.23	19.14	32.61
	0:30:00	0.00	0.00	15.43	22.66	30.22	32.39	41.40	49.03	76.29
	0:35:00	0.00	0.00	17.32	25.69	33.66	47.37	59.93	73.09	109.95
	0:40:00	0.00	0.00	17.33	25.44	33.23	53.59	67.33	82.87	123.22
	0:45:00	0.00	0.00	16.33	23.94	31.33	53.90	67.52	84.36	124.76
	0:50:00	0.00	0.00	15.17	22.40	29.23	51.89	64.94	81.70	120.75
	0:55:00	0.00	0.00	14.15	20.94	27.26	48.83	61.17	77.74	114.90
	1:00:00	0.00	0.00	13.28	19.59	25.56	45.30	56.85	73.55	108.80
	1:05:00	0.00	0.00	12.60	18.50	24.24	42.25	53.13	69.97	103.66
	1:10:00	0.00	0.00	11.82	17.54	23.06	39.15	49.35	65.00	96.53
	1:15:00	0.00	0.00	10.96	16.41	21.87	36.05	45.53	59.29	88.35
	1:20:00	0.00	0.00	10.09	15.13	20.37	32.74	41.37	53.06	79.17
	1:25:00	0.00	0.00	9.27	13.86	18.58	29.46	37.19	46.88	69.93
	1:30:00	0.00	0.00	8.59	12.79	16.93	26.25	33.09	41.26	61.60
	1:35:00	0.00	0.00	8.12	12.04	15.71	23.47	29.58	36.59	54.77
	1:40:00	0.00	0.00	7.76	11.32	14.74	21.39	26.93	33.06	49.55
	1:45:00	0.00	0.00	7.45	10.58	13.88	19.67	24.72	30.12	45.15
	1:50:00	0.00	0.00	7.16	9.88	13.08	18.15	22.77	27.50	41.22
	1:55:00	0.00	0.00	6.69	9.21	12.26	16.76	20.97	25.10	37.61
	2:00:00	0.00	0.00	6.14	8.54	11.33	15.45	19.29	22.85	34.22
	2:05:00	0.00	0.00	5.43	7.57	10.01	13.71	17.08	20.12	30.09
	2:10:00	0.00	0.00	4.67	6.49	8.55	11.78	14.65	17.25	25.73
	2:15:00	0.00	0.00	3.94	5.44	7.15	9.91	12.30	14.49	21.54
	2:20:00	0.00	0.00	3.26	4.46	5.85	8.13	10.08	11.86	17.58
	2:25:00	0.00	0.00	2.64	3.59	4.71	6.51	8.04	9.41	13.91
	2:30:00	0.00	0.00	2.11	2.84	3.74	5.02	6.19	7.18	10.62
	2:35:00	0.00	0.00	1.71	2.30	3.07	3.81	4.71	5.38	8.06
	2:40:00	0.00	0.00	1.42	1.92	2.56	2.99	3.71	4.15	6.26
	2:45:00	0.00	0.00	1.18	1.60	2.13	2.38	2.95	3.23	4.90
	2:50:00	0.00	0.00	0.99	1.33	1.77	1.90	2.35	2.51	3.81
	2:55:00	0.00	0.00	0.82	1.10	1.46	1.52	1.87	1.94	2.95
	3:00:00	0.00	0.00	0.69	0.90	1.19	1.22	1.50	1.49	2.27
	3:05:00	0.00	0.00	0.57	0.74	0.98	0.98	1.20	1.15	1.76
	3:10:00	0.00	0.00	0.47	0.61	0.79	0.79	0.97	0.92	1.40
	3:15:00	0.00	0.00	0.39	0.49	0.64	0.64	0.77	0.74	1.13
	3:20:00	0.00	0.00	0.31	0.39	0.50	0.51	0.61	0.59	0.90
	3:25:00	0.00	0.00	0.25	0.30	0.39	0.40	0.48	0.47	0.71
	3:30:00	0.00	0.00	0.19	0.23	0.30	0.31	0.37	0.36	0.55
	3:35:00	0.00	0.00	0.14	0.17	0.22	0.23	0.27	0.27	0.40
	3:40:00	0.00	0.00	0.09	0.11	0.15	0.16	0.19	0.19	0.28
	3:45:00	0.00	0.00	0.06	0.08	0.10	0.11	0.12	0.12	0.18
	3:50:00	0.00	0.00	0.03	0.04	0.06	0.06	0.07	0.07	0.10
	3:55:00	0.00	0.00	0.02	0.02	0.03	0.03	0.03	0.03	0.05
	4:00:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	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

Determination of Culvert Headwater and Outlet Protection

Project: BLR FILINGS 67-69
Basin ID: PIPE 43 - POND 400 OUTFALL



Soil Type:
Choose One:
(•) Sandy
( ) Non-Sandy

Supercritical Flow! Using Da to calculate protection type.

Design Information (Input):

	Design Discharge	Q =	81.4	cfs
Circular Culvert:				
	Barrel Diameter in Inches	D =	42	inches
	Inlet Edge Type (Choose from pull-down list)		Grooved End Projection	
Box Culvert:			**OR**	
	Barrel Height (Rise) in Feet	Height (Rise) =		ft
	Barrel Width (Span) in Feet	Width (Span) =		ft
	Inlet Edge Type (Choose from pull-down list)			
	Number of Barrels	No =	1	
	Inlet Elevation	Elev IN =	6748.64	ft
	Outlet Elevation **OR** Slope	Elev OUT =	6748	ft
	Culvert Length	L =	80	ft
	Manning's Roughness	n =	0.013	
	Bend Loss Coefficient	k_b =	0	
	Exit Loss Coefficient	k_x =	1	
	Tailwater Surface Elevation	Elev Y_t =		ft
	Max Allowable Channel Velocity	V =	5	ft/s

Required Protection (Output):

Tailwater Surface Height	Y_t =	1.40	ft
Flow Area at Max Channel Velocity	A_t =	16.28	ft^2
Culvert Cross Sectional Area Available	A =	9.62	ft^2
Entrance Loss Coefficient	k_e =	0.20	
Friction Loss Coefficient	k_f =	0.47	
Sum of All Losses Coefficients	k_s =	1.67	ft
Culvert Normal Depth	Y_n =	2.60	ft
Culvert Critical Depth	Y_c =	2.82	ft
Tailwater Depth for Design	d =	3.16	ft
Adjusted Diameter **OR** Adjusted Rise	D_a =	3.05	ft
Expansion Factor	1/(2*tan(Θ)) =	4.78	
Flow/Diameter$^{2.5}$ **OR** Flow/(Span * Rise$^{1.5}$)	Q/D^2.5 =	3.55	$ft^{0.5}/s$
Froude Number	Fr =	1.18	**Supercritical!**
Tailwater/Adjusted Diameter **OR** Tailwater/Adjusted Rise	Yt/D =	0.46	
Inlet Control Headwater	HW_I =	4.67	ft
Outlet Control Headwater	HW_O =	4.37	
Design Headwater Elevation	**HW =**	**6,753.31**	**ft**
Headwater/Diameter OR Headwater/Rise Ratio	**HW/D =**	**1.33**	
Minimum Theoretical Riprap Size	d_{50} =	11	in
Nominal Riprap Size	d_{50} =	12	in
UDFCD Riprap Type	**Type =**	**M**	
Length of Protection	**L_p =**	**35**	**ft**
Width of Protection	**T =**	**11**	**ft**

GREEN INFRASTRUCTURE EXHIBIT
& RUNOFF REDUCTION SHEET

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

Site Outfalls

COS-ICM Tool (Version 1.00, April 2026)

Designer: MATT LARSON
Project: BLR FIL. 67-69
Date: October 8, 2026 **Last Edited:** October 13, 2026

Site Layout

SITE OUTFALLS INFO (user input in highlighted cells)

Average Runoff Producing Rainfall Depth (in)	0.42
Water Quality Rainfall Depth (in)	0.60

Outfall ID	POND 400	A6 SPA	A6 DCIA	DIRECT	POND 300	SPA-P300						
Total Tributary Area (ft^2)	504,458	916,879	510,690	13,819	45,498	6,284						
Total Tributary Area (ac)	11.58	21.05	11.72	0.32	1.04	0.14						
Imperviousness (%)	95.2%	0.0%	100.0%	100.0%	95.2%	0.0%						
Total Impervious Area (ft^2)	480,436	0	510,690	13,819	43,331	0						
WQSV-based PCM Type	EDB	EDB	EDB	None	EDB	EDB						
Is Runoff Reduction Evaluated?	Yes	No	No	No	Yes	No						

Notes:

OUTFALL RESULTS

Volume Reduction Results (WQSV based on 40-hour drain time when checking minimum 10% requirement)

PIA Worksheet Name	PIA_POND 40	--	--	--	PIA_POND 30	--						
Untreated Area (ft^3)	0	0	0	13,819	0	0						
WQSV (ft^3)	18,460	0	20,784	562	1,665	0						
Optional Override WQSV (ft^3)												
WQSV Reduction in all PIAs (ft^3)	4,004	0	0	0	361	0						
Remaining WQSV (ft^3)	14,456	0	20,784	562	1,304	0						
WQSV Reduction (%)	22%	0%	0%	0%	22%	0%						

Calculations for Designing Remaining PCM-Specific WQSV (WQSV based on PCM-specific drain time)

PCM-Specific WQSV (ft^3)	18,460	0	20,784	--	1,665	0						
Optional Override WQSV (ft^3)				--								
WQSV Reduction U/S of PCM (ft^3)	0	0	0	--	0	0						
Remaining PCM WQSV (ft^3)	18,460	0	20,784	--	1,665	0						

TOTAL SITE RESULTS (Sums results from all Outfalls)

Total Site Area	1,997,628	ft^2	45.86	acres
Treated Area	1,983,809	ft^2	45.54	acres
Untreated Area	13,819	ft^2	0.32	acres
Total Site Imperviousness	52.5%	%		
WQSV	41,471	ft^3	0.952	acre-feet
Remaining WQSV	37,107	ft^3	0.852	acre-feet
WQSV Reduction (%)	11%	%		

Minimum infiltration requirement for the Site has been met

Volume Reduction in Planned Infiltration Areas (PIAs) based on Infiltration Capacity Method

COS-ICM Tool (Version 1.00, April 2026)

Designer: MATT LARSON
Project: BLR FIL. 67-69
Date: October 8, 2026 **Last Edited:** October 13, 2026
Outfall ID: POND 300

SITE INFORMATION (user to fill out blue highlighted cells with separate columns as needed for each individual PIA and UIA design point)

Design Point ID	DB_POND 30	UIA2								
Area Type	EDB	UIA								
Downstream Design Point ID	tfall_POND 3	DB_POND 300								
Is WQSV-based PCM designed as PIA?	Yes	--	--	--	--	--	--	--	--	--
Upstream Impervious Area, UIA (ft^2)	--	43,331								
Planned Infiltration Area, PIA (ft^2)	2,167	--								
Specified Cover Type	Dense Grass	--								
Specified Soil Texture	Sandy Loam	--								
Average Infiltration Capacity in PIA (in)	2.0	--								

The sum of all PIA in Row 18 must be at least 2,167 sf to acheive 5% of the UIA based on Row 19 from the Site Outfalls worksheet.
The sum of all UIA tribuatary to EDB_POND 300 in Row 17 must equal 43,331 sf based on Row 19 from the Site Outfalls worksheet.
The UIA tributary to EDB_POND 300 in Cell F28 is off by 0 sf.

VOLUME REDUCTION IN PLANNED INFILTRATION AREAS

UIA tributary to design point (ft^2)	43,331	43,331								
PIA tributary to design point (ft^2)	2,167	0								
UIA and PIA tributary to design point (ft^2)	45,498	43,331								
UIA runoff tributary to design point (ft^3)	1,805	1,805								
Reduced runoff tributary to design point (ft^3)	1,805	1,805								
Ratio of PIA/UIA tributary to design point (%)	5.0%	--								
Infiltration capacity of PIA (ft^3)	361	--								
UIA runoff infiltrated into PIA (ft^3)	361	--								
Remaining infiltration capacity of PIA (ft^3)	0	--								
Excess runoff continuing downstream (ft^3)	1,444	1,805								
Runoff Reduction in PIA (%)	20.0%	--								

OUTFALL RESULTS (Sums results for all upstream design point columns.)

UIA tributary to Outfall (ft^2)	43,331
PIA tributary to Outfall (ft^2)	2,167
UIA and PIA tributary to Outfall (ft^2)	45,498
UIA runoff tributary to Outfall (ft^3)	1,805
UIA runoff infiltrated into PIAs (ft^3)	361
Excess runoff at Outfall (ft^3)	1,444
Runoff Reduction at Outfall (%)	20.0%

UIA/Total IA (%)	100.0%
PIA/Total PA (%)	100.0%
Ratio PIA/UIA (%)	5.0%

Notes:

Volume Reduction in Planned Infiltration Areas (PIAs) based on Infiltration Capacity Method

Volume Reduction in Planned Infiltration Areas (PIAs) based on Infiltration Capacity Method

COS-ICM Tool (Version 1.00, April 2026)

Designer: MATT LARSON
Project: BLR FIL. 67-69
Date: October 8, 2026 **Last Edited:** October 13, 2026
Outfall ID: POND 400

SITE INFORMATION (user to fill out blue highlighted cells with separate columns as needed for each individual PIA and UIA design point)

Design Point ID	DB_POND 40	UIA1								
Area Type	EDB	UIA								
Downstream Design Point ID	tfall_POND 4	DB_POND 400								
Is WQSV-based PCM designed as PIA?	Yes	--	--	--	--	--	--	--	--	--
Upstream Impervious Area, UIA (ft^2)	--	480,436								
Planned Infiltration Area, PIA (ft^2)	24,022	--								
Specified Cover Type	Dense Grass	--								
Specified Soil Texture	Sandy Loam	--								
Average Infiltration Capacity in PIA (in)	2.0	--								

The sum of all PIA in Row 18 must be at least 24,022 sf to acheive 5% of the UIA based on Row 19 from the Site Outfalls worksheet.
The sum of all UIA tribuatary to EDB_POND 400 in Row 17 must equal 480,436 sf based on Row 19 from the Site Outfalls worksheet.
The UIA tributary to EDB_POND 400 in Cell F28 is off by 0 sf.

VOLUME REDUCTION IN PLANNED INFILTRATION AREAS

UIA tributary to design point (ft^2)	480,436	480,436								
PIA tributary to design point (ft^2)	24,022	0								
UIA and PIA tributary to design point (ft^2)	504,458	480,436								
UIA runoff tributary to design point (ft^3)	20,018	20,018								
Reduced runoff tributary to design point (ft^3)	20,018	20,018								
Ratio of PIA/UIA tributary to design point (%)	5.0%	--								
Infiltration capacity of PIA (ft^3)	4,004	--								
UIA runoff infiltrated into PIA (ft^3)	4,004	--								
Remaining infiltration capacity of PIA (ft^3)	0	--								
Excess runoff continuing downstream (ft^3)	16,015	20,018								
Runoff Reduction in PIA (%)	20.0%	--								

OUTFALL RESULTS (Sums results for all upstream design point columns.)

UIA tributary to Outfall (ft^2)	480,436
PIA tributary to Outfall (ft^2)	24,022
UIA and PIA tributary to Outfall (ft^2)	504,458
UIA runoff tributary to Outfall (ft^3)	20,018
UIA runoff infiltrated into PIAs (ft^3)	4,004
Excess runoff at Outfall (ft^3)	16,015
Runoff Reduction at Outfall (%)	20.0%

UIA/Total IA (%)	100.0%
PIA/Total PA (%)	100.0%
Ratio PIA/UIA (%)	5.0%

Notes:

Volume Reduction in Planned Infiltration Areas (PIAs) based on Infiltration Capacity Method

POND 400 UIA1
= 480,436 SF

DIRECT RELEASE
= 13,819 SF

POND 300 UIA2
= 43,332 SF

POND 400 SUMMARY:
UIA = 480,436 SF
DCIA = 510,690 SF
RPA = 24,022 SF
SPA = 916,879 SF
TOTAL SF = 1,932,027 SF

RPA TOTAL AREA =
63,736 SF (1.463 AC.)

RPA NEEDED FOR PROPOSED FIL.
67-69 = 24,022 SF (0.551 AC.)

AREA REMAIN FOR FUTURE =
39,714 SF (0.912 AC.)

POND 300 SUMMARY:
UIA = 43,331 SF
RPA = 2,167 SF
SPA = 6,284 SF
TOTAL SF = 51,782 SF

RPA TOTAL AREA = 31,713 SF (0.728 AC.)

RPA PREVIOUSLY USED = 10,000 SF (0.230 AC.)

RPA NEEDED FOR FIL. 67-69 DEVELOPMENT = 2,167 SF (0.050 AC.)

AREA REMAIN FOR FUTURE = 19,546 SF (0.449 AC.)

LEGEND

EXISTING GROUND CONTOUR (6700)

SUBDIVISION BOUNDARY

PROPOSED LOT LINE

LIMITS OF DISTURBANCE

PROPOSED STORM SEWER

RECEIVING PERVIOUS AREA (RPA)/ PLANNED INFILTRATION AREA (PIA)
PREVIOUSLY USED | FIL. 67-69 RPA | AVAILABLE FOR FUTURE USE

UNCONNECTED IMPERVIOUS AREA (UIA)

EXCLUDED AREAS

DIRECT RELEASE

150 75 0 150 300

SCALE: 1" = 150'

48 HOURS BEFORE YOU DIG,
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NO.	REVISION	DATE

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903

BANNING LEWIS RANCH
FILINGS 67, 68, & 69
GREEN INFRASTRUCTURE EXHIBIT

DESIGNED BY	MAL	SCALE		DATE	10/12/26
DRAWN BY	MAL	(H) 1"= 150'		SHEET	1 OF 1
CHECKED BY		(V) 1"= N/A		JOB NO.	2570.60

N:\2570\01\DRAWINGS\DEVELOPMENT\GI-EXHIBIT.dwg, 10/14/2025 10:30:57 AM, 1:1

DRAINAGE MAPS

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

EXHIBIT 5

Legend

Total Subject area = 597.166ac
North of Dublin = 225.996ac
South of Dublin = 371.170ac
**Ac listed from survey data*

1- Channel = 119.744ac
North of Dublin = 44.103ac
Pond 171 = 22.110ac
South of Dublin = 41.024ac
Pond 184 = 12.507ac
**All Ac listed from survey data*

2- Net land for allocation = 477.422ac
(Total area - Channel)
**Ac listed from survey data*

3- Platted = 110.751ac
32.421ac (North) + 78.330ac (South)
**South area corrected to remove unplatted parcel NW of pond 184*

4- Unplatted = 366.671ac
***Future Fees due, see calculation*

N

Acreages generated using existing plat/survey/legal descriptions over GIS calculations where available.

*Fee calculation provided in 2024 dollars
**Fees per acre are due for parcels/areas in orange

Updated 07/24/2025 by City Stormwater Enterprise

Oakwood Homes BLR Filing No 40-42 32.421ac Platted

North Channel 44.103ac

Unplatted 122.454ac **Includes all unplatted areas N of Dublin*

Pond 171 22.110ac

City ROW 4.908ac **Not included in Unplatted Total*

Unplatted 4.292ac **Inclusion in Unplatted Total*

Future Dublin Blvd. ROW

Unplatted 15.000ac **Included in Unplatted total*

FIL. 69

FIL. 68

FIL. 67

F67-69 = 40.956 AC.

South Channel 41.02407ac

Unplatted 239.309ac **Includes all unplatted areas S of Dublin*

Unplatted 7.233ac **Included in Unplatted total*

Pond 184 12.50732ac

Unplatted 5.859ac **Included in Unplatted total*

BLR Filing No's 50-57c 78.330ac

Banning Lewis Pkwy

Fee Calculation & Summary	
1) Total Subject Area	597.166
2) Channel and Ponds	119.744
3) Net Land For allocation	477.422
4) Previously Platted area (no ponds)	110.751
5) Unplatted (including to be vacated ROW)	366.672
Gross Initial Fees	$12,600,000
Acreage	477.422
Contingency adjustment factor	0.9
Initial 2024 Fees Per Acre	$29,324.14
*Fees per acre are due for parcels/areas in orange	

N:\25706\DRAWINGS\DEVELOPMENT\EX-5-SAND CREEK FEE.dwg, 11/2/2026 10:10:17 PM, 1:332.3

STREET CLASSIFICATION:

ALL PROPOSED AND EXISTING STREETS WITHIN THE STUDY AREA ARE PUBLIC.

CURB TYPES:

ALL EXISTING & PROPOSED CURBS ARE CITY OF COLORADO SPRINGS TYPE 5 (RAMP) CURB & GUTTER WHERE ALONG HOME LOTS AND TYPE 2 (6" VERTICAL) CURB & GUTTER ELSEWHERE AND ALONG COLLECTOR & ARTERIAL ROADWAYS.

EX-C
233.86

EX-A
158.09

EX-B
86.84

LAND TO BE DEDICATED TO CITY FOR EAST FORK SAND CREEK IMPROVEMENTS

CITY OWNED PARCEL FOR EAST FORK SAND CREEK IMPROVEMENTS

CITY OWNED PARCEL FOR EAST FORK SAND CREEK IMPROVEMENTS

REACH 153

REACH 159/159

REACH 152

REACH 161

REACH 157

EXISTING TEMPORARY FULL SPECTRUM DETENTION FACILITY

EXISTING POND 151 FULL SPECTRUM DETENTION

EXISTING BOX CULVERT (14'W X 6'H)

EXISTING PUBLIC RCP STORM (SEE FILING 40-42 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING PUBLIC RCP STORM (SEE FILING 19-20 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING PUBLIC RCP STORM & INLETS (SEE FILING 58-60 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING PUBLIC RCP STORM (SEE FILING 58-60 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING PUBLIC RCP STORM (SEE FILING 62-66 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING PUBLIC RCP STORM (SEE FILING 57 FDR) NOT ASSOC. W/THIS PROJECT

EXISTING BANNING LEWIS RANCH FILING NO. 42

EXISTING BANNING LEWIS RANCH FILING NO. 41

EXISTING BANNING LEWIS RANCH FILING NO. 58

EXISTING BANNING LEWIS RANCH FILING NO. 59

EXISTING BANNING LEWIS RANCH FILING NO. 64

EXISTING BANNING LEWIS RANCH FILING NO. 62

EXISTING BANNING LEWIS RANCH FILING NO. 55

EXISTING BANNING LEWIS RANCH FILING NO. 50A

EXISTING 'POND 200'

EXISTING BANNING LEWIS PARKWAY

EXISTING DUBLIN BOULEVARD

EXISTING QUERSEY LANE

EXISTING VISTA PRADO BOULEVARD

EXISTING LAST CHANCE DRIVE

EXISTING REDCLOUD PEAK DRIVE

UNPLATTED

EXISTING BASIN RUNOFF			
BASIN	(Q5 CFS)	(Q100 CFS)	ACREAGE
EX-A	30.2	202.6	158.09
EX-B	18.1	121.8	86.84
EX-C	38.5	258.2	233.86

200 100 0 200 400

SCALE: 1" = 200'

LEGEND

EXISTING GROUND CONTOUR (6700)
EXISTING BASIN BOUNDARY
PROPOSED BOUNDARY LINE
EXISTING STORM SEWER
EXISTING STORM INLET
EXISTING TYPE 2 MANHOLE
EXISTING TYPE I MANHOLE
PROPERTY LINE
BASIN IDENTIFIER D
AREA IN ACRES 1.41
DIRECTION OF DRAINAGE
EXISTING 100-YR FLOODPLAIN
EXISTING WETLANDS

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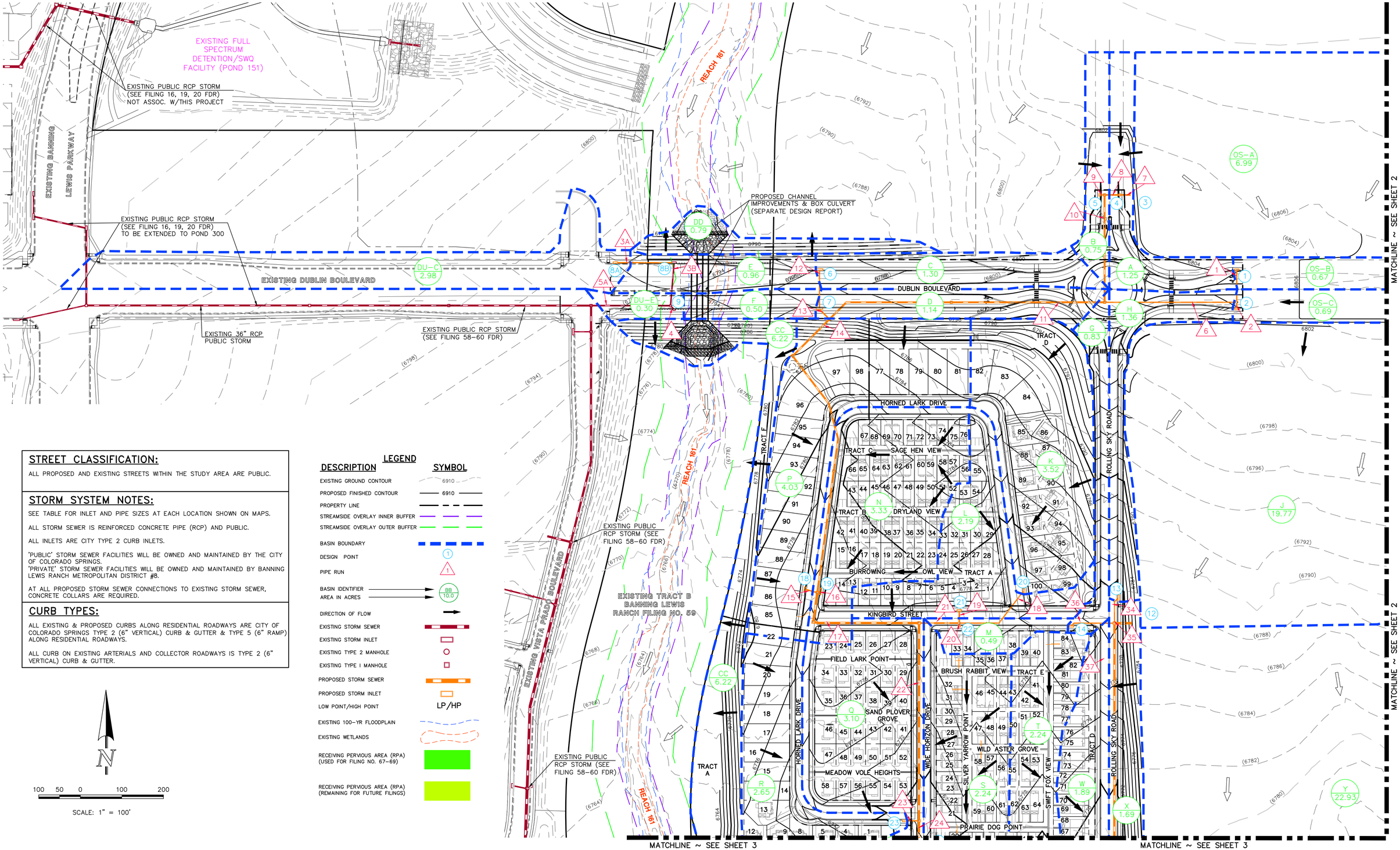
KYLE R. CAMPBELL, COLORADO P.E. #29794 DATE

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619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903

BANNING LEWIS RANCH FIL. 67, 68, & 69

PRELIMINARY DRAINAGE REPORT
EXISTING CONDITIONS MAP

DESIGNED BY	MAL	SCALE	DATE 09/30/26
DRAWN BY	MAL	(H) 1"= 200'	SHEET 1 OF 1
CHECKED BY		(V) 1"= N/A	JOB NO. 2570.60



STREET CLASSIFICATION:

ALL PROPOSED AND EXISTING STREETS WITHIN THE STUDY AREA ARE PUBLIC.

STORM SYSTEM NOTES:

SEE TABLE FOR INLET AND PIPE SIZES AT EACH LOCATION SHOWN ON MAPS.

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CURB TYPES:

ALL EXISTING & PROPOSED CURBS ALONG RESIDENTIAL ROADWAYS ARE CITY OF COLORADO SPRINGS TYPE 2 (6" VERTICAL) CURB & GUTTER & TYPE 5 (6" RAMP) ALONG RESIDENTIAL ROADWAYS.

ALL CURB ON EXISTING ARTERIALS AND COLLECTOR ROADWAYS IS TYPE 2 (6" VERTICAL) CURB & GUTTER.

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910
PROPOSED FINISHED CONTOUR	6910
PROPERTY LINE	
STREAMSIDE OVERLAY INNER BUFFER	
STREAMSIDE OVERLAY OUTER BUFFER	
BASIN BOUNDARY	
DESIGN POINT	1
PIPE RUN	1
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
DIRECTION OF FLOW	
EXISTING STORM SEWER	
EXISTING STORM INLET	
EXISTING TYPE 2 MANHOLE	
EXISTING TYPE I MANHOLE	
PROPOSED STORM SEWER	
PROPOSED STORM INLET	
LOW POINT/HIGH POINT	LP/HP
EXISTING 100-YR FLOODPLAIN	
EXISTING WETLANDS	
RECEIVING PERVIOUS AREA (RPA) (USED FOR FILING NO. 67-69)	
RECEIVING PERVIOUS AREA (RPA) (REMAINING FOR FUTURE FILINGS)	

N

100 50 0 100 200

SCALE: 1" = 100'

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Colorado Springs, Colorado 80903 (719)785-0799(Fax)

BANNING LEWIS RANCH FIL. 67, 68, & 69

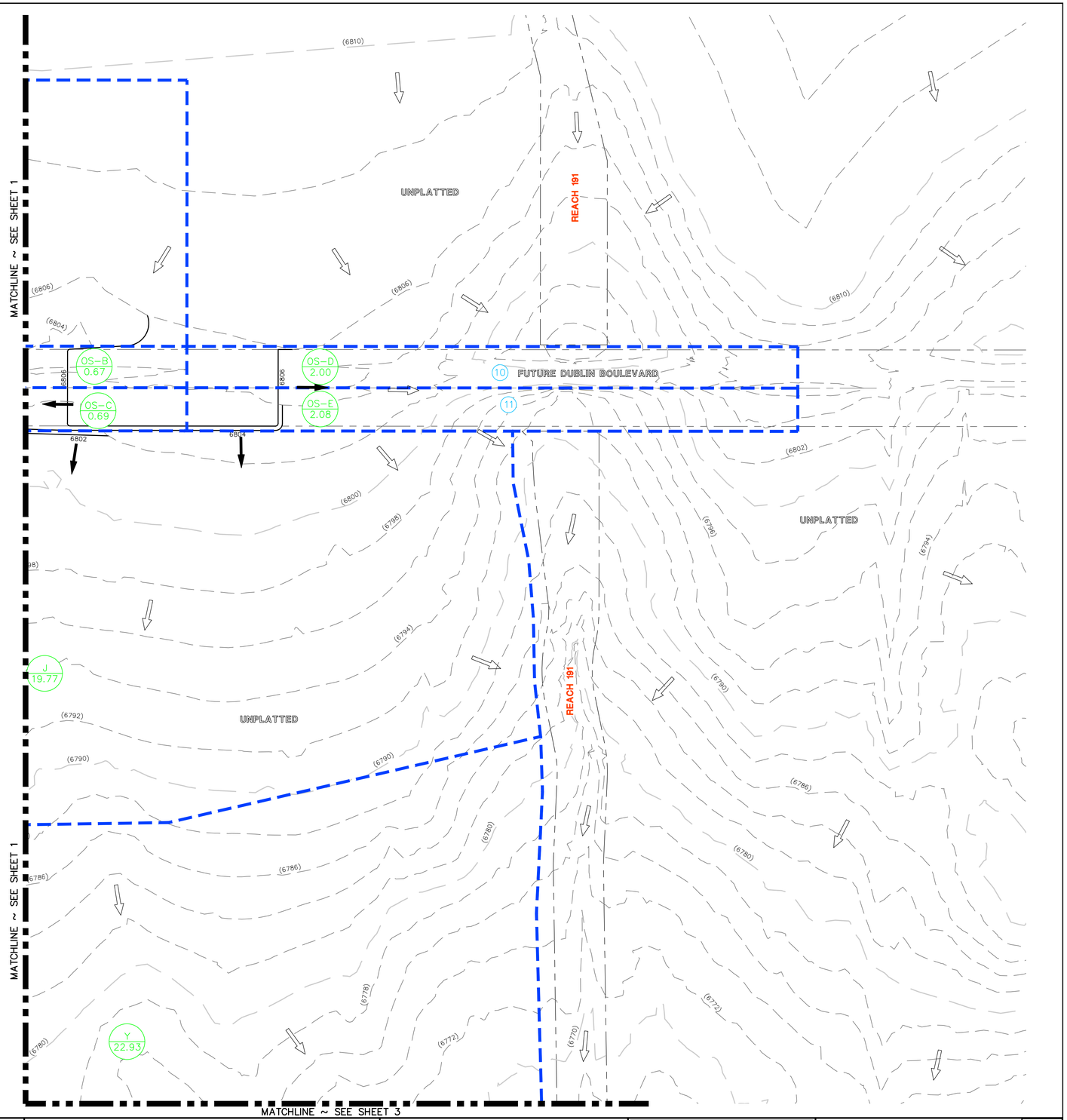
PRELIMINARY DRAINAGE REPORT
DEVELOPED CONDITIONS MAP

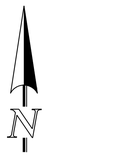
DESIGNED BY	MAL	SCALE		DATE	09/30/26
DRAWN BY	MAL	(H) 1"= 100'		SHEET	1 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	2570.60

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DEVELOPED BASIN RUNOFF			
BASIN	(Q5 CFS)	(Q100 CFS)	ACREAGE
A	3.5	7.0	1.25
B	2.1	4.2	0.75
C	3.6	7.0	1.30
D	3.3	6.3	1.14
E	3.4	6.3	0.96
F	1.6	3.1	0.50
G	3.0	5.4	0.83
H	3.7	7.2	1.36
J (FUT)	31.8	70.8	19.77
K	4.4	12.3	3.52
L	4.2	9.4	2.19
M	1.1	2.5	0.49
N	6.3	14.1	3.33
P	5.5	13.5	4.03
Q	6.2	13.8	3.10
R	4.7	10.4	2.65
S	4.5	10.0	2.24
T	4.2	9.3	2.24
V	2.5	5.5	1.23
W	4.1	8.9	1.89
X	2.8	6.7	1.69
Y (FUT)	36.9	82.2	22.93
Z	1.3	2.4	0.35
AA	2.8	9.7	3.25
BB	3.0	10.2	3.69
CC	2.8	18.9	6.22
DD	0.4	2.5	0.79
OS-A (FUT)	12.9	28.6	6.99
OS-B	2.2	4.1	0.67
OS-C	2.0	3.9	0.69
OS-D	6.2	11.7	2.00
OS-E	5.7	11.2	2.08
DU-C	9.4	17.5	2.98
DU-E	1.2	2.2	0.30

DEVELOPED DESIGN POINT SUMMARY			
DESIGN POINT	(Q5 CFS)	(Q100 CFS)	INLET SIZE
1	2.2	4.1	10' AT-GRADE
2	2.0	3.9	10' AT-GRADE
3	12.9	28.6	FUTURE STORM
4	3.5	7.2	5' SUMP
5	2.1	4.2	5' SUMP
6	3.6	7.0	15' AT-GRADE
7	3.3	6.3	15' AT-GRADE
8A	9.4	17.5	10' AT-GRADE
8B	6.0	14.6	10' SUMP
9	2.6	5.0	5' SUMP
10	6.2	11.7	FUTURE SUMP
11	5.7	11.2	FUTURE SUMP
12	41.5	89.5	FUTURE STORM
13	3.7	7.4	15' AT-GRADE
14	3.0	5.4	10' AT-GRADE
15	36.9	82.2	FUTURE STORM
16	4.1	8.9	10' SUMP
17	2.8	6.8	5' SUMP
18	5.5	13.5	10' SUMP
19	6.3	14.1	15' SUMP
20	4.4	12.3	10' AT-GRADE
21	4.5	14.3	10' SUMP
22	1.1	3.3	5' SUMP
23	4.7	10.4	10' AT-GRADE
24	6.1	16.3	10' AT-GRADE
25	4.5	10.0	10' AT-GRADE
27	4.5	12.3	10' SUMP
28	3.3	13.0	10' SUMP
29	2.8	9.7	PRIVATE PARK STORM
30	148.8	331.4	POND 400
31	1.3	2.4	SURFACE





LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910
PROPOSED FINISHED CONTOUR	6910
PROPERTY LINE	
STREAMSIDE OVERLAY INNER BUFFER	
STREAMSIDE OVERLAY OUTER BUFFER	
BASIN BOUNDARY	
DESIGN POINT	1
PIPE RUN	1
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
DIRECTION OF FLOW	
EXISTING STORM SEWER	
EXISTING STORM INLET	
EXISTING TYPE 2 MANHOLE	
EXISTING TYPE I MANHOLE	
PROPOSED STORM SEWER	
PROPOSED STORM INLET	
LOW POINT/HIGH POINT	LP/HP
EXISTING 100-YR FLOODPLAIN	
EXISTING WETLANDS	
RECEIVING PERVIOUS AREA (RPA) (USED FOR FILING NO. 67-69)	
RECEIVING PERVIOUS AREA (RPA) (REMAINING FOR FUTURE FILINGS)	

STREET CLASSIFICATION:

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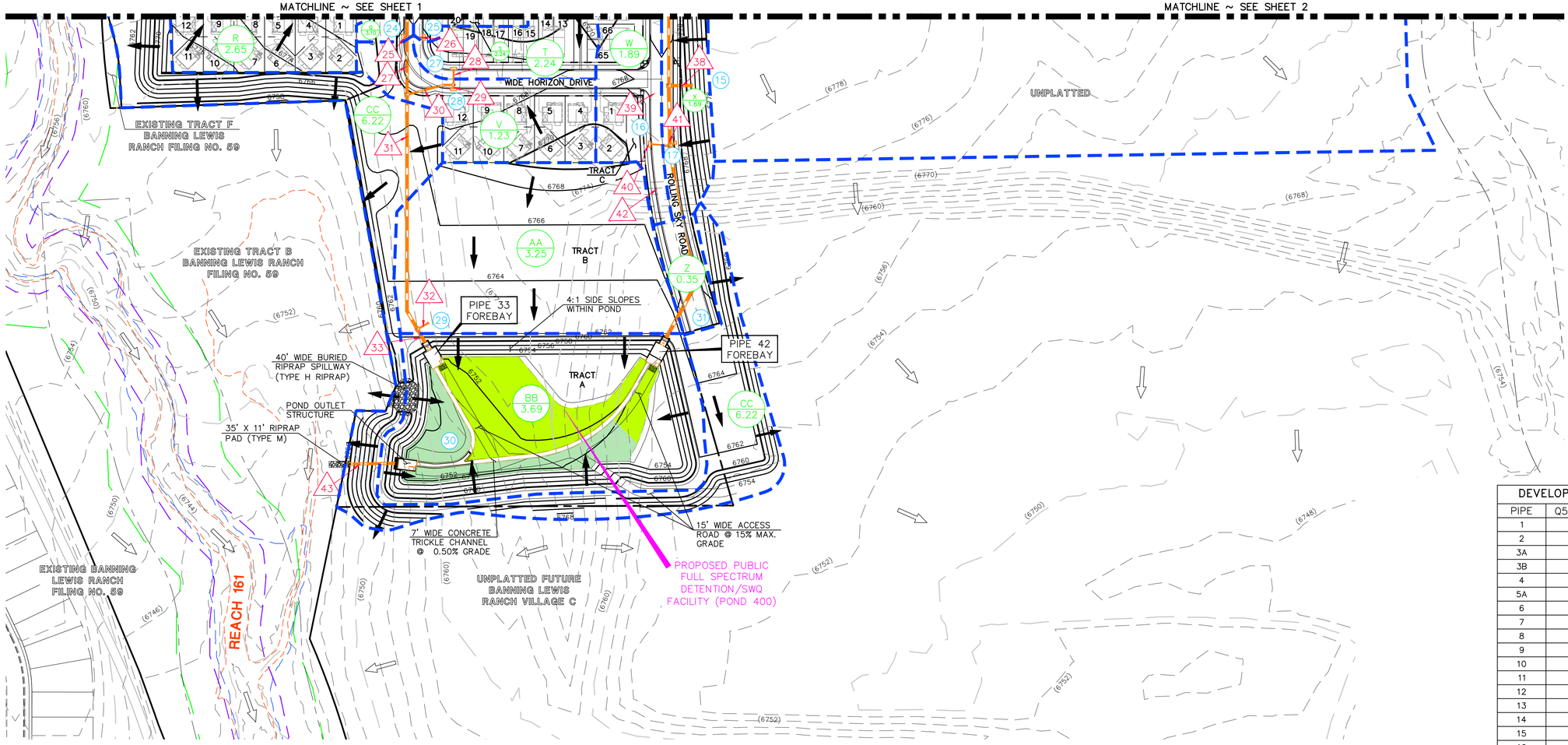
BANNING LEWIS RANCH FIL. 67, 68, & 69

PRELIMINARY DRAINAGE REPORT
DEVELOPED CONDITIONS MAP

CLASSIC CONSULTING

DESIGNED BY	MAL	SCALE		DATE	09/30/26
DRAWN BY	MAL	(H) 1"= 100'		SHEET	2 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	2570.60

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LEGEND

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	6910	PROPOSED STORM SEWER	
PROPOSED FINISHED CONTOUR	6910	PROPOSED STORM INLET	
PROPERTY LINE		LOW POINT/HIGH POINT	LP/HP
STREAMSIDE OVERLAY INNER BUFFER		EXISTING 100-YR FLOODPLAIN	
STREAMSIDE OVERLAY OUTER BUFFER		EXISTING WETLANDS	
BASIN BOUNDARY		RECEIVING PERVIOUS AREA (RPA) (USED FOR FILING NO. 67-69)	
DESIGN POINT	1	RECEIVING PERVIOUS AREA (RPA) (REMAINING FOR FUTURE FILINGS)	
PIPE RUN	1		
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0		
DIRECTION OF FLOW			
EXISTING STORM SEWER			
EXISTING STORM INLET			
EXISTING TYPE 2 MANHOLE			
EXISTING TYPE I MANHOLE			

N

100 50 0 100 200

SCALE: 1" = 100'

DEVELOPED PIPE RUN SUMMARY			
PIPE	Q5 (CFS)	Q100 (CFS)	PIPE SIZE
1	2.2	3.9	18"
2	2.0	3.7	18"
3A	6.4	8.7	18"
3B	12.3	23.1	EX. 30"
4	2.6	5.0	EX. 18"
5A	14.7	27.6	EX. 30"
6	4.2	7.6	18"
7	12.9	28.6	30"
8	15.9	35.0	30"
9	2.1	4.2	18"
10	17.7	38.5	36"
11	21.0	44.5	36"
12	3.6	6.8	18"
13	6.9	13.0	24"
14	26.5	54.8	36"
15	5.5	13.5	24"
16	6.3	14.1	24"
17	36.3	77.8	48"
18	4.1	7.4	18"
19	4.5	14.3	24"
20	1.1	3.3	24"
21	9.5	24.3	42"
22	43.8	97.3	48"
23	4.3	6.8	18"
24	46.8	101.5	48"
25	5.1	8.4	18"
26	4.2	6.7	18"
27	54.5	114.0	48"
28	4.5	12.3	24"
29	3.3	13.0	24"
30	7.7	25.2	30"
31	60.9	135.3	54"
32	2.8	9.7	24"
33	62.1	140.4	54"
34	3.7	7.2	18"
35	41.5	89.5	48"
36	3.0	4.7	18"
37	46.9	99.1	48"
38	36.9	82.2	48"
39	82.2	177.9	60"
40	4.1	8.9	18"
41	2.8	6.8	18"
42	87.5	189.9	60"
43	2.4	81.4	42"

STREET CLASSIFICATION:

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STORM SYSTEM NOTES:

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BANNING LEWIS RANCH FIL. 67, 68, & 69

PRELIMINARY DRAINAGE REPORT
DEVELOPED CONDITIONS MAP

CLASSIC CONSULTING

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DRAWN BY	MAL	(H) 1"= 100'		SHEET	3 OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	2570.60

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