FINAL DRAINAGE REPORT

FOR

LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2
EL PASO COUNTY, COLORADO

FEBRUARY 2023

Prepared for:
Crossroads Development Company, LLC
Mr. Danny Mientka
90 South Cascade Avenue, Suite 1500
Colorado Springs, Colorado Springs 80903

M&S CIVIL RESPONSES ARE IN RED

Prepared by:

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Project #18-005
PCD Filing No.: SF XX-XXX

THE EPC PROJECT FILING NUMBER HAS BEEN REVISED

Revise to:
"PPR2311"
(with no dashes or extras zeros or extra spaces in the file number)

FINAL DRAINAGE REPORT
FOR
LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2

DRAINAGE PLAN STATEMENTS

ENGINEERS STATEMENT

The attached drainage plan and report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the 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.

_____
Virgil A. Sanchez, P.E. #37160
For and on Behalf of M&S Civil Consultants, Inc

DEVELOPER'S STATEMENT

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

BY:_____
Danny Mientka –Owner

DATE:_____

ADDRESS: Crossroads Development Company, LLC
90 South Cascade Avenue, Suite 1500
Colorado Springs, CO 80903

EL PASO COUNTY'S STATEMENT

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

BY:_____ DATE:_____
Joshua Palmer, P.E.
County Engineer / ECM Administrator

CONDITIONS:

FINAL DRAINAGE REPORT
FOR
LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2

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FINAL DRAINAGE REPORT
FOR
LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2

Purpose

This Final Drainage Report for Crossroads Mixed Use Filing No. 2, Lot 1 and Lot 2 is in support of the Final Plat, Preliminary Plan, and Construction Drawings of the subject site. This report functions to identify the existing and proposed runoff patterns and recommend proposed drainage improvements which are intended to safely convey runoff through the proposed development, while minimizing impacts to downstream facilities and adjacent properties.

The Final Plat and Construction Drawings for this site will be submitted concurrently with this report. The phase two (2) development of Lots 1 and 2 are a portion of the Crossroads Mixed Use Filing No. 2 development.

Project Location and Description

The subject site is located in the south half of Section 8, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The 3.364-acre site is currently undeveloped. The site is bound to the west by the planned Southern Rail Point, to the north by Central Rail Way, south by Highway 24, and to the east by Tract C Crossroads Mixed Use Filing No. 2. The proposed site will be developed as the second phase of Crossroads Mixed Use Filing No.2 into two (2) commercial lots, with two (2) parking lots and two (2) private roadways.

The majority of the existing site is covered with native grasses with fair to good cover. Known earthwork operations for “borrow material” have occurred over a small area of the eastern portion of the site in early to mid-2019, but have since stabilized. Generally, the site slopes from east to west slightly greater than 1% with some localized depressions. Some of these may be the results of previous earthwork activities. The site lies within the Sand Creek Drainage Basin. No existing drainage facilities or improvements are onsite, however, surrounding drainage facilities are planned and will connect onsite. No known irrigation systems or wells are present.

Soils

Soils in the project area have been determined to be Blakeland Loamy Sand (8) and Blendon Sandy Loam (10), which are characterized to be part of Hydrologic Soil Types "A" & "B" as determined from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) “Web Soils Survey”. A soils map illustrating the site location and soil types is provided in the appendix of this report.

Floodplain Statement

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Nos. 08041C0754 G & 08041C0752 G, effective date December 7th, 2018, none of the site lies within a designated floodplain. A copy of these annotated maps can be found in the appendix. The Sand Creek East Fork Channel is located to the northwest of the adjacent Meadowbrook Crossing subdivision.

Previous Studies

The area which encompasses Crossroads Mixed Use Filing No. 2, Lot 1 and Lot 2 has been previously studied. Below is a short outline of the assumptions regarding the lands of the subject site and those based upon the previously assembled and approved drainage reports and how the assumptions within them impact the subject site.

“Crossroads Mixed Use Filing No.2 Final Drainage Report, prepared by M&S Civil Consultants, Inc., dated November 2022.

- Establishes all historic, existing, and future drainage patterns and detailed drainage information for the proposed site and adjacent properties.

“Crossroads Mixed Use Filing No.1 Final Drainage Report, prepared by M&S Civil Consultants, Inc., dated February 2021, revised February 2022.

- Establishes all historic, existing, and future drainage patterns and detailed drainage information for the proposed site and adjacent properties.

“Sand Creek Drainage Basin Planning Study, Preliminary Design Report", prepared by Kiowa Engineering Corporation, dated January 1993, revised March 1996.

- Establishes that the subject site falls within the East Fork Sand Creek Drainage Basin, a portion of the larger Sand Creek Watershed
- Establishes that there are no requirements for major infrastructure improvements and subsequently no drainage-improvement related reimbursements with the development of this parcel
- Drainage fees shall be required to plat the subdivision

"Claremont Business Park Filing No.2 prepared by Matrix Design Group, revised November 2006

- Establishes the drainage patterns of offsite Basins 0S-4 and E2 which are to be conveyed within the Meadowbrook Rights of Way
- Established up-gradient offsite drainage to be directed under Meadowbrook north to offsite East Fork Sand Creek Channel, and away from the subject site

"Final Drainage Report, Lot 1 24/94 Business Park Filing No.1 prepared by Core Engineering Group, dated July 14, 2016

- The development of the 24/94 Business Park FDR shows future curb inlets along the future Meadowbrook Parkway extension on the south and west corners of the intersection to capture runoff from up-gradient watersheds in addition to a proposed inlet which was to be located above the intersection at the northwest corner of the subject site.
- Establishes that flows from the parcel upstream of the convenience store (29/94 FDR Basin OS4) EX-B now to be collected by the extension of a 36" RCP along the south side of Meadowbrook Parkway. Runoff within the right of way/roadway separated out as Basin EX-A2.
- Continues assumption that flows from Newt Drive be conveyed north to East Fork Sand Creek.
- Evaluated pre-development drainage patterns for subject site including direct discharge flow rates to the CDOT rights of way of 1.9 and 14.5 cfs for the 5 and 100 year events, respectively. (Basin EX-E).

"Preliminary and Final Drainage Report Meadowbrook Crossing Filing No. 1 and Filing 2, El Paso County, Colorado prepared by Kiowa Engineering Corporation, dated July 25, 2017

- Proposed the installation of a future 10' Type R inlet at the southeast corner of Newt Drive and Meadowbrook Parkway with the extension of Meadowbrook Parkway to the west (along the northern boundary of the subject site). The inlet was to function to collect offsite runoff from a portion of the south half of Meadowbrook Parkway and Newt Drive north of Hwy 24. Intercepted runoff would be conveyed via a proposed 24" storm sewer to the existing storm sewer system within the Meadowbrook Crossings development.
- Proposed the installation of a 10' Type R inlet at the west end of future Meadowbrook Parkway. The inlet was to collect runoff from the north half of the future roadway. An 18" storm drain was proposed to convey collected runoff to the existing water quality pond located within the Meadowbrook Crossings Development. The report indicates a separate forebay or the modification of an existing forebay would be required.
- Shifted the location of the existing 10' Type R curb inlet to be installed upstream of the intersection of Newt Drive (as shown with the 24/94 Business Park FDR), flows in excess of the inlet capacity are to continue within the future Meadowbrook.

"Final Drainage Report for Meadowbrook Dirt Borrow Site, El Paso County Colorado, prepared by M&S Civil Consultants, November 2018.

- Evaluated onsite drainage patterns
- Excluded offsite runoff impacts from areas to the east of site.
- Allowed site to be utilized as a "borrow site" for offsite earthwork activities.

Hydrologic Calculations

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual and where applicable the Mile High Flood District Manual. The Rational Method was used to estimate stormwater runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

Hydraulic Calculations

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual. Storm drains were designed using parameters and criteria summarized in Chapter 8 of El Paso County's Drainage Criteria Manual Vol. 1 and the City of Colorado Springs Drainage Criteria Manuals. Parameters such as Manning's values of 0.13 were used for concrete pipe flow, and design considerations for minimum freeboard and maximum velocities were applied. The relevant data sheets are included in the appendix of this report. Hydraulic grade line calculations for the storm system in the proposed condition are provided in the Appendix of this Final Drainage report.

Drainage Criteria

This drainage analysis has been prepared in accordance with current El Paso County Drainage Criteria Manual and, where applicable, City of Colorado Springs and Mile High Flood District Criteria Manuals. Calculations were performed to determine runoff quantities for the 5-year and 100-year frequency storms for developed conditions using the Rational Method as required for basins having areas less than 100 acres. See Appendix for supporting calculations.

Existing Drainage Characteristics

The subject lots and surrounding areas had been utilized as a "borrow site" to provide surplus earthwork to offsite developments in the area. This recent grading effort occurred during the spring and summer of 2019. The site and surrounding areas have been since been graded during the development of Crossroads Mixed Use Filing No. 2. At the request of El Paso County, an existing conditions drainage analysis has been provided to show the changes to the topography and drainage patterns as a result of this effort. There are no changes between the proposed conditions analysis for the Final Drainage Report for Crossroads Mixed Use Filing No. 2 and the existing conditions analysis for the subject site. Thus, the offsite drainage patterns calculations and assumptions determined within the existing conditions for the subject site will remain the same as the proposed grading from the Crossroads Mixed Use Filing No. 2 FDR/MDDP (CMU2 FDR) by M&S Civil Consultants, Inc (see appendix).

In the existing condition, vegetation remains sparse, consisting primarily of graded soils and weeds with good to fair cover. Areas disturbed by grading activities were reseeded and have since stabilized. Ultimately, all runoff from the site is conveyed to the west towards existing drainage facilities located under Southern Rail Point and ultimately the East Fork of Sand Creek. This

section only discusses the changes in basin geometry and drainage pattern and provides a direct comparison of the proposed conditions from CMU2 FDR versus the existing conditions of the subject lots, utilizing the same (design) points, which have remained undisturbed.

Design Point 1*

Off-site **Basin E2 (Claremont Business Park Filing No.2)** consists of a reported 3.86 acres of development located along the southeastern half of existing Meadowbrook Parkway some 1200' northeast of the subject site. Runoff produced by the offsite development (CBPF2 Lot 46) is conveyed to Meadowbrook Parkway at flow rates of Q5=15.1 and Q100=28.6 cfs in the 5 and 100-year storm events respectively. The collected flows combine with runoff from **Basin EX-A2 (Lot 1 24/94 Business Park Filing No.1)** (Q5=2.5, Q100=4.5 cfs) which consists of 0.59 acres of the southeastern half of Meadowbrook Parkway located immediately east of existing Newt Drive. The collected flows from the two basins culminate at **Design Point 1** at peak rates of Q5=14.2 and Q100=26.5 cfs. An existing 10' CDOT Type R at-grade inlet (**Inlet 1**) intercepts flows of Q5=8.4 and Q100=11.1 cfs, with subsequent by-pass flows of 5.8 and 15.4 cfs in the 5 and 100 year events. Surface flows continue west within the south half of existing Meadowbrook Parkway. Flows at **DP1** are consistent with proposed flows at this location from the CMU2 FDR.

Design Point 2*

Off-site **Basin OS-A (Meadowbrook Crossing Filing 1 and 2)** consists of 1.29 acres of the northern half of existing Meadowbrook Parkway located immediately east of existing Newt Drive. Runoff produced within this basin totals Q5=3.1 and Q100=6.0 cfs. An existing 10' CDOT Type R at-grade inlet (**Inlet 2**) collects runoff of Q5=3.1 and Q100=5.3 cfs, with subsequent by-pass flows in only the 100-year event of 0.7 cfs. Runoff leaving the design point continues west within the north half of existing Meadowbrook Parkway.

Design Point 3*

In accordance with the assumptions outlined within the Meadowbrook Subdivision Final Drainage Report, an offsite public storm sewer pipe and inlet constructed at the southwest corner of the roundabout aids in collecting runoff from a portion of the offsite watershed located to the east of the site.

Off-site **Basin OS-1** consists of approximately 1.40 acres of existing Newt Drive that is retrofitted with a raised median as part of an intersection conversion to a roundabout. Runoff produced within the basin (Q5=6.4 and Q100=11.5 cfs) combines with flow-by from **DP1** at peak rates of Q5=10.2 and Q100=23.3 cfs at an existing public 10' at-grade inlet (**Inlet 3**: Q5=6.7, Q100=9.8 cfs intercepted; Q5=3.5, Q100=13.5 cfs flow by) located at **DP3**. An existing public 24" storm sewer (**PR1**) conveys water across the intersection to the existing 42" storm sewer with Meadowbrook Crossings in accordance with that subdivision's drainage report. Runoff in excess of the inlet capacity continues westward via the curb and gutter of existing Meadowbrook Parkway.

Design Point 4*

Off-site **Basin A** consists of 1.67 acres of the north half of existing Meadowbrook Parkway. Runoff within this basin (Q5=6.5 and Q100=11.6 cfs) combines with flow by from **DP2** for total flows of 6.5 and 12.4 cfs in the 5 year and 100-year events, respectively. An existing 15' at-grade inlet

(**Inlet 4:** Q5=6.5, Q100=10.6 cfs intercepted; Q5=0.0, Q100=1.8 cfs flow by) is located at the west end of the roadway. This inlet conveys intercepted flows to **PR1.5**, an existing 24" RCP public storm sewer. Flow by from the 100-year event continues west to downstream infrastructure.

Design Point 4.5*

1.8 cfs of flow by in the 100-year event continues west from **DP4** towards off-site **Inlet 4.5**, a **NEENAH R-2501 Type C Grate** lid and frame at the low point of the cul-de-sac. Supporting calculations for this non-standard inlet are provided in the CMU2 FDR Appendix. This inlet reaches a maximum depth of 0.5' in order to convey this flow underneath the roadway via an existing public 24" storm sewer (**PR2**). The NEENAH inlet is to be removed and replaced with a standard CDOT 5' Type R inlet when the roadway cul-de-sac is removed and the roadway is extended to the west with future development. In the case of inlet clogging, overflow collects at **DP5**, which has an additional 13.3 cfs capacity.

Design Point 5*

Off-site **Basin B** consists of 1.48 acres of the southern half of existing Meadowbrook Parkway. Runoff produced within this basin (Q5=5.8 and Q100=10.3 cfs) combines with flow-by leaving **DP3** at peak flowrates of Q5=9.9, Q100=25.8 cfs. An existing public 15' sump inlet (**Inlet 5:** Q5=10.1, Q100=26.3 cfs intercepted; no flow by) located at west end of the roadway prevents developed flows from exiting the roadway corridor. The intercepted runoff combines with **PR2** flows in a 36" private storm sewer system (**PR3, by others**). Combined flows within the existing system are calculated to reach peak rates of 16.5 and 37.9 cfs. The storm sewer system is planned by others through the multi-family site (Lot 11) but ultimately will tie back into the system at **DP15**. In case of inlet clogging, overflows overtop the curb on the southern side onto the apartment site and are conveyed to the swale on the west side of the site.

Design Point 6*

Off-site **Basin C** (Q5=9.3, Q100=17.4 cfs) consists of 2.36 acres of the northern portion of commercial Tract C located along the east side of the site. An existing private 30" storm sewer (**PR4**) collects and convey flows of Q5=9.3 and Q100=17.4 cfs in the 5 and 100-year storm event, respectively. Intercepted flows are conveyed west underground within the roadway tract. **PR4** was treated as a flared end pipe for rational method calculation purposes, to account for future development per the CMU2 FDR.

Design Point 6.5*

Off-site **Basin C1** (Q5=9.3, Q100=17.4 cfs) consists of 2.19 acres of the southern portion of commercial Tract C located along the east side of the site. An existing private 30" storm sewer (**PR4.5**) collects and convey flows of Q5=9.3 and Q100=17.4 cfs in the 5 and 100-year storm event, respectively. Intercepted flows from **PR4** and **PR4.5** are conveyed west underground within the roadway tract through **PR5-PR7** at flow rates of Q5=18.7 and Q100=34.7 cfs.

Design Point 7*

Off-site **Basin D** consists of 2.21 acres of commercial Tract B located between existing Meadowbrook Parkway, existing Central Rail Way, existing Pacific Rail Point, and existing Southern Rail Point. **Basin D**, which includes portions of Lots 9 and 10, have a private 24" storm

drain (**PR8**) to collect peak flows of Q5=9.3 and Q100=16.9 cfs from this basin in the 5 and 100-year storm events, respectively.

Design Point 8*

Off-site **Basin E** (Q5=4.0, Q100=7.2 cfs) consists of 0.99 acres of a portion of commercial lots, the northern half of existing Central Rail Way and the western half of existing Pacific Rail Point. A private 10' CDOT Type R at-grade inlet (**Inlet 6:** Q5=4.0, Q100=6.0 cfs intercepted; Q5=0.0, Q100=0.0 cfs flow by in existing conditions) is located on the north side of the roadway to intercept flows. Runoff bypassing this inlet continues to downstream infrastructure. Flows collected from the inlet combine with **PR8** and are conveyed to a box base manhole in the center of the existing Central Rail Way via an exisitng private 30" (**PR9**) storm drain at flow rates of Q5=12.5 and Q100=21.5 cfs. Within the manhole, flows from **PR9** then combine with flows from **PR7** and continue to flow through an existing private 36" (**PR10**) storm drain at flow rates of Q5=29.6 and Q100=53.3 cfs.

Design Point 9

Onsite **Basin E1** (Q5=5.7, Q100=10.4 cfs) consists of 1.47 acres of commercial lots, and the southern half of Central Rail Way. A private 10' CDOT Type R at-grade inlet (**Inlet 7:** Q5=5.5, Q100=7.7 cfs intercepted; Q5=0.2, Q100=2.7 cfs flow by) is located on the south side of the Central Rail Way to intercept flows. Runoff bypassing this inlet continues to downstream infrastructure. Flows collected from the inlet combine with flows from **PR10** and are conveyed south to a box base manhole on the south side of the roadway via a private 36" (**PR11**) storm drain and continue west underground at flow rates of Q5=35.1 and Q100=61.0 cfs. **PR12**, an existing 42" private storm sewer, then directs the system south from another manhole. Pipe flows at Q5= 6.9 and Q100= 13.8 cfs from the neighboring existing apartment site (**PR11.5**, private 24" RCP) combine with flows from **PR12** in an existing private 48" storm drain (**PR12.5**) at flow rates of Q5=43.2 and Q100=77.4 cfs.

Design Point 10*

Off-site **Basin G** (Q5=2.1, Q100=3.8 cfs) consists of 0.46 acres of multi-family lots and roadway located southwest of the proposed site at the southwest edge of existing Southern Rail Point. A private 10' CDOT Type R sump inlet (**Inlet 8**: Q5=2.1, Q100=3.8 cfs; no flow by) located on the west side of the street functions to collect the runoff from **Basin G. PR13**, an existing 18" private storm sewer, directs runoff east to a box base manhole at peak flow rates of 2.1 cfs and 3.8 cfs in the minor and major storm events, respectively. In the case of inlet clogging, overflow is directed to the swale at **DP13**.

Design Point 11

Off-site **Basin G1** (Q5=2.7, Q100=4.9 cfs) consists of 0.59 acres of commercial lots and the east half of Southern Rail Point, located west of the existing site. A private 15' CDOT Type R sump inlet (**Inlet 9:** Q5=2.9, Q100=8.8 cfs intercepted; no flow by), located on the east side of existing Southern Rail Point collects the runoff from **Basin G1** as well as bypass flows from **DP8 and DP9**, totaling Q5=2.9 and Q100=8.8 cfs. **PR14**, an existing 30" private storm sewer, directs runoff west to an underground box base manhole at peak flow rates of 2.9 cfs and 8.8 cfs in the minor and major storm events, respectively. From the junction, flows from **PR12.5**, **PR13**, and **PR14** combine at

PR15 (Q5=47.1, Q100=87.8 cfs), a 48" private storm sewer, and are directed south. In the case of inlet clogging, overflows overtop the curb and collect in the rip rap protected depression at **DP12**.

Design Point 12

Onsite **Basin F** consists of 2.72 acres of on-site commercial lots (Lot 1 and portions of Lot 2) located at the western half of the site. A private existing 24" storm drain (**PR16**) collects the basin flows of Q5=11.4 and Q100=20.8 cfs at **DP12** in the 5 and 100-year events, respectively. Intercepted flows are conveyed west underground to the main line where they combine with flows from **PR15** at a manhole junction. **PR17,** a private 54" RCP storm sewer directs the collected runoff at rates of Q5=56.7 and Q100=105.2 cfs to a manhole which joins with a private 30" RCP**, PR18*** (Q5=2.1, Q100=3.3) at combined peak flow rates of Q5=57.6 and Q100=106.4 cfs. The collected flows are conveyed southwest via **PR19** (Private 54" RCP).

Design Point 13

Basin J1 consists of 0.55 acres of paved roadway, half of a proposed parking lot, and a portion of vegetation. The basin is designed to convey overflow runoff from the existing apartment complex site and sheet flow from the basin to a 5' CDOT type R sump inlet at the southwest corner of the east half of the parking lot at **DP13** (**Basin J1** runoff: Q5=1.5, Q100=3.0 cfs and **Basin D-1 Overflow**: Q5=0.0, Q100=0.9 cfs). A private existing 18" storm drain (**PR20**) collects flows of Q5=1.5 and Q100=3.8 cfs at **DP13** in the 5 and 100-year events, respectively. Intercepted flows are conveyed west underground to the main line where they combine with flows from **PR19** at a manhole junction. The collected flows (Q5=56.2 and Q100=104.8 cfs) are conveyed southwest via **PR21** (Private 54" RCP) to an Underground Detention (UGD). Overflows from the apartment site were obtained by using flow by from the "Final Drainage Report for Aura at Crossroads" MHFD inlet sheets, which are provided in the appendix.

Design Point 14

Basin J2 consists of 1.13 acres of the west side of a proposed parking lot and sparse vegetation. The basin is designed to convey overflow runoff (**Basin Z-1**: Q5=0.47, Q100=1.27 cfs) from the existing apartment complex site and sheet flow from **Basin J2** (Q5=0.2 cfs, Q100=2.9 cfs) to a 2'x2' area inlet on the northern edge of the proposed parking lot (**DP14**). A private existing 18" storm drain (**PR24**) conveys flows of Q5=1.0 and Q100=4.2 cfs in the 5 and 100-year events, respectively. Intercepted flows are conveyed west underground to the main line where they combine with apartment site flows and flows from **DP15** at a manhole junction. Overflows from the apartment site were obtained by using flow by from the "Final Drainage Report for Aura at Crossroads" MHFD inlet sheets, which are provided in the appendix.

Design Point 15*

Off-site **Basin J3** consists of 1.62 acres of the v-shaped, earthen swale located west of the proposed site that collects flows not anticipated to be collected by the planned apartment site's storm sewer (**Basin A-5 Overflow**: Q5=0.9, Q100=7.8 cfs and **Basin Z-2**: Q5=0.57, Q100=1.43 cfs), and combines with flows from **Basin J3** (Q5=0.8, Q100=4.1 cfs) at **DP15** (an existing 2'x2' area inlet). Intercepted flows of Q5=2.2 and Q100=14.1 cfs are conveyed east underground through **PR23** (a private existing 18" storm drain) to the main line where they combine with flows from a private existing 48" storm drain (**PR22***) and **PR24** at a manhole junction. The collected

flows (Q5=12.2 and Q100=29.1 cfs) are conveyed south via **PR25** (Private 54" RCP) to an Underground Detention (UGD). Anticipated flows for **Basin A-5 Overflow** and **Basin Z-2** from "Final Drainage Report for Aura at Crossroads" were used to determine swale cross section prior to the junction location, and combined flows with **Basin J3** were used for after.

Design Point 16

Off-site **DP16** represents the low point and point of outfall for the Underground Detention located southwest of the proposed site. The cumulative flows at this UGD are Q5=64.2 and Q100=126.0 cfs from combined flows within 54" RCP storm line (**PR21**) and 54" RCP storm line (**PR25**). Flow exiting the pond will be routed to the existing 5' bottom earthen swale (Planned Section A-A' Analyses) in CDOT's Right of Way at **DP17** via 18" private **PR26** (Q5=1.2 and Q100=11.4 cfs). A rip rap pad (Type L, D50=9") is provided as outlet protection.

Design Point 17*

Off-site **Basin OS-2** consists of 4.98 acres. Approximately half of this basin is comprised of the paved surface of U.S. Highway 24, while the other half is comprised of the 5-foot bottom earthen swale in CDOT's Right of Way. Runoff produced within this basin (Q5=8.7 and Q100=19.6 cfs) flows from northeast to southwest, combining with outfall flows from **DP16**. This combination of runoff collects in the existing swale in the right of way. According to the CMU1 MDDP, the pond releases flows at Q5=1.2, Q100=11.4 cfs. Thus, the cumulative flows at **DP17** are the same as the planned flows in the CMU1 MDDP at Q5=9.9 and Q100=31.0 cfs. Flows from this design point continue to downstream infrastructure.

Four Step Process

Step 1 **Employ Runoff Reduction Practices** – Approx. 2.54 acres of off-site development is being set aside for an Underground Detention (UGD). Whenever possible, runoff produced within developable area containing impervious surfaces will be routed through landscaped areas or earthen swales (grass-lined where slope exceeds 2%) to minimize direct connection of impervious surfaces.

Step 2 **Stabilize Drainageways** – The development of this site is not anticipated to have negative effects on downstream drainage ways since flows released will be below historic rates. In the interim, the site proposes silt fences, before discharging at the southwest property corner of the site and onto an adjacent undeveloped property via riprap-lined spillways. This ensures that in this stage of the development negative effects on the downstream drainage ways will be avoided.

In the proposed condition, the flow is discharged to the same location southwest through an RCP pipe, to be treated in an off-site Underground Detention (UGD). The flows combine with offsite flows and are released through an RCP pipe outfall lined with rip rap, to CDOT's man-made roadside ditch until it reaches Peterson Road. Flows are then conveyed to the other side of the road, into a similar earthen channel, via a 36" CMP culvert. The drainage continues southwest in the right of way, until it reaches the East Fork Sand Creek Channel. Existing rip rap barriers are lined throughout this portion of the pathway approximately every 90-100 feet within the ditch to the channel bank.

I heard that the developer decided that UG WQ and detention was cost prohibitive and will be doing the above ground pond instead. If so, revise this Step 3 accordingly and all other references to UGD in this report.

Step 3 **Provide Water** Underground Detention (UGD) ROW roadside ditch and ultima drain the water quality event approximately 90% of the prede

THE DEVELOPER MAY DECIDE THAT THE PROPOSED UG WQ AND DETENTION WILL BE REPLACED BY THE ABOVE GROUND POND, HOWEVER, THEY HAVE NOT COME TO A FINAL DECISION ON THIS. THUS, THE UG WQ PROPOSAL WILL REMAIN UNTIL FURTHER NOTICE FROM THE DEVLOPER.

Step 4 **Consider Need For Selecting Industrial And Commercial BMP's** – The proposed development will implement a Stormwater Management Plan including property housekeeping practices, spill containment procedures, and coverage of storage/handling areas. Specialized BMP's are not required since the vertical development of the commercial areas are unknown at this time.

Proposed Drainage Characteristics

The future site will be developed into two (2) commercial lots, with two (2) parking lots and two (2) access roads. The proposed development will extend Pacific Rail Point to the south and into the site to provide access to both commercial lots. The following summary generalizes the proposed drainage patterns and drainage improvements required to safely route developed runoff to downstream facilities.

Off-site flows will collect per the existing detailed drainage discussion. Runoff within the eastern half of Lot 2 will flow northwest to the existing Central Rail Way(private). Flows within the existing Central Rail Way will be conveyed west and collected by a pair of sump inlets located at the west end of the roadway, then routed southwest to the existing off-site UGD. Central Rail Way (private) will provide access and utility corridors for development. Private storm sewer mains, stubs, and inlets will be extended along these corridors to serve the development. Runoff within the western half of Lot 2 will flow to the southwest corner of the lot to an inlet. These flows will be conveyed southwest to the existing off-site UGD. Runoff within the Lot 1 will flow southwest to various on-site inlets and then southwest to the existing off-site UGD. All onsite storm sewer and drainage improvements shall be private. Storm sewer pipes and inlets will be constructed along, and tie in at the southwest boundary of the proposed Central Rail Way and south of Southern Rail Point to aid in collecting runoff from the site. These facilities will connect at the west side of the proposed site, where new parking lots are proposed west of Southern Rail Point. Proposed on-site flows will continue off-site through planned storm pipes, where the flows will combine with adjacent lot flows and continue through existing storm pipes to the existing underground detention pond located southwest of the proposed site. The planned outfall from the pond will discharge into the existing barrow ditch located within the north half of the existing CDOT Right of Way as per the CMU1 MDDP. Refer to the "Existing Detailed Drainage Discussion" of this report for all int 9, since none of the upstream drainage changes in the

THE REQUESTED COMMENTS HAVE BEEN ADDED TO THE REPORT.

Clarify that the downstream pond that these lots are tributary to, must be installed (or at least the Sediment Basin in the pond's location), prior to work commencing on these lots.

THE REQUESTED COMMENTS HAVE BEEN ADDED TO THE REPORT.

THE REQUESTED COMMENTS HAVE BEEN ADDED TO THE REPORT.

Engineer must confirm in the Drainage Report that the existing pond is functioning as intended (ie: not in need of any maintenance).

State that the contractor will be responsible for any re-excavation of sediment and debris that collects in the basin depression required to ensure that the basin meets the design grades following construction. The storm lines shall also be cleaned and free of sediment once the site becomes stabilized.

Proposed Detailed Drainage Discussion

Design Point 9A

Onsite **Basin E1A** (Q5=3.0, Q100=5.4 cfs) consists of 0.71 acres of a commercial lot. The undeveloped lot generally drains from south to northwest until the flows exit the basin as sheet flow at **DP9A** (Q5=3.0, Q100=5.4 cfs). The runoff from this design point is conveyed onto the southern half of Central Rail Way and combines with flows within **Basin E1C.**

Design Point 9B

Onsite **Basin E1B** (Q5=1.8, Q100=3.3 cfs) consists of 0.43 acres of proposed commercial Lot 2. The basin generally drains from south to northwest until the flows exit the basin as sheet flow at **DP9B** (Q5=1.8, Q100=3.3 cfs). The runoff from this design point is conveyed onto the southern half of Central Rail Way and combines with flows within **Basin E1C.**

Design Point 9C

Onsite **Basin E1C** (Q5=1.2, Q100=2.2 cfs) consists of 0.27 acres of the southern half of Central Rail Way. **DP9A** and **DP9B** combine with runoff within **Basin E1C**. These combined flows are conveyed southwest to private 10' CDOT Type R at-grade inlet (**Inlet 7:** Q5=5.5, Q100=7.7 cfs intercepted; Q5=0.5, Q100=3.2 cfs flow by) located at the south side of the Central Rail Way to intercept flows (**DP9C)**. Runoff bypassing this inlet continues to downstream infrastructure. Flows collected from the inlet combine with flows from private 36" storm drain, **PR10** (Q5=29.6, Q100=53.3 cfs) and are conveyed south to a box base manhole on the south side of the roadway via a private 36" (**PR11**) storm drain and continue west and south underground at flow rates of Q5=36.1 and Q100=62.9 cfs. **PR12**, an existing 42" private storm sewer, then directs the system south from another manhole. A proposed 12" private storm sewer, **PR12A,** conveys a fraction (1/5) of roof runoff from **Basin F4** (Q5= 0.5 and Q100= 0.8 cfs) west of Lot 1. Pipe flows at Q5= 6.9 and Q100= 13.8 cfs from the neighboring existing apartment site (**PR11.5**, private 24" RCP) combine with flows from **PR12** and **PR12A** in an existing private 48" storm drain (**PR12.5**) at flow rates of Q5=44.2 and Q100=79.4 cfs.

Design Point 10*

No changes have been made to off-site **Basin G** in the proposed conditions. Since no changes have been made, refer to the existing conditions for **DP10**.

Design Point 11

Off-site **Basin G1** (Q5=2.9, Q100=5.4 cfs) consists of 0.69 acres of commercial lots and the east half of Southern Rail Point, located west of the existing site. A private 15' CDOT Type R sump inlet (**Inlet 9:** Q5=3.4, Q100=9.6 cfs intercepted; no flow by), located on the southeast side of existing Southern Rail Point collects the runoff from **Basin G1** as well as bypass flows from **DP8 and DP9**, totaling Q5=3.4 and Q100=9.6 cfs. **PR14**, an existing 30" private storm sewer, directs runoff west to an underground box base manhole at peak flow rates of 3.4 cfs and 9.6 cfs in the minor and major storm events, respectively. From the junction, flows from **PR12.5**, **PR13**, and **PR14** combine at existing **PR15** (Q5=48.1, Q100=89.7 cfs), a 48" private storm sewer, and are directed south.

Design Point 12A

Onsite **Basin F1** consists of 0.16 acres of a southwest portion of the proposed building and drive through within commercial Lot 2. Runoff within the basin generally flows southwest towards proposed Lot 1. A private proposed 5' CDOT Type R at-grade sump inlet (**Inlet 1F**) collects the basin flows of Q5=0.7 and Q100=1.2 cfs at **DP12A**. A private proposed 12" storm drain (**PR16A**) conveys the basin flows west, underground of Lot 1 where the flows combine with flows from Lot 1 at a manhole junction.

Design Point 12B

Onsite **Basin F2** consists of 0.87 acres of north portions of the proposed parking lots within commercial Lots 1 and 2. A private proposed 3' CDOT Type C area sump inlet (**Inlet 2F**) collects the basin flows of Q5=3.7 and Q100=6.7 cfs at **DP12B**. A private proposed 12" storm drain (**PR16B**) conveys roof and north patio sheet flows of Q5=0.7 and Q100=1.3 cfs from one-fifth (1/5) of **Basin F4** runoff to **Inlet 2F,** where flows within **PR16B** combine with basin flows captured by **Inlet 2F**. The combined flows are conveyed east underground through a private proposed 18" storm drain (**PR16C**) at peak flow rates of Q5=4.4 and Q100=8.0 cfs to a manhole junction. At the manhole junction, flows within **PR16C** combine with flows from **PR16A** at combined peak flow rates of Q5=5.1 and Q100=9.2 cfs and are conveyed south through a private proposed 18" storm drain (**PR16D)** to the next manhole junction.

Design Point 12C

Onsite **Basin F3** consists of 0.21 acres of a central portion of the proposed commercial Lot 1 parking lot. A private proposed 3' CDOT Type C area sump inlet (**Inlet 3F**) collects the basin flows of Q5=0.9 and Q100=1.6 cfs at **DP12B**. A private proposed 6" storm drain (**PR16E**) conveys roof sheet flows of Q5=0.2 and Q100=0.3 cfs from one-seventeenth (1/17) of **Basin F4** runoff to **Inlet 3F,** where flows within **PR16E** combine with basin flows captured by **Inlet 3F**. The combined flows are conveyed east underground through a private proposed 12" storm drain (**PR16F**) at peak flow rates of Q5=1.1 and Q100=2.0 cfs to a manhole junction. At the manhole junction, flows within **PR16F** combine with flows from **PR16D** at combined peak flow rates of Q5=6.1 and Q100=11.2 cfs and are conveyed south and west through a private proposed 24" storm drain (**PR16G)**.

Design Point 12D

Onsite **Basin F4** consists of 0.82 acres of the proposed commercial building within Lot 1 located at the north western portion of the site. A majority of **Basin F4** runoff is carried through roof drains and area inlets around the proposed commercial building to the main storm system. Only one-third (1/3) of **Basin F4** runoff (Q5=1.1 and Q100=2.1 cfs) is conveyed south as sheet flow to **DP12D**. The runoff passing through **DP12D**, enters **Basin F5** to combine with flows from **Basin F5.** These combined flows continue south to **DP12E**.

Design Point 12E

Onsite **Basin F5** consists of 0.64 acres of the southern portion of the proposed commercial Lot 1 parking lot. Flow by from **DP12D** combines with runoff within **Basin F5** (Q5=2.7 and Q100=4.9 cfs). The combined flows (Q5=3.8 and Q100=7.0 cfs) continue south to a private proposed 15' CDOT Type R sump inlet (**Inlet 4F**) at **DP12E**. A private proposed 18" storm drain (**PR16I**)

conveys the flows from **Inlet 4F** north to a manhole junction. A private proposed 12" storm drain (**PR16H**) conveys roof and south patio sheet flows of Q5=0.7 and Q100=1.3 cfs from one-fifth (1/5) of **Basin F4** runoff south, to the same manhole junction. At this manhole, flows from **PR16G**, **PR16H**, and **PR16I** combine and are conveyed southwest through a private proposed 24" storm drain (**PR16J**) at peak flow rates of Q5=10.7 and Q100=19.4 cfs to an existing manhole junction. At the manhole junction, flows within **PR16J** combine with flows from existing **PR15** at combined peak flow rates of Q5=56.9 and Q100=105.6 cfs and are conveyed southwest through a private existing 54" storm drain (**PR17)**. **PR17** directs the collected runoff to a manhole which joins with an existing private 30" RCP**, PR18*** (Q5=2.1, Q100=3.3) at combined peak flow rates of Q5=57.6 and Q100=107.6 cfs. The collected flows are conveyed southwest via **PR19** (Private 54" RCP).

Design Point 13

Basin J1 consists of 0.54 acres of paved roadway, half of a proposed parking lot, and a portion of vegetation. The basin is designed to convey overflow runoff from the existing apartment complex site and sheet flow from the basin to a 5' CDOT type R sump inlet at the southwest corner of the east half of the parking lot at **DP13** (**Basin J1** runoff: Q5=1.7, Q100=3.3 cfs and **Basin D-1 Overflow**: Q5=0.0, Q100=0.9 cfs). A private existing 15" storm drain (**PR20**) collects flows of Q5=1.7 and Q100=4.2 cfs at **DP13** in the 5 and 100-year events, respectively. Intercepted flows are conveyed west underground to the main line where they combine with flows from **PR19** at a manhole junction. The collected flows (Q5=57.6 and Q100=107.6 cfs) are conveyed southwest via **PR21** (Private 54" RCP) to an Underground Detention Pond (UGD). Overflows from the apartment site were obtained by using flow by from the "Final Drainage Report for Aura at Crossroads" MHFD inlet sheets, which are provided in the appendix.

Design Point 14

Basin J2 consists of 1.13 acres of the west side of a proposed parking lot and sparse vegetation. The basin is designed to convey overflow runoff (**Basin Z-1**: Q5=0.47, Q100=1.27 cfs) from the existing apartment complex site and sheet flow from **Basin J2** (Q5=1.4 cfs, Q100=4.0 cfs) to a 2'x2' area inlet on the northern edge of the proposed parking lot (**DP14**). A private existing 18" storm drain (**PR24**) conveys flows of Q5=1.8 and Q100=5.2 cfs in the 5 and 100-year events, respectively. Intercepted flows are conveyed west underground to the main line where they combine with apartment site flows and flows from **DP15** at a manhole junction. Overflows from the apartment site were obtained by using flow by from the "Final Drainage Report for Aura at Crossroads" MHFD inlet sheets, which are provided in the appendix.

Design Point 15*

No changes have been made to off-site **Basin J3** in the proposed conditions. Since no changes have been made, refer to the existing conditions for **DP15**.

Design Point 16

Off-site **DP16** represents the low point and point of outfall for the Underground Detention located southwest of the proposed site. The cumulative flows at this UGD are Q5=65.0 and Q100=127.0 cfs from combined flows within 54" RCP storm line (**PR21**) and 54" RCP storm line (**PR25**). Flow exiting the pond will be routed to the existing 5' bottom earthen swale (Planned Section A-

A' Analyses) in CDOT's Right of Way at **DP17** via 18" private **PR26** (Q5=1.2 and Q100=11.4 cfs). AN existing rip rap pad (Type L, D50=9") is provided as outlet protection.

Design Point 17*

No changes have been made to off-site
have been made, refer to the existing con

THE DEVELOPER MAY DECIDE THAT THE PROPOSED UG WQ AND DETENTION WILL BE REPLACED BY THE ABOVE GROUND POND, HOWEVER, THEY HAVE NOT COME TO A FINAL DECISION ON THIS. THUS, THE UG WQ PROPOSAL WILL REMAIN UNTIL FURTHER NOTICE FROM THE DEVLOPER.

*See Crossroads Mixed Use Filing No. 2
Inc. dated November 2022, in the appendi
for the events at these lots.

Water Quality Provisions and Maintenance

revise if going with above ground.

The off-site planned underground detention (UGD) functions
quality for the proposed development. Refer to the CMU1 MDI
calculations regarding the existing underground detention pond.

INLET PROTECTION HAS BEEN ADDED TO THE LIST OF EROSION CONTROL PROCEDURES FOR THIS PROJECT.

Erosion Control

And inlet protection

It is the policy of the El Paso Coun
control plan with the drainage report
control as proposed erosion control
staging, and concrete washout areas.
the plans.

rosion
ıcking
ɔiling,
npany

THIS SECTION HAS BEEN REVISED TO STATE 2023 DRAINAGE FEES AND THE NARRATIVE HAS BEEN CHANGED TO STATE THAT FEES WILL BE PAID WITH FILING NO. 2

Revise to 2023 drainage fees and update narrative to state fees will be paid with filing no. 2.

2022 Drainage & Bridge Fees:

Drainage fees have already been paid with Filing No. 1.

Construction Cost Estimate (Non-Reimbursable)

Item	Amount	Unit	Unit Cost	Total Cost
3' CDOT Type C Area Inlet	2	EA	$ 7,890.00	$ 15,780.00
5' CDOT Type R Inlet	1	EA	$ 8,890.00	$ 8,890.00
15' CDOT Type R Inlet	1	EA	$ 10,890.00	$ 10,890.00
Type II MH	4	EA	$ 6,000.00	$ 24,000.00
6" SD	6	LF	$ 30.00	$ 180.00
12" SD	361	LF	$ 50.00	$ 18,050.00
18" SD	81	LF	$ 70.00	$ 5,670.00
24" SD	315	LF	$ 81.00	$ 25,515.00
TOTAL COST:	**$ 108,975.00**			

M & S Civil Consultants, Inc. (M & S) cannot and does not guarantee the construction cost will not vary from these opinions of probable costs. These opinions represent our best judgment as design professionals familiar with the construction industry and this development in particular. The above is only an estimate of the facility cost and drainage basin fee amounts in 2023.

Summary

The construction of this site is for the purposes of developing commercial Lots 1 and 2 in the proposed condition. The site will be graded and all disturbed areas will be seeded. Proposed post construction runoff will be discharged from the lots at **PR11** and **PR16J**. At **PR11**, the proposed runoff is 1.0 and 1.9 cfs greater than the planned runoff from the CMU2 FDR for the 5 and 100-year events, respectively. At **PR16J**, the proposed runoff is 0.7 and 1.4 cfs less than the previously assumed (existing) runoff from the CMU2 FDR for the 5 and 100-year events, respectively. This difference is due to the area adjustment of **Basin E1** and **Basin F** from the previously assumed CMU2 FDR to this site's drainage report. Though there is an increase in proposed runoff from **PR11** at **DP9C**, the amount of runoff that reaches the previously assumed UGD from adjacent lots and the proposed site is 0.8 cfs and 1.0 cfs greater than the previously assumed flows at this location from the CMU2 FDR for the 5 and 100-year events, respectively. Thus, the runoff from the proposed site does not affect the size of the previously assumed UGD. Proposed post construction runoff will be discharged from the pond at the same rates as previously assumed for the 5 and 100 year design events from the CMU2 FDR. Thus, the development of the proposed site will not further impact the flows that are planned to be released from the UGD in the CMU2 FDR (see appendix). The construction of Crossroads Mixed Use Filing No. 2 Lots 1 and 2 shall not adversely affect adjacent or downstream property.

References

1.) "El Paso County and City of Colorado Springs Drainage Criteria Manual".

2.) "Urban Storm Drainage Criteria Manual"

3.) SCS Soils Map for El Paso County.

4.) Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency, Revised date December 7th, 2018.

5.) "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc.

6.) "Preliminary and Final Drainage Report Meadowbrook Crossing Filing 1 and Filing 2", dated July 25, 2017, by Kiowa Engineering Corporation.

7.) "Final Drainage Report Lot 1 24/94 Business Park Filing No. 1 on Platte Avenue and Meadowbrook Parkway", dated April 28, 2016 and revised July 14, 2016, by Core Engineering Group, LLC.

8.) "Final Drainage Report for Meadowbrook Dirt Borrow Site ", dated November 2018, by M&S Civil Consultants, Inc.

9.) "Sand Creek Drainage Basin Planning Study", revised March 1996, by Kiowa Engineering Corporation.

10.) “Final Drainage Report for Aura at Crossroads”, dated April 4th, 2022, by Harris Kocher Smith.

11.) “Final Drainage Report for Crossroads Mixed Use Filing No.1”, dated February 2022, by M&S Civil Consultants, Inc.

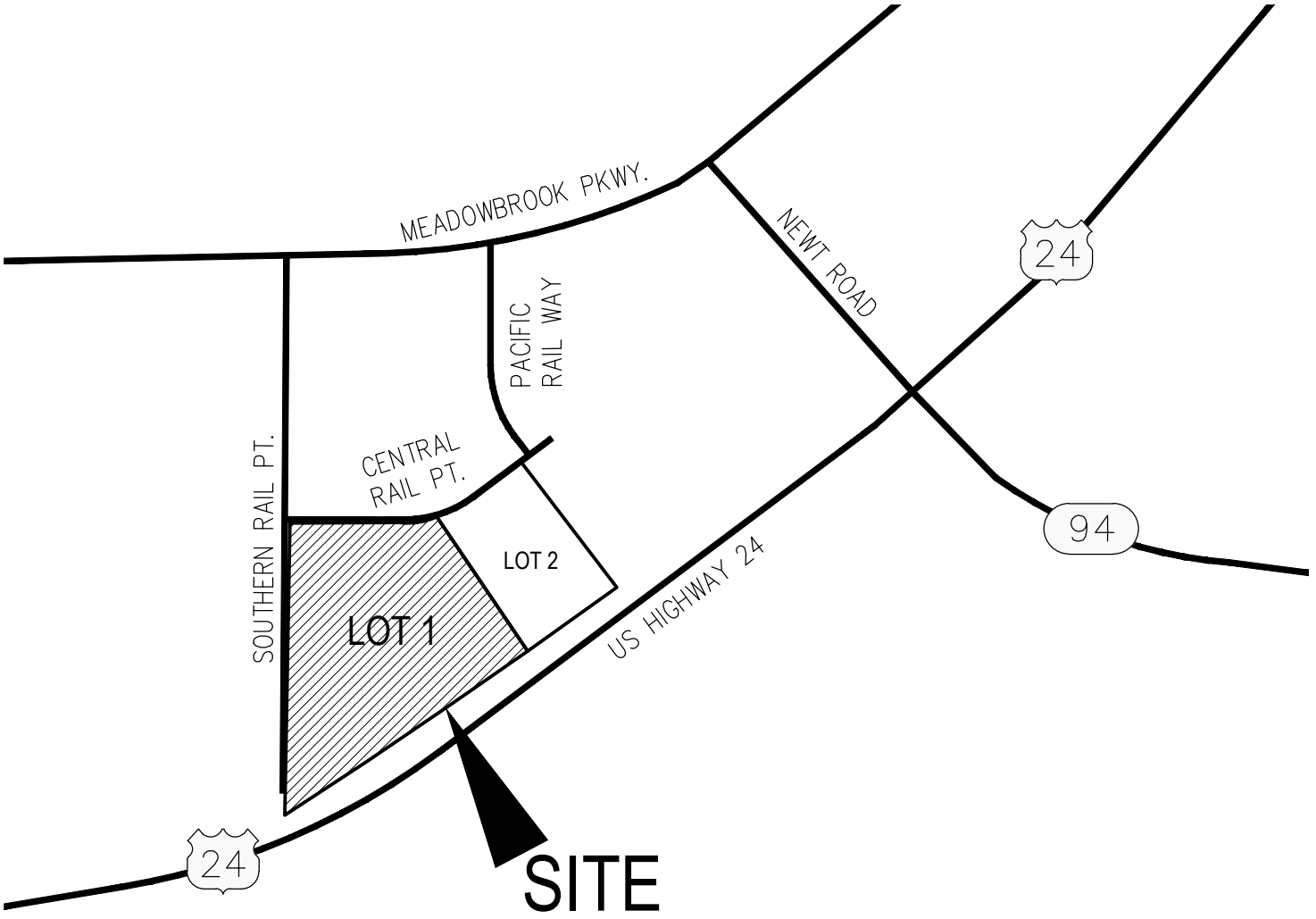
12.) “Final Drainage Report for Crossroads Mixed Use Filing No.2”, dated November 2022, by M&S Civil Consultants, Inc.

APPENDIX

VICINITY MAP

VICINITY MAP

LOT 1 - CROSSROADS MIXED USE FILING NO. 2



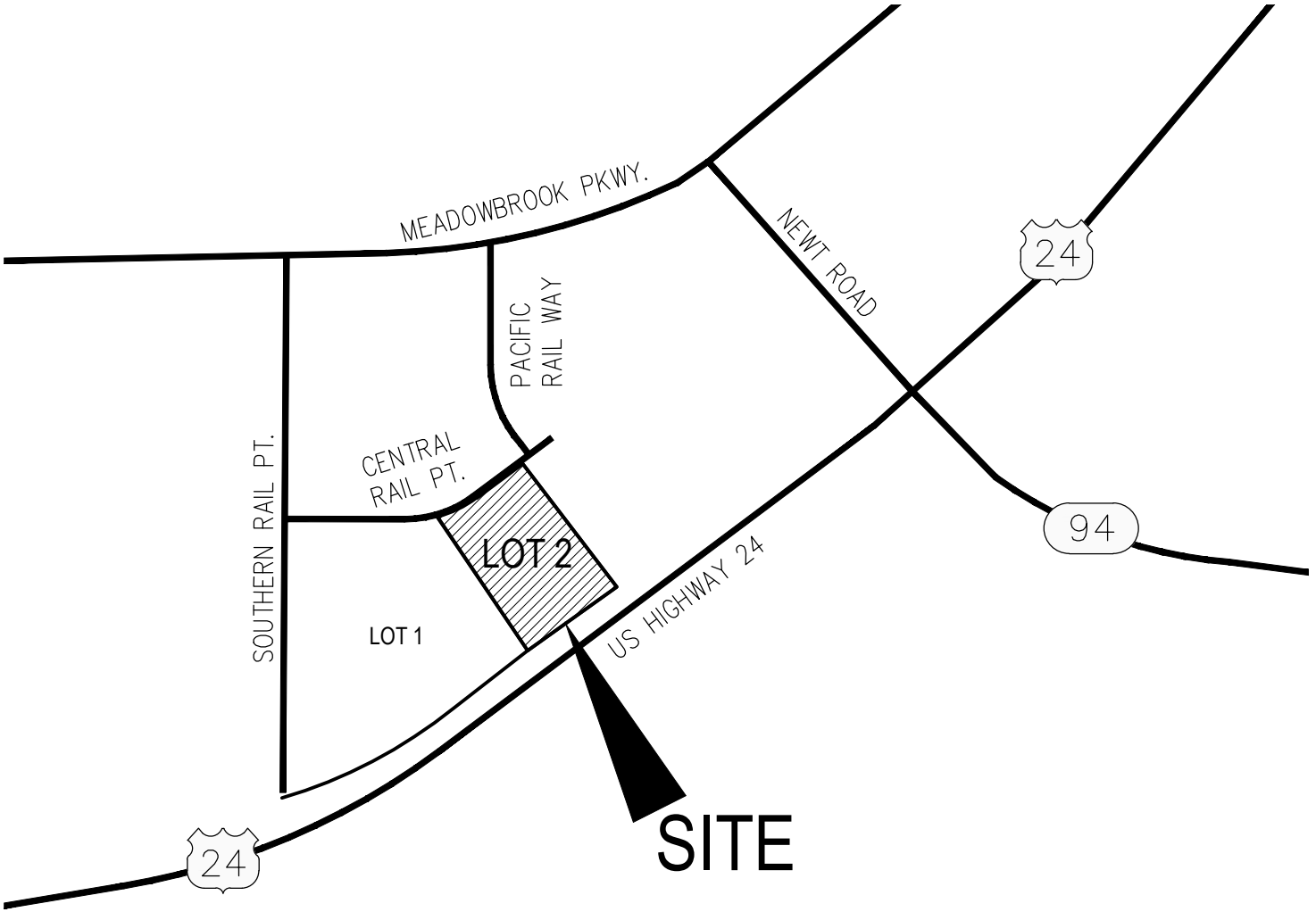
SCALE 1"=300'

LOT 1 – CROSSROADS MIXED USE FILING NO. 2
VICINITY MAP
JOB NO. 18–005
DATE PREPARED: 1/23/2023

File: O:\18005A-CRMUR-LOT 1\The Equity Group\Documents\Exhibits\VICINITY MAP Lot 1.dwg Plotstamp: 1/22/2023 7:46 PM

VICINITY MAP

LOT 2 - CROSSROADS MIXED USE FILING NO. 2



SCALE 1"=300'

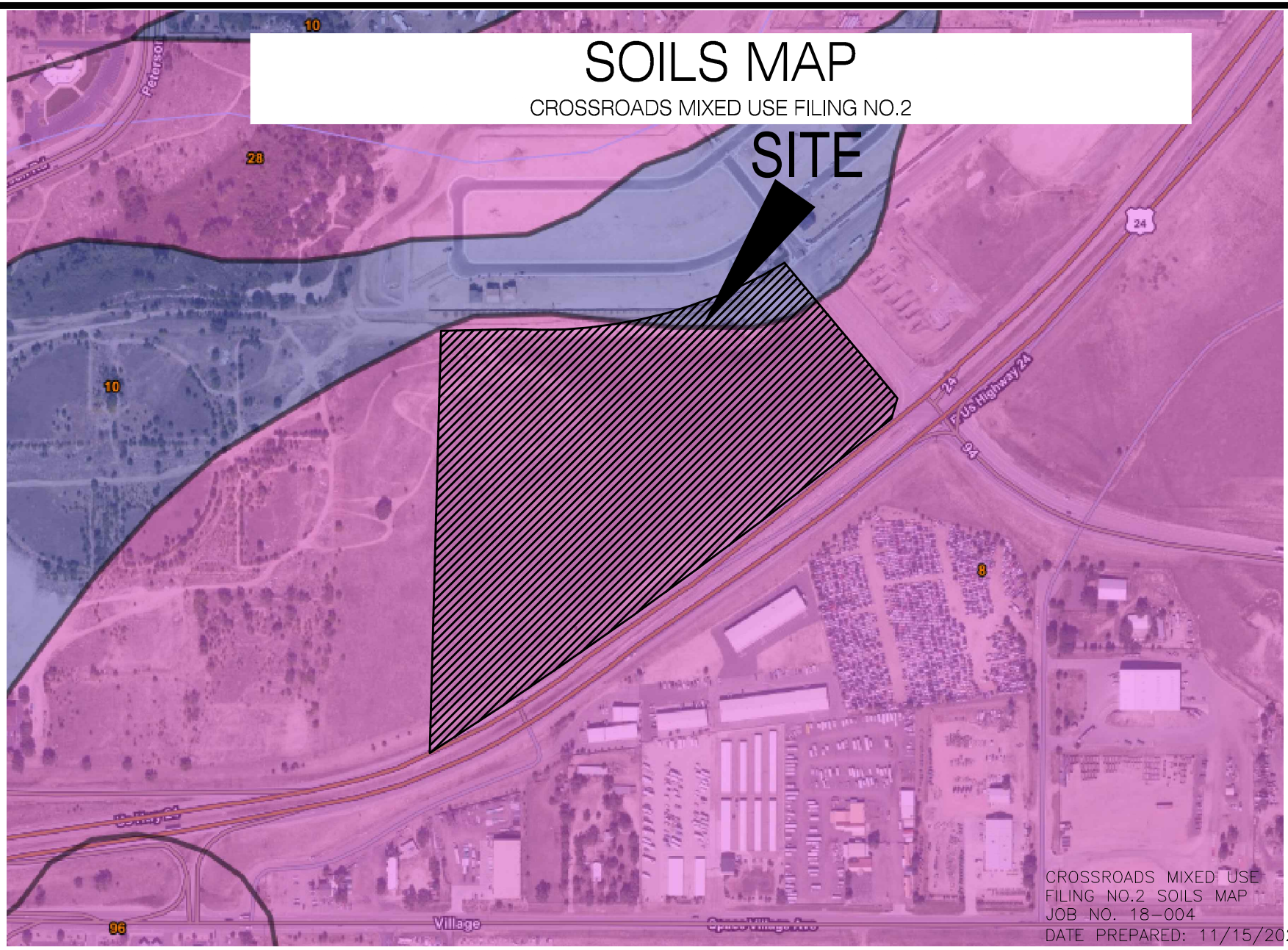
LOT 2 – CROSSROADS MIXED USE FILING NO. 2
VICINITY MAP
JOB NO. 18–005
DATE PREPARED: 1/23/2023

File: O:\18005A-CRMUR-LOT 1\The Equity Group\Documents\Exhibits\VICINITY MAP Lot 2.dwg Plotstamp: 1/22/2023 7:45 PM

SOILS MAP

SOILS MAP

CROSSROADS MIXED USE FILING NO.2



1" = 300

0 150 300 600

Scale in Feet

CROSSROADS MIXED USE
FILING NO.2 SOILS MAP
JOB NO. 18-004
DATE PREPARED: 11/15/2022

Tables Hydrologic Soil Group Summary By Map Unit

Summary by Map Unit — El Paso County Area, Colorado (CO625)

Summary by Map Unit — El Paso County Area, Colorado (CO625)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	282.3	73.2%
10	Blendon sandy loam, 0 to 3 percent slopes	B	54.2	14.1%
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A	40.7	10.6%
70	Pits, gravel	A	0.2	0.1%
96	Truckton sandy loam, 0 to 3 percent slopes	A	8.1	2.1%
Totals for Area of Interest			**385.6**	**100.0%**

CIVIL CONSULTANTS, INC.

212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

SHEET 1 OF 1

File: O:\18004A-Crossroads MU-Retail\Equity Group\Dwg\Eng Exhibits\SOILS MAP.dwg Plotstamp: 11/4/2022 12:31 PM

FIRM PANELS

FLOODPLAIN MAP

CROSSROADS MIXED USE FILING NO. 2

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

CROSSROADS MIXED USE
FILING NO. 2 FLOODPLAIN MAP
FLOODPLAIN MAP
JOB NO. 18-004
DATE PREPARED: 11/15/2022

CIVIL CONSULTANTS, INC.
212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

File: O:\18004A-Crossroads MU-Retail\Equity Group\Dwg\Eng Exhibits\FLOODPLAIN.dwg Plotstamp: 11/4/2022 12:58 PM

HYDROLOGIC CALCULATIONS

CROSSROADS MIXED USE FILING NO. 2 LOTS 1 & 2
FINAL DRAINAGE CALCULATIONS
(Existing Area Runoff Coefficient Summary)

			STREETS / COMMERC.			*MULTI-FAMILY/PARKLAND*			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA** *(Sq Ft)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
EXISTING BASINS													
OS-A*		1.29	1.29	0.62	0.72	0.00	0.49	0.62	0.00	0.08	0.35	***0.62***	***0.72***
E2*		3.86	3.86	0.80	0.90	0.00	0.49	0.62	0.00	0.08	0.35	***0.80***	***0.90***
EX-A2**		0.59	0.59	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
OS-1	***60793.3017***	1.40	1.40	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
OS-2	***217071.1816***	4.98	2.49	0.90	0.96	0.00	0.49	0.62	2.49	0.08	0.35	***0.49***	***0.66***
A	***72787.0873***	1.67	1.67	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
B	***64538.8381***	1.48	1.48	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
C	***102868.78***	2.36	2.22	0.81	0.88	0.00	0.49	0.62	0.15	0.08	0.35	***0.76***	***0.85***
D	***96317.6781***	2.21	2.21	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
E	***42958.775***	0.99	0.41	0.90	0.96	0.57	0.81	0.88	0.00	0.08	0.35	***0.85***	***0.91***
E1	***63999.27***	1.47	0.21	0.90	0.96	1.26	0.81	0.88	0.00	0.08	0.35	***0.82***	***0.89***
F	***118628.9595***	2.72	2.72	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
G	***20057.4496***	0.46	0.46	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
J1	***23922***	0.55	0.40	0.90	0.96	0.15	0.12	0.39	0.00	0.08	0.35	***0.69***	***0.81***
J2	***49122***	1.13	0.00	0.90	0.96	1.13	0.12	0.39	0.00	0.08	0.35	***0.12***	***0.39***
J3	***70707***	1.62	0.00	0.90	0.96	1.62	0.12	0.39	0.00	0.08	0.35	***0.12***	***0.39***
A-5***	***159865.2***	3.67	0.00	0.90	0.96	3.67	0.68	0.79	0.00	0.08	0.35	***0.68***	***0.79***
Z-1***	***16117.2***	0.37	0.00	0.90	0.96	0.37	0.33	0.52	0.00	0.08	0.35	***0.33***	***0.52***
D-1***	***33976.8***	0.78	0.00	0.90	0.96	0.78	0.62	0.75	0.00	0.08	0.35	***0.62***	***0.75***
Z-2***	***16552.8***	0.38	0.00	0.90	0.96	0.38	0.38	0.56	0.00	0.08	0.35	***0.38***	***0.56***
G1	***25617.769***	0.59	0.59	0.90	0.96	0.00	0.16	0.41	0.00	0.08	0.35	***0.90***	***0.96***
C1	***95425.7528***	2.19	2.04	0.81	0.88	0.00	0.49	0.62	0.15	0.08	0.35	***0.76***	***0.84***

*FROM FDR FOR CLAREMONT BUSINESS PARK FILING NO. 2

**FROM FDR FOR MEADOWBROOK CROSSING FILING 1 AND FILING 2

***FROM FDR FOR LOT 1 24/94 BUSINESS PARK FILING NO. 1 ON PLATTE AVENUE AND MEADOWBROOK PARKWAY

****FROM FDR FOR AURA AT CROSSROADS, DATED OCTOBER 29TH, 2021

Calculated by: TAU
Date: 1/31/2023
Checked by: DLM

CROSSROADS MIXED USE FILING NO. 2 LOTS 1 & 2
FINAL DRAINAGE REPORT
(Existing Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY #*		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	C_5 *From DCM Table 5-1*	C_{100}	C_5	**Length** *(ft)*	**Height** *(ft)*	T_C *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	T_t *(min)*	**TOTAL** *(min)*	**CHECK** *(min)*	I_5 *(in/hr)*	I_{100} *(in/hr)*	Q_5 *(c.f.s.)*	Q_{100} *(c.f.s.)*
Existing Area Drainage Summary																	
OS-A*	1.29	0.62	0.72	0.62	40	0.8	4.4	1310	1.9%	2.8	7.9	12.3	17.5	3.8	6.4	***3.1***	***6.0***
E2*	3.86	0.80	0.90	0.80	50	1	3.0	400	1.3%	2.3	2.9	6.0	12.5	4.9	8.2	***15.1***	***28.6***
EX-A2**	0.59	0.90	0.96	0.90	10	0.2	0.9	916	1.9%	2.7	5.6	6.5	15.1	4.8	8.0	***2.5***	***4.5***
OS-1	1.40	0.90	0.96	0.90	100	3	2.5	490	2.2%	3.0	2.7	5.2	13.3	5.1	8.6	***6.4***	***11.5***
OS-2	4.98	0.49	0.66	0.49	85	8	4.8	1165	1.8%	2.0	9.6	14.5	16.9	3.6	6.0	***8.7***	***19.6***
A	1.67	0.90	0.96	0.90	30	0.6	1.6	1325	0.7%	1.7	7.3	8.9	17.5	4.3	7.2	***6.5***	***11.6***
B	1.48	0.90	0.96	0.90	25	0.5	1.4	1335	0.7%	1.7	7.3	8.8	17.6	4.3	7.3	***5.8***	***10.3***
C	2.36	0.76	0.85	0.76	50	1	3.4	260	1.5%	2.4	1.4	5.0	11.7	5.2	8.7	***9.3***	***17.4***
D	2.21	0.81	0.88	0.81	50	1	2.9	200	1.5%	2.4	1.1	5.0	11.4	5.2	8.7	***9.3***	***16.9***
E	0.99	0.85	0.91	0.85	60	1.2	2.8	700	1.0%	2.0	3.8	6.7	14.2	4.7	8.0	***4.0***	***7.2***
E1	1.47	0.82	0.89	0.82	60	1.2	2.8	700	1.0%	2.0	3.8	6.7	14.2	4.7	8.0	***5.7***	***10.4***
F	2.72	0.81	0.88	0.81	50	0.8	3.2	300	1.3%	2.3	1.6	5.0	11.9	5.2	8.7	***11.4***	***20.8***
G	0.46	0.90	0.96	0.90	50	1	2.0	466	1.1%	2.1	2.6	5.0	12.9	5.2	8.7	***2.1***	***3.8***
J1	0.55	0.69	0.81	0.69	50	0.25	6.5	261	1.9%	1.0	4.5	11.0	11.7	4.0	6.7	***1.5***	***3.0***
J2	1.13	0.12	0.39	0.12	50	0.25	15.7	134	0.5%	0.5	4.5	20.2	11.0	4.0	6.7	***0.5***	***2.9***
J3	1.62	0.12	0.39	0.12	25	0.5	7.0	273	2.0%	1.0	4.6	11.6	11.7	3.9	6.6	***0.8***	***4.1***
A-5*****	3.67	0.68	0.79	0.68	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***8.72***	***17.06***
Z-1*****	0.37	0.33	0.52	0.33	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***0.47***	***1.27***
D-1*****	0.78	0.62	0.75	0.62	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***2.08***	***4.20***
Z-2*****	0.38	0.28	0.49	0.28	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***0.57***	***1.43***
G1	0.59	0.90	0.96	0.90	50	1	2.0	466	1.1%	2.1	2.6	5.0	12.9	5.2	8.7	***2.7***	***4.9***
C1	2.19	0.76	0.84	0.76	50	1	3.4	260	1.5%	2.4	1.4	5.0	11.7	5.2	8.7	***9.3***	***17.4***

Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: TAU
Date: 1/31/2023
Checked by: DLM

*VALUES DERIVED USING DATA FROM FDR FOR CLAREMONT BUSINESS PARK FILING NO. 2

**VALUES DERIVED USING DATA FROM FDR MEADOWBROOK CROSSING FILING 1 AND FILING 2 PAGE 31

***VALUES DERIVED USING DATA FROM FDR LOT 1 24/94 BUSINESS PARK FILING NO. 1 ON PLATTE AVENUE AND MEADOWBROOK PARKWAY

****FROM FDR FOR AURA AT CROSSROADS, DATED OCTOBER 29th, 2021

CROSSROADS MIXED USE FILING NO. 2 LOTS 1 & 2
FINAL DRAINAGE REPORT
(Existing Basin Routing Summary)

From Area Runoff Coefficient Summary				OVERLAND				PIPE / CHANNEL FLOW				Time of Travel (T_t)	INTENSITY *		TOTAL FLOWS		
DESIGN POINT	CONTRIBUTING BASINS	CA_5	CA_{100}	C_5	Length (ft)	Height (ft)	T_C (min)	Length (ft)	Slope (%)	Velocity (fps)	T_t (min)	TOTAL (min)	I_5 (in/hr)	I_{100} (in/hr)	Q_5 (c.f.s.)	Q_{100} (c.f.s.)	COMMENTS
EXISTING DRAINAGE BASIN ROUTING SUMMARY																	
1	E2, EX-A2	3.62	4.04				6.0	916	1.9%	2.7	5.6	11.6	3.9	6.6	14.2	26.5	Existing 10' CDOT Type R At-Grade Inlet (Public)
				Tc for E2 Used													
2	OS-A	0.80	0.93									12.3	3.8	6.4	3.1	6.0	Existing 10' CDOT Type R At-Grade Inlet (Public)
				Tc for OS-A Used													
3	OS-1, FB-DP1	2.73	3.69				11.6	150	1.0%	2.0	1.3	12.8	3.8	6.3	10.2	23.3	Proposed 10' CDOT Type R At-Grade Inlet (Public)
				Tc for DP1 Used													
4	A, FB-DP2	1.50	1.71									8.9	4.3	7.2	6.5	12.4	Proposed 15' CDOT Type R At-Grade Inlet (Public)
				Tc for Basin A used													
4.5	FB-DP4	0.00	0.24									8.9	4.3	7.2	0.0	1.8	Proposed NEENAH R-2501 MH Lid and Frame (Public)
				Tc for DP4 used													
5	B, FB-DP3	2.28	3.56									8.8	4.3	7.3	9.9	25.8	Proposed 15' CDOT Type R Sump Inlet (Public)
				Tc for Basin B Used													
6	C	1.81	2.00									5.0	5.2	8.7	9.3	17.4	Future 30" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin C Used													
6.5	C1	1.81	2.00									5.0	5.2	8.7	9.3	17.4	Future 30" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin C1 Used													
7	D	1.79	1.95									5.0	5.2	8.7	9.3	16.9	Future 24" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin D Used													
8	E	0.84	0.90									6.7	4.7	8.0	4.0	7.2	Future 10' CDOT Type R At-Grate Inlet (Private)
				Tc for Basin E Used													
9	E1	1.21	1.31									6.7	4.7	8.0	5.7	10.4	Future 10' CDOT Type R At-Grade Inlet (Private)
				Tc for Basin E1 Used													
10	G	0.41	0.44									5.0	5.2	8.7	2.1	3.8	Proposed 10' CDOT Type R Sump Inlet (Private)
				Tc for Basin G Used													
11	G1	0.53	0.56									5.6	5.0	8.4	2.9	8.8	Proposed 15' CDOT Type R Sump Inlet (Private)
	FB-DP8	0.00	0.15														
	FB-DP9	0.05	0.34														
		0.58	**1.05**	Weighted Tc Used													
12	F	2.21	2.40									5.0	5.2	8.7	11.4	20.8	Proposed 24" RCP or PP Storm Sewer (Private)
				Tc for Basin F Used													
13	J1	0.38	0.44									11.0	4.0	6.7	1.5	3.8	Proposed 2' Bottom Earthen Swale, Rip Rap Rundown
	Basin D-1 (Overflow)	0.00	0.13														
		0.38	**0.57**	Tc for Basin J1 Used													
14	Basin Z-1	0.12	0.19									11.0	4.0	6.7	1.0	4.2	Proposed Triangular Earthen Swale (Private)
	J2	0.14	0.44														
		0.26	**0.63**	Tc for Basin J2 Used													
15	J3	0.19	0.63									11.6	3.9	6.6	2.2	14.1	Full Spectrum Extended Detention Basin (Private)
	Basin Z-2	0.11	0.19														
	Basin A-5 (Overflow)	0.26	1.33														
		0.56	**2.14**	Tc for Basin J3 Used													
16	PR21, PR25	16.45	19.24									11.6	3.9	6.6	64.2	126.0	
				Tc for Basin J3 Used													
17	POND OUTFALL	2.77	5.16									14.5	3.6	6.0	9.9	31.0	HISTORIC FLOW IN CDOT BARROW DITCH
	OS-2																Q5= 10.4 CFS, Q100 = 31.9 CFS
				Tc for Basin OS-2 Used													PER HISTORIC DRAINAGE ANALYSIS

* Intensity equations assume a minimum travel time of 5 minutes.

Overflow- obtain flows from inlet sheets provided in Background Information Section of Appendix

TAU
Date: 1/31/2023
Checked by: DLM

CROSSROADS MIXED USE FILING NO. 2 LOTS 1 & 2
FINAL DRAINAGE CALCULATIONS
(Existing Storm Sewer Routing Summary)

PIPE RUN	*Contributing Pipes/Design Points*	*Equivalent CA_5*	*Equivalent CA_{100}*	*Maximum T_C*	*Intensity**		*Flow*		PIPE SIZE
					I_5	*I_{100}*	*Q_5*	*Q_{100}*	
1	**DP3 (INLET 3)**	1.78	1.55	12.8	3.8	6.3	***6.7***	***9.8***	24" SD
1.5	**DP4 (INLET 4)**	1.50	1.46	8.9	4.3	7.2	***6.5***	***10.6***	24" SD
2	**PR1.5, DP4.5 (INLET 4.5)**	1.50	1.71	9.0	4.3	7.2	***6.4***	***12.3***	24" SD
3	**PR2, DP5 (INLET 5)**	3.78	5.27	9.0	4.3	7.2	***16.2***	***37.9***	36" SD
4	**DP6**	1.81	2.00	5.0	5.2	8.7	***9.3***	***17.4***	30" SD
4.5	**DP6.5**	1.81	2.00	5.0	5.2	8.7	***9.3***	***17.4***	30" SD
5	**PR4, PR4.5**	3.61	4.00	5.0	5.2	8.7	***18.7***	***34.7***	30" SD
6	**PR5**	3.61	4.00	5.0	5.2	8.7	***18.7***	***34.7***	30" SD
7	**PR6**	3.61	4.00	5.0	5.2	8.7	***18.7***	***34.7***	30" SD
8	**DP7**	1.79	1.95	5.0	5.2	8.7	***9.3***	***16.9***	24" SD
9	**PR8, DP8 (Inlet 6)**	2.63	2.70	6.7	4.7	8.0	***12.5***	***21.5***	30" SD
10	**PR7, PR9**	6.25	6.70	6.7	4.7	8.0	***29.6***	***53.3***	36" SD
11	**PR10, DP9 (Inlet 7)**	7.41	7.67	6.7	4.7	8.0	***35.1***	***61.0***	36" SD
*11.5**	**SEE FDR FOR AURA AT CROSSROADS**	1.93	2.30	14.6	3.6	6.0	***6.9***	***13.8***	30" SD
12	**PR11**	7.41	7.67	6.7	4.7	8.0	***35.1***	***61.0***	42" SD
12.5	**PR12, PR11.5**	9.34	9.97	7.2	4.6	7.8	***43.2***	***77.4***	48" SD
13	**DP10 (Inlet 8)**	0.41	0.44	5.0	5.2	8.7	***2.1***	***3.8***	18" SD
14	**DP11 (Inlet 9)**	0.58	1.05	5.6	5.0	8.4	***2.9***	***8.8***	30" SD
15	**PR12.5, PR13, PR14**	10.33	11.46	7.5	4.6	7.7	***47.1***	***87.8***	48" SD
16	**DP12**	2.21	2.40	5.0	5.2	8.7	***11.4***	***20.8***	24" SD
17	**PR15, PR16**	12.54	13.86	7.7	4.5	7.6	***56.7***	***105.2***	54" SD
*18**	**SEE FDR FOR AURA AT CROSSROADS**	0.48	0.46	8.8	4.3	7.3	***2.1***	***3.3***	30" SD
19	**PR17, PR18***	13.02	14.32	8.2	4.4	7.4	***57.6***	***106.4***	54" SD
20	**DP13**	0.38	0.57	11.0	4.0	6.7	***1.5***	***3.8***	15" SD
21	**PR19, PR20**	13.40	14.89	9.6	4.2	7.0	***56.2***	***104.8***	54" SD
*22**	**SEE FDR FOR AURA AT CROSSROADS**	2.24	1.57	15.0	3.5	5.9	***7.9***	***9.3***	48" SD
23	**DP15**	0.56	2.14	11.6	3.9	6.6	***2.2***	***14.1***	18" SD
24	**DP14**	0.26	0.63	11.0	4.0	6.7	***1.0***	***4.2***	18" SD
25	**PR22*, PR23, PR24**	3.05	4.35	11.0	4.0	6.7	***12.2***	***29.1***	54" SD
26	**POND OUTFALL**	PER	MHFD	WKSHT			***1.2***	***11.4***	18" SD

*REFER TO FDR FOR AURA AT CROSSROADS FOR CONTRIBUTING PIPE FLOW DETAILS

DP - Design Point
EX - Existing Design Point
FB- Flow By from Design Point
INT- Intercepted Flow from Design Point

Calculated by: TAU
Date: 1/31/2023
Checked by: DLM

CROSSROADS MIXED USE FILING NO. 2, LOTS 1 & 2
FINAL DRAINAGE CALCULATIONS
(Proposed Area Runoff Coefficient Summary)

			STREETS / COMMERC.			*MULTI-FAMILY/PARKLAND*			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA** *(Sq Ft)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
PROPOSED BASINS													
OS-A*		1.29	1.29	0.62	0.72	0.00	0.49	0.62	0.00	0.08	0.35	***0.62***	***0.72***
E2*		3.86	3.86	0.80	0.90	0.00	0.49	0.62	0.00	0.08	0.35	***0.80***	***0.90***
EX-A2**		0.59	0.59	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
OS-1	***60793.3017***	1.40	1.40	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
OS-2	***217071.1816***	4.98	2.49	0.90	0.96	0.00	0.49	0.62	2.49	0.08	0.35	***0.49***	***0.66***
A	***72787.0873***	1.67	1.67	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
B	***64538.8381***	1.48	1.48	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
C	***102868.78***	2.36	2.22	0.81	0.88	0.00	0.49	0.62	0.15	0.08	0.35	***0.76***	***0.85***
D	***96317.6781***	2.21	2.21	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
E	***42958.775***	0.99	0.41	0.90	0.96	0.57	0.81	0.88	0.00	0.08	0.35	***0.85***	***0.91***
E1A	***30742.6955***	0.71	0.71	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
E1B	***18796.9627***	0.43	0.43	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
E1C	***11897.8659***	0.27	0.22	0.90	0.96	0.05	0.81	0.88	0.00	0.08	0.35	***0.88***	***0.95***
F1	***7032.0238***	0.16	0.16	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
F2	***38092.2581***	0.87	0.87	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
F3	***9319.5393***	0.21	0.21	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
F4	***35534.75***	0.82	0.82	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
F5	***27904.3851***	0.64	0.64	0.81	0.88	0.00	0.49	0.62	0.00	0.08	0.35	***0.81***	***0.88***
G	***20015.5111***	0.46	0.46	0.90	0.96	0.00	0.49	0.62	0.00	0.08	0.35	***0.90***	***0.96***
J1	***23343.6845***	0.54	0.41	0.90	0.96	0.12	0.12	0.39	0.00	0.08	0.35	***0.72***	***0.83***
J2	***49122***	1.13	0.27	0.90	0.96	0.86	0.12	0.39	0.00	0.08	0.35	***0.30***	***0.52***
J3	***70707***	1.62	0.00	0.90	0.96	1.62	0.12	0.39	0.00	0.08	0.35	***0.12***	***0.39***
A-5***	***159865.2***	3.67	0.00	0.90	0.96	3.67	0.68	0.79	0.00	0.08	0.35	***0.68***	***0.79***
Z-1***	***16117.2***	0.37	0.00	0.90	0.96	0.37	0.33	0.52	0.00	0.08	0.35	***0.33***	***0.52***
D-1***	***33976.8***	0.78	0.00	0.90	0.96	0.78	0.62	0.75	0.00	0.08	0.35	***0.62***	***0.75***
Z-2***	***16552.8***	0.38	0.00	0.90	0.96	0.38	0.38	0.56	0.00	0.08	0.35	***0.38***	***0.56***
G1	***29951.0819***	0.69	0.63	0.90	0.96	0.06	0.12	0.39	0.00	0.08	0.35	***0.84***	***0.91***
C1	***95425.7528***	2.19	2.04	0.81	0.88	0.00	0.49	0.62	0.15	0.08	0.35	***0.76***	***0.84***

*FROM FDR FOR CLAREMONT BUSINESS PARK FILING NO. 2

**FROM FDR FOR MEADOWBROOK CROSSING FILING 1 AND FILING 2

***FROM FDR FOR LOT 1 24/94 BUSINESS PARK FILING NO. 1 ON PLATTE AVENUE AND MEADOWBROOK PARKWAY

****FROM FDR FOR AURA AT CROSSROADS, DATED OCTOBER 29TH, 2021

Calculated by: TAU
Date: 2/25/2023
Checked by: DLM

CROSSROADS MIXED USE FILING NO. 2, LOTS 1 & 2
FINAL DRAINAGE REPORT
(Proposed Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY #*		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	C_5 *From DCM Table 5-1*	C_{100} *From DCM Table 5-1*	C_5	**Length** *(ft)*	**Height** *(ft)*	T_C *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	T_t *(min)*	**TOTAL** *(min)*	**CHECK** *(min)*	I_5 *(in/hr)*	I_{100} *(in/hr)*	Q_5 *(c.f.s.)*	Q_{100} *(c.f.s.)*
Proposed Area Drainage Summary																	
OS-A*	1.29	0.62	0.72	0.62	40	0.8	4.4	1310	1.9%	2.8	7.9	12.3	17.5	3.8	6.4	***3.1***	***6.0***
E2*	3.86	0.80	0.90	0.80	50	1	3.0	400	1.3%	2.3	2.9	6.0	12.5	4.9	8.2	***15.1***	***28.6***
EX-A2**	0.59	0.90	0.96	0.90	10	0.2	0.9	916	1.9%	2.7	5.6	6.5	15.1	4.8	8.0	***2.5***	***4.5***
OS-1	1.40	0.90	0.96	0.90	100	3	2.5	490	2.2%	3.0	2.7	5.2	13.3	5.1	8.6	***6.4***	***11.5***
OS-2	4.98	0.49	0.66	0.49	85	8	4.8	1165	1.8%	2.0	9.6	14.5	16.9	3.6	6.0	***8.7***	***19.6***
A	1.67	0.90	0.96	0.90	30	0.6	1.6	1325	0.7%	1.7	7.3	8.9	17.5	4.3	7.2	***6.5***	***11.6***
B	1.48	0.90	0.96	0.90	25	0.5	1.4	1335	0.7%	1.7	7.3	8.8	17.6	4.3	7.3	***5.8***	***10.3***
C	2.36	0.76	0.85	0.76	50	1	3.4	260	1.5%	2.4	1.4	5.0	11.7	5.2	8.7	***9.3***	***17.4***
D	2.21	0.81	0.88	0.81	50	1	2.9	200	1.5%	2.4	1.1	5.0	11.4	5.2	8.7	***9.3***	***16.9***
E	0.99	0.85	0.91	0.85	60	1.2	2.8	700	1.0%	2.0	3.8	6.7	14.2	4.7	8.0	***4.0***	***7.2***
E1A	0.71	0.81	0.88	0.81	50	2	2.3	220	2.7%	3.3	1.2	5.0	11.5	5.2	8.7	***3.0***	***5.4***
E1B	0.43	0.81	0.88	0.81	30	2	1.5	285	2.1%	2.9	1.6	5.0	11.8	5.2	8.7	***1.8***	***3.3***
E1C	0.27	0.88	0.95	0.88	50	1	2.2	420	1.4%	2.4	2.3	5.0	12.6	5.2	8.7	***1.2***	***2.2***
F1	0.16	0.81	0.88	0.81	30	2	1.5	60	3.3%	3.7	0.3	5.0	10.5	5.2	8.7	***0.7***	***1.2***
F2	0.87	0.81	0.88	0.81	50	2	2.3	270	3.3%	3.7	1.5	5.0	11.8	5.2	8.7	***3.7***	***6.7***
F3	0.21	0.81	0.88	0.81	30	0.8	2.1	145	2.1%	2.9	0.8	5.0	11.0	5.2	8.7	***0.9***	***1.6***
F4	0.82	0.81	0.88	0.81	50	2	2.3	345	1.4%	2.4	1.9	5.0	12.2	5.2	8.7	***3.4***	***6.2***
F5	0.64	0.81	0.88	0.81	50	3	2.0	360	1.4%	2.4	2.0	5.0	12.3	5.2	8.7	***2.7***	***4.9***
G	0.46	0.90	0.96	0.90	50	1	2.0	466	1.1%	2.1	2.6	5.0	12.9	5.2	8.7	***2.1***	***3.8***
J1	0.54	0.72	0.83	0.72	50	0.25	6.1	261	1.9%	2.1	2.1	8.2	11.7	4.4	7.4	***1.7***	***3.3***
J2	1.13	0.30	0.52	0.30	50	0.25	12.8	134	0.5%	1.1	2.1	14.9	11.0	4.0	6.7	***1.4***	***4.0***
J3	1.62	0.12	0.39	0.12	25	0.5	7.0	273	2.0%	1.0	4.6	11.6	11.7	3.9	6.6	***0.8***	***4.1***
A-5*****	3.67	0.68	0.79	0.68	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***8.72***	***17.06***
Z-1*****	0.37	0.33	0.52	0.33	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***0.47***	***1.27***
D-1*****	0.78	0.62	0.75	0.62	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***2.08***	***4.20***
Z-2*****	0.38	0.28	0.49	0.28	REFER TO "FDR FOR AURA AT CROSSROADS" FOR DETAILS											***0.57***	***1.43***
G1	0.69	0.84	0.91	0.84	50	1	2.7	466	1.1%	2.1	2.6	5.2	12.9	5.1	8.6	***2.9***	***5.4***
C1	2.19	0.76	0.84	0.76	50	1	3.4	260	1.5%	2.4	1.4	5.0	11.7	5.2	8.7	***9.3***	***17.4***

Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: TAU
Date: 2/25/2023
Checked by: DLM

*VALUES DERIVED USING DATA FROM FDR FOR CLAREMONT BUSINESS PARK FILING NO. 2

**VALUES DERIVED USING DATA FROM FDR MEADOWBROOK CROSSING FILING 1 AND FILING 2 PAGE 31

***VALUES DERIVED USING DATA FROM FDR LOT 1 24/94 BUSINESS PARK FILING NO. 1 ON PLATTE AVENUE AND MEADOWBROOK PARKWAY

****FROM FDR FOR AURA AT CROSSROADS, DATED OCTOBER 29th, 2021

CROSSROADS MIXED USE FILING NO. 2, LOTS 1 & 2
FINAL DRAINAGE REPORT
(Proposed Basin Routing Summary)

From Area Runoff Coefficient Summary				OVERLAND				PIPE / CHANNEL FLOW				Time of Travel (T_t)	INTENSITY *		TOTAL FLOWS		
DESIGN POINT	CONTRIBUTING BASINS	CA_5	CA_{100}	C_5	Length (ft)	Height (ft)	T_C (min)	Length (ft)	Slope (%)	Velocity (fps)	T_t (min)	TOTAL (min)	I_5 (in/hr)	I_{100} (in/hr)	Q_5 (c.f.s.)	Q_{100} (c.f.s.)	COMMENTS
PROPOSED DRAINAGE BASIN ROUTING SUMMARY																	
1	**E2, EX-A2**	3.62	4.04				6.0	916	1.9%	2.7	5.6	11.6	3.9	6.6	***14.2***	***26.5***	Existing 10' CDOT Type R At-Grade Inlet (Public)
				Tc for E2 Used													
2	**OS-A**	0.80	0.93									12.3	3.8	6.4	***3.1***	***6.0***	Existing 10' CDOT Type R At-Grade Inlet (Public)
				Tc for OS-A Used													
3	**OS-1, FB-DP1**	2.73	3.69				11.6	150	1.0%	2.0	1.3	12.8	3.8	6.3	***10.2***	***23.3***	Proposed 10' CDOT Type R At-Grade Inlet (Public)
				Tc for DP1 Used													
4	**A, FB-DP2**	1.50	1.71									8.9	4.3	7.2	***6.5***	***12.4***	Proposed 15' CDOT Type R At-Grade Inlet (Public)
				Tc for Basin A used													
4.5	**FB-DP4**	0.00	0.24									8.9	4.3	7.2	***0.0***	***1.8***	Proposed NEENAH R-2501 MH Lid and Frame (Public)
				Tc for DP4 used													
5	**B, FB-DP3**	2.28	3.56									8.8	4.3	7.3	***9.9***	***25.8***	Proposed 15' CDOT Type R Sump Inlet (Public)
				Tc for Basin B Used													
6	**C**	1.81	2.00									5.0	5.2	8.7	***9.3***	***17.4***	Future 30" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin C Used													
6.5	**C1**	1.81	2.00									5.0	5.2	8.7	***9.3***	***17.4***	Future 30" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin C1 Used													
7	**D**	1.79	1.95									5.0	5.2	8.7	***9.3***	***16.9***	Future 24" RCP or PP Storm Sewer, Rip Rap Pad (Private)
				Tc for Basin D Used													
8	**E**	0.84	0.90									6.7	4.7	8.0	***4.0***	***7.2***	Future 10' CDOT Type R At-Grate Inlet (Private)
				Tc for Basin E Used													
9A	**E1A**	0.57	0.62									5.0	5.2	8.7	***3.0***	***5.4***	Sheet Flow (Private)
				Tc for Basin E1A Used													
9B	**E1B**	0.35	0.38									5.0	5.2	8.7	***1.8***	***3.3***	Sheet Flow (Private)
				Tc for Basin E1B Used													
9C	**9A, 9B, E1C**	1.16	1.26									5.0	5.2	8.7	***6.0***	***10.9***	Sheet Flow (Private)
				Tc for Basin E1C Used													
10	**G**	0.41	0.44									5.0	5.2	8.7	***2.1***	***3.8***	Proposed 10' CDOT Type R Sump Inlet (Private)
				Tc for Basin G Used													
11	**G1**	0.58	0.63									5.6	5.0	8.4	***3.4***	***9.6***	Proposed 15' CDOT Type R Sump Inlet (Private)
	FB-DP8	0.00	0.15														
	FB-DP9	0.10	0.37														
		0.67	**1.15**	Weighted Tc Used													
12A	**F1**	0.13	0.14									5.0	5.2	8.7	***0.7***	***1.2***	Proposed 5' CDOT Type R Sump Inlet (Private)
				Tc for Basin F Used													
12B	**F2**	0.71	0.77									5.0	5.2	8.7	***3.7***	***6.7***	Proposed 3' CDOT Type C Area Inlet (Private)
				Tc for Basin F Used													
12C	**F3**	0.17	0.19									5.0	5.2	8.7	***0.9***	***1.6***	Proposed 3' CDOT Type C Area Inlet (Private)
				Tc for Basin F Used													
12D	**1/3 of F4**	0.22	0.24									5.0	5.2	8.7	***1.1***	***2.1***	Sheet Flow (Private)
				Tc for Basin F Used													
12E	**F5**	0.52	0.56									5.0	5.2	8.7	***3.8***	***7.0***	Proposed 15' CDOT Type R Sump Inlet (Private)
	12D	0.22	0.24														
		0.74	**0.80**	Tc for Basin F Used													
13	**J1**	0.39	0.44									8.2	4.4	7.4	***1.7***	***4.2***	Proposed 2' Bottom Earthen Swale, Rip Rap Rundown
	Basin D-1 (Overflow)	0.00	0.13														
		0.39	**0.57**	Tc for Basin J1 Used													
14	**Basin Z-1**	0.12	0.19									11.0	4.0	6.7	***1.8***	***5.2***	Proposed Triangular Earthen Swale (Private)
	J2	0.34	0.59														
		0.46	**0.78**	Tc for Basin J2 Used													
15	**J3**	0.19	0.63									11.6	3.9	6.6	***2.2***	***14.1***	Full Spectrum Extended Detention Basin (Private)
	Basin Z-2	0.11	0.19														
	Basin A-5 (Overflow)	0.26	1.33														
		0.56	**2.14**	Tc for Basin J3 Used													
16	**PR21, PR25**	16.65	19.39									11.6	3.9	6.6	***65.0***	***127.0***	
				Tc for Basin J3 Used													
17	**POND OUTFALL**	2.77	5.16									14.5	3.6	6.0	***9.9***	***31.0***	HISTORIC FLOW IN CDOT BARROW DITCH
	OS-2																Q5= 10.4 CFS, Q100 = 31.9 CFS
				Tc for Basin OS-2 Used													PER HISTORIC DRAINAGE ANALYSIS

* Intensity equations assume a minimum travel time of 5 minutes.

Overflow- obtain flows from inlet sheets provided in Background Information Section of Appendix

TAU
Date: 2/25/2023
Checked by: DLM

CROSSROADS MIXED USE FILING NO. 2, LOTS 1 & 2
FINAL DRAINAGE CALCULATIONS
(Proposed Storm Sewer Routing Summary)

PIPE RUN	*Contributing Pipes/Design Points*	*Equivalent CA_5*	*Equivalent CA_{100}*	*Maximum T_C*	*Intensity** I_5	*Intensity** I_{100}	*Flow* Q_5	*Flow* Q_{100}	PIPE SIZE
1	**DP3 (INLET 3)**	1.78	1.55	12.8	3.8	6.3	*6.7*	*9.8*	24" SD
1.5	**DP4 (INLET 4)**	1.50	1.46	8.9	4.3	7.2	*6.5*	*10.6*	24" SD
2	**PR1.5, DP4.5 (INLET 4.5)**	1.50	1.71	9.0	4.3	7.2	*6.4*	*12.3*	24" SD
3	**PR2, DP5 (INLET 5)**	3.78	5.27	9.0	4.3	7.2	*16.2*	*37.9*	36" SD
4	**DP6**	1.81	2.00	5.0	5.2	8.7	*9.3*	*17.4*	30" SD
4.5	**DP6.5**	1.81	2.00	5.0	5.2	8.7	*9.3*	*17.4*	30" SD
5	**PR4, PR4.5**	3.61	4.00	5.0	5.2	8.7	*18.7*	*34.7*	30" SD
6	**PR5**	3.61	4.00	5.0	5.2	8.7	*18.7*	*34.7*	30" SD
7	**PR6**	3.61	4.00	5.0	5.2	8.7	*18.7*	*34.7*	30" SD
8	**DP7**	1.79	1.95	5.0	5.2	8.7	*9.3*	*16.9*	24" SD
9	**PR8, DP8 (Inlet 6)**	2.63	2.70	6.7	4.7	8.0	*12.5*	*21.5*	30" SD
10	**PR7, PR9**	6.25	6.70	6.7	4.7	8.0	*29.6*	*53.3*	36" SD
11	**PR10, DP9C (Inlet 7)**	7.31	7.59	5.8	4.9	8.3	*36.1*	*62.9*	36" SD
*11.5**	**SEE FDR FOR AURA AT CROSSROADS**	1.93	2.30	14.6	3.6	6.0	*6.9*	*13.8*	30" SD
12	**PR11**	7.31	7.59	5.8	4.9	8.3	*36.1*	*62.9*	42" SD
12A	**ABOUT 1/5 OF F4**	0.13	0.14	14.6	3.6	6.0	*0.5*	*0.8*	
12.5	**PR12, PR11.5, PR12A**	9.37	10.03	6.8	4.7	7.9	*44.2*	*79.4*	48" SD
13	**DP10 (Inlet 8)**	0.41	0.44	5.0	5.2	8.7	*2.1*	*3.8*	18" SD
14	**DP11 (Inlet 9)**	0.67	1.15	5.6	5.0	8.4	*3.4*	*9.6*	30" SD
15	**PR12.5, PR13, PR14**	10.46	11.62	7.3	4.6	7.7	*48.1*	*89.7*	48" SD
16A	**DP12A (INLET 1F)**	0.13	0.14	5.0	5.2	8.7	*0.7*	*1.2*	12" PP
16B	**ABOUT 1/5 OF F4**	0.14	0.15	5.0	5.2	8.7	*0.7*	*1.3*	12" PVC
16C	**PR16B, DP12B(INLET 2F)**	0.85	0.92	5.0	5.2	8.7	*4.4*	*8.0*	18" PP
16D	**PR16A, PR16C**	0.98	1.06	5.0	5.2	8.7	*5.1*	*9.2*	18" PP
16E	**ABOUT 1/17 OF F4**	0.04	0.04	5.0	5.2	8.7	*0.2*	*0.3*	6" PVC
16F	**PR16E, DP12C(INLET 3F)**	0.21	0.23	5.0	5.2	8.7	*1.1*	*2.0*	12" PP
16G	**PR16F, PR16D**	1.19	1.29	5.0	5.2	8.7	*6.1*	*11.2*	24" PP
16H	**ABOUT 1/5 OF F4**	0.14	0.15	5.0	5.2	8.7	*0.7*	*1.3*	12" PVC
16I	**DP12E(INLET 4F)**	0.74	0.80	5.0	5.2	8.7	*3.8*	*7.0*	18" PP
16J	**PR16G, PR16H, PR16I**	2.06	2.24	5.0	5.2	8.7	*10.7*	*19.4*	24" PP
17	**PR15, PR16J**	12.52	13.86	7.6	4.5	7.6	*56.9*	*105.6*	54" SD
*18**	**SEE FDR FOR AURA AT CROSSROADS**	0.48	0.46	8.8	4.3	7.3	*2.1*	*3.3*	30" SD
19	**PR17, PR18***	13.00	14.31	8.2	4.4	7.4	*57.6*	*106.4*	54" SD
20	**DP13**	0.39	0.57	8.2	4.4	7.4	*1.7*	*4.2*	15" SD
21	**PR19, PR20**	13.39	14.89	8.9	4.3	7.2	*57.6*	*107.6*	54" SD
*22**	**SEE FDR FOR AURA AT CROSSROADS**	2.24	1.57	15.0	3.5	5.9	*7.9*	*9.3*	48" SD
23	**DP15**	0.56	2.14	11.6	3.9	6.6	*2.2*	*14.1*	18" SD
24	**DP14**	0.46	0.78	11.0	4.0	6.7	*1.8*	*5.2*	18" SD
25	**PR22*, PR23, PR24**	3.26	4.50	11.0	4.0	6.7	*13.0*	*30.1*	54" SD
26	**POND OUTFALL**	PER	MHFD	WKSHT			*1.2*	*11.4*	18" SD

*REFER TO FDR FOR AURA AT CROSSROADS FOR CONTRIBUTING PIPE FLOW DETAILS

DP - Design Point
EX - Existing Design Point
FB- Flow By from Design Point
INT- Intercepted Flow from Design Point

Calculated by: TAU
Date: 2/25/2023
Checked by: DLM

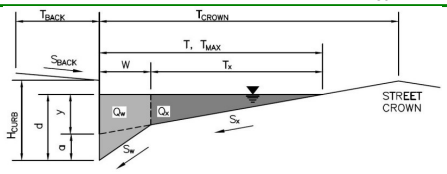
Version 4.06 Released August 2018

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

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

Project: Crossroads Mixed Use

Inlet ID: Inlet 1F



Gutter Geometry (Enter data in the blue cells)

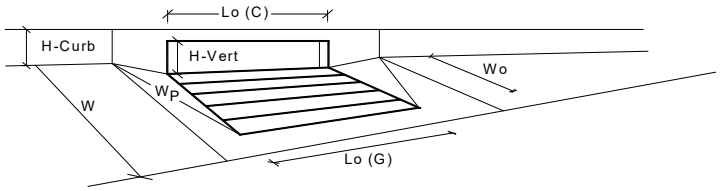
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

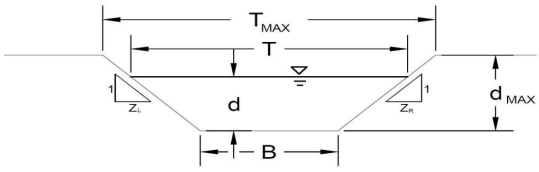


Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.0	4.9	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) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (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} =	0.17	0.24	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.51	0.62	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
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 =**	**1.9**	**3.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	0.7	1.2	cfs

AREA INLET IN A SWALE

Crossroads Mixed Use

Inlet 2F



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.035	
Channel Invert Slope	S_O =	0.0280	ft/ft
Bottom Width	B =	3.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	6.00	6.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	0.50	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	8.2	8.2	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.50	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	4.4	8.0	cfs
Water Depth	d =	0.36	0.49	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.06 Released August 2018

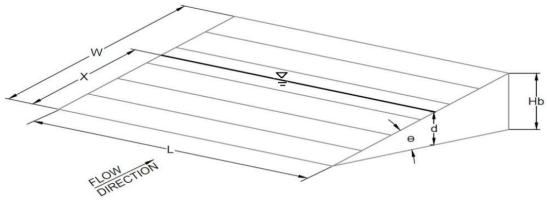
AREA INLET IN A SWALE

Crossroads Mixed Use

Inlet 2F

Inlet Design Information (Input)

Type of Inlet: CDOT Type C (Depressed) — Inlet Type = CDOT Type C (Depressed)



Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.84	
Orifice Coefficient	C_o =	0.56	
Weir Coefficient	C_w =	1.81	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	1.36	1.49	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**16.6**	**17.4**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

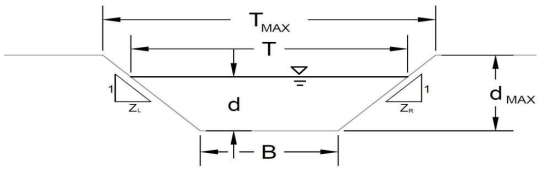
Warning 04: Froude No. exceeds USDCM Volume I recommendation.

Version 4.06 Released August 2018

AREA INLET IN A SWALE

Crossroads Mixed Use

Inlet 3F



This worksheet uses the NRCS vegetal retardance method to determine Manning's n.

For more information see Section 7.2.3 of the USDCM.

Analysis of Trapezoidal Grass-Lined Channel Using SCS Method

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D or E		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.035	
Channel Invert Slope	S_O =	0.0280	ft/ft
Bottom Width	B =	3.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ **Non-Cohesive**
- ◉ **Cohesive**
- ○ **Paved**

		Minor Storm	Major Storm	
Max. Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	6.00	6.00	feet
Max. Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	0.50	feet

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion	Q_{allow} =	8.2	8.2	cfs
MAJOR STORM Allowable Capacity is based on Depth Criterion	d_{allow} =	0.50	0.50	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	1.1	2.0	cfs
Water Depth	d =	0.16	0.23	feet

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Version 4.06 Released August 2018

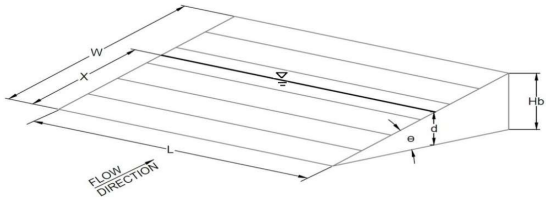
AREA INLET IN A SWALE

Crossroads Mixed Use

Inlet 3F

Inlet Design Information (Input)

Type of Inlet: CDOT Type C (Depressed) — Inlet Type = CDOT Type C (Depressed)



Angle of Inclined Grate (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grate	W =	3.00	feet
Length of Grate	L =	3.00	feet
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grate	H_B =	0.00	feet
Clogging Factor	C_f =	0.50	
Grate Discharge Coefficient	C_d =	0.84	
Orifice Coefficient	C_o =	0.56	
Weir Coefficient	C_w =	1.81	

		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	1.16	1.23	
Total Inlet Interception Capacity (assumes clogged condition)	**Q_a =**	**15.3**	**15.8**	**cfs**
	Bypassed Flow, Q_b =	**0.0**	**0.0**	**cfs**
	Capture Percentage = Q_a/Q_o = C%	**100**	**100**	**%**

Warning 04: Froude No. exceeds USDCM Volume I recommendation.

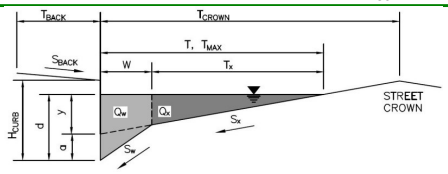
Version 4.06 Released August 2018

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

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

Project: Crossroads Mixed Use

Inlet ID: Inlet 4F



Gutter Geometry (Enter data in the blue cells)

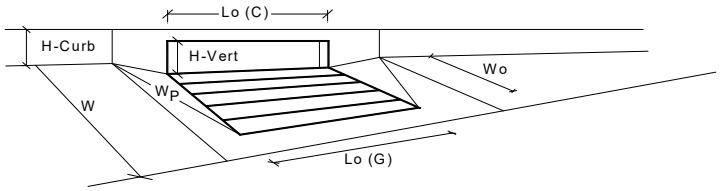
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	7.5	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.4	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

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

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

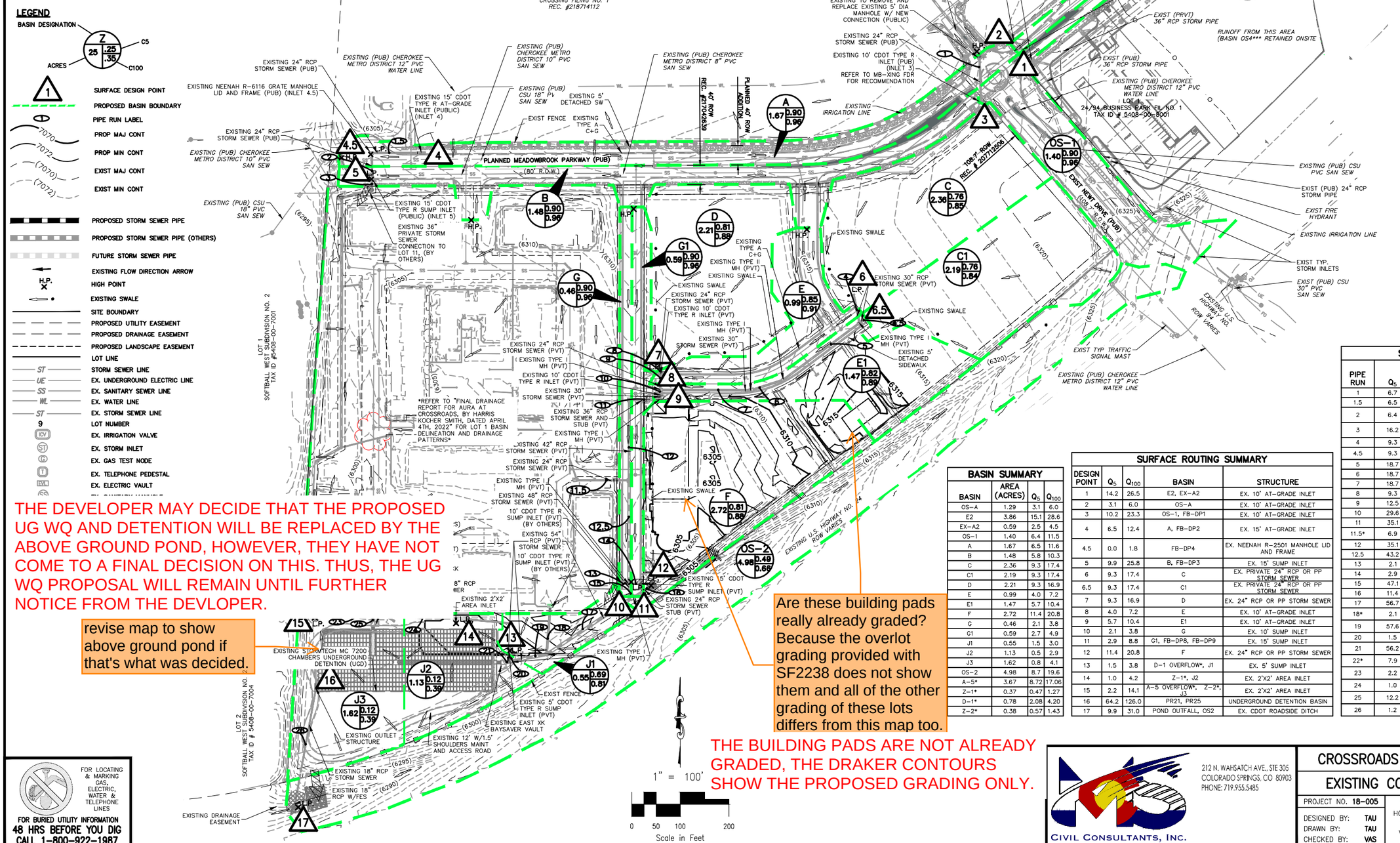


Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.4	6.0	inches
Grate Information			MINOR	MAJOR	☑ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
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) =	15.00	15.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat (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} =	0.20	0.33	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	0.42	0.57	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.67	0.79	
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 =**	**3.9**	**9.7**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK\ REQUIRED}$ =	3.8	7.0	cfs

DRAINAGE MAPS

LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2

EXISTING CONDITIONS DRAINAGE MAP



THE DEVELOPER MAY DECIDE THAT THE PROPOSED UG WQ AND DETENTION WILL BE REPLACED BY THE ABOVE GROUND POND, HOWEVER, THEY HAVE NOT COME TO A FINAL DECISION ON THIS. THUS, THE UG WQ PROPOSAL WILL REMAIN UNTIL FURTHER NOTICE FROM THE DEVLOPER.

revise map to show above ground pond if that's what was decided.

Are these building pads really already graded? Because the overlot grading provided with SF2238 does not show them and all of the other grading of these lots differs from this map too.

THE BUILDING PADS ARE NOT ALREADY GRADED, THE DRAKER CONTOURS SHOW THE PROPOSED GRADING ONLY.

BASIN SUMMARY

BASIN	AREA (ACRES)	Q_5	Q_{100}
OS-A	1.29	3.1	6.0
E2	3.86	15.1	28.6
EX-A2	0.59	2.5	4.5
OS-1	1.40	6.4	11.5
A	1.67	6.5	11.6
B	1.48	5.8	10.3
C	2.36	9.3	17.4
C1	2.19	9.3	17.4
D	2.21	9.3	16.9
E	0.99	4.0	7.2
E1	1.47	5.7	10.4
F	2.72	11.4	20.8
G	0.46	2.1	3.8
G1	0.59	2.7	4.9
J1	0.55	1.5	3.0
J2	1.13	0.5	2.9
J3	1.62	0.8	4.1
OS-2	4.98	8.7	19.6
A-5*	3.67	8.72	17.06
Z-1*	0.37	0.47	1.27
D-1*	0.78	2.08	4.20
Z-2*	0.38	0.57	1.43

SURFACE ROUTING SUMMARY

DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	14.2	26.5	E2, EX-A2	EX. 10' AT-GRADE INLET
2	3.1	6.0	OS-A	EX. 10' AT-GRADE INLET
3	10.2	23.3	OS-1, FB-DP1	EX. 10' AT-GRADE INLET
4	6.5	12.4	A, FB-DP2	EX. 15' AT-GRADE INLET
4.5	0.0	1.8	FB-DP4	EX. NEENAH R-2501 MANHOLE LID AND FRAME
5	9.9	25.8	B, FB-DP3	EX. 15' SUMP INLET
6	9.3	17.4	C	EX. PRIVATE 24" RCP OR PP STORM SEWER
6.5	9.3	17.4	C1	EX. PRIVATE 24" RCP OR PP STORM SEWER
7	9.3	16.9	D	EX. 24" RCP OR PP STORM SEWER
8	4.0	7.2	E	EX. 10' AT-GRADE INLET
9	5.7	10.4	E1	EX. 10' AT-GRADE INLET
10	2.1	3.8	G	EX. 10' SUMP INLET
11	2.9	8.8	G1, FB-DP8, FB-DP9	EX. 15' SUMP INLET
12	11.4	20.8	F	EX. 24" RCP OR PP STORM SEWER
13	1.5	3.8	D-1 OVERFLOW*, J1	EX. 5' SUMP INLET
14	1.0	4.2	Z-1*, J2	EX. 2'X2' AREA INLET
15	2.2	14.1	A-5 OVERFLOW*, Z-2*, J3	EX. 2'X2' AREA INLET
16	64.2	126.0	PR21, PR25	UNDERGROUND DETENTION BASIN
17	9.9	31.0	POND OUTFALL, OS2	EX. CDOT ROADSIDE DITCH

STORM SEWER SUMMARY

PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DESIGN POINTS
1	6.7	9.8	24" SD	DP3 (INLET 3)
1.5	6.5	10.6	24" SD	DP4 (INLET 4)
2	6.4	12.3	24" SD	PR1.5, DP4.5 (INLET 4.5)
3	16.2	37.9	36" SD	PR2, DP5 (INLET 5)
4	9.3	17.4	30" SD	DP6
4.5	9.3	17.4	30" SD	DP6.5
5	18.7	34.7	30" SD	PR4, PR4.5
6	18.7	34.7	30" SD	PR5
7	18.7	34.7	30" SD	PR6
8	9.3	16.9	24" SD	DP7
9	12.5	21.5	30" SD	PR8, DP8 (INLET 6)
10	29.6	53.3	36" SD	PR7, PR9
11	35.1	61.0	36" SD	PR10, DP9 (INLET 7)
11.5*	6.9	13.8	24" SD	SEE FDR FOR AURA AT CROSSROADS
12	35.1	61.0	42" SD	PR11
12.5	43.2	77.4	48" SD	PR12, PR11.5
13	2.1	3.8	18" SD	DP10 (INLET 8)
14	2.9	8.8	30" SD	DP11 (INLET 9)
15	47.1	87.8	48" SD	PR12.5, PR13, PR14
16	11.4	20.8	24" SD	DP12
17	56.7	105.2	54" SD	PR15, PR16
18*	2.1	3.3	30" SD	SEE FDR FOR AURA AT CROSSROADS
19	57.6	106.4	54" SD	PR17, PR18*
20	1.5	3.8	15" SD	DP13
21	56.2	104.8	54" SD	PR19, PR20
22*	7.9	9.3	48" SD	SEE FDR FOR AURA AT CROSSROADS
23	2.2	14.1	18" SD	DP15
24	1.0	4.2	18" SD	DP14
25	12.2	29.1	54" SD	PR22*, PR23, PR24
26	1.2	11.4	18" SD	POND OUTFALL

CIVIL CONSULTANTS, INC.
212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CROSSROADS MIXED USE FILING NO. 2

EXISTING CONDITIONS DRAINAGE MAP

PROJECT NO. 18-005
DESIGNED BY: TAU
DRAWN BY: TAU
CHECKED BY: VAS
SCALE: HORIZONTAL: 1"=100' VERTICAL: 1"=5'
DATE: 01/25/2023
SHEET 1 OF 1
EDM

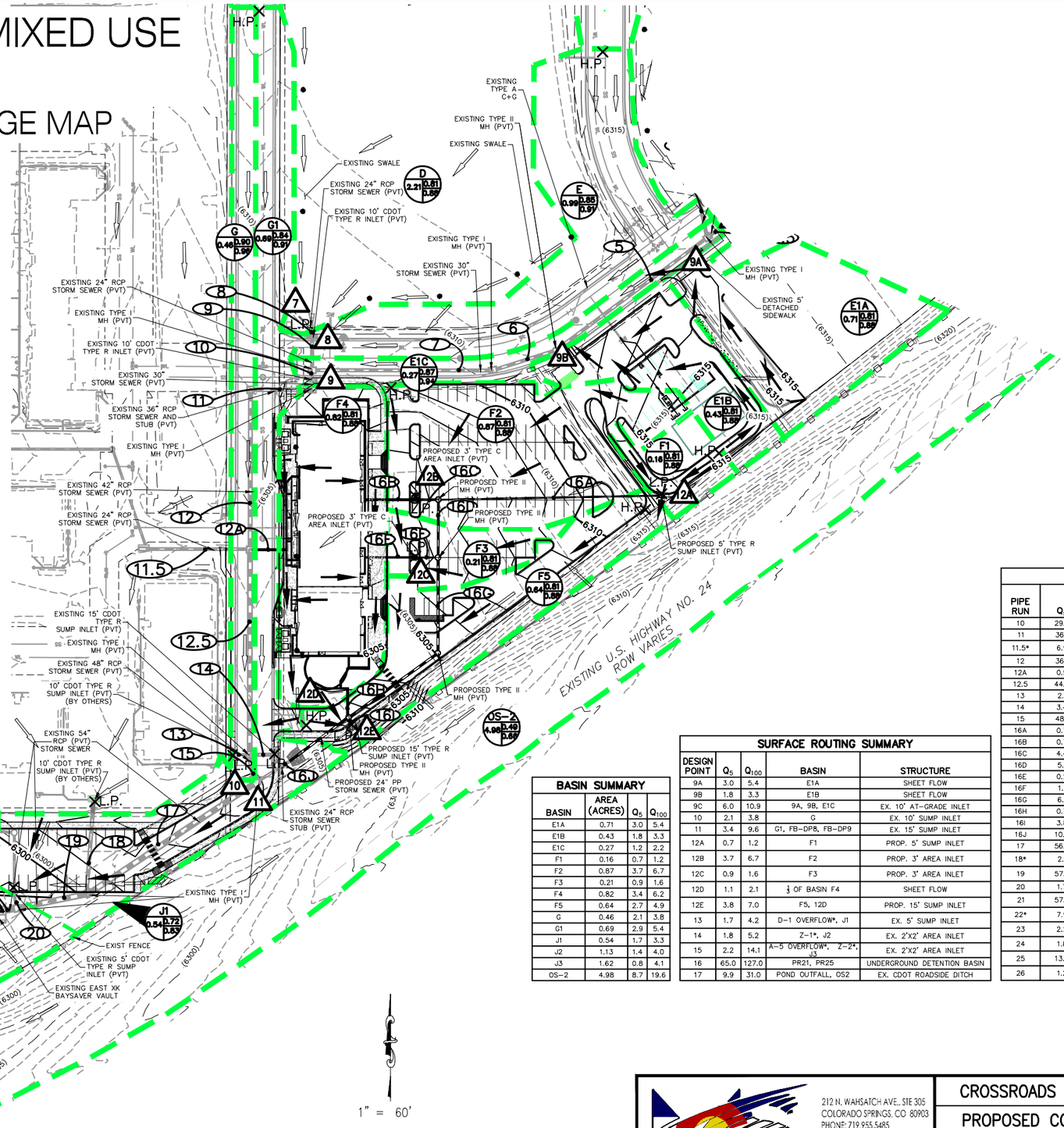
File: O:\18005A-CRMUR-LOT 1\The Equity Group\Drainage\Drainage Map\18-005 EXIST DM.dwg Plotstamp: 2/24/2023 10:31 AM

LOT 1 & LOT 2 CROSSROADS MIXED USE FILING NO. 2

PROPOSED CONDITIONS DRAINAGE MAP

LEGEND

- BASIN DESIGNATION (Z / 25 / .25 / .35 / C5 / C100 / ACRES)
- SURFACE DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PIPE RUN LABEL
- PROP MAJ CONT
- PROP MIN CONT
- EXIST MAJ CONT
- EXIST MIN CONT
- PROPOSED STORM SEWER PIPE
- PROPOSED STORM SEWER PIPE (OTHERS)
- FUTURE STORM SEWER PIPE
- EXISTING FLOW DIRECTION ARROW
- H.P. HIGH POINT
- EXISTING SWALE
- SITE BOUNDARY
- PROPOSED UTILITY EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED LANDSCAPE EASEMENT
- LOT LINE
- ST STORM SEWER LINE
- UE EX. UNDERGROUND ELECTRIC LINE
- SS EX. SANITARY SEWER LINE
- WL EX. WATER LINE
- ST EX. STORM SEWER LINE
- 9 LOT NUMBER
- ICV EX. IRRIGATION VALVE
- ST EX. STORM INLET
- GN EX. GAS TEST NODE
- T EX. TELEPHONE PEDESTAL
- EVLT EX. ELECTRIC VAULT
- SS EX. SANITARY MANHOLE
- EX. WATER VALVE
- PROPOSED RIPRAP
- EMERGENCY OVERFLOW DIRECTION
- L.P. LOW POINT
- PROPOSED SWALE



BASIN SUMMARY

BASIN	AREA (ACRES)	Q_5	Q_{100}
E1A	0.71	3.0	5.4
E1B	0.43	1.8	3.3
E1C	0.27	1.2	2.2
F1	0.16	0.7	1.2
F2	0.87	3.7	6.7
F3	0.21	0.9	1.6
F4	0.82	3.4	6.2
F5	0.64	2.7	4.9
G	0.46	2.1	3.8
G1	0.69	2.9	5.4
J1	0.54	1.7	3.3
J2	1.13	1.4	4.0
J3	1.62	0.8	4.1
OS-2	4.98	8.7	19.6

SURFACE ROUTING SUMMARY

DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
9A	3.0	5.4	E1A	SHEET FLOW
9B	1.8	3.3	E1B	SHEET FLOW
9C	6.0	10.9	9A, 9B, E1C	EX. 10' AT-GRADE INLET
10	2.1	3.8	G	EX. 10' SUMP INLET
11	3.4	9.6	G1, FB-DP8, FB-DP9	EX. 15' SUMP INLET
12A	0.7	1.2	F1	PROP. 5' SUMP INLET
12B	3.7	6.7	F2	PROP. 3' AREA INLET
12C	0.9	1.6	F3	PROP. 3' AREA INLET
12D	1.1	2.1	⅓ OF BASIN F4	SHEET FLOW
12E	3.8	7.0	F5, 12D	PROP. 15' SUMP INLET
13	1.7	4.2	D-1 OVERFLOW*, J1	EX. 5' SUMP INLET
14	1.8	5.2	Z-1*, J2	EX. 2'X2' AREA INLET
15	2.2	14.1	A-5 OVERFLOW*, Z-2*, J3	EX. 2'X2' AREA INLET
16	65.0	127.0	PR21, PR25	UNDERGROUND DETENTION BASIN
17	9.9	31.0	POND OUTFALL, OS2	EX. CDOT ROADSIDE DITCH

STORM SEWER SUMMARY

PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DESIGN POINTS
10	29.6	53.3	36" SD	PR7, PR9
11	36.1	62.9	36" SD	PR10, DP9C (INLET 7)
11.5*	6.9	13.8	24" SD	SEE FDR FOR AURA AT CROSSROADS
12	36.1	62.9	42" SD	PR11
12A	0.5	0.8	12" PP	⅛ OF BASIN F4
12.5	44.2	79.4	48" SD	PR12, PR11.5, PR12A
13	2.1	3.8	18" SD	DP10 (INLET 8)
14	3.4	9.6	30" SD	DP11 (INLET 9)
15	48.1	89.7	48" SD	PR12.5, PR13, PR14
16A	0.7	1.2	12" PP	DP12A (INLET 1F)
16B	0.7	1.3	12" PP	⅛ OF BASIN F4
16C	4.4	8.0	18" PP	PR16B, DP12B (INLET 2F)
16D	5.1	9.2	18" PP	PR16A, PR16C
16E	0.2	0.3	6" PP	⅛ OF BASIN F4
16F	1.1	2.0	12" PP	PR16E, DP12C (INLET 3F)
16G	6.1	11.2	24" PP	PR16F, PR16D
16H	0.7	1.3	12" PP	⅛ OF BASIN F4
16I	3.8	7.0	18" PP	DP12E (INLET 4F)
16J	10.7	19.4	24" PP	PR16G, PR16H, PR16I
17	56.9	105.6	54" SD	PR15, PR16J
18*	2.1	3.3	30" SD	SEE FDR FOR AURA AT CROSSROADS
19	57.6	106.4	54" SD	PR17, PR18*
20	1.7	4.2	15" SD	DP13
21	57.6	107.6	54" SD	PR19, PR20
22*	7.9	9.3	48" SD	SEE FDR FOR AURA AT CROSSROADS
23	2.2	14.1	18" SD	DP15
24	1.8	5.2	18" SD	DP14
25	13.0	30.1	54" SD	PR22*, PR23, PR24
26	1.2	11.4	18" SD	POND OUTFALL

revise map to show above ground pond if that's what was decided.

THE DEVELOPER MAY DECIDE THAT THE PROPOSED UG WQ AND DETENTION WILL BE REPLACED BY THE ABOVE GROUND POND, HOWEVER, THEY HAVE NOT COME TO A FINAL DECISION ON THIS. THUS, THE UG WQ PROPOSAL WILL REMAIN UNTIL FURTHER NOTICE FROM THE DEVLOPER.

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

CIVIL CONSULTANTS, INC.
212 N. WAHSATCH AVE., STE 305
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CROSSROADS MIXED USE FILING NO. 2
PROPOSED CONDITIONS DRAINAGE MAP

PROJECT NO. 18-005
DESIGNED BY: TAU
DRAWN BY: TAU
CHECKED BY: VAS
SCALE: HORIZONTAL: 1"=60' VERTICAL: 1"=5'
DATE: 02/25/2023
SHEET 1 OF 1
PDM

File: O:\18005A-CRMUR-LOT 1\The Equity Group\Drainage Map\18-005 PROP DM.dwg Plotstamp: 2/27/2023 11:17 AM