

Summary of Comments on P:\100\100.064\prelim plan \early grading\100.064early grading cover sheet C0.1 (1)

Page: 12

Author: dsdrice Subject: Callout Date: 11/1/2021 10:54:33 PM -05'00'

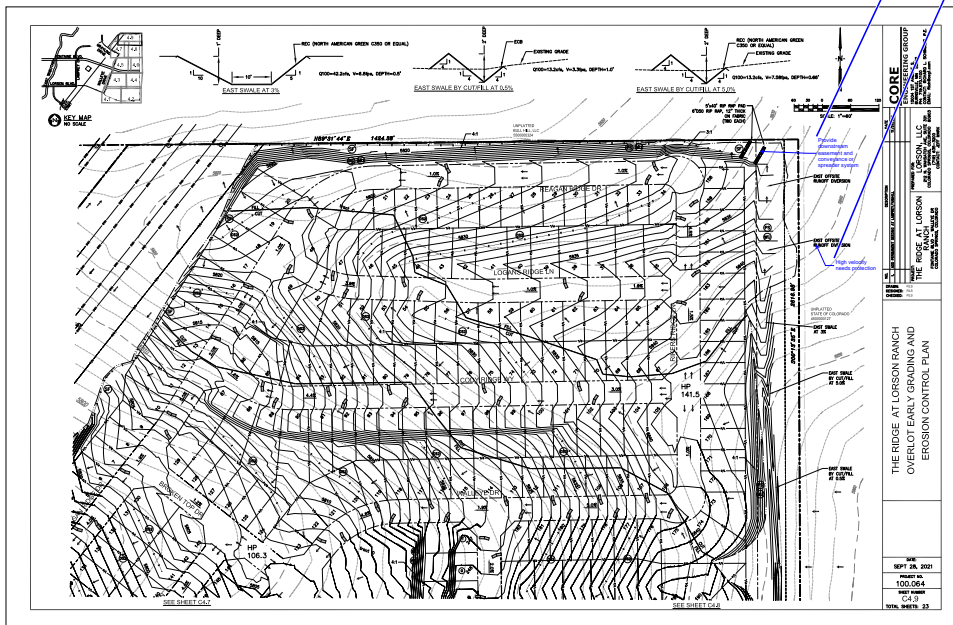
Provide downstream easement and conveyance or spreader system

Author: RSchindler Subject: Sticky Note Date: 11/6/2021 8:39:01 AM -05'00'
will secure letter of understanding

Author: dsdrice Subject: Callout Date: 11/3/2021 4:54:23 PM -05'00'

High velocity needs protection

Author: RSchindler Subject: Sticky Note Date: 11/6/2021 8:39:16 AM -05'00'
swale changed to 3% which has trm.



Author: dsdrice Subject: Callout Date: 11/1/2021 10:53:39 PM -05'00'

The downstream conveyance needs to accommodate undetained 100-year flow.

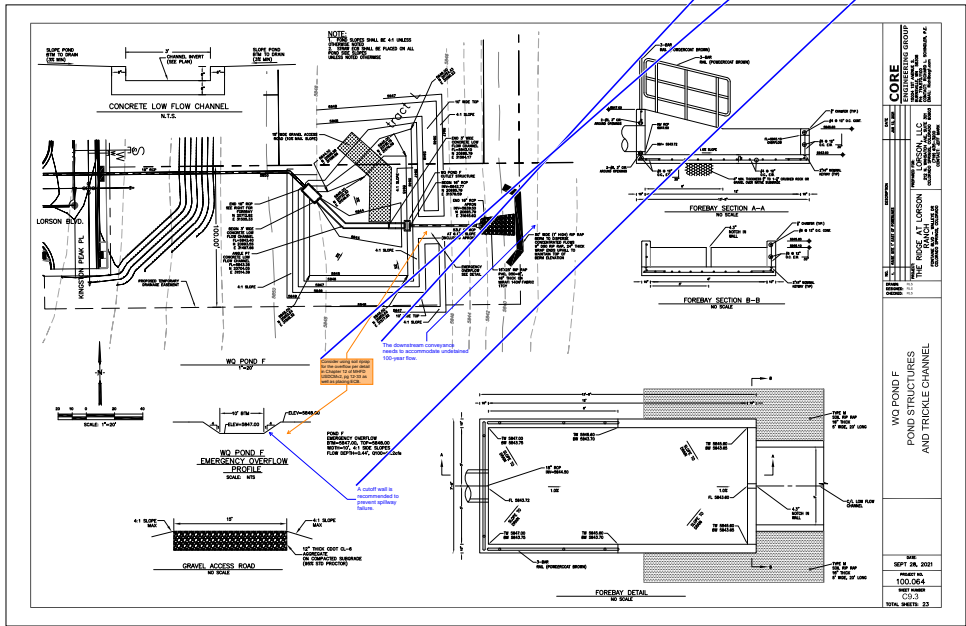
Author: RSchindler Subject: Sticky Note Date: 11/6/2021 8:41:41 AM -05'00'
100-yr undetained (10cfs) flow enters outlet structure. this pond does not detain much beyond WQCV. It all flows into outlet structure.

Author: EPC Stormwater - Glenn Reese Subject: Contractor Date: 11/4/2021 1:40:48 PM -05'00'
Consider using soil riprap for the overflow per detail in Chapter 12 of MHFD USDCMv2, pg 12-33 as well as placing ECB.

Author: RSchindler Subject: Sticky Note Date: 11/6/2021 8:39:45 AM -05'00'
added TRM. pond is entirely in cut and overflow is at existing grade.

Author: dsdrice Subject: Callout Date: 11/4/2021 1:35:52 PM -05'00'
A cutoff wall is recommended to prevent spillway failure.

Author: RSchindler Subject: Sticky Note Date: 11/6/2021 8:40:42 AM -05'00'
added TRM. entire 100year flow enters the outlet structure. pond is entirely in cut so the overflow/slopes are below existing grade and cannot fail.



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 so no offsite easements are necessary. 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.

An easement adequate for the flow and requiring maintenance of any erosion issues is required

Summary of Comments on Microsoft Word - 100.064-pdr

Page: 11

Author: dsdrice Subject: Callout Date: 11/3/2021 9:55:12 AM

An easement adequate for the flow and requiring maintenance of any erosion issues is required

Author: RSchindler Subject: Sticky Note Date: 11/5/2021 9:46:33 AM
sentence added.

Basin C8.7e

This basin consists of runoff from residential development, the east side of Regan 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 Regan 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.

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

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.

<u>(5-year storm)</u>	
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	
<u>(100-year storm)</u>	
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 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 as in existing conditions and will discharge the same runoff rates as in existing flows resulting in no negative impacts downstream. See Design Point 35d for discuss of concentrated runoff from WQ Pond F.

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. Flow from the storm sewer outfall will be dispersed downstream by a 50' wide rip rap berm (1' high) to reduce concentrated flow. In addition, the storm sewer outfall is over 100' west of the Lorson Ranch property line which will further disperse the flow from the storm sewer.

Design Point 35e

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.

Downstream easement and conveyance is needed due to change from sheet flow to point discharge and increased flow

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Author: dsdrice Subject: Callout Date: 11/3/2021 5:03:55 PM

Downstream easement and conveyance is needed due to change from sheet flow to point discharge and increased flow

Author: RSchindler Subject: Sticky Note Date: 11/5/2021 11:19:25 AM
easement language added.

Design Point 62

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

<u>(5-year storm)</u>		
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		
<u>(100-year storm)</u>		
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 Regan Ridge Drive and Logans Ridge Lane and accepts flows from Basin C8.7a&b

<u>(5-year storm)</u>		
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		
<u>(100-year storm)</u>		
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 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 total **existing** offsite 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

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 Author: dsdrice	Date: 11/3/2021 5:25:07 PM
existing	
 Author: RSchindler	Subject: Sticky Note
change to proposed	
Date: 11/5/2021 11:23:18 AM	
 Author: dsdrice	Date: 11/3/2021 5:25:00 PM
existing	
 Author: dsdrice	Subject: Callout
proposed?	
Date: 11/3/2021 5:26:25 PM	
 Author: dsdrice	Subject: Callout
Address downstream easement and conveyance for point discharge and increased flows	
Date: 11/3/2021 5:26:06 PM	
 Author: RSchindler	Subject: Sticky Note
language added	
Date: 11/5/2021 11:26:46 AM	

proposed?

- 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

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 overland to the east. The outlet structure is a standard extended detention basin structure with an orifice plate. Stormwater from the outlet pipe will be dispersed by a rip rap berm and it is located 100' west of the Lorson Ranch property line which will disperse the flow. The flow from the pond is 8.4cfs which will be dispersed by the berm and a downstream easement should not be necessary. 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

Address downstream
easement and
conveyance for increased
flow and point discharge

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.

Channel Report

Hydraflow Express by Intelisolve

Thursday, Jun 17 2021, 9:45 AM

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EAST SWALE 3%

Trapezoidal

Bottom 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

Author: dsdrice
6.88

Date: 11/3/2021 5:52:28 PM



Author: dsdrice

Subject: Callout

Date: 11/3/2021 5:54:49 PM

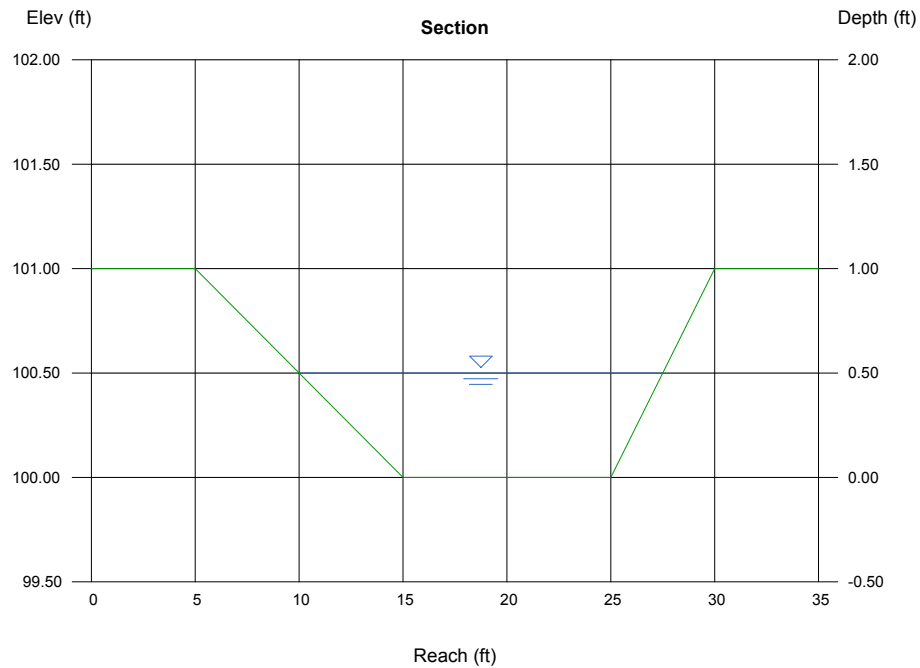
High velocity needs protection



Author: RSchindler Subject: Sticky Note
see grading plan. TRM was added.

Date: 11/5/2021 11:35:24 AM

High velocity
needs protection



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

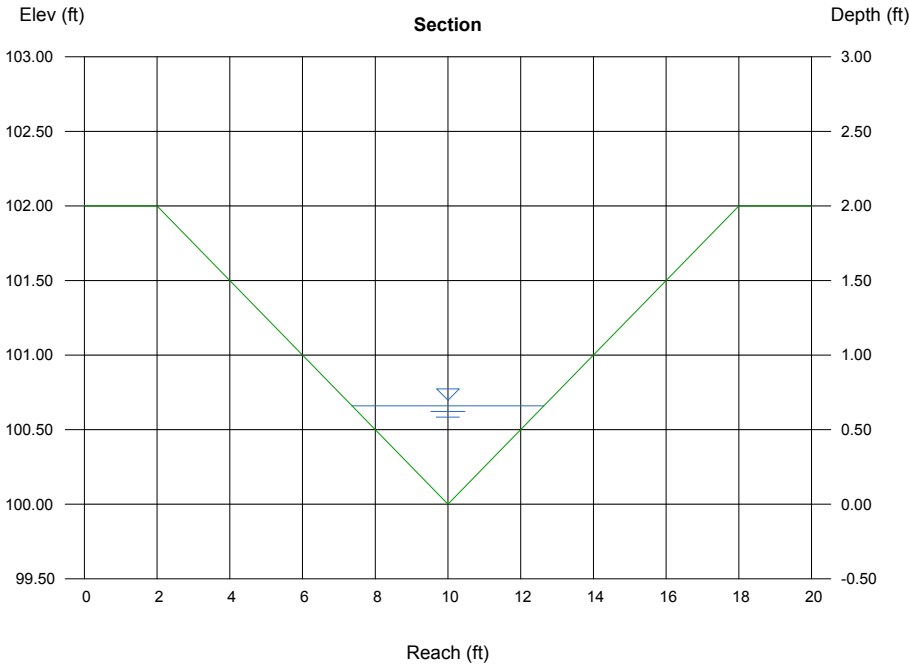
Calculations
Compute by: Known Q
Known Q (cfs) = 13.20

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

Does this need
lining? What is
shear stress?

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-  Author: dsdrice Date: 11/3/2021 5:55:32 PM
7.58
-  Author: dsdrice Subject: Callout Date: 11/3/2021 5:56:10 PM
Does this need lining? What is shear stress?
-  Author: RSchindler Subject: Sticky Note Date: 11/5/2021 11:35:53 AM
yes. we added TRM to that swale.



INLET IN A SUMP OR SAG LOCATION
Version 4.05 Released March 2017

Design Information (input)

Type of Inlet: CDOT Type R Curb Opening

Local Depression (additional to continuous gutter depression 'w' from above): No

Number of Unit Inlets (Grate or Curb Opening): 1

Water Depth at Flowline (outside of local depression): 5.6

Grate Information

Length of a Unit Grate: N/A

Width of a Unit Grate: N/A

Area Opening Ratio for a Grate (typical values 0.15-0.90): N/A

Clogging Factor for a Single Grate (typical value 0.50 - 0.70): N/A

Grate Weir Coefficient (typical value 2.15 - 3.60): N/A

Grate Orifice Coefficient (typical value 0.60 - 0.80): N/A

Curb Opening Information

Length of a Unit Curb Opening: 20.00

Height of Vertical Curb Opening in Inches: 6.00

Height of Curb Orifice Throat in Inches: 6.00

Angle of Throat (see USDCM Figure 5T-6): 63.40

Side Width for Depression Pan (typically the gutter width of 2 feet): 2.00

Clogging Factor for a Single Curb Opening (typical value 0.10): 0.10

Curb Opening Weir Coefficient (typical value 2.3-3.7): 3.60

Curb Opening Orifice Coefficient (typical value 0.60 - 0.70): 0.67

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth: N/A

Depth for Curb Opening Weir Equation: 0.30

Combination Inlet Performance Reduction Factor for Long Inlets: 0.53

Curb Opening Performance Reduction Factor for Long Inlets: 0.78

Grated Inlet Performance Reduction Factor for Long Inlets: N/A

Total Inlet Interception Capacity (assumes clogged condition)

WARNING: Inlet Capacity less than Q Peak for Major Storm

	MINOR	MAJOR
Type	CDOT Type R Curb Opening	CDOT Type R Curb Opening
A_{unit}	3.00	3.00
No	1	1
Ponding Depth	5.6	7.9
L_u (G)	N/A	N/A
W_u	N/A	N/A
A_{ratio}	N/A	N/A
C_u (G)	N/A	N/A
C_w (G)	N/A	N/A
C_o (G)	N/A	N/A
L_u (C)	20.00	20.00
H_{min}	6.00	6.00
H_{throat}	6.00	6.00
Theta	63.40	63.40
W_p	2.00	2.00
C_u (C)	0.10	0.10
C_w (C)	3.60	3.60
C_o (C)	0.67	0.67
d_{cover}	N/A	N/A
d_{curb}	0.30	0.49
$RF_{combined}$	0.53	0.74
RF_{curb}	0.78	0.89
RF_{grate}	N/A	N/A
Q_s	10.3	25.1
Q Peak (REQUIRED)	9.3	27.7

(Overtops to Inlet 43)

Design Procedure Form: Extended Detention Basin (EDB)	
Sheet 3 of 3	
Designer: Richard Schindler Company: Core Engineering Group Date: July 17, 2021 Project: The ridge at Lorson Ranch Location: Pond F	
10. Overflow Embankment A) Describe embankment protection for 100-year and greater overtopping: B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z _e = <input type="text"/> ft / ft
11. Vegetation	Choose One: <input type="radio"/> Irrigated <input type="radio"/> Not Irrigated
12. Access A) Describe Sediment Removal Procedures	
Notes: 	

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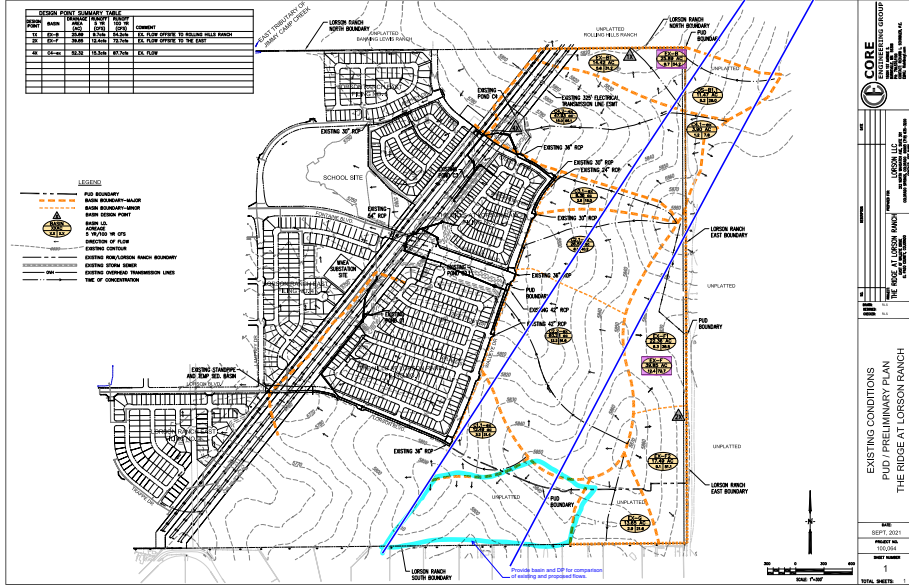
Author: dsdrice Subject: Callout Date: 11/4/2021 2:32:41 PM
Provide - TRM or riprap?

Author: RSchindler Subject: Sticky Note Date: 11/5/2021 11:56:28 AM
TRM added

Provide - TRM or
riprap?

Provide basin and DP for comparison of existing and proposed flows.

design point added



This needs to be a designed level spreader or conveyance, with a downstream drainage easement.

