



PRELIMINARY DRAINAGE REPORT

The Parklands Village 1, Filing No. 3

Aurora, Colorado

Parklands Village 4 Land CO, LLC

Prepared for:

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Approved For One Year From This Date	
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Aurora Water Drainage Division	Date

Advisory Note – Preliminary Drainage Report is required prior to Civil Plan Approval



Project #: 196480001

Prepared: September 2024

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ENGINEER'S CERTIFICATION

This report and plan for the drainage design of The Parklands Village 1, Filing 3 was prepared by me (or under my direct supervision) in accordance with the provisions of City of Aurora Storm Drainage Design and Technical Criteria and was designed to comply with the provisions thereof.

Liam Shannon, P.E.

Registered Professional Engineer

State of Colorado No. 59528

A. Introduction

The purpose of this preliminary drainage report is to outline the drainage design for the proposed Village 1 Filing 3 Development (“the Site” or “the Project”), located at the northeastern corner of E. Jewell Avenue and S. Kewaunee Street.

The purpose of this report is to demonstrate that the proposed residential project conforms to the established drainage patterns set forth in the *Master Drainage Report for the Parklands Development* (“Parklands MDR”), EDN #1583566, prepared by CORE Consultants, Inc. approved April 7th, 2023, and *Preliminary Drainage Report for the Foundry Filing No. 1 Development* (“Foundry PDR”), EDN #224086, prepared by JR Engineering, Inc. approved May 1st, 2024. The drainage design will also conform to the current *City of Aurora Storm Drainage and Technical Criterial Manual* (“the Criteria”) which supplements the Mile High Flood District *Urban Storm Drainage Criteria Manual* (“the Manual”).

1. Location

The Parklands Village 1 Filing 3 project is located in Section 20, Township 4 South, Range 65 west of the 6th Principal Meridian, County of Arapahoe, State of Colorado. The site is bounded by a future Village 1 Filing to the North, E. Jewell Avenue to the South, existing S. Kewaunee Road to the West, and Coal Creek to the East. A vicinity map is provided in **Figure 1** below.



Figure 1: Vicinity Map

There is an existing Extended Detention Pond C located to the east of the Project that has been proposed as a part of the approved Foundry PDR and PDP plans. The pond is shown to discharge to Coal Creek, the major drainage way, that is located to the northeast of the site.

2. Proposed Development

The Site is currently zoned as R2-C (medium density residential) and contains approximately 71.20 acres based on the approved master plan. The Site is situated in planning areas 1I, NP-3, DR-1 and a small portion of planning areas 1H and 1J of the Parklands Master Land Use plan, see **Appendix D**. Planning area 1I has a max density of 257 dwelling units (DUs). Additionally, 1H and 1J have max densities of 359 and 72 DUs respectively. Planning area NP-3 is approximately a 3.3 acre(s) proposed neighborhood park that will be designed/developed with this filing. Drainage Area DR-1 is approximately 14.5 acre(s) and the improvements of the pond are to be constructed as a part of the Foundry Filing No. 1 Development. The Project development includes all associated infrastructure to support the community. Open space is proposed at various locations within the Parklands community.

This Preliminary Drainage Report includes the preliminary analysis of the drainage related to the site layout and grading of Parklands Village 1, Filing No. 3. A Final Drainage Report for this site will be prepared with future Civil Plan submittals to ensure that storm drainage infrastructure is appropriately hydraulically sized to serve the overall development at full build out.

3. Changes to MDR

There are no proposed changes to the Parklands MDR.

4. Variances

There are no other variances requested at this time for this Preliminary Drainage Report. Any future Variance requests will be coordinated with City of Aurora.

B. Historic Drainage

1. Description of Property and Drainage Basin

a. Existing/Historic Condition Rainfall

Currently, the Site consists of approximately 67.49 acres of undeveloped land. The existing conditions slope North toward Coal Creek. The Site is currently covered by natural grasses and slopes on Site are roughly between 0% - 10%. According to a NRCS web soil survey report accessed May 9th, 2024, the site consists of hydrologic soil groups C and D soils. The NRCS web soil survey report is referenced in **Appendix A**.

The Master Drainage Report identifies four existing drainage basins on the Site; A-3, A-4, and H-1. Basin A-3 and A-4 generally flow to the north/northeast and are tributary to Coal Creek. See **Figure 2** below for the historic basins located onsite per the Master Drainage Plan. Note that the basin areas and imperviousness are included within **Figure 2**.

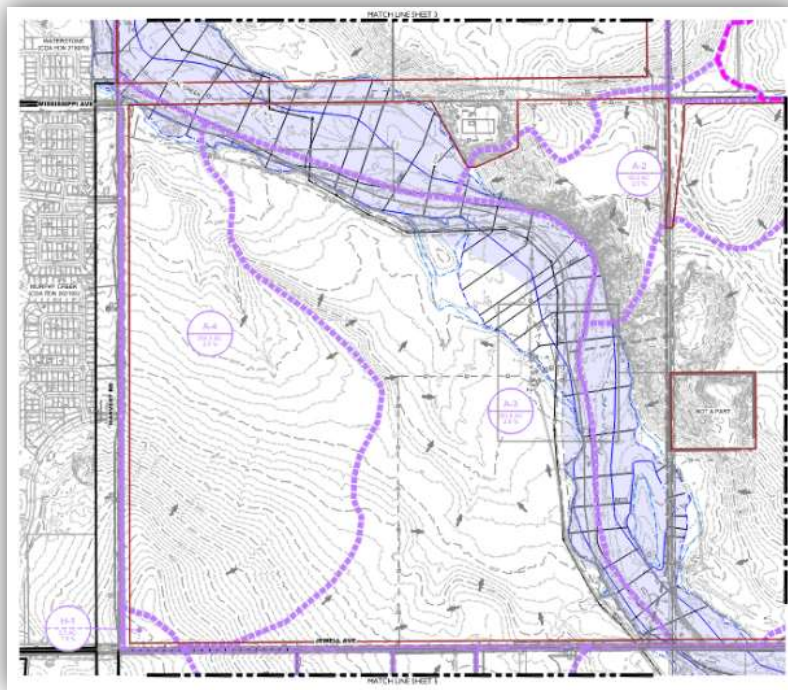


Figure 2: Master Drainage Map - Existing Drainage Patterns (Full size in **Appendix A-1**)

b. Major Drainageways

Coal Creek is major drainageway that is currently mapped as a Zone AE floodplain. The flood hazard boundaries are shown within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 08005C0204K and 08005C0212K. The FEMA FIRM Map are referenced in Appendix A. A portion of Coal Creek passes through the overall Parklands development as noted in the Parklands MDR. Coal Creek is located to the Northeast of the Site.

c. Irrigation Facilities

There are no irrigation canals or ditches located on the property.

d. Offsite-Subbasins

The Offsite-subbasins are located to the south and west of Filing 3. These areas include the drainage areas within E. Jewell Avenue to the south of the site and areas to the west of the site within S. Kewaunee Street. These offsite areas drain to storm sewers that route drainage to either Pond A or Pond C.

e. Outfalls from the Property

The ultimate outfall of the property is Coal Creek is located to the Northeast of the Site. Flows contributing to Coal Creek will collect in the existing detention facility (Pond C) near the eastern boundary of Site. Pond C will be constructed as a part of the Foundry Filing No.1 Development, located to the east of the Project across E. Jewell Ave. Pond C has been designed to accommodate the full build-out of the Parklands Village 1 Filing 3 Site. Refer to the Foundry Filing No. 1 Preliminary Drainage Report ("Foundry PDR") for information regarding the release rate of the outlet structure. The 100-YR discharge rate should be designed to remain below the allowable release rate of 416 cfs set forth in the Parklands MDR.

f. Relevant Major Drainageway Studies

- First Creek Tributaries (Upstream of I-70) Master Drainageway Plan
 - *Westwood - October 2021*
- Coal Creek Stream Improvements
 - *Wright Water Engineers, Inc – May 2022*

C. Design Criteria

1. Hydrologic Criteria

a. Rainfall and Storm Design Frequencies

According to the Criteria section 6.1.2, the design storms for the Project are the 2-year and 100-year frequency events.

Chapter 5 of the Criteria was used to determine the time of concentrations, rainfall intensities, and runoff coefficients to calculate the peak runoff for each storm event.

b. One-Hour Point Precipitation

NOAA Atlas 14 was used to determine the rainfall P1 values for the rainfall intensity values. One-hour rainfall depths used for the calculations at the site are as outlined below in **Table 1** and can be found in **Appendix A**:

Rainfall Depths						
	2-year	5-year	10-year	25-year	50-year	100-year
1-hr	0.86"	1.14"	1.40"	1.79"	2.12"	2.47"

Table 1: One-Hour Rainfall Depths from NOAA Atlas 14

c. Calculation Method

The Standard Form Rational Method computations were conducted for each sub-basin to size the proposed storm sewer infrastructure (inlets, pipe network, drainage channel, etc.) and to check the emergency overflow weir freeboard requirements. The rational method was used to calculate sub-basin run-off coefficients and 2-yr and 100-yr flows. Nine land uses were used for the rational method calculations: Paved Streets, Concrete Drive/Walks, Roofs, Gravel (Pedestrian Use), Gravel (Maintenance Paths), Landscaping, Open Water & WQCV, Native Grasses/Open Space, and Neighborhood Parks. Each land use conforms to the land uses provided in Table 5-5 and 5-6 of the Criteria.

See **Table 2** below for the 2-year and 100-year run-off coefficients used in calculations for each proposed land use. The coefficients are based on the NRCS Soil Group C/D and the new City of Aurora Drainage Manual table 5-7.

Land Use	2-yr coeff.	100-yr coeff.
Paved Street	0.78	0.87
Concrete	0.78	0.87
Roofs	0.78	0.87
Gravel Pedestrian Use	0.30	0.65
Gravel – Maintenance Paths	0.47	0.73
Landscaping	0.14	0.57
WQCV	0.83	0.89
Native Grasses & Open Space	0.03	0.50
Neighborhood Parks	0.18	0.59

Table 2: 2-year & 100-year Coefficients per Land Use Type

See **Appendix B** for Runoff Coefficient Table and Imperviousness results.

The Colorado Urban Hydrograph Procedure (CUHP) method was utilized to compare the Project's overall on-site Basin C assumed values with the assumed values of Basin OS-6 within the Foundry PDR. The CUHP basin information is included within Appendix B and shown within **Table 3** below.

d. Detention Volume Computation Method

Regional Pond C was designed as a part of the Foundry Filing No. 1 Development. The pond design information is provided within the Foundry PDR. The Foundry PDR provides an assumed 100-YR inflow rate from the Parklands Village 1, Filing 3 Project of 240.60 cfs and the actual discharge rate proposed in this report is 229.97 cfs. Because the inflow rate is equal to or less than the inflow rate used in designing Regional Pond C, this report is in conformance to the approved Foundry PDR. No design modifications to the pond are anticipated as a result. See **Table 3** below comparing the values between the Approved Foundry PDR and the Project.

A pond recertification for the existing Pond C is anticipated to be required following the construction of the Project. The construction is not known at the time of the Preliminary Drainage Report. If the timeline becomes known at the time of the Civil Plans, the associated Final Drainage Reports (FDR) will include this information. It is anticipated that Pond C will be constructed in Spring 2025 and the Project start in Fall 2025.

e. Design Criteria

The “City of Aurora Storm Drainage Design and Technical Criteria”, revised November 2023 (the Criteria) and the “Urban Storm Drainage Criteria Manual” Volumes 1, 2, and 3 (The Manual), with latest revisions, were used when preparing the storm calculations. This report is intended to serve as a Site-Specific Preliminary Drainage Report for the Parklands Village 1 Filing 3 Development.

This Preliminary Drainage Report also utilizes previous drainage studies in the area including:

- *Master Drainage Report & Maps for the Parklands Development* (MDR), EDN 223089, approved 04/07/2023
 - *CORE Consultants, Inc. – April 3, 2023*
- Preliminary Drainage Report & Maps for the Foundry Filing No. 1 Development (PDR), EDN 224086, approved on 05/01/2024
 - *JR Engineering – April 5, 2024*

2. **Hydraulic Criteria**

a. Storm Design Frequencies

The storm sewer layout will be designed horizontally along with inlet locations to gravity-flow in the 2-year storm and to convey the 100-year storm with the HGLs 1 foot below the rim elevations of the storm structures.

b. Detention Facility Sizing Methodology

The Extended Detention Pond C was sized within the Foundry PDR and includes full-build out conditions for contributing areas of the Project. **Table 3** shows that the assumed inflow is less the actual inflow to Pond C and therefore in conformance to the Pond C design sizing methodology.

c. Drainageway Sizing Methodology

No Drainageways are proposed in this development.

d. LOMCs Required

No LOMC are required for this proposed development.

e. Infrastructure Maintenance (Public/Private)

The City will be required to maintain proposed public storm infrastructure. The Metro District or Homeowners Association will be required to maintain the proposed private storm infrastructure.

f. Proposed Temporary Stormwater Infrastructure

No temporary stormwater infrastructure is proposed in this development.

g. Hydraulic Analysis Software

Please see the Foundry PDR for the hydraulic analysis of Pond C.

The storm infrastructure pipe will be modeled in AutoCAD Civil 3D Hydraflow Storm Sewers Extension and will be provided within a future Final Drainage Report. The HGLs associated with the 2-year and 100-year storm events will be shown in the FDR and Civil Plan package.

If needed, the emergency outfall path is outlined in the separate Preliminary Drainage Plans via hallow flow arrows. The overflow conditions will be evaluated using the Federal Highway Administration's (FHWA's) Hydraulic Toolbox, latest edition.

h. Outside Sources

No additional outside sources to reference.

D. Drainage Plan

1. General Concept

a. Drainage Concept & Patterns

The proposed design includes routing the developed runoff from the Site through grading and storm drains that outfall into Pond C. Pond C provides full spectrum detention and releases the runoff at a controlled rate to Coal Creek. The proposed drainage design is consistent with the design intent of the approved Parklands Master Drainage Report (*EDN 223089*) and the Foundry Filing No. 1 Preliminary Drainage Report (*EDN 224086*). Pond C will be constructed as a part of the Foundry Development, and it is located near the eastern border of V1F3 nearby the existing Coal Creek. The Site includes a portion of drainage basin C as proposed in the approved Parklands MDR.

The majority of the proposed development will drain toward the existing Pond C to be detained and treated before being released into existing Coal Creek. Per the Foundry Filing 1 PDR, Pond C has a total tributary area of approximately 491.35 acres. The Foundry PDR also accounts for the full build-out of the Site (On-site and E. Jewell Ave. areas). The Site contains approximately 67.30 acres of tributary area to Pond C. Pond C has been designed to accommodate the entirety of its tributary area. **Table 3** below compares the master plan, as well as the assumed Foundry PDR tributary areas, imperviousness values, and 100-YR discharge rates with the Parklands Village 1 Filing 3 actual values.

In order to compare the inflow rates, the onsite basin utilized the CUHP method where the flow lengths match the assumed values within the Foundry PDR to maintain a comparable time of concentration. The E. Jewell Avenue rates utilized the rational calculations, and the total was summed with the on-site CUHP inflow rate. Note that the Site's 100-YR inflow rate remains below the assumed flow within the Foundry PDR and therefore the hydraulic calculations for Pond C is still in compliance with the Foundry PDR (see **Table 3**).

Parklands Village 1 Filing 3	Parklands Development MDR	Foundry PDR (EDN# 224035) Calculated Values	Parklands Village 1 Filing 3 Calculated Values
Pond C 100-YR Volume (acre-ft)	43.89	49.49	N/A
On-site + Jewell Area – Tributary Area (acre)	68.2	70.75	71.20
On-site + Jewell – Imperviousness (%)	54.80%	74.93%	71.67%
On-site + Jewell – 100-YR Runoff (cfs) inflow to Pond C	193.89 cfs (Basin C)	240.60 cfs (Basins OS-6 & OS-8 to OS-10)	208.42+ 21.55= 229.97 cfs (On-site Basin C & Off- site Basins to Pond C)

Table 3 – Pond C and Peak Inflow comparison between Parklands Development MDR, Foundry PDR and V1F3 PDR

The remaining portion of Pond C's tributary area was designed and developed within the Foundry Preliminary Drainage Report. Please refer to **Appendix B & C** for hydrologic and hydraulic calculations.

The required volume of Pond C for the Foundry PDR exceeds the Parklands Development MDR. The Parklands master drainage plan was approved on April 7th, 2023. Per the note within the approved plan, "all preliminary drainage reports are required to design to current City of Aurora standards at the time of submittal which could impact the facility sizes as shown in this MDR". The Foundry PDR sized Pond C according to the standard changes and a master plan amendment is not required.

The majority of the stormwater onsite (Basins C1-C2) will be collected by inlets and flow through pipes to reach Pond C. Basins C3 will sheet flow to the existing Pond C. Note that Basins C1-C3 drainage (Subbasins C100s, C200s, and C300s) will flow east.

The overall tributary area of Pond C includes the majority of the Village 1 Filing 3 and the contributing area of Pond C that was developed as a part of Foundry Filing No. 1, located to the south of E. Jewell Avenue, which follows the Parklands MDR tributary drainage area for Basins C, VMC_C, OS-7, and OS-8. Pond C will be constructed to serve the full buildout of Basin C.

b. Conformance to the MDR

This PDR & PDP is in conformance with the improvements set forth in the Master Drainage report.

Note there are slight variations in acreage and imperviousness from the Parklands MDR to PDR. This is due to the high-level nature of the Parklands MDR's delineation along with the Drainage Manual updates from the city between Parklands MDR approval and PDR submittals. **Table 3** above demonstrates that the values are comparable and that the inflow to Pond C shown in the Foundry PDR remain compliant with the Project.

c. PIP Conformance

This PDR & PDP is in conformance with the improvements set forth in the approved Public Improvement Plan.

d. Site Plan Conformance

This PDR & PDP is in conformance with the improvements set forth in the Site Plan.

e. Off-site Drainage Conformance

There are six (6) offsite basins within the Site that will ultimately be treated by Pond C: Basins OF-1, OF-2, OF-3, OF-208, OF-210, and OF-262. The OF Basins are located to the south of the Site within E. Jewell Avenue. These off-site basins are shown as OS-8, OS-9, and OS-10 within the Foundry PDR.

Basins OF-208, OF-210, and OF-262 will be collected within proposed stormwater infrastructure within the Site and will ultimately drain to Pond C. Meanwhile basins OF-1, OF-2, and OF-3 are designed to drain to inlets within Jewell that will ultimately be routed to Pond C via storm sewer. These off-site basins are tributary to Basin C per the approved Parklands Master Drainage Report and the Foundry Development PDR.

There are three (3) offsite basins within the Site that will ultimately be treated by Pond A: A-518, A-522, and A-526. These basins are conveyed to drainage basin A-2 as shown in the Parklands MDR. The basins are comparable to the assumed basins apart of Parklands Village 1, Filing No. 1.

The flows to the offsite basins inlets are compared within **Table 5** to demonstrate conformance. If actual flows exceed the assumed value, then the inlets will be sized as a part of the Project's master drainage report.

f. Surrounding Development Coordination

Parklands has been in coordination with the Foundry development to the South Side of Jewell Avenue. Information regarding Pond C are included within the Foundry PDR Document.

g. Downstream Outfall(s)

Coal Creek is located to the Northeast of the Site. Flows contributing to Coal Creek will be collected in the proposed detention facilities (Pond C) that were developed as a part of the Foundry Filing No. 1 Development. The controlled release outlet structure of Pond C will outfall directly into Coal Creek at a rate less than the 100 yr max release rate of 416 cfs and is not anticipated to change from Foundry PDR given that the 100-YR inflow rate into pond C from the Parklands Filing No. 3 Site remains below the calculated Foundry PDR value. **Table 3** compares the imperviousness of the basins to the pond and demonstrates compliance.

h. Proposed Development Effects

There are no adverse effects from this proposed development.

i. Water quality SCMs and Detention Plan

Drainage within the site will release runoff into Pond C following historic drainage patterns. Pond C was designed as a part of the Foundry PDR to detain, treat, and release piped flows of runoff into Coal Creek. Please see Foundry PDR for more information regarding the flow rates and other information required by the Criteria, Manual, and the approved Parklands Master Drainage Report/Plans.

Per the approved Parklands Master Drainage Report and Foundry Filing 1 PDR, Regional Pond C is a public full-spectrum detention pond and will be maintained by the Aurora Water. Please reference the Foundry PDR for more information.

2. Specific Details

a. Project Phasing

It is anticipated that the Project will be completed in one phase. If phasing of construction is deemed necessary, the phasing will be determined with the Civil Plans. The associated Final Drainage Reports (FDR) will reflect the detailed drainage provisions required with each phase.

b. Sub-Basin Description & H. Emergency Overflow Path

A standalone Drainage Area Map has been provided in this submittal, to illustrate the sub-basins proposed with this project. Individual sub-basin details such as runoff, coefficient calculations, tributary area, and imperviousness percentages are provided in **Appendix B**. The 2-year and 100-year peak flows are provided below with full calculations provided in **Appendix B**. Note that the PDP sheets contain information to the lot drainage types.

The overall Project imperviousness and associated flow is calculated as a part of **Table 3** to show compliance with the master drainage report.

On-Site Basin C Sub-Basins

Sub-basin C-100

Sub-basin C-100 is located near the northeastern corner of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C100. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-102

Sub-basin C-102 is located near the northeastern corner of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade inlet located at design point C102. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-104

Sub-basin C-104 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C104. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-106

Sub-basin C-106 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C106. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-108

Sub-basin C-108 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C108. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-110

Sub-basin C-110 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C110. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-112

Sub-basin C-112 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of a residential building, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C112. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-114

Sub-basin C-114 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of a residential building, and landscaping. The drainage flows to the

proposed on-grade curb inlet located at design point C114. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-116

Sub-basin C-116 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C116. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-118

Sub-basin C-118 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C118. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-120

Sub-basin C-120 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C120. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-122

Sub-basin C-122 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C122. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-124

Sub-basin C-124 is located near the northwestern corner of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C124. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-126

Sub-basin C-126 is located near the northwestern corner of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C

that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage to the proposed on-grade curb inlet located at design point C126. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-200

Sub-basin C-200 is located near the southeastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C200. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-202

Sub-basin C-202 is located near the southeastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C202. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-204

Sub-basin C-204 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C204. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-206

Sub-basin C-206 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C206. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-208

Sub-basin C-208 is located near the southeastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of residential building, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C208. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-210

Sub-basin C-210 is located near the southern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of residential building, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C210. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-212

Sub-basin C-212 is located near the southeastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C212. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-214

Sub-basin C-214 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C214. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-216

Sub-basin C-216 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C216. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-218

Sub-basin C-218 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C218. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-220

Sub-basin C-220 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed

on-grade curb inlet located at design point C220. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-222

Sub-basin C-222 is located near the eastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C222. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-224

Sub-basin C-224 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C224. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-226

Sub-basin C-226 is located near the southeastern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C226. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-228

Sub-basin C-228 is located near the southern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C228. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-230

Sub-basin C-230 is located near the southern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of a residential building, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C230. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-232

Sub-basin C-232 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that

is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, neighborhood park, and landscaping. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C232. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-234

Sub-basin C-234 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via private storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, neighborhood park, and landscaping. The drainage flows to the proposed sump Type C inlet located at design point C-234. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basin C-236

Sub-basin C-236 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C236. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-238

Sub-basin C-238 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C238. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-240

Sub-basin C-240 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via private storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed sump Type C inlet located at design point C-240. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed private storm sewer.

Sub-basin C-242

Sub-basin C-242 is located near the central side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, neighborhood park, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C242. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-244

Sub-basin C-244 is located near the northern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C244. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-246

Sub-basin C-246 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C246. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-248

Sub-basin C-248 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C248. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-250

Sub-basin C-250 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C250. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-252

Sub-basin C-252 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C252. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-254

Sub-basin C-254 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-

grade curb inlet located at design point C254. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-256

Sub-basin C-256 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C256. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-258

Sub-basin C-258 is located near the western side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C258. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-260

Sub-basin C-260 is located near the southwestern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C260. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-262

Sub-basin C-262 is located near the southern side of the Site and is one of 49 onsite sub-basins on the Site that drains via public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, a portion of a residential building, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C262. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin C-300

Sub-basin C-300 is located to the eastern side of the Site and one of 49 onsite sub-basins. The basin includes the extents of Pond C and drains directly to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of maintenance paths, concrete sidewalk, residential buildings, pond C and landscaping. The drainage will utilize sheet flow to facilitate flow to Pond C.

Off-site sub-basins flowing on-site:***Sub-basin OF-1***

Sub-basin OF-1 is located within E. Jewell Avenue near the southern side of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within E. Jewell Avenue to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point OF-1. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin OF-2

Sub-basin OF-2 is located within E. Jewell Avenue near the southern side of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within E. Jewell Avenue to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point OF-2. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin OF-3

Sub-basin OF-3 is located within E. Jewell Avenue near the southern side of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within E. Jewell Avenue to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point OF-3. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin OF-208

Sub-basin OF-208 is located within E. Jewell Avenue near the southeastern side of the Site and is one of three offsite sub-basins on the Site that drains via onsite public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin flows to the proposed on-grade curb inlet located at design point C208. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin OF-210

Sub-basin OF-210 is located within E. Jewell Avenue near the southern side of the Site and is one of three offsite sub-basins on the Site that drains via onsite public storm drain to the full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C210. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin OF-262

Sub-basin OF-262 is located within E. Jewell Avenue near the southern side of the Site and is one of three offsite sub-basins on the Site that drains via onsite public storm drain to the

full-spectrum detention Pond C that is located to the east of the Site. This sub-basin consists of paved roadway, concrete sidewalk, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point C262. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin A-518

Sub-basin A-518 is located within S. Kewaunee Street near the western edge of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within S. Kewaunee Street to the full-spectrum detention Pond A that is located to the northeast of Filing 1. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point A518. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin A-522

Sub-basin A-522 is located within S. Kewaunee Street near the western edge of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within S. Kewaunee Street to the full-spectrum detention Pond A that is located to the northeast of Filing 1. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point A522. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

Sub-basin A-526

Sub-basin A-526 is located within S. Kewaunee Street near the western edge of the Site and is one of three offsite sub-basins on the Site that drains via public storm drain within S. Kewaunee Street to the full-spectrum detention Pond A that is located to the northeast of Filing 1. This sub-basin consists of paved roadway, concrete sidewalk, residential buildings, and landscaping. The drainage flows to the proposed on-grade curb inlet located at design point A526. This sub-basin will utilize sheet flow and curb & gutter to facilitate flow to proposed public storm sewer.

On-site sub-basins flowing off-site:***Sub-basin OS-B1***

Sub-basin OS-B1 is located near the northeastern side of the Site and is one onsite sub-basins on the Site that drains off-site to a future public storm drain that is a part of a future filing to the east. It will likely be routed to a future the full-spectrum detention Pond B. This sub-basin flows to a future inlet within the roadway located east of design point OS-B1. This sub-basin consists of a portion of residential buildings and landscaping. The drainage will utilize sheet flow and curb & gutter to facilitate flow to future public storm sewer.

c. Impervious Table

RATIONAL CALCULATIONS SUMMARY						
DESIGN POINT	TRIBUTARY BASINS	TRIBUTAR Y AREA (AC)	PEAK FLOWS (CFS)		IMPERVIO USNESS (%)	ROUTED PEAK FLOWS (CFS)
			Q2	Q100		
On-Site Subbasins Draining to Basin C1 (Pond C)						
C100	C100	0.96	1.20	4.63	71.6%	87.06
C102	C102	0.60	0.94	3.57	73.0%	87.06
C104	C104	0.98	1.33	5.12	71.8%	12.55
C106	C106	1.62	1.89	7.43	69.9%	12.55
C108	C108	0.44	0.46	2.13	55.0%	5.32
C110	C110	0.49	0.86	3.19	75.6%	5.32
C112	C112	0.21	0.36	1.35	75.9%	2.99
C114	C114	0.24	0.45	1.64	77.5%	2.99
C116	C116	2.45	2.83	11.00	70.9%	58.00
C118	C118	3.42	3.66	14.76	67.3%	58.00
C120	C120	0.30	0.50	1.89	72.9%	4.42
C122	C122	0.39	0.67	2.53	73.8%	4.42
C124	C124	3.27	3.73	14.97	67.7%	25.34
C126	C126	2.39	2.58	10.37	67.6%	25.34
C128	C128	0.18	0.31	1.17	75.0%	2.47
C130	C130	0.20	0.34	1.30	73.3%	2.47
Basin C1 - Total		18.16	22.10	87.06	69.3%	87.06
On-Site Subbasins Draining to Basin C2 (Pond C)						
C200	C200	1.59	2.01	8.16	66.7%	168.68
C202	C202	0.93	1.30	5.41	64.3%	160.52
C204	C204	0.45	0.49	2.30	55.1%	114.30
C206	C206	0.36	0.46	2.06	58.0%	24.29
C208	C208	0.24	0.41	1.58	72.9%	2.80
C210	C210	0.19	0.31	1.22	70.2%	2.80
C212	C212	0.50	0.91	3.33	77.4%	24.29
C214	C214	0.51	0.91	3.32	77.4%	114.30
C216	C216	1.27	1.75	6.63	73.7%	108.68
C218	C218	0.80	1.08	4.21	70.7%	108.68
C220	C220	0.33	0.59	2.22	74.9%	6.91
C222	C222	0.58	0.90	3.37	74.7%	16.53
C224	C224	1.21	1.73	6.52	74.2%	16.53

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREAS (AC)	PEAK FLOWS (CFS)		IMPERVIOUSNESS (%)	ROUTED PEAK FLOWS (CFS)
			Q2	Q100		Q100
C226	C226	0.60	0.92	3.46	74.7%	16.10
C228	C228	3.04	2.89	12.64	60.0%	16.10
C230	C230	0.19	0.30	1.23	67.4%	2.49
C232	C232	1.72	0.61	4.69	31.3%	6.91
C234	C234	0.88	0.99	4.45	58.1%	6.64
C236	C236	0.62	1.09	4.10	74.3%	28.57
C238	C238	0.85	1.11	4.18	74.3%	58.06
C240	C240	0.33	0.59	2.19	74.9%	6.64
C242	C242	2.12	0.88	6.09	34.9%	90.94
C244	C244	0.78	1.01	4.04	67.9%	90.94
C246	C246	1.51	1.95	7.66	69.7%	22.74
C248	C248	3.30	3.73	15.08	67.0%	22.74
C250	C250	1.49	1.91	7.57	69.2%	22.74
C252	C252	0.40	0.68	2.58	73.4%	58.06
C254	C254	3.30	3.75	15.17	67.0%	22.74
C256	C256	1.49	1.92	7.59	69.2%	19.41
C258	C258	0.39	0.68	2.58	73.4%	28.57
C260	C260	2.99	2.65	11.82	58.7%	19.41
C262	C262	0.20	0.32	1.27	69.4%	2.49
Basin C2 - Total		35.17	40.82	168.68	63.6%	168.68
On-Site Subbasins Draining to Basin C3 (Pond C)						
C300	C300	13.97	28.93	92.87	95.1%	
Basin C3 - Total		13.97	28.93	92.87	95.1%	92.87
TOTAL ON-SITE TO POND C		67.30	91.86	348.61	71.7%	348.61
On-Site Subbasins draining Off-Site						
OSB1	OSB1	0.19	0.31	1.24	69.1%	
TOTAL ON-SITE DRAINING OFF-SITE		0.19	0.31	6.06	69.1%	1.24
TOTAL ON-SITE		67.49	92.17	349.85	71.7%	349.85
Off-Site Subbasins (Jewell) to Pond C via Existing Jewell Storm						
OF1	OF1	0.90	1.41	5.08	79.7%	
OF2	OF2	1.22	1.46	5.61	71.9%	

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)		IMPERVIOUSNESS (%)	ROUTED PEAK FLOWS (CFS)
			Q2	Q100		Q100
OF3	OF3	0.97	1.63	5.83	80.2%	
Off-Site Subbasins (Jewell) to Basin C2						
OF208	OF208	0.07	0.14	0.49	82.3%	
OF210	OF210	0.25	0.48	1.69	82.3%	
OF262	OF262	0.44	0.81	2.86	82.3%	
OFF-SITE TO POND C TOTAL		3.85	5.93	21.55	77.9%	21.55
TOTAL TO POND C		71.15	97.79	370.16	72.0%	370.16
Off-Site Subbasins Draining to Pond A						
A518	A518	0.91	1.46	5.31	78.4%	15.98
A522	A522	1.05	1.67	6.19	76.0%	10.66
A526	A526	0.73	1.18	4.47	73.7%	4.47
Basin A5 - Total		2.69	4.31	15.98	76.2%	15.98

Table 4 – Rational Calculation Summary Table

A comparison of the assumed routed peak flows and actual peak flows to the inlets are shown in **Table 5** below. Note that the inlet capacities for the design points (A518, A522, A526) that are a part of the Parklands Village 1 Filing 1 will be verified in the updated FDR. The inlet capacity calculations for the Foundry design points (OF1, OF2, OF3) will be confirmed as a part of the Project's Final Drainage Report.

Design Point	Actual Routed Peak Flows Q100 (cfs)	Assumed Routed Peak Flows Q100 (cfs)
A518	5.31	4.44
A522	6.19	3.29
A526	4.47	2.35
OF1 [Foundry OS-10]	5.13	5.08
OF2 [Foundry OS-9]	6.19	6.50
OF3 [Foundry OS-8]	5.93	4.70

Table 5 – Inlet Comparison Summary Table

The lot sizes were used to determine the land use types for the rational calculations and to show compliance with the assumed single family residential lots associated with the Foundry PDR. The Foundry PDR assumed 70% imperviousness on average as shown in **Appendix D**. Note that the determined imperviousness for each lot type is included within **Appendix B**. The table below includes a summary of the three lot types.

LOT TYPE	TYP. AREA (SF)	IMPERVIOUSNESS (%)
60' LOT	6710	71.3%
50' LOT	5610	70.0%
45' LOT	4830	69.9%

Table 6 – Lot Type Imperviousness Summary Table

d. Detention Ponds Location & Outfalls

The proposed drainage of the Site will adhere to the existing drainage pattern of the Site. Pond C will ultimately outfall directly into Coal Creek.

Onsite flows within Basin C will be conveyed via public storm drain to the existing full-spectrum detention Pond C located at the eastern boundary of Site. Basin C has a total tributary area of 437.73 acres with an imperviousness of 65.50% per Foundry PDR. Pond C has been sized to attenuate the WQCV, EURV and 100-year events, providing 49.487 acre-feet of 100-YR storage as shown within the Foundry PDR. Note that the Project has a 100-YR discharge rate to Pond C that is below the assumed value from the Foundry PDR report and therefore should also remain in compliance with the approved Parklands MDR.

After the water has been detained, Pond C will discharge directly into Coal Creek located immediately to the northeast of the pond. Note that the maximum allowable release rate of 414.47 cfs for Pond C is anticipated to remain unchanged (per approved Master Drainage Report and Foundry PDR). Pond C also incorporated the use of forebay structures, trickle channels and micropools that were designed in the Foundry PDR. Pond C was designed to retain the required WQCV for at least 40 hrs along with the required EURV and 100-year for 72 hrs.

e. Offsite Water Quality

Offsite basins that drain to public sewer within E. Jewell Avenue will be captured and treated within Pond C. Offsite basins that drain to public sewer within Kewaunee Street will be captured and treated within Pond A. Onsite basins flowing off-site will be treated by a temporary rain garden located to the northeast of the Site. All other onsite basins will be treated by Pond C.

f. Proposed Culverts

No additional solutions to note.

g. Bridge Concepts

Not Applicable.

h. Emergency Overflow paths

There are no emergency overflow paths to note.

i. Swale, Ditch, & Open Channel Concepts

There are no proposed swales, ditch, or open channel concepts a part of the project.

j. Geomorphic analysis

Not Applicable to this Design and Report

k. Table of Street & Alley Capacity

Tables 6-2 and 6-3 from the Criteria are included below which identify the allowable use for roadways and cross pans for the minor and major storm events. Note that the calculations for street capacity and cross pan capacity will be provided in the final drainage report as a part of **Appendix C**.

Table 6-2. Allowable Use of Roadways for Minor and Major Storm Runoff

Roadway Classification	Allowable Use of Roadways for Minor Storm Runoff	Allowable Use of Roadways for Major Storm Runoff
Local	No curb overtopping.* Flow may spread to crown of street but may not crest the crown.	<ul style="list-style-type: none"> The depth of water over the gutter flow line should not exceed one foot. Residential dwellings and public, commercial, and industrial buildings should be no less than one foot above the 100-year water surface elevation (WSEL) or two times the depth of flow, whichever is lesser, at the lowest point of entry (LPE) of the building. Where TODs and Aurora City Center have on-street parking, the maximum depth is 6 inches at the flowline of the parking curb or the curb extension. In no cases can garages be inundated in the 100-year event.
Collector	No curb overtopping. Flow spread must leave at least one lane (10 feet) free of water. If a median or divider is present, flow spread must leave at least one lane free of water in each direction.	<ul style="list-style-type: none"> The same major storm criteria for Local and Collector roadways also applies to Arterial Roadways. In addition: <ul style="list-style-type: none"> The depth of water should not exceed the street crown to allow operation of emergency vehicles.
Arterial	No curb overtopping. Flow spread must leave at least one lane (10 feet) free of water in each direction and should not flood more than two lanes in each direction.	
Parking Lots	N/A	For parking lots, the maximum depth allowed is 1.5 feet for a driving lane and one foot for a parking space.
Alleys	N/A	Alley must contain the 100-year storm event. Freeboard of 0.5 feet to the garage slab is recommended, but not required. In no cases can garages be inundated in the 100-year event.

*Water may spread to the back of walk where mountable curb and attached walk are used. For mountable curb with detached walk, water may spread to the crown of the street (no crown overtopping) or six-inch depth at the curb flowline, whichever is less.

Table 6-3. Allowable Use for Cross-street Flow in Cross Pans

Roadway Classification	Allowable Use of Cross Pans for Minor Storm Runoff	Allowable Use of Cross Pans for Major Storm Runoff
Local*	6 inches of depth in cross pan	12 inches of depth in cross pan or gutter flow line
Collector	Cross pans are not allowed to convey flows across Collector or Arterial roadways. Cross pans located parallel to an arterial require approval of the City Engineer.	
Arterial		

* Cross pans are only allowed at intersections controlled by stop signs. See Section 6.3.3 below.

I. Permanent SCMs

No permanent SCMs are proposed in this development.

m. Compliance to the Approved MDP

The associated Village 1 Filing 3 PDP complies to the approved MDP.

n. Other Solutions to Problems Encountered

No others to note.

E. Conclusion

1. Compliance with Standards

The project complies with the City of Aurora criteria for storm drainage design. City of Aurora Storm Drainage Design and Technical Criteria and the Urban Storm Drainage Criteria Manual Volumes 1, 2, and 3 have been adhered to in the design of the storm sewer system as well as Best Management Practices.

2. Summary of Concept

The project's runoff generated within the site will be collected using curb and gutter, swales, sheet flow, and storm drain systems that will convey stormwater runoff to the existing Pond C Stormwater will be detained and released at a rate consistent with the Foundry Filing 1 PDR, Parklands MDR, MHFD and City of Aurora Criteria Manual directly into Coal Creek. The proposed storm drain system will comply with the applicable master plans and outfall systems planning studies as noted previously in this report.

The weighted imperviousness of each housing product is compliant with the master plan imperviousness of 80%. Note that figures showing the imperviousness compliance for the lot types utilized is included in **Appendix B**.

List of References:

Storm Drainage Design and Technical Criteria, City of Aurora; November 2023.

Urban Storm Drainage Criteria Manual, Volumes 1-3, Urban Drainage and Flood Control District, Updated August 2018.

Master Drainage Report & Maps for the Parklands Development (EDN 223089); Core Engineers, April 3, 2023

Preliminary Drainage Report & Maps for the Foundry Filing No. 1 Development (EDN 223089); JR Engineering, April 5, 2024

Flood Insurance Rate Map, Map Number 08005C0216M, Federal Emergency Management Agency; December 17, 2010.

Flood Insurance Rate Map, Map Number 08005CO212K, Federal Emergency Management Agency; December 17, 2010.

Custom Soil Resource Report, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. May 23, 2024.

Appendix A –Soil, Precipitation, Floodplain, and Airport Pond Buffer Information



United States
Department of
Agriculture

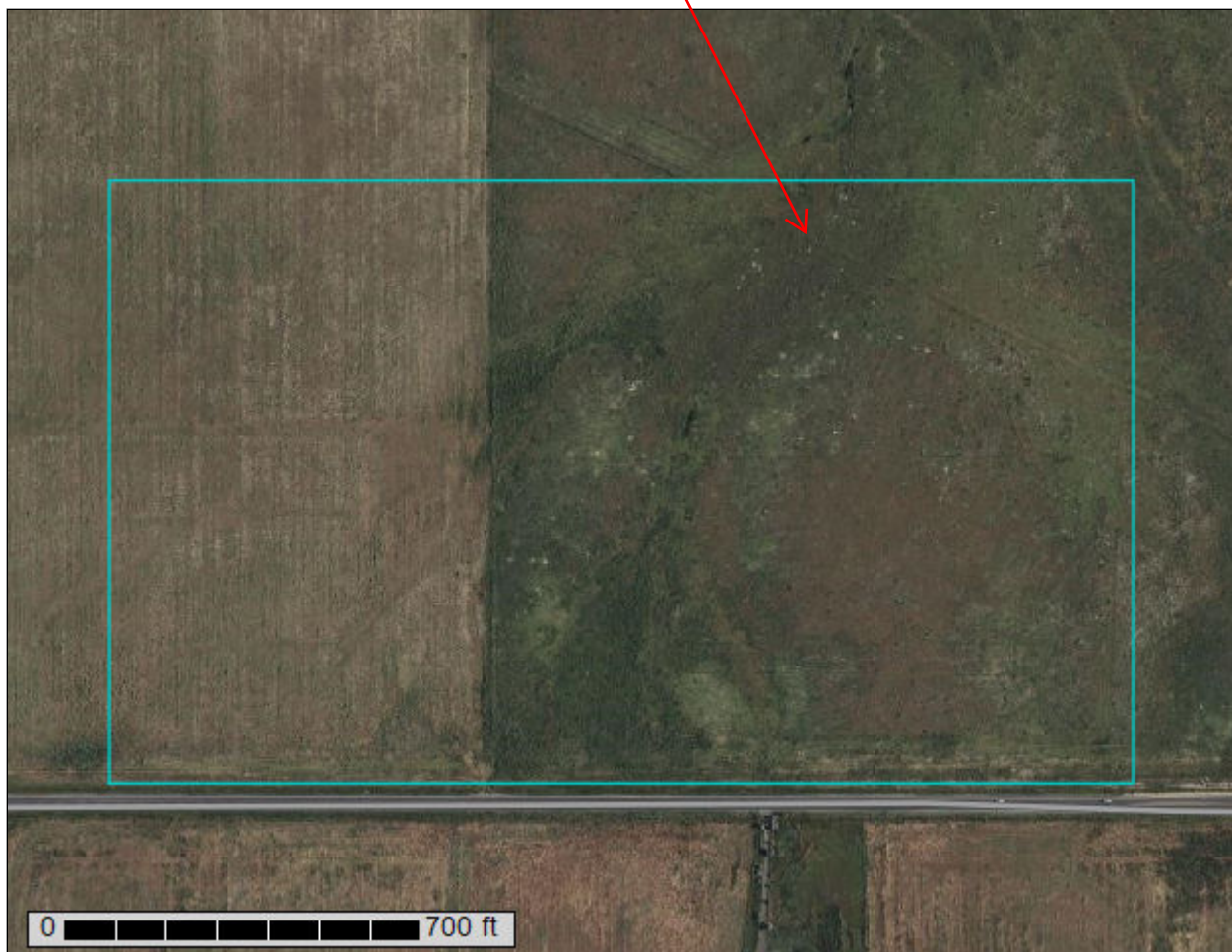
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

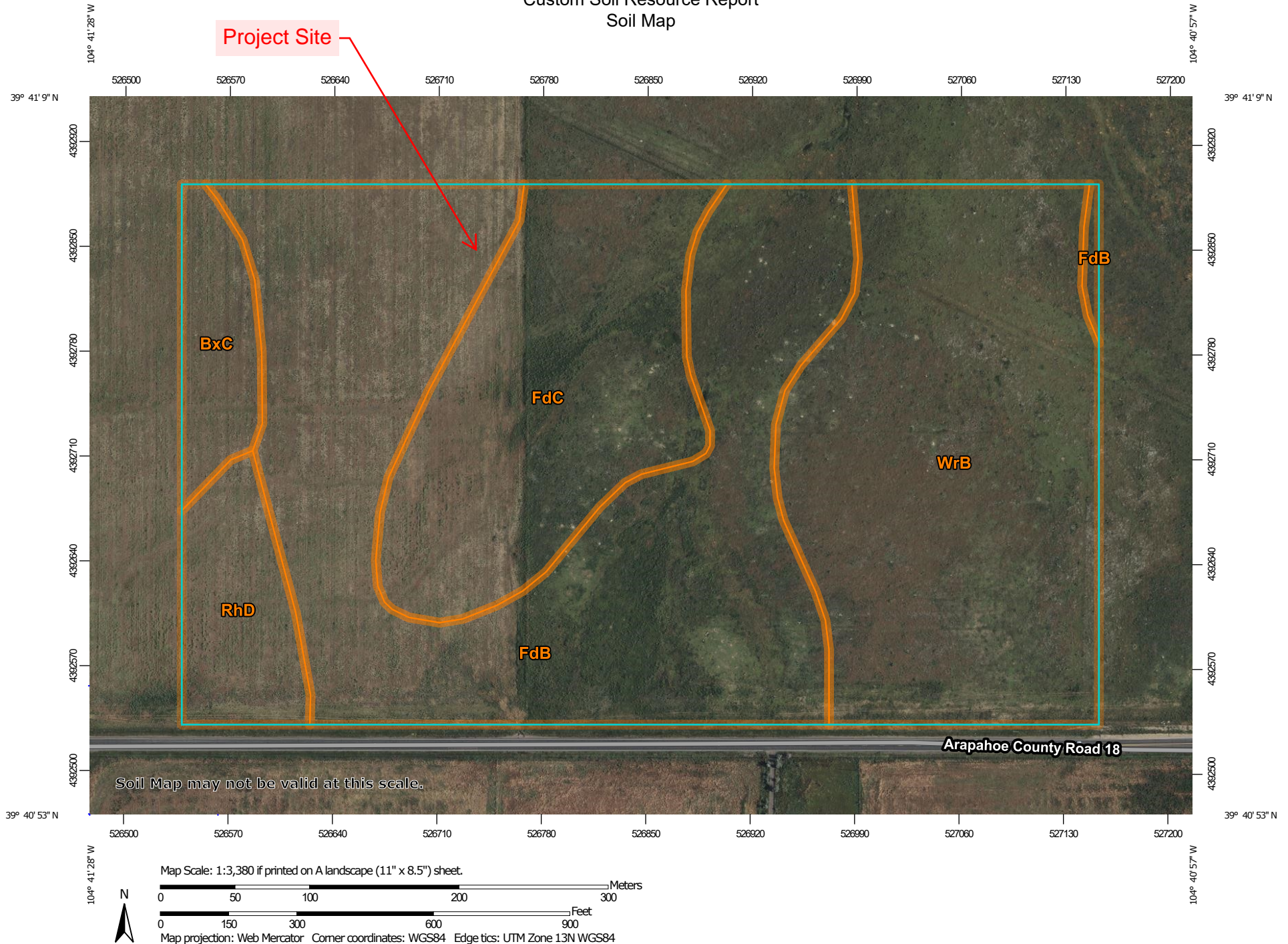
Custom Soil Resource Report for **Arapahoe County, Colorado**

Project Site



May 23, 2024

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout


 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit


 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Arapahoe County, Colorado
Survey Area Data: Version 19, Aug 24, 2023

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BxC	Buick loam, 3 to 5 percent slopes	2.2	4.1%
FdB	Fondis silt loam, 1 to 3 percent slopes	22.6	41.1%
FdC	Fondis silt loam, 3 to 5 percent slopes	10.5	19.0%
RhD	Renohill-Buick loams, 3 to 9 percent slopes	3.0	5.4%
WrB	Weld-Deertrail silt loams, 0 to 3 percent slopes	16.7	30.4%
Totals for Area of Interest		55.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Arapahoe County, Colorado

BxC—Buick loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34y8
Elevation: 4,700 to 6,200 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 150 to 170 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Buick and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buick

Setting

Landform: Drainageways, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 6 inches: loam
H2 - 6 to 22 inches: clay loam
H3 - 22 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3c
***Hydrologic Soil Group:* C**
Ecological site: R049XB202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Renohill

Percent of map unit: 5 percent

Custom Soil Resource Report

Hydric soil rating: No

Weld

Percent of map unit: 5 percent

Hydric soil rating: No

Colby

Percent of map unit: 5 percent

Hydric soil rating: No

FdB—Fondis silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34yh

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fondis and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty and/or loamy

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 27 inches: clay

H3 - 27 to 60 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Custom Soil Resource Report

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R049XB202CO - Loamy Foothill

Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 10 percent

Hydric soil rating: No

Buick

Percent of map unit: 5 percent

Hydric soil rating: No

FdC—Fondis silt loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 34yj

Elevation: 4,700 to 6,200 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fondis and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy and/or silty

Typical profile

H1 - 0 to 6 inches: silt loam

H2 - 6 to 24 inches: clay

H3 - 24 to 32 inches: silty clay loam

H4 - 32 to 46 inches: loam

H5 - 46 to 84 inches: clay loam

Properties and qualities

Slope: 3 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Custom Soil Resource Report

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R049XB202CO - Loamy Foothill

Hydric soil rating: No

Minor Components

Weld

Percent of map unit: 8 percent

Hydric soil rating: No

Buick

Percent of map unit: 7 percent

Hydric soil rating: No

RhD—Renohill-Buick loams, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 34z0

Elevation: 3,600 to 6,200 feet

Mean annual precipitation: 11 to 16 inches

Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 100 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Renohill and similar soils: 65 percent

Buick and similar soils: 25 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Renohill

Setting

Landform: Drainageways

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loam silty and clayey alluvium

Typical profile

H1 - 0 to 4 inches: loam

Custom Soil Resource Report

H2 - 4 to 18 inches: clay
H3 - 18 to 30 inches: clay loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
***Hydrologic Soil Group:* D**
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Description of Buick

Setting

Landform: Ridges
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 20 inches: clay loam
H3 - 20 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4c
***Hydrologic Soil Group:* C**
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Fondis

Percent of map unit: 5 percent
Hydric soil rating: No

Litle

Percent of map unit: 5 percent
Hydric soil rating: No

WrB—Weld-Deertrail silt loams, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 34zv
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 13 to 17 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Weld and similar soils: 60 percent
Deertrail and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weld

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loam silty and clayey eolian deposits

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 14 inches: silty clay
H3 - 14 to 26 inches: silty clay loam
H4 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Calcium carbonate, maximum content: 6 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: C

Ecological site: R067BY002CO - Loamy Plains

Hydric soil rating: No

Description of Deertrail

Setting

Landform: Depressions

Down-slope shape: Linear

Across-slope shape: Linear

Typical profile

H1 - 0 to 2 inches: silt loam

H2 - 2 to 9 inches: clay

H3 - 9 to 12 inches: silty clay

H4 - 12 to 32 inches: silty clay loam

H5 - 32 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Gypsum, maximum content: 2 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Sodium adsorption ratio, maximum: 35.0

Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: C

Ecological site: R067BY047CO - Alkaline Plains

Hydric soil rating: No

Minor Components

Heldt

Percent of map unit: 7 percent

Hydric soil rating: No

Colby

Percent of map unit: 6 percent

Hydric soil rating: No

Custom Soil Resource Report

Adena

Percent of map unit: 2 percent

Hydric soil rating: No



NOAA Atlas 14, Volume 8, Version 2
Location name: Aurora, Colorado, USA*
Latitude: 39.688°, Longitude: -104.693°
Elevation: 5620 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.228 (0.185-0.284)	0.283 (0.229-0.352)	0.381 (0.306-0.475)	0.469 (0.375-0.587)	0.600 (0.467-0.787)	0.709 (0.537-0.938)	0.826 (0.603-1.12)	0.951 (0.666-1.32)	1.13 (0.758-1.60)	1.27 (0.827-1.82)
10-min	0.334 (0.270-0.415)	0.415 (0.335-0.516)	0.558 (0.449-0.695)	0.686 (0.549-0.859)	0.878 (0.685-1.15)	1.04 (0.787-1.37)	1.21 (0.884-1.64)	1.39 (0.974-1.93)	1.65 (1.11-2.34)	1.86 (1.21-2.66)
15-min	0.408 (0.330-0.507)	0.506 (0.409-0.629)	0.680 (0.547-0.848)	0.837 (0.669-1.05)	1.07 (0.835-1.40)	1.27 (0.960-1.68)	1.47 (1.08-1.99)	1.70 (1.19-2.35)	2.02 (1.35-2.86)	2.27 (1.48-3.24)
30-min	0.558 (0.451-0.693)	0.691 (0.558-0.859)	0.926 (0.745-1.16)	1.14 (0.910-1.42)	1.46 (1.13-1.91)	1.72 (1.30-2.27)	2.00 (1.46-2.70)	2.30 (1.61-3.19)	2.73 (1.83-3.87)	3.07 (2.00-4.39)
60-min	0.696 (0.563-0.866)	0.856 (0.691-1.06)	1.14 (0.919-1.42)	1.40 (1.12-1.76)	1.79 (1.40-2.36)	2.12 (1.61-2.81)	2.47 (1.81-3.35)	2.86 (2.00-3.96)	3.40 (2.28-4.82)	3.83 (2.50-5.48)
2-hr	0.835 (0.679-1.03)	1.02 (0.830-1.26)	1.36 (1.10-1.68)	1.66 (1.34-2.07)	2.13 (1.68-2.78)	2.52 (1.93-3.32)	2.95 (2.17-3.96)	3.41 (2.40-4.69)	4.06 (2.75-5.72)	4.59 (3.02-6.50)
3-hr	0.921 (0.752-1.13)	1.12 (0.913-1.38)	1.48 (1.20-1.82)	1.81 (1.46-2.24)	2.31 (1.83-3.01)	2.74 (2.10-3.59)	3.20 (2.37-4.28)	3.70 (2.63-5.07)	4.42 (3.01-6.20)	5.00 (3.30-7.05)
6-hr	1.11 (0.911-1.35)	1.34 (1.10-1.63)	1.75 (1.43-2.14)	2.12 (1.73-2.61)	2.70 (2.14-3.47)	3.18 (2.45-4.12)	3.70 (2.76-4.90)	4.26 (3.04-5.78)	5.06 (3.47-7.03)	5.71 (3.80-7.97)
12-hr	1.36 (1.13-1.65)	1.64 (1.35-1.98)	2.12 (1.75-2.57)	2.55 (2.09-3.11)	3.19 (2.55-4.06)	3.72 (2.89-4.78)	4.29 (3.21-5.62)	4.89 (3.52-6.56)	5.74 (3.97-7.88)	6.42 (4.31-8.89)
24-hr	1.66 (1.38-1.99)	1.99 (1.65-2.39)	2.54 (2.11-3.06)	3.03 (2.49-3.66)	3.73 (2.98-4.67)	4.30 (3.35-5.44)	4.89 (3.68-6.33)	5.51 (3.99-7.31)	6.38 (4.43-8.66)	7.06 (4.77-9.68)
2-day	1.96 (1.64-2.34)	2.33 (1.95-2.78)	2.94 (2.45-3.52)	3.47 (2.88-4.16)	4.22 (3.39-5.22)	4.81 (3.77-6.02)	5.42 (4.11-6.93)	6.05 (4.41-7.93)	6.92 (4.84-9.29)	7.59 (5.18-10.3)
3-day	2.14 (1.80-2.54)	2.52 (2.12-2.99)	3.16 (2.65-3.76)	3.71 (3.09-4.43)	4.49 (3.62-5.53)	5.10 (4.02-6.35)	5.73 (4.36-7.29)	6.38 (4.67-8.32)	7.27 (5.12-9.71)	7.96 (5.46-10.8)
4-day	2.28 (1.92-2.69)	2.67 (2.25-3.16)	3.34 (2.80-3.96)	3.90 (3.26-4.64)	4.70 (3.80-5.77)	5.34 (4.22-6.62)	5.98 (4.57-7.58)	6.66 (4.88-8.64)	7.57 (5.34-10.1)	8.28 (5.69-11.1)
7-day	2.61 (2.21-3.06)	3.04 (2.57-3.57)	3.76 (3.18-4.43)	4.38 (3.67-5.17)	5.24 (4.26-6.37)	5.92 (4.70-7.28)	6.60 (5.07-8.30)	7.32 (5.40-9.42)	8.28 (5.88-10.9)	9.02 (6.24-12.0)
10-day	2.90 (2.47-3.39)	3.36 (2.86-3.94)	4.13 (3.50-4.85)	4.78 (4.02-5.63)	5.68 (4.63-6.88)	6.39 (5.09-7.83)	7.11 (5.48-8.89)	7.84 (5.81-10.0)	8.83 (6.30-11.6)	9.59 (6.67-12.8)
20-day	3.76 (3.22-4.36)	4.30 (3.68-4.99)	5.18 (4.42-6.03)	5.92 (5.01-6.91)	6.92 (5.68-8.29)	7.70 (6.18-9.33)	8.48 (6.59-10.5)	9.27 (6.92-11.7)	10.3 (7.42-13.4)	11.1 (7.80-14.6)
30-day	4.47 (3.84-5.16)	5.09 (4.37-5.88)	6.10 (5.22-7.07)	6.93 (5.90-8.05)	8.05 (6.62-9.57)	8.90 (7.17-10.7)	9.74 (7.59-12.0)	10.6 (7.93-13.3)	11.7 (8.43-15.0)	12.5 (8.81-16.4)
45-day	5.34 (4.60-6.14)	6.11 (5.26-7.02)	7.33 (6.30-8.45)	8.32 (7.10-9.62)	9.62 (7.92-11.3)	10.6 (8.54-12.6)	11.5 (9.01-14.1)	12.4 (9.35-15.5)	13.6 (9.85-17.4)	14.4 (10.2-18.8)
60-day	6.07 (5.24-6.95)	6.98 (6.03-8.00)	8.43 (7.26-9.68)	9.57 (8.20-11.0)	11.1 (9.12-13.0)	12.1 (9.82-14.4)	13.2 (10.3-16.0)	14.2 (10.7-17.6)	15.4 (11.2-19.6)	16.2 (11.6-21.1)

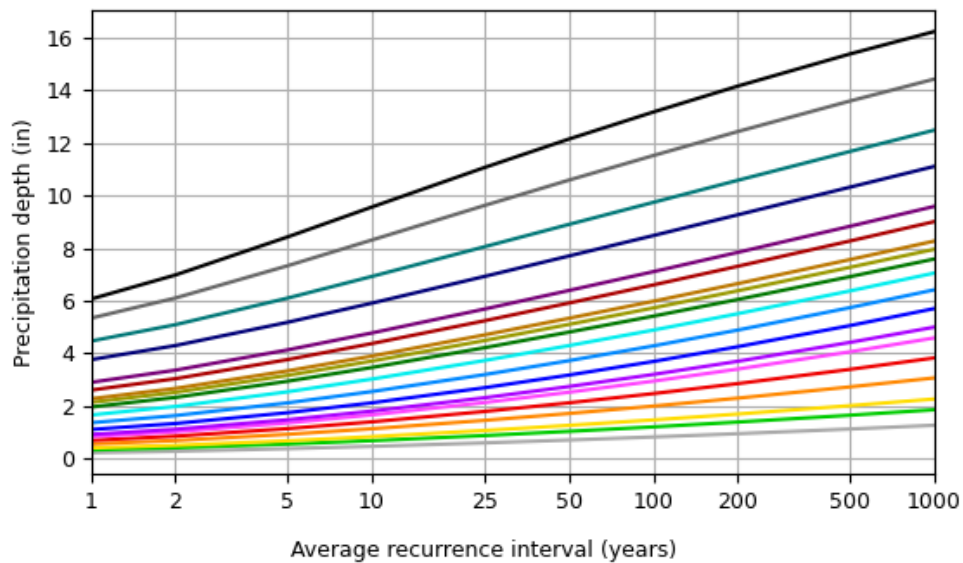
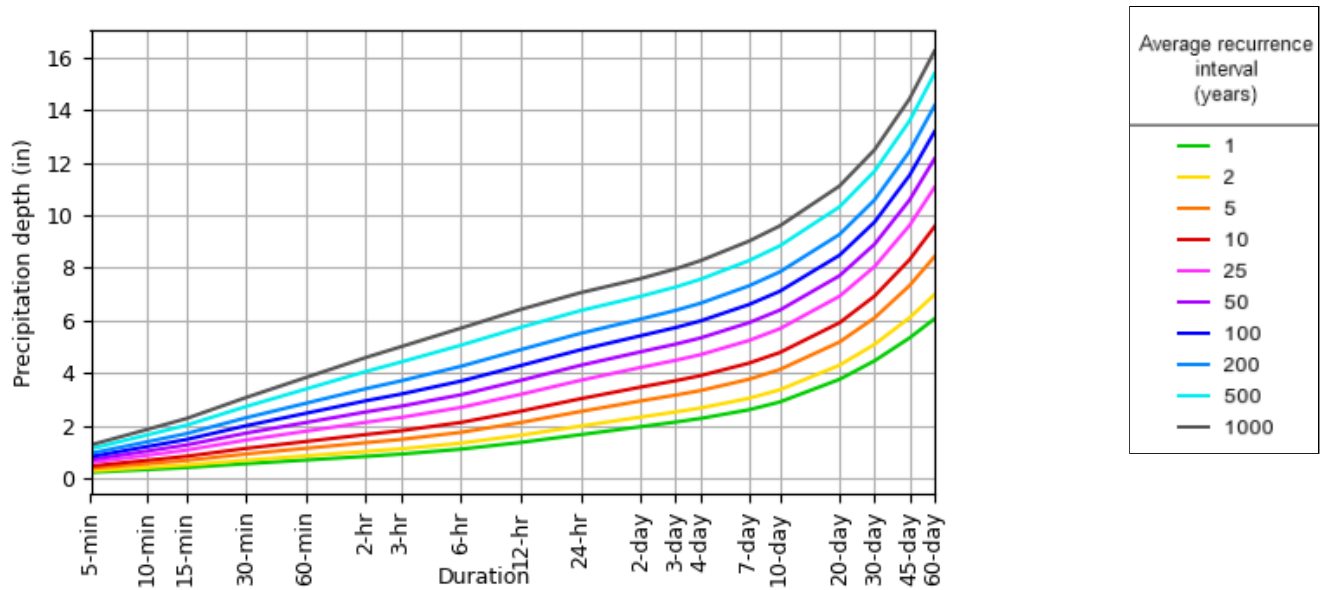
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves

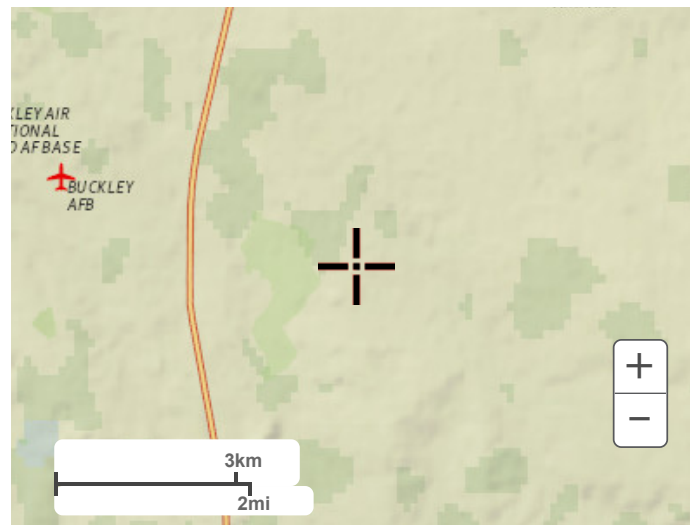
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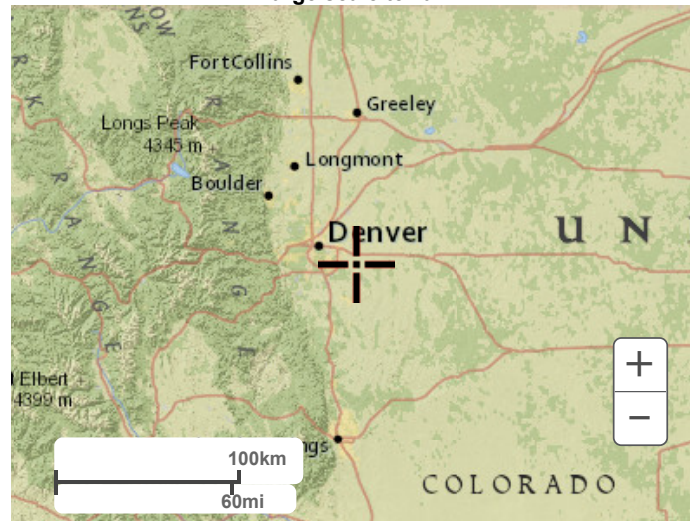
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Fri Feb 9 00:49:42 2024

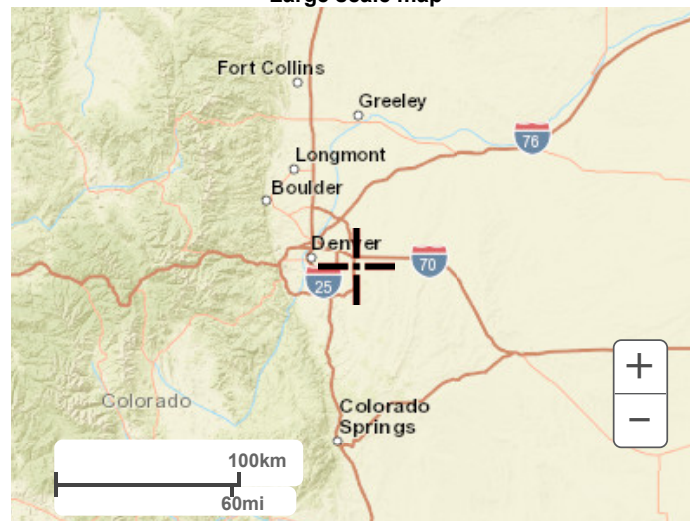
[Back to Top](#)**Maps & aerals****Small scale terrain**



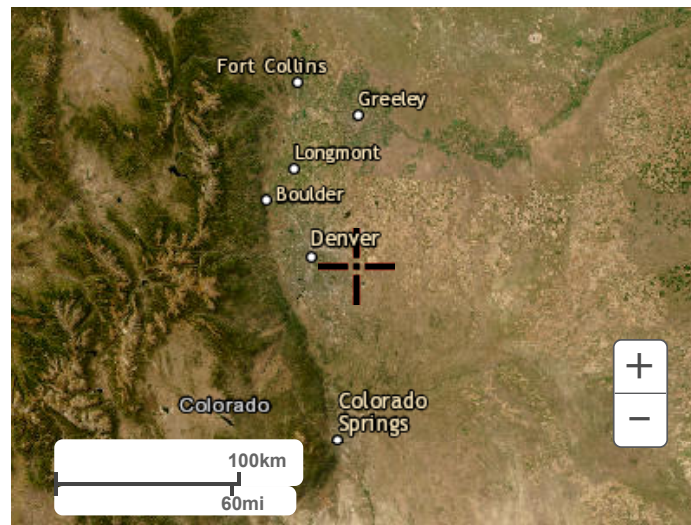
Large scale terrain



Large scale map



Large scale aerial



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[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov
[Disclaimer](#)

NOTES TO USERS

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

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Coastal Base Flood Elevations shown on this map apply only landward of 0.7 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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

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

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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

NGS Information Services
NOAA/NHMS12
National Geodetic Survey
SSM-C-3, #6202
1315 East-West Highway
Silver Spring, MD 20910-3282

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

Base map information shown on this FIRM was provided by the Arapahoe County and Cities of Aurora and Littleton GIS departments. The coordinate system used for production of the digital FIRM is Universal Transverse Mercator, Zone 13N, referenced to the North American Datum of 1983 and the GRS 80 spheroid, Western Hemisphere.

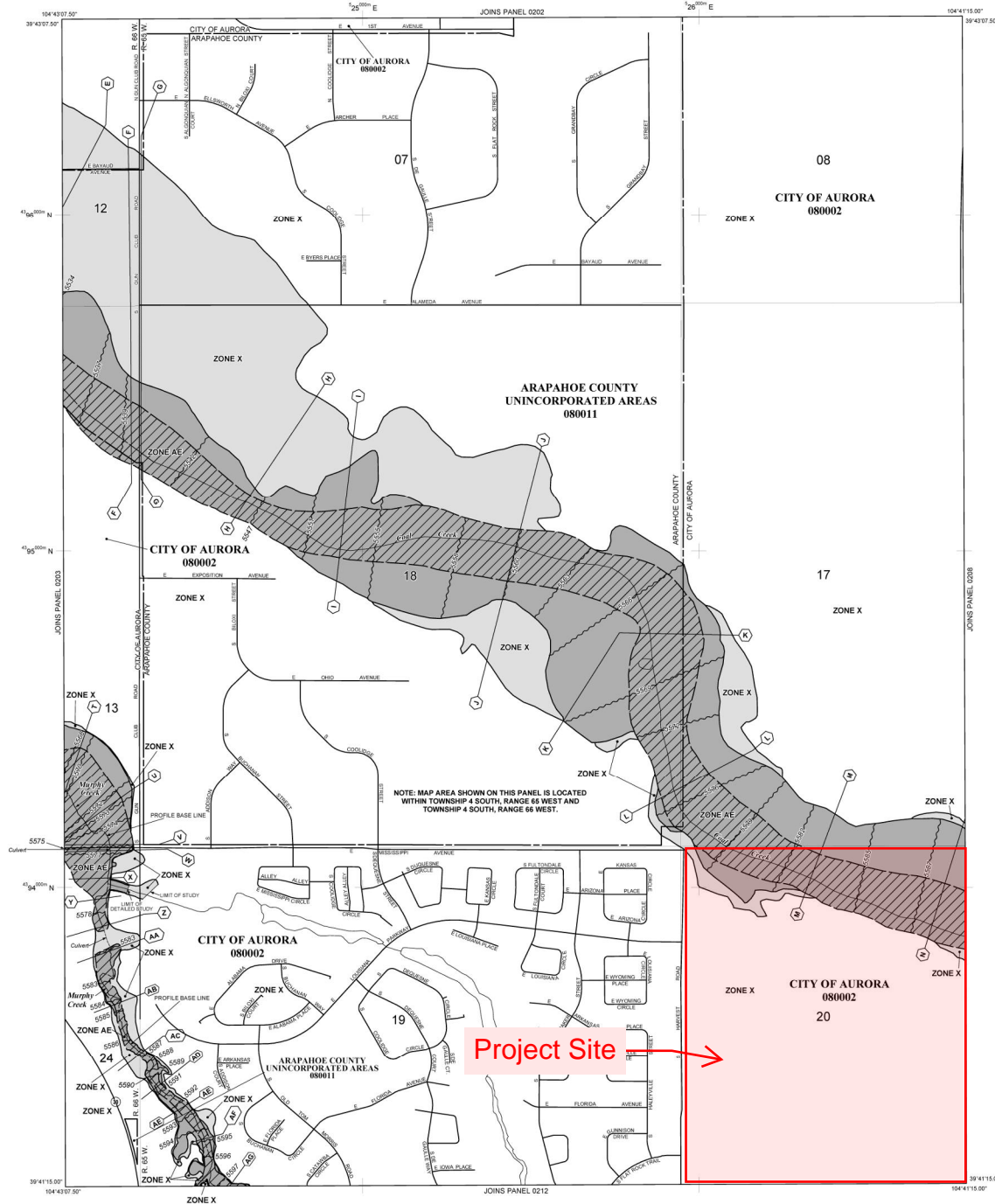
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Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-356-2627) or visit the FEMA website at <http://www.fema.gov/>.



Project Site

LEGEND

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

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

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently identified.

ZONE AR9 Area to be protected from 1% annual chance flood by a Federal flood protection system; no Base Flood Elevations determined.

ZONE AV Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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

OTHER FLOOD AREAS

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

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPA)

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

Floodway boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different base flood elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet

Base Flood Elevation value where uniform within zone; elevation in feet

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

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

1000-meter Universal Transverse Mercator grid ticks; zone 13

5000-foot grid ticks; New York State Plane coordinate system, east zone (FIPSZONE 3101), Transverse Mercator

Bench mark (see explanation in Notes to Users section of this FIRM panel)

Map Repositories

Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTY/STATE FLOOD INSURANCE RATE MAP

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

December 17, 2010 - to update map format, to change Special Flood Hazard Areas, and to change Base Flood Elevation.

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

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-635-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

PANEL 0204K

FIRM

FLOOD INSURANCE RATE MAP

ARAPAHOE COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 204 OF 725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL SUFFIX
ARAPAHOE COUNTY	080011	0204 K
AURORA, CITY OF	080002	0204 K

Map Number
0800SC0204K

MAP REVISED
DECEMBER 17, 2010

Federal Emergency Management Agency

NOTES TO USERS

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NGS Information Services
NOAA NINGS12
National Geodetic Survey
SSM-C-3, #2022
1315 East-West Highway
Silver Spring, MD 20910-3282

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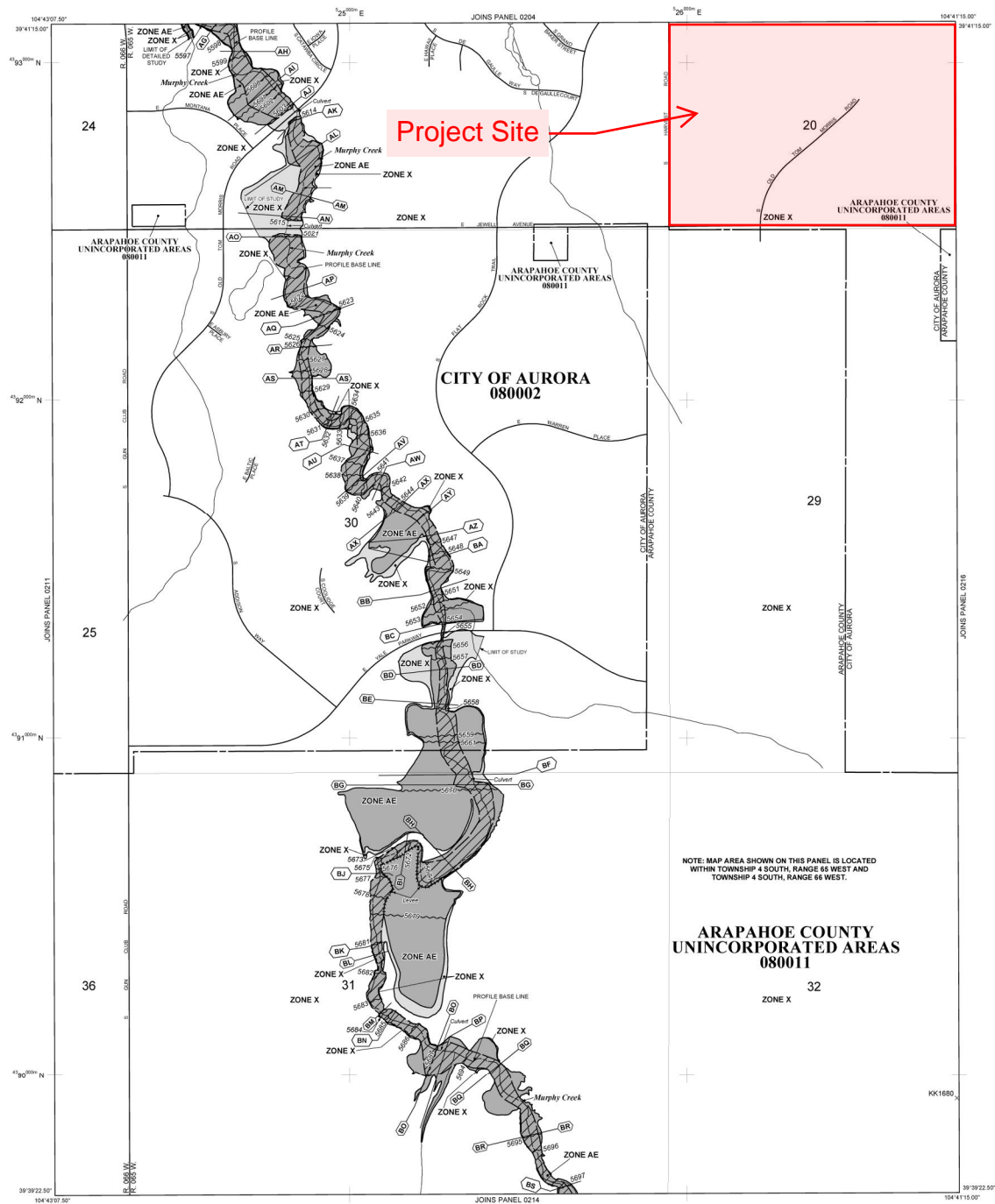
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If you have **questions about this map** or **questions concerning the National Flood Insurance Program** in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 4 SOUTH, RANGE 66 WEST AND TOWNSHIP 4 SOUTH, RANGE 66 WEST.

ARAPAHOE COUNTY UNINCORPORATED AREAS 080011

LEGEND

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

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

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually sheet flow or ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow or ponding); Base Flood Elevation determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently identified as inadequate. Areas within the former flood control system are now protected by flood protection from the 1% annual chance or greater flood.

ZONE AR9 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

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

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

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

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodway boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
Base Flood Elevation line and value; elevation in feet
Base Flood Elevation value where uniform within zone; elevation in feet

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
Cross section line
Transverse line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
1000-meter Universal Transverse Mercator grid ticks; zone 13
5000-foot grid ticks; New York State Plane coordinate system, east zone (FIPSZONE 3011), Transverse Mercator

Bench mark (see explanation in Notes to Users section of this FIRI panel)
DXXXX
M1.5
River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTRYWIDE FLOOD INSURANCE RATE MAP
April 1, 1989
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
December 17, 2010 - to update map format, to change Special Flood Hazard Areas, and to change Base Flood Elevations

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

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-635-6620.

MAP SCALE 1" = 500'
250 0 500 1000
150 0 150 300
FEET
METERS

NFIP

PANEL 0212K

FIRM FLOOD INSURANCE RATE MAP

ARAPAHOE COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 212 OF 725
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ARAPAHOE COUNTY	080011	0212	K
AURORA, CITY OF	080002	0212	K

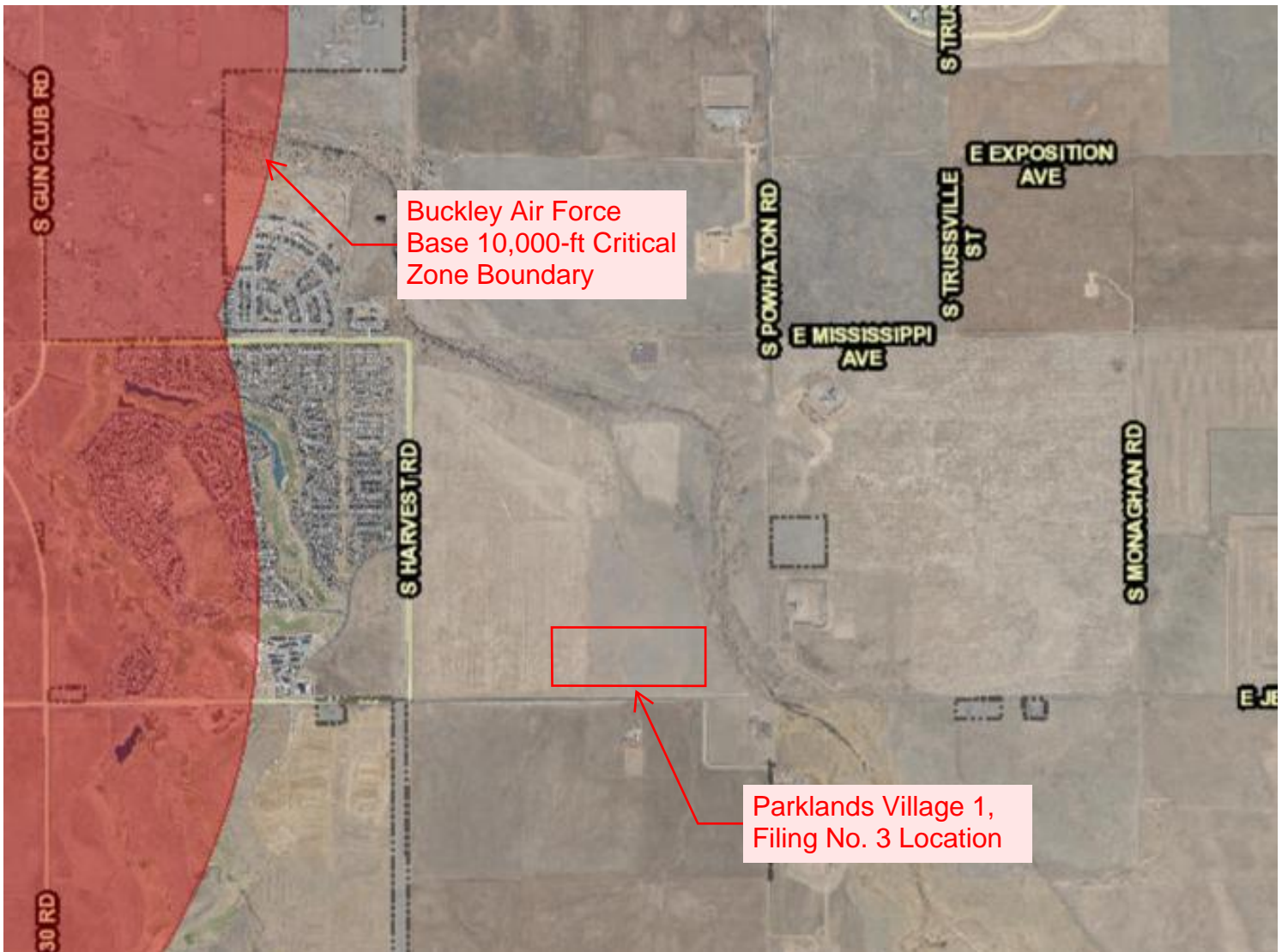
Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 08005C0212K

MAP REVISED DECEMBER 17, 2010

Federal Emergency Management Agency

**Buckley Air Force Base
10,000-ft Critical Zone Boundary**



**Map Not to Scale
GIS Map based on Aurora Open
Data Airport Detention Pond Buffers
Buckley Air Force Base 10,000 ft
Critical Zone**

Appendix B – Hydrologic Computations

Table 5-5. Land Use Based Imperviousness Values for Master Planning

Land Use/Density	Recommended Imperviousness* (Roads Included)
Residential	
Rural SFH (0 - 3 du/ac)	35%
Low & Medium-Density SFH (3 - 5 du/ac)	55%
Manufactured Housing (>= 10 du/ac)	65%
Medium-Density MFH/High Density SFH (5 - 20 du/ac)	65%
High-Density MFH (>20 du/ac)	70%
Commercial	
Low-Density Commercial	65%
Medium- to High-Density Commercial	80%
Urban Core Commercial	90%
Industrial/Institutional	
Schools	55%
Office/Institutional	65%
Industrial Areas	75%
Solar Farm, Gravel Cover ^{*,Δ}	60%
Solar Farm, Grass Cover ^{*,Δ}	45%
Parks and Open Space	
Historic Flow Analysis, Undisturbed Native Grasses, Agricultura Open Space	5%
Community Parks	25%
Neighborhood Parks	25%
Golf Courses	30%
Cemeteries	25%

* Imperviousness values shown in this table are the minimum imperviousness values for a specific land use for Master Drainage Reports (MDRs) and Master Drainage Plans. For Preliminary Drainage Reports (PDRs), imperviousness values must be calculated based on the surface type per Table 5-6. If the Engineer and/or Master Developer are aware of a proposed product type that would increase the imperviousness values beyond what is in this table, the MDR should take this into account.

Imperviousness values at the PDR stage that exceed those used in the MDR, due to changes in land use, may require an amendment to the MDR (see Chapter 2). If the existing downstream infrastructure has already been constructed based on the lower imperviousness values from the MDR, an increase in imperviousness may not be permitted, or may require approved or in-process plans and/or existing infrastructure to be revised.

† Use these values at the master planning stage when the specific layout of panels is not known. Use the values in Table 5-6 at the site planning and design stages when the orientation of panels relative to contours is known.

Δ Assumes a 1:1 ratio of panels to aisles. See the technical memorandum entitled *Determination of Solar Panel Field Runoff Coefficients and Imperviousness Values* (Earles, Olson, & Howard, 2023) for additional information on procedures to reflect other impervious areas (such as roads and pads that may be part of a solar field) and layouts with wider inter-panel spacing.

At the detailed design and site planning phase for a project, more information is known about the proposed site layout, including the location of buildings, asphalt, sidewalks, pervious areas, and other types of ground cover. At the detailed design stage, the engineer should apply the

Table 5-6. Imperviousness Values for Urban Surfaces for Site and Small Watershed Analysis

Surface Type		Imperviousness
Paved Streets		95%
Concrete Drive and Walks		95%
Roofs		95%
Gravel	No Traffic Areas (pedestrian use)	40%
	Low Traffic Areas (maintenance paths and substations)	60%
	High Traffic Areas (roadways and parking)	80%
Landscaping (including water-wise vegetation, active turf, uncompacted gravel, planting beds, residential artificial turf, etc.)		20%
Artificial Turf (non-residential)	Landscape applications (with subgrade drainage layer)	45% [†]
	Sport fields with underdrain pipe system	65%
Open Water Areas, including footprint of WQCV		100%
Solar Panels, Gravel Cover, Rows Parallel to Contours*		50%
Solar Panels, Gravel Cover, Rows Diagonal to Contours*		60%
Solar Panels, Gravel Cover, Rows Perpendicular to Contours*		75%
Solar Panels, Grass Cover, Rows Parallel to Contours*		10%
Solar Panels, Grass Cover, Rows Diagonal to Contours*		20%
Solar Panels, Grass Cover, Rows Perpendicular to Contours*		45%
Historic Flow Analysis, Undisturbed Native Grasses, Agricultural, Open Space		5%
Newly Graded Areas, prior to full vegetation establishment		65%
Restored open space with decompacted soils and full vegetation establishment**		10%

[†] Lower imperviousness values will be considered as a variance, when supported by manufacturer's specifications and/or other data.

* Assumes a 1:1 ratio of panels to aisles. See the technical memorandum entitled *Determination of Solar Panel Field Runoff Coefficients and Imperviousness Values* (Earles, Olson, & Howard, 2023) for additional information on procedures to reflect other impervious areas (such as roads and pads that may be part of a solar field) and layouts with wider inter-panel spacing.

** Full vegetation establishment is defined in *City of Aurora Rules and Regulations Regarding Stormwater Discharges Associated with Construction Activities* as [having] established uniform density matching at least 70% of pre-disturbance vegetative density coverage, [with] no bare spots, etc. If a site's SWMP permit has been closed out, then full vegetation establishment can be assumed.

5.3.2 Runoff Coefficients for Rational Method

Rational Method runoff coefficients shall be determined using the methodology described in Volume 1, Chapter 6: Runoff of the MHFD Manual. The MHFD methodology uses the imperviousness of a drainage area in conjunction with the hydrologic soil group (HSG) to calculate the runoff coefficient. The imperviousness of the land use/surface type draining to the point of interest should be derived from Table 5-5 or Table 5-6 above (depending on the stage of the design). The HSG may be determined using the Natural Resources Conservation Service's (NRCS's) [Web Soil Survey](#) (Natural Resources Conservation Service). These data may be used alongside the tables, charts, and equations in Volume 1, Chapter 6: Runoff of the MHFD Manual to determine runoff coefficients for the Rational Method.

Table 5-7. Runoff Coefficient Equations Based on NRCS Soil Group and Storm Return Period²⁶

NRCS Soil Group	Storm Return Period						
	2-year	5-year	10-year	25-year	50-year	100-year	500-year
A	$C_A = 0.84i^{1.302}$	$C_A = 0.86i^{1.276}$	$C_A = 0.87i^{1.232}$	$C_A = 0.88i^{1.124}$	$C_A = 0.85i + 0.025$	$C_A = 0.78i + 0.110$	$C_A = 0.65i + 0.254$
B	$C_B = 0.84i^{1.169}$	$C_B = 0.86i^{1.088}$	$C_B = 0.81i + 0.057$	$C_B = 0.63i + 0.249$	$C_B = 0.56i + 0.328$	$C_B = 0.47i + 0.426$	$C_B = 0.37i + 0.536$
C/D	$C_{C/D} = 0.83i^{1.122}$	$C_{C/D} = 0.82i + 0.035$	$C_{C/D} = 0.74i + 0.132$	$C_{C/D} = 0.56i + 0.319$	$C_{C/D} = 0.49i + 0.393$	$C_{C/D} = 0.41i + 0.484$	$C_{C/D} = 0.32i + 0.588$

Where:

i = % imperviousness (expressed as a decimal)

C_A = Runoff coefficient for Natural Resources Conservation Service (NRCS) HSG A soils

C_B = Runoff coefficient for NRCS HSG B soils

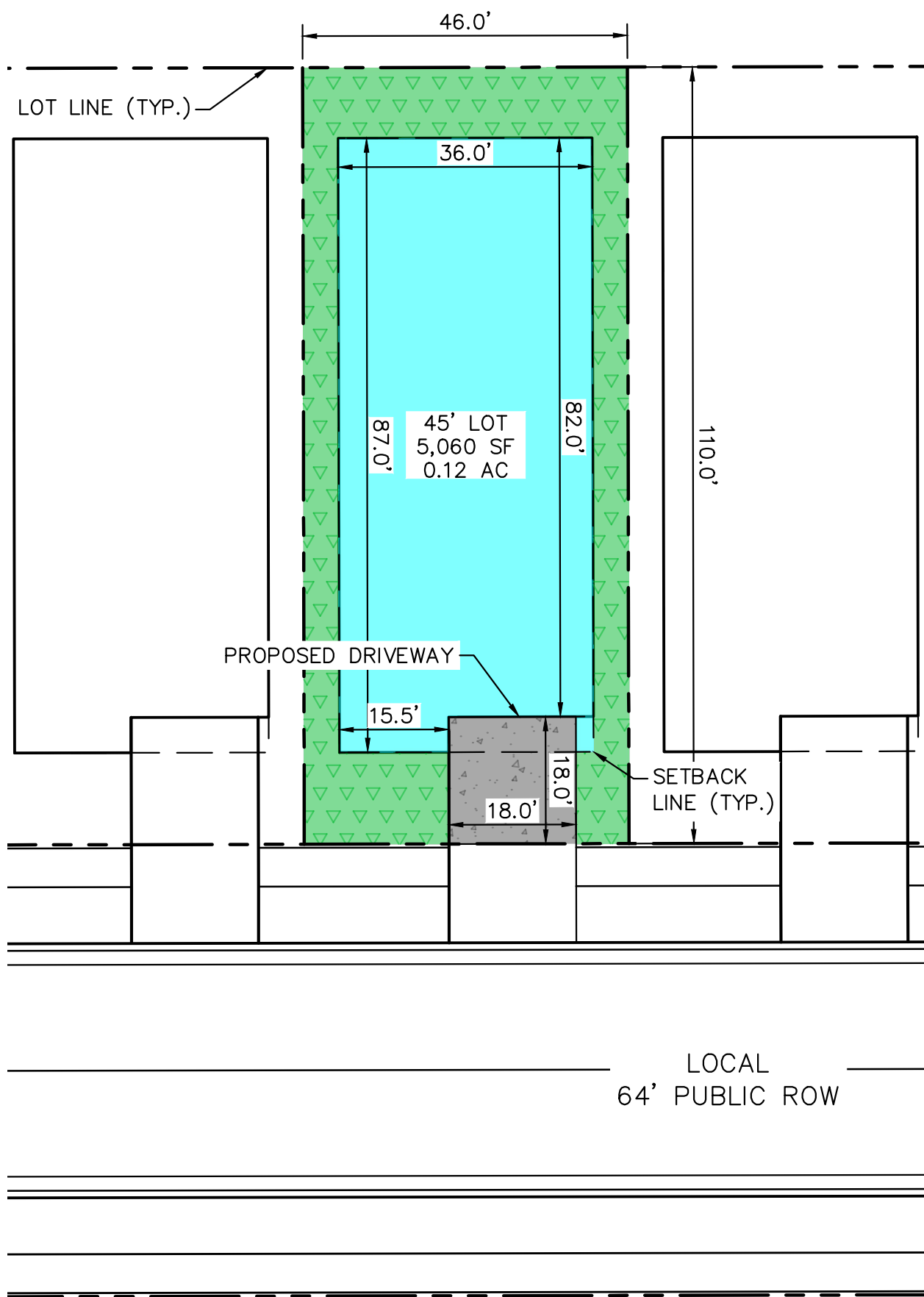
$C_{C/D}$ = Runoff coefficient for NRCS HSG C and D soils.

²⁶ Table 5-7 is a reproduction of Table 6-4 in Volume 1, Chapter 6: Runoff of the MHFD Manual as of the date of publication of this Manual (Mile High Flood District, latest edition). Note that the most up-to-date equations and methodology per the MHFD Manual shall be used to calculate runoff coefficients.

WORST CASE SCENARIO FOR SINGLE FAMILY LOTS

FOR

THE PARKLANDS VILLAGE 1, FILING NO. 3



DETAIL #1
SMALL SINGLE-FAMILY DETACHED LOT
TYPICAL LOT SETBACK DETAIL
≥45' FRONTAGE
1" = 20'

LEGEND:

PROPOSED ROOF

PROPOSED PAVING

PROPOSED LANDSCAPING

NOTE:

THIS IS THE WORST CASE SCENARIO FOR THE SINGLE FAMILY PORTION OF THE PARKLANDS FILING 3 SUBDIVISION. AN AVERAGE OF THE LOT IMPERVIOUS CALCULATIONS SHOWS COMPLIANCE WITH THE 70% IMPERVIOUSNESS VALUE ASSUMED IN THE FOUNDRY DEVELOPMENT PDR FOR SINGLE FAMILY RESIDENTIAL USE.

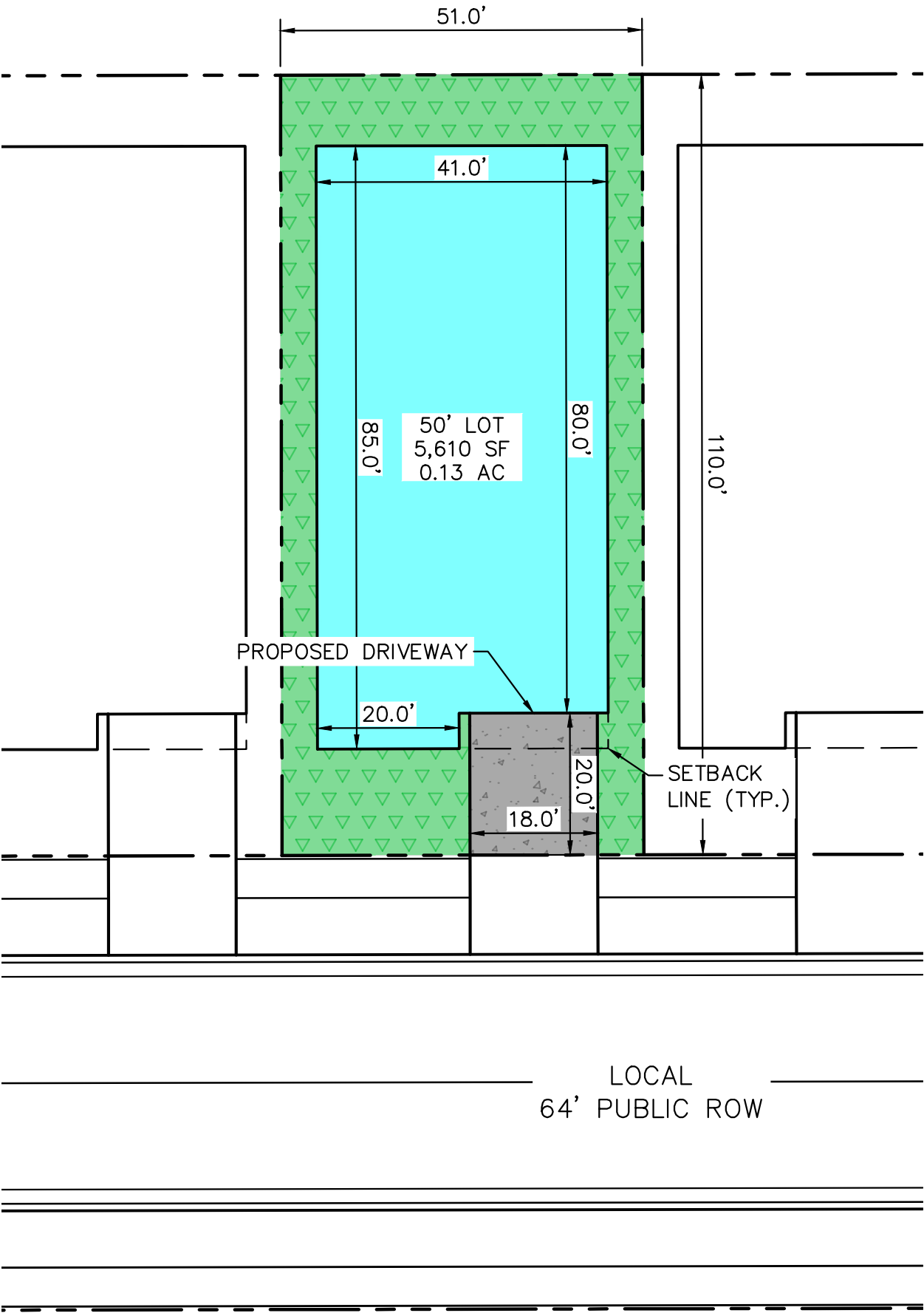
LOT TYPE	TOTAL AREA (AC)	TOTAL AREA (AC)			LANDSCAPING			PAVING			BASINS TOTAL WEIGHTED % IMP.
		% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	
45' LOT	0.12	95%	0.07	57.1%	20%	0.04	6.7%	95%	0.007	6.1%	69.9%

K:\DEN_Civil\196480001_Parklands Village 1\CADD\Filing 3\Exhibits\PDP Worst Case Lots.dwg

WORST CASE SCENARIO FOR SINGLE FAMILY LOTS

FOR

THE PARKLANDS VILLAGE 1, FILING NO. 3



DETAIL #2
STANDARD SINGLE-FAMILY DETACHED LOT
TYPICAL LOT SETBACK DETAIL
≥50' FRONTAGE
1" = 20'

LEGEND:

PROPOSED ROOF

PROPOSED PAVING

PROPOSED LANDSCAPING

NOTE:

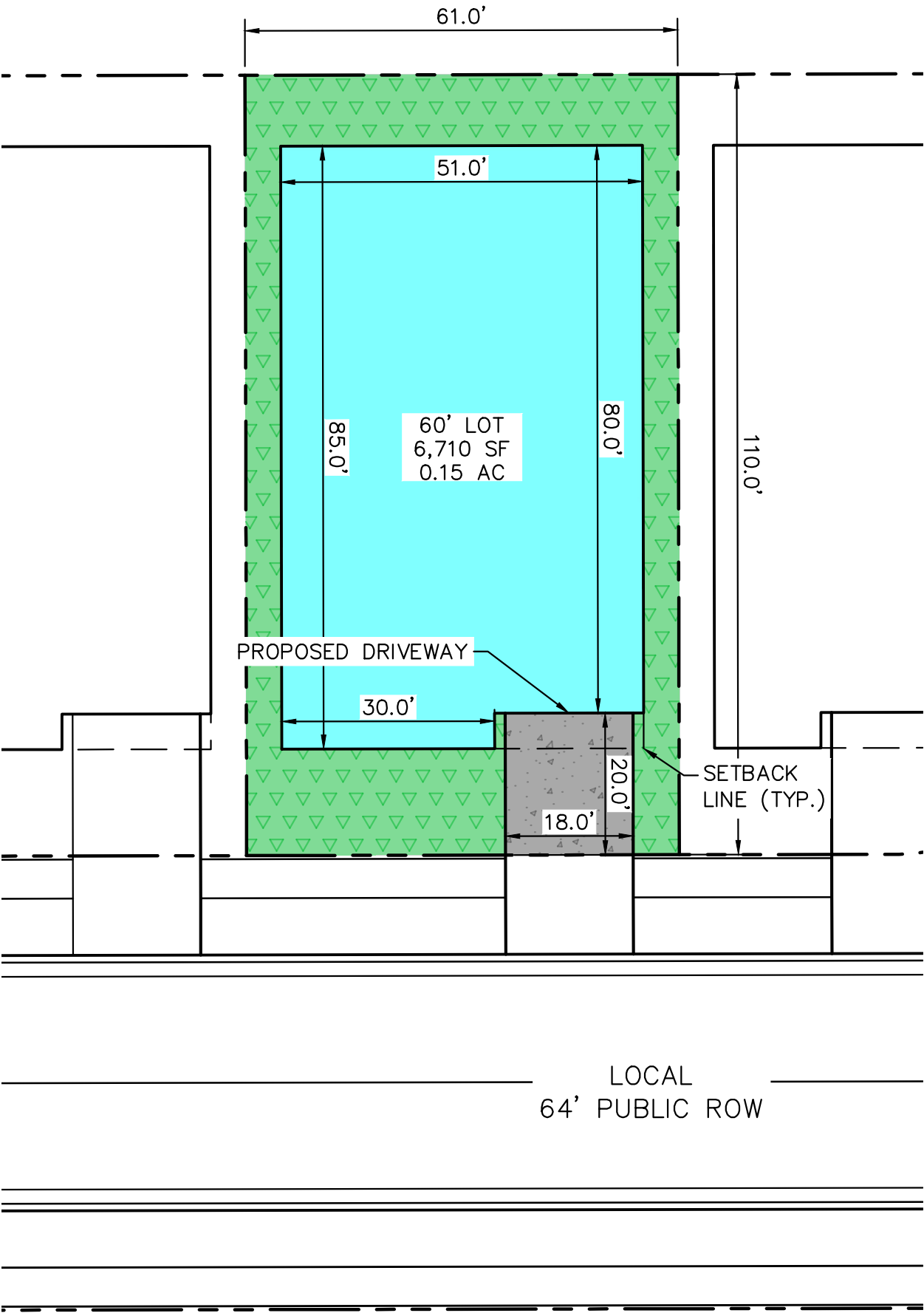
THIS IS THE WORST CASE SCENARIO FOR THE SINGLE FAMILY PORTION OF THE PARKLANDS FILING 3 SUBDIVISION. AN AVERAGE OF THE LOT IMPERVIOUS CALCULATIONS SHOWS COMPLIANCE WITH THE 70% IMPERVIOUSNESS VALUE ASSUMED IN THE FOUNDRY DEVELOPMENT PDR FOR SINGLE FAMILY RESIDENTIAL USE.

LOT TYPE	TOTAL AREA (AC)	TOTAL AREA (AC)			LANDSCAPING			PAVING			BASINS TOTAL WEIGHTED % IMP.
		% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	
50' LOT	0.13	95%	0.08	57.2%	20%	0.04	6.7%	95%	0.008	6.1%	70%

WORST CASE SCENARIO FOR SINGLE FAMILY LOTS

FOR

THE PARKLANDS VILLAGE 1, FILING NO. 3



DETAIL #3
LARGE SINGLE-FAMILY DETACHED LOT
TYPICAL LOT SETBACK DETAIL
≥60' FRONTAGE
1" = 20'

LEGEND:

PROPOSED ROOF

PROPOSED PAVING

PROPOSED LANDSCAPING

NOTE:

THIS IS THE WORST CASE SCENARIO FOR THE SINGLE FAMILY PORTION OF THE PARKLANDS FILING 3 SUBDIVISION. AN AVERAGE OF THE LOT IMPERVIOUS CALCULATIONS SHOWS COMPLIANCE WITH THE 70% IMPERVIOUSNESS VALUE ASSUMED IN THE FOUNDRY DEVELOPMENT PDR FOR SINGLE FAMILY RESIDENTIAL USE.

LOT TYPE	TOTAL AREA (AC)	TOTAL AREA (AC)			LANDSCAPING			PAVING			BASINS TOTAL WEIGHTED % IMP.
		% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	% IMP.	AREA (AC)	WEIGHTED % IMP.	
60' LOT	0.15	95%	0.10	59.9%	20%	0.05	6.3%	95%	0.008	5.1%	71.3%



STANDARD FORM SF-1
RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024

SOIL: C/D

	Paved Streets	Concrete Drive and Walks	Roofs	Gravel - Pedestrian Use	Gravel - Maintenance Paths	Landscaping	Open Water & WQCV	Native Grasses & Open Space	Neighborhood Parks
LAND USE:	AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA
2-YEAR COEFF.	0.78	0.78	0.78	0.30	0.47	0.14	0.83	0.03	0.18
5-YEAR COEFF.	0.81	0.81	0.81	0.36	0.53	0.20	0.86	0.08	0.24
10-YEAR COEFF.	0.84	0.84	0.84	0.43	0.58	0.28	0.87	0.17	0.32
100-YEAR COEFF.	0.87	0.87	0.87	0.65	0.73	0.57	0.89	0.50	0.59
IMPERVIOUS %	95%	95%	95%	40%	60%	20%	100%	5%	25%

DESIGN BASIN	DESIGN POINT	Paved Streets <u>AREA</u> (AC)	Concrete Drive and Walks <u>AREA</u> (AC)	Roofs <u>AREA</u> (AC)	Gravel - Pedestrian Use <u>AREA</u> (AC)	Gravel - Maintenance Paths <u>AREA</u> (AC)	Landscaping <u>AREA</u> (AC)	Open Water & WQCV <u>AREA</u> (AC)	Native Grasses & Open Space <u>AREA</u> (AC)	Neighborhood Parks <u>AREA</u> (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
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On-Site Subbasins to Basin C1

C100	C100	0.12	0.10	0.44	0.00	0.00	0.30	0.00	0.00	0.00	0.96	0.58	0.62	0.66	0.78	71.6%
C102	C102	0.19	0.12	0.11	0.00	0.00	0.18	0.00	0.00	0.00	0.60	0.59	0.63	0.67	0.78	73.0%
C104	C104	0.18	0.13	0.37	0.00	0.00	0.30	0.00	0.00	0.00	0.98	0.58	0.62	0.66	0.78	71.8%
C106	C106	0.18	0.17	0.73	0.00	0.00	0.54	0.00	0.00	0.00	1.62	0.57	0.61	0.65	0.77	69.9%
C108	C108	0.15	0.05	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.44	0.44	0.49	0.54	0.71	55.0%
C110	C110	0.17	0.07	0.12	0.00	0.00	0.13	0.00	0.00	0.00	0.49	0.62	0.66	0.69	0.79	75.6%
C112	C112	0.07	0.03	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.21	0.62	0.66	0.69	0.80	75.9%
C114	C114	0.09	0.04	0.06	0.00	0.00	0.06	0.00	0.00	0.00	0.24	0.63	0.67	0.71	0.80	77.5%
C116	C116	0.28	0.25	1.13	0.00	0.00	0.79	0.00	0.00	0.00	2.45	0.58	0.62	0.66	0.77	70.9%
C118	C118	0.32	0.32	1.52	0.00	0.00	1.26	0.00	0.00	0.00	3.42	0.54	0.59	0.63	0.76	67.3%
C120	C120	0.08	0.05	0.09	0.00	0.00	0.09	0.00	0.00	0.00	0.30	0.59	0.63	0.67	0.78	72.9%
C122	C122	0.11	0.07	0.10	0.00	0.00	0.11	0.00	0.00	0.00	0.39	0.60	0.64	0.68	0.79	73.8%
C124	C124	0.26	0.28	1.54	0.00	0.00	1.19	0.00	0.00	0.00	3.27	0.55	0.59	0.63	0.76	67.7%
C126	C126	0.26	0.24	1.02	0.00	0.00	0.87	0.00	0.00	0.00	2.39	0.55	0.59	0.63	0.76	67.6%
C128	C128	0.05	0.03	0.06	0.00	0.00	0.05	0.00	0.00	0.00	0.18	0.61	0.65	0.69	0.79	75.0%
C130	C130	0.06	0.04	0.05	0.00	0.00	0.06	0.00	0.00	0.00	0.20	0.60	0.64	0.67	0.78	73.3%
BASIN C1 TOTAL		2.57	1.99	7.39	0.00	0.00	6.21	0.00	0.00	0.00	18.16	0.56	0.60	0.65	0.77	69.3%
		14%	11%	41%	0%	0%	34%	0%	0%	0%	100%					

On-Site Subbasins to Basin C2

C200	C200	0.21	0.17	0.61	0.00	0.00	0.60	0.00	0.00	0.00	1.59	0.54	0.58	0.63	0.76	66.7%
C202	C202	0.15	0.11	0.29	0.00	0.00	0.38	0.00	0.00	0.00	0.93	0.52	0.56	0.61	0.75	64.3%
C204	C204	0.16	0.06	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.45	0.44	0.49	0.54	0.71	55.1%
C206	C206	0.13	0.05	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.36	0.46	0.51	0.56	0.72	58.0%
C208	C208	0.10	0.04	0.04	0.00	0.00	0.07	0.00	0.00	0.00	0.24	0.59	0.63	0.67	0.78	72.9%
C210	C210	0.07	0.02	0.03	0.00	0.00	0.06	0.00	0.00	0.00	0.19	0.57	0.61	0.65	0.77	70.2%
C212	C212	0.18	0.07	0.12	0.00	0.00	0.12	0.00	0.00	0.00	0.50	0.63	0.67	0.71	0.80	77.4%
C214	C214	0.18	0.07	0.14	0.00	0.00	0.12	0.00	0.00	0.00	0.51	0.63	0.67	0.70	0.80	77.4%
C216	C216	0.15	0.14	0.62	0.00	0.00	0.35	0.00	0.00	0.02	1.27	0.60	0.64	0.68	0.79	73.7%
C218	C218	0.14	0.10	0.30	0.00	0.00	0.26	0.00	0.00	0.00	0.80	0.57	0.61	0.66	0.77	70.7%



STANDARD FORM SF-1
RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024

SOIL: C/D

	Paved Streets	Concrete Drive and Walks	Roofs	Gravel - Pedestrian Use	Gravel - Maintenance Paths	Landscaping	Open Water & WQCV	Native Grasses & Open Space	Neighborhood Parks
LAND USE:	AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA
2-YEAR COEFF.	0.78	0.78	0.78	0.30	0.47	0.14	0.83	0.03	0.18
5-YEAR COEFF.	0.81	0.81	0.81	0.36	0.53	0.20	0.86	0.08	0.24
10-YEAR COEFF.	0.84	0.84	0.84	0.43	0.58	0.28	0.87	0.17	0.32
100-YEAR COEFF.	0.87	0.87	0.87	0.65	0.73	0.57	0.89	0.50	0.59
IMPERVIOUS %	95%	95%	95%	40%	60%	20%	100%	5%	25%

DESIGN BASIN	DESIGN POINT	Paved Streets <u>AREA</u> (AC)	Concrete Drive and Walks <u>AREA</u> (AC)	Roofs <u>AREA</u> (AC)	Gravel - Pedestrian Use <u>AREA</u> (AC)	Gravel - Maintenance Paths <u>AREA</u> (AC)	Landscaping <u>AREA</u> (AC)	Open Water & WQCV <u>AREA</u> (AC)	Native Grasses & Open Space <u>AREA</u> (AC)	Neighborhood Parks <u>AREA</u> (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
C220	C220	0.08	0.05	0.12	0.00	0.00	0.09	0.00	0.00	0.00	0.33	0.61	0.65	0.69	0.79	74.9%
C222	C222	0.11	0.08	0.23	0.00	0.00	0.16	0.00	0.00	0.00	0.58	0.61	0.65	0.69	0.79	74.7%
C224	C224	0.13	0.12	0.63	0.00	0.00	0.34	0.00	0.00	0.00	1.21	0.60	0.64	0.68	0.79	74.2%
C226	C226	0.11	0.08	0.24	0.00	0.00	0.16	0.00	0.00	0.00	0.60	0.61	0.65	0.68	0.79	74.7%
C228	C228	0.30	0.26	1.07	0.00	0.00	1.42	0.00	0.00	0.00	3.04	0.48	0.53	0.58	0.73	60.0%
C230	C230	0.05	0.03	0.05	0.00	0.00	0.07	0.00	0.00	0.00	0.19	0.55	0.59	0.63	0.76	67.4%
C232	C232	0.10	0.06	0.00	0.00	0.00	0.05	0.00	0.00	1.51	1.72	0.23	0.29	0.36	0.61	31.3%
C234	C234	0.23	0.14	0.06	0.00	0.00	0.15	0.00	0.00	0.31	0.88	0.46	0.51	0.56	0.72	58.1%
C236	C236	0.07	0.07	0.31	0.00	0.00	0.17	0.00	0.00	0.00	0.62	0.61	0.64	0.68	0.79	74.3%
C238	C238	0.10	0.09	0.42	0.00	0.00	0.23	0.00	0.00	0.00	0.85	0.61	0.64	0.68	0.79	74.3%
C240	C240	0.08	0.05	0.11	0.00	0.00	0.09	0.00	0.00	0.00	0.33	0.61	0.65	0.69	0.79	74.9%
C242	C242	0.16	0.09	0.06	0.00	0.00	0.11	0.00	0.00	1.71	2.12	0.26	0.32	0.39	0.63	34.9%
C244	C244	0.14	0.10	0.25	0.00	0.00	0.28	0.00	0.00	0.00	0.78	0.55	0.59	0.63	0.76	67.9%
C246	C246	0.26	0.20	0.54	0.00	0.00	0.51	0.00	0.00	0.00	1.51	0.57	0.61	0.65	0.77	69.7%
C248	C248	0.26	0.28	1.52	0.00	0.00	1.23	0.00	0.00	0.00	3.30	0.54	0.58	0.63	0.76	67.0%
C250	C250	0.26	0.19	0.52	0.00	0.00	0.51	0.00	0.00	0.00	1.49	0.56	0.60	0.64	0.77	69.2%
C252	C252	0.12	0.07	0.10	0.00	0.00	0.12	0.00	0.00	0.00	0.40	0.60	0.64	0.68	0.78	73.4%
C254	C254	0.26	0.28	1.52	0.00	0.00	1.23	0.00	0.00	0.00	3.30	0.54	0.58	0.63	0.76	67.0%
C256	C256	0.26	0.19	0.52	0.00	0.00	0.51	0.00	0.00	0.00	1.49	0.56	0.60	0.64	0.77	69.2%
C258	C258	0.11	0.07	0.09	0.00	0.00	0.11	0.00	0.00	0.00	0.39	0.60	0.64	0.68	0.78	73.4%
C260	C260	0.26	0.24	1.04	0.00	0.00	1.45	0.00	0.00	0.00	2.99	0.47	0.52	0.57	0.72	58.7%
C262	C262	0.06	0.02	0.05	0.00	0.00	0.07	0.00	0.00	0.00	0.20	0.56	0.60	0.65	0.77	69.4%
BASIN C2 TOTAL		5.00	3.62	11.58	0.00	0.00	11.43	0.00	0.00	3.54	35.17	0.51	0.56	0.60	0.74	63.6%
		14%	10%	33%	0%	0%	32%	0%	0%	10%	100%					
On-Site Subbasins to Basin C3																
C300	C300	0.00	0.05	0.51	0.00	1.04	0.29	12.08	0.00	0.00	13.97	0.79	0.82	0.84	0.87	95.1%



STANDARD FORM SF-1
RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024

SOIL: C/D

		Paved Streets	Concrete Drive and Walks	Roofs	Gravel - Pedestrian Use	Gravel - Maintenance Paths	Landscaping	Open Water & WQCV	Native Grasses & Open Space	Neighborhood Parks						
LAND USE:		AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA	AREA						
2-YEAR COEFF.		0.78	0.78	0.78	0.30	0.47	0.14	0.83	0.03	0.18						
5-YEAR COEFF.		0.81	0.81	0.81	0.36	0.53	0.20	0.86	0.08	0.24						
10-YEAR COEFF.		0.84	0.84	0.84	0.43	0.58	0.28	0.87	0.17	0.32						
100-YEAR COEFF.		0.87	0.87	0.87	0.65	0.73	0.57	0.89	0.50	0.59						
IMPERVIOUS %		95%	95%	95%	40%	60%	20%	100%	5%	25%						
DESIGN BASIN	DESIGN POINT	Paved Streets AREA (AC)	Concrete Drive and Walks AREA (AC)	Roofs AREA (AC)	Gravel - Pedestrian Use AREA (AC)	Gravel - Maintenance Paths AREA (AC)	Landscaping AREA (AC)	Open Water & WQCV AREA (AC)	Native Grasses & Open Space AREA (AC)	Neighborhood Parks AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
BASIN C3 TOTAL		0.00	0.05	0.51	0.00	1.04	0.29	12.08	0.00	0.00	13.97	0.79	0.82	0.84	0.87	95.1%
		0%	0%	4%	0%	7%	2%	86%	0%	0%	100%					
TOTAL ON-SITE TO POND C		7.56	5.65	19.48	0.00	1.04	17.93	12.08	0.00	3.54	67.30	0.58	0.62	0.66	0.78	71.7%
		11%	8%	29%	0%	2%	27%	18%	0%	5%	100%					
On-Site Subbasins draining Off-Site																
OSB1	OSB1	0.00	0.01	0.12	0.00	0.00	0.07	0.00	0.00	0.00	0.19	0.56	0.60	0.64	0.77	69.1%
TOTAL ON-SITE DRAINING OFF-SITE		0.00	0.01	0.12	0.00	0.00	0.07	0.00	0.00	0.00	0.19	0.56	0.60	0.64	0.77	69.1%
		0%	5%	60%	0%	0%	34%	0%	0%	0%	100%					
TOTAL ON-SITE		7.56	5.66	19.60	0.00	1.04	18.00	12.08	0.00	3.54	67.49	0.58	0.62	0.66	0.78	71.7%
		11%	8%	29%	0%	2%	27%	18%	0%	5%	100%					
Off-Site Subbasins (Jewell) to Pond C via Existing Jewell Storm																
OF1	OF1	0.12	0.60	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.90	0.65	0.69	0.72	0.81	79.7%
OF2	OF2	0.68	0.16	0.00	0.00	0.00	0.38	0.00	0.00	0.00	1.22	0.58	0.62	0.66	0.78	71.9%
OF3	OF3	0.65	0.13	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.97	0.66	0.69	0.73	0.81	80.2%
Off-Site Subbasins (Jewell) to Basin C2																
OF208	OF208	0.05	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.07	0.67	0.71	0.74	0.82	82.3%
OF210	OF210	0.16	0.04	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.25	0.67	0.71	0.74	0.82	82.3%
OF262	OF262	0.29	0.08	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.44	0.67	0.71	0.74	0.82	82.3%
OFF-SITE TO POND C TOTAL		1.94	1.03	0.00	0.00	0.00	0.88	0.00	0.00	0.00	3.85	0.64	0.67	0.71	0.80	77.9%
		50%	27%	0%	0%	0%	23%	0%	0%	0%	100%					
TOTAL TO POND C		9.50	6.68	19.48	0.00	1.04	18.81	12.08	0.00	3.54	71.15	0.59	0.63	0.66	0.78	72.0%
		13%	9%	27%	0%	1%	26%	17%	0%	5%	100%					
Off-Site Subbasins to Basin A5																
A518	A518	0.46	0.17	0.08	0.00	0.00	0.20	0.00	0.00	0.00	0.91	0.64	0.68	0.71	0.81	78.4%
A522	A522	0.38	0.16	0.24	0.00	0.00	0.27	0.00	0.00	0.00	1.05	0.62	0.66	0.69	0.80	76.0%
A526	A526	0.26	0.11	0.15	0.00	0.00	0.21	0.00	0.00	0.00	0.73	0.60	0.64	0.68	0.79	73.7%
BASIN A5 TOTAL		1.10	0.43	0.48	0.00	0.00	0.67	0.00	0.00	0.00	2.69	0.62	0.66	0.70	0.80	76.2%
		41%	16%	18%	0%	0%	25%	0%	0%	0%	100%					

Kimley»Horn

STANDARD FORM SF-2

Time of Concentration

PROJECT NAME:

Parklands - Village 1 Filing No. 3

PROJECT NUMBER:

196480001

CALCULATED BY:

BAW

CHECKED BY:

LNS

DATE:

SEPT 2024

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					T _c CHECK (URBANIZED BASINS)			FINAL T _c
DESIGN BASIN (1)	AREA A _c (2)	C5 (3)	LENGTH Ft (4)	SLOPE ft/ft (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE ft/ft (8)	C _v (9)	VEL fps (11)	T _t Min. (12)	COMP. t _c (13)	TOTAL LENGTH (14)	T _c Min. (17)	Min. (15)
On-Site Subbasins to Basin C1														
C100	0.96	0.622	126	0.011	9.7	244	0.009	20.0	1.8	2.2	11.9	370	13.8	11.9
C102	0.60	0.634	54	0.025	4.7	267	0.009	20.0	1.8	2.4	7.1	321	13.6	7.1
C104	0.98	0.624	71	0.018	6.1	479	0.011	20.0	2.1	3.9	10.0	550	13.8	10.0
C106	1.62	0.608	127	0.013	9.3	479	0.011	20.0	2.0	3.9	13.2	606	14.1	13.2
C108	0.44	0.486	50	0.015	6.9	252	0.009	20.0	1.8	2.3	9.2	302	16.7	9.2
C110	0.49	0.655	29	0.025	3.2	264	0.009	20.0	1.8	2.4	5.6	293	13.2	5.6
C112	0.21	0.658	42	0.012	4.9	115	0.014	20.0	2.3	0.8	5.7	157	13.1	5.7
C114	0.24	0.670	21	0.028	2.6	140	0.012	20.0	2.2	1.0	3.6	161	12.8	5.0
C116	2.45	0.617	126	0.011	9.8	710	0.009	20.0	1.9	6.1	15.9	836	14.0	14.0
C118	3.42	0.587	179	0.020	10.0	723	0.009	20.0	1.9	6.3	16.3	902	14.6	14.6
C120	0.30	0.633	28	0.010	4.5	211	0.013	20.0	2.3	1.5	6.1	239	13.6	6.1
C122	0.39	0.640	28	0.024	3.4	271	0.011	20.0	2.1	2.1	5.5	299	13.5	5.5
C124	3.27	0.590	184	0.033	8.5	703	0.018	20.0	2.7	4.4	12.9	887	14.5	12.9
C126	2.39	0.590	128	0.011	10.2	716	0.018	20.0	2.7	4.5	14.7	844	14.5	14.5
C128	0.18	0.650	26	0.006	5.1	113	0.020	20.0	2.8	0.7	5.7	139	13.3	5.7
C130	0.20	0.636	27	0.031	3.0	136	0.019	20.0	2.7	0.8	3.9	163	13.6	5.0
On-Site Subbasins to Basin C2														
C200	1.59	0.582	128	0.033	7.2	376	0.016	20.0	2.5	2.5	9.7	504	17.3	9.7
C202	0.93	0.562	38	0.036	4.0	405	0.019	20.0	2.8	2.4	6.4	443	17.8	6.4
C204	0.45	0.487	46	0.024	5.7	279	0.008	20.0	1.8	2.6	8.3	325	19.7	8.3
C206	0.36	0.510	42	0.035	4.6	209	0.017	20.0	2.6	1.4	6.0	251	17.7	6.0
C208	0.24	0.633	77	0.044	4.6	48	0.031	20.0	3.5	0.2	4.8	125	13.8	5.0
C210	0.19	0.610	22	0.025	3.1	111	0.038	20.0	3.9	0.5	3.6	133	14.6	5.0
C212	0.50	0.670	31	0.043	2.7	277	0.023	20.0	3.0	1.5	4.2	308	14.4	5.0
C214	0.51	0.670	29	0.026	3.1	278	0.009	20.0	1.8	2.5	5.6	307	15.4	5.6
C216	1.27	0.640	179	0.025	8.3	228	0.010	20.0	1.9	1.9	10.2	407	15.5	10.2
C218	0.80	0.615	75	0.017	6.4	379	0.009	20.0	1.9	3.3	9.7	454	17.5	9.7
C220	0.33	0.649	27	0.023	3.2	211	0.014	20.0	2.3	1.5	4.7	238	14.8	5.0
C222	0.58	0.648	74	0.018	5.9	226	0.012	20.0	2.1	1.8	7.7	300	15.1	7.7
C224	1.21	0.644	180	0.031	7.7	226	0.012	20.0	2.1	1.8	9.5	406	15.2	9.5
C226	0.60	0.647	73	0.017	5.9	228	0.009	20.0	1.9	2.0	8.0	301	15.4	8.0
C228	3.04	0.527	159	0.047	7.9	719	0.008	20.0	1.8	6.6	14.5	878	23.4	14.5
C230	0.19	0.587	21	0.025	3.2	108	0.032	20.0	3.6	0.5	3.7	129	15.1	5.0
C232	1.72	0.291	300	0.016	22.0	318	0.019	7.0	1.0	5.5	27.4	618	23.6	23.6
C234	0.88	0.512	28	0.022	4.4	646	0.014	20.0	2.4	4.5	8.9	674	21.4	8.9
C236	0.62	0.644	29	0.026	3.3	204	0.017	20.0	2.6	1.3	4.6	233	14.7	5.0
C238	0.85	0.644	127	0.009	9.8	226	0.010	20.0	1.9	1.9	11.8	353	15.4	11.8
C240	0.33	0.649	28	0.022	3.4	205	0.013	20.0	2.3	1.5	4.9	233	14.8	5.0

Kimley»Horn

STANDARD FORM SF-2

Time of Concentration

PROJECT NAME: Parklands - Village 1 Filing No. 3

PROJECT NUMBER: 196480001

CALCULATED BY: BAW

CHECKED BY: LNS

DATE: SEPT 2024

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					T _c CHECK (URBANIZED BASINS)			FINAL T _c
DESIGN BASIN (1)	AREA A _c (2)	C ₅ (3)	LENGTH Ft (4)	SLOPE ft/ft (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE ft/ft (8)	C _v (9)	VEL fps (11)	T _t Min. (12)	COMP. t _c (13)	TOTAL LENGTH (14)	T _c Min. (17)	Min. (15)
C242	2.12	0.321	300	0.018	20.3	274	0.020	7.0	1.0	4.7	25.0	574	22.4	22.4
C244	0.78	0.592	74	0.017	6.7	329	0.009	20.0	1.9	2.9	9.6	403	17.6	9.6
C246	1.51	0.606	77	0.020	6.3	705	0.021	20.0	2.9	4.1	10.4	782	18.5	10.4
C248	3.30	0.584	184	0.032	8.7	711	0.021	20.0	2.9	4.1	12.8	895	19.1	12.8
C250	1.49	0.603	75	0.019	6.4	711	0.024	20.0	3.1	3.9	10.2	786	18.4	10.2
C252	0.40	0.637	25	0.025	3.1	277	0.010	20.0	1.9	2.4	5.5	302	16.0	5.5
C254	3.30	0.584	184	0.032	8.7	711	0.024	20.0	3.1	3.9	12.6	895	18.8	12.6
C256	1.49	0.603	76	0.020	6.3	710	0.024	20.0	3.1	3.8	10.2	786	18.3	10.2
C258	0.39	0.637	28	0.041	2.8	265	0.019	20.0	2.7	1.6	4.4	293	15.2	5.0
C260	2.99	0.516	167	0.015	12.0	711	0.024	20.0	3.1	3.8	15.9	878	20.5	15.9
C262	0.20	0.604	21	0.044	2.5	110	0.030	20.0	3.5	0.5	3.1	131	14.8	5.0
On-Site Subbasins to Basin C3														
C300	13.97	0.815	53	0.250	1.3	481	0.005	20.0	1.4	5.7	7.0	534	14.9	7.0
On-Site Subbasins draining Off-Site														
OSB1	0.19	0.602	52	0.020	5.2	0		20.0	0.0	0.0	5.2	52	10.3	5.2
Off-Site Subbasins (Jewell) to Pond C via Existing Jewell Storm														
OF1	0.90	0.689	72	0.024	4.8	528	0.010	20.0	2.0	4.3	9.1	600	17.3	9.1
OF2	1.22	0.624	87	0.020	6.5	692	0.007	20.0	1.7	6.9	13.4	779	21.9	13.4
OF3	0.97	0.692	72	0.032	4.3	566	0.020	20.0	2.8	3.3	7.6	638	16.1	7.6
Off-Site Subbasins (Jewell) to Basin C2														
OF208	0.07	0.709	78	0.024	4.7	129	0.033	20.0	3.6	0.6	5.3	207	12.9	5.3
OF210	0.25	0.709	49	0.025	3.7	249	0.035	20.0	3.7	1.1	4.8	298	13.3	5.0
OF262	0.44	0.709	72	0.029	4.2	374	0.024	20.0	3.1	2.0	6.3	446	14.4	6.3
Off-Site Subbasins to Basin A5														
A518	0.91	0.678	45	0.027	3.7	642	0.015	20.0	2.5	4.4	8.1	687	17.3	8.1
A522	1.05	0.658	43	0.027	3.8	556	0.016	20.0	2.5	3.7	7.5	599	17.1	7.5
A526	0.73	0.639	42	0.030	3.8	399	0.018	20.0	2.7	2.5	6.3	441	16.3	6.3
<div><div><div>$t_i = \frac{0.395(1.1 - C_s)\sqrt{L_i}}{S_o^{0.33}}$</div><div>$t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$</div><div>$t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$</div></div></div>														



STANDARD FORM SF-3

STORM DRAINAGE DESIGN - RATIONAL METHOD 2 YEAR EVENT

PROJECT NAME: Parklands - Village 1 Filing No. 3

DATE: SEPT 2024

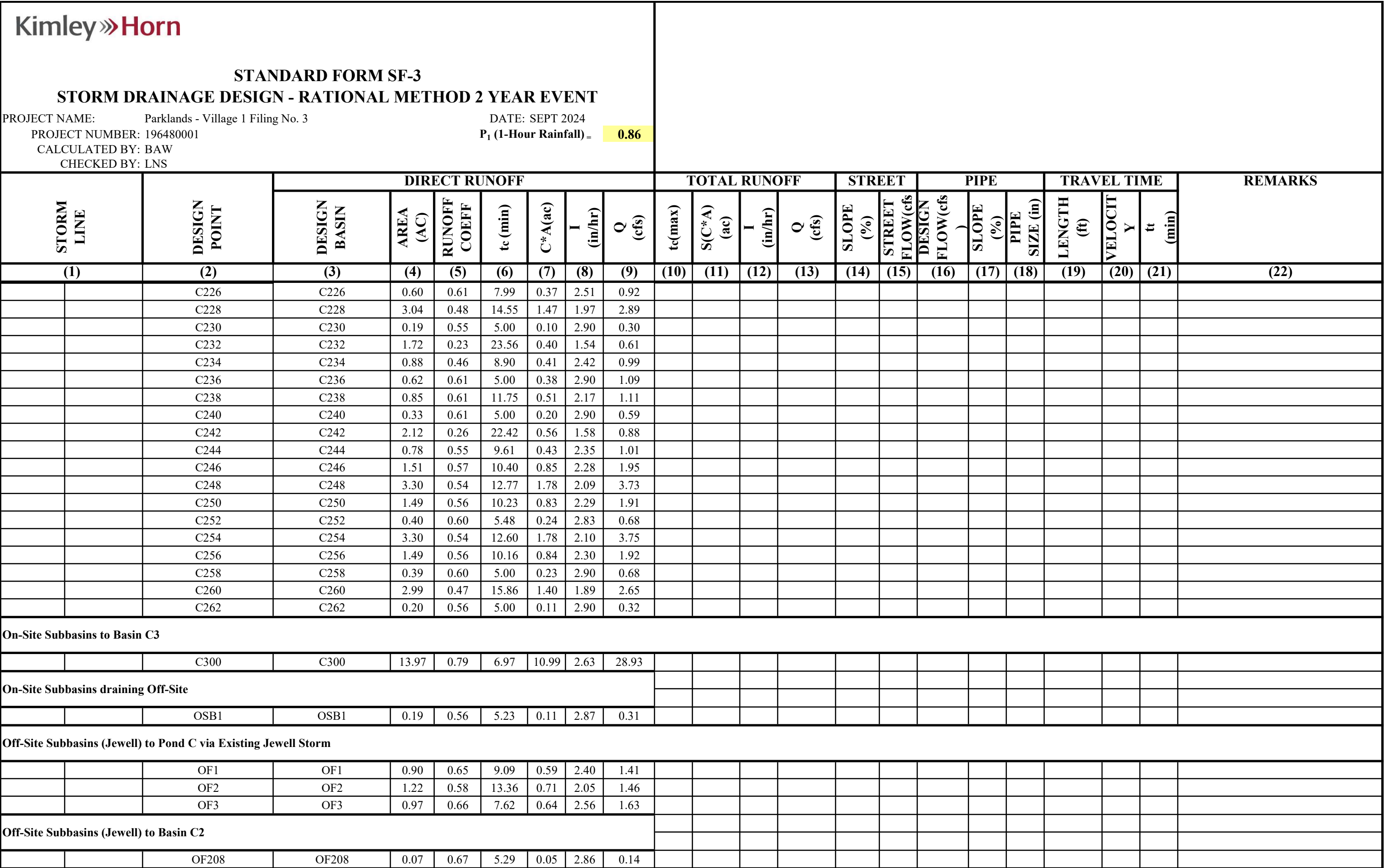
PROJECT NUMBER: 196480001

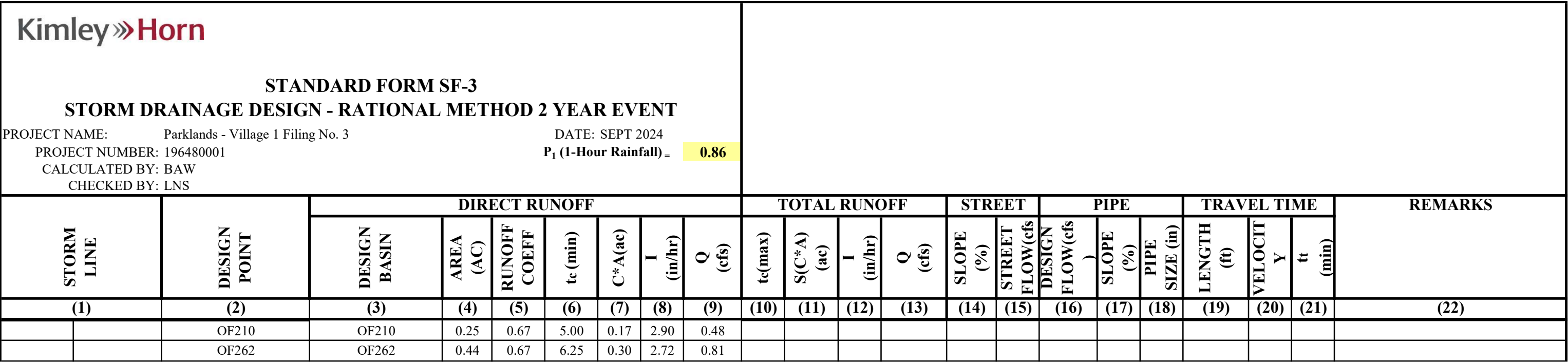
P_1 (1-Hour Rainfall) = 0.86

CALCULATED BY: BAW

CHECKED BY: LNS

[illegible]







STANDARD FORM SF-3

STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024
P₁ (1-Hour Rainfall) = 2.47

STORM LINE	DESIGN POINT	DIRECT RUNOFF								TOTAL RUNOFF				STREET		PIPE		TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCIT Y	tt (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Subbasins to Basin C1																					
		C100	C100	0.96	0.78	11.9	0.74	6.23	4.63												
		C102	C102	0.60	0.78	7.1	0.47	7.57	3.57												
		C104	C104	0.98	0.78	10.0	0.77	6.69	5.12												
		C106	C106	1.62	0.77	13.2	1.25	5.95	7.43												
		C108	C108	0.44	0.71	9.2	0.31	6.90	2.13												
		C110	C110	0.49	0.79	5.6	0.39	8.12	3.19												
		C112	C112	0.21	0.80	5.7	0.17	8.07	1.35												
		C114	C114	0.24	0.80	5.0	0.20	8.38	1.64												
		C116	C116	2.45	0.77	14.0	1.90	5.80	11.00												
		C118	C118	3.42	0.76	14.6	2.60	5.68	14.76												
		C120	C120	0.30	0.78	6.1	0.24	7.94	1.89												
		C122	C122	0.39	0.79	5.5	0.31	8.16	2.53												
		C124	C124	3.27	0.76	12.9	2.49	6.01	14.97												
		C126	C126	2.39	0.76	14.5	1.82	5.69	10.37												
		C128	C128	0.18	0.79	5.7	0.14	8.07	1.17												
		C130	C130	0.20	0.78	5.0	0.16	8.38	1.30												
On-Site Subbasins to Basin C2																					
		C200	C200	1.59	0.76	9.7	1.21	6.77	8.16												
		C202	C202	0.93	0.75	6.4	0.69	7.81	5.41												
		C204	C204	0.45	0.71	8.3	0.32	7.17	2.30												
		C206	C206	0.36	0.72	6.0	0.26	7.97	2.06												
		C208	C208	0.24	0.78	5.0	0.19	8.38	1.58												
		C210	C210	0.19	0.77	5.0	0.15	8.38	1.22												
		C212	C212	0.50	0.80	5.0	0.40	8.38	3.33												
		C214	C214	0.51	0.80	5.6	0.41	8.12	3.32												
		C216	C216	1.27	0.79	10.2	1.00	6.62	6.63												
		C218	C218	0.80	0.77	9.7	0.62	6.76	4.21												
		C220	C220	0.33	0.79	5.0	0.26	8.38	2.22												
		C222	C222	0.58	0.79	7.7	0.46	7.37	3.37												
		C224	C224	1.21	0.79	9.5	0.96	6.82	6.52												

**STANDARD FORM SF-3**

STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024
P₁ (1-Hour Rainfall) = 2.47

[illegible]



STANDARD FORM SF-3

STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Parklands - Village 1 Filing No. 3
PROJECT NUMBER: 196480001
CALCULATED BY: BAW
CHECKED BY: LNS

DATE: SEPT 2024
P₁ (1-Hour Rainfall) = 2.47

[illegible]

<div><div>Kimley»Horn</div><div>PROJECT NAME: Parklands - Village 1 Filing No. 3DATE: SEPT 2024</div><div>PROJECT NUMBER: 196480001</div><div>CALCULATED BY: BAW</div><div>CHECKED BY: LNS</div></div>				
RATIONAL CALCULATIONS SUMMARY				
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)	
			Q2	Q100
On-Site Subbasins Draining to Basin C1 (Pond C)				
C100	C100	0.96	1.20	4.63
C102	C102	0.60	0.94	3.57
C104	C104	0.98	1.33	5.12
C106	C106	1.62	1.89	7.43
C108	C108	0.44	0.46	2.13
C110	C110	0.49	0.86	3.19
C112	C112	0.21	0.36	1.35
C114	C114	0.24	0.45	1.64
C116	C116	2.45	2.83	11.00
C118	C118	3.42	3.66	14.76
C120	C120	0.30	0.50	1.89
C122	C122	0.39	0.67	2.53
C124	C124	3.27	3.73	14.97
C126	C126	2.39	2.58	10.37
C128	C128	0.18	0.31	1.17
C130	C130	0.20	0.34	1.30
Basin C1 - Total		18.16	22.10	87.06
On-Site Subbasins Draining to Basin C2 (Pond C)				
C200	C200	1.59	2.01	8.16
C202	C202	0.93	1.30	5.41
C204	C204	0.45	0.49	2.30
C206	C206	0.36	0.46	2.06
C208	C208	0.24	0.41	1.58
C210	C210	0.19	0.31	1.22
C212	C212	0.50	0.91	3.33
C214	C214	0.51	0.91	3.32
C216	C216	1.27	1.75	6.63
C218	C218	0.80	1.08	4.21
C220	C220	0.33	0.59	2.22
C222	C222	0.58	0.90	3.37
C224	C224	1.21	1.73	6.52
C226	C226	0.60	0.92	3.46
C228	C228	3.04	2.89	12.64
C230	C230	0.19	0.30	1.23
C232	C232	1.72	0.61	4.69
C234	C234	0.88	0.99	4.45
C236	C236	0.62	1.09	4.10
C238	C238	0.85	1.11	4.18
C240	C240	0.33	0.59	2.19
C242	C242	2.12	0.88	6.09
C244	C244	0.78	1.01	4.04
C246	C246	1.51	1.95	7.66
C248	C248	3.30	3.73	15.08
C250	C250	1.49	1.91	7.57
C252	C252	0.40	0.68	2.58
C254	C254	3.30	3.75	15.17
C256	C256	1.49	1.92	7.59
C258	C258	0.39	0.68	2.58
C260	C260	2.99	2.65	11.82
C262	C262	0.20	0.32	1.27
Basin C2 - Total		35.17	40.82	168.68
On-Site Subbasins Draining to Basin C3 (Pond C)				
C300	C300	13.97	28.93	92.87
Basin C3 - Total		13.97	28.93	92.87
TOTAL ON-SITE TO POND C		67.30	91.86	348.61
On-Site Subbasins draining Off-Site				
OSB1	OSB1	0.19	0.31	1.24



PROJECT NAME:

Parklands - Village 1 Filing No. 3

PROJECT NUMBER:

196480001

CALCULATED BY:

BAW

CHECKED BY:

LNS

DATE:

SEPT 2024

RATIONAL CALCULATIONS SUMMARY				
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	PEAK FLOWS (CFS)	
			Q2	Q100
TOTAL ON-SITE DRAINING OFF-SITE		0.19	0.31	1.24
TOTAL ON-SITE		67.49	92.17	349.85
Off-Site Subbasins (Jewell) to Pond C via Existing Jewell Storm				
OF1	OF1	0.90	1.41	5.08
OF2	OF2	1.22	1.46	5.61
OF3	OF3	0.97	1.63	5.83
Off-Site Subbasins (Jewell) to Basin C2				
OF208	OF208	0.07	0.14	0.49
OF210	OF210	0.25	0.48	1.69
OF262	OF262	0.44	0.81	2.86
OFF-SITE TO POND C TOTAL		3.85	5.93	21.55
TOTAL TO POND C		71.15	97.79	370.16
Off-Site Subbasins Draining to Pond A				
A518	A518	0.91	1.46	5.31
A522	A522	1.05	1.67	6.19
A526	A526	0.73	1.18	4.47
Basin A5 - Total		2.69	4.31	15.98

CUHP SUBCATCHMENTS

Columns with this color heading are for required user-input

Columns with this color heading are for optional override values

Columns with this color heading are for program-calculated values

								Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA	Directly Connected Impervious Fraction DCIF (Decimal)	
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (mi ²)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2	Override	Used
C	C	Design Storm	0.1051563	0.244318182	0.4886364	0.01745	71.7	0.35	0.1	4.606	0.001566554	0.6849	0		0.92

Represents the CUHP input information for Pond C for Village 1 Filing 3 On-site Basins. This value is used to determine the inflow of this tributary area. It will be added with the Off-site values to determine the total Inflow to Pond C. This value is compared to the calculated Foundry PDR value within Table 3.

CUHP SUBCATCHMENTS

Receiving Pervious Fraction RPF (Decimal)		Effective Imperviousness	C _T		C _p		Width of Unit Hydrograph (Minutes)		Fraction of Width Before Peak (Decimal)		
Override	Used	(Percent)	Override	Used	Override	Used	Override At 50%	Override At 75%	Override At 50%	Override At 75%	
	0.31	70.70		0.080		0.226					

Typical Depression Losses for Various Land Covers (All Values in Inches)		
Land Cover	Range in Depression (Retention) Losses	Recommended
Impervious:		
Large paved areas	0.05 - 0.15	0.1
Roofs-flat	0.1 - 0.3	0.1
Roofs-sloped	0.05 - 0.1	0.05
Pervious:		
Lawn grass	0.2 - 0.5	0.35
Wooded areas and open fields	0.2 - 0.6	0.4

Recommended Horton's Equation Parameters			
NRCS Hydrologic Soil Group	Infiltration (inches per hour)		Decay Coefficient - a
	Initial - f _i	Final - f _o	
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

100-Year

		Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
Catchment Name/ID	User Comment for Catchment	CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
C		0.080	0.226	15.8	4.24	8.2	3.00	7.1	199	244,299	2.20	538,270	35.0	208.42	536,430	3.10

Represents the Peak Inflow to Pond C for Village 1 Filing 3 On-site Basins. This value is added with the Off-site values to determine the total Inflow to Pond C. This value is compared to the calculated Foundry PDR value within Table 3

Appendix C – Hydraulic Computations

capacity shall be used in conjunction with the allowable use criteria summarized in Table 6-2 to design the storm drains and inlets. Individual hydraulic calculations should be performed using the latest version of MHFD-Inlet for all roadways. Note that variations in street cross slopes, alternate gutter dimensions, assumptions about capacity behind the curb, and other factors will yield different results. The most conservative values should be used to make calculations (e.g., if cross slope varies across an inlet, the cross slope which produces the most conservative results shall be used).

Table 6-2. Allowable Use of Roadways for Minor and Major Storm Runoff

Roadway Classification	Allowable Use of Roadways for Minor Storm Runoff	Allowable Use of Roadways for Major Storm Runoff
Local	No curb overtopping.* Flow may spread to crown of street but may not crest the crown.	<ul style="list-style-type: none"> • The depth of water over the gutter flow line should not exceed one foot. • Residential dwellings and public, commercial, and industrial buildings should be no less than one foot above the 100-year water surface elevation (WSEL) or two times the depth of flow, whichever is lesser, at the lowest point of entry (LPE) of the building. • Where TODs and Aurora City Center have on-street parking, the maximum depth is 6 inches at the flowline of the parking curb or the curb extension. • In no cases can garages be inundated in the 100-year event.
Collector	No curb overtopping. Flow spread must leave at least one lane (10 feet) free of water. If a median or divider is present, flow spread must leave at least one lane free of water in each direction.	
Arterial	No curb overtopping. Flow spread must leave at least one lane (10 feet) free of water in each direction and should not flood more than two lanes in each direction.	<p>The same major storm criteria for Local and Collector roadways also applies to Arterial Roadways. In addition:</p> <ul style="list-style-type: none"> • The depth of water should not exceed the street crown to allow operation of emergency vehicles.
Parking Lots	N/A	For parking lots, the maximum depth allowed is 1.5 feet for a driving lane and one foot for a parking space.

Alleys	N/A	Alley must contain the 100-year storm event. Freeboard of 0.5 feet to the garage slab is recommended, but not required. In no cases can garages be inundated in the 100-year event.
--------	-----	---

* Water may spread to the back of walk where mountable curb and attached walk are used. For mountable curb with detached walk, water may spread to the crown of the street (no crown overtopping) or six-inch depth at the curb flowline, whichever is less.

When streets are used for emergency overflow paths, a minimum of one foot of freeboard must be provided between the emergency overflow WSEL and the lowest point of entry²⁶ (LPE) of each structure along the emergency overflow path.

Cross pans may be used in some limited applications (see Section 6.3.3). Where cross pans are allowed, the allowable use for cross-street flow in cross pans is presented in Table 6-3. Roadway cross pans should not be shown on PDRs. Should clarification of flow direction require depictions of cross pans on PDR plans, they must be accompanied by a note stating, "Cross pans are shown for conceptual location only. Locations are not approved with this document, and will be determined in the Civil Plans,"

Table 6-3. Allowable Use for Cross-street Flow in Cross Pans

Roadway Classification	Allowable Use of Cross Pans for Minor Storm Runoff	Allowable Use of Cross Pans for Major Storm Runoff
Local*	6 inches of depth in cross pan	12 inches of depth in cross pan or gutter flow line
Collector	Cross pans are not allowed to convey flows across Collector or Arterial roadways. Cross pans located parallel to an arterial require approval of the City Engineer.	
Arterial		

* Cross pans are only allowed at intersections controlled by stop signs. See Section 6.3.3 below.

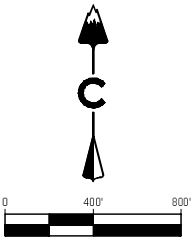
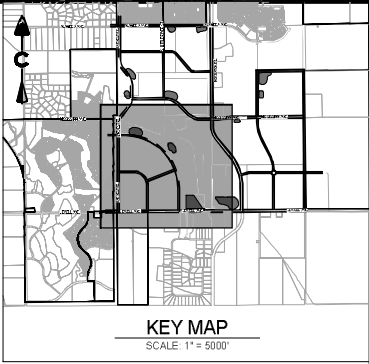
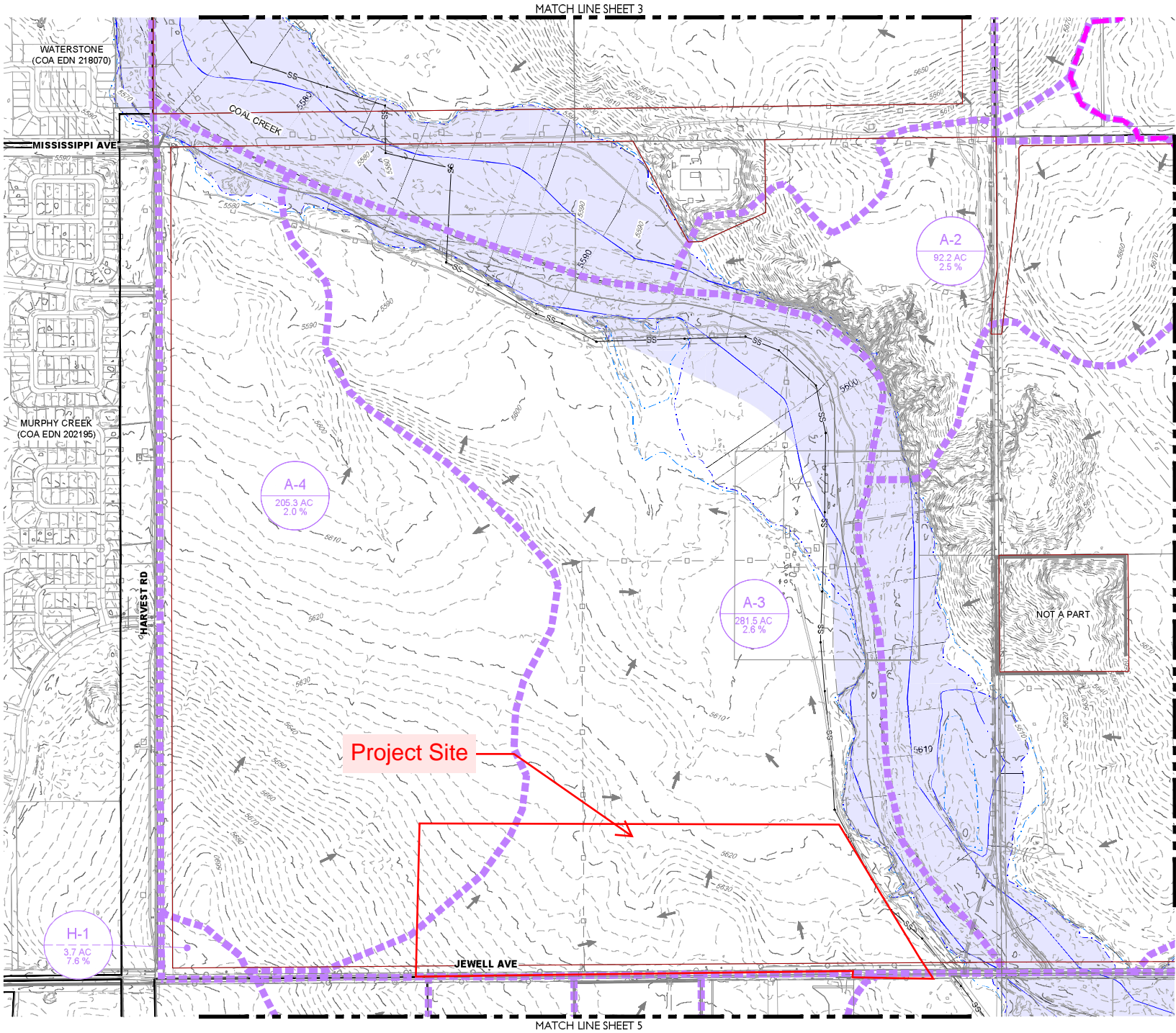
6.2.2 Sidewalk Chases

Within multi-family, single family attached commercial, or industrial developments, stormwater from concentrated points of discharge from a storm event shall not be allowed to flow over internal, private sidewalks and/or perimeter, public sidewalks, but shall instead drain to the

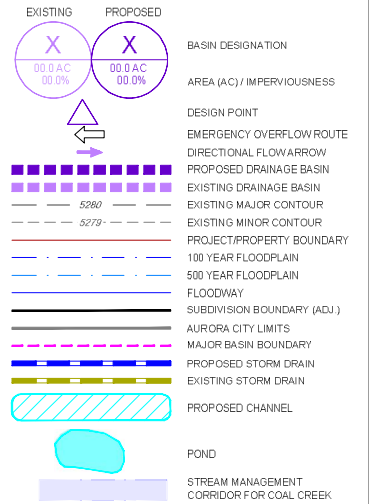
²⁶ The lowest point of entry (LPE) is the lowest elevation at which surface water may enter a structure, such as the elevation of the bottom of a door frame, or the elevation of the top of a basement window well. The LPE is distinct from the lowest floor elevation (LFE), though in some cases the elevations of each may be identical. See Chapter 3 for definitions of the LPE and LFE.

Appendix D – Supporting Documentation, Drainage Maps

PARKLANDS DEVELOPMENT - MASTER DRAINAGE PLAN EXCERPTS



LEGEND



FEMA MAP NOTES

COMMUNITY: CITY OF AURORA
FIRM PANEL: 08005C0204K
EFFECTIVE DATE: 12/17/2010
FIRM PANEL: 08005C0208L
EFFECTIVE DATE: 2/17/2017
FIRM PANEL: 08005C0213K
EFFECTIVE DATE: 12/17/2010
FIRM PANEL: 08005C0218L
EFFECTIVE DATE: 4/18/2018

NOTES

- ALL EMERGENCY OVERFLOWS TO ADJACENT PARCELS SHALL BE COORDINATED WITH IMPACTED PROPERTY OWNERS AT THE TIME OF THE PRELIMINARY DRAINAGE REPORT (PDR). PDR PLANS SHALL SHOW 100-YEAR AND EMERGENCY FLOW RATES TO ADJACENT PROPERTIES AND THE PDR SHALL ADDRESS MITIGATION FOR THE DISCHARGE OF CONCENTRATED FLOWS.
- WORK WITHIN THE 100-YEAR FLOODPLAIN REQUIRES A FLOODPLAIN DEVELOPMENT PERMIT. WORK WITHIN THE FLOODWAY REQUIRES AN APPROVED NO-RISE CERTIFICATION OR CLOMR.
- COAL CREEK STABILIZATION IS AN OBLIGATION OF THIS MOP AND THOSE IMPROVEMENTS ARE CURRENTLY UNDER DESIGN BY OTHERS.
- THE 100-YEAR AND 500-YEAR FLOODPLAIN BOUNDARIES SHOWN ARE A COMPOSITE OF THE WIDEST BOUNDARY INDICATED BY EITHER THE FHAD OR EFFECTIVE FIRM. THE FLOODWAY IS FROM THE EFFECTIVE FIRM. SEE REPORT TEXT FOR ADDITIONAL INFORMATION.

BENCHMARK

COA ID: 458517SE002
ELEVATION US FEET: 6879.43 (NAVD 88)
3" DIAM. BRASS CAP STAMPED (C.O.A., BM, 23-80) ATOP THE CONC. BASE FOR THE EAST MOST LEG OF THE ANGLE POINT POWER TOWER ON THE WEST SIDE OF POWHATON ROAD. POWER LINE PROCEEDING WEST. SAID PWR. TWR. NEAR THE MISSISSIPPI LANDLINE. NOTE: ELEVATION TAKEN AT PUNCH MARK AT CENTER.

ENGINEER'S STATEMENT
PREPARED UNDER MY SUPERVISION

FACSIMILE
THIS ELECTRONIC PLAN IS A FACSIMILE OF THE SIGNED AND SEALED PDF SET

ROBERT D. HANSEN, PE, CFM
4/3/2023
DATE

ROBERT D. HANSEN, P.E.
COLORADO P.E. 50417
FOR AND ON BEHALF OF CORE CONSULTANTS LLC

DATE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
ENGLEWOOD, CO 80113
303.703.4444
LIVE!@CORE.COM

CORE



#	REVISION DESCRIPTION	DATE	BY	CHK
0	SIGNATURE SET	2/18/2023	RH	

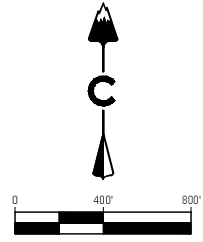
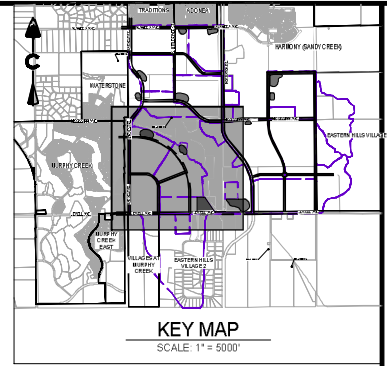
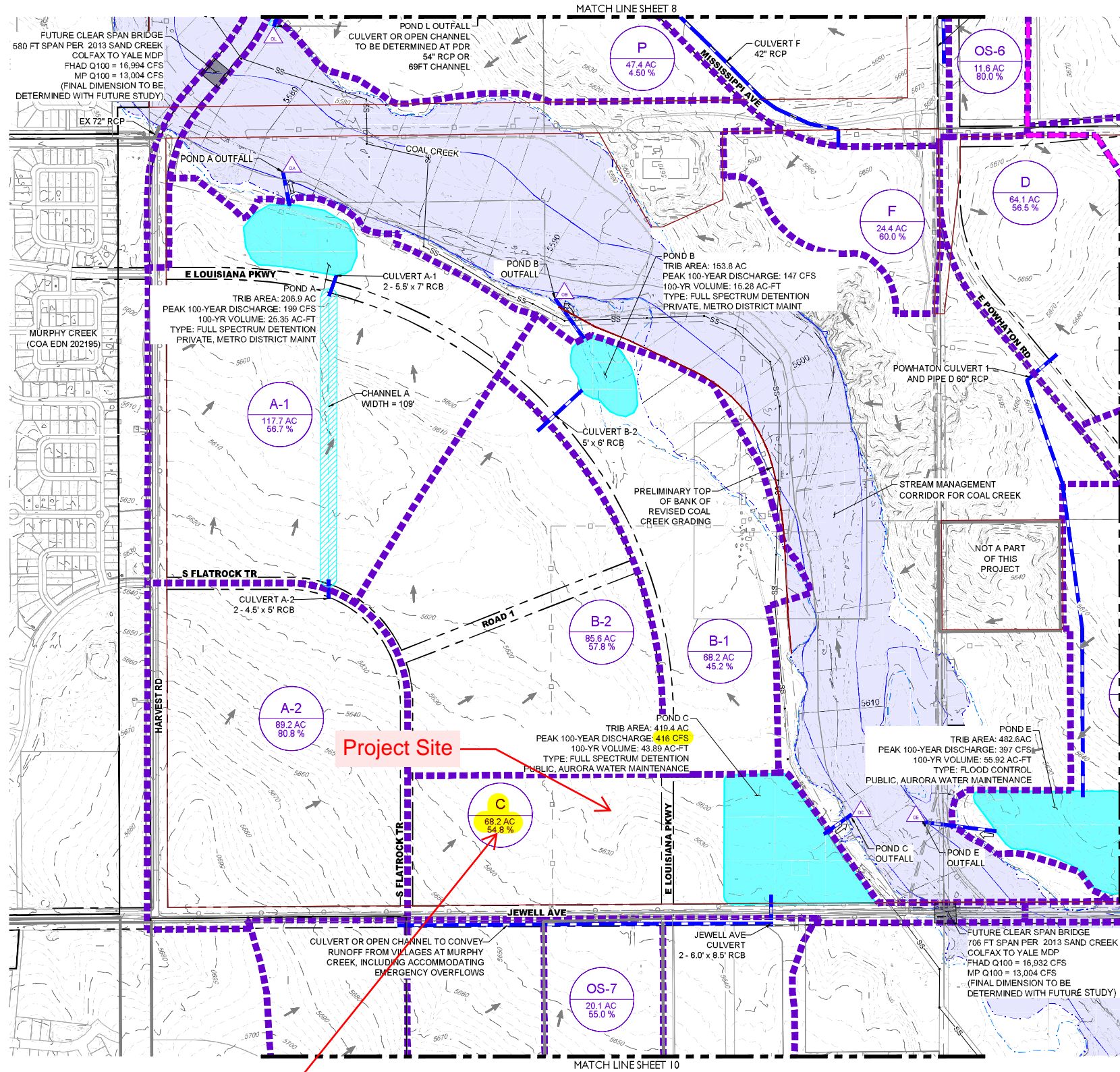
PARKLANDS DEVELOPMENT
AURORA, CO
EXISTING BASIN 2 OF 4

NOT FOR CONSTRUCTION

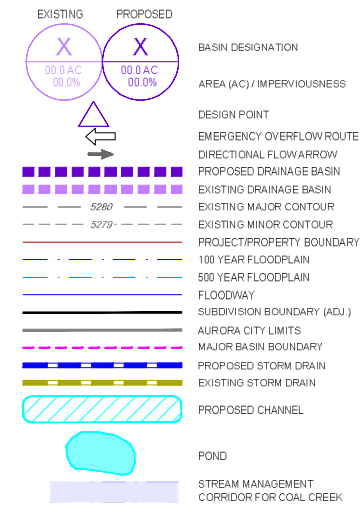
DESIGNED BY: JCS
DRAWN BY: SO
CHECKED BY: JMN

JOB NO.
20-226
SHEET
4

Comparison of tributary area and imperviousness of the master plan is further discussed in the report. See Table 3



LEGEND



FEMA MAP NOTES

COMMUNITY: CITY OF AURORA
FIRM PANEL: 08005C0204K, EFFECTIVE DATE: 12/17/2010
FIRM PANEL: 08005C0208L, EFFECTIVE DATE: 2/17/2017
FIRM PANEL: 08005C0213K, EFFECTIVE DATE: 12/17/2010
FIRM PANEL: 08005C0218L, EFFECTIVE DATE: 4/18/2018

NOTES

- ALL EMERGENCY OVERFLOWS TO ADJACENT PARCELS SHALL BE COORDINATED WITH IMPACTED PROPERTY OWNERS AT THE TIME OF THE PRELIMINARY DRAINAGE REPORT (PDR). PDR PLANS SHALL SHOW 100-YEAR AND EMERGENCY FLOW RATES TO ADJACENT PROPERTIES AND THE PDR SHALL ADDRESS MITIGATION FOR THE DISCHARGE OF CONCENTRATED FLOWS.
- WORK WITHIN THE 100-YEAR FLOODPLAIN REQUIRES A FLOODPLAIN DEVELOPMENT PERMIT. WORK WITHIN THE FLOODWAY REQUIRES AN APPROVED NO-RISE CERTIFICATION OR CLOMR.
- COAL CREEK STABILIZATION IS AN OBLIGATION OF THIS MDP AND THOSE IMPROVEMENTS ARE CURRENTLY UNDER DESIGN BY OTHERS.
- THE 100-YEAR AND 500-YEAR FLOODPLAIN BOUNDARIES SHOWN ARE A COMPOSITE OF THE WIDEST BOUNDARY INDICATED BY EITHER THE FHAD OR EFFECTIVE FIRM. THE FLOODWAY IS FROM THE EFFECTIVE FIRM. SEE REPORT TEXT FOR ADDITIONAL INFORMATION.

ENGINEER'S STATEMENT
PREPARED UNDER MY SUPERVISION

FACSIMILE
THIS ELECTRONIC PLAN IS A FACSIMILE OF THE SIGNED AND SEALED PDF SET
ROBERT D. HANSEN, P.E., CFM
4/3/2023
DATE

ROBERT D. HANSEN, P.E.
COLORADO P.E. 50417
FOR AND ON BEHALF OF CORE CONSULTANTS LLC

DATE

CORE

CORE CONSULTANTS, INC.
3473 S. BROADWAY
ENGLEWOOD, CO 80113
303.703.4444
LIVE! YOUR CORE.COM

LAND DEVELOPMENT
ENERGY
PUBLIC INFRASTRUCTURE

REVISION DESCRIPTION
DATE BY
01 SIGNATURE SET

PARKLANDS DEVELOPMENT
AURORA, CO
PROPOSED BASIN 2 OF 4

NOT FOR CONSTRUCTION

DESIGNED BY: JCS
DRAWN BY: SO
CHECKED BY: JMN

JOB NO.
20-226
SHEET
9

PARKLANDS DEVELOPMENT - MASTER DRAINAGE REPORT EXCERPTS

IV. DRAINAGE PLAN

A. General Concept

The general drainage concept for the Parklands Development is to convey flows adequately and efficiently through the site in accordance with Aurora's stormwater regulations, the previous Eastern Hills Master Drainage Plan, and all other surrounding approved Master Drainage Plans. All surrounding MDP tie-ins are summarized on the Existing MDP Discharge Tie-Ins Map included in Appendix F.

The proposed drainage design for the developed site aims to generally maintain historic flow patterns, as well as analyze subbasins similar to those originally considered for the developed condition of the Eastern Hills MDP. All subbasin delineations for this study are based on the City of Aurora 2013 LiDAR and are described in detail below.

Developed Subbasin A-1 is located in the southwest portion of the site and consists of 117.7 acres of single-family residential, neighborhood business, multi-family, school, park, undeveloped, Pond A water quality capture volume (WQCV), and paved land uses. The calculated percent imperviousness for this subbasin is 56.7%. Runoff from this subbasin will ultimately flow north via curb and gutter, closed conduit, and open channel to Pond A, which will be an online full-spectrum detention (FSD) pond located at the northern end of the subbasin. The open channel designed within this subbasin will be designed as a regional HFLM, maintenance eligible channel.

Developed Subbasin A-2 is located in the southwest corner of the site just south of Developed Subbasin A-1 and consists of 89.2 acres of single-family residential, multi-family residential, park, undeveloped, commercial, and paved land uses. The calculated percent imperviousness for this subbasin is 80.8%. Runoff from this subbasin will ultimately flow north via curb and gutter, closed conduit, and open channel to Pond A.

Developed Subbasin B-1 is located in the in the southwest portion of the site, just east of Developed Subbasins A-1 and A-2. This subbasin consists of 68.2 acres of single-family residential, park, undeveloped, Pond B WQCV, and paved land uses, resulting in a calculated percent imperviousness value of 45.2%. Runoff from this subbasin will ultimately flow north via curb and gutter and closed conduit towards Pond B, which will be an offline FSD detention pond located within the subbasin.

Developed Subbasin B-2 is located in the in the southwest portion of the site, just south of Developed Subbasin B-1. This subbasin consists of 85.6 acres of single-family residential, park, undeveloped, school, and paved land uses, resulting in a calculated percent imperviousness value of 57.8%. Runoff from this subbasin will ultimately flow north via curb and gutter and closed conduit towards Pond B.

Developed Subbasin C is located in the in the southwest corner of the site, just east of Developed Subbasin A-2 and south of Developed Subbasin B-2. This subbasin consists of 68.2 acres of single-family residential, park, undeveloped, Pond C WQCV, and paved land uses, resulting in a calculated percent

imperviousness value of 54.8%. Runoff from this subbasin will ultimately flow east via curb and gutter towards Pond C, which will be an offline FSD detention pond located within the subbasin.

Developed Subbasin D is located near the center of the site, abutting the Harmony Development. This subbasin consists of 64.1 acres of single-family residential, oil and gas, parks, and paved land uses, resulting in a calculated percent imperviousness value of 56.5%. Runoff from this subbasin will generally flow southwest via curb and gutter towards the proposed culvert crossing under the future Powhaton Road alignment. Flows will then be conveyed south via a closed conduit system to Pond E, which will be a flood control pond located in Sub-basin E-1. The closed conduit storm drain system is necessary to convey flows from the future low point in Powhaton Rd. The storm drain is anticipated to cross developable area, hopefully within roadways, in order to reach Pond E and may have depths of around 20-feet.

Developed Subbasin E-1 is located in the south-central portion of the site and consists of 54.4 acres of single-family residential, park and open space land uses. The calculated percent imperviousness for this subbasin is 28.5%. Runoff from this subbasin will generally flow south via curb and gutter to Pond E, which will be a flood control pond located within the subbasin.

Developed Subbasin E-2 is located in the center of the site, just northeast of Developed Subbasin E-1. This subbasin consists of 59.4 acres of single-family residential, paved, and park land uses, resulting in a calculated percent imperviousness value of 60.6%. Runoff from this subbasin will generally flow west via curb and gutter and buried pipe to Developed Subbasin E-1 before ultimately reaching Pond E.

Developed Subbasin E-3 is located directly west of Developed Subbasins E-1 and E-2. This subbasin consists of 187.5 acres of commercial, multi-family residential, undeveloped, parks, and paved land uses, resulting in a calculated percent imperviousness value of 79.9%. Runoff from this subbasin will generally flow west via curb and gutter, open channel, and closed conduit to Pond E. The open channel designed within this subbasin will be designed as a regional HFLM, maintenance eligible channel.

Developed Subbasin E-4 is located directly south of Developed Subbasins M-3 and north of E-3. This subbasin consists of 27.0 acres of commercial, multi-family residential, undeveloped, parks, and paved land uses, resulting in a calculated percent imperviousness value of 60.5%. Runoff from this subbasin will generally flow southwest via curb and gutter, open channel, and closed conduit to Pond E.

Developed Subbasin F is located in the central portion of the site, just west of Developed Subbasin D. This subbasin consists of 24.4 acres of single-family residential land use, resulting in a calculated percent imperviousness value of 60.0%. Runoff from this subbasin will be conveyed northwest via curb and gutter and buried pipe to Pond L, which will be an offline pond located within Developed Subbasin L. Subbasin F sits above the aforementioned erosional feature identified in the *Sand Creek Fluvial Hazard Mapping* study. During the site

characteristics are provided in Appendix A and on the Master Drainage Plan Maps.

Detention Pond A is a private online FSD pond that serves a total tributary area of 206.9 acres, which includes Developed Subbasins A-1 and A-2. This area includes single-family residential, commercial, multi-family residential, school, park, neighborhood business, WQCV, and paved land uses and was subsequently assigned a weighted impervious percentage of 67.1%. Specifically, the pond will be designed as an online EDB located at the northern end of Developed Subbasin A-1. The required 100-year volume is 25.35 ac-ft and the 100-year peak discharge rate is 199 cfs. Pond A will discharge to Coal Creek.

Detention Pond B is a private offline FSD pond that serves a total tributary area of 153.8 acres, which includes Developed Subbasins B-1 and B-2. This area includes single-family residential, school, park, undeveloped, and paved land uses and was subsequently assigned a weighted impervious percentage of 52.5%. Specifically, the pond will be designed as an offline EDB located at the northern end of Developed Subbasin B-1. The required 100-year volume is 15.28 ac-ft and the 100-year peak discharge rate is 147 cfs. Pond B will discharge to Coal Creek.

Required
100-year volume
and 100-year
discharge rate
used in Table 3.

Detention Pond C is a public regional offline FSD pond that serves a total tributary area of 419.4 acres, which includes Developed Subbasins C, VMC_C, OS-7, and OS-8. This area includes single-family residential, school, park, and paved land uses and was subsequently assigned a weighted impervious percentage of 56.1%. This area includes single-family residential, park, paved, and undeveloped land uses, as well as the future Eastern Hills Village 2 development and the Villages at Murphy Creek development. Specifically, the pond will be designed as an offline EDB located at the eastern edge of Developed Subbasin C. The required 100-year volume is 43.89 ac-ft and the 100-year peak discharge rate is 416cfs. Pond C will discharge to Coal Creek.

Detention basin sizing was completed assuming undetained flows from the Villages at Murphy Creek (VMC_C) which includes plans for two local detention ponds. Impacts on detention basin sizing for regional Pond C should be explored. The current approach is conservative as it assumes the Villages at Murphy Creek detention is incapacitated. However, undetained or emergency flow conveyance from Villages at Murphy Creek to Detention Pond C will need to be considered with future Preliminary Drainage Reports.

Detention Pond E is a public regional flood control pond that serves a total tributary area of 482.6 acres, which includes Developed Subbasins D, E-1, E-2, E-3, E-4, and OS-3. WQCV and EURV will be handled offline and not directly within Pond E. This area includes single-family residential, multi-family residential, commercial, school, park, undeveloped, and paved land uses and a portion of Eastern Hills Village 5. Therefore, this tributary area was assigned a weighted impervious percentage of 62.8%. Specifically, the pond will be designed as an offline EDB located at the western edge of Developed Subbasin E-1. The required 100-year volume is 55.92 ac-ft and the 100-year peak discharge rate is 416cfs. Pond E will discharge to Coal Creek via a large diameter pipe or small box culvert that will outfall to the existing floodplain terrace.

Tributary area and imperviousness of the master plan used in Table 3.

Developed Subbasin Percent Imperviousness

Subcatchment Name	Total Area	Landuse Area (H ²)												WQCV	Subcatchment Composite Percent Imperviousness
		Undeveloped	Parks	Oil & Gas (Streets, Gravel)	Single Family Residential (0.25-acre or less dwellings)	School	Residential (SF < 5 du/ac, Multi-family Detached)	Residential Multi-family Attached	Apartments	Business (Neighborhood Area)	Commercial	Paved			
		(H ²)	2%	5%	40%	45%	50%	60%	70%	80%	85%	95%	100%		
A-1	5,128,269	640,108	95,122	0	0	57,913	3,647,300	0	0	87,884	0	545,045	54,905	56.7%	
A-2	3,885,473	0	44,329	0	0	0	1,039,087	0	1,212,351	0	937,699	652,007	0	80.8%	
B-1	2,968,981	705,671	258,993	0	0	0	1,722,195	0	0	0	0	245,226	36,896	45.2%	
B-2	3,728,920	0	163,332	0	0	677,101	2,702,875	0	0	0	0	185,611	0	57.8%	
C	2,971,125	575,362	142,117	0	0	0	1,608,250	0	0	0	0	562,368	83,029	54.8%	
D	2,793,969	0	196,183	713,718	0	0	1,501,808	0	0	0	0	382,261	0	56.5%	
E-1	2,370,808	952,529	110,443	0	1,196,173	0	0	0	0	0	0	0	111,663	28.5%	
E-2	2,586,649	0	195,611	0	0	0	2,082,302	0	0	0	0	308,737	0	60.6%	
E-3	8,168,224	644,721	185,569	0	0	0	0	0	3,545,230	0	2,563,889	1,228,815	0	79.9%	
F-4	1,174,742	0	0	0	0	786,025	177,126	0	0	0	0	211,591	0	60.5%	
F	1,063,935	0	0	0	0	0	1,063,935	0	0	0	0	0	0	60.0%	
G	1,854,120	0	0	0	649,169	0	0	0	0	0	597,930	607,021	0	79.1%	
H	4,253,869	0	0	0	2,736,231	777,950	166,082	253,519	0	0	0	280,559	39,527	52.1%	
I	3,278,009	0	155,236	0	1,990,943	0	199,731	380,082	0	0	0	552,017	0	56.2%	
J	3,491,036	0	148,787	0	1,745,157	0	979,097	0	0	0	0	597,019	20,976	57.2%	
K	4,851,546	487,835	0	876,458	0	0	1,389,765	107,155	0	0	1,349,608	607,376	33,349	65.8%	
L	6,213,911	0	155,236	547,565	4,485,014	0	134,360	234,387	0	0	0	611,737	45,612	50.6%	
M-1	5,887,969	0	196,200	0	0	0	4,035,998	0	0	0	923,324	664,060	68,388	68.6%	
M-2	1,504,794	0	0	0	0	0	1,252,612	0	0	0	0	252,182	0	66.7%	
M-3	7,412,546	0	175,449	0	0	2,039,428	4,668,640	0	0	0	0	529,028	0	58.8%	
N	1,012,137	0	0	0	0	0	757,575	0	0	0	0	254,562	0	70.1%	
P	2,063,174	317,478	1,745,697	0	0	0	0	0	0	0	0	0	0	4.5%	
TR-O1	65,820	0	0	0	0	0	0	0	0	0	0	65,820	0	100.0%	
TR-O3	94,247	0	0	0	0	0	0	0	0	0	0	94,247	0	100.0%	
OS-1	5,807,267	-	-	-	-	-	-	-	-	-	-	-	-	60.0'	
OS-2	1,826,062	-	-	-	-	-	-	-	-	-	-	-	-	50.0''''	
OS-3	3,928,078	-	-	-	-	-	-	-	-	-	-	-	-	54.7''''	
OS-5	687,311	-	-	-	-	-	-	-	-	-	-	-	-	90.0''	
OS-6	507,176	-	-	-	-	-	-	-	-	-	-	-	-	80.0''	
OS-7	877,484	-	-	-	-	-	-	-	-	-	-	-	-	55.0''''	
OS-8	11,487,201	-	-	-	-	-	-	-	-	-	-	-	-	54.8''''	
VMC_C	2,933,708	-	-	-	-	-	-	-	-	-	-	-	-	63.0''''	

¹Land percent imperviousness value obtained from 2021 First Creek MDR
²Land percent imperviousness value obtained from 2016 Harmony MDR
³Land percent imperviousness value obtained from Ware Malcomb (future developer)
⁴Land percent imperviousness value calculated based on pervious study noted below in calculations

OS-2 Composite Imperviousness (2021 First Creek MDR)		
MDR Basin ID	Area (ac)	Percent Imperviousness
360	25.6	50%
365	16.3	50%
Area-Weighted Average =		50.0%

OS-8 Composite Imperviousness (2013 Colfax to Yale MDP)		
MDR Basin ID	Area (ac)	Percent Imperviousness
85	3.6	79.6%
87	118.2	64.0%
89	73.3	48.0%
90	68.9	45.0%
Area-Weighted Average =		54.8%

OS-3 Composite Imperviousness (2013 Colfax to Yale MDP)		
MDR Basin ID	Area (ac)	Percent Imperviousness
92	2.2	63%
93	10.6	46%
94	69.22	55%
95	8.15	61%
Area-Weighted Average =		54.7%

VMC_C Composite Imperviousness (2021 Villages @ Murphy Creek MDR)		
MDR Basin ID	Area (ac)	Percent Imperviousness
C1	24.9	79%
C2	16.6	50%
C3	14	50%
Area-Weighted Average =		63.0%

100-year discharge inflow rate used in Table 3.

100-yr

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

Catchment Name/ID	User Comment for Catchment	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
		CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f.)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
A-1		0.086	0.267	19.0	5.40	9.9	3.81	9.0	290	427,356	2.10	897,527	40.0	312	891,840	2.65
A-2		0.077	0.264	14.6	4.46	7.6	3.15	7.4	287	323,789	2.40	776,994	35.0	310	773,503	3.48
B-1		0.091	0.187	30.9	5.94	16.1	4.20	9.9	103	247,415	1.97	486,901	45.0	127	486,750	1.86
B-2		0.085	0.233	14.0	4.01	7.3	2.83	6.7	287	310,743	2.12	659,773	35.0	281	656,022	3.29
C		0.086	0.206	17.2	4.22	9.0	2.98	7.0	186	247,594	2.08	515,523	35.0	194	511,580	2.84
D		0.086	0.202	14.2	3.71	7.4	2.62	6.2	211	232,831	1.93	450,492	35.0	192	446,568	2.99
E-1		0.103	0.125	36.6	5.03	19.0	3.55	8.4	70	197,567	1.65	326,773	45.0	79	325,984	1.46
E-2		0.084	0.201	16.8	4.09	8.7	2.89	6.8	166	215,554	2.09	451,241	35.0	172	448,931	2.89
E-3		0.077	0.340	16.4	5.74	8.5	3.84	9.6	536	680,685	2.35	1,598,530	35.0	589	1,588,361	3.14
E-4		0.084	0.141	9.7	2.55	5.1	1.80	4.3	130	97,895	2.09	204,802	35.0	99	195,027	3.66
F		0.084	0.134	12.7	2.81	6.6	1.99	4.7	90	88,661	2.03	180,239	35.0	77	173,628	3.17
G		0.077	0.188	14.2	3.55	7.4	2.51	5.9	141	154,510	2.34	361,456	35.0	145	357,535	3.40
H		0.088	0.236	16.4	4.47	8.5	3.16	7.5	279	354,489	1.95	690,941	35.0	274	688,232	2.80
I		0.086	0.217	18.2	4.53	9.4	3.20	7.5	194	273,167	2.03	555,344	35.0	201	552,641	2.67
J		0.085	0.225	25.2	5.85	13.1	4.14	9.8	149	290,920	2.07	601,760	40.0	178	600,911	2.23
K		0.082	0.276	17.9	5.29	9.3	3.73	8.8	292	404,295	2.19	884,784	35.0	314	880,233	2.82
L		0.088	0.266	17.0	4.97	8.9	3.51	8.3	393	517,826	1.94	1,002,392	35.0	386	995,221	2.71
M-1		0.081	0.296	18.2	5.65	9.5	3.99	9.4	347	490,664	2.20	1,079,376	40.0	377	1,073,008	2.79
M-2		0.082	0.163	18.7	3.85	9.7	2.72	6.4	86	125,400	2.17	272,638	35.0	94	271,237	2.73
M-3		0.085	0.300	17.0	5.43	8.9	3.83	9.0	468	617,712	2.07	1,277,803	35.0	478	1,270,188	2.81
N		0.081	0.139	10.9	2.66	5.7	1.88	4.4	100	84,345	2.06	173,620	35.0	78	167,150	3.37
P		0.148	0.138	47.9	6.57	24.9	4.65	11.0	46	171,931	1.38	237,152	50.0	51	237,210	1.07
OS-1		0.084	0.281	21.0	6.02	10.9	4.26	10.0	298	483,939	2.09	1,009,142	40.0	338	1,008,572	2.54
OS-2		0.089	0.158	25.2	4.56	13.1	3.22	7.6	78	152,172	1.95	296,726	40.0	88	295,856	2.11
OS-3		0.087	0.233	20.7	5.20	10.8	3.67	8.7	204	327,340	2.01	659,001	40.0	221	656,492	2.46
OS-5		0.075	0.124	11.4	2.58	5.9	1.82	4.3	65	57,276	2.51	144,029	35.0	59	138,115	3.77
OS-6		0.077	0.105	12.6	2.52	6.6	1.78	4.2	43	42,265	2.27	95,878	35.0	39	91,406	3.33
OS-7		0.086	0.119	18.0	3.14	9.3	2.22	5.2	53	73,124	2.10	153,338	35.0	55	151,362	2.75
OS-8		0.086	0.332	25.8	8.09	13.4	5.72	13.5	479	958,238	2.09	2,006,713	45.0	585	2,005,496	2.22
VMC_C		0.083	0.216	12.1	3.52	6.3	2.49	5.9	260	244,476	2.19	535,481	35.0	236	521,308	3.50
TR-O1		0.073	0.043	16.7	2.06	8.7	1.45	3.4	4	5,445	2.63	14,312	35.0	5	13,623	3.14
TR-O3		0.073	0.052	28.6	2.64	14.9	1.86	4.4	4	7,986	2.63	20,991	40.0	5	20,633	2.28

Required 100-year volume and 100-year discharge rate used in Table 3.

Proposed Stormwater Detention Pond Summary Table

Detention Basin	Type	Watershed	Contributing Basins	Area Served	Impervious	Predominant HSG	COA Sect 6.33 Allowable 100-Year Peak Outflow	WQCV	EURV	100-Yr Volume	100-Year Discharge	MEP Eligible?	Ownership and Maintenance Responsibility
				(ac)	(%)		(cfs)	(ac-ft)	(ac-ft)	(ac-ft)	(cfs)		
A	FSD	Coal Creek	A-1, A-2	206.9	67.1%	C/D	207	4.52	13.63	25.35	199	No	Private, MD
B	FSD	Coal Creek	B-1, B-2	153.8	52.2%	C/D	154	2.73	7.72	15.28	147	No	Private, MD
C	FSD	Coal Creek	C, OS-7, OS-8, VMC_C	419.4	56.1%	C/D	419	7.82	22.51	43.89	416	Yes	Public, Aurora Water
E	Flood Control	Coal Creek	E-1, E-2, E-3, E-4, OS-3, D	482.6	62.8%	B	410	N/A	N/A	55.92	397	Yes	Public, Aurora Water
G	FSD	Coal Creek	G (WQ ONLY)	42.6**	79.1%	B	76	1.14	3.67	5.60	48	No	Private, Metro District (MD)
			G, P (100-Year Volume)	89.9	39.8%								
H	FSD	Coal Creek	H, I, TR-O1, TR-O2	176.6	54.9%	B	150	3.24	10.38	18.83	149	No	Private, MD
J	FSD	First Creek	J	80.1	57.2%	B	68	1.52	4.77	8.11	67	Yes	Private, MD
K	FSD	First Creek	K	111.4	65.8%	B	95	2.38	7.53	13.54	95	No	Private, MD
L****	FSD	Coal Creek	F, L, OS-5, OS-6	194.5	56.8%	B	165	3.67	12.13	21.32	163	Yes	Public, Aurora Water
M1 (8175)	FSD (offline WQ)	First Creek	M-1, OS-1	268.5	64.3%	B	219*	N/A	19.02	31.86	217	Yes	Public, Aurora Water
M2***	Flood Control	First Creek	M-2, M-3, OS-2	246.6	58.4%	B	445***	N/A	N/A	9.74	441	Yes	Public, Aurora Water
N	FSD	First Creek	N	23.2	70.1%	A	12	0.53	1.99	2.73	12	No	Private, MD

* The calculated allowable discharge per the Aurora Sect. 6.33 is greater than allowable discharge as detailed by the 2021 Harmony Master Drainage Plan 2nd Amendment. Therefore, the lower flow from the MDR 2nd Amendment has been adopted as the governing flow rate

** Area treated for WQ

*** Pond M2 is 100-yr flood control only. Allowable peak outflow is per Harmony Filing 15 PDR channel design flow.

**** Pond L outfall type, closed conduit or open channel, will need to be determined at Preliminary Drainage Report. This may also impact if online WQCV and EURV is allowed or if it needs to be treated offline.

Note: Maintenance eligibility with MHFD and public versus private maintenance for ponds may be re-evaluated at time of Preliminary Drainage Report.

Note: WQCV and EURV columns with N/A indicate that those elements will be provided off-line or in separate facilities.

Blue Hatch indicates Public and MEP Eligible

Allowable Flow Rate and calculated pond 100-year discharge rate for Pond C from master report.

Detention Basin	Discharge Location	Contributing Existing Basins for Comparison, see note 2	Estimated existing flow rate, see note 2 cfs	COA Allowable Flow Rate cfs	Allowable adjacent Subdivision or MHFD Allowable Flow Rate cfs	Controlling Outflow Method	Design 100-Year Discharge (cfs)
A	Coal Creek	A-4	171	207	N/A	COA Allowable, see Note 1	199
B	Coal Creek	Approx 75% of A-3	156	154	N/A	COA Allowable, see Note 1	147
C	Coal Creek	Approx 25% of A-3 and OS-7 through OS-10	433	419	N/A	COA Allowable, see Note 1	416
E	Coal Creek	A-1, A-2, OS-3	419	410	N/A	COA Allowable, see Note 1	397
G	Coal Creek	Approx 10% of A-5 and approx 5% of A-6	31	76	N/A	COA Allowable, see Note 1	48
H	Coal Creek	Approx 95% of A-6 and diverted A-7	193	150	N/A	COA Allowable, see Note 1	149
J	Adonea Subdivision	B-1	74	68	Adonea Subdivision, 94cfs	COA Allowable	67
K	Adonea Subdivision	C-1	100	95	Adonea Subdivision, 109cfs	COA Allowable	95
L	Coal Creek	Approx. 45% of A-5 and OS-4,-5,-6	141.3	165	N/A	COA Allowable, see Note 1	163
M1 (8175)	Harmony (Future Filing 14)	E-2, OS-1	249	228	First Creek Trib MDP - Pond 8175 - 230cfs Harmony MDP, 219cfs	Harmony Subdivision	217
M2	Harmony (Future Filing 15)	E-1, OS-2	213	210	Harmony Filing 15 PDR (in review) 445cfs	Harmony Subdivision, pond M2 for flood control only	441
N	Harmony (Future Filing 15)	D-1	9	12	Harmony Filing 15 PDR (in review) 30cfs	Harmony Subdivision	12

Note 1: COA Allowable flow rate is used in several areas along Coal Creek due to discharge to a major drainageway and the offset peaks between Coal Creek and pond peak discharges.

Note 2: Existing basin boundaries and proposed pond tributary areas do not line up well in several scenarios, equivalent existing flow rates are estimates only.

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pipd to the stub at DP OS4. From here, the runoff will be pipd to DP 7.7 and ultimately to the channel. It will then be routed via storm sewer infrastructure to Regional Pond C.

Basin OS5 (11.58 acres, 75% impervious) is anticipated to be Single Family Residential with a 75% imperviousness. With the development of this basin, the offsite area will be provided 100-year detention to reduce the flows to historic conditions per City of Aurora drainage criteria via Regional Pond C. Developed flows will be collected by future storm sewer and pipd to the stub at DP OS5. From here, the runoff will be pipd to DP 7.7 and ultimately to the channel. It will then be routed via storm sewer infrastructure to Regional Pond C.

 Parklands Village 1 Filing 3 On-site Boundary

Basin OS6 (66.83 acres, 75% impervious) is anticipated to be Single-Family Residential with a 75% imperviousness and includes Regional Pond C. The runoff from this basin will follow historic drainage patterns and run east to Regional Pond C. With the development of this basin, the offsite area will be provided 100-year detention to reduce the flows to historic conditions per City of Aurora drainage criteria Regional Pond C. Developed flows will be captured by future storm sewer and conveyed to Regional Pond C at DP OS6. From here, the flows will outfall to Coal Creek.

Basin OS7 (22.76 acres, 75% impervious) is anticipated to be Single Family Residential with a 75% imperviousness. With the development of this basin, the offsite area will be provided 100-year detention to reduce the flows to historic conditions per City of Aurora drainage criteria via Regional Pond C. Overland flows will collected in a proposed swale at DP OS7 before being pipd to DP 7.6. From here, the runoff will be pipd to the channel. It will then be routed via storm sewer infrastructure to Regional Pond C.

 Parklands Village 1 Filing 3 Off-site Boundary OF-3

Basin OS8 (1.08 acres, 74% impervious) is to be the future north half of Jewell Avenue. In the ultimate condition, runoff will be collected via curb and gutter to a Type R inlet at DP OS8. From there, future storm infrastructure will connect at DP 6.3 and to the pipe network to Regional Pond C. An interim condition has been included as exhibits with the preliminary drainage maps that shows runoff being collected in a swale before construction of the road.

 Parklands Village 1 Filing 3 Off-site Boundary OF-2

Basin OS9 (1.65 acres, 74% impervious) is to be the future north half of Jewell Avenue. In the ultimate condition, runoff will be collected via curb and gutter to a Type R inlet at DP OS9. From there, future storm infrastructure will connect at DP 6.5 and to the pipe network to Regional Pond C. An interim condition has been included as exhibits with the preliminary drainage maps that shows runoff being collected in a swale before construction of the road.

 Parklands Village 1 Filing 3 Off-site Boundary OF-1

Basin OS10 (1.19 acres, 74% impervious) is to be the future north half of Jewell Avenue. In the ultimate condition, runoff will be collected via curb and gutter to a Type R inlet at DP OS10. From there, future storm infrastructure will connect at DP 6.8 and to the pipe network to Regional Pond C. An interim condition has been included as exhibits with the preliminary drainage maps that shows runoff being collected in a swale before construction of the road.

Basin OS11 (0.71 acres, 5% impervious) is from Harvest Crossing Filing 1 and comprises of Basins B1-a and OB from the Final Drainage Report shown in Appendix 4. It is a temporary

Parklands Village 1 Filing 3 On-site Boundary

Parklands Village 1 Filing 3 Off-site Boundary OF-3

Basin ID	Total Area (ac)	Paved Roads, Drives, Walks			Single Family Residential (70%)			Multi- Family Residential/ Attached/ Offsite (75%)			School (55%)			Rec Center (50%)			Landscaped Areas			Open Space			Basins Total Weighted % Imp.
		% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	
OS4	9.32	95%	0.00	0.0%	70%	0.00	0.0%	75%	9.32	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
OS5	11.58	95%	0.00	0.0%	70%	0.00	0.0%	75%	11.58	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
OS7	22.76	95%	0.00	0.0%	70%	0.00	0.0%	75%	22.76	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
OS6	66.83	95%	12.19	17.3%	70%	54.64	57.2%	75%	0.00	0.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	74.6%
OS8	1.08	95%	0.78	68.6%	70%	0.00	0.0%	75%	0.00	0.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.30	5.6%	5%	0.00	0.0%	74.2%
OS9	1.65	95%	1.18	67.9%	70%	0.00	0.0%	75%	0.00	0.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.47	5.7%	5%	0.00	0.0%	73.6%
OS10	1.19	95%	0.85	67.9%	70%	0.00	0.0%	75%	0.00	0.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.34	5.7%	5%	0.00	0.0%	73.6%
OS11	0.71	95%	0.00	0.0%	70%	0.00	0.0%	75%	0.00	0.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.71	5.0%	5.0%
OS12	0.55	95%	0.00	0.0%	70%	0.00	0.0%	75%	0.55	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
OS13	0.34	95%	0.00	0.0%	70%	0.00	0.0%	75%	0.34	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
OS14	0.41	95%	0.00	0.0%	70%	0.00	0.0%	75%	0.41	75.0%	55%	0.00	0.0%	50%	0.00	0.0%	20%	0.00	0.0%	5%	0.00	0.0%	75.0%
TOTAL	343.90																						69.6%

Parklands Village 1 Filing 3 Off-site Boundary OF-2

Parklands Village 1 Filing 3 Off-site Boundary OF-1

STANDARD FORM SF-2 TIME OF CONCENTRATION

Subdivision: FOUNDRY FILING NO. 1

Location: Aurora

Project Name: FOUNDRY FILING NO. 1

Project No.: 16146.00

Calculated By: DIG

Checked By: RAB

Date: 2/29/24

Parklands Village 1 Filing 3 On-site Boundary

BASIN ID	SUB-BASIN DATA						INITIAL/OVERLAND (T _i)			TRAVEL TIME (T _t)					t _c CHECK (URBANIZED BASINS)			FINAL t _c (min)
	D.A. (ac)	Hydrologic Soils Group	Impervious (%)	C ₂	C ₅	C ₁₀₀	L (ft)	S _o (%)	t _i (min)	L _t (ft)	S _t (%)	K	VEL. (ft/s)	t _t (min)	COMP. t _c (min)	TOTAL LENGTH (ft)	Urbanized t _c (min)	
A56	2.04	C/D	77%	0.62	0.67	0.80	95	3.9%	4.9	565	2.0%	20.0	2.8	3.3	8.2	660.0	16.3	8.2
A77	0.89	C/D	72%	0.57	0.63	0.78	91	4.7%	4.9	422	2.0%	20.0	2.8	2.5	7.4	513.0	16.4	7.4
A57	1.72	C/D	64%	0.50	0.56	0.75	94	5.0%	5.6	193	4.5%	15.0	3.2	1.0	6.6	287.0	16.0	6.6
A58	2.43	C/D	75%	0.60	0.65	0.79	18	3.7%	2.3	938	2.0%	20.0	2.8	5.5	7.8	956.0	19.0	7.8
A59	0.70	C/D	64%	0.50	0.56	0.75	25	3.2%	3.3	297	2.0%	20.0	2.8	1.8	5.1	322.0	17.1	5.1
A60	1.72	C/D	74%	0.59	0.64	0.79	90	0.6%	9.3	300	2.0%	20.0	2.8	1.8	11.1	390.0	15.3	11.1
A61	1.81	C/D	63%	0.50	0.55	0.74	15	4.0%	2.4	460	2.0%	20.0	2.8	2.7	5.1	475.0	18.3	5.1
A62	0.09	C/D	78%	0.63	0.68	0.81	25	4.0%	2.4	77	2.0%	20.0	2.8	0.5	2.9	102.0	13.1	5.0
A63	2.56	C/D	72%	0.57	0.62	0.78	133	4.2%	6.2	627	2.0%	20.0	2.8	3.7	9.9	760.0	17.7	9.9
A64	2.72	C/D	71%	0.57	0.62	0.78	133	1.6%	8.5	795	2.0%	20.0	2.8	4.7	13.2	928.0	18.8	13.2
A65	1.45	C/D	72%	0.57	0.63	0.78	67	2.6%	5.1	815	2.0%	20.0	2.8	4.8	9.9	882.0	18.8	9.9
A66	0.19	C/D	71%	0.57	0.62	0.78	40	2.4%	4.1	190	2.0%	20.0	2.8	1.1	5.2	230.0	15.1	5.2
A67	0.21	C/D	74%	0.59	0.64	0.79	17	2.8%	2.4	253	2.0%	20.0	2.8	1.5	3.9	270.0	15.0	5.0
A68	0.22	C/D	75%	0.60	0.65	0.79	17	2.8%	2.4	215	2.0%	20.0	2.8	1.3	3.7	232.0	14.6	5.0
A69	1.09	C/D	74%	0.59	0.64	0.79	238	1.0%	12.8	694	2.0%	20.0	2.8	4.1	16.9	932.0	17.7	16.9
A70	13.78	C/D	75%	0.60	0.65	0.79	263	1.8%	10.9	564	1.8%	10.0	1.3	7.0	17.9	827.0	16.8	16.8
A71	1.02	C/D	86%	0.70	0.74	0.84	29	3.3%	2.4	469	2.0%	20.0	2.8	2.8	5.1	498.0	14.0	5.1
A72	10.99	C/D	25%	0.17	0.24	0.58	190	8.9%	10.4	1913	1.0%	15.0	1.5	21.3	31.7	2103.0	47.4	31.7
D1	1.10	C/D	79%	0.63	0.68	0.81	48	2.5%	3.9	1072	2.0%	20.0	2.8	6.3	10.2	1120.0	18.9	10.2
D2	0.32	C/D	79%	0.63	0.68	0.81	38	0.5%	5.9	212	2.0%	20.0	2.8	1.2	7.1	250.0	13.9	7.1
D3	0.59	C/D	78%	0.63	0.68	0.81	38	0.5%	5.9	488	2.0%	20.0	2.8	2.9	8.8	526.0	15.5	8.8
D4	0.49	C/D	86%	0.70	0.74	0.84	44	2.2%	3.3	450	2.0%	20.0	2.8	2.7	6.0	494.0	13.9	6.0
OS1	7.89	C/D	75%	0.60	0.65	0.79	88	3.5%	5.0	1250	4.5%	20.0	4.2	4.9	10.0	1338.0	18.3	10.0
OS2	48.43	C/D	75%	0.60	0.65	0.79	142	2.8%	6.9	2120	4.2%	20.0	4.1	8.6	15.5	2262.0	22.1	15.5
OS3	21.45	C/D	75%	0.60	0.65	0.79	142	2.6%	7.1	1260	4.0%	20.0	4.0	5.3	12.3	1402.0	18.6	12.3
OS4	9.32	C/D	75%	0.60	0.65	0.79	100	2.5%	6.0	1450	2.0%	20.0	2.8	8.5	14.5	1550.0	22.0	14.5
OS5	11.58	C/D	75%	0.60	0.65	0.79	150	2.6%	7.3	1200	2.0%	20.0	2.8	7.1	14.3	1350.0	20.5	14.3
OS7	22.76	C/D	75%	0.60	0.65	0.79	170	1.8%	8.7	970	2.0%	20.0	2.8	5.7	14.4	1140.0	19.1	14.4
OS6	66.83	C/D	75%	0.60	0.65	0.79	890	2.4%	18.3	1690	1.4%	20.0	2.4	11.9	30.2	2580.0	25.6	25.6
OS8	1.08	C/D	74%	0.59	0.64	0.79	50	3.0%	4.1	640	2.0%	20.0	2.8	3.8	7.8	690.0	17.3	7.8
OS9	1.65	C/D	74%	0.59	0.64	0.79	50	3.0%	4.1	970	2.0%	20.0	2.8	5.7	9.8	1020.0	19.4	9.8
OS10	1.19	C/D	74%	0.59	0.64	0.79	50	3.0%	4.1	720	2.0%	20.0	2.8	4.2	8.3	770.0	17.9	8.3
OS11	0.71	C/D	5%	0.25	0.27	0.35	415	2.0%	24.3	450	4.5%	20.0	4.2	1.8	26.1	865.0	28.8	26.1
OS12	0.55	C/D	75%	0.60	0.65	0.79	17	5.0%	2.0	450	2.0%	20.0	2.8	2.7	4.6	467.0	16.0	5.0

Parklands Village 1 Filing 3 Off-site Boundary OF-3

Parklands Village 1 Filing 3 Off-site Boundary OF-2

Parklands Village 1 Filing 3 Off-site Boundary OF-1

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: FOUNDRY FILING NO. 1
Location: Aurora
Design Storm: 2-Year

Project Name: FOUNDRY FILING NO. 1
Project No.: 16146.00
Calculated By: DIG
Checked By: RAB
Date: 2/29/24

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	t_c (min)	C*A (Ac)	I (in/hr)	Q (cfs)	t_{tc} (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
E. CASPIAN AVE	7.4								15.6	35.46	1.91	67.7				67.7	35.46	1.0	54	65	11.2	0.1	SUM OF DP 7.3, D3, D4 PIPED TO DP 7.5
FUTURE FILING	OS3	OS3	21.45	0.60	12.3	12.89	2.12	27.3															OFFSITE BASIN PIPED TO 7.5
E. WARREN AVE	7.5								15.7	48.35	1.90	91.9				91.9	48.35	1.0	60	230	12.1	0.3	SUM OF DP 7.4, OS3 PIPED TO DP 7.6
FUTURE FILING	OS7	OS7	22.76	0.60	14.4	13.68	1.98	27.1								27.1	13.68	1.0	60	112	8.6	0.2	OFFSITE BASIN PIPED TO DP 7.6
FUTURE FILING	7.6								16.0	62.03	1.88	116.6				116.6	62.03	1.0	96	295	12.5	0.4	Sum of DP OS7 & DP 7.5 FUT. POND D OUTLET, PIPED TO CHANNEL
FUTURE FILING	OS4	OS4	9.32	0.60	14.5	5.60	1.97	11.0								11.0	5.60	1.0	24	122	7.1	0.3	OFFSITE BASIN PIPED TO DP 7.7
FUTURE FILING	OS5	OS5	11.58	0.60	14.3	6.96	1.99	13.9								13.9	6.96	1.0	24	211	7.6	0.5	OFFSITE BASIN PIPED TO DP 7.7
E. CASPIAN AVE	7.7								14.8	12.56	1.95	24.5				24.5	12.56	1.0	24	170	7.8	0.4	SUM OF DP OS4, OS5 PIPED TO CHANNEL
PARKLANDS	OS6	OS6	66.83	0.60	25.6	39.90	1.47	58.7															OFFSITE BASIN PIPED TO REGIONAL POND C
FUTURE JEWELL AVE	OS8	OS8	1.08	0.59	7.8	0.64	2.53	1.6								1.6	0.64	1.0	24	70	4.1	0.3	OFFSITE BASIN PIPED TO DP 6.3
FUTURE JEWELL AVE	OS9	OS9	1.65	0.59	9.8	0.97	2.33	2.3								2.3	0.97	1.0	24	70	4.6	0.3	OFFSITE BASIN PIPED TO DP 6.5
FUTURE JEWELL AVE	OS10	OS10	1.19	0.59	8.3	0.70	2.48	1.7								1.7	0.70	1.0	24	70	4.2	0.3	OFFSITE BASIN PIPED TO DP 6.8

Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

Assumed Foundry Development PDR Off-site
2-YR Runoff for inlets of OF-3, OF-2, and OF-1
respectively

STANDARD FORM SF-3
STORM DRAINAGE SYSTEM DESIGN
(RATIONAL METHOD PROCEDURE)

Subdivision: FOUNDRY FILING NO. 1
Location: Aurora
Design Storm: 100-Year

Project Name: FOUNDRY FILING NO. 1
Project No.: 16146.00
Calculated By: DIG
Checked By: RAB
Date: 2/29/24

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS
		Basin ID	Area (ac)	Runoff Coeff.	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	t_c (min)	C*A (ac)	I (in/hr)	Q (cfs)	Q_{street} (cfs)	C*A (ac)	Slope (%)	Q_{pipe} (cfs)	C*A (ac)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	t_t (min)	
E. CASPIAN AVE	7.4								16.0	45.97	5.43	249.6				249.6	45.97	1.0	54	65	15.7	0.1	SUM OF DP 7.3, D3, D4 PIPED TO DP 7.5
FUTURE FILING	OS3	OS3	21.45	0.79	12.3	16.97	6.13	104.0															OFFSITE BASIN PIPED TO 7.5
E. WARREN AVE	7.5								16.1	62.94	5.42	341.2				341.2	62.94	1.0	60	230	17.4	0.2	SUM OF DP 7.4, OS3 PIPED TO DP 7.6
FUTURE FILING	OS7	OS7	22.76	0.60	14.4	13.68	5.71	78.1								78.1	13.68	1.0	60	112	11.6	0.2	OFFSITE BASIN PIPED TO DP 7.6
FUTURE FILING	7.6								16.1	76.62	5.42	415.3				415.3	76.62	1.0	96	295	17.7	0.3	SUM OF DP OS7 & DP 7.5 FUT. POND D OUTLET, PIPED TO CHANNEL
FUTURE FILING	OS4	OS4	9.32	0.79	14.5	7.37	5.69	41.9								41.9	7.37	1.0	24	122	13.4	0.2	OFFSITE BASIN PIPED TO DP 7.7
FUTURE FILING	OS5	OS5	11.58	0.79	14.3	9.16	5.73	52.5								52.5	9.16	1.0	24	211	16.7	0.2	OFFSITE BASIN PIPED TO DP 7.7
FUTURE FILING	7.7								14.7	16.53	5.66	93.6				93.6	16.53	1.0	24	170	29.8	0.1	SUM OF DP OS4, OS5 PIPED TO CHANNEL
E. CASPIAN AVE	OS6	OS6	66.83	0.79	25.6	52.80	4.25	224.4															OFFSITE BASIN PIPED TO REGIONAL POND C
FUTURE JEWELL AVE	OS8	OS8	1.08	0.59	7.8	0.64	7.31	4.7								4.7	0.64	1.0	24	70	5.6	0.2	OFFSITE BASIN PIPED TO DP 6.3
FUTURE JEWELL AVE	OS9	OS9	1.65	0.59	9.8	0.97	6.73	6.5								6.5	0.97	1.0	24	70	6.2	0.2	OFFSITE BASIN PIPED TO DP 6.5
FUTURE JEWELL AVE	OS10	OS10	1.19	0.59	8.3	0.70	7.15	5.0								5.0	0.70	1.0	24	70	5.8	0.2	OFFSITE BASIN PIPED TO DP 6.8

Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

Assumed Foundry Development PDR Off-site
100-YR Runoff for inlets of OF-3, OF-2, and OF-1
respectively

"FOR REFERENCE ONLY. SEE CIVIL PLANS FOR DESIGN INFORMATION"

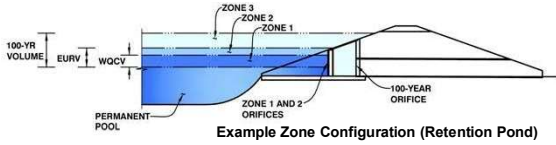
Foundry Development PDR Pond C Sizing - to be in place for Village 1 Filing 3 Development

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.06 (July 2022)

Project: Foundry Filing No. 1

Basin ID: Regional Pond C



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	4.75	10.550	Orifice Plate
Zone 2 (EURV)	6.68	17.235	Rectangular Orifice
Zone 3 (100-year)	8.47	19.531	Weir&Pipe (Rect.)
Total (all zones)		47.316	

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

Underdrain Orifice Invert Depth = N/A ft (distance below the filtration media surface)
Underdrain Orifice Diameter = N/A inches

Calculated Parameters for Underdrain
Underdrain Orifice Area = N/A ft²
Underdrain Orifice Centroid = N/A feet

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

Centroid of Lowest Orifice = 0.00 ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate = 4.75 ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing = 19.00 inches
Orifice Plate: Orifice Area per Row = 25.82 sq. inches (use rectangular openings)

Calculated Parameters for Plate
WQ Orifice Area per Row = 1.793E-01 ft²
Elliptical Half-Width = N/A feet
Elliptical Slot Centroid = N/A feet
Elliptical Slot Area = N/A ft²

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.58	3.17					
Orifice Area (sq. inches)	25.82	25.82	25.82					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

Invert of Vertical Orifice = 4.76 ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice = 6.68 ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Height = 5.00 inches
Vertical Orifice Width = 8.00 inches

Calculated Parameters for Vertical Orifice
Zone 2 Rectangular Not Selected
Vertical Orifice Area = 0.28 ft²
Vertical Orifice Centroid = 0.21 feet

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

Overflow Weir Front Edge Height, H_o = 6.69 ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length = 40.00 feet
Overflow Weir Grate Slope = 0.00 H:V
Horiz. Length of Weir Sides = 7.00 feet
Overflow Grate Type = Close Mesh Grate
Debris Clogging % = 0% N/A %

Calculated Parameters for Overflow Weir
Zone 3 Weir Not Selected
Height of Grate Upper Edge, H_u = 6.69 feet
Overflow Weir Slope Length = 7.00 feet
Grate Open Area / 100-yr Orifice Area = 6.92
Overflow Grate Open Area w/o Debris = 221.48 ft²
Overflow Grate Open Area w/ Debris = 221.48 ft²

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

Depth to Invert of Outlet Pipe = 0.58 ft (distance below basin bottom at Stage = 0 ft)
Rectangular Orifice Width = 96.00 inches
Rectangular Orifice Height = 48.00 inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate
Zone 3 Rectangular Not Selected
Outlet Orifice Area = 32.00 ft²
Outlet Orifice Centroid = 2.00 feet
Half-Central Angle of Restrictor Plate on Pipe = N/A radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage = 8.92 ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length = 190.00 feet
Spillway End Slopes = 4.00 H:V
Freeboard above Max Water Surface = 1.00 feet

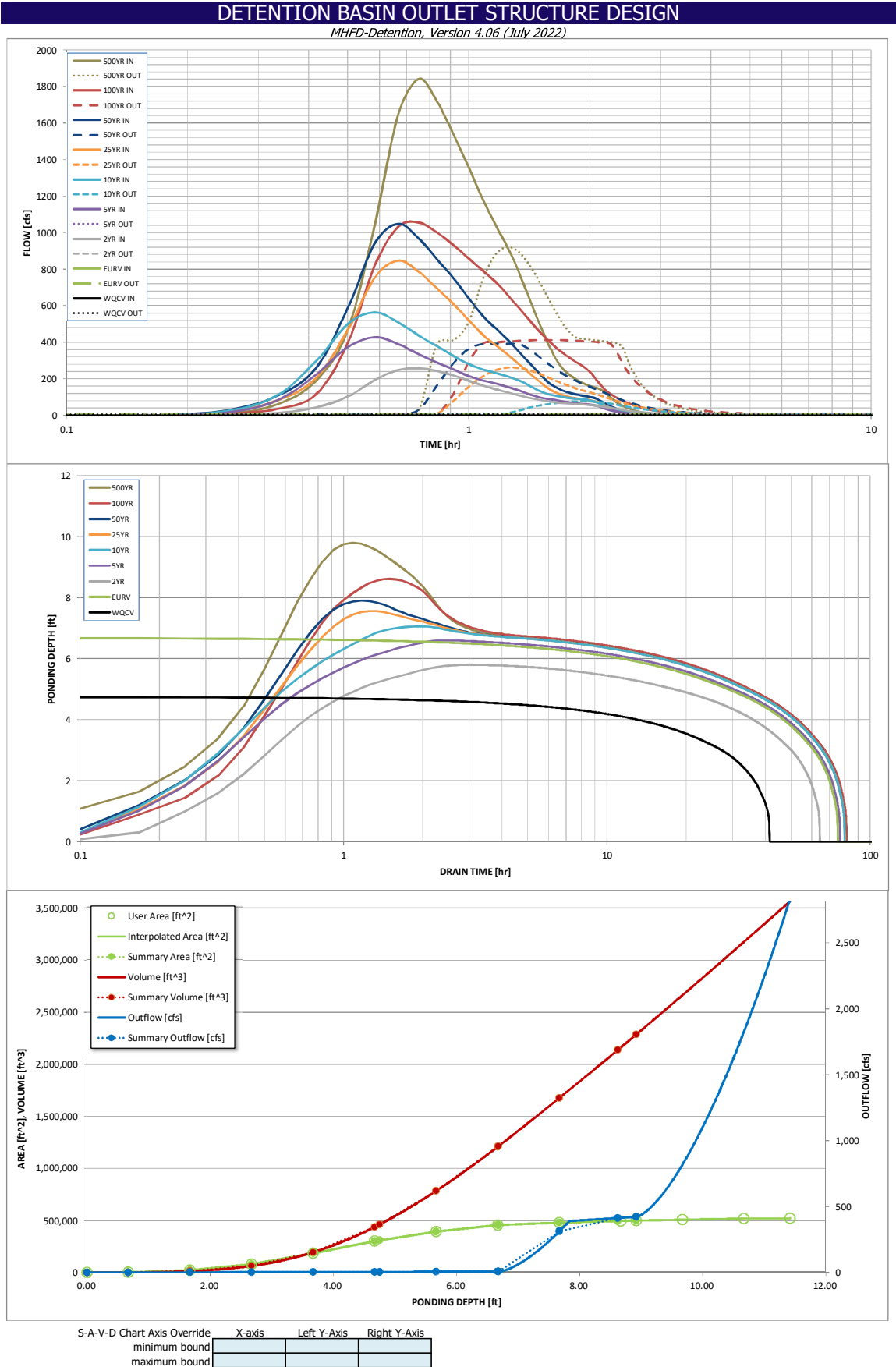
Calculated Parameters for Spillway
Spillway Design Flow Depth = 1.48 feet
Stage at Top of Freeboard = 11.40 feet
Basin Area at Top of Freeboard = 11.94 acres
Basin Volume at Top of Freeboard = 81.63 acre-ft

Routed Hydrograph Results

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

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period	N/A	N/A	0.86	1.14	1.40	1.79	2.12	2.48	3.40
One-Hour Rainfall Depth (in)	N/A	N/A	0.86	1.14	1.40	1.79	2.12	2.48	3.40
CUHP Runoff Volume (acre-ft)	10.550	27.785	19.410	28.231	37.463	53.291	66.001	80.868	116.974
User Override Inflow Hydrograph Volume (acre-ft)	N/A	N/A	20.823	28.231	37.463	53.291	66.001	89.404	116.974
CUHP Predevelopment Peak Q (cfs)	N/A	N/A	4.1	46.1	115.6	286.8	396.0	537.3	846.7
OPTIONAL Override Predevelopment Peak Q (cfs)	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre)	N/A	N/A	0.01	0.11	0.26	0.66	0.90	1.23	1.93
Peak Inflow Q (cfs)	N/A	N/A	258.4	428.0	564.3	847.5	1049.4	1056.3	1842.1
Peak Outflow Q (cfs)	4.5	7.5	6.5	7.5	77.7	261.8	392.2	413.3	921.4
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	0.2	0.7	0.9	1.0	0.8	1.1
Structure Controlling Flow	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Gate 1 (fps)	N/A	N/A	N/A	N/A	0.3	1.1	1.7	1.8	2.0
Max Velocity through Gate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours)	38	68	58	69	71	69	67	65	61
Time to Drain 99% of Inflow Volume (hours)	40	72	62	73	76	75	74	74	71
Maximum Ponding Depth (ft)	4.75	6.68	5.80	6.59	7.06	7.56	7.90	8.62	9.80
Area at Maximum Ponding Depth (acres)	7.09	10.48	9.19	10.35	10.67	10.93	11.07	11.33	11.68
Maximum Volume Stored (acre-ft)	10.585	27.843	19.086	26.905	31.755	37.155	40.898	48.962	62.553

Foundry Development PDR Pond C Sizing - to be in place for Village 1 Filing 3 Development



"FOR REFERENCE ONLY. SEE CIVIL PLANS FOR DESIGN INFORMATION"

Foundry Development PDR Pond C Sizing - to be in place for Village 1 Filing 3 Development

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	CUHP	CUHP	USER	CUHP	CUHP	CUHP	CUHP	USER	CUHP
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	9.10
	0:15:00	0.00	0.00	1.16	16.15	23.84	19.02	27.79	9.09	60.78
	0:20:00	0.00	0.00	13.78	81.40	108.34	80.43	106.20	35.27	188.50
	0:25:00	0.00	0.00	43.78	222.69	296.23	204.14	258.62	114.35	467.29
	0:30:00	0.00	0.00	102.95	374.43	500.27	468.23	588.04	396.42	1041.34
	0:35:00	0.00	0.00	193.83	427.95	564.30	753.94	941.08	819.11	1644.16
	0:40:00	0.00	0.00	248.02	391.41	510.01	847.51	1049.43	1031.56	1842.09
	0:45:00	0.00	0.00	258.42	335.85	438.16	786.77	968.95	1056.33	1719.28
	0:50:00	0.00	0.00	243.02	290.05	379.08	694.91	854.52	1001.17	1534.07
	0:55:00	0.00	0.00	218.14	250.26	325.41	609.56	749.91	931.87	1357.74
	1:00:00	0.00	0.00	189.82	215.11	280.14	519.93	640.05	858.01	1183.48
	1:05:00	0.00	0.00	164.03	191.13	252.41	441.22	544.14	792.49	1039.76
	1:10:00	0.00	0.00	143.04	174.07	232.19	385.10	476.27	729.43	919.00
	1:15:00	0.00	0.00	124.92	156.72	213.02	332.36	412.28	658.13	779.74
	1:20:00	0.00	0.00	109.39	136.09	190.31	280.36	348.31	587.50	635.31
	1:25:00	0.00	0.00	96.12	115.09	161.78	230.07	285.50	519.61	499.05
	1:30:00	0.00	0.00	85.08	98.40	133.04	183.96	227.54	458.77	380.68
	1:35:00	0.00	0.00	76.37	89.14	115.20	143.92	177.76	406.05	289.79
	1:40:00	0.00	0.00	70.09	82.34	104.79	119.67	147.72	362.15	235.26
	1:45:00	0.00	0.00	65.80	74.61	97.48	104.54	128.77	326.78	201.58
	1:50:00	0.00	0.00	62.99	68.02	92.17	94.65	116.29	296.50	177.82
	1:55:00	0.00	0.00	60.67	63.31	87.87	87.74	107.56	269.76	161.61
	2:00:00	0.00	0.00	57.48	59.30	82.12	83.25	101.79	237.84	149.87
	2:05:00	0.00	0.00	53.57	51.52	70.41	73.72	89.97	190.09	130.25
	2:10:00	0.00	0.00	48.10	39.54	53.61	56.76	69.16	146.45	98.95
	2:15:00	0.00	0.00	42.05	28.68	38.61	40.88	49.71	116.83	71.07
	2:20:00	0.00	0.00	36.00	20.92	27.94	29.65	36.00	95.22	51.65
	2:25:00	0.00	0.00	30.29	15.17	20.28	21.63	26.24	78.53	37.98
	2:30:00	0.00	0.00	25.23	10.65	14.47	15.35	18.60	65.17	27.12
	2:35:00	0.00	0.00	20.90	7.33	10.18	10.79	13.08	54.16	19.05
	2:40:00	0.00	0.00	17.34	5.09	7.12	7.70	9.32	44.88	13.54
	2:45:00	0.00	0.00	14.44	3.37	4.61	5.12	6.19	37.35	8.96
	2:50:00	0.00	0.00	12.05	2.00	2.65	3.06	3.69	31.11	5.32
	2:55:00	0.00	0.00	10.09	0.99	1.24	1.52	1.83	25.97	2.61
	3:00:00	0.00	0.00	8.48	0.32	0.37	0.50	0.60	21.79	0.84
	3:05:00	0.00	0.00	7.20	0.01	0.00	0.00	0.00	18.39	0.00
	3:10:00	0.00	0.00	6.20	0.00	0.00	0.00	0.00	15.70	0.00
	3:15:00	0.00	0.00	5.42	0.00	0.00	0.00	0.00	13.59	0.00
	3:20:00	0.00	0.00	4.79	0.00	0.00	0.00	0.00	11.91	0.00
	3:25:00	0.00	0.00	4.28	0.00	0.00	0.00	0.00	10.55	0.00
	3:30:00	0.00	0.00	3.85	0.00	0.00	0.00	0.00	9.40	0.00
	3:35:00	0.00	0.00	3.49	0.00	0.00	0.00	0.00	8.43	0.00
	3:40:00	0.00	0.00	3.18	0.00	0.00	0.00	0.00	7.59	0.00
	3:45:00	0.00	0.00	2.91	0.00	0.00	0.00	0.00	6.88	0.00
	3:50:00	0.00	0.00	2.67	0.00	0.00	0.00	0.00	6.24	0.00
	3:55:00	0.00	0.00	2.45	0.00	0.00	0.00	0.00	5.69	0.00
	4:00:00	0.00	0.00	2.28	0.00	0.00	0.00	0.00	5.20	0.00
	4:05:00	0.00	0.00	2.10	0.00	0.00	0.00	0.00	4.75	0.00
	4:10:00	0.00	0.00	1.97	0.00	0.00	0.00	0.00	4.38	0.00
	4:15:00	0.00	0.00	1.83	0.00	0.00	0.00	0.00	4.02	0.00
	4:20:00	0.00	0.00	1.72	0.00	0.00	0.00	0.00	3.73	0.00
	4:25:00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	3.44	0.00
	4:30:00	0.00	0.00	1.51	0.00	0.00	0.00	0.00	3.20	0.00
	4:35:00	0.00	0.00	1.41	0.00	0.00	0.00	0.00	2.97	0.00
	4:40:00	0.00	0.00	1.33	0.00	0.00	0.00	0.00	2.77	0.00
	4:45:00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	2.57	0.00
	4:50:00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	2.41	0.00
	4:55:00	0.00	0.00	1.11	0.00	0.00	0.00	0.00	2.25	0.00
	5:00:00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	2.11	0.00
	5:05:00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.97	0.00
	5:10:00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	1.86	0.00
	5:15:00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	1.74	0.00
	5:20:00	0.00	0.00	0.86	0.00	0.00	0.00	0.00	1.64	0.00
	5:25:00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	1.55	0.00
	5:30:00	0.00	0.00	0.78	0.00	0.00	0.00	0.00	1.46	0.00
	5:35:00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	1.38	0.00
	5:40:00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	1.31	0.00
	5:45:00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	1.23	0.00
	5:50:00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	1.17	0.00
	5:55:00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	1.11	0.00
	6:00:00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	1.06	0.00

Foundry Development PDR Pond C Sizing - to be in place for Village 1 Filing 3 Development

MHFD-Detention, Version 4.06 (July 2022)

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

[illegible]

"FOR REFERENCE ONLY. SEE CIVIL PLANS FOR DESIGN INFORMATION"

REGIONAL POND C FOREBAY VOLUME REQUIREMENTS				
Equation 3-1	$WQCV = a(0.91I^3 - 1.19I^2 + 0.781I)$ a=1 (40 hour drain time)			
Regional Pond C	I=.659	WQCV=	0.25766	in
Equation 3-3	$V = (WQCV/12)A$			
Regional Pond C	A=491.35 Acres	V=	10.55009	ac-ft
*Note: The WQCV includes offsite basins OS1 & OS2, as the release from these ponds is mixed with untreated flows along Kewaunee Street.				
3% OF WQCV				
FOREBAY TOTAL VOLUME=		.03(V)		
VOLUME REQUIRED FOR POND C FOREBAY =	0.3165	AC-FT	13787	CF
VOLUME PROVIDED FOR POND C FOREBAY =	0.3357	AC-FT	14625	CF
Q ₁₀₀ Discharges	2% OF Q ₁₀₀			
Q ₁₀₀ BASIN A=	.02*966 CFS= 19.32 CFS			

Weir Report

Foundry Development PDR Pond C Forebay Sizing - to be in place for Village 1 Filing 3 Development

Regional Pond C Forebay Notch

Rectangular Weir

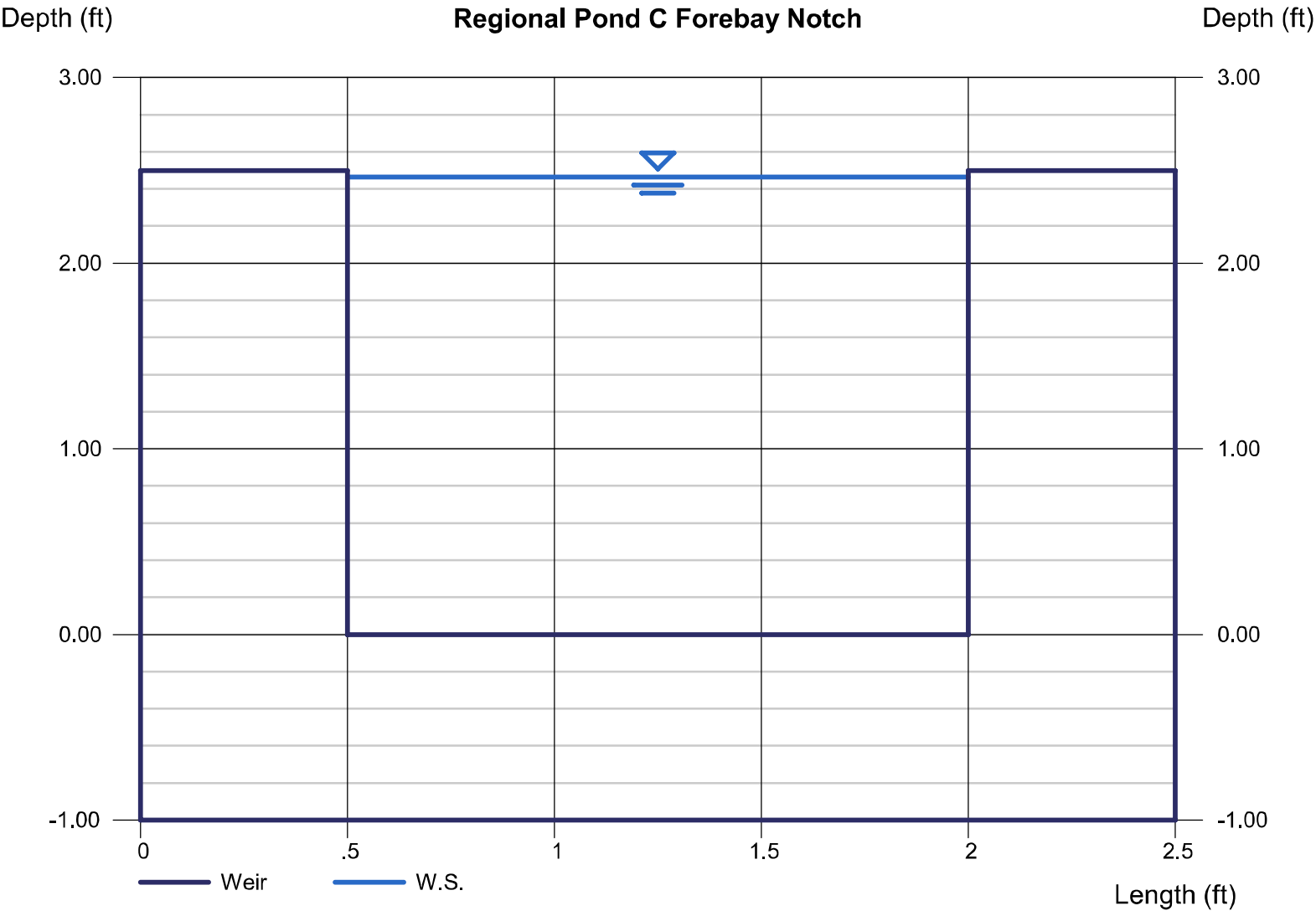
Crest = Sharp
Bottom Length (ft) = 1.50
Total Depth (ft) = 2.50

Highlighted

Depth (ft) = 2.47
Q (cfs) = 19.32
Area (sqft) = 3.70
Velocity (ft/s) = 5.22
Top Width (ft) = 1.50

Calculations

Weir Coeff. Cw = 3.33
Compute by: Known Q
Known Q (cfs) = 19.32



Channel Report

Foundry Development PDR Pond C Trickle Channel Sizing - to be in place for Village 1 Filing 3 Development

Regional Pond C Trickle Channel

Rectangular

Bottom Width (ft) = 6.00
Total Depth (ft) = 1.00

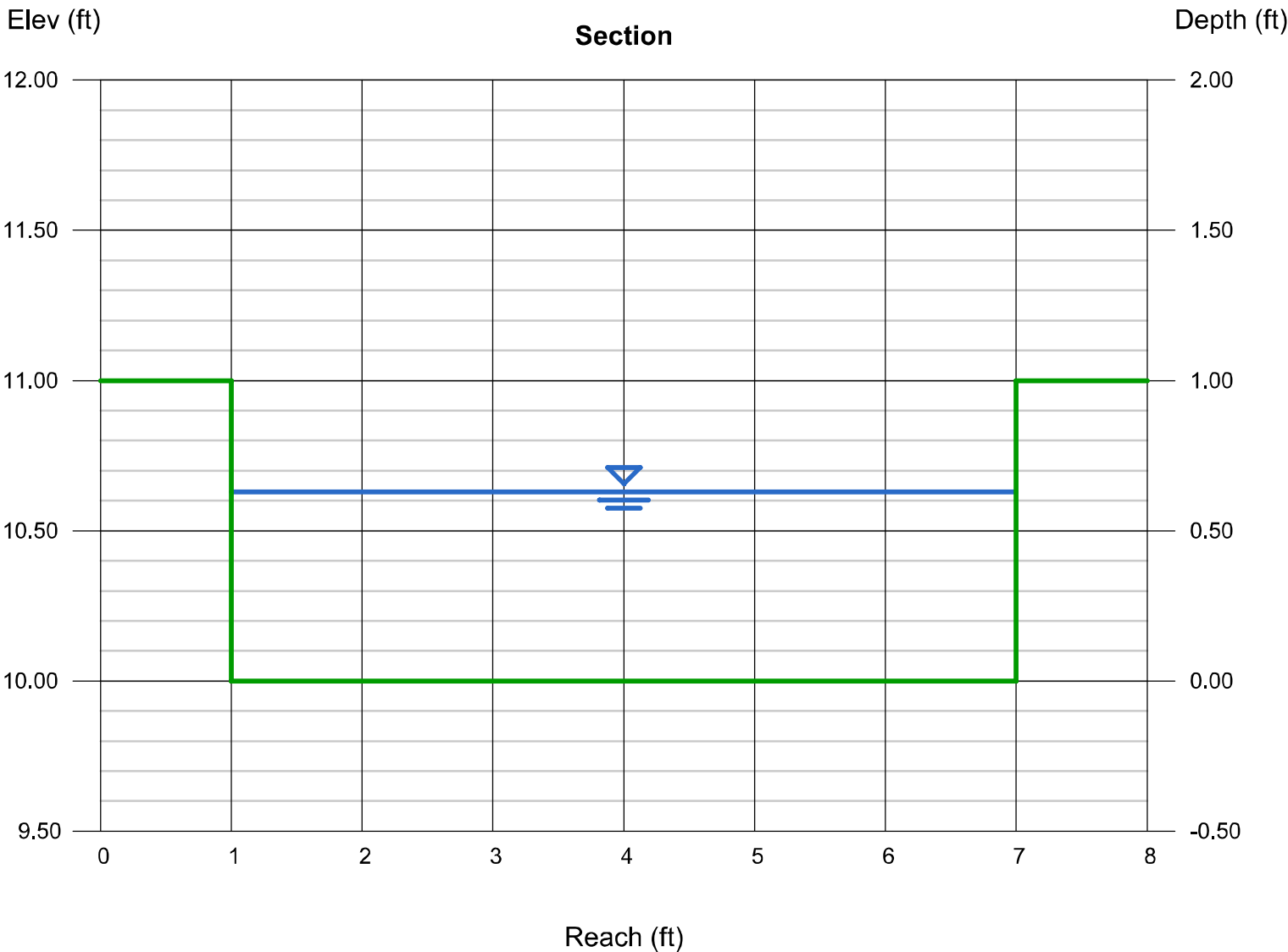
Invert Elev (ft) = 10.00
Slope (%) = 0.50
N-Value = 0.013

Calculations

Compute by: Known Q
Known Q (cfs) = 19.32

Highlighted

Depth (ft) = 0.63
Q (cfs) = 19.32
Area (sqft) = 3.78
Velocity (ft/s) = 5.11
Wetted Perim (ft) = 7.26
Crit Depth, Yc (ft) = 0.69
Top Width (ft) = 6.00
EGL (ft) = 1.04



Weir Report

Foundry Development PDR Pond C Spillway Sizing - to be in place for Village 1 Filing 3 Development

Regional Pond C Spillway

Trapezoidal Weir

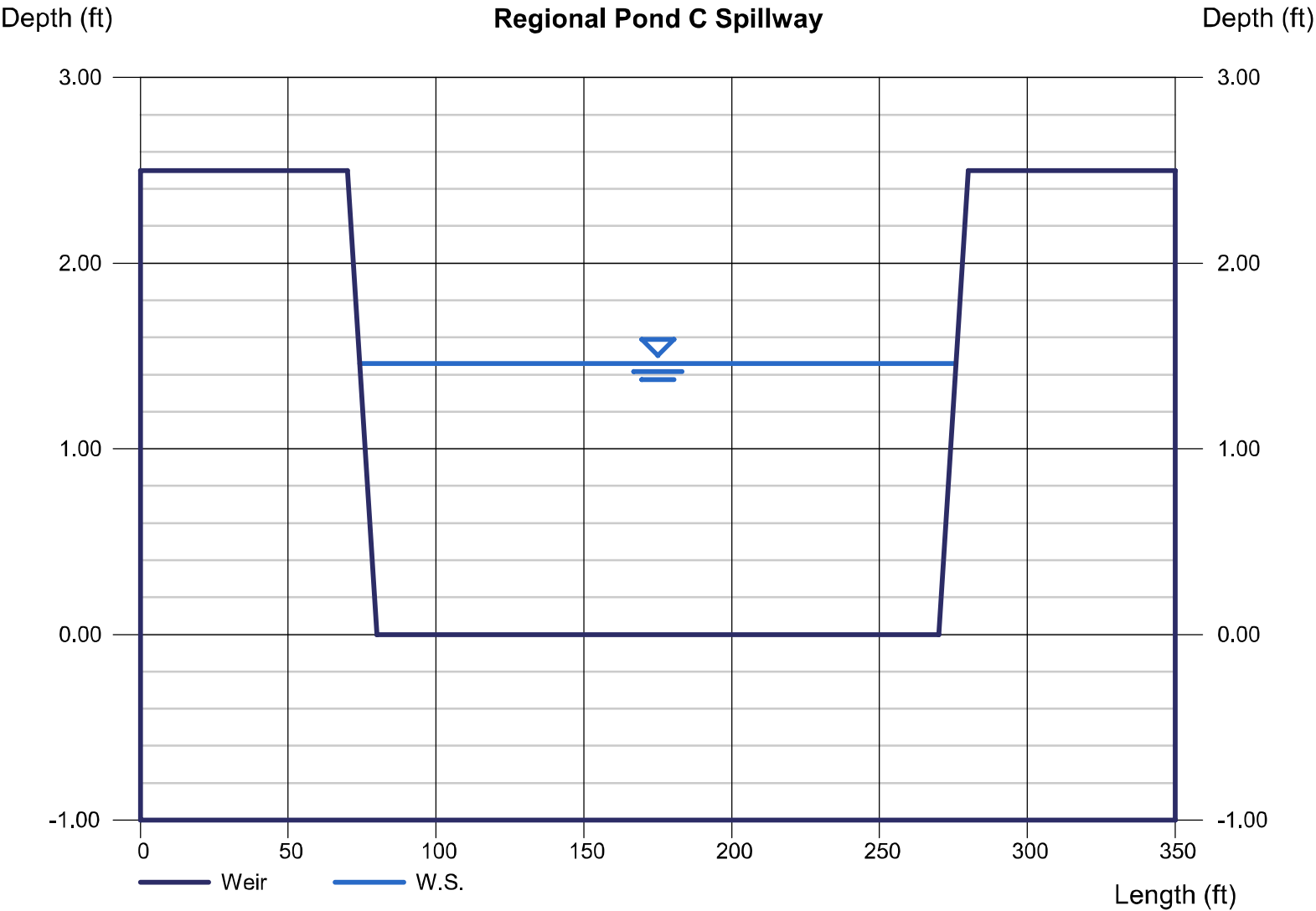
Crest = Sharp
Bottom Length (ft) = 190.00
Total Depth (ft) = 2.50
Side Slope (z:1) = 4.00

Highlighted

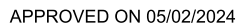
Depth (ft) = 1.46
Q (cfs) = 1056.30
Area (sqft) = 285.93
Velocity (ft/s) = 3.69
Top Width (ft) = 201.68

Calculations

Weir Coeff. Cw = 3.10
Compute by: Known Q
Known Q (cfs) = 1056.30

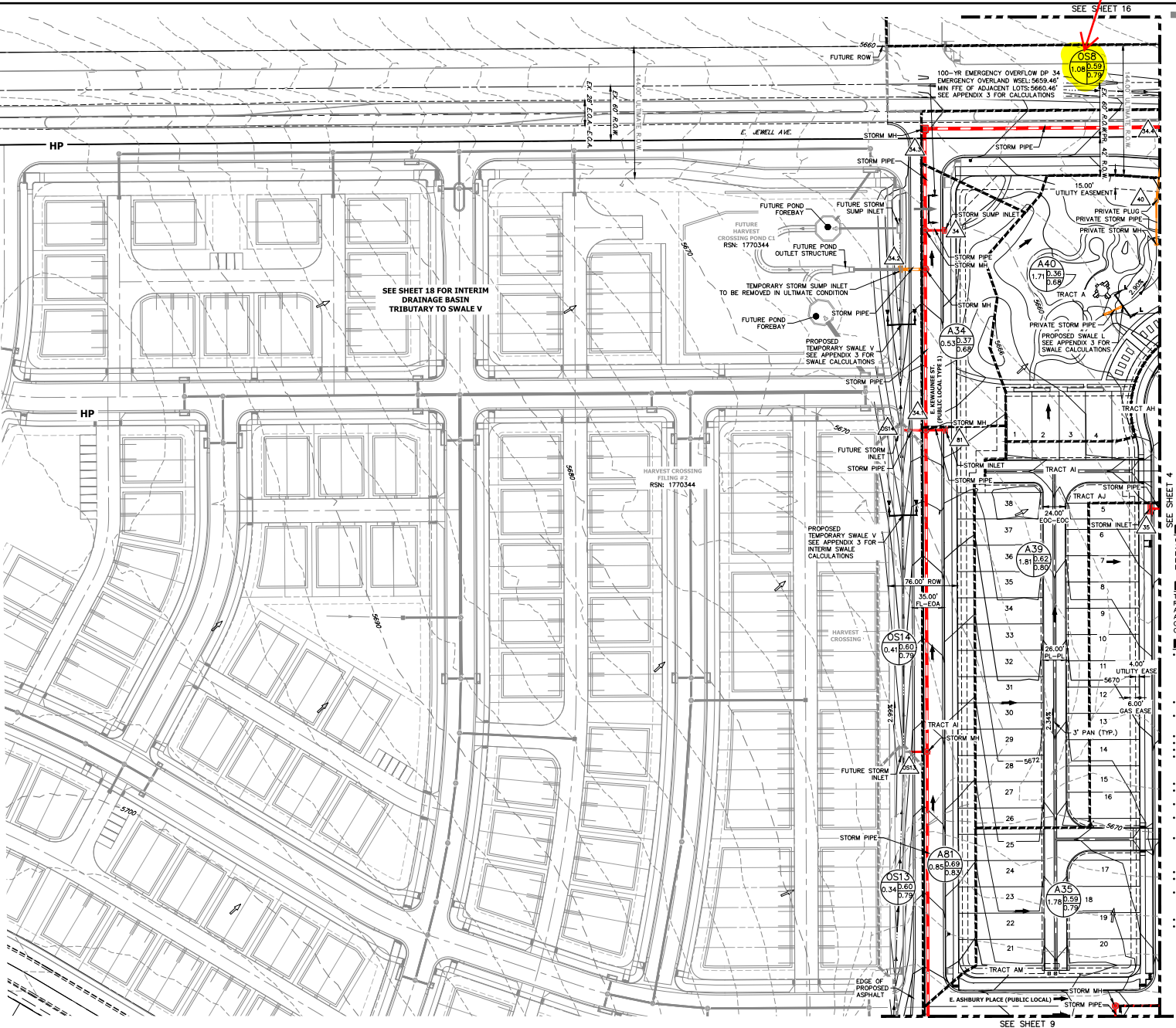


FOUNDRY DEVELOPMENT - APPROVED PRELIMINARY DRAINAGE PLAN EXCERPTS



224086

3



KEY MAP

SCALE: N.T.S.

LEGEND:

- EXISTING/FUTURE STORM SEWER
- PROPOSED PUBLIC STORM SEWER
- PROPOSED PRIVATE STORM SEWER
- 6100 PROPOSED MAJOR CONTOUR
- 6100 PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- DRAINAGE BASIN
- DRAINAGE OFFSITE BASIN
- A = BASIN DESIGNATION
- B = AREA IN ACRES
- C = 2-YR RUNOFF COEFFICIENT
- D = 100-YR RUNOFF COEFFICIENT
- DESIGN POINT
- HIGH POINT
- LOW POINT
- DRAINAGE ARROW
- EXISTING DRAINAGE ARROW
- EMERGENCY OVERFLOW PATH
- PROPOSED DRAINAGE SWALE
- PROPOSED 100YR FLOODPLAIN
- EXISTING FLOODWAY

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

BENCHMARK.

CITY OF AURORA BENCHMARK #456529W001 BEING 3" BRASS CAP ATOP A 30" LONG STEEL PIPE IN CONC. ON SOUTH SIDE OF E. JEWELL AVE. BEING 1 FT. N. OF S. R/W FE. LINE & 4 FT. E. OF INTER. OF SD. R/W FE. W/ N-S FE. RUNNING SOUTH, IN VICINITY OF 1/4 COR. TO SECS. 20/29, T4S, R65W. EL. NAVD88 = 5,643.37.

BASIS OF BEARINGS.

THE NORTH LINE OF THE NORTHWEST 1/4 OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A 2-1/2" ALUMINUM CAP STAMPED "T4S 13155" AT THE NORTHWEST CORNER, AND BY A 3-1/4" ALUMINUM CAP STAMPED "S 15244" AT THE NORTH QUARTER CORNER, BEARING N89°35'54"E AS REFERENCED TO COLORADO STATE PLANE CENTRAL ZONE.

NOTES:

- CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
- ALL PROPOSED STORM INFRASTRUCTURE WITHIN THE RIGHT-OF-WAY SHALL BE PUBLIC AND WILL BE MAINTAINED BY THE CITY OF AURORA.
- ALL PROPOSED DETENTION PONDS, SWALES, AND AREA INLETS SHALL BE PRIVATE AND WILL BE MAINTAINED BY THE HOA EXCEPT REGIONAL DETENTION FACILITY.
- ALL STORM INFRASTRUCTURE IS SIZED FOR THE 100-YEAR STORM EVENT.
- PIPE CLASS SHALL BE CLASS III.
- PIPE BEDDING MATERIAL SHALL BE CLASS B.
- FOR ALL SUMP INLETS AND EMERGENCY OVERFLOW LOCATIONS, FINISHED FLOOR ELEVATIONS SHALL BE 1' MINIMUM ABOVE THE EMERGENCY OVERFLOW ELEVATIONS AND GARAGES SHALL NOT BE INUNDATED. CALCULATIONS TO BE INCLUDED IN CIVIL PLAN AND FOR.
- FOR PUMP BEING APPROVED PRIOR TO CIVIL PLAN APPROVAL.
- NO WORK IS ALLOWED IN THE FLOODPLAIN WITHOUT A FLOODPLAIN DEVELOPMENT PERMIT.
- NO WORK IS ALLOWED WITHIN THE FLOODWAY WITHOUT A CLOM OR A NO RISE ANALYSIS INCLUDED WITHIN THE FLOODPLAIN DEVELOPMENT PERMIT.
- ENSURE THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS, ARE UPHOLD.
- WHERE DRAINAGE PATHS CROSS SIDEWALKS THAT THE SWALES SHALL PROVIDE CHASE DRAINS WITH A MINIMUM CAPACITY FOR THE MINOR EVENT, CAPACITY AND EMERGENCY OVERFLOW CALCULATIONS SHALL BE INCLUDED IN THE CIVIL PLANS AND FOR. ALL FREEBOARD SHALL MEET THE CURRENT CITY CRITERIA FOR 100-YEAR AND EMERGENCY OVERFLOW CONDITIONS.
- EROSION PROTECTION FOR ALL SWALES TO BE EVALUATED WITH CIVIL PLANS.
- INLET LOCATIONS MAY HAVE TO BE MODIFIED WITH CIVIL PLANS TO MAXIMIZE CAPTURE VOLUME ONCE ROADWAY MARKING DETAILS ARE PROVIDED.
- THE CITY OF AURORA WILL ALLOW ACCESS FROM JEWELL AVE IN THE INTERIM CONDITION. WHEN THE PROPERTY ADJACENT TO THE POND DEVELOPS, ACCESS MUST BE REDESIGNED TO BE INTERNAL TO THE SITE AND CANNOT BE FROM A COLLECTOR OR ARTERIAL ROADWAY.
- PRIVATE PIPES TO BE MAINTAINED BY SUBDIVISION HOA.
- ALL PRIVATE SWALES WITH LESS THAN 2% SLOPE SHALL HAVE UNDERDRAINS.

FACSIMILE

THIS ELECTRONIC PLAN IS A FACSIMILE OF THE SIGNED AND SEALED PDF SET.

KDW

4/8/2024

Kurtis W. Williams, P.E. DATE

PREPARED FOR

CENTURY COMMUNITIES, LLC
2000 S COLORADO BLVD
DENVER, CO 80202
ATT: JERRY RICHMOND
(303) 268-8364

FR ENGINEERING
Aurora Company
Central 303-742-8888 • Colorado Springs 719-595-5588
For Cities 970-491-8888 • www.frengineering.com

BY	DATE	NO.	REVISION

NO.	REVISION	DATE	DESIGNED BY	DRAWN BY	CHECKED BY
1	N/A	2/25/24	DIG	RAB	

FOUNDRY FILING NO. 1

PRELIMINARY DRAINAGE PLAN

SHEET 3 OF 33

JOB NO. 16146.00

APPROVED ON 05/02/2024

Off-site basin OF-3 for the Project

Portions of the grading shown here are not reflected on current submittal of Site Plan. Approval of Civil Plans will require that proposed grading and extents of work correspond to the site plan.



SEE SHEET 5



SCALE: N.T.S

SCALE: N.T.S

-
- DESIGN POINT
 HIGH POINT
 LOW POINT
 DRAINAGE ARROW
 EXISTING DRAINAGE ARROW
 EMERGENCY OVERFLOW PATH
 PROPOSED DRAINAGE SWALE
 PROPOSED 100YR FLOODPLAIN
 EXISTING FLOODWAY
- 50 25 0 50 100
- ORIGINAL SCALE: 1" = 50'

CITY OF AURORA BENCHMARK #456529NW001 BEING 3" BRASS CAP ATOP 30" LONG STEEL PIPE IN CONC. ON SOUTH SIDE OF E. JEWELL AVE. BEING FT. N. OF S. R/W FE. LINE & 4 FT. E. OF INTERS. OF SD. R/W FE. W/ N- FE. RUNNING SOUTH. IN VICINITY OF 1/4 COR. TO SECS. 20/29, T4S, R65W EL. NAVD88 = 5,643.37'

THE NORTH LINE OF THE NORTHWEST 1/4 OF SECTION 29, TOWNSHIP 4 SOUTH
RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A 2-1/2
ALUMINUM CAP STAMPED "PLS 13155" AT THE NORTHWEST CORNER, AND BY
A 3-1/4" ALUMINUM CAP STAMPED "LS 15244" AT THE NORTH QUARTER
CORNER, BEARING N89°35'54"E AS REFERENCED TO COLORADO STATE PLANE
CENTRAL ZONE.

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[illegible]

THIS ELECTRONIC PLAN IS A FACSIMILE OF
THE SIGNED AND SEALED PDF SET.

KDin

4/8/2024

Kurtis W. Williams, P.E.

DATE _____

FOUNDRY FILING NO. 1		H-SCALE		1"=50'		NO. REVISION		BY		DATE		PREPARED FOR		UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	
PRELIMINARY DRAINAGE PLAN		V-SCALE		N/A								CENTURY COLUMBIOS, LLC 2000 S COLORADO BLVD TOWER 1, STE 1500 CENTURY CO, CO 80101 ATTN: JERRY RICHMOND (303) 268-8364		CENTURY COLUMBIOS, LLC 2000 S COLORADO BLVD TOWER 1, STE 1500 CENTURY CO, CO 80101 ATTN: JERRY RICHMOND (303) 268-8364	
		DESIGNED BY		D/C								FR ENGINEERING A Whittier Company 3000 E. 10th Ave. Colorado Springs, CO 80906 For Sales 970-491-9988 • www.frengineering.com		UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	
		DRAWN BY		RAB										UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	
		CHECKED BY												UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	
SHEET 4 OF 33														UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	
JOB NO. 16146.00														UNTIL SUCH TIME AS THE DRAWING IS APPROVED BY THE APPROPRIATE REVIEWING OFFICE. THIS DRAWING IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN AUTHORIZATION.	

SEE SHEET 16



LEGEND: SCALE: N.T.S

- SEE SHEET 6

BENCHMARK

CITY OF AURORA BENCHMARK #458529NW001 BEING 3" BRASS CAP ATOP A 30' LONG STEEL PIPE IN CONC. ON SOUTH SIDE OF E. JEWELL AVE. BEING 1 FT. N. OF S. R/W FE. LINE & 4 FT. E. OF INTERS. OF SD. R/W FE. W/ N-S FE. RUNNING SOUTH. IN VICINITY OF 1/4 COR. TO SECS. 20/29, T4S, R65W. EL. NAVD88 = 5,643.37'

BASIS OF BEARINGS.

THE NORTH LINE OF THE NORTHWEST $\frac{1}{4}$ OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A 2-1/2 ALUMINUM CAP STAMPED "PLS 13155" AT THE NORTHWEST CORNER, AND BY A 3-1/4" ALUMINUM CAP STAMPED "LS 15244" AT THE NORTH QUARTER CORNER, BEARING N89°35'54"E AS REFERENCED TO COLORADO STATE PLANE CENTRAL ZONE.

NOTES.

- CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, OF DIMENSIONS AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
- ALL PROPOSED STORM INFRASTRUCTURE WITHIN THE RIGHT-OF-WAY SHALL BE PUBLIC AND WILL BE MAINTAINED BY THE CITY OF AURORA.
- ALL PROPOSED DETENTION PONDS, SWALES, AND AREA INLETS SHALL BE MAINTAINED BY THE CITY OF AURORA.

PRIVATE AND WILL BE MAINTAINED BY THE HOA EXCEPT REGIONAL DETENTION FACILITY.
ALL STORM INFRASTRUCTURE IS SIZED FOR THE 100-YEAR STORM EVENT.
PIPE CLASS SHALL BE CLASS III.
PIPE BEDDING MATERIAL SHALL BE CLASS B.
FOR ALL SUMP INLETS AND EMERGENCY OVERFLOW LOCATIONS, FINISHED FLOOR ELEVATIONS SHALL BE 1' MINIMUM ABOVE THE EMERGENCY OVERFLOW ELEVATIONS AND GARAGES SHALL NOT BE INUNDATED. CALCULATIONS TO BE INCLUDED IN CIVIL PLAN AND FDR.
FDR MUST BE APPROVED PRIOR TO CIVIL PLAN APPROVAL.
NO WORK IS ALLOWED IN THE FLOODPLAIN WITHOUT A FLOODPLAIN DEVELOPMENT PERMIT.

- NO WORK IS ALLOWED WITHIN THE FLOODWAY WITHOUT A CLOMR OR A NO RISE ANALYSIS INCLUDED WITHIN THE FLOODPLAIN DEVELOPMENT PERMIT.
- ENSURE THE PROVISIONS OF CRS 37-92-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE UPHOLD.

WHERE DRAINAGE PATHS CROSS SIDEWALKS THAT THE SWALES SHALL PROVIDE CHARGE CHAINS WITH A MINIMUM CAPACITY FOR THE MINOR EVENT OF EXCESSIVE RAINFALL. THE SWALES SHALL BE DESIGNED TO MEET THE CIVIL PLANS AND FDR. ALL FREEBOARD SHALL MEET THE CURRENT CITY CRITERIA FOR 100-YEAR AND EMERGENCY OVERTFLOW CONDITIONS. EROSION PROTECTION FOR ALL SWALES TO BE EVALUATED WITH CIVIL PLANS. THE CITY ENGINEERS WILL PROVIDE THE SWALES WITH THE MAXIMIZED CAPTURE VOLUME ONCE ROADWAY WARPING DETAILS ARE PROVIDED. THE CITY OF AURORA WILL ALLOW ACCESS FROM JEWELL AVE. IN THE INTERSECTION CONDITION. THE CITY ENGINEERS WILL PROVIDE THE DEVELOPS, ACCESS MUST BE REDESIGNED TO BE INTERNAL TO THE SITE AND CANNOT BE FROM A COLLECTOR OR ARTERIAL ROADWAY. PRIVATE PIPES TO BE SUBMITTED BY SUBMITTER. ALL PRIVATE SWALES WITH LESS THAN 2% SLOPE SHALL HAVE UNDERDRAINS.

FACSIMILE

THIS ELECTRONIC PLAN IS A FACSIMILE OF
THE SIGNED AND SEALED PDF SET.

4/8/2024

Kurtis W. Williams, P.E.

DATE _____

APPROVED ON 05/02/2024

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
CENTURY COMMUNITIE
2000 S COLORADO
TOWER 1, STE 15
DENVER, CO 8022
ATT: JERRY RICHM
(303) 268-836

J.R. ENGINEERING
A Westran Company



Centennial 303-740-0803 • Colorado Springs 719-585-2583
Fort Collins 970-491-9888 • www.jrengineering.com

	BY	DATE

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H-SCALE	1"=5'
V-SCALE	N/A
DATE	2/25/
DESIGNED BY	DIG
DRAWN BY	RAB
CHECKED BY	

	LAN	
--	-----	--

RY FILING NO. 1

RY DRAINAGE P

INDI	NAI
------	-----

FO
RELIN

SHEET 5 OF 33




















JOB NO. 16146.00

SEE SHEET 16



LEGEND:

SCALE: N.T.S

- LEGEND**
-  EXISTING/FUTURE STORM SEWER
 -  PROPOSED PUBLIC STORM SEWER
 -  PROPOSED PRIVATE STORM SEWER
 -  6100 PROPOSED MAJOR CONTOUR
 -  6100 PROPOSED MINOR CONTOUR
 -  EXISTING MAJOR CONTOUR
 -  EXISTING MINOR CONTOUR
 -  DRAINAGE BASIN DESIGNATION
 -  B = AREA IN ACRES
 -  C = 2-YR OVF COEFFICIENT
 -  D = 100-YR RUNOFF COEFFICIENT
 -  DESIGN POINT
 -  HIGH POINT
 -  LOW POINT
 -  DRAINAGE ARROW
 -  EMERGENCY OVERFLOW PATH
 -  PROPOSED DRAINAGE SWALE
 -  PROPOSED 100% FLOODPLAIN
 -  EXISTING FLOODWAY

BENCHMARK.

CITY OF AURORA BENCHMARK #4S6529NW001 BEING 3" BRASS CAP ATOP A 30" LONG STEEL PIPE IN CONC. ON SOUTH SIDE OF E. JEWELL AVE. BEING 4 FT. N. OF S. R/W FE. LINE & 4 FT. E. OF INTERS. OF SD. R/W FE. W/ N-5 FE. RUNNING SOUTH, IN VICINITY OF 1/4 COR. TO SECS. 20/29, T4S, R65W. EL. NAVD88 = 5,643.37'

BASIS OF BEARINGS.

THE NORTH LINE OF THE NORTHWEST 1/4 OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A 2-1/2 ALUMINUM CAP STAMPED "PLS 13155" AT THE NORTHWEST CORNER, AND BY A 3-1/4" ALUMINUM CAP STAMPED "LS 15244" AT THE NORTH QUARTER CORNER, BEARING N89°35'54"E AS REFERENCED TO COLORADO STATE PLANE CENTRAL ZONE.

NOTES.

- [illegible]

FACSIMILE

THIS ELECTRONIC PLAN IS A FACSIMILE OF
THE SIGNED AND SEALED PDF SET.

KDn

4/8/2024

Kurtis W. Williams, P.E.

DATE _____

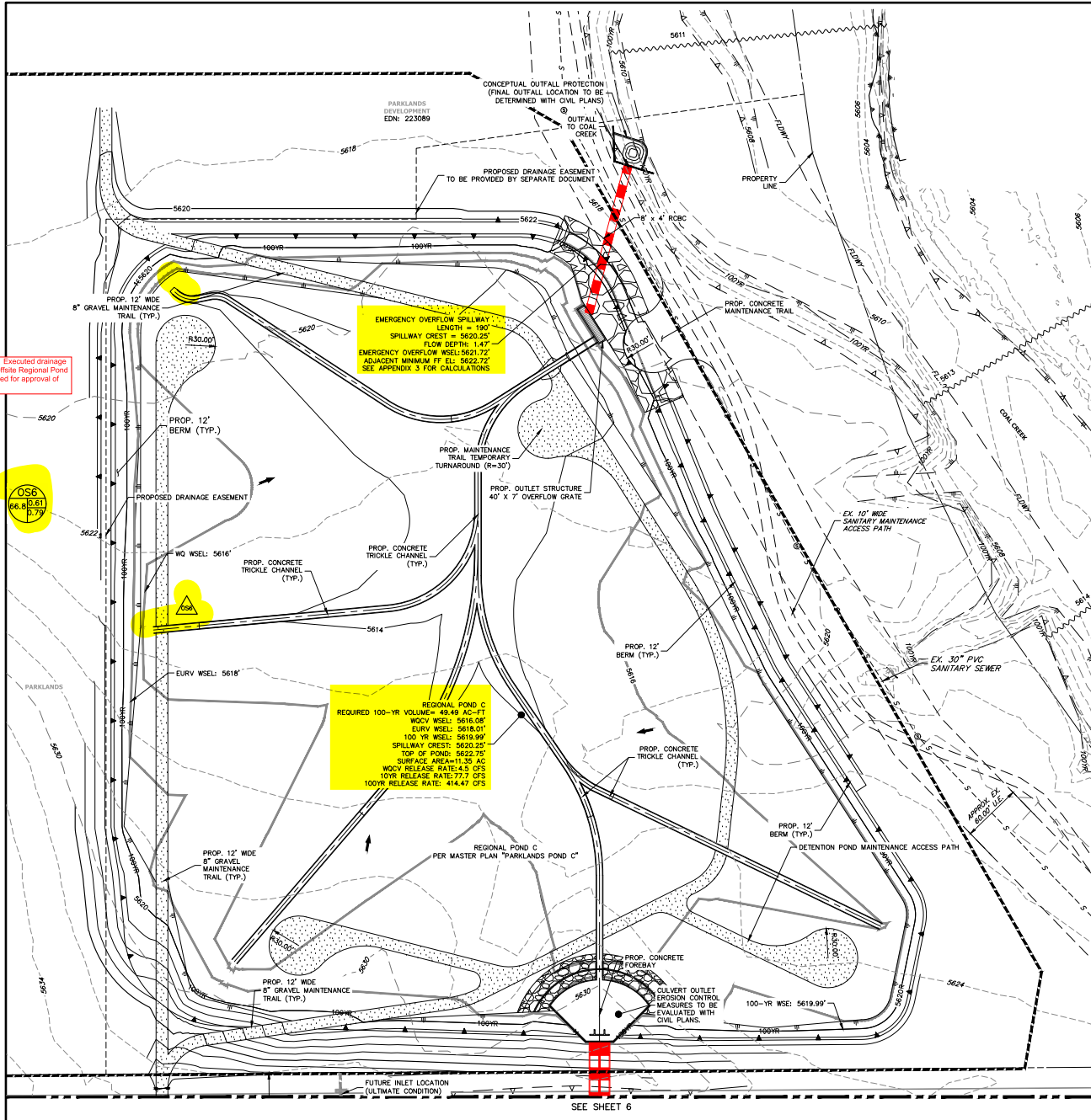
APPROVED ON 05/02/2024

[illegible]

16

224086

Advisory Note: Executed drainage easement for offsite Regional Pond C will be required for approval of Civil Plans.



POND NOTES:

- FUTURE CHANNEL IMPROVEMENTS ARE BEING PROPOSED WITH THE PARKLANDS DEVELOPMENT. THE DEVELOPER WILL BE RESPONSIBLE FOR RELOCATING OR REORIENTING THE POND OUTFALL TO ACCOMMODATE FUTURE CHANNEL DESIGN.
- FINAL OUTFALL LOCATION TO BE DETERMINED WITH CIVIL PLANS.

FLOODPLAIN NOTES:

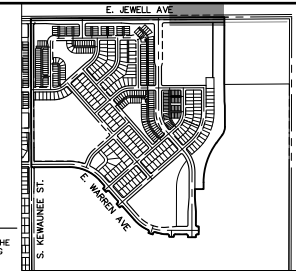
- FEMA FLOODPLAIN INFORMATION: FIRM PANEL F08020203H, DATED OCTOBER 2020.
- FLOODPLAIN LIMITS AND BIE'S FROM 2010 FHAD STUDY FOR SANDCREEK CREEK, PROVIDED BY MILE HIGH FLOOD DISTRICT.
- APPLICANT UNDERSTANDS THAT CONSTRUCTION OR GRADING IN THE 100-YR FLOODPLAIN REQUIRES FLOODPLAIN DEVELOPMENT PERMIT, WHICH MUST BE OBTAINED PRIOR TO GRADING OR CONSTRUCTION CAN COMMENCE.

BENCHMARK:

THE DEVELOPER SHALL HAVE A LICENSED PROFESSIONAL ENGINEER CERTIFY EACH STORM WATER DETENTION POND AND/OR WATER QUALITY BMP IS BUILT ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS AND THE REQUIRED DETENTION VOLUME, INCLUDING THE WQ WHEN USED, IS MET. THE CERTIFICATION SHALL ALSO VERIFY ALL PERTINENT DIMENSIONS, ELEVATIONS, REQUIRED OUTLET ORIFICE PLATES FOR DETENTION AND WQV AND OTHER PERMANENT BMP'S REQUIREMENTS ARE INSTALLED PER THE APPROVED PLANS AND SPECIFICATIONS, AND SHALL SHOW THE AS-BUILT DESIGN VOLUMES (WQV, 10-YEAR, 100-YEAR, CURVE) AND OTHER PERTINENT DIMENSIONS, ELEVATIONS AND CAPACITY REQUIREMENTS ASSOCIATED WITH THE WQ BMP USED. THE CERTIFICATION SHALL BE PROVIDED TO THE CITY OF AURORA ENGINEERING CONTROL SECTION PRINCIPAL ENGINEER. AN APPROVED POND CERTIFICATE SHALL BE REQUIRED PRIOR TO THE RETURN OF ANY FISCAL SECURITY DEPOSIT (AS WELL AS SATISFYING OTHER CONDITIONS OF THE STORM WATER PERMIT) FOR SITES THAT DO NOT REQUIRE A CERTIFICATE OF OCCUPANCY. EXAMPLES OF THESE SITES INCLUDE BUT ARE NOT LIMITED TO: SITES WITHOUT VERTICAL CONSTRUCTION, OIL AND GAS WELL PADS, OUTDOOR STORAGE, AND TOW YARDS. AN APPROVED POND CERTIFICATE SHALL BE REQUIRED PRIOR TO COMMENCEMENT OF BUSINESS OPERATIONS. IN NO CASE SHALL A CERTIFICATE OF OCCUPANCY OR TEMPORARY CERTIFICATE OF OCCUPANCY BE ISSUED WITHOUT AN APPROVED POND CERTIFICATE.

BASIS OF BEARINGS:

THE NORTH LINE OF THE NORTHWEST 1/4 OF SECTION 29, TOWNSHIP 4 SOUTH, RANGE 65 WEST OF THE 6TH P.M., BEING MONUMENTED BY A 2-1/2" ALUMINUM CAP STAMPED "NLS 131524" AT THE NORTHWEST CORNER, AND BY A 3-1/4" ALUMINUM CAP STAMPED "NLS 15244" AT THE NORTH QUARTER CORNER, BEARING N89°35'54"E AS REFERENCED TO COLORADO STATE PLANE CENTRAL ZONE.



KEY MAP

SCALE: N.T.S.

LEGEND:

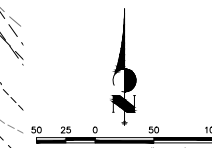
- EXISTING/FUTURE STORM SEWER
- PROPOSED PUBLIC STORM SEWER
- PROPOSED PRIVATE STORM SEWER
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- DRAINAGE BASIN
- DRAINAGE OFFSITE BASIN
- DESIGN POINT
- HIGH POINT
- LOW POINT
- DRAINAGE ARROW
- EXISTING DRAINAGE ARROW
- EMERGENCY OVERFLOW PATH
- PROPOSED DRAINAGE SWALE
- PROPOSED 100-YR FLOODPLAIN
- EXISTING FLOODPLAIN

CITY OF AURORA POND CERTIFICATION NOTE:

THE DEVELOPER SHALL HAVE A LICENSED PROFESSIONAL ENGINEER CERTIFY EACH STORM WATER DETENTION POND AND/OR WATER QUALITY BMP IS BUILT ACCORDING TO THE APPROVED PLANS AND SPECIFICATIONS AND THE REQUIRED DETENTION VOLUME, INCLUDING THE WQ WHEN USED, IS MET. THE CERTIFICATION SHALL ALSO VERIFY ALL PERTINENT DIMENSIONS, ELEVATIONS, REQUIRED OUTLET ORIFICE PLATES FOR DETENTION AND WQV AND OTHER PERMANENT BMP'S REQUIREMENTS ARE INSTALLED PER THE APPROVED PLANS AND SPECIFICATIONS, AND SHALL SHOW THE AS-BUILT DESIGN VOLUMES (WQV, 10-YEAR, 100-YEAR, CURVE) AND OTHER PERTINENT DIMENSIONS, ELEVATIONS AND CAPACITY REQUIREMENTS ASSOCIATED WITH THE WQ BMP USED. THE CERTIFICATION SHALL BE PROVIDED TO THE CITY OF AURORA ENGINEERING CONTROL SECTION PRINCIPAL ENGINEER. AN APPROVED POND CERTIFICATE SHALL BE REQUIRED PRIOR TO THE RETURN OF ANY FISCAL SECURITY DEPOSIT (AS WELL AS SATISFYING OTHER CONDITIONS OF THE STORM WATER PERMIT) FOR SITES THAT DO NOT REQUIRE A CERTIFICATE OF OCCUPANCY. EXAMPLES OF THESE SITES INCLUDE BUT ARE NOT LIMITED TO: SITES WITHOUT VERTICAL CONSTRUCTION, OIL AND GAS WELL PADS, OUTDOOR STORAGE, AND TOW YARDS. AN APPROVED POND CERTIFICATE SHALL BE REQUIRED PRIOR TO COMMENCEMENT OF BUSINESS OPERATIONS. IN NO CASE SHALL A CERTIFICATE OF OCCUPANCY OR TEMPORARY CERTIFICATE OF OCCUPANCY BE ISSUED WITHOUT AN APPROVED POND CERTIFICATE.

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- ALL PROPOSED DETENTION PONDS, SWALES, AND AREA INLETS SHALL BE PRIVATE AND WILL BE MAINTAINED BY THE HOA EXCEPT REGIONAL DETENTION FACILITY.
- ALL STORM INFRASTRUCTURE IS SIZED FOR THE 100-YEAR STORM EVENT.
- PIPE CLASS SHALL BE CLASS II.
- PIPE BEDDING MATERIAL SHALL BE CLASS B.
- FOR ALL SLUMP INLETS AND EMERGENCY OVERFLOW LOCATIONS, FINISHED FLOOR ELEVATIONS SHALL BE 1" MINIMUM ABOVE THE EMERGENCY OVERFLOW ELEVATIONS AND GARAGES SHALL NOT BE INUNDATED. CALCULATIONS TO BE INCLUDED IN CIVIL PLAN AND FOR.
- FOR MUST BE APPROVED PRIOR TO CIVIL PLAN APPROVAL.
- NO WORK IS ALLOWED WITHIN THE FLOODPLAIN WITHOUT A FLOODPLAIN DEVELOPMENT PERMIT.
- NO RISE ANALYSIS INCLUDED WITHIN THE FLOODPLAIN DEVELOPMENT PERMIT.
- ENFORCE THE PROVISIONS OF CRS 37-82-602, AS AMENDED BY SENATE BILL 15-212, REGARDING NOTIFICATION OF DOWNSTREAM WATER RIGHTS HOLDERS ARE APPLIED.
- WHERE DRAINAGE PATHS CROSS SIDEWALKS THAT THE SWALES SHALL PROVIDE CHASE DRAINS WITH A MINIMUM CAPACITY FOR THE MINOR EVENT. CAPACITY AND EMERGENCY OVERFLOW CALCULATIONS SHALL BE INCLUDED IN THE CIVIL PLANS AND FOR. ALL FREEBOARD SHALL MEET THE CURRENT CITY CRITERIA FOR 100-YEAR AND EMERGENCY OVERFLOW CONDITIONS.
- EROSION PROTECTION FOR ALL SWALES TO BE EVALUATED WITH CIVIL PLANS.
- INLET LOCATIONS MAY HAVE TO BE MODIFIED WITH CIVIL PLANS TO MAXIMIZE CAPTURE VOLUME ONCE ROADWAY WARPING DETAILS ARE PROVIDED.
- THE CITY OF AURORA WILL ALLOW ACCESS FROM JEWELL AVE IN THE INTERIM CONDITION, WHEN THE PROPERTY ADJACENT TO THE POND DEVELOPS ACCESS MUST BE REDESIGNED TO PROVIDE ACCESS TO THE SITE AND CANNOT BE FROM A COLLECTOR OR ARTERIAL ROADWAY.
- PRIVATE PIPES TO BE MAINTAINED BY SUBDIVISION HOA.
- ALL PRIVATE SWALES WITH LESS THAN 2% SLOPE SHALL HAVE UNDERDRAINS.



Know what's Below.
Call before you dig.

FACSIMILE

THIS ELECTRONIC PLAN IS A FACSIMILE OF
THE SIGNED AND SEALED PDF SET.

Kurtis W. Williams, P.E.

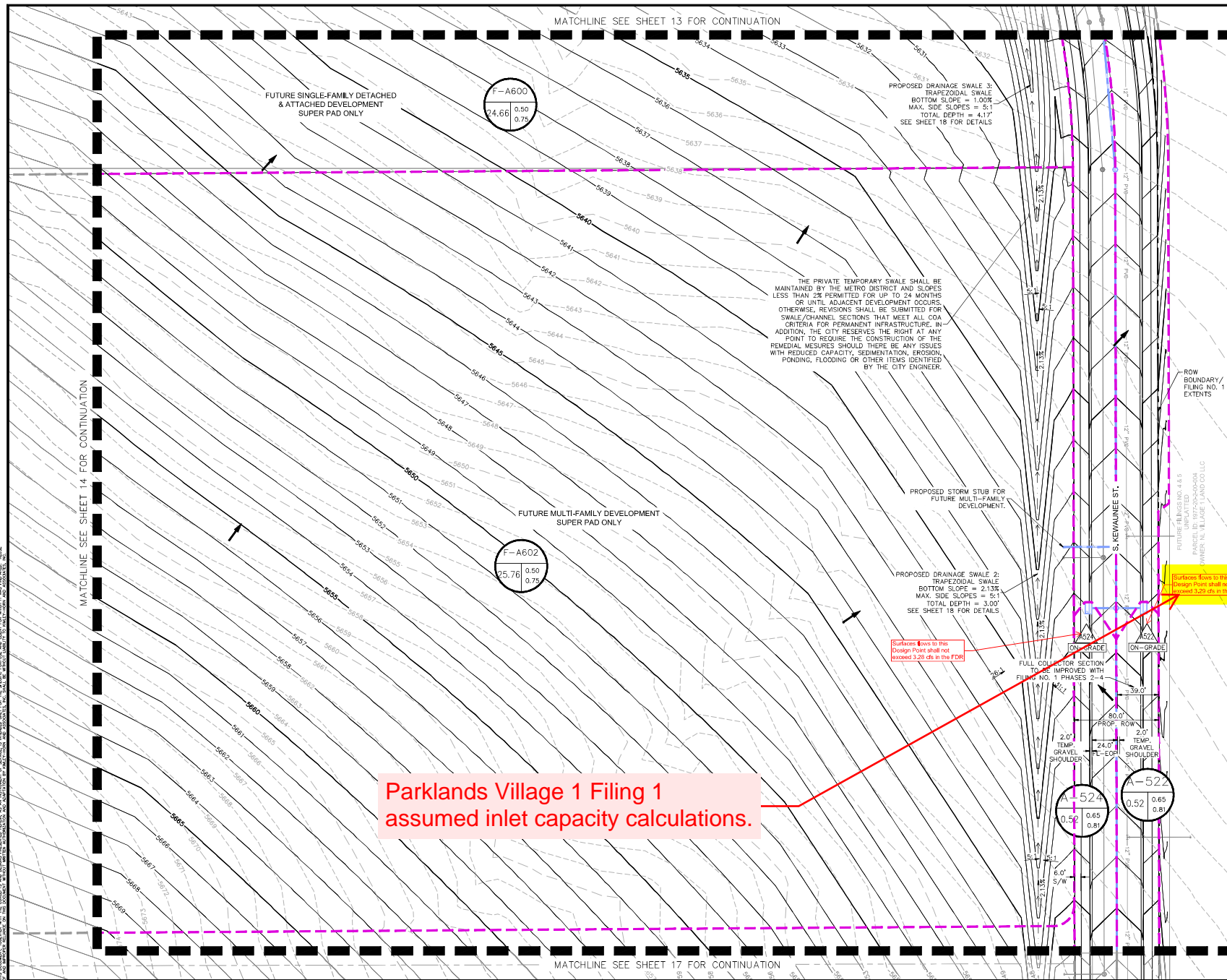
4/8/2024

DATE

APPROVED ON 05/02/2024

PREPARED FOR	UNTIL SUCH TIME AS THE APPROVED BY THE ENGINEER REVIEWING THESE PLANS. THESE PLANS ARE DESIGNATED BY WRITTEN AUTHORIZATION.
CENTURY COMMUNITIES, LLC 2000 S COLORADO BLVD DENVER, CO 80220 ATT: JERRY BOCHING	(303) 268-8364
PROJECT NO.	224086
DATE	4/8/2024
BY	
NO.	
REVISION	
1"=50'	
H-SCALE	N/A
V-SCALE	2/25/24
DATE	DIG
DESIGNED BY	RAB
DRAWN BY	
CHECKED BY	
FOUNDRY FILING NO. 1	
PRELIMINARY DRAINAGE PLAN	
SHEET 16 OF 33	
JOB NO.	16146-00

**PARKLANDS VILLAGE 1
FILING 1 DEVELOPMENT -
APPROVED PRELIMINARY
DRAINAGE PLAN EXCERPTS**



Parklands Village 1 Filing 1
assumed inlet capacity calculations.

PROPOSED DRAINAGE LEGEND

- # = BASIN DESIGNATION
- AC = AREA IN ACRES
- 0.2 = RUNOFF COEFFICIENT
- C100 = 100-YR FLOOD EFFICIENT
- # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOW ARROW
- EMERGENCY OVERFLOW ARROW
- MAX SUMP INLET PONDING
- COAL CREEK CENTERLINE
- COAL CREEK FLOODWAY
- 100-YR FLOODPLAIN
- 500-YR FLOODPLAIN
- PROPOSED PUBLIC STORM PIPE
- PROPOSED PUBLIC STORM MANHOLE
- PROPOSED PUBLIC TYPE-R INLET

NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND Adequacy OF THE DESIGN, DIMENSIONS, AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.
2. PROPOSED PUBLIC ON-SITE STORM DRAIN PIPES TO CONVEY THE MINOR (02) STORM WITHOUT SURCHARGING AND MAJOR (0100) STORM MAXIMUM SURCHARGING TO BE A MINIMUM OF ONE-FT BELOW PROPOSED GRADE. PROPOSED STORM DRAIN SYSTEM IS PUBLIC UNLESS STATED OTHERWISE.
3. ALL FFEES SHALL BE A MIN OF 1-FT ABOVE EMERGENCY WSELL. ALL GARAGES MUST BE ABOVE THE EMERGENCY WSEL. NOT TO BE INUNDATED.
4. THE MAJORITY OF THE SITE FALLS WITHIN ZONE X AND A SMALL PORTION OF THE SITE FALLS WITHIN ZONE AS ACCORDING TO FEMA FIRM MAP #808005 PANEL 0208L AND #808006 PANEL 0210L effective 2017 AND 2020 RESPECTIVELY. AND, L0MR21-08-0331P EFFECTIVE APRIL 2022.

SITE BENCHMARK

CITY OF AURORA BENCHMARK #456518SE002, BEING A 3" BRASS CAP ON SOUTH WEST CORNER OF ANGLE POINT POWER TOWER BEING ON NORTH SIDE OF MISSISSIPPI AVE. AND IN LINE WITH THE W. SIDE OF HARVEST RD. TO THE NORTH. NORTH ELEV. TAKEN AT PUNCH MARK AT THE CENTER OF BRASS CAP. AC# 21-060.

ELEVATION = 5579.67' (NAVD83)

KEY MAP
1" = 1,000'

GRAPHIC SCALE IN FEET
0 20 40 60

811 Know who's below. Call before you dig.

THE PARKLANDS
VILLAGE 1 - FILING NO. 1
PRELIMINARY DRAINAGE PLAN

Kimley-Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
200 SOUTH DIXIEWAY WAY, SUITE 300
GREENWOOD VILLAGE, CO 80111 (303) 228-2300

DESIGNED	DRAWN	CHECKED
KIM/HJR	KIM/HJR	UNS
SCALE (H): 1" = 40'		
SCALE (V): N/A		
DATE: FEBRUARY 2024		
PROJECT NO. 196A80001		
DWG. NAME		
PP02-0209024.dwg		

Facsimile
This electronic plan is a facsimile of the signed and sealed Pdf set.

Liam Shannon
Liam Shannon, P.E.
DATE: 02/09/2024

SHEET NO.
15

MATCHLINE SEE SHEET 15 FOR CONTINUATION

Parklands Village 1 Filing 1
assumed inlet capacity calculations.

THE PRIVATE TEMPORARY SWALE SHALL BE MAINTAINED BY THE METRO DISTRICT AND OPERATED AT ALL TIMES TO ALLOW FOR A MINIMUM OF LESS THAN 2% PERMITTED FOR UP TO 24 MONTHS OR UNTIL ADJACENT DEVELOPMENT OCCURS. OTHERWISE, REVISIONS SHALL BE SUBMITTED FOR SWALE/CHANNEL SECTIONS THAT MEET ALL COA CRITERIA FOR PERMANENT INFRASTRUCTURE. IN ADDITION, THE CITY RESERVES THE RIGHT AT ANY POINT TO REQUIRE THE CONSTRUCTION OF THE REMEDIAL MEASURES WOULD BE ANY AND ALL WITH REDUCED CARRYING, SEDIMENTATION, EROSION, PONDING, FLOODING OR OTHER ITEMS IDENTIFIED BY THE CITY ENGINEER.

Surfaces flows to this Design Point shall not exceed 3.16 cfs in the FDF

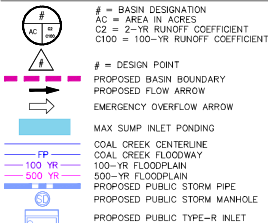
PROPOSED DRAINAGE SWALE 2:
TRAPEZOIDAL SWALE
BOTTOM SLOPE = 2.13%
MAX. SIDE SLOPES = 5:1
TOTAL DEPTH = 3.00'
SEE SHEET 18 FOR DETAILS

FUTURE COMMERCIAL ACTIVITY
CENTER DEVELOPMENT

Surfaces flows to this
Design Point shall not
exceed 5.30 cfs in the EDR

Surfaces flows to this Design Point shall not exceed 5.37 cfs in the EDR

PROPOSED DRAINAGE LEGEND



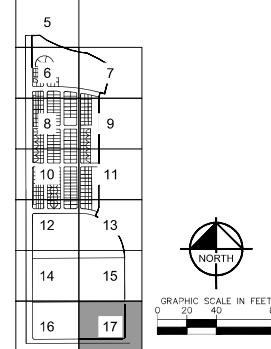
NOTES:

1. CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA FOR CITY COLLECTOR AND COMBINED SEWER SYSTEMS. THE CITY OF AURORA DOES NOT GUARANTEE THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND ELEVATIONS WHICH SHALL BE THE RESPONSIBILITY OF THE DESIGNER. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE DESIGN, CONSTRUCTION, MAINTENANCE, OR OPERATION.
2. PROPOSED PUBLIC ON-SITE STORM DRAIN PIPES TO CONVEY THE MINOR (20" STORM DRAIN SURCHARGING CAPACITY) (20" DRAIN) TO THE CITY OF AURORA MUST BE A MINIMUM OF ONE-FT BELOW PROPOSED GRADE. PROPOSED STORM DRAIN SYSTEM IS PUBLIC UNLESS OTHERWISE NOTED.
3. ALL FEES SHALL BE A MIN OF 1-FT ABOVE EMERGENCY WSEAL. ALL GARAGES MUST BE ABOVE THE EMERGENCY WSEAL. ALL GARAGES MUST BE INDICATED ON THE PLAN.
4. THE MAJORITY OF THE SITE FALLS WITHIN ZONE X AND A SMALL PORTION OF THE SITE FALLS WITHIN ZONE AE. THE SITE IS TO BE DEVELOPED IN ACCORDANCE WITH ZONE X AND #8000SC PLAN, 02/16M EFFECTIVE 2017 AND 2020 AS APPLICABLE. AND, 10M/21E-08-0351P EFFECTIVE APRIL 2021.

SITE BENCHMARK

CITY OF AURORA BENCHMARK #456518SE002. BEING A 3" BRASS CAP ON SOUTH MOST CONC. LEG OF ANGLE POINT POWER TOWER BEING ON NORTH SIDE OF MISSISSIPPI AVE. AND IN LINE WITH THE W. SIDE OF HARVEST RD. TO THE NORTH. NOTE: ELEV. TAKEN AT PUNCH MARK AT THE CENTER OF BRASS CAP. AKA 21-060.


ELEVATION = 5579.67' (NAVD88).



THE PARKLANDS
VILLAGE 1 - FILING NO. 1
PRELIMINARY DRAINAGE PLAN

Kimley»Horro

© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
6200 SOUTH SYRACUSE WAY, SUITE 300
GREENWOOD VILLAGE, CO 80111 (303) 228-2300

Facsimile This electronic plan is a facsimile of the signed and sealed PDF set.  Liam Shannon, P.E. Date: 02/09/2024	DESIGNED	DRAWN	CHECKED
	KJM/HJR	KJM/HJR	LNS
	SCALE (H): 1" = 40'		
	SCALE (V): N/A		
DATE:	FEBRUARY 2024		SHEET NO.
PROJECT NO.	196480001		17
DWG. NAME:	BPP02-A80001.dwg		

APPROVED ON 02/26/2024

10.