FINAL DRAINAGE PLAN

THE RIDGE AT LORSON RANCH

FILING NO. 1: SF 22-XX SF224

FILING NO. 2 : SF22-XX SF225

FILING NO. 3: SF22-XX SF227

JANUARY, 2022

Prepared for:

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Project No. 100.066

CORE ENGINEERING GROUP

Summary of Comments on Microsoft Word - 100.064-pdr

Page: 1

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/14/2022 6:04:48 PM -06'00'
SF224

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:26:26 PM -06'00'
added

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/14/2022 6:04:57 PM -06'00'
SF225

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:26:30 PM -06'00'
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Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/14/2022 6:11:55 PM -06'00'
SF227

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:26:34 PM -06'00'
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1.0 LOCATION and DESCRIPTION

The Ridge at Lorson Ranch Filing No's. 1-3 is located east of the East Tributary of Jimmy Camp Creek. The entire three filings are located on approximately 206.473 acres of vacant land. This project will develop this site into a single-family residential development. The land for the residential lots is currently owned by Love In Action

The site is located in the NE 1/4 of Sections 24 and the SE 1/4 of Section 13, Township 15 South and Range 65 West of the 6th Principal Meridian. The site is bounded on the north by unplatted land owned by Bull Hill, LLC, on the west by The Hills at Lorson Ranch, on the east by unplatted land, and the south by unplatted land in Lorson Ranch. For reference, a vicinity map is included in Appendix A of this report.

Conformance with applicable Drainage Basin Planning Studies (DBPS)
There is an existing (unapproved) DBPS for Jimmy Camp Creek prepared by Wilson & Company in 1987, and is referenced in this report. The only major drainage improvements for this study area according to the 1987 Wilson study was the reconstruction of the East Tributary of Jimmy Camp Creek (East Tributary). In 2014 and in 2018 the East Tributary was reconstructed from downstream of Lorson Boulevard north to the northern property line of Lorson Ranch in accordance with the 1987 study. The last section of the East Tributary (to the south property line of Lorson Ranch) has been designed by Kiowa Engineering and will be completed in 2020. There are no further improvements to be made on the East Tributary. On March 9, 2015 a new DBPS for Jimmy Camp Creek and the East Tributary was completed by Kiowa Engineering. The Kiowa Engineering DBPS for Jimmy Camp Creek has not been adopted by El Paso County but is allowed for concept design. The concept design includes the East Tributary armoring concept and the full spectrum detention pond requirements. The Kiowa DBPS did not calculate drainage fees so current El Paso County drainage/bridge fees apply to this

Conformance with Lorson East MDDP by Core Engineering Group
Core Engineering Group has an approved MDDP for Lorson East which covers this study area. This PDR conforms to the MDDP for Lorson East and is referenced in this report. The major infrastructure to be constructed in this site includes outlet structures in Detention/WQ Ponds C2.1 and C4 and WQ Pond F. Both detention ponds were graded, low flow channels, and forebays were constructed as part of The Hills at Lorson Ranch under PUDSP-20-003 and the WQ Pond F will be constructed with this project. There are also two bridges over the East Tributary that were built in 2018 to provide access to this development across the East Tributary. The bridges are located at Fontaine Boulevard and Lorson Boulevard.

The Ridge at Lorson Ranch is located within the ***"Jimmy Camp Creek Drainage Basin"***, which is a fee basin in El Paso County and a small portion (SE corner) within the "Upper Williams Creek Drainage Basin which does not have a DBPS.

2.0 DRAINAGE CRITERIA

The supporting drainage design and calculations were performed in accordance with the City of Colorado Springs and El Paso County "Drainage Criteria Manual (DCM)", dated November, 1991, the El Paso County "Engineering Criteria Manual", Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014, and the UDFCD "Urban Storm Drainage Criteria Manual" Volumes 1, 2 and 3 for inlet sizing and full spectrum ponds. No deviations from these published criteria are requested for this site.

The Rational Method as outlined in Section 6.3.0 of the May 2014 "Drainage Criteria Manual" and in Section 3.2.8.F of the El Paso County "Engineering Criteria Manual" was used for basins less than 130

Reference Preliminary
Report which was also

rt

Page: 4

Author: CDurham Subject: Callout Date: 2/17/2022 1:15:57 PM -06'00'
Reference Preliminary Drainage Report which was also completed.

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:30:13 PM -06'00'
added text

Author: CDurham Subject: Callout Date: 2/17/2022 1:15:29 PM -06'00'
Final Drainage Report

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:30:21 PM -06'00'
updated text

Author: CDurham Subject: Callout Date: 2/17/2022 1:16:52 PM -06'00'
Ponds C2.1 & C4

Author: RSchindler Subject: Sticky Note Date: 3/7/2022 2:30:49 PM -06'00'
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This site is not located within the delineated 100-year floodplain of the East Tributary of Jimmy Camp Creek per the Federal Emergency Management Agency (FEMA) Flood Rate Insurance Map (FIRM) number 08041C10976 G, effective December 7, 2018.

Basin OS-B1.1
This existing offsite basin consists of existing flow from undeveloped areas east of Lorson Ranch. Runoff flows overland to the northwest and drains offsite at Design Point 1x. The existing runoff is 5.2cfs and 29.0cfs for the 5-year and 100-year events.

Basin EX-B1
This existing basin consists of existing flow from undeveloped areas within Lorson Ranch near the north property line. Runoff flows overland to the north and drains offsite at Design Point 1x. The existing runoff is 5.6cfs and 31.2cfs for the 5-year and 100-year events.

Design Point 1x
Design Point 1x is the total existing runoff flowing offsite to the north. The developed runoff flowing north will need to be lower than the existing runoff at this design point. The existing runoff is 9.7cfs and 54.2cfs for the 5-year and 100-year events.

Basin C1.1-ex
This existing basin consists of existing flow from undeveloped areas east of the Lorson Boulevard/Walleye Drive intersection. Runoff flows overland to the west and drains into an existing storm sewer system in Lorson/Walleye. The existing runoff is 3.2cfs and 21cfs for the 5-year and 100-year events.

21.4

Basin C2.1-ex
This existing basin consists of existing flow from undeveloped areas east of the Fontaine Boulevard/Walleye Drive intersection. Runoff flows overland to the west and drains into an existing storm sewer system in Fontaine/Walleye. The existing runoff is 6.1cfs and 40.2cfs for the 5-year and 100-year events.

Basin C2.2-ex
This existing basin consists of existing flow from undeveloped areas on west side of the site. Runoff flows overland to the west and drains to an existing 42" storm sewer that discharges west into Existing Pond C2.1. The existing runoff is 12.2cfs and 81.8cfs for the 5-year and 100-year events.

Basin C3.1-ex
This existing basin consists of existing flow from undeveloped areas on the central portion of the PUD. Runoff flows overland to the west and drains into an existing storm sewer system at the intersection of Walleye Drive/Grayling Drive. The existing runoff is 2.6cfs and 15.0cfs for the 5-year and 100-year events.

Basin C4.1-ex
This existing basin consists of existing flow from offsite undeveloped areas east of Lorson Ranch. Runoff flows overland to the west into Basin C4.2-ex. The existing runoff is 1.2cfs and 7.8cfs for the 5-year and 100-year events.

Basin C4.2-ex
This existing basin consists of existing flow from undeveloped areas in the northern portion of the PUD. Runoff flows overland to the west to Existing Pond C4 excavated as part of The Hills at Lorson Ranch. The existing runoff is 15.0cfs and 85.1cfs for the 5-year and 100-year events.

Design Point 4x
Design Point 4x is the existing flow entering Exising Pond C4 from Basin C4.1-ex and C4.2-ex. The existing runoff is 15.3cfs and 87.7cfs for the 5-year and 100-year events from these two basins. This flow is then routed south into Existing Pond C3.

Update flow to match hydrology spreadsheet

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Page: 6

Author: CDurham Subject: Callout Date: 2/17/2022 1:22:32 PM -06'00'
21.4

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 8:30:39 AM -06'00'
updated.

Author: CDurham Subject: Callout Date: 2/17/2022 1:25:06 PM -06'00'
Update flow to match hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 8:57:01 AM -06'00'
FLOWS UPDATED

Page: 7

Author: CDurham Subject: Text Box Date: 2/17/2022 1:26:54 PM -06'00'
Include discussion for Basins Ex-G and Ex-H, shown on existing drainage map

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:09:56 AM -06'00'
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Author: CDurham Subject: Callout Date: 2/17/2022 1:35:03 PM -06'00'
Label all inlets as either sump or at-grade

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:16:02 AM -06'00'
ALL INLETS ARE LABELED IN THE DESIGN POINT DISCUSSIONS. THIS SECTION IS JUST HYDROLOGY

Basin EX-F1
This existing basin consists of existing flow from undeveloped areas in the east portions of the PUD. Runoff flows overland eastward and offisite to the adjacent landowner located in the Upper Williams Creek Drainage Basin. The existing runoff is 6.3cfs and 38.5cfs for the 5-year and 100-year events.

Basin EX-F2
This existing basin consists of existing flow from undeveloped areas in the east portions of the PUD. Runoff flows overland southeast and offisite to the adjacent landowner located in the Upper Williams Creek Drainage Basin. The existing runoff is 9.1cfs and 51.1cfs for the 5-year and 100-year events.

Design Point 2x
Design Point 2x is the total existing flow at the east property line from Basins EX-F1 and EX-F2. The existing runoff is 12.4cfs and 72.7cfs for the 5-year and 100-year events from these two basins. This flows east overland and offsite in the Upper Williams Creek Drainage Basin. Per Colorado Water regulations Lorson Ranch will need to maintain existing runoff amounts into the Upper Williams Creek Drainage Basin.

Include discussion for Basins Ex-G and Ex-H, shown on existing drainage map

4.0 DEVELOPED HYDROLOGICAL CONDITIONS

Hydrology for the **The Ridge at Lorson Ranch** drainage report was based on the City of Colorado Springs/El Paso County Drainage Criteria. Sub-basins that lie within this project were determined and the 5-year and 100-year peak discharges for the developed conditions have been presented in this report. Based on these flows, storm inlets will be added when the street capacity is exceeded.

Soil type B/C/D has been assumed for the developed hydrologic conditions. See Appendix A for SCS Soils Map.

The time of concentration for each basin and sub-basin was developed using an overland, ditch, street and pipe flow components. The maximum overland flow length for developed conditions was limited to 100 feet. Travel time velocities ranged from 2 to 6 feet per second. The travel time calculations are included in the back of this report.
Runoff coefficients for the various land uses were obtained from Table 6-6 dated May, 2014 from the updated City of Colorado Springs/El Paso County Drainage Criteria Manual. See Appendix B.

All detention ponds for this project have been constructed per The Hills at Lorson Ranch (SF21-010 & EGP 20-005) and WQ Pond F will be constructed with this project. See Section 6.0 for Detention Pond Discussions. The list below shows the ponds and the tributary drainage basins:

1. C1 Basins drain to Pond C1
2. C3 & C4 Basins drain to Pond C2.1
3. C5 Basins drain to Pond C2.2
4. C8 Basins drain to Pond C4
5. F Basins drain to WQ Pond F

Drainage concepts for each of the basins are briefly discussed as follow:

Basin C1.1
This basin consists of runoff from residential development and the east side of Nystrom Terrace and the north side of Aspen Butte Terrace. Runoff will be directed west to Design Point 1 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 5.6cfs and 12.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Label all inlets as either sump or at-grade

Basin C1.2
This basin consists of runoff from residential development and the west side of Nystrom Terrace and the south side of Aspen Butte Terrace. Runoff will be directed west to Design Point 2 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 2.7cfs and 5.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C1.3
This basin consists of runoff from residential development and the north side of Lorson Blvd. Runoff will be directed south and west in Lorson Boulevard to Design Point 4 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 14.1cfs and 30.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Update flows to match hydrology spreadsheet

Basin C1.4
This basin consists of runoff from residential development, Nystrom Terrace, and Walleye Drive. Runoff will be directed west to Walleye Drive, then south to Design Point 1b in curb/gutter where it will be collected by an existing 15' Type R inlet. The developed flow from this basin is 4.2cfs and 9.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C1.5
This basin consists of runoff from future residential development and the south side of Lorson Blvd. Runoff will be directed north and west in Lorson Boulevard to Design Point 6 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 3.0cfs and 6.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C1.6
This basin consists of runoff from future residential development southeast of Walleye Dr./Lorson Blvd at Design Point 1a. Runoff will be directed north to Design Point 1a by future streets and a future storm sewer sized to handle a portion of the 100-year storm event from this basin. The remaining runoff will continue west in a future street to a future street intersection at Lorson Boulevard west of Brook Trout Trail. The future developed flow from this basin is 12.8cfs and 28.3cfs for the 5/100-year storm event. See the appendix for detailed calculations. This flow is only to be used to size a storm sewer stub from Design Point 6

Basin C3.1
This basin consists of runoff from residential development, Aspen Butte Terrace, Copper Butte Way, and the east half of Split Mountain Drive. Runoff will be directed west and north to Design Point 12 in curb/gutter of Split Mountain Drive where it will be collected by a Type R inlet. The developed flow from this basin is 9.9cfs and 21.8cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.2
This basin consists of runoff from residential development, Mission Peak Place, and the east half of Split Mountain Drive. Runoff will be directed west and north to Design Point 13 in curb/gutter of Split Mountain Drive where it will be collected by a Type R inlet. The developed flow from this basin is 7.9cfs and 17.3cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.3
This basin consists of runoff from residential development, Pearsoll Street, and the east half of Split Mountain Drive. Runoff will be directed west and north to Design Point 15 in curb/gutter of Split Mountain Drive where it will be collected by a Type R inlet. The developed flow from this basin is 8.5cfs and 18.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.4

Page: 8

Author: CDurham Subject: Callout Date: 2/17/2022 1:31:15 PM -06'00'
Update flows to match hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:17:53 AM -06'00'
FLOWS UPDATED

This basin consists of runoff from residential development, Lost Peak Lane, and the east half of Split Mountain Drive. Runoff will be directed west and north to Design Point 17 in curb/gutter of Split Mountain Drive where it will be collected by a Type R inlet. The developed flow from this basin is 7.2cfs and 15.8cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.5
This basin consists of runoff from residential development, Split Mountain Drive, and the south side of Lake Trout Dr. Runoff will be directed north and west to Design Point 19 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 10.3cfs and 22.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.6a
This basin consists of runoff from residential development and the north side of Lake Trout Dr. Runoff will be directed west to Design Point 20a in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 5.6cfs and 12.3cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.6b
This basin consists of runoff from residential development and Lookout Peak Lane. Runoff will be directed west and south to Design Point 21 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 7.2cfs and 15.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.7
This basin consists of runoff from residential development, Dragontail Terrace, and the south side of Lake Trout Dr. Runoff will be directed north and west to Design Point 23 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 8.7cfs and 19.1cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.8
This basin consists of runoff from residential development, Foraker Lane, Raven Ridge Terrace, and the north side of Lake Trout Dr. Runoff will be directed west and south to Design Point 25 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 10.0cfs and 22.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.9
This basin consists of runoff from residential development, Raven Ridge Terrace, and the south side of Lake Trout Dr. Runoff will be directed north and west to Design Point 27 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 8.1cfs and 17.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C3.10
This basin consists of runoff from residential development, Nystrom Terrace, and the south side of Lake Trout Dr. Runoff will be directed north and west to Design Point 29 in curb/gutter of Lake Trout Dr where it will be collected by a Type R inlet. The developed flow from this basin is 9.2cfs and 20.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C4.1
This basin consists of runoff from residential development, Pearsoll Street, Buckner Way, and the south side of Fontaine Boulevard. Runoff will be directed north and west to Fontaine Boulevard where it will flow west to Design Point 31. The developed flow from this basin is 6.4cfs and 14.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

west side of Pearsoll St

north side of Foraker Lane

Page: 9

Author: CDurham Subject: Callout Date: 2/17/2022 1:39:05 PM -06'00'
west side of Pearsoll St

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:25:09 AM -06'00'
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Author: CDurham Subject: Callout Date: 2/17/2022 1:43:02 PM -06'00'
north side of Foraker Lane

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:26:28 AM -06'00'
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Basin C4.2
This basin consists of runoff from residential development and the south side of Fontaine Boulevard. Runoff will be directed north and west to Fontaine Boulevard to Design Point 31. The developed flow from this basin is 4.8cfs and 10.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C4.3
This basin consists of runoff from residential development, Lake Trout Dr, and Nystrom Terrace. Runoff will be directed north and west to Design Point 32 in curb/gutter of Nystrom Terrace where it will be collected by a Type R inlet. The developed flow from this basin is 5.7cfs and 12.4cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C4.4
This basin consists of runoff from residential development, Lake Trout Dr, and the west side of Walleye Drive. Runoff will be directed west and north to an existing 25' Type R inlet at Design Point 33 in curb/gutter of Walleye Drive. The developed flow from this basin is 6.2cfs and 13.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C5.1a
This basin consists of runoff from residential development and the south side of Sanderling Street. Runoff will be directed west and south to Design Point 39 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 4.2cfs and 9.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C5.1b
This basin consists of runoff from residential development and the north side of Gray Wolf Court. Runoff will be directed west to Design Point 36 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 11.4cfs and 25.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C5.1c
This basin consists of runoff from residential development and the south side of Gray Wolf Court. Runoff will be directed west to Design Point 37 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 7.4cfs and 16.3cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C5.1d
This basin consists of runoff from residential development and the north side of Snowfield Court. Runoff will be directed west and north to Design Point 41 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 9.3cfs and 20.7cfs for the 5/100-year storm event. See the appendix for detailed calculations.

open space, Buckner Ct and north half of Fontaine Blvd

Basin C5.1e
This basin consists of runoff from residential development and the south side of Snowfield Court. Runoff will be directed west to Design Point 43 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 10.0cfs and 21.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C5.2
This basin consists of runoff from residential development and the west side of Walleye Drive. Runoff will be directed south to Design Point 45 in curb/gutter where it will be collected by an existing 15' Type R inlet. The developed flow from this basin is 3.7cfs and 8.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Page: 10

Author: CDurham Subject: Callout Date: 2/17/2022 1:50:48 PM -06'00'
open space, Buckner Ct and north half of Fontaine Blvd

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:29:19 AM -06'00'
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Basin C5.3
This basin consists of runoff from residential development and the north side of Fontaine Boulevard. Runoff will be directed west to Design Point 45 in curb/gutter where it will be collected by an existing 15' Type R inlet. The developed flow from this basin is 4.3cfs and 9.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.1a
This basin consists of runoff from residential development and the south side of Meridith Ridge Way. Runoff will be directed west to Design Point 47 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 7.5cfs and 16.4cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.1b
This basin consists of runoff from residential development and the north side of Meridith Ridge Way and Donnas Drive. Runoff will be directed west and south to Design Point 49 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 6.3cfs and 13.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.1c
This basin consists of runoff from residential development and the north side of Sanderling Street. Runoff will be directed west to Design Point 48 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 3.4cfs and 7.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.2
This basin consists of runoff from residential development and the east side of Walleye Drive. Runoff will be directed west and north to Design Point 51 in curb/gutter where it will be collected by an existing 25' Type R inlet in Walleye Drive. The developed flow from this basin is 4.5cfs and 10.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin OS-C4a
This basin consists of runoff from undeveloped offsite land east of Lorson Ranch. Runoff will be directed northwest to a swale where the flow is conveyed north to Design Point 63a. The existing flow from this basin is 1.2cfs and 7.7cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.3a
This basin consists of runoff from residential development and the east side of Danis Drive. Runoff will be directed north to Design Point 53 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 10.5cfs and 23.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.3b
This basin consists of runoff from residential development and the west side of Rikers Ridge Lane and the south side of Walley Drive. Runoff will be directed west to Design Point 54 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 6.0cfs and 13.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin OS-C4b
This basin consists of runoff from undeveloped offsite land east of Lorson Ranch. Runoff will be directed northwest to a swale where the flow is conveyed north to Design Point 63a. At Design Point 63a the concentrated flow will be dissipated by two rip rap pads to change the flow to be closer to overland sheet flow. Lorson Ranch owns the downstream offsite land (to the north) and a letter of understanding will be secured at the final plat stage to address maintenance of any erosion issues should they occur on the offsite area and to acknowledge the manner of which drainage enters the

westside of Danis Dr

& south

east

This is final plat. Please update

Page: 11

Author: CDurham Subject: Callout Date: 2/17/2022 1:52:38 PM -06'00'
westside of Danis Dr

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:30:54 AM -06'00'
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Author: CDurham Subject: Callout Date: 2/17/2022 1:57:49 PM -06'00'
& south

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:33:11 AM -06'00'
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Author: CDurham Subject: Text Box Date: 2/17/2022 1:59:17 PM -06'00'
east

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 10:34:14 AM -06'00'
text changed

Author: CDurham Subject: Callout Date: 2/17/2022 2:01:53 PM -06'00'
This is final plat. Please update statement to address maintenance agreement with offsite property owner

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:16:37 AM -06'00'
agreement added to appendix

offsite property has changed. The existing flow from this basin is 0.9cfs and 5.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.3c
These basins consist of runoff from residential development and the south side of Rikers Ridge Lane and Danis Drive. Runoff will be directed west to Design Point 54 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 4.5cfs and 9.9cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.3d
This basin consists of runoff from residential development and the north side of Jasons Ridge Way, and Donnas Drive. Runoff will be directed northwest to Design Point 56 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 8.9cfs and 19.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.4
This basin consists of runoff from residential development and the south side of Jasons Ridge Way and Donnas Drive. Runoff will be directed southwest to Design Point 57 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 11.0cfs and 24.1cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.5
This basin consists of runoff from residential development and the west side of Rikers Ridge Way and north side of Walleye Drive. Runoff will be directed southwest to Design Point 59 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 7.0cfs and 15.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.6
This basin consists of runoff from residential development, west side of Walleye Drive, and the north side of Grayling Drive. Runoff will be directed west to Design Point 62 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 4.0cfs and 6.4cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.7a
This basin consists of runoff from residential development and the north side of Logans Ridge Lane and the south side of Reagan Ridge Drive. Runoff will be directed west to Design Point 63 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 8.1cfs and 18.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.7b
This basin consists of runoff from residential development and the south side of Logans Ridge Lane. Runoff will be directed west to Design Point 63 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 3.4cfs and 7.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.7c
This basin consists of runoff from residential development and Cody Ridge Way. Runoff will be directed west to Design Point 64 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 9.4cfs and 21.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.7d

Walleye Dr

west sid

Portion of E

west side of Rik
Ridge Ln

Page: 12

Author: CDurham Subject: Text Box Date: 3/8/2022 11:18:43 AM -06'00'
Walleye Dr

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:18:51 AM -06'00'
text added

Author: CDurham Subject: Callout Date: 2/17/2022 2:06:10 PM -06'00'
west side of Danis Dr

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:20:10 AM -06'00'
text added

Author: CDurham Subject: Callout Date: 2/17/2022 2:08:24 PM -06'00'
Portion of Broken Top Terr

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:23:44 AM -06'00'
text added

Author: CDurham Subject: Callout Date: 2/17/2022 2:12:47 PM -06'00'
west side of Rikers Ridge Ln

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:27:46 AM -06'00'
text added

This basin consists of runoff from residential development and the east side of Reagan Ridge Drive. Runoff will be directed west to Design Point 66 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 0.6cfs and 1.4cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.7e
This basin consists of runoff from residential development, the east side of Reagan Ridge Drive, and Alpine Ridge Lane. Runoff will be directed southwest to Design Point 62 in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 11.1cfs and 24.5cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin OS-B1
This basin consists of runoff from undeveloped offsite land east of Lorson Ranch. Runoff will be directed north to Design Point 63a in a swale. The existing flow from this basin is 5.2cfs and 29.0cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.8a
This basin consists of runoff from residential development, the west/north side of Reagan Ridge Drive. Runoff will be directed southwest to Design Point 69 in curb/gutter where it will be collected by an existing 25' Type R inlet. The developed flow from this basin is 7.9cfs and 17.3cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin C8.8
This basin consists of runoff from residential development. Runoff will be directed south directly to existing Pond C4. The developed flow from this basin is 5.9cfs and 21.8cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin F1.1
This basin consists of runoff from residential development. Runoff will be directed east into Basin F1.2 as sheet flow. The developed flow from this basin is 7.5cfs and 16.5cfs for the 5/100-year storm event. See the appendix for detailed calculations. Water quality for this basin flowing offsite will be addressed by the Runoff Reduction method for sheet flows crossing open space in Basin F1.2. See water quality section.

Basin F1.2
This basin consists of runoff from open space and will be directed east offsite generally as sheet flow which will not significantly be changed from existing conditions and grading. The flow from this basin is 6.1cfs and 44.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin F1.3
This basin consists of runoff from residential development, the east/north side of Kingston Peak Place. Runoff will be directed south to Design Point 35b in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 1.9cfs and 4.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin F1.4
This basin consists of runoff from residential development, the west/south side of Kingston Peak Place. Runoff will be directed south to Design Point 35a in curb/gutter where it will be collected by a Type R inlet. The developed flow from this basin is 5.9cfs and 13.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Combined Flow From the "F" developed basins
Developed runoff flowing east into the Upper Williams Creek Drainage Basin is required to match existing conditions. See Design Point 35 for analysis of offsite flows to the east.

Broken

Update flows hydrology spr

north side of Mission Peak Pl

portions of Copper Butte Way, Aspen Butte Terr & South half of Mission Peak Pl

Page: 13

Author: CDurham Subject: Callout Date: 2/17/2022 2:14:48 PM -06'00'
~~Broken~~ Top Terr

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 11:28:42 AM -06'00'
text added

Author: CDurham Subject: Callout Date: 2/17/2022 2:16:09 PM -06'00'
Update flows to match hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/8/~~2022~~ 2:55:14 PM -06'00'
flows are correct. changed basin name to be correct.

Author: CDurham Subject: Callout Date: 2/17/2022 2:19:54 PM -06'00'
north side of Mission Peak Pl

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 2:57:53 PM -06'00'
text added

Author: CDurham Subject: Line Date: 2/17/2022 2:19:23 PM -06'00'

Author: CDurham Subject: Callout Date: 2/17/2022 2:21:20 PM -06'00'
portions of Copper Butte Way, Aspen Butte Terr & South half of Mission Peak Pl

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 2:59:24 PM -06'00'
text updated

Author: CDurham Subject: Line Date: 2/17/2022 2:20:27 PM -06'00'

Interim Basin G1

This basin consists of existing runoff from undeveloped land. Runoff flows south to Design Point 35e located on the south property line of Lorson Ranch. This basin was added to analyze existing runoff rates before and after development flowing south in the Upper Williams Creek Drainage Basin at the Lorson Ranch south property line. See Design Point 35e for this analysis. The existing flow from this basin is 2.5cfs and 18.2cfs for the 5/100-year storm event. See the appendix for detailed calculations.

See the Developed Conditions Hydrology Calculations in the back of this report and the Developed Conditions Drainage Map (Map Pocket) for the 5-year and 100-year storm event amounts.

Missing discussion on Basin C 4.5 & Interim Basin H1

5.0 HYDRAULIC SUMMARY

The sizing of the hydraulic structures and detentions ponds were prepared by using the *Storm Sewer* and *Hydrographs* computer software programs developed by Intellisolve, which conforms to the methods outlined in the "City of Colorado Springs/El Paso County Drainage Criteria Manual". Street capacities and Inlets were sized by Denver Urban Drainage's xcel spreadsheet UD-Inlet.

be final

It is the intent of this drainage report to use the proposed curb/gutter and storm sewer in the streets to convey runoff to detention and water quality ponds then to the East Tributary of Jimmy Camp Creek. Inlet size and location are preliminary only as shown on the storm sewer layout in the appendix. See Appendix C for detailed hydraulic calculations and the storm sewer model.

Table 1: Street Capacities (100-year capacity is only ½ of street)

	Residential Local		Residential Collector		Principal Arterial	
Street Slope	5-year	100-year	5-year	100-year	5-year	100-year
0.5%	6.3	26.4	9.7	29.3	9.5	28.5
0.6%	6.9	28.9	10.6	32.1	10.4	31.2
0.7%	7.5	31.2	11.5	34.6	11.2	33.7
0.8%	8.0	33.4	12.3	37.0	12.0	36.0
0.9%	8.5	35.4	13.0	39.3	12.7	38.2
1.0%	9.0	37.3	13.7	41.4	13.4	40.2
1.4%	10.5	44.1	16.2	49.0	15.9	47.6
1.8%	12.0	45.4	18.4	50.4	18.0	50.4
2.2%	13.3	42.8	19.4	47.5	19.5	47.5
2.6%	14.4	40.7	18.5	45.1	18.5	45.1
3.0%	15.5	39.0	17.7	43.2	17.8	43.2
3.5%	16.7	37.2	16.9	41.3	17.0	41.3
4.0%	17.9	35.7	16.2	39.7	16.3	29.7
4.5%	19.0	34.5	15.7	38.3	15.7	38.3
5.0%	19.9	33.4	15.2	37.1	15.2	37.1

Note: all flows are in cfs (cubic feet per second)

Design Point 1a

Design Point 1a is located south of Lorson Boulevard and Walleye Drive and flow is from future development from Basin C1.6. A 24" storm sewer will be stubbed out from Design Pt. 6 at Lorson Boulevard north towards this design point. The total future flow is 12.8cfs/28.3cfs in the 5/100-year storm events for this basin. In the 5-year storm event 12cfs will be routed north to Design Point 6 (in pipe) and 0.8cfs will be routed to west in the future street (surface flow in street). In the 100-year storm event 20cfs will be routed north to Design Point 6 (in pipe) and 8.3cfs will be routed west in the future street (surface flow in street).

Page: 14

Author: CDurham Subject: Text Box Date: 2/17/2022 2:25:10 PM -06'00'
Missing discussion on Basin C 4.5 & Interim Basin H1

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:09:39 PM -06'00'
basin 4.5 was not needed and removed. basin h1 added

Author: CDurham Subject: Callout Date: 2/17/2022 2:25:51 PM -06'00'
Sizes need to be final

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:10:14 PM -06'00'
sizes are final

Page: 15

Author: CDurham Subject: Callout Date: 2/17/2022 2:29:51 PM -06'00'
Inlet spreadsheet has 5' inlet. Please coordinate inlet size between 2 locations.

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:14:18 PM -06'00'
inlet made 10'

Design Point 1
Design Point 1 is located at the NE corner of Nystrom Terrace and Aspen Butte Terrace at a knuckle and accepts flows from Basin C1.1 The developed conditions are as follows:

(5-year storm)
Tributary Basins: C1.1 **Inlet/MH Number:** Inlet DP1
Upstream flowby: **Total Street Flow:** 5.6cfs

Flow Intercepted: 5.6cfs **Flow Bypassed:** 0
Inlet Size: 10' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 9cfs, okay

(100-year storm)
Tributary Basins: C1.1 **Inlet/MH Number:** Inlet DP1
Upstream flowby: **Total Street Flow:** 12.2cfs

Flow Intercepted: 12.2cfs **Flow Bypassed:**
Inlet Size: 10' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 37cfs (half street) is okay

Design Point 2
Design Point 2 is located at the SW corner of Nystrom Terrace at a knuckle and accepts flows from Basin C1.2 The developed conditions are as follows:

(5-year storm)
Tributary Basins: C1.2 **Inlet/MH Number:** Inlet DP2
Upstream flowby: **Total Street Flow:** 2.7cfs

Flow Intercepted: 2.7cfs **Flow Bypassed:** 0
Inlet Size: 10' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 9cfs, okay

(100-year storm)
Tributary Basins: C1.2 **Inlet/MH Number:** Inlet DP2
Upstream flowby: **Total Street Flow:** 5.9cfs

Flow Intercepted: 5.9cfs **Flow Bypassed:**
Inlet Size: 10' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 37cfs (half street) is okay

Design Point 3
Design Point 3 is the storm sewer pipe flow from Nystrom Terrace to Lorson Boulevard from Design Pt's 1 and 2. The total pipe flow is 8.3cfs/18.1cfs in the 5/100-year storm events in the storm sewer.

Design Point 4
Design Point 4 is located at the NE of Lorson Boulevard and Walleye Drive and accepts flows from Lorson Boulevard (Basin C1.3).

(5-year storm)
Tributary Basins: C1.3 **Inlet/MH Number:** Inlet DP4
Upstream flowby: **Total Street Flow:** 8.9cfs

Flow Intercepted: 13.5cfs **Flow Bypassed:** 0.6cfs to ex. 15' inlet
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 18cfs, okay

(100-year storm)
Tributary Basins: C1.3 **Inlet/MH Number:** Inlet DP4
Upstream flowby: 1.9cfs **Total Street Flow:** 21.6cfs

Flow Intercepted: 18.0cfs **Flow Bypassed:** 3.6cfs to ex. 15' inlet
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 50cfs (half street) is okay

The existing 15' inlet was designed to accept 10cfs of upstream flow in the 100-year storm. See final drainage report for CDR 20-007 at Design Point 1b and 1.

Inlet spreadsheet shows no pass flow from this inlett

Design Point 5
Design Point 5 is the storm sewer pipe flow from Design Pt's 3 and 4. The total pipe flow is 17.2cfs/36.1cfs in the 5/100-year storm events in the storm sewer.

Flows do not match the hydrology spread

Design Point 6
Design Point 6 is located at the SE of Lorson Boulevard and Walleye Drive and accepts flows from Lorson Boulevard (Basin C1.5).

(5-year storm)
Tributary Basins: C1.5 **Inlet/MH Number:** Inlet DP6
Upstream flowby: **Total Street Flow:** 3.0cfs

Flow Intercepted: 3.0cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 18cfs, okay

(100-year storm)
Tributary Basins: C1.5 **Inlet/MH Number:** Inlet DP6
Upstream flowby: **Total Street Flow:** 6.6cfs

Flow Intercepted: 5.7cfs **Flow Bypassed:** 0.9cfs in curb downstream
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 50cfs (half street) is okay

Page: 16

Author: CDurham Subject: Callout Date: 2/17/2022 2:33:05 PM -06'00'
How is flow intercepted greater that flow at DP?

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:23:37 PM -06'00'
flow intercepted revised to 8.9

Author: CDurham Subject: Callout Date: 2/17/2022 2:32:10 PM -06'00'
Inlet spreadsheet shows no by pass flow from this inlett

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:17:44 PM -06'00'
no bypass is correct

Author: CDurham Subject: Callout Date: 2/17/2022 2:33:36 PM -06'00'
Where is flowby coming from?

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 4:23:50 PM -06'00'
DP-35a added to label

Author: CDurham Subject: Text Box Date: 2/17/2022 2:36:32 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 5:49:44 PM -06'00'
hydrology spreadsheets do not account for bypass. The spreadsheet has been updated to remove design points.

Design Point 7
Design Point 7 is the existing 36" storm sewer pipe flow located in Lorson Boulevard. The total pipe flow is 36.8cfs/65.8cfs in the 5/100-year storm events in the storm sewer. Per the drainage report for CDR 20-007 the allowable flow in the existing 36" is 37.1cfs/65.3cfs. Flows do not match the hydrology sprea

Design Points 8-11 are not used

Design Point 12
Design Point 12 is located at the SE corner of Split Mountain Drive and Mission Peak Place and accepts flows from Basin C3.1.

(5-year storm)
Tributary Basins: C3.1 **Inlet/MH Number:** Inlet DP12
Upstream flowby: **Total Street Flow:** 9.9cfs

Flow Intercepted: 9.3cfs **Flow Bypassed:** 0.6cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.6%, capacity = 14.4cfs, okay

(100-year storm)
Tributary Basins: C3.1 **Inlet/MH Number:** Inlet DP12
Upstream flowby: **Total Street Flow:** 21.8cfs

Flow Intercepted: 14.8cfs **Flow Bypassed:** 7.0cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.6%, capacity = 40.7cfs (half street) is okay

Design Point 13
Design Point 13 is located at the SE corner of Split Mountain Drive and Pearsoll Street and accepts flows from Basin C3.2.

(5-year storm)
Tributary Basins: C3.2 **Inlet/MH Number:** Inlet DP13
Upstream flowby: 0.6cfs from Des. Pt 12 **Total Street Flow:** 8.5cfs

Flow Intercepted: 8.3cfs **Flow Bypassed:** 0.2cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.2%, capacity = 13.3cfs, okay

(100-year storm)
Tributary Basins: C3.2 **Inlet/MH Number:** Inlet DP13
Upstream flowby: 7.0cfs from Des. Pt 12 **Total Street Flow:** 24.3cfs

Flow Intercepted: 15.6cfs **Flow Bypassed:** 8.7cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.2%, capacity = 42.8cfs (half street) is okay

Page: 17

Author: CDurham Subject: Text Box Date: 2/17/2022 2:38:14 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 7:39:48 AM -06'00'
flows in spreadsheet do not account for runby. we added des.pt. 6a for more clarity.

Design Point 14
Design Point 14 is the storm sewer pipe flow from Design Pt's 12 and 13. The total pipe flow is 17.6cfs/30.4cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreads

Design Point 15
Design Point 15 is located at the SE corner of Split Mountain Drive and Lost Peak Lane and accepts flows from Basin C3.3.

(5-year storm)
Tributary Basins: C3.3 **Inlet/MH Number:** Inlet DP15
Upstream flowby: 0.2cfs from Des. Pt 13 **Total Street Flow:** 8.7cfs

Flow Intercepted: 8.4cfs **Flow Bypassed:** 0.3cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.9%, capacity = 12.2cfs, okay

(100-year storm)
Tributary Basins: C3.3 **Inlet/MH Number:** Inlet DP15
Upstream flowby: 8.7cfs from Des. Pt 13 **Total Street Flow:** 27.3cfs

Flow Intercepted: 16.5cfs **Flow Bypassed:** 10.8cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.9%, capacity = 44.0cfs (half street) is okay

Design Point 16
Design Point 16 is the storm sewer pipe flow from Design Pt's 14 and 15. The total pipe flow is 26.0cfs/46.9cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreads

Design Point 17
Design Point 17 is located at the SE corner of Split Mountain Drive and Lake Trout Dr and accepts flows from Basin C3.4.

(5-year storm)
Tributary Basins: C3.4 **Inlet/MH Number:** Inlet DP17
Upstream flowby: 0.3cfs from Des. Pt 15 **Total Street Flow:** 7.5cfs

Flow Intercepted: 7.5cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 3.4%, capacity = 16.5cfs, okay

(100-year storm)
Tributary Basins: C3.4 **Inlet/MH Number:** Inlet DP17
Upstream flowby: 10.8cfs from Des. Pt 15 **Total Street Flow:** 26.7cfs

Flow Intercepted: 20.4cfs **Flow Bypassed:** 6.3cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 3.4%, capacity = 37.0cfs (half street) is okay

Page: 18

Author: CDurham Subject: Text Box Date: 2/17/2022 2:40:24 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 7:44:21 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Author: CDurham Subject: Text Box Date: 2/17/2022 2:41:34 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 8:57:18 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Design Point 18
Design Point 18 is the storm sewer pipe flow from Design Pt's 16 and 17. The total pipe flow is 33.5cfs/67.3cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreads

Design Point 19
Design Point 19 is located at the SW corner of Split Mountain Drive and Lake Trout Dr and accepts flows from Basin C3.5.

(5-year storm)
Tributary Basins: C3.5 **Inlet/MH Number:** Inlet DP19
Upstream flowby: **Total Street Flow:** 10.3cfs

Flow Intercepted: 10.3cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.6%, capacity = 14.4cfs, okay

(100-year storm)
Tributary Basins: C3.5 **Inlet/MH Number:** Inlet DP19
Upstream flowby: 6.3cfs from Des. Pt 17 **Total Street Flow:** 28.8cfs

Flow Intercepted: 21.2cfs **Flow Bypassed:** 7.6cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.6%, capacity = 40.7cfs (half street) is okay

Design Point 20
Design Point 20 is the storm sewer pipe flow from Design Pt's 18 and 19. The total pipe flow is 43.8cfs/88.5cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spread

Design Point 20a
Design Point 20a is located at the NE corner of Lookout Peak Lane and Lake Trout Dr and accepts flows from Basin C3.6a.

(5-year storm)
Tributary Basins: C3.6a **Inlet/MH Number:** Inlet DP20a
Upstream flowby: **Total Street Flow:** 5.6cfs

Flow Intercepted: 5.6cfs **Flow Bypassed:** 0
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.1%, capacity = 13.0cfs, okay

(100-year storm)
Tributary Basins: C3.6a **Inlet/MH Number:** Inlet DP20a
Upstream flowby: **Total Street Flow:** 12.3cfs

Flow Intercepted: 10.7cfs **Flow Bypassed:** 1.6cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.1%, capacity = 42.0cfs (half street) is okay

Page: 19

Author: CDurham Subject: Text Box Date: 2/17/2022 2:44:50 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 8:57:39 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Author: CDurham Subject: Text Box Date: 2/17/2022 2:45:42 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 8:59:45 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Design Point 20b
Design Point 20b is the storm sewer pipe flow from Design Pt's 20a and 20. The total pipe flow is 49.4cfs/99.2cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreads

Design Point 21
Design Point 21 is located at the NW corner of Lookout Peak Lane and Lake Trout Dr and accepts flows from Basin C3.6b.

(5-year storm)
Tributary Basins: C3.6b **Inlet/MH Number:** Inlet DP21
Upstream flowby: **Total Street Flow:** 7.2cfs

Flow Intercepted: 7.2cfs **Flow Bypassed:**
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.1%, capacity = 13.0cfs, okay

(100-year storm)
Tributary Basins: C3.6b **Inlet/MH Number:** Inlet DP21
Upstream flowby: 1.6cfs from Des. Pt 20a **Total Street Flow:** 17.5cfs

Flow Intercepted: 13.1cfs **Flow Bypassed:** 4.4cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.1%, capacity = 42.0cfs (half street) is okay

Design Point 22 not used

Design Point 23
Design Point 23 is located at the SW corner of Dragontail Terrace and Lake Trout Dr and accepts flows from Basin C3.7.

(5-year storm)
Tributary Basins: C3.7 **Inlet/MH Number:** Inlet DP23
Upstream flowby: **Total Street Flow:** 8.7cfs

Flow Intercepted: 8.4cfs **Flow Bypassed:** 0.3cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 13.0cfs, okay

(100-year storm)
Tributary Basins: C3.7 **Inlet/MH Number:** Inlet DP23
Upstream flowby: 7.6cfs from Des. Pt 19 **Total Street Flow:** 26.7cfs

Flow Intercepted: 16.3cfs **Flow Bypassed:** 10.4cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 42.0cfs (half street) is okay

Page: 20

Author: CDurham Subject: Text Box Date: 2/17/2022 2:48:19 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:00:02 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Design Point 24
Design Point 24 is the storm sewer pipe flow from Design Pt's 20b and 23. The total pipe flow is 57.8cfs/115.5cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology sprea

Design Point 24a
Design Point 24a is the storm sewer pipe flow from Design Pt's 21 and 24. The total pipe flow is 65cfs/118.6cfs in the 5/100-year storm events in the storm sewer. Design point not in table

Design Point 25
Design Point 25 is located at the NW corner of Nystrom Terr and Lake Trout Dr and accepts flows from Basin C3.8.

(5-year storm)
Tributary Basins: C3.8 **Inlet/MH Number:** Inlet DP25
Upstream flowby: **Total Street Flow:** 10.0cfs

Flow Intercepted: 7.2cfs **Flow Bypassed:** 2.9cfs in curb downstream
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 1.1%, capacity = 10.1cfs, okay

(100-year storm)
Tributary Basins: C3.8 **Inlet/MH Number:** Inlet DP25
Upstream flowby: 4.4cfs from Des. Pt 21 **Total Street Flow:** 26.4cfs

Flow Intercepted: 11.3cfs **Flow Bypassed:** 15.1cfs in curb downstream
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 1.1%, capacity = 39.0cfs (half street) is okay

Design Point 26 – not used

Design Point 27
Design Point 27 is located at the SW corner of Raven Ridge Terrace and Lake Trout Dr and accepts flows from Basin C3.9.

(5-year storm)
Tributary Basins: C3.9 **Inlet/MH Number:** Inlet DP27
Upstream flowby: 0.3cfs from Des.Pt. 23 **Total Street Flow:** 8.4cfs

Flow Intercepted: 8.4cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.7%, capacity = 11.9cfs, okay

(100-year storm)
Tributary Basins: C3.9 **Inlet/MH Number:** Inlet DP27
Upstream flowby: 10.4cfs from Des. Pt 23 **Total Street Flow:** 28.3cfs

Flow Intercepted: 20.7cfs **Flow Bypassed:** 7.6cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.7%, capacity = 45.0cfs (half street) is okay

Page: 21

Author: CDurham Subject: Text Box Date: 2/17/2022 2:50:53 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: CDurham Subject: Text Box Date: 2/17/2022 2:51:26 PM -06'00'
Design point not in table

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:01:35 AM -06'00'
THIS DESIGN POINT ONLY ADDS PIPE FLOW

Design Point 28
Design Point 28 is the storm sewer pipe flow from Design Pt's 27 and 24a. The total pipe flow is 73.4cfs/132.7cfs in the 5/100-year storm events in the storm sewer.

Flows do not match the hydrology sprea

Design Point 28a
Design Point 28a is the storm sewer pipe flow from Design Pt's 28 and 25. The total pipe flow is 80.6cfs/133.4cfs in the 5/100-year storm events in the storm sewer.

Design point not in spreadsheet

Design Point 29
Design Point 29 is located at the SW corner of Nystrom Terrace and Lake Trout Dr and accepts flows from Basin C3.10.

(5-year storm)
Tributary Basins: C3.10 **Inlet/MH Number:** Inlet DP29
Upstream flowby: 0.3cfs from Des.Pt. 27 **Total Street Flow:** 9.2cfs

9.5

Flow Intercepted: 9.2cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.0%, capacity = 9.2cfs, okay

(100-year storm)
Tributary Basins: C3.10 **Inlet/MH Number:** Inlet DP29
Upstream flowby: 7.6cfs from Des. Pt 27 **Total Street Flow:** 27.8cfs

Flow Intercepted: 20.5cfs **Flow Bypassed:** 7.3cfs in curb downstream
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.0%, capacity = 37.3cfs (half street) is okay

Design Point 30
Design Point 30 is the storm sewer pipe flow from Design Pt's 28a and 29. The total pipe flow is 89.8cfs/153.9cfs in the 5/100-year storm events in the storm sewer.

Flows do not match the hydrology spreadshee

Page: 22

Author: CDurham Subject: Text Box Date: 2/17/2022 2:53:06 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:01:58 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Author: CDurham Subject: Text Box Date: 3/9/2022 9:06:24 AM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:02:21 AM -06'00'
THIS DESIGN POINT ONLY ADDS PIPE FLOW

Author: CDurham Subject: Callout Date: 2/17/2022 2:54:18 PM -06'00'
9.5

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:06:31 AM -06'00'
UPDATED

Author: CDurham Subject: Text Box Date: 2/17/2022 2:54:58 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:06:41 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Design Point 31
Design Point 31 is located east of Walleye Drive on the south side of Fontaine Boulevard and accepts flows from Basin C4.1 and C4.2.

(5-year storm)
Tributary Basins: C4.1+C4.2 **Inlet/MH Number:** Inlet DP31
Upstream flowby: **Total Street Flow:** 10.5cfs

Flow Intercepted: 9.7cfs **Flow Bypassed:** 0.8cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 4.8%, capacity = 15.7cfs, okay

(100-year storm)
Tributary Basins: C4.1+C4.2 **Inlet/MH Number:** Inlet DP31
Upstream flowby: **Total Street Flow:** 23.2cfs

Flow Intercepted: 15.3cfs **Flow Bypassed:** 7.9cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 4.8%, capacity = 38.3cfs (half street) is okay

Design Point 32 is located on the north end of Nystrom Terr in a cul-de-sac and accepts flows from Basin C4.3

(5-year storm)
Tributary Basins: C4.3 **Inlet/MH Number:** Inlet DP32
Upstream flowby: 2.8cfs from Des. Pt.25 **Total Street Flow:** 10.3 cfs

Flow Intercepted: 10.3cfs **Flow Bypassed:**
Inlet Size: 20' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 9.2cfs, okay

(100-year storm)
Tributary Basins: C4.3 **Inlet/MH Number:** Inlet DP32
Upstream flowby: 15.1cfs from Des.Pt. 25 **Total Street Flow:** 27.5cfs

Flow Intercepted: 27.5cfs **Flow Bypassed:**
Inlet Size: 20' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 37.3cfs (half street) is okay

Design Point 32a
Design Point 32a is the storm sewer pipe flow from Design Pt's 31 and 32. The total pipe flow is 18.2cfs/42.8cfs in the 5/100-year storm events in the storm sewer.

Design point is not in spreadsheet

Page: 23

Author: CDurham Subject: Text Box Date: 2/17/2022 2:57:53 PM -06'00'
Design point is not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:15:50 AM -06'00'
THIS DESIGN POINT ONLY ADDS PIPE FLOW

Design Point 33
Design Point 33 is located on Walleye Drive south of Fontaine Boulevard and is an existing 25' type R inlet in a sump condition constructed as part of CDR 20-007.

(5-year storm)
Tributary Basins: C4.4 **Inlet/MH Number:** ex. 25' inlet DP33
Upstream flowby: 0.8cfs from Des.Pt. 31 **Total Street Flow:** 7.0cfs

Flow Intercepted: 7.0cfs **Flow Bypassed:**
Inlet Size: ex 25' type R, sump

Street Capacity: Street slope = 0.7%, capacity = 11.5cfs, okay

(100-year storm)
Tributary Basins: C4.4 **Inlet/MH Number:** ex. 25' inlet DP33
Upstream flowby: 7.3cfs from Des.Pt. 29
7.9cfs from Des. Pt. 31
Total Street Flow: 28.7cfs

Flow Intercepted: 28.7cfs **Flow Bypassed:**
Inlet Size: ex 25' type R, sump

Street Capacity: Street slope = 0.7%, capacity = 34.6cfs (half street) is okay

Design Point 34
Design Point 34 is the storm sewer pipe flow from Design Pt's 30, 32a, and 33. The total pipe flow is 115.0cfs/225.4cfs in the 5/100-year storm events in the existing 54" storm sewer constructed as part of CDR 20-007. The revised calculated flow in the existing 54" storm sewer is slightly more than the design flow in CDR 20-007 of 101.2cfs/218.6cfs in the 5/100-year storm events but the HGL's are not above the top of the 54" storm sewer. Flows do not match the hydrology spreadsheet

Design Point 35a
Design Point 35a is located at the NW corner of Kingston Peak Place and Lorson Boulevard and accepts flows from Basin F1.4.

(5-year storm)
Tributary Basins: F1.4 **Inlet/MH Number:** Inlet DP29
Upstream flowby: **Total Street Flow:** 5.9cfs

Flow Intercepted: 5.9cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 0.9%, capacity = 9.2cfs, okay

(100-year storm)
Tributary Basins: F1.4 **Inlet/MH Number:** Inlet DP29
Upstream flowby: **Total Street Flow:** 13.2cfs

Flow Intercepted: 11.3cfs **Flow Bypassed:** 1.9cfs in curb downstream
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 0.9%, capacity = 37.3cfs (half street) is okay

Page: 24

Author: CDurham Subject: Text Box Date: 3/9/2022 9:38:39 AM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:38:51 AM -06'00'
THIS DESIGN POINT ONLY ADDS PIPE FLOWS

Design Point 35b
Design Point 35b is located at the NE corner of Kingston Peak Place and Lorson Boulevard and accepts flows from Basin F1.3.

(5-year storm)
Tributary Basins: F1.3 **Inlet/MH Number:** Inlet DP29
Upstream flowby: **Total Street Flow:** 1.9cfs

Flow Intercepted: 1.9cfs **Flow Bypassed:** 0cfs in curb downstream
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 9.2cfs, okay

(100-year storm)
Tributary Basins: F1.3 **Inlet/MH Number:** Inlet DP29
Upstream flowby: **Total Street Flow:** 4.6cfs

Flow Intercepted: 4.4cfs **Flow Bypassed:** 0.2cfs
Inlet Size: 5' type R, sump

Street Capacity: Street slope = 0.9%, capacity = 37.3cfs (half street) is okay

Design Point 35c
Design Point 35c is the storm sewer pipe flow from Design Pt's 35a and 35b. The total pipe flow is 7.8cfs/15.7cfs in the 5/100-year storm events in the storm sewer. Stormwater enters WQ Pond F where it will be treated and released. WQ Pond F has been sized for water quality and the 5-100-year storm runoff will be allowed to flow through the pond with minimal detention.

Design point not in spreadsheet

Design Point 35
Design Point 35 is located on the east side of this site and is the total flow from Basins F1.1, F1.2, and Design Point 35d. The total flow from these basins and the WQ pond (Des.Pt. 35d) is 15.5cfs/69.5cfs in the 5/100-year storm events. The existing flow calculated at Design Point 2x flowing east offsite is 12.4cfs/72.7cfs in the 5/100-year storm events. The developed flow will remain sheet flow into the Upper Williams Creek Drainage Basin for the majority of the runoff along the east boundary of Lorson Ranch as in existing conditions and will discharge the same runoff rates as in existing flows. BJ Ranches, LLC is the downstream offsite landowner located east of Lorson Ranch. Lorson Ranch will try to secure a letter of understanding with the downstream landowner to address maintenance of any erosion issues should they occur on the offsite area and to acknowledge the manner of which drainage enters the offsite property has changed at the Pond F outfall. A spreader is proposed at the pond outfall to convert point discharges into sheet flow. See Design Point 35d for discussion of concentrated runoff from WQ Pond F.

Flows do

Design Point 35d
Design Point 35d is located at the storm sewer outfall from WQ Pond F. The total pipe flow is 1.9cfs/8.4cfs in the 5/100-year storm events in the storm sewer per the full spectrum excel spreadsheets. Equation GB-1 from the Grass Buffer worksheet determines the length of the spreader (W=Q2/.05) required to convert point discharges into sheet flow to reduce the erosion potential. For a flow of 8.4cfs, the length of the spreader from the storm sewer outfall is required to be 168' long with 1.5" wide openings every 2' along the curb spreader. The curb spreader will be 4' wide with 8" tall curbs. In addition to the curb spreader, the flows will drain and additional 100' overland before exiting the Lorson Ranch property.

Include Grass buffer worksheet in appendix

Design Point 35e

et has

Page: 25

Author: CDurham Subject: Callout Date: 2/17/2022 3:01:32 PM -06'00'
Inlet spreadsheet has 10' inlet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:40:46 AM -06'00'
TEXT UPDATED.

Author: CDurham Subject: Text Box Date: 2/17/2022 3:02:15 PM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 9:41:24 AM -06'00'
THIS DESIGN POINT ONLY ADDS PIPE FLOW

Author: CDurham Subject: Highlight Date: 2/17/2022 3:03:03 PM -06'00'
15.5cfs/69.5

Author: CDurham Subject: Text Box Date: 2/17/2022 3:02:57 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:11:16 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY AND FOR WQ POND F

Author: CDurham Subject: Text Box Date: 2/17/2022 3:05:16 PM -06'00'
Include Grass buffer worksheet in appendix

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:16:17 AM -06'00'
THERE IS NO GRASS BUFFER. RUNOFF REDUCTION CALCS LOCATED IN APPENDIX D AND DISCUSSED IN THE WQ SECTION OF THE FDR

Design Point 35e is located on the south property line of Lorson Ranch and is the total flow from Basin G1 which is 2.5cfs/18.2cfs in the 5/100-year storm events. The existing flow at this design point (Basin EX-G) is 2.9cfs/21.6cfs in the 5/100-year storm events. The runoff at the south property line of Lorson Ranch was reduced slightly due to grading north of Lorson Boulevard. The discharge is only slightly less than existing flows resulting in no negative impacts downstream.

Design Point 35f

Design Point 35f is located on the south property line of Lorson Ranch and is the total flow from Basin H1 which is 6.0cfs/40.2cfs in the 5/100-year storm events. The existing flow at this design point (Basin EX-H) is 6.1cfs/42.9cfs in the 5/100-year storm events. The runoff at the south property line of Lorson Ranch was reduced slightly due to grading north of Lorson Boulevard. The discharge is slightly less than existing flows resulting in no negative impacts downstream.

DP 35e & 35f missing from spreadsheet

Page: 26

Author: CDurham Subject: Text Box Date: 2/17/2022 3:06:32 PM -06'00'

DP 35e & 35f missing from spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:16:35 AM -06'00'

THESE POINTS ARE JUST TO COMPARE EXISTING TO PROPOSED.

Design Point 38
Design Point 38 is the storm sewer pipe flow from Design Pt's 36 and 37. The total pipe flow is 7.5cfs/10.5cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreadsh

Design Point 39
Design Point 39 is located at the southeast corner of Gray Wolf Court and Donnas Drive and accepts flows from Basin C5.1a.

(5-year storm)
Tributary Basins: C5.1a.b,c **Inlet/MH Number:** Inlet DP39
Upstream flowby: 20.2cfs – 4.1(inlet DP36) – 3.4(inlet DP37)
Total Street Flow: 12.7cfs

Flow Intercepted: 12.7cfs **Flow Bypassed:**
Inlet Size: 25' type R, on-grade

Street Capacity: Street slope = 1.9%, capacity = 14cfs, okay

(100-year storm)
Tributary Basins: C5.1a,b,c **Inlet/MH Number:** Inlet DP39
Total flow in street: 44.5cfs – 5.7(inlet DP36) – 4.8(inlet DP37)
Total Street Flow: 34.0cfs

Flow Intercepted: 27.0cfs **Flow Bypassed:** 7.0cfs in curb downstream
Inlet Size: 25' type R, on-grade

Street Capacity: Street slope = 1.9%, capacity = 45.4cfs (half street) is okay

Design Point 40
Design Point 40 is the storm sewer pipe flow from Design Pt's 38 and 39. The total pipe flow is 23.0cfs/37.0cfs in the 5/100-year storm events in the storm sewer.

Design point is not in spreadsheet

Page: 28

Author: CDurham Subject: Text Box Date: 2/17/2022 3:08:03 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:25:35 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Author: CDurham Subject: Text Box Date: 2/17/2022 3:10:00 PM -06'00'
Design point is not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:25:07 AM -06'00'
THIS DESIGN POINT JUST ADDS PIPE FLOW

Design Point 41
Design Point 41 is located south of Gray Wolf Court on the east side of Donnas Drive and accepts flows from Basin C5.1d.

(5-year storm)
Tributary Basins: C5.1d **Inlet/MH Number:** Inlet DP41
Upstream flowby: **Total Street Flow:** 9.3cfs

Flow Intercepted: 9.3cfs **Flow Bypassed:**
Inlet Size: 20' type R, SUMP

Street Capacity: Street slope = 1.4%, capacity = 10.5cfs, okay

(100-year storm)
Tributary Basins: C5.1d **Inlet/MH Number:** Inlet DP41
Upstream flowby: 7.0cfs from Des.Pt.39 **Total Street Flow:** 27.7cfs

Flow Intercepted: 25.1cfs **Flow Bypassed:** 2.6cfs to DP43
Inlet Size: 20' type R, SUMP (inlet overtops to Des. Pt. 43)

Street Capacity: Street slope = 1.4%, capacity = 44.1cfs (half street) is okay

Design Point 42
Design Point 42 is the storm sewer pipe flow from Design Pt's 40 and 41. The total pipe flow is 32.3cfs/62.1cfs in the 5/100-year storm events in the storm sewer. Flows do not match the hydrology spreads

Design Point 43
Design Point 43 is located south of Gray Wolf Court on the west side of Donnas Drive and accepts flows from Basin C5.1e and flowby from Des. Pt. 41. See Des.Pt. 44 for overflow conveyance.

(5-year storm)
Tributary Basins: C5.1e **Inlet/MH Number:** Inlet DP41 43
Upstream flowby: **Total Street Flow:** 10.0cfs

Flow Intercepted: 10.0cfs **Flow Bypassed:**
Inlet Size: 20' type R, SUMP

Street Capacity: Street slope = 1.4%, capacity = 10.5cfs, okay

(100-year storm)
Tributary Basins: C5.1e **Inlet/MH Number:** Inlet DP41
Upstream flowby: 2.6cfs from Des.Pt.41 **Total Street Flow:** 24.5cfs

Flow Intercepted: 24.5cfs **Flow Bypassed:**
Inlet Size: 20' type R, SUMP

Street Capacity: Street slope = 1.4%, capacity = 44.1cfs (half street) is okay

Page: 29

Author: CDurham Subject: Text Box Date: 2/17/2022 3:11:07 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:26:46 AM -06'00'
SPREADSHEET DOES NOT ACCOUNT FOR RUNBY

Author: CDurham Subject: Text Box Date: 2/17/2022 3:11:50 PM -06'00'
43

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:26:52 AM -06'00'
TEXT UPDATED

eadsheet

Design Point 44

Design Point 44 is the storm sewer pipe flow from Design Pt's 42 and 43. The total pipe flow is 42.3cfs/87.1cfs in the 5/100-year storm events in the storm sewer. The FDR for CDR20-007 (Design Point 16a) was designed to accept 42.3cfs/92.5cfs in the existing 36" RCP stub in Fontaine Boulevard. This design point is also at a low point in Donnas Drive and in the event the inlet at Design Point 43 is clogged, runoff will flow overland through Tract G which has a 25' wide swale (depression) which is 1' lower than the adjacent lots.

Include calculations for overflow swale in appendix

Design Points 45 & 46

Design Points 45 & 46 are located at the NE corner of Walleye Drive and Fontaine Boulevard and is an existing 15' type R inlet in a sump condition constructed as part of CDR 20-007

(5-year storm)

Tributary Basins: C5.2 & C5.3 **Inlet/MH Number:** ex. 15' inlet
Upstream flowby: **Total Street Flow:** 7.7cfs

Flow Intercepted: 7.7cfs **Flow Bypassed:**
Inlet Size: ex 15' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 13.7cfs, okay

(100-year storm)

Tributary Basins: C5.2 & C5.3 **Inlet/MH Number:** ex. 15' inlet
Upstream flowby: **Total Street Flow:** 17.1cfs

Flow Intercepted: 17.1cfs **Flow Bypassed:**
Inlet Size: ex 15' type R, sump

Street Capacity: Street slope = 1.0%, capacity = 41.4cfs (half street) is okay

The FDR for CDR 20-007 designed the existing inlet to accept 7.9cfs/17.7cfs in the 5/100 year storm events.

Page: 30

Author: CDurham Subject: Text Box Date: 2/17/2022 3:12:41 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:39:57 AM -06'00'
WE JUST ADDED THE FLOWS FROM TEH DESIGN POINT FOR THESE NUMBERS

Author: CDurham Subject: Highlight Date: 2/17/2022 3:12:47 PM -06'00'
42.3cfs/87.

Author: CDurham Subject: Text Box Date: 3/9/2022 10:39:00 AM -06'00'
Include calculations for overflow swale in appendix

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 10:39:07 AM -06'00'
CALCULATIONS INCLUDED

Design Point 49
Design Point 49 is located in the NW corner of Sanderling Street and Donnas Drive and accepts flows from Basin C8.1b.

(5-year storm)
Tributary Basins: C8.1b **Inlet/MH Number:** Inlet DP49
Upstream flowby: 1.4cfs from Des.Pt. 47 **Total Street Flow:** 7.7 cfs

Flow Intercepted: 7.7cfs **Flow Bypassed:**
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.8%, capacity = 14.4cfs, okay

(100-year storm)
Tributary Basins: C8.1b **Inlet/MH Number:** Inlet DP49
Upstream flowby: 7.3cfs from Des.Pt.47
1.4cfs from Des.Pt.48
5.1cfs from Des.Pt.57 **Total Street Flow:** 27.7cfs

Flow Intercepted: 20.8cfs **Flow Bypassed:** 6.9cfs
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 2.8%, capacity = 40.7cfs (half street) is okay

Design Point 50
Design Point 50 is the storm sewer pipe flow from Design Pt's 48 and 49. The total pipe flow is 11.1cfs/27.0cfs in the 5/100-year storm events in the storm sewer. The FDR for CDR20-007 (Design Point 31a) was designed to accept 8.9cfs/20.9cfs in the existing 30" RCP stub from Walleye Drive at Sanderling Street. However, the existing pipe has capacity to handle the additional pipe flow based on the HGL. See Design Point 52.

Design point not in spreadsheet

Page: 32

Author: CDurham Subject: Text Box Date: 2/17/2022 3:18:09 PM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 11:13:01 AM -06'00'
DESIGN POINT ONLY ADDS PIPE FLOWS

Design Point 51
Design Point 51 is located at an existing 25' type R inlet in the SW corner of Grayling Drive and Walleye Drive and accepts flows from Basin C8.2.

(5-year storm)
Tributary Basins: C8.2 **Inlet/MH Number:** existing 25'
Upstream flowby: **Total Street Flow:** 4.5 cfs

Flow Intercepted: 4.5cfs **Flow Bypassed:**
Inlet Size: ex 25' type R, SUMP

Street Capacity: Street slope (collector) = 1.0%, capacity = 13.7cfs, okay

(100-year storm)
Tributary Basins: C8.2 **Inlet/MH Number:** existing 25'
Upstream flowby: 6.9cfs from Des.Pt.49
9.1cfs from Des.Pt.56 **Total Street Flow:** 26.0cfs

Flow Intercepted: 26.0cfs **Flow Bypassed:**
Inlet Size: ex 25' type R, SUMP

Street Capacity: Street slope = 1.0% (collector) , capacity = 41.4cfs (half street) is okay

The FDR for CDR 20-007 (Des.Pt. 31) designed the existing inlet to accept 14.5cfs/30.0cfs in the 5/100 year storm events.

Design Point 52
Design Point 52 is the storm sewer pipe flow from Design Pt's 50 and 51 in an existing 36" storm sewer in Walleye Drive. The total pipe flow is 15.6cfs/53.0cfs in the 5/100-year storm events in the storm sewer. The FDR for CDR20-007 (Design Point 31c) designed the storm sewer to accept 23.4cfs/50.9cfs in the existing 36" RCP storm sewer in Walleye Drive. The existing pipe has capacity to handle the slight increase in pipe flow in the 100yr storm event.

Design point not in spreadsheet

Page: 33

Author: CDurham Subject: Text Box Date: 2/17/2022 3:19:03 PM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 11:37:09 AM -06'00'
DESIGN POINT ONLY ADDS PIPE FLOW

Design Point 53
Design Point 53 is located in the SE corner of Danis Drive and Walleye Drive and accepts flows from Basin C8.3a. Basin OS-C4a existing and future flows will be diverted north to Des. Pt. 63a.

(5-year storm)
Tributary Basins: C8.3a **Inlet/MH Number:** Inlet DP53
Upstream flowby: **Total Street Flow:** 10.6cfs

Flow Intercepted: 9.7cfs **Flow Bypassed:** 0.9cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.4%, capacity = 10.5cfs, okay

(100-year storm)
Tributary Basins: C8.3a **Inlet/MH Number:** Inlet DP53
Upstream flowby: **Total Street Flow:** 26.5cfs

Flow Intercepted: 16.2cfs **Flow Bypassed:** 10.3cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.4%, capacity = 44.1cfs (half street) is okay

Design Point 54
Design Point 54 is located in the NE corner of Donnas Drive and Walleye Drive and accepts flows from Basin C8.3b& C8.3c.

(5-year storm)
Tributary Basins: C8.3b & C8.3c **Inlet/MH Number:** Inlet DP54
Upstream flowby: 0.9cfs from Des.Pt.53 **Total Street Flow:** 11.8cfs

Flow Intercepted: 11.7cfs **Flow Bypassed:** 0.1cfs
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.5%, capacity = 11.8cfs, okay

(100-year storm)
Tributary Basins: C8.3b & C8.3c **Inlet/MH Number:** Inlet DP54
Upstream flowby: 10.3cfs from Des.Pt.53 **Total Street Flow:** 37.6cfs

Flow Intercepted: 24.0cfs **Flow Bypassed:** 13.6cfs
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.5%, capacity = 45.0cfs (half street) is okay

Multiple DP-54's in spreadsheet. Please clarify what flows are used for inlet analysis

Design Point 55
Design Point 55 is the storm sewer pipe flow from Design Pt's 53 and 54. The total pipe flow is 21.4cfs/40.2cfs in the 5/100-year storm events in the storm sewer.

Page: 34

Author: CDurham Subject: Text Box Date: 2/17/2022 3:21:57 PM -06'00'
Multiple DP-54's in spreadsheet. Please clarify what flows are used for inlet analysis

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 11:44:12 AM -06'00'
LABELS REMOVED FROM SPREADSHEET

Design Point 56
Design Point 56 is located on Walleye Drive south of Donnas Drive and accepts flows from Basin C8.3d

(5-year storm)
Tributary Basins: C8.3d **Inlet/MH Number:** Inlet DP56
Upstream flowby: 0.1cfs from Des.Pt.54 **Total Street Flow:** 9.0cfs

Flow Intercepted: 9.0cfs **Flow Bypassed:**
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.2%, capacity = 10.0cfs, okay

(100-year storm)
Tributary Basins: C8.3d **Inlet/MH Number:** Inlet DP56
Upstream flowby: 13.6cfs from Des.Pt.54 **Total Street Flow:** 32.8cfs

Flow Intercepted: 32.8cfs **Flow Bypassed:** 9.1cfs
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.2%, capacity = 38.0cfs (half street) is okay

ot match
t

Design Point 57
Design Point 57 is located at the NE corner of Donnas Drive and Meridith Ridge Way and accepts flows from Basin C8.4

(5-year storm)
Tributary Basins: C8.4 **Inlet/MH Number:** Inlet DP57
Upstream flowby: **Total Street Flow:** 11.0cfs

Flow Intercepted: 11.0cfs **Flow Bypassed:**
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.0%, capacity = 9.0cfs, okay

(100-year storm)
Tributary Basins: C8.4 **Inlet/MH Number:** Inlet DP57
Upstream flowby: **Total Street Flow:** 24.1cfs

Flow Intercepted: 19.0cfs **Flow Bypassed:** 5.1cfs to DP49
Inlet Size: 20' type R, on-grade

Street Capacity: Street slope = 1.0%, capacity = 37.3cfs (half street) is okay

Design Point 58
Design Point 58 is the storm sewer pipe flow from Design Pt's 57 and 47. The total pipe flow is 17.1cfs/28.1cfs in the 5/100-year storm events in the storm sewer.

Design point not in spreadsheet

Page: 35

Author: CDurham Subject: Callout Date: 2/17/2022 3:23:17 PM -06'00'
Flow does not match spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 11:47:13 AM -06'00'
FLOW UPDATED FOR BYPASS

Author: CDurham Subject: Text Box Date: 2/17/2022 3:24:05 PM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 1:38:51 PM -06'00'
design point only adds pipe flow

Design Point 59
Design Point 59 is located on the north side of Walleye Drive south of Broken Top Drive and accepts flows from Basin C8.5

(5-year storm)
Tributary Basins: C8.5 **Inlet/MH Number:** Inlet DP59
Upstream flowby: **Total Street Flow:** 7.0cfs

Flow Intercepted: 5.9cfs **Flow Bypassed:** 1.1cfs
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 1.2%, capacity = 10.0cfs, okay

(100-year storm)
Tributary Basins: C8.5 **Inlet/MH Number:** Inlet DP59
Upstream flowby: **Total Street Flow:** 15.5cfs

Flow Intercepted: 8.9cfs **Flow Bypassed:** 6.6cfs
Inlet Size: 10' type R, on-grade

Street Capacity: Street slope = 1.2%, capacity = 38.0cfs (half street) is okay

Please provide inlet design spreadsheet for this design point

Design Point 60
Design Point 60 is the storm sewer pipe flow from Design Pt's 55, 56 and 59. The total pipe flow is 32.7cfs/73.3cfs in the 5/100-year storm events in the storm sewer.

Design Point 61
Design Point 61 is the storm sewer pipe flow from Design Pt's 52, 58 and 60 from the C8.1, C8.3, C8.4, and C8.5 basins. The total pipe flow is 44.9cfs/104.1cfs in the 5/100-year storm events in the storm sewer. The FDR for CDR20-007 (Design Point 32) designed the storm sewer to accept 45.1cfs/105.4cfs in the existing 42" RCP storm sewer in Walleye Drive.

Both Design points (60 & 61) missing in spreadsheet

Page: 36

Author: CDurham Subject: Text Box Date: 3/9/2022 2:24:43 PM -06'00'
Please provide inlet design spreadsheet for this design point

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 2:24:49 PM -06'00'
design added

Author: CDurham Subject: Text Box Date: 2/17/2022 3:25:54 PM -06'00'
Both Design points (60 & 61) missing in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 2:25:27 PM -06'00'
des. pt. 61 added. des. pt 60 is just flows added together

Design Point 62
Design Point 62 is located in the NE corner of Grayling Drive and Reagan Ridge Drive and accepts flows from Basin C8.6 & C8.7e.

(5-year storm)
Tributary Basins: C8.6 & C8.7e **Inlet/MH Number:** Inlet DP62
Upstream flowby: 1.1 cfs from Des.Pt.59 **Total Street Flow:** 14.3cfs

Flow Intercepted: 14.3cfs **Flow Bypassed:**
Inlet Size: 25' type R, SUMP

Street Capacity: Street slope = 2.5%, capacity = 14.2cfs, okay

(100-year storm)
Tributary Basins: C8.6 & C8.7e **Inlet/MH Number:** Inlet DP62
Upstream flowby: 6.6cfs from Des.Pt.59
2.7cfs from Des.Pt.66 **Total Street Flow:** 37.4cfs

Flow Intercepted: 37.4cfs **Flow Bypassed:**
Inlet Size: 25' type R, SUMP

Street Capacity: Street slope = 2.5%, capacity = 41.4cfs (half street) is okay

Design Point 63
Design Point 63 is located at the SE corner of Reagan Ridge Drive and Logans Ridge Lane and accepts flows from Basin C8.7a&b

(5-year storm)
Tributary Basins: C8.7a&b **Inlet/MH Number:** Inlet DP63
Upstream flowby: **Total Street Flow:** 11.5cfs

Flow Intercepted: 10.2cfs **Flow Bypassed:** 1.3cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.6%, capacity = 11.5cfs, okay

(100-year storm)
Tributary Basins: C8.7a&b **Inlet/MH Number:** Inlet DP63
Upstream flowby: **Total Street Flow:** 25.6cfs

Flow Intercepted: 15.9cfs **Flow Bypassed:** 9.7cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 1.6%, capacity = 45.0cfs (half street) is okay

Design point not shown in spreadsheet

Design Point 63a
Design Point 63a is the existing offsite flow from areas west of Lorson Ranch from offsite Basins OS-B1, OS-C4a, and OS-C4b. These offsite basins will be routed north in a wide shallow swale onto adjacent land owned by Lorson Ranch. The proposed total flow in the swale is 7.3cfs/42.2cfs in the 5/100-year storm events which is less than existing total flow onto the adjacent property at Design Point 1x which is 9.7cfs/54.2cfs in the 5/100-year storm events (see existing conditions). Two rip rap pads will be constructed at the north end of the shallow swale to disperse the concentrated flow as it flows

Flows shown do not match design point flows in spreadsheet

Provide calculations for sizing riprap

Page: 37

Author: CDurham Subject: Callout Date: 2/17/2022 3:26:59 PM -06'00'
Inlet spreadsheet shows 30' inlet. Please verify correct size

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 2:33:43 PM -06'00'
changed to 30'

Author: CDurham Subject: Text Box Date: 2/17/2022 3:28:05 PM -06'00'
Flows shown do not match design point flows in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 4:56:22 PM -06'00'
basins added for total flow.

Author: CDurham Subject: Text Box Date: 3/9/2022 4:58:14 PM -06'00'
Design point not shown in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 4:58:25 PM -06'00'
basin flows just added together for total

Author: CDurham Subject: Text Box Date: 2/17/2022 3:28:48 PM -06'00'
Provide calculations for sizing riprap

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 4:59:04 PM -06'00'
rip rap taken out. not needed since Lorson owns offsite land. letter of understanding has been signed.

north onto the adjacent property owned by Lorson Ranch. Lorson Ranch owns the downstream offsite land (to the north) and a letter of understanding will be secured at the final plat stage to address maintenance of any erosion issues should they occur on the offsite area and to acknowledge the manner of which drainage enters the offsite property has changed.

Design Point 64
Design Point 64 is located at the SE corner of Reagan Ridge Drive and Cody Ridge Way and accepts flows from Basin C8.7c

(5-year storm)
Tributary Basins: C8.7c **Inlet/MH Number:** Inlet DP64
Upstream flowby: 1.3cfs from Des.Pt.63 **Total Street Flow:** 10.7cfs

Flow Intercepted: 9.8cfs **Flow Bypassed:** 0.9cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 4.0%, capacity = 17.9cfs, okay

(100-year storm)
Tributary Basins: C8.7c **Inlet/MH Number:** Inlet DP64
Upstream flowby: 9.7cfs from Des.Pt.63 **Total Street Flow:** 30.6cfs

Flow Intercepted: 17.5cfs **Flow Bypassed:** 13.1cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 4.0%, capacity = 35.7cfs (half street) is okay

Flows shown do not match design point flows shown i spreadsheet. Also, mutiple DP-64's shown. Clarify wh flows are used for inlet des

Design Point 65
Design Point 65 is the storm sewer pipe flow from Design Pt's 63 and 64. The total pipe flow is 20.0cfs/33.4cfs in the 5/100-year storm events in the storm sewer.

Design Point not shown in spreadsheet

Design Point 66
Design Point 66 is located at the NE corner of Reagan Ridge Drive and Broken Top Drive and accepts flows from Basin C8.7d

(5-year storm)
Tributary Basins: C8.7d **Inlet/MH Number:** Inlet DP66
Upstream flowby: 0.9cfs from Des.Pt.64 **Total Street Flow:** 1.5cfs

Flow Intercepted: 1.5cfs **Flow Bypassed:**
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 12.5cfs, okay

(100-year storm)
Tributary Basins: C8.7d **Inlet/MH Number:** Inlet DP66
Upstream flowby: 13.1cfs from Des.Pt.64 **Total Street Flow:** 14.5cfs

Flow Intercepted: 11.8cfs **Flow Bypassed:** 2.7cfs
Inlet Size: 15' type R, on-grade

Street Capacity: Street slope = 2.0%, capacity = 44.0cfs (half street) is okay

Doesn't match DP flow shown in spreadsheet

Page: 38

Author: CDurham Subject: Text Box Date: 2/17/2022 3:31:03 PM -06'00'
Flows shown do not match design point flows shown in spreadsheet. Also, mutiple DP-64's shown. Clarify which flows are used for inlet design.

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:13:19 PM -06'00'
design point removed from spreadsheet

Author: CDurham Subject: Text Box Date: 2/17/2022 3:31:41 PM -06'00'
Design Point not shown in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:14:27 PM -06'00'
pipe flows are from adding flows together.

Author: CDurham Subject: Callout Date: 2/17/2022 3:33:07 PM -06'00'
Doesn't match DP flow shown in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:15:51 PM -06'00'
spreadsheet doesn't account for runby

Design Point 67
Design Point 67 is the storm sewer pipe flow from Design Pt's 65 and 66. The total pipe flow is 21.5cfs/45.2cfs in the 5/100-year storm events in the storm sewer.

Design Point 68
Design Point 68 is the storm sewer pipe flow from Basins C8.6-C8.7e and runby from Des.Pt. 59. The total pipe flow is 33.0cfs/76.5cfs in the 5/100-year storm events in the storm sewer.

Design Point 69
Design Point 69 is located at the NW corner of Reagan Ridge Drive and Walleye Drive at an existing 25' Type R sump inlet and accepts flows from Basin OS-B1 & C8.8a

(5-year storm)
Tributary Basins: C8.8a **Inlet/MH Number:** Inlet DP69
Upstream flowby: **Total Street Flow:** 7.9cfs

Flow Intercepted: 7.9cfs **Flow Bypassed:**
Inlet Size: Ex 25' type R, SUMP

Street Capacity: Street slope = 2.0%, capacity = 12.5cfs, okay

(100-year storm)
Tributary Basins: C8.8a **Inlet/MH Number:** Inlet DP69
Upstream flowby: **Total Street Flow:** 17.3cfs

Flow Intercepted: 17.3cfs **Flow Bypassed:**
Inlet Size: Ex 25' type R, SUMP

Street Capacity: Street slope = 2.0%, capacity = 44.0cfs (half street) is okay

Design Point 70
Design Point 70 is the storm sewer pipe flow from the offsite basins, C8.7's, and C8.8a basins and runby from Des.Pt.59. The total pipe flow is 34.5cfs/86.3cfs in the 5/100-year storm events in the storm sewer from the xcel spreadsheet calculations. The FDR for CDR20-007 (Design Point 34a) designed the storm sewer to accept 38.2cfs/84.5cfs in the existing 42" RCP storm sewer in Walleye Drive. The storm sewer has capacity for these basins.

6.0 DETENTION AND WATER QUALITY PONDS

Detention and Storm Water Quality for The Ridge at Lorson Ranch is required per El Paso County criteria. We have implemented the Full Spectrum approach for detention for the Denver Urban Drainage Districts specifications. There are four permanent full spectrum ponds previously constructed in The Hills at Lorson Ranch for this development which will incorporate storm water quality features and comply with the Lorson Ranch East MDDP. In addition, one WQ pond will drain eastward as in existing condition into the Upper Williams Creek Drainage Basin required to match existing conditions. The ponds have been sized and include access roads, outlet pipes, overflow structures, and low flow channels. This drainage report provides design information on the outlet structure, trickle channel, and the forebays.

Design point not in spreadsheet

Flows do not match the hydrology spreadsheet

Flows shown do not match DP flows shown in spreadsheet

Flows do not match the hydrology spreadsheet

Page: 39

Author: CDurham Subject: Text Box Date: 2/17/2022 3:33:53 PM -06'00'
Design point not in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:16:16 PM -06'00'
flows are from adding design point flows

Author: CDurham Subject: Text Box Date: 2/17/2022 3:34:04 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:24:50 PM -06'00'
spreadsheet does not include the runby

Author: CDurham Subject: Text Box Date: 2/17/2022 3:34:49 PM -06'00'
Flows shown do not match DP flows shown in spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/9/2022 5:26:08 PM -06'00'
flows match

Author: CDurham Subject: Text Box Date: 2/17/2022 3:35:15 PM -06'00'
Flows do not match the hydrology spreadsheet

Author: CDurham Subject: Highlight Date: 2/17/2022 3:35:01 PM -06'00'
34.5cfs/86.3cfs

revise to "structures" (plural)

Full Spectrum Pond Construction Requirements

All four of the detention ponds required for this project have been previously graded as part of The Hills at Lorson Ranch (PUDSP 20-003) and include Pond C1, C2.1, C2.2, and C4. The Hills at Lorson Ranch constructed Existing Pond C1 and C2.2 which are complete full spectrum ponds that do not need to be modified and include the full spectrum outlet structure, forebays, outfall storm sewer, and low flow channels. Existing Pond C2.1 and Pond C4 were graded and constructed with forebays, outfall storm sewers, and low flow channels but did not include the full spectrum outlet structure. The outlet structure for these two ponds will be discussed in this section including ~~what type~~ of structure is proposed. Per the Lorson East MDDP, these four ponds and downstream Pond C5 (at Fontaine/East tributary) are part of an overall storm water system to be constructed by Lorson Ranch. Existing Pond C5 (including the final configuration of the orifice plate) was completed with Lorson Ranch East Filing No. 1 in 2018 and the entire stormwater system tributary to Pond C5 will be completed with this subdivision.

Re-phrase to clarify that all applicable runoff must be treated unless excluded per ECM App I.7.1.

Design calculations for Pond C2.1 and Pond C4 spectrum outlet structures are included in this report. The existing ponds currently have a 15' wide gravel access road at a maximum 10% slope to the pond bottom, forebay, storm sewer outfall, and concrete low flow channels. The final design of the Pond C2.1 and Pond C4 will consist of a full spectrum outlet structure and overflow weirs. Soil borings, embankment, slope, and compaction requirements for detention ponds can be found in the geotechnical report for the The Hills at Lorson Ranch prepared by RMG.

WQ Pond Construction Requirements

In addition to the four detention ponds Lorson Ranch is required to discharge the same runoff rates eastward into the Upper Williams which will require one WQ Pond to be constructed for a small area draining eastward. The WQ pond will have a 15' wide gravel access road at a maximum 10% slope to the pond bottom, forebay, and a concrete low flow channel.

Detention Pond C1 (existing pond for information only, See CDR20-007)

This is an existing permanent full spectrum detention pond that includes water quality and discharges downstream to a storm sewer system in Fontaine Boulevard. Pond C1 is designed in the UDCF Full Spectrum spreadsheets for Water Quality and EURV volumes. The 5-year and 100-year flow rates meet the Lorson East MDDP and have been modeled in the full spectrum worksheets. The outlet structure is a standard full spectrum extended detention basin structure and will include an emergency overflow spillway. See map in appendix for watershed areas.

- Watershed Area: 71.1 acres
- Watershed Imperviousness: 55%
- Hydrologic Soils Group B
- Zone 1 WQCV: 1.307ac-ft, WSEL: 5746.97
- Zone 2 EURV: 4.212ac-ft, WSEL: 5749.02, Top outlet structure set at 5749.50, 3'x6' outlet structure
- (5-yr): 4.691ac-ft, WSEL: 5749.33, 6.4cfs
- Zone 3 (100-yr): 9.954ac-ft, WSEL: 5752.39, 17.7cfs
- Pipe Outlet: 18" RCP at 0.5%
- Overflow Spillway: 28' wide bottom, elevation=5753.40, 4:1 side slopes, flow depth=1.37' 1.16' freeboard
- Micropool Elevation: 5743.40

Detention Pond C2.2 (existing pond for information only, see CDR 20-007)

This is a permanent full spectrum detention pond that includes water quality and discharges downstream to an existing storm sewer in Fontaine Boulevard. Inflow to this pond is from direct

Page: 40

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 9:02:08 PM -06'00'
revise to "structures" (plural)

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:03:41 AM -06'00'
text changed

Author: Glenn Reese - EPC Stormwater Subject: SW - Highlight Date: 2/22/2022 9:01:53 PM -06'00'
structure

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:03:49 AM -06'00'
changed

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 9:05:14 PM -06'00'
Re-phrase to clarify that all applicable runoff must be treated unless excluded per ECM App I.7.1.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:04:12 AM -06'00'
text changed to say runoff treated.

Author: Glenn Reese - EPC Stormwater Subject: SW - Highlight Date: 2/22/2022 9:02:49 PM -06'00'
In addition to the four detention ponds Lorson Ranch is required to discharge the same runoff rates eastward into the Upper Williams which will require one WQ Pond to be constructed

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:05:04 AM -06'00'
text changed

tributary development and outflow from Pond C3. The inflow hydrograph has been modeled in the full spectrum spreadsheets by adding the direct tributary area CUHP hydrograph to the upstream pond outflow hydrograph of Pond C3. The outlet structure, overflow wall, pond forebay and low flow channel will be built as part of the CDR 20-007 project. Pond C2.2 is designed in the UDCF Full Spectrum spreadsheets for Water Quality and EURV volumes. The 5-year and 100-year flow rates meet the Lorson East MDDP and have been modeled in the modeled in the full spectrum worksheets. The outlet structure is a standard full spectrum extended detention basin structure and will include an emergency overflow spillway. See map in appendix for watershed areas.

- Watershed Area: 45.0 acres
- Watershed Imperviousness: 55%
- Hydrologic Soils Group B (95%), Group C/D (5%)
- Zone 1 WQCV: 0.829ac-ft, WSEL: 5747.25
- Zone 2 EURV: 2.658ac-ft, WSEL: 5749.17, Top outlet structure set at 5751.00, 8'x6' outlet structure
- (5-yr): 4.475ac-ft, WSEL: 5760.88, 2.7cfs
- Zone 3 (100-yr): 6.67ac-ft. WSEL: 5752.75. 42.9cfs
- Pipe Outlet: 30" RCP w/18" restrictor plate
- Overflow Spillway: 20' wide bottom, elevation=5754.00, 4:1 side slopes, flow depth=1.51' 1.49' freeboard
- Micropool Elevation: 5744.00

Detention Pond C2.1

This is a permanent full spectrum detention pond that includes water quality and discharges downstream to Pond C2.3. The outlet Structure and overflow wall will be built as part of the final plat for this project. The pond forebay and low flow channel were built as part of the CDR 20-007 project. Pond C2.1 is designed in the UDCF Full Spectrum spreadsheets for Water Quality and EURV volumes. The 5-year and 100-year flow rates meet the Lorson East MDDP and have been modeled in the modeled in the full spectrum worksheets. The outlet structure is a standard full spectrum extended detention basin structure and will include an emergency overflow spillway. The full spectrum print outs are in the appendix of this report. See map in appendix for watershed areas.

- Watershed Area: 74.5 acres
- Watershed Imperviousness: 55%
- Hydrologic Soils Group B
- Zone 1 WQCV: 1.377ac-ft, WSEL: 5763.42
- Zone 2 EURV: 4.415ac-ft, WSEL: 5766.20, Top outlet structure set at 5766.20, 8'x6' outlet structure
- (5-yr): 4.694ac-ft, WSEL: 5766.44, 12.8cfs
- Zone 3 (100-yr): 7.829ac-ft, WSEL: 5768.80, 65.0cfs
- Pipe Outlet: 30" RCP at 0.5%
- Overflow Spillway: 25' wide bottom, elevation=5769.30, 4:1 side slopes, flow depth=1.69' 1.01' freeboard
- Micropool Elevation: 5760.00

Detention Pond C4

This is a permanent full spectrum detention pond that includes water quality and discharges downstream to Pond C3. Pond C4 has been graded. The outlet Structure and overflow wall will be built with the final plat of this project. The pond forebay and low flow channel were built as part of the CDR 20-007 project. Pond C4 is designed in the UDCF Full Spectrum spreadsheets for Water Quality and EURV volumes. The 5-year and 100-year flow rates meet the Lorson East MDDP and have been modeled in the modeled in the full spectrum worksheets. The outlet structure is a standard full

Page: 41

Author: CDurham Subject: Text Box Date: 2/17/2022 3:53:00 PM -06'00'
w/18" restrictor plate

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:05:35 AM -06'00'
text added

spectrum extended detention basin structure and will include an emergency overflow spillway. The full spectrum print outs are in the appendix of this report. See map in appendix for watershed areas.

- Watershed Area: 81.00 acres
- Watershed Imperviousness: 55%
- Hydrologic Soils Group B (40%), Group C/D (60%)
- Zone 1 WQCV: 1.488ac-ft, WSEL: 5767.97
- Zone 2 EURV: 4.477ac-ft, WSEL: 5770.41, Top outlet structure set at 5770.50, 6'x6' outlet structure
- (5-yr): 3.934ac-ft, WSEL: 5770.84, 16.5cfs
- Zone 3 (100-yr): 10.152ac-ft, WSEL: 5774.34, 43.7cfs
- Pipe Outlet: 24" RCP at 0.5%
- Overflow Spillway: 30' wide bottom, elevation=5775.00, 4:1 side slopes, flow depth=1.87' 1.13' freeboard
- Micropool Elevation: 5765.00

per dsheet

Note that all RPA areas will need to be within a no build/drainage easement and discussed in the maintenance agreement and O&M manual. Also show easement on GEC Plan.

Water Quality for Basin F1.1 (4.23ac) - - - backyards of lots draining east offsite

Developed runoff from this basin flows east offsite (shallow sheet flow) and does not include a water quality pond. Runoff from this basin is from a standard 50'x110' lot with the back 90 feet of the residential lots which flows overland east across a 145' wide open space tract prior to discharging to the east. The Runoff Reduction Method procedure from the Mile High Flood Control District spreadsheet (UD-BMP-V3.07) calculations have been applied to a standard 50' wide lot to address water quality provisions for development in this basin (see appendix). The UIA area is 4500sf (50'x90') and the RPA area is 7250sf (50'x145') per lot which can then be applied to the remaining lots within the basin. The large 145' wide open space tract provides a 100% reduction in the water quality requirements for this basin. Grading within this basin should not channelize flow from backyards and flow should be allowed to pass under any backyard fencing without obstructing or channelizing the overland flow.

Water Quality Pond F (4.9ac)

This is a permanent water quality pond that discharges eastward overland into the Upper Williams Creek drainage basin. The pond forebay, low flow channel, and outlet structure will be built as part of this project. WQ Pond F is designed in the UDCF Full Spectrum spreadsheets for Water Quality. In order to maintain existing discharge rates to the east (see Design Pt. 35), this pond allow the 5-year and 100-year storms to discharge undetained through the pond outlet structure and discharge overland to the east. The outlet structure is a standard extended detention basin structure with an orifice plate. Point discharge of stormwater from the outlet pipe will be dispersed by a slotted concrete channel (See Des. Pt. 35d). In addition, the slotted channel is located 100' west of the Lorson Ranch property line and the sheet flow will drain across a 100' wide open space tract on Lorson Ranch before entering the offsite property. Lorson Ranch will try to secure a letter of understanding with the downstream landowner to address maintenance of any erosion issues should they occur on the offsite area and to acknowledge the manner in which drainage enters the offsite property has changed at the Pond F outfall. The pond print outs are in the appendix of this report. See map in appendix for watershed areas.

- Watershed Area: 4.90 acres
- Watershed Imperviousness: 55%
- Hydrologic Soils Group B (100%)
- Zone 1 WQCV: 0.09ac-ft, WSEL: 5845.04
- Zone 2 EURV: not used
- (5-yr): not used
- Zone 3 (100-yr): not used
- Micropool Elevation: 5842.77

Page: 42

Author: CDurham Subject: Callout Date: 2/17/2022 3:57:27 PM -06'00'
5.031 per spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:07:27 AM -06'00'
text updated

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 9:06:22 PM -06'00'
Note that all RPA areas will need to be within a no build/drainage easement and discussed in the maintenance agreement and O&M manual. Also show easement on GEC Plan.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 7:08:59 AM -06'00'
do not need easement since this is in an open space tract owned by the district.

Jimmy Camp Creek[3]	$21,134	$989

See snippet to the left. Revise fee calculations accordingly.

7.0 DRAINAGE AND BRIDGE FEES

The Ridge at Lorson Ranch is located within the Jimmy Camp Creek drainage basin which is currently a fee basin in El Paso County. Current El Paso County regulations require drainage and bridge fees to be paid for platting of land as part of the plat recordation process.

The Ridge at Lorson Ranch Filing No. 1 contains 107.820acres. The 2022 drainage fees are $19,752, bridge fees are $924 and Drainage Surety fees are $7,285 per impervious acre per Resolution. The drainage and bridge fees are calculated when the final plat is submitted and are due at plat recordation. Lorson Ranch intends to use the Bridge Fee credits for the bridge fees and pay drainage/surety fees unless the Jimmy Camp Creek DBPS drainage fee structure is updated by El Paso County. The following table details the drainage fees for this filing:

Table 1a: Filing No. 1 2021 Drainage/Bridge Fees (107.820ac)

Type of Land Use	Total Area (ac)	Imperviousness	Drainage Fee	Bridge Fee	Surety Fee
Residential Area	91.497	51%	$921,696	$43,117	$339,943
Open Space, Landscape Tracts,	16.323	2%	$6,448	$301	$2,378
		Total	$928,144	$43,418	$342,321

Table 1b: Filing No. 2 2021 Drainage/Bridge Fees (57.898ac)

Type of Land Use	Total Area (ac)	Imperviousness	Drainage Fee	Bridge Fee	Surety Fee
Residential Area	50.744	51%	$511,170	$23,912	$188,531
Open Space, Landscape Tracts,	7.154	2%	$2,826	$132	$1,042
		Total	$513,996	$24,044	$189,573

Table 1c: Filing No. 3 2021 Drainage/Bridge Fees (40.755ac)

Type of Land Use	Total Area (ac)	Imperviousness	Drainage Fee	Bridge Fee	Surety Fee
Residential Area	27.592	51%	$277,948	$13,002	$102,513
Open Space, Landscape Tracts,	13.163	2%	$5,199	$243	$1,917
		Total	$283,147	$13,245	$104,430

Page: 43

Author: dsdrice Subject: Snapshot Date: 2/17/2022 2:47:47 PM -06'00'

Author: dsdrice Subject: Callout Date: 2/17/2022 2:49:38 PM -06'00'

See snippet to the left. Revise fee calculations accordingly.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:33:23 AM -06'00'
fees updated

Author: dsdrice Date: 2/17/2022 2:50:08 PM -06'00'
2021

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:33:30 AM -06'00'
2022

Author: dsdrice Date: 2/17/2022 2:50:21 PM -06'00'
2021

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:33:35 AM -06'00'
2022

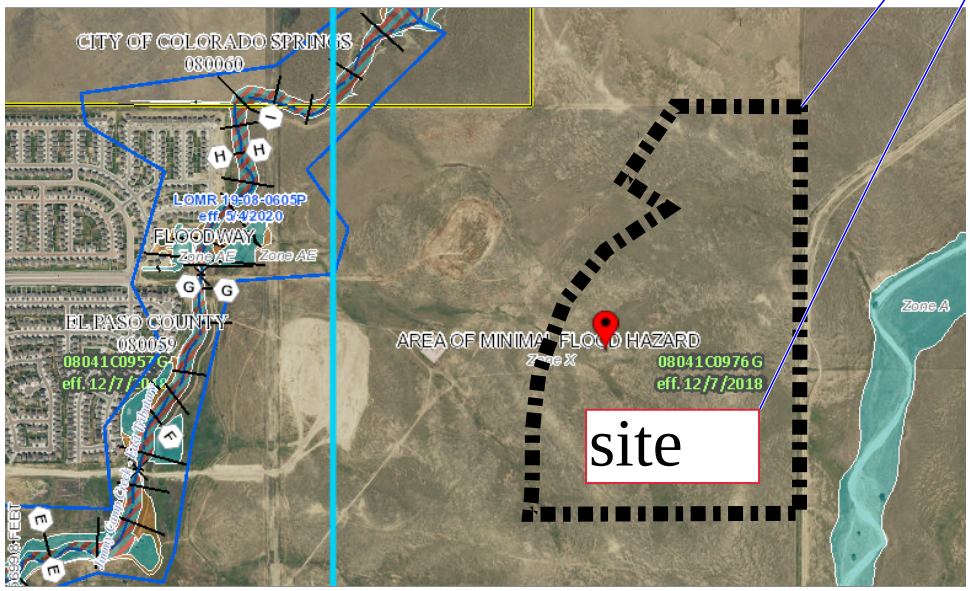
Author: dsdrice Date: 2/17/2022 2:50:23 PM -06'00'
2021

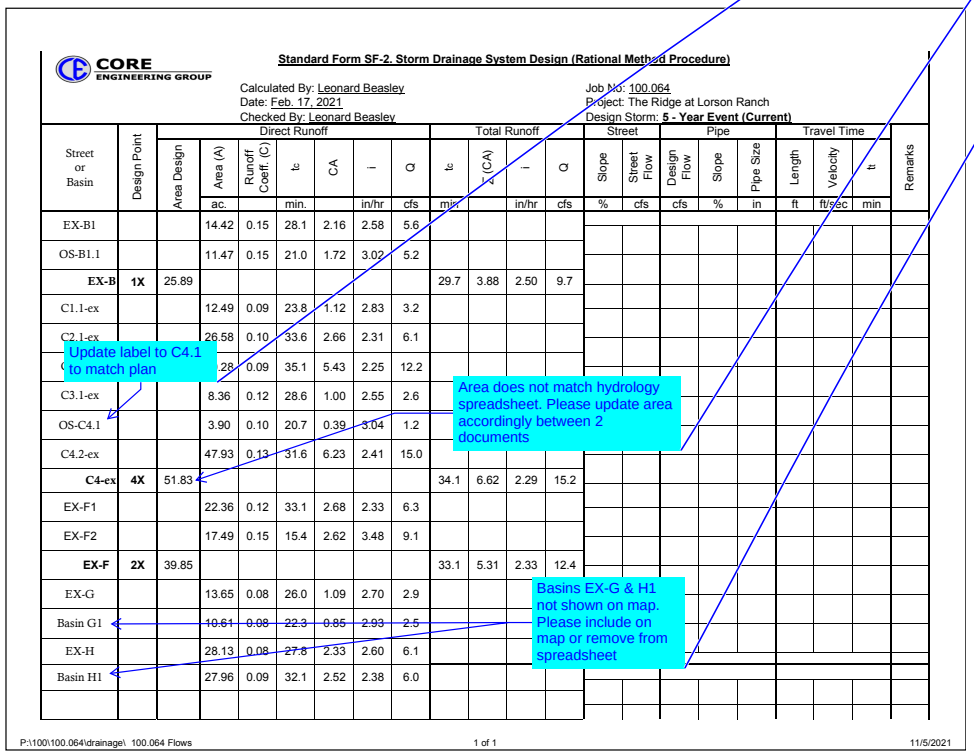
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:33:41 AM -06'00'
2022

Author: RSchindler Subject: Polygonal Line Date: 3/18/2021 3:42:47 PM

Author: RSchindler Subject: Text Box Date: 3/18/2021 3:42:51 PM

site





CORE ENGINEERING GROUP

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

Calculated By: Leonard Beasley
Date: Feb. 17, 2021
Checked By: Leonard Beasley

Job No: 100.064
Project: The Ridge at Lorson Ranch
Design Storm: **5 - Year Event (Current)**

Street or Basin	Design Point	Direct Runoff: Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	Total Runoff: t_c	Σ (CA)	i	Q	Street: Slope	Street Flow	Pipe: Design Flow	Slope	Pipe Size	Travel Time: Length	Velocity	t_t	Remarks
		ac.			min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	%	in	ft	ft/sec	min	
EX-B1			14.42	0.15	28.1	2.16	2.58	5.6													
OS-B1.1			11.47	0.15	21.0	1.72	3.02	5.2													
EX-B	**1X**	25.89							29.7	3.88	2.50	9.7									
C1.1-ex			12.49	0.09	23.8	1.12	2.83	3.2													
C2.1-ex			26.58	0.10	33.6	2.66	2.31	6.1													
C3.1-ex			8.36	0.12	28.6	1.00	2.55	2.6													
OS-C4.1			3.90	0.10	20.7	0.39	3.04	1.2													
C4.2-ex			47.93	0.13	31.6	6.23	2.41	15.0													
C4-ex	**4X**	51.83							34.1	6.62	2.29	15.2									
EX-F1			22.36	0.12	33.1	2.68	2.33	6.3													
EX-F2			17.49	0.15	15.4	2.62	3.48	9.1													
EX-F	**2X**	39.85							33.1	5.31	2.33	12.4									
EX-G			13.65	0.08	26.0	1.09	2.70	2.9													
Basin G1			10.61	0.08	22.3	0.85	2.93	2.5													
EX-H			28.13	0.08	27.8	2.33	2.60	6.1													
Basin H1			27.96	0.09	32.1	2.52	2.38	6.0													

Update label to C4.1 to match plan

Area does not match hydrology spreadsheet. Please update area accordingly between 2 documents

Basins EX-G & H1 not shown on map. Please include on map or remove from spreadsheet

P:\100\100.064\drainage\ 100.064 Flows 1 of 1 11/5/2021

Page: 53

Author: CDurham Subject: Callout Date: 2/16/2022 6:28:34 PM -06'00'
Update label to C4.1 to match plan

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:37:24 AM -06'00'
label updated

Author: CDurham Subject: Callout Date: 2/16/2022 6:03:55 PM -06'00'
Area does not match hydrology spreadsheet. Please update area accordingly between 2 documents

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:49:03 AM -06'00'
hydrology updated

Author: CDurham Subject: Callout Date: 2/16/2022 6:29:18 PM -06'00'
Basins EX-G & H1 not shown on map. Please include on map or remove from spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:37:56 AM -06'00'
these are existing basins shown on the dev. conditions map

CORE ENGINEERING GROUP

Standard Form SF-2. Storm Drainage System Design (Rational Method Procedure)

Calculated By: Leonard Beasley
Date: Feb. 18, 2021
Checked By: Leonard Beasley

Job No: 100.064
Project: The Ridge at Lorson Ranch
Design Storm: **5 - Year Event (Proposed)**

Street or Basin	Design Point	Direct Runoff							Total Runoff				Street		Pipe			Travel Time			Remarks
		Area Design	Area (A)	Runoff Coeff. (C)	t_c	CA	i	Q	t_c	$\sum$ (CA)	i	Q	Slope	Street Flow	Design Flow	Slope	Pipe Size	Length	Velocity	t_t	
			ac.		min.		in/hr	cfs	min		in/hr	cfs	%	cfs	cfs	%	in	ft	ft/sec	min	
OS-C4b			2.10	0.11	12.7	0.23	3.78	0.9													
C8.3b			3.46	0.48	14.2	1.66	3.61	6.0													
C8.3c (OS-C4b-C8.3c)	I-54	7.89	2.33	0.48	10.7	1.12	4.03	4.5	14.2	3.01	3.61	10.9									
OS-C4a-C8.3c	**I-54**	16.06							20.0	5.92	3.09	18.3									
C8.3d	I-56		5.26	0.48	15.1	2.52	3.51	8.9													
OS-C4a-C8.3d	**I-56**	21.32							20.6	8.45	3.05	25.7									
C8.4	I-57		6.70	0.46	14.5	3.08	3.57	11.0													
C8.1-C8.4	**I-51**	39.83							21.1	12.57	3.01	37.9									
C8.5	I-59		3.84	0.49	13.4	1.88	3.69	7.0													
C8.6			0.79	0.90	5.6	0.71	5.58	4.0													
C8.7a			4.52	0.49	13.7	2.21	3.66	8.1													
C8.7b	I-63		1.77	0.49	11.3	0.87	3.94	3.4													
C8.7a-C8.7b	**I-63**	6.29							13.9	3.08	3.63	11.2									
C8.7c	I-64		4.94	0.49	11.7	2.42	3.90	9.4													
C8.7a-C8.7c	**I-64**	11.23							14.4	5.50	3.59	19.7									
C8.7d	I-66		0.27	0.46	5.0	0.12	5.17	0.6													
C8.7e			6.09	0.47	11.9	2.86	3.87	11.1													
C8.6+C8.7e	I-62								13.4	3.57	3.69	13.2									
C8.7a-C8.7e		17.59							15.4	8.49	3.48	29.5									
C8.6-C8.7e	**I-68**	18.38							15.5	9.20	3.47	31.9									
OS-B1			5.11	0.15	12.7	0.77	3.77	2.9													
C8.8a			5.65	0.49	23.4	2.77	3.86	7.9													
OS-B1-C8.8a	**I-69**	10.76							27.3	3.54	2.62	9.3									
68+69	**I-70**	29.14							27.3	12.74	2.62	33.4									
C8.8			7.80	0.22	15.6	1.72	3.46	5.9													
C8			73.39	0.43	27.5	31.46	2.61	82.2													
Missing basins H1 & G1																					

Page: 57

Author: CDurham Subject: Text Box Date: 3/10/2022 8:49:24 AM -06'00'
Missing basins H1 & G1

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:49:43 AM -06'00'
added to ex. conditions spreadsheet because they are existing basins.

Channel Report

EAST SWALE 3%

Trapezoidal

Botom Width (ft)	= 10.00
Side Slope (z:1)	= 10.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 100.00
Slope (%)	= 3.00
N-Value	= 0.020

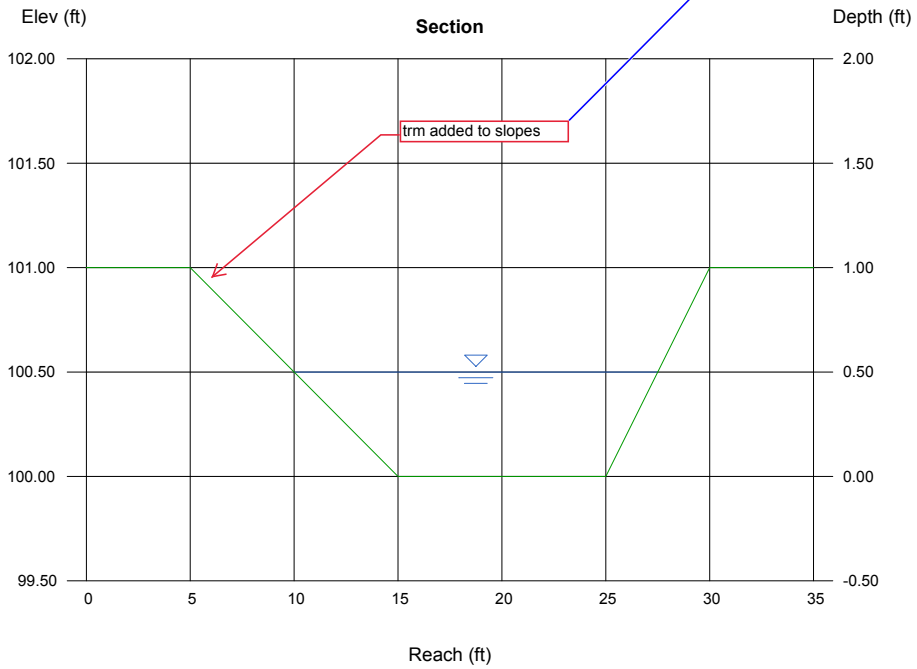
Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 47.31
Area (sqft)	= 6.88
Velocity (ft/s)	= 6.88
Wetted Perim (ft)	= 17.57
Crit Depth, Yc (ft)	= 0.59
Top Width (ft)	= 17.50
EGL (ft)	= 1.24

Include design information for TRM



Author: CDurham Subject: Text Box Date: 2/17/2022 10:36:39 AM -06'00'
Include design information for TRM

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:59:19 AM -06'00'
type of TRM added

Author: RSchindler Subject: Callout Date: 11/5/2021 11:54:20 AM
trm added to slopes

Channel Report

Hydraflow Express by Intelisolve — Wednesday, Sep 29 2021, 9:34 AM

EAST SWALE BY CUT/FILL (5.0%)

Triangular

Side Slope (z:1)	= 4.00
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 100.00
Slope (%)	= 5.00
N-Value	= 0.020

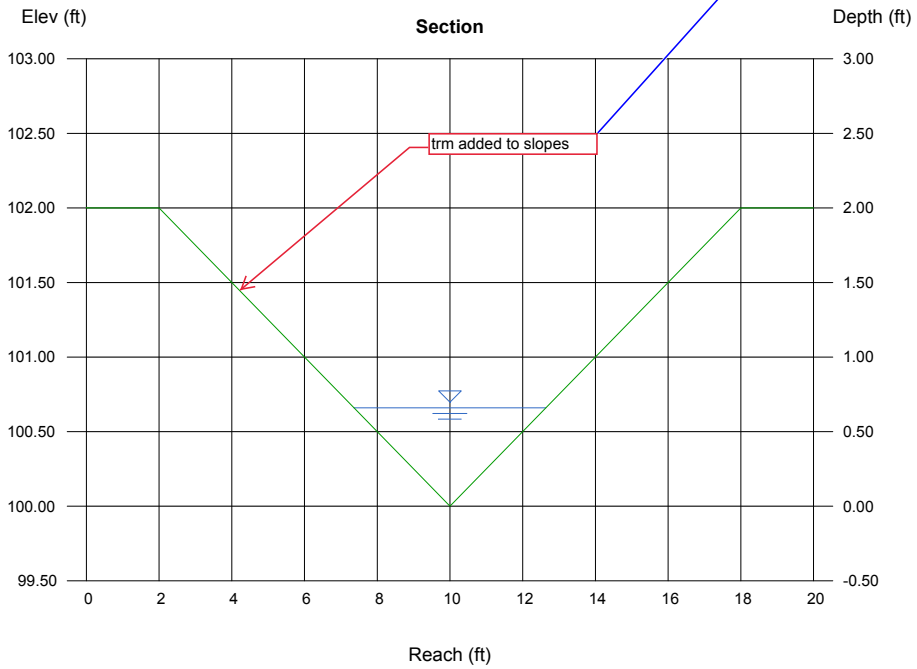
Calculations

Compute by:	Known Q
Known Q (cfs)	= 13.20

Highlighted

Depth (ft)	= 0.66
Q (cfs)	= 13.20
Area (sqft)	= 1.74
Velocity (ft/s)	= 7.58
Wetted Perim (ft)	= 5.44
Crit Depth, Yc (ft)	= 0.93
Top Width (ft)	= 5.28
EGL (ft)	= 1.55

Include design information for TRM



Page: 79

Author: CDurham Subject: Text Box Date: 2/17/2022 10:40:55 AM -06'00'
Include design information for TRM

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 8:59:33 AM -06'00'
type of TRM added

Author: RSchindler Subject: Callout Date: 11/5/2021 11:54:31 AM
trm added to slopes

Channel Report

Hydraflow Express by Intelisolve — Friday, Nov 5 2021, 10:47 AM

Pond F spreader - 8-in curbhead

Rectangular

Botom Width (ft)	= 4.00
Total Depth (ft)	= 0.67
Invert Elev (ft)	= 100.00
Slope (%)	= 0.60
N-Value	= 0.013

Calculations

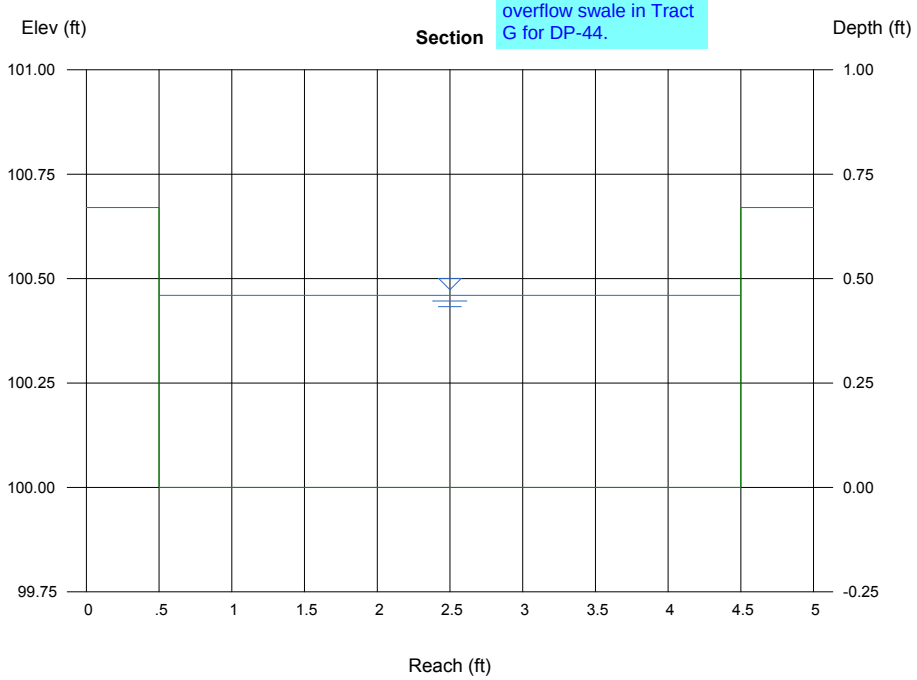
Compute by:	Known Q
Known Q (cfs)	= 8.40

Highlighted

Depth (ft)	= 0.46
Q (cfs)	= 8.400
Area (sqft)	= 1.84
Velocity (ft/s)	= 4.57
Wetted Perim (ft)	= 4.92
Crit Depth, Yc (ft)	= 0.52
Top Width (ft)	= 4.00
EGL (ft)	= 0.78

Include calculation to size riprap for spreader.

Include design for overflow swale in Tract G for DP-44.



Page: 80

Author: CDurham Subject: Text Box Date: 3/10/2022 9:00:09 AM -06'00'
Include calculation to size riprap for spreader.

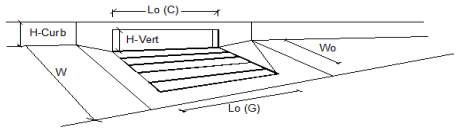
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:00:43 AM -06'00'
not needed. spreader reduced flows to non-erosive velocities. we added small rock for additional protection.

Author: CDurham Subject: Text Box Date: 2/17/2022 4:32:22 PM -06'00'
Include design for overflow swale in Tract G for DP-44.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:01:21 AM -06'00'
design added

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	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_fG =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_fC =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Design Discharge for Half of Street (from Sheet *Inlet Management*)	Q_o =	**8.9**	**21.6**	cfs
Water Spread Width	T =	13.3	19.0	ft
Water Depth at Flowline (outside of local depression)	d =	4.7	6.1	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.448	0.312	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	4.9	14.9	cfs
Discharge within the Gutter Section W	Q_w =	4.0	6.7	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.62	0.85	sq ft
Velocity within the Gutter Section W	V_W =	6.5	8.0	fps
Water Depth for Design Condition	d_{LOCAL} =	7.7	9.1	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoef =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	**N/A**	**N/A**	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	**N/A**	**N/A**	cfs
Curb or Slotted Inlet Opening Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e (based on grate carry-over)	S_e =	0.104	0.079	ft/ft
Required Length L_T to Have 100% Interception	L_T =	17.27	30.89	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	17.27	20.00	ft
Interception Capacity	Q_i =	8.9	18.3	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoef =	1.33	1.33	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.03	0.03	
Effective (Unclogged) Length	L_e =	17.34	17.34	ft
Actual Interception Capacity	Q_a =	**8.9**	**18.0**	cfs
Carry-Over Flow = $Q_{o(GRATE)}$-Q_a	Q_b =	**0.0**	**3.6**	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	**8.9**	**18.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	**0.0**	**3.6**	**cfs**
Capture Percentage = Q_a/Q_o =	C% =	**100**	**83**	%

Hydrology spreadsheet has Q100 = 19.7 at DP-4

Page: 86

Author: CDurham Subject: Callout Date: 2/17/2022 10:54:14 AM -06'00'

Hydrology spreadsheet has Q100 = 19.7 at DP-4

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:17:55 AM -06'00'

hydrology spreadsheet did not account for 1.9cfs from Des.Pt. 35a. the design point summaries detail out all of this.

Author: CDurham Subject: Highlight Date: 2/17/2022 10:53:39 AM -06'00'

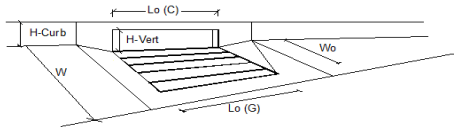
18.0

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:18:03 AM -06'00'

this is correct

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**3.0**	**5.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.9**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**86**	**%**

Hydrology spreadsheet h
Q100 = 6.6 at

Page: 88

Author: CDurham Subject: Callout Date: 2/17/2022 10:56:25 AM -06'00'
Hydrology spreadsheet has Q100 = 6.6 at DP-6

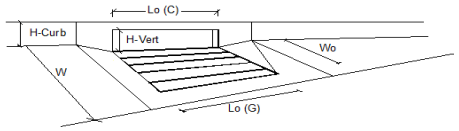
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:20:44 AM -06'00'
if you add interception to bypass this is 6.6

Author: CDurham Subject: Highlight Date: 2/17/2022 10:55:59 AM -06'00'
5.7

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 9:20:52 AM -06'00'
correct

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			MINOR	MAJOR	
Total Inlet Interception Capacity		**Q =**	**9.3**	**14.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)		**Q_b =**	**0.6**	**7.0**	**cfs**
Capture Percentage = Q_a/Q_o =		**C% =**	**94**	**68**	**%**

Hydrology spreadsheet has flows of 9.9 & 21.8 at DP-12

Page: 90

Author: CDurham Subject: Highlight Date: 2/17/2022 10:57:32 AM -06'00'
9.3

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:18:23 AM -06'00'
this is correct

Author: CDurham Subject: Highlight Date: 2/17/2022 10:57:34 AM -06'00'
14.8

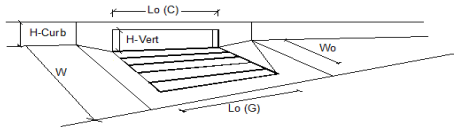
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:18:31 AM -06'00'
this is correct

Author: CDurham Subject: Callout Date: 2/17/2022 10:58:01 AM -06'00'
Hydrology spreadsheet has flows of 9.9 & 21.8 at DP-12

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:09:44 AM -06'00'
if you add interception to bypass this is 9.9/ 21.8

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			MINOR	MAJOR	
Total Inlet Interception Capacity		**Q =**	**8.3**	**15.6**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)		**Q_b =**	**0.2**	**8.7**	**cfs**
Capture Percentage = Q_a/Q_o =		**C% =**	**97**	**64**	**%**

Hydrology spreadsheet has flows of 7.9 & 17.3 at DP-13

Page: 92

Author: CDurham Subject: Highlight Date: 2/17/2022 10:58:38 AM -06'00'
8.3

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:19:05 AM -06'00'
this is correct

Author: CDurham Subject: Highlight Date: 2/17/2022 10:58:40 AM -06'00'
15.6

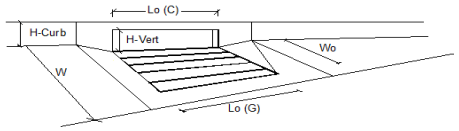
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:19:11 AM -06'00'
this is correct

Author: CDurham Subject: Callout Date: 3/10/2022 10:20:18 AM -06'00'
Hydrology spreadsheet has flows of 7.9 & 17.3 at DP-13

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:20:35 AM -06'00'
spreadsheet doesn't account for bypass flow from upstream

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			MINOR	MAJOR	
Total Inlet Interception Capacity		**Q =**	**8.4**	**16.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)		**Q_b =**	**0.3**	**10.6**	**cfs**
Capture Percentage = Q_a/Q_o =		**C% =**	**97**	**60**	**%**

Hydrology spreadsheet has Q100 = 18.6 at DP-15

Page: 94

Author: CDurham Subject: Highlight Date: 2/17/2022 11:00:21 AM -06'00'
16.5

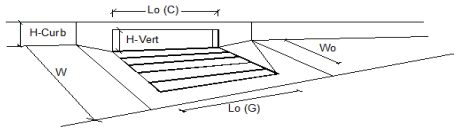
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:20:43 AM -06'00'
correct.

Author: CDurham Subject: Callout Date: 2/17/2022 11:00:52 AM -06'00'
Hydrology spreadsheet has Q100 = 18.6 at DP-15

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:21:44 AM -06'00'
spreadsheets do not account for upstream bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	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 =**	**10.3**	**21.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**7.6**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**74**	**%**

Hydrology spreadsheet has Q100=22.6 at DP-19

Page: 98

Author: CDurham Subject: Callout Date: 2/17/2022 11:02:39 AM -06'00'

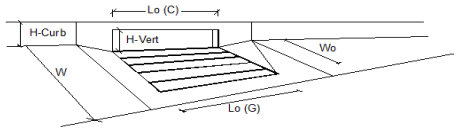
Hydrology spreadsheet has Q100=22.6 at DP-19

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:46:30 AM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**5.6**	**10.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**1.6**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**87**	**%**

Hydrology spreadsheet has Q100=12.3 at DP-20a

Page: 100

Author: CDurham Subject: Callout Date: 2/17/2022 11:06:59 AM -06'00'

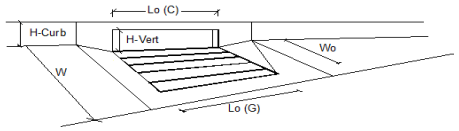
Hydrology spreadsheet has Q100=12.3 at DP-20a

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:46:44 AM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**7.2**	**13.1**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**4.4**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**75**	**%**

Hydrology spreadsheet has Q100=15.9 at DP-21

Page: 102

Author: CDurham Subject: Callout Date: 2/17/2022 11:07:55 AM -06'00'

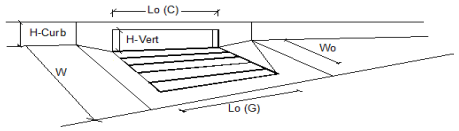
Hydrology spreadsheet has Q100=15.9 at DP-21

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:51:13 AM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**8.4**	**16.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.3**	**10.4**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**97**	**61**	**%**

Hydrology spreadsheet has Q100=19.1 at DP-23

Page: 104

Author: CDurham Subject: Callout Date: 2/17/2022 11:08:47 AM -06'00'

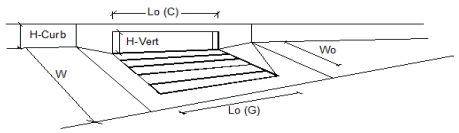
Hydrology spreadsheet has Q100=19.1 at DP-23

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:51:17 AM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**7.2**	**11.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**2.9**	**15.1**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**71**	**43**	**%**

Hydrology spreadsheet has flows of 10.0 & 22.0 at DP-25

Page: 106

Author: CDurham Subject: Callout Date: 2/17/2022 11:09:48 AM -06'00'

Hydrology spreadsheet has flows of 10.0 & 22.0 at DP-25

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:51:23 AM -06'00'

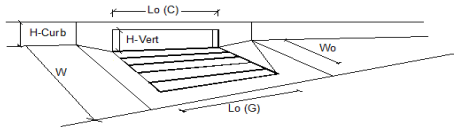
spreadsheets do not account for bypass

Author: CDurham Subject: Callout Date: 2/17/2022 11:14:15 AM -06'00'
Hydrology spreadsheet has Q100=23.2 at DP-31

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:51:28 AM -06'00'
spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017

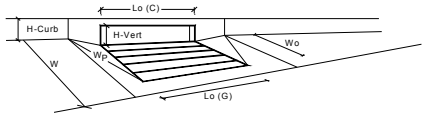


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	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	
Design Discharge for Half of Street (from Sheet *Inlet Management*)	Q_o =	**10.5**	**23.2**	cfs
Water Spread Width	T =	12.4	17.2	ft
Water Depth at Flowline (outside of local depression)	d =	4.5	5.6	inches
Water Depth at Street Crown (or at T_{MAX})	d_{CROWN} =	0.0	0.0	inches
Ratio of Gutter Flow to Design Flow	E_o =	0.477	0.346	
Discharge outside the Gutter Section W, carried in Section T_x	Q_x =	5.5	15.2	cfs
Discharge within the Gutter Section W	Q_w =	5.0	8.0	cfs
Discharge Behind the Curb Face	Q_{BACK} =	0.0	0.0	cfs
Flow Area within the Gutter Section W	A_W =	0.58	0.77	sq ft
Velocity within the Gutter Section W	V_W =	8.6	10.4	fps
Water Depth for Design Condition	d_{LOCAL} =	7.5	8.6	inches
Grate Analysis (Calculated)		MINOR	MAJOR	
Total Length of Inlet Grate Opening	L =	N/A	N/A	ft
Ratio of Grate Flow to Design Flow	$E_{o\text{-}GRATE}$ =	N/A	N/A	
Under No-Clogging Condition		MINOR	MAJOR	
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Interception Capacity	Q_i =	N/A	N/A	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient for Multiple-unit Grate Inlet	GrateCoef =	N/A	N/A	
Clogging Factor for Multiple-unit Grate Inlet	GrateClog =	N/A	N/A	
Effective (unclogged) Length of Multiple-unit Grate Inlet	L_e =	N/A	N/A	ft
Minimum Velocity Where Grate Splash-Over Begins	V_o =	N/A	N/A	fps
Interception Rate of Frontal Flow	R_f =	N/A	N/A	
Interception Rate of Side Flow	R_x =	N/A	N/A	
Actual Interception Capacity	Q_a =	**N/A**	**N/A**	cfs
Carry-Over Flow = Q_o-Q_a (to be applied to curb opening or next d/s inlet)	Q_b =	**N/A**	**N/A**	cfs
Curb or Slotted Inlet Opening Analysis (Calculated)		MINOR	MAJOR	
Equivalent Slope S_e (based on grate carry-over)	S_e =	0.110	0.085	ft/ft
Required Length L_T to Have 100% Interception	L_T =	19.05	32.09	ft
Under No-Clogging Condition		MINOR	MAJOR	
Effective Length of Curb Opening or Slotted Inlet (minimum of L, L_T)	L =	15.00	15.00	ft
Interception Capacity	Q_i =	9.9	15.7	cfs
Under Clogging Condition		MINOR	MAJOR	
Clogging Coefficient	CurbCoef =	1.31	1.31	
Clogging Factor for Multiple-unit Curb Opening or Slotted Inlet	CurbClog =	0.04	0.04	
Effective (Unclogged) Length	L_e =	13.03	13.03	ft
Actual Interception Capacity	Q_a =	**9.7**	**15.3**	cfs
Carry-Over Flow = $Q_{o(GRATE)}$-Q_a	Q_b =	**0.8**	**7.9**	cfs
Summary		MINOR	MAJOR	
Total Inlet Interception Capacity	Q =	**9.7**	**15.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	Q_b =	**0.8**	**7.9**	**cfs**
Capture Percentage = Q_a/Q_o =	C% =	**92**	**66**	%

Hydrology spreadsheet has Q100=23.2 at DP-31

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening	MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.6	8.4	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	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 (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.30	0.53	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.53	0.79	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.76	0.91	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	**10.3**	**29.2**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	8.6	27.5	cfs

Please include DP-32 on hydrology spreadsheet to verify inlet flows

Author: CDurham Subject: Text Box Date: 2/17/2022 11:15:26 AM -06'00'

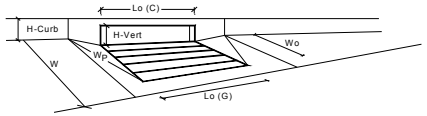
Please include DP-32 on hydrology spreadsheet to verify inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:54:03 AM -06'00'

flow only from basin C4.3 which is in spreadsheet. the design point details bypass flows.

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	4.6	7.7	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	25.00	25.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.22	0.47	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.43	0.72	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.69	0.88	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**7.0**	**28.7**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	7.0	28.7	cfs

Please include DP-33 on hydrology spreadsheet to verify inlet flows

Author: CDurham Subject: Text Box Date: 2/17/2022 11:16:56 AM -06'00'

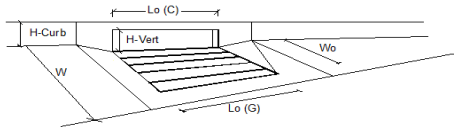
Please include DP-33 on hydrology spreadsheet to verify inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 10:55:54 AM -06'00'

flow is only from Basin C4.4 and upstream bypass. the basin flow is in the spreadsheet.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	15.00	15.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**5.9**	**11.3**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**1.9**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**86**	**%**

Include DP-35a on hydrology spreadsheet to verify inlet flows

Page: 118

Author: CDurham Subject: Text Box Date: 2/17/2022 11:18:06 AM -06'00'

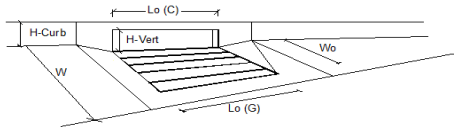
Include DP-35a on hydrology spreadsheet to verify inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:54:52 PM -06'00'

flow is only from Basin f1.4 and the basin flow is in the spreadsheet.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	10.00	10.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**1.9**	**4.4**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**0.2**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**96**	**%**

Include DP-35b on hydrology spreadsheet to verify inlet flows

Page: 120

Author: CDurham Subject: Text Box Date: 2/17/2022 11:19:00 AM -06'00'

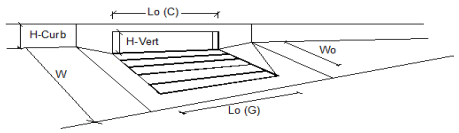
Include DP-35b on hydrology spreadsheet to verify inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:55:16 PM -06'00'

flow is only from Basin f1.3 and the basin flow is in the spreadsheet.

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)	No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)	L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**4.1**	**5.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**7.3**	**19.5**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**36**	**22**	**%**

Hydrology spreadsheet has flows of 11.4 & 25.2 at DP-36

Page: 122

Author: CDurham Subject: Callout Date: 2/17/2022 11:20:45 AM -06'00'

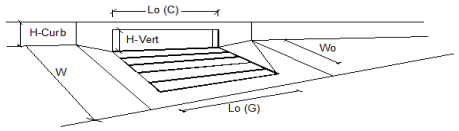
Hydrology spreadsheet has flows of 11.4 & 25.2 at DP-36

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:56:01 PM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		No =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_f-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity'			MINOR	MAJOR	
Total Inlet Interception Capacity		**Q =**	**3.4**	**4.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)		**Q_b =**	**4.0**	**11.5**	**cfs**
Capture Percentage = Q_a/Q_o =		**C% =**	**46**	**29**	**%**

Hydrology spreadsheet has flows of 7.4 & 16.3 at DP-37

Page: 124

Author: CDurham Subject: Callout Date: 2/17/2022 11:21:27 AM -06'00'

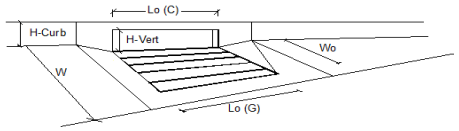
Hydrology spreadsheet has flows of 7.4 & 16.3 at DP-37

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:57:29 PM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	25.00	25.00	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 =**	**12.7**	**27.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**7.0**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**79**	**%**

Include DP-39 on hydrology spreadsheet to verify inlet flows

Author: CDurham Subject: Text Box Date: 2/17/2022 11:22:44 AM -06'00'
Include DP-39 on hydrology spreadsheet to verify inlet flows

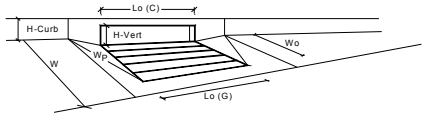
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:57:52 PM -06'00'
spreadsheets do not account for bypass

Author: RSchindler Subject: Text Box Date: 11/5/2021 11:55:56 AM

inlet overtops and flows to Inlet DP-43

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017

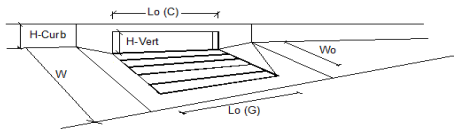


Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.6	7.9	inches
Grate Information		MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	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 (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.30	0.49	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.53	0.74	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.76	0.89	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	**10.3**	**25.1**	cfs
WARNING: Inlet Capacity less than Q Peak for Major Storm	$Q_{PEAK\ REQUIRED}$ =	9.3	27.7	cfs

inlet overtops and flows to Inlet DP-43

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	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 =**	**7.7**	**20.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**6.9**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**75**	**%**

There are two DP-49's listed in hydrology spreadsheet. Please clarify which set of flows is used for inlet flow.

Author: CDurham Subject: Text Box Date: 2/17/2022 11:27:44 AM -06'00'

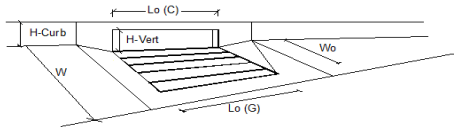
There are two DP-49's listed in hydrology spreadsheet. Please clarify which set of flows is used for inlet flow.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 12:59:30 PM -06'00'

spreadsheets do not account for bypass

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**9.7**	**16.2**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.9**	**10.3**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**91**	**61**	**%**

Hydrology spreadsheet has Q100=23 at DP-53

Page: 140

Author: CDurham Subject: Callout Date: 2/17/2022 11:29:54 AM -06'00'

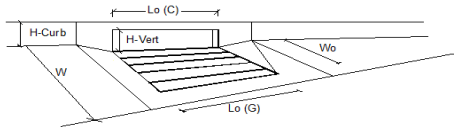
Hydrology spreadsheet has Q100=23 at DP-53

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:18:27 PM -06'00'

spreadsheet has 26.5cfs for Basin C8.3a

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	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 =**	**11.7**	**24.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.1**	**13.6**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**99**	**64**	**%**

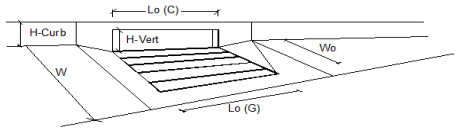
Hydrology spreadsheet has Q100=26.5 at DP-54

Author: CDurham Subject: Callout Date: 2/17/2022 11:31:52 AM -06'00'
Hydrology spreadsheet has Q100=26.5 at DP-54

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:39:25 PM -06'00'
spreadsheet does not account for spread/runby

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR & MAJOR STORM		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**9.0**	**23.7**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**9.1**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**72**	**%**

There are two DP-56's listed in hydrology spreadsheet. Please clarify which set of flows is used for inlet flow.

Author: CDurham Subject: Text Box Date: 2/17/2022 11:33:39 AM -06'00'

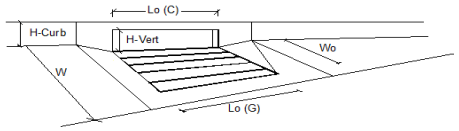
There are two DP-56's listed in hydrology spreadsheet. Please clarify which set of flows is used for inlet flow.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:40:10 PM -06'00'

spreadsheet updated

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =	20.00	20.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)	W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)	C_f-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)	C_f-C =	0.10	0.10	
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR STORM		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**11.0**	**19.0**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**5.1**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**79**	**%**

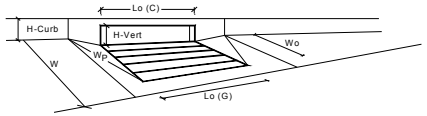
Hydrology spreadsheet has Q100=24.1 at DP-57

Author: CDurham Subject: Callout Date: 2/17/2022 11:34:55 AM -06'00'
Hydrology spreadsheet has Q100=24.1 at DP-57

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:40:31 PM -06'00'
spreadsheets do not account for bypass

INLET IN A SUMP OR SAG LOCATION

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)	a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)	No =	1	1	
Water Depth at Flowline (outside of local depression)	Ponding Depth =	5.6	8.0	inches
Grate Information		MINOR	MAJOR	☑ Override
Length of a Unit Grate	L_o (G) =	N/A	N/A	feet
Width of a Unit Grate	W_o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)	A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)	C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)	C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)	C_o (G) =	N/A	N/A	
Curb Opening Information		MINOR	MAJOR	
Length of a Unit Curb Opening	L_o (C) =	30.00	30.00	feet
Height of Vertical Curb Opening in Inches	H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches	H_{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)	Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)	W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)	C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)	C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)	C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR	MAJOR	
Depth for Grate Midwidth	d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation	d_{Curb} =	0.30	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets	$RF_{Combination}$ =	0.53	0.75	
Curb Opening Performance Reduction Factor for Long Inlets	RF_{Curb} =	0.76	0.89	
Grated Inlet Performance Reduction Factor for Long Inlets	RF_{Grate} =	N/A	N/A	
		MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	**14.9**	**37.4**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)	$Q_{PEAK\ REQUIRED}$ =	14.3	37.4	cfs

Inlet labeled as existing inlet on map. Please ve correct length and upda spreadsheet/map accordingly.

Author: CDurham Subject: Callout Date: 2/17/2022 11:36:38 AM -06'00'

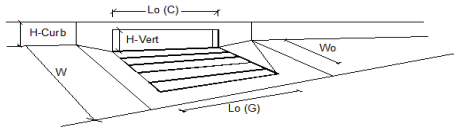
Inlet labeled as existing 25' inlet on map. Please verify correct length and update spreadsheet/map accordingly.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:41:14 PM -06'00'

inlet to be 30' inlet

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**10.2**	**15.9**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**1.3**	**9.7**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**89**	**62**	**%**

There are two DP-63's listed on hydrology spreadsheet. Please clarify which set of flows are used for inlet flows

Page: 150

Author: CDurham Subject: Text Box Date: 2/17/2022 11:39:01 AM -06'00'

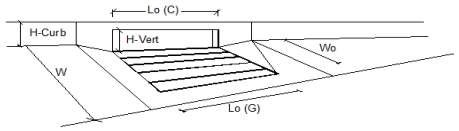
There are two DP-63's listed on hydrology spreadsheet. Please clarify which set of flows are used for inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:42:33 PM -06'00'

spreadsheet revised

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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: WARNING: Q > ALLOWABLE Q FOR MAJOR STORM		MINOR	MAJOR	
Total Inlet Interception Capacity	**Q =**	**9.8**	**17.5**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.9**	**13.1**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**92**	**57**	**%**

There are two DP-64's listed on hydrology spreadsheet. Please clarify which set of flows are used for inlet flows

Author: CDurham Subject: Text Box Date: 2/17/2022 11:39:49 AM -06'00'

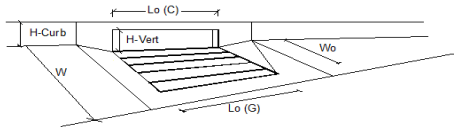
There are two DP-64's listed on hydrology spreadsheet. Please clarify which set of flows are used for inlet flows

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:42:51 PM -06'00'

spreadsheet revised

INLET ON A CONTINUOUS GRADE

Version 4.05 Released March 2017



Design Information (Input)		MINOR	MAJOR	
Type of Inlet	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')	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 =**	**1.5**	**11.8**	**cfs**
Total Inlet Carry-Over Flow (flow bypassing inlet)	**Q_b =**	**0.0**	**2.7**	**cfs**
Capture Percentage = Q_a/Q_o =	**C% =**	**100**	**81**	**%**

Hydrology spreadsheet has Q100 = 44.1 cfs at DP-66

Page: 154

Author: CDurham Subject: Callout Date: 2/17/2022 11:41:35 AM -06'00'

Hydrology spreadsheet has Q100 = 44.1 cfs at DP-66

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:44:17 PM -06'00'

spreadsheet revised. this is a small basin

Please include spreadsheet/table listing contributing basins and % impervious to each pond.

Page: 157

Author: CDurham Subject: Text Box Date: 2/17/2022 12:16:24 PM -06'00'

Please include spreadsheet/table listing contributing basins and % impervious to each pond.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:45:56 PM -06'00'

not needed nor should this be in the appendix. See section 6.0 which has all that data for each pond.

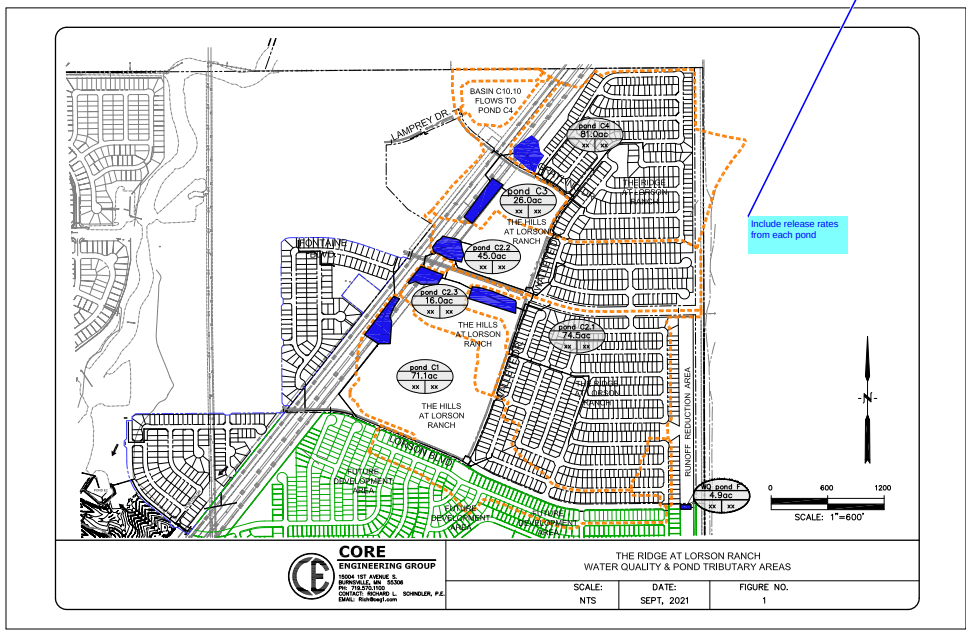
Page: 158

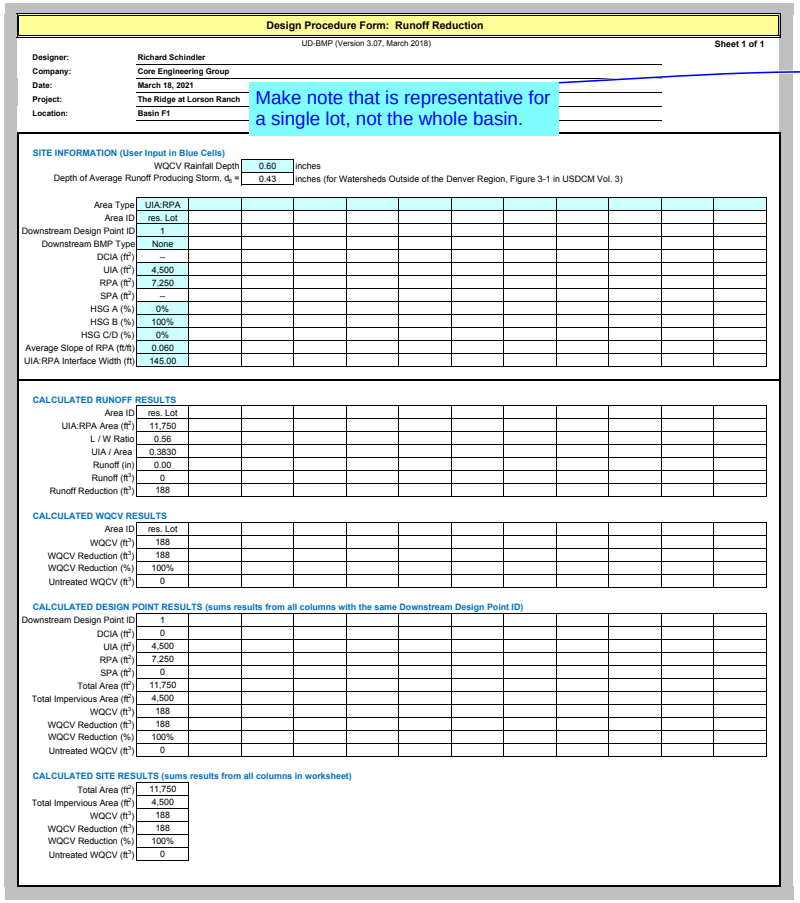
Author: CDurham Subject: Text Box Date: 2/17/2022 11:43:30 AM -06'00'

Include release rates from each pond

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:46:35 PM -06'00'

not needed. See section 6.0 which has all that data for each pond.





Design Procedure Form: Runoff Reduction

UD-BMP (Version 3.07, March 2018) — Sheet 1 of 1

Designer: Richard Schindler
Company: Core Engineering Group
Date: March 18, 2021
Project: The Ridge at Lorson Ranch
Location: Basin F1

Make note that is representative for a single lot, not the whole basin.

SITE INFORMATION (User Input in Blue Cells)

WQCV Rainfall Depth: 0.60 inches
Depth of Average Runoff Producing Storm, d_6 = 0.43 inches (for Watersheds Outside of the Denver Region, Figure 3-1 in USDCM Vol. 3)

Area Type	UIA:RPA												
Area ID	res. Lot												
Downstream Design Point ID	1												
Downstream BMP Type	None												
DCIA (ft²)	--												
UIA (ft²)	4,500												
RPA (ft²)	7,250												
SPA (ft²)	--												
HSG A (%)	0%												
HSG B (%)	100%												
HSG C/D (%)	0%												
Average Slope of RPA (ft/ft)	0.060												
UIA:RPA Interface Width (ft)	145.00												

CALCULATED RUNOFF RESULTS

Area ID	res. Lot												
UIA:RPA Area (ft²)	11,750												
L / W Ratio	0.56												
UIA / Area	0.3830												
Runoff (in)	0.00												
Runoff (ft³)	0												
Runoff Reduction (ft³)	188												

CALCULATED WQCV RESULTS

Area ID	res. Lot												
WQCV (ft³)	188												
WQCV Reduction (ft³)	188												
WQCV Reduction (%)	100%												
Untreated WQCV (ft³)	0												

CALCULATED DESIGN POINT RESULTS (sums results from all columns with the same Downstream Design Point ID)

Downstream Design Point ID	1												
DCIA (ft²)	0												
UIA (ft²)	4,500												
RPA (ft²)	7,250												
SPA (ft²)	0												
Total Area (ft²)	11,750												
Total Impervious Area (ft²)	4,500												
WQCV (ft³)	188												
WQCV Reduction (ft³)	188												
WQCV Reduction (%)	100%												
Untreated WQCV (ft³)	0												

CALCULATED SITE RESULTS (sums results from all columns in worksheet)

Total Area (ft²)	11,750
Total Impervious Area (ft²)	4,500
WQCV (ft³)	188
WQCV Reduction (ft³)	188
WQCV Reduction (%)	100%
Untreated WQCV (ft³)	0

Page: 159

Author: CDurham Subject: Text Box Date: 2/17/2022 4:34:02 PM -06'00'
Make note that is representative for a single lot, not the whole basin.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:47:47 PM -06'00'
this was noted clearly in Section 6.0 which details all the information.

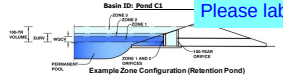
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.02 (February 2020)

Project: The Hills at Lorson Ranch

Basin ID: Pond C1

Please label as existing



Example Zone Configuration (Retention Pond)

pond bottom=5743.40

Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume ($ac\text{-}ft$)
Top of Micropool	**	0.00	**	**	**	40	0.001		
5743.73	**	0.33	**	**	**	52	0.001	15	0.000
5744	**	0.60	**	**	**	300	0.007	63	0.001
5745	**	1.60	**	**	**	4,017	0.092	2,221	0.051
5746	**	2.60	**	**	**	26,320	0.604	17,389	0.399
5747	**	3.60	**	**	**	56,078	1.287	58,588	1.345
5748	**	4.60	**	**	**	62,238	1.429	117,746	2.703
5749	**	5.60	**	**	**	66,563	1.528	182,147	4.182
5750	**	6.60	**	**	**	70,969	1.629	250,913	5.760
5751	**	7.60	**	**	**	75,495	1.733	324,145	7.441
5752	**	8.60	**	**	**	80,136	1.840	401,960	9.228
5753	**	9.60	**	**	**	85,057	1.953	484,557	11.124
5754	**	10.60	**	**	**	90,000	2.066	572,085	13.133
5755	**	11.60	**	**	**	95,000	2.181	664,585	15.257
5756	**	12.60	**	**	**	100,000	2.296	762,085	17.495

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	71.10	acres
Watershed Length =	4,800	ft
Watershed Length to Centroid =	2,100	ft
Watershed Slope =	0.040	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.306	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	4.212	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	3.975	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	5.580	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	6.975	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	8.792	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	10.293	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	12.175	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	16.033	acre-feet	inches
Approximate 2-yr Detention Volume =	3.210	acre-feet	
Approximate 5-yr Detention Volume =	4.365	acre-feet	
Approximate 10-yr Detention Volume =	5.698	acre-feet	
Approximate 25-yr Detention Volume =	6.193	acre-feet	
Approximate 50-yr Detention Volume =	6.465	acre-feet	
Approximate 100-yr Detention Volume =	7.133	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.306	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.906	acre-feet
Zone 3 (100yr + 1/2 WQCV - Zones 1 & 2) =	3.574	acre-feet
Total Detention Basin Volume =	7.786	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_{LW}) =	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

Page: 160

Author: CDurham Subject: Text Box Date: 2/17/2022 11:51:13 AM -06'00'

Please label as existing

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:49:09 PM -06'00'

section 6.0 discusses each pond

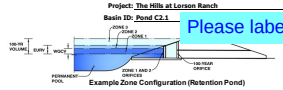
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.02 (February 2020)

Project: The Hills at Lorson Ranch

Basin ID: Pond C2.1

Please label as existing



Example Zone Configuration (Retention Pond)

top micropool-5760.00

Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume ($ac-ft$)
Top of Micropool	**	0.00	**	**	**	42	0.001		
5760.33	**	0.33	**	**	**	50	0.001	15	0.000
5761	**	1.00	**	**	**	1,264	0.029	455	0.010
5762	**	2.00	**	**	**	20,478	0.470	11,326	0.260
5763	**	3.00	**	**	**	41,417	0.951	42,274	0.970
5764	**	4.00	**	**	**	44,796	1.028	85,380	1.960
5765	**	5.00	**	**	**	48,239	1.107	131,898	3.028
5766	**	6.00	**	**	**	51,758	1.188	181,896	4.176
5767	**	7.00	**	**	**	55,348	1.271	235,449	5.405
5768	**	8.00	**	**	**	59,010	1.355	292,628	6.718
5769	**	9.00	**	**	**	62,743	1.440	353,505	8.115
5770	**	10.00	**	**	**	66,548	1.528	418,150	9.599
5771	**	11.00	**	**	**	70,423	1.617	486,636	11.172
5772	**	12.00	**	**	**	74,434	1.709	559,064	12.834

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	74.50	acres
Watershed Length =	2,500	ft
Watershed Length to Centroid =	2,000	ft
Watershed Slope =	0.038	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.368	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	4.414	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	4.152	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	5.828	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	7.285	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	9.182	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	10.750	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	12.716	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	16.746	acre-feet	inches
Approximate 2-yr Detention Volume =	3.363	acre-feet	
Approximate 5-yr Detention Volume =	4.574	acre-feet	
Approximate 10-yr Detention Volume =	5.970	acre-feet	
Approximate 25-yr Detention Volume =	6.490	acre-feet	
Approximate 50-yr Detention Volume =	6.774	acre-feet	
Approximate 100-yr Detention Volume =	7.475	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.368	acre-feet
Zone 2 Volume (EURV - Zone 1) =	3.045	acre-feet
Zone 3 (100yr + 1/ 2 WQCV - Zones 1 & 2) =	3.745	acre-feet
Total Detention Basin Volume =	8.159	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_{LW}) =	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

Page: 169

Author: CDurham Subject: Text Box Date: 2/17/2022 11:51:48 AM -06'00'

Please label as existing

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:49:14 PM -06'00'

section 6.0 discusses each pond

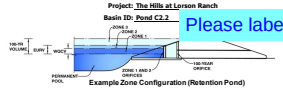
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.02 (February 2020)

Project: The Hills at Lorson Ranch

Basin ID: Pond C2.2

Please label as existing



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	45.00	acres
Watershed Length =	2,500	ft
Watershed Length to Centroid =	1,200	ft
Watershed Slope =	0.045	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	95.0%	percent
Percentage Hydrologic Soil Groups C/D =	5.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.827	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	2.651	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.510	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	3.521	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	4.403	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	5.541	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	6.487	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	7.671	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	10.104	acre-feet	inches
Approximate 2-yr Detention Volume =	2.035	acre-feet	
Approximate 5-yr Detention Volume =	2.778	acre-feet	
Approximate 10-yr Detention Volume =	3.600	acre-feet	
Approximate 25-yr Detention Volume =	3.912	acre-feet	
Approximate 50-yr Detention Volume =	4.081	acre-feet	
Approximate 100-yr Detention Volume =	4.507	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.827	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.824	acre-feet
Zone 3 (100yr + 1/2 WQCV - Zones 1 & 2) =	2.269	acre-feet
Total Detention Basin Volume =	4.920	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_{LW}) =	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

Micropool + 0 = 5744.00

Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume ($ac\text{-}ft$)
Top of Micropool	--	0.00	--	--	--	40	0.001		
5744.33	--	0.33	--	--	--	50	0.001	15	0.000
5745	--	1.00	--	--	--	255	0.006	117	0.003
5746	--	2.00	--	--	--	6,998	0.161	3,743	0.086
5747	--	3.00	--	--	--	38,392	0.881	26,438	0.607
5748	--	4.00	--	--	--	40,927	0.940	66,098	1.517
5749	--	5.00	--	--	--	43,534	0.999	108,328	2.487
5750	--	6.00	--	--	--	46,212	1.061	153,201	3.517
5751	--	7.00	--	--	--	48,991	1.125	200,803	4.610
5752	--	8.00	--	--	--	51,837	1.190	251,217	5.767
5753	--	9.00	--	--	--	54,731	1.256	304,501	6.990
5754	--	10.00	--	--	--	58,033	1.332	360,883	8.285

Page: 179

Author: CDurham Subject: Text Box Date: 2/17/2022 11:52:36 AM -06'00'

Please label as existing

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:49:18 PM -06'00'

section 6.0 discusses each pond

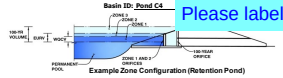
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.02 (February 2020)

Project: The Hills at Lorson Ranch

Basin ID: Pond C4

Please label as existing



Example Zone Configuration (Retention Pond)

micropool = 0 = 5765

Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume ($ac\text{-}ft$)
Top of Micropool	**	0.00	**	**	**	40	0.001		
5765.33	**	0.33	**	**	**	50	0.001	15	0.000
5766	**	1.00	**	**	**	630	0.014	243	0.006
5767	**	2.00	**	**	**	40,811	0.937	20,962	0.481
5768	**	3.00	**	**	**	49,929	1.146	66,332	1.523
5769	**	4.00	**	**	**	52,779	1.212	117,686	2.702
5770	**	5.00	**	**	**	55,690	1.278	171,921	3.947
5771	**	6.00	**	**	**	58,660	1.347	229,096	5.259
5772	**	7.00	**	**	**	61,704	1.417	289,278	6.641
5773	**	8.00	**	**	**	64,811	1.488	352,535	8.093
5774	**	9.00	**	**	**	67,980	1.561	418,931	9.617
5775	**	10.00	**	**	**	71,215	1.635	488,528	11.215
5776	**	11.00	**	**	**	75,000	1.722	561,636	12.893

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	81.00	acres
Watershed Length =	2,300	ft
Watershed Length to Centroid =	1,200	ft
Watershed Slope =	0.050	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	40.0%	percent
Percentage Hydrologic Soil Groups C/D =	60.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.488	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	4.468	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	4.607	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	6.475	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	8.109	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	10.045	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	11.748	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	13.830	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	18.178	acre-feet	inches
Approximate 2-yr Detention Volume =	3.723	acre-feet	
Approximate 5-yr Detention Volume =	5.293	acre-feet	
Approximate 10-yr Detention Volume =	6.364	acre-feet	
Approximate 25-yr Detention Volume =	6.876	acre-feet	
Approximate 50-yr Detention Volume =	7.136	acre-feet	
Approximate 100-yr Detention Volume =	7.948	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.488	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.980	acre-feet
Zone 3 (100yr + 1/ 2 WQCV - Zones 1 & 2) =	4.225	acre-feet
Total Detention Basin Volume =	8.692	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_{LW}) =	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

Page: 189

Author: CDurham Subject: Text Box Date: 2/17/2022 11:54:06 AM -06'00'

Please label as existing

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:49:28 PM -06'00'

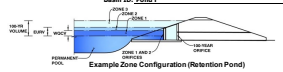
section 6.0 discusses each pond

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.02 (February 2020)

Project: The Ridge at Lorson Ranch

Basin ID: Pond F



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	4.90	acres
Watershed Length =	900	ft
Watershed Length to Centroid =	450	ft
Watershed Slope =	0.009	ft/ft
Watershed Imperviousness =	55.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

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

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.090	acre-feet	acre-feet
Excess Urban Runoff Volume (EURV) =	0.200	acre-feet	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.270	acre-feet	1.19 inches
5-yr Runoff Volume (P1 = 1.5 in.) =	0.379	acre-feet	1.50 inches
10-yr Runoff Volume (P1 = 1.75 in.) =	0.474	acre-feet	1.75 inches
25-yr Runoff Volume (P1 = 2 in.) =	0.597	acre-feet	2.00 inches
50-yr Runoff Volume (P1 = 2.25 in.) =	0.699	acre-feet	2.25 inches
100-yr Runoff Volume (P1 = 2.52 in.) =	0.827	acre-feet	2.52 inches
500-yr Runoff Volume (P1 = 3.14 in.) =	1.089	acre-feet	inches
Approximate 2-yr Detention Volume =	0.221	acre-feet	
Approximate 5-yr Detention Volume =	0.301	acre-feet	
Approximate 10-yr Detention Volume =	0.393	acre-feet	
Approximate 25-yr Detention Volume =	0.427	acre-feet	
Approximate 50-yr Detention Volume =	0.446	acre-feet	
Approximate 100-yr Detention Volume =	0.492	acre-feet	

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.090	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.200	acre-feet
Zone 3 (100yr + 1/2 WQCV - Zones 1 & 2) =	0.246	acre-feet
Total Detention Basin Volume =	0.537	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_{LW}) =	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

Please include calculation for low flow channel in Pond & riprap sizing for spillway

top micropool-S842.77

Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	**	0.00	**	**	**	30	0.001		
S844	**	1.23	**	**	**	1,180	0.027	744	0.017
S845	**	2.23	**	**	**	4,840	0.111	3,754	0.086
S846	**	3.23	**	**	**	6,608	0.152	9,478	0.218
S847	**	4.23	**	**	**	8,201	0.188	16,883	0.388
S848	**	5.23	**	**	**	9,600	0.220	25,783	0.592
S849	**	6.23	**	**	**	10,600	0.243	35,883	0.824

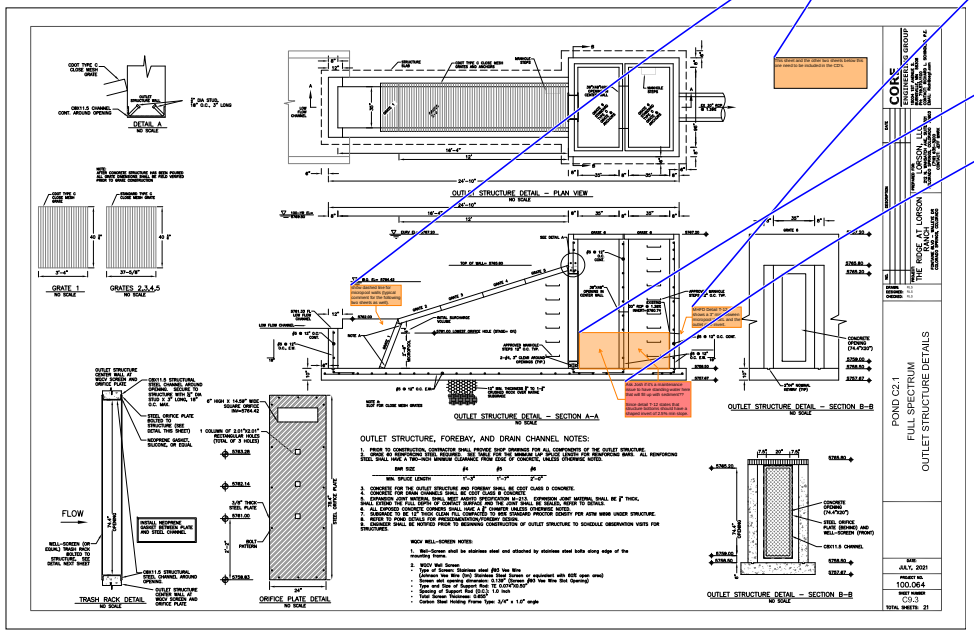
Page: 198

Author: CDurham Subject: Text Box Date: 2/17/2022 4:27:33 PM -06'00'

Please include calculation for low flow channel in Pond & riprap sizing for spillway

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 1:58:46 PM -06'00'

low flow included and rip rap removed because we installed a spreader



Page: 203

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox Date: 2/22/2022 9:07:18 PM -06'00'
This sheet and the other two sheets below this one need to be included in the CD's.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:02:08 PM -06'00'
these structures are in the early grading plan and are built.

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 9:08:48 PM -06'00'
show dashed line for micropool walls (typical comment for the following two sheets as well).

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:01:20 PM -06'00'
these structures are already built with early grading. the micropool wall is at 5762.00

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/23/2022 3:23:48 PM -06'00'
MHFD Detail T-12 shows a 3" min between micropool WSEL and the outlet pipe invert.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:01:45 PM -06'00'
this structure is already built with early grading.

Author: Glenn Reese - EPC Stormwater Subject: Rectangle Date: 2/22/2022 8:50:23 PM -06'00'

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/23/2022 3:21:09 PM -06'00'
Ask Josh if it's a maintenance issue to have standing water here that will fill up with sediment?? Since detail T-12 states that structure bottoms should have a shaped invert of 2.5% min slope.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:01:03 PM -06'00'
this structure is built with early grading.

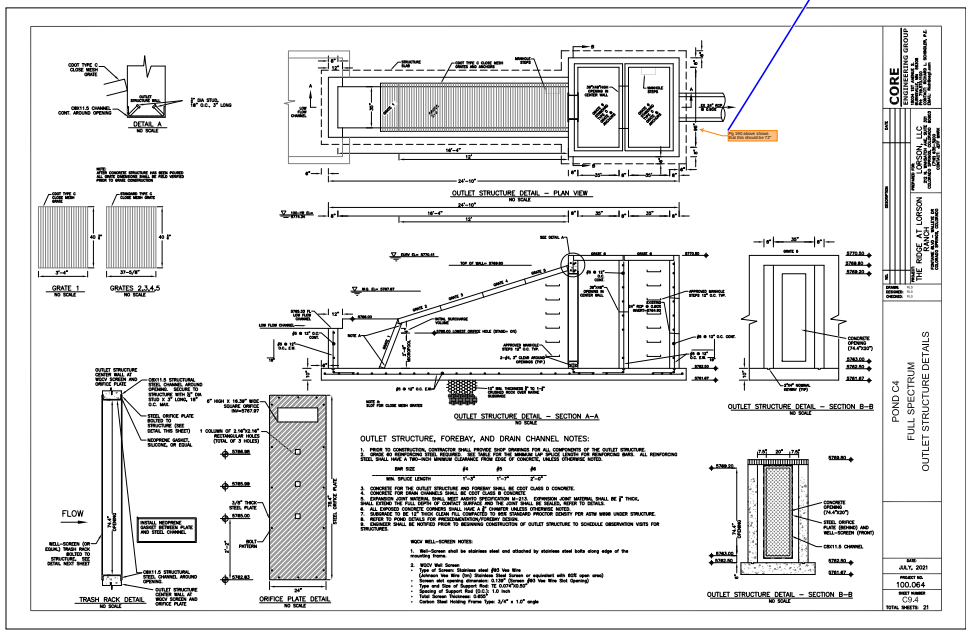
Page: 204

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 8:55:03 PM -06'00'

Pg 190 above shows that this should be 72"

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:08:38 PM -06'00'

revised to 72"



Page: 205

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 8:58:33 PM -06'00'

should be 36" per pg 199 above.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:17:46 PM -06'00'

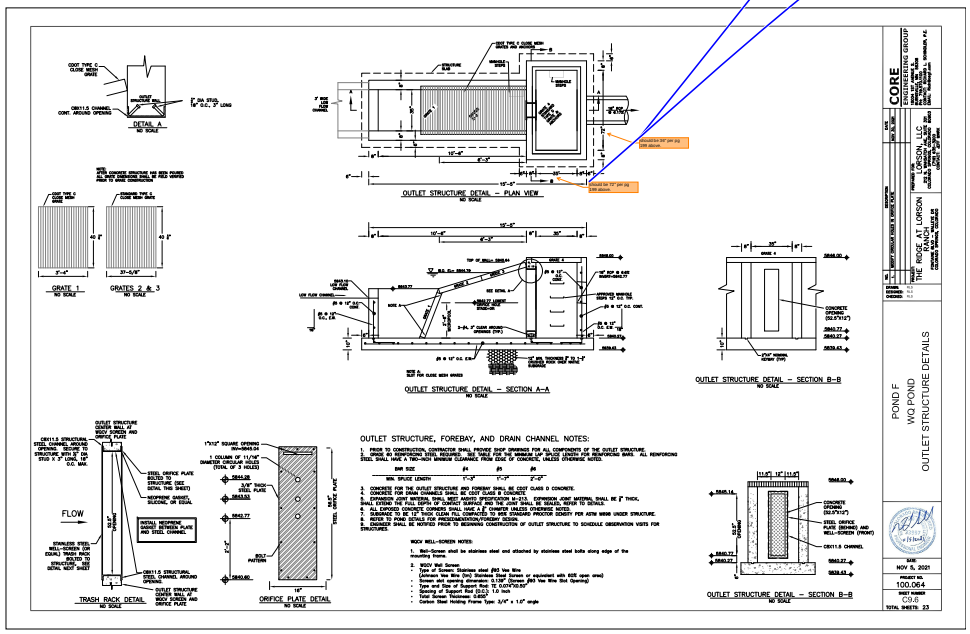
the size is correct. we just juxtaposed length/width which does not change design.

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox with Arrow Date: 2/22/2022 8:58:46 PM -06'00'

should be 72" per pg 199 above.

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:17:52 PM -06'00'

the size is correct. we just juxtaposed length/width which does not change design.



Update storm sewer calculations as flows at proposed inlets may have changed

Page: 206

Author: CDurham Subject: Text Box Date: 2/17/2022 12:36:46 PM -06'00'
Update storm sewer calculations as flows at proposed inlets may have changed

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:18:29 PM -06'00'
flows updated

Page: 228

Author: CDurham Subject: Callout Date: 2/17/2022 1:10:11 PM -06'00'

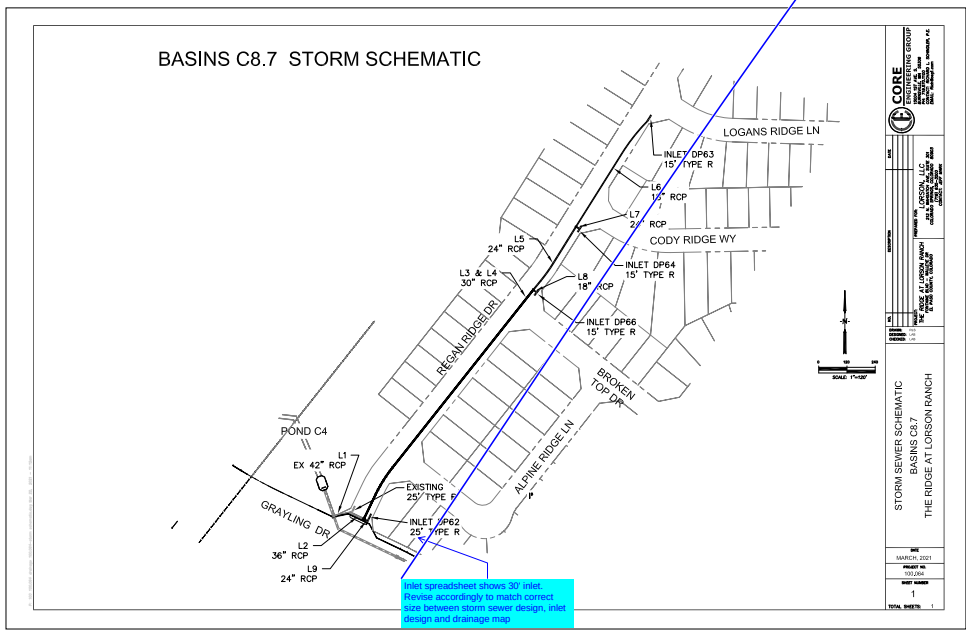
Inlet spreadsheet shows 30' inlet. Revise accordingly to match correct size between storm sewer design, inlet design and drainage map

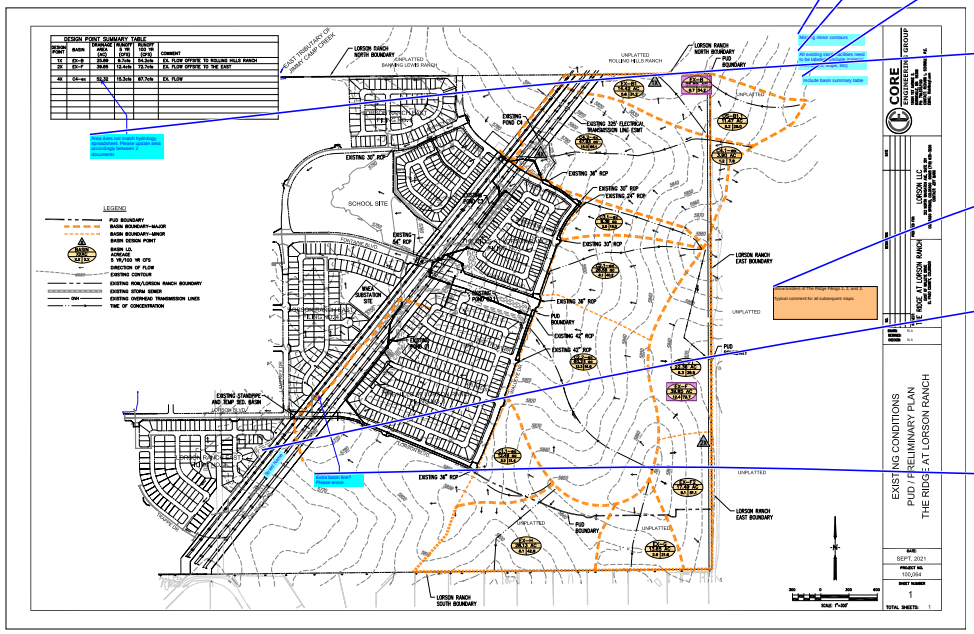
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:18:46 PM -06'00'

inlet updated

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 2:22:28 PM -06'00'

structure updated





Page: 237

Author: CDurham Subject: Text Box Date: 2/16/2022 5:56:34 PM -06'00'
Missing minor contours

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:12:36 AM -06'00'
minor contours not shown so the map is cleaner.

Author: CDurham Subject: Text Box Date: 2/16/2022 6:00:26 PM -06'00'
All existing storm facilities need to be labeled. (include material, size, shape, slope, etc)

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:15:56 AM -06'00'
will include slope. all pipe is round unless designated HERCP. We have little to no HERCP pipe in Lorson.

Author: CDurham Subject: Text Box Date: 2/16/2022 6:14:42 PM -06'00'
Include basin summary table

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:14:03 AM -06'00'
we do not need a summary table. This makes an additonal item for mistakes on basin flows matching

Author: CDurham Subject: Callout Date: 2/16/2022 6:03:17 PM -06'00'
Area does not match hydrology spreadsheet. Please update area accordingly between 2 documents

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 3:18:02 PM -06'00'
area updated

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox Date: 2/14/2022 6:03:59 PM -06'00'
Show borders of The Ridge Filings 1, 2, and 3. Typical comment for all subsequent maps.

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:47:09 AM -06'00'
BOUNDARY ADDED

Author: CDurham Subject: Text Box Date: 2/16/2022 5:58:31 PM -06'00'
Street Name

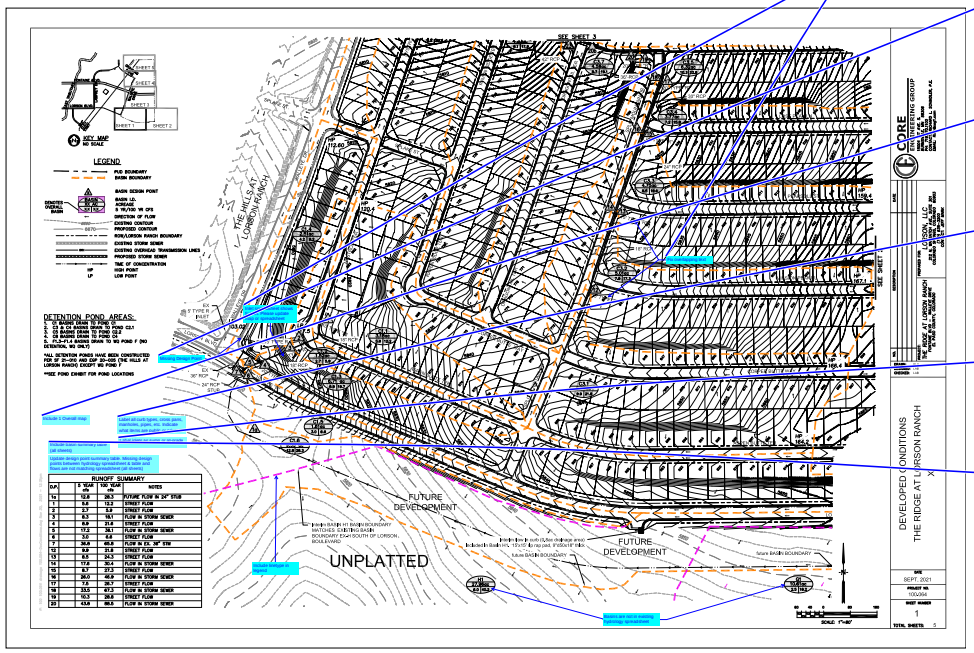
Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:39:01 AM -06'00'
LABELED ELEC. ESMT

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 3:18:13 PM -06'00'
elec. esmt labeled

Author: CDurham Subject: Callout Date: 2/16/2022 6:01:23 PM -06'00'
Extra basin line? Please erase.

Author: RSchindler Subject: Sticky Note Date: 3/8/2022 9:38:50 AM -06'00'
ERASED

Comments from page 237 continued on next page



Page: 238

Author: CDurham Subject: Callout Date: 2/16/2022 6:50:48 PM -06'00'
Fix overlapping text

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:25:31 AM -06'00'
TEXT FIXED

Author: RSchindler Subject: Sticky Note Date: 3/14/2022 8:05:59 AM
text moved

Author: CDurham Subject: Callout Date: 2/17/2022 1:02:22 PM -06'00'
Inlet spreadsheet shows 5' inlet. Please update map or spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:22:52 AM -06'00'
INLET SPREADSHEET CHANGED TO 10'

Author: CDurham Subject: Callout Date: 2/17/2022 4:35:32 PM -06'00'
Missing Design Point

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:20:49 AM -06'00'
design pt. added

Author: CDurham Subject: Text Box Date: 2/16/2022 6:43:59 PM -06'00'
Include 1 Overall map

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 3:42:47 PM -06'00'
MAP OF FILINGS ADDED

Author: CDurham Subject: Text Box Date: 2/17/2022 12:55:23 PM -06'00'
Label all curb types, cross pans, manholes, pipes, etc. Indicate what items are public or private.

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:04:44 AM -06'00'
ALL STREETS AND STORM ARE PUBLIC.

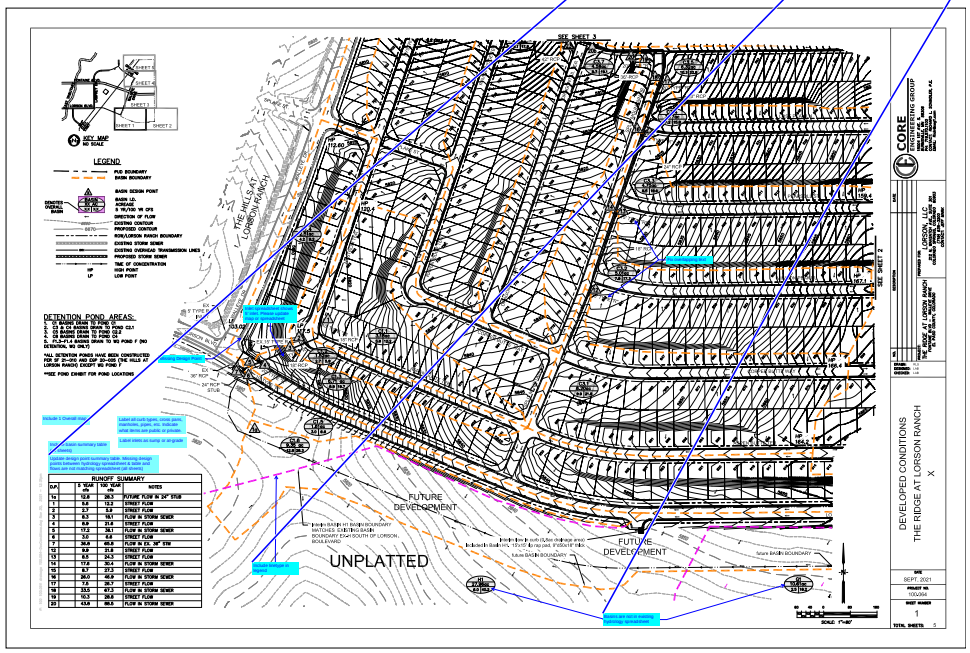
Author: CDurham Subject: Text Box Date: 2/17/2022 12:55:37 PM -06'00'
Label inlets as sump or at-grade

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:04:27 AM -06'00'
INLETS LABELED

Author: CDurham Subject: Text Box Date: 2/17/2022 12:57:12 PM -06'00'
Include basin summary table (all sheets)

Author: RSchindler Subject: Sticky Note Date: 3/10/2022 3:43:18 PM -06'00'
NOT NEEDED

Comments from page 238 continued on next page



Author: CDurham Subject: Text Box Date: 2/17/2022 12:54:11 PM -06'00'
Update design point summary table. Missing design points between hydrology spreadsheet & table and flows are not matching spreadsheet (all sheets)

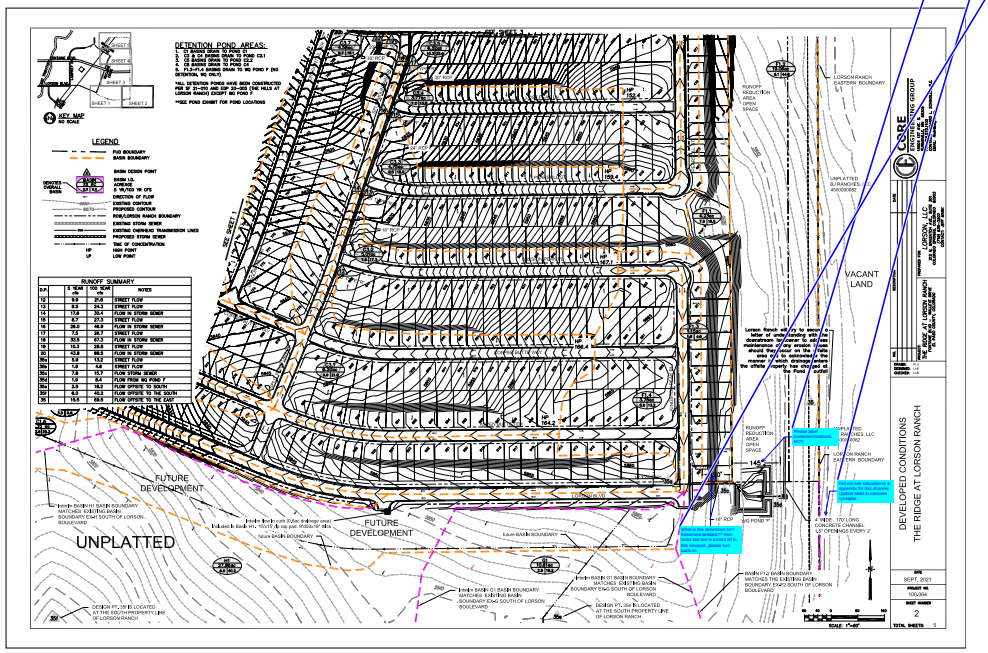
Author: RSchindler Subject: Sticky Note Date: 3/10/2022 3:43:05 PM -06'00'
TABLES AND POINTS UPDTATED

Author: CDurham Subject: Callout Date: 2/17/2022 12:56:02 PM -06'00'
Include linetype in legend

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:24:34 AM -06'00'
LINETYPE ADDED

Author: CDurham Subject: Callout Date: 2/17/2022 12:56:38 PM -06'00'
Basins are not in existing hydrology spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:24:59 AM -06'00'
YES THE BASINS ARE IN THE SPREADSHEET



Page: 239

Author: CDurham Subject: Callout Date: 2/17/2022 1:00:40 PM -06'00'
Please label (easement/setback, etc?)

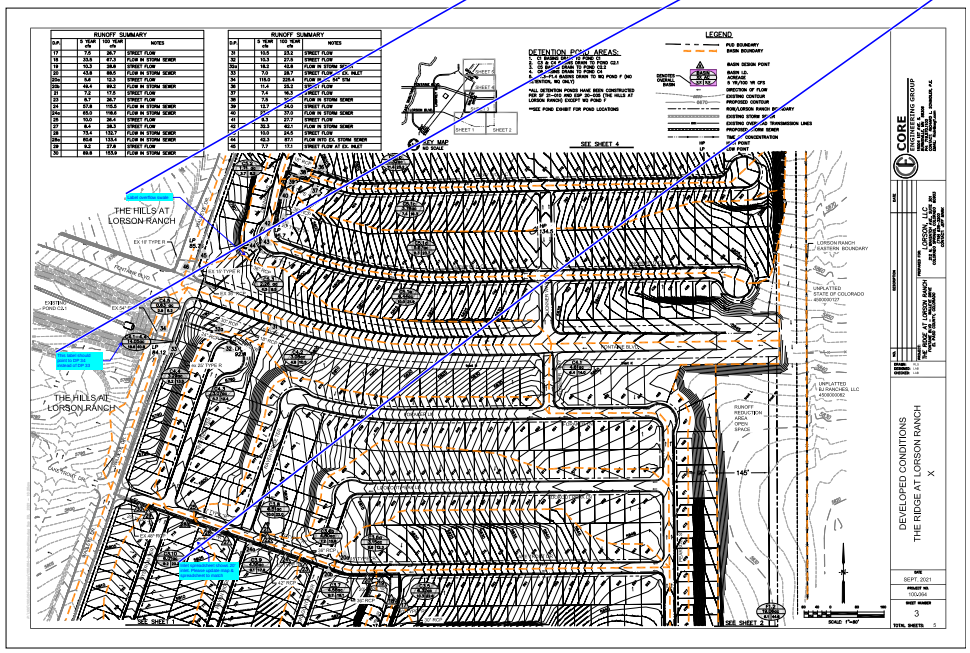
Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:28:47 AM -06'00'
RUNOFF REDUCTION DIMENSION

Author: CDurham Subject: Callout Date: 2/17/2022 4:36:32 PM -06'00'
Did not see calculations in appendix for this channel. Update label to concrete spreader.

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:37:02 AM -06'00'
CALCULATIONS IN APPENDIX C

Author: CDurham Subject: Callout Date: 2/17/2022 1:00:22 PM -06'00'
What is this dimension for? Easement/setback?? Also looks like line is turned off in this viewport, please turn back on.

Author: RSchindler Subject: Sticky Note Date: 3/14/2022 8:06:27 AM
dimension for runoff off reduction calculations



Page: 240

Author: CDurham Subject: Callout Date: 2/17/2022 4:37:04 PM -06'00'

Label overflow swale

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:40:58 AM -06'00'

SWALE LABELED

Author: CDurham Subject: Callout Date: 2/17/2022 1:05:06 PM -06'00'

This label should point to DP 34 instead of DP 33

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:39:05 AM -06'00'

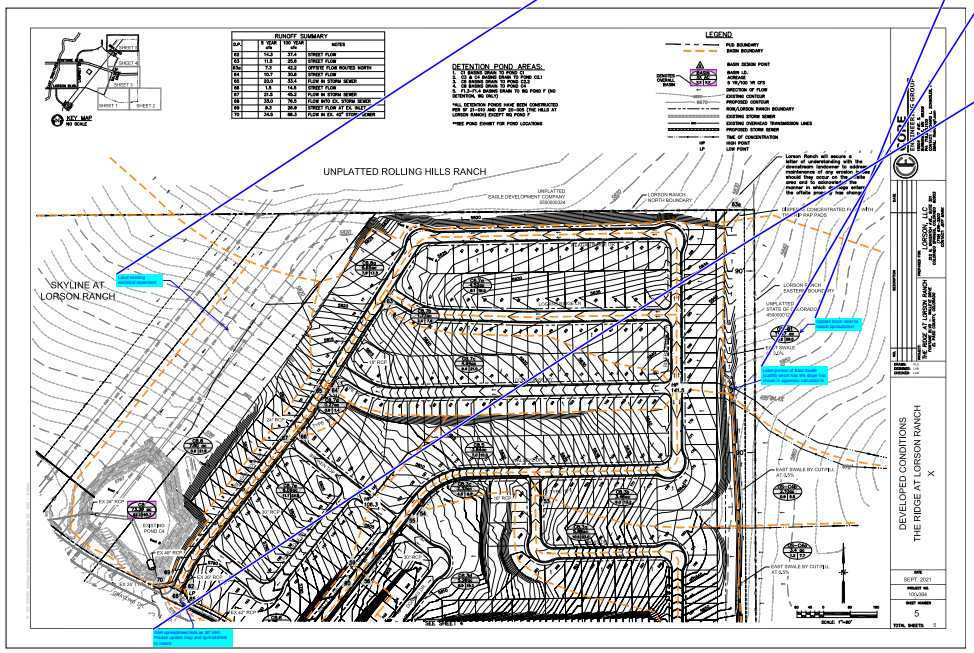
LABEL NOT NEEDED AND IS REMOVED

Author: CDurham Subject: Callout Date: 2/17/2022 1:04:34 PM -06'00'

Inlet spreadsheet shows 20' inlet. Please update map & spreadsheet to match

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:55:31 AM -06'00'

INLET IS 20'



Page: 242

Author: CDurham Subject: Callout Date: 2/17/2022 1:19:35 PM -06'00'
Label existing electrical easement

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:56:56 AM -06'00'
LABELED

Author: CDurham Subject: Callout Date: 2/17/2022 1:08:01 PM -06'00'
Update basin label to match spreadsheet

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 8:12:57 AM -06'00'
BASIN LABEL UPDATED

Author: CDurham Subject: Callout Date: 2/17/2022 1:07:35 PM -06'00'
Label portion of East Swale (cut/fill) which has 5% slope has shown in appendix calculations

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 8:12:42 AM -06'00'
SWALE LABELED

Author: CDurham Subject: Callout Date: 2/17/2022 1:06:41 PM -06'00'
Inlet spreadsheet lists as 30' inlet. Please update map and spreadsheet to match

Author: RSchindler Subject: Sticky Note Date: 3/11/2022 7:57:09 AM -06'00'
INLET IS 30'