MASTER DEVELOPMENT DRAINAGE PLAN FOR BROADMOOR VIEW AT SPRING CREEK WEST
SUBDIVISION FILINGS NO. 1 AND 2
And
FINAL DRAINAGE REPORT
For
BROADMOOR VIEW AT SRPING CREEK WEST FILING NO. 1 AND 2, A TRADITIONAL NEIGHBORHOOD

September 2016

Prepared for:
COLA, LLC
6240 Lake Shore Court
Colorado Springs, CO 80915

Prepared by:

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Colorado Springs, CO 80909
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Project #15-006

MASTER DEVELOPMENT DRAINAGE PLAN FOR BROADMOOR VIEW WEST SUBDIVISION FILINGS 1 AND 2
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FINAL DRAINAGE REPORT
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DRAINAGE PLAN STATEMENTS

ENGINEER'S STATEMENT

The attached drainage plan and report for Broadmoor View at Spring Creek West Filings No. 1 and 2 were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the City of Colorado Springs Drainage Design and Technical Criteria for the owners of said project. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others.

Kent D Rockwell, P.E.

Kent D. Rockwell, P.E.

COLORADO REGISTERED KENT D. ROCKWELL 25086 PROFESSIONAL ENGINEER 9/27/16

CERTIFICATION STATEMENT

COLA, LLC. hereby certifies that the drainage facilities for Broadmoor View at Spring Creek West Filings No. 1 and 2 shall be constructed according to the design presented in this report. I, as the developer, understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that the City of Colorado Springs reviews drainage plans pursuant to Colorado Revised Statutes, Title 30, Article 28; but cannot, on behalf of Broadmoor View at Spring Creek West Subdivision Filings No. 1 and 2, guarantee that final drainage design review will absolve COLA, LLC and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

COLA, LLC

BY: _____ 9-26-16
AUTHORIZED SIGNATURE — DATE
KEVIN HUNT

TITLE: MEMBER

ADDRESS:

CITY OF COLORADO SPRINGS

Filed in accordance with Section 7-7-906 of the code of the City of Colorado Springs, 2001, as amended.

_____ 10/12/16
CITY ENGINEER — DATE

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GENERAL LOCATION AND DESCRIPTION

Broadmoor View at Spring Creek West Subdivision Filings No. 1 and 2 are located northwest of the Hancock Expressway and Union Boulevard intersection in Colorado Springs, Colorado. The site lies within Section 28, Township 14 South, Range 66 West of the 6th P.M., El Paso County, Colorado (see Vicinity Map in appendix). These filings are located adjacent to existing Broadmoor View at Spring Creek Filings 1 and 2.

The site is bounded on the south and west by Hancock Expressway, on the east by Union Boulevard and on the north by State Highway 24. The site lies within the Spring Creek Drainage Basin. Filings 1 and 2 will be developed as single-family residential lots. Existing ground cover consists of native grasses and vegetation.

Broadmoor View at Spring Creek West Subdivision Filing No. 1 and 2 contains a total of 22.644 acres. Filing No. 1 contains approximately 8.786 acres. Filing 1 will be developed initially and Filing 2 will be developed subsequent to Filing No. 1. Filing NO. 2 will consist of 13.88 acres.

REFERENCES

1. Master Development Drainage Plan for Spring Creek Development Phase 2 and Final Drainage Report for Spring Creek Filing No. 4 which includes portions of Union Boulevard, Monterey Drive and Hancock Expressway", prepared by KLH Engineering Consultants, Inc. dated February, 1986.

2. Master Development Drainage Plan for Spring Creek Development," prepared by JR Engineering, dated March, 2002.

3. "Final Drainage Report for Broadmoor View at Spring Creek Filing No. 1 and 2 and Preliminary Drainage Report for Broadmoor View, prepared by WestWorks Engineering, dated October 29, 2007, revised October 26, 2009 and November 16, 2009.

4. "Spring Creek Drainage Basin Planning Study and Existing Structure Inventory, " prepared by URS Consultants, Inc., dated October, 1993.

SOILS

According to the US Department of Agriculture Soil Conservation Services Soil Survey of El Paso County, Broadmoor View at Spring Creek West Subdivision Filings No. 1 and 1 are underlain by the Nelson-Tassel Series (Soil 56) which is classified as a Hydrologic Group "B-D" soil. Hydrologic Group "D" was used for runoff calculation purposes. See Figure 2.

FLOOD PLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA), as depicted on Flood Insurance Rate Map (FIRM) 08041CO741 F (March 1997), no portion of this site lies within a designated Flood Plain. See map in Appendix.

DRAINAGE DESIGN CRITERIA

The current City of Colorado Springs and El Paso County Drainage Criteria was used in the preparation of this report. The Rational Method was used to determine the runoff quantities as required for basins containing less than 100 acres. Peak runoff was determined for both the 5 year and 100 year frequency storms.

HISTORIC DRAINAGE ANALYSIS

Proposed Broadmoor View at Spring Creek West Subdivision Filings No. 1 and 2 are defined by seven (7) Historic drainage basins. Exhibit 1 depicts the 7 historic drainage basins and historic direction of flow. Although a portion of the outfall tributary area has been developed, these historic basin reflect pre-development conditions to determine the allowed discharge rates from the proposed pond. This approach will result in a larger required detention pond.

Historic Basin A consists of 3.06 acres of existing residential development. As stated above, for the purpose of this drainage report, this area is analyzed from a "historic" standpoint as undeveloped to help size the proposed detention pond for this development. Runoff rates of 2.5 cubic feet per second (cfs) and 6.8 cfs are generated from this basin during the 5 and 100 year storms, respectively. These flows historically flowed northwesterly entering historic Basin F.

Historic Basin B consists of 3.32 acres of existing residential development. The historic flows from this basin are Q_5 = 2.6 cfs and Q_{100} = 7.0 cfs. These flows historically entered Basin C and reached Hancock Expressway as sheet flows.

Basin C consists of 3.79 acres along the northeast side of Hancock Expressway. The runoff rates of 3.9 cfs during the 5 year storm and 10.4 cfs during the 100 year storm generated from this basin sheet flow toward Hancock Expressway and continue northeasterly as street flows within Hancock Expressway. These flows eventually reach the low point of Hancock Expressway and discharge directly into Spring Ceek.

Basin D consists of 0.51 acres along the off-ramp from Highway 24. Runoff rates of 0.8 cfs and 2.1 cfs generated from this basin during the 5 and 100 year storms, respectively, enter the roadside ditch along the southern side of the Highway 24 off-ramp. The swale conveys these flows westerly to an existing area inlet along the south side of Highway 24.

Basin E comprises 9.88 acres located toward the northeast portion of the proposed Broadmoor View at Spring Creek West development. Runoff rates of 7.1 cfs during the 5 year storm and 18.9 cfs during the 100 year storm are generated from this basin. These runoff rates also flow toward the existing inlet along the south side of Highway 24.

Basin F comprises the central portion of the site and generates runoff rates of Q_5 = 7.7 cfs and Q_{100} = 20.5 cfs. These flows exit the western tip of the property and enter the CDOT right-of-way. These runoff rates are conveyed to Spring Creek within a broad swale, paralleling Hancock Expressway, but approximately 15' below the elevation of Hancock Expressway.

Basin G comprises approximately 2.24 acres of off-site area located along Union Boulevard. This off-site area is under separate ownership, but approximately 0.449 acres will be platted as part of the Braodmoor View at Spring Creek West Filing No. 1 final plat. This 0.449 acres comprises the east half of the shared roadway and landscape area that is centered on the common property line between the 2 properties. The 2.24 off-site Basin G generates runoff rates of 2.2 cfs during the 5 year storm and 6.0 cfs during the 100 year storm. These flows currently sheet flow into Basins D and E reaching the existing area inlet along the south side of Highway 24.

Based on conversations with CDOT, the total historic flow rates generated from Basins A to F and a portion of Basin G will be utilized as the allowed discharge flow rates for the proposed pond.

Total historic flow rates of 21.6 cfs during the 5 year storm and 57.8 cfs during the 100 year storm are generated from historic Basins A through F and the 0.449 acres of Basin G (Historic DP#1).

DEVELOPED DRAINAGE ANALYSIS

This portion of the report analyzes the developed runoff quantities and patterns for the site. The area has been depicted on the Developed Drainage Plan by nineteen (19) developed drainage basins. Following is a description of the basins and the proposed runoff patterns and drainage improvements.

Basin OS-1 consists of 1.83 acres of existing residential lots and a portion of an existing park within Broadmoor View at Spring Creek Filing No. 1 and No. 2. The runoff rates of 4.2 cfs and 8.7 cfs generated from this basin during the 5 and 100 year storms, respectively, flow northerly as street flows within Derbyshire Street reaching the intersection of Derbyshire Street and Abbington Street. These flows enter Basin OS-2 as street flows.

The 0.80 acre Basin 1 is located along the north side of Lambourne Street. Runoff rates of Q_5 = 2.7 cfs and Q_{100} = 5.6 cfs generated from this basin flow westerly within the proposed alley and enter Derbyshire as street flows. These flows once they reach Derbyshire Street also flow northerly and enter Basin OS-2 as street flow.

Basin 2A is located along the south side of Abbington Street, comprising 0.64 acres. Runoff rates of 2.1 cfs during the 5 year storm and 4.4 cfs during the 100 year storm generated from this basin flow westerly within Abbington Street to Basin OS-2.

Total runoff rates of 8.1 cfs during the 5 year storm and 16.6 cfs during the 100 year storm enter Basin OS-2 from Basins 1, 2A, and OS-1 as street flows reaching Design Point #1A.

Basin OS-2 consists of an additional 0.74 acres of existing residential lots. Runoff rates of 2.6 cfs and 5.2 cfs generated from this basin combine with the flows generated from Basin 1, 2 and OS-1, resulting in total street flows of 9.8 cfs and 20.1 cfs reaching the west end of Basin OS-2 as street flows during the 5 and 100 year storms, respectively, at Design Point #1B.

A proposed 10' on-grade inlet will be constructed at the west end of Basin OS-2 to collect a portion of these flows. This 10' on-grade inlet will collect flow rates of Q_5 = 4.6 cfs and Q_{100} = 6.9 cfs. The flow rates of Q_5 = 5.2 cfs and Q_{100} = 13.2 cfs bypassing this inlet will enter Basin 2B as street flows. An 18" reinforced concrete pipe (RCP) will convey the collected flows from this inlet southwesterly.

Basin 2B consists of 0.48 acres along the northwest side of Abbington Street. The runoff rates of Q_5 = 1.7 cfs and Q_{100} = 3.4 cfs generated from this basin flow southwesterly as street flow. The flows bypassing the inlet within Basin OS-2 combine with these flows and turn north onto Grand Overlook Drive from Abbington Street.

The existing lots and streets located just south of this intersection comprises Basin OS-3. This 2.21 acre basin generates runoff rates of 5.6 cfs abd 11.5 cfs during the 5 and 100 year storms, respectively. These flows combine with the flows from Basin 2B and the bypass flows from Inlet OS-2 and flow northerly within the east side of Grand Overlook Drive. Total flow rates of 12.5 cfs and 28.1 cfs reach a proposed 10' on-grade inlet just north of the Grand Overlook and Abbington Street intersection. This inlet will collect runoff rates of 3.9 cfs and 6.1 cfs during the 5 and 100 year storms, respectively. The flow rates of Q_5 = 8.6 cfs and Q_{100} = 22.0 cfs bypassing this inlet will enter Basin 11 as street flows.

Total runoff rates of Q_5 = 16.2 cfs and Q_{100} =32.0 cfs reach Design Point #1C. Approximately 7.6 cfs during the 5 year storm and 10.0 cfs during the 100 year storm are piped and flow rates of Q_5 = 8.6 cfs and Q_{100} = 22.0 cfs are being conveyed as street flows.

Basin 3 is located along the east side of Grand Overlook Drive. This 0.57 acre basin generates runoff rates of 1.8 cfs during the 5 year storm and 3.6 cfs during the 100 year storm. These flows continue northerly as street flow along the east side of Grand Overlook Drive.

The off-site commercial parcel - Basin OS-5 - located east of Basin 3 generates runoff rates of 9.2 cfs and 18.5 cfs during the 5 and 100 year storms, respectively. These flows enter Basin 3 as sheet flows and also flow northerly within Grand Overlook Drive. Total flow rates of Q_5 = 11.0 cfs and Q_{100} = 22.1 cfs reach the north end of Basin 3 where a proposed 10' on-grade inlet will be installed to collect a portion of these flows. An 18" RCP stub out is being provided into the adjacent parcel.

This inlet will collect runoff rates of 3.9 cfs during the 5 year storm and 5.8 cfs during the 100 year storm. Flow rates of Q_5 = 7.1 cfs and Q_{100} = 16.3 cfs will bypass this inlet and enter Basin 8 as street flows. An 18" RCP will convey these collected flows westerly.

Basin 4 is located along the west side of Grand Overlook Drive and comprises 0.87 acres. Runoff rates of 3.0 cfs during the 5 year storm and 6.0 cfs during the 100 year storm generated from this basin flow northerly within the west side of Grand Overlook Drive. These flows then turn westerly toward the Grand Overlook Street and Little Overlook Street intersection and enter Basin 6B.

The proposed lots along the east side of Little Overlook Street comprise Basin 5. Runoff rates of Q_5 = 5.1 cfs and Q_{100} = 10.4 cfs generated from this basin flow northerly as street flow to a proposed 10' on-grade inlet. This inlet collects 2.7 cfs during the 5 year storm and 4.0 cfs during the 100 year storm. The bypass flows of Q_5 = 2.4 cfs and Q_{100} = 6.4 cfs will continue on as street flows entering Basin 6B.

Approximately 0.58 acres along the west side of Little Overlook Street comprises Basin 6A. The runoff rates of 2.1 cfs and 4.2 cfs generated from this basin during the 5 and 100 year storms, respectively, flow northerly as street flows within the west side of Little Overlook Street and then turn westerly into Grand Overlook Drive.

These flows along with the flows from Basins 4 and the bypass flows from Basin 5 enter Basin 6B.

Basin 6B consisting of an additional 0.67 acres generates runoff rates of 2.4 cfs during the 5 year storm and 4.9 cfs during the 100 year storm. Including the flows entering Basin 6B from the upstream basins, total flow rates of Q_5 = 9.9 cfs and Q_{100} = 21.5 cfs reach an another 10' on-grade inlet at the west end of Basin 6B.

This proposed 10' on-grade inlet will be constructed along the south side of Grand Overlook Drive. This inlet will collect runoff rates of Q_5 = 3.7 cfs and Q_{100} = 5.7 cfs. Flow rates of 6.2 cfs during the 5 year storm and 15.8 cfs during the 100 year storm will bypass this inlet and enter Basin 7 as street flows.

Basin 7 comprises 0.64 acres and generates runoff rates of 2.2 cfs during the 5 year storm and 4.6 cfs during the 100 year storm. These flows combine with the flows bypassing the inlet within Basin 6B. Total street flows of 8.4 cfs during the 5 year storm and 20.4 cfs during the 100 year storm will approach a proposed 10' on-grade inlet at the west end of Basin 7. This inlet collects flow rates of Q_5 = 3.7 cfs and Q_{100} = 6.0 cfs during the 5 and 100 year storms, respectively. Flow rates of 4.7 cfs during the 5 year storm and 14.4 cfs during the 100 year storm bypassing this inlet enter Basin 13A as street flows.

At Design Point DP#2, runoff rates of 22.7 cfs during the 5 year storm and 45.7 cfs during the 100 year storm are being conveyed westerly as street flow and pipe flows. Approximately 18.0 cfs during the 5 year storm and 31.5 cfs during the 100 year storm are within the storm sewer pipes. Street flows of Q_5 = 4.7 cfs and Q_{100} = 14.4 cfs enter Basin 13A.

Basin 8 is located along the north side of Grand Overlook Drive. This 1.36 acre basin generates runoff rates of Q_5 = 4.6 cfs and Q_{100} = 9.3 cfs. Including the bypass flows from Basin 3, total flow rates of Q_5 = 11.7 cfs and Q_{100} = 25.6 cfs reach the west end of Basin 8. An additional 10' on-grade inlet will be constructed at the west end of Basin 8. This inlet will collect flow rates of 4.4 cfs during the 5 year storm and 6.8 cfs during the 100 year storms. The flow rates of Q_5 = 7.3 cfs and Q_{100} = 18.8 cfs will bypass this inlet and enter Basin 16 as street flows.

Basin 9 comprises 2.67 acres along the northeast side of Derbyshire Street. The runoff rates of 8.1 cfs and 16.5 cfs generated during the 5 and 100 year storms, respectively, flow northeasterly within Derbyshire Street to Grand Overlook Drive.

A proposed 10' on-grade inlet will be installed along the west side of Derbyshire Drive to collect at portion of these flows. This inlet will collect 3.7 cfs during the 5 year storm and 5.5 cfs during the 100 year storm. Runoff rates of Q_5 = 4.4 cfs and Q_{100} = 11.0 cfs will bypass this inlet and enter Basin 13A as street flow.

Basin 10 is located along the southwest side of Derbyshire Street. This 0.98 acre basin generates runoff rates of Q_5 = 3.2 cfs and Q_{100} = 6.5 cfs. These flow rates continue northerly within Derbyshire Street as street flow. A proposed 10' on-grade inlet at the north end of Basin 10 will collect runoff rates of 2.0 cfs during the 5 year storm and 3.3 cfs during the 100 year storm. The flow rates of Q_5 = 1.2 cfs and Q_{100} = 3.2 cfs bypassing this inlet will turn southwesterly into Grand Overlook and combine with the bypass flows from Basins 7 and 9 entering Basin 13A.

Total street flows 10.3 cfs and 28.6 cfs during the 5 and 100 year storms, respectively, will enter Basin 13A from the east.

Basin 13A comprises an additional 0.43 acres at the intersection of Derbyshire Street and Grand Overlook Street. Runoff rates of Q_5 = 1.7 cfs and Q_{100} = 3.5 cfs generated from this basin combine with the flows entering this basin from the east. Total street flows of 12.0 cfs and 32.2 cfs during the 5 and 100 year storms, respectively, reach a proposed 14' on-grade inlet at the west end of Basin 13A.

This 14' inlet will collect flows of Q_5 = 6.2 cfs and Q_{100} = 10.8cfs. The bypass flows of 5.8 cfs during the 5 year storm and and 21.4 cfs during the 100 year storm will bypass this inlet and enter Basin 13B as street flows.

Basin 11 comprises 2.08 acres along the northeast side of Grand Overlook Drive. Runoff rates of 6.7 cfs and 13.6 cfs during the 5 and 100 year storms, respectively, are generated from this basin. Total flow rates of 15.3 cfs during the 5 year storm and 35.6 cfs during the 100 year storm reach the northwest line of Basin 11.

A proposed 14' on-grade will be constructed at the northwest end of Basin 11. Flow rates of 6.6 cfs and 10.5 cfs will be collected by this inlet during the 5 and 100 year storms, respectively. The remaining flow rates of Q_5 = 8.7 cfs and Q_{100} = 25.1 cfs bypassing this inlet will enter Basin 12 as street flow.

Total runoff rates of 19.1 cfs during the 5 year storm and 37.9 cfs during the 100 year storm reach Design Point #3. The pipe flows at this point are Q_5 = 11.1 cfs and Q_{100} = 18.1 cfs. The street flows are 8.0 cfs during the 5 year storm and 19.8 cfs during the 100 year storm.

Basin 12 comprises 0.77 acres and generates runoff rates of 2.6 cfs and 5.3 cfs during the 5 and 100 year storms, respectively. These flows plus the bypass flows from Basin 11 result in total flow rates of Q_5 = 11.3 cfs and Q_{100} = 30.4 cfs reaching a proposed 16' sump inlet at the low point of Basin 11 and Basin 12 from the southeast.

The 0.47 acre Basin 13B generates runoff rates of 1.7 cfs during the 5 year storm and 3.4 cfs during the 100 year storm. As stated above, runoff rates of Q_5 = 5.8 cfs and Q_{100} = 21.4 cfs enter Basin 13B from the northeast. Total flow rates of 14.5 cfs during the 5 year storm and 46.5 cfs during the 100 year storm reach the 16' sump inlet at the low point of Basin 12 and 13 from the north.

DP#4 is located at the low point of Basin 13B. Total runoff rates of Q_5 = 38.6 cfs and Q_{100} = 78.4 cfs will reach this point.

Basin OS-4 consists of 1.10 acres of existing residential lots. This basin generates runoff rates of Q_5 = 2.8 cfs and Q_{100} = 5.6 cfs which flow northwesterly within Grand Overlook Drive and enter Basin 14 as street flows.

Basin 14 is located between Hancock Expressway and Grand Overview Drive, consisting of 0.87 acres of residential lots. Runoff rates of 3.0 cfs during the 5 year storm and 6.2 cfs during the 100 year storm are generated from this basin. Total runoff rates of 5.8 cfs during the 5 year storm and 11.8 cfs during the 100 year storm from Basin OS-4 and Basin 14 reach a proposed 14' on-grade inlet at the downstream end of Basin 14. This inlet will collect 3.6 cfs during the 5 year storm and 5.7 cfs during the 100 year storm. Bypass flows of Q_5 = 2.2 cfs and Q_{100} = 6.1 cfs will enter Basin 15 as street flows.

Total runoff rates of 22.3 cfs and 44.7 cfs reach Design Point #5 from Basins OS-4, 14 and DP#3. Flow rates of 21.3 cfs and 38.1 cfs are conveyed in the pipe during the 5 and 100 year storms, respectively. Street flows at this point are 2.2 cfs during the 5 year storm and 6.1 cfs during the 100 year storm.

Basin 15 comprising 0.29 acres generates runoff rates of 1.1 cfs and 2.1 cfs during the 5 and 100 year storms, respectively. Including the bypass flows entering Basin 15 from Basin 14 flow rates of Q_5 = 3.3 cfs and Q_{100} = 8.2 cfs reach a proposed 16' sump inlet at the low point of Basins 15 and 16 from the east.

Additional flow rates of Q_5 = 2.3 cfs and Q_{100} = 4.6 cfs are generated from the 0.63 acre Basin 16. As stated above, runoff rates of 7.3 cfs during the 5 year storm and 18.8 cfs during the 100 year storm enter Basin 16 from Basin 8 resulting in total flow rates of Q_5 = 9.6 cfs and Q_{100} = 23.4 cfs reaching the proposed 16' sump inlet at the low point of Basins 15 and 16 from the north.

This inlet collects total flow rates of Q_5 = 12.9 cfs and Q_{100} = 31.6 cfs.

Design Point #6 is located at the low point of Grand Overlook Street. Flow rates of Q_5 = 41.0 cfs and Q_{100} = 83.1 cfs are piped across Grand Overlook Street within a proposed 36" RCP at this location. A 36" RCP will also convey flow rates of Q_5 = 56.1 cfs and Q_{100} = 113.2 cfs to the proposed detention/water quality pond (Design Point #7).

Basin 17 comprises 1.67 acres along the northerly boundary line of the project. Runoff rates of 6.1 cfs during the 5 year storm and 12.2 cfs during the 100 year storm are generated from this basin. These flows compare to the runoff rates of 7.9 cfs during the 5 year storm and 21.0 cfs during the 100 year storm generated from historic Basins D and E.

Basin 18 is located along Hancock Expressway and consists of the rear lots of the proposed residential lots along Grand Overlook Drive. The runoff rates of Q_5 = 9.8 cfs and Q_{100} = 19.1 cfs reach Hancock Expressway and flow northwesterly as street flows. This compares to historic runoff rates of Q_5 = 3.9 cfs and Q_{100} = 10.4 cfs generated from Basin C.

Two 8' on-grade inlets will be installed along Hancock Expressway to collect total runoff rates of 9.6 cfs during the 5 year storm and 22.7 cfs during the 100 year storm, thus reducing the street flows to Q_5 = 3.6 cfs and Q_{100} = 9.4 cfs which is lower than the historic rates generated from Basin C.

Basin 19 comprises the rear lots of 9 proposed residential lots and the proposed detention pond. Runoff rates of Q_5 = 4.9 cfs and Q_{100} = 10.9 cfs are generated from this basin.

Based on the Rational Methodology, total runoff rates of 65.3 cfs during the 5 year storm and 132.1 cfs during the 100 year storm reach Design Point #8.

Street capacities will not be exceeded within the proposed development under this drainage plan and report.

Storm sewer layout and sizing may vary with actual layout and design.

The Lot Owner/Home Builder/Home Owner will be responsible for individual lot drainage. The builders, landscapers, property owners and/or homeowners will assure all storm runoff, including roof drains, from the upper lots/homes will be routed and conveyed through the rear and side lot drainage easements of the adjacent and downhill lots. The property owner and/or homeowner will be responsible to maintain the drainage easements.

WATER QUALITY AND DETENTION

The proposed Broadmoor View at Spring Creek West Filings 1 and 2 development requires water quality measures and detention. The discharge flows exiting the pond should be limited to the historic flow rates. The water quality measures and detention will be handled within the same pond with an outfall structure that will control both water quality capture volume and detention.

The historic discharge point and the developed discharge point are onto CDOT property, so CDOT has asked for a Full Spectrum pond for this development. Full Spectrum detention requirements are 3.30 acre feet (see attached spreadsheet in the appendix of this report). The pond provides Full Spectrum Detention for Broadmoor View at Spring Creek West Filing No. 1 and 2 and for that portion of Braodmoor View at Spring Creek Filings 1 and 2 that are tributary to the pond and the future commercial site located along the west side of Union Boulevard.

Water Quality Capture Volume of 0.61 acre feet is required for the Broadmoor View at Spring Creek West Filings 1 and 2 developments, Broadmoor View at Spring Creek Filings 1 and 2 consisting of a total of 31 acres. The full spectrum pond is designed based on total inflow rates of 60.4 cfs during the 5 year storm and 132.7 cfs during the 100 year storm per the enclosed spreadsheet

The discharge rates are 9.8 cfs during the 5 year storm and 49.0 cfs during the 100 year storm. These discharge rates are substantially less than the historic flow rates of 22.9 cfs during the 5 year storm and 61.2 cfs during the 100 year storm calculated for the historic rates from the site. Therefore, the 3.30 acre feet of detention and water quality capture volume provides a conservatively higher detention volume.

The detention pond will be constructed with Broadmoor View West at Spring Creek Filings No. 1 and 2. The pond will act as a temporary sedimentation pond during construction.

PROPOSED FACILITIES (Construction Cost Estimate):

Following is a cost estimate of the proposed drainage facilities required for this development. All proposed drainage facilities will be public, non-reimbursable.

Filing No. 1 will be the first filing to be developed. The storm sewer system within Filing No. 1 along with a portion of the storm sewer within Filing No. 2 in order to pipe the collected storm water all the way to the pond. The cost estimate below reflects 1) storm sewer within Filing No. 1, 2) storm sewer within Filing No. 2 that will be constructed as part of Filing No. 1 and 3) balance of storm sewer within Filing No. 2.

Broadmoor View West Filing No. 1 - Public, Non-Reimbursable:

1.	10' D-10-R Inlet	3 Ea.	@	$4,400.00/Ea.	$13,200.00
2.	14' D-10-R Inlet	0 Ea.	@	$4,800.00/Ea.	$0.00
3.	16' D-10-R Inlet	0 Ea.	@	$5,200.00/Ea.	$0.00
4.	18" RCP	308 L.F.	@	$30.00/L.F.	$9,240.00
5.	24" RCP	466 L.F.	@	$36.00/L.F.	$16,776.00
6.	30" RCP	0 L.F.	@	$48.00/L.F.	$0.00
7.	36" RCP	0 L.F.	@	$55.00/L.F.	$0.00
8.	Extended Detention Basin Structure	0 Ea.	@	$15,000.00/Ea.	$0.00
9.	Energy Dissipater	0 Ea.	@	$15,000.00/Ea.	$0.00
10.	Type 2 MH	0 Ea.	@	$3,000.00/Ea.	$0.00
				Subtotal:	$39,216.00
				10% Engineering & Contingency:	$3,921.60
				TOTAL:	**$43,137.60**

Broadmoor View West Filing No. 2 to be Constructed with Filing No. 1 - Public, Non-Reimbursable:

1.	10' D-10-R Inlet	4 Ea.	@	$4,400.00/Ea.	$17,600.00
2.	14' D-10-R Inlet	1 Ea.	@	$4,800.00/Ea.	$4,800.00
3.	16' D-10-R Inlet	2 Ea.	@	$5,200.00/Ea.	$10,400.00
4.	18" RCP	136 L.F.	@	$30.00/L.F.	$4,080.00
5.	24" RCP	224 L.F.	@	$36.00/L.F.	$8,064.00
6.	30" RCP	151 L.F.	@	$48.00/L.F.	$7,248.00
7.	36" RCP	245 L.F.	@	$55.00/L.F.	$13,475.00
8.	Extended Detention Basin Structure	1 Ea.	@	$15,000.00/Ea.	$15,000.00
9.	Energy Dissipater	1 Ea.	@	$15,000.00/Ea.	$15,000.00
10.	Type 2 MH	0 Ea.	@	$3,000.00/Ea.	$0.00
				Subtotal:	$95,667.00
				10% Engineering & Contingency:	$9,566.70
				TOTAL:	**$10,5233.70**

Broadmoor View West Filing No. 2 Balance after Filing No. 1 Construction - Public, Non-Reimbursable:

1.	10' D-10-R Inlet	2 Ea.	@	$4,400.00/Ea.	$8,800.00
2.	14' D-10-R Inlet	2 Ea.	@	$4,800.00/Ea.	$9,600.00
3.	16' D-10-R Inlet	0 Ea.	@	$5,200.00/Ea.	$0.00
4.	18" RCP	733 L.F.	@	$30.00/L.F.	$21,990.00
5.	24" RCP	243 L.F.	@	$36.00/L.F.	$8,748.00
6.	30" RCP	0 L.F.	@	$48.00/L.F.	$0.00
7.	36" RCP	0 L.F.	@	$55.00/L.F.	$0.00
8.	Extended Detention Basin Structure	0 Ea.	@	$15,000.00/Ea.	$0.00
9.	Energy Dissipater	0 Ea.	@	$15,000.00/Ea.	$0.00
10.	Type 2 MH	1 Ea.	@	$3,000.00/Ea.	$3,000.00
				Subtotal:	$52,138.00
				10% Engineering & Contingency:	$5,213.80
				TOTAL:	**$57,351.80**

DRAINAGE FEES

Broadmoor View Filing No. 1 contains 8.786 acres. The site lies within the Spring Creek Drainage Basin.

The 2016 Drainage Fees are detailed below:

Broadmoor View West Filing No. 1:

Spring Creek Drainage Basin (8.675 acres)

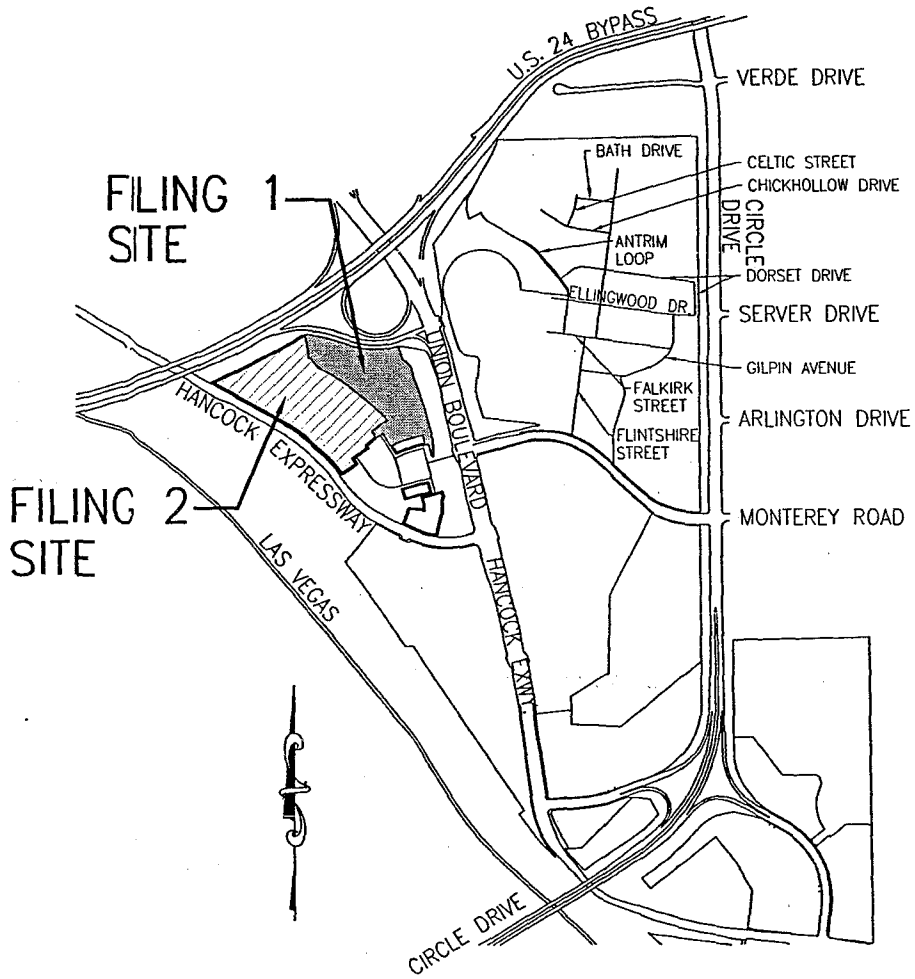
Drainage Fee: $ 9,089/acre.x 8.675 acres = $ 78,847.07

Broadmoor View West Filing No. 2:

Spring Creek Drainage Basin (8.675 acres)

Drainage Fee: $ 9,089/acre.x 13.895 acres = $ 126,291.66

APPENDIX



Vicinity Map

NOT TO SCALE

FIGURE 1

FILE: 15006FP-NEW.DWG

JOB NO. 15-006

DATE: 11/24/15

ROCKWELL CONSULTING, Inc.
ENGINEERING • SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 • FAX (719) 475-9223

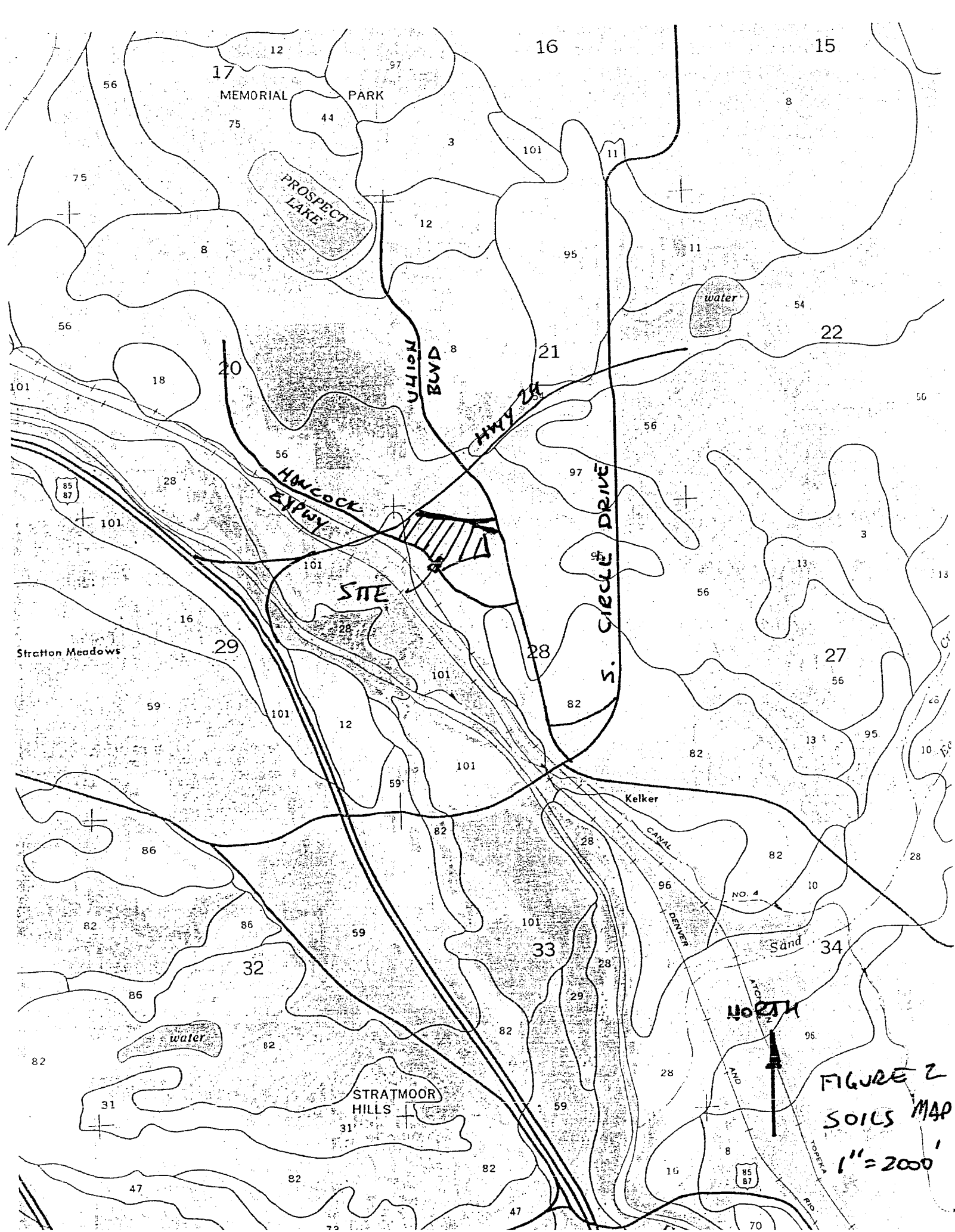


FIGURE 2
SOILS MAP
1" = 2000'

B C D

CITY OF COLORADO SPRINGS
080060

JOINS PANEL 0733

ZONE X

ZONE AE

ZONE AO
(DEPTH 1)

20

21

28

29

HANCOCK EXPRESSWAY

ATCHISON TOPEKA AND SANTA FE

LAS VEGAS STREET

DENVER AND RIO GRANDE WESTERN

HANCOCK DRIVE

MUSKET STREET DRIVE

MUSKET STREET

LENMAR

EAST

BROOKSHIRE AVENUE

STEVENS AVENUE

PASO AVENUE

FRANKLIN AVENUE

PROSPECT AVENUE

INSTITUTE AVENUE

SOUTH EL PASO

SOUTH FRANKLIN

SOUTH PROSPECT

SOUTH INSTITUTE

CORONA AVENUE

HOUSTON AVENUE

ASPEN AVENUE

MT WERNER CIRCLE

MT WERNER TRAIL

MT WERNER PLACE

BRISTOL AVENUE

FALCON LA JUNTA AVE

MONTROSE AVENUE

CHEYENNE ROAD

Spring Run Overflow

Spring Creek

Spring Run

100-YEAR AND 500-YEAR FLOODS CONTAINED IN CULVERT

FLOODWAY TOO NARROW TO SHOW TO SCALE; REFER TO FLOODWAY

Culvert

100-YEAR FLOOD CONTAINED

EL PASO COUNTY
UNINCORPORATED AREAS
080059

FOUR SEASONS DRIVE

HANFELL ROAD

LAS VEGAS STREET

DENVER AND RIO GRANDE WESTERN

UNION BOULEVARD

MONTEREY

NOTE: MAP AREA SHOWN ON THIS PANEL IS L
TOWNSHIP 14 SOUTH, RANGE 66 WEST AND TO
~~RANGE 65~~ WEST.

SITE

CITY OF COLOR
0800

5910 5906 5902 5900 5898 5896 5894 5892 5890 5888 5886 5885 5882 5879 5876 5873 5872 5870 5868 5865 5862 5861 5859 5858 5854 5852 5880 5875 5872 5869 5868 5867 5866 5865 5870

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: A
AREA: 3.06
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	3.06	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.06			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	675	4.5		23.66
Street	0	4	4.0	0.00
Tc Total:				23.66

Intensity, I (inches/hr)

I5	**I100**
2.8 in/hr	4.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.5 cfs	6.8 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: B
AREA: 3.32
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	3.32	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.32			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	730	4		25.58
Street	0	4	4.0	0.00
Tc Total:				25.58

Intensity, I (inches/hr)

I5	**I100**
2.6 in/hr	4.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.6 cfs	7.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: C
AREA: 3.79
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	3.79	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	3.79			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	320	15		10.95
Street	900	3	3.5	4.33
Tc Total:				15.28

Intensity, I (inches/hr)

I5	**I100**
3.4 in/hr	6.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.9 cfs	10.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: D
AREA: 0.51
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	0.51	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.51			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	45	30		3.27
Tc Total:				3.27

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
0.8 cfs	2.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: E
AREA: 9.88
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	9.88	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	9.88			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	1000	4		29.94
Swale	300	12	6.9	0.72
Tc Total:				30.66

Intensity, I (inches/hr)

I5	**I100**
2.4 in/hr	4.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
7.1 cfs	18.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: F
AREA: 9.13
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	9.13	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	9.13			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	1000	9		22.91
Swale	0	4	4.0	0.00
Tc Total:				22.91

Intensity, I (inches/hr)

I5	**I100**
2.8 in/hr	5.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
7.7 cfs	20.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: Basin G
AREA: 2.24
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.00	0.70	0.80	0.00%
Undeveloped	2.24	0.30	0.45	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.24			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	350	5		16.46
Swale	0	4	4.0	0.00
Tc Total:				16.46

Intensity, I (inches/hr)

I5	**I100**
3.3 in/hr	5.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.2 cfs	6.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: Historic DP #1
AREA: 31.93
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin A	3.06	0.30	0.45	9.58%
Basin B	3.32	0.30	0.45	10.40%
Basin C	3.79	0.30	0.45	11.87%
Basin D	0.51	0.30	0.45	1.60%
Basin E	9.88	0.30	0.45	30.94%
BASIN F	9.13	0.30	0.45	28.59%
Basin G	2.24	0.30	0.45	7.02%
	31.93			100%

COMPOSITE: C5= 0.30 C100= 0.45

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	1000	4		29.94
Street	300	12	6.9	0.72
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				30.66

Intensity, I (inches/hr)

I5	**I100**
2.4 in/hr	4.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
22.9 cfs	61.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: OS-1
AREA: 1.83
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.42	0.70	0.80	77.60%
Open Space	0.41	0.25	0.35	22.40%
	1.83			100%

COMPOSITE: C5= 0.60 C100= 0.70

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	7		10.58
Street	220	3.6	2.8	1.29
Tc Total:				11.87

Intensity, I (inches/hr)

I5	**I100**
3.8 in/hr	6.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
4.2 cfs	8.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: OS-2
AREA: 0.74
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.74	0.70	0.80	100.00%
Open Space	0.00	0.25	0.35	0.00%
	0.74			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	70	3		4.36
Street	230	5	3.4	1.14
Tc Total:				5.50

Intensity, I (inches/hr)

I5	**I100**
5.0 in/hr	8.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.6 cfs	5.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: OS-3
AREA: 2.21
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.80	0.70	0.80	81.45%
Open Space	0.41	0.25	0.35	18.55%
	2.21			100%

COMPOSITE: C5= 0.62 C100= 0.72

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	70	7		7.00
Street	500	3.2	2.7	3.11
Tc Total:				10.10

Intensity, I (inches/hr)

I5	**I100**
4.1 in/hr	7.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
5.6 cfs	11.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: OS-4
AREA: 1.10
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.10	0.70	0.80	100.00%
Open Space	0.00	0.25	0.35	0.00%
	1.10			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	600	5		10.77
Street	500	3.2	2.7	3.11
Tc Total:				13.88

Intensity, I (inches/hr)

I5	**I100**
3.6 in/hr	6.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.8 cfs	5.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: OS-5
AREA: 2.55
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Commecial	2.55	0.80	0.90	100.00%
	0.00	0.25	0.35	0.00%
	2.55			100%

COMPOSITE: C5= 0.80 C100= 0.90

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	4		4.49
Street	600	4.6	3.2	3.11
Tc Total:				7.60

Intensity, I (inches/hr)

I5	**I100**
4.5 in/hr	8.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
9.2 cfs	18.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 1
AREA: 0.80
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.80	0.70	0.80	100.00%
	0	0.30	0.45	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.80			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	100	3		5.21
Street	200	5.5	4.7	0.71
Tc Total:				5.92

Intensity, I (inches/hr)

I5	**I100**
4.9 in/hr	8.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.7 cfs	5.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 2A
AREA: 0.64
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.64	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.64			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	100	3		5.21
Street	300	5	4.5	1.12
Tc Total:				6.32

Intensity, I (inches/hr)

I5	**I100**
4.8 in/hr	8.5 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.1 cfs	4.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 2B
AREA: 0.48
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.48	0.70	0.80	100.00%
	0	0.25	0.35	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.48			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	100	3		5.21
Street	50	5	4.5	0.19
Tc Total:				5.39

Intensity, I (inches/hr)

I5	**I100**
5.1 in/hr	8.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.7 cfs	3.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 3
AREA: 0.57
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Street	0.32	0.90	0.95	56.14%
Landscaping	0.25	0.30	0.45	43.86%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.57			100%

COMPOSITE: C5= 0.64 C100= 0.73

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	10	3		3.29
Street	550	3.1	3.5	2.60
Tc Total:				5.90

Intensity, I (inches/hr)

I5	**I100**
4.9 in/hr	8.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.8 cfs	3.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 4
AREA: 0.87
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential Lots	0.87	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.87			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	50	3		3.68
Street	520	3.8	3.9	2.22
Tc Total:				5.90

Intensity, I (inches/hr)

I5	**I100**
4.9 in/hr	8.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.0 cfs	6.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 5
AREA: 1.57
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.57	0.70	0.80	100.00%
		0.00	0.00	0.00%
		0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.57			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	170	6		5.40
Street	350	3.3	3.6	1.61
				7.00

Tc Total:

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	8.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
5.1 cfs	10.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 6A
AREA: 0.58
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residentail	0.58	0.70	0.80	100.00%
Open Space	0	0.25	0.35	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.58			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3		3.29
Street	450	4.2	4.1	1.83
Tc Total:				5.12

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.1 cfs	4.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 6B
AREA: 0.67
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residentail	0.67	0.70	0.80	100.00%
Open Space	0	0.25	0.35	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.67			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3		3.29
Street	450	4.2	4.1	1.83
Tc Total:				5.12

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.4 cfs	4.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 7
AREA: 0.64
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.64	0.70	0.80	100.00%
	0.00	0.00	0.00	0.00%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.64			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	65	3		4.20
Street & Pipe	300	4.6	4.3	1.17
Tc Total:				5.36

Intensity, I (inches/hr)

I5	**I100**
5.0 in/hr	8.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.2 cfs	4.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 8
AREA: 1.36
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.36	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.36			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3		3.29
Street	750	4.6	4.3	2.91
Tc Total:				6.21

Intensity, I (inches/hr)

I5	**I100**
4.8 in/hr	8.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
4.6 cfs	9.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 9
AREA: 2.67
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	2.67	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.67			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	120	3		5.70
Street	720	4.4	4.2	2.86
Tc Total:				8.56

Intensity, I (inches/hr)

I5	**I100**
4.3 in/hr	7.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
8.1 cfs	16.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 10
AREA: 0.98
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.98	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.98			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	60	3		4.03
Street	730	4.4	4.2	2.90
Tc Total:				6.93

Intensity, I (inches/hr)

I5	**I100**
4.7 in/hr	8.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.2 cfs	6.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 11
AREA: 2.08
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	2.08	0.70	0.80	100.00%
	0	0.25	0.35	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.08			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	170	6		5.40
Street	480	5	4.5	1.79
Tc Total:				7.19

Intensity, I (inches/hr)

I5	**I100**
4.6 in/hr	8.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
6.7 cfs	13.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 12
AREA: 0.77
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.77	0.70	0.80	100.00%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.77			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	180	6		5.56
Street	180	4	4.0	0.75
				6.31

Tc Total:

Intensity, I (inches/hr)

I5	**I100**
4.8 in/hr	8.5 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.6 cfs	5.3 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 13A
AREA: 0.43
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.43	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.43			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	50	7		2.78
Street	0	3.5	3.7	0.00
Tc Total:				2.78

Intensity, I (inches/hr)

I5	**I100**
5.8 in/hr	10.3 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.7 cfs	3.5 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 13B
AREA: 0.47
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.47	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.47			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	180	7		5.28
Street	0	3.5	3.7	0.00
Tc Total:				5.28

Intensity, I (inches/hr)

I5	**I100**
5.0 in/hr	9.0 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.7 cfs	3.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 14
AREA: 0.87
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.87	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.87			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	50	3		3.68
Street	480	5	4.5	1.79
Tc Total:				5.47

Intensity, I (inches/hr)

I5	**I100**
5.0 in/hr	8.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
3.0 cfs	6.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 15
AREA: 0.29
SOIL TYPE:

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.29	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.29			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	50	3		3.68
Street	171	3	3.5	0.82
Tc Total:				4.50

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
1.1 cfs	2.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 16
AREA: 0.63
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.63	0.70	0.80	100.00%
Streets	0	0.90	0.95	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0.63			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	40	3		3.29
Street	310	3.5	3.7	1.38
Tc Total:				4.67

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
2.3 cfs	4.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 17
AREA: 1.67
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.67	0.70	0.80	100.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	1.67			100%

COMPOSITE: C5= 0.70 C100= 0.80

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	80	22		2.41
Swale	0	2	2.1	0.00
Tc Total:				2.41

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
6.1 cfs	12.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 18
AREA: 2.48
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	1.69	0.70	0.80	68.15%
Street	0.79	0.90	0.95	31.85%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.48			100%

COMPOSITE: C5= 0.76 C100= 0.85

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	100	10		3.50
Street	100	3	2.6	0.64
Tc Total:				4.14

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
9.8 cfs	19.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: 19
AREA: 2.62
SOIL TYPE: C&D

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Residential	0.63	0.70	0.80	24.05%
Pond & Open Space	1.99	0.25	0.35	75.95%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	2.62			100%

COMPOSITE: C5= 0.36 C100= 0.46

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	150	33		2.89
Tc Total:				2.89

Intensity, I (inches/hr)

I5	**I100**
5.2 in/hr	9.1 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
4.9 cfs	10.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #1A
AREA: 3.27
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
OS-1	1.83	0.60	0.70	55.96%
	0	0.70	0.80	0.00%
	0.00	0.62	0.72	0.00%
1	0.8	0.70	0.80	24.46%
2A	0.64	0.70	0.80	19.57%
	0	0.70	0.80	0.00%
	0	0.00	0.00	0.00%
	3.27			100%

COMPOSITE: C5= 0.64 C100= 0.74

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	7		10.58
Street	220	3.6	2.8	1.29
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				11.87

Intensity, I (inches/hr)

I5	**I100**
3.8 in/hr	6.8 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
8.1 cfs	16.6 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #1B
AREA: 4.01
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#1	3.27	0.64	0.74	81.55%
OS-2	0.74	0.70	0.80	18.45%
	0.00	0.62	0.72	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.00	0.00	0.00%
	4.01			100%

COMPOSITE: C5= 0.65 C100= 0.75

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	7		10.58
Street	320	3.6	2.8	1.87
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				12.45

Intensity, I (inches/hr)

I5	I100
3.8 in/hr	6.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	Q100
9.8 cfs	20.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #1C
AREA: 6.70
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#1B	4.01	0.65	0.70	59.85%
2B	0.48	0.70	0.80	7.16%
OS-3	2.21	0.62	0.72	32.99%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	6.70			100%

COMPOSITE: C5= 0.64 C100= 0.71

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	7		10.58
Street	320	3.6	2.8	1.87
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				12.45

Intensity, I (inches/hr)

I5	I100
3.8 in/hr	6.7 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	Q100
16.2 cfs	32.0 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #2
AREA: 7.45
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
Basin OS-5	2.55	0.80	0.90	34.23%
3	0.57	0.64	0.73	7.65%
4	0.87	0.70	0.80	11.68%
5	1.57	0.70	0.80	21.07%
6A and 6B	1.25	0.70	0.80	16.78%
7	0.64	0.70	0.80	8.59%
		0.70	0.80	
	7.45			100%

COMPOSITE: C5= 0.73 C100= 0.83

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	170	6		5.40
Street	900	3.3	3.6	4.13
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				9.53

Intensity, I (inches/hr)

I5	**I100**
4.2 in/hr	7.4 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
22.7 cfs	45.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #3
AREA: 8.78
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#1C	6.7	0.64	0.71	76.31%
11	2.08	0.70	0.80	23.69%
	0.00	0.00	0.00	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0			0.00%
	8.78			100%

COMPOSITE: C5= 0.65 C100= 0.73

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	160	7		10.58
Street	1000	3.6	2.8	5.86
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				16.43

Intensity, I (inches/hr)

I5	**I100**
3.3 in/hr	5.9 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
19.1 cfs	37.9 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #4
AREA: 13.36
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#2	7.45	0.73	0.83	55.76%
8	1.36	0.70	0.80	10.18%
9	2.67	0.70	0.80	19.99%
10	0.98	0.70	0.80	7.34%
13A	0.43	0.70	0.80	3.22%
13B	0.47	0.70	0.80	3.52%
		0.70	0.80	
	0			0.00%
	13.36			100%

COMPOSITE: C5= 0.72 C100= 0.82

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	170	6		5.40
Street	1100	3.3	3.6	5.05
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				10.45

Intensity, I (inches/hr)

I5	**I100**
4.0 in/hr	7.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
38.6 cfs	78.4 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #5
AREA: 10.71
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
OS-4	1.1	0.70	0.80	10.27%
14	0.83	0.70	0.80	7.75%
DP#3	8.78	0.65	0.73	81.98%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0	0.70	0.80	0.00%
	0			0.00%
	10.71			100%

COMPOSITE: C5= 0.66 C100= 0.74

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	600	5		10.77
Street	1200	3.2	2.7	7.45
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				18.23

Intensity, I (inches/hr)

I5	I100
3.2 in/hr	5.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	Q100
22.3 cfs	44.7 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #6
AREA: 14.13
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
12	0.77	0.70	0.80	5.45%
DP#4	13.36	0.72	0.82	94.55%
	0.00	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0	0.00	0.00	0.00%
	0			0.00%
	14.13			100%

COMPOSITE: C5= 0.72 C100= 0.82

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	170	6		5.40
Street	1100	3.3	3.6	5.05
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				10.45

Intensity, I (inches/hr)

I5	**I100**
4.0 in/hr	7.2 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
41.0 cfs	83.1 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #7
AREA: 25.90
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#6	14.13	0.72	0.82	54.56%
16	0.63	0.35	0.45	2.43%
DP#5	10.71	0.66	0.74	41.35%
15	0.43	0.70	0.80	1.66%
	0	0.77	0.85	0.00%
	0	0.80	0.90	0.00%
	0	0.70	0.80	0.00%
	0			0.00%
	25.90			100%

COMPOSITE: C5= 0.69 C100= 0.78

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	600	5		10.77
Street	1200	3.2	2.7	7.45
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				18.23

Intensity, I (inches/hr)

I5	**I100**
3.2 in/hr	5.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
56.1 cfs	113.2 cfs

HYDROLOGY

RATIONAL METHODOLOGY

PROJECT: Broadmoor View West At Spring Creek West Filings 1 and 2

BASIN: DP #8
AREA: 31.00
SOIL TYPE: B

RUNOFF COEFFICIENT, C

ZONE/DEVELOPMENT TYPE	AREA	C5	C100	% AREA
DP#7	25.9	0.69	0.78	83.55%
18	2.48	0.76	0.85	8.00%
19	2.62	0.36	0.46	8.45%
	0	0.70	0.80	0.00%
	0	0.77	0.85	0.00%
	0	0.80	0.90	0.00%
	0	0.70	0.80	0.00%
	0			0.00%
	31.00			100%

COMPOSITE: C5= 0.67 C100= 0.76

TIME OF CONCENTRATION: Tc In Minutes:

Travel Type	L	s %	v (fps)	Tc
Overland	600	5		10.77
Street	1200	3.2	2.7	7.45
Pond Swale	0	0.5	1.5	0.00
Outlet Pipe	0	0.5	4.0	0.00
Tc Total:				18.23

Intensity, I (inches/hr)

I5	**I100**
3.2 in/hr	5.6 in/hr

PEAK FLOW: Q-CIA in cfs

Q5	**Q100**
65.3 cfs	132.1 cfs

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET OS-2

Q5 =	9.8	Q100 =	20.1
SL =	0.02	SO =	0.02

5 YEAR		100 YEAR	
T	14.90	T	19.50
FW	1.85	FW	1.95
L1	21.2	L1	29.2
L2	12.7	L2	17.6
L3	45.5	L3	62.7

Li =	10.00		
5 YR Q =	9.8	100 YR Q	20.1
5 YR Qi =	4.6	100 YR Qi	6.9
5 YR Qfb =	5.2	100 YR Qfb	13.2

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 2B

	Q5 =	12.5	Q100 =	28.1
	SL =	0.06	SO =	0.02

5 YEAR		100 YEAR	
T	13.28	T	18.00
FW	3.13	FW	3.32
L1	32.1	L1	46.0
L2	19.3	L2	27.7
L3	68.7	L3	98.7

	Li =	10.00		
	5 YR Q =	12.5	100 YR Q	28.1
	5 YR Qi =	3.9	100 YR Qi	6.1
	5 YR Qfb =	8.6	100 YR Qfb	22.0

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 3

	Q5 =	11.0	Q100 =	22.1
	SL =	0.045	SO =	0.02

5 YEAR		100 YEAR	
T	13.36	T	17.36
FW	2.72	FW	2.86
L1	28.0	L1	38.2
L2	16.8	L2	22.9
L3	59.9	L3	81.9

	Li =	10.00		
	5 YR Q =	11	100 YR Q	22.1
	5 YR Qi =	3.9	100 YR Qi	5.8
	5 YR Qfb =	7.1	100 YR Qfb	16.3

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 5

Q5 =	5.1	Q100 =	10.4
SL =	0.0387	SO =	0.02

5 YEAR		100 YEAR	
T	10.30	T	13.46
FW	2.39	FW	2.52
L1	19.0	L1	26.2
L2	11.4	L2	15.7
L3	40.7	L3	56.1

Li = 10.00

5 YR Q =	5.1	100 YR Q	10.4
5 YR Qi =	2.7	100 YR Qi	4.0
5 YR Qfb =	2.4	100 YR Qfb	6.4

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 6B

Q5 =	9.9	Q100 =	21.5
SL =	0.045	SO =	0.02

5 YEAR		100 YEAR	
T	12.85	T	17.18
FW	2.70	FW	2.85
L1	26.7	L1	37.7
L2	16.0	L2	22.7
L3	57.2	L3	80.9

Li =	10.00		
5 YR Q =	9.9	100 YR Q	21.5
5 YR Qi =	3.7	100 YR Qi	5.7
5 YR Qfb =	6.2	100 YR Qfb	15.8

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 7

	Q5 =	8.4	Q100 =	20.4
	SL =	0.034	SO =	0.02

5 YEAR		100 YEAR	
T	12.73	T	17.76
FW	2.34	FW	2.49
L1	22.9	L1	34.1
L2	13.8	L2	20.5
L3	49.1	L3	73.1

	Li =	10.00		
	5 YR Q =	8.4	100 YR Q	20.4
	5 YR Qi =	3.7	100 YR Qi	6.0
	5 YR Qfb =	4.7	100 YR Qfb	14.4

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 8

Q5 =	11.7	Q100 =	25.6
SL =	0.034	SO =	0.02

5 YEAR		100 YEAR	
T	14.41	T	19.33
FW	2.40	FW	2.53
L1	26.6	L1	37.7
L2	16.0	L2	22.7
L3	57.0	L3	80.9

Li =	10.00		
5 YR Q =	11.7	100 YR Q	25.6
5 YR Qi =	4.4	100 YR Qi	6.8
5 YR Qfb =	7.3	100 YR Qfb	18.8

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 9

Q5 =	8.1	Q100 =	16.5
SL =	0.0304	SO =	0.02

5 YEAR		100 YEAR	
T	12.82	T	16.75
FW	2.22	FW	2.33
L1	21.9	L1	30.1
L2	13.1	L2	18.1
L3	46.9	L3	64.5

Li =	10.00		
5 YR Q =	8.1	100 YR Q	16.5
5 YR Qi =	3.7	100 YR Qi	5.5
5 YR Qfb =	4.4	100 YR Qfb	11.0

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 10

Q5 =	3.2	Q100 =	6.5
SL =	0.0304	SO =	0.02

5 YEAR		100 YEAR	
T	9.05	T	11.81
FW	2.06	FW	2.18
L1	14.4	L1	19.8
L2	8.6	L2	11.9
L3	30.8	L3	42.5

Li =	10.00		
5 YR Q =	3.2	100 YR Q	6.5
5 YR Qi =	2.0	100 YR Qi	3.3
5 YR Qfb =	1.2	100 YR Qfb	3.2

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 13A

	Q5 =	12.0	Q100 =	32.2
	SL =	0.034	SO =	0.02

5 YEAR			100 YEAR	
T	14.55		T	21.07
FW	2.40		FW	2.58
L1	26.9		L1	41.8
L2	16.2		L2	25.1
L3	57.7		L3	89.5
	Li =	14.00		
	5 YR Q =	12	100 YR Q	32.2
	5 YR Qi =	6.2	100 YR Qi	10.8
	5 YR Qfb =	5.8	100 YR Qfb	21.4

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 11

	Q5 =	15.3	Q100 =	35.6
	SL =	0.046	SO =	0.02

5 YEAR		100 YEAR	
T	15.06	T	20.67
FW	2.81	FW	2.98
L1	32.6	L1	47.5
L2	19.6	L2	28.5
L3	69.9	L3	101.8

	Li =	14.00		
	5 YR Q =	15.3	100 YR Q	35.6
	5 YR Qi =	6.6	100 YR Qi	10.5
	5 YR Qfb =	8.7	100 YR Qfb	25.1

Broadmoor View West Filings 1 and 2

Sump Inlet 12 AND 13

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		11.3	30.4	s(x)=	0.02
	d =	0.48	0.70	s(l)=	0.002
				n=	0.016
TOTAL FLOWS		18.8	55.2		
				L=	16
	d(max)=	0.43	1.04		

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 14

Q5 =	5.8	Q100 =	11.8
SL =	0.046	SO =	0.02

5 YEAR		100 YEAR	
T	10.47	T	13.66
FW	2.62	FW	2.76
L1	21.1	L1	29.0
L2	12.7	L2	17.4
L3	45.2	L3	62.2

Li =	14.00		
5 YR Q =	5.8	100 YR Q	11.8
5 YR Qi =	3.6	100 YR Qi	5.7
5 YR Qfb =	2.2	100 YR Qfb	6.1

Broadmoor View West Filings 1 and 2

Sump Inlet 15 AND 16

		5 YEAR	100 YEAR		
APPROACH FLOWS (worse case)		9.6	23.4	s(x)=	0.02
	d =	0.46	0.64	s(l)=	0.002
				n=	0.016
TOTAL FLOWS		12.9	31.6		
				L=	10
	d(max)=	0.41	0.86		

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 18A

Q5 =	9.0	Q100 =	17.5
SL =	0.035	SO =	0.02

5 YEAR		100 YEAR	
T	12.99	T	16.67
FW	2.38	FW	2.50
L1	23.8	L1	32.1
L2	14.3	L2	19.3
L3	51.1	L3	68.8

Li =	8.00		
5 YR Q =	9	100 YR Q	17.5
5 YR Qi =	3.0	100 YR Qi	4.4
5 YR Qfb =	6.0	100 YR Qfb	13.1

Broadmoor View at Springs Ranch West Filings 1 and 2

INLET 18B

Q5 =	6.0	Q100 =	13.1
SL =	0.035	SO =	0.02

5 YEAR		100 YEAR	
T	11.16	T	14.96
FW	2.31	FW	2.45
L1	19.9	L1	28.2
L2	11.9	L2	16.9
L3	42.6	L3	60.5

Li =	8.00		
5 YR Q =	6	100 YR Q	13.1
5 YR Qi =	2.4	100 YR Qi	3.7
5 YR Qfb =	3.6	100 YR Qfb	9.4

Design Procedure Form: Extended Detention Basin (EDB)

Designer:	**Kent Rockwell**
Company:	**Rockwell Consulting**
Date:	**September 21, 2016**
Project:	**Broadmoor View West Filings 1 and 2**
Location:	

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a	I_a = 60.0 %
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.600
C) Contributing Watershed Area	Area = 31.000 ac
D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = ____ in
E) Design Concept (Select EURV when also designing for flood control)	Choose One: (●) Water Quality Capture Volume (WQCV); ( ) Excess Urban Runoff Volume (EURV)
F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area * 1.2)$)	V_{DESIGN}= 0.732 ac-ft
G) For Watersheds Outside the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} / 0.43))$)	$V_{DESIGN\ OTHER}$= ____ ac-ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{DESIGN\ USER}$= ____ ac-ft
I) Predominant Watershed NRCS Soil Group	Choose One: ( ) A; ( ) B; (●) C / D
J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: EURVA = (0.1878i - 0.0104)*Area For HSG B: $EURV_B$ = (0.1178i - 0.0042)*Area For HSG C/D: $EURV_{C/D}$ = (0.1043i - 0.0031)*Area	EURV = ____ ac-ft
2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)	L : W = 3.0 : 1
3. Basin Side Slopes	
A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z = 3.00 ft / ft DIFFICULT TO MAINTAIN, INCREASE WHERE POSSIBLE
4. Inlet	
A) Describe means of providing energy dissipation at concentrated inflow locations:	

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

5. Forebay	
A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)	V_{FMIN} = 0.018 ac-ft
B) Actual Forebay Volume	V_F = 0.019 ac-ft
C) Forebay Depth (D_F = 18 inch maximum)	D_F = 18.0 in
D) Forebay Discharge	
i) Undetained 100-year Peak Discharge	Q_{100} = 142.00 cfs
ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)	Q_F = 2.84 cfs
E) Forebay Discharge Design	Choose One: ○Berm With Pipe ◉Wall with Rect. Notch ○Wall with V-Notch Weir (flow too small for berm w/ pipe)
F) Discharge Pipe Size (minimum 8-inches)	Calculated D_P = in
G) Rectangular Notch Width	Calculated W_N = 9.2 in
6. Trickle Channel	
A) Type of Trickle Channel	Choose One: ◉Concrete ○Soft Bottom
F) Slope of Trickle Channel	S = 0.0050 ft / ft
7. Micropool and Outlet Structure	
A) Depth of Micropool (2.5-feet minimum)	D_M = 2.5 ft
B) Surface Area of Micropool (10 ft^2 minimum)	A_M = 40 sq ft
C) Outlet Type	Choose One: ◉Orifice Plate ○Other (Describe):
D) Depth of Design Volume (EURV or 1.2 WQCV) Based on the Design Concept Chosen Under 1.E.	H = 2.50 feet
E) Volume to Drain Over Prescribed Time	WQCV = 0.610 ac-ft
F) Drain Time (Min T_D for WQCV= 40 hours; Max T_D for EURV= 72 hours)	T_D = 40 hours
G) Recommended Maximum Outlet Area per Row, (A_o)	A_o = 1.41 square inches
H) Orifice Dimensions: i) Circular Orifice Diameter or ii) Width of 2" High Rectangular Orifice	$D_{orifice}$ = 5/8 inches; $W_{orifice}$ = inches
I) Number of Columns	n_c = 1 number
J) Actual Design Outlet Area per Row (A_o)	A_o = 1.35 square inches
K) Number of Rows (nr)	n_r = 7 number
L) Total Outlet Area (A_{ot})	A_{ot} = 10.1 square inches
M) Depth of WQCV (H_{WQCV}) (Estimate using actual stage-area-volume relationship and V_{WQCV})	H_{WQCV} = feet
N) Ensure Minimum 40 Hour Drain Time for WQCV	$T_{D\,WQCV}$ = hours

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

8. Initial Surcharge Volume	
A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)	D_{IS} = 4.0 in
B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)	V_{IS} = 79.7 cu ft
C) Initial Surcharge Provided Above Micropool	V_s = 13.3 cu ft INCREASE DEPTH OF INITIAL SURCHARGE OR SURFACE AREA OF MICROPOOL
9. Trash Rack	
A) Type of Water Quality Orifice Used	Choose One: (●) Circular (up to 2" diameter) ( ) Rectangular (2" high)
B) Water Quality Screen Open Area: $A_t = 38.5*(e^{-0.095D})*A_{ot}$	A_t = 345 square inches
C) For 2", or Smaller, **Circular Opening** (See Fact Sheet T-12):	
i) Width of Water Quality Screen and Concrete Opening ($W_{opening}$)	$W_{opening}$ = 12.0 inches
ii) Height of Water Quality Screen (H_{TR})	H_{TR} = 58.0 inches
iii) Type of Screen, Describe if "Other"	Choose One: (●) S.S. Well Screen with 60% Open Area* ( ) Other (Describe):
D) For 2" High **Rectangular Opening**:	
i) Width of Rectangular Opening ($W_{orifice}$)	W = inches
ii) Width of Water Quality Screen Opening ($W_{opening}$)	$W_{opening}$ = ft
iii) Height of Water Quality Screen (H_{TR})	H_{TR} = ft
iv) Type of Screen, Describe if "Other"	Choose One: ( ) Aluminum Amico-Klemp SR Series (or equal) ( ) Other (Describe):
v) Cross-bar Spacing	inches
vi) Minimum Bearing Bar Size	

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

10. Overflow Embankment A) Describe embankment protection for 100-year and greater overtopping: B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z_E = _____ ft / ft
11. Vegetation	Choose One ○ Irrigated ○ Not Irrigated
12. Access A) Describe Sediment Removal Procedures	

Notes:

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a	I_a = 60.0 %
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.600
C) Contributing Watershed Area	Area = 31.000 ac
D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = _____ in
E) Design Concept (Select EURV when also designing for flood control)	Choose One: (●) Water Quality Capture Volume (WQCV) ( ) Excess Urban Runoff Volume (EURV)
F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area * 1.2$)	V_{DESIGN}= 0.732 ac-ft
G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} / 0.43))$	$V_{DESIGN\ OTHER}$= _____ ac-ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{DESIGN\ USER}$= _____ ac-ft
I) Predominant Watershed NRCS Soil Group	Choose One: ( ) A ( ) B (●) C / D
J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: EURVA = (0.1878i - 0.0104)*Area For HSG B: $EURV_B$ = (0.1178i - 0.0042)*Area For HSG C/D: $EURV_{C/D}$ = (0.1043i - 0.0031)*Area	EURV = _____ ac-f t
2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)	L : W = 3.0 : 1
3. Basin Side Slopes	
A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z = 3.00 ft / ft DIFFICULT TO MAINTAIN, INCREASE WHERE POSSIBLE
4. Inlet	
A) Describe means of providing energy dissipation at concentrated inflow locations:	

Design Procedure Form: Extended Detention Basin (EDB)

Designer:	**Kent Rockwell**
Company:	**Rockwell Consulting**
Date:	**September 21, 2016**
Project:	**Broadmoor View West Filings 1 and 2**
Location:	

5. Forebay

A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV) — V_{FMIN} = 0.018 ac-ft

B) Actual Forebay Volume — V_F = 0.019 ac-ft

C) Forebay Depth (D_F = 18 inch maximum) — D_F = 18.0 in

D) Forebay Discharge

i) Undetained 100-year Peak Discharge — Q_{100} = 132.00 cfs

ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$) — Q_F = 2.64 cfs

E) Forebay Discharge Design

Choose One
- ○ Berm With Pipe
- ◉ Wall with Rect. Notch
- ○ Wall with V-Notch Weir

(flow too small for berm w/ pipe)

F) Discharge Pipe Size (minimum 8-inches) — Calculated D_P = in

G) Rectangular Notch Width — Calculated W_N = 8.8 in

6. Trickle Channel

A) Type of Trickle Channel

Choose One
- ◉ Concrete
- ○ Soft Bottom

F) Slope of Trickle Channel — S = 0.0050 ft / ft

7. Micropool and Outlet Structure

A) Depth of Micropool (2.5-feet minimum) — D_M = 2.5 ft

B) Surface Area of Micropool (10 ft^2 minimum) — A_M = 160 sq ft

C) Outlet Type

Choose One
- ◉ Orifice Plate
- ○ Other (Describe):

D) Depth of Design Volume (EURV or 1.2 WQCV) Based on the Design Concept Chosen Under 1.E. — H = 2.50 feet

E) Volume to Drain Over Prescribed Time — WQCV = 0.610 ac-ft

F) Drain Time (T_D for WQCV= 40 hours; Max T_D for EURV= 72 hours) — T_D = 40 hours

G) Recommended Maximum Outlet Area per Row, (A_o) — A_o = 1.41 square inches

H) Orifice Dimensions:
- i) Circular Orifice Diameter or — $D_{orifice}$ = 5/8 inches
- ii) Width of 2" High Rectangular Orifice — $W_{orifice}$ = inches

I) Number of Columns — n_c = 1 number

J) Actual Design Outlet Area per Row (A_o) — A_o = 1.35 square inches

K) Number of Rows (nr) — n_r = 7 number

L) Total Outlet Area (A_{ot}) — A_{ot} = 10.1 square inches

M) Depth of WQCV (H_{WQCV}) (Estimate using actual stage-area-volume relationship and V_{WQCV}) — H_{WQCV} = feet

N) Ensure Minimum 40 Hour Drain Time for WQCV — $T_{D\,WQCV}$ = hours

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

8. Initial Surcharge Volume

A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches) — D_{IS} = 6.0 in

B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV) — V_{IS} = 79.7 cu ft

C) Initial Surcharge Provided Above Micropool — V_s = 80.0 cu ft

9. Trash Rack

A) Type of Water Quality Orifice Used

Choose One
- (●) Circular (up to 2" diameter)
- ( ) Rectangular (2" high)

B) Water Quality Screen Open Area: $A_t = 38.5*(e^{-0.095D})*A_{ot}$ — A_t = 345 square inches

C) For 2", or Smaller, **Circular Opening** (See Fact Sheet T-12):

i) Width of Water Quality Screen and Concrete Opening ($W_{opening}$) — $W_{opening}$ = 12.0 inches

ii) Height of Water Quality Screen (H_{TR}) — H_{TR} = 58.0 inches

iii) Type of Screen, Describe if "Other"

Choose One
- (●) S.S. Well Screen with 60% Open Area*
- ( ) Other (Describe):

D) For 2" High **Rectangular Opening**:

i) Width of Rectangular Opening ($W_{orifice}$) — W = _____ inches

ii) Width of Water Quality Screen Opening ($W_{opening}$) — $W_{opening}$ = _____ ft

iii) Height of Water Quality Screen (H_{TR}) — H_{TR} = _____ ft

iv) Type of Screen, Describe if "Other"

Choose One
- ( ) Aluminum Amico-Klemp SR Series (or equal)
- ( ) Other (Describe):

v) Cross-bar Spacing — _____ inches

vi) Minimum Bearing Bar Size

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Kent Rockwell
Company: Rockwell Consulting
Date: September 21, 2016
Project: Broadmoor View West Filings 1 and 2
Location:

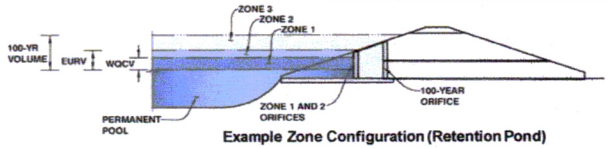
10. Overflow Embankment A) Describe embankment protection for 100-year and greater overtopping: B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z_E = _____ ft / ft
11. Vegetation	Choose One ○ Irrigated ○ Not Irrigated
12. Access A) Describe Sediment Removal Procedures	

Notes:

Detention Basin Outlet Structure Design

Project: Broadmoor View at Spring Creek West Filing 1 and 2

Basin ID: Broadmoor View at Spring Creek West Filing 1 and 2



Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.38	0.610	Orifice Plate
Zone 2 (EURV)	4.46	1.175	Orifice Plate
Zone 3 (100-year)	6.74	1.522	Weir&Pipe (Restrict)
		3.308	Total

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

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

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

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

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	4.18	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	16.70	inches
Orifice Plate: Orifice Area per Row =	3.66	sq. inches (use rectangular openings)

Calculated Parameters for Plate

WQ Orifice Area per Row =	2.542E-02	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

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

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.39	2.79					
Orifice Area (sq. inches)	3.66	3.66	3.66					

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

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	4.18	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	5.00	N/A	feet
Overflow Weir Slope =	4.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	7.00	N/A	feet
Overflow Grate Open Area % =	70%	N/A	%, grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	5.93	N/A	feet
Over Flow Weir Slope Length =	7.22	N/A	feet
Grate Open Area / 100-yr Orifice Area =	6.71	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	25.25	N/A	ft^2
Overflow Grate Open Area w/ Debris =	12.63	N/A	ft^2

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.50	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	30.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	21.50		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	3.76	N/A	ft^2
Outlet Orifice Centroid =	1.00	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	2.02	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.60	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	44.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

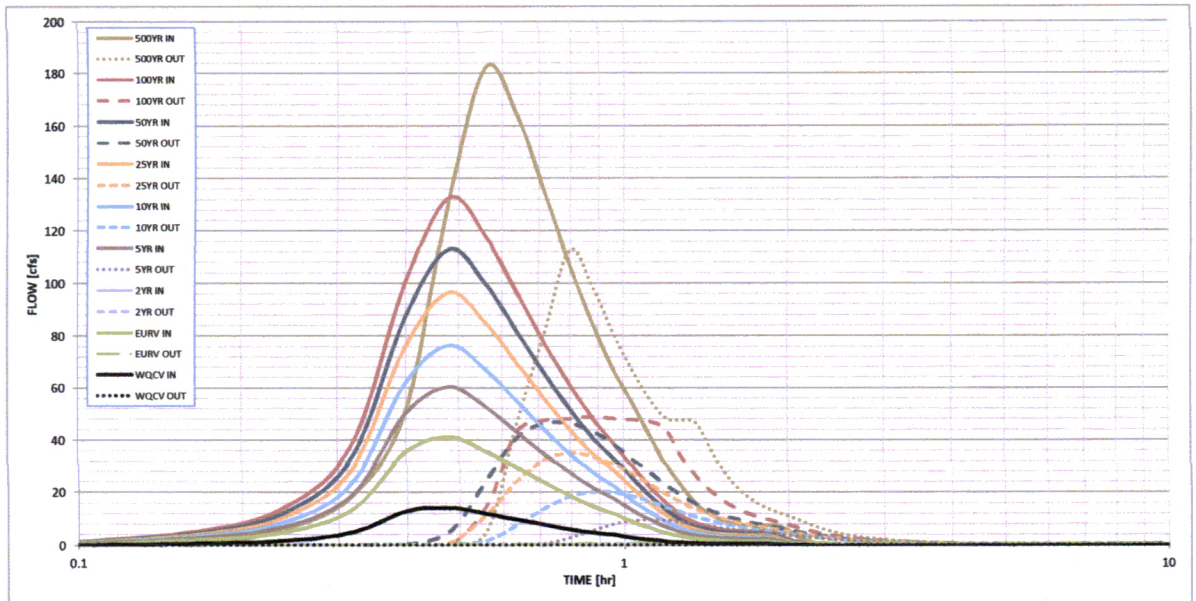
Calculated Parameters for Spillway

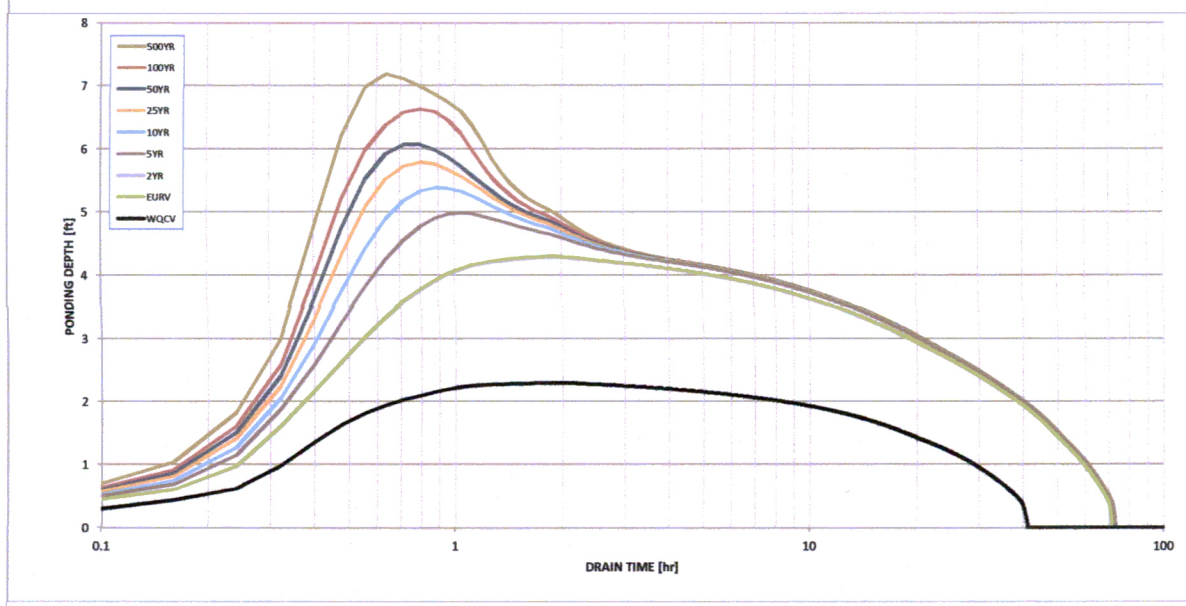
Spillway Design Flow Depth=	0.95	feet
Stage at Top of Freeboard =	8.55	feet
Basin Area at Top of Freeboard =	0.48	acres

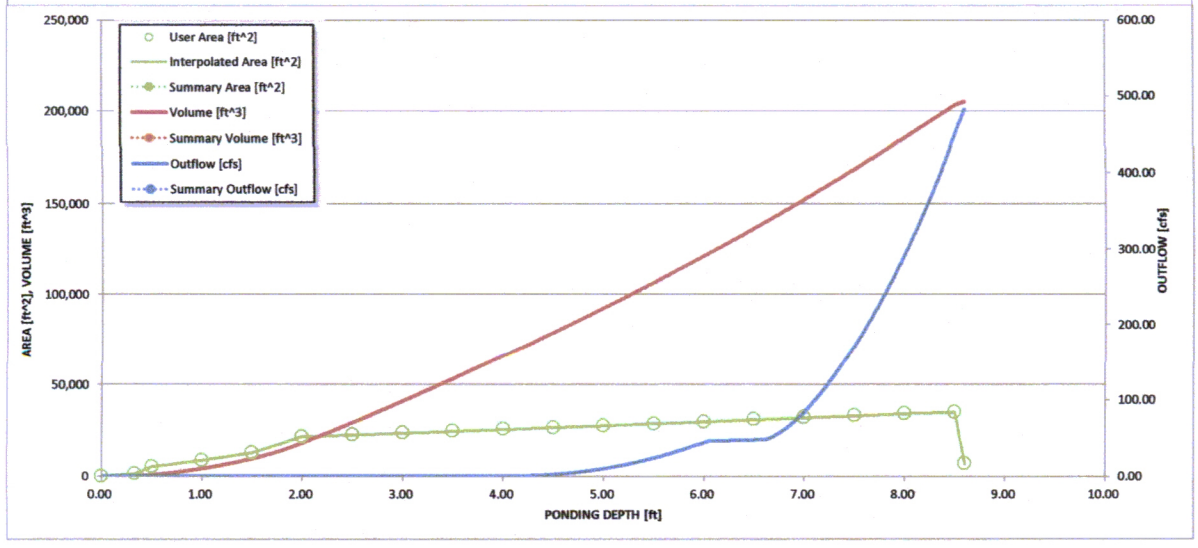
Routed Hydrograph Results

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	3.29
Calculated Runoff Volume (acre-ft) =	0.610	1.786	1.772	2.604	3.288	4.142	4.841	5.687	7.812
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.610	1.786	1.772	2.605	3.289	4.143	4.842	5.687	7.812
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.02	0.34	0.57	1.07	1.35	1.69	2.35
Predevelopment Peak Q (cfs) =	0.0	0.0	0.5	10.6	17.7	33.2	42.0	52.4	72.9
Peak Inflow Q (cfs) =	14.2	41.3	41.0	60.4	76.4	96.5	112.9	132.7	182.4
Peak Outflow Q (cfs) =	0.3	1.0	0.9	9.8	20.2	35.0	46.4	49.0	112.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.9	1.1	1.1	1.1	0.9	1.5
Structure Controlling Flow =	Plate	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Outlet Plate 1	Spillway	Spillway
Max Velocity through Grate 1 (fps) =	N/A	0.01	0.01	0.4	0.8	1.4	1.8	1.9	2.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	64	64	63	61	58	56	54	50
Time to Drain 99% of Inflow Volume (hours) =	40	68	68	69	68	67	66	65	63
Maximum Ponding Depth (ft) =	2.29	4.30	4.29	4.99	5.39	5.79	6.06	6.63	7.19
Area at Maximum Ponding Depth (acres) =	0.51	0.60	0.60	0.64	0.66	0.68	0.69	0.72	0.75
Maximum Volume Stored (acre-ft) =	0.568	1.689	1.677	2.111	2.370	2.636	2.828	3.222	3.639

Detention Basin Outlet Structure Design



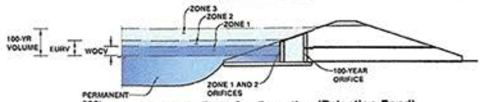




DETENTION BASIN STAGE-STORAGE TABLE BUILDER

Project: Broadmoor View West At Spring Creek Filings 1 and 2

Basin ID:



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB			
Watershed Area =	31.00	acres		
Watershed Length =	1,750	ft		
Watershed Slope =	0.035	ft/ft		
Watershed Imperviousness =	60.00%	percent		
Percentage Hydrologic Soil Group A =	0.0%	percent		
Percentage Hydrologic Soil Group B =	0.0%	percent		
Percentage Hydrologic Soil Groups C/D =	100.0%	percent		
Desired WQCV Drain Time =	40.0	hours		
Location for 1-hr Rainfall Depths =	UDFCD Default			
Water Quality Capture Volume (WQCV) =	0.610	acre-feet	Optional User Input 1-hr Precipitation	
Excess Urban Runoff Volume (EURV) =	1.786	acre-feet		
2-yr Runoff Volume (P1 = 1.19 in.) =	1.772	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	2.604	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	3.288	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	4.142	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	4.841	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	5.687	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.29 in.) =	7.812	acre-feet	3.29	inches
Approximate 2-yr Detention Volume =	1.679	acre-feet		
Approximate 5-yr Detention Volume =	2.179	acre-feet		
Approximate 10-yr Detention Volume =	2.343	acre-feet		
Approximate 25-yr Detention Volume =	2.508	acre-feet		
Approximate 50-yr Detention Volume =	2.841	acre-feet		
Approximate 100-yr Detention Volume =	3.308	acre-feet		

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.610	acre-feet
Zone 2 Volume (EURV - Zone 1) =	1.175	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.522	acre-feet
Total Detention Basin Volume =	3.308	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Micropool	--	0.00	--	--	--	20	0.000		
73.5	--	0.33	--	--	--	1,200	0.028	189	0.004
74	--	0.50	--	--	--	5,233	0.120	697	0.016
74.5	--	1.00	--	--	--	8,744	0.201	4,155	0.095
75	--	1.50	--	--	--	12,932	0.297	9,532	0.219
75.5	--	2.00	--	--	--	21,773	0.500	18,120	0.416
76	--	2.50	--	--	--	22,725	0.522	29,462	0.676
76.5	--	3.00	--	--	--	23,695	0.544	41,067	0.943
77	--	3.50	--	--	--	24,680	0.567	53,161	1.220
77.5	--	4.00	--	--	--	25,726	0.591	65,762	1.510
78	--	4.50	--	--	--	26,754	0.614	78,882	1.811
78.5	--	5.00	--	--	--	27,798	0.638	92,520	2.124
79	--	5.50	--	--	--	28,856	0.662	106,684	2.449
79.5	--	6.00	--	--	--	29,902	0.686	121,373	2.786
80	--	6.50	--	--	--	30,989	0.711	136,596	3.136
80.5	--	7.00	--	--	--	32,090	0.737	152,366	3.498
81	--	7.50	--	--	--	33,107	0.760	168,665	3.872
81.5	--	8.00	--	--	--	34,284	0.787	185,513	4.259
82	--	8.50	--	--	--	35,102	0.806	202,859	4.657
82.1	--	8.60	--	--	--	7,000	0.161	204,962	4.705
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1" = 100'

0 25 50 100 200

Scale in Feet

HISTORIC DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
A	3.06	2.5	6.8
B	3.32	2.6	7.0
C	3.79	3.9	10.4
D	0.51	0.8	2.1
E	9.88	7.1	18.9
F	9.13	7.7	20.5
G	2.24	2.2	6.0
DP-H1	31.93	22.9	61.2

LEGEND

- 6450 — EXISTING CONTOURS
- HISTORIC BASINS
- DIRECTION OF FLOW
- *A* — DRAINAGE BASIN

EXHIBIT 1

FILE: 15006grd11-3-15.DWG 7/1/16

ROCKWELL CONSULTING, Inc.
ENGINEERING • SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 • FAX (719) 475-9223

BROADMOOR VIEW AT SPRING CREEK WEST FILINGS NO. 1 AND 2

TITLE : HISTORIC DRAINAGE PLAN

SCALE : 1"=100'	DRAWN BY : KDR	15-006
DATE : 7/1/16	CHECKED BY : KDR	JOB NO.

DEVELOPED DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
1	0.80	2.7	5.6
2A	0.64	2.1	4.4
2B	0.48	1.7	3.4
3	0.57	1.8	3.6
4	0.87	3.0	6.0
5	1.57	5.1	10.4
6A	0.58	2.1	4.2
6B	0.67	2.4	4.9
7	0.64	2.2	4.6
8	1.36	4.6	9.3
9	2.67	8.1	16.5
10	0.98	3.2	6.6
11	2.08	6.7	13.6
12	0.77	2.6	5.3
13A	0.43	1.7	3.5
13B	0.47	1.7	3.4
14	0.87	3.0	6.2
15	0.29	1.1	3.1
16	0.63	2.3	4.6
17	1.67	6.1	12.2
18	2.48	9.8	19.1
19	2.62	4.9	10.9
OS-1	1.83	4.2	8.7
OS-2	0.74	2.6	5.2
OS-3	2.21	5.6	11.5
OS-4	1.10	2.8	5.6
OS-5	2.55	9.2	18.5
DP#1A	3.27	8.1	16.6
DP#1B	4.01	9.8	20.1
DP#1C	6.70	16.2	32.0
DP#2	7.45	22.7	45.9
DP#3	8.78	19.1	37.9
DP#4	13.36	38.6	78.4
DP#5	10.71	22.3	44.7
DP#6	14.13	41.0	83.1
DP#7	25.90	56.1	113.2
DP#8	31.00	65.3	132.1

1" = 60'

0 15 30 60 120

Scale in Feet

EXHIBIT 2-SHEET 1

FILE: 15006grd11-3-15.DWG 7/25/16

ROCKWELL CONSULTING, Inc.

ENGINEERING • SURVEYING
1955 N. UNION BLVD., SUITE 200
COLORADO SPRINGS, CO 80909
(719) 475-2575 • FAX (719) 475-9223

BROADMOOR VIEW AT SPRING CREEK WEST FILINGS NO. 1 AND 2

TITLE : DEVELOPED DRAINAGE PLAN

SCALE :	1"=60'	DRAWN BY :	KDR	15-006
DATE :	9/1/16	CHECKED BY :	KDR	JOB NO.

POND TRICKLE CHANNEL, FOREBAY AND OUTFALL STRUCTURE TO BE MAINTAINED BY THE HOA

PRO. FULL SECTRUM POND OUTFALL STRUCTURE

TRICKLE CHANNEL

HWY 24 OFF RAMP

GRAND OVERLOOK STREET (52' ROW)

DERBYSHIRE STREET (52' ROW)

OVERLOOK STREET (52' ROW)

LITTLE OVERLOOK STREET (52' ROW)

ABBINGTON STREET (52' ROW)

HANCOCK EXPRESSWAY

MONTEREY ROAD

PRIVATE ALLEY TRACT C

FILING NO. 1

FILING NO. 2

PUBLIC UTILITY EASEMENT RECEPTION NO. 202173776

PUBLIC UTILITY EASEMENT REC. NO. 200074465

FOREBAY

POND ACCESS ROAD

DP#1A
DP#1B
DP#1C
DP#2
DP#3
DP#4
DP#5
DP#6
DP#7
DP#8

OS-1
OS-2
OS-3
OS-5

PRO. 18" RCP
PRO. 24" RCP
PRO. 30" RCP
PRO. 36" RCP
PRO. ENERGY DISSIPATOR

DEVELOPED DRAINAGE BASIN TABLE

BASIN	AREA (Ac.)	Q_5 (CFS)	Q_{100} (CFS)
1	0.80	2.7	5.6
2A	0.64	2.1	4.4
2B	0.48	1.7	3.4
3	0.57	1.8	3.6
4	0.87	3.0	6.0
5	1.57	5.1	10.4
6A	0.58	2.1	4.2
6B	0.67	2.4	4.9
7	0.64	2.2	4.6
8	1.36	4.6	9.3
9	2.67	8.1	16.5
10	0.98	3.2	6.6
11	2.08	6.7	13.6
12	0.77	2.6	5.3
13A	0.43	1.7	3.5
13B	0.47	1.7	3.4
14	0.87	3.0	6.2
15	0.29	1.1	3.1
16	0.63	2.3	4.6
17	1.67	6.1	12.2
18	2.48	9.8	19.1
19	2.62	4.9	10.9
OS-1	1.83	4.2	8.7
OS-2	0.74	2.6	5.2
OS-3	2.21	5.6	11.5
OS-4	1.10	2.8	5.6
OS-5	2.55	9.2	18.5
DP#1A	3.27	8.1	16.6
DP#1B	4.01	9.8	20.1
DP#1C	6.70	16.2	32.0
DP#2	7.45	22.7	45.9
DP#3	8.78	19.1	37.9
DP#4	13.36	38.6	78.4
DP#5	10.71	22.3	44.7
DP#6	14.13	41.0	83.1
DP#7	25.90	56.1	113.2
DP#8	31.00	65.3	132.1

LEGEND

- EXISTING 1' CONTOUR
- EXISTING 10' CONTOUR (5450)
- PROPOSED 1' CONTOUR
- PROPOSED 10' CONTOUR (5450)
- DEVELOPED BASINS
- DIRECTION OF FLOW
- PROPOSED INLET & PIPE
- X — DRAINAGE BASIN
- DP#1 — DESIGN POINT

1" = 60'

0 15 30 60 120

Scale in Feet

EXHIBIT 2 –SHEET 2

FILE: 15006grd11-3-15.DWG 7/1/16

ROCKWELL CONSULTING, Inc.

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BROADMOOR VIEW AT SPRING CREEK WEST FILINGS NO. 1 AND 2

TITLE : DEVELOPED DRAINAGE PLAN

SCALE : 1"=60'	DRAWN BY : KDR	15-006
DATE : 9/1/16	CHECKED BY : KDR	JOB NO.