FINAL DRAINAGE REPORT
FOR
STERLING RANCH EAST FILING NO. 6

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PCD Project No. SF2610

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

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

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

Business Name: CLASSIC SRJ LAND, LLC

By: _____

Title: _____

Address: 2138 Flying Horse Club Drive

Colorado Springs, CO 80921

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

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

Conditions:

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PURPOSE

The purpose of this Final Drainage Report is to address on-site and off-site drainage patterns and identify specific drainage improvements and facilities required to minimize impacts to the adjacent properties.

GENERAL DESCRIPTION

The Sterling ranch East Filing No. 6 Final Plat is 62.50-acre site located in portions sections 27 and 34, township 12 south, range 65 west of the sixth principal meridian. 198 urban residential lots are planned. The Preliminary Plan (SP244) for this project had a total acreage of 56.13 ac. The difference in acreage for this proposed Final Plat is the inclusion of the adjacent Sterling Ranch Road ROW that was originally shown in the Sterling Ranch East Phase 1 Preliminary Plan and included as portion of the Filing 4 area. The intent is to develop this proposed Filing 6 before Filing 4 and thus, now including this portion of Sterling Ranch Road with the Filing 6 Final Plat.

The site is bounded on the north and east by unplatted, future Sterling Ranch residential development, to the south by proposed Briargate Parkway extension and to the west by existing and proposed public ROW (Sterling Ranch Road). The site is in the upper portion of the Sand Creek East Fork Drainage Basin. Urban single family residential is proposed in this Filing that is consistent with the latest approved Sterling Ranch Sketch Plan Amendment and the Sterling Ranch East Filing No. 6 Preliminary Plan. The overall area for this property includes Tract H, which is proposed to be Pond FSD-16. This facility is described in the most recent drainage report for this area ("Final Drainage Report for Sterling Ranch East Filing No. 2 & Sterling Ranch East Filing No. 8", dated Sept. 2025 – SF2526) and handles nearly this entire development along with multiple other surrounding filings along with 100+ acres of future Sterling Ranch residential development to the north.

The average soil condition reflects Hydrologic Group "A" (Columbine gravelly sandy loam) as determined by the "Web Soil Survey of El Paso County Area," prepared by the Natural Resources Conservation Service (see map in Appendix). Type A soils were used to determine the pre-

development conditions however, a mix a both Type A and Type B soils are utilized for developed site conditions as some import is anticipated for this development.

EXISTING DRAINAGE CONDITIONS

The Sterling Ranch East Filing No. 6 property is located in the upper portion of the Sand Creek East Fork Drainage Basin. The southern portion of the site along with a gravel access roads traversing the site are the areas of the property that are currently disturbed. Pond FSD-16 was previously graded under the Early GEC Plan approved for the Villages site to the south (SP226). This area currently acts as a TSB until formal development along with this final plat. The rest of the site is covered with native grasses with no trees or other vegetation.

This site has been previously studied in the "MDDP Amendment for Sterling Ranch", prepared by JR Engineering, LLC, dated September 2022 and "Sterling Ranch MDDP Amendment No. 2 & Preliminary Drainage Report for Sterling Ranch East Preliminary Plan 1", prepared by Classic Consulting, dated January 2023. The latter report analyzed the pre-development conditions for the flows off-site to the south. The entire site currently drains as sheet flow in a southerly direction within the previously studied pre-development basins EX-9, EX-10, EX-10A and EX-11. These are referenced in the Appendix. However, the most recent reports covering this property are "Final Drainage Report for Sterling Ranch East Filing No. 2 & Sterling Ranch East Filing No. 8" – SF2526 and "Preliminary Drainage Report for Sterling Ranch East Filing No. 6 Preliminary Plan and Final Drainage Report for Early Grading" – SP244.

The following descriptions represent the pre-development basins for the property:

Basin EX-9 (Q_5 = 9 cfs, Q_{100} = 61 cfs) consists of approximately 65.3 acres of property that sheet flows in a southerly direction through the westerly portion of the proposed site. This basin is similar to the original MDDP with the northern portion of the west basin line defining the westerly edge of the East Fork basin. The flows seem to remain as sheet flows as they travel through the site towards the existing Pond FSD-16 acting as a TSB (designed under Foursquare at Sterling Ranch Filing No. 1 development due west of this project – SF2236 and SF2526). The facility will

remain a TSB until the development of either Sterling Ranch East Filing No. 2, Foursquare at Sterling Ranch Filing No. 1 or the proposed Sterling Ranch East Filing No. 6, whichever comes first. At that time the proposed pond structures (concrete forebays, trickle channels, outlet structure and emergency overflow spillway) will be installed based on the pond design plans approved originally with Sterling Ranch East Filing 8 and now modified with the proposed Sterling Ranch East Filing No. 6 Final Plat. (See Detention/SWQ Facilities section of this report below) **Design Point EX-1 (Q_5 = 9 cfs, Q_{100} = 61 cfs)** represents these total pre-developed flows tributary to the existing Pond FSD-16.

Basin EX-10A (Q_5 = 4 cfs, Q_{100} = 25 cfs) consists of approximately 17.8 acres of property that sheet flows in a southerly direction through the eastern half of the proposed site. **Design Point EX-2 (Q_5 = 4 cfs, Q_{100} = 25 cfs)** represents the total pre-developed flows that currently continue to travel in a southerly direction towards the extension of Briargate Parkway.

Basin EX-10 (Q_5 = 105 cfs, Q_{100} = 222 cfs) consists of approximately 265.9 acres of property at the extreme top of the Sand Creek East Fork Basin. The off-site northern portion of this basin is within the Black Forest, heavily treed area. The off-site eastern portion of the basin contains existing 5 ac. lot development (Indian Wells Subd. Filing 1). The flows from this large basin sheet flow in a southerly direction across the northern portion of the Sterling Ranch property and enter Basin EX-11. **Basin EX-11 (Q_5 = 1 cfs, Q_{100} = 7 cfs)** consists of approximately 3.9 acres of property that sheet flows across the northeastern corner of the proposed property. **Design Point EX-3 (Q_5 = 105 cfs, Q_{100} = 222 cfs)** represents the total combined pre-developed flows from basins EX-10 and EX-11 that currently continue to travel in a southerly direction through Sterling Ranch property east of all the currently approved development taking place.

PROPOSED DRAINAGE CONDITIONS

As described in the General Description of the report, this proposed Final Plat contains 62.50 acres of urban residential lots including Tract H containing Pond FSD-16. This report describes how this facility has been redesigned, yet still designed to handle all the anticipated future

developed flows as previously planned. Thus, this report remains consistent with the recently approved Preliminary Drainage Report for Sterling Ranch East Filing No. 6 and Final Drainage Report for Sterling Ranch East Filing No. 8.

Per the El Paso County ECM, Section I.7.1.B, all urban lots are required to provide Water Quality Capture Volume (WQCV). Thus, the proposed FSD-16 facility within this development will provide WQCV along with an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume with an outlet control device. Frequent and infrequent inflows are released at rates approximating undeveloped conditions. This concept provides some mitigation of increased runoff volume by releasing a portion of the increased runoff at a low rate over an extended period of time, up to 72 hours. This means that frequent storms, smaller than the 2-year event, will be reduced to very low flows near or below the sediment carrying threshold value for downstream drainage ways. Also, by incorporating an outlet structure that limits the 100-year runoff to the undeveloped condition rate, the discharge hydrograph for storms between the 2 year and the 100-year event will approximate the hydrograph for the undeveloped conditions and will help effectively mitigate the effects of development. WQCV will be provided for all proposed roads and urban lots. (See Appendix for SWQ map)

The following developed basin descriptions will start at the north end of the project and move south and describe how this development proposes to handle both the off-site and on-site drainage conditions both from an interim standpoint based on adjacent construction phasing and the ultimate buildout scenario. This report will also include the adjusted Pond FSD-16 final design.

Pond FSD-16 Phasing:

Pond FSD-16 will be phased from an outlet plate standpoint and will be reflected in the final construction drawings. The **"Interim" condition** accounts for the full-buildout of Sterling Ranch East Filings 4, 6 and 8 with the future Sterling Ranch residential area to the north remaining undeveloped. Basin P-INT represents this undeveloped area currently tributary to Pond FSD-16

with a total acreage of 33.4 ac. that includes the undeveloped portions of Basins CC and DD. The **"Ultimate" condition** then accounts for the full-buildout of all filings, including the anticipated future development represented by Basin P1-F1 (60.6 ac.).

Design Points 1-23 represent both the Interim and Ultimate Condition:

Design Point 1 (Q_5 = 4 cfs, Q_{100} = 11 cfs) represents developed flows from Basin A (3.6 ac.) that is tributary to the proposed at-grade inlet at this location. A 10' Type R at-grade inlet will collect Q_5 = 3.9 cfs, Q_{100} = 7.4 cfs with flow-by of Q_5 = 0.1 cfs, Q_{100} = 3.6 cfs. This flow-by will then travel towards the sump condition at Design Point 2. The collected flows will be routed downstream via a public 24" RCP within the ROW. **Pipe Run 1 (Q_5 = 4 cfs, Q_{100} = 7 cfs)** represents the total flow in the public storm system at this point.

Design Point 2 (Q_5 = 6 cfs, Q_{100} = 20 cfs) represents developed flows from Basins B (1.2 ac.), C (4.5 ac.) and flow-by from DP-1 that are tributary to the proposed sump condition at Design Point 2. At this location, a 10' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A 24" public RCP within the ROW will convey these developed flows further downstream.

Design Point 3 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin D (1.5 ac.) that are tributary to Design Point 3. At this location, a 5' Type R sump inlet is installed to completely collect both the 5-yr. and 100-yr. developed flows. A 30" public RCP storm system within the ROW will convey the collected flows further downstream. **Pipe Run 4 (Q_5 = 12 cfs, Q_{100} = 31 cfs)** represents the total flow in the public storm system at this point.

Design Point 4 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin E (1.6 ac.) that are tributary to the proposed at-grade condition at Design Point 4. At this location, a 10' Type R at-grade inlet will be installed to collect Q_5 = 2.0 cfs, Q_{100} = 4.7 cfs with flow-by of Q_5 = 0.0 cfs, Q_{100} = 0.3 cfs. This minimal 100-yr. flow-by will then travel further downstream towards Design Point 17. The collected flows will be routed downstream via a public 18" RCP within the ROW.

Pipe Run 6 (Q_5 = 14 cfs, Q_{100} = 35 cfs) represents the total flow in the public storm system at this point.

Design Point 5 (Q_5 = 4 cfs, Q_{100} = 11 cfs) represents developed flows from Basin F (3.5 ac.) that are tributary to the proposed sump condition at Design Point 5. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 24" RCP within the ROW will convey these developed flows further downstream.

Design Point 6 (Q_5 = 2 cfs, Q_{100} = 4 cfs) represents developed flows from Basin G (1.1 ac.) that are tributary to the proposed sump condition at Design Point 6. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 9 (Q_5 = 6 cfs, Q_{100} = 14 cfs)** represents the total flow in the public storm system just downstream of this sump condition. **Pipe Run 10 (Q_5 = 19 cfs, Q_{100} = 48 cfs)** represents the total flow in the public storm system once combined with the upstream flows from PR-6.

Design Point 7 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin H (1.7 ac.) that are tributary to the proposed sump condition at Design Point 7. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 8 (Q_5 = 0.3 cfs, Q_{100} = 0.8 cfs) represents developed flows from Basin I (0.22 ac.) that are tributary to the proposed sump condition at Design Point 8. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 13 (Q_5 = 22 cfs, Q_{100} = 53 cfs)** represents the total flow in the public storm system just downstream of this sump condition.

Design Point 9 (Q_5 = 2 cfs, Q_{100} = 6 cfs) represents developed flows from Basin J (1.9 ac.) that are tributary to the proposed sump condition at Design Point 9. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 10 (Q_5 = 1.1 cfs, Q_{100} = 2.6 cfs) represents developed flows from Basin K (0.73 ac.) that are tributary to the proposed sump condition at Design Point 10. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 16 (Q_5 = 3 cfs, Q_{100} = 8 cfs)** represents the total flow in the public storm system just downstream of this sump condition. **Pipe Run 17 (Q_5 = 24 cfs, Q_{100} = 60 cfs)** represents the total flow in the public storm system once combined with the upstream flows from PR-13.

Design Point 11 (Q_5 = 3 cfs, Q_{100} = 7 cfs) represents developed flows from Basin L (2.2 ac.) that are tributary to the proposed sump condition at Design Point 11. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 12 (Q_5 = 0.8 cfs, Q_{100} = 2.0 cfs) represents developed flows from Basin M (0.57 ac.) that are tributary to the proposed sump condition at Design Point 12. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 20 (Q_5 = 3 cfs, Q_{100} = 8 cfs)** represents the total flow in the public storm system just downstream of this sump condition.

Design Point 13 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin N (1.7 ac.) that are tributary to the proposed sump condition at Design Point 13. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 14 (Q_5 = 0.7 cfs, Q_{100} = 1.8 cfs) represents developed flows from Basin O (0.49 ac.) that are tributary to the proposed sump condition at Design Point 14. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 23 (Q_5 = 6 cfs, Q_{100} = 15 cfs)** represents the total flow in the public storm system just downstream of this sump condition. **Pipe Run 24 (Q_5 = 30 cfs, Q_{100} = 73 cfs)** represents the total flow in the public storm system once combined with the upstream flows from PR-17.

Design Point 15 (Q_5 = 0.6 cfs, Q_{100} = 1.5 cfs) represents developed flows from Basin P (0.40 ac.) that are tributary to the proposed sump condition at Design Point 15. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 16 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin Q (1.7 ac.) that are tributary to the proposed sump condition at Design Point 16. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 27 (Q_5 = 32 cfs, Q_{100} = 79 cfs)** represents the total flow in the public storm system just downstream of this sump condition.

Design Point 17 (Q_5 = 2 cfs, Q_{100} = 9 cfs) represents developed flows from Basin R (2.7 ac.) and Flow-by from DP-4 that are tributary to the proposed at-grade condition at Design Point 17. At this location, a 10' Type R at-grade inlet will be installed to collect Q_5 = 2.0 cfs, Q_{100} = 6.4 cfs with flow-by of Q_5 = 0.0 cfs, Q_{100} = 2.0 cfs. This 100-yr. flow-by will then travel further downstream into Basin U. The collected flows will be routed downstream via a public 18" RCP within the ROW.

Design Point 18 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin S (1.6 ac.) that are tributary to the proposed sump condition at Design Point 18. At this location, a 5' Type R

sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Design Point 19 (Q_5 = 0.7 cfs, Q_{100} = 1.8 cfs) represents developed flows from Basin T (0.49 ac.) that are tributary to the proposed sump condition at Design Point 19. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 31 (Q_5 = 6 cfs, Q_{100} = 13 cfs)** represents the total flow in the public storm system just downstream of this sump condition. **Pipe Run 32 (Q_5 = 37 cfs, Q_{100} = 90 cfs)** also known as **Design Point 20**, represents the total flow in the public storm system once combined with the upstream flows from PR-27. This total flow enters Pond FSD-16 at the east end of the facility where a concrete forebay, associated rip-rap and concrete trickle channel will be installed. A total of 33.4 acres is tributary to this outfall with a 51.1% Imperviousness.

Design Point 21 (Q_5 = 3 cfs, Q_{100} = 7 cfs) represents developed flows from Basin V (2.7 ac.) At this location, a 6' County std. crosspan will be installed to convey these flows further downstream.

Design Point 22 (Q_5 = 6 cfs, Q_{100} = 16 cfs) represents developed flows from Basin W (0.79 ac.), Basin X (2.0 ac.) and DP-21, that are all tributary to the proposed sump condition at Design Point 22. At this location, a 10' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 24" RCP within the ROW will convey these developed flows further downstream.

Design Point 23 (Q_5 = 4 cfs, Q_{100} = 9 cfs) represents developed flows from Basin Y (3.2 ac.) that are tributary to the proposed sump condition at Design Point 23. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 30" RCP within a public drainage easement between lots 42 and 43 will convey these

developed flows further downstream. **Pipe Run 34 (Q_5 = 10 cfs, Q_{100} = 25 cfs)** represents the total flow in the public storm system just downstream of this sump condition.

The following Design Points are proposed to collect anticipated future or already planned residential development to the north and west of Sterling Ranch Road that are tributary to Pond FSD-16. The P1-F1, CC and DD basins are anticipated areas for future development within Sterling Ranch to the north and the F4 basins represent the Sterling Ranch East Filing No. 4 areas as planned and consistent with the approved "Sterling Ranch East Phase 1 Preliminary Plan - Filings 1-4" (SP224). The F2 and F8 basins represent the Sterling Ranch East Filing No. 2 (SF2237) and Filing No. 8 (SF2236 and SF2526) subdivisions as planned and recently reviewed/approved.

Ultimate & Interim Condition:

Design Point 24 (Q_5 = 5 cfs, Q_{100} = 16 cfs) represents the anticipated ultimate condition and future development flows from the undeveloped property to the north within Basin CC (5.8 ac.) that is tributary to a future sump condition. Type R sump inlets will be sized in a future Final Drainage Report. However, in the interim condition, a temporary sediment basin will be installed just north of Sterling Ranch Road (Design Point 26) to collect off-site undeveloped flows from basin P INT (33.4 ac.). The outfall for this basin will be downstream towards the proposed sump condition in Sterling Ranch Road. Two public 42" RCP stubs will be provided at the north end of the Sterling Ranch Road extension to handle the anticipated future development within the off-site basin P1-F1 (60.6 ac.) to the north. **Pipe Run 35 (Q_5 = 30 cfs, Q_{100} = 72 cfs)** represents an anticipated 50% of this off-site basin with **Pipe Run 36 (Q_5 = 33 cfs, Q_{100} = 84 cfs)** representing the other half of the basin along with basin CC in the ultimate condition.

Ultimate Condition:

Design Point 25 (Q_5 = 2 cfs, Q_{100} = 5 cfs) represents developed flows from Basin EE (1.3 ac.) that are tributary to the proposed sump condition at Design Point 25. At this location, a 5' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 18" RCP within the ROW will convey these developed flows further downstream.

Ultimate Condition:

Design Point 26 (Q_5 = 5 cfs, Q_{100} = 13 cfs) represents developed flows from Basin DD (4.4 ac.) that are tributary to the proposed sump condition at Design Point 26. At this location, a 10' Type R sump inlet will be installed to completely collect both the 5-yr. and 100-yr. developed flows. A public 24" RCP within the ROW will convey these developed flows further downstream. **Pipe Run 39 (Q_5 = 7 cfs, Q_{100} = 18 cfs)** represents the total flow in the public storm system just downstream of this sump condition.

Design Points 27-36 represent both the Interim and Ultimate Condition with Sterling Ranch East 4 being built:

Design Point 27 (Q_5 = 10 cfs, Q_{100} = 26 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-1 (9.0 ac.) that are tributary to the proposed sump condition at Design Point 27. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 28 (Q_5 = 3 cfs, Q_{100} = 7 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-2 (2.2 ac.) that are tributary to the proposed sump condition at Design Point 28. At this location, a Type R sump inlet will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A private storm system within a drainage esmt. and tract will convey these developed flows further downstream. Sizing of this facility will be provided in a future FDR.

Design Point 29 (Q_5 = 4 cfs, Q_{100} = 9 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-3 (3.2 ac.) that are tributary to Design Point 29. At this location, an anticipated Type R at-grade inlet will be sized to collect developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 30 (Q_5 = 8 cfs, Q_{100} = 25 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-4 (9.8 ac.) that are tributary to the proposed sump condition at Design Point 30. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 31 (Q_5 = 2 cfs, Q_{100} = 6 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-5 (1.7 ac.) that are tributary to the proposed sump condition at Design Point 31. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows along with the collected flows from the Design Points described above further downstream towards the large diameter storm system within Sterling Ranch Road. Sizing of these facilities and the storm system outfall will be provided in a future FDR.

Design Point 32 (Q_5 = 4 cfs, Q_{100} = 13 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-6 (3.5 ac.) along with some flow-by from the anticipated upstream Type R at-grade inlet that is tributary to the proposed sump condition at Design Point 32. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 33 (Q_5 = 8 cfs, Q_{100} = 20 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-7 (6.9 ac.) that are tributary to the proposed sump condition at Design Point 33. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 34 (Q_5 = 2 cfs, Q_{100} = 4 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-8 (1.1 ac.) that are tributary to the proposed sump condition at Design Point 34. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 35 (Q_5 = 6 cfs, Q_{100} = 14 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-9 (4.9 ac.) that are tributary to the proposed sump condition at Design Point 35. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 36 (Q_5 = 10 cfs, Q_{100} = 24 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 4 residential use within Basin F4-10 (8.5 ac.) that are tributary to the proposed sump condition at Design Point 34. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A private storm system within a tract will convey these developed flows further downstream towards the large diameter public storm system along Sterling Ranch Road. Sizing of these facilities will be provided in a future FDR.

Design Points 37 & 38 represent both the Interim and Ultimate Conditions:

Design Point 37 (Q_5 = 5 cfs, Q_{100} = 10 cfs) represents anticipated developed flows from Basin GG (2.5 ac.) along the north side of Sterling Ranch Road that are tributary to Design Point 37. A 15' Type R at-grade inlet is proposed at this location that will completely collect the 5-yr. developed flows with some minimal flow-by of the 100-yr. flows. A public storm system within the ROW will convey the collected flows towards the public storm system within Sterling Ranch Road. This remains consistent with *Design Point 13 (Q_5 = 5.4 cfs, Q_{100} = 15.1 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 38 (Q_5 = 5 cfs, Q_{100} = 9 cfs) represents anticipated developed flows from Basin HH (2.0 ac.) along the south side of Sterling Ranch Road that are tributary to Design Point 38. A 15' Type R at-grade inlet is proposed at this location that will completely collect the 5-yr. developed flows with some minimal flow-by *(Q_5 = 0.0 cfs, Q_{100} = 0.4 cfs)* of the 100-yr. flows. A public storm system within the ROW will convey the collected flows towards the public storm system within Sterling Ranch Road. This remains consistent with *Design Point 14 (Q_5 = 4.0 cfs, Q_{100} = 11.2 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Fil. 1 (SF2236).*

Ultimate Condition:

Design Point 39 (Q_5 = 123 cfs, Q_{100} = 307 cfs) represents the total collected developed flows during the ultimate condition with basins P1-F1, CC, DD, EE, GG, HH, V, W, X and Y being tributary to this **northwest storm system outfall into Pond FSD-16**. Sizing of this storm outfall and the proposed concrete forebay/impact structure is based on the ultimate condition. This remains fairly consistent with *Design Point 4 (Q_5 = 218 cfs, Q_{100} = 379 cfs)* as described in the approved *Sterling Ranch MDDP Amendment No. 2 and PDR for Sterling Ranch East Preliminary Plan No.1 (SP224).* The hydrologic calculation method difference between this report using rational method and the MDDP/PDR using SWWM 5.1 proves challenging for exact flow comparison. However, the future final drainage report(s) for these various proposed developments will provide the final determination of the interim and ultimate developed flow conditions.

Interim Condition:

Design Point 39 (Q_5 = 51 cfs, Q_{100} = 152 cfs) represents the total collected developed flows during the interim condition with basins P-INT, EE, GG, HH, V, W, X, Y and only the developed portions of CC and DD being tributary to this **northwest storm system outfall into Pond FSD-16**. Sizing of this storm outfall and the proposed concrete forebay/impact structure is based on the ultimate condition.

Design Points 40-48 represent both the Interim and Ultimate Condition
with Sterling Ranch East Filings 2 and 8 being built:

Design Point 40 (Q_5 = 4 cfs, Q_{100} = 11 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 8 residential use within Basin F8-1 (3.7 ac.) that are tributary to the proposed sump condition at Design Point 40. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 41 (Q_5 = 1.2 cfs, Q_{100} = 3 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 8 residential use within Basin F8-2 (1.0 ac.) that are tributary to the proposed sump condition at Design Point 41. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 42 (Q_5 = 5 cfs, Q_{100} = 11 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 8 residential use within Basin F8-3 (3.4 ac.) that are tributary to Design Point 42. At this location, an anticipated Type R at-grade inlet will be sized to collect developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 43 (Q_5 = 6 cfs, Q_{100} = 14 cfs) represents the anticipated developed flows from the planned Sterling Ranch East Filing No. 8 residential use within Basin F8-4 (4.7 ac.) that are tributary to Design Point 43. At this location, an anticipated Type R at-grade inlet will be sized to collect developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 44 (Q_5 = 7 cfs, Q_{100} = 15 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 8 residential use within Basin F8-7 (4.6 ac.) that are tributary to the proposed sump condition at Design Point 44. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

Design Point 45 (Q_5 = 4 cfs, Q_{100} = 10 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 2 residential use within Basin F2-A (2.9 ac.) that are tributary to the proposed sump condition at Design Point 45. At this location, a 10' Type R sump inlet has already been designed to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. This remains consistent with *Design Point 2 (Q_5 = 4.5 cfs, Q_{100} = 11.1 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 46 (Q_5 = 6 cfs, Q_{100} = 16 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 2 residential use within Basin F2-B (5.0 ac.) that are tributary to the proposed sump condition at Design Point 46. At this location, a 10' Type R sump inlet has already been designed to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. This remains consistent with *Design Point 1 (Q_5 = 6.6 cfs, Q_{100} = 16.0 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 47 (Q_5 = 4 cfs, Q_{100} = 10 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 2 residential use within Basin F8-5 (3.0 ac.) that are tributary to the proposed sump condition at Design Point 47. At this location, a 15' Type R at-grade inlet has already been designed to collect the majority of the developed flows with a minimal flow-by of (Q_5 = 0.0 cfs, Q_{100} = 0.8 cfs). A public storm system within the ROW will convey these developed flows further downstream. This remains consistent with *Design Point 11 Flow by (Q_5 = 0.0 cfs, Q_{100} = 0.0 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 48 (Q_5 = 3 cfs, Q_{100} = 9 cfs) represents the anticipated developed flows from the Sterling Ranch East Filing No. 8 residential use within Basin F8-6 (2.8 ac.) that are tributary to the proposed sump condition at Design Point 48. At this location, Type R sump inlets will be sized to completely collect both the 5-yr. and 100-yr. developed flows. A public storm system within the ROW will convey these developed flows further downstream. Sizing of these facilities will be provided in a future FDR.

<u>Design Points 49 & 50 represent both the Interim and Ultimate Conditions:</u>

Design Point 49 (Q_5 = 3 cfs, Q_{100} = 8 cfs) represents developed flows from Basin SR-1 (1.2 ac.) and the minimal flow-by from DP-37 along the north side of Sterling Ranch Road that are tributary to Design Point 49. A 15' Type R at-grade inlet has already been designed to collect the majority of the developed flows with a minimal flow-by of (Q_5 = 0.0 cfs, Q_{100} = 0.1 cfs). A public storm system within the ROW will convey these developed flows further downstream. This remains consistent with *Design Point 15 Flow by (Q_5 = 0.0 cfs, Q_{100} = 1.2 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 50 (Q_5 = 2.2 cfs, Q_{100} = 5.1 cfs) represents anticipated developed flows from Basin SR-2 (0.65 ac.) and Basin Z (0.30) along the south side of Sterling Ranch Road that are tributary to Design Point 50. A 15' Type R at-grade inlet has already been designed to collect the majority of the developed flows with a minimal flow-by of (Q_5 = 0.0 cfs, Q_{100} = 0.0 cfs). A public

storm system within the ROW will convey these developed flows further downstream. This remains consistent with *Design Point 16 Flow by (Q_5 = 0.0 cfs, Q_{100} = 0.4 cfs)* as described in the approved FDR for *Foursquare at Sterling Ranch East Filing No. 1 (SF2236).*

Design Point 51 represents both the Interim and Ultimate Conditions with Sterling Ranch East Filing No. 8 and Sterling Ranch East Filing No. 2 being built:

Design Point 51 (Q_5 = 38 cfs, Q_{100} = 89 cfs) represents the **total developed flows at the southwest forebay** from all the designed residential development tributary to this outfall location into Pond FSD-16. This remains fairly consistent with *Design Point 17 (Q_5 = 48 cfs, Q_{100} = 112 cfs)* as described in the approved FDR for *Sterling Ranch East Filing No. 8 (SF2526).*

Design Points 52-54 represents both the Interim and Ultimate Conditions:

Design Point 52 (Q_5 = 12.2 cfs, Q_{100} = 25.7 cfs) consists of developed flows from Basin F2-C, P1-A2, F8-8 and Flow-by from DP-47. Basin F2-C is 0.72 acres and Basin F8-8 is 1.3 acres of open space tracts adjacent to Briargate Parkway. Basin P1-A2 is 4.2 acres of the north half of Briargate Parkway. These basins combine flows that travel as curb and gutter flow along the north flowline of Briargate Parkway. These flows are intercepted by an existing 15' Type R at-grade inlet recently constructed in Briargate Parkway. This at-grade inlet intercepts (Q_5= 10.4 cfs, Q_{100}= 15.4 cfs) with a flow-by of (Q_5= 1.8 cfs, Q_{100}= 10.4 cfs) that travels in the north curb line of Briargate Parkway towards Design Point 53. Intercepted flows are conveyed by a public 24" RCP storm sewer within Briargate Parkway. These flows are then routed further downstream towards the existing Pond FSD-14A recently constructed along the Sterling Ranch East Filing No. 1 (SF2235)

This basin was originally studied in the "Drainage Letter for Sterling Ranch Road and Briargate Parkway Interim Plan", prepared by JR Engineering, approved 7/25/23 (CDR221) as Basin A2 and Design Point 2 (Q_5= 10.5 cfs, Q_{100}= 21.4 cfs). These off-site flows remain fairly consistent with what was previously planned and anticipated and the downstream facilities will continue to adequately handle these flows.

Design Point 53 (Q_5 = 7.5 cfs, Q_{100} = 24.0 cfs) consists of developed flows from Basin F8-9, off-site Basin P1-A3 and Flow-by from DP-52. Basin F8-9 is 1.6 acres of open space tract adjacent to Briargate Parkway. Basin P1-A3 is 1.2 acres of the north half of Briargate Parkway. These basins combine flows that travel as curb and gutter flow along the north flowline of Briargate Parkway. These flows are intercepted by an existing 15' Type R at-grade inlet recently constructed in Briargate Parkway just west of the intersection with Sterling Ranch Road. This at-grade inlet intercepts (Q_5= 7.2 cfs, Q_{100}= 14.3 cfs) with a flow-by of (Q_5= 0.1 cfs, Q_{100}= 7.9 cfs) that travels in the north half of Briargate Parkway towards Design Point 54. Intercepted flows are conveyed by a public 24" RCP storm sewer within Briargate Parkway. These flows are then routed further downstream towards the existing Pond FSD-14A recently constructed along the Sterling Ranch East Filing No. 1 (SF2235)

This basin was originally studied in the "Drainage Letter for Sterling Ranch Road and Briargate Parkway Interim Plan", prepared by JR Engineering, approved 7/25/23 (CDR221) as Basin A3 and Design Point 5 (Q_5= 5.1 cfs, Q_{100}= 13.2 cfs). Again, these off-site flows remain fairly consistent with what was previously planned and anticipated and the downstream facilities will continue to adequately handle these flows.

Design Point 54 (Q_5 = 11.2 cfs, Q_{100} = 32.6 cfs) consists of developed flows from Basins BG-1, U and flow-by from Design Points 17, 49 & 53. Basin BG-1 is 4.2 acres of Sterling Ranch Road, open space tract adjacent to Briargate Parkway and the proposed Briargate Parkway extension to the east. Basin U is 1.7 ac. of rear yards and open space north of Briargate Parkway. These flows travel as curb and gutter flow within Briargate Parkway to Design Point 54. At this location an existing 20' Type R sump inlet constructed along with the recent Briargate Parkway and Filing No. 1 improvements completely collects these proposed and anticipated future developed flows. Intercepted flows are conveyed by a public 30" RCP storm sewer within Briargate Parkway. These flows are then routed further downstream towards the existing Pond FSD-14A recently constructed along the Sterling Ranch East Filing No. 1 (SF2235)

This basin was previously studied in the "Final Drainage Report for Sterling Ranch East Filing No. 1", prepared by Classic Consulting, approved 7/2/24 (SF2235) as Basins P1-C2, P1-A5 and Design Point 6 (Q_5= 10.3 cfs, Q_{100}= 31.6 cfs). These off-site flows remain fairly consistent with what was previously planned and anticipated and the downstream facilities will continue to adequately handle these flows.

Interim and Ultimate Condition:

Design Point 55 (Q_5 = 7 cfs, Q_{100} = 13 cfs) represents developed flows from Basin BG-2 (3.0 ac.) that are tributary to the proposed sump condition at Design Point 55. At this location, as existing 15' Type R sump inlet, constructed with the recent Briargate Parkway and Filing No. 1 improvements will completely collect both the 5-yr. and 100-yr. developed flows. A public 24" RCP within the ROW will convey these developed flows further downstream.

The following Basins represent both the Interim and Ultimate Conditions:

Basin U (Q_5 = 2 cfs, Q_{100} = 6 cfs) represents developed flows from rear yards of lots 1-6 that are not able to be captured and routed to Pond FSD-16. However, these developed flows will enter the proposed north curb line of Briargate Parkway and travel as curb and gutter flow in a westerly direction towards the existing 20' Type R sump inlet at DP-54. This condition is consistent with the approved *Sterling Ranch MDDP Amendment No. 2 and PDR for Sterling Ranch East Preliminary Plan No.1 (SP224)* as previously planned Basin P1-A5. These developed flows within this basin are completely captured and routed downstream within the public storm system within Sterling Ranch Road and ultimately enter the existing Pond FSD-14A as constructed with *Sterling Ranch East Filing No. 1 FDR (SF2235).*

Basin Z (Q_5 = 0.3 cfs, Q_{100} = 0.9 cfs) represents developed flows from rear yards of lots and the open space tract adjacent to Sterling Ranch Road (0.30 ac.). These flows sheet flow into the easterly curb line of Sterling Ranch Road and travel as curb and gutter flow in a southerly direction towards the downstream 15' Type R at-grade inlet proposed at DP-50. This basin was previously accounted for as Basin OS-4 in the Sterling Ranch East Filing No. 8 FDR.

Basin AA (Q_5 = 4 cfs, Q_{100} = 10 cfs) represents developed flows from rear lots and adjacent Tract that sheet flow directly into Pond FSD-16 (2.6 ac.).

Basin BB (Q_5 = 3 cfs, Q_{100} = 16 cfs) represents developed flows from the Pond FSD-16 area itself (6.2 ac.). These developed flows travel as sheet flow into the facility and then routed via concrete trickle channels towards the outlet structure.

Interim Condition:

Basin FF (Q_5 = 2 cfs, Q_{100} = 4 cfs) represents developed flows from the north half of the proposed Oshkosh Rd. public roadway. These developed flows travel as curb and gutter flows in a southeasterly direction towards an off-site temporary sediment basin, as they are not able to be routed to Pond FSD-16. However, these flows will ultimately be treated in a future downstream permanent SWQ facility. Given this basin is only 0.62 ac. and is well less than 20% of this total Filing acreage, we request an exclusion for this specific basin from providing WQCV.

A temporary control berm is proposed along the north side of Oshkosh Rd. to route the off-site pre-developed flows from the north around the site. The berm will remain in place until future upstream facilities are designed and constructed with future Sterling Ranch residential filings within this basin.

Basin P1-F1 (Q_5 = 59 cfs, Q_{100} = 144 cfs) represents the entire anticipated upstream basin tributary to Pond FSD-16 within the future Sterling Ranch Development in the ultimate condition. (Reference "Sterling Ranch East Prelim. Plan Filings 1-4 Preliminary Drainage Report" – SP244) At this time, it is estimated that approximately 50% of these future developed flows will be routed to the 42" RCP storm stub provided at Pipe Run 35 and the other 50% routed to the other 42" RCP storm stub at Pipe Run 36.

Basin P1-INT (Q_5 = 6 cfs, Q_{100} = 39 cfs) represents undeveloped flows from the area to the north (33.4 ac.) tributary to this development in the interim condition. These undeveloped flows

continue to sheet flow in a southerly direction towards a proposed temporary sediment basin just north of Sterling Ranch Road. The release from this temporary facility will be directly into the proposed storm system at DP-26.

DETENTION / STORMWATER QUALITY FACILITES

As required, storm water quality measures will be utilized in order to reduce the amount of sediment, debris and pollutants that are allowed to enter Sand Creek. These features include but are not limited to Pond FSD-16 and existing downstream Pond FSD-14A. (All owned and maintained by Sterling Ranch Metro District No. 3). All urban areas require detention and will provide a WQCV and Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume that will release the more frequent storms at a slower rate to help minimize the effects of development of the property. The proposed facilities are to be private facilities with ownership and maintenance by the Sterling Ranch Metropolitan District No. 3. After completion of construction and upon the Board of County Commissioners acceptance, all the drainage facilities within the public Right-of-Way will be owned and maintained by El Paso County.

The following represents the proposed **Pond FSD-16 design:**

(See MHFD-Detention Design Sheets in Appendix)

Ultimate Condition:

Total Tributary acreage: 211.5 Ac. with Eff. Imp. of 49.1%

3.592 Ac.-ft. WQCV required

8.114 Ac.-ft. EURV required

7.446 Ac.-ft. 100-yr. Storage

19.152 Ac.-ft. Total

Total In-flow: **Q_5 = 190 cfs, Q_{100} = 471 cfs**

Pond Design Release: **Q_5 = 4.0 cfs, Q_{100} = 118.8 cfs**

Interim Condition:

Total Tributary acreage: 184.3 Ac. with Eff. Imp. of 39.4%

2.738 Ac.-ft. WQCV required

5.041 Ac.-ft. EURV required

5.869 Ac.-ft. 100-yr. Storage

13.648 Ac.-ft. Total

Total In-flow: Q_5 **= 101 cfs,** Q_{100} **= 276 cfs**

Pond Design Release: Q_5 **= 3.3 cfs,** Q_{100} **= 76.8 cfs**

(Both conditions will have Ownership and maintenance by the Sterling Ranch Metro District No. 3)

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual on-site developed basin design used for detention/SWQ basin sizing was calculated using the Rational Method. Runoff Coefficients are based on the imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. The average rainfall intensity, by recurrence interval found in the Intensity-Duration-Frequency (IDF) curves in Figure 6-5. (See Appendix)

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

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

1. **Employ Runoff Reduction Practices:** All proposed lot impervious area (roof tops, patios, etc.) will sheet flow across landscaped portions of front and rear yards and through open space areas to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets or detention facilities. This will minimize directly connected impervious areas within the project site. Final Drainage Report will provide further detail on basins that will be providing Runoff Reduction.

2. **Stabilize Drainageways:** After developed flows utilize the runoff reduction practices through the front and rear yards, developed flows will travel via curb and gutter within the public streets and eventually public storm systems. These collected flows are then routed directly to the proposed extended detention basins (full-spectrum facilities). Where developed flows are not able to be routed to public street, sheet flows will travel across landscaped rear yards and then through undeveloped property prior to being released off-site.

3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV and excess urban runoff volume (EURV) in the proposed Full-Spectrum permanent Extended Detention Basins (Pond FSD-16 and Pond FSD-14A) designed per current El Paso County drainage criteria. For the small area that is not able to be captured and routed to a permanent EDB, Basin FF (0.62 ac.) falls under the less than 1.0 ac. and 20% exclusion. In the future, this area will be treated in a downstream FSD pond.

4. **Consider need for Industrial and Commercial BMPs**: No industrial or commercial uses are proposed within this development. However, a site-specific storm water quality and erosion control plan and narrative along with the grading and erosion control plan will be submitted with the future Final Plat submittal. Details such as site-specific sediment and erosion control construction BMP's as well as temporary and permanent BMP's will be detailed in this plan and narrative to protect receiving waters. BMP's will be constructed

and maintained as the development has been graded and erosion control methods employed.

FLOODPLAIN STATEMENT

No portion of this site is located within a floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C0533G and 08041C535G with effective date of December 7, 2018 (See Appendix).

DRAINAGE AND BRIDGE FEES

This subdivision lies entirely within the Sand Creek Drainage Basin boundaries. The following are anticipated drainage and bridge fees using the following impervious acreage method approved by El Paso County.

Total Final Plat area equals 62.50 acres with the following different land uses proposed:

10.10 Ac.	Park/Open Space/Pond Tracts (Tracts A-H)
44.36 Ac.	Urban Lots (RS-5000 zone with avg. Lot Size = 7,590 SF)
8.04 Ac.	Briargate Parkway, Sterling Ranch Road and Oshkosh Rd. Right-of-Way
62.50 Ac.	**Total**

The percent imperviousness for this subdivision is calculated as follows:

Fees for Park/Open Space/Pond Tracts

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

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

Fees for Urban Lots (Avg. Lot Size of 7,390 SF)

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

44.36 Ac. x 48% = **21.29 Impervious Ac.**

Fees for adjacent Public Right-of-Way

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

8.04 Ac. x 80% = **6.43 Impervious Ac.**

Total Impervious Acreage: **28.43 Imp. Ac.** (Drainage Fees)

Total Impervious Acreage: **28.43 Imp. Ac.** (Bridge Fees)

The following calculations are based on the 2026 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS (Filing No. 6):

Bridge Fees

$ 11,518.00 x 28.43 Impervious Ac. = **$ 327,456.74**

Drainage Fees (Credits may be used)

$ 28,160.00 x 28.43 Impervious Ac. = **$ 800,588.80**

Credits within the basin may be used for Drainage Fees only. Please reference the "Pre-credits" table below. Bridge Fees will be paid at plat recordation.

SUMMARY

The proposed Sterling Ranch East Filing No. 6 Final Plat is within the Sand Creek Drainage Basin. Recommendations are made within this report concerning necessary improvements that will be required as a result of development of this property. The points of storm water release from the proposed site are required to be at or below the calculated pre-developed flow quantities. The development of the proposed site does not significantly impact any downstream facility or property to an extent greater than that which currently exists in the pre-development conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC

Marc A. Whorton, P.E.
Project Manager

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REFERENCES

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

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

3. "Final Drainage Report for Forest Gate Subdivision" Law & Mariotti Consultants, Inc. dated October 2004.

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

5. "2018 Sterling Ranch MDDP", M&S Civil Consultants, Inc., June 2018

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

7. "Final Drainage Report for Retreat at TimberRidge Filing No. 2", Classic Consulting, approved September, 2022.

8. "Sterling Ranch MDDP Amendment No. 2 & Preliminary Drainage Report for Sterling Ranch East Preliminary Plan No. 1", Classic Consulting, approved January, 2023.

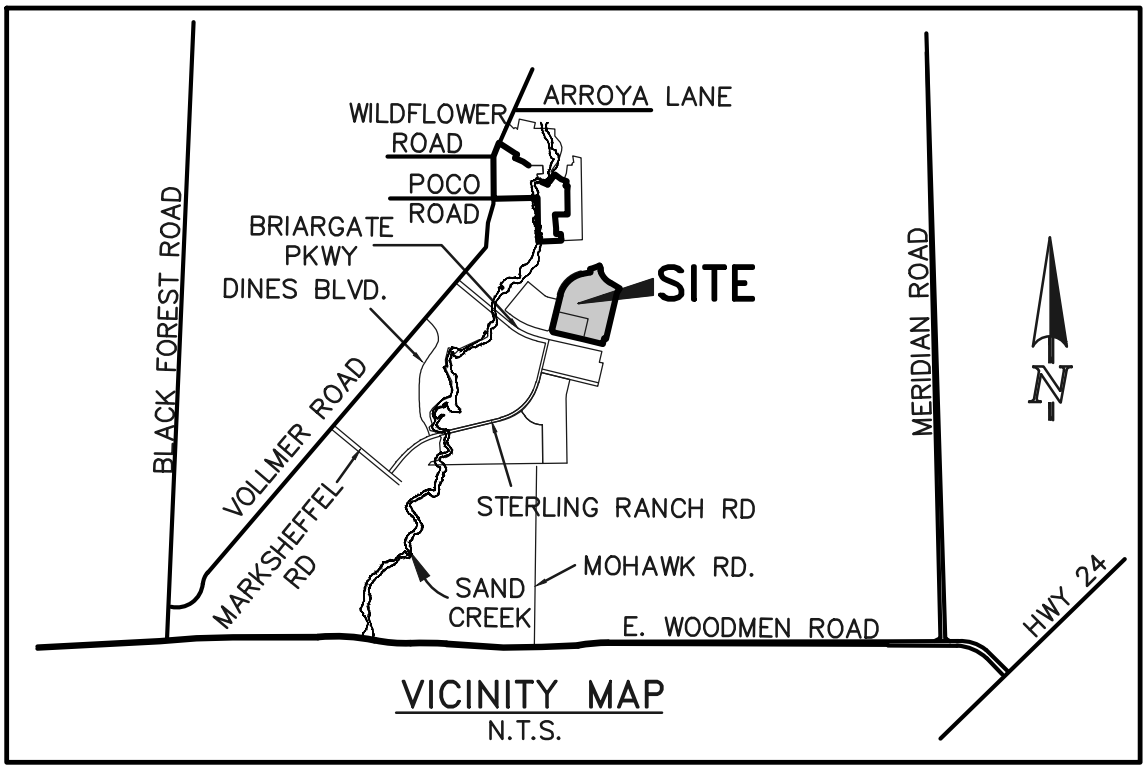
9. "Final Drainage Report for Sterling Ranch East Filing No. 2 and Foursquare at Sterling Ranch East Filing No. 1", Classic Consulting, dated August, 2024.

10. "Preliminary Drainage Report for Sterling Ranch East Filing No. 6 Preliminary Plan and Final Drainage Report for Early Grading ", Classic Consulting, dated April 2025

APPENDIX

VICINITY MAP

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

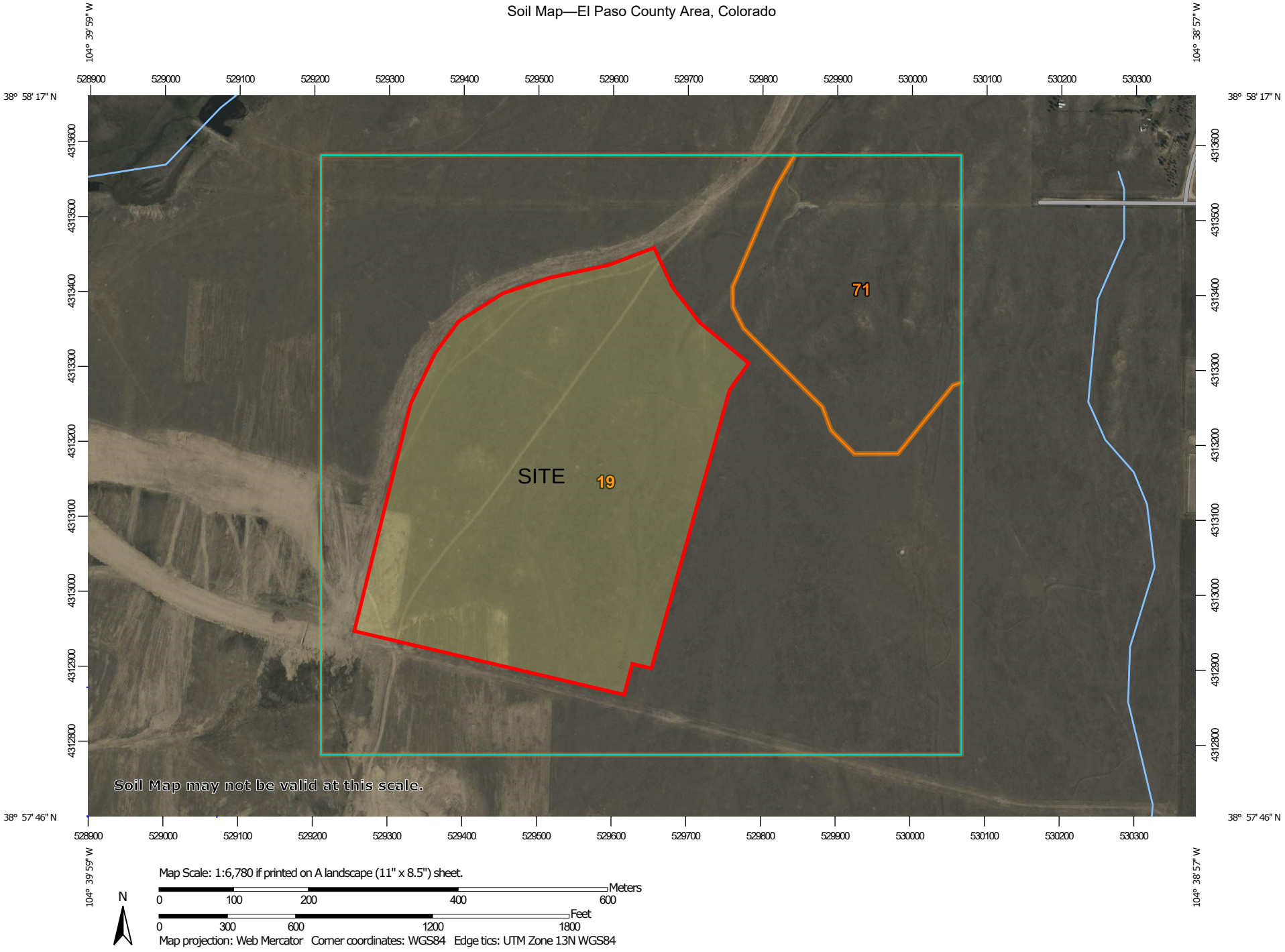


VICINITY MAP

N.T.S.

SOILS MAP (S.C.S SURVEY)

Soil Map—El Paso County Area, Colorado



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 21, Aug 24, 2023

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	146.7	86.2%
71	Pring coarse sandy loam, 3 to 8 percent slopes	23.5	13.8%
Totals for Area of Interest		**170.2**	**100.0%**

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent

Landform: Swales
Hydric soil rating: Yes

Other soils
Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 21, Aug 24, 2023

El Paso County Area, Colorado

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

Map Unit Setting

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

Map Unit Composition

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

Description of Pring

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

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

Minor Components

Pleasant

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

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 21, Aug 24, 2023

F.E.M.A. MAP

NOTES TO USERS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

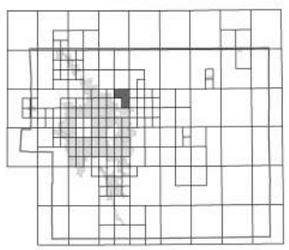
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)

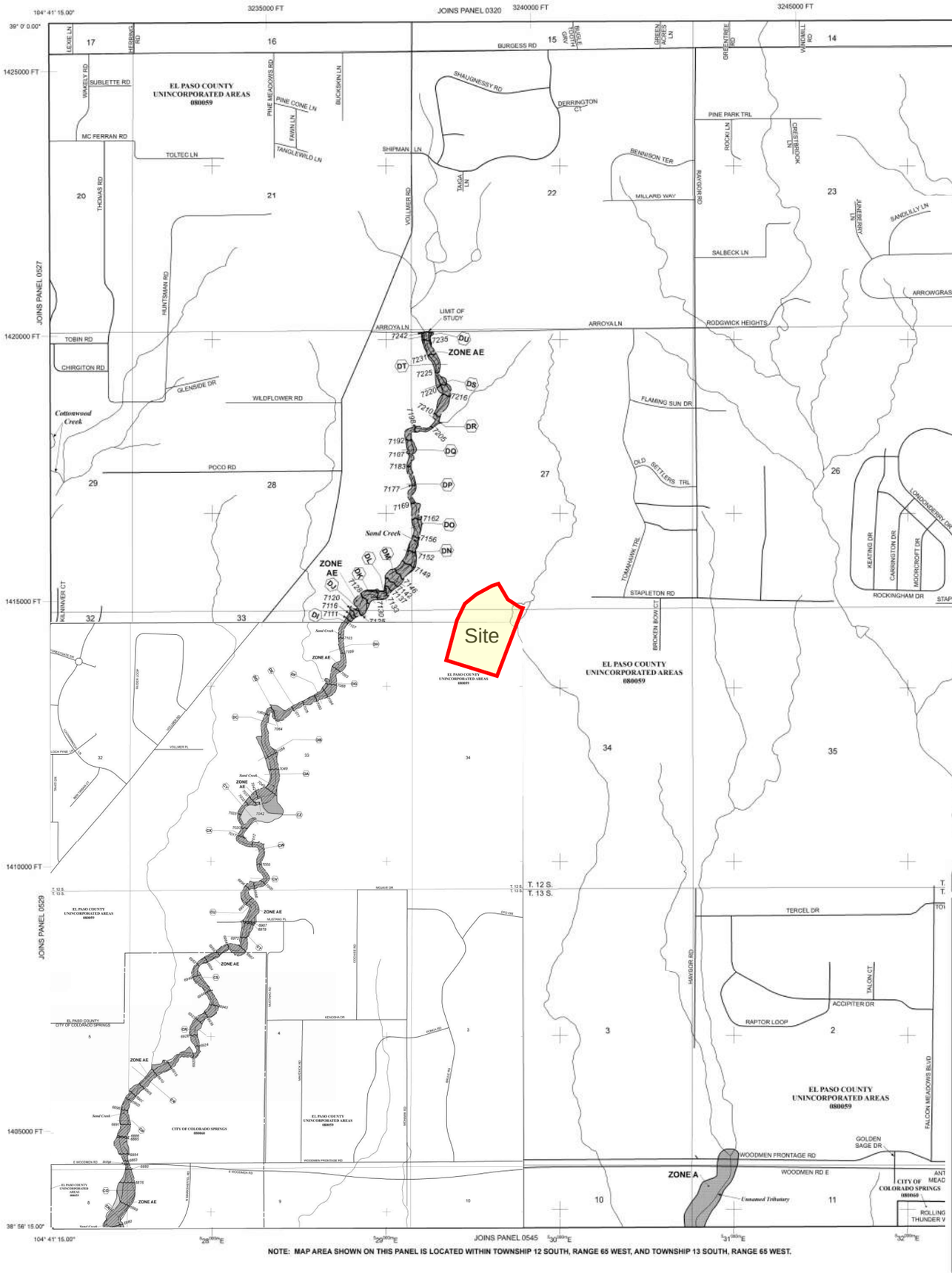
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION

Panel Location Map



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

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



LEGEND

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

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

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

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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

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

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

- A — A — Cross section line
- 23 — 23 — Transect line
- 97° 07' 30.00" / 32° 22' 30.00" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4375000 FT — 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT — 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

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

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

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

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

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

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0533G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 533 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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

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

MAP NUMBER 08041C0533G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0535G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 535 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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

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

MAP NUMBER 08041C0535G

MAP REVISED DECEMBER 7, 2018

Federal Emergency Management Agency

HYDROLOGIC CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

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

Table 6-2. Rainfall Depths for Colorado Springs

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

Where Z= 6,840 ft/100

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

2.2 Design Storms

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

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

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

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

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

3.2 Time of Concentration

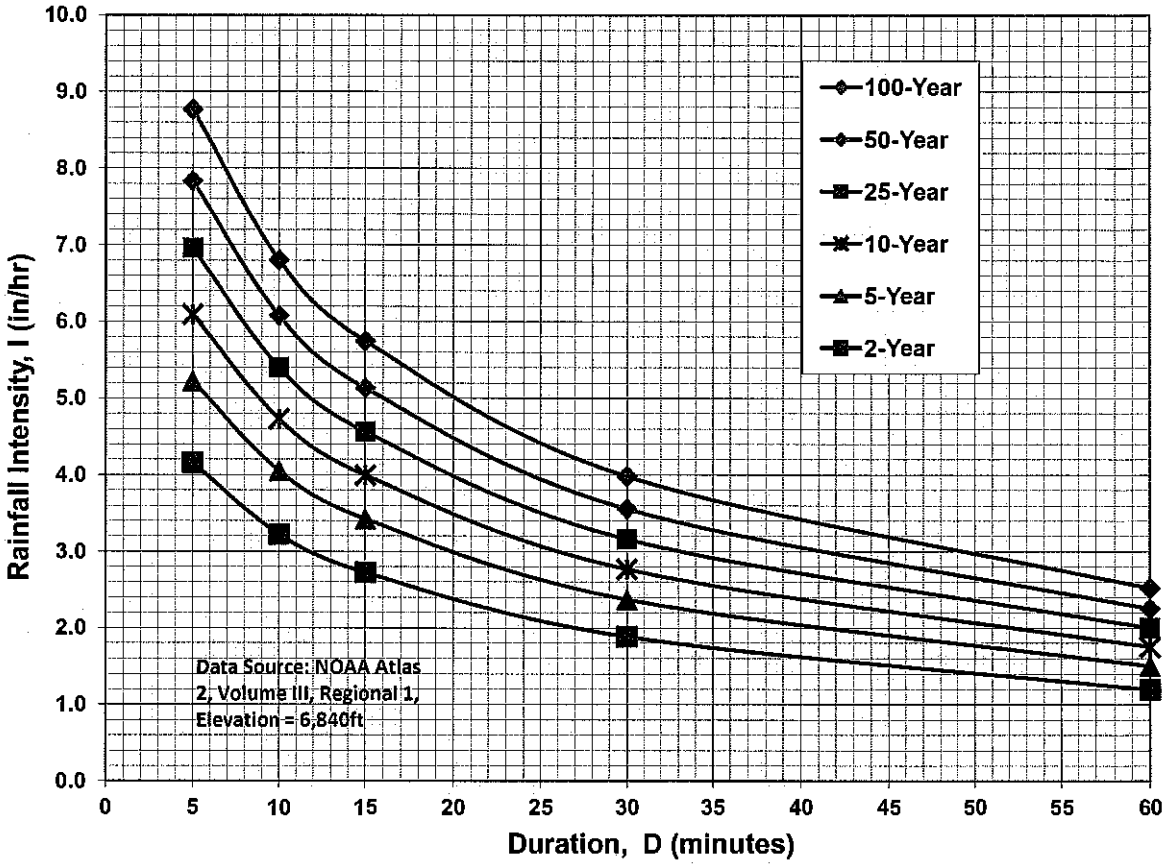
One of the basic assumptions underlying the Rational Method is that runoff is a function of the average rainfall rate during the time required for water to flow from the hydraulically most remote part of the drainage area under consideration to the design point. However, in practice, the time of concentration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

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

Table 6-10. NRCS Curve Numbers for Frontal Storms & Thunderstorms for Developed Conditions (ARCII)

Fully Developed Urban Areas (vegetation established)[1]	Treatment	Hydrologic Condition	% I	Pre-Development CN			
				HSG A	HSG B	HSG C	HSG D
Open space (lawns, parks, golf courses, cemeteries, etc.):							
Poor condition (grass cover < 50%)	-----	-----	---	68	79	86	89
Fair condition (grass cover 50% to 75%)	-----	-----	---	49	69	79	84
Good condition (grass cover > 75%)	-----	-----	---	39	61	74	80
Impervious areas:							
Paved parking lots, roofs, driveways, etc. (excluding right-of-way	-----	-----	---	98	98	98	98
Streets and roads:							
Paved; curbs and storm sewers (excluding right-of-way)	-----	-----	---	98	98	98	98
Paved; open ditches (including right-of-way)	-----	-----	---	83	89	92	93
Gravel (including right-of-way)	-----	-----	---	76	85	89	91
Dirt (including right-of-way)	-----	-----	---	72	82	87	89
Western desert urban areas:							
Natural desert landscaping (pervious areas only)	-----	-----	---	63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)	-----	-----	---	96	96	96	96
Urban districts:							
Commercial and business	-----	-----	85	89	92	94	95
Industrial	-----	-----	72	81	88	91	93
Residential districts by average lot size:							
1/8 acre or less (town houses)	-----	-----	65	77	85	90	92
1/4 acre	-----	-----	38	61	75	83	87
1/3 acre	-----	-----	30	57	72	81	86
1/2 acre	-----	-----	25	54	70	80	85
1 acre	-----	-----	20	51	68	79	84
2 acres	-----	-----	12	46	65	77	82
Developing Urban Areas[1]	**Treatment[2]**	**Hydrologic Condition[3]**	**% I**	**HSG A**	**HSG B**	**HSG C**	**HSG D**
Newly graded areas (pervious areas only, no vegetation)	-----	-----	---	77	86	91	94
Cultivated Agricultural Lands[1]	**Treatment**	**Hydrologic Condition**	**% I**	**HSG A**	**HSG B**	**HSG C**	**HSG D**
Fallow	Bare soil	-----	---	77	86	91	94
	Crop residue cover (CR)	Poor	---	76	85	90	93
		Good	---	74	83	88	90
Row crops	Straight row (SR)	Poor	---	72	81	88	91
		Good	---	67	78	85	89
	SR + CR	Poor	---	71	80	87	90
		Good	---	64	75	82	85
	Contoured (C)	Poor	---	70	79	84	88
		Good	---	65	75	82	86
	C + CR	Poor	---	69	78	83	87
		Good	---	64	74	81	85
	Contoured & terraced (C&T)	Poor	---	66	74	80	82
		Good	---	62	71	78	81
	C&T+ CR	Poor	---	65	73	79	81
		Good	---	61	70	77	80
Small grain	SR	Poor	---	65	76	84	88
		Good	---	63	75	83	87
	SR + CR	Poor	---	64	75	83	86
		Good	---	60	72	80	84
	C	Poor	---	63	74	82	85
		Good	---	61	73	81	84
	C + CR Poor	Poor	---	62	73	81	84
		Good	---	60	72	80	83
	C&T	Poor	---	61	72	79	82
		Good	---	59	70	78	81
	C&T+ CR	Poor	---	60	71	78	81
		Good	---	58	69	77	80

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

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

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

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

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

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

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

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

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/29/26*
CALCULATED BY: *MAW*

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

BASIN	TOTAL AREA (AC)	C VALUE DCM TABLE 6-6						WEIGHTED CA			DCM TABLE 6-6
		LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	WEIGHTED % IMPERVIOUS
EX-9	65.30	UNDEV.	2.0%	65.30	0.03	0.09	0.36	1.96	5.88	23.51	2.0%
EX-10	265.90	REFERENCE STERLING RANCH EAST PRELIMINARY PLAN NO. 1 SWMM CALCULATIONS (SP224)									
EX-10A	17.80	UNDEV.	2.0%	17.80	0.03	0.09	0.36	0.53	1.60	6.41	2.0%
EX-11	3.90	UNDEV.	2.0%	3.90	0.03	0.09	0.36	0.12	0.35	1.40	2.0%

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

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

Table 6-7. Conveyance Coefficient, C_v

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

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

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

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

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-9	1.96	5.88	23.51	0.12	300	8	22.2	3500	3.0%	1.7	33.7	55.9	1.25	1.55	2.60	2	**9**	**61**
EX-10	REFERENCE STERLING RANCH EAST PRELIMINARY PLAN NO. 1 SWMM CALCULATIONS (SP224)																**105**	**222**
EX-10A	0.53	1.60	6.41	0.12	300	8	22.2	1100	3.0%	1.7	10.6	32.8	1.88	2.35	3.94	1	**4**	**25**
EX-11	0.12	0.35	1.40	0.12	300	8	22.2					22.2	2.35	2.93	4.93	0.3	**1**	**7**

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (PRE-DEVELOPMENT)

Design Point(s)	Contributing Basins / Design Point	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Outfall
					I(5)	I(100)	Q(5)	Q(100)	
EX1	EX-9	5.88	23.51	55.9	1.55	2.60	9	61	Exist. Pond FSD-16 (Interim - TSB)
EX2	EX-10A	1.60	6.41	32.8	2.35	3.94	4	25	
EX3	EX-10 & EX-11	REFERENCE STERLING RANCH EAST PRELIMINARY PLAN NO. 1 SWMM CALCULATIONS (SP224)					105	222	

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
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FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY (DEVELOPED)

		C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						WEIGHTED "C" VALUE			WEIGHTED CA			DCM TABLE 6-6
BASIN	TOTAL AREA (AC)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(2)	C(5)	C(100)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	WEIGHTED % IMPERVIOUS
A	3.60	RES 1/6 AC.	52.5%	3.60	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	1.15	1.35	1.96	52.5%
B	1.20	RES 1/6 AC.	52.5%	1.20	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.38	0.45	0.65	52.5%
C	4.50	RES 1/6 AC.	52.5%	3.90	0.32	0.38	0.55	OPEN SPACE	7.0%	0.60	0.05	0.12	0.39	0.28	0.34	0.52	1.28	1.53	2.36	46.4%
D	1.50	RES 1/6 AC.	52.5%	1.50	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.48	0.56	0.82	52.5%
E	1.60	RES 1/6 AC.	52.5%	1.60	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.51	0.60	0.87	52.5%
F	3.50	RES 1/6 AC.	52.5%	3.50	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	1.12	1.31	1.91	52.5%
G	1.10	RES 1/6 AC.	52.5%	1.10	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.35	0.41	0.60	52.5%
H	1.70	RES 1/6 AC.	52.5%	1.70	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.54	0.64	0.93	52.5%
I	0.22	RES 1/6 AC.	52.5%	0.22	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.07	0.08	0.12	52.5%
J	1.90	RES 1/6 AC.	52.5%	1.90	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.61	0.71	1.04	52.5%
K	0.73	RES 1/6 AC.	52.5%	0.73	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.23	0.27	0.40	52.5%
L	2.20	RES 1/5 AC.	46.0%	2.20	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.62	0.75	1.14	46.0%
M	0.57	RES 1/5 AC.	46.0%	0.57	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.16	0.19	0.30	46.0%
N	1.70	RES 1/6 AC.	52.5%	1.70	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.54	0.64	0.93	52.5%
O	0.49	RES 1/6 AC.	52.5%	0.49	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.16	0.18	0.27	52.5%
P	0.40	RES 1/6 AC.	52.5%	0.40	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.13	0.15	0.22	52.5%
Q	1.70	RES 1/6 AC.	52.5%	1.70	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.54	0.64	0.93	52.5%
R	2.70	RES 1/6 AC.	52.5%	2.70	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.86	1.01	1.47	52.5%
S	1.60	RES 1/6 AC.	52.5%	1.60	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.51	0.60	0.87	52.5%
T	0.49	RES 1/6 AC.	52.5%	0.49	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.16	0.18	0.27	52.5%
U	1.70	RES 1/6 AC.	52.5%	1.37	0.32	0.38	0.55	OPEN SPACE	7.0%	0.33	0.05	0.12	0.39	0.27	0.33	0.51	0.45	0.55	0.88	43.7%
V	2.70	RES 1/5 AC.	46.0%	1.93	0.28	0.34	0.52	POCKET PARK	7.0%	0.77	0.05	0.12	0.39	0.21	0.28	0.48	0.58	0.75	1.30	34.9%
W	0.79	RES 1/6 AC.	52.5%	0.79	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.25	0.30	0.43	52.5%
X	2.00	RES 1/6 AC.	52.5%	2.00	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.64	0.75	1.09	52.5%
Y	3.20	RES 1/5 AC.	46.0%	3.20	0.28	0.34	0.52			0.00	0.89	0.90	0.96	0.28	0.34	0.52	0.90	1.09	1.66	46.0%
Z	0.30	RES 1/5 AC.	46.0%	0.15	0.28	0.34	0.52	OPEN SPACE	7.0%	0.15	0.05	0.12	0.39	0.17	0.23	0.46	0.05	0.07	0.14	26.5%
AA	2.60	RES 1/5 AC.	46.0%	2.35	0.28	0.34	0.52	OPEN SPACE	7.0%	0.25	0.05	0.12	0.39	0.26	0.32	0.51	0.67	0.83	1.32	42.3%
BB	6.20	RES 1/5 AC.	46.0%	0.00	0.28	0.34	0.52	OPEN SPACE	7.0%	6.20	0.05	0.12	0.39	0.05	0.12	0.39	0.31	0.74	2.42	7.0%
CC	5.80	RES 1/5 AC.	46.0%	3.60	0.28	0.34	0.52	OPEN SPACE	7.0%	2.20	0.05	0.12	0.39	0.19	0.26	0.47	1.12	1.49	2.73	31.2%
DD	4.40	RES 1/6 AC.	52.5%	4.00	0.32	0.38	0.55	OPEN SPACE	7.0%	0.40	0.05	0.12	0.39	0.30	0.35	0.53	1.30	1.55	2.34	48.4%
EE	1.30	STREET	100.0%	0.60	0.89	0.90	0.96	OPEN SPACE	7.0%	0.80	0.05	0.12	0.39	0.44	0.49	0.68	0.57	0.64	0.89	50.5%
FF	0.62	STREET	100.0%	0.60	0.89	0.90	0.96			0.00	0.05	0.12	0.39	0.86	0.87	0.93	0.53	0.54	0.58	96.8%
GG	2.50	RES 1/6 AC.	52.5%	1.90	0.32	0.38	0.55	STREET	100.0%	0.60	0.89	0.90	0.96	0.46	0.50	0.64	1.14	1.25	1.61	63.9%
HH	2.00	RES 1/6 AC.	52.5%	1.00	0.32	0.38	0.55	STREET	100.0%	1.00	0.89	0.90	0.96	0.61	0.64	0.75	1.21	1.28	1.51	76.3%
F4-1	9.00	RES 1/5 AC.	46.0%	9.00	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	2.52	3.06	4.68	46.0%
F4-2	2.20	RES 1/5 AC.	46.0%	2.20	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.62	0.75	1.14	46.0%
F4-3	3.20	RES 1/5 AC.	46.0%	3.20	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.90	1.09	1.66	46.0%
F4-4	9.80	RES 1/5 AC.	46.0%	6.10	0.28	0.34	0.52	OPEN SPACE	7.0%	3.70	0.05	0.12	0.39	0.19	0.26	0.47	1.89	2.52	4.62	31.3%
F4-5	1.70	RES 1/6 AC.	52.5%	1.70	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	0.54	0.64	0.93	52.5%
F4-6	3.50	RES 1/5 AC.	46.0%	3.50	0.28	0.34	0.52			0.00	0.02	0.08	0.35	0.28	0.34	0.52	0.98	1.19	1.82	46.0%
F4-7	6.90	RES 1/6 AC.	52.5%	6.90	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	2.21	2.59	3.76	52.5%
F4-8	1.10	RES 1/6 AC.	52.5%	1.10	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.35	0.41	0.60	52.5%
F4-9	4.90	RES 1/6 AC.	52.5%	4.90	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	1.57	1.84	2.67	52.5%
F4-10	8.50	RES 1/6 AC.	52.5%	8.50	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	2.72	3.19	4.63	52.5%
F2-A	2.90	RES 1/6 AC.	52.5%	2.90	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	0.93	1.09	1.58	52.5%
F2-B	5.00	RES 1/6 AC.	52.5%	5.00	0.32	0.38	0.55			0.00	0.02	0.08	0.35	0.32	0.38	0.55	1.60	1.88	2.73	52.5%
F2-C	0.72	STREET	100.0%	0.19	0.89	0.90	0.96	OPEN SPACE	7.0%	0.53	0.05	0.12	0.39	0.27	0.33	0.54	0.20	0.23	0.39	31.5%
F8-1	3.30	RES 1/6 AC.	52.5%	3.10	0.32	0.38	0.55	OPEN SPACE	7.0%	0.20	0.05	0.12	0.39	0.30	0.36	0.54	1.00	1.19	1.77	49.7%
F8-2	1.00	RES 1/5 AC.	46.0%	0.88	0.28	0.34	0.52	OPEN SPACE	7.0%	0.12	0.05	0.12	0.39	0.25	0.31	0.50	0.25	0.31	0.50	41.3%
F8-3	3.00	RES 1/8 AC.	65.0%	2.75	0.41	0.45	0.59	OPEN SPACE	7.0%	0.25	0.05	0.12	0.39	0.38	0.42	0.57	1.14	1.27	1.72	60.2%

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FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY (DEVELOPED)

		C VALUE DCM TABLE 6-6						C VALUE DCM TABLE 6-6						WEIGHTED "C" VALUE			WEIGHTED CA			DCM TABLE 6-6
BASIN	TOTAL AREA (AC)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(2)	C(5)	C(100)	LAND USE	PERCENT IMPERVIOUS	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	WEIGHTED % IMPERVIOUS
F8-4	5.00	RES 1/8 AC.	65.0%	4.75	0.41	0.45	0.59	OPEN SPACE	7.0%	0.25	0.05	0.12	0.39	0.39	0.43	0.58	**1.96**	**2.17**	**2.90**	62.1%
F8-5	2.50	RES 1/8 AC.	65.0%	2.01	0.41	0.45	0.59	OPEN SPACE	7.0%	0.49	0.05	0.12	0.39	0.34	0.39	0.55	**0.85**	**0.96**	**1.38**	53.6%
F8-6	3.50	RES 1/8 AC.	65.0%	2.30	0.41	0.45	0.59	OPEN SPACE	7.0%	1.20	0.05	0.12	0.39	0.29	0.34	0.52	**1.00**	**1.18**	**1.83**	45.1%
F8-7	4.90	RES 1/8 AC.	65.0%	4.75	0.41	0.45	0.59	OPEN SPACE	7.0%	0.15	0.05	0.12	0.39	0.40	0.44	0.58	**1.96**	**2.16**	**2.86**	63.2%
F8-8	1.30	RES 1/8 AC.	65.0%	0.50	0.41	0.45	0.59	OPEN SPACE	7.0%	0.80	0.05	0.12	0.39	0.19	0.25	0.47	**0.25**	**0.32**	**0.61**	29.3%
F8-9	1.60	RES 1/8 AC.	65.0%	0.80	0.41	0.45	0.59	OPEN SPACE	7.0%	0.80	0.05	0.12	0.39	0.23	0.29	0.49	**0.37**	**0.46**	**0.78**	36.0%
P1-A2	4.20	STREET	100.0%	3.50	0.89	0.90	0.96	OPEN SPACE	7.0%	0.70	0.05	0.12	0.39	0.75	0.77	0.87	**3.15**	**3.23**	**3.63**	84.5%
P1-A3	1.20	STREET	100.0%	1.03	0.89	0.90	0.96	OPEN SPACE	7.0%	0.17	0.05	0.12	0.39	0.77	0.79	0.88	**0.93**	**0.95**	**1.06**	86.8%
SR-1	1.20	STREET	100.0%	0.75	0.89	0.90	0.96	OPEN SPACE	7.0%	0.45	0.05	0.12	0.39	0.58	0.61	0.75	**0.69**	**0.73**	**0.90**	65.1%
SR-2	0.65	STREET	100.0%	0.48	0.89	0.90	0.96	OPEN SPACE	7.0%	0.17	0.05	0.12	0.39	0.67	0.70	0.81	**0.44**	**0.45**	**0.53**	75.7%
BG-1	4.20	STREET	100.0%	3.00	0.89	0.90	0.96	OPEN SPACE	7.0%	1.20	0.05	0.12	0.39	0.65	0.68	0.80	**2.73**	**2.84**	**3.35**	73.4%
BG-2	3.00	STREET	100.0%	2.25	0.89	0.90	0.96	OPEN SPACE	7.0%	0.75	0.05	0.12	0.39	0.68	0.71	0.82	**2.04**	**2.12**	**2.45**	76.8%
P1-INT	33.40	UNDEV.	2.0%	33.40	0.03	0.09	0.36			0.00	0.89	0.90	0.96	0.03	0.09	0.36	**1.00**	**3.01**	**12.02**	2.0%
P1-F1	60.60	RES 1/6 AC.	52.5%	60.60	0.32	0.38	0.55			0.00	0.89	0.90	0.96	0.32	0.38	0.55	**19.39**	**22.73**	**33.03**	52.5%
TOTAL AREA TRIBUTARY TO POND FSD-16	**211.5**	**49.1%**																		
Tributary Area to NWesterly Outfall	**136.1**	**49.1%**																		
Tributary Area to Easterly Outfall	**33.4**	**51.1%**																		
Tributary Area to SWesterly Outfall	**33.0**	**52.0%**																		
Basins tributary to Pond FSD-14A	**17.9**	**66.4%**																		
Basin tributary to future SWQ pond	**0.62**	**96.8%**																		

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Return Period	1-Hour Depth
2	1.19
5	1.50
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50	2.25
100	2.52

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

Table 6-7. Conveyance Coefficient, C_v

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

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

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

FINAL DRAINAGE REPORT ~ 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	1.15	1.35	1.96	0.12	100	2	14.1	600	1.5%	2.4	4.1	18.2	2.59	3.23	5.43	3	4	11
B	0.38	0.45	0.65	0.12	100	2	14.1	650	2.5%	3.2	3.4	17.5	2.63	3.29	5.52	1	1	4
C	1.28	1.53	2.36	0.12	100	2	14.1	650	2.5%	3.2	3.4	17.5	2.63	3.29	5.52	3	5	13
D	0.48	0.56	0.82	0.12	50	1	10.0	650	1.5%	2.4	4.4	14.4	2.86	3.58	6.02	1	2	5
E	0.51	0.60	0.87	0.12	100	2	14.1	360	2.0%	2.8	2.1	16.2	2.72	3.41	5.72	1	2	5
F	1.12	1.31	1.91	0.12	100	2	14.1	510	1.5%	2.4	3.5	17.5	2.63	3.29	5.52	3	4	11
G	0.35	0.41	0.60	0.12	50	1	10.0	510	1.5%	2.4	3.5	13.4	2.94	3.69	6.19	1	2	4
H	0.54	0.64	0.93	0.12	100	2	14.1	180	1.5%	2.4	1.2	15.3	2.79	3.49	5.86	2	2	5
I	0.07	0.08	0.12	0.12	50	1	10.0	10	1.5%	2.4	0.1	10.0	3.29	4.13	6.93	0.2	0.3	0.8
J	0.61	0.71	1.04	0.12	100	2	14.1	240	1.5%	2.4	1.6	15.7	2.76	3.45	5.79	2	2	6
K	0.23	0.27	0.40	0.12	50	1	10.0	240	1.5%	2.4	1.6	11.6	3.12	3.91	6.56	0.7	1.1	2.6
L	0.62	0.75	1.14	0.12	100	2	14.1	220	1.5%	2.4	1.5	15.6	2.77	3.46	5.82	2	3	7
M	0.16	0.19	0.30	0.12	50	1	10.0	200	1.5%	2.4	1.4	11.3	3.15	3.94	6.62	0.5	0.8	2.0
N	0.54	0.64	0.93	0.12	100	2	14.1	180	1.5%	2.4	1.2	15.3	2.79	3.49	5.86	2	2	5
O	0.16	0.18	0.27	0.12	50	1	10.0	180	1.5%	2.4	1.2	11.2	3.16	3.96	6.65	0.5	0.7	1.8

JOB NAME: ***STERLING RANCH EAST FILING NO. 6 - FINAL PLAT***
JOB NUMBER: ***1183.60***
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CALC'D BY: ***MAW***

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

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

Table 6-7. Conveyance Coefficient, C_v

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

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

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

FINAL DRAINAGE REPORT ~ 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)
P	0.13	0.15	0.22	0.12	50	1	10.0	120	3.0%	3.5	0.6	10.5	3.23	4.05	6.80	0.4	**0.6**	**1.5**
Q	0.54	0.64	0.93	0.12	100	2	14.1	340	3.0%	3.5	1.6	15.7	2.76	3.45	5.79	1	**2**	**5**
R	0.86	1.01	1.47	0.12	100	2	14.1	675	3.0%	3.5	3.2	17.3	2.64	3.30	5.55	2	**3**	**8**
S	0.51	0.60	0.87	0.12	100	2	14.1	675	3.0%	3.5	3.2	17.3	2.64	3.30	5.55	1	**2**	**5**
T	0.16	0.18	0.27	0.12	50	1	10.0	150	1.5%	2.4	1.0	11.0	3.18	3.99	6.70	0.5	**0.7**	**1.8**
U	0.45	0.55	0.88	0.12	80	3	10.2					10.2	3.27	4.09	6.87	1	**2**	**6**
V	0.58	0.75	1.30	0.12	100	2	14.1	390	2.0%	2.8	2.3	16.4	2.71	3.39	5.69	2	**3**	**7**
W	0.25	0.30	0.43	0.12	50	1	10.0	370	2.0%	2.8	2.2	12.1	3.06	3.84	6.45	0.8	**1.1**	**2.8**
X	0.64	0.75	1.09	0.12	100	2	14.1	350	1.5%	2.4	2.4	16.5	2.70	3.38	5.68	2	**3**	**6**
Y	0.90	1.09	1.66	0.12	100	2	14.1	600	4.0%	4.0	2.5	16.6	2.69	3.37	5.66	2	**4**	**9**
Z	0.05	0.07	0.14	0.12	90	3	11.3					11.3	3.15	3.95	6.63	0.2	**0.3**	**0.9**
AA	0.67	0.83	1.32	0.12	10	0.2	4.5	650	3.5%	3.7	2.9	7.3	3.66	4.59	7.71	2	**4**	**10**
BB	0.31	0.74	2.42	0.12	70	2	10.5					10.5	3.24	4.06	6.82	1	**3**	**16**
CC	1.12	1.49	2.73	0.12	100	2	14.1	300	2.0%	2.8	1.8	15.8	2.75	3.44	5.77	3	**5**	**16**

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

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

Table 6-7. Conveyance Coefficient, C_v

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

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

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

FINAL DRAINAGE REPORT ~ 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)
DD	1.30	1.55	2.34	0.12	100	2	14.1	350	2.0%	2.8	2.1	16.1	2.73	3.41	5.73	4	5	13
EE	0.57	0.64	0.89	0.12	90	2	12.9	300	1.5%	2.4	2.0	14.9	2.82	3.53	5.92	2	2	5
FF	0.53	0.54	0.58	0.12	10	0.2	4.5	650	3.5%	3.7	2.9	7.3	3.66	4.59	7.71	2	2	4
GG	1.14	1.25	1.61	0.12	80	5	8.6	900	3.5%	3.7	4.0	12.7	3.01	3.78	6.34	3	5	10
HH	1.21	1.28	1.51	0.12	80	3	10.2	900	3.5%	3.7	4.0	14.2	2.87	3.60	6.04	3	5	9
F4-1	2.52	3.06	4.68	0.12	100	2	14.1	670	2.5%	3.2	3.5	17.6	2.62	3.28	5.51	7	10	26
F4-2	0.62	0.75	1.14	0.12	100	2	14.1	350	2.5%	3.2	1.8	15.9	2.74	3.43	5.76	2	3	7
F4-3	0.90	1.09	1.66	0.12	100	2	14.1	450	2.5%	3.2	2.4	16.4	2.70	3.38	5.68	2	4	9
F4-4	1.89	2.52	4.62	0.12	100	2	14.1	730	2.5%	3.2	3.8	17.9	2.60	3.25	5.46	5	8	25
F4-5	0.54	0.64	0.93	0.12	50	1	10.0	770	2.5%	3.2	4.1	14.0	2.89	3.62	6.08	2	2	6
F4-6	0.98	1.19	1.82	0.12	50	1	10.0	850	1.5%	2.4	5.8	15.7	2.76	3.45	5.79	3	4	11
F4-7	2.21	2.59	3.76	0.12	100	2	14.1	870	2.0%	2.8	5.1	19.2	2.52	3.15	5.29	6	8	20
F4-8	0.35	0.41	0.60	0.12	50	1	10.0	200	1.5%	2.4	1.4	11.3	3.15	3.94	6.62	1	2	4
F4-9	1.57	1.84	2.67	0.12	50	1	10.0	1500	2.0%	2.8	8.8	18.8	2.54	3.18	5.34	4	6	14
F4-10	2.72	3.19	4.63	0.12	100	2	14.1	1070	2.5%	3.2	5.6	19.7	2.49	3.11	5.22	7	10	24

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JOB NUMBER: ***1183.60***
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Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

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

Table 6-7. Conveyance Coefficient, C_v

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Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

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

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

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (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)
F2-A	0.93	1.09	1.58	0.12	50	1	10.0	300	2.0%	2.8	1.8	11.7	3.11	3.89	6.53	3	**4**	**10**
F2-B	1.60	1.88	2.73	0.12	100	2	14.1	300	2.0%	2.8	1.8	15.8	2.75	3.44	5.77	4	**6**	**16**
F2-C	0.20	0.23	0.39	0.12	50	1	10.0					10.0	3.30	4.14	6.94	0.6	**1.0**	**3**
F8-1	1.00	1.19	1.77	0.12	90	2	12.9	560	1.5%	2.4	3.8	16.7	2.68	3.36	5.64	3	**4**	**10**
F8-2	0.25	0.31	0.50	0.12	100	3	12.3	60	1.5%	2.4	0.4	12.7	3.01	3.77	6.33	0.8	**1.2**	**3**
F8-3	1.14	1.27	1.72	0.12	50	1	10.0	650	1.5%	2.4	4.4	14.4	2.86	3.58	6.02	3	**5**	**10**
F8-4	1.96	2.17	2.90	0.12	100	2	14.1	800	1.5%	2.4	5.4	19.5	2.50	3.13	5.25	5	**7**	**15**
F8-5	0.85	0.96	1.38	0.12	50	1	10.0	650	2.3%	3.0	3.6	13.5	2.94	3.68	6.17	2	**4**	**8**
F8-6	1.00	1.18	1.83	0.12	100	2	14.1	325	1.5%	2.4	2.2	16.3	2.71	3.40	5.70	3	**4**	**10**
F8-7	1.96	2.16	2.86	0.12	100	2	14.1	500	1.5%	2.4	3.4	17.5	2.63	3.29	5.53	5	**7**	**16**
F8-8	0.25	0.32	0.61	0.12	120	7	10.8					10.8	3.20	4.01	6.73	0.8	**1.3**	**4**
F8-9	0.37	0.46	0.78	0.12	80	8	7.4					7.4	3.65	4.58	7.69	1	**2**	**6**

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

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

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
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Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

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

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

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY (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)
P1-A2	3.15	3.23	3.63	0.12	20	0.5	5.8	1500	1.0%	2.0	12.5	18.3	2.57	3.22	5.40	8.1	**10.4**	**19.6**
P1-A3	0.93	0.95	1.06	0.12	20	0.5	5.8	780	1.0%	2.0	6.5	12.3	3.04	3.81	6.40	2.8	**3.6**	**6.8**
SR-1	0.69	0.73	0.90	0.12	50	5	5.9	550	3.5%	3.7	2.4	8.3	3.52	4.41	7.40	2	**3**	**7**
SR-2	0.44	0.45	0.53	0.12	15	0.4	5.0	550	3.5%	1.9	4.9	9.9	3.31	4.15	6.97	1	**2**	**4**
BG-1	2.73	2.84	3.35	0.12	80	2	11.7	700	1.0%	2.0	5.8	17.5	2.63	3.29	5.52	7	**9**	**18**
BG-2	2.04	2.12	2.45	0.12	60	2	9.2	1150	1.0%	2.0	9.6	18.8	2.54	3.18	5.34	5	**7**	**13**
P1-INT	1.00	3.01	12.02	0.12	300	7.5	22.6	2300	3.5%	1.9	20.5	43.1	1.56	1.94	3.25	2	**6**	**39**
P1-F1	19.39	22.73	33.03	0.12	100	2	14.1	2000	1.5%	2.4	13.6	27.7	2.08	2.60	4.37	40	**59**	**144**

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*ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Ultimate)

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	A	1.35	1.96	18.2	3.23	5.43	4	11	Prop. 10' Type R At-grade Inlet
2	B, C, Flow-by from DP-1	2.01	3.66	18.4	3.22	5.40	6	20	Prop. 10' Type R Sump Inlet
3	D	0.56	0.82	14.4	3.58	6.02	2	5	Prop. 5' Type R Sump Inlet
4	E	0.60	0.87	16.2	3.41	5.72	2	5	Prop. 10' Type R At-grade Inlet
5	F	1.31	1.91	17.5	3.29	5.52	4	11	Prop. 5' Type R Sump Inlet
6	G	0.41	0.60	13.4	3.69	6.19	2	4	Prop. 5' Type R Sump Inlet
7	H	0.64	0.93	15.3	3.49	5.86	2	5	Prop. 5' Type R Sump Inlet
8	I	0.08	0.12	10.0	4.13	6.93	0.3	0.8	Prop. 5' Type R Sump Inlet
9	J	0.71	1.04	15.7	3.45	5.79	2	6	Prop. 5' Type R Sump Inlet
10	K	0.27	0.40	11.6	3.91	6.56	1.1	2.6	Prop. 5' Type R Sump Inlet
11	L	0.75	1.14	15.6	3.46	5.82	3	7	Prop. 5' Type R Sump Inlet
12	M	0.19	0.30	11.3	3.94	6.62	0.8	2.0	Prop. 5' Type R Sump Inlet
13	N	0.64	0.93	15.3	3.49	5.86	2	5	Prop. 5' Type R Sump Inlet
14	O	0.18	0.27	11.2	3.96	6.65	0.7	1.8	Prop. 5' Type R Sump Inlet

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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Ultimate)

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)	
15	P	0.15	0.22	10.5	4.05	6.80	0.6	1.5	Prop. 5' Type R Sump Inlet
16	Q	0.64	0.93	15.7	3.45	5.79	2	5	Prop. 5' Type R Sump Inlet
17	R, Flow-by from DP-4	1.01	1.53	17.3	3.30	5.55	3	9	Prop. 10' Type R At-grade Inlet
18	S	0.60	0.87	17.3	3.30	5.55	2	5	Prop. 5' Type R Sump Inlet
19	T	0.18	0.27	11.0	3.99	6.70	0.7	1.8	Prop. 5' Type R Sump Inlet
20	**POND FSD-16 INFLOW (EASTERLY FOREBAY)**	**12.28**	**17.69**	**20.8**	**3.03**	**5.09**	**37**	**90**	**Prop. Concrete Forebay**
21	V	0.75	1.30	16.4	3.39	5.69	3	7	Prop. 6' County Std. Crosspan
22	W, X, DP-21	1.79	2.82	16.5	3.38	5.68	6	16	Prop. 10' Type R Sump Inlet
23	Y	1.09	1.66	16.6	3.37	5.66	4	9	Prop. 5' Type R Sump Inlet
24	CC	1.49	2.73	15.8	3.44	5.77	5	16	Future Type R inlets at Sump Condition
25	EE	0.64	0.89	14.9	3.53	5.92	2	5	Prop. 5' Type R Sump Inlet
26	DD	1.55	2.34	16.1	3.41	5.73	5	13	Prop. 10' Type R Sump Inlet
27	F4-1	3.06	4.68	17.6	3.28	5.51	10	26	Future Type R inlets at Sump Condition

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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Ultimate)

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)	
28	F4-2	0.75	1.14	15.9	3.43	5.76	3	7	Future Type R inlet at Sump Condition
29	F4-3	1.09	1.66	16.4	3.38	5.68	4	9	Future At-grade Type R inlet
30	F4-4	2.52	4.62	17.9	3.25	5.46	8	25	Future Type R inlets at Sump Condition
31	F4-5	0.64	0.93	14.0	3.62	6.08	2	6	Future Type R inlets at Sump Condition
32	F4-6, Flow-by from DP-29	1.20	2.25	15.7	3.45	5.79	4	13	Future Type R inlets at Sump Condition
33	F4-7	2.59	3.76	19.2	3.15	5.29	8	20	Future Type R inlets at Sump Condition
34	F4-8	0.41	0.60	11.3	3.94	6.62	2	4	Future Type R inlets at Sump Condition
35	F4-9	1.84	2.67	18.8	3.18	5.34	6	14	Future Type R inlets at Sump Condition
36	F4-10	3.19	4.63	19.7	3.11	5.22	10	24	Future Type R inlets at Sump Condition
37	GG	1.25	1.61	12.7	3.78	6.34	5	10	Prop. 15' Type R At-Grade Inlet
38	HH	1.28	1.51	14.2	3.60	6.04	5	9	Prop. 15' Type R At-Grade Inlet
39	**POND FSD-16 INFLOW (NORTHWEST FOREBAY)**	**49.07**	**73.02**	**29.5**	**2.51**	**4.21**	**123**	**307**	**Prop. Impact Structure**

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/30/26*
CALCULATED BY: *MAW*

*ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Ultimate)

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)	
40	F8-1	1.31	1.97	16.7	3.36	5.64	4	11	Future Type R inlets at Sump Condition
41	F8-2	0.32	0.51	12.7	3.77	6.33	1.2	3	Future Type R inlet at Sump Condition
42	F8-3	1.33	1.89	14.4	3.58	6.02	5	11	Future At-grade Type R inlet
43	F8-4	2.02	2.71	19.5	3.13	5.25	6	14	Future At-grade Type R inlet
44	F8-7	2.02	2.68	17.5	3.29	5.53	7	15	Future Type R inlet at Sump Condition
45	F2-A	1.09	1.58	11.7	3.89	6.53	4	10	Prop. 10' Type R Sump Inlet
46	F2-B	1.88	2.73	15.8	3.44	5.77	6	16	Prop. 10' Type R Sump Inlet
47	F8-5	1.19	1.67	13.5	3.68	6.17	4	10	Prop. 15' Type R At-Grade Inlet
48	F8-6	1.05	1.52	16.3	3.40	5.70	4	9	Future Type R inlet at Sump Condition
49	SR-1, Flow-by from DP-37	0.73	1.02	8.3	4.41	7.40	3	8	Prop. 15' Type R At-Grade Inlet
50	SR-2, Z, Flow-by from DP-38	0.52	0.74	9.9	4.15	6.97	2.2	5.1	Prop. 15' Type R At-Grade Inlet
51	**POND FSD-16 INFLOW (SOUTHWEST FOREBAY)**	**13.38**	**18.53**	**23.2**	**2.87**	**4.81**	**38**	**89**	**Prop. Concrete Forebay**

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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Ultimate)

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)	
52	P1-A2, F2-C, F8-8, Flow-by from DP-47	3.79	4.76	18.3	3.22	5.40	12.2	25.7	Exist. 15' Type R At-grade Inlet
53	P1-A3, F8-9, Flow-by from DP-52	1.97	3.74	12.3	3.81	6.40	7.5	24.0	Exist. 15' Type R At-grade Inlet
54	BG-1, U, Flow-by from DP-17, 49 and 53	3.42	5.91	17.5	3.29	5.52	11.2	32.6	Exist. 20' Type R Sump Inlet
55	BG-2	2.12	2.45	18.8	3.18	5.34	7	13	Exist. 15' Type R Sump Inlet
	POND FSD-16 TOTALINFLOW (Incl. Basins AA and BB)	**76.30**	**112.97**	**29.9**	**2.49**	**4.17**	**190**	**472**	

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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Interim)

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	A	1.35	1.96	18.2	3.23	5.43	4	11	Prop. 10' Type R At-grade Inlet
2	B, C, Flow-by from DP-1	2.01	3.66	18.4	3.22	5.40	6	20	Prop. 10' Type R Sump Inlet
3	D	0.56	0.82	14.4	3.58	6.02	2	5	Prop. 5' Type R Sump Inlet
4	E	0.60	0.87	16.2	3.41	5.72	2	5	Prop. 10' Type R At-grade Inlet
5	F	1.31	1.91	17.5	3.29	5.52	4	11	Prop. 5' Type R Sump Inlet
6	G	0.41	0.60	13.4	3.69	6.19	2	4	Prop. 5' Type R Sump Inlet
7	H	0.64	0.93	15.3	3.49	5.86	2	5	Prop. 5' Type R Sump Inlet
8	I	0.08	0.12	10.0	4.13	6.93	0.3	0.8	Prop. 5' Type R Sump Inlet
9	J	0.71	1.04	15.7	3.45	5.79	2	6	Prop. 5' Type R Sump Inlet
10	K	0.27	0.40	11.6	3.91	6.56	1.1	2.6	Prop. 5' Type R Sump Inlet
11	L	0.75	1.14	15.6	3.46	5.82	3	7	Prop. 5' Type R Sump Inlet
12	M	0.19	0.30	11.3	3.94	6.62	0.8	2.0	Prop. 5' Type R Sump Inlet
13	N	0.64	0.93	15.3	3.49	5.86	2	5	Prop. 5' Type R Sump Inlet
14	O	0.18	0.27	11.2	3.96	6.65	0.7	1.8	Prop. 5' Type R Sump Inlet

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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Interim)

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)	
15	P	0.15	0.22	10.5	4.05	6.80	0.6	1.5	Prop. 5' Type R Sump Inlet
16	Q	0.64	0.93	15.7	3.45	5.79	2	5	Prop. 5' Type R Sump Inlet
17	R, Flow-by from DP-4	1.01	1.53	17.3	3.30	5.55	3	9	Prop. 10' Type R At-grade Inlet
18	S	0.60	0.87	17.3	3.30	5.55	2	5	Prop. 5' Type R Sump Inlet
19	T	0.18	0.27	11.0	3.99	6.70	0.7	1.8	Prop. 5' Type R Sump Inlet
20	**POND FSD-16 INFLOW (EASTERLY FOREBAY)**	**12.28**	**17.69**	**20.8**	**3.03**	**5.09**	**37**	**90**	**Prop. Concrete Forebay**
21	V	0.75	1.30	16.4	3.39	5.69	3	7	Prop. 6' County Std. Crosspan
22	W, X, DP-21	1.79	2.82	16.5	3.38	5.68	6	16	Prop. 10' Type R Sump Inlet
23	Y	1.09	1.66	16.6	3.37	5.66	4	9	Prop. 5' Type R Sump Inlet
24	NO DESIGN POINT IN INTERIM CONDITION								
25	EE	0.64	0.89	14.9	3.53	5.92	2	5	Prop. 5' Type R Sump Inlet
26	DEVELOPED PORTION OF BASIN DD	0.15	0.27	16.1	3.41	5.73	1	2	Prop. 10' Type R Sump Inlet
TSB	DEV. PORTIONS OF BASINS CC & DD AND BASIN P-INT	3.55	12.93	43.1	1.94	3.25	7	42	Prop. 42" RCP Storm Stub at PR-36
27	F4-1	3.06	4.68	17.6	3.28	5.51	10	26	Future Type R inlets at Sump Condition

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Interim)

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)	
28	F4-2	0.75	1.14	15.9	3.43	5.76	3	7	Future Type R inlet at Sump Condition
29	F4-3	1.09	1.66	16.4	3.38	5.68	4	9	Future At-grade Type R inlet
30	F4-4	2.52	4.62	17.9	3.25	5.46	8	25	Future Type R inlets at Sump Condition
31	F4-5	0.64	0.93	14.0	3.62	6.08	2	6	Future Type R inlets at Sump Condition
32	F4-6, Flow-by from DP-29	1.20	2.25	15.7	3.45	5.79	4	13	Future Type R inlets at Sump Condition
33	F4-7	2.59	3.76	19.2	3.15	5.29	8	20	Future Type R inlets at Sump Condition
34	F4-8	0.41	0.60	11.3	3.94	6.62	2	4	Future Type R inlets at Sump Condition
35	F4-9	1.84	2.67	18.8	3.18	5.34	6	14	Future Type R inlets at Sump Condition
36	F4-10	3.19	4.63	19.7	3.11	5.22	10	24	Future Type R inlets at Sump Condition
37	GG	1.25	1.61	12.7	3.78	6.34	5	10	Prop. 15' Type R At-Grade Inlet
38	HH	1.28	1.51	14.2	3.60	6.04	5	9	Prop. 15' Type R At-Grade Inlet
39	**POND FSD-16 INFLOW (NORTHWEST FOREBAY)**	**27.02**	**48.00**	**44.7**	**1.88**	**3.16**	**51**	**152**	**Prop. Impact Structure**

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Interim)

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)	
40	F8-1	1.31	1.97	16.7	3.36	5.64	4	11	Future Type R inlets at Sump Condition
41	F8-2	0.32	0.51	12.7	3.77	6.33	1.2	3	Future Type R inlet at Sump Condition
42	F8-3	1.33	1.89	14.4	3.58	6.02	5	11	Future At-grade Type R inlet
43	F8-4	2.02	2.71	19.5	3.13	5.25	6	14	Future At-grade Type R inlet
44	F8-7	2.02	2.68	17.5	3.29	5.53	7	15	Future Type R inlet at Sump Condition
45	F2-A	1.09	1.58	11.7	3.89	6.53	4	10	Prop. 10' Type R Sump Inlet
46	F2-B	1.88	2.73	15.8	3.44	5.77	6	16	Prop. 10' Type R Sump Inlet
47	F8-5	1.19	1.67	13.5	3.68	6.17	4	10	Prop. 15' Type R At-Grade Inlet
48	F8-6	1.05	1.52	16.3	3.40	5.70	4	9	Future Type R inlet at Sump Condition
49	SR-1, Flow-by from DP-37	0.73	1.02	8.3	4.41	7.40	3	8	Prop. 15' Type R At-Grade Inlet
50	SR-2, Z, Flow-by from DP-38	0.52	0.74	9.9	4.15	6.97	2.2	5.1	Prop. 15' Type R At-Grade Inlet
51	**POND FSD-16 INFLOW (SOUTHWEST FOREBAY)**	**13.38**	**18.53**	**23.2**	**2.87**	**4.81**	**38**	**89**	**Prop. Concrete Forebay**

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
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FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY (Developed - Interim)

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)	
52	P1-A2, F2-C, F8-8, Flow-by from DP-47	3.79	4.76	18.3	3.22	5.40	12.2	25.7	Exist. 15' Type R At-grade Inlet
53	P1-A3, F8-9, Flow-by from DP-52	1.97	3.74	12.3	3.81	6.40	7.5	24.0	Exist. 15' Type R At-grade Inlet
54	BG-1, U, Flow-by from DP-17, 49 and 53	3.42	5.91	17.5	3.29	5.52	11.2	32.6	Exist. 20' Type R Sump Inlet
55	BG-2	2.12	2.45	18.8	3.18	5.34	7	13	Exist. 15' Type R Sump Inlet
	POND FSD-16 TOTALINFLOW (Incl. Basins AA and BB)	**54.24**	**87.96**	**45.1**	**1.87**	**3.13**	**101**	**276**	

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* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - ULTIMATE)

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 Capture	1.32	1.31	18.7	3.19	5.36	4	7	PROP. 18" RCP
2	DP-2	2.01	3.66	18.4	3.22	5.40	6	20	PROP. 24" RCP
3	DP-3	0.56	0.82	14.4	3.58	6.02	2	5	PROP. 18" RCP
4	PR-1, PR-2, PR-3	3.90	5.79	19.0	3.17	5.32	12	31	PROP. 30" RCP
5	DP-4 Capture	0.60	0.81	16.2	3.41	5.72	2	5	PROP. 18" RCP
6	PR-4, PR-5	4.50	6.60	19.1	3.16	5.31	14	35	PROP. 30" RCP
7	DP-5	1.31	1.91	17.5	3.29	5.52	4	11	PROP. 24" RCP
8	DP-6	0.41	0.60	13.4	3.69	6.19	2	4	PROP. 18" RCP
9	PR-7, PR-8	1.73	2.51	17.7	3.27	5.49	6	14	PROP. 24" RCP
10	PR-6, PR-9	6.22	9.11	19.5	3.13	5.25	19	48	PROP. 36" RCP
11	DP-7	0.64	0.93	15.3	3.49	5.86	2	5	PROP. 18" RCP
12	DP-8	0.08	0.12	10.0	4.13	6.93	0.3	0.8	PROP. 18" RCP
13	PR-10, PR-11, PR-12	6.94	10.16	19.7	3.12	5.23	22	53	PROP. 36" RCP

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FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - ULTIMATE)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
14	DP-9	0.71	1.04	15.7	3.45	5.79	2	6	PROP. 18" RCP
15	DP-10	0.27	0.40	11.6	3.91	6.56	1.1	2.6	PROP. 18" RCP
16	PR-14, PR-15	0.99	1.43	15.7	3.45	5.79	3	8	PROP. 24" RCP
17	PR-13, PR-16	7.93	11.59	20.2	3.08	5.17	24	60	PROP. 36" RCP
18	DP-11	0.75	1.14	15.6	3.46	5.82	3	7	PROP. 18" RCP
19	DP-12	0.19	0.30	11.3	3.94	6.62	0.8	2.0	PROP. 18" RCP
20	PR-18, PR-19	0.94	1.44	16.1	3.42	5.74	3	8	PROP. 24" RCP
21	DP-13	0.64	0.93	15.3	3.49	5.86	2	5	PROP. 18" RCP
22	DP-14	0.18	0.27	11.2	3.96	6.65	0.7	1.8	PROP. 18" RCP
23	PR-20, PR-21, PR-22	1.76	2.63	16.2	3.41	5.72	6	15	PROP. 30" RCP
24	PR-17, PR-23	9.69	14.22	20.4	3.06	5.14	30	73	PROP. 42" RCP
25	DP-15	0.15	0.22	10.5	4.05	6.80	0.6	1.5	PROP. 18" RCP
26	DP-16	0.64	0.93	15.7	3.45	5.79	2	5	PROP. 18" RCP

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FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - ULTIMATE)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
27	PR-24, PR-25, PR-6	10.48	15.37	20.6	3.05	5.12	32	79	PROP. 42" RCP
28	DP-17 Capture	1.01	1.18	17.3	3.30	5.55	3	7	PROP. 18" RCP
29	DP-18	0.60	0.87	17.3	3.30	5.55	2	5	PROP. 18" RCP
30	DP-19	0.18	0.27	11.0	3.99	6.70	0.7	1.8	PROP. 18" RCP
31	PR-28, PR-29, PR-30	1.80	2.32	17.4	3.30	5.53	6	13	PROP. 24" RCP
32	**TOTAL INFLOW POND FSD - 16 (EASTERLY FOREBAY)**	**12.28**	**17.69**	**20.8**	**3.03**	**5.09**	**37**	**90**	**PROP. 48" RCP**
33	DP-22	1.79	2.82	16.5	3.38	5.68	6	16	PROP. 24" RCP
34	DP-23, PR-33	2.88	4.49	16.7	3.36	5.65	10	25	PROP. 30" RCP
35	P1-F1 (50%)	11.36	16.51	27.7	2.60	4.37	30	72	PROP. 42" RCP STUB
36	DP-24, P1-F1 (50%)	12.85	19.24	27.7	2.60	4.37	33	84	PROP. 42" RCP STUB
37	PR-35, PR-36	24.21	35.76	27.9	2.59	4.35	63	155	PROP. 48" RCP
38	DP-25	0.64	0.89	14.9	3.53	5.92	2	5	PROP. 18" RCP
39	DP-26, PR-38	2.18	3.22	16.1	3.41	5.73	7	18	PROP. 24" RCP

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FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - ULTIMATE)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
40	PR-37, PR-39	26.40	38.98	28.6	2.55	4.29	67	167	PROP. 48" RCP
41	DP-27, DP-28, DP-29 Capture, DP-30, DP-31	8.04	12.60	20.4	3.06	5.13	25	65	PROP. 42" RCP
42	PR-40, PR-41	34.44	51.58	29.2	2.52	4.23	87	218	PROP. 54" RCP
43	DP-32, DP-33, DP-34, DP-35, DP-36	9.23	13.92	20.2	3.07	5.16	28	72	PROP. 42" RCP
44	PR-42, PR-43	43.66	65.49	29.2	2.52	4.23	110	277	PROP. 60" RCP
45	DP-38 Capture	1.28	1.51	14.2	3.60	6.04	5	9	PROP. 18" RCP
46	DP-37 Capture, PR-45	2.53	3.04	14.2	3.60	6.04	9	18	PROP. 24" RCP
47	PR-44, PR-46	46.19	68.53	29.3	2.52	4.22	116	290	PROP. 60" RCP
48	**PR-34, PR-47 TOTAL INFLOW POND FSD-16 (NW OUTFALL)**	**49.07**	**73.02**	**29.5**	**2.51**	**4.21**	**123**	**307**	**PROP. 66" RCP**
49	**DP-40 THRU DP-50 TOTAL INFLOW POND FSD-16 (SW OUTFALL)**	**13.38**	**18.53**	**23.2**	**2.87**	**4.81**	**38**	**89**	**PROP. 48" RCP**

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/30/26*
CALCULATED BY: *MAW*

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - INTERIM)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
1	DP-1 Capture	1.32	1.31	18.7	3.19	5.36	4	7	PROP. 18" RCP
2	DP-2	2.01	3.66	18.4	3.22	5.40	6	20	PROP. 24" RCP
3	DP-3	0.56	0.82	14.4	3.58	6.02	2	5	PROP. 18" RCP
4	PR-1, PR-2, PR-3	3.90	5.79	19.0	3.17	5.32	12	31	PROP. 30" RCP
5	DP-4 Capture	0.60	0.81	16.2	3.41	5.72	2	5	PROP. 18" RCP
6	PR-4, PR-5	4.50	6.60	19.1	3.16	5.31	14	35	PROP. 30" RCP
7	DP-5	1.31	1.91	17.5	3.29	5.52	4	11	PROP. 24" RCP
8	DP-6	0.41	0.60	13.4	3.69	6.19	2	4	PROP. 18" RCP
9	PR-7, PR-8	1.73	2.51	17.7	3.27	5.49	6	14	PROP. 24" RCP
10	PR-6, PR-9	6.22	9.11	19.5	3.13	5.25	19	48	PROP. 36" RCP
11	DP-7	0.64	0.93	15.3	3.49	5.86	2	5	PROP. 18" RCP
12	DP-8	0.08	0.12	10.0	4.13	6.93	0.3	0.8	PROP. 18" RCP
13	PR-10, PR-11, PR-12	6.94	10.16	19.7	3.12	5.23	22	53	PROP. 36" RCP

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/30/26*
CALCULATED BY: *MAW*

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REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - INTERIM)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
14	DP-9	0.71	1.04	15.7	3.45	5.79	2	6	PROP. 18" RCP
15	DP-10	0.27	0.40	11.6	3.91	6.56	1.1	2.6	PROP. 18" RCP
16	PR-14, PR-15	0.99	1.43	15.7	3.45	5.79	3	8	PROP. 24" RCP
17	PR-13, PR-16	7.93	11.59	20.2	3.08	5.17	24	60	PROP. 36" RCP
18	DP-11	0.75	1.14	15.6	3.46	5.82	3	7	PROP. 18" RCP
19	DP-12	0.19	0.30	11.3	3.94	6.62	0.8	2.0	PROP. 18" RCP
20	PR-18, PR-19	0.94	1.44	16.1	3.42	5.74	3	8	PROP. 24" RCP
21	DP-13	0.64	0.93	15.3	3.49	5.86	2	5	PROP. 18" RCP
22	DP-14	0.18	0.27	11.2	3.96	6.65	0.7	1.8	PROP. 18" RCP
23	PR-20, PR-21, PR-22	1.76	2.63	16.2	3.41	5.72	6	15	PROP. 30" RCP
24	PR-17, PR-23	9.69	14.22	20.4	3.06	5.14	30	73	PROP. 42" RCP
25	DP-15	0.15	0.22	10.5	4.05	6.80	0.6	1.5	PROP. 18" RCP
26	DP-16	0.64	0.93	15.7	3.45	5.79	2	5	PROP. 18" RCP

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/30/26*
CALCULATED BY: *MAW*

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - INTERIM)

Pipe Run	Contributing Basin / Design Point / Pipe Run	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		
					I(5)	I(100)	Q(5)	Q(100)	Pipe Size*
27	PR-24, PR-25, PR-6	10.48	15.37	20.6	3.05	5.12	32	79	PROP. 42" RCP
28	DP-17 Capture	1.01	1.18	17.3	3.30	5.55	3	7	PROP. 18" RCP
29	DP-18	0.60	0.87	17.3	3.30	5.55	2	5	PROP. 18" RCP
30	DP-19	0.18	0.27	11.0	3.99	6.70	0.7	1.8	PROP. 18" RCP
31	PR-28, PR-29, PR-30	1.80	2.32	17.4	3.30	5.53	6	13	PROP. 24" RCP
32	**TOTAL INFLOW POND FSD - 16 (EASTERLY FOREBAY)**	**12.28**	**17.69**	**20.8**	**3.03**	**5.09**	**37**	**90**	**PROP. 48" RCP**
33	DP-22	1.79	2.82	16.5	3.38	5.68	6	16	PROP. 24" RCP
34	DP-23, PR-33	2.88	4.49	16.7	3.36	5.65	10	25	PROP. 30" RCP
35	NO FLOWS IN INTERIM CONDITION								
36	DEV. PORTIONS OF BASINS CC & DD AND BASIN P-INT FROM OUTFALL OF TSB	3.55	12.93	43.1	1.94	3.25	7	42	PROP. 42" RCP STUB
37	PR-35, PR-36	3.55	12.93	43.1	1.94	3.25	7	42	PROP. 48" RCP
38	DP-25	0.64	0.89	14.9	3.53	5.92	2	5	PROP. 18" RCP

JOB NAME: *STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER: *1183.60*
DATE: *07/30/26*
CALCULATED BY: *MAW*

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM SLOPE.
REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.
ALL STORM FACILITIES WITHIN PUBLIC ROW TO BE OWNED/MAINTAINED BY EL PASO COUNTY

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY (DEVELOPED - INTERIM)

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)	
39	DP-26, PR-38	0.78	1.16	16.1	3.41	5.73	3	7	PROP. 24" RCP
40	PR-37, PR-39	4.34	14.09	43.8	1.91	3.21	8	45	PROP. 48" RCP
41	DP-27, DP-28, DP-29 Capture, DP-30, DP-31	8.04	12.60	20.4	3.06	5.13	25	65	PROP. 42" RCP
42	PR-40, PR-41	12.38	26.69	44.4	1.89	3.17	23	85	PROP. 54" RCP
43	DP-32, DP-33, DP-34, DP-35, DP 36	9.23	13.92	20.2	3.07	5.16	28	72	PROP. 42" RCP
44	PR-42, PR-43	21.60	40.60	44.4	1.89	3.17	41	129	PROP. 60" RCP
45	DP-38 Capture	1.28	1.43	12.7	3.78	6.34	5	9	PROP. 18" RCP
46	DP-37 Capture, PR-45	2.53	2.91	14.2	3.60	6.04	9	18	PROP. 24" RCP
47	PR-44, PR-46	24.13	43.51	44.5	1.89	3.17	46	138	PROP. 60" RCP
48	**PR-34, PR-47 TOTAL INFLOW POND FSD-16 (NW OUTFALL)**	**27.02**	**48.00**	**44.7**	**1.88**	**3.16**	**51**	**152**	**PROP. 66" RCP**
49	**DP-40 THRU DP-50 TOTAL INFLOW POND FSD-16 (SW OUTFALL)**	**13.38**	**18.53**	**23.2**	**2.87**	**4.81**	**38**	**89**	**PROP. 48" RCP**

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-1	DP-2	DP-3	DP-4
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	In Sump	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	4.00	6.00	2.00	2.00
Major Peak Flow, Q (cfs)	11.00	16.00	5.00	5.00

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	DP-1	No Bypass Flow Received	No Bypass Flow Received
Bypass Flow Description (Optional):				
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.07	0.00	0.00
Major Bypass Flow Received, Q_b (cfs)	0.00	3.64	0.00	0.00

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	4.00	6.07	2.00	2.00
Major Total Design Peak Flow, Q (cfs)	11.00	19.64	5.00	5.00
Minor Inlet Interception Capacity, Q_a (cfs)	3.93	8.28	5.38	2.00
Major Inlet Interception Capacity, Q_a (cfs)	7.36	25.53	12.26	4.66
Minor Flow Bypassed Downstream, Qb (cfs)	0.07	N/A	N/A	0.00
Major Flow Bypassed Downstream, Qb (cfs)	3.64	N/A	N/A	0.34
Minor Flow Capture Percentage, C%	98%	100%	100%	100%
Major Flow Capture Percentage, C%	67%	100%	100%	93%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-5	DP-6	DP-7	DP-8	DP-9
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	4.00	2.00	2.00	0.30	2.00
Major Peak Flow, Q (cfs)	11.00	4.00	5.00	0.80	6.00

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	4.00	2.00	2.00	0.30	2.00
Major Total Design Peak Flow, Q (cfs)	11.00	4.00	5.00	0.80	6.00
Minor Inlet Interception Capacity, Q_a (cfs)	5.38	5.38	5.38	5.38	5.38
Major Inlet Interception Capacity, Q_a (cfs)	12.26	12.26	12.26	12.26	12.26
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Minor Flow Capture Percentage, C%	100%	100%	100%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	100%	100%	100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-10	DP-11	DP-12	DP-13	DP-14
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	1.10	3.00	0.80	2.00	0.70
Major Peak Flow, Q (cfs)	2.60	7.00	2.00	5.00	1.80

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received	No Bypass Flow Received
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	1.10	3.00	0.80	2.00	0.70
Major Total Design Peak Flow, Q (cfs)	2.60	7.00	2.00	5.00	1.80
Minor Inlet Interception Capacity, Q_a (cfs)	5.38	5.38	5.38	5.38	5.38
Major Inlet Interception Capacity, Q_a (cfs)	12.26	12.26	12.26	12.26	12.26
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Minor Flow Capture Percentage, C%	100%	100%	100%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	100%	100%	100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-15	DP-16	DP-17	DP-18	DP-19
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	On Grade	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	0.60	2.00	3.00	2.00	0.70
Major Peak Flow, Q (cfs)	1.50	5.00	8.00	5.00	1.80

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received	DP-4	No Bypass Flow Received	No Bypass Flow Received
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.00	0.00	0.00
Major Bypass Flow Received, Q_b (cfs)	0.00	0.00	0.34	0.00	0.00

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	0.60	2.00	3.00	2.00	0.70
Major Total Design Peak Flow, Q (cfs)	1.50	5.00	8.34	5.00	1.80
Minor Inlet Interception Capacity, Q_a (cfs)	5.38	5.38	3.00	5.38	5.38
Major Inlet Interception Capacity, Q_a (cfs)	12.26	12.26	6.38	12.26	12.26
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	0.00	N/A	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	1.96	N/A	N/A
Minor Flow Capture Percentage, C%	100%	100%	100%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	77%	100%	100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-22	DP-23	DP-29	DP-37	DP-38
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	6.00	4.00	4.00	5.00	5.00
Major Peak Flow, Q (cfs)	16.00	9.00	9.00	10.00	9.00

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:					
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)					
Major Bypass Flow Received, Q_b (cfs)					

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	6.00	4.00	4.00	5.00	5.00
Major Total Design Peak Flow, Q (cfs)	16.00	9.00	9.00	10.00	9.00
Minor Inlet Interception Capacity, Q_a (cfs)	8.28	5.38	3.94	5.00	5.00
Major Inlet Interception Capacity, Q_a (cfs)	25.53	12.26	6.68	9.23	8.56
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	0.06	0.00	0.00
Major Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	2.32	0.77	0.44
Minor Flow Capture Percentage, C%	100%	100%	99%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	74%	92%	95%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-47	DP-49	DP-50	DP-52	DP-53
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	On Grade	On Grade	On Grade	On Grade	On Grade
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	4.00	3.00	2.20	12.20	5.40
Major Peak Flow, Q (cfs)	10.00	7.00	4.60	25.00	11.80

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		DP-37	DP-38	DP-47	DP-52
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)		0.00	0.00	0.00	1.83
Major Bypass Flow Received, Q_b (cfs)		0.77	0.44	0.80	10.43

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	4.00	3.00	2.20	12.20	7.23
Major Total Design Peak Flow, Q (cfs)	10.00	7.77	5.04	25.80	22.23
Minor Inlet Interception Capacity, Q_a (cfs)	4.00	3.00	2.20	10.37	7.15
Major Inlet Interception Capacity, Q_a (cfs)	9.20	7.64	5.04	15.37	14.34
Minor Flow Bypassed Downstream, Qb (cfs)	0.00	0.00	0.00	1.83	0.08
Major Flow Bypassed Downstream, Qb (cfs)	0.80	0.13	0.00	10.43	7.89
Minor Flow Capture Percentage, C%	100%	100%	100%	85%	99%
Major Flow Capture Percentage, C%	92%	98%	100%	60%	65%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-54	DP-55	DP-25	DP-26	DP-45
Inlet Application (Street or Area)	STREET	STREET	STREET	STREET	STREET
Hydraulic Condition	In Sump	In Sump	In Sump	In Sump	In Sump
Inlet Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening	CDOT Type R Curb Opening
Number of Inlet Units	1	1	1	1	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	11.20	7.00	2.00	5.00	4.00
Major Peak Flow, Q (cfs)	23.30	13.00	5.00	13.00	10.00

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	User-Defined				
Bypass Flow Description (Optional):					
Minor Bypass Flow Received, Q_b (cfs)	0.02				
Major Bypass Flow Received, Q_b (cfs)	9.19				

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	11.22	7.00	2.00	5.00	4.00
Major Total Design Peak Flow, Q (cfs)	32.49	13.00	5.00	13.00	10.00
Minor Inlet Interception Capacity, Q_a (cfs)	12.48	9.73	5.38	8.28	8.28
Major Inlet Interception Capacity, Q_a (cfs)	52.66	39.07	12.26	25.53	25.53
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A	N/A	N/A	N/A	N/A
Minor Flow Capture Percentage, C%	100%	100%	100%	100%	100%
Major Flow Capture Percentage, C%	100%	100%	100%	100%	100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT
Minor: 5-year
Major: 100-year

Worksheet Protected

INLET NAME	DP-46
Inlet Application (Street or Area)	STREET
Hydraulic Condition	In Sump
Inlet Type	CDOT Type R Curb Opening
Number of Inlet Units	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	6.00
Major Peak Flow, Q (cfs)	16.00

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	
Bypass Flow Description (Optional):	
Minor Bypass Flow Received, Q_b (cfs)	
Major Bypass Flow Received, Q_b (cfs)	

CALCULATED OUTPUT

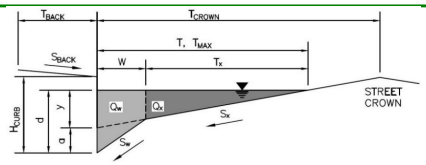
Minor Total Design Peak Flow, Q (cfs)	6.00
Major Total Design Peak Flow, Q (cfs)	16.00
Minor Inlet Interception Capacity, Q_a (cfs)	8.28
Major Inlet Interception Capacity, Q_a (cfs)	25.53
Minor Flow Bypassed Downstream, Qb (cfs)	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A
Minor Flow Capture Percentage, C%	100%
Major Flow Capture Percentage, C%	100%

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-1**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.015	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

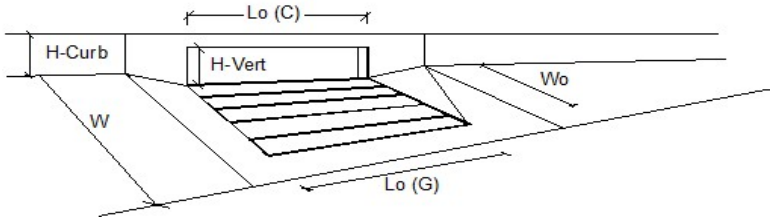
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**13.3**	**13.3**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.00 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 11.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

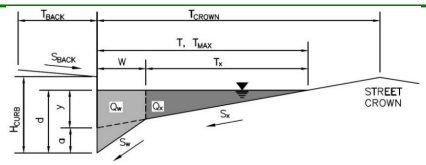
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**3.9**	**7.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**3.6**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**98**	**67**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-2**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

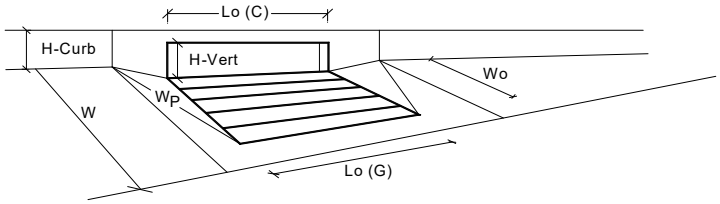
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



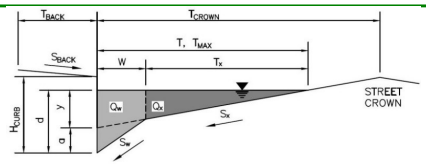
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.1	19.6	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-3**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

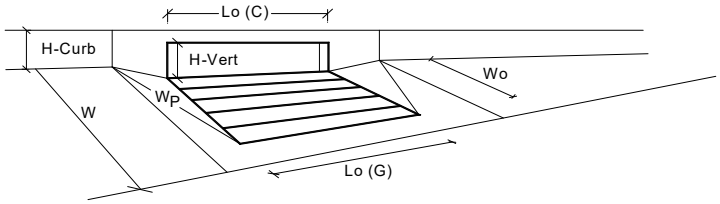
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



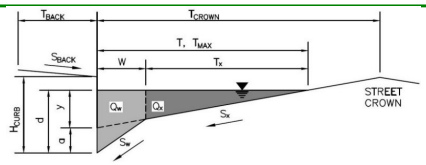
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-4**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.020	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} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

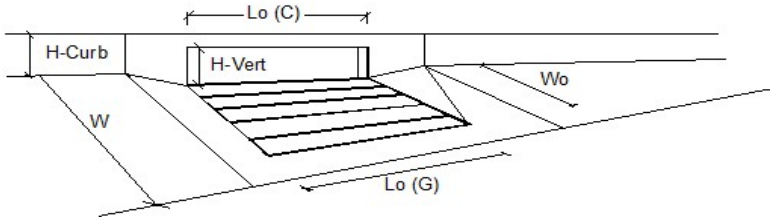
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**15.4**	**15.4**	**cfs**

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 5.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

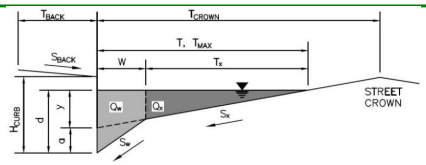
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**2.0**	**4.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.3**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**93**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-5**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

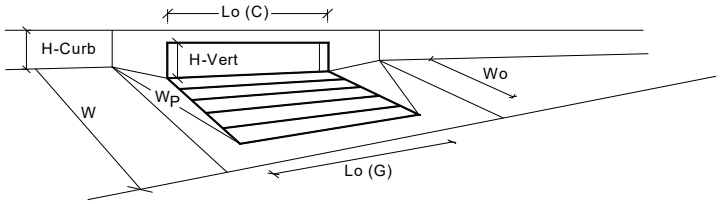
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



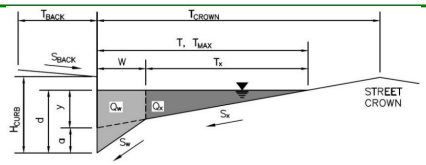
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.0	11.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-6**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

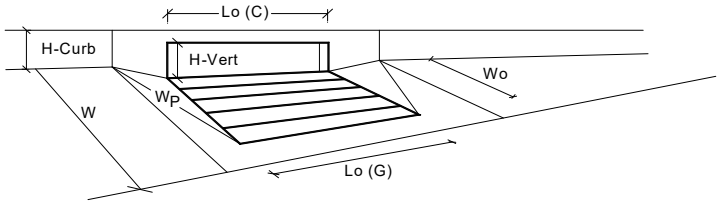
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



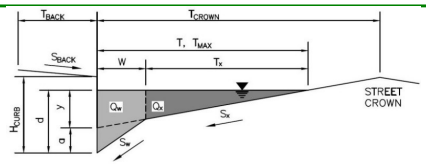
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	4.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-7**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

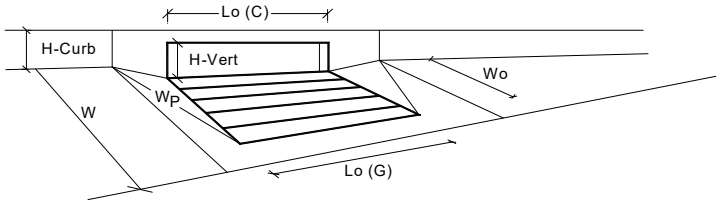
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



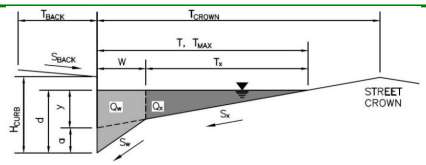
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-8**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

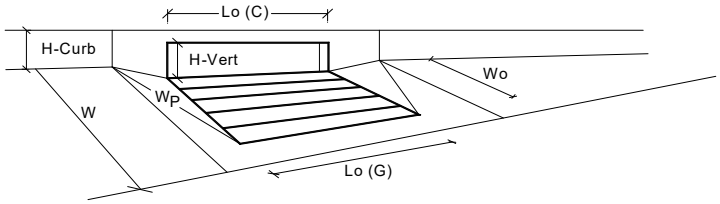
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



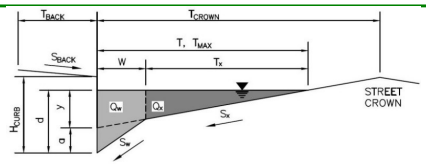
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.3	0.8	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-9**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

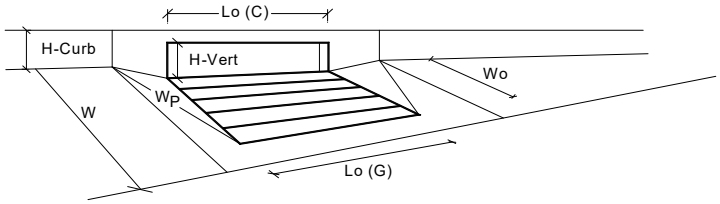
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



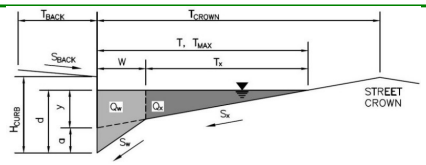
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	6.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-10**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

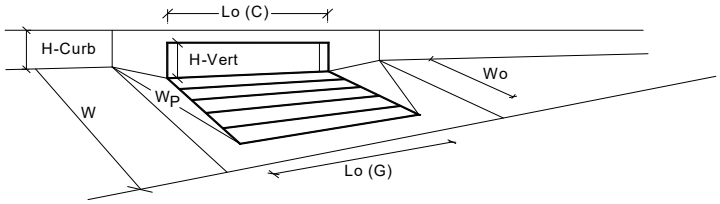
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



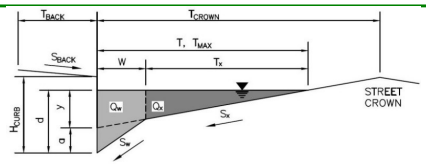
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	1.1	2.6	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-11**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

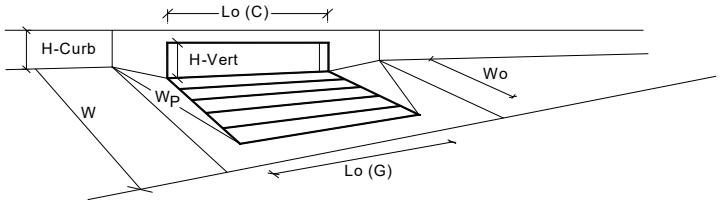
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



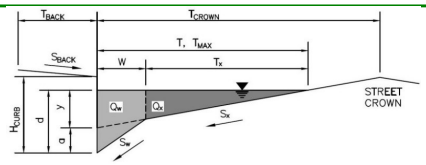
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	3.0	7.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-12**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

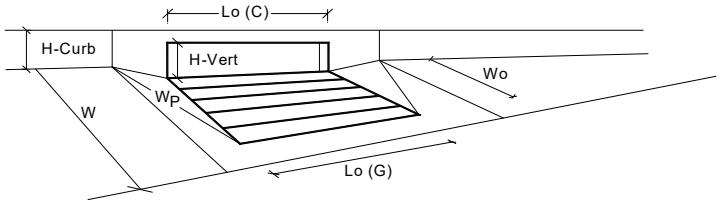
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



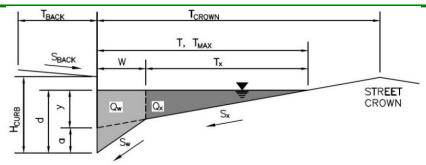
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.8	2.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-13**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

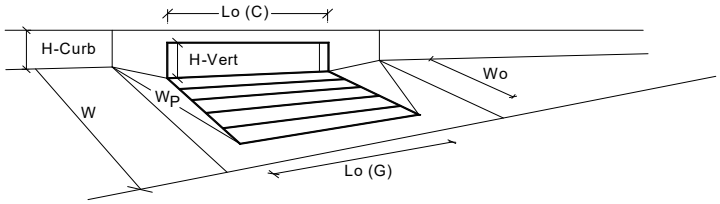
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



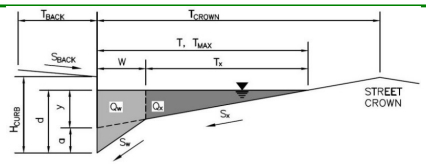
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

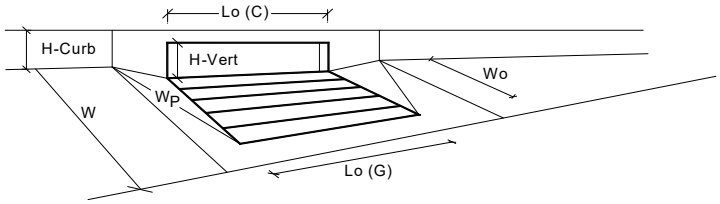
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



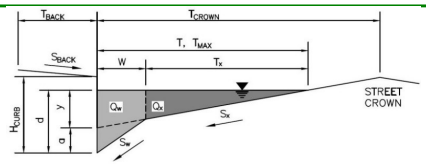
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.7	1.8	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-15**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

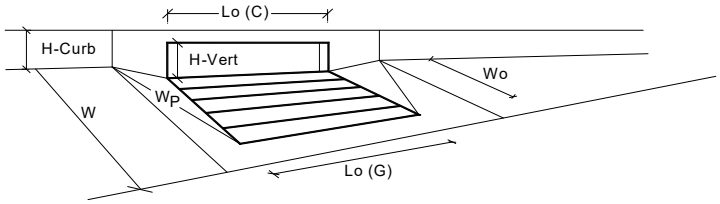
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



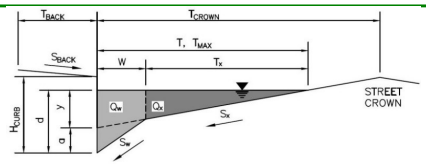
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.6	1.5	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-16**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

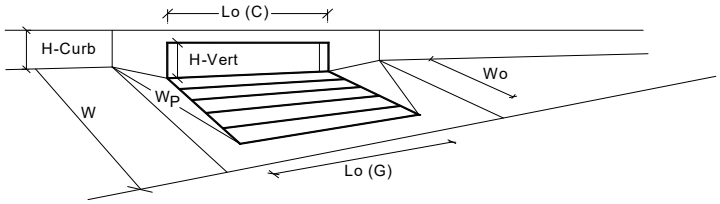
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



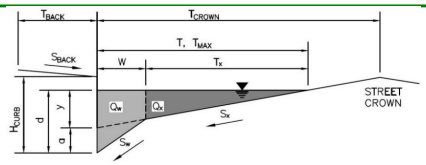
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-17**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.018	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} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

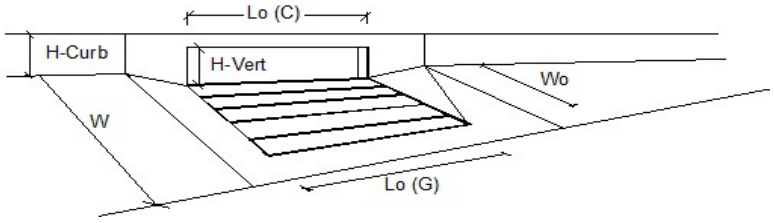
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**14.6**	**14.6**	**cfs**

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 8.34 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

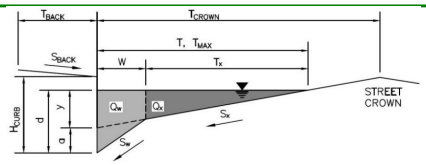
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**3.0**	**6.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**2.0**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**77**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

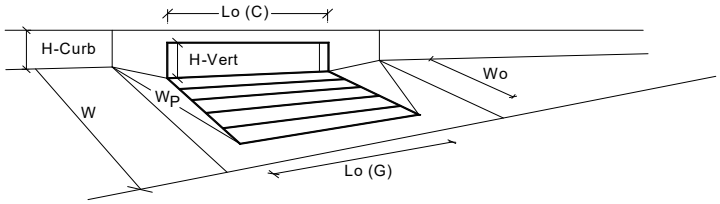
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



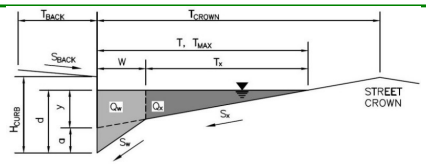
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

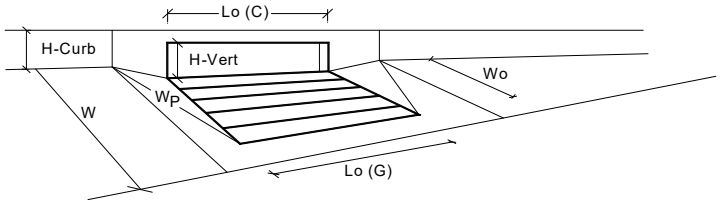
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



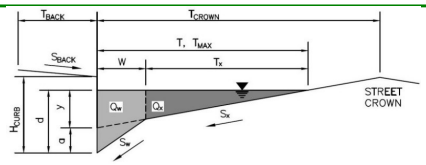
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	0.7	1.8	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

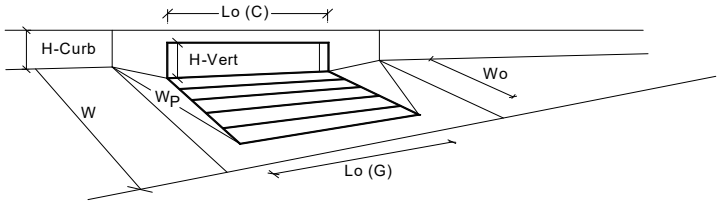
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



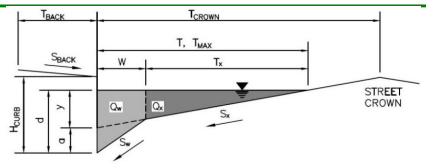
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.0	16.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

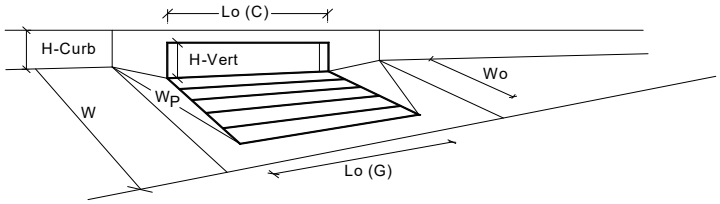
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



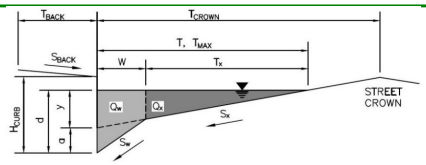
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.0	9.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-25**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	32.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	25.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

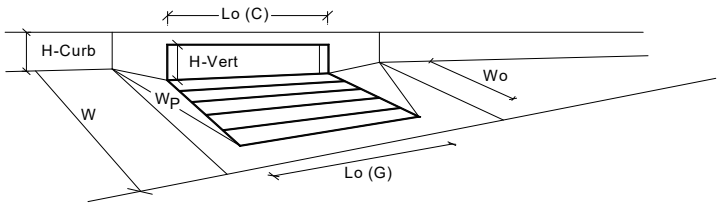
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



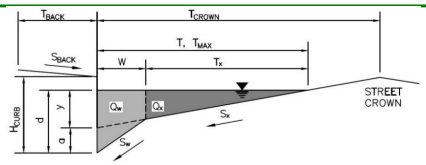
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**5.4**	**12.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	2.0	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: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-26**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	24.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	24.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

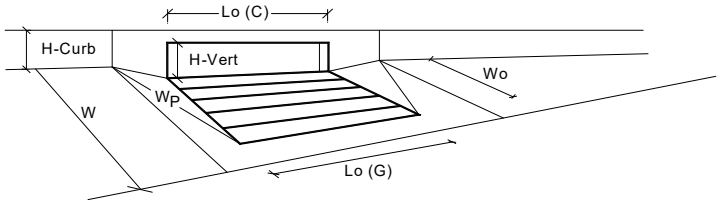
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



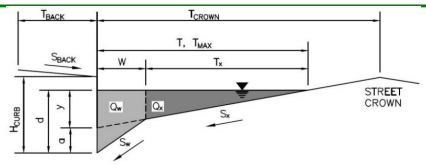
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	5.0	13.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-29**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.025	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

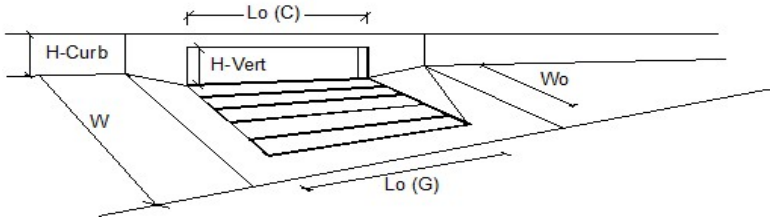
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**17.2**	**17.2**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.00 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 9.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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	

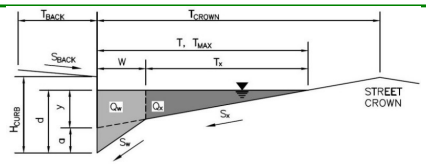
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**3.9**	**6.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**2.3**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**99**	**74**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-37**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	26.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.035	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

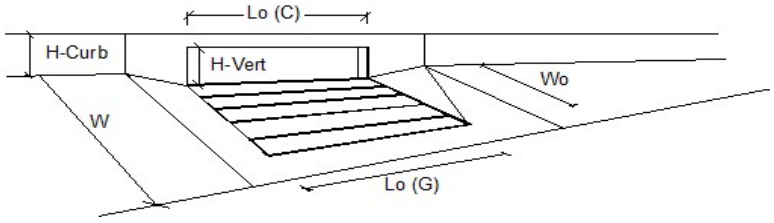
	Minor Storm	Major Storm	
Q_{allow} =	**17.0**	**62.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 5.00 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 6.00 (August 2025)



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

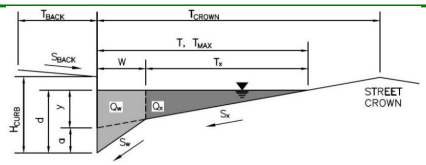
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**5.0**	**9.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.8**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**92**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-38**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	26.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.035	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

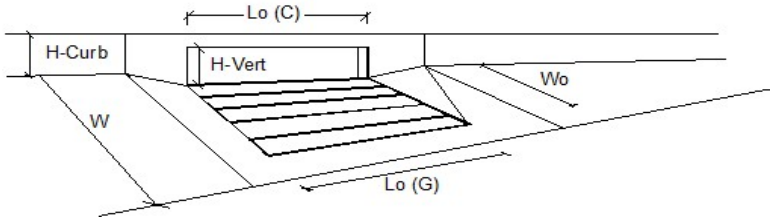
	Minor Storm	Major Storm	
Q_{allow} =	**17.0**	**62.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 5.00 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 9.00 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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	

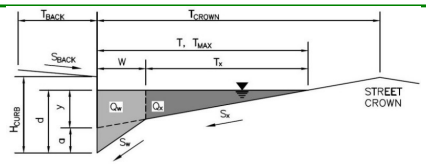
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**5.0**	**8.6**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.4**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**95**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-45**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

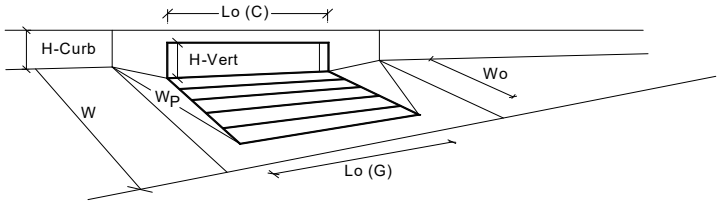
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



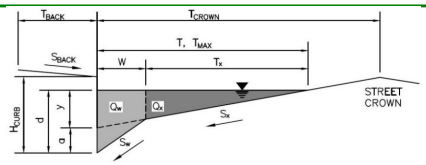
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	4.0	10.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-46**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

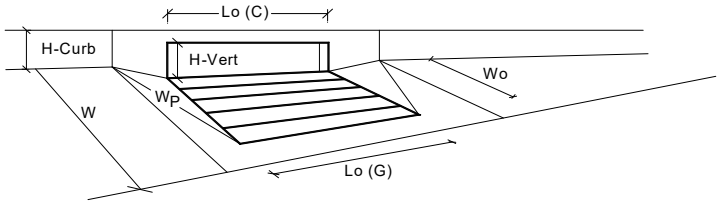
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



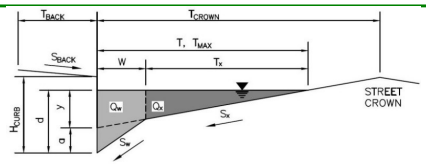
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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 =**	**8.3**	**25.5**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	6.0	16.0	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-47**



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} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.025	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

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

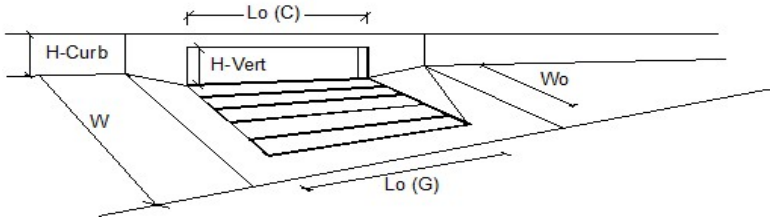
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Spread Criterion				
MAJOR STORM Allowable Capacity is based on Spread Criterion	**Q_{allow} =**	**17.2**	**17.2**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.00 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 6.00 (August 2025)



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

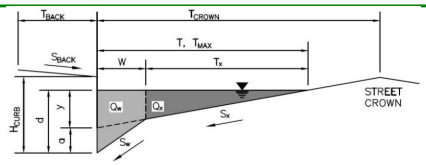
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**4.0**	**9.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.8**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**92**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-49**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	26.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.033	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

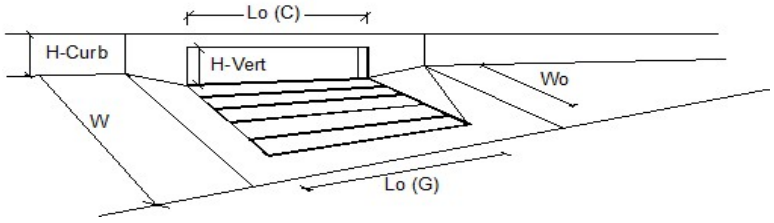
	Minor Storm	Major Storm	
Q_{allow} =	**17.3**	**60.3**	**cfs**

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 7.77 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

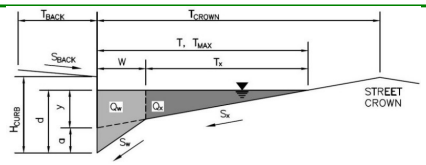
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**3.0**	**7.6**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.1**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**98**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-50**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	13.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	26.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.033	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

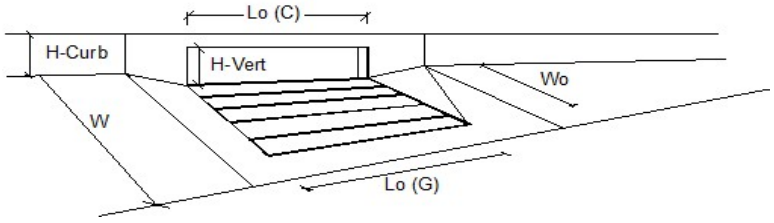
	Minor Storm	Major Storm	
Q_{allow} =	**17.3**	**60.3**	**cfs**

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 5.04 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

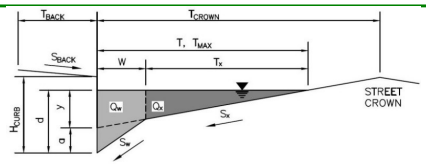
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**2.2**	**5.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.0**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**100**	**100**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-52**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	57.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.009	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

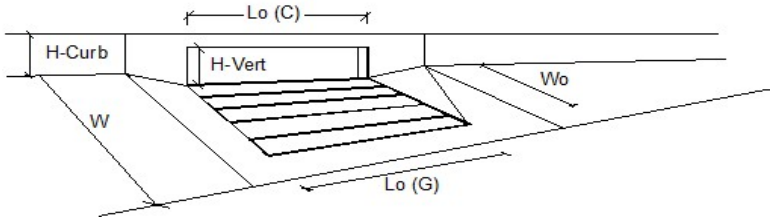
	Minor Storm	Major Storm	
Q_{allow} =	**12.7**	**30.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 12.20 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 25.80 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

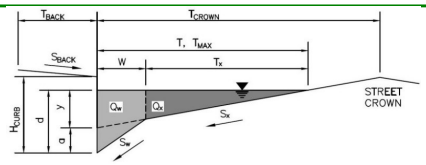
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**10.4**	**15.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.8**	**10.4**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**85**	**60**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-53**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	57.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.009	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} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Spread Criterion

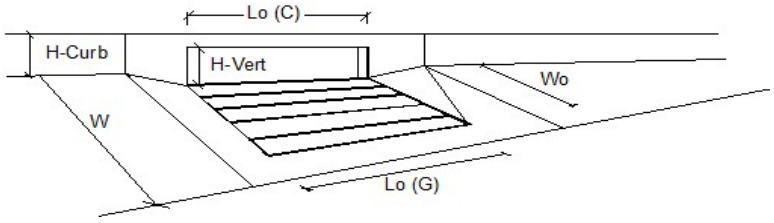
	Minor Storm	Major Storm	
Q_{allow} =	**12.7**	**30.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 7.23 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 22.23 cfs on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

MHFD-Inlet, Version 6.00 (August 2025)



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

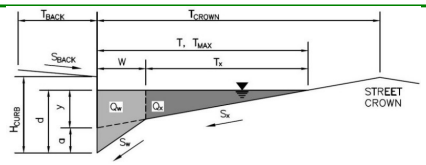
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q_a =**	**7.2**	**14.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**7.9**	**cfs**
Capture Percentage = Q_a/Q_o	**C% =**	**99**	**65**	**%**

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-54**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	56.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

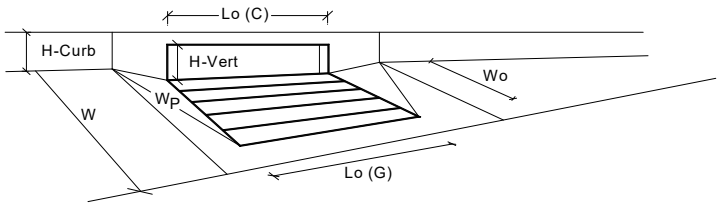
MINOR STORM Allowable Capacity is not applicable to Sump Condition

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 6.00 (August 2025)



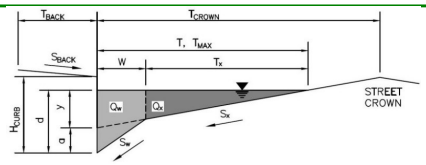
Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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) =	20.00	20.00	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} =	0.33	0.83	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} =	0.79	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 =**	**12.5**	**52.7**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	11.2	32.5	cfs

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

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

Project: **STERLING RANCH EAST FILING NO. 6 - FINAL PLAT**

Inlet ID: **DP-55**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.013	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	56.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	26.0	26.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

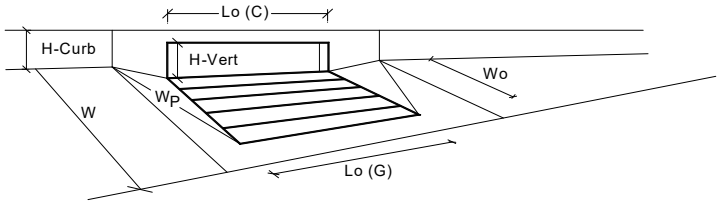
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

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

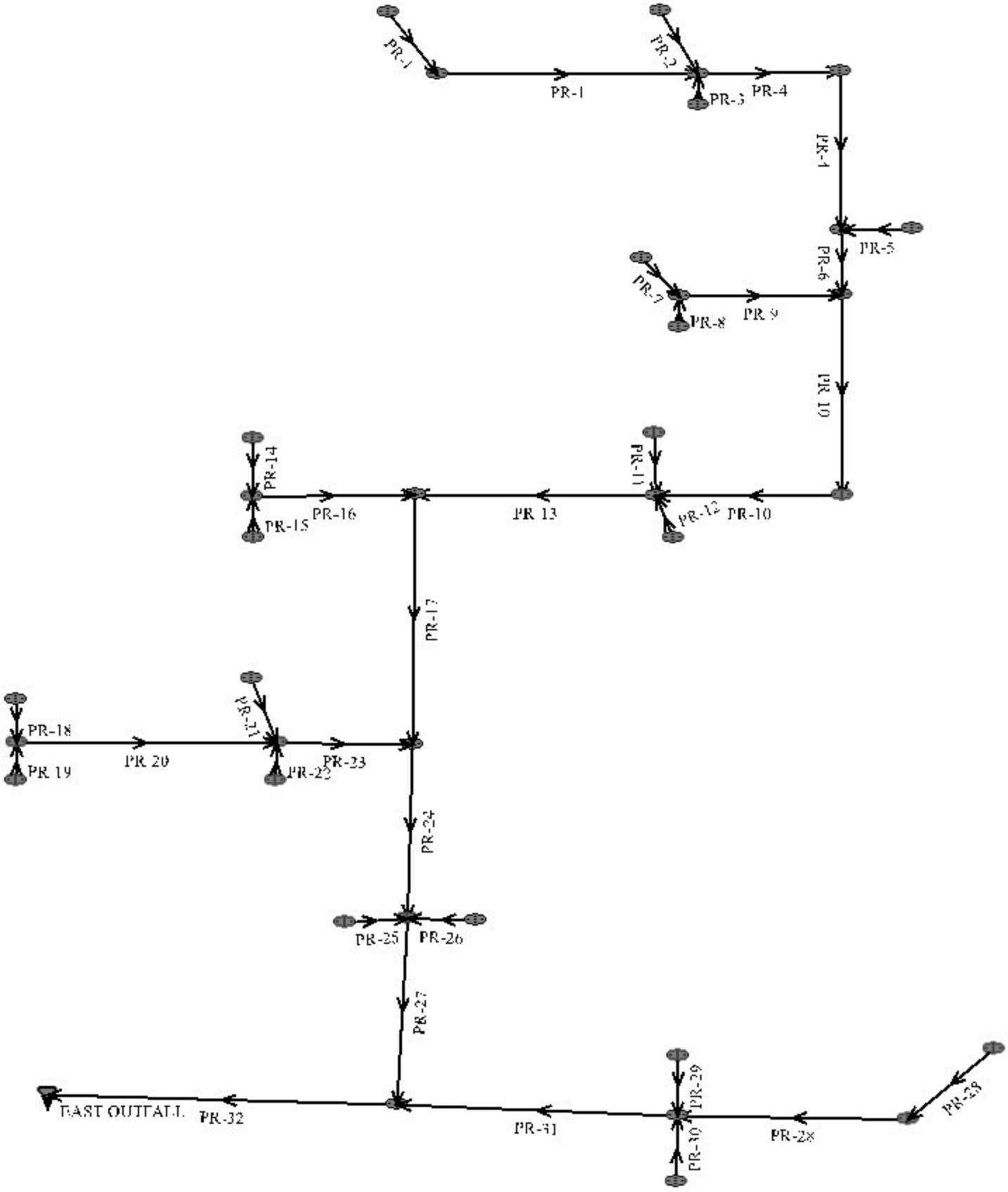
INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	6.0	12.0	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
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} =	0.33	0.83	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} =	0.79	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 =**	**9.7**	**39.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)	$Q_{PEAK\ REQUIRED}$ =	7.0	13.0	cfs

East 48" RCP Storm Outfall
100-yr. HGL Map



System Input Summary (East 48” RCP Storm Outfall – 100yr. HGL)

Rainfall Parameters

Rainfall Return Period: 100
Rainfall Calculation Method: Formula

One Hour Depth (in): 2.52
Rainfall Constant "A": 28.5
Rainfall Constant "B": 10
Rainfall Constant "C": 0.786

Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.20
Maximum Rural Overland Len. (ft): 500
Maximum Urban Overland Len. (ft): 300
Used UDFCD Tc. Maximum: Yes

Sizer Constraints

Minimum Sewer Size (in): 18.00
Maximum Depth to Rise Ratio: 0.90
Maximum Flow Velocity (fps): 18.0
Minimum Flow Velocity (fps): 2.0

Backwater Calculations:

Tailwater Elevation (ft): 7100.59

Manhole Input Summary:

		Given Flow		Sub Basin Information						
Element Name	**Ground Elevation (ft)**	**Total Known Flow (cfs)**	**Local Contribution (cfs)**	**Drainage Area (Ac.)**	**Runoff Coefficient**	**5yr Coefficient**	**Overland Length (ft)**	**Overland Slope (%)**	**Gutter Length (ft)**	**Gutter Velocity (fps)**
EAST OUTFALL	7102.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-32	7115.00	90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-27	7113.60	78.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-24	7116.20	73.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-23	7115.33	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-20	7116.87	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-19	7117.09	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-18	7117.09	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-21	7115.41	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-22	7115.33	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-17	7128.88	59.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-16	7128.21	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-15	7128.44	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-14	7128.44	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-13	7126.22	52.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-10	7127.45	47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-10	7133.44	47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-9	7132.21	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PR-7	7132.50	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-8	7132.44	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-6	7134.64	34.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-4	7139.43	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-4	7138.41	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-2	7138.62	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-1	7141.50	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-1	7141.80	7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-3	7138.55	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-5	7134.80	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-11	7126.44	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-12	7126.44	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-25	7113.97	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-26	7113.97	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-31	7112.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-28	7113.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-28	7114.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-30	7112.24	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-29	7112.24	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manhole Output Summary:

	Local Contribution					Total Design Flow				
Element Name	**Overland Time (min)**	**Gutter Time (min)**	**Basin Tc (min)**	**Intensity (in/hr)**	**Local Contrib (cfs)**	**Coeff. Area**	**Intensity (in/hr)**	**Manhole Tc (min)**	**Peak Flow (cfs)**	**Comment**
EAST OUTFALL	0.00	0.00	0.00	0.00	0.00	7.90	11.39	0.41	90.00	
PR-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	
PR-27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.00	
PR-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	73.00	
PR-23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	
PR-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	
PR-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	
PR-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
PR-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	
PR-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.00	
PR-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	
PR-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	
PR-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
PR-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.00	
PR-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.00	
PR-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.00	
PR-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.00	
PR-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	
PR-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	

PR-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.00	
PR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00	
PR-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00	
PR-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	
PR-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
PR-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	
PR-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	
PR-25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	
PR-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	
PR-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
PR-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	
PR-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	
PR-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	

Sewer Input Summary:

		Elevation			Loss Coefficients			Given Dimensions		
Element Name	Sewer Length (ft)	Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
PR-32	177.55	7098.75	2.1	7102.48	0.013	0.03	1.00	CIRCULAR	48.00 in	48.00 in
PR-27	91.37	7102.98	3.0	7105.72	0.013	1.32	1.00	CIRCULAR	42.00 in	42.00 in
PR-24	114.13	7106.22	1.1	7107.51	0.013	0.05	1.00	CIRCULAR	42.00 in	42.00 in
PR-23	89.26	7108.51	1.0	7109.41	0.013	1.32	0.00	CIRCULAR	30.00 in	30.00 in
PR-20	306.24	7109.91	0.7	7112.05	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in
PR-19	5.67	7112.55	3.0	7112.72	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-18	24.67	7112.55	1.0	7112.80	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-21	26.51	7110.41	2.0	7110.94	0.013	1.06	0.00	CIRCULAR	18.00 in	18.00 in
PR-22	5.67	7110.41	5.0	7110.69	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-17	290.50	7108.01	3.0	7116.73	0.013	0.05	1.00	CIRCULAR	36.00 in	36.00 in
PR-16	160.50	7119.23	2.2	7122.76	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
PR-15	5.67	7123.26	5.0	7123.54	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-14	24.67	7123.26	1.0	7123.51	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-13	180.09	7117.23	1.2	7119.39	0.013	1.32	1.00	CIRCULAR	36.00 in	36.00 in
PR-10	99.91	7119.89	1.0	7120.89	0.013	0.05	1.00	CIRCULAR	36.00 in	36.00 in
PR-10	285.50	7121.39	1.5	7125.67	0.013	1.32	1.00	CIRCULAR	36.00 in	36.00 in
PR-9	90.51	7126.67	0.5	7127.12	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
PR-7	26.32	7127.62	1.0	7127.88	0.013	0.83	0.00	CIRCULAR	24.00 in	24.00 in
PR-8	5.67	7128.12	2.0	7128.23	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-6	49.67	7126.17	3.0	7127.66	0.013	0.05	1.00	CIRCULAR	30.00 in	30.00 in

PR-4	230.83	7128.16	1.5	7131.62	0.013	0.05	1.00	CIRCULAR	30.00 in	30.00 in
PR-4	88.97	7132.12	1.0	7133.01	0.013	1.32	1.00	CIRCULAR	30.00 in	30.00 in
PR-2	25.97	7133.51	1.5	7133.90	0.013	0.83	0.00	CIRCULAR	24.00 in	24.00 in
PR-1	221.09	7133.51	1.0	7135.72	0.013	0.63	0.00	CIRCULAR	24.00 in	24.00 in
PR-1	29.37	7136.22	1.0	7136.51	0.013	0.63	0.00	CIRCULAR	24.00 in	24.00 in
PR-3	5.67	7134.01	3.0	7134.18	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-5	24.67	7129.66	3.0	7130.40	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-11	24.67	7121.39	2.0	7121.88	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-12	9.96	7121.39	5.0	7121.89	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-25	5.67	7108.22	5.0	7108.50	0.013	1.32	1.00	CIRCULAR	18.00 in	18.00 in
PR-26	24.67	7108.22	4.0	7109.21	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-31	187.00	7104.48	1.6	7107.41	0.013	0.05	1.00	CIRCULAR	24.00 in	24.00 in
PR-28	79.98	7107.91	1.0	7108.71	0.013	0.05	0.00	CIRCULAR	18.00 in	18.00 in
PR-28	52.72	7109.21	1.0	7109.74	0.013	0.31	1.00	CIRCULAR	18.00 in	18.00 in
PR-30	25.17	7107.91	1.0	7108.16	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in
PR-29	6.17	7107.91	0.5	7107.94	0.013	1.32	0.00	CIRCULAR	18.00 in	18.00 in

Sewer Flow Summary:

	Full Flow Capacity		Critical Flow		Normal Flow						
Element Name	**Flow (cfs)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Froude Number**	**Flow Condition**	**Flow (cfs)**	**Surcharged Length (ft)**	**Comment**
PR-32	208.72	16.61	34.51	9.31	22.03	15.99	2.37	Supercritical	90.00	0.00	
PR-27	174.73	18.16	33.14	9.58	19.66	17.65	2.76	Supercritical Jump	78.00	22.78	
PR-24	107.23	11.15	32.11	9.25	25.42	11.99	1.58	Supercritical	73.00	0.00	
PR-23	41.31	8.41	15.67	5.78	12.50	7.75	1.54	Supercritical Jump	15.00	62.92	
PR-20	18.98	6.04	12.08	5.05	10.87	5.78	1.22	Supercritical	8.00	0.00	
PR-19	18.24	10.32	6.40	3.55	4.02	6.78	2.46	Supercritical	2.00	0.00	
PR-18	10.53	5.96	12.29	5.45	10.72	6.38	1.30	Supercritical	7.00	0.00	
PR-21	14.90	8.43	10.32	4.77	7.18	7.60	2.00	Supercritical	5.00	0.00	
PR-22	23.55	13.33	6.06	3.45	3.37	7.88	3.14	Supercritical	1.80	0.00	
PR-17	115.87	16.39	29.80	9.43	18.19	16.47	2.66	Supercritical	59.00	0.00	
PR-16	33.64	10.71	12.08	5.05	7.97	8.78	2.22	Supercritical	8.00	0.00	
PR-15	23.55	13.33	7.33	3.84	4.04	8.77	3.18	Supercritical	2.60	0.00	
PR-14	10.53	5.96	11.35	5.11	9.73	6.15	1.34	Supercritical	6.00	0.00	
PR-13	73.25	10.36	28.13	8.77	22.40	11.25	1.57	Supercritical Jump	52.00	147.03	
PR-10	66.88	9.46	26.79	8.33	22.25	10.25	1.44	Supercritical	47.00	0.00	
PR-10	81.91	11.59	26.79	8.33	19.55	11.98	1.84	Supercritical	47.00	0.00	
PR-9	16.04	5.11	16.17	6.22	17.36	5.75	0.87	Pressurized	14.00	90.51	

PR-7	22.68	7.22	14.27	5.65	11.79	7.17	1.44	Supercritical Jump	11.00	10.78	
PR-8	14.90	8.43	9.18	4.41	6.37	7.15	2.02	Pressurized	4.00	5.67	
PR-6	71.24	14.51	23.79	8.15	14.60	14.34	2.60	Supercritical	34.00	0.00	
PR-4	50.37	10.26	22.03	7.51	16.33	10.62	1.79	Supercritical	29.00	0.00	
PR-4	41.13	8.38	22.03	7.51	18.59	9.08	1.39	Supercritical	29.00	0.00	
PR-2	27.78	8.84	18.34	6.99	14.07	9.41	1.68	Supercritical Jump	18.00	14.27	
PR-1	22.68	7.22	11.26	4.83	9.15	6.36	1.49	Supercritical Jump	7.00	20.15	
PR-1	22.68	7.22	11.26	4.83	9.15	6.36	1.49	Supercritical	7.00	0.00	
PR-3	18.24	10.32	10.32	4.77	6.44	8.80	2.47	Pressurized	5.00	5.67	
PR-5	18.24	10.32	10.32	4.77	6.44	8.80	2.47	Supercritical	5.00	0.00	
PR-11	14.90	8.43	10.32	4.77	7.18	7.60	2.00	Supercritical	5.00	0.00	
PR-12	23.55	13.33	3.99	2.74	2.27	6.19	3.03	Supercritical Jump	0.80	0.82	
PR-25	23.55	13.33	5.51	3.27	3.08	7.46	3.12	Pressurized	1.50	5.67	
PR-26	21.07	11.92	10.32	4.77	5.97	9.77	2.86	Supercritical	5.00	0.00	
PR-31	28.39	9.04	15.56	6.03	11.40	8.84	1.82	Supercritical Jump	13.00	40.27	
PR-28	10.53	5.96	11.35	5.11	9.73	6.15	1.34	Supercritical	6.00	0.00	
PR-28	10.53	5.96	11.35	5.11	9.73	6.15	1.34	Supercritical	6.00	0.00	
PR-30	10.53	5.96	6.06	3.45	5.03	4.45	1.43	Supercritical	1.80	0.00	
PR-29	7.45	4.21	10.32	4.77	10.79	4.52	0.92	Subcritical	5.00	0.00	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.

- If the sewer is pressurized, full flow represents the pressurized flow conditions.

Sewer Sizing Summary:

			Existing		Calculated		Used			
Element Name	**Peak Flow (cfs)**	**Cross Section**	**Rise**	**Span**	**Rise**	**Span**	**Rise**	**Span**	**Area (ft^2)**	**Comment**
PR-32	90.00	CIRCULAR	48.00 in	48.00 in	36.00 in	36.00 in	48.00 in	48.00 in	12.57	
PR-27	78.00	CIRCULAR	42.00 in	42.00 in	33.00 in	33.00 in	42.00 in	42.00 in	9.62	
PR-24	73.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
PR-23	15.00	CIRCULAR	30.00 in	30.00 in	21.00 in	21.00 in	30.00 in	30.00 in	4.91	
PR-20	8.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-19	2.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-18	7.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-21	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-22	1.80	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-17	59.00	CIRCULAR	36.00 in	36.00 in	30.00 in	30.00 in	36.00 in	36.00 in	7.07	
PR-16	8.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-15	2.60	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-14	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-13	52.00	CIRCULAR	36.00 in	36.00 in	33.00 in	33.00 in	36.00 in	36.00 in	7.07	
PR-10	47.00	CIRCULAR	36.00 in	36.00 in	33.00 in	33.00 in	36.00 in	36.00 in	7.07	
PR-10	47.00	CIRCULAR	36.00 in	36.00 in	30.00 in	30.00 in	36.00 in	36.00 in	7.07	

PR-9	14.00	CIRCULAR	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	3.14	
PR-7	11.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
PR-8	4.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-6	34.00	CIRCULAR	30.00 in	30.00 in	24.00 in	24.00 in	30.00 in	30.00 in	4.91	
PR-4	29.00	CIRCULAR	30.00 in	30.00 in	27.00 in	27.00 in	30.00 in	30.00 in	4.91	
PR-4	29.00	CIRCULAR	30.00 in	30.00 in	27.00 in	27.00 in	30.00 in	30.00 in	4.91	
PR-2	18.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
PR-1	7.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-1	7.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-3	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-5	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-11	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-12	0.80	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-25	1.50	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-26	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-31	13.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-28	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-28	6.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-30	1.80	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-29	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics where calculated using the 'Used' parameters.

Grade Line Summary:

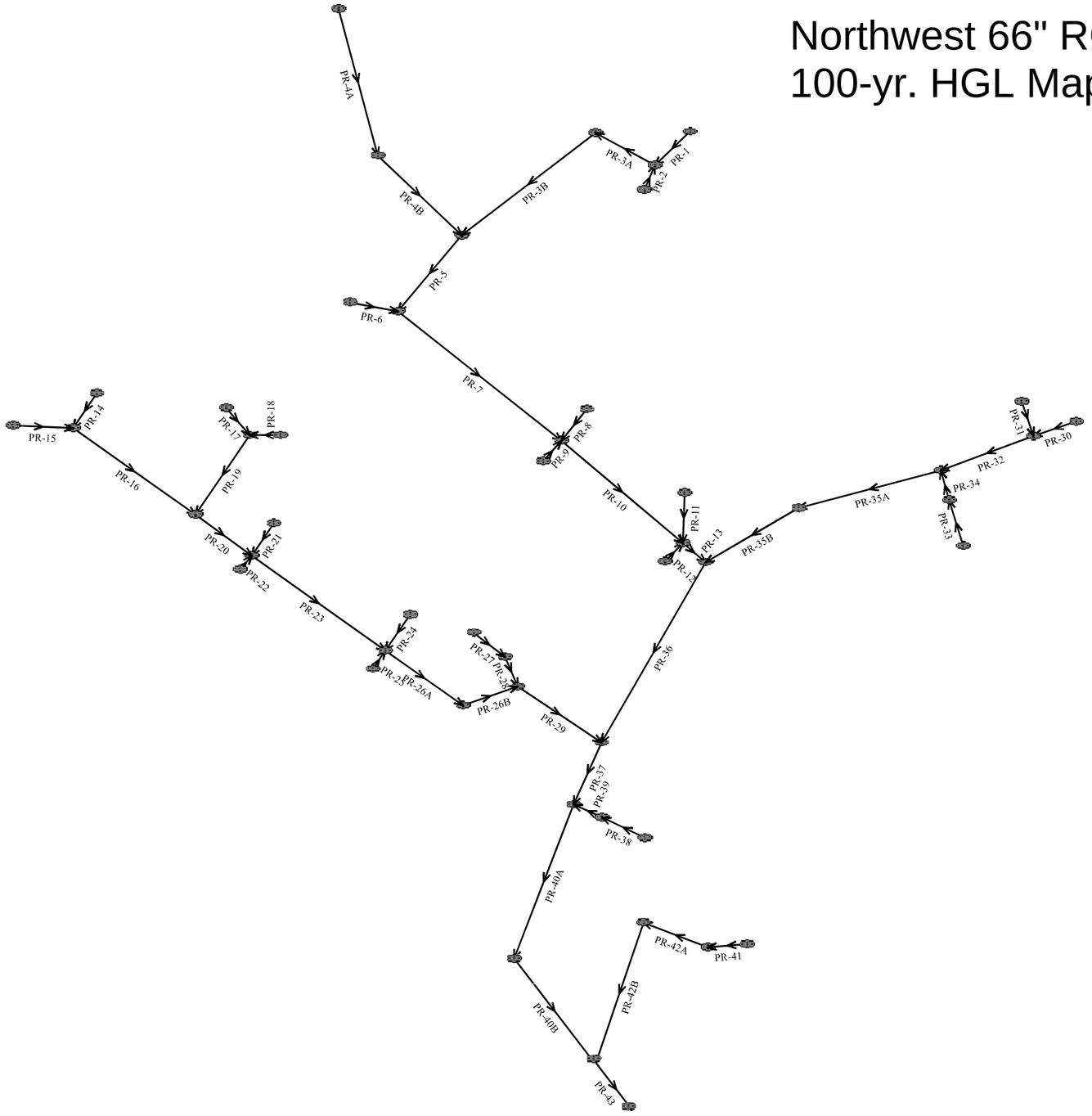
Tailwater Elevation (ft): 7100.59

	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
Element Name	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
PR-32	7098.75	7102.48	0.00	0.00	7100.59	7105.36	7104.56	2.14	7106.70
PR-27	7102.98	7105.72	1.35	0.00	7107.03	7108.48	7108.05	1.86	7109.91
PR-24	7106.22	7107.51	0.04	0.13	7108.65	7110.19	7110.57	0.94	7111.51
PR-23	7108.51	7109.41	0.19	0.00	7111.56	7111.62	7111.71	0.08	7111.79
PR-20	7109.91	7112.05	0.01	0.00	7111.68	7113.06	7111.79	1.66	7113.45
PR-19	7112.55	7112.72	0.03	0.00	7113.08	7113.53	7113.60	0.00	7113.60
PR-18	7112.55	7112.80	0.32	0.00	7113.44	7113.82	7114.07	0.21	7114.28
PR-21	7110.41	7110.94	0.13	0.00	7111.79	7111.80	7111.92	0.23	7112.15
PR-22	7110.41	7110.69	0.02	0.00	7111.79	7111.79	7111.81	0.01	7111.82
PR-17	7108.01	7116.73	0.05	0.00	7110.24	7119.21	7113.74	6.86	7120.59
PR-16	7119.23	7122.76	0.13	0.00	7119.89	7123.77	7121.09	3.07	7124.16
PR-15	7123.26	7123.54	0.04	0.00	7123.81	7124.75	7124.79	0.00	7124.79
PR-14	7123.26	7123.51	0.24	0.00	7124.07	7124.45	7124.66	0.20	7124.86
PR-13	7117.23	7119.39	1.11	0.24	7121.10	7121.73	7121.94	0.98	7122.93
PR-10	7119.89	7120.89	0.03	0.15	7121.92	7123.12	7123.37	0.83	7124.20
PR-10	7121.39	7125.67	0.91	0.00	7124.03	7127.91	7125.25	3.73	7128.98

PR-9	7126.67	7127.12	0.41	0.00	7129.08	7129.43	7129.39	0.34	7129.73
PR-7	7127.62	7127.88	0.16	0.00	7129.70	7129.71	7129.89	0.03	7129.92
PR-8	7128.12	7128.23	0.11	0.00	7129.76	7129.77	7129.84	0.01	7129.85
PR-6	7126.17	7127.66	0.04	0.00	7127.94	7129.64	7130.58	0.09	7130.67
PR-4	7128.16	7131.62	0.03	0.20	7129.87	7133.46	7131.27	3.06	7134.33
PR-4	7132.12	7133.01	0.72	0.00	7134.48	7134.85	7135.05	0.67	7135.72
PR-2	7133.51	7133.90	0.42	0.00	7135.63	7135.63	7136.14	0.09	7136.23
PR-1	7133.51	7135.72	0.05	0.00	7135.69	7136.66	7135.77	1.25	7137.02
PR-1	7136.22	7136.51	0.05	0.00	7136.98	7137.45	7137.61	0.20	7137.82
PR-3	7134.01	7134.18	0.16	0.00	7135.76	7135.77	7135.88	0.01	7135.90
PR-5	7129.66	7130.40	0.16	0.00	7130.20	7131.26	7131.40	0.21	7131.61
PR-11	7121.39	7121.88	0.16	0.00	7121.93	7122.74	7123.09	0.00	7123.10
PR-12	7121.39	7121.89	0.00	0.00	7122.93	7122.93	7122.93	0.00	7122.94
PR-25	7108.22	7108.50	0.01	1.01	7110.92	7110.92	7110.93	0.00	7110.93
PR-26	7108.22	7109.21	0.16	0.00	7108.72	7110.07	7110.20	0.22	7110.42
PR-31	7104.48	7107.41	0.01	0.53	7106.98	7108.71	7107.24	2.03	7109.27
PR-28	7107.91	7108.71	0.01	0.00	7108.72	7109.66	7109.31	0.75	7110.06
PR-28	7109.21	7109.74	0.06	0.00	7110.02	7110.69	7110.61	0.48	7111.09
PR-30	7107.91	7108.16	0.02	0.00	7109.28	7109.28	7109.29	0.01	7109.30
PR-29	7107.91	7107.94	0.16	0.00	7109.30	7109.31	7109.44	0.01	7109.45

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K * V_fi ^ 2/(2*g)
- Lateral loss = V_fo ^ 2/(2*g)- Junction Loss K * V_fi ^ 2/(2*g).
- Friction loss is always Upstream EGL - Downstream EGL.

Northwest 66" RCP Storm Outfall
100-yr. HGL Map



System Input Summary (NW 66” RCP Storm Outfall – 100 yr. HGL)

Rainfall Parameters

Rainfall Return Period: 100
Rainfall Calculation Method: Formula

One Hour Depth (in): 2.52
Rainfall Constant "A": 28.5
Rainfall Constant "B": 10
Rainfall Constant "C": 0.786

Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.20
Maximum Rural Overland Len. (ft): 500
Maximum Urban Overland Len. (ft): 300
Used UDFCD Tc. Maximum: Yes

Sizer Constraints

Minimum Sewer Size (in): 18.00
Maximum Depth to Rise Ratio: 0.90
Maximum Flow Velocity (fps): 18.0
Minimum Flow Velocity (fps): 2.0

Backwater Calculations:

Tailwater Elevation (ft): 7101.78

Manhole Input Summary:

		Given Flow		Sub Basin Information						
Element Name	Ground Elevation (ft)	Total Known Flow (cfs)	Local Contribution (cfs)	Drainage Area (Ac.)	Runoff Coefficient	5yr Coefficient	Overland Length (ft)	Overland Slope (%)	Gutter Length (ft)	Gutter Velocity (fps)
NW OUTFALL	7102.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-43C	7109.50	313.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-43B	7121.00	313.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-43A	7127.53	313.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-42	7127.53	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-41	7126.04	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-40	7133.62	295.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-37B	7137.14	283.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-37A	7137.04	283.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-36	7150.63	231.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-13	7150.30	84.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-35B	7158.19	165.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-35A	7159.31	165.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-34	7158.32	18.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-33	7158.32	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-32	7160.00	154.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-30	7162.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-31	7161.00	82.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

PR-29	7139.80	62.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-39	7132.81	19.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PR-38	7132.81	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Manhole Output Summary:

	Local Contribution					Total Design Flow				
Element Name	**Overland Time (min)**	**Gutter Time (min)**	**Basin Tc (min)**	**Intensity (in/hr)**	**Local Contrib (cfs)**	**Coeff. Area**	**Intensity (in/hr)**	**Manhole Tc (min)**	**Peak Flow (cfs)**	**Comment**
NW OUTFALL	0.00	0.00	0.00	0.00	0.00	26.70	11.72	0.04	313.00	
PR-43C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	313.00	Surface Water Present (Downstream)
PR-43B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	313.00	
PR-43A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	313.00	
PR-42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	
PR-41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00	
PR-40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	295.00	
PR-37B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	283.00	
PR-37A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	283.00	
PR-36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	231.00	
PR-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.00	
PR-35B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	165.00	
PR-35A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	165.00	

PR-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.00	
PR-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	
PR-32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	154.00	
PR-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.00	
PR-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.00	
PR-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.00	
PR-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.00	
PR-38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	

Sewer Input Summary:

		Elevation			Loss Coefficients			Given Dimensions		
Element Name	**Sewer Length (ft)**	**Downstream Invert (ft)**	**Slope (%)**	**Upstream Invert (ft)**	**Mannings n**	**Bend Loss**	**Lateral Loss**	**Cross Section**	**Rise (ft or in)**	**Span (ft or in)**
PR-43C	30.00	7099.50	1.0	7099.80	0.013	0.03	1.00	CIRCULAR	66.00 in	66.00 in
PR-43B	88.67	7099.80	6.0	7105.12	0.013	0.05	1.00	CIRCULAR	66.00 in	66.00 in
PR-43A	130.03	7105.12	6.0	7112.92	0.013	0.15	1.00	CIRCULAR	66.00 in	66.00 in
PR-42	120.00	7118.77	1.0	7119.97	0.013	1.32	0.00	CIRCULAR	30.00 in	30.00 in
PR-41	47.56	7120.47	1.0	7120.95	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in
PR-40	169.25	7115.92	3.0	7121.00	0.013	0.05	1.00	CIRCULAR	66.00 in	66.00 in
PR-37B	93.35	7122.50	1.0	7123.43	0.013	0.05	1.00	CIRCULAR	66.00 in	66.00 in
PR-37A	99.27	7124.94	1.0	7125.93	0.013	1.32	1.00	CIRCULAR	66.00 in	66.00 in
PR-36	588.27	7127.52	1.8	7138.11	0.013	1.32	1.00	CIRCULAR	54.00 in	54.00 in
PR-13	20.00	7140.11	1.0	7140.31	0.013	1.32	0.00	CIRCULAR	42.00 in	42.00 in

PR-35B	339.56	7139.71	1.5	7144.80	0.013	0.05	1.00	CIRCULAR	48.00 in	48.00 in
PR-35A	303.56	7145.30	1.5	7149.85	0.013	0.05	1.00	CIRCULAR	48.00 in	48.00 in
PR-34	18.33	7152.36	2.1	7152.74	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
PR-33	59.34	7153.24	1.0	7153.83	0.013	0.05	0.00	CIRCULAR	18.00 in	18.00 in
PR-32	114.98	7150.36	1.5	7152.08	0.013	0.05	1.00	CIRCULAR	48.00 in	48.00 in
PR-30	73.90	7152.58	2.0	7154.06	0.013	0.05	1.00	CIRCULAR	42.00 in	42.00 in
PR-31	23.77	7152.58	1.0	7152.82	0.013	1.32	0.00	CIRCULAR	42.00 in	42.00 in
PR-29	8.00	7128.43	1.0	7128.51	0.013	0.05	0.00	CIRCULAR	42.00 in	42.00 in
PR-39	22.33	7126.00	3.3	7126.74	0.013	1.32	0.00	CIRCULAR	24.00 in	24.00 in
PR-38	53.33	7127.25	1.0	7127.78	0.013	0.05	0.00	CIRCULAR	24.00 in	24.00 in

Sewer Flow Summary:

	Full Flow Capacity		Critical Flow		Normal Flow						
Element Name	**Flow (cfs)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Depth (in)**	**Velocity (fps)**	**Froude Number**	**Flow Condition**	**Flow (cfs)**	**Surcharged Length (ft)**	**Comment**
PR-43C	336.71	14.17	58.10	14.13	50.34	16.10	1.39	Supercritical	313.00	0.00	
PR-43B	824.78	34.72	58.10	14.13	28.19	32.33	4.27	Supercritical	313.00	0.00	Velocity is Too High
PR-43A	824.78	34.72	58.10	14.13	28.19	32.33	4.27	Supercritical Jump	313.00	106.51	Velocity is Too High
PR-42	41.13	8.38	20.44	7.02	16.89	8.78	1.45	Supercritical	25.00	0.00	
PR-41	22.68	7.22	17.30	6.60	14.87	7.82	1.34	Supercritical	16.00	0.00	
PR-40	583.20	24.55	56.81	13.56	33.23	24.62	2.94	Supercritical	295.00	0.00	Velocity is Too High
PR-37B	336.71	14.17	55.86	13.20	46.34	15.88	1.49	Supercritical	283.00	0.00	

PR-37A	336.71	14.17	55.86	13.20	46.34	15.88	1.49	Pressurized	283.00	99.27	
PR-36	264.54	16.63	50.45	14.94	39.07	18.75	1.89	Pressurized	231.00	588.27	Velocity is Too High
PR-13	100.88	10.49	34.28	9.99	29.28	11.73	1.39	Pressurized	84.00	20.00	
PR-35B	176.40	14.04	44.38	13.60	36.82	15.95	1.61	Pressurized	165.00	339.56	
PR-35A	176.40	14.04	44.38	13.60	36.82	15.95	1.61	Pressurized	165.00	303.56	
PR-34	32.87	10.46	18.34	6.99	12.67	10.70	2.05	Pressurized	18.00	18.33	
PR-33	10.53	5.96	10.32	4.77	8.73	5.88	1.38	Pressurized	5.00	59.34	
PR-32	176.40	14.04	43.51	12.86	34.72	15.82	1.69	Pressurized	154.00	114.98	
PR-30	142.67	14.83	31.89	9.18	21.12	14.86	2.23	Pressurized	72.00	73.90	
PR-31	100.88	10.49	33.91	9.85	28.75	11.68	1.40	Pressurized	82.00	23.77	
PR-29	100.88	10.49	29.61	8.55	23.80	11.02	1.53	Pressurized	62.00	8.00	
PR-39	41.21	13.12	18.82	7.19	11.45	12.85	2.63	Supercritical	19.00	0.00	
PR-38	22.68	7.22	12.08	5.05	9.84	6.59	1.48	Supercritical	8.00	0.00	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

Sewer Sizing Summary:

			Existing		Calculated		Used			
Element Name	**Peak Flow (cfs)**	**Cross Section**	**Rise**	**Span**	**Rise**	**Span**	**Rise**	**Span**	**Area (ft^2)**	**Comment**
PR-43C	313.00	CIRCULAR	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	23.76	

PR-43B	313.00	CIRCULAR	66.00 in	66.00 in	48.00 in	48.00 in	66.00 in	66.00 in	23.76	
PR-43A	313.00	CIRCULAR	66.00 in	66.00 in	48.00 in	48.00 in	66.00 in	66.00 in	23.76	
PR-42	25.00	CIRCULAR	30.00 in	30.00 in	27.00 in	27.00 in	30.00 in	30.00 in	4.91	
PR-41	16.00	CIRCULAR	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	24.00 in	3.14	
PR-40	295.00	CIRCULAR	66.00 in	66.00 in	54.00 in	54.00 in	66.00 in	66.00 in	23.76	
PR-37B	283.00	CIRCULAR	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	23.76	
PR-37A	283.00	CIRCULAR	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	66.00 in	23.76	
PR-36	231.00	CIRCULAR	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	54.00 in	15.90	
PR-13	84.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
PR-35B	165.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
PR-35A	165.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
PR-34	18.00	CIRCULAR	24.00 in	24.00 in	21.00 in	21.00 in	24.00 in	24.00 in	3.14	
PR-33	5.00	CIRCULAR	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	18.00 in	1.77	
PR-32	154.00	CIRCULAR	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	48.00 in	12.57	
PR-30	72.00	CIRCULAR	42.00 in	42.00 in	33.00 in	33.00 in	42.00 in	42.00 in	9.62	
PR-31	82.00	CIRCULAR	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	42.00 in	9.62	
PR-29	62.00	CIRCULAR	42.00 in	42.00 in	36.00 in	36.00 in	42.00 in	42.00 in	9.62	
PR-39	19.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	
PR-38	8.00	CIRCULAR	24.00 in	24.00 in	18.00 in	18.00 in	24.00 in	24.00 in	3.14	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics where calculated using the 'Used' parameters.

Grade Line Summary:

Tailwater Elevation (ft): 7101.78

	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
Element Name	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
PR-43C	7099.50	7099.80	0.00	0.00	7103.70	7104.64	7107.72	0.02	7107.74
PR-43B	7099.80	7105.12	0.13	0.00	7104.78	7115.68	7118.38	0.00	7118.38
PR-43A	7105.12	7112.92	0.40	0.00	7116.09	7117.76	7118.78	2.08	7120.86
PR-42	7118.77	7119.97	0.53	0.00	7120.16	7121.67	7121.39	1.04	7122.44
PR-41	7120.47	7120.95	0.02	0.00	7121.71	7122.39	7122.66	0.40	7123.07
PR-40	7115.92	7121.00	0.12	0.30	7118.69	7125.73	7128.10	0.49	7128.59
PR-37B	7122.50	7123.43	0.11	0.19	7126.36	7128.09	7130.27	0.52	7130.79
PR-37A	7124.94	7125.93	2.91	0.00	7131.49	7132.20	7133.70	0.70	7134.40
PR-36	7127.52	7138.11	4.32	0.00	7136.52	7144.59	7139.80	8.07	7147.87
PR-13	7140.11	7140.31	1.56	0.00	7148.25	7148.39	7149.43	0.14	7149.57
PR-35B	7139.71	7144.80	0.13	0.60	7145.92	7150.38	7148.60	4.46	7153.06
PR-35A	7145.30	7149.85	0.13	0.00	7150.52	7154.50	7153.19	3.98	7157.18
PR-34	7152.36	7152.74	0.67	0.00	7157.34	7157.46	7157.85	0.12	7157.96
PR-33	7153.24	7153.83	0.01	0.00	7157.85	7157.98	7157.97	0.13	7158.10
PR-32	7150.36	7152.08	0.12	0.35	7155.31	7156.62	7157.64	1.31	7158.95
PR-30	7152.58	7154.06	0.04	1.46	7159.59	7159.97	7160.46	0.38	7160.84
PR-31	7152.58	7152.82	1.49	0.00	7159.31	7159.47	7160.44	0.16	7160.60

PR-29	7128.43	7128.51	0.03	0.00	7133.79	7133.82	7134.43	0.03	7134.46
PR-39	7126.00	7126.74	0.75	0.00	7127.14	7128.31	7128.79	0.32	7129.11
PR-38	7127.25	7127.78	0.01	0.00	7129.00	7129.00	7129.12	0.13	7129.25

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K * V_fi ^ 2/(2*g)
- Lateral loss = V_fo ^ 2/(2*g)- Junction Loss K * V_fi ^ 2/(2*g).
- Friction loss is always Upstream EGL - Downstream EGL.

STORMWATER QUALITY CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

DP-20 (4' trickle channel)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.010 ft/ft	
Bottom Width	4.00 ft	
Discharge	1.80 cfs	* Based on 2% of 100-yr flows

Results	
Normal Depth	1.8 in
Flow Area	0.6 ft²
Wetted Perimeter	4.3 ft
Hydraulic Radius	1.7 in
Top Width	4.00 ft
Critical Depth	2.2 in
Critical Slope	0.005 ft/ft
Velocity	3.04 ft/s
Velocity Head	0.14 ft
Specific Energy	0.29 ft
Froude Number	1.394
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	Dry
Profile Headloss	0.00 ft
Downstream Velocity	∞ ft/s
Upstream Velocity	∞ ft/s
Normal Depth	1.8 in
Critical Depth	2.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.005 ft/ft

DP-51 (4' trickle channel)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.010 ft/ft	
Bottom Width	4.00 ft	
Discharge	1.80 cfs	* Based on 2% of 100-yr flows

Results	
Normal Depth	1.8 in
Flow Area	0.6 ft²
Wetted Perimeter	4.3 ft
Hydraulic Radius	1.7 in
Top Width	4.00 ft
Critical Depth	2.2 in
Critical Slope	0.005 ft/ft
Velocity	3.04 ft/s
Velocity Head	0.14 ft
Specific Energy	0.29 ft
Froude Number	1.394
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	Dry
Profile Headloss	0.00 ft
Downstream Velocity	∞ ft/s
Upstream Velocity	∞ ft/s
Normal Depth	1.8 in
Critical Depth	2.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.005 ft/ft

DP-39 (7' trickle channel)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	0.010 ft/ft	
Bottom Width	7.00 ft	
Discharge	6.14 cfs	* Based on 2% of 100-yr flows

Results	
Normal Depth	2.6 in
Flow Area	1.5 ft²
Wetted Perimeter	7.4 ft
Hydraulic Radius	2.5 in
Top Width	7.00 ft
Critical Depth	3.5 in
Critical Slope	0.004 ft/ft
Velocity	3.99 ft/s
Velocity Head	0.25 ft
Specific Energy	0.47 ft
Froude Number	1.503
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	Dry
Profile Headloss	0.00 ft
Downstream Velocity	∞ ft/s
Upstream Velocity	∞ ft/s
Normal Depth	2.6 in
Critical Depth	3.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.004 ft/ft

Figure 13-12c. Emergency Spillway Protection

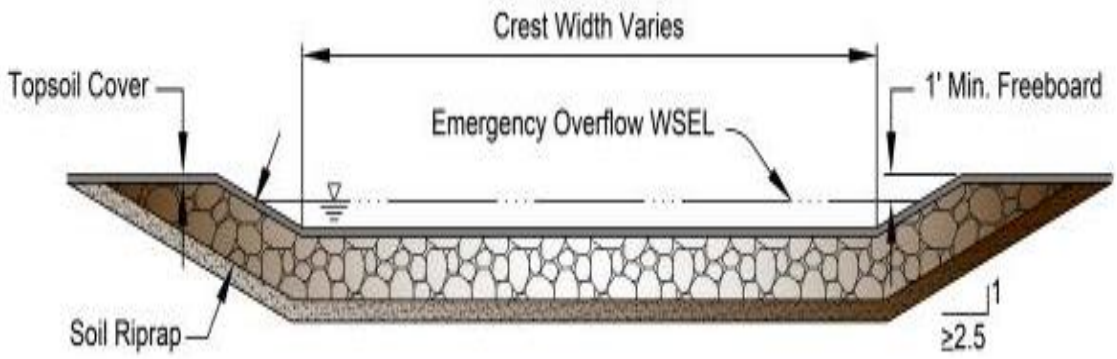
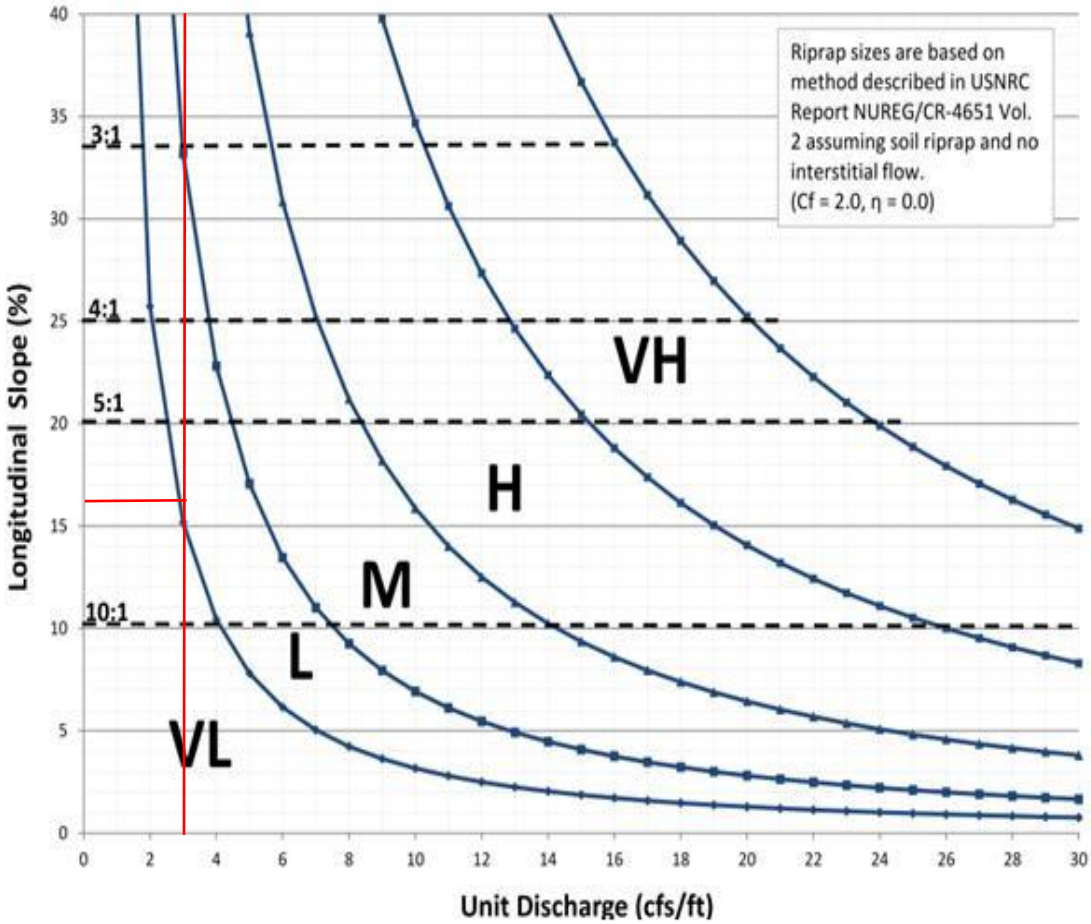


Figure 13-12d. Riprap Types for Emergency Spillway Protection



USE TYPE L RIP-RAP

ULTIMATE & INTERIM CONDITION

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: May 1, 2026
Project: Sterling Ranch East Filing No. 6 - Final Plat
Location: Easterly Forebay

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 51.1 %

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.511

C) Contributing Watershed Area — Area = 33.400 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
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$) — $V_{DESIGN\ OTHER}$ = 0.569 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 = 50 %
- ii) Percentage of Watershed consisting of Type B Soils — HSG_B = 50 %
- 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: $EURV_{C/D} = 1.20 * i^{1.08}$
— $EURV_{DESIGN}$ = 1.907 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:

5. Forebay

A) Minimum Forebay Volume
(V_{FMIN} = 3% of the WQCV) — V_{FMIN} = 0.017 ac-ft

B) Actual Forebay Volume — V_F = 0.017 ac-ft

C) Forebay Depth
(D_F = 18 inch maximum) — D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge — Q_{100} = 90.00 cfs

ii) Forebay Discharge Design Flow
($Q_F = 0.02 * Q_{100}$) — Q_F = 1.80 cfs

E) Forebay Discharge Design

Choose One
- ○ Berm With Pipe
- ◉ Wall with Rect. Notch
- ○ Wall with V-Notch Weir

Flow too small for berm w/ pipe

F) Discharge Pipe Size (minimum 8-inches) — Calculated D_P = in

G) Rectangular Notch Width — Calculated W_N = 7.1 in

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: July 27, 2026
Project: Sterling Ranch East Filing No. 6 - Final Plat
Location: Northwest Forebay

1. Basin Storage Volume		
A) Effective Imperviousness of Tributary Area, I_a	I_a = 49.1	%
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.491	
C) Contributing Watershed Area	Area = 136.000	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 ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$)	$V_{DESIGN\ OTHER}$= 2.256	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 = 50	%
ii) Percentage of Watershed consisting of Type B Soils	HSG_B = 50	%
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: $EURV_{C/D} = 1.20 * i^{1.08}$	$EURV_{DESIGN}$ = 7.405	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:		
5. Forebay		
A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)	V_{FMIN} = 0.068	ac-ft
B) Actual Forebay Volume	V_F = 0.068	ac-ft
C) Forebay Depth (D_F = 30 inch maximum)	D_F = 30.0	in
D) Forebay Discharge		
i) Undetained 100-year Peak Discharge	Q_{100} = 307.00	cfs
ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)	Q_F = 6.14	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 = 11.6	in

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: July 29, 2026
Project: Sterling Ranch East Filing No. 6 - Final Plat
Location: Southwest Forebay

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a — I_a = 52.0 %

B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$) — i = 0.520

C) Contributing Watershed Area — Area = 33.000 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
($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN}/0.43))$
$V_{DESIGN\ OTHER}$ = 0.569 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 = 50 %
ii) Percentage of Watershed consisting of Type B Soils — HSG_B = 50 %
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: $EURV_{C/D} = 1.20 * i^{1.08}$
$EURV_{DESIGN}$ = 1.923 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:

5. Forebay

A) Minimum Forebay Volume
(V_{FMIN} = 3% of the WQCV)
V_{FMIN} = 0.017 ac-ft

B) Actual Forebay Volume
V_F = 0.017 ac-ft

C) Forebay Depth
(D_F = 18 inch maximum)
D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge
Q_{100} = 90.00 cfs

ii) Forebay Discharge Design Flow
($Q_F = 0.02 * Q_{100}$)
Q_F = 1.80 cfs

E) Forebay Discharge Design

Choose One
- ○ Berm With Pipe
- ◉ Wall with Rect. Notch
- ○ Wall with V-Notch Weir

Flow too small for berm w/ pipe

F) Discharge Pipe Size (minimum 8-inches)
Calculated D_P = in

G) Rectangular Notch Width
Calculated W_N = 7.1 in

WATER QUALITY TREATMENT PLAN MAP

FILING 6 BOUNDARY LINE	
AREA ROUTED TO AND TREATED IN PROPOSED PERMANENT POND FSD-16	211.50 AC.
AREA ROUTED TO AND TREATED IN EXISTING PERMANENT POND FSD-14A	17.9 AC.
20% EXCLUSION LESS THAN 1.0 AC. UNTIL FUTURE DOWNSTREAM PERMANENT POND IN PLACE.	0.62 AC. (BASIN FF)

TRACT D
RETREAT AT TIMBERRIDGE
FILING NO. 1 - POND 2

EXIST. NATURAL SWALE TO CONTINUE SOUTH WITHIN BASIN F1-F1 UPON FUTURE DEVELOPMENT

FUTURE STERLING RANCH EAST DEVELOPMENT UNPLATTED

ANTICIPATED FUTURE BASIN TRIBUTARY TO POND FSD-16

REFERENCE "STERLING RANCH EAST PRELIM. PLAN FILINGS 5-6 - PRELIM. DRAINAGE REPORT" BASIN F1-F (SF2224)

FUTURE STERLING RANCH ROAD 90' PUBLIC ROW

EXIST. TEMP. SEDIMENT BASIN TO BE REMOVED UPON DEVELOPMENT OF STERLING RANCH EAST FILING NO. 4

EXIST. NATURAL SWALE TO BE REMOVED UPON DEVELOPMENT OF STERLING RANCH EAST FILING NO. 4

INTERIM OFF-SITE UNDEVELOPED BASIN

PLANNED STERLING RANCH EAST FILING NO. 4 (SF2224) UNPLATTED

FUTURE STERLING RANCH EAST DEVELOPMENT UNPLATTED

FUTURE SUMP CONDITION TYPE R SUMP INLETS SIZED WITH FUTURE FDR

TYPE R AT-GRADE INLET SIZED WITH FUTURE FDR AS REQUIRED

PROP. TEMP. SEDIMENT BASIN

PROP. PUBLIC 42" RCP STORM STUB

PROP. PUBLIC 48" RCP STORM

PROP. 10' TYPE R SUMP INLET

PROP. PUBLIC 42" RCP STORM

PROP. PUBLIC 18" RCP STORM (TYP.)

PROP. 5' TYPE R SUMP INLET

PROP. DIVERSION BERM TO ROUTE OFF-SITE FLOWS AROUND SITE.

STERLING RANCH ROAD

MINNEAPOLIS CT.

VANCOUVER STREET

MISSOULA WAY

GREAT FALLS DR.

GRAND FORKS DR.

ROCK SPRINGS CT.

SAUK FALLS WAY

JAMESTOWN PLACE

RAPID CITY PLACE

VANCOUVILLE RD.

PROP. PUBLIC 10' TYPE R AT-GRADE INLET

PROP. PUBLIC 10' TYPE R SUMP INLET

PROP. PUBLIC 15' TYPE R AT-GRADE INLET

PROP. PUBLIC 24" RCP STORM (TYP.)

PROP. PUBLIC 66" RCP STORM (TYP.)

PROP. PUBLIC 5' TYPE R SUMP INLET

PROP. PUBLIC 36" RCP STORM (TYP.)

PROP. PUBLIC 18" RCP STORM (TYP.)

PROP. PUBLIC 54" RCP STORM

PROP. PUBLIC 48" RCP STORM (TYP.)

PROP. 6' STD. CROSSPAN

PROP. PUBLIC 10' TYPE R AT-GRADE INLET

PROP. PUBLIC 15' TYPE R AT-GRADE INLETS

PROP. CONC. FOREBAY/ IMPACT STRUCTURE

PROP. CONC. TRICKLE CHANNEL

PROP. CONC. FOREBAY AND TRICKLE CHANNEL

PROP. CONC. MICROPOOL/ OUTLET STRUCTURE

PROP. CONC. FOREBAY

PROP. PUBLIC 10' TYPE R SUMP INLET (SF2235)

EXIST. 15' TYPE R AT-GRADE INLET (CDR221)

EXIST. 30" RCP STORM OUTFALL (CDR221)

EXIST. 36" RCP STORM OUTFALL (SF2235)

EXIST. 48" RCP STORM OUTFALL (CDR221)

EXIST. 18" RCP STORM

EXIST. 42" RCP STORM

EXIST. 48" RCP STORM

EXIST. PUBLIC 15' TYPE R SUMP INLET (SF2235)

EXIST. STERLING RANCH ROAD 90' PUBLIC ROW

EXIST. BRIARGATE PARKWAY (160' PUBLIC ROW)

PROP. BRIARGATE PARKWAY (160' PUBLIC ROW)

STERLING RANCH EAST FILING NO. 5 (SF2337)

STERLING RANCH EAST FILING NO. 6 (SF2238)

HOLCOMB CITY CIRCLE (50' PUBLIC ROW)

WATER PARK PATH (50' PUBLIC ROW)

SALT LAKE WAY (50' PUBLIC ROW)

RED RAMBLE TRAIL (50' PUBLIC ROW)

MANITOPA CT. (50' PUBLIC ROW)

SAND CREEK

VILLAGES AT STERLING RANCH

FUTURE STERLING RANCH EAST DEVELOPMENT UNPLATTED

DWG: P:\STERLING RANCH\SR EAST\DRAWINGS\PRELIM\SR EAST PRELIM DRAINAGE REPORT\SR EAST PRELIM DRAINAGE REPORT.DWG Map Date: Jan 08, 2024 - 2:39pm

JOB NAME:	*STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER:	*1183.60*
DATE:	*07/30/26*
CALCULATED BY:	*MAW*

POND FSD-16 TRIBUTARY BASINS (Ultimate)

TRIBUTARY BASIN	BASIN AREA (AC)	WEIGHTED % IMPERVIOUS
A	3.60	52.5%
B	1.20	52.5%
C	4.50	46.4%
D	1.50	52.5%
E	1.60	52.5%
F	3.50	52.5%
G	1.10	52.5%
H	1.70	52.5%
I	0.22	52.5%
J	1.90	52.5%
K	0.73	52.5%
L	2.20	46.0%
M	0.57	46.0%
N	1.70	52.5%
O	0.49	52.5%
P	0.40	52.5%
Q	1.70	52.5%
R	2.70	52.5%
S	1.60	52.5%
T	0.49	52.5%
V	2.70	34.9%
W	0.79	52.5%
X	2.00	52.5%
Y	3.20	46.0%
Z	0.30	26.5%
AA	2.60	42.3%
BB	6.20	7.0%
CC	5.80	31.2%
DD	4.40	48.4%
EE	1.30	50.5%
GG	2.50	63.9%
HH	2.00	76.3%
F4-1	9.00	46.0%
F4-2	2.20	46.0%
F4-3	3.20	46.0%
F4-4	9.80	31.3%
F4-5	1.70	52.5%
F4-6	3.50	46.0%
F4-7	6.90	52.5%
F4-8	1.10	52.5%
F4-9	4.90	52.5%
F4-10	8.50	52.5%
F2-A	2.90	52.5%
F2-B	5.00	52.5%
F8-1	3.30	49.7%
F8-2	1.00	41.3%
F8-3	3.00	60.2%
F8-4	5.00	62.1%
F8-5	2.50	53.6%
F8-6	3.50	45.1%
F8-7	4.90	63.2%
SR-1	1.20	65.1%
SR-2	0.65	75.7%
P1-F1	60.60	52.5%
TOTAL	**211.5**	**49.1%**

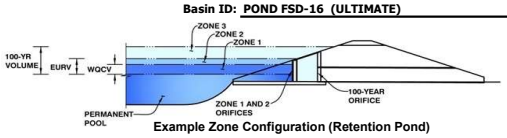
POND FSD-16 (Ultimate) EFF. IMPERVIOUS % **49.1%**

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT

Basin ID: POND FSD-16 (ULTIMATE)



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	211.50	acres
Watershed Length =	4,000	ft
Watershed Length to Centroid =	2,000	ft
Watershed Slope =	0.040	ft/ft
Watershed Imperviousness =	49.10%	percent
Percentage Hydrologic Soil Group A =	75.0%	percent
Percentage Hydrologic Soil Group B =	25.0%	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) =	3.592	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	11.706	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	9.253	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	12.236	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	15.137	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	20.045	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	23.974	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	29.280	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3 in.) =	37.677	acre-feet	3.00	inches
Approximate 2-yr Detention Volume =	7.828	acre-feet		
Approximate 5-yr Detention Volume =	10.426	acre-feet		
Approximate 10-yr Detention Volume =	13.041	acre-feet		
Approximate 25-yr Detention Volume =	15.483	acre-feet		
Approximate 50-yr Detention Volume =	17.000	acre-feet		
Approximate 100-yr Detention Volume =	19.152	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	3.592	acre-feet
Zone 2 Volume (EURV - Zone 1) =	8.114	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	7.446	acre-feet
Total Detention Basin Volume =	19.152	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

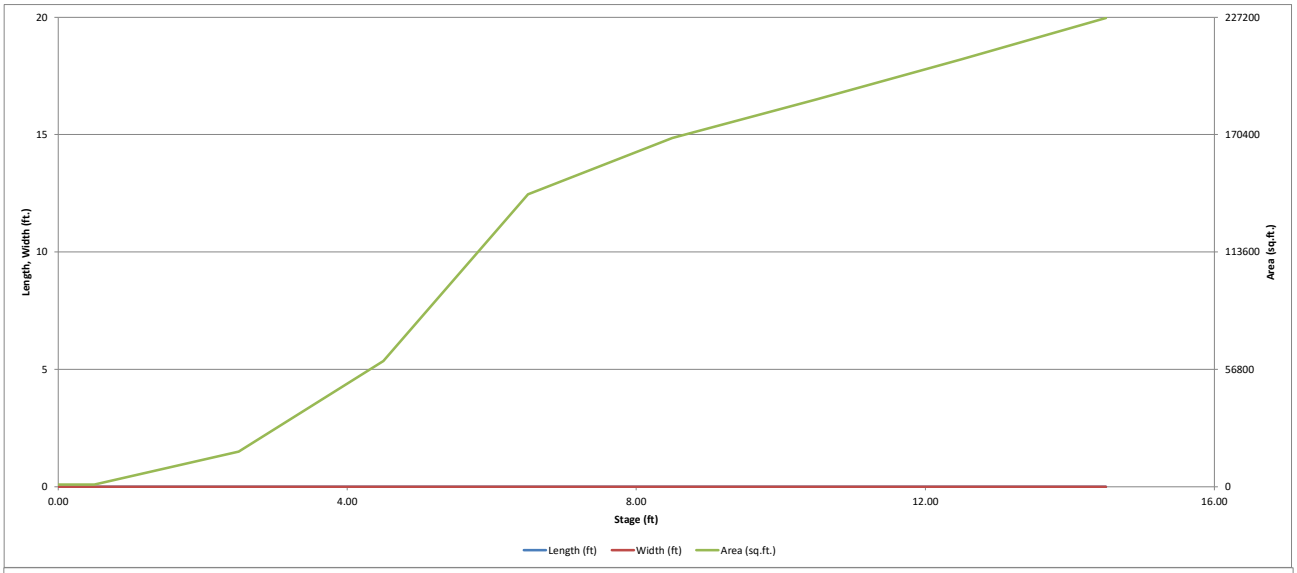
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user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

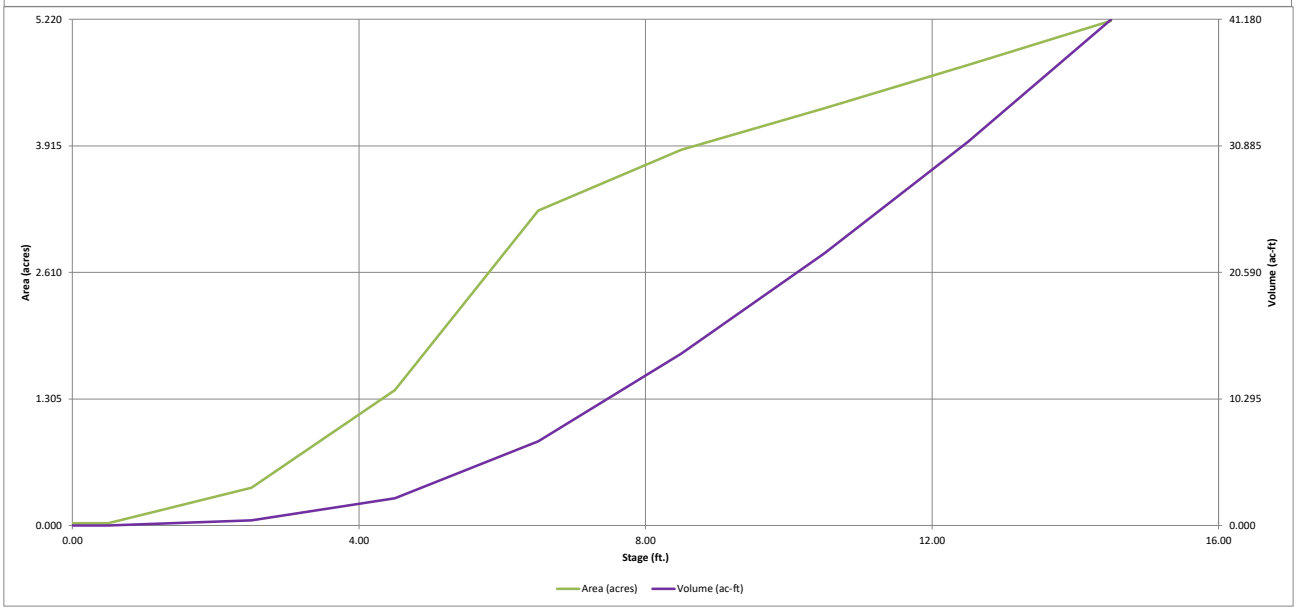
Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	1,027	0.024		
7092	--	0.50	--	--	--	1,027	0.024	514	0.012
7094	--	2.50	--	--	--	17,010	0.390	18,550	0.426
7096	--	4.50	--	--	--	60,913	1.398	96,473	2.215
7098	--	6.50	--	--	--	141,508	3.249	298,894	6.862
7100	--	8.50	--	--	--	168,799	3.875	609,201	13.985
7102	--	10.50	--	--	--	187,503	4.304	965,503	22.165
7104	--	12.50	--	--	--	206,914	4.750	1,359,920	31.219
7106	--	14.50	--	--	--	226,802	5.207	1,793,636	41.176

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



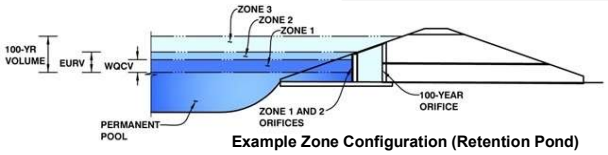


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT

Basin ID: POND FSD-16 (ULTIMATE)



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	5.29	3.592	Orifice Plate
Zone 2 (EURV)	7.90	8.114	Orifice Plate
Zone 3 (100-year)	9.79	7.446	Weir&Pipe (Restrict)
Total (all zones)		19.152	

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

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

Calculated Parameters for Underdrain

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

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	8.50	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	20.40	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	sq. inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.70	3.40	5.10	6.80			
Orifice Area (sq. inches)	7.00	9.00	16.00	16.00	16.00			

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

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	8.50	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	8.50	N/A	feet
Overflow Weir Front Edge Length =	20.00	N/A	feet	Overflow Weir Slope Length =	4.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	7.65	N/A	
Horiz. Length of Weir Sides =	4.00	N/A	feet	Overflow Grate Open Area w/o Debris =	55.68	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	27.84	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	7.28	N/A	ft^2
Outlet Pipe Diameter =	48.00	N/A	inches	Outlet Orifice Centroid =	1.28	N/A	feet
Restrictor Plate Height Above Pipe Invert =	27.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.70	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	12.50	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	1.00	feet
Spillway Crest Length =	170.00	feet	Stage at Top of Freeboard =	14.50	feet
Spillway End Slopes =	6.00	H:V	Basin Area at Top of Freeboard =	5.21	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	41.18	acre-ft

Calculated Parameters for Spillway

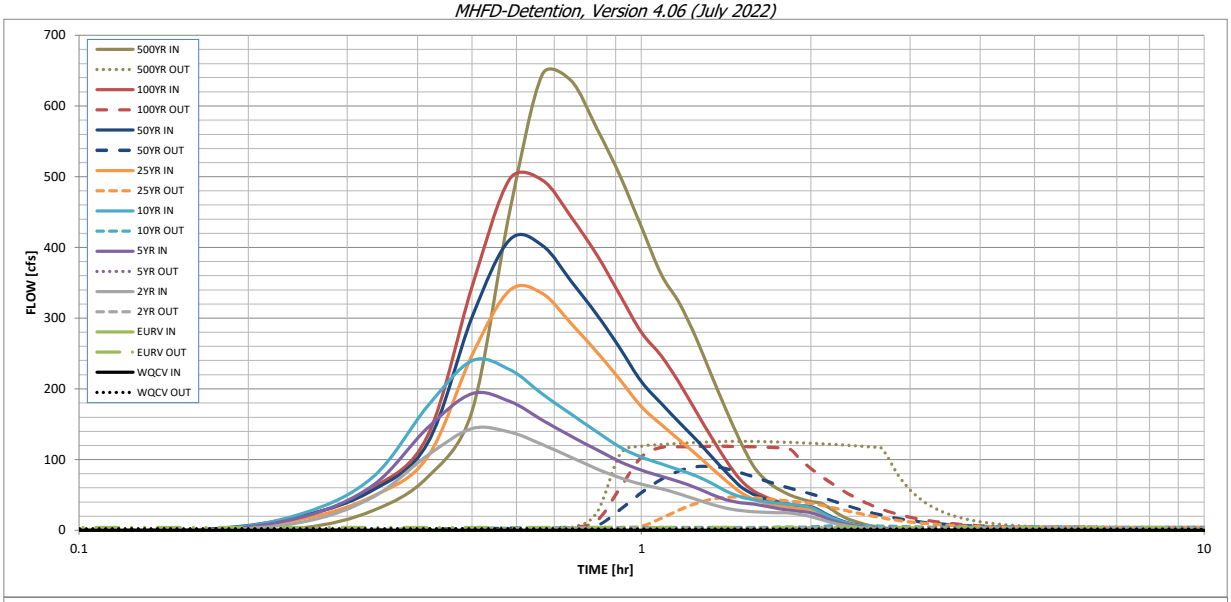
Routed Hydrograph Results

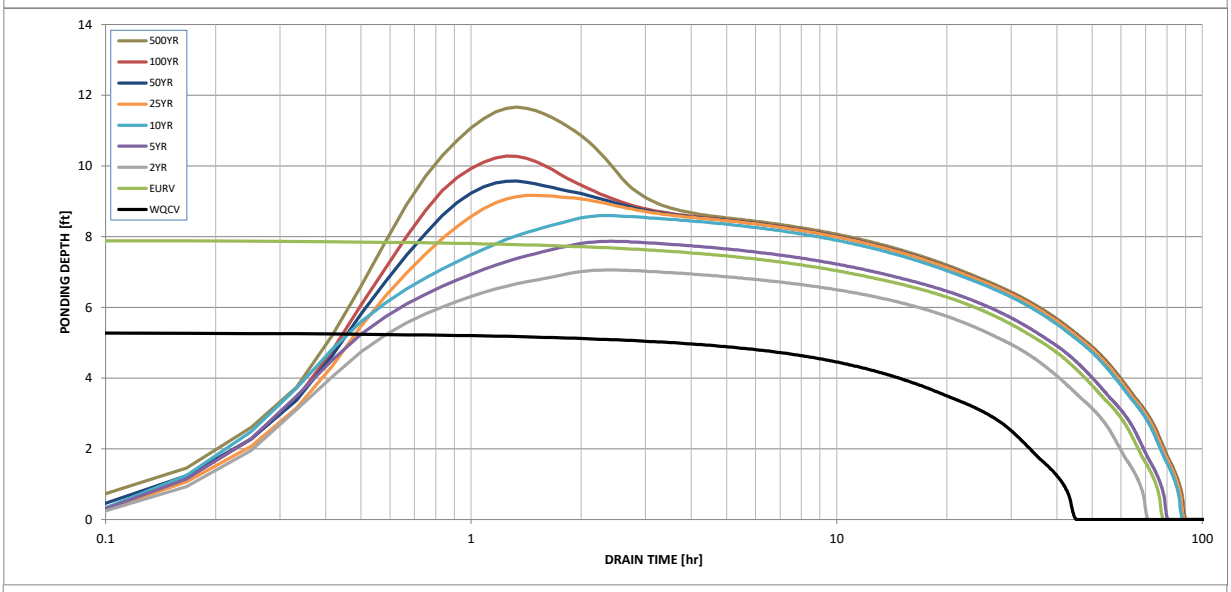
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

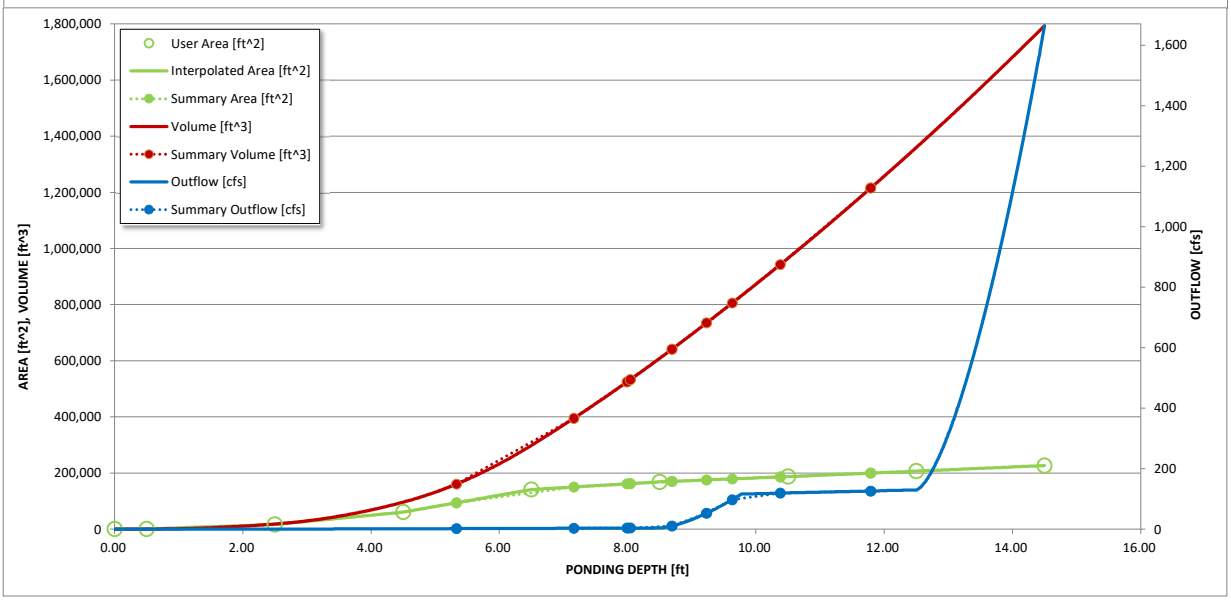
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.00
CUHP Runoff Volume (acre-ft) =	3.592	11.706	9.253	12.236	15.137	20.045	23.974	29.280	37.677
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	9.253	12.236	15.137	20.045	23.974	29.280	37.677
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	2.5	4.3	22.1	90.6	133.2	193.1	288.1
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.10	0.43	0.63	0.91	1.36
Peak Inflow Q (cfs) =	N/A	N/A	143.7	193.1	239.7	339.3	410.9	496.7	644.7
Peak Outflow Q (cfs) =	2.1	4.0	3.4	4.0	6.7	46.9	90.4	118.8	125.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.9	0.3	0.5	0.7	0.6	0.4
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.0	0.8	1.5	2.0	2.2
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	59	67	73	71	69	67	64
Time to Drain 99% of Inflow Volume (hours) =	**42**	71	65	74	80	79	78	77	76
Maximum Ponding Depth (ft) =	5.29	7.90	7.06	7.87	8.59	9.17	9.57	10.28	11.66
Area at Maximum Ponding Depth (acres) =	2.13	3.69	3.42	3.67	3.89	4.02	4.10	4.26	4.56
Maximum Volume Stored (acre-ft) =	3.608	11.717	8.696	11.569	14.335	16.590	18.214	21.181	27.308

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	1.34	0.13	3.39
	0:15:00	0.00	0.00	11.65	19.15	23.83	16.06	20.69	19.72	27.90
	0:20:00	0.00	0.00	46.85	63.75	75.65	48.28	56.84	60.25	75.15
	0:25:00	0.00	0.00	106.07	144.99	175.45	103.46	122.86	133.31	168.33
	0:30:00	0.00	0.00	143.73	193.12	239.69	247.59	301.25	344.55	451.33
	0:35:00	0.00	0.00	138.94	182.21	227.19	339.27	410.94	496.71	644.73
	0:40:00	0.00	0.00	121.06	155.82	192.62	334.63	402.74	495.18	635.82
	0:45:00	0.00	0.00	103.22	132.94	164.08	292.18	351.96	442.95	568.16
	0:50:00	0.00	0.00	86.94	113.98	139.19	252.14	305.11	389.41	500.94
	0:55:00	0.00	0.00	74.00	96.99	117.48	212.59	256.95	332.11	428.69
	1:00:00	0.00	0.00	65.12	84.92	103.42	174.63	209.95	279.70	362.27
	1:05:00	0.00	0.00	58.95	76.44	94.01	149.83	179.66	247.17	322.10
	1:10:00	0.00	0.00	51.60	68.88	85.51	128.14	153.08	208.94	272.24
	1:15:00	0.00	0.00	43.69	60.14	76.99	107.82	128.33	168.10	218.36
	1:20:00	0.00	0.00	36.72	50.84	66.61	87.96	103.98	131.06	169.24
	1:25:00	0.00	0.00	31.17	43.17	55.03	69.86	81.75	98.12	125.49
	1:30:00	0.00	0.00	27.83	39.03	47.42	53.63	62.17	71.28	90.42
	1:35:00	0.00	0.00	26.22	36.96	43.23	43.84	50.55	55.51	70.02
	1:40:00	0.00	0.00	25.38	33.94	40.36	38.19	43.73	46.64	58.28
	1:45:00	0.00	0.00	24.88	30.76	38.27	34.76	39.53	40.62	50.18
	1:50:00	0.00	0.00	24.50	28.47	36.84	32.36	36.64	36.64	44.74
	1:55:00	0.00	0.00	22.27	26.79	35.21	30.84	34.83	33.88	40.92
	2:00:00	0.00	0.00	19.45	24.99	32.40	29.75	33.54	31.91	38.24
	2:05:00	0.00	0.00	15.47	20.13	25.81	24.31	27.35	25.70	30.64
	2:10:00	0.00	0.00	11.39	14.65	18.68	17.60	19.75	18.57	22.06
	2:15:00	0.00	0.00	8.35	10.68	13.53	12.76	14.30	13.48	15.98
	2:20:00	0.00	0.00	6.06	7.72	9.79	9.27	10.38	9.86	11.67
	2:25:00	0.00	0.00	4.35	5.42	6.97	6.58	7.35	7.01	8.29
	2:30:00	0.00	0.00	3.03	3.71	4.88	4.59	5.12	4.88	5.75
	2:35:00	0.00	0.00	2.06	2.56	3.40	3.25	3.62	3.45	4.07
	2:40:00	0.00	0.00	1.31	1.70	2.22	2.17	2.41	2.29	2.69
	2:45:00	0.00	0.00	0.74	1.03	1.29	1.30	1.44	1.36	1.59
	2:50:00	0.00	0.00	0.35	0.52	0.62	0.65	0.72	0.67	0.78
	2:55:00	0.00	0.00	0.13	0.18	0.20	0.22	0.24	0.22	0.25
	3:00:00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.
The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]
WQCV	5.33	94,360	2.166	160,911	3.694	2.11
2-yr.	7.16	150,514	3.455	395,261	9.074	3.46
5-yr.	7.99	161,840	3.715	524,888	12.050	4.06
EURV	8.04	162,522	3.731	532,997	12.236	4.09
10-yr.	8.69	170,576	3.916	641,442	14.725	10.87
25-yr.	9.23	175,626	4.032	734,916	16.871	52.98
50-yr.	9.63	179,367	4.118	805,915	18.501	97.83
100-yr.	10.38	186,381	4.279	943,070	21.650	119.37
500-yr.	11.79	200,023	4.592	1,215,457	27.903	126.42

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

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

JOB NAME:	*STERLING RANCH EAST FILING NO. 6 - FINAL PLAT*
JOB NUMBER:	*1183.60*
DATE:	*07/30/26*
CALCULATED BY:	*MAW*

POND FSD-16 TRIBUTARY BASINS (Interim)

TRIBUTARY BASIN	BASIN AREA (AC)	WEIGHTED % IMPERVIOUS
A	3.60	52.5%
B	1.20	52.5%
C	4.50	46.4%
D	1.50	52.5%
E	1.60	52.5%
F	3.50	52.5%
G	1.10	52.5%
H	1.70	52.5%
I	0.22	52.5%
J	1.90	52.5%
K	0.73	52.5%
L	2.20	46.0%
M	0.57	46.0%
N	1.70	52.5%
O	0.49	52.5%
P	0.40	52.5%
Q	1.70	52.5%
R	2.70	52.5%
S	1.60	52.5%
T	0.49	52.5%
V	2.70	34.9%
W	0.79	52.5%
X	2.00	52.5%
Y	3.20	46.0%
Z	0.30	26.5%
AA	2.60	42.3%
BB	6.20	7.0%
CC	5.80	31.2%
DD	4.40	48.4%
EE	1.30	50.5%
GG	2.50	63.9%
HH	2.00	76.3%
F4-1	9.00	46.0%
F4-2	2.20	46.0%
F4-3	3.20	46.0%
F4-4	9.80	31.3%
F4-5	1.70	52.5%
F4-6	3.50	46.0%
F4-7	6.90	52.5%
F4-8	1.10	52.5%
F4-9	4.90	52.5%
F4-10	8.50	52.5%
F2-A	2.90	52.5%
F2-B	5.00	52.5%
F8-1	3.70	48.8%
F8-2	1.00	42.1%
F8-3	3.40	54.8%
F8-4	4.70	61.3%
F8-5	3.00	55.5%
F8-6	2.80	51.5%
F8-7	4.60	63.1%
SR-1	1.20	65.1%
SR-2	0.65	75.7%
P1-INT	33.40	2.0%
TOTAL	**184.3**	**39.4%**

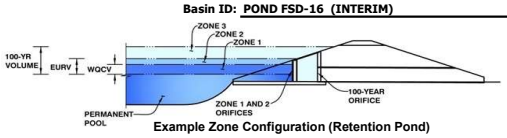
POND FSD-16 (Ultimate) EFF. IMPERVIOUS % **39.4%**

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT

Basin ID: POND FSD-16 (INTERIM)



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	184.30	acres
Watershed Length =	4,000	ft
Watershed Length to Centroid =	2,000	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	39.40%	percent
Percentage Hydrologic Soil Group A =	75.0%	percent
Percentage Hydrologic Soil Group B =	25.0%	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) =	2.738	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	7.778	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	6.205	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	8.308	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	10.542	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	14.825	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	18.119	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	22.767	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3 in.) =	29.988	acre-feet	3.00	inches
Approximate 2-yr Detention Volume =	5.140	acre-feet		
Approximate 5-yr Detention Volume =	6.911	acre-feet		
Approximate 10-yr Detention Volume =	8.815	acre-feet		
Approximate 25-yr Detention Volume =	10.617	acre-feet		
Approximate 50-yr Detention Volume =	11.772	acre-feet		
Approximate 100-yr Detention Volume =	13.648	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	2.738	acre-feet
Zone 2 Volume (EURV - Zone 1) =	5.041	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	5.869	acre-feet
Total Detention Basin Volume =	13.648	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

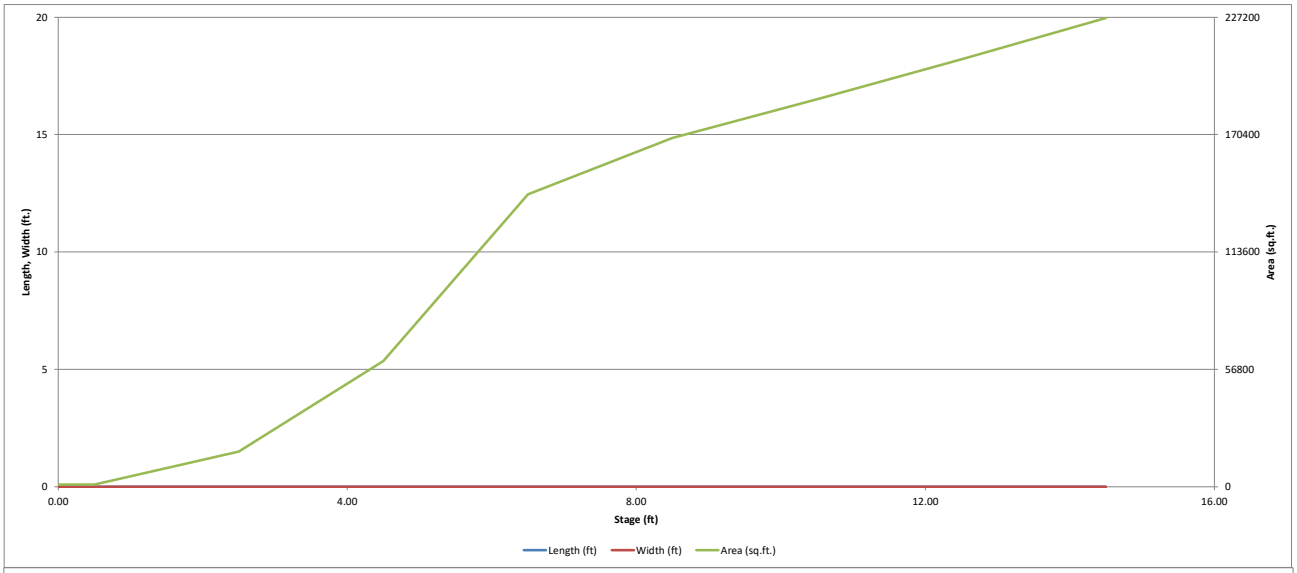
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user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

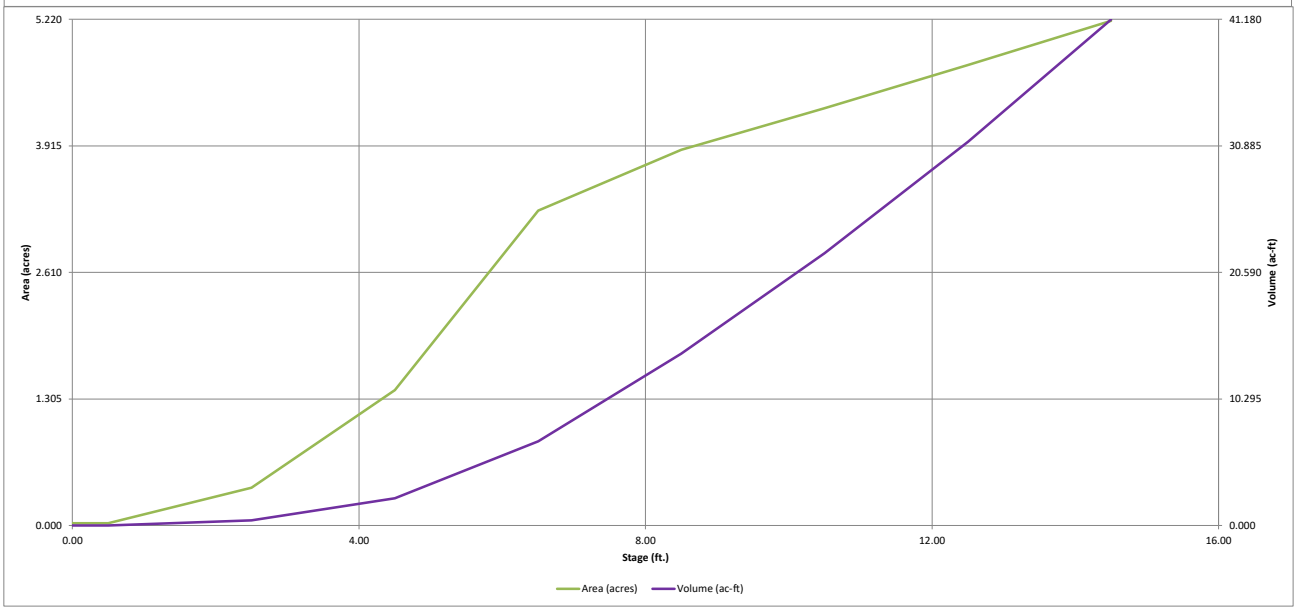
Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	1,027	0.024		
7092	--	0.50	--	--	--	1,027	0.024	514	0.012
7094	--	2.50	--	--	--	17,010	0.390	18,550	0.426
7096	--	4.50	--	--	--	60,913	1.398	96,473	2.215
7098	--	6.50	--	--	--	141,508	3.249	298,894	6.862
7100	--	8.50	--	--	--	168,799	3.875	609,201	13.985
7102	--	10.50	--	--	--	187,503	4.304	965,503	22.165
7104	--	12.50	--	--	--	206,914	4.750	1,359,920	31.219
7106	--	14.50	--	--	--	226,802	5.207	1,793,636	41.176

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)



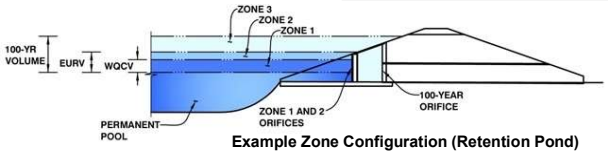


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: STERLING RANCH EAST FILING NO. 6 - FINAL PLAT

Basin ID: POND FSD-16 (INTERIM)



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	4.84	2.738	Orifice Plate
Zone 2 (EURV)	6.78	5.041	Orifice Plate
Zone 3 (100-year)	8.42	5.869	Weir&Pipe (Restrict)
Total (all zones)		13.648	

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

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

Calculated Parameters for Underdrain

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

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	8.50	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	20.40	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	sq. inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.70	3.40	5.10	6.80			
Orifice Area (sq. inches)	4.00	4.00	25.00	25.00	25.00			

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

Calculated Parameters for Vertical Orifice

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

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	8.50	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	8.50	N/A	feet
Overflow Weir Front Edge Length =	20.00	N/A	feet	Overflow Weir Slope Length =	4.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	4.43	N/A	
Horiz. Length of Weir Sides =	4.00	N/A	feet	Overflow Grate Open Area w/o Debris =	55.68	N/A	ft^2
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	27.84	N/A	ft^2
Debris Clogging % =	50%	N/A	%				

Calculated Parameters for Overflow Weir

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

	Zone 3 Restrictor	Not Selected			Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	12.57	N/A	ft^2
Outlet Pipe Diameter =	48.00	N/A	inches	Outlet Orifice Centroid =	2.00	N/A	feet
Restrictor Plate Height Above Pipe Invert =	48.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	12.50	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	1.00	feet
Spillway Crest Length =	170.00	feet	Stage at Top of Freeboard =	14.50	feet
Spillway End Slopes =	6.00	H:V	Basin Area at Top of Freeboard =	5.21	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	41.18	acre-ft

Calculated Parameters for Spillway

Routed Hydrograph Results

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

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.00
CUHP Runoff Volume (acre-ft) =	2.738	7.778	6.205	8.308	10.542	14.825	18.119	22.767	29.988
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	6.205	8.308	10.542	14.825	18.119	22.767	29.988
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.8	3.1	15.8	65.0	96.2	142.8	213.5
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.02	0.09	0.35	0.52	0.77	1.16
Peak Inflow Q (cfs) =	N/A	N/A	74.9	101.6	131.5	205.8	254.1	315.8	416.7
Peak Outflow Q (cfs) =	1.5	3.3	2.8	3.3	4.2	5.3	31.4	76.8	152.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.1	0.3	0.1	0.3	0.5	0.7
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	0.5	1.3	2.6
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) =	54	69	66	71	75	80	78	74	67
Time to Drain 99% of Inflow Volume (hours) =	**59**	79	75	82	87	94	93	91	88
Maximum Ponding Depth (ft) =	4.84	6.78	6.13	6.76	7.38	8.49	8.98	9.44	10.03
Area at Maximum Ponding Depth (acres) =	1.71	3.34	2.90	3.33	3.52	3.87	3.98	4.08	4.20
Maximum Volume Stored (acre-ft) =	2.744	7.784	5.694	7.717	9.806	13.947	15.870	17.723	20.166

DETENTION BASIN OUTLET STRUCTURE DESIGN

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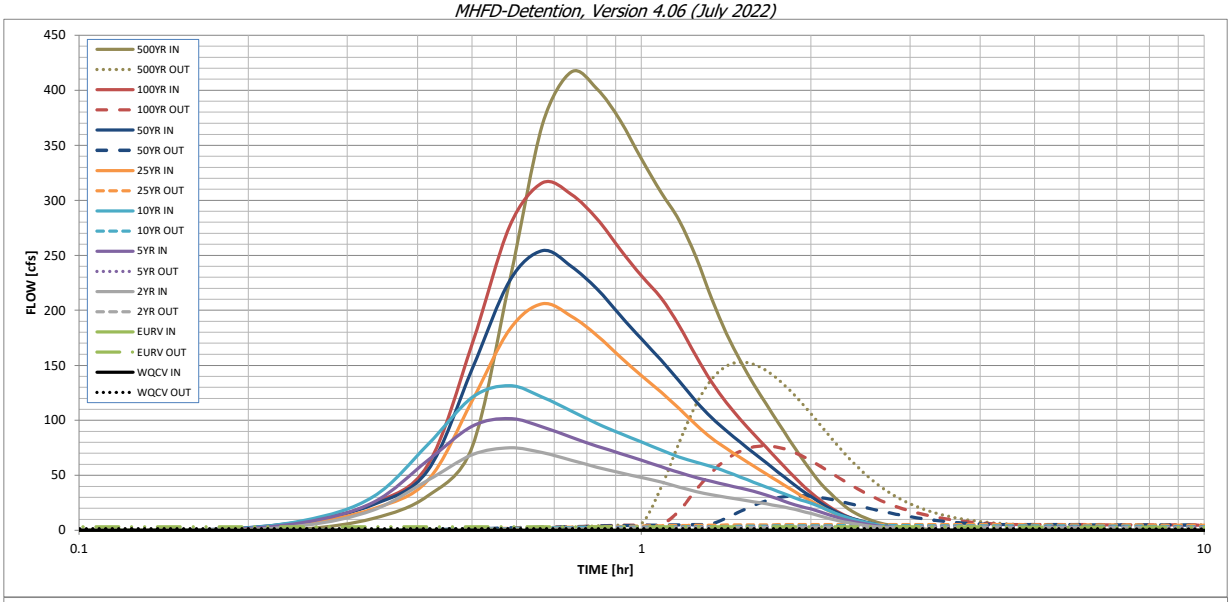

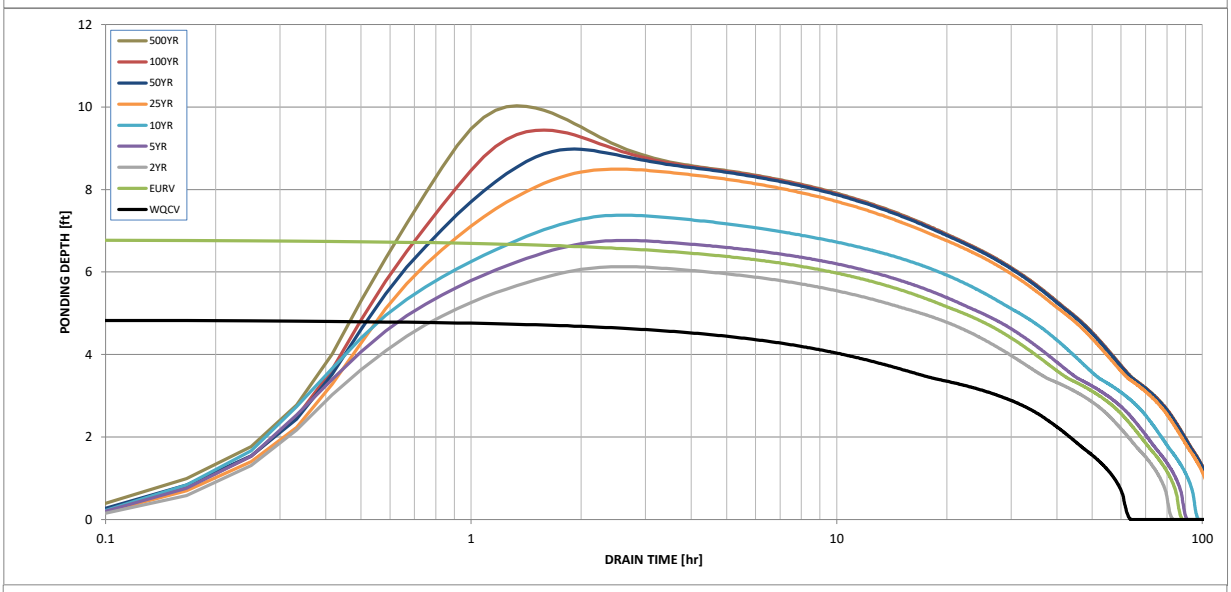

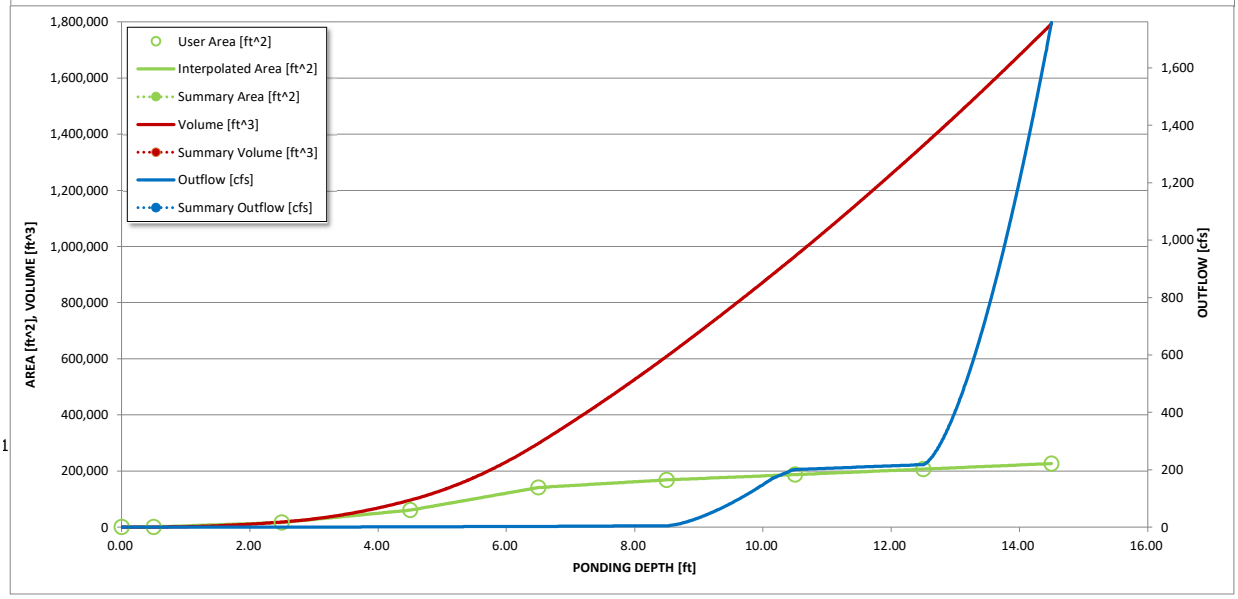

S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			