

**PRELIMINARY AND
FINAL DRAINAGE PLAN
PUD/SP** 22-003

**CREEKSIDE SOUTH AT
LORSON RANCH FILING NO. 2**

MAY, 2022

Prepared for:

Lorson, LLC
212 N. Wahsatch Ave, Suite 301
Colorado Springs, Colorado 80903
(719) 635-3200

Prepared by:

Core Engineering Group, LLC
15004 1ST Avenue South
Burnsville, MN 55306
(719) 570-1100

Project No. 100.069



ENGINEER'S STATEMENT

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

Richard L. Schindler, P.E. #33997 _____ Date
For and on Behalf of Core Engineering Group, LLC

OWNER'S STATEMENT

I, the Owner, have read and will comply with all the requirements specified in the drainage report and plan.

Lorson, LLC _____ Date

By
Jeff Mark
Title
Manager
Address
212 N. Wahsatch Avenue, Suite 301, Colorado Springs, CO 80903

FLOODPLAIN STATEMENT

To the best of my knowledge and belief, this development is not located within a designated floodplain as shown on Flood Insurance Rate Map Panel No. and 08041C0957 G, dated December 7, 2018. (See Appendix A, FEMA FIRM Exhibit)

Richard L. Schindler, #33997 _____ Date

EL PASO COUNTY

Filed in accordance with the requirements of the El Paso County Land Development Code, Drainage Criteria Manual, Volume 1 and 2, and Engineering Criteria Manual, As Amended.

Jennifer Irvine _____ Date
County Engineer/ECM Administrator

Conditions: _____

Revise to:
Joshua Palmer, P.E.
Interim County Engineer / ECM Administrator

1.0 LOCATION and DESCRIPTION

Creekside South at Lorson Ranch Filing No. 2 is located east and southeasterly of the East Tributary of Jimmy Camp Creek. The site is located on approximately 6.01 acres of vacant land. This project will develop this site into single-family residential developments. The land for the residential lots is currently owned by Lorson LLC or its nominees for Lorson Ranch.

The site is located in the Northeast 1/2 of Section 23, Township 15 South and Range 85 West of the 6th Principal Meridian. The site is bounded on the north by Lorson Boulevard, on the east by Trappe Drive, on the south by ~~Creekside South at Lorson Ranch~~ and the East Tributary of Jimmy Camp Creek (East Tributary), on the west. For reference, a vicinity map is included in Appendix A of this report.

Luneth Drive

Conformance with applicable Drainage Basin Planning Studies

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 development.

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 required for this site is existing Detention/WQ Pond E2 and Pond D2 and the East Tributary of Jimmy Camp Creek which was discussed above. Existing Pond E2 and Pond D2 are full spectrum detention/WQ ponds (including outlet structures) completed as part of the Creekside South at Lorson Ranch Filing No. 1 and Lorson Ranch East Filing No. 1 and detain/treats runoff from this project site for detention and water quality. There are no improvements to be made to Pond E2 and Pond D2 for 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.

Creekside South at Lorson Ranch Filing No. 2 is located within the "**Jimmy Camp Creek Drainage Basin**", which is a fee basin in El Paso County.

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

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Author: CDurham Subject: Line Date: 6/1/2022 10:36:52 AM

Author: CDurham Subject: Callout Date: 6/1/2022 10:36:46 AM

Luneth Drive

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:09:03 PM
added

acres to determine the rainfall and runoff conditions for the proposed development of the site. The runoff rates for the 5-year initial storm and 100-year major design storm were calculated.

Current updates to the Drainage Criteria manual for El Paso County states the if detention is necessary, Full Spectrum Detention will be included in the design, based on this criteria. Full Spectrum Detention including water quality is provided in existing Pond E2 and Pond D2.

3.0 EXISTING HYDROLOGICAL CONDITIONS

This site is currently rough graded and undeveloped, with vegetation (grass with no shrubs) and moderate to steep slopes in a westerly direction to the East Tributary of Jimmy Camp Creek.

The Soil Conservation Service (SCS) classifies the soils at Lorson Ranch Filing No. 2 property as Nelson-Tassel fine Sandy loam; and Wiley silt loam [3]. The sandy and silty loams are considered hydrologic soil group B soils with moderate to moderately rapid permeability. All of these soils are susceptible to erosion by wind and water, have low bearing strength, moderate shrink-swell potential, and high frost heave potential (see Table 3.1 below). Weathered bedrock may be encountered beneath some of the site but it can be excavated using conventional techniques.

Table 3.1: SCS Soils Survey

Soil	Hydro. Group	Shrink/Swell Potential	Permeability	Surface Runoff Potential	Erosion Hazard
52-Manzanola Clay Loam (59%)	C	Moderate to High	Slow	Medium	Moderate
108-Wiley Silt Loam	B	Moderate	Moderate	Medium	Moderate

Excerpts from the SCS "Soil Survey of El Paso County Area, Colorado" are provided in **Appendix A** for further reference.

In preparing hydrologic calculations for this report, the soil of each basin was weighted and used in the preparation of this report.

This site is located adjacent to 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 08041C10957 G, effective December 7, 2018.

Basin EX-E1

This existing basin directs runoff via overland, southerly and westerly, and drains into Existing Pond E2, then outlets to the East Tributary of Jimmy Camp Creek. The existing flow from this 3.72 acre basin is 0.8cfs and 5.0cfs for the 5-year and 100-year events.

Basin EX-E2

This existing basin directs runoff via overland, northerly and westerly to the East Tributary of Jimmy Camp Creek. The existing runoff from this 1.04 acre basin is 0.4cfs and 2.3cfs for the 5-year and 100-year events.

Flow arrows show this basin being directed towards the east & north, existing inlet in Trappe Dr

4.0 DEVELOPED HYDROLOGICAL CONDITIONS

Hydrology for **Creekside South at Lorson Ranch Filing No. 2** drainage report was based on the City of Colorado Springs/El Paso County Drainage Criteria. Sub-basins that lie within this project were

- Author: CDurham Subject: Callout Date: 6/1/2022 10:41:08 AM
Per soils map & table below, should be Manzanola Clay
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:09:13 PM
revised
- Author: CDurham Subject: Callout Date: 6/1/2022 10:46:33 AM
& C
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:10:26 PM
removed sentence
- Author: CDurham Subject: Text Box Date: 6/1/2022 10:44:11 AM
Flow arrows show this basin being directed towards the east & north, existing inlet in Trappe Dr
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:10:41 PM
revised direction

Per soils map & table below, should be Manzanola Clay

& C

Flow arrows show this basin being directed towards the east & north, existing inlet in Trappe Dr

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 types B and C have been weighted for the developed hydrologic conditions. See the appendix for the SCS Soils Map and detailed calculations.

The time of concentration for each 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 the appendix.

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

Basin D1.1

This basin consists of runoff from residential development and Akela Lane. Runoff will be directed ~~easterly and westerly~~ to Akela Lane, then routed north via curb/gutter to Design Point 1 and will be collected by a 5' Type R sump inlet. Runoff from this inlet is routed east in an 18" storm sewer to Trappe Drive, then north to existing pond D2 in existing storm sewer constructed as part of Lorson Ranch East Filing No. 1. For more detailed information, see the design point discussions. The developed flow from this 0.57 acre basin is 1.1cfs and 2.6cfs for the 5-year and 100-year storm event. See the appendix for detailed calculations.

Basin D1.2

This basin consists of runoff from residential development and Trappe Drive. Runoff will be directed easterly as sheet flow to Trappe Drive, then routed north via existing curb/gutter in Trappe Drive to an existing 20' Type R sump inlet. Runoff from this inlet is routed north via the existing storm drain system to the aforementioned existing Pond D2 built as part of Lorson Ranch East Filing No. 1. The developed flow from this 0.55 acre basin is 1.1cfs and 2.5cfs for the 5-year and 100-year storm event. See the appendix for detailed calculations. The final drainage report for Lorson Ranch East Filing No.4 allows 0.57acres to drain to the existing sump inlet in this basin.

Basin E1.1

This basin consists of runoff from residential development and Akela Lane. Runoff will be directed southwesterly and northwesterly to Akela Lane, then routed southerly and northerly via curb/gutter in Akela Lane to Design Point 2 and will be collected by a 5' Type R sump inlet. Runoff from this inlet is routed via the proposed and existing storm drain system to existing pond E2, located west of Creeks/de South at Lorson Ranch Filing No. 2. For more detailed information, see the design point discussions. The developed flow from this 2.33 acre basin is 4.1cfs and 9.1cfs for the 5-year and 100-year storm event. See the appendix for detailed calculations.

Basin E1.2

This basin consists of runoff from residential development and Akela Lane. Runoff will be directed southeasterly to Akela Lane, then routed southerly and northerly via curb/gutter in Akela Lane to Design Point 3 and will be collected by a 5' Type R sump inlet. Runoff from this inlet is routed via the proposed and existing storm drain system to the aforementioned existing pond E2. For more detailed information, see the design point discussions. The developed flow from this 1.27 acre basin is 2.1cfs and 4.7cfs for the 5-year and 100-year storm event. See the appendix for detailed calculations.

Basin E1.3

Author: CDurham	Subject: Callout	Date: 6/1/2022 10:48:48 AM
the cul-de-sac in		
Author: RSchindler	Subject: Sticky Note	Date: 6/28/2022 4:10:52 PM
added		
Author: CDurham	Subject: Callout	Date: 6/1/2022 10:49:01 AM
towards		
Author: RSchindler	Subject: Sticky Note	Date: 6/28/2022 4:10:56 PM
added		
Author: CDurham	Subject: Line	Date: 6/1/2022 10:49:10 AM
Author: CDurham	Subject: Text Box	Date: 6/1/2022 11:49:40 AM
Include what the accepted flows were from this basin in the Filing 4 report and how they compare		
Author: RSchindler	Subject: Sticky Note	Date: 6/28/2022 4:11:07 PM
added text		
Author: CDurham	Subject: Callout	Date: 6/1/2022 10:53:59 AM
eastern portion of		
Author: RSchindler	Subject: Sticky Note	Date: 6/28/2022 4:11:21 PM
added		
Author: CDurham	Subject: Callout	Date: 6/1/2022 10:54:04 AM
western portion of		
Author: RSchindler	Subject: Sticky Note	Date: 6/28/2022 4:11:24 PM
added		

towards

the cul-de-sac in

Include what the accepted flows were from this basin in the Filing 4 report and how they compare

eastern portion of

western portion of

This basin consists of runoff from residential development and open space. Runoff sheetflows in a northerly direction to the aforementioned existing pond E2. The developed flow from this 0.32 acre basin is 0.7cfs and 1.6cfs for the 5/100-year storm event. See the appendix for detailed calculations.

Basin E1.4

This basin consists of runoff from residential development and Luneth Drive. Runoff is directed southerly to Luneth Drive, then routed via curb/gutter in Luneth Drive to twin existing 10' Type R sump inlets. Runoff from these inlets is routed north via the storm drain system to the aforementioned existing pond E2. The developed flow from this 0.29 acre basin is 0.7cfs and 1.6cfs for the 5-year and 100-year storm event. See the appendix for detailed calculations. This basin size is smaller than the allowable basin size flowing to the existing inlets according to the Creekside South at Lorson Ranch Filing No. 1 final drainage report.

State what the flows were from the Filing 1 report and how they compare

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.

Per my comment on the drainage map, add paragraph(s) for all areas within the F2 limits to show that WQ treatment is accounted for throughout.

5.0 HYDRAULIC SUMMARY

The sizing of the hydraulic structures and detentions ponds were prepared by using the *StormSewers* 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.

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 1/2 of street)

Street Slope	Residential Local		Residential Collector		Principal Arterial	
	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	39.7
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)

Author: CDurham Subject: Text Box Date: 6/1/2022 11:49:50 AM
 State what the flows were from the Filing 1 report and how they compare

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:12:05 PM
 statement added

Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox Date: 5/26/2022 2:21:34 PM
 Per my comment on the drainage map, add paragraph(s) for all areas within the F2 limits to show that WQ treatment is accounted for throughout.

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:12:15 PM
 paragraph added

Design Point 1a

Move this discussion to after Design Point 1

Design Point 1a is located at the SW corner of Lorson Boulevard and Trappe Drive and is located at an existing 18" RCP storm sewer constructed as part of Lorson Ranch East Filing No. 4. The total flow in the pipe is from Design Point 1 and is 1.1cfs/2.6cfs in the 5/100-year storm events. The existing storm sewer has been designed for 2.1cfs/4.6cfs in the Lorson Ranch East Filing No. 1 fdr (Basin D.2.10a)

What flow did this existing system account for from this basin? How does the entire system work with the pond? Ensure no "extra" headwater extending back into the storm pipe

Design Point 1

Design Point 1 is located at the north end of Akela Lane and accepts flows from (Basin D1.1).

<u>(5-year storm)</u>	
Tributary Basins: D1.1	Inlet/MH Number: Inlet DP1
Upstream flowby:	Total Street Flow: 1.1cfs
Flow Intercepted: 1.1cfs	Flow Bypassed: 0
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 6.9cfs, okay	
<u>(100-year storm)</u>	
Tributary Basins: D1.1	Inlet/MH Number: Inlet DP1
Upstream flowby:	Total Street Flow: 2.6cfs
Flow Intercepted: 2.6cfs	Flow Bypassed:
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 28.9cfs (half street) is okay	

Include discussion for overflow paths on all proposed sump inlets

Design Point 2

Design Point 2 is located at the east side of Akela Lane at a low point and accepts flows from Akela Lane (Basin E1.1).

<u>(5-year storm)</u>	
Tributary Basins: E1.1	Inlet/MH Number: Inlet DP2
Upstream flowby:	Total Street Flow: 4.1cfs
Flow Intercepted: 4.1cfs	Flow Bypassed: 0
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 6.9cfs, okay	
<u>(100-year storm)</u>	
Tributary Basins: E1.1	Inlet/MH Number: Inlet DP2
Upstream flowby:	Total Street Flow: 9.1cfs
Flow Intercepted: 9.1cfs	Flow Bypassed:
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 28.9cfs (half street) is okay	

- Author: CDurham Subject: Text Box Date: 6/1/2022 11:55:26 AM
Move this discussion to after Design Point 1
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:12:40 PM
#1 moved up.
- Author: CDurham Subject: Text Box Date: 6/1/2022 12:27:11 PM
What flow did this existing system account for from this basin? How does the entire system work with the pond? Ensure there's no "extra" headwater extending back into the storm pipe.
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:12:51 PM
model updated
- Author: CDurham Subject: Text Box Date: 6/1/2022 12:33:51 PM
Include discussion for overflow paths on all proposed sump inlets
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:13:01 PM
overflow path added

Design Point 3

Design Point 3 is located at the west side of Akela Lane at a low point and accepts flows from Akela Lane (Basin E1.2).

<u>(5-year storm)</u>	
Tributary Basins: E1.2	Inlet/MH Number: Inlet DP3
Upstream flowby:	Total Street Flow: 2.1cfs
Flow Intercepted: 2.1cfs	Flow Bypassed: 0
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 6.9cfs, okay	
<u>(100-year storm)</u>	
Tributary Basins: E1.2	Inlet/MH Number: Inlet DP3
Upstream flowby:	Total Street Flow: 4.7cfs
Flow Intercepted: 4.7cfs	Flow Bypassed:
Inlet Size: 5' type R, sump	
Street Capacity: Street slope = 0.6%, capacity = 28.9cfs (half street) is okay	

Design Point 4

Design Point 4 is the storm sewer pipe flow in Akela Lane from Design Pt's 2 and 3. The total pipe flow is 6.2cfs/13.8cfs in the 5/100-year storm events in the 24" storm sewer. The proposed storm sewer flows south and connects to an existing manhole constructed as part of Lorson Ranch East Filing No. 4. The existing type 1 storm manhole was constructed in LRE4 to accommodate a pipe size increase from 48" to 54" RCP and to accommodate flows from the future Akela Lane. The existing manhole was also constructed with a bulkheaded opening for a future 24" storm sewer (to the north) which will be connected to for this project.

What flow did this existing system account for from these basins? How does the entire system work with the pond? Ensure there's no "extra" headwater extending back into the storm pipe.

6.0 DETENTION AND WATER QUALITY

Detention and Storm Water Quality for Creekside at Lorson Ranch Filing No. 2 is required per El Paso County criteria. There are two existing permanent full spectrum ponds including water quality that were designed/constructed to accommodate developed runoff from this development to be in compliance with the Lorson Ranch East MDDP. The ponds have been constructed and include access roads, outlet pipes, overflow structures, and low flow channels. Existing Pond D2 treats/detains runoff for the "D" basins (Lorson Ranch East Filing No. 1) and Existing Pond E2 treats/detains runoff for the "E" basins (Lorson Ranch East Filing No. 4).

Include copy of pond spreadsheets to show facilities are functioning as proposed in earlier filings.

Engineer must confirm in the Drainage Report that the existing ponds are functioning as intended.

Creekside South at Lorson Ranch Filing No. 2 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.

- Author: CDurham Subject: Text Box Date: 6/1/2022 12:03:57 PM
What flow did this existing system account for from these basins? How does the entire system work with the pond? Ensure there's no "extra" headwater extending back into the storm pipe.
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:13:28 PM
model updated
- Author: Glenn Reese - EPC Stormwater Subject: SW - Textbox Date: 5/26/2022 2:21:38 PM
Engineer must confirm in the Drainage Report that the existing ponds are functioning as intended.
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:14:38 PM
statement added
- Author: CDurham Subject: Text Box Date: 6/1/2022 12:00:39 PM
Include copy of pond spreadsheets to show facilities are functioning as proposed in earlier filings.
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:16:31 PM
sheets added

4 (3 inlets & 1 manhole)

Table 7.1: Public Drainage Facility Costs (non-reimbursable)

Item	Quantity	Unit	Unit Cost	Item Total
Inlets/Manholes	3	EA	\$3000/EA	\$9,000
18" Storm	155	LF	\$35	\$5,425
24" Storm	83	LF	\$40	\$3,320
			Subtotal	\$17,745
			Eng/Cont (10%)	\$1,774
			Total Est. Cost	\$19,519

Creekside South at Lorson Ranch Filing No. 2 contains 6.009 acres and is in the JCC drainage basin. The 2022 drainage fees are \$21,134, bridge fees are \$989 and Drainage Surety fees are \$7,285 per impervious acre per Resolution 21-468. 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 7.2: 2022 Drainage/Bridge Fees

Type of Land Use	Total Area (ac)	Imperviousness	Drainage Fee	Bridge Fee	Surety Fee
JCC Residential Area	4.79	52%	\$52,640	\$2,463	\$18,145
Open Space, Landscape Tracts	1.22	2%	\$515	\$24	\$177
		Total	\$53,155	\$2,487	\$18,322

Include calculation was obtained, v in Appendix B ii imperviousness

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- Author: CDurham Subject: Callout Date: 6/1/2022 12:01:34 PM
4 (3 inlets & 1 manhole)
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:16:38 PM
updated
- Author: CDurham Subject: Callout Date: 6/1/2022 12:11:35 PM
Include calculation to show how this imperviousness was obtained, when under "C" calculation spreadsheet in Appendix B it shows all basins with 65% imperviousness.
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:17:00 PM
impervious updated.

8.0 FOUR STEP PROCESS

The site has been developed to minimize wherever possible the rate of developed runoff that will leave the site and to provide water quality management for the runoff produced by the site as proposed on the development plan. The following four step process should be considered and incorporated into the storm water collection system and storage facilities where applicable.

Step 1: Employ Runoff Reduction Practices

Creekside South at Lorson Ranch Filing No. 2 has employed several methods of reducing runoff.

- The street configuration was laid out to minimize the length of streets. Many streets are straight and perpendicular resulting in lots with less wasted space.
- There are open space buffers next to the East Tributary of Jimmy Camp Creek

- Utilize two existing full spectrum detention ponds for detention/water quality. The full spectrum detention mimics existing storm discharges and includes water quality.

Step 2: Stabilize Drainageways

East Tributary of Jimmy Camp Creek is a major drainageway located west of this site. In 2014 and in 2018 the East Tributary of JCC was reconstructed and stabilized per county criteria. The design included a natural sand bottom and armored sides.

Step 3: Provide Water Quality Capture Volume

Treatment of the water quality capture volume (WQCV) is required for all new developments. Creekside South at Lorson Ranch Filing No. 2 will utilize the two existing full spectrum stormwater extended detention basins which include Water Quality Volumes and WQ outlet structures.

Step 4: Consider Need for Industrial and Commercial BMP's

There are no commercial or industrial areas within this site.

9.0 CONCLUSIONS

This drainage report has been prepared in accordance with the City of Colorado Springs/El Paso County Drainage Criteria Manual. The proposed development and drainage infrastructure will not cause adverse impacts to adjacent properties or properties located downstream. Several key aspects of the development discussed above are summarized as follows:

- Developed runoff will be conveyed via curb/gutter and storm sewer facilities
- The East Tributary of Jimmy Camp Creek has been reconstructed west of this study area
- Bridges over the East Tributary at Lorson Boulevard and Fontaine Boulevard and have been constructed providing access to this site.
- Detention and water quality for this site area is provided in two existing full spectrum permanent ponds

Include statement that there are no adverse impacts to downstream facilities

10.0 REFERENCES

1. City of Colorado Springs/El Paso County Drainage Criteria Manual DCM, dated November, 1991
2. Soil Survey of El Paso County Area, Colorado by USDA, SCS
3. Jimmy Camp Creek Drainage Basin Planning Study, Dated March 9, 2015, by Kiowa Engineering Corporation
4. City of Colorado Springs "Drainage Criteria Manual, Volume 2
5. El Paso County "Engineering Criteria Manual"
6. Lorson Ranch East MDDP, June 30, 2017 by Core Engineering.
7. El Paso County Resolution #15-042, El Paso County adoption of Chapter 6 and Section 3.2.1 of the City of Colorado Springs Drainage Criteria Manual dated May, 2014.
8. Lorson Ranch East MDDP prepared by Core Engineering Group, dated November 27, 2017
9. Final Drainage Report for Lorson Ranch East Filing No. 1 prepared by Core Engineering Group, Reference SF18-008, approved July 24, 2018
10. Final Drainage Report for Lorson Ranch East Filing No. 4 prepared by Core Engineering Group, Reference SF19-008, approved September 12, 2019
11. Final Drainage Report for Creekside South at Lorson Ranch Filing No. 1 prepared by Core Engineering Group, Reference SF 20-017, approved September 20, 2020

Channel Report

Hydraflow Express by Intelisolve

Wednesday, Apr 27 2022, 12:5 PM

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Overflow Swale

Trapezoidal

Bottom Width (ft) = 16.00
Side Slope (z:1) = 3.00
Total Depth (ft) = 1.50
Invert Elev (ft) = 100.00
Slope (%) = 0.50
N-Value = 0.017

Calculations

Compute by: Q vs Depth
No. Increments = 10

Highlighted

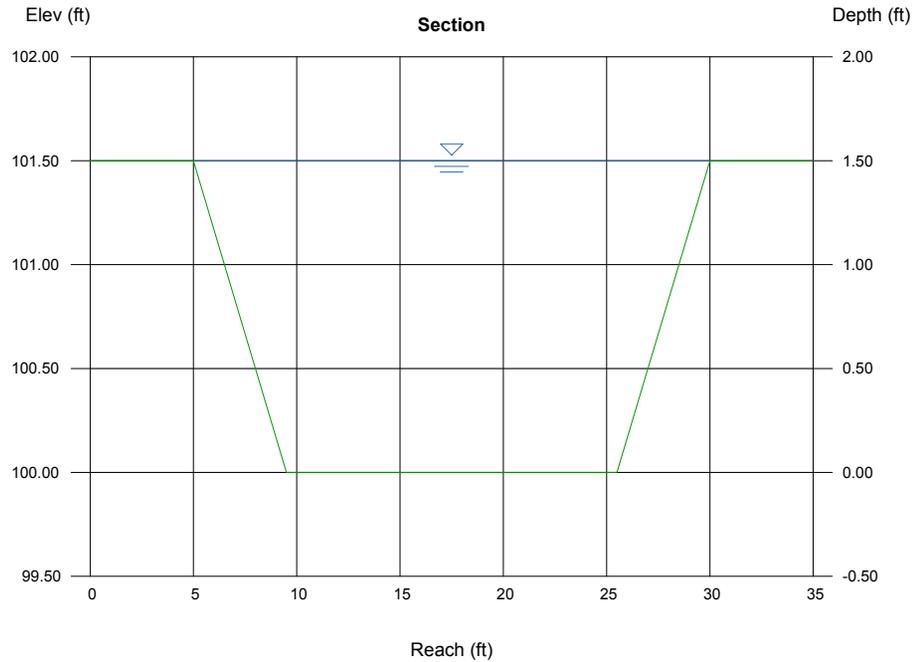
Depth (ft) = 1.50
Q (cfs) = 215.42
Area (sqft) = 30.75
Velocity (ft/s) = 7.01
Wetted Perim (ft) = 25.49
Crit Depth, Yc (ft) = 1.43
Top Width (ft) = 25.00
EGL (ft) = 2.26

Where was this flow obtained from?
Provide small discussion of this
facility in report.

Author: CDurham Subject: Text Box Date: 6/1/2022 12:24:20 PM

Where was this flow obtained from? Provide small discussion of this facility in report.

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:17:49 PM
discuss added.

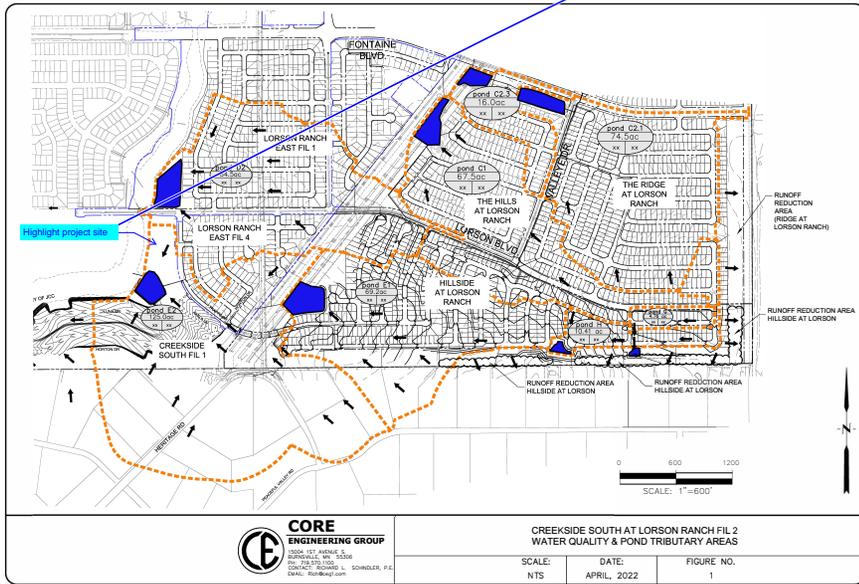


Provide copies of MHFD
pond spreadsheets to
show ponds still function as
designed.

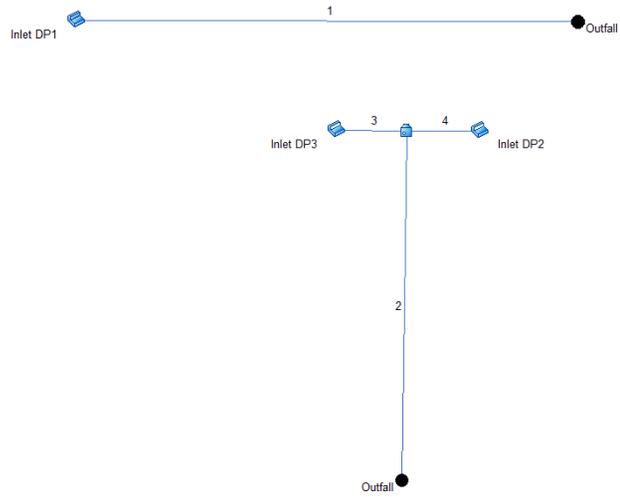
Author: CDurham Subject: Text Box Date: 6/1/2022 12:25:06 PM

Provide copies of MHFD pond spreadsheets to show ponds still function as designed.

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:17:59 PM
spreadsheets added



Hydraflow Plan View



Creekside South 2 - 5yr

No. Lines: 4

04-27-2022

Hydraflow Storm Sewers 2005

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1		1.10	18 c	123.0	5704.30	5705.53	1.000	5704.70	5705.93	0.13	5705.93	End
2		6.20	24 c	85.0	5701.16	5702.44	1.506	5702.04	5703.32	n/a	5703.32	End
3		2.10	18 c	17.5	5703.40	5703.58	1.030	5703.85	5704.14	0.19	5704.33	2
4		4.10	18 c	17.5	5703.40	5703.58	1.030	5704.05	5704.40	0.27	5704.67	2

96.4 ft to match CD's

5702.60 to match CD's

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Author: CDurham Subject: Callout Date: 6/1/2022 2:08:05 PM
 5702.60 to match CD's

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:18:47 PM
 model updated

Author: CDurham Subject: Callout Date: 6/1/2022 2:23:06 PM
 96.4 ft to match CD's

Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:18:56 PM
 model updated

Creeside South 2 - 5yr Number of lines: 4 Run Date: 04-27-2022

NOTES: c = cir; e = ellip; b = box; Return period = 5 Yrs.



- Author: CDurham Subject: Text Box Date: 6/1/2022 12:35:41 PM (FEMA)
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:19:49 PM added
- Author: CDurham Subject: Callout Date: 6/1/2022 12:39:57 PM Linetype doesn't match plan
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:19:05 PM linetype updated
- Author: CDurham Subject: Callout Date: 6/1/2022 12:38:33 PM Include this area as basin that drains to ex inlet in Lorson
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:20:34 PM basin added
- Author: CDurham Subject: PolyLine Date: 6/1/2022 12:37:22 PM
- Author: CDurham Subject: Callout Date: 6/1/2022 12:38:49 PM Include this area as basin that drains to channel
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:20:18 PM basin added
- Author: CDurham Subject: Callout Date: 6/1/2022 12:39:43 PM Include BFE's in floodplain
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:19:57 PM added
- Author: CDurham Subject: Text Box Date: 6/1/2022 12:39:24 PM PLAIN
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:20:12 PM added
- Author: CDurham Subject: PolyLine Date: 6/1/2022 12:37:57 PM
- Author: CDurham Subject: Callout Date: 6/1/2022 12:39:08 PM Include this area as basin that drains to ex inlet in Luneth
- Author: RSchindler Subject: Sticky Note Date: 6/28/2022 4:20:44 PM basin added

