

Butterfield Drainage Compliance Letter

Project location and description:

The project is located at 3952 Butterfield Crossing Dr., Castle Rock, CO, APN: 2351-294-01-074, within the Butterfield Crossing Park Recreation Facility. The project consists of a new non-habitable 225 SF building inside a 368 SF lease area, with a T-Mobile Antenna tower and Equipment Cabinet located approx. 100 LF to the SW, inside said park.

The site is an existing recreational park named Butterfield Crossing Park located at 3952 Butterfield Crossing Dr, Castle Rock, Douglas County, CO. The new cell equipment yard will attach to an existing park restroom and pool locker facility. The site is bounded on the north by Butterfield Crossing Dr, on the south by Meadows Blvd, on the west by residential lots and east by Meadow View Elementary School.

Butterfield Crossing Park includes a pool facility, turf play fields, tennis courts and hardscape areas. Per the Preliminary Phase III Drainage Report by JVA, Inc. Consulting Engineers, dated 8/06/2021, project no. 3433c, a detention pond located in the NW corner of the park site (Basin A4) detains the 100 yr runoff. Runoff from the new cell equipment yard and cell tower flows via sheet flow into the adjacent parking lot and access drive to the north. An existing catch basin (Design Point 5) is located at the East side of said access drive at the intersection of Butterfield Crossing Drive. Said catch basin (DP5) conveys storm runoff westerly via a 12" PVC storm drain pipe to detention pond Basin A4.

Detention Pond Capacity:

The new cell tower equipment yard facility will bring a very small additional 226 SF of impermeable surface to the park tuff areas. The delta for the Q100 storm runoff was calculated per the FFA Rational Method. The additional Q100 flow is: $Q_{100} = CIA = 0.95 * 2.20 \text{ cfs} * 0.00519 \text{ ac} = 0.011 \text{ cfs}$.

The additional runoff generated by the cell yard will increase the direct required flow at said catch basin inlet (DP-5) from 10.71 cfs to 10.72 cfs. Catch basin inlet DP-5 has sufficient capacity to handle the increased flow.

Basin Capacity:

Storm water runoff for the west side of the park including the new cell equipment yard are conveyed to the existing detention pond Basin A4. Extreme storm overflow runoff from Butterfield Crossing Park is conveyed via an existing storm drain system to the East Plum Creek Watershed and contribute to East Plum Creek. During the 100 year / 1 hour storm event, an additional 36 CF is generated by the proposed cell tower improvements. This volume will increase the high water elevation of Pond DP4 by: $36 \text{ CF} / 24,207 \text{ SF} = 0.00014'$ or a trivial elevation increase. The existing system has sufficient capacity to accept the additional runoff generated by the proposed cell tower improvements, therefore no additional stormwater retention facilities are proposed.

Drainage Route Map:

Exhibit 1 (attached) is a Drainage Route Map and shows the storm water runoff route from the new cell tower equipment yard facility to the existing public outlet connection.

Four-step water quality process:

Step 1: Reduce Runoff Volume to the Maximum Extent Practicable.

The new cell tower enclosure is designed to filter storm runoff from the cell yard through the existing turf located between said facility and the adjacent parking lot and access driveway before runoff arrival at said inlet catch basin DP-5. No direct connection is made between the cell equipment yard and the catch basin.

Step 2: Provide Water Quality Capture Volume and Flood Control Detention Via Full-Spectrum Detention.

The cell tower enclosure is disturbing 0.00519 acres within Butterfield Crossing Park. No additional driveways are being added. The difference in storm runoff between the pre and post construction has been shown to be trivial and no surface detention is included in this design.

Step 3: Utilize Stream Channel Stabilization Techniques.

The cell tower and restroom facility is disturbing 0.00519 acres within Butterfield Crossing Park. Additional slight grading is required to build the cell tower equipment yard facility but no slopes will be created or disturbed that require an erosion blanket to stabilize graded areas during construction. No stabilization BMPs are required.

Step 4: Undertake Source Control.

The cell tower equipment yard will enclose power and communications equipment. The potential for chemicals, oils, fertilizers, or other pollutants to enter the stormwater system is low.

Additional Notes:

I have reviewed data from the approved drainage report by JVA, Inc. Consulting Engineers, dated 8/06/2021. I concur with the data, analysis and conclusions for that referenced report. The Appendix attached to this letter references the data used in this analysis.

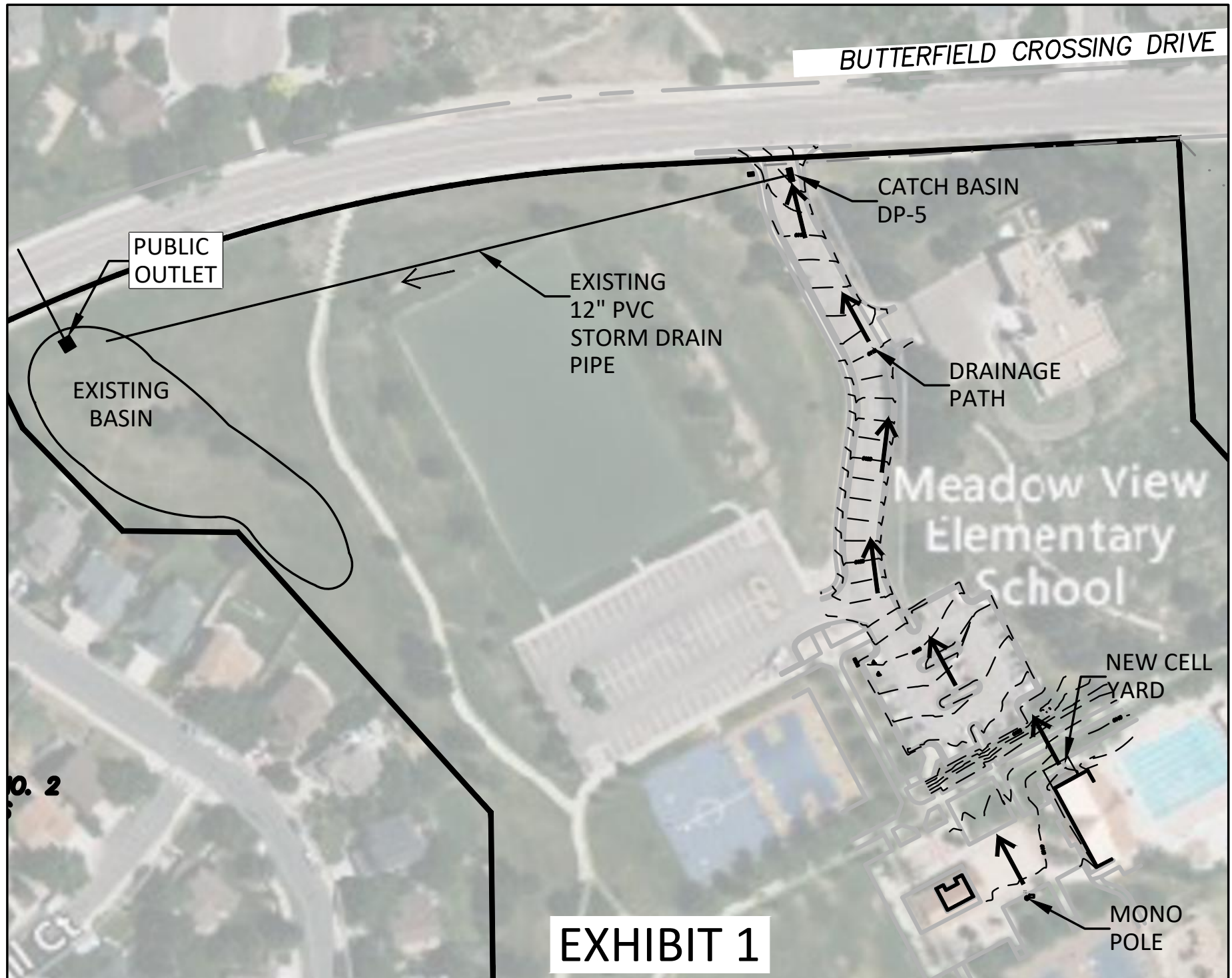
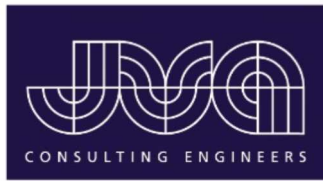


EXHIBIT 1



Preliminary Phase III Drainage Report

FOR

Butterfield Crossing Park

AT

3952 W BUTTERFIELD CROSSING DRIVE, CASTLE ROCK, COLORADO 80104

FOR

Town of Castle Rock Parks & Recreation

Town of Castle Rock Project Number: CD21-0024



August 6, 2021

Revised December 17, 2021

Table 3 below presents a detailed summary of developed peak flows.

Table 3: Developed Peak Flow

Basin	Design Point	Area (acre)	5-Year Flow* (cfs)	100-Year Flow* (cfs)
A1	1	2.51	0.79	7.98
A2	2	2.22	1.04	7.39
A3	3	2.43	4.21	10.79
A4	4	5.00	2.02	16.36
A5	5	2.64	3.35	10.71
A6	6	0.75	0.22	2.65
B1	7	1.75	1.27	6.46
B2	8	2.39	1.21	8.28
B3	9	1.35	1.16	4.93
B4	10	6.67	2.12	20.69
OS1	11	2.53	4.23	13.40

*Flows represent direct (unrouted) flows

IV. Drainage Design Criteria

A. Regulations

The proposed drainage facilities have been designed to comply with the 2019 Town of Castle Rock Storm Drainage Design and Technical Criterial Manual and the Mile High Flood District Urban Storm Drainage Criteria Manual (USDCM).

B. Drainage Studies, Master Plans, Site Constraints

The existing site was accounted for in two existing drainage studies. The first drainage study is the “Butterfield Crossing Park and Water Treatment Plant Drainage Study” prepared by Rocky Mountain Consultant Inc and dated February 1987. This drainage study analyzed the impacts of the proposed water treatment plant on the existing public storm sewer infrastructure system within Butterfield Crossing Drive.

The second drainage study is a drainage letter prepared by R&R Engineers and Surveyors. This letter, titled “Butterfield Park Drainage Letter” is dated August 18, 2005 was prepared in conjugation with the design of the site’s artificial turf field and western parking lot. Based on this drainage letter, it is anticipated that 2.65 cfs of runoff is directed to the existing detention facility at the northwest corner of the site during the 2-year storm event and 39.2 cfs is being directed to the detention facility during the major, 100-year storm event. A copy of the drainage letter is included at the end of this report in Appendix D.

SUMMARY TABLE
DEVELOPED RUNOFF

1. HISTORIC CONDITIONS MAP REPRESENTS THE EXISTING DEVELOPED CONDITION AT THE SITE PRIOR TO REDEVELOPMENT.
2. TYPE C/D SOILS DISTRIBUTED THROUGH SITE PER NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY.
3. DRAINAGE CALCULATIONS PERFORMED PER THE LATEST MILE HIGH FLOOD DISTRICT DRAINAGE MANUAL GUIDANCE.

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

DIRECTION OF FLOW (HISTORIC)

DEVELOPED DRAINAGE BASIN BOUNDARY (MAJOR BASIN)

DEVELOPED DRAINAGE BASIN BOUNDARY (SUB BASIN)

HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)

HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)

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PROPOSED INTERMEDIATE CONTROLS

PROPOSED INDEX CONTOUR

EXISTING INTERMEDIATE CONTROLS

DRAINAGE MAP LEGEND



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