CONSULTING ENGINEERS

Master Drainage Report

FOR

Salisbury Park North

AT

11700 N MOTSENBOCKER RD

PARKER CO 80134

FOR

Town of Parker

PARKER
COLORADO

November 20, 2024

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
303.444.1951
info@jvajva.com

www.jvajva.com

November 20, 2024

Mr. Michael Walton, PE, CFM, Senior Development Review Engineer
Town of Parker
Engineering and Development
20120 E. Main Street
Parker, CO 80138

RE: Drainage Report for Salisbury Park North
JVA, Inc. Project No. 3752c

Dear Michael:

The following Master Drainage Report has been prepared for the for Lutheran High School Athletic Fields project. The stormwater report and drainage maps have been produced in accordance with the Storm Drainage and Environmental Policies for Parker, Colorado and the latest Mile High Flood Control District recommendations.

It is our understanding that the information provided herein meets the requirements specified in the Storm Drainage and Environmental Criterial Manual.

Please contact us if you have any questions regarding this submission.

Sincerely,

JVA, Inc.

_____
Jacob A. Zeigler, P.E.
Project Engineer

CONSULTING ENGINEERS

Engineer's Statement:

This report for Salisbury Park North was prepared by me (or under my direct supervision) in accordance with the provisions of the Storm Drainage and Environmental Criterial Manual for the owners thereof. I understand that the City of Parker does not and will not assume liability for drainage facilities designed by others.

_____

Cody F. Gratny
Registered Professional Engineer
State of Colorado No. 45353

_____

Seal and Date

Master Drainage Report

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1319 Spruce Street

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(303) 444-1951

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TABLE OF CONTENTS

Drainage Report – Salisbury Park North

DRAINAGE REPORT

Salisbury Park North

I. General Location and Description

A. Site Location

Salisbury Park North is a proposed sporting complex located in the Town of Parker. The site will be positioned on a north-facing slope overlooking Cherry Creek. The site is currently an undeveloped property located at 11700 N Motsenbocker Rd in the City of Parker, Douglas County, Colorado.

The legal description describes the site as Lot 1 Salisbury North Minor Development 2nd Amendment location in the Northwest Quarter of Section 27 and Northwest Quarter of Section 28, Township 6 South, Range 66 West of the 6th P.M. The site is generally bounded by the Salisbury Equestrian Park to the south, Cherry Creek to the north and east, and N Motsenbocker Rd to the west. A vicinity map is provided in Appendix A.

B. Description of Property

The site primarily consists of natural vegetation. Runoff generated within the site flows into two existing drainage culverts at the north end of the site. From these culverts runoff continues to travel north along existing drainage channels into Cherry Creek. For this study, it is assumed that the entirety of the site is tributary to the system. Existing runoff sheet flows across the site with slopes ranging from 0.5% to 6.0%.

Salisbury Park will be constructed in 4 phases, with a few alternates. Phase 1 of the project will include the construction of four baseball fields with supporting dugouts, bull pens, and batting cages. A centralized plaza will be constructed within the center of the four baseball fields that will contain bleachers and facilities buildings. In addition to the baseball fields, there are two proposed multipurpose fields, and some associated parking. In Phase 2, a complex of tennis courts will be built in the southeast corner of the site, with some additional parking area. Phase 3 includes the construction of a community hub, fitness area, inclusive playground and some additional parking. In Phase 4, a bike park, overlook pavilion, and some bike trails will be built.

According to the US Fish and Wildlife National Wetlands Inventory, Cherry Creek is classified as a Riverine area. However, there appear to be no wetland areas on-site. There are no known regional drainage plans affected by this development. The property is located adjacent to a floodway zoned AE flood hazard, with flood elevations between 5926' and 5920' per FEMA FIRM panel 08035C0069F. The property does fall within the Zone X designation which corresponds with a 0.2% annual chance flood hazard. Grading and ground disturbances will be kept outside of the floodway areas but will fall within the floodplain. This is discussed later in the report.

Per the National Resource Conservation Service (NRCS), the site soils are generally classified as Buick-Satanta Loams at 3 to 9 percent slopes (approximately 3.7% of the site), Loamy Alluvial Land (approximately 24.9% of the site), Sampson Loam (approximately 22.2% of the site), Sandy Wet Alluvial Land (approximately 13.1%), and Satanta Loam (approximately 36.1% of the site). Buick-Satanta Loam is classified as hydrologic soil group (HSG) C, Loamy Alluvial Land is classified as HSG C, Sampson Loam is classified as HSG B, Sandy Wet Alluvial Land is classified as HSG D, and Satanta Loam is classified as HSG B. Group A soils have a high infiltration rate when thoroughly wet with a high rate of water transmission. Group B soils have moderate infiltration rates when thoroughly wet and a moderate infiltration potential. Groups C and D have slow to very slow infiltration rates, with slow to very slow rates of water transmission. The NRCS classification maps for HSG are included in Appendix A.

Grades will be designed to match existing drainage patterns. Detention and water quality for the site will be met utilizing multiple extended detention basins (EDB) located along the northern extents of site improvements and will drain to the north along historic drainage paths. The EDB will collect drainage from proposed impervious surfaces on-site, including roof areas, and parking lots.

In general, the proposed development will result in a 45.6% overall increase in site imperviousness. A summary of the historic and developed impervious values is shown in Table 1 below:

Table 1 - Impervious Surface Summary

	Site Area (acres)	**Imperviousness**
Historic	75.57	5.8%
Developed	46.62	51.4%

II. Drainage Basins and Sub-basins

A. Major Basin Description

The project site is located within the Cherry Creek Watershed. In general, the proposed development will match historic drainage patterns. Stormwater generally flows from the south to the north across the site. A network of proposed water quality basins will be constructed along the northern extents of the proposed site. Stormwater will be treated for water quality in these basins before it is discharged along historic drainage paths into Cherry Creek via storm sewer and overland flow.

B. Site Sub-Basin Description

To better evaluate the impacts of the proposed development on existing site hydrology, the site was separated into existing and developed minor basins.

The existing site has been divided into drainage basins which are described in the report below. The basin delineations are shown within the Existing Drainage Map with corresponding design points for each basin. The Historic Drainage Map is included in Appendix C.

Basin H1 (7.57 acres) is located within property limits along the east side of the site and is tributary to Cherry Creek. Runoff sheet flows north across this basin with slopes between 0.5% to 5.0%. An existing culvert carries runoff off-site to the north.

Basin H2 (44.80 acres) is located within property limits and contains the central and western portion of the site and is also tributary to Cherry Creek. Runoff sheet flows north across this basin with slopes between 0.5% and 8.0%. An existing culvert in the northwest corner of the site carries runoff off-site to the north.

Basin H3 (0.84 acres) is located along the south side of Dransfeldt Rd, along the northwest corner of the Salisbury Park North site. This basin acts as a drainage channel for runoff generated on Dransfeldt Rd. Stormwater generated on the road is collected via storm inlet and discharged to the south into basin H3. From there it is carried a short distance north, before entering a culvert which runs to the northwest, crossing back under Dransfeldt Rd.

Basin H4 (12.37 acres) represents an area to the north of the project site predominantly composed of undeveloped areas. Cherry Creek passes through the middle of this basin, so runoff sheets flows to the north and south towards the middle where the creek is located. This basin will not be disturbed by the construction of the Salisbury Park North project.

The proposed site has been divided into major basins with minor sub basins. The basin delineations are shown within the Developed Drainage Map with corresponding design points for each basin. The Developed Drainage Map is included in Appendix C.

Basins A1-A12 (23.64 acres) are onsite disturbed areas which comprise the east half of the proposed site. Contained within these basins are proposed baseball fields, batting cages, the HQ building, pickleball courts, and associated parking. Runoff generated within these basins is tributary to proposed WQCV Pond A. Conveyance to this pond is achieved with a network of overland flow channels, storm lines, and culverts. Outfall from Pond A is directed to the north along a proposed swale into an existing drainage culvert, and ultimately into Cherry Creek.

Basins B1-B5 (11.6 acres) are onsite disturbed areas located in the western portion of the site. This area represents a potential community hub building that has not been solidified at the time of this report. Contained within the rest of the B basins are two multi purpose fields, a basketball court, a workout area, and associated walks and open spaces. Runoff generated within these basins is tributary to proposed WQCV basin Pond B. A network of storm lines will provide conveyance to the Pond. Outfall from Pond B is directed to the north along a proposed swale into an existing drainage culvert, and ultimately into Cherry Creek.

Basins C1-C4 (11.44 acres) are onsite disturbed areas that contain the drainage channel along the southern extent of the site, the two western baseball fields, and a parking area. Runoff generated within these basins is tributary to the proposed WQCV Pond C. A network of storm sewer and overland drainage channels will convey runoff to the Pond. Outfall from Pond C is directed along a proposed swale to an existing drainage culvert, and ultimately into Cherry Creek.

III. Drainage Design Criteria

A. Regulations

It is JVA's understanding that the work presented within this drainage report complies with all applicable Town of Parker and Mile High Flood District design standards Point rainfall data that was used for design was taken from the Storm Drainage and Environmental Criteria Manual from the Town of Parker and the calculation methods specified are used.

B. Hydrology

The Rational Method (Q=CIA) was used to determine the storm runoff (Q) from the areas tributary to the new storm system, with composite runoff coefficients (C) and contributing areas (A) given for design points in sub-basins.

The runoff coefficients for various land usages were obtained from Urban Drainage and Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual (USDCM) Volume 1 – Table 6-4 updated March 2024. Intensities (I) were determined using the Time-Intensity-Frequency Values and a calculated Time of Concentration (t_c) using equations 5-1, 6-2, 6-3, 6-4, and 6-5 respectively from USDCM Volume 1 dated March 2024. Post-development Time of Concentration calculations for each sub-basin, corresponding rainfall intensities, composite runoff coefficients, and storm flows for the 100-year storms for each design point are provided in Appendix B. Specific equations and references to the USDCM are provided within the calculation spreadsheets.

The composite runoff coefficients (C) were calculated using site imperviousness and hydrologic soil type to define an area-weighted coefficient per basin. The rainfall intensity (I) in inches per hour was defined using the intensity-duration curves included in Table 5.1 of the Parker Storm Drainage and Environmental Criteria Manual and shown below in Table 2. The Time of concentration values were a minimum five (5) minutes per MHFD standard. Each basin was evaluated based on area (A) in acres. Final peak discharge (Q) is defined in cubic feet per second (cfs). Post-development time of concentration calculations for each sub-basin, corresponding rainfall intensities, and composite runoff coefficients for each sub-basin are provided in the Appendix. Table 2 below presents the design rainfall used for runoff calculations.

Table 2 - Design Rainfall Totals

Frequency of Design Event	One Hour Point Rainfall P1 (in)
2 yr	0.99
5 yr	1.39
10 yr	1.64
25 yr	1.98
50 yr	2.31
100 yr	2.60

C. Hydraulics

Design storm recurrence intervals are consistent with the City of Parker requirements: the minor storm analysis is the 5-year event, and the major storm is the 100-year event. Water surface profiles

and pipe hydraulic grade line computations are performed using Autodesk Civil 3D Hydraflow Storm Sewers Extension, version 2024.

D. Water Quality Enhancement

Detention and water quality for the site's developed basins is provided through a network of proposed extended detention basins located generally along the north extents of the site improvements. These facilities will slow down runoff and encourage infiltration, sedimentation, and filtration, thus aiding in the removal of excess sediment, solids, nutrients, metals and grit, and other typical pollutants from stormwater.

IV. Drainage Facility Design

A network of new storm sewers and drainage swales will convey captured runoff northward towards a series of proposed extended detention basins and water quality treatment facilities. These basins will discharge stormwater to the north along historic drainage paths. All proposed storm sewers and drainage swales will be maintained by the Town of Parker.

The Town of Parker's Storm Drainage and Environmental Criteria Manual requires the implementation of full-spectrum detention. This approach is designed to control peak discharge across all runoff events, from frequent storms to the 100-year event, effectively replicating pre-development conditions. Due to site constraints onsite water quality ponds are proposed instead of full-spectrum detention. This variance along with any others is discussed in the Master Drainage Report.

The Water Quality Basin designs include one of two outlet structure designs. The first design is an outlet structure with a water quality orifice plate and overflow pipe. The second design is a weir with a water quality orifice plate and an overflow weir. This approach meets the Town's stormwater management requirements for water quality and keeps fill within the adjacent floodplain as minimal as possible.

In the final drainage condition, three ponds will provide WQCV for the entire site. Pond A and Pond C will be constructed in Phase 1. Interim ponds will provide WQCV for the remainder of the site until Pond B is constructed in Phase 3.

Table 3 – Detention basin volumes

Basin ID	Watershed Area (ac.)	Provided Volume (ac-ft)	Required Volume (ac-ft)	CUHP Predevelopment Q (cfs)	Peak Outflow Q (cfs)
Pond A	23.63	0.777	0.448	N/A	0.17
Pond B	11.55	0.402	0.205	N/A	0.12
Pond C	11.44	0.384	0.170	N/A	0.11

V. Conclusions

A. Compliance with Standards

The stormwater facilities and design proposed for the Salisbury Park North have been designed and analyzed in accordance with the City of Parker Storm Drainage and Environmental Criteria Manual, the Mile High Flood District recommendations set forth in the Urban Storm Drainage Criteria Manuals and engineering best practices within the State of Colorado. The proposed drainage design will maintain existing runoff conditions by attenuating and treating developed flows and reduce the potential for adverse effects downstream.

B. Variances

For this project, we are seeking one key variance from the Town of Parker's standard requirements for stormwater facilities. This variance concerns the on-site extended detention basins as they pertain to Section 7.2 of the Storm Drainage and Environmental Citeria Manual regarding the need for full spectrum detention ponds. Due to the site falling within a floodplain, an effort is being made to reduce the amount of fill being used in the design. This constraint limits the amount of detention that can be provided within each pond, and therefore full-spectrum detention cannot be provided. Water Quality has been prioritized and provided for all modified drainage basins within the site.

C. Drainage Concept

The proposed stormwater management infrastructure and techniques are in substantial compliance with all applicable regulations and will improve existing site drainage conditions. The design incorporates strategic grading, Best Management Practices, and control measures to provide stormwater quality treatment and attenuate developed flows to mimic historic flows for a variety of return events. The improvements presented in this report are intended to improve existing conditions and minimize flood risk. It is believed that the proposed improvements will not adversely impact properties upstream or downstream, and do not adversely impact drainageways downstream.

VI. References

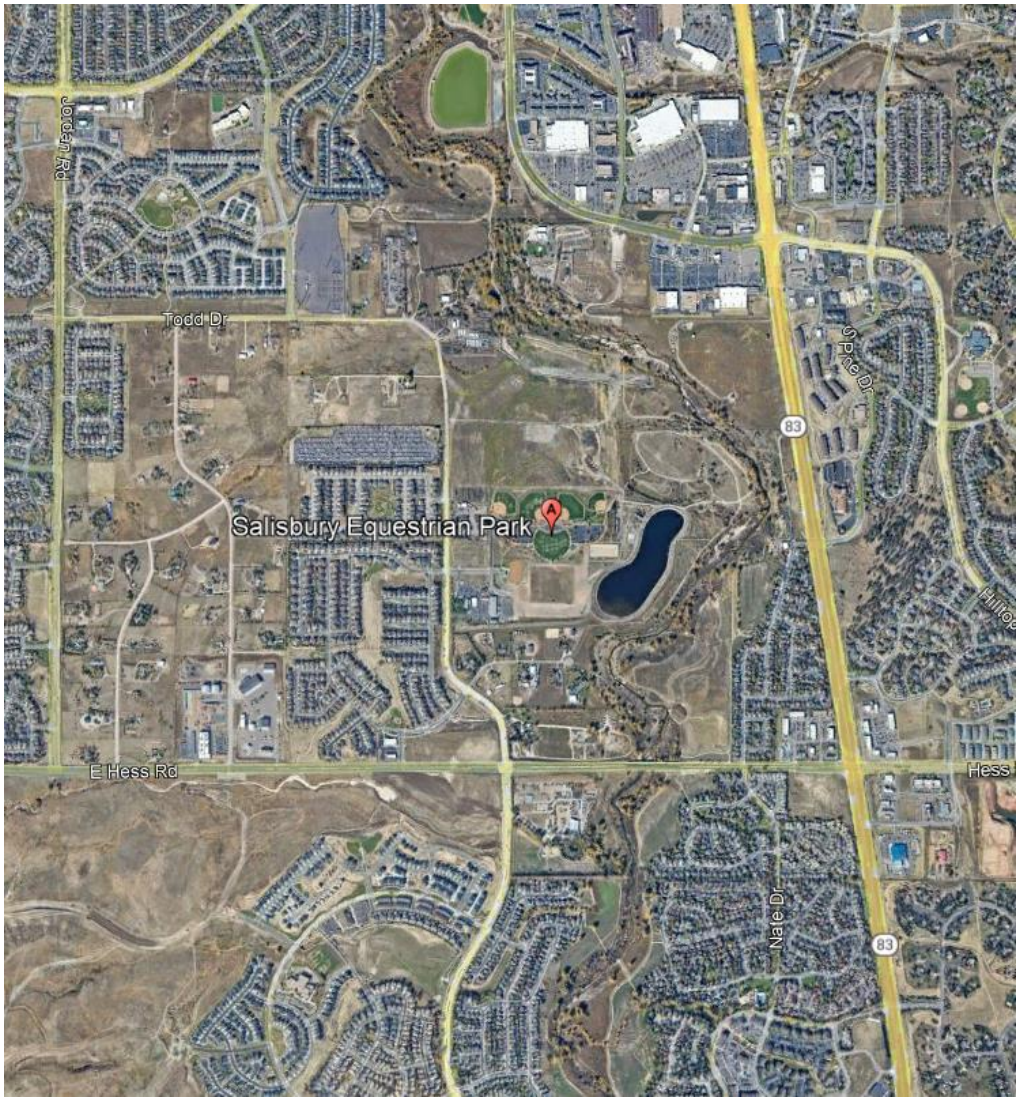
1. “Final Roadway Drainage Report for Dransfeldt Road Extension” Douglas County, Colorado, August, 2023
2. “Salisbury Park North Phase 1 Floodplain Development Permit Application” City of Parker, Colorado, November 2023
3. “Storm Drainage and Environmental Criteria Manual”, Town of Parker, Colorado, February, 2014.
4. “Urban Storm Drainage Criteria Manual”, Mile High Flood District, Latest Edition.
5. https://www.fema.gov/flood-maps. Accessed 14 May 2024.
6. https://websoilsurvey.nrcs.usda.gov/app/. Accessed 14 May 2024
7. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed 14 May 2024

APPENDIX A – LOCATION INFORMATION

Salisbury Park North

Development

AT
11700 Motsenbocker Road
Parker, CO

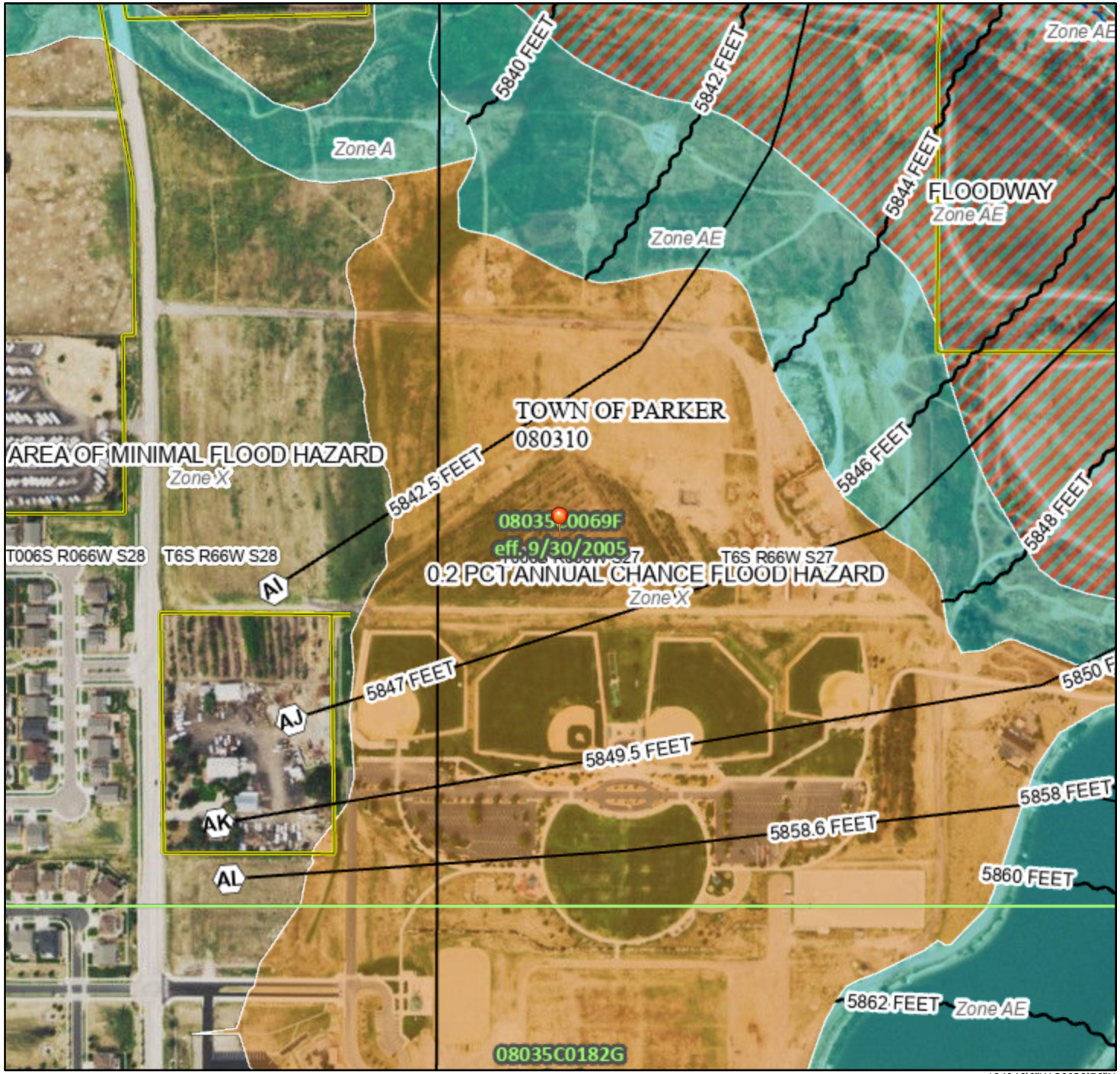


VICINITY MAP NOT TO SCALE

National Flood Hazard Layer FIRMette

FEMA

104°46'43"W 39°30'24"N



104°46'6"W 39°29'56"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

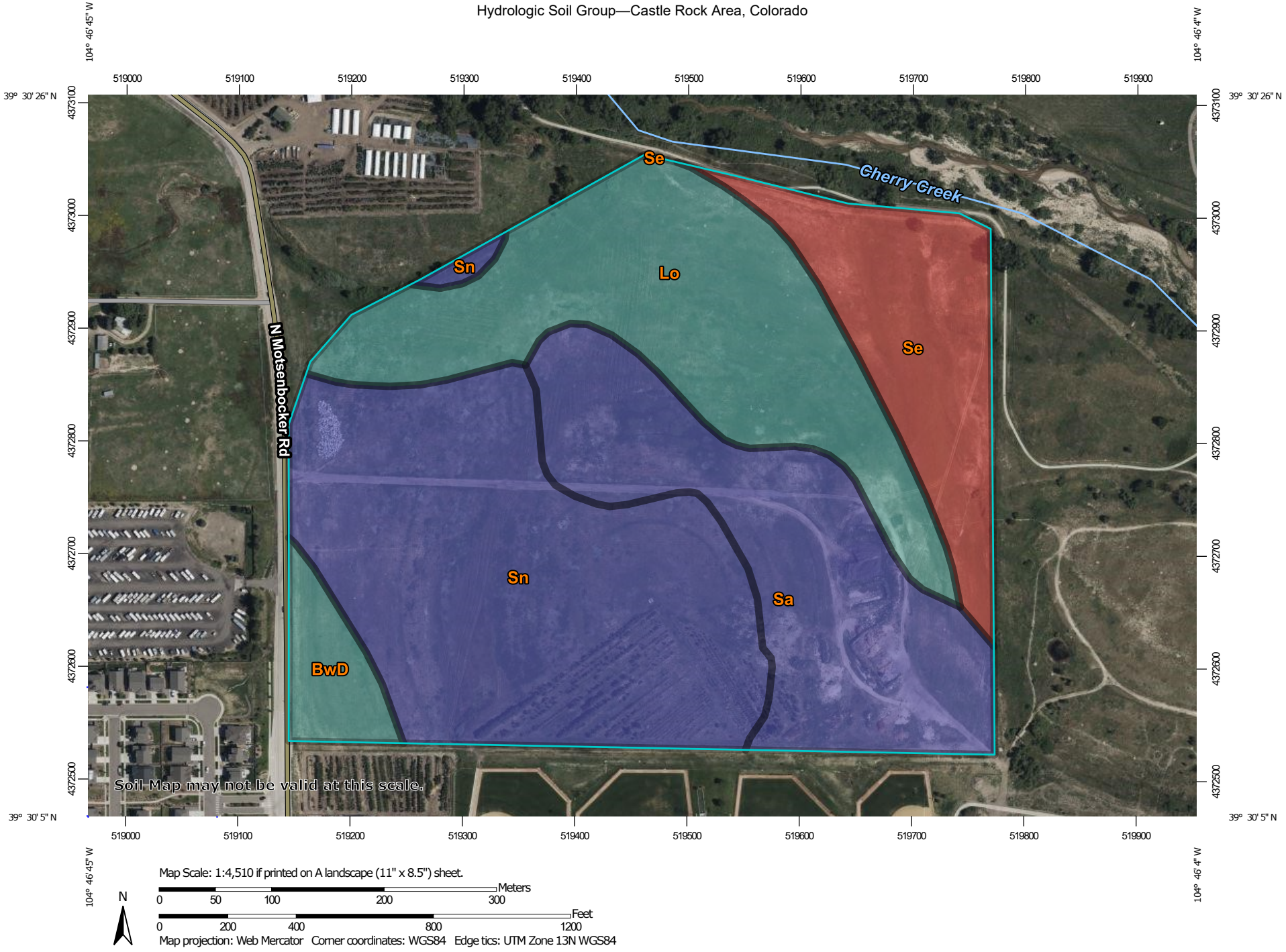
N

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

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/16/2023 at 4:40 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Map Scale: 1:4,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

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: Castle Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BwD	Buick-Satanta loams, 3 to 9 percent slopes	C	2.6	3.7%
Lo	Loamy alluvial land	C	18.0	24.9%
Sa	Sampson loam	B	16.0	22.2%
Se	Sandy wet alluvial land	D	9.4	13.1%
Sn	Satanta loam	B	26.0	36.1%
Totals for Area of Interest			**72.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

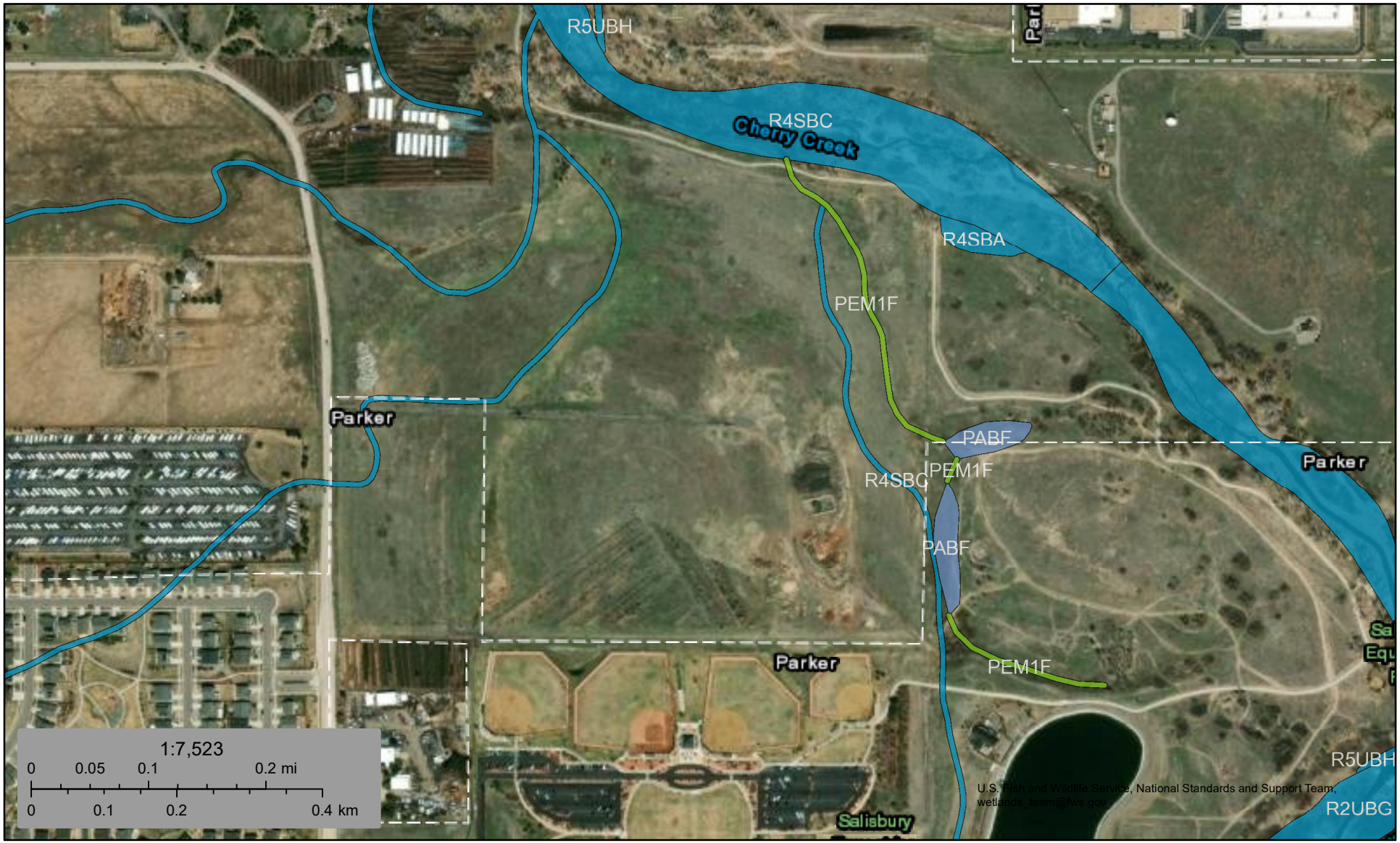
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

U.S. Fish and Wildlife Service
National Wetlands Inventory

Salisbury Park North Wetlands Inventory



November 14, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX B – COMPUTATIONS

JVA Incorporated
1319 Spruce Street
Boulder, CO 80302
Ph: (303) 444 1951

JVA Office:
Boulder

Version 2024.03: 10/3/2024

Project Information:

Job Name:	Salisbury Park North
Job Number:	3752c
Date:	11/19/2024
Designed by:	KAM
Municipality :	Parker
Soil Type:	C/D

Runoff Calculations:

Minor Design Storm:	5	year
Major Design Storm:	100	year

Detention Calculations:

Minor Storm Detention:	EURV	year	plus	0	% EURV
Major Storm Detention:	100	year	plus	100	% EURV
Detention Volume by:	EURV (MHFD)		Enter WQCV :	0	cf

(GB, PP, PLD, SFB, EDB,etc.)

Allowable Release Rates (if applicable):

Max release rate 1 cfs / acre? Yes Site Area: 0.00 acres

Enter Offsite flows to bypass site (these will be added to the allowable release rates)

Qminor =	0.00	cfs (bypass flows)	**Qminor allow =**	**ENTER VALUE**	**cfs**
Q100 =	0.00	cfs (bypass flows)	**Q100allow =**	**0.00**	**cfs**

Rainfall Data Information:

Enter City, Town, or County: Parker

Frequency of Design Event	One Hour Point Rainfall P1	
2 yr	0.99	in
5 yr	1.39	in
10 yr	1.64	in
100 yr	2.60	in

Runoff Coefficient Calculations:

Use MHFD Equations? Yes

Intensity Duration Values:

I-D-F Calculate

JVA Incorpo
1319 Spruce
Boulder, CO
Ph: (303) 444

Job Name: Salisbury Park North
Job Number: 3752c
Date: 11/19/24
By: KAM

Municipality: Parker

Salisbury Park North

Historic Runoff Coefficient & Time of Concentration Calculations

Municipality: Parker
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae
Major Design Storm: 100
Minor Design Storm: 5

Basin Design Data

		I (%) =	5%	95%			I (%)	Runoff Coefficients (MHFD Forumulae Table 6-5)				Initial Overland Time (t_i) MHFD Eq 6-3			Channelized Travel Time (t_t) MHFD Eq 6-4						t_c Comp	Regional Check ($t_{regional}$) MHFD Eq 6-5			t_c Final
Basin Name	Soil Type	Design Point	Area (sf) Undisturbed Native	Area (sf) Concrete Drives/Walks	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100	Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	K	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Channelized Length (ft)	Channelized Slope (ft/ft)	$t_{regional}$	t_c or $t_{regional}$
H1	C/D	1	759,288	5,897	765,185	17.57	5.7%	0.03	0.08	0.17	0.51	500	1.4%	37.8			Paved areas & shallow paved swales	20	0.0	0.0	37.8	0	0.000	N/A	37.8
H2	C/D	2	1,951,339		1,951,339	44.80	5.0%	0.03	0.08	0.17	0.50	500	1.0%	42.6			Paved areas & shallow paved swales	20	0.0	0.0	42.6	0	0.000	N/A	42.6
H3	C/D	3	35,811	970	36,780	0.84	7.4%	0.04	0.10	0.19	0.51	19	25.0%	2.7	163	1.8%	Paved areas & shallow paved swales	20	2.7	1.0	3.8	163	0.018	26.8	5.0
H4	C/D	4	516304.11	22422.37	538,726	12.37	8.7%	0.05	0.11	0.20	0.52	438	1.4%	34.1	570	0.5%	Grassed waterway	15	1.1	9.0	43.0	570	0.005	37.7	37.7
	TOTAL SITE		3,262,742	29,289	3,292,031	75.57	5.8%	0.03	0.08	0.17	0.51														

$I = (28.5\ P1) / ((10 + TC)\ 0.786)$

			Runoff Coeff's				Rainfall Intensities (in/hr)				Area		Flow Rates (cfs)			
Basin Name	Design Point	Time of Conc (tc)	C2	C5	C10	C100	2	5	10	100	A_{Total} (sf)	A_{Total} (ac)	Q2	Q5	Q10	Q100
H1	1	37.8	0.03	0.08	0.17	0.51	1.35	1.90	2.24	3.55	765,185	17.57	0.79	2.71	6.83	31.61
H2	2	42.6	0.03	0.08	0.17	0.50	1.25	1.76	2.08	3.29	1,951,339	44.80	1.62	5.97	15.69	74.37
H3	3	5.0	0.04	0.10	0.19	0.51	3.36	4.71	5.56	8.82	36,780	0.84	0.13	0.38	0.87	3.83
H4	4	37.7	0.05	0.11	0.20	0.52	1.35	1.90	2.24	3.55	538,726	12.37	0.91	2.50	5.44	22.85
										TOTAL SITE	3,292,031	75.57	3.45	11.56	28.84	132.66

JVA Incorporated
1319 Spruce Street
Boulder, CO 80302
Ph: (303) 444 1951

Job Name: Salisbury Park North
Job Number: 3752c
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By: KAM

Salisbury Park North

Composite Runoff Coefficient Calculations

Municipality: Parker
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae

Basin Design Data

		I (%) =	95%	95%	95%	20%	60%			I (%)	Runoff Coefficients (MHFD Forumulae Table 6-5)			
Basin Name	Soil Type	Design Point	Area (sf) Streets Paved	Area (sf) Concrete Drives/Walks	Area (sf) Roof	Area (sf) Landscaping	Area (sf) Artificial Turf (Sports Fields)	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100
A1	C/D	1		25,874	3,584	10,157		39,615	0.91	75.8%	0.61	0.65	0.69	0.79
A2	C/D	2		28,471	3,467	11,513		43,451	1.00	75.1%	0.61	0.65	0.68	0.79
A3	C/D	3		27,319		97,375		124,694	2.86	36.4%	0.27	0.33	0.40	0.63
A4	C/D	4		39,552		185,057		224,609	5.16	33.2%	0.24	0.31	0.38	0.62
A5	C/D	5	26,659	3,814		13,178		43,651	1.00	72.4%	0.58	0.62	0.66	0.78
A6	C/D	6	22,604	5,199		11,625		39,428	0.91	72.9%	0.58	0.63	0.67	0.78
A7	C/D	7	89,321	90,745		83,566		263,633	6.05	71.2%	0.57	0.62	0.66	0.78
A8	C/D	9		25,179		19,576		44,756	1.03	62.2%	0.49	0.54	0.59	0.74
A9	C/D	10	28,367	44,241		44,275		116,883	2.68	66.6%	0.53	0.58	0.62	0.76
A10	C/D	11	28,658					28,658	0.66	95.0%	0.79	0.81	0.83	0.87
A11	C/D	12	16,081	2,450		586		19,117	0.44	92.7%	0.77	0.79	0.81	0.86
A12	C/D	13				40,845		40,845	0.94	20.0%	0.14	0.20	0.28	0.57
B1	C/D	14		27,166		30,105	217,308	274,579	6.30	59.1%	0.46	0.52	0.57	0.73
B2	C/D	15		23,969		42,563		66,531	1.53	47.0%	0.36	0.42	0.48	0.68
B3	C/D	16		1,578		26,032		27,610	0.63	24.3%	0.17	0.23	0.31	0.58
B4	C/D	17		17,719	6,765	19,105		43,589	1.00	62.1%	0.49	0.54	0.59	0.74
B5	C/D	19		16,717		74,094		90,810	2.08	33.8%	0.25	0.31	0.38	0.62
C1	C/D	20	31,860	7,024		64,739		103,623	2.38	48.1%	0.37	0.43	0.49	0.68
C2	C/D	21	30,714	5,552		6,425		42,691	0.98	83.7%	0.68	0.72	0.75	0.83
C3	C/D	22		22,578		152,490		175,068	4.02	29.7%	0.21	0.28	0.35	0.61
C4	C/D	23		28,633	1,734	146,505		176,871	4.06	32.9%	0.24	0.30	0.37	0.62
	TOTAL SITE		274,264	443,778	15,549	1,079,811	217,308	2,030,711	46.62	51.4%	0.40	0.45	0.51	0.69

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Boulder, CO 80302
Ph: (303) 444 1951

Municipality: Parker

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By: KAM

Salisbury Park North

Time of Concentration Calculations

Municipality: Parker
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae

Sub-Basin Data				Initial Overland Time (t_i) MHFD Eq 6-3			Channelized Travel Time (t_t) MHFD Eq 6-4						t_c Comp	Regional Check ($t_{regional}$) MHFD Eq 6-5			t_c Final
Basin Name	Design Point	A_{Total} (ac)	C5	Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	C_v	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Channelized Length (ft)	Channelized Slope (ft/ft)	$t_{regional}$	t_c or $t_{regional}$
A1	1	0.91	0.65	190	1.00%	11.3			Paved areas & shallow paved swales	20	0.0	0.0	11.3	0	0.000	N/A	11.3
A2	2	1.00	0.65	21	2.00%	3.0			Grassed waterway	15	0.0	0.0	3.0	0	0.000	N/A	5.0
A3	3	2.86	0.33	110	1.00%	14.8	583	0.50%	Grassed waterway	15	1.1	9.2	23.9	583	0.005	29.6	23.9
A4	4	5.16	0.31	300	1.20%	23.7	442	0.60%	Grassed waterway	15	1.2	6.3	30.1	442	0.006	27.3	27.3
A5	5	1.00	0.62	121	2.65%	6.9	237	0.60%	Grassed waterway	15	1.2	3.4	10.3	237	0.006	16.4	10.3
A6	6	0.91	0.63	154	2.65%	7.7	204	0.60%	Grassed waterway	15	1.2	2.9	10.7	204	0.006	15.9	10.7
A7	7	6.05	0.62	41	4.10%	3.6	1491	1.00%	Paved areas & shallow paved swales	20	2.0	12.4	16.0	1491	0.010	27.0	16.0
A8	9	1.03	0.54	190	1.00%	14.1			Paved areas & shallow paved swales	20	0.0	0.0	14.1	0	0.000	N/A	14.1
A9	10	2.68	0.58	392	3.10%	13.0	304	1.10%	Grassed waterway	15	1.6	3.2	16.2	304	0.011	17.3	16.2
A10	11	0.66	0.81	12	2.00%	1.5	1152	1.40%	Paved areas & shallow paved swales	20	2.4	8.1	9.6	1152	0.014	17.1	9.6
A11	12	0.44	0.79	12	2.00%	1.6	271	1.00%	Paved areas & shallow paved swales	20	2.0	2.3	3.8	271	0.010	12.3	5.0
A12	13	0.94	0.20	21	24.60%	2.6	346	0.50%	Grassed waterway	15	1.1	5.4	8.0	346	0.005	29.5	8.0
B1	14	6.30	0.52	308	0.50%	23.7			Tillage/field	5	0.0	0.0	23.7	0	0.000	N/A	23.7
B2	15	1.53	0.42	304	2.30%	16.5			Short Pasture and lawns	7	0.0	0.0	16.5	0	0.000	N/A	16.5
B3	16	0.63	0.23	215	1.90%	18.8			Short Pasture and lawns	7	0.0	0.0	18.8	0	0.000	N/A	18.8
B4	17	1.00	0.54	88	1.90%	7.8			Short Pasture and lawns	7	0.0	0.0	7.8	0	0.000	N/A	7.8
B5	19	2.08	0.31	200	2.00%	16.2	218	1.00%	Grassed waterway	15	1.5	2.4	18.7	218	0.010	22.9	18.7
C1	20	2.38	0.43	118	2.10%	10.5	554	0.70%	Paved areas & shallow paved swales	20	1.7	5.5	16.0	554	0.007	24.8	16.0
C2	21	0.98	0.72	76	1.60%	5.2	201	0.50%	Paved areas & shallow paved swales	20	1.4	2.4	7.6	201	0.005	14.1	7.6
C3	22	4.02	0.28	120	1.00%	16.5	795	0.40%	Grassed waterway	15	0.9	14.0	30.5	795	0.004	36.9	30.5
C4	23	4.06	0.30	143	1.00%	17.5	685	0.50%	Grassed waterway	15	1.1	10.8	28.2	685	0.005	32.3	28.2

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1319 Spruce Street
Boulder, CO 80302
Ph: (303) 444 1951

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Salisbury Park North

Developed Storm Runoff Calculations

Design Storm : **100 Year**

Point Hour Rainfall (P_1) : **2.60**

$I = (28.5\ P1) / ((10 + TC)^{0.786})$

	Direct Runoff							Total Runoff				Inlets				Pipe						Pipe/Swale Travel Time				
Basin Name	Design Point	Area (ac)	C100	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q Intercepted	Q carryover	Q bypass	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)	tt (min)	Total Time (min)	Notes
A1	1	0.91	0.79	11.3	0.72	6.69	4.83	11.31	0.72	6.69	4.83	Trench Drain	4.83	0.00	0.00	12 in	RCP	0.5%	**4.8**	2.7	30	3.2	0.16	11.46	Basin A1
A2	2	1.00	0.79	5.0	0.79	8.81	6.95	5.00	0.79	8.82	6.96	Perforated Drains	6.96	0.00	0.00	12 in	PVC	0.5%	**7.0**	3.5	487	4.2	1.95	6.95	Basin A2
A3	3	2.86	0.63	23.9	1.81	4.64	8.41	23.93	1.81	4.64	8.41		8.41	0.00	0.00										Basin A3
	TOTAL TO DP3							23.93	3.32	4.64	15.43	Flared End Section	15.43	0.00	0.00	18 in	RCP	0.4%	**15.4**	7.1	180	3.8	0.80	24.73	Basin A1 + A2 + A3
A4	4	5.16	0.62	27.3	3.20	4.30	13.74	27.32	3.20	4.31	13.77		13.77	0.00	0.00										Basin A4
	TOTAL TO DP4							27.32	6.52	4.31	28.08	Flared End Section	28.08	0.00	0.00	24 in	RCP	1.9%	28.1	33.6	220	11.1	0.33	27.65	DP3 + Basin A4
A5	5	1.00	0.78	10.3	0.78	6.94	5.42	10.33	0.78	6.95	5.43		5.43	0.00	0.00										Basin A5
	TOTAL TO DP5							27.65	7.30	4.28	31.23	Area Inlet	31.23	0.00	0.00	18 in	RCP	0.4%	**31.2**	7.1	108	3.8	0.48	28.13	DP4 + Basin A5
A6	6	0.91	0.78	10.7	0.71	6.85	4.85	10.67	0.71	6.85	4.85	Area Inlet	4.85	0.00	0.00	18 in	RCP	0.5%	4.9	8.0	51	4.4	0.19	10.86	Basin A6
A7	7	6.05	0.78	16.0	4.69	5.72	26.84	15.98	4.69	5.73	26.87	Combination Inlet	26.87	0.00	0.00	24 in	RCP	0.5%	**26.9**	17.2	335	5.1	1.10	17.07	Basin A7
	TOTAL TO DP8							17.07	5.40	5.54	29.94	N/A	29.94	0.00	0.00	36 in	RCP	0.5%	29.9	50.7	163	7.0	0.39	17.46	DP6 + DP7
A8	9	1.03	0.74	14.1	0.76	6.07	4.60	14.10	0.76	6.07	4.61	Trench Drain	4.61	0.00	0.00	12 in	RCP	0.5%	**4.6**	2.7	267	3.2	1.39	15.49	Basin A8
A9	10	2.68	0.76	16.2	2.03	5.68	11.53	16.22	2.03	5.69	11.54		11.54	0.00	0.00										Basin A9
	TOTAL TO DP10							16.22	2.79	5.69	15.85	Area Inlet	15.85	0.00	0.00	18 in	RCP	0.5%	**15.9**	8.0	14	4.2	0.06	16.28	Basin A8 + A9
A10	11	0.66	0.87	9.6	0.57	7.15	4.10	9.58	0.57	7.15	4.11		4.11	0.00	0.00										Basin A10
	TOTAL TO DP11							16.28	3.36	5.68	19.08	Combination Inlet	19.08	0.00	0.00	18 in	RCP	0.5%	**19.1**	8.1	35	4.2	0.14	16.42	DP10 + Basin A10
A11	12	0.44	0.86	5.0	0.38	8.81	3.34	5.00	0.38	8.82	3.34	Sheet Flow to Pond	3.34	0.00	0.00										Basin A11
A12	13	0.94	0.57	8.0	0.53	7.62	4.04	8.04	0.53	7.63	4.05	Sheet Flow to Pond	4.05	0.00	0.00										Basin A12
B1	14	6.30	0.73	23.7	4.57	4.67	21.36	23.66	4.57	4.67	21.37	Underdrain	21.37	0.00	0.00	24 in	RCP	0.5%	**21.4**	17.2	125	5.1	0.41	24.06	Basin B1
B2	15	1.53	0.68	16.5	1.03	5.63	5.82	16.51	1.03	5.64	5.82		5.82	0.00	0.00										Basin B2
	TOTAL TO DP15							24.06	5.61	4.63	25.95	Area Inlet	25.95	0.00	0.00	24 in	RCP	1.0%	**26.0**	24.3	109	7.2	0.25	24.32	Basin B1 + B2
B3	16	0.63	0.58	18.8	0.37	5.27	1.95	18.82	0.37	5.28	1.95		1.95	0.00	0.00										Basin B3
	TOTAL TO DP16							24.32	5.98	4.60	27.50	Area Inlet	27.50	0.00	0.00	24 in	RCP	1.0%	**27.5**	24.3	106	7.2	0.25	24.56	DP15 + Basin B3
B4	17	1.00	0.74	7.8	0.74	7.72	5.70	7.76	0.74	7.72	5.70	Area Inlet	5.70	0.00	0.00	24 in	RCP	1.0%	5.7	24.3	91	5.9	0.26	8.01	Basin B4
	TOTAL TO DP18							24.56	6.72	4.58	30.73	N/A	30.73	0.00	0.00	24 in	RCP	1.0%	**30.7**	24.3	134	7.2	0.31	24.87	DP16 + DP17
B5	19	2.08	0.62	18.7	1.30	5.30	6.88	18.67	1.30	5.30	6.88		6.88	0.00	0.00										Basin B5
	TOTAL TO DP19							24.87	8.01	4.54	36.41		36.41	0.00	0.00	24 in	RCP	1.0%	**36.4**	24.3	63	7.2	0.15	25.02	DP18 + Basin B5
C1	20	2.38	0.68	16.0	1.62	5.72	9.27	15.98	1.62	5.73	9.28	Combination Inlet	9.28	0.00	0.00	18 in	PVC	1.0%	9.3	14.7	274	8.2	0.56	16.54	Basin C1
C2	21	0.98	0.83	7.6	0.81	7.77	6.29	7.60	0.81	7.78	6.30		6.30	0.00	0.00										Basin C2
	TOTAL TO DP21							16.54	2.43	5.63	13.68	Combination Inlet	13.68	0.00	0.00	24 in	PVC	1.0%	13.7	31.6	138	9.0	0.26	16.79	Basin C1 + C2
C3	22	4.02	0.61	30.5	2.43	4.03	9.80	30.50	2.43	4.04	9.83		9.83	0.00	0.00										Basin C3
	TOTAL TO DP22							30.50	4.86	4.04	19.64	Flared End Section	19.64	0.00	0.00	24 in	RCP	1.0%	19.6	24.3	123	8.0	0.26	30.76	DP21 + Basin C3
C4	23	4.06	0.62	28.2	2.51	4.22	10.60	28.24	2.51	4.23	10.61		10.61	0.00	0.00										Basin C4
	TOTAL TO DP23							30.76	7.37	4.02	29.64	Flared End Section	29.64	0.00	0.00	24 in	RCP	1.0%	**29.6**	24.3	312	7.2	0.72	31.48	DP22 + Basin C4
	TOTAL TO DP24							31.48	15.39	3.96	61.00	N/A	61.00	0.00	0.00	24 in	RCP	1.0%	**61.0**	24.3	222	7.2	0.51	31.99	DP19 + DP23

JVA Incorporated
1319 Spruce Street
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Salisbury Park North

Developed Storm Runoff Calculations

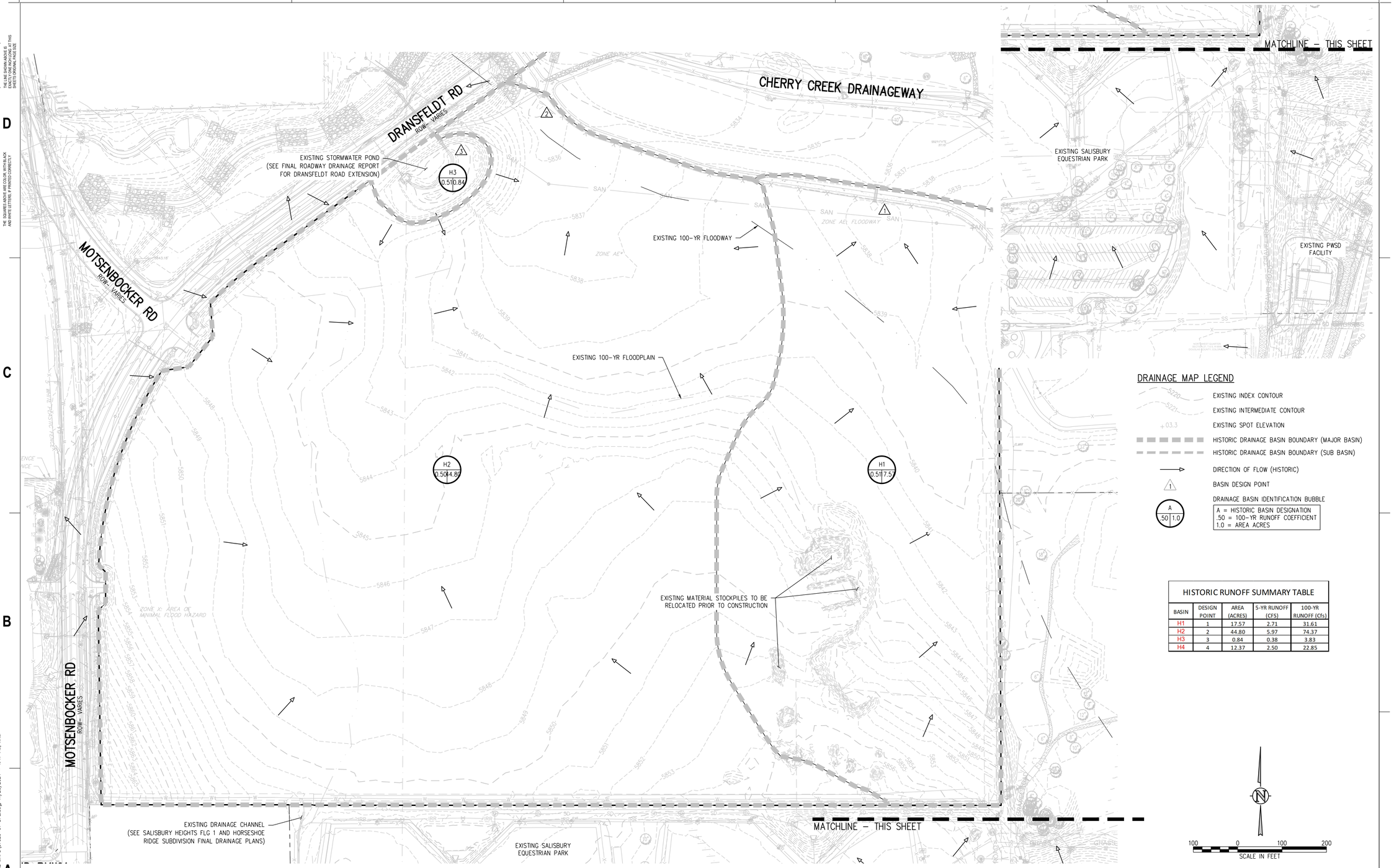
Design Storm : **5 Year**

Point Hour Rainfall (P_1) : **1.39**

$I = (28.5\ P1) / ((10 + TC)^{0.786})$

	Direct Runoff							Total Runoff				Inlets				Pipe					Pipe/Swale Travel Time				
Basin Name	Design Point	Area (ac)	C5	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q Intercepted	Q carryover	Q bypass	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)	tt (min)	Total Time (min)	Notes
A1	1	0.91	0.65	11.31	0.59	3.57	2.12	11.31	0.59	3.58	2.12	Trench Drain	2.12	0.00	0.00	12 in	RCP	0.5%	2.1	2.7	30	3.5	0.14	11.45	Basin A1
A2	2	1.00	0.65	5.00	0.65	4.71	3.04	5.00	0.65	4.71	3.04	Perforated Drains	3.04	0.00	0.00	12 in	PVC	0.5%	3.0	3.5	487	4.7	1.74	6.74	Basin A2
A3	3	2.86	0.33	23.93	0.95	2.48	2.36	23.93	0.95	2.48	2.36		2.36	0.00	0.00										Basin A3
	TOTAL TO DP3							23.93	2.19	2.48	5.43	Flared End Section	5.43	0.00	0.00	18 in	RCP	0.4%	5.4	7.1	180	4.1	0.73	24.66	Basin A1 + A2 + A3
A4	4	5.16	0.31	27.32	1.58	2.30	3.62	27.32	1.58	2.30	3.63		3.63	0.00	0.00										Basin A4
	TOTAL TO DP4							27.32	3.77	2.30	8.67	Flared End Section	8.67	0.00	0.00	24 in	RCP	1.9%	8.7	33.6	220	8.4	0.44	27.76	DP3 + Basin A4
A5	5	1.00	0.62	10.33	0.63	3.71	2.32	10.33	0.63	3.71	2.32		2.32	0.00	0.00										Basin A5
	TOTAL TO DP5							27.76	4.39	2.28	10.02	Area Inlet	10.02	0.00	0.00	18 in	RCP	0.4%	10.0	7.1	108	3.8	0.48	28.24	DP4 + Basin A5
A6	6	0.91	0.63	10.67	0.57	3.66	2.08	10.67	0.57	3.66	2.09	Area Inlet	2.09	0.00	0.00	18 in	RCP	0.5%	2.1	8.0	51	3.5	0.24	10.91	Basin A6
A7	7	6.05	0.62	15.98	3.73	3.06	11.40	15.98	3.73	3.06	11.41	Combination Inlet	11.41	0.00	0.00	24 in	RCP	0.5%	11.4	17.2	335	5.5	1.02	17.00	Basin A7
	TOTAL TO DP8							17.00	4.29	2.97	12.76	N/A	12.76	0.00	0.00	36 in	RCP	0.5%	12.8	50.7	163	5.6	0.49	17.49	DP6 + DP7
A8	9	1.03	0.54	14.10	0.56	3.24	1.80	14.10	0.56	3.25	1.81	Trench Drain	1.81	0.00	0.00	12 in	RCP	0.5%	1.8	2.7	267	3.4	1.30	15.40	Basin A8
A9	10	2.68	0.58	16.22	1.55	3.03	4.70	16.22	1.55	3.04	4.71		4.71	0.00	0.00										Basin A9
	TOTAL TO DP10							16.22	2.11	3.04	6.40	Area Inlet	6.40	0.00	0.00	18 in	RCP	0.5%	6.4	8.0	14	4.7	0.05	16.27	Basin A8 + A9
A10	11	0.66	0.81	9.58	0.53	3.82	2.03	9.58	0.53	3.82	2.04		2.04	0.00	0.00										Basin A10
	TOTAL TO DP11							16.27	2.64	3.03	8.01	Combination Inlet	8.01	0.00	0.00	18 in	RCP	0.5%	8.0	8.1	35	4.2	0.14	16.41	DP10 + Basin A10
A11	12	0.44	0.79	5.00	0.35	4.71	1.63	5.00	0.35	4.71	1.64	Sheet Flow to Pond	1.64	0.00	0.00										Basin A11
A12	13	0.94	0.20	8.04	0.19	4.07	0.76	8.04	0.19	4.08	0.76	Sheet Flow to Pond	0.76	0.00	0.00										Basin A12
B1	14	6.30	0.52	23.66	3.26	2.49	8.11	23.66	3.26	2.50	8.13	Underdrain	8.13	0.00	0.00	24 in	RCP	0.5%	8.1	17.2	125	5.0	0.42	24.07	Basin B1
B2	15	1.53	0.42	16.51	0.64	3.01	1.92	16.51	0.64	3.01	1.92		1.92	0.00	0.00										Basin B2
	TOTAL TO DP15							24.07	3.89	2.47	9.63	Area Inlet	9.63	0.00	0.00	24 in	RCP	1.0%	9.6	24.3	109	6.8	0.27	24.34	Basin B1 + B2
B3	16	0.63	0.23	18.82	0.15	2.82	0.42	18.82	0.15	2.82	0.42		0.42	0.00	0.00										Basin B3
	TOTAL TO DP16							24.34	4.04	2.46	9.94	Area Inlet	9.94	0.00	0.00	24 in	RCP	1.0%	9.9	24.3	106	6.8	0.26	24.60	DP15 + Basin B3
B4	17	1.00	0.54	7.76	0.54	4.12	2.23	7.76	0.54	4.13	2.24	Area Inlet	2.24	0.00	0.00	24 in	RCP	1.0%	2.2	24.3	91	4.5	0.34	8.10	Basin B4
	TOTAL TO DP18							24.60	4.58	2.44	11.20	N/A	11.20	0.00	0.00	24 in	RCP	1.0%	11.2	24.3	134	7.0	0.32	24.92	DP16 + DP17
B5	19	2.08	0.31	18.67	0.65	2.83	1.83	18.67	0.65	2.83	1.83		1.83	0.00	0.00										Basin B5
	TOTAL TO DP19							24.92	5.23	2.43	12.69		12.69	0.00	0.00	24 in	RCP	1.0%	12.7	24.3	63	7.3	0.14	25.06	DP18 + Basin B5
C1	20	2.38	0.43	15.98	1.02	3.06	3.11	15.98	1.02	3.06	3.11	Combination Inlet	3.11	0.00	0.00	18 in	PVC	1.0%	3.1	14.7	274	6.2	0.74	16.72	Basin C1
C2	21	0.98	0.72	7.60	0.70	4.15	2.92	7.60	0.70	4.16	2.92		2.92	0.00	0.00										Basin C2
	TOTAL TO DP21							16.72	1.72	2.99	5.15	Combination Inlet	5.15	0.00	0.00	24 in	PVC	1.0%	5.1	31.6	138	7.0	0.33	17.05	Basin C1 + C2
C3	22	4.02	0.28	30.50	1.11	2.15	2.39	30.50	1.11	2.16	2.40		2.40	0.00	0.00										Basin C3
	TOTAL TO DP22							30.50	2.83	2.16	6.12	Flared End Section	6.12	0.00	0.00	24 in	RCP	1.0%	6.1	24.3	123	6.0	0.34	30.84	DP21 + Basin C3
C4	23	4.06	0.30	28.24	1.23	2.25	2.77	28.24	1.23	2.26	2.78		2.78	0.00	0.00										Basin C4
	TOTAL TO DP23							30.84	4.06	2.15	8.72	Flared End Section	8.72	0.00	0.00	24 in	RCP	1.0%	8.7	24.3	312	6.6	0.79	31.63	DP22 + Basin C4
	TOTAL TO DP24							31.63	9.29	2.11	19.64	N/A	19.64	0.00	0.00	24 in	RCP	1.0%	19.6	24.3	222	8.0	0.46	32.09	DP19 + DP23

APPENDIX C – MAPPING



DRAINAGE MAP LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING SPOT ELEVATION
- HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DIRECTION OF FLOW (HISTORIC)
- BASIN DESIGN POINT
- DRAINAGE BASIN IDENTIFICATION BUBBLE

A = HISTORIC BASIN DESIGNATION
.50 = 100-YR RUNOFF COEFFICIENT
1.0 = AREA ACRES

HISTORIC RUNOFF SUMMARY TABLE

BASIN	DESIGN POINT	AREA (ACRES)	5-YR RUNOFF (CFS)	100-YR RUNOFF (Cfs)
H1	1	17.57	2.71	31.61
H2	2	44.80	5.97	74.37
H3	3	0.84	0.38	3.83
H4	4	12.37	2.50	22.85

100 0 100 200
SCALE IN FEET

CALL 811 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR MARKING OF UNDERGROUND MEMBER UTILITIES

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LANDSCAPE ARCHITECT / ARCHITECT
1800 Wazee Street, Suite 450
Denver, CO 80202
p. 303.607.0977

CIVIL ENGINEER / STRUCTURAL ENGINEER
JVA Incorporated
1675 Larimer Street, #500
Denver, CO 80202
p. 303.444.1951

ELECTRICAL ENGINEER
Ackerman Engineering, Inc.
3000 Youngfield Street, #264
Wheat Ridge, CO 80215
p. 303.278.7297

IRRIGATION
Avocet Irrigation
11757 W. Ken Caryl Ave., Suite F-509
Littleton, CO 80127
p. 303.986.2175

MECHANICAL ENGINEER
ENVISION Mechanical Engineers, Inc.
9777 Pyramid Court, #260
Englewood, CO 80112
p. 303.688.0223

Town of Parker
SALISBURY PARK NORTH - PHASE 1
11700 MOTSENBOCKER RD
PARKER, CO 80134

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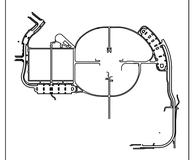
ARCHITECTURE
LANDSCAPE ARCHITECTURE
PLANNING
INTERIOR DESIGN

	DATE	DESCRIPTION

Project Number: 223072.00
Sheet Issue Date: 2024-11-22
Drawn By: AMF/MGG/MJS
Checked By: WTP/CWK/CFG

Key Map



Drawing
HISTORIC DRAINAGE MAP

FIG. 1

SITE PLAN SUBMITTAL

THE LINE SHOWN ABOVE IS 1" WHEN PLOTTED AT 24"x36" SHEETS ORIGINAL PAGE SIZE

THE SQUARES ABOVE ARE COLOR WITH BLACK WHEN PLOTTED AT 24"x36" SHEETS ORIGINAL PAGE SIZE

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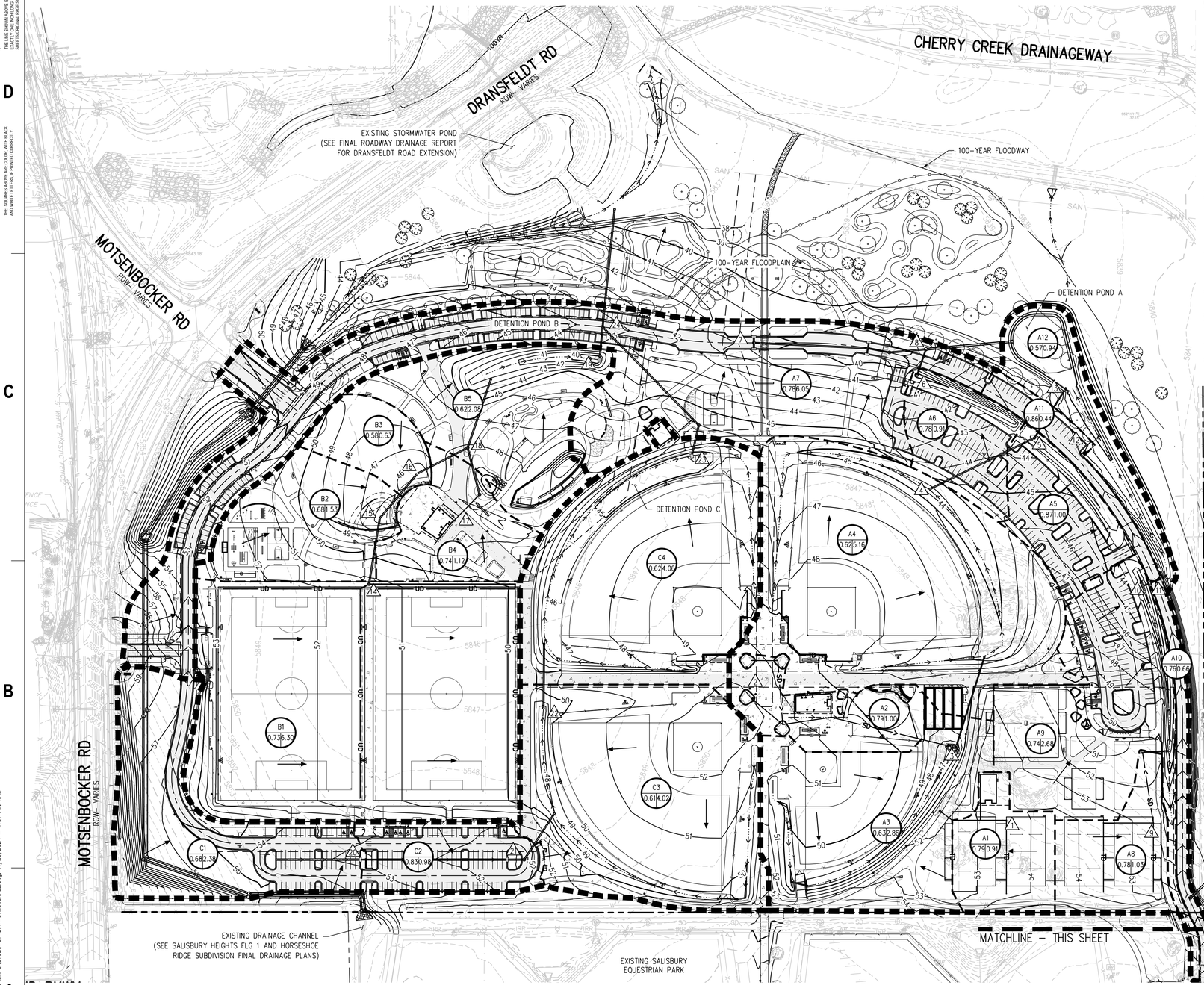

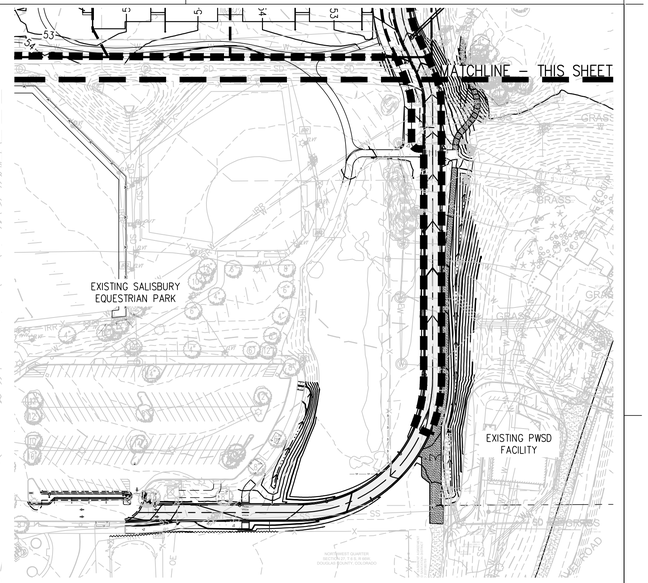

DRAINAGE MAP LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- DEVELOPED DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DIRECTION OF FLOW (HISTORIC)
- DIRECTION OF FLOW (DEVELOPED)
- OVERFLOW PATH
- BASIN DESIGN POINT
- DRAINAGE BASIN IDENTIFICATION BUBBLE

A = DEVELOPED BASIN DESIGNATION
.50 = 100-YR RUNOFF COEFFICIENT
1.0 = AREA ACRES

DEVELOPED RUNOFF SUMMARY TABLE

BASIN	DESIGN POINT	AREA (ACRES)	5-YR RUNOFF (CFS)	100-YR RUNOFF (Cfs)
A1	1	0.76	2.12	4.83
A2	2	0.75	3.04	6.96
A3	3	0.36	2.36	8.41
A4	4	0.33	3.63	13.77
A5	5	0.72	2.32	5.43
A6	6	0.73	2.09	4.85
A7	7	0.71	11.41	26.87
A8	8	0.62	1.81	4.61
A9	10	0.67	4.71	11.54
A10	11	0.95	2.04	4.11
A11	12	0.93	1.64	3.34
A12	13	0.20	0.76	4.05
B1	14	0.59	8.13	21.37
B2	15	0.47	1.92	5.82
B3	16	0.24	0.42	1.95
B4	17	0.62	2.24	5.70
B5	19	0.34	1.83	6.88
C1	20	0.48	3.11	9.28
C2	21	0.84	2.92	6.30
C3	22	0.30	2.40	9.83
C4	23	0.33	2.78	10.61

N

100 0 100 200
SCALE IN FEET

COLORADO 811
CALL 811 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR MARKING OF UNDERGROUND MEMBER UTILITIES

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1800 Wazee Street, Suite 450
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Town of Parker
SALISBURY PARK NORTH - PHASE 1
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PARKER, CO 80134

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ARCHITECTURE
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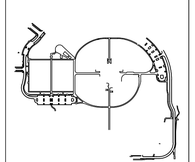
Key Map



Drawing

DEVELOPED MASTER DRAINAGE MAP

FIG. 2

SITE PLAN SUBMITTAL