



**MASTER DEVELOPMENT DRAINAGE PLAN
FOR
BRADLEY HEIGHTS**

JANUARY 2015

Prepared for:
THE CASE COMPANY
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Job no. 2266.00



MASTER DEVELOPMENT DRAINAGE PLAN (MDDP) FOR BRADLEY HEIGHTS

ENGINEER'S STATEMENT:

The attached drainage plan and report 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 criteria established for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

CERTIFICATION STATEMENT:

This report and plan is for the Master Development Drainage Plan for Bradley Heights was prepared by me (or under my direct supervision) in accordance with the provisions of City of Colorado Springs Drainage Criteria Manual Drainage Design and Technical Criteria for the owners thereof. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others.



Kyle R Campbell, Colorado P.E. #29794

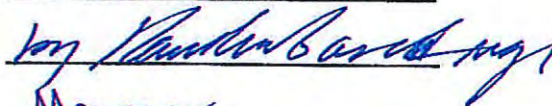
1-21-15
Date

DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

The Case Company hereby certifies that the drainage facilities for Bradley Heights shall be constructed according to the design presented in this report. I 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 Bradley Heights, guarantee that final drainage design review will absolve the Case Company 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.

Business Name: c/o Marksheffel-Woodmen Investments, LLC
THE CASE COMPANY

By: 
Title: Manager

Address: 102 EAST PIKES PEAK AVE ST 200
COLORADO SPRINGS CO 80903

CITY OF COLORADO SPRINGS ONLY:

Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001. As amended.


For the City Engineer

2/12/15
Date



MASTER DEVELOPMENT DRAINAGE PLAN (MDDP) FOR BRADLEY HEIGHTS

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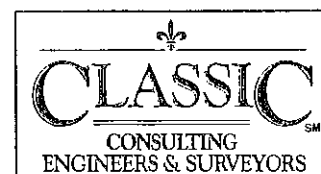
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U.S.A. CORPS OF ENGINEERS LETTER



MASTER DEVELOPMENT DRAINAGE PLAN (MDDP) FOR BRADLEY HEIGHTS

PURPOSE

The intent of the owner/developer is to develop the Bradley Heights site. The purpose of this Master Development Drainage Plan, as part of the Bradley Heights Master Plan, is to identify major drainage features and facilities and to estimate peak rates of stormwater runoff, from on-site and off-site sources. Also the purpose is to outline the necessary improvements to safely route developed storm water runoff to adequate outfall facilities. The drainage improvements proposed in this report are preliminary in nature and final drainage reports are required upon any development within the Bradley Heights site that detail the 'to be constructed' drainage systems and detention ponds.

GENERAL DESCRIPTION

Bradley Heights is a 529.5-acre site located within east half of Section 9, west half of Section 10 and north half of Section 15 Township 15 South, Range 65 West of the Sixth Principal Meridian in the City of Colorado Springs, County of El Paso, State of Colorado. The site is bounded on the north by existing Bradley Road, to the east by unplatted land and west by Marksheffel Road, and to the south by Peaceful Ridge at Fountain Valley Subdivision in El Paso County. This is a PUD development which will consist of single-family residential, multi-family residential, commercial, parks, school sites and Business areas.

Soil types considered within the proposed site boundary as determined by the "Natural Resources Conservation Service," Web Soil Survey El Paso County Area, Colorado version 6 August 2008 consist of Razor-Midway complex, Hydrologic Group "C", Nelson-Tassel fine sandy loams, Hydrologic Group "C", Stoneham sandy loam Hydrologic Group "B", and Kim loam Hydrologic Group "B" as prepared by the Soil Conservation Service. The soils throughout the entire tributary area to the proposed site consist of those within groups A, B, C, and a very small amount within soil group D (see map in Appendix). CN values were derived for each basin based upon the corresponding soil types of the City of Colorado Springs Drainage Criteria Manual (See Calculations in Appendix).

EXISTING DRAINAGE CONDITIONS

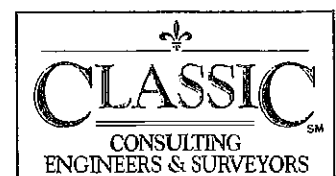
The proposed site is located within the Jimmy Camp Creek Drainage Basin. The majority of the site in its existing condition consists of undeveloped grasslands typical of those areas located along the eastern edge of Colorado Springs. Existing grades on the site have slopes that typically range from 1% to 10%. Runoff reaching the site is limited to those flows produced to the north of the site, as grading constraints prevent



offsite flows from entering the site from both offsite areas to the east and west. The majority of the site drains to the east to the existing Marksheffel Tributary that runs adjacent to Marksheffel Road and into the existing Colorado Centre regional detention pond located just outside of the Bradley Heights property.

The entire off-site area tributary to the proposed site is within the Jimmy Camp Creek Drainage Basin, and more specifically drains to the Marksheffel Tributary Channel thru the site. Currently, Kiowa Engineering, LLC, is completing the Drainage Basin Planning Study (D.B.P.S.) for the Jimmy Camp Creek Basin. Kiowa Engineering has provided us (Classic Consulting) with their computer modeling and basin information for the Marksheffel Tributary of the Jimmy Camp Creek Basin. This information has been incorporated into our existing and proposed drainage analysis in order to accurately quantify the storm water within the existing Marksheffel Tributary Channel thru the site and into the existing regional detention facility. The difference in runoff quantities between the D.B.P.S. in progress and this M.D.D.P. are due to the different computer programs being used, however the values at corresponding points are very comparable. Kiowa is using HEC-HMS modeling (SCS method) with 'areal' rainfall adjustment due to the size of its study for the D.B.P.S.; whereas, we are using Bentley PondPack V8i (SCS method) with the standard rainfall per the City Drainage Criteria Manual. Generally, the values found within this M.D.D.P. are higher than those of the D.B.P.S., providing more conservative estimates on conveyance methods for the proposed site.

Design Points M5 thru M11 matches those from the Drainage Basin Planning Study for Jimmy Camp Creek currently in progress by Kiowa Engineering. All of the SCS Curve numbers, basin areas, lag time of concentrations, and reach information matches that of the D.B.P.S. The PondPack program used for the SCS model within this report quantifies runoff based upon an inputted time of concentration, not lag time of concentration. Therefore, the lag time of concentrations from the D.B.P.S. have been converted to the normal time of concentration ($T_c = 1.6667 * (\text{lag } T_c)$). An Existing Off-site Drainage Map is included in the Appendix of this report that shows these basins to the north tributary to the proposed site (as defined in the D.B.P.S.). Below is a table that compares the runoff quantities calculated with this M.D.D.P. analysis to the D.B.P.S. quantities calculated by Kiowa Engineering for Design Points M5 thru M11.



Design Point	MDDP (CLASSIC)		DBPS (KIOWA)	
	Q 10 Yr.	Q 100 Yr.	Q 10 Yr.	Q 100 Yr.
M5	67.3	178.8	57.4	178.9
M6	467.9	1,114.3	404.7	1,065.0
M7	138.7	343.9	104.1	297.7
M8	362.2	862.5	274.0	709.1
M9	90.5	294.9	81.3	274.5
M10	54.3	168.6	60.7	188.6
M11	6.2	32.0	4.2	29.9

Design Point E1 ($Q_5 = 110.34$ cfs, $Q_{100} = 474.03$ cfs) consists of off-site flows from Basins M-4 ($Q_5 = 58.92$ cfs, $Q_{100} = 190.04$ cfs) and M-7 ($Q_5 = 31.57$ cfs, $Q_{100} = 138.68$ cfs) as well as those from off-site Design Point M5, north of Bradley Road. A portion of this off-site tributary area has been developed (Foreign Trade Zone development), but the majority is currently undeveloped. This storm water is conveyed to two existing drainage swales that combine just north of Bradley Road at an existing (2) cell 31.2' x 6.3' (width x height) reinforced concrete box culvert in good condition. This culvert is north of the proposed site boundary and has more than adequate capacity to handle this storm water (capacity approximately 4,300 cfs). This runoff passes through the RCB to the south and drains into the Marksheffel Tributary Channel north of the property boundary line (Design Point E3).

Design Point E2 ($Q_5 = 299.67$ cfs, $Q_{100} = 1,328.17$ cfs) consists of off-site flows from Basins M-8 ($Q_5 = 64.75$ cfs, $Q_{100} = 184.02$ cfs) and M-9 ($Q_5 = 27.13$ cfs, $Q_{100} = 92.28$ cfs) as well as those from off-site Design Point M6, north of Bradley Road. A portion of Basin M9 has been developed into single family residential, this development as with any others in place at the time of this report, is accounted for in the corresponding curve numbers and basin data. These off-site flows are routed through another reinforced concrete box culvert in good condition (44.9' x 9.2', width x height (3) cell) and drain south into the Marksheffel Tributary Channel within the proposed site. This box culvert is also more than adequately sized to convey this storm water (capacity approximately 10,000 cfs). This runoff passes through the RCB to the south and drains into the Marksheffel Tributary Channel north of the property boundary line (Design Point E3).

Design Point E3 ($Q_5 = 372.13$ cfs, $Q_{100} = 1,628.44$ cfs) consists of flows from Design Points E1 and E2 and Basin OS-1 ($Q_5 = 62.85$ cfs, $Q_{100} = 134.14$ cfs). Basin OS-1 is 33.48 acres and consists of approximately 11 acres of roadway and the roadside ditch along the south side of Bradley Road. It also includes the undeveloped



land at the intersection of Bradley Road and Marksheffel Road and the undeveloped land west of the site, south of Bradley Road. This runoff enters the proposed site boundary and continues south within the existing, natural Marksheffel Tributary Channel, eventually into the existing Colorado Centre regional detention pond at Design Point E5.

Design Point E4 ($Q_5 = 389.77$ cfs, $Q_{100} = 1,691.97$ cfs) consists of runoff from Design Point E3 and Basin EX-1 ($Q_5 = 49.23$ cfs, $Q_{100} = 169.71$ cfs). Basin EX-1 is 111.17 acres of undeveloped area within the Bradley Heights proposed development. Storm water sheet flows east through this basin into the Marksheffel Tributary Channel where the combined flow continues south toward the existing regional detention facility.

Design Point E5 ($Q_5 = 403.83$ cfs, $Q_{100} = 1,738.05$ cfs) consists of runoff from Design Point E4 and Basin EX-4 ($Q_5 = 70.89$ cfs, $Q_{100} = 245.59$ cfs). Basin EX-4 is 131.78 acres of undeveloped land within the proposed site that drains to the east, directly into the Marksheffel Tributary Channel that runs through the site. This design point is the entry point into the existing regional detention facility from the Tributary Channel.

Existing Colorado Centre Regional Detention Facility ($Q_5 = 412.39$ cfs, $Q_{100} = 1,764.80$ cfs) consists of stormwater from Design Point E5, Basin EX-4A, and Basin OS-5. Basin EX-4A ($Q_5 = 65.86$ cfs, $Q_{100} = 200.29$ cfs) is 76.47 acres of undeveloped land within the proposed site that drains directly into the detention pond. Basin OS-5 is the area of the pond itself. In the existing conditions, this Colorado Centre regional detention facility releases $Q_2 = 193.12$ cfs, $Q_5 = 398.16$ cfs and $Q_{100} = 1,147.02$ cfs through the existing (5) cell box culvert and concrete weir. Each cell of the box culvert is 6.0' x 3.0' (width x height) and the weir measures 38.0' wide at elevation 5754.50. This weir structure was constructed with concrete side walls that are 4.8' in height, above elevation 5754.50.

The top of berm elevation is 5761.50 with the invert of the box culvert at 5746.50. This creates an embankment of 15.0' tall. Also, this pond has a capacity (to top of berm) of more than 100 acre-feet, making this pond a state jurisdictional facility. Any improvements made to this facility will require the State of Colorado approval as well as the City of Colorado Springs. This facility does not provide water quality measures as required by the City of Colorado Springs. Pictures of the existing outlet structure are included in the Appendix of this report.



This existing detention facility is not within the proposed site boundary and is owned and maintained by the Colorado Centre Metropolitan District. This pond was originally designed to detain runoff from a majority of the Colorado Centre District (See map in appendix that delineates this area). However since the time of the design for this existing facility, which was initiated within the County, the City of Colorado Springs has changed its pond design criteria; more specifically, the City now requires water quality measures in these detention facilities. Also, the Drainage Basin Planning Study requires all detention facilities within the Jimmy Camp Creek Basin to be full-spectrum facilities. This is a term developed by the Urban Drainage and Flood Control District which requires an estimated 20% - 30% more overall pond volume than a pond with no water quality control measures. See the 'Detention Facilities' Section on Page 14 for more information about this existing facility and the revisions necessary to make this pond a full-spectrum detention facility.

Design Point E6 & Marksheffel Tributary Out ($Q_5 = 399.69$ cfs, $Q_{100} = 1,149.69$ cfs) consists of the existing release from the regional detention facility and the runoff from Basin OS-4, 20.09 acres of off-site undeveloped land that sheet flows to this location. This is the total flow out of the site within this Marksheffel Tributary Channel corridor to Jimmy Camp Creek. At this location, there are two existing 5' diameter CMP culverts that pass this stormwater underneath Marksheffel Road and eventually into Jimmy Camp Creek. These culverts are not adequately sized to convey this existing 100-year storm event. With the future expansion and re-alignment of Marksheffel Road, these culverts are to be upsized in order to fully accommodate the developed 100-yr storm water release without any backwater ponding effects.

Design Point E8 ($Q_5 = 4.72$ cfs, $Q_{100} = 14.43$ cfs) consists of storm runoff from Basin EX-3, 6.11 acres of undeveloped area within the Bradley Heights proposed development along the western property line. This runoff sheet flows west to an off-site existing natural channel. With the proposed development of Bradley Heights, runoff reaching this point shall be at or below this existing value.

Design Point E9 ($Q_5 = 36.98$ cfs, $Q_{100} = 142.30$ cfs) consists of flows from Basin EX-2, 91.09 acres of undeveloped area located at the south-west corner of the Bradley Heights site. This area produces storm runoff that travels south within an existing natural channel, continuing onto unplatted land. Any future development will be limited to releasing at or below this existing runoff amount.

Design Point E10 ($Q_5 = 83.97$ cfs, $Q_{100} = 267.42$ cfs) consists of storm runoff from Basin EX-5, Basin EX-6, and Basin OS-2. Basin EX-5 and EX-6 are 25.23 and 62.10 acres respectively of undeveloped land within



the proposed site boundary. Basin OS-2 is 32.75 acres of undeveloped land to the west of the Bradley Heights property. This OS-2 area drains onto the proposed site to an existing natural channel that flows toward the south. Runoff from all three of these basins combine at DP E10 and continue south through unplatted land. There is a small existing stock pond used for cattle grazing purposes within Basin EX-6 that will be removed with any development of this land and was not used in the modeling to determine the existing southerly flow rates. Any future development will be limited to releasing at or below existing run off amount.

Design Point E11 ($Q_5 = 22.63$ cfs, $Q_{100} = 72.63$ cfs) consists of storm runoff from Basin EX-7, 35.97 acres of undeveloped land at the south-east corner of the proposed site. This basin is located along the southern boundary of the site along the city/county border. This historic runoff continues south-east in a natural swale to an existing culvert crossing of existing Marksheffel Drive. This culvert conveys the flow to the east, eventually into Jimmy Camp Creek. A future subdivision is planned for the site directly south over this existing swale (Peaceful Ridge at Fountain Valley Subdivision). Per the approved report for this future subdivision, a 48" RCP storm sewer will intercept the allowable flows ($Q_5 = 30.3$ cfs, $Q_{100} = 78.2$ cfs) and convey them through the subdivision into an adequate outfall across Marksheffel. Detention will be required for developed flows greater than the allowable release.

Design Point E12 ($Q_5 = 11.54$ cfs, $Q_{100} = 36.20$ cfs) consists of flows from Basin OS-3, 15.85 acres of undeveloped area located outside of the site boundary to the south-east, but west of Marksheffel Road. This basin produces runoff that drains south and east toward existing Marksheffel Road. Any development on the Bradley Heights site is to maintain these historic runoff rates to this point.

PROPOSED DRAINAGE CONDITIONS

Bradley Heights is a proposed PUD development which will consist of single-family residential, multi-family residential, commercial, parks, a school site and Business areas. The existing Colorado Centre regional detention facility is to be made into a full spectrum water quality and detention facility with the development of Bradley Heights. By revising the outlet structure to achieve this requirement, the existing pond no longer has the volume necessary to detain all of Colorado Centre's developed runoff and release at a rate at or below existing conditions. For the purposes of this analysis, a specific area of Colorado Centre north of Bradley Road is modeled as developed, while the remaining area is required to provide its own detention/storm water quality and release at or below historic rates to downstream facilities. An exhibit is included in the Appendix that shows the areas considered developed for this analysis. As development occurs within Colorado Centre,



this pond will need to be continuously re-evaluated to determine the available volume, and therefore how much more developed area this pond is able to serve. The developer will be responsible for evaluation of the existing facility with each Development Plan submittal. See the 'Detention Facilities' section on Page 14 for more details. A Developed Conditions Drainage Map is also included in the Appendix of this report that depicts the basins, pipe runs, and design points that are described below.

Basins M4-DEV, M5-DEV, & M8-DEV

The future development within these basins of Colorado Centre are planned to be Industrial land use. CN values for this land use and soil type were assigned to these basins per the Drainage Criteria Manual Table 5-5. However, it is anticipated that these developments will be of less imperviousness than the average industrial use site. Therefore the CN values of the planned developed basins north of Bradley Road have been decreased by four (approximately 12% less site imperviousness). As these developments take place, the estimated runoff amounts within this report shall be verified and the functionality of the detention pond shall remain intact. Adjustments to the allowable developable area tributary to this regional facility are to be made as upstream development occurs. The remainder of the off-site tributary basins to the north are modeled as 'existing' and are required to provide their own detention and storm water quality prior to release into downstream facilities.

Basin M9-DEV

The same reduction in assigned CN value occurs for this upstream Residential basin. Density of the future home lots within this basin are planned to be 8 DU/Ac., however with the incorporation of open space & park parcels this density will be less. Again, as final development within Basin M9 takes place, the runoff to the existing facility shall be monitored.

Design Point E1 ($Q_5 = 222.10$ cfs, $Q_{100} = 660.54$ cfs) consists of off-site 'historic' flows Basins M4-EX, M5-EX, M6-EX, and M7-EX. Also this point contains developed flows from the planned Colorado Centre developments within Basins M4-DEV, and M5-DEV. See Drainage Map and Hydrologic Calculations within the appendix of this report for the basin runoff results. This design point location corresponds exactly with the existing drainage conditions and the runoff is conveyed under Bradley Road via the existing large box culvert. This culvert has more than adequate capacity to convey this flow (approximately 4,300 cfs).

Design Point E2 ($Q_5 = 309.65$ cfs, $Q_{100} = 1,325.18$ cfs) consists of off-site flows from the existing tributary basins described within the Existing Conditions portion of the report. The only difference is the incorporation



of developed flows from the planned Colorado Centre developments within Basins M8-DEV and M9-DEV. This runoff is conveyed under Bradley Road and onto the proposed site via the existing (3) cell large box culvert (44.9' x 9.2', width x height). This box culvert is also more than adequately sized to convey this storm water (capacity approximately 10,000 cfs). The runoff continues south within the improved Marksheffel Tributary Channel toward the existing regional detention facility.

Design Point E3 ($Q_5 = 461.82$ cfs, $Q_{100} = 1,667.15$ cfs) consists of flows from Design Points E1 and E2 and Basin OS-1 ($Q_5 = 63.02$ cfs, $Q_{100} = 134.50$ cfs). Basin OS-1 is as described within the Existing Conditions portion of this report.

Design Point 4 ($Q_5 = 556.27$ cfs, $Q_{100} = 1,720.53$ cfs) consists of flows from Design Points E3 and Bradley Heights developed Basins 1-N, 2, 5A, 3468N and 5B. Basin 1-N ($Q_5 = 18.07$ cfs, $Q_{100} = 42.28$ cfs) is 13.16 acres of proposed residential land. Basin 2 ($Q_5 = 29.24$ cfs, $Q_{100} = 53.53$ cfs) is 10.75 acres of a planned business center (commercial) with surrounding roadways. Basin 5A ($Q_5 = 58.59$ cfs, $Q_{100} = 107.25$ cfs) is another planned business center parcel with surrounding roadway of 21.54 acres. Basin 3468N ($Q_5 = 60.83$ cfs, $Q_{100} = 141.87$ cfs) is 44.16 acres of proposed residential. A schematic storm sewer layout is included throughout the Bradley Heights proposed site basins. These storm pipes have been preliminarily sized at a minimum slope of 0.50% (included in Appendix of report and on Developed Drainage Map). Pipe C4 contains the developed flow from the previous described basins and is preliminarily sized as a 78" RCP. Final design will dictate any changes in pipe size. Basin 5B ($Q_5 = 23.11$ cfs, $Q_{100} = 52.78$ cfs) is conveyed to DP-4 via its own storm pipe C5 (estimated 42" RCP). This basin is 18.06 acres of planned single-family residential lots and surrounding roadway. All planned single-family development within Bradley Heights is 3.5 – 7.99 DU/Ac. density. The storm water at this location continues south within the improved Marksheffel Tributary Channel toward the existing regional detention facility.

Design Point 5 ($Q_5 = 632.14$ cfs, $Q_{100} = 1,771.82$ cfs) consists of flows from Design Points 4 and Bradley Heights developed Basins 3468S, 11-N, 12-N, 13-E, and 9AB. Basin 3468S ($Q_5 = 53.76$ cfs, $Q_{100} = 125.84$ cfs) is 39.16 acres of a planned residential with surrounding roadway. Basin 11-N ($Q_5 = 35.30$ cfs, $Q_{100} = 67.88$ cfs) is 14.23 acres of a planned multi-family use on the east side of the improved Marksheffel Tributary Channel corridor. All planned multi-family use within Bradley Heights is at a 12-20 DU/Ac. density. Basin 12-N is the northern portion of the improved Marksheffel Tributary Channel. Basin 13-E ($Q_5 = 19.52$ cfs, $Q_{100} = 45.68$ cfs) is 14.22 acres) of planned single-family development. Basin 9AB ($Q_5 = 36.36$ cfs, $Q_{100} =$



103.98 cfs) is 37.12 acres of school and park with incorporated roadways. This basin also includes a planned 5 acre park. Preliminary pipe sizes are provided on the drainage map that for each of these developed parcels. The outfall into the improved channel from these parcels is estimated to be another 72" RCP at 0.50% minimum. Final design to dictate this pipe size and slope and will be detailed within a site specific final drainage report for any development of these parcels.

Existing Colorado Centre Detention Facility

The total flow into this facility in the developed conditions is $Q_2 = 459.86$ cfs, $Q_5 = 739.86$, $Q_{10} = 1,126.01$ cfs and $Q_{100} = 2,029.97$ cfs. This flow into the pond comes from DP-5, and developed on-site Basins 11-S, 12-S, 9C-N, 9C-S, 16-N, and the detention pond area Basin DET. Basin 11-S ($Q_5 = 49.69$ cfs, $Q_{100} = 95.55$ cfs) is the south half of the multi-family parcel to the east of the improved channel corridor. Basin 12-S is the southern half of the channel corridor. Basin 9C-N ($Q_5 = 56.63$ cfs, $Q_{100} = 132.52$ cfs) is 41.45 acres of single-family residential just west of the pond. Basin 9C-S is also single-family residential and surrounding roadways of 29.90 acres in size ($Q_5 = 41.05$ cfs, $Q_{100} = 96.06$ cfs). Basin 16-N is a portion of the residential parcel (16.88 acres) located west of the parcel 9C subdivision. Flows from this basin are $Q_5 = 25.83$ cfs and $Q_{100} = 59.00$ cfs. As previously discussed, these flows into this facility represent a certain amount of development north of Bradley Road releasing un-detained developed flows into this channel corridor and to the pond. As development occurs within the tributary basin, continual re-analysis of this facility will need to take place in order to maintain these maximum flows into this facility. The developer will be responsible for evaluation of the existing facility with each Development Plan submittal.

The existing Colorado Centre regional detention facility is not required to be expanded with this specified maximum in-flow. The D.B.P.S. for Jimmy Camp Creek currently being completed by Kiowa Engineering, requires that all detention facilities within the basin be of full-spectrum design. Essentially this increases the required volume of water to be treated with a storm water quality outlet structure and is currently required by the City of Colorado Springs. The City of Colorado Springs has implemented this full-spectrum pond design and has provided a spreadsheet to determine the required volume to be treated with water quality measures. This volume is called the Extended Urban Runoff Volume (EURV), and the calculations for all the proposed detention facilities for this volume is included in the Appendix of this report.

The overall tributary developed area to this pond is 779.17 acres, including those basins designated as developed north of Bradley Road. Using the impervious values from the Drainage Criteria Manual, the



composite imperviousness of the tributary area is 61.48%. Calculating the soil distribution of this tributary area shows that 32.96% of soils are of Group 'B' designation, with the remaining 67.04% being of soils Group 'C'. The BMP spreadsheet calculates a required EURV of 53.158 acre-feet. This volume of water is to release from the pond by only small orifice slots on the face of a storm water quality outlet box. As mentioned in the Existing Conditions portion of the report, this existing pond currently has two outlet structures; one is the (5) cell box culvert located at the bottom of the pond (5746.50), the other is the 38.0' wide concrete/riprap weir structure at elevation 5754.50 (top of berm elevation is 5761.50). The outlet modifications required to meet this full spectrum detention and storm water quality volume will be to plug the entire existing box culvert and to install a 5.5' tall outlet box with rectangular orifice slots on the face of the box sized by the BMP spreadsheet to be 2" tall by 8.70" wide (15 rows, 4" center to center vertical spacing). This proposed box is to be closed on top with a 30" RCP outlet pipe. By plugging the existing box culvert, the volume of water to the existing 38.0' weir/spillway, the only remaining large outlet structure, is 59.02 acre-feet. This volume is greater than the required EURV, which occurs at approximately elevation 5754.11. With the top of the proposed box closed and the existing box culvert plugged, the majority of the release from this pond is through the existing 38.0' concrete and riprap weir structure at elevation 5754.50.

The following are the release rates of the existing Marksheffel Tributary Pond thru the orifice slots of the proposed outlet box and the existing weir structure.

$Q_2 = 24.16$ cfs @ elevation 5754.42 (entirely thru the outlet box orifice holes)
 $Q_5 = 125.75$ cfs @ elevation 5755.41 (depth of water thru weir is approximately 11")
 $Q_{10} = 379.52$ cfs @ elevation 5756.62 (depth of water thru weir is approximately 2.0")
 $Q_{100} = 1,153.73$ cfs @ elevation 5759.09 (depth of water thru weir is approximately 4.6")

As mentioned earlier, the weir structure has vertical concrete walls that measure 4.8' in height. Therefore, the existing weir structure is capable of conveying the 100-year fully developed runoff with no improvements necessary. The top of the berm elevation of the pond is 5761.50, giving 2.4' of freeboard above the 100-year water surface elevation. Further pond improvement details, including forebay, trickle channel and micro-pool, are to be provided in a future drainage report for such construction. Construction documents for all pond improvements to this facility are required to be approved by the City of Colorado Springs and the State of Colorado since this facility is of state jurisdictional size. Currently the Colorado Centre Metro District owns and maintains the pond, and will continue to maintain the channels and pond. Any future changes in ownership and maintenance will be discussed in final drainage report submittals.



Design Point 7 ($Q_5 = 126.28$ cfs, $Q_{100} = 1,156.32$ cfs) consists of the developed release from the regional Marksheffel Tributary detention facility and the runoff from Basin OS-4, 20.09 acres of off-site undeveloped land and existing Marksheffel Road that sheet flows to this location. At this location, there are two existing 5' diameter CMP culverts that pass this stormwater underneath Marksheffel Road and eventually into Jimmy Camp Creek. These culverts are not adequately sized to convey this 100-year storm event (capacity estimated at 520 cfs). With the future expansion of Marksheffel Road, these culverts are to be upsized in order to fully accommodate this developed 100-yr storm water without any backwater ponding effects. Culvert sizing and roadway drainage are to be detailed with a future drainage report for the roadway expansion. The developed 100-year event flow to this Marksheffel Tributary outfall is slightly higher than the existing discharge of 1,149.7 cfs, however the developed discharge to this point is less than historic in all other storm events (5 year historic is 400 cfs). This minor increase in only the 100-year storm (6 cfs) is negligible and will not cause any harm to downstream facilities.

Design Point 8 ($Q_5 = 11.54$ cfs, $Q_{100} = 36.20$ cfs) is identical in location and tributary area to that of Existing Design Point E12. See Existing Conditions for the basin description. Any re-alignment or expansion of Marksheffel Road through this off-site basin shall detail the necessary drainage improvements within a final drainage report for such construction.

Design Point 9 ($Q_5 = 36.98$ cfs, $Q_{100} = 142.30$ cfs) represents the maximum allowable outflow rates of proposed Detention Pond #1. This release rate corresponds with the existing runoff rate at this location quantified within the Existing Conditions portion of this report (DP E9). The developed runoff into proposed Pond #1 ($Q_5 = 140.82$ cfs, $Q_{100} = 301.75$ cfs) is from Basins 1-S, 7, 13-W, and ELEC. Basin 1-S ($Q_5 = 18.07$ cfs, $Q_{100} = 42.28$ cfs) is 13.16 acres of planned residential located toward the north-west corner of the Bradley Heights site. Basin 7 ($Q_5 = 48.93$ cfs, $Q_{100} = 95.69$ cfs) is 21.22 acres of multi-family land and surrounding roadway, north of Pond #1. Basin 13-W ($Q_5 = 34.15$ cfs, $Q_{100} = 79.90$ cfs) is 24.87 acres of single-family residential and Basin ELEC is a future electric substation for Colorado Springs Utilities, located directly west of Pond #1. See the Detention Facilities portion of this report for more details about this proposed pond.

Design Point 10 ($Q_5 = 83.97$ cfs, $Q_{100} = 267.42$ cfs) represents the maximum allowable release rates of proposed Detention Pond #2. This release rate corresponds with the existing runoff rate at this location quantified within the Existing Conditions portion of this report (DP E10). The developed runoff into proposed Pond #2 ($Q_5 = 129.25$ cfs, $Q_{100} = 322.22$ cfs) is from Basins 16-W, 14, and OS-2. Basin 16-W (Q_5



= 38.05 cfs, $Q_{100} = 89.68$ cfs) is 30.67 acres of single-family residential with a 5 acre park. Basin 14 ($Q_5 = 70.65$ cfs, $Q_{100} = 166.53$ cfs) is 56.95 acres of single-family residential north of Pond #2. Basin OS-2 is as described in the Existing Conditions portion and is tributary to the site and this facility. This restricted release continues south from the proposed site boundary in its natural channel corridor. Per the D.B.P.S. all detention facilities within Jimmy Camp Creek Basin are required to provide full-spectrum detention. See the Detention Facilities portion of this report for more details about all of the proposed detention ponds.

Design Point 11 ($Q_5 = 22.63$ cfs, $Q_{100} = 72.63$ cfs) represents the maximum allowable release rates of proposed Detention Pond #3. This release rate corresponds with the existing runoff rate at this location quantified within the Existing Conditions portion of this report (DP E11). The developed runoff into proposed Pond #3 (**$Q_5 = 73.01$ cfs, $Q_{100} = 151.49$ cfs**) is from Basins 16-E, and 17. Basin 16-E ($Q_5 = 24.99$ cfs, $Q_{100} = 58.47$ cfs) is 18.20 acres of single-family residential located along the south boundary line of the site. Basin 17 ($Q_5 = 50.51$ cfs, $Q_{100} = 98.27$ cfs) is 20.98 acres of multi-family and surrounding roadways. The outfall from this pond is to be directed south into the existing natural swale and culvert crossing of Marksheffel Road. A future Peaceful Ridge at Fountain Creek subdivision is planned for this parcel directly south of the site and a final drainage report has been approved. Per the Final Drainage Report for Peaceful Ridge at Fountain Valley these flows will be intercepted by a 48" RCP storm sewer that will cross Marksheffel Road and into Jimmy Camp Creek. Per the FDR this 48" RCP will accept ($Q_5 = 30.3$ cfs, $Q_{100} = 78.2$ cfs) from the upstream development. The calculated allowable release rate per this report is less than this amount and will therefore not cause any downstream drainage issues in the present or future conditions.

MARKSHEFFEL TRIBUTARY CHANNEL

The Marksheffel Tributary channel flows from north to south through the proposed site from Bradley Road to the existing regional Colorado Centre detention facility. An existing box culvert and weir structure conveys the restricted release south-east to the existing 5.0' CMP culverts under Marksheffel Road and eventually into the main Jimmy Camp Creek. With the development of Bradley Heights and the upstream parcels of Colorado Centre, it was determined within this analysis that the channel will be required to be improved in order to convey these developed flow rates into the existing detention facility. The ultimate allowable developed flow within the channel through the proposed site is 1,800 cfs. A proposed channel section has been provided as well as a 200.0' wide corridor in the master plan for the site for these channel improvements. A Letter of Map Revision (LOMR) has been completed and approved by FEMA in order to properly define the existing 100-year floodplain of the Marksheffel Tributary Channel through the proposed site. This defined existing



100-year floodplain is shown on the Drainage Maps within the Appendix of this report. With the proposed realignment of the channel, an additional LOMR will be required to revise the 100-year floodplain limits to the new channel corridor.

A meeting between Classic Consulting, Walsh Environmental, and the United States Corps of Engineers took place on February 11, 2009 to determine whether this channel shall be considered a jurisdictional floodway of the United States. Based upon the very limited wetlands vegetation, dry hydrology and poorly defined high water marks, Van Truan with the USACOE, concluded that this drainage corridor from Bradley Road to the northerly edge of the detention facility is classified as a Non-Jurisdictional Upland Swale. Therefore, future improvements in this corridor will not require any additional coordination or approval from the USACOE, State of Colorado, or the Environment Protection Agency. See U.S.A. Corps of Engineers Letter within the Appendix of this report.

The proposed channel section to convey the developed 1,800 cfs is a 0.50% sloped grass channel with (4) sloping riprap drop structures (3.0' to 4.0' in height, maximum slope of 10%). A typical bottom width of the channel is 98', with 4.5' tall side slopes (4:1 maximum slope). The bottom width is to neck down to 80' wide through the sloping drop structures with riprap protection as deemed necessary. A 50' trail and access road corridor (2.0% max. cross slope) is to be placed along the west side of the channel, with a 16' wide access road on the east side of the channel. This equates to a 200.0' total width of channel improvements. Final design of this channel shall be detailed more with the Final Drainage Report for such construction. This preliminary section and results are located in the Appendix of this report. A possible roadway crossing may occur at Design Point 5 and a box culvert shall be designed at this location to convey the calculated 1,795 cfs. Final design specifics of such crossing shall be included in a Final Drainage Report for the Marksheffel Tributary channel improvements. Currently the Colorado Centre Metro District owns and maintains the channels, and will continue to maintain the channels and pond. Any future changes in ownership and maintenance will be discussed in final drainage report submittals.

DETENTION FACILITIES

As specified within the D.B.P.S. for Jimmy Camp Creek, each detention facility is to provide full spectrum detention and storm water quality measures. The following are the estimated volumes associated with providing such detention. Final required volumes and pond design are to be discussed in more detail within



the final drainage reports for any development within Bradley Heights. See the Proposed Conditions Section for details about the existing *Colorado Centre Detention Pond* and necessary improvements.

Detention Pond No. 1

This facility will be an Extended Detention Basin (EDB) with a full-spectrum outlet box. The total area that contributes to Detention Pond No. 1 from Basins ELEC, Parcel 1-S, Parcel 7, Parcel 13-W is 82.39 acres, with a computed imperviousness 54.2%. Using the BMP spreadsheet, the required Extended Urban Runoff Volume (EURV) for this facility is 4.40 ac.-ft. In order to achieve the allowable release rates, an estimated 11.94 ac.-ft. facility is required at this location. An outlet structure will be designed to release the EURV volume with a 72-hr drain time, a full-spectrum requirement, and restrict the large event release to allowable rates (Design Point E9, $Q_{100} = 142.3$ cfs). Currently the Colorado Centre Metro District owns and maintains the channels, and will continue to maintain the channels and ponds. Any future changes in ownership and maintenance will be discussed in final drainage report submittals.

Detention Pond No. 2

This facility will be an Extended Detention Basin (EDB) with a full-spectrum outlet box. The total area that contributes to Detention Pond No. 2 from Basins 16-W, Parcel 14, and OS-2 is 120.37 acres, with a computed imperviousness 29.7%. Using the spreadsheet, the required Extended Urban Runoff Volume (EURV) for this facility is 3.35 ac.-ft. In order to achieve the allowable release rates, an estimated 6.59 ac.-ft. facility is required at this location. An outlet structure will be designed to release the EURV volume with a 72-hr drain time, a full-spectrum requirement, and restrict the large event release to allowable rates (Design Point E10, $Q_{100} = 267.4$ cfs). Currently the Colorado Centre Metro District owns and maintains the channels, and will continue to maintain the channels and ponds. Any future changes in ownership and maintenance will be discussed in final drainage report submittals

Detention Pond No. 3

This facility will be an Extended Detention Basin (EDB) with a full-spectrum outlet box. The total area that contributes to Detention Pond No. 3 from Basins 16-E, and Parcel 17 is 39.18 acres, with a computed imperviousness 40.0%. Using the spreadsheet, the required Extended Urban Runoff Volume (EURV) for this facility is 2.06 ac.-ft. In order to achieve the allowable release rates, an estimated 4.89 ac.-ft. facility is required at this location. An outlet structure will be designed to release the EURV volume with a 72-hr drain time, a full-spectrum requirement, and restrict the large event release to allowable rates (Design Point E11,



$Q_{100} = 72.6$ cfs). Currently the Colorado Centre Metro District owns and maintains the channels, and will continue to maintain the channels and ponds. Any future changes in ownership and maintenance will be discussed in final drainage report submittals.

WETLANDS MITIGATION

No wetlands are located on site. As previously mentioned, the USACOE has verified that wetlands are not located within the proposed site. See USACOE Letter within the 'Marksheffel Channel Improvements' section in the Appendix of this report.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994. Due to offsite and onsite basin sizes, the SCS Hydrograph Method was used to determine the existing and developed runoff rates through the proposed site.

EROSION CONTROL PLAN

The City of Colorado Springs Drainage Criteria Manual specifies an Erosion Control Plan and associated cost estimate be submitted with the Final Drainage Report. We respectfully request that the Erosion Control Plan be submitted in conjunction with the Overlot Grading Plan and construction assurances posted prior to obtaining a grading permit.

FLOODPLAIN STATEMENT

A portion of this site is located within a Zone A designated floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Numbers 08041C0769 and 08041C0768 effective date, March 17, 1997 (See Appendix). This Zone A designation means that the flood limits are "un-studied". Recently CCES has prepared a Letter of Map Revision (LOMR) that has been reviewed and approved by FEMA. This LOMR simply provides the hydrologic computer model that verifies the limits of the 100-year floodplain. These revised limits are shown on the Drainage Maps within the Appendix of this report.

DRAINAGE AND BRIDGE FEES

This area lies within Jimmy Camp Creek Drainage Basin. The Drainage Basin Planning Study for Jimmy Camp Creek has not been approved by the City of Colorado Springs. This report is currently in progress by Kiowa



Engineering with pending approval by the City of Colorado Springs. Since this report is not approved, there has been no drainage, bridge or pond fees established for this basin. Calculation of any drainage feels will be deferred to the Final Drainage Report. Any applicable fees shall be provided prior to final plat recordation of any development within the Bradley Heights site.

SUMMARY

The proposed Bradley Heights site is within the Jimmy Camp Creek Drainage Basin. The majority of the Bradley Heights site and all of the tributary land to the north of the site, drains into the Marksheffel Tributary Channel to Jimmy Camp Creek and to the Regional Colorado Centre Detention Facility. Recommendations are made within this report concerning necessary improvement to this channel and regional detention facility, as well as the need for three more proposed detention facilities on the Bradley Heights site. All of the points of storm water release from the proposed site are at or below the calculated historic flow quantities, with exception of the minor increase in the 100-year release at DP-7. The development of the proposed Bradley Heights does not hinder any downstream facility or property to an extent greater than that which currently exists in the 'historic' conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements. Upon development of the individual parcels within the Bradley Heights development, separate Final Drainage Reports will be required to be submitted and approved by the City of Colorado Springs that details all storm systems, pond design and fee calculation.

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC



David L. Gibson P.E.
Project Engineer

Ag/226610/reports/MDDP NEW FORMAT.doc



REFERENCES

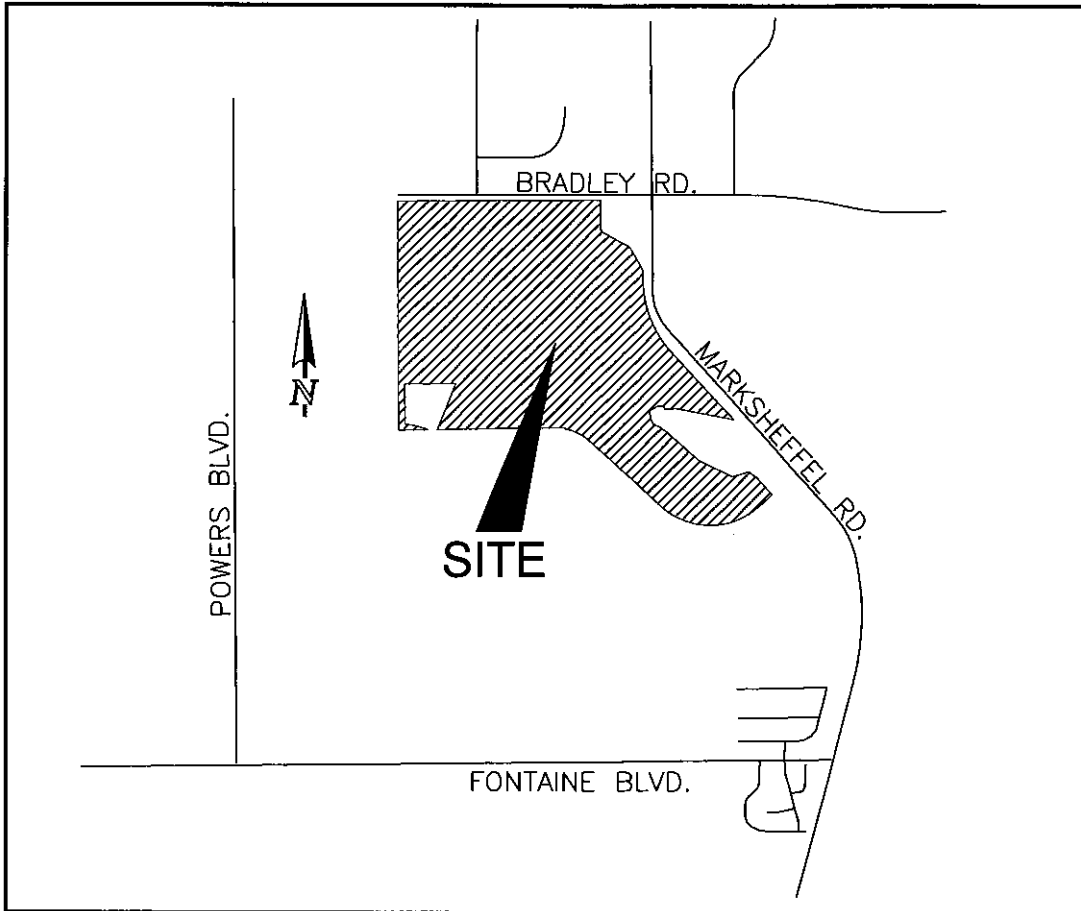
1. City of Colorado Springs/County of El Paso Drainage Criteria Manual dated October 1991.
2. "Drainage Criteria Manual, Volume No. 2," by City of Colorado Springs Engineering Division, dated November 1, 2002.
3. "Preliminary and Final Drainage Report Peaceful Ridge at Fountain Valley Subdivision," by Kiowa Engineering Corporation, dated July 2006.
4. "Drainage Basin Planning Study for Jimmy Camp Creek HEC-HMS Model," provided to Classic Consulting for use in the LOMR for Marksheffel Tributary Channel and this report by Kiowa Engineering. Not approved as of November 2009.
5. "Detention Volume Estimating Workbook, Version 2.02," released January 2007 by Urban Drainage and Flood Control District Denver, Colorado. Spreadsheet used for purposes of Extended Urban Runoff Volume pond sizing.

APPENDIX



VICINITY MAP

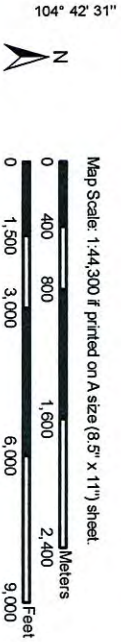
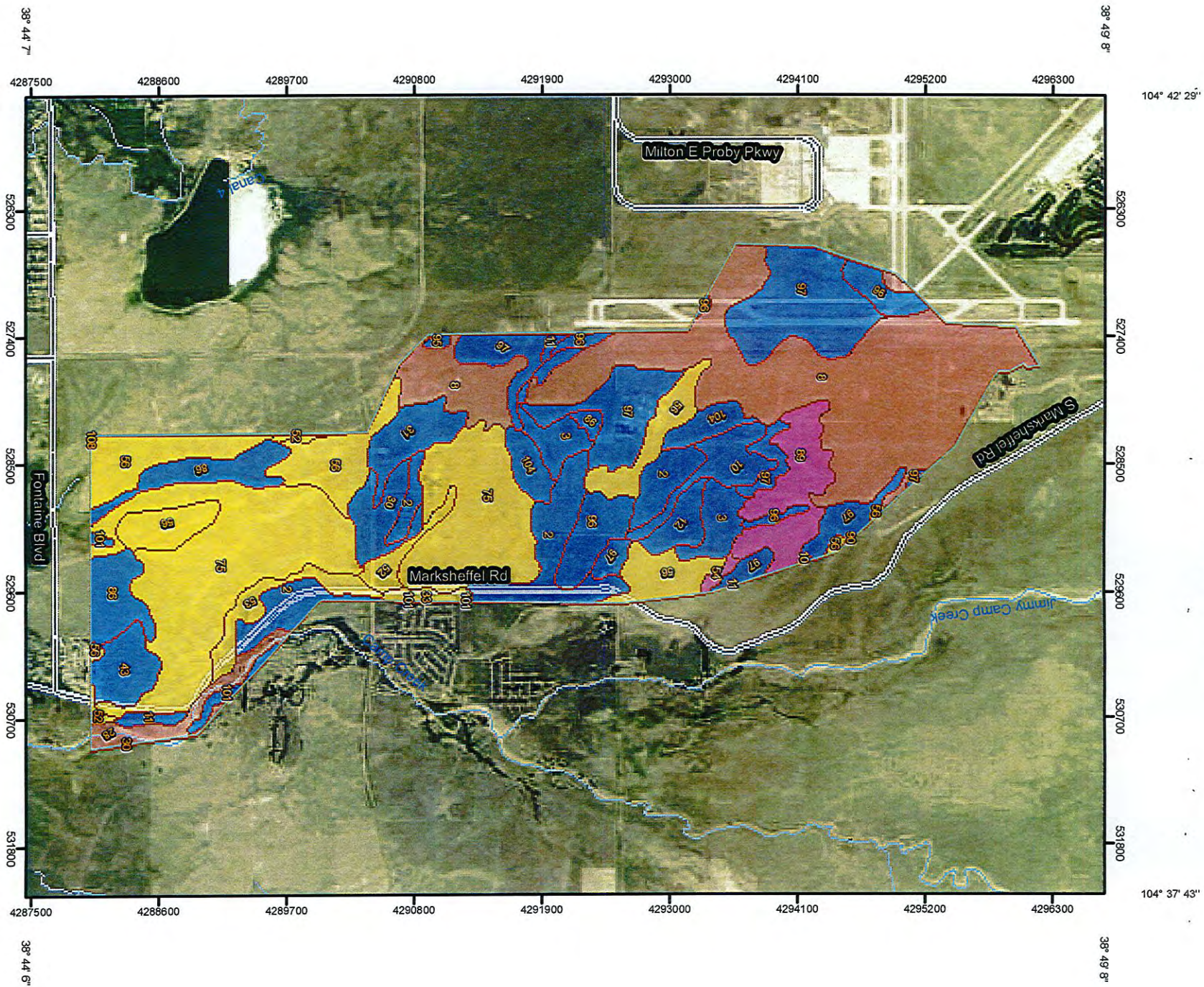




VICINITY MAP
N.T.S.

SOILS MAP






Map Scale: 1:44,300 if printed on A size (8.5" x 11") sheet.

MAP LEGEND









Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available





Political Features

 Cities

Water Features

-  Oceans
-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads

MAP INFORMATION

Map Scale: 1:44,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 13N NAD83

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 6, Aug 21, 2008

Date(s) aerial images were photographed: 7/29/2005; 7/30/2005

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — El Paso County Area, Colorado				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Ascalon sandy loam, 1 to 3 percent slopes	B	283.0	6.7%
3	Ascalon sandy loam, 3 to 9 percent slopes	B	114.5	2.7%
8	Blakeland loamy sand, 1 to 9 percent slopes	A	919.6	21.7%
10	Blendon sandy loam, 0 to 3 percent slopes	B	76.9	1.8%
11	Bresser sandy loam, 0 to 3 percent slopes	B	21.5	0.5%
12	Bresser sandy loam, 3 to 5 percent slopes	B	45.5	1.1%
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A	69.7	1.6%
30	Fort Collins loam, 0 to 3 percent slopes	B	74.0	1.7%
31	Fort Collins loam, 3 to 8 percent slopes	B	81.9	1.9%
33	Heldt clay loam, 0 to 3 percent slopes	C	19.9	0.5%
43	Kim loam, 1 to 8 percent slopes	B	73.8	1.7%
52	Manzanola clay loam, 1 to 3 percent slopes	C	47.6	1.1%
53	Manzanola clay loam, 3 to 9 percent slopes	C	66.0	1.6%
54	Midway clay loam, 3 to 25 percent slopes	D	9.1	0.2%
56	Nelson-Tassel fine sandy loams, 3 to 18 percent slopes	C	441.8	10.4%
75	Razor-Midway complex	C	792.7	18.7%
86	Stoneham sandy loam, 3 to 8 percent slopes	B	173.3	4.1%
89	Tassel fine sandy loam, 3 to 18 percent slopes	D	154.7	3.7%
90	Terry sandy loam, 1 to 8 percent slopes	C	1.1	0.0%
95	Truckton loamy sand, 1 to 9 percent slopes	B	5.8	0.1%
96	Truckton sandy loam, 0 to 3 percent slopes	B	140.0	3.3%
97	Truckton sandy loam, 3 to 9 percent slopes	B	512.7	12.1%
101	Ustic Torrifluvents, loamy	B	23.8	0.6%
104	Vona sandy loam, 1 to 3 percent slopes	B	79.8	1.9%
108	Wiley silt loam, 3 to 9 percent slopes	B	0.7	0.0%
Totals for Area of Interest			4,229.6	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

**F.E.M.A. MAPS &
APPROVED LOMR THRU BRADLEY HEIGHTS SITE**





APPROXIMATE SCALE IN FEET
500 0 500

CITY OF COLORADO SPRINGS
080060

11
ZONE X

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 769 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS CITY OF	080060	0769	F
EL PASO COUNTY UNINCORPORATED AREAS	080060	0769	F

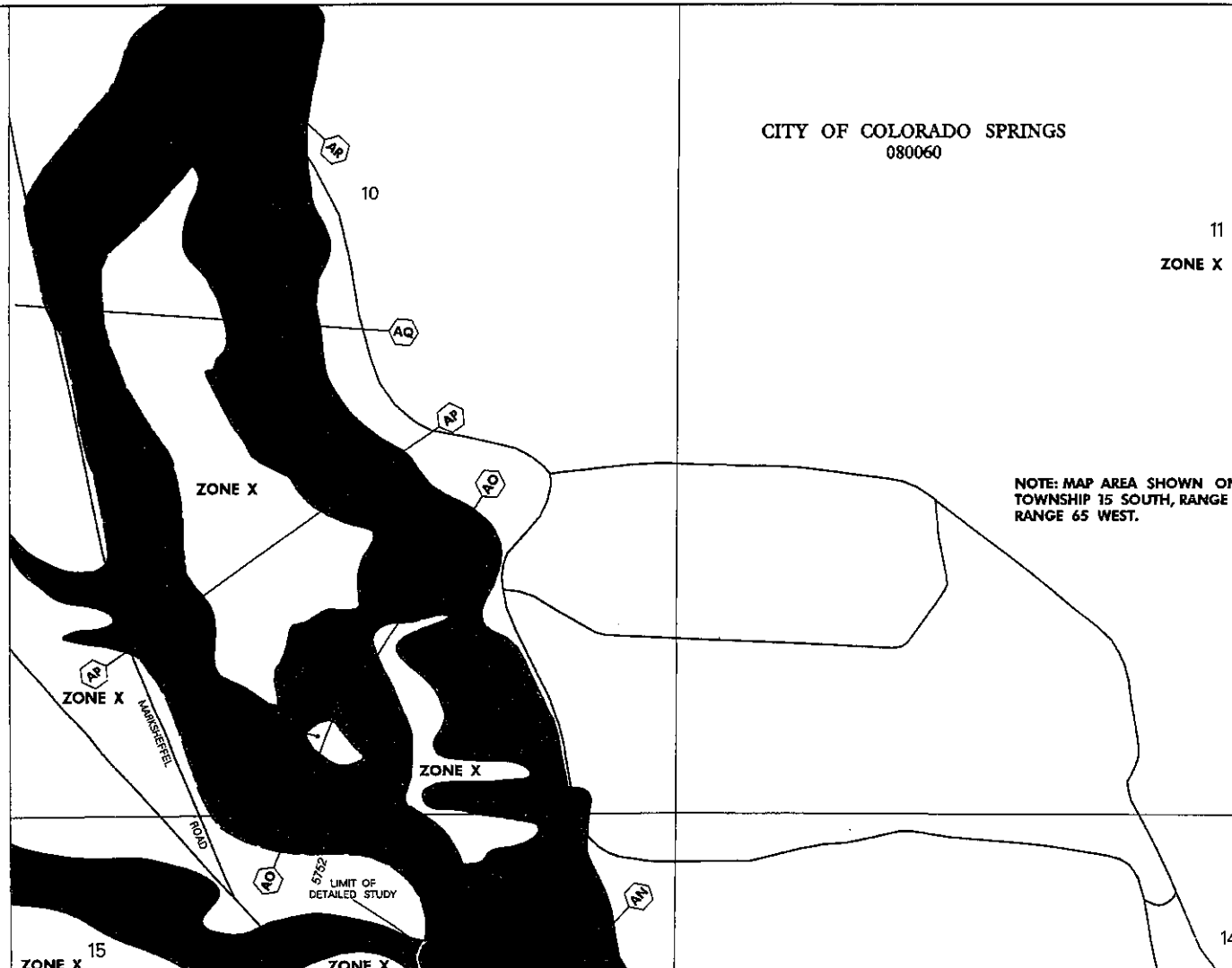
MAP NUMBER
08041C0769 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency

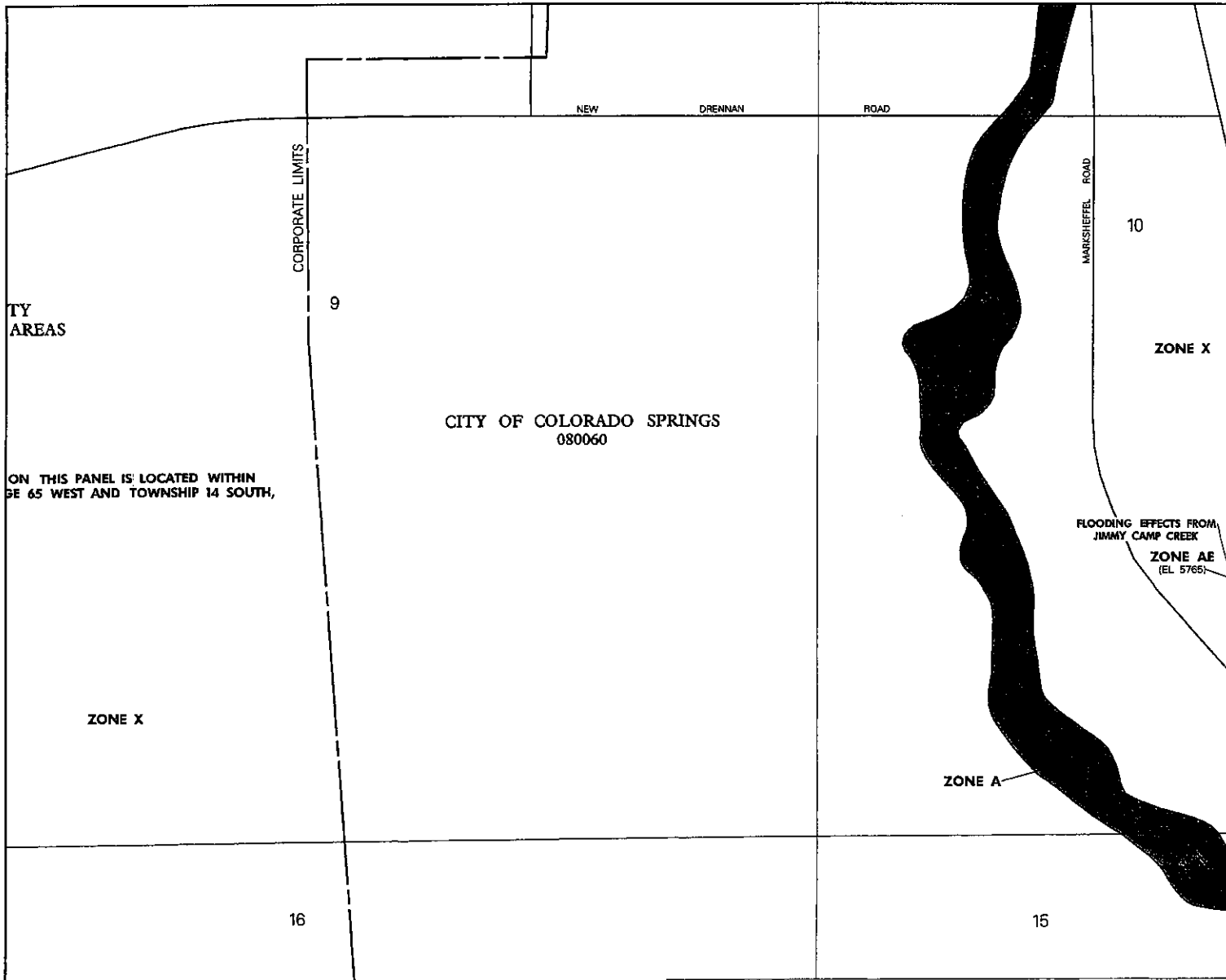
NOTE: MAP AREA SHOWN ON T
TOWNSHIP 15 SOUTH, RANGE 65
RANGE 65 WEST.



JOINS PANEL 0967

38°45'00"
104°39'22"

This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE IN FEET
500 0 600

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 768 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0768	F
EL PASO COUNTY, UNINCORPORATED AREAS	080060	0768	F

MAP NUMBER
08041C0768 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Federal Emergency Management Agency

Washington, D.C. 20472

June 30, 2009

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Lionel Rivera
Mayor, City of Colorado Springs
30 South Nevada Avenue
Colorado Springs, CO 80903

IN REPLY REFER TO:

Case No.: 09-08-0556P
Community Name: City of Colorado Springs, CO
Community No.: 080060
Effective Date of
This Revision: June 30, 2009

Dear Mayor Rivera:

The Flood Insurance Study report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Denver, Colorado, at (303) 235-4830, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Sincerely,

David N. Bascom, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Mr. Tim Condit
Floodplain Engineer
Pikes Peak Regional Building Dept.

Mr. Kyle R. Campbell
Classic Consulting Engineers and Surveyors

Mr. Randy Case
Marksheffel Woodmen Investments, I.LC



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT**

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Colorado Springs El Paso County Colorado	NO PROJECT	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 080060		
IDENTIFIER	Bradley Heights	APPROXIMATE LATITUDE & LONGITUDE: 38.753, -104.660 SOURCE: Other DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 08041C0768 F DATE: March 17, 1997		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: August 23, 1999 PROFILE(S): 381P	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Jimmy Camp Creek Unnamed Tributary - from approximately 2,850 feet upstream to approximately 8,930 feet upstream of the confluence with Jimmy Camp Creek

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Jimmy Camp Creek Unnamed Tributary	Zone A None	Zone AE BFEs*	YES YES	YES NONE

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

David N. Bascom

David N. Bascom, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.09080556

102-I-A-C



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance discharges computed in the submitted hydrologic analysis. Future development of projects upstream could cause increased discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on discharges and could, therefore, indicate that greater flood hazards exist in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-338-2827 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "David N. Bascom".

David N. Bascom, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Jeanine D. Petterson
Director, Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in black ink, appearing to read "David N. Bascom".

David N. Bascom, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD 29)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Jimmy Camp Creek Unnamed Tributary	Approximately 2,850 feet upstream of the confluence with Jimmy Camp Creek	NONE	5,755	08041C0768 F
	Approximately 6,930 feet upstream of the confluence with Jimmy Camp Creek	NONE	5,790	08041C0768 F

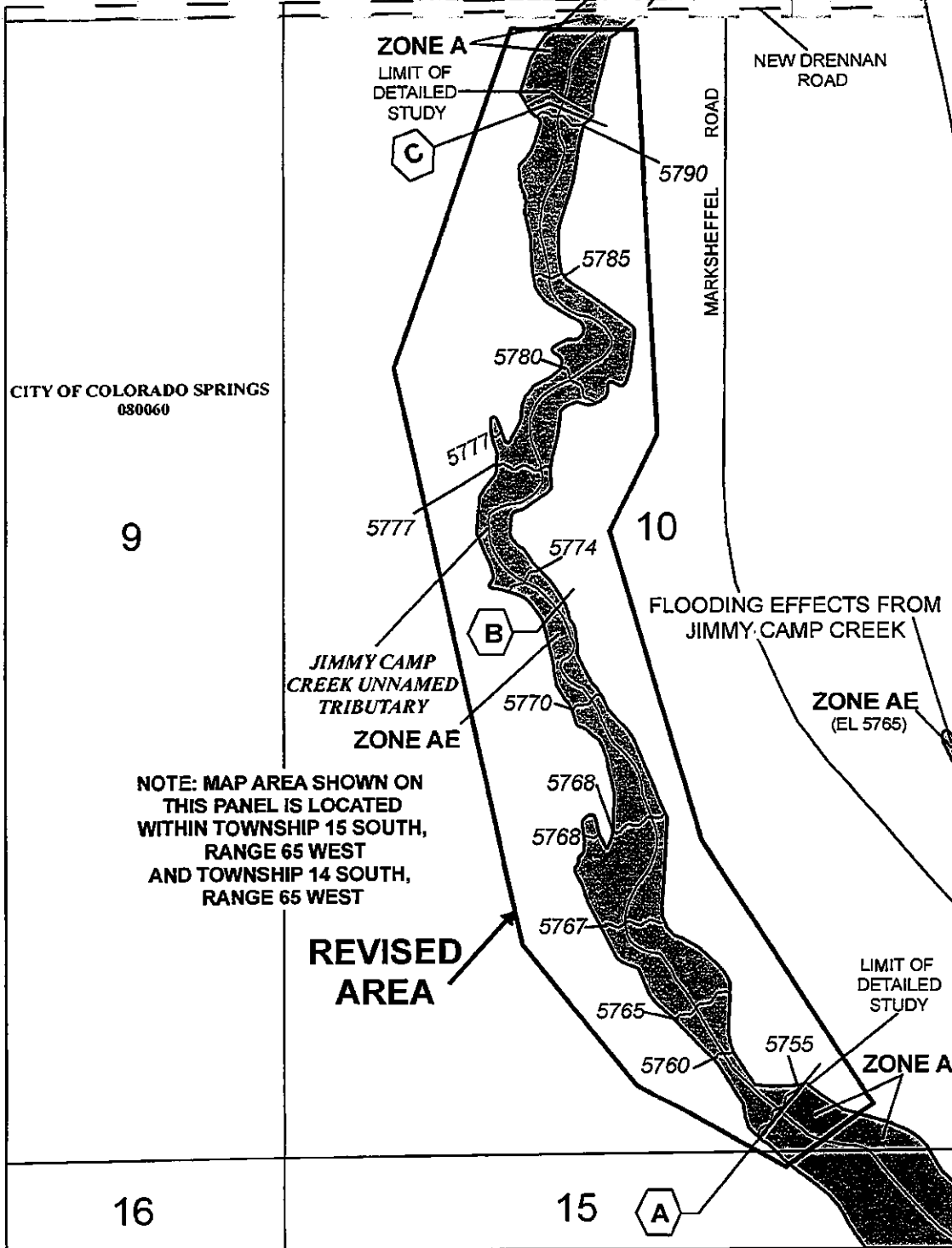
Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. This revision is effective as of the date of this letter. However, until the 90-day period has elapsed, the revised BFEs presented in this LOMR may be changed.

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below.

LOCAL NEWSPAPER Name: *El Paso County News*
Dates: 7/8/2009 and 7/15/2009

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

David N. Bascom, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



CITY OF COLORADO SPRINGS
080060

9

10

NOTE: MAP AREA SHOWN ON
THIS PANEL IS LOCATED
WITHIN TOWNSHIP 15 SOUTH,
RANGE 65 WEST
AND TOWNSHIP 14 SOUTH,
RANGE 65 WEST

REVISED
AREA

16

15

NEW DRENNAN
ROAD

MARKSHEFFEL
ROAD

FLOODING EFFECTS FROM
JIMMY CAMP CREEK




ZONE AE
(EL 5765)

LIMIT OF
DETAILED
STUDY

ZONE A

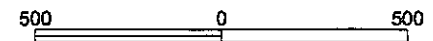
JOINS PANEL 0769

Legend

-  1% annual chance
(100-Year) Floodplain
-  1% annual chance
(100-Year) Floodway
-  0.2% annual chance
(500-Year) Floodplain



APPROXIMATE SCALE IN FEET



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

EL PASO COUNTY
COLORADO AND
INCORPORATED AREAS

PANEL 768 OF 1300

CONTAINS:

COMMUNITY NUMBER PANEL SUFFIX

COLORADO SPRINGS, CITY OF	080060	0742	F
EL PASO COUNTY, UNINCORPORATED AREAS	080058	0742	F

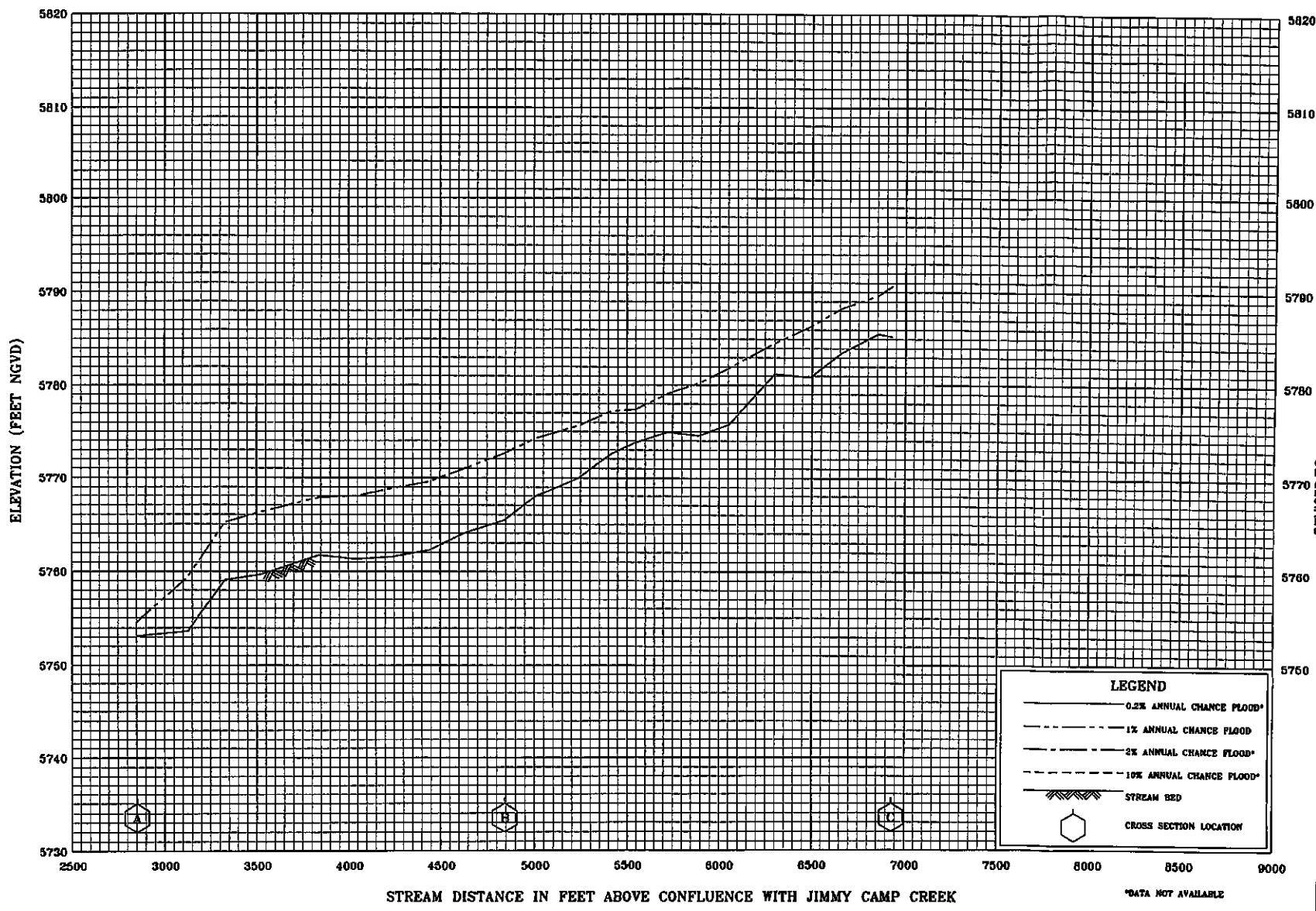
REVISED TO
REFLECT LOMR
EFFECTIVE: June 30, 2009

COMMUNITY-PANEL NUMBER
08041C0768 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency



REVISED TO REFLECT LOMR EFFECTIVE: June 30, 2009
FLOOD PROFILES
 JIMMY CAMP CREEK UNNAMED TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY
 EL PASO COUNTY, CO
 AND INCORPORATED AREAS

381P

*DATA NOT AVAILABLE

EXISTING CONDITIONS
HYDROLOGIC CALCULATIONS & PONDPACK RESULTS



COMPOSITE C_N VALUES - EXISTING CONDITIONS

BASIN (label)	BASIN AREA (Ac)	SOIL TYPE A		SOIL TYPE B		SOIL TYPE C		WEIGHTED C _N
		CN	AREA (Ac.)	CN	AREA (Ac.)	CN	AREA (Ac.)	
M-4 thru M-27		SEE DRAINAGE BASIN PLANNING STUDY						
OS-1 (undev)	22.48	39		61	3.96	74	21.73	82.3
OS-1 (roadway)	11.00	39		98	4.61	98	6.39	98.0
OS-1 (composite)	33.48							87.4
OS-2	32.75	39		61		74	32.75	74.0
OS-3	15.85	39		61		74	15.85	74.0
OS-4	20.09	39		61		74	20.09	74.0
OS-5	24.91	39		61	2.65	74	22.26	72.6
EX-1	111.17	39		61	12.47	74	98.70	72.5
EX-2	91.09	39		61	28.4	74	62.69	69.9
EX-3	6.11	39		61		74	6.11	74.0
EX-4	131.78	39		61	16.18	74	115.60	72.4
EX-4A	76.47	39		61		74	76.47	74.0
EX-5	25.23	39		61		74	25.23	74.0
EX-6	62.10	39		61		74	62.10	74.0
EX-7	35.97	39		61		74	35.97	74.0

ALL UNDEVELOPED LAND ASSUMED "GOOD PASTURE OR RANGE" LAND USAGE

TIME OF CONCENTRATION

BASIN	Cn	C(5)	Length (ft)	OVERLAND Height (ft)	Tc (min)	STREET / CHANNEL FLOW				Tc TOTAL (min)	Tc TOTAL (hr)
						Length (ft)	Slope (%)	Velocity (fps)	Tc (min)		
M4										0.0000	0.0000
THRU										0.0000	0.0000
M27										0.0000	0.0000
OS-1	87.4	0.25	100	4	10.1	1850	2.38%	5.4	5.7	15.7700	<u>0.2628</u>
OS-2	74.0	0.25	730	50	22.8	820	2.93%	6.0	2.3	25.0405	<u>0.4173</u>
OS-3	74.0	0.25	400	40	14.9	950	0.85%	3.2	4.9	19.7761	<u>0.3296</u>
OS-4	74.0	0.25	370	34	14.7	450	2.22%	5.2	1.4	16.1437	<u>0.2691</u>
OS-5	72.6	0.25	200	4	17.9	0		0.0	0.0	17.8828	<u>0.2980</u>
EX-1	72.5	0.25	1190	82	29.0	2200	2.30%	5.3	6.9	35.9083	<u>0.5985</u>
EX-2	69.9	0.25	760	42	24.9	970	2.90%	6.0	2.7	27.6390	<u>0.4607</u>
EX-3	74.0	0.25	410	24	18.0	0		0.0	0.0	17.9639	<u>0.2994</u>
EX-4	72.4	0.75	1500	72	15.1	1400	0.50%	2.5	9.4	24.5340	<u>0.4089</u>
EX-4A	74.0	0.75	1500	84	14.4	0		0.0	0.0	14.3567	<u>0.2393</u>
EX-5	74.0	0.25	850	54	25.2	880	2.73%	5.8	2.5	27.7123	<u>0.4619</u>
EX-6	74.0	0.75	860	44	11.2	850	3.30%	6.4	2.2	13.4278	<u>0.2238</u>
EX-7	74.0	0.25	700	44	22.9	800	2.80%	5.9	2.3	25.2039	<u>0.4201</u>

BASIN SUMMARY - EXISTING CONDITIONS

BASIN (label)	TOTAL BASIN AREA (acres)	TOTAL BASIN AREA (sq mi)	WEIGHTED CN	TOTAL LAG TIME (hours)	TOTAL Time of Concentration PondPak Model (hours)	Q 2 Yr. (cfs)	Q 5 Yr. (cfs)	Q 10 Yr. (cfs)	Q 50 Yr. (cfs)	Q 100 Yr. (cfs)
M4	148.22	0.2316	75.1	0.5167	0.8613	32.08	58.92	97.47	173.52	190.04
M5	115.07	0.1798	67.9	0.3833	0.6390	11.85	28.82	56.45	114.49	127.46
M6	143.10	0.2236	55.8	0.3833	0.6390	0.35	3.16	15.28	52.92	62.82
M7	108.54	0.1696	68.0	0.3167	0.5279	12.93	31.57	61.02	124.47	138.68
M8	158.53	0.2477	78.7	0.7500	1.2503	38.61	64.75	100.95	169.42	184.02
M9	150.66	0.2354	72.5	1.1167	1.8615	14.24	27.13	46.04	83.79	92.28
M10	88.83	0.1388	71.7	0.7667	1.2781	9.88	19.55	34.27	64.65	71.39
M11	69.06	0.1079	73.0	0.4333	0.7223	13.55	26.56	45.62	83.36	91.57
M12	106.24	0.1660	63.5	0.4500	0.7502	4.18	13.79	31.40	71.24	80.42
M13	144.45	0.2257	61.7	0.5500	0.9169	2.87	11.63	28.75	70.50	80.39
M14	72.70	0.1136	70.3	0.5000	0.8335	8.53	18.61	34.20	66.43	73.79
M15	59.14	0.0924	57.8	0.2833	0.4723	0.32	3.04	11.35	33.88	39.49
M16	148.54	0.2321	64.8	0.5667	0.9447	6.44	18.78	40.37	88.46	99.46
M17	182.02	0.2844	75.7	0.5000	0.8335	45.59	81.11	132.20	233.23	255.04
M18	163.40	0.2553	71.4	0.5500	0.9169	20.41	42.69	76.56	146.74	162.28
M19	192.00	0.3000	65.2	0.5833	0.9724	8.16	23.64	50.51	111.88	126.13
M20	89.54	0.1399	63.7	0.6500	1.0836	2.87	8.82	19.74	44.49	50.25
M21	146.56	0.2290	63.7	0.3833	0.6390	6.41	21.29	48.71	111.51	126.01
M22	66.11	0.1033	50.3	0.3667	0.6113	0.01	0.17	1.32	11.07	14.10
M23	132.80	0.2075	53.7	0.7330	1.2219	0.21	1.19	6.16	23.65	28.29
M24	99.58	0.1556	65.0	0.4000	0.6668	5.45	16.36	35.20	78.36	88.30
M25	101.82	0.1591	57.7	0.3833	0.6390	0.54	4.28	15.40	46.59	54.43
M26	114.30	0.1786	54.1	0.9833	1.6392	0.18	0.97	4.53	16.41	19.58
M27	124.86	0.1951	49.8	1.0333	1.7225	0.02	0.31	1.83	10.03	12.48
OS-1	33.48	0.0523	87.4	0.1577	0.2629	44.11	62.85	86.20	126.09	134.14
OS-2	32.75	0.0512	74.0	0.2504	0.4174	10.96	20.57	34.22	60.39	66.00
OS-3	15.85	0.0248	74.0	0.1978	0.3297	6.22	11.54	19.01	33.18	36.20
OS-4	20.09	0.0314	74.0	0.1614	0.2691	9.12	16.32	26.33	45.94	50.11
OS-5	24.91	0.0389	72.6	0.1788	0.2981	9.47	17.82	29.53	51.78	56.55
EX-1	111.17	0.1737	72.5	0.3591	0.5986	25.50	49.23	84.45	154.50	169.71
EX-2	91.09	0.1423	69.9	0.2764	0.4607	16.92	36.98	67.07	128.54	142.30
EX-3	6.11	0.0095	74.0	0.1796	0.2995	2.59	4.72	7.67	13.24	14.43
EX-4	131.78	0.2059	72.4	0.2453	0.4090	35.27	70.89	122.64	223.73	245.59
EX-4A	76.47	0.1195	74.0	0.1436	0.2393	36.11	65.86	106.96	183.99	200.29
EX-5	25.23	0.0394	74.0	0.2771	0.4620	7.89	14.69	24.57	43.99	48.17
EX-6	62.10	0.0970	74.0	0.1343	0.2238	30.81	55.53	89.50	152.82	166.19
EX-7	35.97	0.0562	74.0	0.2520	0.4201	12.05	22.63	37.64	66.45	72.63

BASINS M4 - M27 INPUT DATA MATCHES JIMMY CAMP CREEK D.B.P.S.

DESIGN POINTS - EXISTING CONDITIONS

Design Point (label)	Q 2 Yr. Q (cfs)	Q 5 Yr. Q (cfs)	Q 10 Yr. Q (cfs)	Q 50 Yr. Q (cfs)	Q 100 Yr. Q (cfs)
E1	52.54	110.34	204.78	424.10	474.03
E2	133.27	299.67	574.39	1,186.78	1,328.17
E3	169.53	372.13	710.48	1,455.90	1,628.44
E4	179.50	389.77	741.42	1,514.32	1,691.97
E5	187.65	403.83	765.45	1,555.84	1,738.05
Pond-Marksheffel In	193.18	412.39	779.38	1,580.25	1,764.80
Pond-Marksheffel Out	193.12	398.16	699.03	1,078.09	1,147.02
E6 - Marksheffel Trib. Out	194.24	399.69	701.23	1,080.70	1,149.69
E8	2.59	4.72	7.67	13.24	14.43
E9	16.92	36.98	67.07	128.54	142.30
E10	45.99	83.97	138.22	244.61	267.42
E11	12.05	22.63	37.64	66.45	72.63
E12	6.22	11.54	19.01	33.18	36.20

BRADLEY HEIGHTS

Project Summary

Title	BRADLEY HEIGHTS
Engineer	DAVE GIBSON
Company	
Date	9/11/2014

Notes	EXISTING CONDITIONS
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BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
EX-3	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.202	6.100	2.59
EX-3	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.339	6.100	4.72
EX-3	COLO SPRGS - Synthetic Curve, 10 yrs	10	0.528	6.100	7.67
EX-3	COLO SPRGS - Synthetic Curve, 100 yrs	100	0.965	6.050	14.43
EX-1	COLO SPRGS - Synthetic Curve, 2 yrs	2	3.108	6.300	22.43
EX-1	COLO SPRGS - Synthetic Curve, 5 yrs	5	5.386	6.300	44.90
EX-1	COLO SPRGS - Synthetic Curve, 10 yrs	10	8.613	6.250	78.48
EX-1	COLO SPRGS - Synthetic Curve, 100 yrs	100	16.183	6.250	161.24
OS-1	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.747	6.050	44.11
OS-1	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.893	6.050	62.85
OS-1	COLO SPRGS - Synthetic Curve, 10 yrs	10	5.343	6.050	86.20
OS-1	COLO SPRGS - Synthetic Curve, 100 yrs	100	8.388	6.050	134.14
EX-2	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.121	6.200	16.92
EX-2	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.825	6.200	36.98
EX-2	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.286	6.200	67.07

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
EX-2	COLO SPRGS - Synthetic Curve, 100 yrs	100	12.170	6.150	142.30
EX-4	COLO SPRGS - Synthetic Curve, 2 yrs	2	3.684	6.150	35.27
EX-4	COLO SPRGS - Synthetic Curve, 5 yrs	5	6.386	6.150	70.89
EX-4	COLO SPRGS - Synthetic Curve, 10 yrs	10	10.213	6.150	122.64
EX-4	COLO SPRGS - Synthetic Curve, 100 yrs	100	19.193	6.150	245.59
OS-5	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.759	6.100	9.47
OS-5	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.292	6.100	17.82
OS-5	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.040	6.100	29.53
OS-5	COLO SPRGS - Synthetic Curve, 100 yrs	100	3.779	6.050	56.55
OS-2	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.084	6.150	10.96
OS-2	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.814	6.150	20.57
OS-2	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.829	6.150	34.22
OS-2	COLO SPRGS - Synthetic Curve, 100 yrs	100	5.171	6.150	66.00
EX-5	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.836	6.200	7.89
EX-5	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.399	6.200	14.69
EX-5	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.182	6.150	24.57

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
EX-5	COLO SPRGS - Synthetic Curve, 100 yrs	100	3.986	6.150	48.17
EX-6	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.057	6.050	30.81
EX-6	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.443	6.050	55.53
EX-6	COLO SPRGS - Synthetic Curve, 10 yrs	10	5.369	6.050	89.50
EX-6	COLO SPRGS - Synthetic Curve, 100 yrs	100	9.810	6.050	166.19
EX-7	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.192	6.150	12.05
EX-7	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.995	6.150	22.63
EX-7	COLO SPRGS - Synthetic Curve, 10 yrs	10	3.111	6.150	37.64
EX-7	COLO SPRGS - Synthetic Curve, 100 yrs	100	5.685	6.150	72.63
OS-3	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.525	6.100	6.22
OS-3	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.879	6.100	11.54
OS-3	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.370	6.100	19.01
OS-3	COLO SPRGS - Synthetic Curve, 100 yrs	100	2.504	6.100	36.20
OS-4	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.666	6.100	9.12
OS-4	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.114	6.100	16.32
OS-4	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.737	6.050	26.33

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OS-4	COLO SPRGS - Synthetic Curve, 100 yrs	100	3.174	6.050	50.11
EX-4A	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.534	6.050	36.11
EX-4A	COLO SPRGS - Synthetic Curve, 5 yrs	5	4.240	6.050	65.86
EX-4A	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.612	6.050	106.96
EX-4A	COLO SPRGS - Synthetic Curve, 100 yrs	100	12.081	6.050	200.29
M21	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.759	6.400	6.41
M21	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.742	6.350	21.29
M21	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.829	6.300	48.71
M21	COLO SPRGS - Synthetic Curve, 100 yrs	100	14.719	6.300	126.01
M23	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.195	20.050	0.21
M23	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.944	7.500	1.19
M23	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.474	7.000	6.16
M23	COLO SPRGS - Synthetic Curve, 100 yrs	100	7.174	6.800	28.29
M20	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.075	6.800	2.87
M20	COLO SPRGS - Synthetic Curve, 5 yrs	5	2.287	6.650	8.82
M20	COLO SPRGS - Synthetic Curve, 10 yrs	10	4.173	6.650	19.74

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M20	COLO SPRGS - Synthetic Curve, 100 yrs	100	8.994	6.650	50.25
M24	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.355	6.400	5.45
M24	COLO SPRGS - Synthetic Curve, 5 yrs	5	2.787	6.400	16.36
M24	COLO SPRGS - Synthetic Curve, 10 yrs	10	4.982	6.350	35.20
M24	COLO SPRGS - Synthetic Curve, 100 yrs	100	10.524	6.300	88.30
M27	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.010	24.100	0.02
M27	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.353	20.200	0.31
M27	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.338	7.800	1.83
M27	COLO SPRGS - Synthetic Curve, 100 yrs	100	4.833	7.150	12.48
M26	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.168	20.100	0.18
M26	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.813	8.100	0.97
M26	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.129	7.250	4.53
M26	COLO SPRGS - Synthetic Curve, 100 yrs	100	6.174	7.000	19.58
M22	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.005	20.150	0.01
M22	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.187	20.000	0.17
M22	COLO SPRGS - Synthetic Curve, 10 yrs	10	0.708	6.600	1.32

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M22	COLO SPRGS - Synthetic Curve, 100 yrs	100	2.559	6.350	14.10
M25	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.457	8.100	0.54
M25	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.341	6.450	4.28
M25	COLO SPRGS - Synthetic Curve, 10 yrs	10	2.895	6.400	15.40
M25	COLO SPRGS - Synthetic Curve, 100 yrs	100	7.253	6.300	54.43
M16	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.022	6.650	6.44
M16	COLO SPRGS - Synthetic Curve, 5 yrs	5	4.157	6.550	18.78
M16	COLO SPRGS - Synthetic Curve, 10 yrs	10	7.432	6.550	40.37
M16	COLO SPRGS - Synthetic Curve, 100 yrs	100	15.699	6.550	99.46
M17	COLO SPRGS - Synthetic Curve, 2 yrs	2	7.069	6.450	45.59
M17	COLO SPRGS - Synthetic Curve, 5 yrs	5	11.464	6.450	81.11
M17	COLO SPRGS - Synthetic Curve, 10 yrs	10	17.473	6.350	132.20
M17	COLO SPRGS - Synthetic Curve, 100 yrs	100	31.098	6.350	255.04
M18	COLO SPRGS - Synthetic Curve, 2 yrs	2	4.177	6.500	20.41
M18	COLO SPRGS - Synthetic Curve, 5 yrs	5	7.379	6.500	42.69
M18	COLO SPRGS - Synthetic Curve, 10 yrs	10	11.957	6.500	76.56

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M18	COLO SPRGS - Synthetic Curve, 100 yrs	100	22.800	6.450	162.28
M19	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.614	6.700	8.16
M19	COLO SPRGS - Synthetic Curve, 5 yrs	5	5.373	6.600	23.64
M19	COLO SPRGS - Synthetic Curve, 10 yrs	10	9.606	6.600	50.51
M19	COLO SPRGS - Synthetic Curve, 100 yrs	100	20.291	6.500	126.13
M10	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.483	6.800	9.88
M10	COLO SPRGS - Synthetic Curve, 5 yrs	5	4.304	6.800	19.55
M10	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.882	6.650	34.27
M10	COLO SPRGS - Synthetic Curve, 100 yrs	100	12.931	6.650	71.37
M15	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.265	8.050	0.32
M15	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.779	6.300	3.04
M15	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.682	6.250	11.35
M15	COLO SPRGS - Synthetic Curve, 100 yrs	100	4.213	6.200	39.49
M14	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.693	6.450	8.53
M14	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.052	6.450	18.61
M14	COLO SPRGS - Synthetic Curve, 10 yrs	10	5.016	6.450	34.20

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M14	COLO SPRGS - Synthetic Curve, 100 yrs	100	9.713	6.350	73.79
M13	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.314	6.750	2.87
M13	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.030	6.600	11.63
M13	COLO SPRGS - Synthetic Curve, 10 yrs	10	5.790	6.500	28.75
M13	COLO SPRGS - Synthetic Curve, 100 yrs	100	13.037	6.500	80.39
M12	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.275	6.500	4.18
M12	COLO SPRGS - Synthetic Curve, 5 yrs	5	2.713	6.400	13.79
M12	COLO SPRGS - Synthetic Curve, 10 yrs	10	4.951	6.400	31.40
M12	COLO SPRGS - Synthetic Curve, 100 yrs	100	10.669	6.400	80.42
M11	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.106	6.350	13.55
M11	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.584	6.350	26.56
M11	COLO SPRGS - Synthetic Curve, 10 yrs	10	5.658	6.350	45.62
M11	COLO SPRGS - Synthetic Curve, 100 yrs	100	10.481	6.350	91.57
M8	COLO SPRGS - Synthetic Curve, 2 yrs	2	7.688	6.700	38.61
M8	COLO SPRGS - Synthetic Curve, 5 yrs	5	11.958	6.650	64.75
M8	COLO SPRGS - Synthetic Curve, 10 yrs	10	17.659	6.650	100.95

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M8	COLO SPRGS - Synthetic Curve, 100 yrs	100	30.290	6.650	184.02
M9	COLO SPRGS - Synthetic Curve, 2 yrs	2	4.212	7.200	12.60
M9	COLO SPRGS - Synthetic Curve, 5 yrs	5	7.300	7.200	24.78
M9	COLO SPRGS - Synthetic Curve, 10 yrs	10	11.673	7.200	42.89
M9	COLO SPRGS - Synthetic Curve, 100 yrs	100	21.933	6.950	87.43
M6	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.397	8.200	0.35
M6	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.420	6.550	3.16
M6	COLO SPRGS - Synthetic Curve, 10 yrs	10	3.334	6.400	15.28
M6	COLO SPRGS - Synthetic Curve, 100 yrs	100	8.929	6.300	62.82
M5	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.196	6.400	11.85
M5	COLO SPRGS - Synthetic Curve, 5 yrs	5	4.146	6.300	28.82
M5	COLO SPRGS - Synthetic Curve, 10 yrs	10	7.025	6.300	56.45
M5	COLO SPRGS - Synthetic Curve, 100 yrs	100	14.051	6.300	127.46
M7	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.071	6.300	12.93
M7	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.910	6.250	31.57
M7	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.626	6.250	61.02

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M7	COLO SPRGS - Synthetic Curve, 100 yrs	100	13.253	6.200	138.68
M4	COLO SPRGS - Synthetic Curve, 2 yrs	2	5.324	6.450	32.08
M4	COLO SPRGS - Synthetic Curve, 5 yrs	5	8.766	6.450	58.92
M4	COLO SPRGS - Synthetic Curve, 10 yrs	10	13.513	6.450	97.47
M4	COLO SPRGS - Synthetic Curve, 100 yrs	100	24.363	6.400	190.04

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E6	COLO SPRGS - Synthetic Curve, 2 yrs	2	65.087	6.750	191.63
DP E6	COLO SPRGS - Synthetic Curve, 5 yrs	5	117.687	6.900	396.31
DP E6	COLO SPRGS - Synthetic Curve, 10 yrs	10	195.896	7.000	698.08
DP E6	COLO SPRGS - Synthetic Curve, 100 yrs	100	388.271	7.300	1,144.13
DP E5	COLO SPRGS - Synthetic Curve, 2 yrs	2	61.130	6.750	185.08
DP E5	COLO SPRGS - Synthetic Curve, 5 yrs	5	111.043	6.750	400.03
DP E5	COLO SPRGS - Synthetic Curve, 10 yrs	10	185.508	6.700	760.22
DP E5	COLO SPRGS - Synthetic Curve, 100 yrs	100	369.238	6.650	1,730.55

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E4	COLO SPRGS - Synthetic Curve, 2 yrs	2	57.446	6.800	177.00
DP E4	COLO SPRGS - Synthetic Curve, 5 yrs	5	104.657	6.800	386.09
DP E4	COLO SPRGS - Synthetic Curve, 10 yrs	10	175.295	6.750	736.40
DP E4	COLO SPRGS - Synthetic Curve, 100 yrs	100	350.045	6.700	1,684.68
DP E2	COLO SPRGS - Synthetic Curve, 2 yrs	2	41.604	6.950	131.49
DP E2	COLO SPRGS - Synthetic Curve, 5 yrs	5	77.136	6.900	297.12
DP E2	COLO SPRGS - Synthetic Curve, 10 yrs	10	130.842	6.850	571.00
DP E2	COLO SPRGS - Synthetic Curve, 100 yrs	100	264.880	6.800	1,323.29
DP E3	COLO SPRGS - Synthetic Curve, 2 yrs	2	54.338	6.850	167.90
DP E3	COLO SPRGS - Synthetic Curve, 5 yrs	5	99.270	6.800	369.64
DP E3	COLO SPRGS - Synthetic Curve, 10 yrs	10	166.683	6.750	707.14
DP E3	COLO SPRGS - Synthetic Curve, 100 yrs	100	333.862	6.700	1,623.65
DP-M10	COLO SPRGS - Synthetic Curve, 2 yrs	2	3.027	6.900	6.62
DP-M10	COLO SPRGS - Synthetic Curve, 5 yrs	5	6.971	6.750	22.12
DP-M10	COLO SPRGS - Synthetic Curve, 10 yrs	10	13.474	6.650	54.38
DP-M10	COLO SPRGS - Synthetic Curve, 100 yrs	100	30.884	6.550	168.54

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP-M9	COLO SPRGS - Synthetic Curve, 2 yrs	2	5.014	7.000	9.92
DP-M9	COLO SPRGS - Synthetic Curve, 5 yrs	5	12.439	6.600	36.07
DP-M9	COLO SPRGS - Synthetic Curve, 10 yrs	10	25.508	6.500	90.46
DP-M9	COLO SPRGS - Synthetic Curve, 100 yrs	100	62.206	6.500	294.68
DP-M11	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.178	20.300	0.19
DP-M11	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.166	8.500	1.09
DP-M11	COLO SPRGS - Synthetic Curve, 10 yrs	10	3.467	7.400	6.23
DP-M11	COLO SPRGS - Synthetic Curve, 100 yrs	100	11.008	7.150	32.00
DP-M8	COLO SPRGS - Synthetic Curve, 2 yrs	2	20.786	6.500	78.43
DP-M8	COLO SPRGS - Synthetic Curve, 5 yrs	5	40.673	6.550	183.14
DP-M8	COLO SPRGS - Synthetic Curve, 10 yrs	10	71.818	6.500	362.04
DP-M8	COLO SPRGS - Synthetic Curve, 100 yrs	100	151.923	6.500	862.25
DP-M6	COLO SPRGS - Synthetic Curve, 2 yrs	2	29.738	6.700	98.19
DP-M6	COLO SPRGS - Synthetic Curve, 5 yrs	5	57.918	6.750	235.72
DP-M6	COLO SPRGS - Synthetic Curve, 10 yrs	10	101.553	6.700	467.62
DP-M6	COLO SPRGS - Synthetic Curve, 100 yrs	100	212.702	6.700	1,114.10

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP-M7	COLO SPRGS - Synthetic Curve, 2 yrs	2	6.648	6.450	24.55
DP-M7	COLO SPRGS - Synthetic Curve, 5 yrs	5	13.150	6.450	66.19
DP-M7	COLO SPRGS - Synthetic Curve, 10 yrs	10	23.084	6.450	138.47
DP-M7	COLO SPRGS - Synthetic Curve, 100 yrs	100	48.095	6.400	343.86
DP E1	COLO SPRGS - Synthetic Curve, 2 yrs	2	9.987	6.450	52.54
DP E1	COLO SPRGS - Synthetic Curve, 5 yrs	5	18.241	6.450	110.34
DP E1	COLO SPRGS - Synthetic Curve, 10 yrs	10	30.497	6.450	204.78
DP E1	COLO SPRGS - Synthetic Curve, 100 yrs	100	60.594	6.400	474.03
DP-M5	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.593	6.400	11.85
DP-M5	COLO SPRGS - Synthetic Curve, 5 yrs	5	5.565	6.350	30.48
DP-M5	COLO SPRGS - Synthetic Curve, 10 yrs	10	10.359	6.350	67.30
DP-M5	COLO SPRGS - Synthetic Curve, 100 yrs	100	22.979	6.300	178.76
MARK TRIB OUT	COLO SPRGS - Synthetic Curve, 2 yrs	2	65.087	6.750	191.63
MARK TRIB OUT	COLO SPRGS - Synthetic Curve, 5 yrs	5	117.687	6.900	396.31
MARK TRIB OUT	COLO SPRGS - Synthetic Curve, 10 yrs	10	195.896	7.000	698.08
MARK TRIB OUT	COLO SPRGS - Synthetic Curve, 100 yrs	100	388.271	7.300	1,144.13

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E10	COLO SPRGS - Synthetic Curve, 2 yrs	2	3.977	6.100	45.99
DP E10	COLO SPRGS - Synthetic Curve, 5 yrs	5	6.656	6.100	83.97
DP E10	COLO SPRGS - Synthetic Curve, 10 yrs	10	10.380	6.050	138.22
DP E10	COLO SPRGS - Synthetic Curve, 100 yrs	100	18.967	6.050	267.42
DP E11	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.192	6.150	12.05
DP E11	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.995	6.150	22.63
DP E11	COLO SPRGS - Synthetic Curve, 10 yrs	10	3.111	6.150	37.64
DP E11	COLO SPRGS - Synthetic Curve, 100 yrs	100	5.685	6.150	72.63
DP E9	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.121	6.200	16.92
DP E9	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.825	6.200	36.98
DP E9	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.286	6.200	67.07
DP E9	COLO SPRGS - Synthetic Curve, 100 yrs	100	12.170	6.150	142.30
DP E8	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.202	6.100	2.59
DP E8	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.339	6.100	4.72
DP E8	COLO SPRGS - Synthetic Curve, 10 yrs	10	0.528	6.100	7.67
DP E8	COLO SPRGS - Synthetic Curve, 100 yrs	100	0.965	6.050	14.43

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E12	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.525	6.100	6.22
DP E12	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.879	6.100	11.54
DP E12	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.370	6.100	19.01
DP E12	COLO SPRGS - Synthetic Curve, 100 yrs	100	2.504	6.100	36.20
J-M21	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.759	6.400	6.41
J-M21	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.742	6.350	21.29
J-M21	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.829	6.300	48.71
J-M21	COLO SPRGS - Synthetic Curve, 100 yrs	100	14.719	6.300	126.01
J-M15	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.265	8.050	0.32
J-M15	COLO SPRGS - Synthetic Curve, 5 yrs	5	0.779	6.300	3.04
J-M15	COLO SPRGS - Synthetic Curve, 10 yrs	10	1.682	6.250	11.35
J-M15	COLO SPRGS - Synthetic Curve, 100 yrs	100	4.213	6.200	39.49
J-M12	COLO SPRGS - Synthetic Curve, 2 yrs	2	1.275	6.500	4.18
J-M12	COLO SPRGS - Synthetic Curve, 5 yrs	5	2.713	6.400	13.79
J-M12	COLO SPRGS - Synthetic Curve, 10 yrs	10	4.951	6.400	31.40
J-M12	COLO SPRGS - Synthetic Curve, 100 yrs	100	10.669	6.400	80.42

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
J-M6	COLO SPRGS - Synthetic Curve, 2 yrs	2	0.397	8.200	0.35
J-M6	COLO SPRGS - Synthetic Curve, 5 yrs	5	1.420	6.550	3.16
J-M6	COLO SPRGS - Synthetic Curve, 10 yrs	10	3.334	6.400	15.28
J-M6	COLO SPRGS - Synthetic Curve, 100 yrs	100	8.929	6.300	62.82
J-M7	COLO SPRGS - Synthetic Curve, 2 yrs	2	2.071	6.300	12.93
J-M7	COLO SPRGS - Synthetic Curve, 5 yrs	5	3.910	6.250	31.57
J-M7	COLO SPRGS - Synthetic Curve, 10 yrs	10	6.626	6.250	61.02
J-M7	COLO SPRGS - Synthetic Curve, 100 yrs	100	13.253	6.200	138.68

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
EX POND MRK-1 (IN)	COLO SPRGS - Synthetic Curve, 2 yrs	2	64.423	6.700	190.54	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS - Synthetic Curve, 2 yrs	2	64.423	6.750	190.51	5,748.38	0.273
EX POND MRK-1 (IN)	COLO SPRGS - Synthetic Curve, 5 yrs	5	116.574	6.750	408.59	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS - Synthetic Curve, 5 yrs	5	116.574	6.900	394.78	5,749.57	2.419
EX POND MRK-1 (IN)	COLO SPRGS - Synthetic Curve, 10 yrs	10	194.160	6.700	774.16	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
EX POND MRK-1 (OUT)	COLO SPRGS - Synthetic Curve, 10 yrs	10	194.160	7.000	695.89	5,751.00	10.521
EX POND MRK-1 (IN)	COLO SPRGS - Synthetic Curve, 100 yrs	100	385.098	6.650	1,757.30	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS - Synthetic Curve, 100 yrs	100	385.098	7.300	1,141.46	5,754.50	59.656

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

Time-Depth Curve: TYPEIIA 24HR (2.1 in)	
Label	TYPEIIA 24HR (2.1 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.0	0.0	0.0	0.0	0.1
3.750	0.1	0.1	0.1	0.1	0.1
5.000	0.1	0.2	0.2	0.8	1.5
6.250	1.5	1.6	1.6	1.6	1.7
7.500	1.7	1.7	1.7	1.7	1.7
8.750	1.8	1.8	1.8	1.8	1.8
10.000	1.8	1.8	1.8	1.8	1.8
11.250	1.8	1.9	1.9	1.9	1.9
12.500	1.9	1.9	1.9	1.9	1.9
13.750	1.9	1.9	1.9	1.9	1.9
15.000	2.0	2.0	2.0	2.0	2.0
16.250	2.0	2.0	2.0	2.0	2.0
17.500	2.0	2.0	2.0	2.0	2.0
18.750	2.0	2.0	2.0	2.0	2.1
20.000	2.1	2.1	2.1	2.1	2.1
21.250	2.1	2.1	2.1	2.1	2.1
22.500	2.1	2.1	2.1	2.1	2.1
23.750	2.1	2.1	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

Time-Depth Curve: TYPEIIA 24HR (2.6 in)	
Label	TYPEIIA 24HR (2.6 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	5 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.0	0.0	0.1	0.1	0.1
3.750	0.1	0.1	0.1	0.1	0.1
5.000	0.2	0.2	0.3	1.0	1.8
6.250	1.9	2.0	2.0	2.0	2.1
7.500	2.1	2.1	2.1	2.1	2.2
8.750	2.2	2.2	2.2	2.2	2.2
10.000	2.2	2.2	2.3	2.3	2.3
11.250	2.3	2.3	2.3	2.3	2.3
12.500	2.3	2.3	2.4	2.4	2.4
13.750	2.4	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.4	2.4	2.4
16.250	2.5	2.5	2.5	2.5	2.5
17.500	2.5	2.5	2.5	2.5	2.5
18.750	2.5	2.5	2.5	2.5	2.5
20.000	2.5	2.6	2.6	2.6	2.6
21.250	2.6	2.6	2.6	2.6	2.6
22.500	2.6	2.6	2.6	2.6	2.6
23.750	2.6	2.6	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
Label: COLO SPRGS

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

Time-Depth Curve: TYPEIIA 24HR (3.2 in)

Label	TYPEIIA 24HR (3.2 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.1	0.1	0.1	0.1	0.1
3.750	0.1	0.1	0.1	0.1	0.2
5.000	0.2	0.2	0.3	1.3	2.2
6.250	2.3	2.4	2.4	2.5	2.5
7.500	2.6	2.6	2.6	2.6	2.7
8.750	2.7	2.7	2.7	2.7	2.7
10.000	2.8	2.8	2.8	2.8	2.8
11.250	2.8	2.8	2.8	2.8	2.9
12.500	2.9	2.9	2.9	2.9	2.9
13.750	2.9	2.9	2.9	3.0	3.0
15.000	3.0	3.0	3.0	3.0	3.0
16.250	3.0	3.0	3.0	3.0	3.0
17.500	3.1	3.1	3.1	3.1	3.1
18.750	3.1	3.1	3.1	3.1	3.1
20.000	3.1	3.1	3.1	3.1	3.2
21.250	3.2	3.2	3.2	3.2	3.2
22.500	3.2	3.2	3.2	3.2	3.2
23.750	3.2	3.2	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

Time-Depth Curve: TYPEIIA 24HR (4.4 in)

Label	TYPEIIA 24HR (4.4 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.750	0.1	0.1	0.2	0.2	0.2
5.000	0.3	0.3	0.4	1.8	3.1
6.250	3.2	3.3	3.4	3.4	3.5
7.500	3.5	3.6	3.6	3.6	3.7
8.750	3.7	3.7	3.7	3.7	3.8
10.000	3.8	3.8	3.8	3.8	3.9
11.250	3.9	3.9	3.9	3.9	3.9
12.500	3.9	4.0	4.0	4.0	4.0
13.750	4.0	4.0	4.1	4.1	4.1
15.000	4.1	4.1	4.1	4.1	4.1
16.250	4.1	4.2	4.2	4.2	4.2
17.500	4.2	4.2	4.2	4.2	4.2
18.750	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.3	4.3	4.3
21.250	4.3	4.3	4.4	4.4	4.4
22.500	4.4	4.4	4.4	4.4	4.4
23.750	4.4	4.4	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Elevation-Area Volume Curve

Return Event: 100 years

Label: EX POND MRK-1

Storm Event: TYPEIIA 24HR (4.4 in)

Elevation (ft)	Planimeter (ft ²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
5,746.50	0.0	0.001	0.000	0.000	0.000
5,747.00	0.0	0.020	0.024	0.004	0.004
5,748.00	0.0	0.233	0.322	0.107	0.111
5,750.00	0.0	4.801	6.091	4.061	4.172
5,752.00	0.0	12.294	24.777	16.518	20.690
5,754.00	0.0	17.855	44.964	29.976	50.666
5,756.00	0.0	18.612	54.696	36.464	87.130
5,758.00	0.0	19.387	56.995	37.996	125.127
5,760.00	0.0	20.276	59.490	39.660	164.787

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: EX POND OUTLET

Return Event: 2 years
Storm Event: TYPEIIA 24HR (2.1 in)

Requested Pond Water Surface Elevations

Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box	C0	Forward	TW	5,746.50	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
 Label: EX POND OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

Structure ID: C0	
Structure Type: Culvert-Box	
Number of Barrels	5
Width	6.00 ft
Height	3.00 ft
Length	132.00 ft
Length (Computed Barrel)	132.00 ft
Slope (Computed)	0.007 ft/ft
<hr/>	
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft
<hr/>	
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.175
T2 ratio (HW/D)	1.362
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
 Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	5,750.02 ft	T1 Flow	109.12 ft ³ /s
T2 Elevation	5,750.59 ft	T2 Flow	124.71 ft ³ /s

BRADLEY HEIGHTS

Subsection: Outlet Input Data

Return Event: 2 years

Label: EX POND OUTLET

Storm Event: TYPEIIA 24HR (2.1 in)

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE

Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	26.03	(N/A)	0.00
5,747.50	73.54	(N/A)	0.00
5,748.00	135.01	(N/A)	0.00
5,748.50	207.88	(N/A)	0.00
5,749.00	290.49	(N/A)	0.00
5,749.50	381.81	(N/A)	0.00
5,750.00	481.17	(N/A)	0.00
5,750.50	588.08	(N/A)	0.00
5,751.00	696.90	(N/A)	0.00
5,751.50	776.05	(N/A)	0.00
5,752.00	847.82	(N/A)	0.00
5,752.50	914.10	(N/A)	0.00
5,753.00	975.85	(N/A)	0.00
5,753.50	1,034.02	(N/A)	0.00
5,754.00	1,088.98	(N/A)	0.00
5,754.50	1,141.31	(N/A)	0.00
5,755.00	1,191.38	(N/A)	0.00
5,755.50	1,239.30	(N/A)	0.00
5,756.00	1,285.55	(N/A)	0.00
5,756.50	1,330.14	(N/A)	0.00
5,757.00	1,373.41	(N/A)	0.00
5,757.50	1,415.25	(N/A)	0.00
5,758.00	1,455.90	(N/A)	0.00
5,758.50	1,495.36	(N/A)	0.00
5,759.00	1,533.99	(N/A)	0.00
5,759.50	1,571.54	(N/A)	0.00
5,760.00	1,608.25	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .143ft
Dcr= .286ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .286ft
Dcr= .572ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .429ft
Dcr= .857ft CRIT.DEPTH Hev= .00ft

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 2 years
Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

CRIT.DEPTH CONTROL Vh= .571ft Dcr= 1.143ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .714ft Dcr= 1.428ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .857ft Dcr= 1.714ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.000ft Dcr= 2.000ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.143ft Dcr= 2.286ft CRIT.DEPTH Hev= .00ft
INLET CONTROL... Submerged: HW =4.50
INLET CONTROL... Submerged: HW =5.00
INLET CONTROL... Submerged: HW =5.50
INLET CONTROL... Submerged: HW =6.00
INLET CONTROL... Submerged: HW =6.50
INLET CONTROL... Submerged: HW =7.00
INLET CONTROL... Submerged: HW =7.50
INLET CONTROL... Submerged: HW =8.00
INLET CONTROL... Submerged: HW =8.50
INLET CONTROL... Submerged: HW =9.00
INLET CONTROL... Submerged: HW =9.50
INLET CONTROL... Submerged: HW =10.00
INLET CONTROL... Submerged: HW =10.50
INLET CONTROL... Submerged: HW =11.00
INLET CONTROL... Submerged: HW =11.50

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 2 years
Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

INLET CONTROL... Submerged: HW =12.00
INLET CONTROL... Submerged: HW =12.50
INLET CONTROL... Submerged: HW =13.00
INLET CONTROL... Submerged: HW =13.50

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 2 years
Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=40.31;
H=1.00; Htw=.00; Qfree=114.00;
H=1.50; Htw=.00; Qfree=209.43;
H=2.00; Htw=.00; Qfree=322.44;
H=2.50; Htw=.00; Qfree=450.62;
H=3.00; Htw=.00; Qfree=592.36;
H=3.50; Htw=.00; Qfree=746.46;
H=4.00; Htw=.00; Qfree=912.00;
H=4.50; Htw=.00; Qfree=1088.24;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data
 Label: EX POND OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box	C0	Forward	TW	5,746.50	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
 Label: EX POND OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

Structure ID: C0	
Structure Type: Culvert-Box	
Number of Barrels	5
Width	6.00 ft
Height	3.00 ft
Length	132.00 ft
Length (Computed Barrel)	132.00 ft
Slope (Computed)	0.007 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.175
T2 ratio (HW/D)	1.362
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	5,750.02 ft	T1 Flow	109.12 ft ³ /s
T2 Elevation	5,750.59 ft	T2 Flow	124.71 ft ³ /s

BRADLEY HEIGHTS

Subsection: Outlet Input Data

Return Event: 5 years

Label: EX POND OUTLET

Storm Event: TYPEIIA 24HR (2.6 in)

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5} /s)

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	26.03	(N/A)	0.00
5,747.50	73.54	(N/A)	0.00
5,748.00	135.01	(N/A)	0.00
5,748.50	207.88	(N/A)	0.00
5,749.00	290.49	(N/A)	0.00
5,749.50	381.81	(N/A)	0.00
5,750.00	481.17	(N/A)	0.00
5,750.50	588.08	(N/A)	0.00
5,751.00	696.90	(N/A)	0.00
5,751.50	776.05	(N/A)	0.00
5,752.00	847.82	(N/A)	0.00
5,752.50	914.10	(N/A)	0.00
5,753.00	975.85	(N/A)	0.00
5,753.50	1,034.02	(N/A)	0.00
5,754.00	1,088.98	(N/A)	0.00
5,754.50	1,141.31	(N/A)	0.00
5,755.00	1,191.38	(N/A)	0.00
5,755.50	1,239.30	(N/A)	0.00
5,756.00	1,285.55	(N/A)	0.00
5,756.50	1,330.14	(N/A)	0.00
5,757.00	1,373.41	(N/A)	0.00
5,757.50	1,415.25	(N/A)	0.00
5,758.00	1,455.90	(N/A)	0.00
5,758.50	1,495.36	(N/A)	0.00
5,759.00	1,533.99	(N/A)	0.00
5,759.50	1,571.54	(N/A)	0.00
5,760.00	1,608.25	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
 CRIT.DEPTH CONTROL Vh= .143ft
 Dcr= .286ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .286ft
 Dcr= .572ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .429ft
 Dcr= .857ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .571ft
 Dcr= 1.143ft CRIT.DEPTH Hev= .00ft

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

CRIT.DEPTH CONTROL Vh= .714ft Dcr= 1.428ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .857ft Dcr= 1.714ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.000ft Dcr= 2.000ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.143ft Dcr= 2.286ft CRIT.DEPTH Hev= .00ft
INLET CONTROL... Submerged: HW =4.50
INLET CONTROL... Submerged: HW =5.00
INLET CONTROL... Submerged: HW =5.50
INLET CONTROL... Submerged: HW =6.00
INLET CONTROL... Submerged: HW =6.50
INLET CONTROL... Submerged: HW =7.00
INLET CONTROL... Submerged: HW =7.50
INLET CONTROL... Submerged: HW =8.00
INLET CONTROL... Submerged: HW =8.50
INLET CONTROL... Submerged: HW =9.00
INLET CONTROL... Submerged: HW =9.50
INLET CONTROL... Submerged: HW =10.00
INLET CONTROL... Submerged: HW =10.50
INLET CONTROL... Submerged: HW =11.00
INLET CONTROL... Submerged: HW =11.50
INLET CONTROL... Submerged: HW =12.00
INLET CONTROL... Submerged: HW =12.50

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

INLET CONTROL... Submerged: HW =13.00
INLET CONTROL... Submerged: HW =13.50

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=40.31;
H=1.00; Htw=.00; Qfree=114.00;
H=1.50; Htw=.00; Qfree=209.43;
H=2.00; Htw=.00; Qfree=322.44;
H=2.50; Htw=.00; Qfree=450.62;
H=3.00; Htw=.00; Qfree=592.36;
H=3.50; Htw=.00; Qfree=746.46;
H=4.00; Htw=.00; Qfree=912.00;
H=4.50; Htw=.00; Qfree=1088.24;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: EX POND OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box	C0	Forward	TW	5,746.50	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data

Return Event: 10 years

Label: EX POND OUTLET

Storm Event: TYPEIIA 24HR (3.2 in)

Structure ID: C0	
Structure Type: Culvert-Box	
Number of Barrels	5
Width	6.00 ft
Height	3.00 ft
Length	132.00 ft
Length (Computed Barrel)	132.00 ft
Slope (Computed)	0.007 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.175
T2 ratio (HW/D)	1.362
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.

Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	5,750.02 ft	T1 Flow	109.12 ft ³ /s
T2 Elevation	5,750.59 ft	T2 Flow	124.71 ft ³ /s

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: EX POND OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

Structure ID: W0	
Structure Type: Rectangular Weir	

Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: TW	
Structure Type: TW Setup, DS Channel	

Tailwater Type	Free Outfall
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Convergence Tolerances	
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Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	26.03	(N/A)	0.00
5,747.50	73.54	(N/A)	0.00
5,748.00	135.01	(N/A)	0.00
5,748.50	207.88	(N/A)	0.00
5,749.00	290.49	(N/A)	0.00
5,749.50	381.81	(N/A)	0.00
5,750.00	481.17	(N/A)	0.00
5,750.50	588.08	(N/A)	0.00
5,751.00	696.90	(N/A)	0.00
5,751.50	776.05	(N/A)	0.00
5,752.00	847.82	(N/A)	0.00
5,752.50	914.10	(N/A)	0.00
5,753.00	975.85	(N/A)	0.00
5,753.50	1,034.02	(N/A)	0.00
5,754.00	1,088.98	(N/A)	0.00
5,754.50	1,141.31	(N/A)	0.00
5,755.00	1,191.38	(N/A)	0.00
5,755.50	1,239.30	(N/A)	0.00
5,756.00	1,285.55	(N/A)	0.00
5,756.50	1,330.14	(N/A)	0.00
5,757.00	1,373.41	(N/A)	0.00
5,757.50	1,415.25	(N/A)	0.00
5,758.00	1,455.90	(N/A)	0.00
5,758.50	1,495.36	(N/A)	0.00
5,759.00	1,533.99	(N/A)	0.00
5,759.50	1,571.54	(N/A)	0.00
5,760.00	1,608.25	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
 CRIT.DEPTH CONTROL Vh= .143ft
 Dcr= .286ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .286ft
 Dcr= .572ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .429ft
 Dcr= .857ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .571ft
 Dcr= 1.143ft CRIT.DEPTH Hev= .00ft

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

CRIT.DEPTH CONTROL Vh= .714ft Dcr= 1.428ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .857ft Dcr= 1.714ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.000ft Dcr= 2.000ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.143ft Dcr= 2.286ft CRIT.DEPTH Hev= .00ft
INLET CONTROL... Submerged: HW =4.50
INLET CONTROL... Submerged: HW =5.00
INLET CONTROL... Submerged: HW =5.50
INLET CONTROL... Submerged: HW =6.00
INLET CONTROL... Submerged: HW =6.50
INLET CONTROL... Submerged: HW =7.00
INLET CONTROL... Submerged: HW =7.50
INLET CONTROL... Submerged: HW =8.00
INLET CONTROL... Submerged: HW =8.50
INLET CONTROL... Submerged: HW =9.00
INLET CONTROL... Submerged: HW =9.50
INLET CONTROL... Submerged: HW =10.00
INLET CONTROL... Submerged: HW =10.50
INLET CONTROL... Submerged: HW =11.00
INLET CONTROL... Submerged: HW =11.50
INLET CONTROL... Submerged: HW =12.00
INLET CONTROL... Submerged: HW =12.50

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

INLET CONTROL... Submerged: HW =13.00
INLET CONTROL... Submerged: HW =13.50

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=40.31;
H=1.00; Htw=.00; Qfree=114.00;
H=1.50; Htw=.00; Qfree=209.43;
H=2.00; Htw=.00; Qfree=322.44;
H=2.50; Htw=.00; Qfree=450.62;
H=3.00; Htw=.00; Qfree=592.36;
H=3.50; Htw=.00; Qfree=746.46;
H=4.00; Htw=.00; Qfree=912.00;
H=4.50; Htw=.00; Qfree=1088.24;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data
 Label: EX POND OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box	C0	Forward	TW	5,746.50	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: EX POND OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Structure ID: C0	
Structure Type: Culvert-Box	
Number of Barrels	5
Width	6.00 ft
Height	3.00 ft
Length	132.00 ft
Length (Computed Barrel)	132.00 ft
Slope (Computed)	0.007 ft/ft
Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0260
M	1.0000
C	0.0347
Y	0.8100
T1 ratio (HW/D)	1.175
T2 ratio (HW/D)	1.362
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control, interpolate between flows at T1 & T2...

T1 Elevation	5,750.02 ft	T1 Flow	109.12 ft ³ /s
T2 Elevation	5,750.59 ft	T2 Flow	124.71 ft ³ /s

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: EX POND OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s
Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	26.03	(N/A)	0.00
5,747.50	73.54	(N/A)	0.00
5,748.00	135.01	(N/A)	0.00
5,748.50	207.88	(N/A)	0.00
5,749.00	290.49	(N/A)	0.00
5,749.50	381.81	(N/A)	0.00
5,750.00	481.17	(N/A)	0.00
5,750.50	588.08	(N/A)	0.00
5,751.00	696.90	(N/A)	0.00
5,751.50	776.05	(N/A)	0.00
5,752.00	847.82	(N/A)	0.00
5,752.50	914.10	(N/A)	0.00
5,753.00	975.85	(N/A)	0.00
5,753.50	1,034.02	(N/A)	0.00
5,754.00	1,088.98	(N/A)	0.00
5,754.50	1,141.31	(N/A)	0.00
5,755.00	1,191.38	(N/A)	0.00
5,755.50	1,239.30	(N/A)	0.00
5,756.00	1,285.55	(N/A)	0.00
5,756.50	1,330.14	(N/A)	0.00
5,757.00	1,373.41	(N/A)	0.00
5,757.50	1,415.25	(N/A)	0.00
5,758.00	1,455.90	(N/A)	0.00
5,758.50	1,495.36	(N/A)	0.00
5,759.00	1,533.99	(N/A)	0.00
5,759.50	1,571.54	(N/A)	0.00
5,760.00	1,608.25	(N/A)	0.00

Computation Messages

Upstream HW & DNstream TW < Inv.El
 CRIT.DEPTH CONTROL Vh= .143ft
 Dcr= .286ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .286ft
 Dcr= .572ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .429ft
 Dcr= .857ft CRIT.DEPTH Hev= .00ft
 CRIT.DEPTH CONTROL Vh= .571ft
 Dcr= 1.143ft CRIT.DEPTH Hev= .00ft

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

CRIT.DEPTH CONTROL Vh= .714ft Dcr= 1.428ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .857ft Dcr= 1.714ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.000ft Dcr= 2.000ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.143ft Dcr= 2.286ft CRIT.DEPTH Hev= .00ft
INLET CONTROL... Submerged: HW =4.50
INLET CONTROL... Submerged: HW =5.00
INLET CONTROL... Submerged: HW =5.50
INLET CONTROL... Submerged: HW =6.00
INLET CONTROL... Submerged: HW =6.50
INLET CONTROL... Submerged: HW =7.00
INLET CONTROL... Submerged: HW =7.50
INLET CONTROL... Submerged: HW =8.00
INLET CONTROL... Submerged: HW =8.50
INLET CONTROL... Submerged: HW =9.00
INLET CONTROL... Submerged: HW =9.50
INLET CONTROL... Submerged: HW =10.00
INLET CONTROL... Submerged: HW =10.50
INLET CONTROL... Submerged: HW =11.00
INLET CONTROL... Submerged: HW =11.50
INLET CONTROL... Submerged: HW =12.00
INLET CONTROL... Submerged: HW =12.50

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = C0 (Culvert-Box)

Mannings open channel maximum capacity: 222.61 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

INLET CONTROL... Submerged: HW =13.00
INLET CONTROL... Submerged: HW =13.50

Subsection: Individual Outlet Curves
 Label: EX POND OUTLET

Return Event: 100 years
 Storm Event: TYPEIIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: EX POND OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=40.31;
H=1.00; Htw=.00; Qfree=114.00;
H=1.50; Htw=.00; Qfree=209.43;
H=2.00; Htw=.00; Qfree=322.44;
H=2.50; Htw=.00; Qfree=450.62;
H=3.00; Htw=.00; Qfree=592.36;
H=3.50; Htw=.00; Qfree=746.46;
H=4.00; Htw=.00; Qfree=912.00;
H=4.50; Htw=.00; Qfree=1088.24;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

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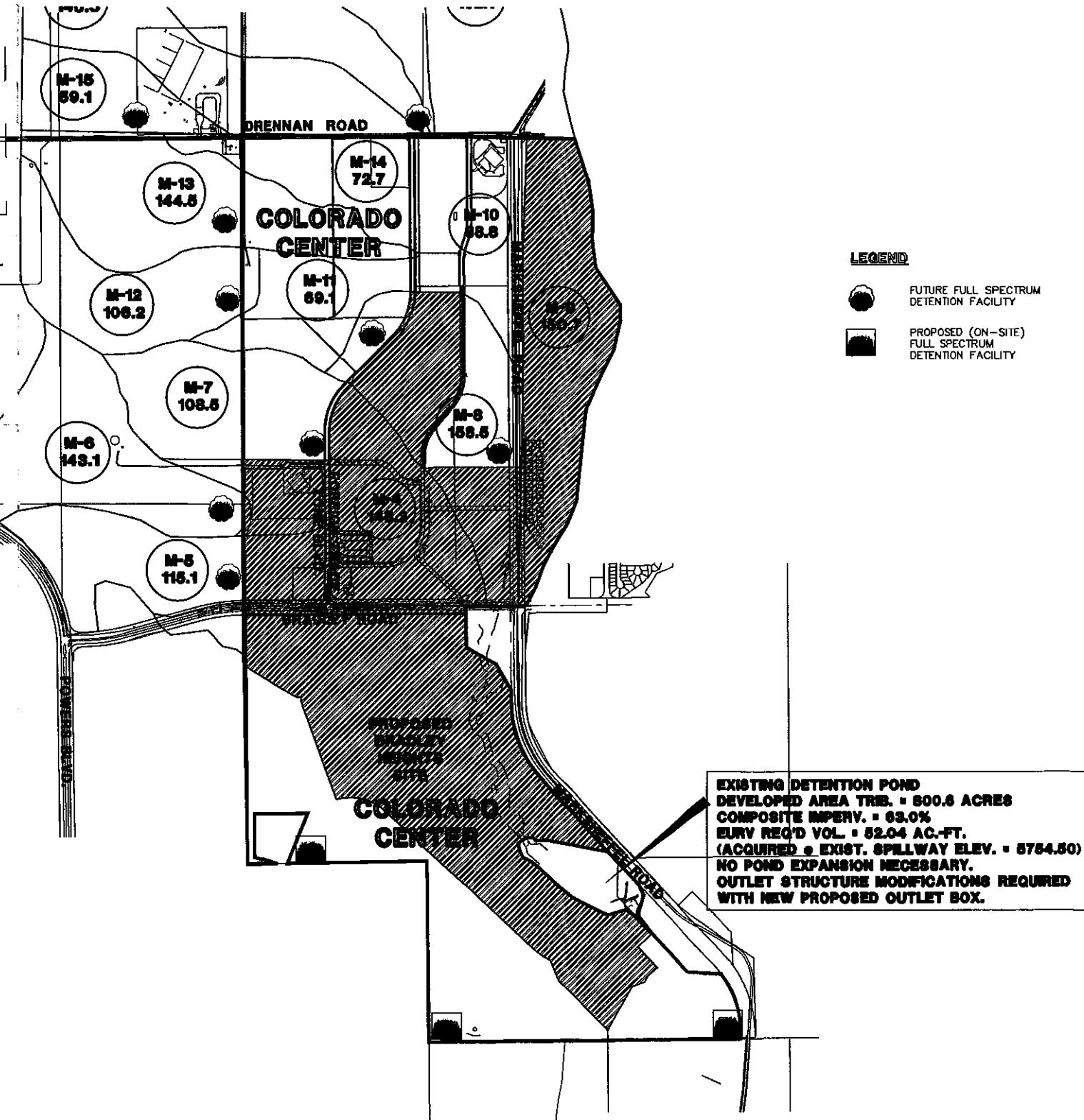
**COLORADO CENTRE TRIBUTARY BASINS
TO REGIONAL POND EXHIBIT**





BRADLEY HEIGHTS MDDP
 COLORADO CENTRE DEVELOPMENT
 TO REGIONAL DETENTION POND EXHIBIT
 JOB NO. 2266.00
 NOVEMBER 2009

6385 Corporate Drive, Suite 101 (719)785-0790
 Colorado Springs, Colorado 80919 (719)785-0799 (Fax)



EXISTING DETENTION POND
 DEVELOPED AREA TRIB. = 800.8 ACRES
 COMPOSITE IMPERV. = 63.0%
 EURY REQ'D VOL. = 52.04 AC.-FT.
 (ACQUIRED @ EXIST. SPILLWAY ELEV. = 5784.50)
 NO POND EXPANSION NECESSARY.
 OUTLET STRUCTURE MODIFICATIONS REQUIRED
 WITH NEW PROPOSED OUTLET BOX.

PROPOSED CONDITIONS
HYDROLOGIC CALCULATIONS & PONDPACK RESULTS



COMPOSITE C_N VALUES - DEVELOPED CONDITIONS

BASIN (label)	BASIN AREA (ac)	LAND USE	SUB-AREA LAND USE 1		SUB-AREA LAND USE 2		TOTAL BASIN AREA (ac)	TOTAL BASIN AREA (sq mi)	WEIGHTED C _N
			AREA (ac)	ESTIMATED CN	AREA (ac)	ESTIMATED CN			
1-N	13.16	RES	13.16	85	0	N/A	13.16	0.020563	85.0
1-S	23.51	RES	23.51	85	0	N/A	23.51	0.03673	85.0
2	10.75	COMM	10.75	94	0	N/A	10.75	0.01680	94.0
5A	21.54	COMM	21.54	94	0	N/A	21.54	0.03366	94.0
3468N	44.16	RES	44.16	85	0	N/A	44.16	0.06900	85.0
11-N	14.23	MULTIFAM	14.23	91	0	N/A	14.23	0.02223	91.0
11-S	20.03	MULTIFAM	20.03	91	0	N/A	20.03	0.03130	91.0
7	21.22	MULTIFAM	21.22	91	0	N/A	21.22	0.03316	91.0
ELEC	12.79	ELEC SUB	12.79	91	0	N/A	12.79	0.01998	91.0
3468S	39.16	RES	39.16	85	0	N/A	39.16	0.06119	85.0
12-N	8.67	CHANNEL	8.67	74	0	N/A	8.67	0.01355	74.0
12-S	4.40	CHANNEL	4.40	74	0	N/A	4.40	0.00688	74.0
13-W	24.87	RES	24.87	85	0	N/A	24.87	0.03886	85.0
13-E	14.22	RES	14.22	85	0	N/A	14.22	0.02222	85.0
5B	15.10	RES	15.10	85	0	N/A	15.10	0.02359	85.0
9AB	37.12	SCHL & PARK	27.12	91	5.00	74	37.12	0.05800	76.5
9C-N	41.45	RES	41.45	85	0	N/A	41.45	0.06477	85.0
9C-S	29.90	RES	29.90	85	0	N/A	29.90	0.04672	85.0
17	20.98	MULTIFAM	20.98	91	0	N/A	20.98	0.03278	91.0
16-N	16.88	RES	16.88	85	0	N/A	16.88	0.02638	85.0
16-W	30.67	RES & PARK	25.67	85	5.00	74	30.67	0.04792	83.2
16-E	18.20	RES	18.20	85	0	N/A	18.20	0.02844	85.0
14	56.95	RES	56.95	85	0	N/A	56.95	0.08898	85.0
OS-1	33.57	UNDEV	33.57	74	0	N/A	33.57	0.05245	87.4
OS-2	32.75	UNDEV	32.75	74	0	N/A	32.75	0.05117	74.0
OS-3	15.85	UNDEV	15.85	74	0	N/A	15.85	0.02477	74.0
OS-4	20.09	UNDEV	20.09	74	0	N/A	20.09	0.03139	74.0
DET	24.91	POND	24.91	74	0	N/A	24.91	0.03892	72.6

BASIN SUMMARY - DEVELOPED CONDITIONS

BASIN (label)	TOTAL BASIN AREA (acres)	TOTAL BASIN AREA (sq mi)	LAND USE	WEIGHTED CN	TOTAL Time of Concentration (hours)	Q 5 Yr. (cfs)	Q 100 Yr. (cfs)
1-N	13.16	0.0206	RES	85.0	0.4167	18.07	42.28
1-S	23.51	0.0367	RES	85.0	0.4167	32.78	75.53
2	10.75	0.0168	COMM	94.0	0.2000	29.24	53.53
5A	21.54	0.0337	COMM	94.0	0.2000	58.59	107.25
3468N	44.16	0.0690	RES	85.0	0.4167	60.83	141.87
11-N	14.23	0.0222	MULTIFAM	91.0	0.1667	35.30	67.88
11-S	20.03	0.0313	MULTIFAM	91.0	0.1667	49.69	95.55
7	21.22	0.0332	MULTIFAM	91.0	0.2500	48.93	95.69
ELEC	12.79	0.0200	ELEC SUB	91.0	0.1667	31.70	60.97
3468S	39.16	0.0612	RES	85.0	0.4167	53.76	125.81
12-N	8.67	0.0135	CHANNEL	74.0	0.2500	7.27	22.37
12-S	4.40	0.0069	CHANNEL	74.0	0.1667	3.69	11.35
13-W	24.87	0.0389	RES	85.0	0.4167	34.15	79.90
13-E	14.22	0.0222	RES	85.0	0.4167	19.52	45.68
5B	15.10	0.0236	RES	85.0	0.3330	23.11	52.78
9AB	37.12	0.0580	SCHL & PARK	76.5	0.2500	36.36	103.98
9C-N	41.45	0.0648	RES	85.0	0.4167	56.63	132.52
9C-S	29.90	0.0467	RES	85.0	0.4167	41.05	96.06
17	20.98	0.0328	MULTIFAM	91.0	0.2000	50.51	98.27
16-N	16.88	0.0264	RES	85.0	0.3330	25.83	59.00
16-W	30.67	0.0479	RES & PARK	83.2	0.5000	38.05	89.68
16-E	18.20	0.0284	RES	85.0	0.4167	24.99	58.47
14	56.95	0.0890	RES	85.0	0.5000	70.65	166.53
OS-1	33.57	0.0525	UNDEV	87.4	0.2629	63.02	134.50
OS-2	32.75	0.0512	UNDEV	74.0	0.4174	20.57	66.00
OS-3	15.85	0.0248	UNDEV	74.0	0.3297	11.54	36.20
OS-4	20.09	0.0314	UNDEV	74.0	0.2691	16.32	50.11
DET	24.91	0.0389	POND	72.6	0.2981	17.82	56.55
M4-EX	6.50	0.0102	UNDEV	75.1	0.1667	6.88	19.18
M4-DEV	141.72	0.2214	INDUS *	86.0	0.6667	152.99	356.32
M5-EX	84.84	0.1326	UNDEV	67.9	0.6667	20.43	90.95
M5-DEV	30.23	0.0472	INDUS *	84.0	0.3833	40.65	96.34
M6-EX	143.10	0.2236	UNDEV	55.8	0.6390	3.16	62.71
M7-EX	108.54	0.1696	UNDEV	68.0	0.5279	31.55	138.81
M8-EX	66.31	0.1036	UNDEV	78.7	0.5833	48.99	137.22
M8-DEV	92.22	0.1441	INDUS *	86.0	0.5000	121.84	279.74
M9-DEV	150.66	0.2354	RES (8 DU/AC.) *	81.0	1.4167	64.44	171.57
M10-EX	88.83	0.1388	UNDEV	71.7	1.2781	19.55	71.39
M11-EX	69.06	0.1079	UNDEV	73.0	0.7223	26.54	91.53
M12-EX	106.24	0.1660	UNDEV	63.5	0.7502	13.77	80.33
M13-EX	144.45	0.2257	UNDEV	61.7	0.9169	11.62	80.42
M14-EX	72.70	0.1136	UNDEV	70.3	0.8335	18.62	73.79
M15-EX	59.14	0.0924	UNDEV	57.8	0.4723	3.04	39.50
M16-EX	148.54	0.2321	UNDEV	64.8	0.9447	18.78	99.49
M17-EX	182.02	0.2844	UNDEV	75.7	0.8335	81.13	255.04
M18-EX	163.40	0.2553	UNDEV	71.4	0.9169	42.71	162.25
M19-EX	192.00	0.3000	UNDEV	65.2	0.9724	23.63	126.16
M20-EX	89.54	0.1399	UNDEV	63.7	1.0836	8.83	50.26
M21-EX	146.56	0.2290	UNDEV	63.7	0.6390	21.28	125.81
M22-EX	66.11	0.1033	UNDEV	50.3	0.6113	0.17	14.09
M23-EX	132.80	0.2075	UNDEV	53.7	1.2219	1.19	28.28
M24-EX	99.58	0.1556	UNDEV	65.0	0.6668	16.35	88.24
M25-EX	101.82	0.1591	UNDEV	57.7	0.6390	4.28	54.33
M26-EX	114.30	0.1786	UNDEV	54.1	1.6392	0.97	19.58
M27-EX	124.86	0.1951	UNDEV	49.8	1.0333	0.31	12.48

Time of Concentrations for all developed parcels are estimated as grading and storm design are unknown at this time.

* Developed basins north of Bradley Road were modeled as reduced industrial and residential (M9) land uses. Reduction equates to approx. 12% imperviousness.

DESIGN POINTS - DEVELOPED CONDITIONS

Design Point (label)	Q 2 Yr. Q (cfs)	Q 5 Yr. Q (cfs)	Q 10 Yr. Q (cfs)	Q 50 Yr. Q (cfs)	Q 100 Yr. Q (cfs)
E1	138.75	222.10	343.00	602.30	660.54
E2	144.46	309.65	582.39	1,187.02	1,325.18
E3	287.43	461.82	760.37	1,498.54	1,667.15
4	355.17	556.27	843.14	1,547.84	1,720.53
5	397.10	632.14	956.89	1,611.37	1,771.82
Pond-Marksheffel In	459.86	739.86	1,126.01	1,866.91	2,029.97
Pond-Marksheffel Out	57.36	125.45	380.70	1,009.18	1,156.30
7 - Marksheffel Trib. Out	24.16	125.75	379.52	1,006.65	1,153.73
8	6.22	11.54	19.01	33.18	36.20
Pond 1 In	99.25	140.82	193.07	283.40	301.75
9 (Historic Release)	16.92	36.98	67.07	128.54	142.30
Pond 2 In	84.09	129.25	190.00	299.45	322.22
10 (Historic Release)	45.99	83.97	138.22	244.61	267.42
Pond 3 In	52.38	73.01	98.67	142.61	151.49
11 (Historic Release)	12.05	22.63	37.64	66.45	72.63

JOB NAME BRADLEY HEIGHTS
 JOB NUM 2266.00
 DATE 03/17/09
 CALC BY DLG

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM GRADE.
 REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.

DEVELOPED CONDITIONS - PRELIMINARY PIPE SIZING

Pipe Run	Contributing Basins	Flow		Pipe Size*
		Q(5)	Q(100)	
C1	PARCEL 1-N & PARCEL 2	45.2	92.1	48" RCP @ 0.50% minimum
C2	PARCEL 3468N	60.8	60.8	42" RCP @ 0.50% minimum
C3	PIPE C1 & C2	101.6	228.6	72" RCP @ 0.50% minimum
C4	PARCEL 5A + PIPE C3	158.5	331.7	78" RCP @ 0.50% minimum
C5	PARCEL 5B	23.1	52.8	42" RCP @ 0.50% minimum
C6	PARCEL 3468S (1/2)	26.9	62.9	42" RCP @ 0.50% minimum
C7	PARCEL 3467S (1/2)	26.9	62.9	42" RCP @ 0.50% minimum
C8	PIPE C6 & C7	53.8	125.8	54" RCP @ 0.50% minimum
C9	PARCEL 13-E	19.5	45.7	36" RCP @ 0.50% minimum
C10	PARCEL 9AB + PIPES C8 & C9	108.8	269.0	72" RCP @ 0.53% minimum
C11	PARCEL 9C-N	56.6	132.5	54" RCP @ 0.50% minimum
C12	PARCEL 16-N	25.8	59.0	42" RCP @ 0.50% minimum
C13	PARCEL 9C-S + PIPE C11	97.7	228.6	66" RCP @ 0.50% minimum
C14	PIPE C12 & C13	123.5	234.2	66" RCP @ 0.50% minimum
C15	PARCEL 16-W	38.1	89.7	48" RCP @ 0.50% minimum
C16	PARCEL 14 + PIPE C15	108.7	256.2	72" RCP @ 0.50% minimum
C17	PARCEL 1-S	32.3	75.5	54" RCP @ 0.50% minimum
C18	PARCEL 7	48.9	95.7	48" RCP @ 0.50% minimum
C19	PIPE C17 & C18	79.0	167.8	60" RCP @ 0.50% minimum
C20	PARCEL ELEC	31.7	61.0	42" RCP @ 0.50% minimum
C21	PARCEL 13-W	34.2	79.9	48" RCP @ 0.50% minimum
C22	PARCEL 16-E	25.0	58.5	42" RCP @ 0.50% minimum
C23	PARCEL 17 + PIPE C22	73.0	151.5	60" RCP @ 0.50% minimum

BRADLEY HEIGHTS

Project Summary

Title	BRADLEY HEIGHTS
Engineer	DAVID GIBSON
Company	
Date	9/11/2014

Notes	DEVELOPED CONDITIONS MARKSHEFFEL TRIBUTARY CHANNEL AND REGIONAL DETENTION POND
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BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
OS-1	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.754	6.050	44.23
OS-1	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.904	6.050	63.02
OS-1	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.358	6.050	86.43
OS-1	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	8.411	6.050	134.50
OS-3	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.525	6.100	6.22
OS-3	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.879	6.100	11.54
OS-3	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.370	6.100	19.01
OS-3	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	2.504	6.100	36.20
OS-4	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.666	6.100	9.12
OS-4	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.114	6.100	16.32
OS-4	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.737	6.050	26.33
OS-4	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.174	6.050	50.11
M21-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.759	6.400	6.41
M21-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.742	6.350	21.28
M21-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.829	6.300	48.62

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M21-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	14.718	6.300	125.81
M23-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.195	20.050	0.21
M23-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.944	7.500	1.19
M23-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.474	7.000	6.16
M23-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	7.174	6.800	28.28
M20-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.075	6.800	2.87
M20-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.287	6.650	8.83
M20-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.173	6.650	19.74
M20-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	8.994	6.650	50.26
M24-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.355	6.400	5.45
M24-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.787	6.400	16.34
M24-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.982	6.350	35.20
M24-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.524	6.300	88.24
M27-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.010	24.100	0.02
M27-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.353	20.200	0.31
M27-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.338	7.800	1.82

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M27-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	4.833	7.150	12.48
M26-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.168	20.100	0.18
M26-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.813	8.100	0.97
M26-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.129	7.250	4.53
M26-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	6.175	7.000	19.58
M22-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.005	20.150	0.01
M22-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.187	20.000	0.17
M22-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	0.708	6.600	1.32
M22-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	2.559	6.350	14.09
M25-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.457	8.100	0.54
M25-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.341	6.450	4.28
M25-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.895	6.400	15.40
M25-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	7.252	6.300	54.33
M16-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.022	6.650	6.44
M16-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.157	6.550	18.78
M16-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	7.432	6.550	40.39

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M16-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	15.699	6.550	99.49
M17-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	7.069	6.450	45.60
M17-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	11.464	6.450	81.13
M17-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	17.473	6.350	132.20
M17-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	31.098	6.350	255.05
M18-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	4.177	6.500	20.42
M18-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	7.379	6.500	42.71
M18-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	11.957	6.500	76.60
M18-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	22.800	6.450	162.25
M19-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.614	6.700	8.15
M19-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	5.373	6.600	23.63
M19-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	9.606	6.600	50.48
M19-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	20.291	6.500	126.16
M10-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.483	6.800	9.88
M10-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.304	6.800	19.55
M10-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.882	6.650	34.28

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M10-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	12.931	6.650	71.39
M15-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.265	8.050	0.32
M15-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.779	6.300	3.04
M15-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.682	6.250	11.35
M15-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	4.213	6.200	39.50
M14-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.693	6.450	8.53
M14-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.052	6.450	18.62
M14-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.016	6.450	34.21
M14-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	9.713	6.350	73.79
M13-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.314	6.750	2.87
M13-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.030	6.600	11.62
M13-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.790	6.500	28.76
M13-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	13.037	6.500	80.42
M12-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.275	6.500	4.18
M12-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.713	6.400	13.77
M12-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.951	6.400	31.37

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M12-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.669	6.400	80.33
M11-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.106	6.350	13.54
M11-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.584	6.350	26.54
M11-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.658	6.350	45.59
M11-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.480	6.350	91.53
M8-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	3.216	6.250	29.44
M8-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	5.002	6.250	48.99
M8-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	7.387	6.200	75.61
M8-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	12.670	6.200	137.22
M9-DEV	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	8.397	6.800	40.07
M9-DEV	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	12.734	6.800	64.44
M9-DEV	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	18.443	6.800	97.45
M9-DEV	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	30.908	6.800	171.57
M5-DEV	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.054	6.100	26.87
M5-DEV	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.007	6.100	40.65
M5-DEV	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.237	6.100	58.45

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M5-DEV	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	6.867	6.100	96.34
M7-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.071	6.300	12.93
M7-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.910	6.250	31.55
M7-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.626	6.250	60.99
M7-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	13.253	6.200	138.81
M4-DEV	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	10.929	6.300	103.11
M4-DEV	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	15.655	6.250	152.99
M4-DEV	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	21.672	6.250	217.97
M4-DEV	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	34.381	6.250	356.32
PARCEL 5A	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.675	6.000	44.96
PARCEL 5A	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.528	6.000	58.59
PARCEL 5A	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.567	6.000	74.90
PARCEL 5A	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	6.673	6.000	107.25
PARCEL 2	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.335	6.000	22.44
PARCEL 2	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.761	6.000	29.24
PARCEL 2	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.279	6.000	37.38

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
PARCEL 2	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.330	6.000	53.53
PARCEL 1-N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.953	6.150	12.17
PARCEL 1-N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.380	6.100	18.07
PARCEL 1-N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.928	6.100	25.82
PARCEL 1-N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.091	6.100	42.28
PARCEL 3468N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	3.199	6.150	40.83
PARCEL 3468N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.632	6.100	60.63
PARCEL 3468N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.469	6.100	86.63
PARCEL 3468N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.372	6.100	141.87
DET	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.759	6.100	9.47
DET	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.292	6.100	17.82
DET	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.040	6.100	29.53
DET	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.779	6.050	56.55
PARCEL 16-N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.222	6.100	17.56
PARCEL 16-N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.770	6.100	25.83
PARCEL 16-N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.471	6.100	36.33

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
PARCEL 16-N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.962	6.050	59.00
PARCEL 11-S	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.089	6.000	37.01
PARCEL 11-S	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.840	6.000	49.69
PARCEL 11-S	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	3.769	6.000	64.99
PARCEL 11-S	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	5.678	6.000	95.55
M6-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.397	8.200	0.35
M6-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.420	6.550	3.16
M6-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	3.334	6.400	15.29
M6-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	8.928	6.300	62.71
M5-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.619	6.400	8.55
M5-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.057	6.350	20.43
M5-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.179	6.300	39.93
M5-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.359	6.300	90.95
M8-DEV	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	7.112	6.200	82.88
M8-DEV	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	10.188	6.150	121.84
M8-DEV	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	14.104	6.150	172.55

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
M8-DEV	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	22.374	6.150	279.74
PARCEL 5B	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.093	6.100	15.71
PARCEL 5B	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.583	6.100	23.11
PARCEL 5B	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.211	6.100	32.50
PARCEL 5B	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.544	6.050	52.78
PARCEL 11-N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.484	6.000	26.29
PARCEL 11-N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.018	6.000	35.30
PARCEL 11-N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.678	6.000	46.17
PARCEL 11-N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	4.034	6.000	67.88
PARCEL 3468S	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.837	6.150	36.21
PARCEL 3468S	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.108	6.100	53.76
PARCEL 3468S	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.737	6.100	76.82
PARCEL 3468S	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	9.198	6.100	125.81
PARCEL 13-E	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.030	6.150	13.15
PARCEL 13-E	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.492	6.100	19.52
PARCEL 13-E	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	2.083	6.100	27.90

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
PARCEL 13-E	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	3.340	6.100	45.68
PARCEL 9AB	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.442	6.100	21.16
PARCEL 9AB	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.338	6.050	36.36
PARCEL 9AB	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	3.564	6.050	57.26
PARCEL 9AB	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	6.343	6.050	103.98
PARCEL 12-N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.287	6.100	4.08
PARCEL 12-N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.481	6.050	7.27
PARCEL 12-N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	0.750	6.050	11.88
PARCEL 12-N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	1.370	6.050	22.37
PARCEL 9C-N	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.988	6.150	38.14
PARCEL 9C-N	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.327	6.100	56.63
PARCEL 9C-N	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.043	6.100	80.92
PARCEL 9C-N	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	9.689	6.100	132.52
PARCEL 9C-S	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.166	6.150	27.64
PARCEL 9C-S	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.136	6.100	41.05
PARCEL 9C-S	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.380	6.100	58.66

BRADLEY HEIGHTS

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
PARCEL 9C-S	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	7.023	6.100	96.06
M4-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.233	6.050	4.08
M4-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.385	6.050	6.88
M4-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	0.593	6.050	10.62
M4-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	1.068	6.000	19.18
PARCEL 12-S	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.146	6.100	2.07
PARCEL 12-S	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.244	6.050	3.69
PARCEL 12-S	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	0.380	6.050	6.03
PARCEL 12-S	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	0.695	6.050	11.35

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP-E3	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	68.486	6.200	287.43
DP-E3	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	117.139	6.250	461.82
DP-E3	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	188.442	6.600	760.37
DP-E3	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	361.874	6.600	1,667.15

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E2	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	48.429	6.850	144.46
DP E2	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	85.802	6.850	309.65
DP E2	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	141.444	6.800	582.39
DP E2	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	278.607	6.800	1,325.18
Junc 15	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	65.732	6.250	268.18
Junc 15	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	113.235	6.300	443.40
Junc 15	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	183.084	6.600	751.10
Junc 15	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	353.463	6.650	1,653.93
DP-M10	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	3.026	6.900	6.62
DP-M10	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	6.971	6.750	22.12
DP-M10	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	13.473	6.650	54.37
DP-M10	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	30.884	6.550	168.51
DP-M9	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	5.014	7.000	9.92
DP-M9	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	12.439	6.600	36.07
DP-M9	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	25.508	6.500	90.44
DP-M9	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	62.205	6.500	294.62

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP-M11	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.178	20.300	0.19
DP-M11	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.166	8.500	1.09
DP-M11	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	3.467	7.400	6.23
DP-M11	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	11.008	7.150	32.00
DP-M8	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	20.785	6.500	78.45
DP-M8	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	40.673	6.550	183.11
DP-M8	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	71.818	6.500	362.05
DP-M8	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	151.922	6.500	862.24
DP-M6	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	29.738	6.700	98.18
DP-M6	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	57.917	6.750	235.69
DP-M6	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	101.552	6.700	467.58
DP-M6	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	212.700	6.700	1,113.98
DP-M7	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	6.648	6.450	24.55
DP-M7	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	13.150	6.450	66.17
DP-M7	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	23.084	6.450	138.43
DP-M7	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	48.094	6.400	343.80

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP E1	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	17.303	6.300	138.75
DP E1	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	27.433	6.300	222.10
DP E1	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	41.641	6.300	343.01
DP E1	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	74.856	6.300	660.54
DP-M5	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	4.070	6.150	31.61
DP-M5	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	7.484	6.150	54.05
DP-M5	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	12.750	6.200	92.51
DP-M5	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	26.155	6.200	203.01
DP-4	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	77.711	6.200	355.17
DP-4	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	129.990	6.200	556.27
DP-4	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	205.860	6.250	843.14
DP-4	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	388.848	6.600	1,720.53
Junc 30	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	8.162	6.050	113.71
Junc 30	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	11.301	6.050	158.49
Junc 30	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	15.243	6.050	214.71
Junc 30	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	23.466	6.050	331.70

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Junc 20	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	5.487	6.100	70.25
Junc 20	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	7.773	6.100	101.64
Junc 20	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	10.676	6.050	142.33
Junc 20	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	16.793	6.050	228.64
DP-5	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	84.750	6.250	397.10
DP-5	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	140.381	6.200	632.14
DP-5	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	220.624	6.200	956.89
DP-5	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	413.083	6.550	1,771.82
Junc 80	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	5.308	6.100	70.03
Junc 80	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	7.938	6.100	108.83
Junc 80	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	11.384	6.100	159.57
Junc 80	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	18.881	6.050	269.00
Junc 10	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.837	6.150	36.21
Junc 10	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	4.108	6.100	53.76
Junc 10	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	5.737	6.100	76.82
Junc 10	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	9.198	6.100	125.81

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Junc 50	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.397	8.200	0.35
Junc 50	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	1.420	6.550	3.16
Junc 50	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	3.334	6.400	15.29
Junc 50	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	8.928	6.300	62.71
Junc 60	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	2.071	6.300	12.93
Junc 60	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.910	6.250	31.55
Junc 60	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.626	6.250	60.99
Junc 60	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	13.253	6.200	138.81
Junc 70	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	6.376	6.100	82.70
Junc 70	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	9.233	6.100	123.52
Junc 70	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	12.894	6.100	175.91
Junc 70	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	20.674	6.100	286.87
Junc 40	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	5.154	6.150	65.78
Junc 40	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	7.463	6.100	97.69
Junc 40	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	10.423	6.100	139.58
Junc 40	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	16.712	6.100	228.58

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
DP-7	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	56.880	20.000	24.35
DP-7	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	111.697	8.800	126.28
DP-7	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	195.993	7.850	381.01
DP-7	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	399.612	7.350	1,156.32
DP-8	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.525	6.100	6.22
DP-8	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.879	6.100	11.54
DP-8	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.370	6.100	19.01
DP-8	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	2.504	6.100	36.20
J-M21-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.759	6.400	6.41
J-M21-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	3.742	6.350	21.28
J-M21-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	6.829	6.300	48.62
J-M21-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	14.718	6.300	125.81
J-M15-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	0.265	8.050	0.32
J-M15-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	0.779	6.300	3.04
J-M15-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	1.682	6.250	11.35
J-M15-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	4.213	6.200	39.50

BRADLEY HEIGHTS

Subsection: Master Network Summary

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
J-M12-EX	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	1.275	6.500	4.18
J-M12-EX	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	2.713	6.400	13.77
J-M12-EX	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	4.951	6.400	31.37
J-M12-EX	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	10.669	6.400	80.33

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
EX POND MRK-1 (IN)	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	94.081	6.250	459.86	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS: 1 - Synthetic Curve, 2 yrs	2	56.215	20.500	24.16	5,754.42	58.236
EX POND MRK-1 (IN)	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	153.949	6.200	739.86	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS: 1 - Synthetic Curve, 5 yrs	5	110.583	8.800	125.75	5,755.41	76.269
EX POND MRK-1 (IN)	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	239.663	6.200	1,126.01	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS: 1 - Synthetic Curve, 10 yrs	10	194.256	7.850	379.52	5,756.62	98.727
EX POND MRK-1 (IN)	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	443.862	6.200	2,029.97	(N/A)	(N/A)
EX POND MRK-1 (OUT)	COLO SPRGS: 1 - Synthetic Curve, 100 yrs	100	396.437	7.350	1,153.73	5,759.09	146.616

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS: 1

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

Time-Depth Curve: TYPEIIA 24HR (2.1 in)	
Label	TYPEIIA 24HR (2.1 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.0	0.0	0.0	0.0	0.1
3.750	0.1	0.1	0.1	0.1	0.1
5.000	0.1	0.2	0.2	0.8	1.5
6.250	1.5	1.6	1.6	1.6	1.7
7.500	1.7	1.7	1.7	1.7	1.7
8.750	1.8	1.8	1.8	1.8	1.8
10.000	1.8	1.8	1.8	1.8	1.8
11.250	1.8	1.9	1.9	1.9	1.9
12.500	1.9	1.9	1.9	1.9	1.9
13.750	1.9	1.9	1.9	1.9	1.9
15.000	2.0	2.0	2.0	2.0	2.0
16.250	2.0	2.0	2.0	2.0	2.0
17.500	2.0	2.0	2.0	2.0	2.0
18.750	2.0	2.0	2.0	2.0	2.1
20.000	2.1	2.1	2.1	2.1	2.1
21.250	2.1	2.1	2.1	2.1	2.1
22.500	2.1	2.1	2.1	2.1	2.1
23.750	2.1	2.1	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS: 1

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

Time-Depth Curve: TYPEIIA 24HR (2.6 in)	
Label	TYPEIIA 24HR (2.6 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	5 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.250 hours
 Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.0	0.0	0.1	0.1	0.1
3.750	0.1	0.1	0.1	0.1	0.1
5.000	0.2	0.2	0.3	1.0	1.8
6.250	1.9	2.0	2.0	2.0	2.1
7.500	2.1	2.1	2.1	2.1	2.2
8.750	2.2	2.2	2.2	2.2	2.2
10.000	2.2	2.2	2.3	2.3	2.3
11.250	2.3	2.3	2.3	2.3	2.3
12.500	2.3	2.3	2.4	2.4	2.4
13.750	2.4	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.4	2.4	2.4
16.250	2.5	2.5	2.5	2.5	2.5
17.500	2.5	2.5	2.5	2.5	2.5
18.750	2.5	2.5	2.5	2.5	2.5
20.000	2.5	2.6	2.6	2.6	2.6
21.250	2.6	2.6	2.6	2.6	2.6
22.500	2.6	2.6	2.6	2.6	2.6
23.750	2.6	2.6	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS: 1

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

Time-Depth Curve: TYPEIIA 24HR (3.2 in)	
Label	TYPEIIA 24HR (3.2 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.0	0.0
2.500	0.1	0.1	0.1	0.1	0.1
3.750	0.1	0.1	0.1	0.1	0.2
5.000	0.2	0.2	0.3	1.3	2.2
6.250	2.3	2.4	2.4	2.5	2.5
7.500	2.6	2.6	2.6	2.6	2.7
8.750	2.7	2.7	2.7	2.7	2.7
10.000	2.8	2.8	2.8	2.8	2.8
11.250	2.8	2.8	2.8	2.8	2.9
12.500	2.9	2.9	2.9	2.9	2.9
13.750	2.9	2.9	2.9	3.0	3.0
15.000	3.0	3.0	3.0	3.0	3.0
16.250	3.0	3.0	3.0	3.0	3.0
17.500	3.1	3.1	3.1	3.1	3.1
18.750	3.1	3.1	3.1	3.1	3.1
20.000	3.1	3.1	3.1	3.1	3.2
21.250	3.2	3.2	3.2	3.2	3.2
22.500	3.2	3.2	3.2	3.2	3.2
23.750	3.2	3.2	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Time-Depth Curve
 Label: COLO SPRGS: 1

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

Time-Depth Curve: TYPEIIA 24HR (4.4 in)	
Label	TYPEIIA 24HR (4.4 in)
Start Time	0.000 hours
Increment	0.250 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)

Output Time Increment = 0.250 hours

Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
1.250	0.0	0.0	0.0	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.750	0.1	0.1	0.2	0.2	0.2
5.000	0.3	0.3	0.4	1.8	3.1
6.250	3.2	3.3	3.4	3.4	3.5
7.500	3.5	3.6	3.6	3.6	3.7
8.750	3.7	3.7	3.7	3.7	3.8
10.000	3.8	3.8	3.8	3.8	3.9
11.250	3.9	3.9	3.9	3.9	3.9
12.500	3.9	4.0	4.0	4.0	4.0
13.750	4.0	4.0	4.1	4.1	4.1
15.000	4.1	4.1	4.1	4.1	4.1
16.250	4.1	4.2	4.2	4.2	4.2
17.500	4.2	4.2	4.2	4.2	4.2
18.750	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.3	4.3	4.3
21.250	4.3	4.3	4.4	4.4	4.4
22.500	4.4	4.4	4.4	4.4	4.4
23.750	4.4	4.4	(N/A)	(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Elevation-Area Volume Curve

Return Event: 2 years

Label: EX POND MRK-1

Storm Event: TYPEIIA 24HR (2.1 in)

Elevation (ft)	Planimeter (ft ²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
5,746.50	0.0	0.001	0.000	0.000	0.000
5,747.00	0.0	0.020	0.024	0.004	0.004
5,748.00	0.0	0.233	0.322	0.107	0.111
5,750.00	0.0	4.801	6.091	4.061	4.172
5,752.00	0.0	12.294	24.777	16.518	20.690
5,754.00	0.0	17.855	44.964	29.976	50.666
5,756.00	0.0	18.612	54.696	36.464	87.130
5,758.00	0.0	19.387	56.995	37.996	125.127
5,760.00	0.0	20.276	59.490	39.660	164.787

BRADLEY HEIGHTS

Subsection: Elevation-Area Volume Curve
 Label: EX POND MRK-1

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

Elevation (ft)	Planimeter (ft ²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
5,746.50	0.0	0.001	0.000	0.000	0.000
5,747.00	0.0	0.020	0.024	0.004	0.004
5,748.00	0.0	0.233	0.322	0.107	0.111
5,750.00	0.0	4.801	6.091	4.061	4.172
5,752.00	0.0	12.294	24.777	16.518	20.690
5,754.00	0.0	17.855	44.964	29.976	50.666
5,756.00	0.0	18.612	54.696	36.464	87.130
5,758.00	0.0	19.387	56.995	37.996	125.127
5,760.00	0.0	20.276	59.490	39.660	164.787

BRADLEY HEIGHTS

Subsection: Elevation-Area Volume Curve
 Label: EX POND MRK-1

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

Elevation (ft)	Planimeter (ft ²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
5,746.50	0.0	0.001	0.000	0.000	0.000
5,747.00	0.0	0.020	0.024	0.004	0.004
5,748.00	0.0	0.233	0.322	0.107	0.111
5,750.00	0.0	4.801	6.091	4.061	4.172
5,752.00	0.0	12.294	24.777	16.518	20.690
5,754.00	0.0	17.855	44.964	29.976	50.666
5,756.00	0.0	18.612	54.696	36.464	87.130
5,758.00	0.0	19.387	56.995	37.996	125.127
5,760.00	0.0	20.276	59.490	39.660	164.787

BRADLEY HEIGHTS

Subsection: Elevation-Area Volume Curve
 Label: EX POND MRK-1

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

Elevation (ft)	Planimeter (ft ²)	Area (acres)	A1+A2+sqr (A1*A2) (acres)	Volume (ac-ft)	Volume (Total) (ac-ft)
5,746.50	0.0	0.001	0.000	0.000	0.000
5,747.00	0.0	0.020	0.024	0.004	0.004
5,748.00	0.0	0.233	0.322	0.107	0.111
5,750.00	0.0	4.801	6.091	4.061	4.172
5,752.00	0.0	12.294	24.777	16.518	20.690
5,754.00	0.0	17.855	44.964	29.976	50.666
5,756.00	0.0	18.612	54.696	36.464	87.130
5,758.00	0.0	19.387	56.995	37.996	125.127
5,760.00	0.0	20.276	59.490	39.660	164.787

BRADLEY HEIGHTS

Subsection: Outlet Input Data
 Label: REVISED OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.25 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	O0	Forward	TW	5,746.75	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 2 years
Storm Event: TYPEIIA 24HR (2.1 in)

Structure ID: O0	
Structure Type: Orifice-Area	
Number of Openings	15
Elevation	5,746.75 ft
Orifice Area	0.1 ft ²
Top Elevation	5,752.00 ft
Datum Elevation	5,746.75 ft
Orifice Coefficient	0.600
Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5} /s)
Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall
Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.95	(N/A)	0.00
5,747.25	1.90	(N/A)	0.00
5,747.50	2.85	(N/A)	0.00
5,747.75	3.81	(N/A)	0.00
5,748.00	4.76	(N/A)	0.00
5,748.25	5.71	(N/A)	0.00
5,748.50	6.66	(N/A)	0.00
5,748.75	7.61	(N/A)	0.00
5,749.00	8.56	(N/A)	0.00
5,749.25	9.52	(N/A)	0.00
5,749.50	10.47	(N/A)	0.00
5,749.75	11.42	(N/A)	0.00
5,750.00	12.37	(N/A)	0.00
5,750.25	13.32	(N/A)	0.00
5,750.50	14.27	(N/A)	0.00
5,750.75	15.23	(N/A)	0.00
5,751.00	16.18	(N/A)	0.00
5,751.25	17.13	(N/A)	0.00
5,751.50	18.08	(N/A)	0.00
5,751.75	19.03	(N/A)	0.00
5,752.00	19.98	(N/A)	0.00
5,752.25	20.45	(N/A)	0.00
5,752.50	20.91	(N/A)	0.00
5,752.75	21.36	(N/A)	0.00
5,753.00	21.80	(N/A)	0.00
5,753.25	22.23	(N/A)	0.00
5,753.50	22.66	(N/A)	0.00
5,753.75	23.07	(N/A)	0.00
5,754.00	23.48	(N/A)	0.00
5,754.25	23.88	(N/A)	0.00
5,754.50	24.28	(N/A)	0.00
5,754.75	24.67	(N/A)	0.00
5,755.00	25.05	(N/A)	0.00
5,755.25	25.43	(N/A)	0.00
5,755.50	25.80	(N/A)	0.00

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,755.75	26.16	(N/A)	0.00
5,756.00	26.52	(N/A)	0.00
5,756.25	26.88	(N/A)	0.00
5,756.50	27.23	(N/A)	0.00
5,756.75	27.58	(N/A)	0.00
5,757.00	27.92	(N/A)	0.00
5,757.25	28.26	(N/A)	0.00
5,757.50	28.59	(N/A)	0.00
5,757.75	28.92	(N/A)	0.00
5,758.00	29.25	(N/A)	0.00
5,758.25	29.58	(N/A)	0.00
5,758.50	29.89	(N/A)	0.00
5,758.75	30.21	(N/A)	0.00
5,759.00	30.52	(N/A)	0.00
5,759.25	30.83	(N/A)	0.00
5,759.50	31.14	(N/A)	0.00
5,759.75	31.44	(N/A)	0.00
5,760.00	31.75	(N/A)	0.00

Computation Messages

HW & TW below invert
 Hi=.00; Ht=5.25; Qt=1.33
 Hi=.25; Ht=5.25; Qt=1.33
 Hi=.50; Ht=5.25; Qt=1.33
 Hi=.75; Ht=5.25; Qt=1.33
 Hi=1.00; Ht=5.25; Qt=1.33
 Hi=1.25; Ht=5.25; Qt=1.33
 Hi=1.50; Ht=5.25; Qt=1.33
 Hi=1.75; Ht=5.25; Qt=1.33
 Hi=2.00; Ht=5.25; Qt=1.33
 Hi=2.25; Ht=5.25; Qt=1.33
 Hi=2.50; Ht=5.25; Qt=1.33
 Hi=2.75; Ht=5.25; Qt=1.33
 Hi=3.00; Ht=5.25; Qt=1.33
 Hi=3.25; Ht=5.25; Qt=1.33
 Hi=3.50; Ht=5.25; Qt=1.33
 Hi=3.75; Ht=5.25; Qt=1.33
 Hi=4.00; Ht=5.25; Qt=1.33

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 2 years
Storm Event: TYPEIIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

Hi=4.25; Ht=5.25; Qt=1.33
Hi=4.50; Ht=5.25; Qt=1.33
Hi=4.75; Ht=5.25; Qt=1.33
Hi=5.00; Ht=5.25; Qt=1.33
H =5.25
H =5.50
H =5.75
H =6.00
H =6.25
H =6.50
H =6.75
H =7.00
H =7.25
H =7.50
H =7.75
H =8.00
H =8.25
H =8.50
H =8.75
H =9.00
H =9.25
H =9.50
H =9.75
H =10.00
H =10.25
H =10.50
H =10.75
H =11.00
H =11.25
H =11.50
H =11.75
H =12.00
H =12.25
H =12.50
H =12.75
H =13.00
H =13.25

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

 Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.25	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,747.75	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.25	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,748.75	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.25	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,749.75	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.25	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,750.75	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.25	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,751.75	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.25	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,752.75	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.25	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,753.75	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.25	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,754.75	14.25	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.25	74.05	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 2 years
 Storm Event: TYPEIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,755.75	159.32	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00
5,756.25	263.91	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,756.75	384.75	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.25	519.88	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,757.75	667.93	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.25	827.85	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,758.75	998.82	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.25	1,180.17	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,759.75	1,371.34	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

BRADLEY HEIGHTS

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 2 years
Storm Event: TYPEIIIA 24HR (2.1 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.25; Htw=.00; Qfree=14.25;
H=.50; Htw=.00; Qfree=40.31;
H=.75; Htw=.00; Qfree=74.05;
H=1.00; Htw=.00; Qfree=114.00;
H=1.25; Htw=.00; Qfree=159.32;
H=1.50; Htw=.00; Qfree=209.43;
H=1.75; Htw=.00; Qfree=263.91;
H=2.00; Htw=.00; Qfree=322.44;
H=2.25; Htw=.00; Qfree=384.75;
H=2.50; Htw=.00; Qfree=450.62;
H=2.75; Htw=.00; Qfree=519.88;
H=3.00; Htw=.00; Qfree=592.36;
H=3.25; Htw=.00; Qfree=667.93;
H=3.50; Htw=.00; Qfree=746.46;
H=3.75; Htw=.00; Qfree=827.85;
H=4.00; Htw=.00; Qfree=912.00;
H=4.25; Htw=.00; Qfree=998.82;
H=4.50; Htw=.00; Qfree=1088.24;
H=4.75; Htw=.00; Qfree=1180.17;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.25; Htw=.00; Qfree=1371.34;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

Requested Pond Water Surface Elevations	
Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.25 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	O0	Forward	TW	5,746.75	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

Structure ID: O0	
Structure Type: Orifice-Area	
Number of Openings	15
Elevation	5,746.75 ft
Orifice Area	0.1 ft ²
Top Elevation	5,752.00 ft
Datum Elevation	5,746.75 ft
Orifice Coefficient	0.600

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 5 years
 Storm Event: TYPEIIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.95	(N/A)	0.00
5,747.25	1.90	(N/A)	0.00
5,747.50	2.85	(N/A)	0.00
5,747.75	3.81	(N/A)	0.00
5,748.00	4.76	(N/A)	0.00
5,748.25	5.71	(N/A)	0.00
5,748.50	6.66	(N/A)	0.00
5,748.75	7.61	(N/A)	0.00
5,749.00	8.56	(N/A)	0.00
5,749.25	9.52	(N/A)	0.00
5,749.50	10.47	(N/A)	0.00
5,749.75	11.42	(N/A)	0.00
5,750.00	12.37	(N/A)	0.00
5,750.25	13.32	(N/A)	0.00
5,750.50	14.27	(N/A)	0.00
5,750.75	15.23	(N/A)	0.00
5,751.00	16.18	(N/A)	0.00
5,751.25	17.13	(N/A)	0.00
5,751.50	18.08	(N/A)	0.00
5,751.75	19.03	(N/A)	0.00
5,752.00	19.98	(N/A)	0.00
5,752.25	20.45	(N/A)	0.00
5,752.50	20.91	(N/A)	0.00
5,752.75	21.36	(N/A)	0.00
5,753.00	21.80	(N/A)	0.00
5,753.25	22.23	(N/A)	0.00
5,753.50	22.66	(N/A)	0.00
5,753.75	23.07	(N/A)	0.00
5,754.00	23.48	(N/A)	0.00
5,754.25	23.88	(N/A)	0.00
5,754.50	24.28	(N/A)	0.00
5,754.75	24.67	(N/A)	0.00
5,755.00	25.05	(N/A)	0.00
5,755.25	25.43	(N/A)	0.00
5,755.50	25.80	(N/A)	0.00
5,755.75	26.16	(N/A)	0.00
5,756.00	26.52	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	26.88	(N/A)	0.00
5,756.50	27.23	(N/A)	0.00
5,756.75	27.58	(N/A)	0.00
5,757.00	27.92	(N/A)	0.00
5,757.25	28.26	(N/A)	0.00
5,757.50	28.59	(N/A)	0.00
5,757.75	28.92	(N/A)	0.00
5,758.00	29.25	(N/A)	0.00
5,758.25	29.58	(N/A)	0.00
5,758.50	29.89	(N/A)	0.00
5,758.75	30.21	(N/A)	0.00
5,759.00	30.52	(N/A)	0.00
5,759.25	30.83	(N/A)	0.00
5,759.50	31.14	(N/A)	0.00
5,759.75	31.44	(N/A)	0.00
5,760.00	31.75	(N/A)	0.00

Computation Messages

HW & TW below invert
 Hi=.00; Ht=5.25; Qt=1.33
 Hi=.25; Ht=5.25; Qt=1.33
 Hi=.50; Ht=5.25; Qt=1.33
 Hi=.75; Ht=5.25; Qt=1.33
 Hi=1.00; Ht=5.25; Qt=1.33
 Hi=1.25; Ht=5.25; Qt=1.33
 Hi=1.50; Ht=5.25; Qt=1.33
 Hi=1.75; Ht=5.25; Qt=1.33
 Hi=2.00; Ht=5.25; Qt=1.33
 Hi=2.25; Ht=5.25; Qt=1.33
 Hi=2.50; Ht=5.25; Qt=1.33
 Hi=2.75; Ht=5.25; Qt=1.33
 Hi=3.00; Ht=5.25; Qt=1.33
 Hi=3.25; Ht=5.25; Qt=1.33
 Hi=3.50; Ht=5.25; Qt=1.33
 Hi=3.75; Ht=5.25; Qt=1.33
 Hi=4.00; Ht=5.25; Qt=1.33
 Hi=4.25; Ht=5.25; Qt=1.33
 Hi=4.50; Ht=5.25; Qt=1.33
 Hi=4.75; Ht=5.25; Qt=1.33
 Hi=5.00; Ht=5.25; Qt=1.33

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

H =5.25
H =5.50
H =5.75
H =6.00
H =6.25
H =6.50
H =6.75
H =7.00
H =7.25
H =7.50
H =7.75
H =8.00
H =8.25
H =8.50
H =8.75
H =9.00
H =9.25
H =9.50
H =9.75
H =10.00
H =10.25
H =10.50
H =10.75
H =11.00
H =11.25
H =11.50
H =11.75
H =12.00
H =12.25
H =12.50
H =12.75
H =13.00
H =13.25

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 5 years
 Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.25	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,747.75	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.25	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,748.75	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.25	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,749.75	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.25	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,750.75	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.25	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,751.75	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.25	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,752.75	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.25	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,753.75	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.25	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,754.75	14.25	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.25	74.05	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,755.75	159.32	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 5 years
 Storm Event: TYPEIIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	263.91	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,756.75	384.75	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.25	519.88	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,757.75	667.93	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.25	827.85	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,758.75	998.82	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.25	1,180.17	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,759.75	1,371.34	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
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 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 5 years
Storm Event: TYPEIIA 24HR (2.6 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.25; Htw=.00; Qfree=14.25;
H=.50; Htw=.00; Qfree=40.31;
H=.75; Htw=.00; Qfree=74.05;
H=1.00; Htw=.00; Qfree=114.00;
H=1.25; Htw=.00; Qfree=159.32;
H=1.50; Htw=.00; Qfree=209.43;
H=1.75; Htw=.00; Qfree=263.91;
H=2.00; Htw=.00; Qfree=322.44;
H=2.25; Htw=.00; Qfree=384.75;
H=2.50; Htw=.00; Qfree=450.62;
H=2.75; Htw=.00; Qfree=519.88;
H=3.00; Htw=.00; Qfree=592.36;
H=3.25; Htw=.00; Qfree=667.93;
H=3.50; Htw=.00; Qfree=746.46;
H=3.75; Htw=.00; Qfree=827.85;
H=4.00; Htw=.00; Qfree=912.00;
H=4.25; Htw=.00; Qfree=998.82;
H=4.50; Htw=.00; Qfree=1088.24;
H=4.75; Htw=.00; Qfree=1180.17;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.25; Htw=.00; Qfree=1371.34;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data

Return Event: 10 years

Label: REVISED OUTLET

Storm Event: TYPEIIA 24HR (3.2 in)

Requested Pond Water Surface Elevations

Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.25 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	O0	Forward	TW	5,746.75	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

Structure ID: O0	
Structure Type: Orifice-Area	
Number of Openings	15
Elevation	5,746.75 ft
Orifice Area	0.1 ft ²
Top Elevation	5,752.00 ft
Datum Elevation	5,746.75 ft
Orifice Coefficient	0.600

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.95	(N/A)	0.00
5,747.25	1.90	(N/A)	0.00
5,747.50	2.85	(N/A)	0.00
5,747.75	3.81	(N/A)	0.00
5,748.00	4.76	(N/A)	0.00
5,748.25	5.71	(N/A)	0.00
5,748.50	6.66	(N/A)	0.00
5,748.75	7.61	(N/A)	0.00
5,749.00	8.56	(N/A)	0.00
5,749.25	9.52	(N/A)	0.00
5,749.50	10.47	(N/A)	0.00
5,749.75	11.42	(N/A)	0.00
5,750.00	12.37	(N/A)	0.00
5,750.25	13.32	(N/A)	0.00
5,750.50	14.27	(N/A)	0.00
5,750.75	15.23	(N/A)	0.00
5,751.00	16.18	(N/A)	0.00
5,751.25	17.13	(N/A)	0.00
5,751.50	18.08	(N/A)	0.00
5,751.75	19.03	(N/A)	0.00
5,752.00	19.98	(N/A)	0.00
5,752.25	20.45	(N/A)	0.00
5,752.50	20.91	(N/A)	0.00
5,752.75	21.36	(N/A)	0.00
5,753.00	21.80	(N/A)	0.00
5,753.25	22.23	(N/A)	0.00
5,753.50	22.66	(N/A)	0.00
5,753.75	23.07	(N/A)	0.00
5,754.00	23.48	(N/A)	0.00
5,754.25	23.88	(N/A)	0.00
5,754.50	24.28	(N/A)	0.00
5,754.75	24.67	(N/A)	0.00
5,755.00	25.05	(N/A)	0.00
5,755.25	25.43	(N/A)	0.00
5,755.50	25.80	(N/A)	0.00
5,755.75	26.16	(N/A)	0.00
5,756.00	26.52	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	26.88	(N/A)	0.00
5,756.50	27.23	(N/A)	0.00
5,756.75	27.58	(N/A)	0.00
5,757.00	27.92	(N/A)	0.00
5,757.25	28.26	(N/A)	0.00
5,757.50	28.59	(N/A)	0.00
5,757.75	28.92	(N/A)	0.00
5,758.00	29.25	(N/A)	0.00
5,758.25	29.58	(N/A)	0.00
5,758.50	29.89	(N/A)	0.00
5,758.75	30.21	(N/A)	0.00
5,759.00	30.52	(N/A)	0.00
5,759.25	30.83	(N/A)	0.00
5,759.50	31.14	(N/A)	0.00
5,759.75	31.44	(N/A)	0.00
5,760.00	31.75	(N/A)	0.00

Computation Messages

HW & TW below invert
 Hi=.00; Ht=5.25; Qt=1.33
 Hi=.25; Ht=5.25; Qt=1.33
 Hi=.50; Ht=5.25; Qt=1.33
 Hi=.75; Ht=5.25; Qt=1.33
 Hi=1.00; Ht=5.25; Qt=1.33
 Hi=1.25; Ht=5.25; Qt=1.33
 Hi=1.50; Ht=5.25; Qt=1.33
 Hi=1.75; Ht=5.25; Qt=1.33
 Hi=2.00; Ht=5.25; Qt=1.33
 Hi=2.25; Ht=5.25; Qt=1.33
 Hi=2.50; Ht=5.25; Qt=1.33
 Hi=2.75; Ht=5.25; Qt=1.33
 Hi=3.00; Ht=5.25; Qt=1.33
 Hi=3.25; Ht=5.25; Qt=1.33
 Hi=3.50; Ht=5.25; Qt=1.33
 Hi=3.75; Ht=5.25; Qt=1.33
 Hi=4.00; Ht=5.25; Qt=1.33
 Hi=4.25; Ht=5.25; Qt=1.33
 Hi=4.50; Ht=5.25; Qt=1.33
 Hi=4.75; Ht=5.25; Qt=1.33
 Hi=5.00; Ht=5.25; Qt=1.33

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

H =5.25
H =5.50
H =5.75
H =6.00
H =6.25
H =6.50
H =6.75
H =7.00
H =7.25
H =7.50
H =7.75
H =8.00
H =8.25
H =8.50
H =8.75
H =9.00
H =9.25
H =9.50
H =9.75
H =10.00
H =10.25
H =10.50
H =10.75
H =11.00
H =11.25
H =11.50
H =11.75
H =12.00
H =12.25
H =12.50
H =12.75
H =13.00
H =13.25

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.25	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,747.75	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.25	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,748.75	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.25	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,749.75	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.25	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,750.75	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.25	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,751.75	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.25	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,752.75	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.25	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,753.75	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.25	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,754.75	14.25	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.25	74.05	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,755.75	159.32	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 10 years
 Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	263.91	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,756.75	384.75	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.25	519.88	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,757.75	667.93	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.25	827.85	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,758.75	998.82	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.25	1,180.17	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,759.75	1,371.34	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
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 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 10 years
Storm Event: TYPEIIA 24HR (3.2 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.25; Htw=.00; Qfree=14.25;
H=.50; Htw=.00; Qfree=40.31;
H=.75; Htw=.00; Qfree=74.05;
H=1.00; Htw=.00; Qfree=114.00;
H=1.25; Htw=.00; Qfree=159.32;
H=1.50; Htw=.00; Qfree=209.43;
H=1.75; Htw=.00; Qfree=263.91;
H=2.00; Htw=.00; Qfree=322.44;
H=2.25; Htw=.00; Qfree=384.75;
H=2.50; Htw=.00; Qfree=450.62;
H=2.75; Htw=.00; Qfree=519.88;
H=3.00; Htw=.00; Qfree=592.36;
H=3.25; Htw=.00; Qfree=667.93;
H=3.50; Htw=.00; Qfree=746.46;
H=3.75; Htw=.00; Qfree=827.85;
H=4.00; Htw=.00; Qfree=912.00;
H=4.25; Htw=.00; Qfree=998.82;
H=4.50; Htw=.00; Qfree=1088.24;
H=4.75; Htw=.00; Qfree=1180.17;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.25; Htw=.00; Qfree=1371.34;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Requested Pond Water Surface Elevations

Minimum (Headwater)	5,746.50 ft
Increment (Headwater)	0.25 ft
Maximum (Headwater)	5,760.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Area	O0	Forward	TW	5,746.75	5,760.00
Rectangular Weir	W0	Forward	TW	5,754.50	5,760.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

BRADLEY HEIGHTS

Subsection: Outlet Input Data
Label: REVISED OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

Structure ID: O0	
Structure Type: Orifice-Area	
Number of Openings	15
Elevation	5,746.75 ft
Orifice Area	0.1 ft ²
Top Elevation	5,752.00 ft
Datum Elevation	5,746.75 ft
Orifice Coefficient	0.600

Structure ID: W0	
Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	5,754.50 ft
Weir Length	38.00 ft
Weir Coefficient	3.00 (ft ^{0.5})/s

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	40
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft ³ /s
Flow Tolerance (Maximum)	10.000 ft ³ /s

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.95	(N/A)	0.00
5,747.25	1.90	(N/A)	0.00
5,747.50	2.85	(N/A)	0.00
5,747.75	3.81	(N/A)	0.00
5,748.00	4.76	(N/A)	0.00
5,748.25	5.71	(N/A)	0.00
5,748.50	6.66	(N/A)	0.00
5,748.75	7.61	(N/A)	0.00
5,749.00	8.56	(N/A)	0.00
5,749.25	9.52	(N/A)	0.00
5,749.50	10.47	(N/A)	0.00
5,749.75	11.42	(N/A)	0.00
5,750.00	12.37	(N/A)	0.00
5,750.25	13.32	(N/A)	0.00
5,750.50	14.27	(N/A)	0.00
5,750.75	15.23	(N/A)	0.00
5,751.00	16.18	(N/A)	0.00
5,751.25	17.13	(N/A)	0.00
5,751.50	18.08	(N/A)	0.00
5,751.75	19.03	(N/A)	0.00
5,752.00	19.98	(N/A)	0.00
5,752.25	20.45	(N/A)	0.00
5,752.50	20.91	(N/A)	0.00
5,752.75	21.36	(N/A)	0.00
5,753.00	21.80	(N/A)	0.00
5,753.25	22.23	(N/A)	0.00
5,753.50	22.66	(N/A)	0.00
5,753.75	23.07	(N/A)	0.00
5,754.00	23.48	(N/A)	0.00
5,754.25	23.88	(N/A)	0.00
5,754.50	24.28	(N/A)	0.00
5,754.75	24.67	(N/A)	0.00
5,755.00	25.05	(N/A)	0.00
5,755.25	25.43	(N/A)	0.00
5,755.50	25.80	(N/A)	0.00
5,755.75	26.16	(N/A)	0.00
5,756.00	26.52	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	26.88	(N/A)	0.00
5,756.50	27.23	(N/A)	0.00
5,756.75	27.58	(N/A)	0.00
5,757.00	27.92	(N/A)	0.00
5,757.25	28.26	(N/A)	0.00
5,757.50	28.59	(N/A)	0.00
5,757.75	28.92	(N/A)	0.00
5,758.00	29.25	(N/A)	0.00
5,758.25	29.58	(N/A)	0.00
5,758.50	29.89	(N/A)	0.00
5,758.75	30.21	(N/A)	0.00
5,759.00	30.52	(N/A)	0.00
5,759.25	30.83	(N/A)	0.00
5,759.50	31.14	(N/A)	0.00
5,759.75	31.44	(N/A)	0.00
5,760.00	31.75	(N/A)	0.00

Computation Messages

HW & TW below invert
 Hi=.00; Ht=5.25; Qt=1.33
 Hi=.25; Ht=5.25; Qt=1.33
 Hi=.50; Ht=5.25; Qt=1.33
 Hi=.75; Ht=5.25; Qt=1.33
 Hi=1.00; Ht=5.25; Qt=1.33
 Hi=1.25; Ht=5.25; Qt=1.33
 Hi=1.50; Ht=5.25; Qt=1.33
 Hi=1.75; Ht=5.25; Qt=1.33
 Hi=2.00; Ht=5.25; Qt=1.33
 Hi=2.25; Ht=5.25; Qt=1.33
 Hi=2.50; Ht=5.25; Qt=1.33
 Hi=2.75; Ht=5.25; Qt=1.33
 Hi=3.00; Ht=5.25; Qt=1.33
 Hi=3.25; Ht=5.25; Qt=1.33
 Hi=3.50; Ht=5.25; Qt=1.33
 Hi=3.75; Ht=5.25; Qt=1.33
 Hi=4.00; Ht=5.25; Qt=1.33
 Hi=4.25; Ht=5.25; Qt=1.33
 Hi=4.50; Ht=5.25; Qt=1.33
 Hi=4.75; Ht=5.25; Qt=1.33
 Hi=5.00; Ht=5.25; Qt=1.33

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = 00 (Orifice-Area)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

H =5.25
H =5.50
H =5.75
H =6.00
H =6.25
H =6.50
H =6.75
H =7.00
H =7.25
H =7.50
H =7.75
H =8.00
H =8.25
H =8.50
H =8.75
H =9.00
H =9.25
H =9.50
H =9.75
H =10.00
H =10.25
H =10.50
H =10.75
H =11.00
H =11.25
H =11.50
H =11.75
H =12.00
H =12.25
H =12.50
H =12.75
H =13.00
H =13.25

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,746.50	0.00	(N/A)	0.00
5,746.75	0.00	(N/A)	0.00
5,747.00	0.00	(N/A)	0.00
5,747.25	0.00	(N/A)	0.00
5,747.50	0.00	(N/A)	0.00
5,747.75	0.00	(N/A)	0.00
5,748.00	0.00	(N/A)	0.00
5,748.25	0.00	(N/A)	0.00
5,748.50	0.00	(N/A)	0.00
5,748.75	0.00	(N/A)	0.00
5,749.00	0.00	(N/A)	0.00
5,749.25	0.00	(N/A)	0.00
5,749.50	0.00	(N/A)	0.00
5,749.75	0.00	(N/A)	0.00
5,750.00	0.00	(N/A)	0.00
5,750.25	0.00	(N/A)	0.00
5,750.50	0.00	(N/A)	0.00
5,750.75	0.00	(N/A)	0.00
5,751.00	0.00	(N/A)	0.00
5,751.25	0.00	(N/A)	0.00
5,751.50	0.00	(N/A)	0.00
5,751.75	0.00	(N/A)	0.00
5,752.00	0.00	(N/A)	0.00
5,752.25	0.00	(N/A)	0.00
5,752.50	0.00	(N/A)	0.00
5,752.75	0.00	(N/A)	0.00
5,753.00	0.00	(N/A)	0.00
5,753.25	0.00	(N/A)	0.00
5,753.50	0.00	(N/A)	0.00
5,753.75	0.00	(N/A)	0.00
5,754.00	0.00	(N/A)	0.00
5,754.25	0.00	(N/A)	0.00
5,754.50	0.00	(N/A)	0.00
5,754.75	14.25	(N/A)	0.00
5,755.00	40.31	(N/A)	0.00
5,755.25	74.05	(N/A)	0.00
5,755.50	114.00	(N/A)	0.00
5,755.75	159.32	(N/A)	0.00
5,756.00	209.43	(N/A)	0.00

Subsection: Individual Outlet Curves
 Label: REVISED OUTLET

Return Event: 100 years
 Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
 Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
 Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft ³ /s)	Tailwater Elevation (ft)	Convergence Error (ft)
5,756.25	263.91	(N/A)	0.00
5,756.50	322.44	(N/A)	0.00
5,756.75	384.75	(N/A)	0.00
5,757.00	450.62	(N/A)	0.00
5,757.25	519.88	(N/A)	0.00
5,757.50	592.36	(N/A)	0.00
5,757.75	667.93	(N/A)	0.00
5,758.00	746.46	(N/A)	0.00
5,758.25	827.85	(N/A)	0.00
5,758.50	912.00	(N/A)	0.00
5,758.75	998.82	(N/A)	0.00
5,759.00	1,088.24	(N/A)	0.00
5,759.25	1,180.17	(N/A)	0.00
5,759.50	1,274.56	(N/A)	0.00
5,759.75	1,371.34	(N/A)	0.00
5,760.00	1,470.45	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
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 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500
 HW & TW below Inv.El.=5754.500

Subsection: Individual Outlet Curves
Label: REVISED OUTLET

Return Event: 100 years
Storm Event: TYPEIIA 24HR (4.4 in)

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = W0 (Rectangular Weir)

Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
HW & TW below Inv.El.=5754.500
H=.00; Htw=.00; Qfree=.00;
H=.25; Htw=.00; Qfree=14.25;
H=.50; Htw=.00; Qfree=40.31;
H=.75; Htw=.00; Qfree=74.05;
H=1.00; Htw=.00; Qfree=114.00;
H=1.25; Htw=.00; Qfree=159.32;
H=1.50; Htw=.00; Qfree=209.43;
H=1.75; Htw=.00; Qfree=263.91;
H=2.00; Htw=.00; Qfree=322.44;
H=2.25; Htw=.00; Qfree=384.75;
H=2.50; Htw=.00; Qfree=450.62;
H=2.75; Htw=.00; Qfree=519.88;
H=3.00; Htw=.00; Qfree=592.36;
H=3.25; Htw=.00; Qfree=667.93;
H=3.50; Htw=.00; Qfree=746.46;
H=3.75; Htw=.00; Qfree=827.85;
H=4.00; Htw=.00; Qfree=912.00;
H=4.25; Htw=.00; Qfree=998.82;
H=4.50; Htw=.00; Qfree=1088.24;
H=4.75; Htw=.00; Qfree=1180.17;
H=5.00; Htw=.00; Qfree=1274.56;
H=5.25; Htw=.00; Qfree=1371.34;
H=5.50; Htw=.00; Qfree=1470.45;

BRADLEY HEIGHTS

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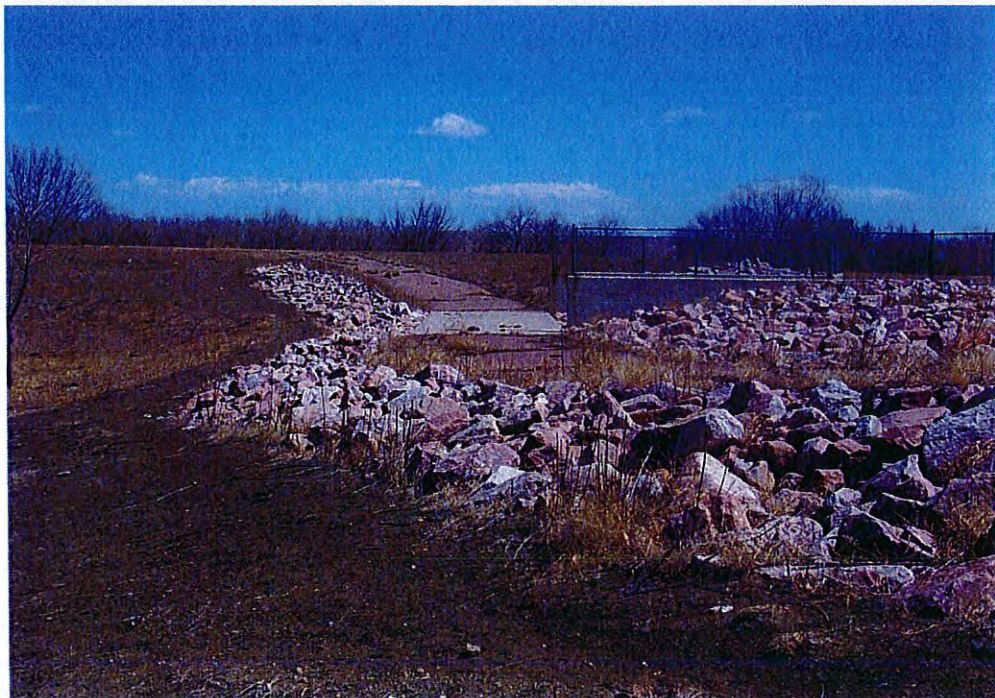
DETENTION FACILITIES
EURV CALCULATIONS & COLORADO CENTRE POND VOLUMES



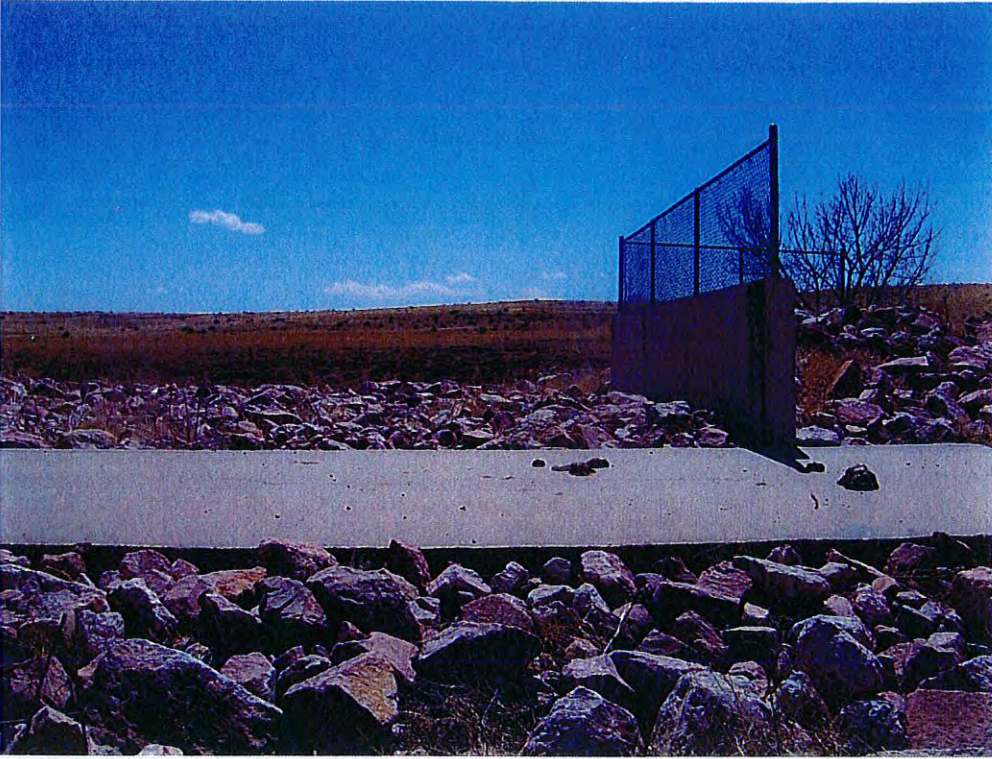
**COLORADO CENTRE REGIONAL DETENTION FACILITY –
EXISTING OUTLET STRUCTURES**



Existing (5) cell box culvert outfall. Each cell measures 6' wide by 3' tall. Invert is at elevation 5746.50.



Looking east across 38.0' wide concrete & riprap surfaced weir structure. Concrete walls are 4.8' in height. Top of berm elevation is 5761.50.



Looking south out of weir structure.
Riprap extends to the bottom of the downstream outfall corridor.

**REGIONAL COLORADO CENTRE DETENTION FACILITY
BRADLEY HEIGHTS ONSITE BASINS**

BASIN	LAND USE	AREA (AC.)	% IMPERVIOUSNESS*	A*I
1-N	RES	13.16	40	5.264
2	COM	10.75	85	9.1375
5A	COM	21.54	85	18.309
3468N	RES	44.16	40	17.664
11-N	MULTI-FAM	14.23	75	10.6725
11-S	MULTI-FAM	20.03	75	15.0225
3468S	RES	39.16	40	15.664
12-N	CHANNEL	8.67	5	0.4335
12-S	CHANNEL	4.40	5	0.22
13-E	RES	14.22	40	5.688
5B	RES	15.10	40	6.04
9AB	SCHOOL	37.12	85	31.552
9C-N	RES	41.45	40	16.58
9C-S	RES	29.90	40	11.96
16-N	RES	16.88	40	6.752
OS-1	EXIST	33.57	30	10.071

Onsite A*I Total **181.03**
Onsite Area Total **364.34**
Onsite Composite Imperv. **0.496871055**

* USES VALUES FROM UDFCD DCM VOL. 1 TABLE RO-3
RESIDENTIAL LAND ASSUMED AT AVG. 5 DU/AC. & 2000 SQ. FT. HOMES

BRADLEY HEIGHTS OFFSITE DEVELOPED BASINS

BASIN	LAND USE	AREA (AC.)	% IMPERVIOUSNESS*	A*I
M-4 DEV	IND. HIGH	141.72	90	127.548
M-5 DEV	IND. HIGH	30.23	90	27.207
M-8 DEV	IND. HIGH	92.22	90	82.998
M-9 DEV	RES	150.66	40	60.264

Offsite A*I Total **298.017**
Offsite Area Total **414.83**
Offsite Composite Imperv. **0.71840754**

TOTAL DEV. TRIB. AREA TO POND (AC.) **779.17**
TOTAL A*I **479.047**

TOTAL TRIB. IMPERVIOUSNESS **0.614817049**
61.48%

TRIBUTARY BASINS TO COLORADO CENTRE POND - SOIL TYPE				
SOIL TYPE	A	B	C/D	TOTAL A CHECK
ON-SITE		35.68	328.66	364.34
M-4-DEV		60.57	81.15	141.72
M-5-DEV		30.23		30.23
M-8-DEV			92.22	92.22
M-9-DEV		130.35	20.31	150.66
TOTALS	0	256.83	522.34	779.17
PERCENTAGE	0	32.96%	67.04%	

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 1 of 4

Designer: David Gibson
Company: Classic Consulting Engineers
Date: October 30, 2014
Project: Bradley Heights Colorado Centre Existing Pond Modification
Location: _____

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, I_p</p> <p>B) Tributary Area's Imperviousness Ratio ($i = I_p / 100$)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * I^2 - 1.19 * I + 0.78 * i) / 12 * Area * 1.2)$)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6 * (V_{DESIGN} * 0.43))$)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) Predominant Watershed NRCS Soil Group</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURV_A = (0.1878i - 0.0104) * Area$ For HSG B: $EURV_B = (0.1178i - 0.0042) * Area$ For HSG C/D: $EURV_{C/D} = (0.1043i - 0.0031) * Area$ </p>	<p>$I_p =$ <u>61.5</u> %</p> <p>$i =$ <u>0.615</u></p> <p>Area = <u>779.170</u> ac</p> <p>$d_6 =$ <u>0.42</u> in</p> <p>Choose One _____</p> <p><input type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input checked="" type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p>$V_{DESIGN} =$ <u>18.795</u> ac-ft</p> <p>$V_{DESIGN\ OTHER} =$ <u>18.358</u> ac-ft</p> <p>$V_{DESIGN\ USER} =$ _____ ac-ft</p> <p>Choose One _____</p> <p><input type="radio"/> A</p> <p><input checked="" type="radio"/> B</p> <p><input type="radio"/> C / D</p> <p>EURV = <u>53.158</u> ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = <u>2.0</u> : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = <u>3.00</u> ft / ft</p> <p align="center">DIFFICULT TO MAINTAIN, INCREASE WHERE POSSIBLE</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 2 of 4

Designer: David Gibson
Company: Classic Consulting Engineers
Date: October 30, 2014
Project: Bradley Heights Colorado Centre Existing Pond Modification
Location: _____

<p>5. Forebay</p> <p>A) Minimum Forebay Volume ($V_{MIN} = \underline{3\%}$ of the WQCV)</p> <p>B) Actual Forebay Volume</p> <p>C) Forebay Depth ($D_F = \underline{30}$ inch maximum)</p> <p>D) Forebay Discharge</p> <p style="margin-left: 20px;">i) Undetained 100-year Peak Discharge</p> <p style="margin-left: 20px;">ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)</p> <p>E) Forebay Discharge Design</p> <p>G) Rectangular Notch Width</p>	<p>$V_{MIN} = \underline{0.459}$ ac-R</p> <p>$V_F = \underline{0.500}$ ac-ft</p> <p>$D_F = \underline{30.0}$ in</p> <p>$Q_{100} = \underline{2030.00}$ cfs</p> <p>$Q_F = \underline{40.60}$ cfs</p> <p>Choose One</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <input type="radio"/> Berm With Pipe <input checked="" type="radio"/> Wall with Rect. Notch <input type="radio"/> Wall with V-Notch Weir </div> <p>Calculated $W_N = \underline{43.0}$ in</p>
<p>6. Trickle Channel</p> <p>A) Type of Trickle Channel</p> <p>F) Slope of Trickle Channel</p>	<p>Choose One</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <input checked="" type="radio"/> Concrete <input type="radio"/> Soft Bottom </div> <p>$S = \underline{0.0100}$ ft / ft</p>
<p>7. Micropool and Outlet Structure</p> <p>A) Depth of Micropool (2.5-foot minimum)</p> <p>B) Surface Area of Micropool (10 ft² minimum)</p> <p>C) Outlet Type</p> <p>D) Depth of Design Volume (EURV or 1.2 WQCV) Based on the Design Concept Chosen Under 1.E.</p> <p>E) Volume to Drain Over Prescribed Time</p> <p>F) Drain Time (Min T_D for WQCV= 40 hours; Max T_D for EURV= 72 hours)</p> <p>G) Recommended Maximum Outlet Area per Row, (A_o)</p> <p>H) Orifice Dimensions: Circular Orifice (if selected) ii) Width of 2" High Rectangular Orifice</p> <p>I) Number of Columns</p> <p>J) Actual Design Outlet Area per Row (A_o)</p> <p>K) Number of Rows (n_r)</p> <p>L) Total Outlet Area (A_{ot})</p> <p>M) Depth of WQCV (H_{wacv}) (Estimate using actual stage-area-volume relationship and V_{wacv})</p> <p>N) Ensure Minimum 40 Hour Drain Time for WQCV</p>	<p>$D_M = \underline{2.5}$ ft</p> <p>$A_M = \underline{2200}$ sq ft</p> <p>Choose One</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <input checked="" type="radio"/> Orifice Plate <input type="radio"/> Other (Describe): _____ </div> <p>$H = \underline{5.00}$ feet</p> <p>EURV = <u>53.158</u> ac-ft</p> <p>$T_D = \underline{72}$ hours</p> <p>$A_o = \underline{17.39}$ square inches</p> <p>$W_{orifice} = \underline{8.70}$ inches</p> <p>$n_c = \underline{1}$ number</p> <p>$A_o = \underline{17.39}$ square inches</p> <p>$n_r = \underline{15}$ number</p> <p>$A_{ot} = \underline{261.0}$ square inches</p> <p>$H_{wacv} = \underline{\hspace{1cm}}$ feet</p> <p>$T_{D\ wacv} = \underline{\hspace{1cm}}$ hours</p>

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 3 of 4

Designer: David Gibson
Company: Classic Consulting Engineers
Date: October 30, 2014
Project: Bradley Heights Colorado Centre Existing Pond Modification
Location: _____

<p>8. Initial Surcharge Volume</p> <p>A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)</p> <p>B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)</p> <p>C) Initial Surcharge Provided Above Micropool</p>	<p>$D_{IS} =$ <u>12.0</u> in</p> <p>$V_{IS} =$ <u>1,999.2</u> cu ft</p> <p>$V_s =$ <u>2200.0</u> cu ft</p>
<p>9. Trash Rack</p> <p>A) Type of Water Quality Orifice Used</p> <p>B) Water Quality Screen Open Area: $A_t = A_c * 38.5 * (e^{-0.095D})$</p> <p>D) For Circular Opening (greater than 1-1/4" diameter) OR 2" High Rectangular Opening (See Fact Sheet T-12):</p> <p>i) Width of Water Quality Screen Opening ($W_{opening}$)</p> <p>ii) Height of Water Quality Screen (H_{TR})</p> <p>iii) Type of Screen, Describe if "Other"</p> <p>*Size trash rack per Figure OS-1. Use 4-inch high staggered rectangular orifices to limit size of the structure.</p> <p>v) Cross-bar Spacing</p> <p>vi) Minimum Bearing Bar Size</p>	<p>Choose One _____</p> <p><input type="radio"/> Circular (up to 1-1/4" diameter)</p> <p><input checked="" type="radio"/> Circular (greater than 1-1/4" diameter) OR Rectangular (2" high)</p> <p>$A_t =$ <u>8,310</u> square inches</p> <p>_____</p> <p>_____</p> <p>Choose One _____</p> <p><input type="radio"/> C.S. Well Screen with 60% Open Area*</p> <p><input type="radio"/> Other (Describe): _____</p> <p>_____</p> <p>_____</p> <p>$W_{opening} =$ _____ ft *SIZE TRASH RACK PER FIGURE OS-1</p> <p>$H_{TR} =$ <u>7.3</u> ft</p> <p>Choose One _____</p> <p><input type="radio"/> Aluminum Amico-Klemp SR Series (or equal)</p> <p><input type="radio"/> Other (Describe): _____</p> <p>_____</p> <p>_____</p> <p>_____ inches</p> <p>_____</p>

JOB NAME: BRADLEY HEIGHTS
 JOB NUMBER: 2266.02
 DATE: 11/12/09
 CALCULATED BY: MAL

OVERALL EXISTING POND VOLUME COLORADO CENTRE REGIONAL FACILITY

POND SIZING WITH PONDPACK EQUATION:
 INSERT POND DESIGN SIZE INFO: (RED)

POND ELEVATION :	
(from lowest to highest)	
	5747.00
	5748.00
	5750.00
	5752.00
	5754.00
	5756.00
	5758.00
	5760.00
	5761.00
	5761.50

AREA (BTM to TOP):		
150	0.0034435	acres
10,150	0.2330119	acres
209,124	4.8008264	acres
535,514	12.2937098	acres
777,754	17.8547750	acres
810,725	18.6116850	acres
844,517	19.3874426	acres
883,221	20.2759642	acres
899,672	20.65	acres
910,473	20.90	acres
	-	acres
	-	acres

PRELIMINARY SIZE:

VOLUME = $1/3\{(EL2-EL1)*(A1+A2+((A1*A2)^{.5}))\}$

						CUMMULATIVE VOLUME:
0.09	AC-FT	from	5,747	to	5,748	
4.02	AC-FT	from	5,748	to	5,750	4.10777
16.35	AC-FT	from	5,750	to	5,752	20.46058
29.68	AC-FT	from	5,752	to	5,754	50.13686
36.10	AC-FT	from	5,754	to	5,756	86.23606
37.62	AC-FT	from	5,756	to	5,758	123.85259
39.26	AC-FT	from	5,758	to	5,760	163.11607
20.26	AC-FT	from	5,760	to	5,761	183.37593
10.28	AC-FT	from	5,761	to	5,762	193.66079
-	AC-FT	from	5,762	to	-	193.66079
-	AC-FT	from	-	to	-	193.66079

*SIZING IS FOR PRELIMINARY PURPOSES ONLY.

VOLUME = 193.66 AC-FT

APPROXIMATE SURFACE AREA REQUIREMENT

POND DEPTH (FT)	POND VOLUME			SURFACE AREA (SF)
	AC-FT	=	CF	
4	193.66	=	#####	2,108,966
6	193.66	=	#####	1,405,977
8	193.66	=	#####	1,054,483
10	193.66	=	#####	843,586

JOB NAME: BRADLEY HEIGHTS
 JOB NUMBER: 2266.02
 DATE: 11/12/09
 CALCULATED BY: MAL

VOLUME OF COLORADO CENTRE POND TO EXISTING WEIR STRUCTURE

POND SIZING WITH PONDPACK EQUATION:

INSERT POND DESIGN SIZE INFO: (RED)

POND ELEVATION :	
(from lowest to highest)	
	5747.00
	5748.00
	5750.00
	5752.00
	5754.00
	5754.50

AREA (BTM to TOP):		
150	0.0034435	acres
10,150	0.2330119	acres
209,124	4.8008264	acres
535,514	12.2937098	acres
777,754	17.8547750	acres
785,997	18.0440025	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres
	-	acres

PRELIMINARY SIZE:

VOLUME = $1/3\{(EL2-EL1)*(A1+A2+((A1*A2)^.5))\}$

CUMMULATIVE VOLUME:

0.09	AC-FT	from	5,747	to	5,748	
4.02	AC-FT	from	5,748	to	5,750	4.10777
16.35	AC-FT	from	5,750	to	5,752	20.46058
29.68	AC-FT	from	5,752	to	5,754	50.13686
8.88	AC-FT	from	5,754	to	5,755	59.02177
-	AC-FT	from	5,755	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177
-	AC-FT	from	-	to	-	59.02177

*SIZING IS FOR PRELIMINARY PURPOSES ONLY.

VOLUME = 59.02 AC-FT

APPROXIMATE SURFACE AREA REQUIREMENT

POND DEPTH (FT)	POND VOLUME			SURFACE AREA (SF)
	AC-FT	=	CF	
4	59.02	=	#####	642,747
6	59.02	=	#####	428,498
8	59.02	=	#####	321,374
10	59.02	=	#####	257,099

**PROPOSED DETENTION POND #1
BRADLEY HEIGHTS ONSITE BASINS**

BASIN	LAND USE	AREA (AC.)	% IMPERVIOUSNESS*	A*I
1-S	RES	23.51	40	9.404
7	MULTI	21.22	65	13.793
13-W	RES	24.87	40	9.948
ELEC	INDUST	12.79	90	11.511
Onsite A*I Total				44.656
Onsite Area Total				82.39
Onsite Composite Imperv.				<u>0.542007525</u>

* USES VALUES FROM UDFCD DCM VOL. 1 TABLE RO-3
RESIDENTIAL LAND ASSUMED AT AVG. 5 DU/AC. & 2000 SQ. FT. HOMES

TOTAL TRIB. IMPERVIOUSNESS **0.54**
54.20%

**PROPOSED DETENTION POND #2
BRADLEY HEIGHTS ONSITE BASINS**

BASIN	LAND USE	AREA (AC.)	% IMPERVIOUSNESS*	A*I
14	RES	56.95	40	22.78
16-W	RES	30.67	40	12.268
OS-2	UNDEV	32.75	2	0.655
Onsite A*I Total				35.703
Onsite Area Total				120.37
Onsite Composite Imperv.				<u>0.296610451</u>

* USES VALUES FROM UDFCD DCM VOL. 1 TABLE RO-3
RESIDENTIAL LAND ASSUMED AT AVG. 5 DU/AC. & 2000 SQ. FT. HOMES

TOTAL TRIB. IMPERVIOUSNESS **120.37**
29.66%

**PROPOSED DETENTION POND #3
BRADLEY HEIGHTS ONSITE BASINS**

BASIN	LAND USE	AREA (AC.)	% IMPERVIOUSNESS*	A*I
17	MULTI	20.98	65	13.637
16-E	RES	18.20	40	7.28
Onsite A*I Total				20.917
Onsite Area Total				39.18
Onsite Composite Imperv.				<u>0.533869321</u>

* USES VALUES FROM UDFCD DCM VOL. 1 TABLE RO-3
RESIDENTIAL LAND ASSUMED AT AVG. 5 DU/AC. & 2000 SQ. FT. HOMES

TOTAL TRIB. IMPERVIOUSNESS **0.53**
53.39%

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 1 of 4

Designer: DAVE GIBSON
Company: CLASSIC CONSULTING
Date: October 30, 2014
Project: BRADLEY HEIGHTS POND 1
Location: _____

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, I_b</p> <p>B) Tributary Area's Imperviousness Ratio ($i = I_b / 100$)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * I^2 - 1.19 * I + 0.78 * i) / 12 * Area * 1.2)$)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_b * (V_{DESIGN} * 0.43))$)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) Predominant Watershed NRCS Soil Group</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURV_A = (0.1878i - 0.0104) * Area$ For HSG B: $EURV_B = (0.1178i - 0.0042) * Area$ For HSG C/D: $EURV_{C/D} = (0.1043i - 0.0031) * Area$ </p>	<p>$I_b =$ <u>54.2</u> %</p> <p>$i =$ <u>0.542</u></p> <p>Area = <u>82.390</u> ac</p> <p>$d_b =$ <u>0.42</u> in</p> <p>Choose One _____</p> <p><input type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input checked="" type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p>$V_{DESIGN} =$ <u>1.797</u> ac-ft</p> <p>$V_{DESIGN\ OTHER} =$ <u>1.755</u> ac-ft</p> <p>$V_{DESIGN\ USER} =$ _____ ac-ft</p> <p>Choose One _____</p> <p><input type="radio"/> A</p> <p><input type="radio"/> B</p> <p><input checked="" type="radio"/> C / D</p> <p>EURV = <u>4.402</u> ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = _____ : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = _____ ft / ft</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 1 of 4

Designer: DAVE GIBSON
Company: CLASSIC CONSULTING
Date: October 30, 2014
Project: BRADLEY HEIGHTS POND 2
Location: _____

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, i_b</p> <p>B) Tributary Area's Imperviousness Ratio ($i = i_b / 100$)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^2 - 1.19 * i^4 + 0.78 * i) / 12 * Area * 1.2)$)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_b * V_{DESIGN} / 0.43)$)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) Predominant Watershed NRCS Soil Group</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURV_A = (0.1878i - 0.0104i^2) * Area$ For HSG B: $EURV_B = (0.1178i - 0.0042i^2) * Area$ For HSG C/D: $EURV_{C/D} = (0.1043i - 0.0031i^2) * Area$ </p>	<p>$i_b =$ <u>29.7</u> %</p> <p>$i =$ <u>0.297</u></p> <p>Area = <u>120.370</u> ac</p> <p>$d_b =$ <u>0.42</u> in</p> <p>Choose One _____</p> <p><input type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input checked="" type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p>$V_{DESIGN} =$ <u>1.810</u> ac-ft</p> <p>$V_{DESIGN\ OTHER} =$ <u>1.768</u> ac-ft</p> <p>$V_{DESIGN\ USER} =$ _____ ac-ft</p> <p>Choose One _____</p> <p><input type="radio"/> A</p> <p><input type="radio"/> B</p> <p><input checked="" type="radio"/> C / D</p> <p>EURV = <u>3.351</u> ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = _____ : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = _____ ft / ft</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>

Design Procedure Form: Extended Detention Basin (EDB)

Sheet 1 of 4

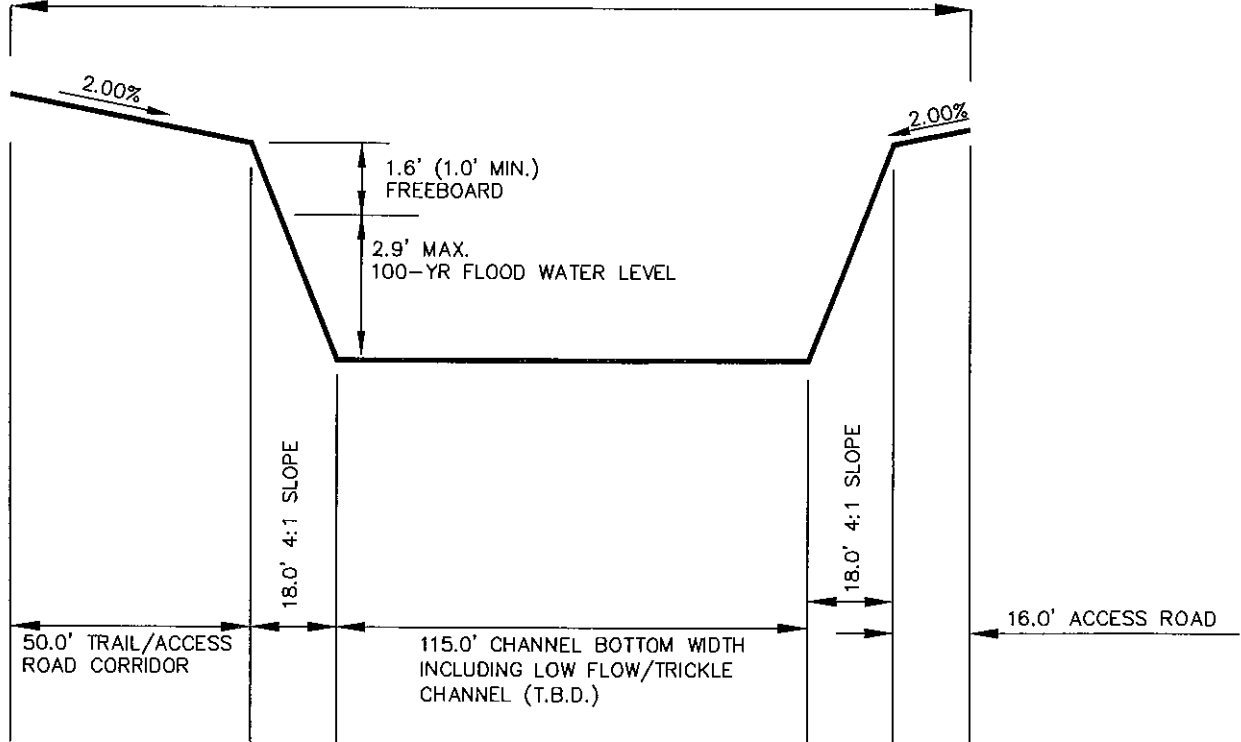
Designer: DAVE GIBSON
Company: CLASSIC CONSULTING
Date: October 30, 2014
Project: BRADLEY HEIGHTS POND 3
Location: _____

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, I_a</p> <p>B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^2 - 1.19 * i^2 + 0.78 * i) / 12 * Area * 1.2)$)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6 * V_{DESIGN} * 0.43)$)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) Predominant Watershed NRCS Soil Group</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURVA = (0.1878i - 0.0104) * Area$ For HSG B: $EURVB = (0.1178i - 0.0042) * Area$ For HSG C/D: $EURV_{CD} = (0.1043i - 0.0031) * Area$ </p>	<p>$I_a =$ <u>53.4</u> %</p> <p>$i =$ <u>0.534</u></p> <p>Area = <u>39.180</u> ac</p> <p>$d_6 =$ <u>0.42</u> in</p> <p>Choose One _____</p> <p><input type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input checked="" type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p>$V_{DESIGN} =$ <u>0.845</u> ac-ft</p> <p>$V_{DESIGN\ OTHER} =$ <u>0.826</u> ac-ft</p> <p>$V_{DESIGN\ USER} =$ _____ ac-ft</p> <p>Choose One _____</p> <p><input type="radio"/> A</p> <p><input type="radio"/> B</p> <p><input checked="" type="radio"/> C / D</p> <p>EURV = <u>2.060</u> ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = _____ : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = _____ ft / ft</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>

MARKSHEFFEL CHANNEL IMPROVEMENTS
PROPOSED SECTION & CALCULATIONS



200' WIDE SCHEMATIC TYPICAL CHANNEL SECTION THRU BRADLEY HEIGHTS SITE



SCHEMATIC CHANNEL DESIGN:

0.50% TYPICAL SLOPE.

4 SLOPING DROP STRUCTURES (3.0'-4.0' HEIGHT EACH).

BOTTOM WIDTH NECKS DOWN TO 80.0' THRU DROP STRUCTURES WITH MAX. SLOPE OF 10.0%.

Worksheet for November '09 MDDP Developed Channel

Project Description

Friction Method Manning Formula
 Solve For Normal Depth

Input Data

Roughness Coefficient	0.035	
Channel Slope	0.00500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	98.00	ft
Discharge	1800.00	ft ³ /s

Results

Normal Depth	2.89	ft
Flow Area	317.00	ft ²
Wetted Perimeter	121.86	ft
Top Width	121.14	ft
Critical Depth	2.12	ft
Critical Slope	0.01433	ft/ft
Velocity	5.68	ft/s
Velocity Head	0.50	ft
Specific Energy	3.39	ft
Froude Number	0.62	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.89	ft
Critical Depth	2.12	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.01433	ft/ft

U.S.A. CORPS OF ENGINEERS LETTER





DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
SOUTHERN COLORADO REGULATORY OFFICE
200 S. SANTA FE, SUITE 301
PUEBLO, COLORADO 81003

REPLY TO
ATTENTION OF:

February 17, 2009

Operations Division
Regulatory Branch

Janetta Shepard
Walsh Environmental Scientists & Engineers, LLC
3888 Pearl East Circle, Suite 108
Boulder, Colorado 80301

Dear Ms. Shepard:

This replies to your February 12, 2007 letter regarding the proposed the Bradley Heights Property site near Colorado Springs, El Paso County, Colorado. We have assigned Action No. SPA-2009-00108-SCO to this activity.

We have evaluated the information you provided and studied the project description, other records, and documents available to us. It appears that no waters of the United States are located within the project site. We met with you on site on February 11, 2008. The project is not regulated under the provisions of Section 404 of the Clean Water Act and a Department of the Army permit will not be required if there are no Corps of Engineers' jurisdictional waters on the site.

Our disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, state and local laws may apply to the activities. Therefore, you should also contact other Federal, state and local regulatory authorities to determine whether the activities may require other authorizations or permits.

This letter contains an approved jurisdictional determination for your site. If you object to this determination, you may request an administrative appeal under Corps' regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the South Pacific Division Office at the following address:

Thomas Cavanaugh, Appeal Review Officer
U.S. Army Corps of Engineers, CESPD-PDS-O

1455 Market Street, Room 1760
San Francisco, CA 94103-1399
Tel. (415)503-6574 FAX (415)503-6646

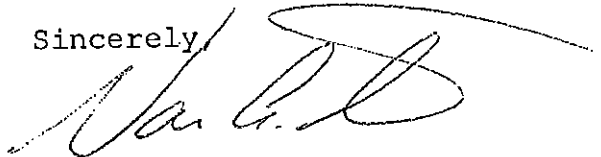
In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by March 23, 2008.

It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

This determination will be valid for 5 years from the date of this letter unless new information warrants revision of the determination within that time. Please be aware that since no site visit was made, waters of the United States may be present on the project site and a Section 404 permit may be needed for some work.

If you have any questions, please feel free to contact me at 719-543-6915 or e-mail me at van.a.truan@usace.army.mil. For more information about the regulatory program, please see our web site at www.spa.usace.army.mil/reg.

Sincerely,



Van A. Truan
Chief, Southern Colorado
Regulatory Office

Enclosures

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESSES AND
REQUEST FOR APPEAL**

Applicant:	File Number:	Date:
Attached is:		See Section below
INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
PROFFERED PERMIT (Standard Permit or Letter of permission)		B
PERMIT DENIAL		C
APPROVED JURISDICTIONAL DETERMINATION		D
PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION II: The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/ceewo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the DISTRICT ENGINEER within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the DISTRICT ENGINEER will evaluate your objections and may modify the permit, deny all of your requests, or modify the permit and determine if you are eligible to appeal.

B: PROFFERED PERMIT: You may accept or appeal the permit

ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the DISTRICT ENGINEER for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER (address on reverse). This form must be received by the DIVISION ENGINEER within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER. This form must be received by the DIVISION (not district) ENGINEER within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the DIVISION (not district) ENGINEER (address on reverse). This form must be received by the DIVISION ENGINEER within 60 days of the date of this notice. Exception: JD appeals based on new information must be submitted to the DISTRICT ENGINEER within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an

SECTION II: REQUEST FOR APPEAL OR OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to

POINT OF CONTACT FOR QUESTIONS OR INFORMATION

If you have questions regarding this decision and/or the appeal process you may contact:

DISTRICT ENGINEER
Albuquerque District, Corps of Engineers
Attn: CESP-OD-R, Regulatory Branch

If you only have questions regarding the appeal process you may also contact:

DIVISION ENGINEER
Army Engineer Division, South Pacific, CESP-DM-O
Attn: Doug Pomeroy, Administrative Appeal Review Officer
333 Market Street, San Francisco, CA 94105 (415-977-8035)
(Use this address for submittals to the DIVISION ENGINEER)

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date:

Telephone number:

REQUEST FOR APPEAL (RFA)

Name of Appellant: _____

Corps File Number: SPA-2009-00108-SCO

Date Filed: _____
(for Corps Use Only)

Reason(s) for Appeal: (attach additional pages as needed)

CONDITIONS:

1. The reason(s) for requesting an appeal should be clearly stated, and your explanation must contain detailed information explaining the grounds for your appeal of the permit decision, or your appeal of the declined individual permit.

2. The appeal of a permit denial, or a declined individual permit, is limited to a review of the administrative record, the record of the appeal conference, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant or the Corps may raise new issues during the appeal process, but both parties may provide additional information as needed to clarify issues already identified in the administrative record.

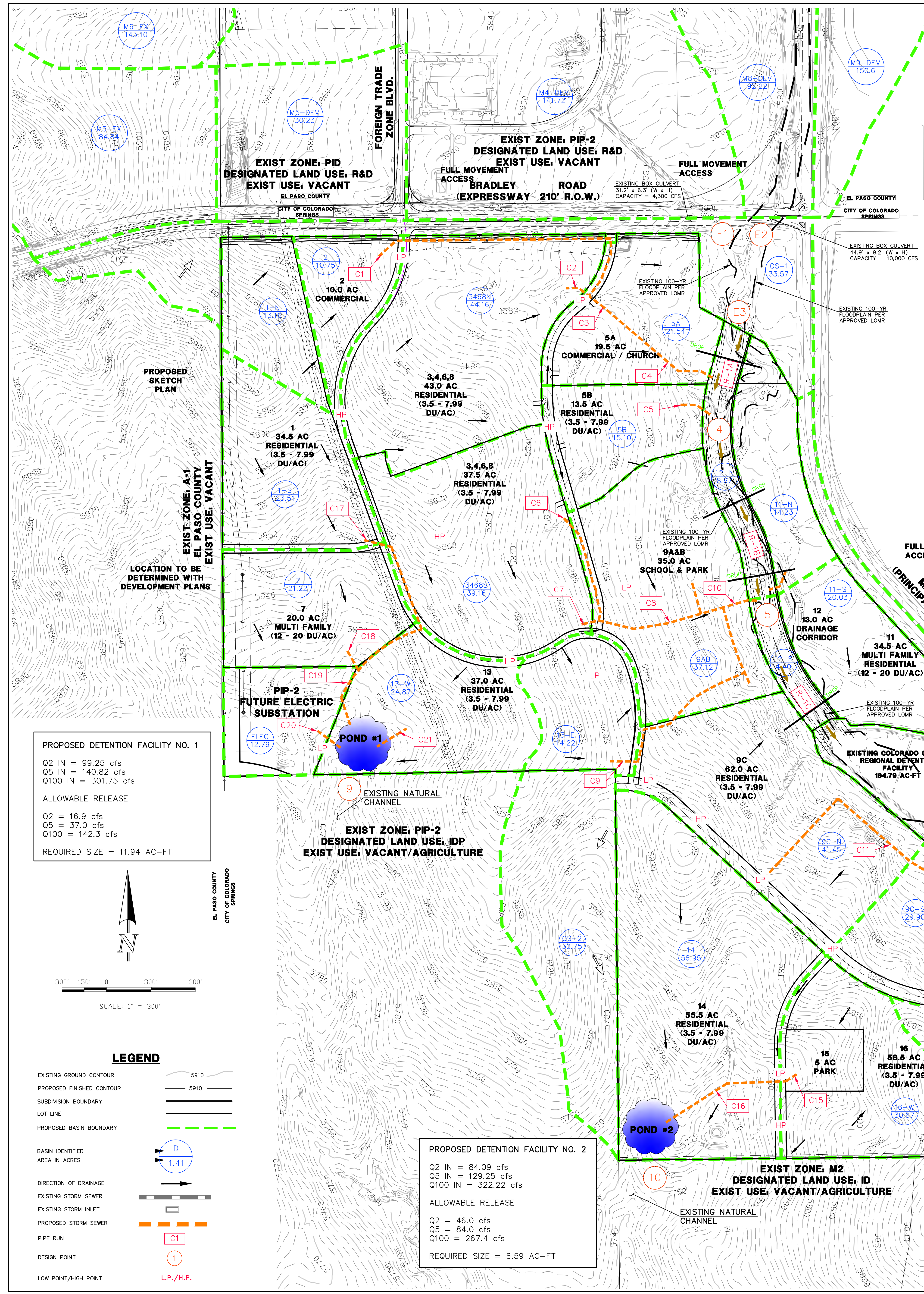
3. You must grant right-of-entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

I have read and fully understand the above conditions. I am signing this document to request initiation of an administrative appeal.

Appellant

DRAINAGE MAPS



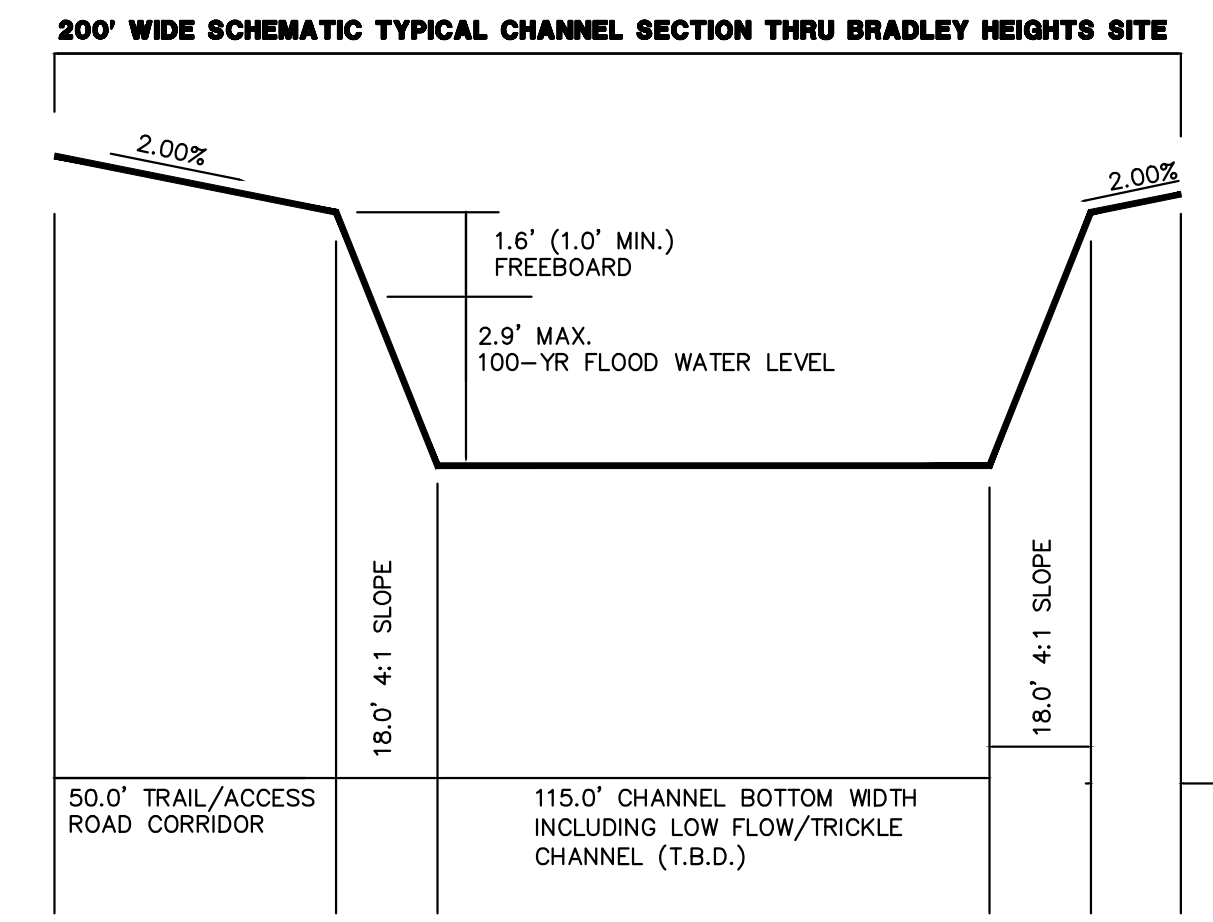


COMPOSITE C_n VALUES - DEVELOPED CONDITIONS

BASIN (label)	BASIN AREA (ac)	LAND USE	SUB-AREA LAND USE 1 AREA (ac)	ESTIMATED CN	SUB-AREA LAND USE 2 AREA (ac)	ESTIMATED CN	TOTAL BASIN AREA (sq ft)	TOTAL BASIN AREA (sq mi)	WEIGHTED C
1-N	13.16	RES	13.16	85	0	N/A	13.16	0.02053	85.0
1-S	23.51	RES	23.51	85	0	N/A	23.51	0.03673	85.0
2	10.75	COMM	10.75	94	0	N/A	10.75	0.01680	94.0
5A	21.54	COMM	21.54	94	0	N/A	21.54	0.03356	94.0
3468N	44.16	RES	44.16	85	0	N/A	44.16	0.06900	85.0
11-N	14.23	MULTIFAM	14.23	91	0	N/A	14.23	0.02223	91.0
11-S	20.03	MULTIFAM	20.03	91	0	N/A	20.03	0.03130	91.0
7	21.22	MULTIFAM	21.22	91	0	N/A	21.22	0.03316	91.0
ELEC	12.79	ELEC SUB	12.79	91	0	N/A	12.79	0.01968	91.0
3468S	39.16	RES	39.16	85	0	N/A	39.16	0.06119	85.0
12-N	8.67	CHANNEL	8.67	74	0	N/A	8.67	0.01355	74.0
12-S	4.40	CHANNEL	4.40	74	0	N/A	4.40	0.00688	74.0
13-W	24.87	RES	24.87	85	0	N/A	24.87	0.03886	85.0
13-E	14.22	RES	14.22	85	0	N/A	14.22	0.02222	85.0
5B	15.10	RES	15.10	85	0	N/A	15.10	0.02359	85.0
9A-B	37.12	SCHL & PARK	27.12	91	5.00	74	37.12	0.05600	76.5
9C-N	41.45	RES	41.45	85	0	N/A	41.45	0.06477	85.0
9C-S	29.90	RES	29.90	85	0	N/A	29.90	0.04672	85.0
17	20.98	MULTIFAM	20.98	91	0	N/A	20.98	0.03278	91.0
15-N	16.88	RES	16.88	85	0	N/A	16.88	0.02638	85.0
16-W	30.67	RES & PARK	25.67	85	5.00	74	30.67	0.04782	83.2
16-E	18.20	RES	18.20	85	0	N/A	18.20	0.02844	85.0
14	56.95	RES	56.95	85	0	N/A	56.95	0.08688	85.0
OS-1	33.57	UNDEV	33.57	74	0	N/A	33.57	0.05245	74.0
OS-2	32.75	UNDEV	32.75	74	0	N/A	32.75	0.05117	74.0
OS-3	15.85	UNDEV	15.85	74	0	N/A	15.85	0.02477	74.0
OS-4	20.09	UNDEV	20.09	74	0	N/A	20.09	0.03139	74.0
DET	24.91	POND	24.91	74	0	N/A	24.91	0.03892	72.6

Basin Summary - Developed Conditions

BASIN (label)	TOTAL BASIN AREA (ac)	TOTAL BASIN AREA (sq mi)	LAND USE	WEIGHTED CN	TOTAL Time of Concentration (hours)	Q 5 Yr. (cfs)	Q 100 Yr. (cfs)
1-N	13.16	0.02053	RES	85.0	0.4167	18.07	42.28
1-S	23.51	0.03673	RES	85.0	0.4167	32.78	75.53
2	10.75	0.01680	COMM	94.0	0.2000	29.24	53.53
5A	21.54	0.03356	COMM	94.0	0.2000	58.59	107.25
3468N	44.16	0.06900	RES	85.0	0.4167	60.83	141.87
11-N	14.23	0.02223	MULTIFAM	91.0	0.1867	35.30	67.88
11-S	20.03	0.03130	MULTIFAM	91.0	0.1867	49.69	95.55
7	21.22	0.03316	MULTIFAM	91.0	0.2500	48.93	95.69
ELEC	12.79	0.01968	ELEC SUB	91.0	0.1867	31.70	60.97
3468S	39.16	0.06119	RES	85.0	0.4167	53.75	125.81
12-N	8.67	0.01355	CHANNEL	74.0	0.2500	7.27	22.37
12-S	4.40	0.00688	CHANNEL	74.0	0.1867	3.69	11.35
13-W	24.87	0.03886	RES	85.0	0.4167	34.15	79.90
13-E	14.22	0.02222	RES	85.0	0.4167	19.52	45.68
5B	15.10	0.02359	RES	85.0	0.3300	23.11	52.78
9A-B	37.12	0.05600	SCHL & PARK	76.5	0.2500	36.36	103.38
9C-N	41.45	0.06477	RES	85.0	0.4167	55.63	132.52
9C-S	29.90	0.04672	RES	85.0	0.4167	41.05	96.06
17	20.98	0.03278	MULTIFAM	91.0	0.2000	50.51	98.27
16-N	16.88	0.02638	RES	85.0	0.3300	25.83	58.00
16-W	30.67	0.04782	RES & PARK	83.2	0.5000	38.05	89.68
16-E	18.20	0.02844	RES	85.0	0.4167	24.99	58.47
14	56.95	0.08688	RES	85.0	0.5000	70.65	168.53
OS-1	33.57	0.05245	UNDEV	74.0	0.2629	63.02	134.50
OS-2	32.75	0.05117	UNDEV	74.0	0.4174	29.57	68.00
OS-3	15.85	0.02477	UNDEV	74.0	0.3297	11.54	36.20
OS-4	20.09	0.03139	UNDEV	74.0	0.2991	16.32	50.11
DET	24.91	0.03892	POND	72.6	0.2991	17.82	56.55
M4-EX	6.50	0.0102	UNDEV	75.1	0.1867	6.88	18.18
M4-DEV	141.72	0.2274	INDUS*	86.0	0.6867	152.99	358.32
M5-EX	84.84	0.1326	UNDEV	67.9	0.6667	20.43	90.95
M5-DEV	30.23	0.0472	INDUS*	84.0	0.3833	40.65	96.34
M6-EX	143.10	0.2236	UNDEV	58.8	0.6390	3.16	62.71
M7-EX	108.54	0.1688	UNDEV	68.0	0.5279	31.55	138.81
M8-EX	66.31	0.1036	UNDEV	76.7	0.5833	48.99	137.22
M8-DEV	92.22	0.1441	INDUS*	86.0	0.5000	121.84	279.74
M9-DEV	150.66	0.2354	RES (B DU/AC)*	81.0	1.4167	64.44	171.57
M10-EX	88.83	0.1388	UNDEV	67.7	1.2781	19.55	71.39
M11-EX	58.44	0.0924	UNDEV	70.0	0.7223	26.54	91.53
M12-EX	106.24	0.1660	UNDEV	63.5	0.7502	13.77	80.33
M13-EX	144.45	0.2257	UNDEV	61.7	0.9169	11.62	80.42
M14-EX	72.70	0.1136	UNDEV	70.3	0.8335	18.82	73.79
M15-EX	58.44	0.0924	UNDEV	67.0	0.4729	3.04	38.50
M16-EX	148.54	0.2321	UNDEV	68.8	0.9447	18.78	99.49
M17-EX	182.02	0.2844	UNDEV	75.7	0.8335	81.13	285.04
M18-EX	163.40	0.2553	UNDEV	71.4	0.9169	42.71	162.26
M19-EX	192.00	0.3000	UNDEV	69.2	0.9274	23.83	128.18
M20-EX	89.54	0.1359	UNDEV	63.7	1.0838	6.83	50.28
M21-EX	146.56	0.2290	UNDEV	63.7	0.6390	21.28	125.61
M22-EX	66.11	0.1033	UNDEV	50.3	0.6113	0.17	14.09
M23-EX	132.80	0.2075	UNDEV	53.7	1.2219	1.19	28.28
M24-EX	98.58	0.1568	UNDEV	66.0	0.6568	16.36	68.24
M25-EX	101.82	0.1591	UNDEV	67.7	0.6390	4.28	54.33
M26-EX	114.30	0.1786	UNDEV	54.1	1.6392	0.97	19.58
M27-EX	124.86	0.1951	UNDEV	49.8	1.0333	0.31	12.48



SCHEMATIC CHANNEL DESIGN:
 0.50% TYPICAL SLOPE.
 4 SLOPING DROP STRUCTURES (3'-0" TO 4'-0" HEIGHT EACH).
 BOTTOM WIDTH NARROWS DOWN TO 80.0' THRU DROP STRUCTURES WITH MAX. SLOPE OF 10.0%.

EXISTING MARKSHEFFEL TRIBUTARY DETENTION FACILITY
 Q2 IN = 459.86 cfs
 Q5 IN = 739.85 cfs
 Q100 IN = 2,029.97 cfs

DEVELOPED RELEASE
 Q2 = 24.16 cfs
 Q5 = 125.75 cfs
 Q100 = 1,153.73 cfs

EXISTING VOLUME TO TOP OF BERM (ELEV. 5761.50) = 193.66 AC-FT

DEVELOPED CONDITIONS - PRELIMINARY PIPE SIZING

Pipe Run	Contributing Basins	Flow		Pipe Size*
		Q(5)	Q(100)	
C1	PARCEL 1-N & PARCEL 2	45.2	92.1	48" RCP @ 0.50% minimum
C2	PARCEL 3468N	60.8	60.8	42" RCP @ 0.50% minimum
C3	PIPE C1 & C2	101.6	228.6	72" RCP @ 0.50% minimum
C4	PARCEL 5A + PIPE C3	158.5	331.7	78" RCP @ 0.50% minimum
C5	PARCEL 5B	23.1	52.8	42" RCP @ 0.50% minimum
C6	PARCEL 3468S (1/2)	26.9	62.9	42" RCP @ 0.50% minimum
C7	PARCEL 3467S (1/2)	26.9	62.9	42" RCP @ 0.50% minimum
C8	PIPE C6 & C7	53.8	125.8	54" RCP @ 0.50% minimum
C9	PARCEL 13-E	19.5	45.7	36" RCP @ 0.50% minimum
C10	PARCEL 9A-B + PIPES C8 & C9	108.8	269.0	72" RCP @ 0.50% minimum
C11	PARCEL 9C-N	56.6	132.5	54" RCP @ 0.50% minimum
C12	PARCEL 16-N	25.8	59.0	42" RCP @ 0.50% minimum
C13	PARCEL 9C-S + PIPE C11	97.7	228.6	66" RCP @ 0.50% minimum
C14	PIPE C12 & C13	123.5	234.2	66" RCP @ 0.50% minimum
C15	PARCEL 16-W	38.1	89.7	48" RCP @ 0.50% minimum
C16	PARCEL 14 + PIPE C15	108.7	256.2	72" RCP @ 0.50% minimum
C17	PARCEL 1-S	32.3	75.5	54" RCP @ 0.50% minimum
C18	PARCEL 7	48.9	95.7	48" RCP @ 0.50% minimum
C19	PIPE C17 & C18	79.0	167.8	60" RCP @ 0.50% minimum
C20	PARCEL ELEC	31.7	61.0	42" RCP @ 0.50% minimum
C21	PARCEL 13-W	34.2	79.9	48" RCP @ 0.50% minimum
C22	PARCEL 16-E	25.0	58.5	42" RCP @ 0.50% minimum
C23	PARCEL 17 + PIPE C22	73.0	151.5	60" RCP @ 0.50% minimum

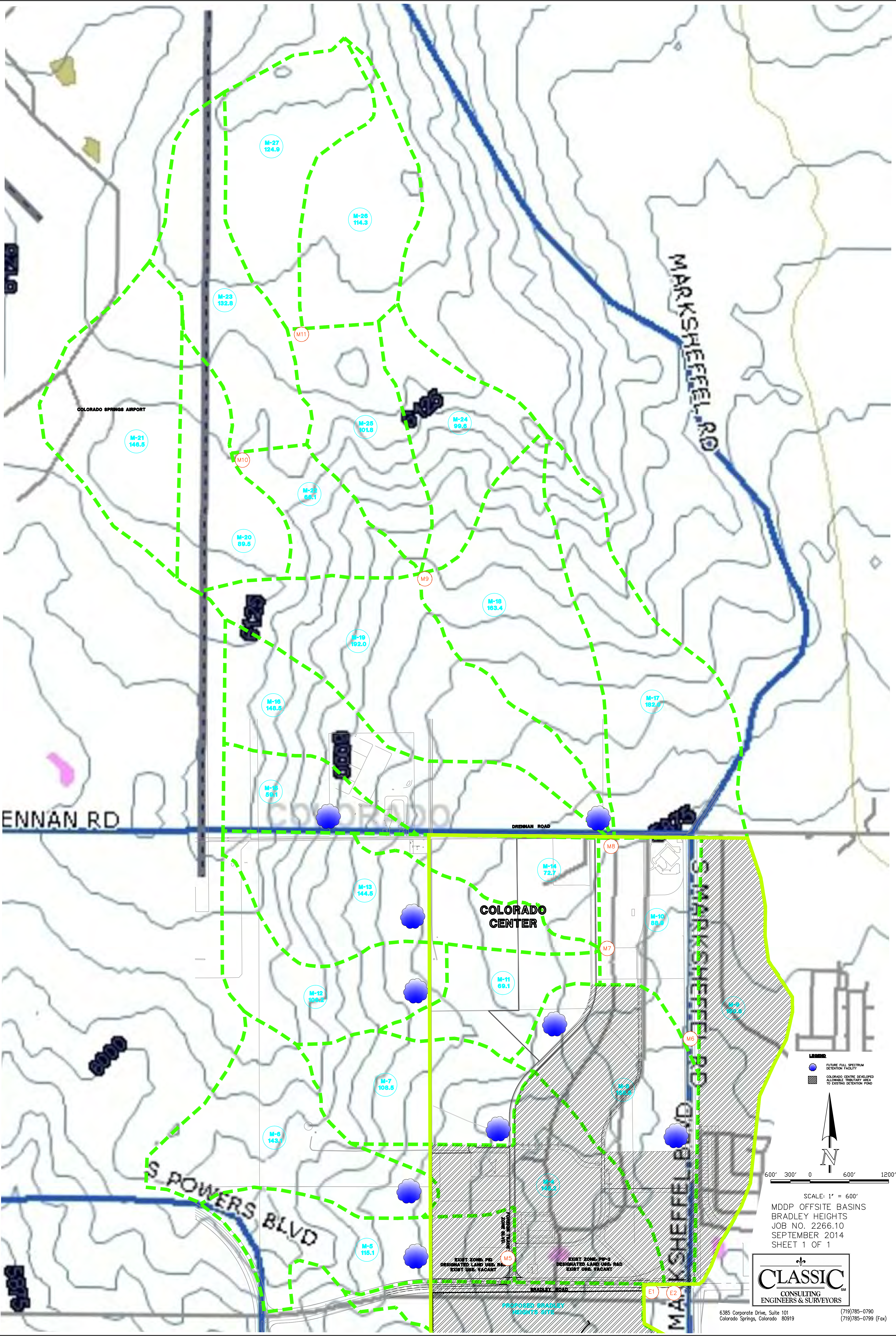
DESIGN POINTS - DEVELOPED CONDITIONS

Design Point (label)	Q 2 Yr.	Q 5 Yr.	Q 10 Yr.	Q 50 Yr.	Q 100 Yr.
	Q (cfs)	Q (cfs)	Q (cfs)	Q (cfs)	Q (cfs)
E1	138.75	222.10	343.00	602.30	660.54
E2	305.65	144.46	309.65	1,187.02	1,325.18
E3	287.43	461.82	760.37	1,498.54	1,667.15
4	355.17	556.27	843.14	1,547.84	1,720.53
5	397.10	632.14	956.89	1,611.37	1,771.82
Pond-Marksheffel In	499.86	739.86	1,126.01	1,866.91	2,029.97
Pond-Marksheffel Out	57.35	125.45	380.70	1,009.18	1,156.30
7 - Marksheffel Trib. Out	24.16	125.75	379.52	1,006.65	1,153.73
8	6.22	11.54	19.01	33.18	36.20
Pond 1 In	99.25	140.82	193.07	283.40	301.75
9 (Historic Release)	67.07	142.58	142.58	142.58	142.58
Pond 2 In	84.09	129.25	190.00	299.45	322.22
10 (Historic Release)	45.99	83.97	138.22	244.61	267.42
Pond 3 In	52.38	73.01	98.67	142.61	151.49
11 (Historic Release)	12.05	22.63	37.64	66.45	72.63

DEVELOPED DRAINAGE MAP BRADLEY HEIGHTS
 JOB NO. 2266.00
 JANUARY 2015
 SHEET 1 OF 1

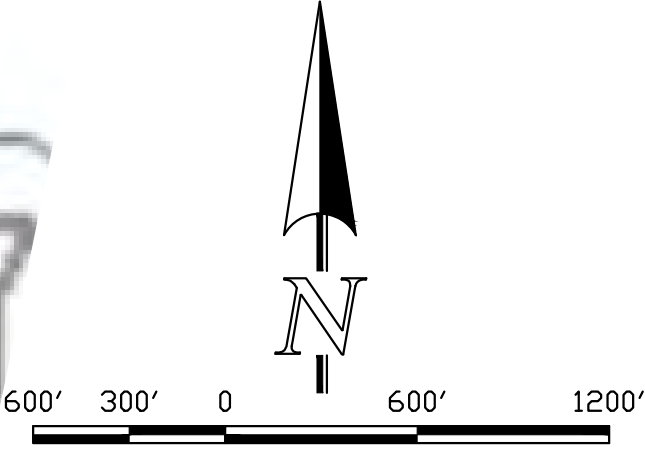


6385 Corporate Drive, Suite 101 Colorado Springs, Colorado 80919 (719)785-0790 (719)785-0799 (Fax)



LEGEND

- FUTURE FULL SPECTRUM DETENTION FACILITY
- COLORADO CENTRE DEVELOPED ALLOWABLE TRIBUTARY AREA TO EXISTING DETENTION POND



SCALE: 1" = 600'
 MDDP OFFSITE BASINS
 BRADLEY HEIGHTS
 JOB NO. 2266.10
 SEPTEMBER 2014
 SHEET 1 OF 1

CLASSIC
 CONSULTING
 ENGINEERS & SURVEYORS

6385 Corporate Drive, Suite 101
 Colorado Springs, Colorado 80919 (719)785-0790
 (719)785-0799 (Fax)

N:\2266.10\BRADLEY HEIGHTS\DEVELOPMENT\2266600-MDDP-OFFSITE-44-2-2014-REV-3-25-14-PW.dwg, PLOT: 6- 8/25/14

COMPOSITE C_n VALUES - EXISTING CONDITIONS

BASIN (label)	BASIN AREA (Ac)	SOIL TYPE A		SOIL TYPE B		SOIL TYPE C		WEIGHTED C
		CN	AREA (Ac.)	CN	AREA (Ac.)	CN	AREA (Ac.)	
M-4 thru M-27		SEE DRAINAGE BASIN PLANNING STUDY						
OS-1 (undev)	22.48	39		61	3.96	74	21.73	82.3
OS-1 (roadway)	11.00	39		98	4.61	98	6.39	98.0
OS-1 (composite)	33.48							87.4
OS-2	32.75	39		61		74	32.75	62.82
OS-3	15.85	39		61		74	15.85	74.0
OS-4	20.09	39		61		74	20.09	74.0
OS-5	24.91	39		61	2.65	74	22.26	72.6
EX-1	111.17	39		61		74	12.47	74.0
EX-2	91.09	39		61	28.4	74	62.69	69.9
EX-3	6.11	39		61		74	6.11	74.0
EX-4	131.78	39		61	16.18	74	115.60	72.4
EX-4A	76.47	39		61		74	76.47	74.0
EX-5	25.23	39		61		74	25.23	74.0
EX-6	62.10	39		61		74	62.10	74.0
EX-7	35.97	39		61		74	35.97	74.0

ALL UNDEVELOPED LAND ASSUMED "GOOD PASTURE OR RANGE" LAND USAGE

BASIN SUMMARY - EXISTING CONDITIONS

BASIN (label)	TOTAL BASIN AREA (acres)	TOTAL BASIN AREA (sq m)	WEIGHTED CN	TOTAL LAG TIME (hours)	TOTAL Time of Concentration PondPak Model (hours)	Q 2 Yr. (cfs)	Q 5 Yr. (cfs)	Q 10 Yr. (cfs)	Q 50 Yr. (cfs)	Q 100 Yr. (cfs)
M4	148.22	0.2316	75.1	0.5167	0.8613	32.08	58.82	97.47	173.52	190.04
M5	115.07	0.1798	67.9	0.3833	0.6390	11.85	28.82	56.45	114.49	127.46
M6	143.10	0.2236	55.8	0.3833	0.6390	0.35	3.16	15.26	52.52	62.82
M7	106.54	0.1696	68.0	0.3167	0.5279	12.93	31.57	61.02	124.47	138.66
M8	158.53	0.2477	78.7	0.7500	1.2503	38.61	64.75	100.95	168.42	184.02
M9	150.66	0.2354	72.5	1.1167	1.8615	14.24	27.13	46.04	83.79	92.28
M10	86.83	0.1388	71.7	0.7667	1.2781	9.86	19.55	34.27	64.65	71.39
M11	69.09	0.1079	73.0	0.4333	0.7233	8.69	17.38	34.76	69.57	77.57
M12	106.24	0.1660	63.5	0.4500	0.7502	4.18	13.79	31.40	71.24	80.42
M13	144.45	0.2257	61.7	0.5500	0.9189	2.87	11.63	28.75	70.50	80.39
M14	72.70	0.1136	70.3	0.5000	0.8335	8.53	18.61	34.20	66.43	73.79
M15	59.14	0.0924	57.8	0.3833	0.6390	0.32	3.94	11.35	33.85	39.49
M16	148.54	0.2321	64.8	0.5667	0.9447	6.44	18.78	40.37	88.46	99.46
M17	182.02	0.2844	75.7	0.5000	0.8335	45.59	81.11	132.20	233.23	255.04
M18	163.40	0.2563	71.4	0.5500	0.9189	20.41	42.69	76.56	145.74	162.28
M19	192.00	0.3000	65.2	0.3833	0.6390	8.16	23.84	50.51	111.86	126.13
M20	85.54	0.1368	63.7	0.6500	1.0826	2.87	8.82	19.74	44.49	50.25
M21	146.56	0.2290	63.7	0.3833	0.6390	6.41	21.29	48.71	111.51	126.01
M22	66.11	0.1033	50.3	0.3667	0.6113	0.01	0.17	1.32	11.07	14.10
M23	132.80	0.2075	53.7	0.7350	1.2219	0.21	1.19	6.16	23.85	28.29
M24	99.58	0.1568	65.0	0.6668	1.1036	5.45	16.36	35.20	78.36	88.30
M25	101.82	0.1591	57.7	0.3833	0.6390	0.54	4.28	15.40	46.59	54.43
M26	114.30	0.1786	54.1	0.9833	1.6392	0.18	0.97	4.53	16.41	19.58
M27	124.86	0.1961	49.8	1.0333	1.7225	0.02	0.31	1.83	10.03	12.48
OS-1	33.48	0.0523	87.4	0.1577	0.2629	44.11	82.85	166.20	126.06	134.14
OS-2	32.75	0.0512	74.0	0.2504	0.4174	10.96	20.67	34.22	62.39	66.02
OS-3	15.85	0.0248	74.0	0.1978	0.3297	6.22	11.54	19.01	33.18	36.20
OS-4	20.09	0.0314	74.0	0.1614	0.2691	9.12	16.32	26.33	45.94	50.11
OS-5	24.91	0.0389	72.6	0.1788	0.2981	3.47	17.82	29.53	51.78	56.55
EX-1	111.17	0.1737	72.5	0.3591	0.5996	25.50	49.23	84.45	154.50	169.71
EX-2	91.09	0.1423	69.9	0.2764	0.4607	16.92	36.68	67.07	128.54	142.30
EX-3	6.11	0.0095	74.0	0.1798	0.2995	2.59	4.72	7.87	13.24	14.43
EX-4	131.78	0.2059	72.4	0.2453	0.4090	35.27	70.89	122.64	223.73	245.59
EX-4A	76.47	0.1195	74.0	0.1498	0.2393	36.11	65.96	106.96	163.99	200.29
EX-5	25.23	0.0384	74.0	0.2771	0.4620	7.89	14.69	24.57	43.99	48.17
EX-6	62.10	0.0970	74.0	0.1343	0.2238	30.81	55.63	89.50	152.82	166.19
EX-7	35.97	0.0562	74.0	0.2520	0.4201	12.05	22.63	37.64	66.45	72.63

BASINS M4 - M27 INPUT DATA MATCHES JIMMY CAMP CREEK D.B.P.S.

DESIGN POINTS - EXISTING CONDITIONS

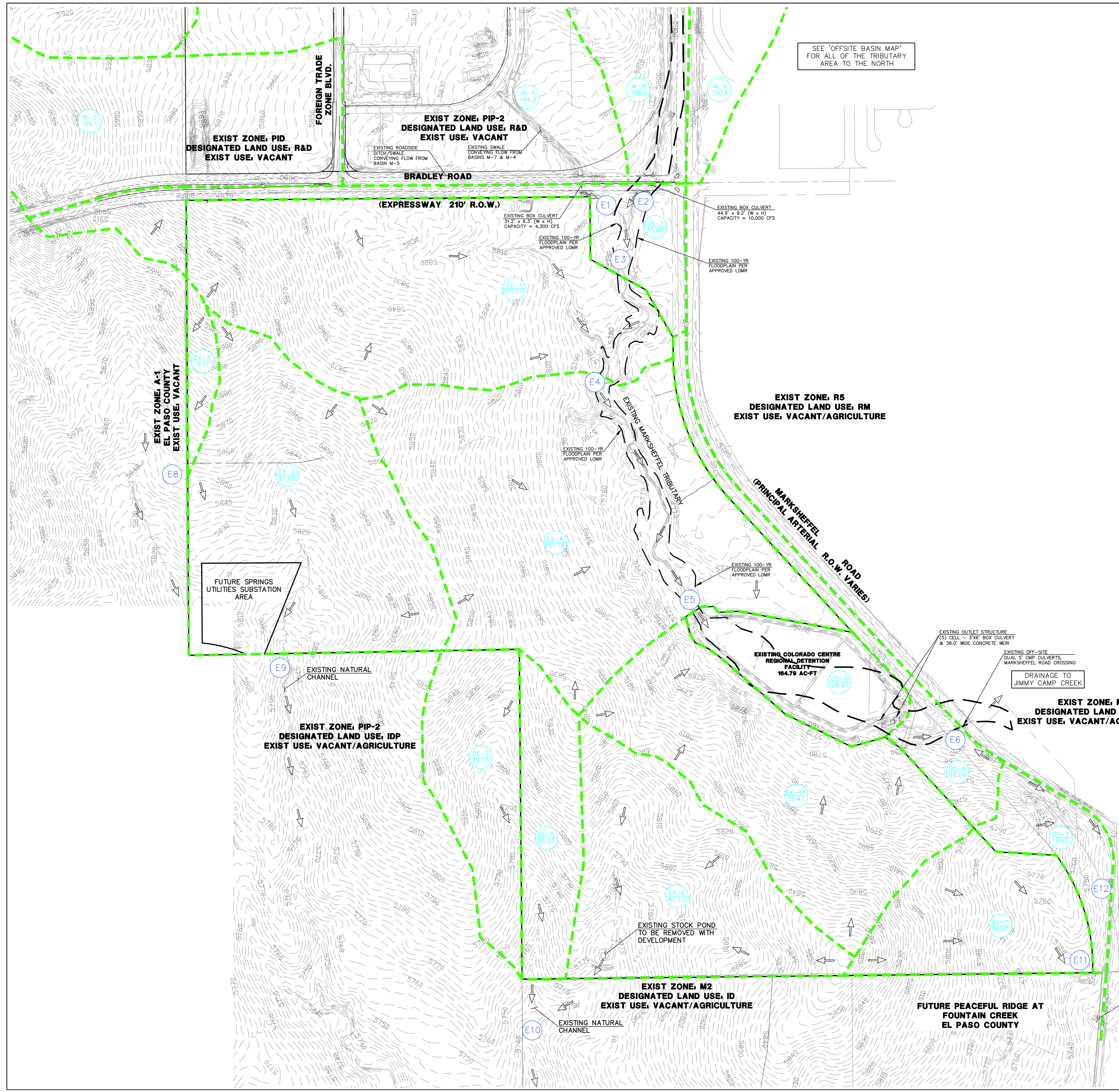
Design Point (label)	Q 2 Yr. Q (cfs)	Q 5 Yr. Q (cfs)	Q 10 Yr. Q (cfs)	Q 50 Yr. Q (cfs)	Q 100 Yr. Q (cfs)
E1	52.54	110.34	204.78	424.10	474.03
E2	133.27	299.67	574.39	1,186.78	1,328.17
E3	169.53	372.13	710.48	1,455.90	1,628.44
E4	179.50	389.77	741.42	1,514.32	1,691.97
E5	187.65	403.83	765.45	1,555.84	1,738.05
Pond-Marksheffel In	193.18	412.39	779.38	1,580.25	1,764.80
Pond-Marksheffel Out	193.12	398.16	699.03	1,078.09	1,147.02
E6 - Marksheffel Trib. Out	194.24	399.69	701.23	1,080.70	1,149.69
E6	2.68	4.72	7.87	13.24	14.43
E9	16.92	36.68	67.07	128.54	142.30
E10	45.99	83.97	138.22	244.61	267.42
E11	12.05	22.63	37.64	66.45	72.63
E12	6.22	11.54	19.01	33.18	36.20



SCALE: 1" = 300'

LEGEND

- EXISTING INDEX CONTOUR 5910
- EXISTING NOMINAL CONTOUR 5910
- SUBDIVISION BOUNDARY
- LOT LINE
- BASIN IDENTIFIER D
- AREA IN ACRES 1.41
- HISTORIC BASIN BOUNDARY
- DIRECTION OF DRAINAGE
- EXISTING STORM SEWER
- EXISTING STORM INLET
- FEMA 100-YR FLOODPLAIN BOUNDARY LINE
- DESIGN POINT 1



EXISTING DRAINAGE MAP
BRADLEY HEIGHTS
JOB NO. 2266.10
SEPTEMBER 2014
SHEET 1 OF 1



6385 Corporate Drive, Suite 101
Colorado Springs, Colorado 80919
(719) 785-0790
(719) 785-0799 (Fax)

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