Galloway
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07/26/2024
Town of Parker
Engineering Department
20120 East Mainstreet
Parker, CO 80138

RE: Mister Car Wash – Parker Pointe Subdivision – Parker, CO

Introduction
This drainage conformance letter is for the proposed Mister Car Wash (MCW) pad development on Lot 13 of the Parker Pointe overall development in Parker, Colorado. The objective is to show that the proposed drainage design for the site conforms with the *"Final Drainage Report – Parker Pointe"* (Overall Report) prepared by Perception Design. Excerpts from the Overall Report are included in Appendix E of this report.

The proposed MCW development site is 1.35 acres. The existing site is overlot graded sloping from west to east with an existing storm sewer inlet provided from the storm main in the private drive to the east. The proposed improvements include a 5,440 sf car wash facility, parking areas, drive aisles, pos canopy, attendant hut, landscaping and sidewalks. Runoff from the building roof will be collected in roof drains and rounded via underground PVC storm sewer. Ground runoff will be collected by an on-site storm sewer system which will connect to the existing storm system. Drainage for the Mister Car Wash site is consistent and meets the assumptions of the Overall Report. During development of the overall site, a storm sewer stub was provided to convey developed runoff to the extended detention basin at the southeast corner of the overall site that provides both detention and water quality facilities.

Drainage Narrative
Per the Overall Report, the car wash site is the Overall Report Basin L13 and a portion of Basin L14, which were both 0.73 acres and assumed to have an imperviousness of 95% for both basins. The expected runoff for the MCW site, per the overall report for each basin, is 2.78 cfs and 5.69 cfs in the 5- and 100-yr events, respectively.

The proposed MCW development is 1.35 acres and has an imperviousness of 73.3%. Runoff flows generated by the site are 0.49 cfs in the 5-year storm and 5.27 cfs in the 100-year storm.

A curb inlet with a storm stub was provided at the southeast end of the carwash site for connection to onsite storm system (Design Point #9). In the existing condition for Basin L13, flows drain towards Parker Road in the overlot condition, but they get conveyed to the mainline storm sewer down the center of the private access drive to the detention pond.

Water quality and detention is provided off-site in the Detention Pond, southeast of the site that is designed to accommodate the majority of the Parker Pointe Development (see Appendix E). Ultimately pond outflows discharge to Kinney Creek.

NRCS Web Soil survey results indicated the site's native soils are Hydrologic Group A. A copy of the WSS is included in Appendix C.

Drainage Analysis & Details
The proposed MCW drainage plan includes three (5) onsite basins as described below. Please refer to Appendix D for a copy of the Drainage Map, and Appendix A for hydrologic calculations.

- Basin MCW-1 (0.19 ac, 12.2% impervious) –The landscaped area west of the proposed car wash building will continue following existing drainage patterns and flow offsite. Due to a 10 foot gas line easement within this basin, a grass swale will not be able to be constructed; therefore, flow will continue to flow into Parker Road.

- Basin MCW-2 (0.14 ac, 90.3% impervious) – The majority of the basin encompasses the car wash flows through roof drains. These are connected to storm sewer infrastructure that ultimately gets conveyed to the southeast corner of the site to the existing inlet. This existing inlet will be resized to capture the entire site's runoff. The remaining flow within this basin is comprised of paved areas that all sheet flows to the trench drain at the south end of the basin.

- Basin MCW-3 (0.30 ac, 79.7% impervious) – The majority of this basin is pavement that sheet flows to the curb and gutters conveying the flow to the curb inlet on the north side of the site.

- Basin MCW-4 (0.39 ac, 86.8% impervious) – This basin is comprised of primarily pavement and landscaping including the center and southeast portion of the site. Flows sheet flow into a concrete valley pan adjacent to the parking stalls that is conveyed southwest to a curb inlet.

- Basin MCW-5 (0.02 ac, 100.00% impervious) – This basin is a portion of the sidewalk that flows north to the existing storm stub in the drive access.

The proposed car wash storm sewer system was analyzed using Bently Storm CAD and Inlet capacities were calculated using the MHFD UD-Inlet spread sheet. Please refer to Appendix B for results.

Conclusions:
The drainage design for the Mister Car Wash follows the Overall Report. The actual design for the onsite drainage area is 1.35 acres with an imperviousness of 73.3% which is less than what was assumed in the overall report. The Mister Car Wash Development does not create additional flows or cause adverse impacts to the overall drainage. Therefore, the Mister Car Wash development and drainage design is in conformance.

Sincerely,
GALLOWAY

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Greenwood Village, CO 80111
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Appendices:

Appendix A – Hydrologic Computations

Appendix B – StormCAD Results & Inlet Capacities

Appendix C – Web Soil Survey

Appendix D – Proposed Drainage Plan

Appendix E – Excerpts from “Final Drainage Report Parker Pointe”

Appendix A: Hydrologic Computations

BASIN SUMMARY TABLE						
Tributary Sub-basin	Area (acres)	C_5	C_{100}	t_c (min)	Q_5 (cfs)	Q_{100} (cfs)
MCW-1	0.19	0.06	0.20	11.19	0.04	0.27
MCW-2	0.14	0.76	0.81	7.09	0.47	0.96
MCW-3	0.30	0.64	0.73	9.45	0.73	1.58
MCW-4	0.39	0.72	0.79	7.92	1.15	2.38
MCW-5	0.02	0.86	0.89	5.00	0.05	0.09

COMPOSITE % IMPERVIOUS CALCULATIONS

Subdivision:
Location: CO, Parker

Project Name:
Project No.: TEC04
Calculated By: KML
Checked By: MRK
Date: 7/26/24

		Paved Roads			Lawns			Roofs			Basins Total
Basin ID	Total Area (ac)	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	Weighted % Imp.
MCW-1	0.19	100	0.02	12.2	0	0.17	0.0	90	0.00	0.00	12.17
MCW-2	0.14	100	0.02	12.3	0	0.00	0.0	90	0.12	78.00	90.26
MCW-3	0.30	100	0.22	74.5	0	0.06	0.0	90	0.02	5.20	79.67
MCW-4	0.39	100	0.34	86.8	0	0.05	0.0	90	0.00	0.00	86.78
MCW-5	0.02	100	0.02	100.0	0	0.00	0.0	90	0.00	0.00	100.00
Total MCW	1.04	100	0.62		0	0.28		100	0.14		73.27

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STANDARD FORM SF-2
TIME OF CONCENTRATION

Subdivision:
Location: CO, Parker

Project Name:
Project No.: TEC04
Calculated By: KML
Checked By: MRK
Date: 7/26/24

SUB-BASIN DATA						INITIAL/OVERLAND (T_i)			TRAVEL TIME (T_t)					Tc CHECK (URBANIZED BASINS)			FINAL
BASIN ID	D.A. (AC)	Hydrologic Soils Group	Impervious (%)	C_{100}	C_5	L (FT)	S (%)	T_i (MIN)	L (FT)	S (%)	Cv	VEL. (FPS)	T_t (MIN)	COMP. T_c (MIN)	TOTAL LENGTH (FT)	Urbanized T_c (MIN)	T_c (MIN)
MCW-1	0.19	A	12.2	0.20	0.06	215	1.5	24.4	0	1.5	20.0	2.4	0.0	24.4	215.0	11.2	11.2
MCW-2	0.14	A	90.3	0.81	0.76	170	1.5	7.1	0	1.5	20.0	2.4	0.0	7.1	170.0	10.9	7.1
MCW-3	0.30	A	79.7	0.73	0.64	165	1.5	9.5	0	1.5	20.0	2.4	0.0	9.5	165.0	10.9	9.5
MCW-4	0.39	A	86.8	0.79	0.72	170	1.5	7.9	0	1.5	20.0	2.4	0.0	7.9	170.0	10.9	7.9
MCW-5	0.02	A	100.0	0.89	0.86	55	1.5	2.8	0	1.5	20.0	2.4	0.0	2.8	55.0	10.3	5.0

NOTES:

T_i = (0.395*(1.1 - C_5)*(L)^0.5)/((S)^0.33), S in ft/ft

T_t=L/60V (Velocity From Fig. 501)

Velocity V=Cv*S^0.5, S in ft/ft

Tc Check = 10+L/180

For Urbanized basins a minimum T_c of 5.0 minutes is required.

For non-urbanized basins a minimum T_c of 10.0 minutes is required

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

Subdivision:
Location: CO, Parker
Design Storm: 5-Year

Project Name:
Project No.: TEC04
Calculated By: KML
Checked By: MRK
Date: 7/26/24

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	
	1	MCW-1	0.19	0.06	11.2	0.01	3.59	0.04													
	2	MCW-2	0.14	0.76	7.1	0.11	4.26	0.47													
	3	MCW-3	0.30	0.64	9.5	0.19	3.84	0.73													
	4	MCW-4	0.39	0.72	7.9	0.28	4.10	1.15													
	5	MCW-5	0.02	0.86	5.0	0.01	4.71	0.05													

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

Subdivision:
Location: CO, Parker
Design Storm: 100-Year

Project Name:
Project No.: TEC04
Calculated By: KML
Checked By: MRK
Date: 7/26/24

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	
	1	MCW-1	0.19	0.20	11.19	0.04	6.72	0.27													
	2	MCW-2	0.14	0.81	7.09	0.12	7.96	0.96													
	3	MCW-3	0.30	0.73	9.45	0.22	7.19	1.58													
	4	MCW-4	0.39	0.79	7.92	0.31	7.67	2.38													
	5	MCW-5	0.02	0.89	5.00	0.01	8.82	0.09													

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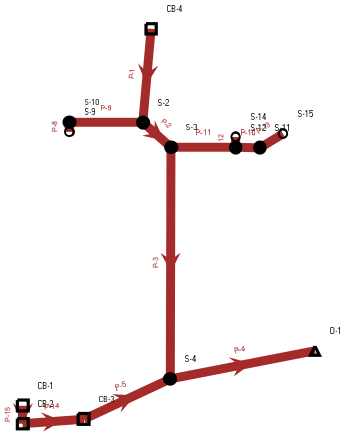
Appendix B: StormCAD Results & Inlet Capacities

Scenario: 100-Year



Scenario: 100-Year
Current Time Step: 0.000Hr
Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Length (Unified) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Capacity (Full Flow) (cfs)
P-4	S-4	O-1	5,973.17	5,970.48	83.0	5,972.24	5,969.94	0.028	14.00
P-10	S-11	S-12	5,975.31	5,975.04	13.6	5,975.31	5,975.04	0.020	1.03
P-13	S-11	S-15	5,975.56	5,975.56	15.2	5,975.56	5,975.41	0.010	1.57
P-1	CB-4	S-2	5,975.67	5,975.02	52.9	5,975.14	5,974.61	0.010	4.63
P-8	S-9	S-10	5,975.36	5,975.28	5.4	5,975.36	5,975.28	0.014	0.85
P-9	S-10	S-2	5,975.18	5,975.05	41.4	5,975.18	5,974.62	0.014	0.85
P-11	S-12	S-3	5,974.95	5,974.62	36.2	5,974.95	5,974.22	0.020	2.22
P-12	S-12	S-14	5,975.10	5,975.10	6.0	5,975.10	5,975.04	0.010	1.57
P-2	S-2	S-3	5,975.05	5,974.62	21.1	5,974.51	5,974.22	0.014	5.42
P-3	S-3	S-4	5,974.62	5,973.17	130.4	5,974.12	5,972.34	0.014	9.83
P-14	CB-2	CB-3	5,975.45	5,974.73	34.4	5,974.98	5,974.02	0.028	7.72
P-15	CB-2	CB-1	5,975.77	5,975.35	10.2	5,975.08	5,975.36	-0.028	7.72
P-5	CB-3	S-4	5,974.73	5,972.94	53.6	5,973.92	5,972.43	0.028	7.72

H:\T\TerraForm\CO_Parker_TEC04_Parker and Cottonwood\0CIV\5-C3D\Pipes\TEC04_STORM.stsw

Appendix C: Web Soil Survey

United States Department of Agriculture

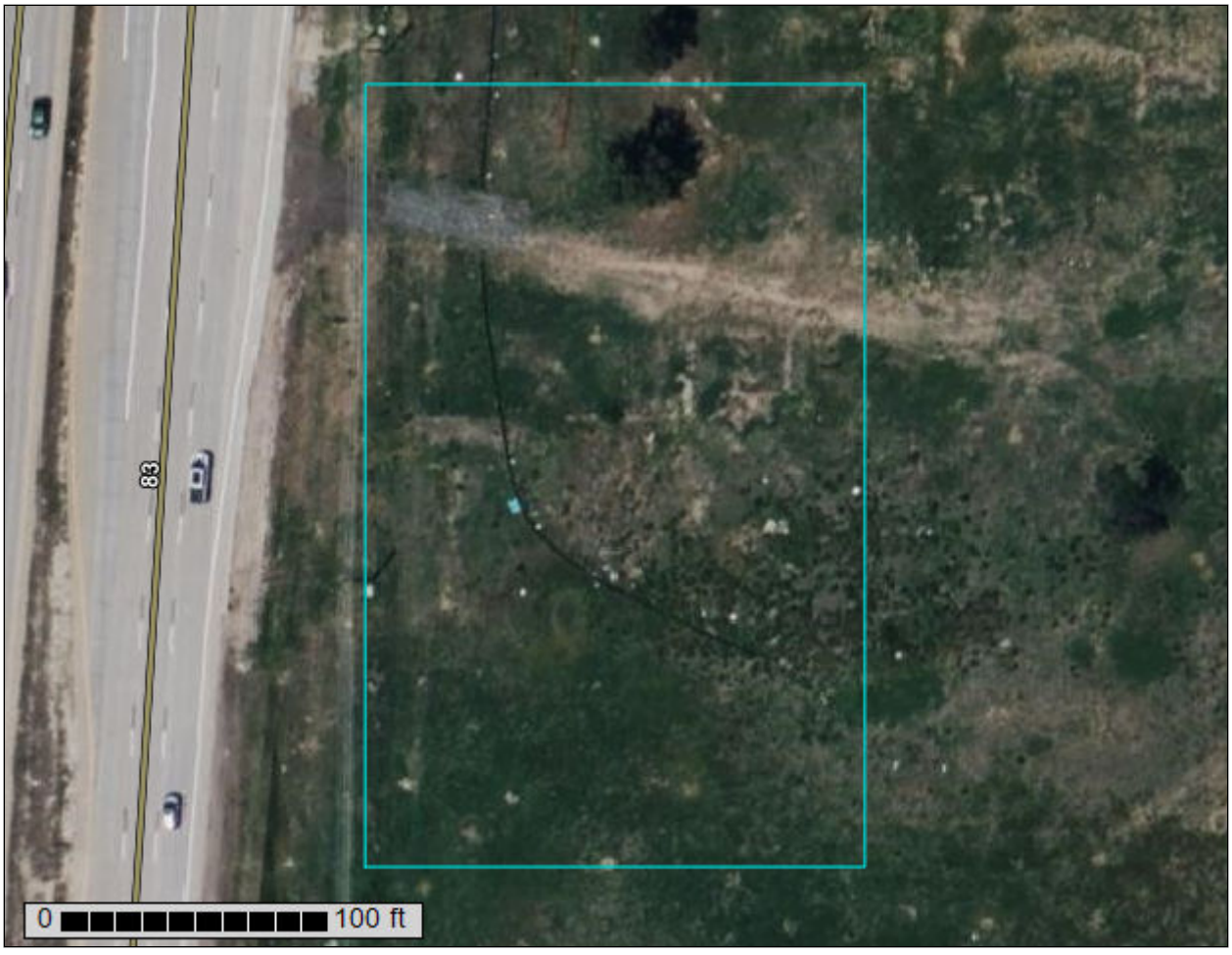
NRCS

Natural Resources Conservation Service

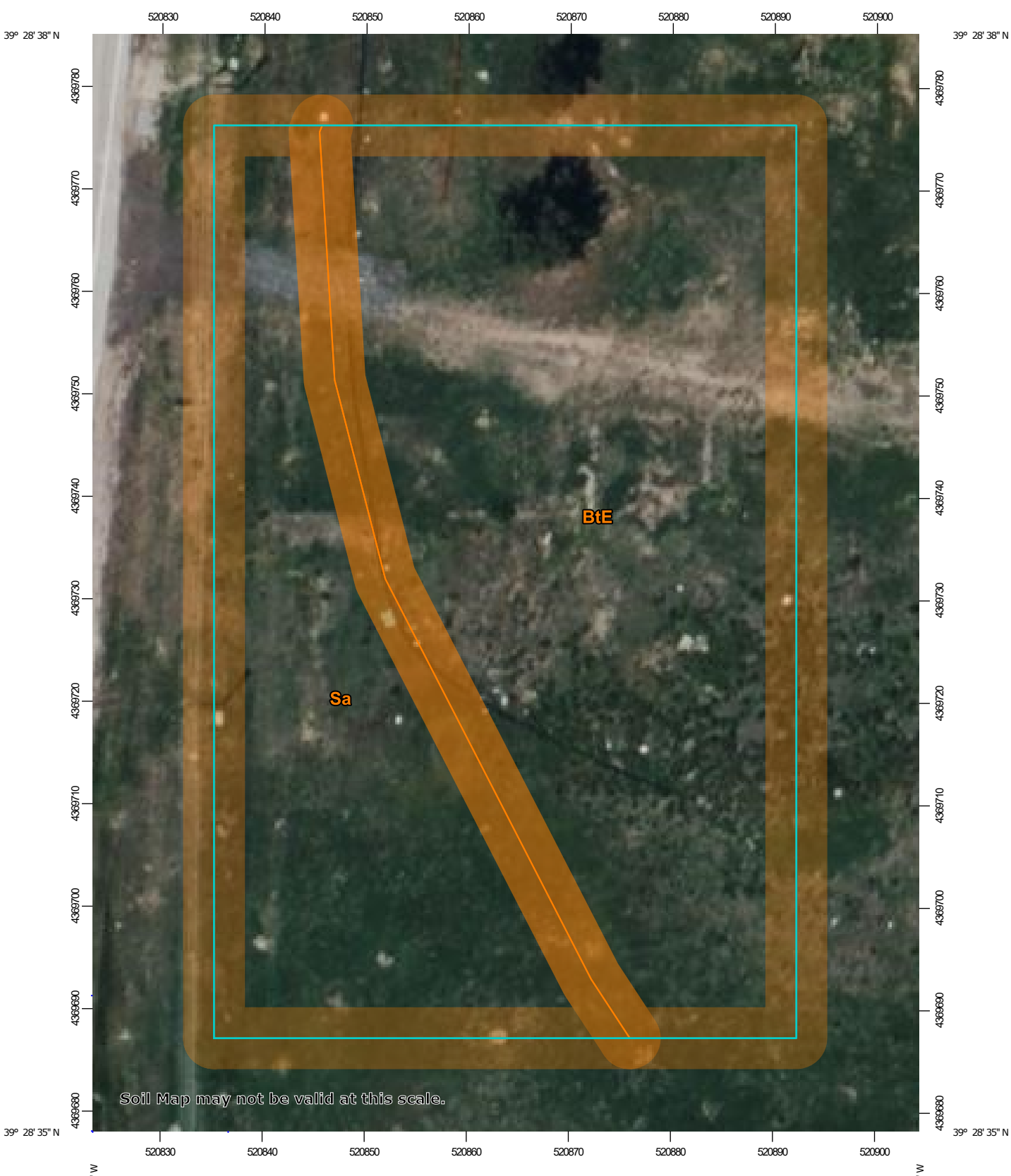
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Castle Rock Area, Colorado

Mister Car Wash - Parker Pointe



January 15, 2024



Map Scale: 1:522 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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 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: Castle Rock Area, Colorado
Survey Area Data: Version 16, 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: Jun 9, 2021—Jun 12, 2021

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
BtE	Bresser-Truckton sandy loams, 5 to 25 percent slopes	0.8	64.1%
Sa	Sampson loam	0.5	35.9%
Totals for Area of Interest		**1.3**	**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.

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.

Castle Rock Area, Colorado

BtE—Bresser-Truckton sandy loams, 5 to 25 percent slopes

Map Unit Setting

National map unit symbol: jqy9
Elevation: 5,500 to 6,600 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 52 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Bresser and similar soils: 50 percent
Truckton and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bresser

Setting

Landform: Terraces
Landform position (three-dimensional): Riser, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: loamy sand

Properties and qualities

Slope: 5 to 15 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 to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Description of Truckton

Setting

Landform: Terraces
Landform position (three-dimensional): Riser, tread

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkosic sedimentary rock

Typical profile
H1 - 0 to 4 inches: sandy loam
H2 - 4 to 19 inches: sandy loam
H3 - 19 to 60 inches: sandy loam

Properties and qualities
Slope: 10 to 25 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): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

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

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

Stapleton
Percent of map unit: 4 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Sa—Sampson loam

Map Unit Setting
National map unit symbol: jr02

Elevation: 5,500 to 6,600 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sampson and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sampson

Setting

Landform: Stream terraces on drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Weathered alluvium derived from arkose

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 28 inches: clay loam
H3 - 28 to 38 inches: loam
H4 - 38 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 4 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 to high (0.60 to 2.00 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: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Ecological site: R049XC202CO - Loamy Foothill 14-19 PZ
Hydric soil rating: No

Minor Components

Englewood

Percent of map unit: 8 percent
Hydric soil rating: No

Bresser

Percent of map unit: 7 percent
Hydric soil rating: No

Loamy alluvial land

Percent of map unit: 4 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

References

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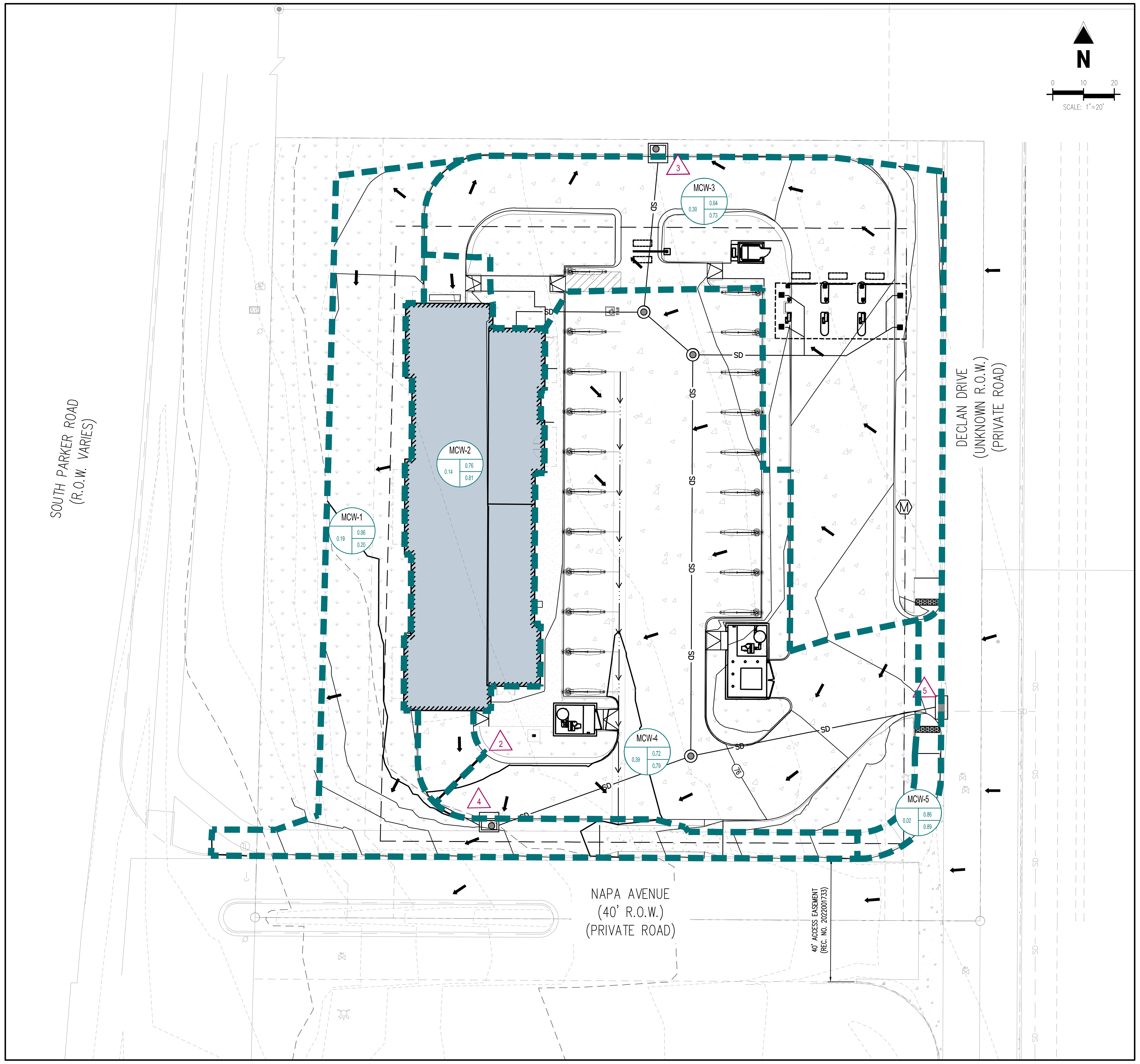
Appendix D: Proposed Drainage Map

MISTER CARWASH

13225 SOUTH PARKER ROAD
PARKER, CO 80134
LOCATED IN THE NORTHEAST QUARTER OF SECTION 3, TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE 6TH P.M.
TOWN OF PARKER, DOUGLAS COUNTY, STATE OF COLORADO

SITE CONSTRUCTION PLANS



SITE LEGEND

- ZONE LOT BOUNDARY
- ADJACENT PROPERTY BOUNDARY LINE
- EASEMENT LINE
- PROPOSED CURB AND GUTTER
- EXISTING CURB AND GUTTER
- EXISTING SIGN
- PROPOSED SIGN
- PROPOSED ADA PARKING SYMBOL
- PROPOSED TRANSFORMER
- EXISTING LIGHT POLE
- PROPOSED SITE LIGHTING
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER MANHOLE
- PROPOSED STORM SEWER MANHOLE
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- PROPOSED WATER METER
- PROPOSED STORM INLET
- EXISTING ELECTRIC BOX
- CAR VACUUM EQUIPMENT
- PROPOSED CONCRETE PAVEMENT PER GEOTECH
- PROPOSED CONCRETE SIDEWALK PER GEOTECH
- PROPOSED LANDSCAPING PER LANDSCAPE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- SLOPE DIRECTION LABEL
- DRAINAGE BASIN BOUNDARY
- BASIN DESIGNATION
- 100-YEAR C COEFFICIENT
- 5-YEAR C COEFFICIENT
- BASIN AREA IN ACRES
- DESIGN POINT

DRAINAGE BASIN SUMMARY TABLE

TRIBUTARY SUB-BASIN	AREA (ACRES)	C_5	C_{100}	T_C (MIN)	Q_5	Q_{100}
MCW-1	0.19	0.06	0.20	11.19	0.04	0.27
MCW-2	0.14	0.76	0.81	7.09	0.47	0.96
MCW-3	0.30	0.64	0.73	9.45	0.73	1.58
MCW-4	0.39	0.72	0.79	7.92	1.15	2.38
MCW-5	0.02	0.86	0.89	5.00	0.05	0.09

THE TOWN OF PARKER REVIEW CONSTITUTES GENERAL COMPLIANCE WITH THE TOWN'S STANDARDS AND APPROVED VARIANCES, SUBJECT TO THESE PLANS BEING STAMPED, SIGNED, AND DATED BY THE PROFESSIONAL ENGINEER OF RECORD. REVIEW BY THE TOWN DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY AND CORRECTNESS OF ENGINEERING CALCULATIONS. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.

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TOWN OF PARKER, DIRECTOR OF ENGINEERING   DATE

Galloway
5500 Greenwood Plaza Blvd., Suite 200
Greenwood Village, CO 80111
303.770.8884
GallowayUS.com

NOT FOR CONSTRUCTION

MISTER CAR WASH
13225 SOUTH PARKER ROAD
PARKER, CO 80134

SITE PLAN SUBMITTAL

#	Date	Issue / Description	Init.

Project No:	TEC000004.20
Drawn By:	KML
Checked By:	MRK
Date:	07/10/24

DRAINAGE MAP

DR-1

Appendix E: Excerpts from “Final Drainage Report – Parker Pointe”

Perception Design Group, Inc.
6901 South Pierce Street, Suite 315
Littleton, Colorado 80128
(303) 232-8088 Fax (303) 232-5255

Designed by: JWD
Checked by: JWD
Date: 18-Sep-17
Job Number: 2015-015

Project: Parker Pointe

COMPOSITE RUNOFF COEFFICIENTS

TYPE B SOILS

	FUTURE COMMERCIAL		DRIVES/WALKS/ROOF		LANDSCAPING				
Catchment	Area (Ac.)	C	Area (Ac.)	C	Area (Ac.)	C	Composite C	Catchment Area (Ac.)	Imperviousness
	Imperviousness = 95%		Imperviousness = 100%		Imperviousness = 2%				
L12 (5 YR)	0.56	0.81	0.00	0.90	0.00	0.09	**0.81**	0.56	95.0%
L12 (100 YR)	0.56	0.88	0.00	0.96	0.00	0.36	**0.88**	0.56	
L13 (5 YR)	0.73	0.81	0.00	0.90	0.00	0.09	**0.81**	0.73	95.0%
L13 (100 YR)	0.73	0.88	0.00	0.96	0.00	0.36	**0.88**	0.73	
L14 (5 YR)	0.73	0.81	0.00	0.90	0.00	0.09	**0.81**	0.73	95.0%
L14 (100 YR)	0.73	0.88	0.00	0.96	0.00	0.36	**0.88**	0.73	
L15 (5 YR)	0.72	0.81	0.00	0.90	0.00	0.09	**0.81**	0.72	95.0%
L15 (100 YR)	0.72	0.88	0.00	0.96	0.00	0.36	**0.88**	0.72	
IN1 (5 YR)	0.00	0.81	0.26	0.90	0.00	0.09	**0.90**	0.26	100.0%
IN1 (100 YR)	0.00	0.88	0.26	0.96	0.00	0.36	**0.96**	0.26	
IN2 (5 YR)	0.00	0.81	0.53	0.90	0.00	0.09	**0.90**	0.53	100.0%
IN2 (100 YR)	0.00	0.88	0.53	0.96	0.00	0.36	**0.96**	0.53	
IN3 (5 YR)	0.00	0.81	0.11	0.90	0.00	0.09	**0.90**	0.11	100.0%
IN3 (100 YR)	0.00	0.88	0.11	0.96	0.00	0.36	**0.96**	0.11	
OS1 (5 YR)	0.00	0.81	1.21	0.90	22.13	0.09	**0.13**	23.34	7.1%
OS1 (100 YR)	0.00	0.88	1.21	0.96	22.13	0.36	**0.39**	23.34	
SR1 (5 YR)	0.00	0.81	0.40	0.90	3.35	0.09	**0.18**	3.75	12.5%

Perception Design Group, Inc.
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(303) 232-8088 Fax (303) 232-5255

Designed by: JWD
Checked by: JWD
Date: 18-Sep-17
Job Number: 2015-015

Project: Parker Pointe

RUNOFF CALCULATIONS

(RATIONAL METHOD)

Design Storm: 5-Yr.

		Direct Runoff						
	Design	Basin	Area	Runoff	CA	Tc	I	Q
	Point	Desig.	(Acres)	Coefficient		(min)	(in/hr)	(cfs)
		H1	10.52	0.09	0.95	26.0	2.30	2.18
		L1	0.71	0.81	0.58	5.0	4.70	2.70
		L2	0.50	0.81	0.41	5.0	4.70	1.90
		L2A	0.19	0.81	0.15	5.0	4.70	0.72
		L3	0.43	0.81	0.35	5.0	4.70	1.64
		L3A	0.16	0.81	0.13	5.0	4.70	0.61
		L4	0.63	0.81	0.51	5.0	4.70	2.40
		L4A	0.24	0.81	0.19	5.0	4.70	0.91
		L5	0.63	0.81	0.51	5.0	4.70	2.40
		L5A	0.24	0.81	0.19	5.0	4.70	0.91
		L6	0.78	0.81	0.63	5.0	4.70	2.97
		L7	0.68	0.81	0.55	5.0	4.70	2.59
		L8	0.87	0.81	0.70	5.0	4.70	3.31
		L9	0.71	0.81	0.58	5.0	4.70	2.70
		L10	0.88	0.81	0.71	5.0	4.70	3.35
		L11A	0.50	0.81	0.41	5.0	4.70	1.90
		L11B	0.42	0.81	0.34	5.0	4.70	1.60
		L12	0.56	0.81	0.45	5.0	4.70	2.13
		L13	0.73	0.81	0.59	5.0	4.70	2.78
		L14	0.73	0.81	0.59	5.0	4.70	2.78
		L15	0.72	0.81	0.58	5.0	4.70	2.74
		IN1	0.26	0.90	0.23	5.0	4.70	1.10
		IN2	0.53	0.90	0.48	5.0	4.70	2.24
		IN3	0.11	0.9	0.10	5.0	4.70	0.47
		SR1	3.75	0.18	0.68	22.4	2.60	1.76
		SR2	0.32	0.87	0.28	5.0	4.70	1.31
		PR1	0.42	0.77	0.32	5.0	4.70	1.52
		PR2	0.91	0.96	0.87	5.0	4.70	4.11
		U1	1.37	0.09	0.12	5.0	4.70	0.58
		U2	0.3	0.74	0.22	5.0	4.70	1.04
		U3	0.17	0.09	0.02	5.0	4.70	0.07
		U4	0.23	0.58	0.13	5.0	4.70	0.63
		OS1	23.34	0.13	3.03	25.5	2.50	7.59

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Designed by: JWD
Checked by: JWD
Date: 18-Sep-17
Job Number: 2015-015

Project: Parker Pointe

RUNOFF CALCULATIONS

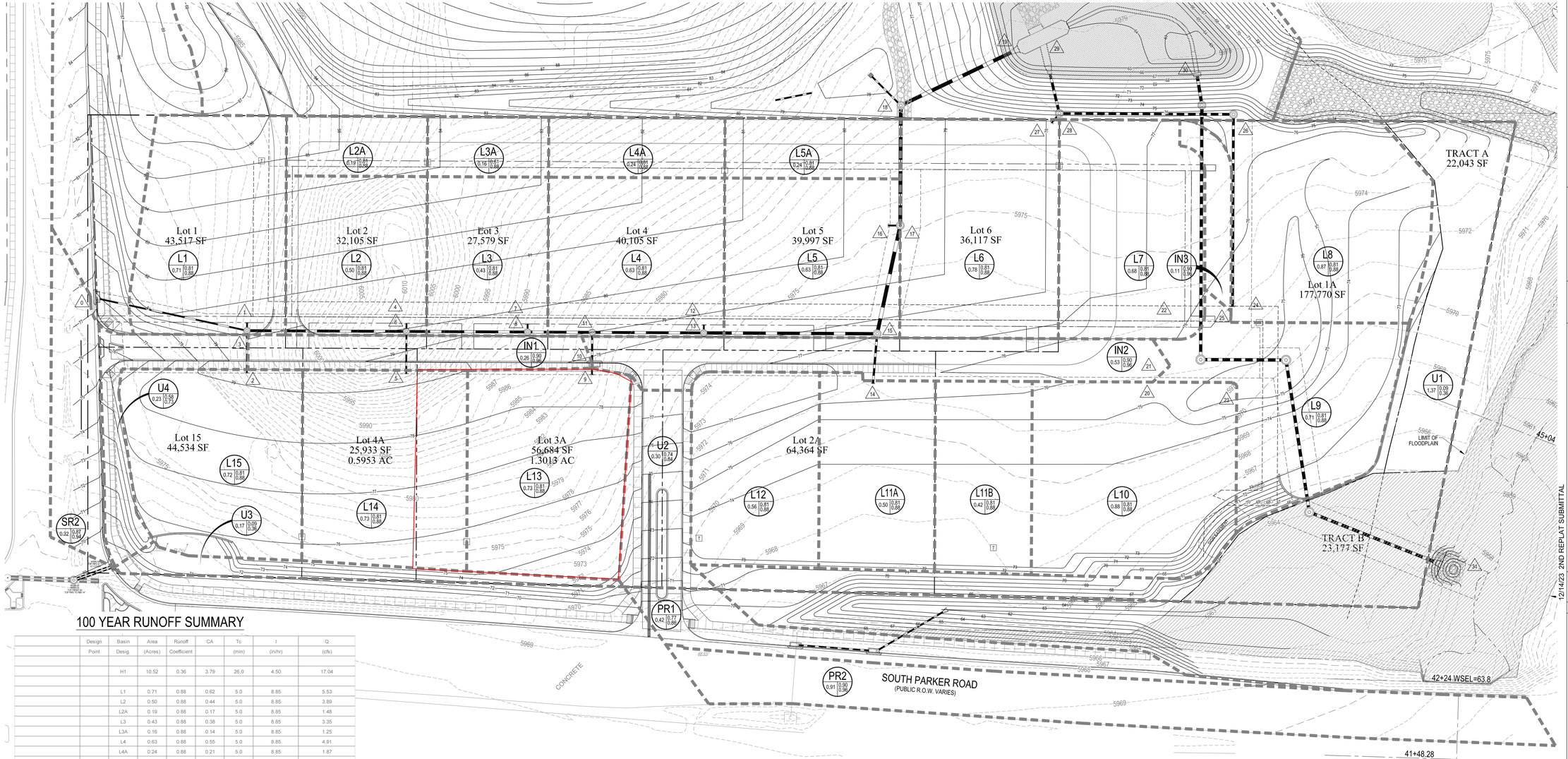
(RATIONAL METHOD)

Design Storm: 100-Yr.

		Direct Runoff						
	Design	Basin	Area	Runoff	CA	Tc	I	Q
	Point	Desig.	(Acres)	Coefficient		(min)	(in/hr)	(cfs)
		H1	10.52	0.36	3.79	26.0	4.50	17.04
		L1	0.71	0.88	0.62	5.0	8.85	5.53
		L2	0.50	0.88	0.44	5.0	8.85	3.89
		L2A	0.19	0.88	0.17	5.0	8.85	1.48
		L3	0.43	0.88	0.38	5.0	8.85	3.35
		L3A	0.16	0.88	0.14	5.0	8.85	1.25
		L4	0.63	0.88	0.55	5.0	8.85	4.91
		L4A	0.24	0.88	0.21	5.0	8.85	1.87
		L5	0.63	0.88	0.55	5.0	8.85	4.91
		L5A	0.24	0.88	0.21	5.0	8.85	1.87
		L6	0.78	0.88	0.69	5.0	8.85	6.07
		L7	0.68	0.88	0.60	5.0	8.85	5.30
		L8	0.87	0.88	0.77	5.0	8.85	6.78
		L9	0.71	0.88	0.62	5.0	8.85	5.53
		L10	0.88	0.88	0.77	5.0	8.85	6.85
		L11A	0.50	0.88	0.44	5.0	8.85	3.89
		L11B	0.42	0.88	0.37	5.0	8.85	3.27
		L12	0.56	0.88	0.49	5.0	8.85	4.36
		L13	0.73	0.88	0.64	5.0	8.85	5.69
		L14	0.73	0.88	0.64	5.0	8.85	5.69
		L15	0.72	0.88	0.63	5.0	8.85	5.61
		IN1	0.26	0.96	0.25	5.0	8.85	2.21
		IN2	0.53	0.96	0.51	5.0	8.85	4.50
		IN3	0.11	0.96	0.11	5.0	8.85	0.93
		SR1	3.75	0.42	1.58	22.4	4.90	7.72
TOTAL FLOW TO FOREBAY								103.45
		OS1	23.34	0.39	9.10	25.5	4.50	40.96
TOTAL TO POND			39.30					144.41
		U1	1.37	0.36	0.49	25.5	4.50	2.22
		U2	0.3	0.84	0.25	25.5	4.50	1.13
		U3	0.17	0.36	0.06	25.5	4.50	0.28
		U4	0.23	0.73	0.17	25.5	4.50	0.76
UN-CAPTURED SITE RUNOFF								4.38
		SR2	0.32	0.94	0.30	5.0	8.85	2.66
		PR1	0.42	0.86	0.36	5.0	8.85	3.20
		PR2	0.91	0.96	0.87	5.0	8.85	7.73

SEE SHEET DP3

STROH ROAD



100 YEAR RUNOFF SUMMARY

Design Point	Basin Desig.	Area (Acres)	Runoff Coefficient	CA	Tc (min)	I (in/hr)	Q (cfs)
	H1	10.52	0.36	3.79	26.0	4.50	17.04
	L1	0.71	0.88	0.62	5.0	8.85	5.53
	L2	0.50	0.88	0.44	5.0	8.85	3.89
	L2A	0.19	0.88	0.17	5.0	8.85	1.48
	L3	0.43	0.88	0.38	5.0	8.85	3.35
	L3A	0.16	0.88	0.14	5.0	8.85	1.25
	L4	0.63	0.88	0.55	5.0	8.85	4.91
	L4A	0.24	0.88	0.21	5.0	8.85	1.87
	L5	0.63	0.88	0.55	5.0	8.85	4.91
	L5A	0.24	0.88	0.21	5.0	8.85	1.87
	L6	0.78	0.88	0.69	5.0	8.85	6.07
	L7	0.68	0.88	0.60	5.0	8.85	5.30
	L8	0.87	0.88	0.77	5.0	8.85	6.78
	L9	0.71	0.88	0.62	5.0	8.85	5.53
	L10	0.88	0.88	0.77	5.0	8.85	6.85
	L11A	0.50	0.88	0.44	5.0	8.85	3.89
	L11B	0.42	0.88	0.37	5.0	8.85	3.27
	L12	0.56	0.88	0.49	5.0	8.85	4.36
	L13	0.73	0.88	0.64	5.0	8.85	5.69
	L14	0.73	0.88	0.64	5.0	8.85	5.69
	L15	0.72	0.88	0.63	5.0	8.85	5.61
	IN1	0.26	0.96	0.25	5.0	8.85	2.21
	IN2	0.53	0.96	0.51	5.0	8.85	4.50
	IN3	0.11	0.96	0.11	5.0	8.85	0.93
	SR1	3.75	0.42	1.58	22.4	4.90	7.72
TOTAL FLOW TO FOREBAY							103.45
	OS1	23.34	0.39	9.10	25.5	4.50	40.96
TOTAL TO POND		39.30					144.41
	U1	1.37	0.36	0.49	25.5	4.50	2.22
	U2	0.3	0.84	0.25	25.5	4.50	1.13
	U3	0.17	0.36	0.06	25.5	4.50	0.28
	U4	0.23	0.73	0.17	25.5	4.50	0.76
UN-CAPTURED SITE RUNOFF							4.38
	SR2	0.32	0.94	0.30	5.0	8.85	2.66
	PR1	0.42	0.86	0.36	5.0	8.85	3.20
	PR2	0.91	0.96	0.87	5.0	8.85	7.73

DETENTION SUMMARY

ZONE	VOLUME	ELEVATION	RELEASE RATE
WQCV	0.566 AC-FT		41 HOURS
EURV+WQCV	1.472 AC-FT	5968.03	70 HOURS
100 YEAR	2.753 AC-FT	5970.05	36.7 CFS

LEGEND

- 5340 — EXISTING CONTOUR
- 42 — PROPOSED CONTOUR
- R1 / 0.20 / 0.75 / 0.83 — BASIN DESIGNATION; 5 YR RUNOFF COEFFICIENT; 100 YR RUNOFF COEFFICIENT; BASIN AREA
- BASIN BOUNDARY LINE
- 1 — DESIGN POINT

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

BENCHMARK

BENCHMARK: DOUGLAS COUNTY SURVEY CONTROL MONUMENT TT15A – 3" DIAMETER DOUGLAS COUNTY GIS ALUMINUM CAP AT THE NE CORNER OF STROH ROAD AND SOUTH PARKER ROAD (US HIGHWAY 83)
ELEVATION: 5970.79 FEET (NAVD 1988 DATUM)

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TOWN OF PARKER, DIRECTOR OF ENGINEERING — DATE

PERCEPTION
DESIGN GROUP, INC.
6901 SOUTH PIERCE STREET, SUITE 315 . LITTLETON, CO 80128 . 303-232-8868
WWW.PERCEPTIONDESIGNGROUP.COM

PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

DATE	DESCRIPTION
12/14/23	2ND REPLAT SUBMITTAL
06/01/23	SECOND CDOT NTP SUBMITTAL
04/21/23	CDOT NTP SUBMITTAL / RE-PLAT SUBMITTAL
04/15/22	RESUBMITTAL
11/01/18	SIXTH SUBMITTAL
08/31/18	FOURTH SUBMITTAL
05/25/18	THIRD SUBMITTAL
10/24/17	INITIAL SUBMITTAL

REVISIONS

DRAINAGE PLAN WEST

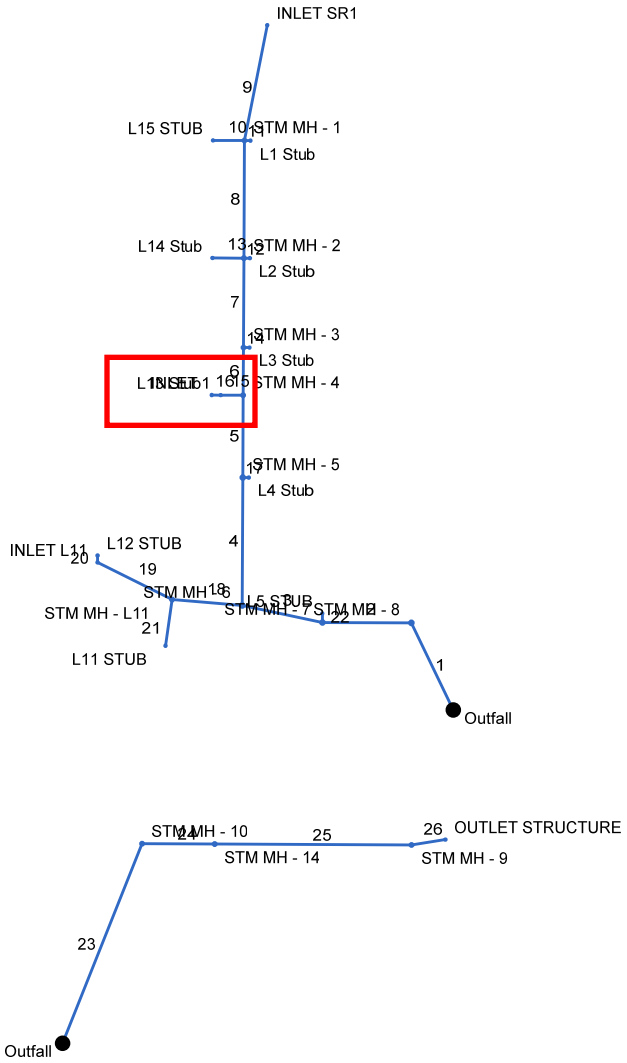
PARKER POINTE
LOTS 1 THRU 15 AND TRACTS A AND B, PARKER POINTE FILING NO. 1
SOUTHEAST CORNER PARKER ROAD AND STROH ROAD
PARKER, COLORADO

design by: JWD
approved by: JWD
project no.: 2015-015

date: 10/01/17

SHEET
DP2

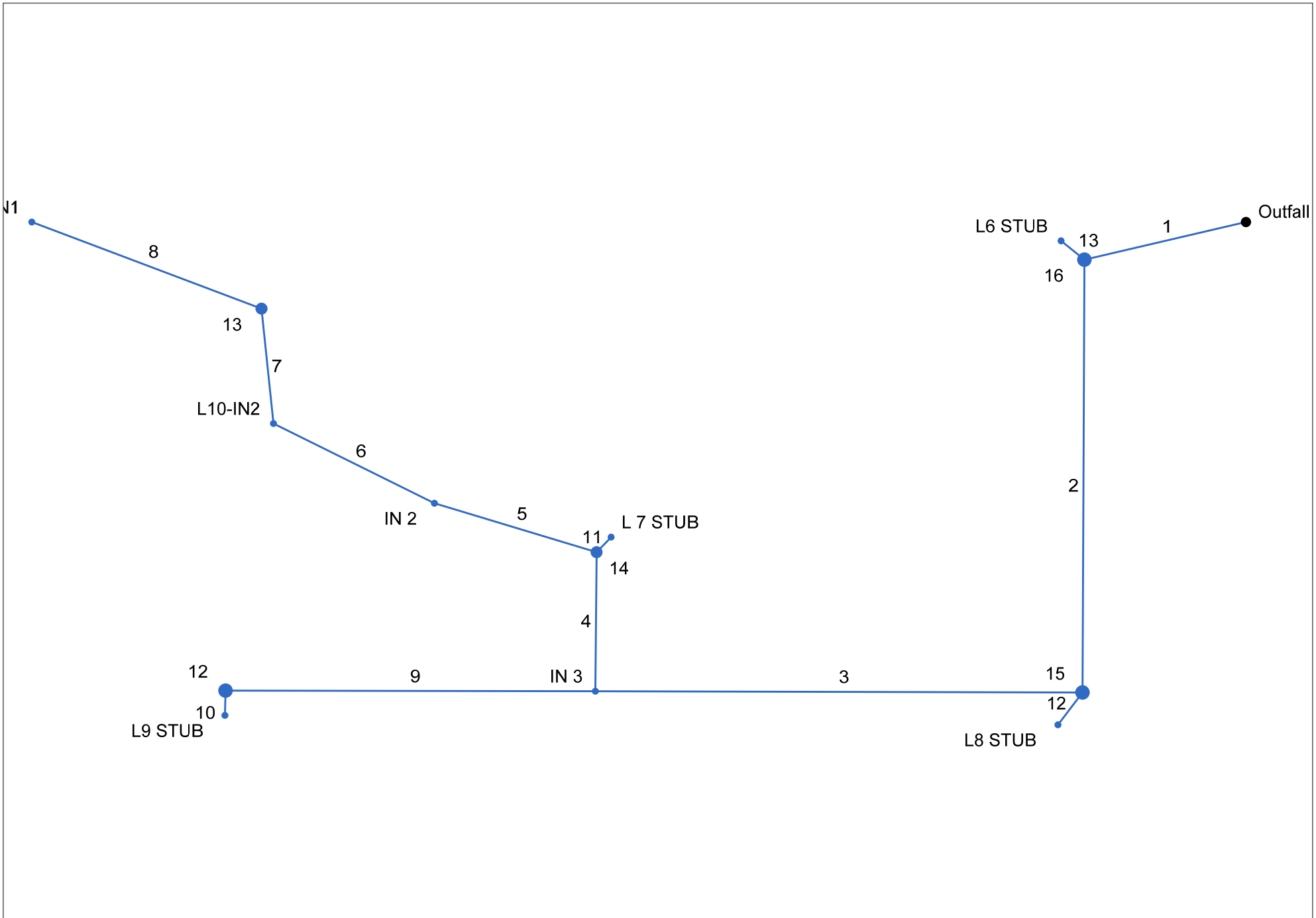
Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Storm Line A 100 yr.stm	Number of lines: 26	Date: 3/1/2018

Line No.	Line Size	Flow Rate	Vel Ave	Depth Up	Depth Dn	HGL Up	HGL Dn	Line ID
	(in)	(cfs)	(ft/s)	(ft)	(ft)	(ft)	(ft)	
1	42	61.03	8.31	2.49	2.50	5967.48	5966.84	P-22
2	42	61.03	6.74	2.99	3.28	5968.77	5968.47	P-21
3	42	56.12	5.91	3.29	3.50	5969.82	5969.53	P-19
4	42	44.60	4.83	3.04	3.50	5970.63	5970.36	P-14
5	42	39.69	5.72	1.96**	3.23	5970.30	5971.02	P-12
6	36	31.79	7.11	1.83**	1.80	5970.99	5970.64	P-9
7	30	28.44	6.73	2.01	2.01	5972.27	5971.67	P-7
8	30	18.86	4.18	1.98	2.50	5973.23	5972.97	P-4
9	21	7.72	4.34	1.03**	1.55	5974.21 j	5973.55	P-1
10	18	5.61	3.17	1.50	1.50	5973.67	5973.55	P-2
11	18	5.53	3.13	1.50	1.50	5973.57	5973.55	P-3
12	18	3.89	2.20	1.50	1.50	5972.98	5972.97	P-6
13	18	5.69	3.22	1.50	1.50	5973.10	5972.97	P-5
14	18	3.35	3.40	0.70**	1.02	5970.83	5970.99	P-8
15	18	7.90	4.73	1.35	1.35	5970.64	5970.49	P-11
16	18	5.69	3.82	1.16	1.20	5970.71	5970.69	P-10
17	18	4.91	2.78	1.50	1.50	5971.04	5971.02	P-13
18	24	11.52	3.67	2.00	2.00	5970.61	5970.36	P-18
19	18	4.36	2.47	1.50	1.50	5971.01	5970.82	P-16
20	18	4.36	2.47	1.50	1.50	5971.11	5971.09	P-15
21	18	7.16	4.05	1.50	1.50	5971.11	5970.82	P-17
22	18	4.91	2.78	1.50	1.50	5969.55	5969.53	P-20
23	36	36.00	7.34	1.98	1.95	5961.42	5959.95	STM PIPE - 37
24	36	36.00	6.00	2.23	2.55	5962.36	5962.19	STM PIPE - 38
25	36	36.00	7.06	1.95**	2.13	5963.59 j	5962.45	STM PIPE - 39
26	36	36.00	6.66	2.14	2.15	5964.17	5963.99	STM PIPE - 40

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: Storm 2 100 yr.stm	Number of lines: 13	Date: 3/1/2018

Line No.	Line Size	Flow Rate	Vel Ave	Depth Up	Depth Dn	HGL Up	HGL Dn	Line ID
	(in)	(cfs)	(ft/s)	(ft)	(ft)	(ft)	(ft)	
1	36	35.96	7.35	1.96	1.96	5966.63	5966.30	Pipe - (6)
2	36	29.89	5.75	1.77**	2.58	5967.50	5967.45	Pipe - (5)
3	36	23.11	6.23	1.55**	1.57	5968.44	5967.50	Pipe - (4)
4	24	16.65	5.78	1.72	1.72	5969.89	5969.62	Pipe - (10)
5	24	11.35	3.69	1.84	2.00	5970.54	5970.40	Pipe - (14)
6	18	6.85	4.18	1.26	1.38	5970.82	5970.58	Pipe - (15)
7	18	6.85	4.28	1.24	1.31	5971.23	5971.07	Pipe - (16)
8	18	6.85	4.40	1.17	1.31	5971.86	5971.50	Pipe - (17)
9	18	5.53	4.61	0.96	0.96	5970.09	5969.35	Pipe - (3)
10	18	5.53	4.05	1.07	1.10	5970.44	5970.42	Pipe - (9)
11	18	5.30	3.00	1.50	1.50	5970.42	5970.40	Pipe - (18)
12	18	6.78	5.85	1.01**	0.88	5968.40	5968.11	Pipe - (11)
13	18	6.07	4.46	0.95**	1.28	5967.36	5967.45	Pipe - (12)