STORMWATER POLLUTION PREVENTION PLAN

LEGOLAND NEW YORK
COMMERCIAL RECREATION FACILITY

Town of Goshen, Orange County, New York

Prepared For:
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PRELIMINARY

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I. INTRODUCTION

The LEGOLAND project consists development of theme park and resort on approximately 148.5 acres of a 507.4 acre site consisting of 13 total parcels located off Harriman Drive in the Town of Goshen. The theme park will include rides and attractions, an aquarium, theaters, restaurants, parking areas, a hotel, and various back of house facilities including offices and staff areas. Access to the project will be provided from Harriman Drive, South Street, and the NYS Route 17M Connector Road, these roads will be improved to handle traffic for the project. Stormwater runoff from the off-site NYS Route 17, NYS Route 17M, and South Street improvements will be handled separately from the LEGOLAND project. However the portions of the highway improvements which drain into the site have been accounted for in the water quality and water quantity design of the on-site stormwater practices. The project will be serviced with municipal water and sewer from the Village of Goshen. The project is anticipated to disturb a total of approximately 148.5 acres. Based on the size of the proposed development and the grading required, the applicant will seek a waiver from the MS4 to allow greater than 5 acres to be disturbed at a time. Stormwater for the project will be collected and treated on-site and treated through several New York State Department of Environmental Conservation (NYSDEC) approved stormwater management practices before discharging to the Otter Kill and tributaries.

The impacts of this type of development must be evaluated, and if necessary, mitigated to ensure minimal impact on the stormwater drainage patterns within the site watershed areas. The purpose of this study is to evaluate if any impacts are associated with the proposed development, ensure treatment of the water quality volume as per current NYSDEC stormwater standards, and make certain that no increases in the peak discharge from the proposed construction are created as part of State Pollutant Discharge Elimination System (SPDES) General Stormwater Permit GP-0-15-002.

II. APPENDICES TO THIS PLAN

The following is a list of the Appendices included with this report.

A. Site Location Map
   Soils Report for Project
   Rainfall Data
B. Pre- and Post-Development Watershed Model
C. Pre- and Post-Development Watershed Maps
   Stormwater Practice Map
D. Calculations:
   Water Quality/Runoff Reduction Volume
   Channel Protection Volume
   Stormwater Practice Design
E. Excerpts from the "New York State Stormwater Design Manual"
   Construction Specifications
F. Standard Construction and Maintenance Inspections Forms

G. Notice of Intent
Notice of Termination
MS4 SWPPP Acceptance
H. Construction Site Log Book
Contractor's Certification Statement
I. Pipe Sizing
J. Site Plans

III. CURRENT REGULATIONS

Current NYSDEC regulations under General Stormwater Permit GP-0-15-002 require that any construction site proposing a disturbance of one acre or greater prepare a Stormwater Pollution Prevention Plan. This SWPPP consists of the following: water quality treatment and control, water quantity control and an Erosion and Sediment Control Plan. Preparation of each portion of the SWPPP depends on the type and level of construction proposed. The proposed development requires the preparation of a full Stormwater Pollution Prevention Plan that includes all of the items mentioned above. Also as part of the SWPPP, the filing of a Notice of Intent ten days prior to construction to the NYSDEC Bureau of Water Permits located at 625 Broadway, Albany, New York (see Appendix G) is required. This NOI identifies all of the major requirements and design criteria that are necessary for the site drainage design. This form shall be signed and certified by the owner/operator of the site. A contractor's certification statement (see Appendix H) shall also be completed by the general contractor and subcontractors and submitted to the Town of Goshen Building Department to ensure on site compliance with local regulations.

IV. METHODOLOGY

The analysis presented in this report was developed using the Bentley Systems computer software program called PondPack. PondPack is based upon and implements the Soil Conservation Service Technical Release 55 (SCS TR-55) "Urban Hydrology for Small Watersheds Methodology" for computing CN, Tc, Runoff values, and hydrographs for the development of drainage and hydraulic calculations. For purposes of this report and in accordance with the regulations set forth by the NYSDEC as part of a SPDES Permit for Stormwater Discharges from Construction Activities, the 1-(Channel Protection), 10-(Overbank Flood), and 100-year (Extreme Storm) storm events were analyzed. This analysis is specific for this site and is based on current and proposed land cover, underlying soil types, weighted runoff coefficients, theoretical flow paths, and rain events. These were then input into the computer model, which developed hydrographs for both pre- and post-development conditions. This information is shown in Appendix B.

V. WATER QUANTITY

The NYSDEC has selected three criteria as part of the stormwater quantity regulations. They are summarized as follows:

Channel Protection: 24-hour extended detention of post-developed one-year, 24-hour storm event

Overbank Flood:	Control the peak discharge from the 10-year storm to 10-year pre-development rates
Extreme Storm:	Control the peak discharge from 100-year storm to 100-year pre-development rates

The site has been designed to limit post-development flow rates to less than or equal to pre-development flow rates at all study points. The site watershed has been divided into two areas in the pre-development model. Study point A is the Otter Kill discharge point beneath NYS Route 17 downstream of the on-site wetlands. Study point B is the discharge point of the existing pond beneath NYS Route 17 to an unnamed tributary to the Otter Kill. In post-development conditions twenty subareas representing the areas captured by the proposed stormwater areas were created. All watershed areas within the site have detailed summations of the characteristics for both pre- and post-development as listed in Section VI & VII of this report.

Channel protection volume control is provided through low-flow orifices in the proposed stormwater areas. Calculations for channel protection volume and orifices are provided in Appendix D.

VI. PRE-DEVELOPMENT CONDITIONS

With the information available on the Orange County Water Authority mapping, USGS Mapping, and the site survey, the drainage occurring on and through the project site has been divided into two watershed areas corresponding to culvert crossings under NYS Route 17. Figures are provided within Appendix C which depict the watershed areas that were utilized in the hydraulic computer model. The soil boundaries and types shown are provided by the U.S. Department of Agriculture National Resources Conservation Service, a detailed soil classification report including maps is provided in Appendix A. The soils at the site are detailed in Table 1 below.

Soil Description	Hydrologic Soil Group	Location/Notes
Alden silt loam	C/D	Wooded area, assumed HSG C
Alden extremely stony	C/D	Wetland area, assumed HSG D
Bath-Nassau channery silt loams	C	Located throughout watershed
Erie gravelly silt loam	D	Located throughout watershed
Farmington silt loam	D	Located in upland wooded area
Halsey silt loam	B/D	Residential development area, assumed HSG B
Hoosic gravelly sandy loam	A	In residential development area
Madalin silt loam	C/D	In large wetland surrounding Otterkill, assumed HSG D
Mardin gravelly silt loam	D	Located throughout watershed
Nassau channery silt loam	D	In upland wooded area
Rock outcrop-Farmington & Nassau	-	Located adjacent to HSG D soils, assumed to be HSG D

Table 1: Soil Types

Watershed A consists of approximately 1,216.22 acres of land encompassing the watershed of the Otter Kill to the south of NYS Route 17. Wetlands located in this watershed generally follow the Otter Kill and its tributaries. Arcadia Hills, a residential subdivision, is located to the east of the Otter Kill, adjacent to NYS Route 17. Portions of Arcadia Road, Conklingtown Road, Reservoir Road, and Fort Hill Road are also in this watershed. South of Conklingtown Road has several farms and larger lot residential areas. Approximately 67.13 acres of impervious cover exists in this watershed consisting of roads, buildings, and driveways. Goshen Reservoir #2 and its associated dam, part of the water supply for the Village of Goshen, are located in this watershed. The Otter Kill flows through the reservoir before entering the project area, the watershed area tributary to the reservoir is approximately 483.56 acres. A distributary splits from the Otter Kill just upstream of the reservoir which flows around the reservoir and rejoins the Otter Kill to the north. Due to the location of the Goshen Reservoir #2 and dam within a larger watershed and the presence of a distributary around the reservoir, the detention capability of the reservoir will be negligible and therefore has not been made part of the modeling. Stormwater runoff in the watershed is collected by smaller ditches and unnamed tributaries to the Otter Kill, then flows through and around the Goshen Reservoir #2. The Otter Kill then flows north through several culverts, along the west side of Arcadia Hills, where it splits again before rejoining at the NYS Route 17 culvert crossing. The existing wetlands surrounding the Otter Kill provide detention for the entire watershed using the culvert crossing beneath NYS Route 17 for control of flows. The pre-development peak discharge for this watershed is summarized in Table 2, located below, as well as in the pre-development model located in Appendix B.

Watershed B consists of approximately 164.86 acres of land encompassing the watershed to the existing on-site pond adjacent to Harriman Drive and outlet culvert beneath NYS Route 17. The majority of the area is woods and wetland areas. A deteriorated paved access road runs south to the remains of a restaurant and a cell tower. A portion of Harriman Drive and two residential dwellings are located in this area. Approximately 2.48 acres of impervious cover exists in this watershed consisting of roads, buildings, and driveways. A small pond exists near the highest point adjacent to the cell tower. The small pond discharges to a ditch that runs north to

the larger northern pond. The larger pond discharges to a ditch and culvert beneath NYS Route 17. The existing pond along Harriman Drive provides detention for the entire watershed using the culvert crossing beneath NYS Route 17 for control of flows. This stream eventually joins the Otter Kill to the north of NYS Route 17. The pre-development peak discharge for this watershed is summarized in Table 2, located below, as well as in the pre-development model located in Appendix B.

Watershed Area	Area (Ac.)	CN	Tc (hrs.)	Impervious Cover (Ac.)	1 Year Peak Runoff (cfs)	10 Year Peak Runoff (cfs)	100 Year Peak Runoff (cfs)
Watershed A	1,216.22	78	1.175	67.13	423.37	1,254.33	2,880.46
Watershed B	164.86	76	0.877	2.48	59.16	187.54	446.74
Into Existing Pond	1,216.22	--	--	--	423.37	1,254.33	2,880.46
Into Existing Wetlands	164.86	--	--	--	62.42	198.75	473.09
Study Point A	**1,216.22**	**--**	**--**	**--**	**207.90**	**400.59**	**730.04**
Study Point B	**164.86**	**--**	**--**	**--**	**49.47**	**90.99**	**125.65**

Table 2: Pre-Development Conditions

VII. POST-DEVELOPMENT CONDITIONS

The proposed development includes a theme park, hotel, parking area, back of house facilities and associated utilities. Twenty three stormwater areas are proposed at the project site for water quality treatment and stormwater quantity control. Stormwater water quality treatment will be provided through a filtration using six underground stormwater sand filters, nine bio-retention areas, and dry swales. The bio-retention areas and dry swale also provide runoff reduction volume credit (RRV). A stormwater pond will provide quantity control for the project. In order to minimize site disturbance and mimic existing drainage patterns, existing topography was held to the greatest extent possible when determining the proposed site grading. The study points utilized for the pre-development conditions were maintained and evaluated for post-development conditions. Below is a description of each watershed subarea that correlates with the post-development drainage area map provided in Appendix C.

Watershed A1 consists of approximately 1,162.33 acres of land encompassing the watershed of the Otterkill to the south of NYS Route 17, surrounding the area that is captured by proposed stormwater practices. The majority of this area is outside the project limits and will not change from pre-development conditions. Proposed improvements in this area include the perimeter grading around the project, emergency access to Arcadia Road, and hotel access road. Approximately 3.35 acres of impervious cover is proposed in this area including the gravel emergency access and hotel access road. Portions of the area surrounding the project are located near on-site wetlands and buffers and will use the sheet flow to riparian buffers green infrastructure technique for water quality treatment. No stormwater practices are proposed for this area. Stormwater runoff in this area follows pre-development patterns. The existing wetlands surrounding the Otter Kill provides detention for the entire watershed using the culvert crossing beneath NYS Route 17 for control of flows. The

post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A2 consists of approximately 3.77 acres of area that is captured by proposed bio-retention area A2. This area includes a portion of the back of house facility. Approximately 1.31 acres of impervious cover is proposed in this area, including a portion of the proposed parking area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area A2. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to the wetland area surrounding the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A2b consists of approximately 2.00 acres of area that is captured by proposed bio-retention area A2. This area includes a portion of the proposed Harriman Drive/NYS Route 17 improvements. Approximately 1.16 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area A2. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to the wetland area surrounding the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A3 consists of approximately 6.00 acres of area that is captured by proposed underground sand filter A3. This area includes one of the proposed theme park visitor parking areas. Approximately 4.94 acres of impervious cover is proposed in this area, including the proposed parking area and walkways. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter A3. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system is connected to a pipe network that will discharge to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A4 consists of approximately 6.41 acres of area that is captured by proposed underground sand filter A4. This area includes one of the proposed theme park visitor parking areas. Approximately 5.18 acres of impervious cover is proposed in this area, including the proposed parking area and walkways. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter A4. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system is connected to a pipe network that will discharge to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A5 consists of approximately 7.88 acres of area that is captured by proposed underground sand filter A5. This area includes one of the proposed theme park visitor parking areas. Approximately 6.24 acres of impervious cover is proposed in this area, including the proposed parking area and walkways.

Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter A5. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system is connected to a pipe network that will discharge to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A6 consists of approximately 7.42 acres of area that is captured by proposed underground sand filter A6. This area includes one of the proposed theme park visitor parking areas. Approximately 6.27 acres of impervious cover is proposed in this area, including the proposed parking area and walkways. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter A6. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system is connected to a pipe network that will discharge to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A7 consists of approximately 6.01 acres of area that is captured by proposed underground sand filter A7. This area includes one of the proposed theme park visitor parking areas. Approximately 5.39 acres of impervious cover is proposed in this area, including the proposed parking area and walkways. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter A7. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system is connected to a pipe network that will discharge to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A8 consists of approximately 5.66 acres of area that is captured by proposed bio-retention area A8. This area includes the proposed hotel and hotel parking area. Approximately 3.50 acres of impervious cover is proposed in this area, including the proposed parking area and hotel. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area A8. Two rain gardens will collect and treat runoff from a portion of the hotel roof. 0.17 acres of porous pavers are proposed in the sidewalks in the hotel entrance area. Porous pavers have been assumed to be impervious in the stormwater model, but pervious for the water quality calculations. The bio-retention area, rain gardens, and porous pavers will provide water quality treatment and runoff reduction volume. The stormwater treatment system is connected to a pipe network that will discharge to the adjacent wetland area that flows to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed A9 consists of approximately 15.59 acres of area that is captured by proposed bio-retention/sand filter area A9. This area includes the proposed hotel and parking area. Approximately 8.06 acres of impervious cover is proposed in this area, including a portion of the theme park area. Stormwater runoff from

this area will be collected by a stormwater collection system and conveyed to bio-retention/sand filte area A9. The treatment area is located off-line by use of an upstream diversion structure that will divert a portion of the flow to bio-retention area B7 and stormwater pond B7. The bio-retention portion of the treatment area will provide water quality treatment and runoff reduction volume, while the sand filter portion will provide water quality treatment. The stormwater treatment system will discharge to the adjacent wetland area that flows to the Otter Kill. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B1 consists of approximately 96.77 acres of land encompassing the watershed to the existing on-site pond adjacent to Harriman Drive and outlet culvert beneath NYS Route 17, surrounding the area that is captured by proposed stormwater practices. The majority of this area is outside the project limits and will not change from pre-development conditions. Proposed improvements in this area include the perimeter grading around the project and Harriman Drive. Approximately 5.45 acres of impervious cover is proposed in this area. Portions of the area surrounding the project are located near on-site wetlands and buffers and will use the sheet flow to riparian buffers green infrastructure technique for water quality treatment. No stormwater practices are proposed for this area. Stormwater runoff in this area follows pre-development patterns. The existing pond along Harriman Drive provides detention for the entire watershed using the culvert crossing beneath NYS Route 17 for control of flows. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B2 consists of approximately 2.08 acres of area that is captured by proposed bio-retention area B2. This area includes a portion of the theme park entrance road. Approximately 0.60 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B2. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B3 consists of approximately 2.23 acres of area that is captured by proposed bio-retention area B3. This area includes a portion of the theme park entrance road. Approximately 0.59 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B3. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B4 consists of approximately 2.60 acres of area that is captured by proposed bio-retention area B4. This area includes a portion of the theme park entrance road. Approximately 0.44 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B4. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to a small on-site stream that flows to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B5 consists of approximately 4.93 acres of the theme park entrance road. Approximately 0.70 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater and treated by roadside dry swales. The dry swales will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to a small on-site stream that flows to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B6 consists of approximately 6.50 acres of area that is captured by proposed bio-retention area B6. This area includes a portion of the theme park entrance including the parking control structure. Approximately 3.13 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B6. The bio-retention area is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the bio-retention area. The bio-retention area will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to a small on-site stream that flows to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B7 consists of approximately 22.21 acres of area that encompasses a portion of the theme park area. This area includes a portion of the theme park and theme park service road. Approximately 12.40 acres of impervious cover is proposed in this area, including a portion of the perimeter service road, walkways, and areas surrounding rides. 1.89 acres of porous pavers are proposed in the pedestrian areas of the theme park. Porous pavers have been assumed to be impervious in the stormwater model, but pervious for the water quality calculations. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B7 and stormwater pond B7. The bio-retention area, dry swales, and porous pavers will provide water quality treatment and runoff reduction volume. The bio-retention area includes a diversion forebay which allows larger storms to bypass the filter bed and flow to stormwater pond B7. Stormwater pond B7 is a wet pond and will provide water quality treatment through a permanent pool, channel protection volume, and quantity control. The stormwater treatment system will discharge to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B8 consists of approximately 6.79 acres of area that encompasses the center portion of the theme park area. This area includes a portion of the theme park and theme park service road. Approximately 3.26 acres of impervious cover is proposed in this area, including a portion of the perimeter service road, walkways, and areas surrounding rides. 0.51 acres of porous pavers are proposed in the pedestrian areas of the theme park. Porous pavers have been assumed to be impervious in the stormwater model, but pervious for the water quality calculations. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to dry swales along the service road. The dry swales and porous pavers will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B9 consists of approximately 8.97 acres of area that encompasses a portion of the theme park area that is captured by proposed bio-retention area B9. This area includes a portion of the theme park and theme park service road. Approximately 3.88 acres of impervious cover is proposed in this area, including a

portion of the perimeter service road, walkways, and areas surrounding rides. 0.31 acres of porous pavers are proposed in the pedestrian areas of the theme park. Porous pavers have been assumed to be impervious in the stormwater model, but pervious for the water quality calculations. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to bio-retention area B9. The bio-retention area is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the bio-retention area. The bio-retention area, dry swales, and porous pavers will provide water quality treatment and runoff reduction volume. The stormwater treatment system will discharge to a small on-site stream that flows to the wetland area surrounding the existing on-site pond. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed B10 consists of approximately 5.09 acres of area that is captured by proposed underground sand filter B10. This area includes a portion of the back of house facility parking area and access road. Approximately 3.96 acres of impervious cover is proposed in this area. Stormwater runoff from this area will be collected by a stormwater collection system and conveyed to underground sand filter B10. The underground sand filter is located off-line by use of an upstream diversion structure that will divert storms larger than the 1-year storm around the system. The underground sand filter consists of a chamber system with a sand filter bed beneath a portion of the system to provide water quality treatment. The stormwater treatment system will discharge to the adjacent wetland area. The post-development peak discharge for this area is summarized in Table 3, located below, as well as in the post-development model located in Appendix B.

Watershed Area	Area (Ac.)	CN	Tc (hrs.)	Impervious Cover (Ac.)	1 Year Peak Runoff (cfs)	10 Year Peak Runoff (cfs)	100 Year Peak Runoff (cfs)
Watershed A1	1,162.33	78	1.175	66.27	404.61	1,198.74	2,752.81
Watershed A2	3.77	92	0.083	2.57	6.97	13.95	25.93
Watershed A2b	4.81	85	0.117	1.31	6.23	14.84	30.22
Watershed A3	6.00	95	0.104	4.94	12.14	22.98	41.63
Watershed A4	6.41	95	0.083	5.18	13.14	24.81	44.92
Watershed A5	7.88	94	0.083	6.24	15.65	30.10	54.93
Watershed A6	7.42	95	0.129	6.27	14.62	27.75	50.33
Watershed A7	6.01	96	0.095	5.39	12.58	23.39	42.06
Watershed A8	5.66	91	0.386	3.50	7.16	14.90	28.23
Watershed A9	12.59	85	0.293	8.06	18.43	37.35	69.89
Watershed B1	96.77	78	0.793	5.45	42.48	124.86	286.81
Watershed B2	2.08	84	0.141	0.60	2.47	6.04	12.54
Watershed B3	2.23	83	0.232	0.59	2.22	5.63	11.91
Watershed B4	2.60	82	0.186	0.44	2.63	6.81	14.51
Watershed B5	4.93	80	0.218	0.70	4.17	11.62	25.74
Watershed B6	6.50	88	0.116	3.13	9.78	21.61	42.24
Watershed B7	22.21	90	0.219	12.40	32.53	69.00	132.10
Watershed B8	6.79	90	0.333	3.26	8.68	18.36	35.26
Watershed B9	8.97	88	0.124	3.88	13.35	29.55	57.83
Watershed B10	5.09	94	0.328	3.96	7.65	14.87	27.29
Into Existing Wetlands	1,222.88	--	--	--	404.91	1,216.10	2,865.58
Into Existing Pond	158.17	--	--	--	52.75	198.09	452.66
Study Point A	**1,222.88**	**--**	**--**	**--**	**202.05**	**394.22**	**726.39**
Study Point B	**158.17**	**--**	**--**	**--**	**44.44**	**89.58**	**125.54**

Table 3: Post-Development Conditions

VIII. WATER QUALITY AND RUNOFF REDUCTION

The water quality volume denoted as WQ_v is designed to improve water quality by capturing and treating 90% of the average annual stormwater runoff volume. The WQ_v is directly related to the amount impervious cover created at a site. The NYSDEC requires that the water quality volume be treated through use of specific green infrastructure practices. The design of these practices is based on promoting infiltration of the water quality volume. The treatment provided by the green infrastructure practices is called the runoff reduction volume (RR_v). The NYSDEC requires the RRv to equal the WQ_v unless site specific conditions do not allow the full treatment using green infrastructure practices. Table 4, shown below, describes the feasibility of the NYSDEC's Green Infrastructure Techniques.

Table 4: Green Infrastructure Technique Feasibility

Conservation of Natural Areas	
Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas, stream and wetland buffers by restoring and/or permanently conserving these areas on a site.	No natural areas exist within the project disturbance area delineated for the water quality calculation.
Sheet flow to Riparian Buffers or Filter Strips	
Undisturbed natural areas such as forested conservation areas and stream buffers or vegetated filter strips and riparian buffers can be used to treat and control stormwater runoff from some areas of a development project.	Portions of Harriman Drive, the emergency access to Arcadia Road, and perimeter grading of the project sheet flow to the on-site wetlands and wetland buffers. See the description of this technique below.
Vegetated Open Swale	
The natural drainage paths, or properly designed vegetated channels, can be used instead of constructing underground storm sewers or concrete open channels to increase time of concentration, reduce the peak discharge, and provide infiltration.	Grades at the site and the theme park use do not allow the use of swales. However, a dry swales are proposed along portions of the guest entrance road and portions of loop service road.
Tree Planting / Tree Box	
Plant or conserve trees to reduce stormwater runoff, increase nutrient uptake, and provide bank stabilization. Trees can be used for applications such as landscaping, stormwater management practice areas, conservation areas and erosion and sediment control.	Trees are proposed throughout the project area. See the description of this technique below.
Disconnection of Rooftop Runoff	
Direct runoff from residential rooftop areas and upland overland runoff flow to designated pervious areas to reduce runoff volumes and rates.	The theme park use does not allow for rooftops to be disconnected.
Stream Daylighting for Redevelopment Projects	
Stream Daylight previously-culverted/piped streams to restore natural habitats, better attenuate runoff by increasing the storage size, promoting infiltration, and help reduce pollutant loads.	The project is not a redevelopment, therefore this technique is not applicable.
Rain Garden	
Manage and treat small volumes of stormwater runoff using a conditioned planting soil bed and planting materials to filter runoff stored within a shallow depression.	Two rain gardens are proposed for treating a portion of the hotel roof runoff. Several bio-retention areas are also proposed throughout the project area. See the description of this technique below.

Table 4: Green Infrastructure Technique Feasibility (continued)

Green Roof	
Capture runoff by a layer of vegetation and soil installed on top of a conventional flat or sloped roof. The rooftop vegetation allows evaporation and evapotranspiration processes to reduce volume and discharge rate of runoff entering conveyance system.	The structural design of the proposed buildings does not allow this technique.
Stormwater Planter	
Small landscaped stormwater treatment devices that can be designed as infiltration or filtering practices. Stormwater planters use soil infiltration and biogeochemical processes to decrease stormwater quantity and improve water quality.	Runoff from the building roofs is being treated by the bio-retention areas.
Rain Tank / Cistern	
Capture and store stormwater runoff to be used for irrigation systems or filtered and reused for non-contact activities.	Landscape irrigation or rainwater reuse is not proposed, building roofs will be treated by the proposed bio-retention areas. No cisterns are proposed.
Porous Pavement	
Pervious types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils.	Porous pavers are proposed in the theme park area. See the description of this technique below.

Below are calculations developed specifically for the site. Details for the water quality volume and runoff reduction volume calculations are provided in Appendix D of this report. Below is summary of the required and provided water quality and runoff reduction volumes.

Required Water Quality Volume (WQ_V) = 389,244 cubic feet
Required Minimum Runoff Reduction Volume (RR_V) = 76,124 cubic feet
Provided Runoff Reduction Volume (RR_V) = 94,068 cubic feet
Required WQ_V minus the provided RR_V = 313,120 cubic feet
Provided Water Quality Volume (WQ_V) = 325,311 cubic feet
Total Treatment Volume Provided $WQ_V + RR_V$ = 419,379 cubic feet

Several different practices are being proposed throughout the site for treatment of the water quality and runoff reduction volumes. See the map in Appendix C for locations of the stormwater practices. Descriptions for practices are shown below.

Sheet flow to Riparian Buffers

Areas that drain to the wetlands and wetland buffers can be deducted from the water quality volume up to maximum of 150 feet for pervious cover. In order to claim this practice, all flow must enter the buffer in

sheet flow form. The areas of the project that drain to wetlands and wetland buffers will be graded to promote sheet flow into the undisturbed areas. Any pipe discharges in these areas will utilize riprap outlet protection or level spreaders to prevent erosion and promote sheet flow. The wetlands and wetland buffers are protected and will remain undisturbed. The sheet flow areas of the project will be left in a natural state and not regularly mowed to further promote sheet flow and decrease runoff. Areas along the Harriman Drive, portions of the emergency access to Arcadia Road, and the perimeter of the project grading have been removed from the water quality volume using this practice. 937,825 square feet has been removed from the drainage area and 150,950 square feet has been removed from the impervious cover area.

Tree Planting

Trees planted adjacent to impervious cover allow the drainage area to be reduced when calculating the water quality volume. The method of reduction chosen for this site is 100 square feet of drainage area for each tree. A total of 880 trees are proposed, allowing an 88,000 square foot reduction of the drainage area.

Bio-Retention Areas

Nine bio-retention areas are proposed throughout the project. They have been designed to treat runoff from the lawn areas, proposed paved areas, and the building roofs. Soil types in the locations of the bio-retention areas are hydrologic soil group D, therefore the systems will be installed with underdrains. 40% of the treatment volume of the bio-retention areas can be claimed as runoff reduction volume and remaining volume will be claimed as water quality volume. Several of the bio-retention areas will be located off-line from larger storms through using upstream diversion structures. Diversion structure calculations are provided in Appendix D. Provided treatment volume for the bio-retention areas are listed in Table 5 below. A total 47,551 cubic feet of treatment will deducted from the water quality volume, the remaining 71,327 cubic feet will treat standard water quality. Sedimentation forebays will be utilized for water quality pre-treatment.

Bio-Retention Area	Online/Offline	Filter Bed Area (SF)	Total Treatment Volume (CF)
A2	Offline	12,500	22,329
A8	Online	8,300	12,928
A9	Offline	7,600	12,220
B2	Online	2,300	3,286
B3	Online	2,850	4,367
B4	Online	1,810	2,624
B6	Offline	7,610	10,776
B7	Offline	29,500	42,443
B9	Offline	5,300	7,906
Total			**118,878**

Table 5: Bio-Retention Area Treatment Volumes

Porous Pavers

Porous pavers will be used in the pedestrian areas and walkways in the theme park area. Porous pavers consist of a interlocking paver blocks with spaces between blocks to allow infiltration and a stone layer of stone beneath the pavement designed to temporarily hold the water quality volume while it infiltrates. Swales and catch basins will be installed at the low points to allow stormwater from storm events larger than the water quality storm to exit the area. An underdrain will also be used to ensure proper drainage of larger storms. The area of porous pavers is 125,539 square feet, this area will be deducted from the impervious area in the water quality volume calculation.

Dry Swales

Dry swales are proposed for treating runoff from a portion of the guest entrance road and areas within the theme park. The total length of swales with a slope of 4% or less is 2,094 feet. The dry swale will have a minimum 3 or 4 foot bottom width, 1 foot depth, with 3 horizontal to 1 vertical side slopes. Soil types in this area are hydrologic soil group D, meaning the up to 20% of the treatment volume of the dry swale can be claimed as runoff reduction volume and remaining volume will be claimed as water quality volume. 3,869 cubic feet of treatment will deducted from the water quality volume, the remaining 15,476 cubic feet will treat standard water quality. Gravel diaphragms will be utilized for water quality pre-treatment.

Underground Sand Filter Areas

Six underground sand filters are proposed for treating runoff from the theme park visitor parking areas and a portion of the back of house parking area. Soil types at the site are hydrologic soil group D, no infiltration is expected in these areas, therefore no runoff reduction will be claimed for this practice. The entrance rows of each system will consist of a separator row that wrapped with a geotextile and will provide pre-treatment for the sand filter area. Water quality will be provided by sand filtration beds installed under the separator rows. Additional rows in the system will provide channel protection volume. Provided treatment volume for the bio-retention areas are listed in Table 6 below.

Underground Sand Filter	Treatment Volume (CF)	Pre-Treatment Volume(CF)	Total Treatment Volume (CF)
A3	18,521	8,863	27,384
A4	18,521	8,863	27,384
A5	20,630	9,872	30,502
A6	20,630	9,872	30,502
A7	18,521	8,863	27,384
B10	15,957	7,636	23,592
Total			**166,748**

Table 6: Underground Sand Filter Area Treatment Volumes

Rain Gardens

Rain gardens are small, vegetated stormwater treatment areas designed for capturing and infiltrating runoff from roofs, driveways, yards, and other small areas. Rain gardens are very similar to bio-retention areas, but are much smaller. Two rain gardens are proposed for treating a portion of the hotel roof runoff. The treatment volume of rain gardens is quantified as a volume, similar to a standard stormwater practice, such as a bio-retention area. The 2 rain gardens will treat approximately 468 cubic feet of water quality volume.

Stormwater Pond

A stormwater pond is proposed for handling water quality treatment, channel protection volume, and quantity control from the theme park area. The pond will be a wet pond, design P-2. Water quality treatment will be provided through permanent pool. Stormwater ponds do not allow for runoff reduction credit. The stormwater pond will provide 66,208 cubic feet of water quality treatment through permanent pool.

Sand Filtration Areas

Sand filtration area A9 is proposed for treating runoff from watershed A9. The sand filtration area will be constructed within bio-retention area A9 to increase the water quality treatment capacity of the overall system. Treatment volume from sand filtration areas cannot be claimed as runoff reduction volume. The provided water quality volumes for sand filtration area A9 is 5,533 cubic feet.

IX. EROSION AND SEDIMENT CONTROL MEASURES

The SPDES General Permit (GP-0-15-002) for construction activities requires that an Erosion and Sediment Control Plan be developed. This plan has provided as part of the Site Plans, and will be available at Town Hall and the project site at the time of construction. The plan will also be in compliance with current regulations, including construction sequence, both short- and long-term maintenance of facilities, storage of materials and temporary and permanent structures.

The following temporary and permanent erosion control practices are proposed for use during construction and for long-term protection:

A. Stabilized Construction Entrance:
A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets. Stabilized construction entrances will be placed as shown on the Sediment and Erosion Control Plans.

B. Siltation Fence:
A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil. The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment loads. Limits imposed by

ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year). Silt fence will be placed as shown on the Sediment and Erosion Control Plans.

C. Sediment Traps:

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment. The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation. Stone outlet sediment traps will be used at the locations shown on the Sediment and Erosion Control Plans.

D. Sediment Basins:

A temporary barrier or dam constructed across a drainage way or at other suitable locations to intercept sediment laden runoff to trap and retain the sediment to reduce the amount of sediment leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin. Sediment basins are proposed in the areas of the proposed bio-retention areas, calculations for the sizing of the temporary sediment basins are provided in Appendix D.

E. Diversion Swales:

A temporary excavated drainage way. The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device. Diversion swales will be used for diverting clean runoff around the project area and for intercept sediment laden runoff and directing it to sediment traps/basins. Diversion swales will be placed as shown on the Sediment and Erosion Control Plans.

F. Water Bars

A ridge or ridge and channel constructed diagonally across a sloping road or utility right-of-way that is subject to erosion. The purpose is to limit the accumulation of erosive velocity of water by diverting surface runoff at pre-designed intervals. Water bars will be placed as necessary during construction.

G. Storm Drain Inlet Protection:

A temporary, somewhat permeable barrier, installed around inlets in the form of a fence, berm, or excavation around an opening, trapping water and thereby reducing the sediment content of sediment laden water by settling. The purpose is to prevent heavily sediment laden water from entering a storm drain system through inlets. Curb drop, filter fabric drop, and excavated drop inlet protection will be used throughout the site. Inlet protection will only be used in road areas before pavement is placed. Locations of inlet protection are shown on Sediment and Erosion Control Plans.

H. Level Spreaders:

A temporary non-erosive outlet for concentrated runoff, constructed to disperse flow uniformly across a slope. The purpose is to convert concentrated flow to sheet flow and release it uniformly over a stabilized area. Level spreaders will be used at the ends of diversion swales used for diverting

clean runoff around the project area. Level spreader locations are shown on the Sediment and Erosion Control Plans.

I. Slope Stabilization Matting:
Matting made synthetic or natural fibers that is placed on steep slopes to allow newly planted vegetation to take root and protect the slope from erosion before vegetation is fully established. Locations of slope stabilization matting are shown on Sediment and Erosion Control Plans.

J. Rock Outlet Protection:
A section of rock protection placed at the outlet of the culverts, conduits, or channels. The purpose of the rock outlet protection is to reduce the depth, velocity, and energy of water, such that the flow will not erode the receiving downstream reach. Rock outlet protection is proposed at all pipe discharge points. See the Sediment and Erosion Control Plans for locations of rock outlet protection.

K. Pipe Slope Drain:
A temporary structure placed from the top of a slope to the bottom of a slope to convey surface runoff down slopes without causing erosion. Pipe slope drains are proposed along the benched slopes along the western side of the project. See the Sediment and Erosion Control Plans for locations of pipe slope drains.

X. IMPLEMENTATION SCHEDULE & MAINTENANCE

A. Schedule

As part of the development of the Erosion and Sediment Control Plans for the project, preparation of construction sequencing was completed to ensure water quality discharges are maintained during construction. The following construction schedule for implementing stormwater management during construction is proposed. Please refer to the Site Plans for specific sequencing and scheduling.

General Notes:

1. The owner or operator shall have a qualified inspector conduct at least two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

2. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased.

3. Temporary Stabilization means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

4. Final Stabilization means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

Construction Sequence:

1. Pre-construction meeting: Before construction activities an evaluation of the site will be performed with the site contractor, Town personnel and site design engineer to discuss general construction procedures and sequencing. During this meeting sensitive areas of the property shall be delineated and marked-out with orange construction fence (i.e.: trees, wetlands, wells, etc.).

2. Delineate total site disturbance limits: Placement of orange construction fencing along the limit of disturbance throughout the site.

3. Protect existing buffers: Place erosion control devices (silt fencing, diversion berms, etc.) upstream of any existing watercourse within or outside of construction areas, prior to the start of any construction.

4. Construction entrances/siltation controls: A temporary construction entrance will be installed at the site entrances as shown on the Site Plans. In addition, any other siltation control devices, as shown on the erosion control plan are to be installed adjacent to the temporary entrance and staging area.

5. Construction of temporary sediment traps/basins: Construction of the temporary sediment traps prior to the start of any major earthwork movement or site construction.

6. Staging area: The staging area will be graded for storage of equipment and placement of construction trailers.

7. Strip topsoil: Topsoil will be stripped from this phase and will be stockpiled for later reuse.

8. Land grading: Bulk soil grading in this phase will commence. At this time, temporary stockpile areas should be utilized.

9. Retaining walls: Begin construction of on-site retaining walls. Walls to be installed concurrently with land grading.

10. Back of house construction: Upon completion of grading in back of house area, construction of buildings and roads will begin.

11. Utility installation: Install sanitary sewer, water, and stormwater. Inlet protection will be installed at all stormwater catch basins.

12. Stormwater installation: Install underground stormwater areas when all contributing areas have been stabilized. Protect areas during and after construction until pavement is installed.

13. Pavement construction: Construct paved parking and access roads.

14. Theme park construction: Upon completion of grading and retaining walls, construction of rides, buildings, and walkways will commence.

15. Landscaping and final stabilization: All open areas to be stabilized with topsoil and seeded as per the seeding schedule specified on the erosion and sediment control plans. Removal of all temporary measures, flushing/cleaning of all catch basins and pipe, and removal and disposal of all trapped sediment on site shall be completed.

16. Final site inspection and certification: At the end of construction a site evaluation of the site will be performed with site contractor, Town personnel, and site engineer to ensure that all stormwater facilities were constructed as per the SWPPP design and that the site has been stabilized. A Notice of Termination will be submitted to the NYSDEC.

Please refer to the Erosion and Sediment Control Plans within the Site Plans for construction notes and seeding schedule for disturbance and final stabilization.

B. Pollution Prevention Measures:

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner conforms to all applicable Federal and State regulations that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

<u>Vehicles, construction equipment, and/or petroleum product storage/dispensing:</u>

1. All vehicles, equipment, and petroleum product storage/dispensing areas will be observed regularly during site observations to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.

2. On-site fueling tanks and petroleum product storage containers shall include secondary containment.

3. Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.

4. In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.

5. Contaminated surfaces shall be cleaned immediately following any discharge or spill incident. Contaminated soil shall be removed from site and disposed of in accordance with all current Federal and State Regulations.

Chemical storage:

1. Any chemicals stored in the construction areas will conform to the appropriate manufacturer's recommendations and or the appropriate State/Federal Regulations. All chemicals shall have cover, containment, and protection provided on site, per all Federal and NYSDEC regulations.

2. Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Demolition:

1. Dust released from demolished sidewalks, buildings, structures or on site grading operations will be controlled using Dust Control measures as specified in the N.Y.S. Erosion and Sediment Control Specification Manual.

2. Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection.

3. Process water and slurry resulting from saw cutting and surfacing operations will be prevented from entering the waters of the State by implementing Saw cutting and Surfacing Pollution Prevention measures.

Concrete and grout:

1. Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures.

Sanitary wastewater:

1. Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.

2. Wheel wash or tire bath wastewater shall be discharged to a temporary erosion and sediment control facility which has been constructed on site.

Solid Waste:

1. Solid waste will be stored in secure, clearly marked containers.

Litter/Trash:

1. Litter and Trash shall be cleaned and disposed of in secure clearly marked dumpsters or trash receptacles.

2. Site is to be cleaned daily of debris and disposed of on a daily basis.

Other:

1. Other BMPs will be administered as necessary to address any other additional pollutant sources on site.

C. Maintenance (Construction/Long-Term)

1. The property owner/operator will be responsible for the maintenance and operation of all site related stormwater management facilities during construction and the property owner will be responsible for long-term maintenance.

2. A standalone Operation and Maintenance Plan will be prepared prior to filing of the NOTs and will include the following: schedules, procedures, forms for inspections, maps showing stormwater practice areas, and the maintenance agreement. Please refer to Appendix F for standard Inspection and Maintenance Forms.

3. Construction and long-term maintenance shall be carried out in accordance with the following notes:

   a. Bio-retention Areas: Inspection shall be made weekly by a licensed professional and after every ½" rainfall event by the owner or contractor during construction. During the first growing season inspections shall be conducted monthly and annually thereafter. The following tasks shall be performed as needed:

      (1) Removal of accumulated sediment and cleaning and/or restoration of the filter bed areas whenever accumulated sediment reaches a volume of 50% of the available capacity.

      (2) Restoration of any disturbed plant material and any eroded embankments.

      (3) Removal of accumulated debris within the filter bed areas and at all inlet and outfall structures.

      (4) Annual mowing of the berm and surrounding area of the basins. Removal of any fallen trees or limbs. No mowing or trimming is to occur within the constructed area of the wetland. Replacement of proposed plants shall occur if more then 50% of the coverage of the facility is not achieved.

b. Porous Pavers: Pavers shall be protected from silt and sediment during construction of surrounding areas, if possible, the pavers should be installed after stabilization of surrounding areas. During winter conditions, sand and salt should be avoided being utilized to the porous pavers sections. The following tasks shall be performed as needed:

(1) Clean debris and sediment from pavers monthly.

(2) Ensure paver area fully drains after storms monthly and after storms greater than 0.5 inches.

(3) Mow and seed bare areas upland and adjacent to the pavers as needed.

(4) Vacuum pavers surface 2 to 3 times a year depending on site conditions.

(5) Inspection of the surface for dislodged or damagers pavers, replacing as necessary.

c. Underground Sand Filtration Systems: Inspection shall be made weekly by a qualified professional and after every ½" rainfall event by the contractor during construction. For the first year following construction, the system shall be inspected quarterly by the owner and at the end of the year by a qualified professional. Thereafter, the system shall be inspected annually. The following tasks shall be performed as needed:

(1) Visual inspections to be performed at the inlet manhole and inspection ports.

(2) Removal of accumulated sediment every 5 years and/or when depth reaches 3" within the stormwater separator row by jetting and washing sediment to inlet manhole and vacuuming from the sump.

(3) Removal of accumulated debris within the system and at all inlet and outfall structures.

(4) Check for settlement of the ground above and around the underground system. Fill low spots as necessary.

(5) Restoration and repair of any damaged portion of the system. Sand filter replacement once every 10 years if warranted by visual inspection.

d. Swales: Inspection shall be made weekly and after every ½" rainfall event during construction. During the first growing season inspections shall be conducted monthly, and on an annual basis thereafter. The following tasks shall be performed as needed:

(1) Removal of accumulated sediment and cleaning and/or restoration whenever accumulated sediment reaches a volume of 50% of the available capacity.

(2) Restoration of any eroded embankments. Infrequent reshaping of the swale line should be completed as needed.

(3) Removal of accumulated debris/trash within the swale and at all inlet and outfall structures.

(4) Seasonal mowing of the swale bottom and surrounding side slopes. Removal of any fallen trees or limbs. Replacement and/or restoration of proposed grasses shall occur if more than 50% of the coverage of the facility is not achieved. Grasses should be kept at a maximum height of 6" – 8".

e. Stormwater Pond: Inspection shall be made weekly by a licensed professional and after every ½" rainfall event by the owner or contractor during construction. During the first growing season inspections shall be conducted monthly and bi-annually thereafter. The following tasks shall be performed as needed:

(1) Removal of accumulated sediment and cleaning and/or restoration of the sediment forebays every 5 or 6 years or whenever accumulated sediment reaches a volume of 50% of the available capacity.

(2) Restoration of any disturbed plant material and any eroded embankments. Replacement of proposed plants shall occur if more than 50% of the coverage of the facility is not achieved.

(3) Removal of accumulated debris within the basin and at all inlet and outfall structures.

(4) Annual mowing of the berm and surrounding area of the basins. Removal of any fallen trees or limbs.

(5) Inspection of the outlet structure to ensure structural stability and removal of any accumulated trash within the structure.

f. Rain Gardens: Inspection shall be made weekly during construction and during the first growing season, and on an annual basis thereafter. The following tasks shall be performed as needed:

(1) Removal of accumulated sediment and cleaning and/or restoration of the filter bed areas whenever accumulated sediment reaches a volume of 50% of the available capacity.

(2) Restoration of any disturbed plant material and any eroded embankments.

(3) Removal of accumulated debris within the filter bed areas and at all inlet and outfall structures.

(4) Regular weeding and watering as needed.

g. Sand Filtration Areas: Inspection shall be made weekly during construction. During the first growing season inspections shall be conducted monthly, and on an annual basis thereafter. The following tasks shall be performed as needed:

(1) Removal of accumulated sediment and cleaning and/or restoration of the filter bed areas whenever accumulated sediment reaches a volume of 50% of the available capacity.

(2) Restoration of any disturbed plant material and any eroded embankments.

(3) Removal of accumulated debris within the filter bed areas and at all inlet and outfall structures.

(4) Annual mowing of the berm and surrounding area of the basins. Removal of any fallen trees or limbs. No mowing or trimming is to occur within the constructed area of the wetland. Replacement of proposed plants shall occur if more then 50% of the coverage of the facility is not achieved.

h. Roadway Pavements: Roadway pavements shall be swept on a regular basis to remove accumulated sediment. Collected sediment shall be removed, which will not allow the re-entrance of silt into the storm water drainage system.

i. Catch Basins: Catch basins shall be flushed and cleaned of any collected sediment within the bottom of the basin approximately every 4-5 years. Collected sediment shall be removed, which will not allow the reentrance of silt into the storm water drainage system.

j. Vegetative Stabilization:

(1) All vegetative planting on areas that have been disturbed and are finish graded shall be inspected monthly during the first growing season and annually thereafter. Planting (or seeding) shall be maintained in viable conditions to stabilize the soil and to prevent soil erosion. Restore all site planting and/or seeding which has been damaged to a viable condition.

(2) If vegetative stabilization has been damaged from storm water erosion, correct upstream conditions that caused the erosion. Check dams may be required in drainage ways and stone outfall aprons may be required to be repaired on storm water outfall sites.

k. Temporary erosion and sediment control maintenance:

(1) All erosion and sediment control practices will be checked for stability and operation following every runoff-producing rainfall, but in no case less than once every week.

Any needed repairs will be made immediately to maintain all practices as designed and installed for their appropriate phase of the project.

(2) Sediment will be removed from the sediment trap and inlet protection device when storage capacity has been approximately 50% filled.

(3) Sediment will be removed from behind the sediment fence when it becomes about 0.5 ft deep at the fence. The sediment fence will be repaired as necessary to maintain a barrier.

XI. ANALYSIS AND CONCLUSION

As can be seen from the calculations provided above the proposed rain gardens, bio-retention areas, and dry swale provide water quality treatment and runoff reduction in accordance with the stormwater quality management guidelines set forth by the NYSDEC. Also, the proposed underground sand filter system and surface sand filter will provide water quality treatment and the proposed stormwater pond will provide water quality and quantity control. The project will also implement tree plantings, porous pavement, and sheet flow to riparian buffers to meet runoff reduction requirements. The proposed stormwater practices and the post-development layout of the site show that peak stormwater runoff flowrates at the study point decrease for all analyzed storms. Based upon the results of this analysis, the site has demonstrated the ability to meet all requirements for stormwater quantity and quality and any impacts to the existing watershed and downstream waters should be negligible.

Table 7 below summarizes the pre- and post-development discharges for the development. Please refer to Appendix B for detailed analysis and calculations of the individual watershed subareas. Peak flowrates were compared between pre- and post-development conditions at the entrance to the existing wetlands and existing pond, as well as the study points downstream of the wetlands and pond outlet culverts. Post-development peak runoff was less than pre-development conditions both going into and coming out of the existing wetlands and existing pond.

	Condition	1 Year Peak Runoff (cfs)	10 Year Peak Runoff (cfs)	100 Year Peak Runoff (cfs)
Into Existing Wetlands	Pre-Development	423.37	1,254.33	2,880.46
	Post-Development	404.91	1,216.10	2,865.58
	Difference	**-18.46 (-4.4%)**	**-38.23 (-3.0%)**	**-14.88 (-0.5%)**
Into Existing Pond	Pre-Development	62.42	198.75	473.09
	Post-Development	52.75	198.09	452.66
	Difference	**-9.67 (-15.5%)**	**-0.66 (-0.3%)**	**-20.43 (-4.3%)**
Study Point A	Pre-Development	207.90	400.59	730.04
	Post-Development	202.05	394.22	726.39
	Difference	**-5.85 (-2.8%)**	**-6.37 (-1.6%)**	**-3.65 (-0.5%)**
Study Point B	Pre-Development	49.47	90.99	125.65
	Post-Development	44.44	89.58	125.54
	Difference	**-5.03 (-10.2%)**	**-1.41 (-1.5%)**	**-0.11 (-0.1%)**

Table 7: Comparison of Pre- and Post-Development Conditions at Study Points

By implementing both the Stormwater Pollution Prevention Plan and Erosion and Sediment Control Plans during the construction of the proposed project, current NYSDEC and Town regulations can be met. However, the owner and contractor are responsible for implementation of the project's erosion and sedimentation controls and any required maintenance. In addition, this also includes filing the NOI for each project and meeting all requirements of the General Permit, including necessary site assessment and inspections.

Respectfully submitted,
LANC & TULLY, P.C.

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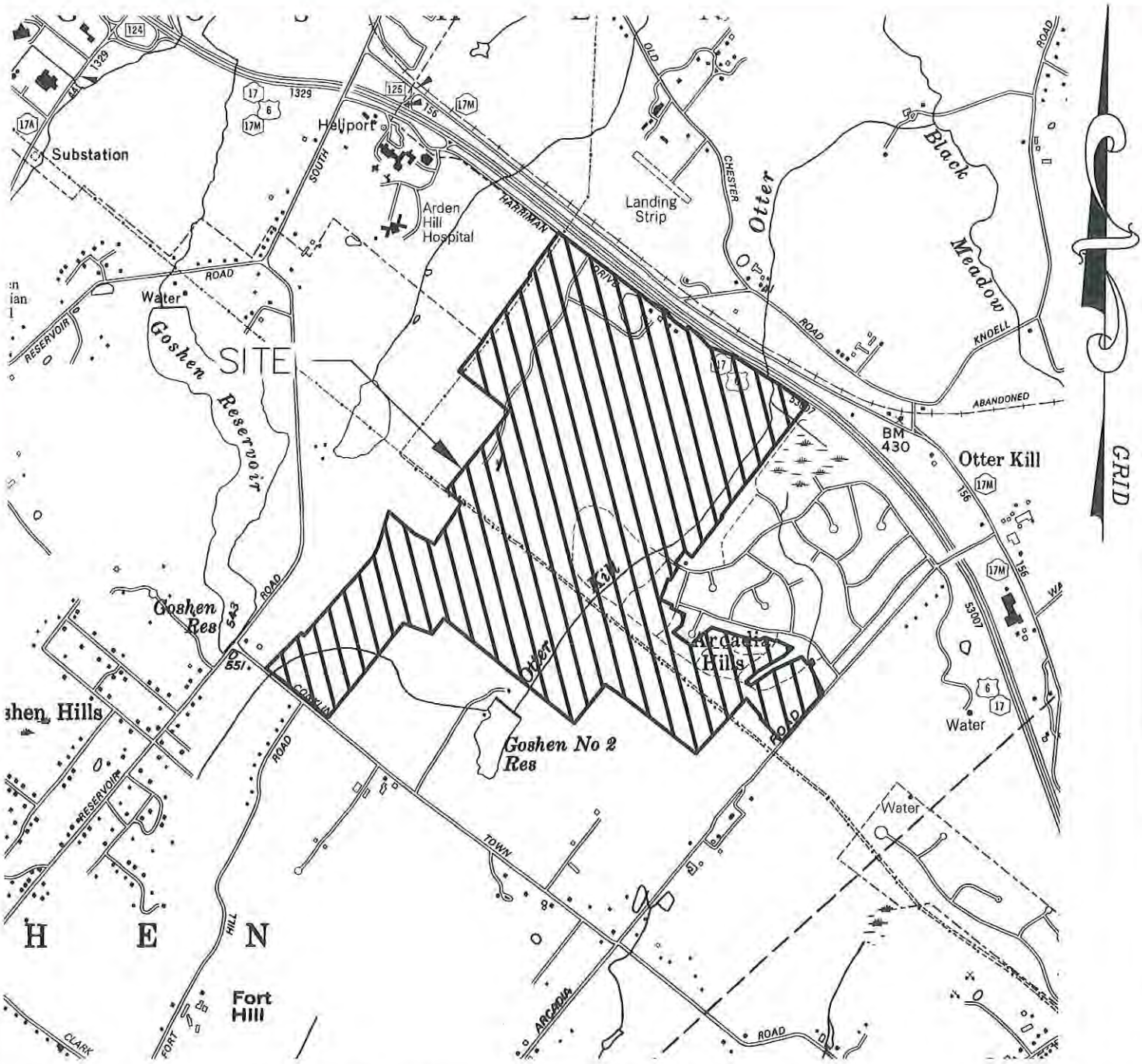
APPENDIX A

SITE LOCATION MAP
SOILS REPORT FOR PROJECT
RAINFALL DATA



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LANC & TULLY
ENGINEERING AND SURVEYING, P.C.
P.O. Box 687, Rt. 207
Goshen, N.Y. 10924
(845) 294-3700

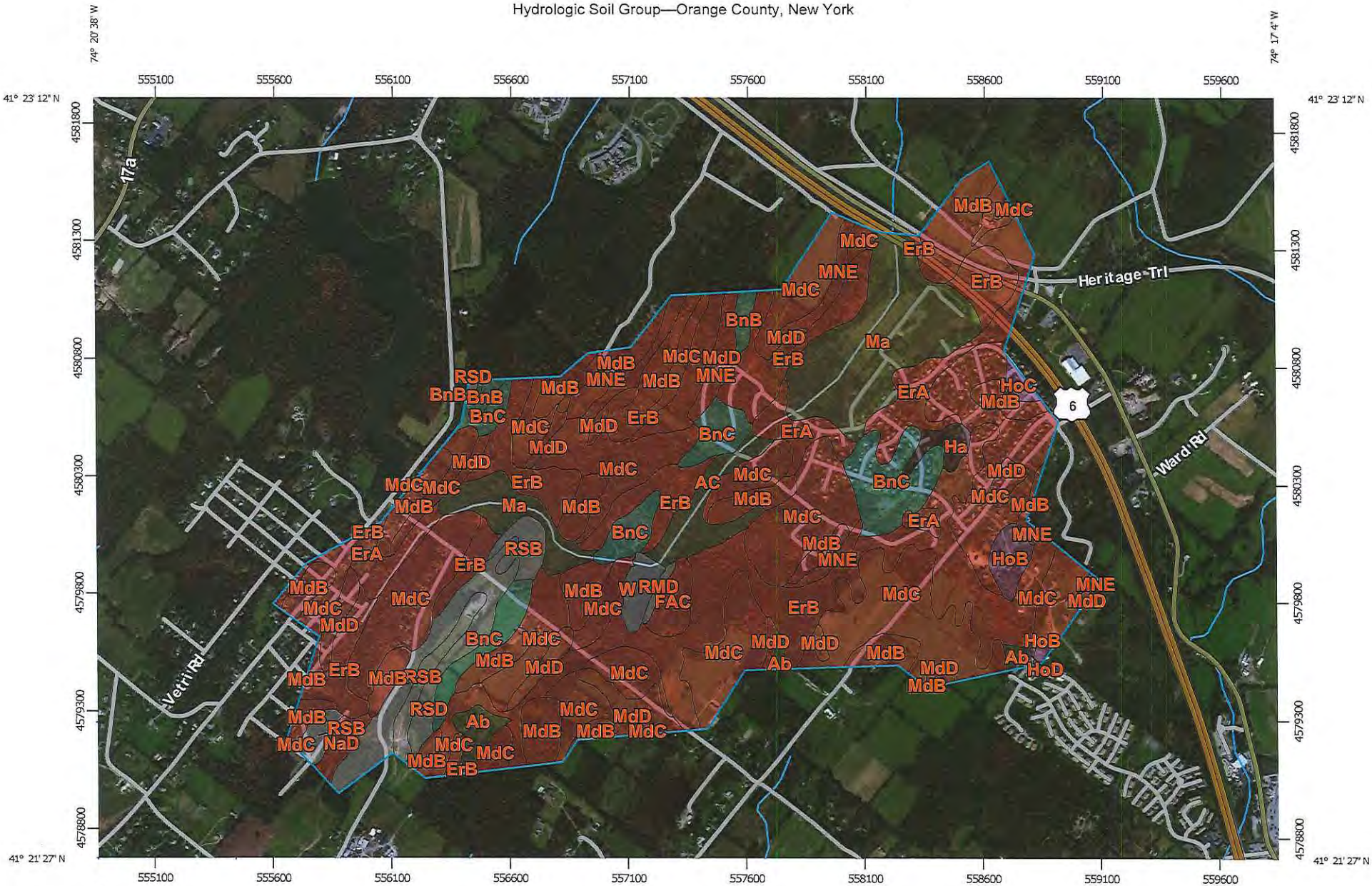
SITE LOCATION MAP

LEGOLAND NEW YORK
TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

Date:	SEPTEMBER 16, 2016
Revisions:	APRIL 7, 2017
CAD File:	160042-DRAINAGE
Layout:	LOCATION
Sheet No.:	1 OF 5
Drawing No.:	C3D F - 16 - 0042 - 01

Drawn By:	Checked By:	Scale:	Tax Map No.:
ESR		1" = 2,000'	SEE SITE PLANS

Hydrologic Soil Group—Orange County, New York



Map Scale: 1:22,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Orange County, New York
Survey Area Data: Version 16, Sep 24, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 20, 2011—Oct 10, 2011

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 — Orange County, New York (NY071)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ab	Alden silt loam	C/D	12.0	0.9%
AC	Alden extremely stony soils	C/D	21.6	1.7%
BnB	Bath-Nassau channery silt loams, 3 to 8 percent slopes	C	7.0	0.5%
BnC	Bath-Nassau channery silt loams, 8 to 15 percent slopes	C	71.2	5.5%
ErA	Erie gravelly silt loam, 0 to 3 percent slopes	D	53.0	4.1%
ErB	Erie gravelly silt loam, 3 to 8 percent slopes	D	243.5	18.9%
FAC	Farmington silt loam, sloping	D	10.3	0.8%
Ha	Halsey silt loam	B/D	7.8	0.6%
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	A	11.1	0.9%
HoC	Hoosic gravelly sandy loam, 8 to 15 percent slopes	A	3.4	0.3%
HoD	Hoosic gravelly sandy loam, 15 to 25 percent slopes	A	0.5	0.0%
Ma	Madalin silt loam	C/D	107.5	8.4%
MdB	Mardin gravelly silt loam, 3 to 8 percent slopes	D	158.9	12.4%
MdC	Mardin gravelly silt loam, 8 to 15 percent slopes	D	407.6	31.7%
MdD	Mardin gravelly silt loam, 15 to 25 percent slopes	D	53.8	4.2%
MNE	Mardin soils, steep	D	31.1	2.4%
NaD	Nassau channery silt loam, 15 to 25 percent slopes	D	7.1	0.5%
RMD	Rock outcrop-Farmington complex, hilly		2.0	0.2%
RSB	Rock outcrop-Nassau complex, undulating		26.7	2.1%

Hydrologic Soil Group— Summary by Map Unit — Orange County, New York (NY071)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
RSD	Rock outcrop-Nassau complex, hilly		40.9	3.2%
W	Water		8.9	0.7%
Totals for Area of Interest			**1,285.7**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	74.316 degrees West
Latitude	41.378 degrees North
Elevation	0 feet
Date/Time	Tue, 26 Jul 2016 08:20:34 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.50	0.62	0.82	1.02	1.27	**1yr**	0.88	1.19	1.46	1.79	2.18	2.65	3.06	**1yr**	2.34	2.94	3.38	4.07	4.71	**1yr**
2yr	0.39	0.60	0.75	0.99	1.24	1.55	**2yr**	1.07	1.44	1.77	2.17	2.64	3.19	3.64	**2yr**	2.83	3.50	4.01	4.72	5.38	**2yr**
5yr	0.46	0.71	0.90	1.20	1.54	1.93	**5yr**	1.33	1.78	2.22	2.72	3.31	4.00	4.61	**5yr**	3.54	4.43	5.06	5.84	6.60	**5yr**
10yr	0.51	0.81	1.02	1.39	1.80	2.29	**10yr**	1.56	2.09	2.64	3.24	3.93	4.74	5.50	**10yr**	4.20	5.29	6.03	6.85	7.71	**10yr**
25yr	0.60	0.95	1.21	1.68	2.23	2.86	**25yr**	1.93	2.59	3.31	4.08	4.96	5.95	6.97	**25yr**	5.27	6.70	7.60	8.47	9.48	**25yr**
50yr	0.68	1.09	1.39	1.95	2.63	3.39	**50yr**	2.27	3.04	3.94	4.86	5.89	7.07	8.34	**50yr**	6.25	8.02	9.07	9.95	11.09	**50yr**
100yr	0.77	1.24	1.60	2.27	3.10	4.02	**100yr**	2.67	3.58	4.68	5.78	7.01	8.40	9.98	**100yr**	7.43	9.60	10.83	11.70	12.98	**100yr**
200yr	0.87	1.42	1.84	2.64	3.65	4.77	**200yr**	3.15	4.21	5.57	6.89	8.35	9.99	11.96	**200yr**	8.84	11.50	12.94	13.75	15.21	**200yr**
500yr	1.04	1.71	2.23	3.24	4.55	5.98	**500yr**	3.92	5.23	7.00	8.68	10.52	12.57	15.19	**500yr**	11.12	14.61	16.38	17.05	18.76	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.74	0.92	1.11	**1yr**	0.79	1.08	1.24	1.57	2.01	2.30	2.58	**1yr**	2.04	2.48	2.91	3.72	4.23	**1yr**
2yr	0.38	0.58	0.72	0.97	1.20	1.44	**2yr**	1.03	1.41	1.63	2.09	2.59	3.09	3.53	**2yr**	2.73	3.39	3.90	4.59	5.23	**2yr**
5yr	0.42	0.65	0.81	1.11	1.42	1.67	**5yr**	1.22	1.63	1.90	2.44	3.04	3.68	4.23	**5yr**	3.25	4.07	4.69	5.39	6.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.87	**10yr**	1.38	1.83	2.13	2.72	3.44	4.19	4.88	**10yr**	3.71	4.70	5.39	6.08	6.88	**10yr**
25yr	0.53	0.81	1.00	1.43	1.89	2.16	**25yr**	1.63	2.11	2.49	3.20	4.01	4.95	5.89	**25yr**	4.38	5.66	6.49	7.13	8.00	**25yr**
50yr	0.58	0.89	1.11	1.59	2.14	2.42	**50yr**	1.85	2.37	2.79	3.62	4.52	5.59	6.80	**50yr**	4.94	6.54	7.49	8.07	9.00	**50yr**
100yr	0.65	0.98	1.23	1.77	2.43	2.71	**100yr**	2.10	2.65	3.15	4.09	5.11	6.31	7.88	**100yr**	5.58	7.57	8.64	9.17	10.10	**100yr**
200yr	0.72	1.09	1.38	2.00	2.79	3.03	**200yr**	2.41	2.96	3.55	4.65	5.78	7.12	9.14	**200yr**	6.31	8.79	10.01	10.41	11.33	**200yr**
500yr	0.84	1.26	1.62	2.35	3.34	3.53	**500yr**	2.88	3.45	4.16	5.53	6.85	8.35	11.16	**500yr**	7.39	10.73	12.19	12.33	13.25	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.55	0.68	0.91	1.12	1.35	**1yr**	0.96	1.32	1.55	1.96	2.41	2.87	3.30	**1yr**	2.54	3.18	3.64	4.32	5.02	**1yr**
2yr	0.41	0.63	0.78	1.05	1.30	1.55	**2yr**	1.12	1.51	1.76	2.24	2.79	3.33	3.79	**2yr**	2.95	3.65	4.18	4.93	5.63	**2yr**
5yr	0.50	0.77	0.96	1.31	1.67	1.99	**5yr**	1.44	1.94	2.27	2.90	3.62	4.35	4.95	**5yr**	3.85	4.76	5.45	6.31	7.07	**5yr**
10yr	0.59	0.91	1.13	1.58	2.04	2.44	**10yr**	1.76	2.38	2.76	3.55	4.42	5.36	6.09	**10yr**	4.74	5.86	6.68	7.62	8.50	**10yr**
25yr	0.75	1.13	1.41	2.01	2.65	3.21	**25yr**	2.29	3.13	3.63	4.66	5.77	7.06	7.99	**25yr**	6.25	7.68	8.74	9.80	10.83	**25yr**
50yr	0.88	1.35	1.68	2.41	3.25	3.79	**50yr**	2.80	3.71	4.44	5.70	7.04	8.71	9.81	**50yr**	7.71	9.43	10.72	11.86	13.03	**50yr**
100yr	1.05	1.59	1.99	2.88	3.95	4.62	**100yr**	3.41	4.52	5.43	6.97	8.60	10.78	12.06	**100yr**	9.54	11.60	13.14	14.38	15.68	**100yr**
200yr	1.25	1.88	2.39	3.46	4.82	5.64	**200yr**	4.16	5.51	6.64	8.54	10.51	13.36	14.82	**200yr**	11.83	14.25	16.11	17.40	18.89	**200yr**
500yr	1.59	2.36	3.04	4.41	6.27	7.32	**500yr**	5.41	7.16	8.68	11.15	13.70	17.76	19.43	**500yr**	15.72	18.68	21.10	22.41	24.18	**500yr**

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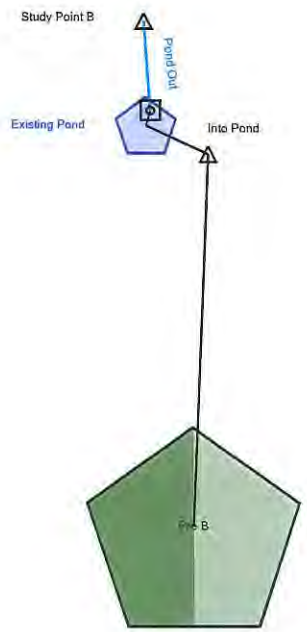
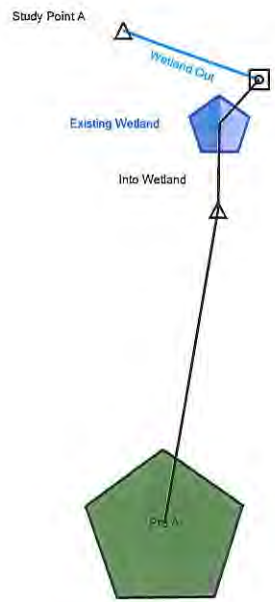
Northeast Regional Climate Center

APPENDIX B

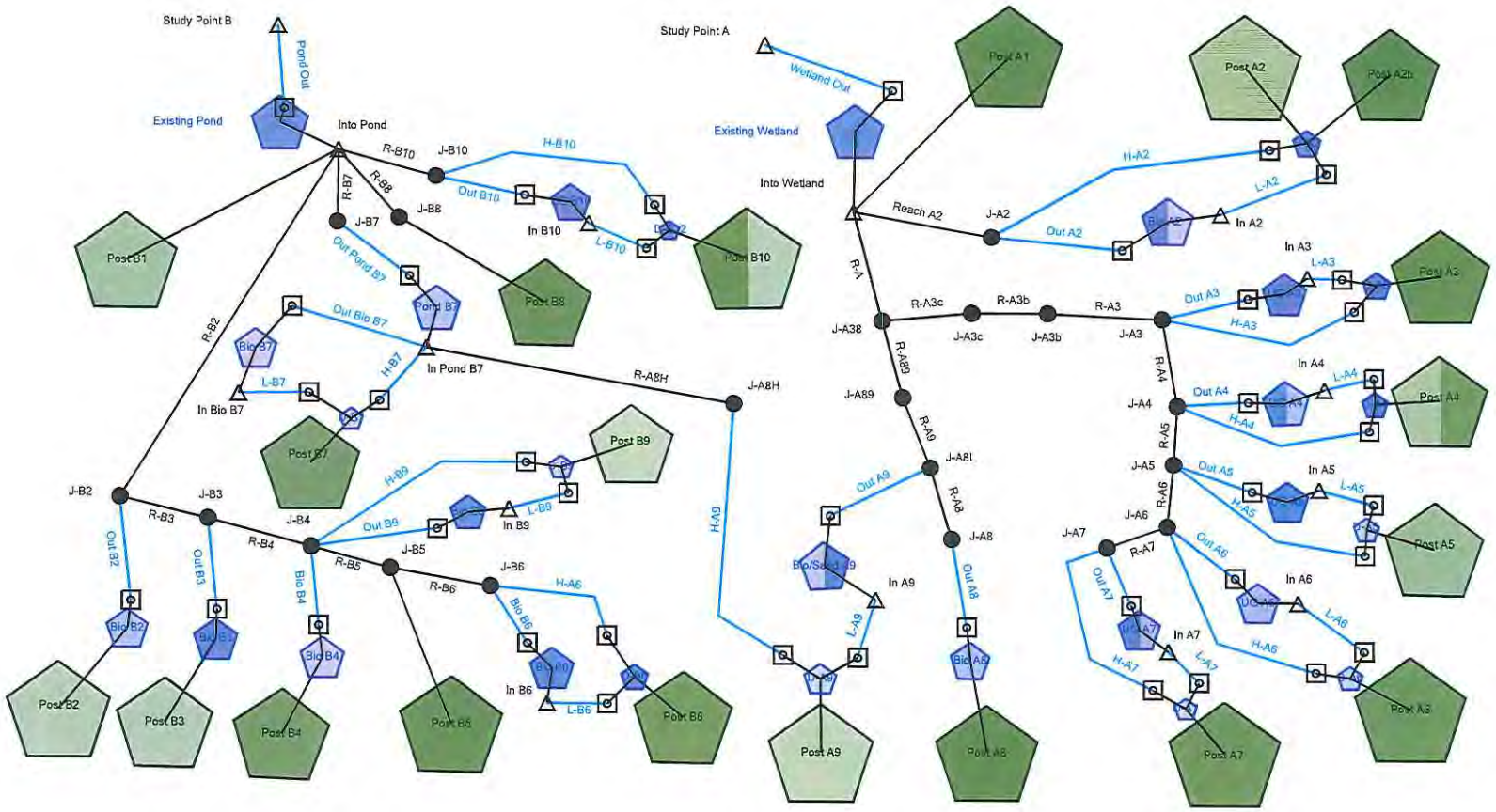
PRE/POST-DEVELOPMENT WATERSHED MODEL

Scenario: Pre 1-Year





Scenario: Post 1-Year



Project Summary	
Title	LEGOLAND NY
Engineer	Eric Rogge PE
Company	Lanc & Tully
Date	3/16/2017

Notes	Pre- vs. Post-Development Conditions Modeled with existing pond & wetland

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Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Pre B	Pre 1-Year	1	10.813	12.600	62.42
Pre B	Pre 10-Year	10	31.915	12.550	198.75
Pre B	Pre 100-Year	100	75.886	12.550	473.09
Pre A	Pre 1-Year	1	89.879	12.850	423.37
Pre A	Pre 10-Year	10	252.611	12.850	1,254.33
Pre A	Pre 100-Year	100	583.970	12.800	2,880.46
Post B1	Post 1-Year	1	7.151	12.600	42.48
Post B1	Post 10-Year	10	20.098	12.550	124.86
Post B1	Post 100-Year	100	46.462	12.550	286.81
Post A1	Post 1-Year	1	85.896	12.850	404.61
Post A1	Post 10-Year	10	241.416	12.850	1,198.74
Post A1	Post 100-Year	100	558.092	12.800	2,752.81
Post B2	Post 1-Year	1	0.214	12.150	2.47
Post B2	Post 10-Year	10	0.527	12.100	6.04
Post B2	Post 100-Year	100	1.125	12.100	12.54
Post B7	Post 1-Year	1	3.082	12.150	32.53
Post B7	Post 10-Year	10	6.710	12.150	69.00
Post B7	Post 100-Year	100	13.323	12.150	132.10
Post B10	Post 1-Year	1	0.853	12.250	7.65
Post B10	Post 10-Year	10	1.717	12.200	14.87
Post B10	Post 100-Year	100	3.254	12.200	27.29
Post A2	Post 1-Year	1	0.575	12.100	6.97
Post A2	Post 10-Year	10	1.204	12.100	13.95
Post A2	Post 100-Year	100	2.335	12.100	25.93
Post A3	Post 1-Year	1	1.054	12.100	12.14
Post A3	Post 10-Year	10	2.081	12.100	22.98
Post A3	Post 100-Year	100	3.901	12.100	41.63
Post A4	Post 1-Year	1	1.126	12.100	13.14
Post A4	Post 10-Year	10	2.223	12.100	24.81
Post A4	Post 100-Year	100	4.167	12.100	44.92
Post A5	Post 1-Year	1	1.322	12.100	15.65
Post A5	Post 10-Year	10	2.660	12.100	30.10
Post A5	Post 100-Year	100	5.042	12.100	54.93
Post A6	Post 1-Year	1	1.303	12.100	14.62
Post A6	Post 10-Year	10	2.572	12.100	27.75
Post A6	Post 100-Year	100	4.821	12.100	50.33
Post A7	Post 1-Year	1	1.105	12.100	12.58
Post A7	Post 10-Year	10	2.140	12.100	23.39
Post A7	Post 100-Year	100	3.964	12.100	42.06
Post B3	Post 1-Year	1	0.217	12.200	2.22
Post B3	Post 10-Year	10	0.545	12.150	5.63
Post B3	Post 100-Year	100	1.179	12.150	11.91
Post B4	Post 1-Year	1	0.241	12.150	2.63
Post B4	Post 10-Year	10	0.618	12.150	6.81
Post B4	Post 100-Year	100	1.353	12.150	14.51
Post B5	Post 1-Year	1	0.409	12.200	4.17
Post B5	Post 10-Year	10	1.096	12.150	11.62
Post B5	Post 100-Year	100	2.466	12.150	25.74
Post B6	Post 1-Year	1	0.818	12.100	9.78
Post B6	Post 10-Year	10	1.854	12.100	21.61
Post B6	Post 100-Year	100	3.769	12.100	42.24

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Post B8	Post 1-Year	1	0.943	12.250	8.68
Post B8	Post 10-Year	10	2.053	12.250	18.36
Post B8	Post 100-Year	100	4.076	12.200	35.26
Post B9	Post 1-Year	1	1.129	12.100	13.35
Post B9	Post 10-Year	10	2.557	12.100	29.55
Post B9	Post 100-Year	100	5.200	12.100	57.83
Post A2b	Post 1-Year	1	0.521	12.100	6.23
Post A2b	Post 10-Year	10	1.255	12.100	14.84
Post A2b	Post 100-Year	100	2.648	12.100	30.22
Post A8	Post 1-Year	1	0.825	12.250	7.16
Post A8	Post 10-Year	10	1.761	12.250	14.90
Post A8	Post 100-Year	100	3.456	12.250	28.23
Post A9	Post 1-Year	1	1.925	12.200	18.43
Post A9	Post 10-Year	10	4.028	12.200	37.35
Post A9	Post 100-Year	100	7.814	12.200	69.89

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
J-A3b	Post 1-Year	1	3.004	15.650	2.82
J-A3b	Post 10-Year	10	8.696	12.150	31.38
J-A3b	Post 100-Year	100	18.871	12.200	145.16
J-B2	Post 1-Year	1	2.459	12.350	4.06
J-B2	Post 10-Year	10	6.608	12.300	54.80
J-B2	Post 100-Year	100	14.499	12.200	145.74
J-B7	Post 1-Year	1	3.374	15.650	2.48
J-B7	Post 10-Year	10	8.330	13.300	12.33
J-B7	Post 100-Year	100	17.536	12.700	54.96
J-B10	Post 1-Year	1	0.622	15.650	0.43
J-B10	Post 10-Year	10	1.482	12.400	11.45
J-B10	Post 100-Year	100	3.016	12.250	26.85
J-A2	Post 1-Year	1	0.686	16.000	0.53
J-A2	Post 10-Year	10	2.044	12.150	14.35
J-A2	Post 100-Year	100	4.566	12.100	52.00
J-A3	Post 1-Year	1	3.004	15.600	2.82
J-A3	Post 10-Year	10	8.697	12.150	33.68
J-A3	Post 100-Year	100	18.871	12.150	146.19
J-A4	Post 1-Year	1	2.478	15.550	2.33
J-A4	Post 10-Year	10	7.160	12.150	28.81
J-A4	Post 100-Year	100	15.523	12.150	125.27
J-A5	Post 1-Year	1	1.882	15.550	1.78
J-A5	Post 10-Year	10	5.482	12.150	23.00
J-A5	Post 100-Year	100	11.909	12.150	94.21
J-A6	Post 1-Year	1	1.152	15.550	1.13
J-A6	Post 10-Year	10	3.431	12.150	14.78
J-A6	Post 100-Year	100	7.486	12.150	51.82
J-A7	Post 1-Year	1	0.512	15.600	0.50
J-A7	Post 10-Year	10	1.536	12.100	6.62
J-A7	Post 100-Year	100	3.352	12.100	22.27
J-B3	Post 1-Year	1	2.314	12.350	4.05

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)
J-B3	Post 10-Year	10	6.152	12.250	51.56
J-B3	Post 100-Year	100	13.444	12.200	137.33
J-B4	Post 1-Year	1	2.179	12.250	4.30
J-B4	Post 10-Year	10	5.690	12.200	48.56
J-B4	Post 100-Year	100	12.349	12.150	128.55
J-B5	Post 1-Year	1	1.016	12.200	4.18
J-B5	Post 10-Year	10	2.735	12.250	21.61
J-B5	Post 100-Year	100	6.019	12.150	63.19
J-B6	Post 1-Year	1	0.609	16.000	0.40
J-B6	Post 10-Year	10	1.641	12.150	13.68
J-B6	Post 100-Year	100	3.555	12.100	40.20
J-B8	Post 1-Year	1	0.943	12.250	8.68
J-B8	Post 10-Year	10	2.053	12.250	18.36
J-B8	Post 100-Year	100	4.076	12.200	35.26
Study Point A	Post 1-Year	1	90.602	13.750	202.05
Study Point A	Pre 1-Year	1	89.879	13.750	207.90
Study Point A	Pre 10-Year	10	252.611	14.150	400.59
Study Point A	Post 10-Year	10	254.810	14.150	394.22
Study Point A	Pre 100-Year	100	583.970	14.350	730.04
Study Point A	Post 100-Year	100	587.025	14.350	726.39
Study Point B	Post 1-Year	1	14.540	12.800	44.44
Study Point B	Pre 1-Year	1	10.813	12.900	49.47
Study Point B	Pre 10-Year	10	31.915	13.200	92.22
Study Point B	Post 10-Year	10	38.559	13.150	89.58
Study Point B	Pre 100-Year	100	75.886	13.550	125.63
Study Point B	Post 100-Year	100	85.574	13.550	125.54
J-A89	Post 1-Year	1	1.077	14.200	1.09
J-A89	Post 10-Year	10	2.749	12.650	12.49
J-A89	Post 100-Year	100	5.607	12.400	39.57
J-A38	Post 1-Year	1	4.067	15.700	3.88
J-A38	Post 10-Year	10	11.422	12.300	23.86
J-A38	Post 100-Year	100	24.449	12.300	156.59
J-A3c	Post 1-Year	1	3.000	15.750	2.82
J-A3c	Post 10-Year	10	8.689	12.250	27.72
J-A3c	Post 100-Year	100	18.862	12.250	140.32
J-A8	Post 1-Year	1	0.597	15.950	0.41
J-A8	Post 10-Year	10	1.530	12.450	11.42
J-A8	Post 100-Year	100	3.222	12.350	26.73
J-A8L	Post 1-Year	1	1.077	14.200	1.09
J-A8L	Post 10-Year	10	2.749	12.650	12.63
J-A8L	Post 100-Year	100	5.607	12.350	39.80
J-A8H	Post 1-Year	1	1.163	12.250	11.21
J-A8H	Post 10-Year	10	2.527	12.250	26.08
J-A8H	Post 100-Year	100	5.147	12.200	53.27

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Bio A2 (IN)	Post 1-Year	1	1.096	12.100	12.69	(N/A)	(N/A)
Bio A2 (OUT)	Post 1-Year	1	0.685	16.000	0.53	427.37	0.761
Bio A2 (IN)	Post 10-Year	10	2.304	12.100	18.75	(N/A)	(N/A)
Bio A2 (OUT)	Post 10-Year	10	1.889	12.350	11.92	427.88	0.991
Bio A2 (IN)	Post 100-Year	100	4.175	12.100	22.91	(N/A)	(N/A)
Bio A2 (OUT)	Post 100-Year	100	3.758	12.200	21.27	428.10	1.100
UG A7 (IN)	Post 1-Year	1	1.105	12.100	12.36	(N/A)	(N/A)
UG A7 (OUT)	Post 1-Year	1	0.512	15.600	0.50	586.69	0.830
UG A7 (IN)	Post 10-Year	10	2.053	12.100	17.18	(N/A)	(N/A)
UG A7 (OUT)	Post 10-Year	10	1.450	14.450	1.28	588.21	1.406
UG A7 (IN)	Post 100-Year	100	3.511	12.100	20.76	(N/A)	(N/A)
UG A7 (OUT)	Post 100-Year	100	2.898	12.500	11.39	590.09	1.862
UG A6 (IN)	Post 1-Year	1	1.303	12.150	14.26	(N/A)	(N/A)
UG A6 (OUT)	Post 1-Year	1	0.640	15.500	0.63	568.27	0.959
UG A6 (IN)	Post 10-Year	10	2.448	12.150	19.25	(N/A)	(N/A)
UG A6 (OUT)	Post 10-Year	10	1.771	14.650	1.50	570.01	1.668
UG A6 (IN)	Post 100-Year	100	4.189	12.100	22.86	(N/A)	(N/A)
UG A6 (OUT)	Post 100-Year	100	3.502	12.500	15.27	571.55	2.058
UG A5 (IN)	Post 1-Year	1	1.321	12.100	15.29	(N/A)	(N/A)
UG A5 (OUT)	Post 1-Year	1	0.729	15.550	0.65	550.51	0.949
UG A5 (IN)	Post 10-Year	10	2.521	12.100	20.50	(N/A)	(N/A)
UG A5 (OUT)	Post 10-Year	10	1.912	12.950	3.08	552.30	1.572
UG A5 (IN)	Post 100-Year	100	4.356	12.100	24.13	(N/A)	(N/A)
UG A5 (OUT)	Post 100-Year	100	3.738	12.300	19.72	553.53	1.828
UG A4 (IN)	Post 1-Year	1	1.126	12.100	12.82	(N/A)	(N/A)
UG A4 (OUT)	Post 1-Year	1	0.596	15.450	0.55	503.21	0.817
UG A4 (IN)	Post 10-Year	10	2.124	12.100	17.81	(N/A)	(N/A)
UG A4 (OUT)	Post 10-Year	10	1.579	13.800	1.70	505.17	1.433
UG A4 (IN)	Post 100-Year	100	3.662	12.100	21.46	(N/A)	(N/A)
UG A4 (OUT)	Post 100-Year	100	3.109	12.300	16.67	506.33	1.646
UG A3 (IN)	Post 1-Year	1	1.054	12.100	11.88	(N/A)	(N/A)
UG A3 (OUT)	Post 1-Year	1	0.526	15.600	0.49	498.20	0.779
UG A3 (IN)	Post 10-Year	10	1.995	12.100	16.82	(N/A)	(N/A)
UG A3 (OUT)	Post 10-Year	10	1.451	14.950	1.11	500.09	1.387
UG A3 (IN)	Post 100-Year	100	3.443	12.100	20.44	(N/A)	(N/A)
UG A3 (OUT)	Post 100-Year	100	2.891	12.400	14.05	501.48	1.655
Bio B2 (IN)	Post 1-Year	1	0.214	12.150	2.47	(N/A)	(N/A)
Bio B2 (OUT)	Post 1-Year	1	0.145	16.200	0.11	448.26	0.142
Bio B2 (IN)	Post 10-Year	10	0.527	12.100	6.04	(N/A)	(N/A)
Bio B2 (OUT)	Post 10-Year	10	0.457	12.200	5.18	448.53	0.177
Bio B2 (IN)	Post 100-Year	100	1.125	12.100	12.54	(N/A)	(N/A)
Bio B2 (OUT)	Post 100-Year	100	1.056	12.150	12.10	448.70	0.200
Bio B3 (IN)	Post 1-Year	1	0.217	12.200	2.22	(N/A)	(N/A)
Bio B3 (OUT)	Post 1-Year	1	0.138	16.600	0.10	458.22	0.146
Bio B3 (IN)	Post 10-Year	10	0.545	12.150	5.63	(N/A)	(N/A)
Bio B3 (OUT)	Post 10-Year	10	0.465	12.300	4.73	458.47	0.175
Bio B3 (IN)	Post 100-Year	100	1.179	12.150	11.91	(N/A)	(N/A)

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Bio B3 (OUT)	Post 100-Year	100	1.099	12.200	11.66	458.64	0.196
Bio B4 (IN)	Post 1-Year	1	0.241	12.150	2.63	(N/A)	(N/A)
Bio B4 (OUT)	Post 1-Year	1	0.189	16.700	0.12	489.58	0.158
Bio B4 (IN)	Post 10-Year	10	0.618	12.150	6.81	(N/A)	(N/A)
Bio B4 (OUT)	Post 10-Year	10	0.565	12.150	6.94	489.73	0.171
Bio B4 (IN)	Post 100-Year	100	1.353	12.150	14.51	(N/A)	(N/A)
Bio B4 (OUT)	Post 100-Year	100	1.301	12.150	14.34	489.87	0.185
Bio B6 (IN)	Post 1-Year	1	0.818	12.150	9.52	(N/A)	(N/A)
Bio B6 (OUT)	Post 1-Year	1	0.609	16.000	0.40	543.05	0.555
Bio B6 (IN)	Post 10-Year	10	1.719	12.100	13.37	(N/A)	(N/A)
Bio B6 (OUT)	Post 10-Year	10	1.506	12.350	10.29	543.47	0.669
Bio B6 (IN)	Post 100-Year	100	3.107	12.100	16.09	(N/A)	(N/A)
Bio B6 (OUT)	Post 100-Year	100	2.893	12.200	15.64	543.59	0.703
Bio B7 (IN)	Post 1-Year	1	2.983	12.150	28.23	(N/A)	(N/A)
Bio B7 (OUT)	Post 1-Year	1	2.203	12.450	16.35	470.01	1.151
Bio B7 (IN)	Post 10-Year	10	6.183	12.200	51.08	(N/A)	(N/A)
Bio B7 (OUT)	Post 10-Year	10	5.403	12.300	42.41	470.47	1.498
Bio B7 (IN)	Post 100-Year	100	11.740	12.200	86.69	(N/A)	(N/A)
Bio B7 (OUT)	Post 100-Year	100	10.961	12.300	75.08	470.92	1.858
Bio B9 (IN)	Post 1-Year	1	1.128	12.150	12.97	(N/A)	(N/A)
Bio B9 (OUT)	Post 1-Year	1	0.973	16.250	0.51	497.05	0.770
Bio B9 (IN)	Post 10-Year	10	2.384	12.150	18.95	(N/A)	(N/A)
Bio B9 (OUT)	Post 10-Year	10	2.217	12.250	17.10	497.41	0.853
Bio B9 (IN)	Post 100-Year	100	4.323	12.100	23.12	(N/A)	(N/A)
Bio B9 (OUT)	Post 100-Year	100	4.153	12.150	23.04	497.51	0.877
UG B10 (IN)	Post 1-Year	1	0.852	12.250	7.56	(N/A)	(N/A)
UG B10 (OUT)	Post 1-Year	1	0.621	15.650	0.43	466.79	0.598
UG B10 (IN)	Post 10-Year	10	1.629	12.250	11.15	(N/A)	(N/A)
UG B10 (OUT)	Post 10-Year	10	1.394	12.450	9.72	467.85	0.691
UG B10 (IN)	Post 100-Year	100	2.808	12.250	13.95	(N/A)	(N/A)
UG B10 (OUT)	Post 100-Year	100	2.570	12.300	13.76	468.11	0.711
Pond B7 (IN)	Post 1-Year	1	3.432	12.300	25.66	(N/A)	(N/A)
Pond B7 (OUT)	Post 1-Year	1	3.374	15.650	2.48	464.27	3.514
Pond B7 (IN)	Post 10-Year	10	8.424	12.250	82.26	(N/A)	(N/A)
Pond B7 (OUT)	Post 10-Year	10	8.330	13.300	12.33	466.61	5.930
Pond B7 (IN)	Post 100-Year	100	17.656	12.250	165.52	(N/A)	(N/A)
Pond B7 (OUT)	Post 100-Year	100	17.536	12.700	54.96	469.99	10.213
D-A3 (IN)	Post 1-Year	1	1.054	12.100	12.14	(N/A)	(N/A)
D-A3 (OUT)	Post 1-Year	1	1.054	12.100	11.89	498.45	0.001
D-A3 (IN)	Post 10-Year	10	2.081	12.100	22.98	(N/A)	(N/A)
D-A3 (OUT)	Post 10-Year	10	2.081	12.100	22.58	499.49	0.001
D-A3 (IN)	Post 100-Year	100	3.901	12.100	41.63	(N/A)	(N/A)
D-A3 (OUT)	Post 100-Year	100	3.901	12.100	40.97	500.49	0.002
D-A4 (IN)	Post 1-Year	1	1.126	12.100	13.14	(N/A)	(N/A)

Subsection: Master Network Summary

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft³/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
D-A4 (OUT)	Post 1-Year	1	1.126	12.100	12.97	503.51	0.001
D-A4 (IN)	Post 10-Year	10	2.223	12.100	24.81	(N/A)	(N/A)
D-A4 (OUT)	Post 10-Year	10	2.223	12.100	24.58	504.65	0.001
D-A4 (IN)	Post 100-Year	100	4.167	12.100	44.92	(N/A)	(N/A)
D-A4 (OUT)	Post 100-Year	100	4.167	12.100	44.57	505.71	0.002
D-A5 (IN)	Post 1-Year	1	1.322	12.100	15.65	(N/A)	(N/A)
D-A5 (OUT)	Post 1-Year	1	1.322	12.100	15.42	551.23	0.001
D-A5 (IN)	Post 10-Year	10	2.660	12.100	30.10	(N/A)	(N/A)
D-A5 (OUT)	Post 10-Year	10	2.660	12.100	29.80	552.61	0.002
D-A5 (IN)	Post 100-Year	100	5.042	12.100	54.93	(N/A)	(N/A)
D-A5 (OUT)	Post 100-Year	100	5.042	12.100	54.48	553.82	0.002
D-A6 (IN)	Post 1-Year	1	1.303	12.100	14.62	(N/A)	(N/A)
D-A6 (OUT)	Post 1-Year	1	1.303	12.150	14.27	569.00	0.001
D-A6 (IN)	Post 10-Year	10	2.572	12.100	27.75	(N/A)	(N/A)
D-A6 (OUT)	Post 10-Year	10	2.572	12.150	27.00	570.25	0.002
D-A6 (IN)	Post 100-Year	100	4.821	12.100	50.33	(N/A)	(N/A)
D-A6 (OUT)	Post 100-Year	100	4.821	12.100	48.95	571.38	0.002
D-A7 (IN)	Post 1-Year	1	1.105	12.100	12.58	(N/A)	(N/A)
D-A7 (OUT)	Post 1-Year	1	1.105	12.100	12.39	587.12	0.001
D-A7 (IN)	Post 10-Year	10	2.140	12.100	23.39	(N/A)	(N/A)
D-A7 (OUT)	Post 10-Year	10	2.140	12.100	23.10	588.18	0.001
D-A7 (IN)	Post 100-Year	100	3.964	12.100	42.06	(N/A)	(N/A)
D-A7 (OUT)	Post 100-Year	100	3.964	12.100	41.58	589.19	0.002
D-B12 (IN)	Post 1-Year	1	0.853	12.250	7.65	(N/A)	(N/A)
D-B12 (OUT)	Post 1-Year	1	0.853	12.250	7.64	464.80	0.001
D-B12 (IN)	Post 10-Year	10	1.717	12.200	14.87	(N/A)	(N/A)
D-B12 (OUT)	Post 10-Year	10	1.717	12.250	14.84	465.72	0.001
D-B12 (IN)	Post 100-Year	100	3.254	12.200	27.29	(N/A)	(N/A)
D-B12 (OUT)	Post 100-Year	100	3.254	12.250	27.20	466.69	0.002
Existing Wetland (IN)	Post 1-Year	1	90.603	12.850	404.91	(N/A)	(N/A)
Existing Wetland (OUT)	Post 1-Year	1	90.602	13.750	202.05	402.02	19.214
Existing Wetland (IN)	Pre 1-Year	1	89.879	12.850	423.37	(N/A)	(N/A)
Existing Wetland (OUT)	Pre 1-Year	1	89.879	13.750	207.90	402.09	20.711
Existing Wetland (IN)	Pre 10-Year	10	252.611	12.850	1,254.33	(N/A)	(N/A)
Existing Wetland (OUT)	Pre 10-Year	10	252.611	14.150	400.59	404.01	91.787
Existing Wetland (IN)	Post 10-Year	10	254.811	12.850	1,216.10	(N/A)	(N/A)
Existing Wetland (OUT)	Post 10-Year	10	254.810	14.150	394.22	403.95	88.673
Existing Wetland (IN)	Pre 100-Year	100	583.970	12.800	2,880.46	(N/A)	(N/A)

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)
Existing Wetland (OUT)	Pre 100-Year	100	583.970	14.350	730.04	406.67	258.291
Existing Wetland (IN)	Post 100-Year	100	587.026	12.800	2,865.58	(N/A)	(N/A)
Existing Wetland (OUT)	Post 100-Year	100	587.025	14.350	726.39	406.64	256.380
Existing Pond (IN)	Post 1-Year	1	14.540	12.550	52.75	(N/A)	(N/A)
Existing Pond (OUT)	Post 1-Year	1	14.540	12.800	44.44	426.92	0.417
Existing Pond (IN)	Pre 1-Year	1	10.813	12.600	62.42	(N/A)	(N/A)
Existing Pond (OUT)	Pre 1-Year	1	10.813	12.900	49.47	427.14	0.704
Existing Pond (IN)	Pre 10-Year	10	31.915	12.550	198.75	(N/A)	(N/A)
Existing Pond (OUT)	Pre 10-Year	10	31.915	13.200	92.22	428.85	7.140
Existing Pond (IN)	Post 10-Year	10	38.560	12.500	198.09	(N/A)	(N/A)
Existing Pond (OUT)	Post 10-Year	10	38.560	13.150	89.58	428.79	6.783
Existing Pond (IN)	Pre 100-Year	100	75.886	12.550	473.09	(N/A)	(N/A)
Existing Pond (OUT)	Pre 100-Year	100	75.886	13.550	125.63	431.28	26.722
Existing Pond (IN)	Post 100-Year	100	85.575	12.350	452.66	(N/A)	(N/A)
Existing Pond (OUT)	Post 100-Year	100	85.575	13.550	125.54	431.27	26.650
Bio/Sand A9 (IN)	Post 1-Year	1	0.761	12.250	6.94	(N/A)	(N/A)
Bio/Sand A9 (OUT)	Post 1-Year	1	0.479	13.950	0.70	550.83	0.464
Bio/Sand A9 (IN)	Post 10-Year	10	1.501	12.250	10.59	(N/A)	(N/A)
Bio/Sand A9 (OUT)	Post 10-Year	10	1.219	12.750	3.76	552.08	0.816
Bio/Sand A9 (IN)	Post 100-Year	100	2.667	12.200	15.22	(N/A)	(N/A)
Bio/Sand A9 (OUT)	Post 100-Year	100	2.385	12.350	13.15	552.40	0.918
Bio A8 (IN)	Post 1-Year	1	0.825	12.250	7.16	(N/A)	(N/A)
Bio A8 (OUT)	Post 1-Year	1	0.597	15.950	0.41	573.90	0.568
Bio A8 (IN)	Post 10-Year	10	1.761	12.250	14.90	(N/A)	(N/A)
Bio A8 (OUT)	Post 10-Year	10	1.530	12.450	11.42	574.37	0.706
Bio A8 (IN)	Post 100-Year	100	3.456	12.250	28.23	(N/A)	(N/A)
Bio A8 (OUT)	Post 100-Year	100	3.222	12.350	26.73	574.71	0.814

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)
D-A9 (IN)	Post 1-Year	1	1.925	12.200	18.43	(N/A)	(N/A)
D-A9 (OUT)	Post 1-Year	1	1.925	12.250	18.16	550.94	0.001
D-A9 (IN)	Post 10-Year	10	4.028	12.200	37.35	(N/A)	(N/A)
D-A9 (OUT)	Post 10-Year	10	4.028	12.250	36.67	551.81	0.001
D-A9 (IN)	Post 100-Year	100	7.814	12.200	69.89	(N/A)	(N/A)
D-A9 (OUT)	Post 100-Year	100	7.814	12.200	68.49	553.45	0.002
D-B9 (IN)	Post 1-Year	1	1.129	12.100	13.35	(N/A)	(N/A)
D-B9 (OUT)	Post 1-Year	1	1.129	12.150	13.11	544.14	0.001
D-B9 (IN)	Post 10-Year	10	2.557	12.100	29.55	(N/A)	(N/A)
D-B9 (OUT)	Post 10-Year	10	2.557	12.150	28.78	545.56	0.002
D-B9 (IN)	Post 100-Year	100	5.200	12.100	57.83	(N/A)	(N/A)
D-B9 (OUT)	Post 100-Year	100	5.200	12.100	56.19	546.87	0.002
D-B6 (IN)	Post 1-Year	1	0.818	12.100	9.78	(N/A)	(N/A)
D-B6 (OUT)	Post 1-Year	1	0.818	12.150	9.52	544.00	0.001
D-B6 (IN)	Post 10-Year	10	1.854	12.100	21.61	(N/A)	(N/A)
D-B6 (OUT)	Post 10-Year	10	1.854	12.100	20.97	545.23	0.001
D-B6 (IN)	Post 100-Year	100	3.769	12.100	42.24	(N/A)	(N/A)
D-B6 (OUT)	Post 100-Year	100	3.769	12.100	41.21	546.33	0.002
D-B7 (IN)	Post 1-Year	1	3.082	12.150	32.53	(N/A)	(N/A)
D-B7 (OUT)	Post 1-Year	1	3.048	12.150	32.15	469.59	0.066
D-B7 (IN)	Post 10-Year	10	6.710	12.150	69.00	(N/A)	(N/A)
D-B7 (OUT)	Post 10-Year	10	6.676	12.200	67.59	469.89	0.086
D-B7 (IN)	Post 100-Year	100	13.323	12.150	132.10	(N/A)	(N/A)
D-B7 (OUT)	Post 100-Year	100	13.289	12.200	129.04	470.28	0.115
D-A2 (IN)	Post 1-Year	1	1.096	12.100	13.20	(N/A)	(N/A)
D-A2 (OUT)	Post 1-Year	1	1.096	12.100	12.79	428.58	0.001
D-A2 (IN)	Post 10-Year	10	2.459	12.100	28.79	(N/A)	(N/A)
D-A2 (OUT)	Post 10-Year	10	2.459	12.100	28.13	430.00	0.002
D-A2 (IN)	Post 100-Year	100	4.983	12.100	56.16	(N/A)	(N/A)
D-A2 (OUT)	Post 100-Year	100	4.983	12.100	55.12	431.30	0.002

Subsection: Time-Depth Curve
Label: Orange County

Return Event: 100 years
Storm Event: 100-Year

Time-Depth Curve: 100-Year	
Label	100-Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 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
0.500	0.0	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.5	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.6	0.6	0.7
6.500	0.7	0.7	0.7	0.7	0.7
7.000	0.8	0.8	0.8	0.8	0.8
7.500	0.9	0.9	0.9	0.9	0.9
8.000	1.0	1.0	1.0	1.0	1.1
8.500	1.1	1.1	1.1	1.2	1.2
9.000	1.2	1.3	1.3	1.3	1.4
9.500	1.4	1.4	1.5	1.5	1.5
10.000	1.6	1.6	1.7	1.7	1.8
10.500	1.8	1.9	1.9	2.0	2.0
11.000	2.1	2.2	2.2	2.3	2.4
11.500	2.5	2.6	2.9	3.1	3.5
12.000	4.2	4.9	5.3	5.5	5.8
12.500	5.9	6.0	6.1	6.2	6.2
13.000	6.3	6.4	6.4	6.5	6.5
13.500	6.6	6.6	6.7	6.7	6.8
14.000	6.8	6.9	6.9	6.9	7.0
14.500	7.0	7.0	7.1	7.1	7.1
15.000	7.2	7.2	7.2	7.3	7.3
15.500	7.3	7.3	7.4	7.4	7.4
16.000	7.4	7.5	7.5	7.5	7.5
16.500	7.5	7.6	7.6	7.6	7.6
17.000	7.6	7.7	7.7	7.7	7.7
17.500	7.7	7.7	7.8	7.8	7.8
18.000	7.8	7.8	7.8	7.8	7.8
18.500	7.9	7.9	7.9	7.9	7.9
19.000	7.9	7.9	7.9	8.0	8.0
19.500	8.0	8.0	8.0	8.0	8.0
20.000	8.0	8.0	8.1	8.1	8.1
20.500	8.1	8.1	8.1	8.1	8.1

Subsection: Time-Depth Curve
Label: Orange County

Return Event: 100 years
Storm Event: 100-Year

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
21.000	8.1	8.2	8.2	8.2	8.2
21.500	8.2	8.2	8.2	8.2	8.2
22.000	8.2	8.2	8.3	8.3	8.3
22.500	8.3	8.3	8.3	8.3	8.3
23.000	8.3	8.3	8.3	8.3	8.4
23.500	8.4	8.4	8.4	8.4	8.4
24.000	8.4	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: 10-Year	
Label	10-Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 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
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.4	0.4	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.7	0.7
9.000	0.7	0.7	0.7	0.7	0.8
9.500	0.8	0.8	0.8	0.9	0.9
10.000	0.9	0.9	0.9	1.0	1.0
10.500	1.0	1.1	1.1	1.1	1.2
11.000	1.2	1.2	1.3	1.3	1.4
11.500	1.4	1.5	1.6	1.8	2.0
12.000	2.4	2.8	3.0	3.1	3.3
12.500	3.3	3.4	3.4	3.5	3.5
13.000	3.6	3.6	3.6	3.7	3.7
13.500	3.7	3.7	3.8	3.8	3.8
14.000	3.8	3.9	3.9	3.9	3.9
14.500	4.0	4.0	4.0	4.0	4.0
15.000	4.0	4.1	4.1	4.1	4.1
15.500	4.1	4.1	4.2	4.2	4.2
16.000	4.2	4.2	4.2	4.2	4.2
16.500	4.3	4.3	4.3	4.3	4.3
17.000	4.3	4.3	4.3	4.3	4.3
17.500	4.4	4.4	4.4	4.4	4.4
18.000	4.4	4.4	4.4	4.4	4.4
18.500	4.4	4.4	4.5	4.5	4.5
19.000	4.5	4.5	4.5	4.5	4.5
19.500	4.5	4.5	4.5	4.5	4.5
20.000	4.5	4.5	4.5	4.6	4.6
20.500	4.6	4.6	4.6	4.6	4.6

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
21.000	4.6	4.6	4.6	4.6	4.6
21.500	4.6	4.6	4.6	4.6	4.6
22.000	4.6	4.7	4.7	4.7	4.7
22.500	4.7	4.7	4.7	4.7	4.7
23.000	4.7	4.7	4.7	4.7	4.7
23.500	4.7	4.7	4.7	4.7	4.7
24.000	4.7	(N/A)	(N/A)	(N/A)	(N/A)

Time-Depth Curve: 1-Year	
Label	1-Year
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 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
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.0	0.0	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.1
4.500	0.1	0.1	0.1	0.1	0.1
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.2	0.2	0.2	0.2	0.2
7.000	0.2	0.2	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.3	0.3	0.3
8.500	0.3	0.3	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.4
9.500	0.4	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.5	0.6
10.500	0.6	0.6	0.6	0.6	0.6
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.8	0.9	1.0	1.1
12.000	1.3	1.5	1.7	1.8	1.8
12.500	1.9	1.9	1.9	1.9	2.0
13.000	2.0	2.0	2.0	2.0	2.1
13.500	2.1	2.1	2.1	2.1	2.1
14.000	2.1	2.2	2.2	2.2	2.2
14.500	2.2	2.2	2.2	2.2	2.3
15.000	2.3	2.3	2.3	2.3	2.3
15.500	2.3	2.3	2.3	2.3	2.3
16.000	2.3	2.4	2.4	2.4	2.4
16.500	2.4	2.4	2.4	2.4	2.4
17.000	2.4	2.4	2.4	2.4	2.4
17.500	2.4	2.4	2.4	2.5	2.5
18.000	2.5	2.5	2.5	2.5	2.5
18.500	2.5	2.5	2.5	2.5	2.5
19.000	2.5	2.5	2.5	2.5	2.5
19.500	2.5	2.5	2.5	2.5	2.5
20.000	2.5	2.5	2.5	2.5	2.5
20.500	2.6	2.6	2.6	2.6	2.6

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
21.000	2.6	2.6	2.6	2.6	2.6
21.500	2.6	2.6	2.6	2.6	2.6
22.000	2.6	2.6	2.6	2.6	2.6
22.500	2.6	2.6	2.6	2.6	2.6
23.000	2.6	2.6	2.6	2.6	2.6
23.500	2.6	2.6	2.6	2.6	2.6
24.000	2.7	(N/A)	(N/A)	(N/A)	(N/A)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.010 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.06 ft/s
Segment Time of Concentration	0.473 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	2,840.00 ft
Is Paved?	False
Slope	0.036 ft/ft
Average Velocity	3.06 ft/s
Segment Time of Concentration	0.258 hours

Segment #3: TR-55 Channel Flow	
Flow Area	18.0 ft²
Hydraulic Length	5,670.00 ft
Manning's n	0.040
Slope	0.006 ft/ft
Wetted Perimeter	13.20 ft
Average Velocity	3.55 ft/s
Segment Time of Concentration	0.444 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.175 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
Label: Post A2b

Return Event: 1 years
Storm Event: 1-Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	79.00 ft
Manning's n	0.013
Slope	0.020 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.15 ft/s
Segment Time of Concentration	0.019 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	356.00 ft
Is Paved?	True
Slope	0.025 ft/ft
Average Velocity	3.21 ft/s
Segment Time of Concentration	0.031 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	214.00 ft
Manning's n	0.012
Slope	0.046 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	13.87 ft/s
Segment Time of Concentration	0.004 hours

Segment #4: TR-55 Sheet Flow	
Hydraulic Length	21.00 ft
Manning's n	0.240
Slope	0.025 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.09 ft/s
Segment Time of Concentration	0.062 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.117 hours

Subsection: Time of Concentration Calculations
Label: Post A2b

Return Event: 1 years
Storm Event: 1-Year

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	51.00 ft
Manning's n	0.240
Slope	0.157 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.23 ft/s
Segment Time of Concentration	0.061 hours

Segment #2: TR-55 Sheet Flow	
Hydraulic Length	49.00 ft
Manning's n	0.013
Slope	0.050 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.51 ft/s
Segment Time of Concentration	0.009 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	304.00 ft
Is Paved?	True
Slope	0.038 ft/ft
Average Velocity	3.96 ft/s
Segment Time of Concentration	0.021 hours

Segment #4: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	479.00 ft
Manning's n	0.012
Slope	0.027 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	10.62 ft/s
Segment Time of Concentration	0.013 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.104 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	47.00 ft
Manning's n	0.240
Slope	0.245 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.27 ft/s
Segment Time of Concentration	0.048 hours

Segment #2: TR-55 Sheet Flow	
Hydraulic Length	53.00 ft
Manning's n	0.013
Slope	0.040 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.40 ft/s
Segment Time of Concentration	0.011 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	525.00 ft
Manning's n	0.012
Slope	0.022 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	9.59 ft/s
Segment Time of Concentration	0.015 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =

(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
Label: Post A5

Return Event: 1 years
Storm Event: 1-Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	37.00 ft
Manning's n	0.240
Slope	0.332 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.29 ft/s
Segment Time of Concentration	0.035 hours

Segment #2: TR-55 Sheet Flow	
Hydraulic Length	64.00 ft
Manning's n	0.013
Slope	0.039 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.44 ft/s
Segment Time of Concentration	0.012 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	238.00 ft
Is Paved?	True
Slope	0.041 ft/ft
Average Velocity	4.12 ft/s
Segment Time of Concentration	0.016 hours

Segment #4: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	688.00 ft
Manning's n	0.012
Slope	0.033 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	11.75 ft/s
Segment Time of Concentration	0.016 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.083 hours

Subsection: Time of Concentration Calculations
Label: Post A5

Return Event: 1 years
Storm Event: 1-Year

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	47.00 ft
Manning's n	0.240
Slope	0.077 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.17 ft/s
Segment Time of Concentration	0.076 hours

Segment #2: TR-55 Sheet Flow	
Hydraulic Length	53.00 ft
Manning's n	0.013
Slope	0.037 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.36 ft/s
Segment Time of Concentration	0.011 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	395.00 ft
Is Paved?	True
Slope	0.025 ft/ft
Average Velocity	3.21 ft/s
Segment Time of Concentration	0.034 hours

Segment #4: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	485.00 ft
Manning's n	0.012
Slope	0.071 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	17.23 ft/s
Segment Time of Concentration	0.008 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.129 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
Label: Post A7

Return Event: 1 years
Storm Event: 1-Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	36.00 ft
Manning's n	0.240
Slope	0.174 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.23 ft/s
Segment Time of Concentration	0.044 hours

Segment #2: TR-55 Sheet Flow	
Hydraulic Length	64.00 ft
Manning's n	0.013
Slope	0.034 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.36 ft/s
Segment Time of Concentration	0.013 hours

Segment #3: TR-55 Shallow Concentrated Flow	
Hydraulic Length	250.00 ft
Is Paved?	True
Slope	0.023 ft/ft
Average Velocity	3.08 ft/s
Segment Time of Concentration	0.023 hours

Segment #4: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	615.00 ft
Manning's n	0.012
Slope	0.032 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	11.57 ft/s
Segment Time of Concentration	0.015 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.095 hours

Subsection: Time of Concentration Calculations
Label: Post A7

Return Event: 1 years
Storm Event: 1-Year

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.010 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.09 ft/s
Segment Time of Concentration	0.314 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	104.00 ft
Is Paved?	False
Slope	0.010 ft/ft
Average Velocity	1.61 ft/s
Segment Time of Concentration	0.018 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	165.00 ft
Manning's n	0.012
Slope	0.010 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	6.47 ft/s
Segment Time of Concentration	0.007 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	264.00 ft
Is Paved?	True
Slope	0.006 ft/ft
Average Velocity	1.57 ft/s
Segment Time of Concentration	0.047 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.386 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.023 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.12 ft/s
Segment Time of Concentration	0.227 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	13.00 ft
Is Paved?	False
Slope	0.023 ft/ft
Average Velocity	2.42 ft/s
Segment Time of Concentration	0.001 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	450.00 ft
Manning's n	0.012
Slope	0.010 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	6.47 ft/s
Segment Time of Concentration	0.019 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	230.00 ft
Is Paved?	True
Slope	0.018 ft/ft
Average Velocity	2.73 ft/s
Segment Time of Concentration	0.023 hours

Segment #5: TR-55 Channel Flow	
Flow Area	12.8 ft^2
Hydraulic Length	430.00 ft
Manning's n	0.030
Slope	0.013 ft/ft
Wetted Perimeter	13.49 ft
Average Velocity	5.45 ft/s
Segment Time of Concentration	0.022 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.293 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.019 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.366 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	930.00 ft
Is Paved?	False
Slope	0.021 ft/ft
Average Velocity	2.34 ft/s
Segment Time of Concentration	0.110 hours

Segment #3: TR-55 Channel Flow	
Flow Area	5.0 ft^2
Hydraulic Length	1,849.00 ft
Manning's n	0.050
Slope	0.044 ft/ft
Wetted Perimeter	6.83 ft
Average Velocity	5.08 ft/s
Segment Time of Concentration	0.101 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,634.00 ft
Is Paved?	False
Slope	0.017 ft/ft
Average Velocity	2.10 ft/s
Segment Time of Concentration	0.216 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.793 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Time of Concentration Calculations
Label: Post B10

Return Event: 1 years
Storm Event: 1-Year

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.012 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.10 ft/s
Segment Time of Concentration	0.292 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	15.00 ft
Is Paved?	False
Slope	0.037 ft/ft
Average Velocity	3.10 ft/s
Segment Time of Concentration	0.001 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	440.00 ft
Manning's n	0.012
Slope	0.011 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	6.78 ft/s
Segment Time of Concentration	0.018 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	230.00 ft
Is Paved?	True
Slope	0.035 ft/ft
Average Velocity	3.80 ft/s
Segment Time of Concentration	0.017 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.328 hours

Subsection: Time of Concentration Calculations
Label: Post B10

Return Event: 1 years
Storm Event: 1-Year

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.090 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.21 ft/s
Segment Time of Concentration	0.131 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	142.00 ft
Is Paved?	False
Slope	0.266 ft/ft
Average Velocity	8.32 ft/s
Segment Time of Concentration	0.005 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	164.00 ft
Manning's n	0.012
Slope	0.017 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	8.43 ft/s
Segment Time of Concentration	0.005 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.141 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.034 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.14 ft/s
Segment Time of Concentration	0.193 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	490.00 ft
Is Paved?	False
Slope	0.123 ft/ft
Average Velocity	5.67 ft/s
Segment Time of Concentration	0.024 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	106.00 ft
Manning's n	0.012
Slope	0.018 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	8.68 ft/s
Segment Time of Concentration	0.003 hours

Segment #4: TR-55 Channel Flow	
Flow Area	11.3 ft^2
Hydraulic Length	466.00 ft
Manning's n	0.030
Slope	0.057 ft/ft
Wetted Perimeter	12.49 ft
Average Velocity	11.06 ft/s
Segment Time of Concentration	0.012 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.232 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.055 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.17 ft/s
Segment Time of Concentration	0.159 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	353.00 ft
Is Paved?	False
Slope	0.123 ft/ft
Average Velocity	5.66 ft/s
Segment Time of Concentration	0.017 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	175.00 ft
Manning's n	0.012
Slope	0.168 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	26.50 ft/s
Segment Time of Concentration	0.002 hours

Segment #4: TR-55 Channel Flow	
Flow Area	11.3 ft^2
Hydraulic Length	332.00 ft
Manning's n	0.030
Slope	0.062 ft/ft
Wetted Perimeter	12.49 ft
Average Velocity	11.53 ft/s
Segment Time of Concentration	0.008 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.186 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.032 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.14 ft/s
Segment Time of Concentration	0.197 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	255.00 ft
Is Paved?	False
Slope	0.145 ft/ft
Average Velocity	6.14 ft/s
Segment Time of Concentration	0.012 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	134.00 ft
Manning's n	0.012
Slope	0.085 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	18.85 ft/s
Segment Time of Concentration	0.002 hours

Segment #4: TR-55 Channel Flow	
Flow Area	11.3 ft²
Hydraulic Length	165.00 ft
Manning's n	0.030
Slope	0.019 ft/ft
Wetted Perimeter	12.49 ft
Average Velocity	6.39 ft/s
Segment Time of Concentration	0.007 hours

Time of Concentration (Composite)	
Time of Concentration (Compesite)	0.218 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	54.00 ft
Manning's n	0.240
Slope	0.169 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.24 ft/s
Segment Time of Concentration	0.062 hours

Segment #2: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	985.00 ft
Manning's n	0.012
Slope	0.051 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	14.60 ft/s
Segment Time of Concentration	0.019 hours

Segment #3: TR-55 Channel Flow	
Flow Area	11.3 ft²
Hydraulic Length	1,240.00 ft
Manning's n	0.030
Slope	0.044 ft/ft
Wetted Perimeter	12.49 ft
Average Velocity	9.72 ft/s
Segment Time of Concentration	0.035 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.116 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =

(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.050 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.17 ft/s
Segment Time of Concentration	0.165 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	144.00 ft
Is Paved?	False
Slope	0.014 ft/ft
Average Velocity	1.91 ft/s
Segment Time of Concentration	0.021 hours

Segment #3: TR-55 Channel Flow	
Flow Area	1.8 ft^2
Hydraulic Length	460.00 ft
Manning's n	0.012
Slope	0.010 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	6.47 ft/s
Segment Time of Concentration	0.020 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	20.00 ft
Is Paved?	True
Slope	0.040 ft/ft
Average Velocity	4.07 ft/s
Segment Time of Concentration	0.001 hours

Segment #5: TR-55 Shallow Concentrated Flow	
Hydraulic Length	60.00 ft
Is Paved?	False
Slope	0.043 ft/ft
Average Velocity	3.35 ft/s
Segment Time of Concentration	0.005 hours

Segment #6: TR-55 Shallow Concentrated Flow	
Hydraulic Length	48.00 ft
Is Paved?	True
Slope	0.041 ft/ft
Average Velocity	4.12 ft/s

Segment #6: TR-55 Shallow Concentrated Flow	
Segment Time of Concentration	0.003 hours

Segment #7: TR-55 Channel Flow	
Flow Area	12.8 ft^2
Hydraulic Length	118.00 ft
Manning's n	0.030
Slope	0.034 ft/ft
Wetted Perimeter	13.49 ft
Average Velocity	8.82 ft/s
Segment Time of Concentration	0.004 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.219 hours

==== SCS Channel Flow

Tc =

```
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600
```

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

```
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600
```

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =

```
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
```

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	59.00 ft
Manning's n	0.240
Slope	0.005 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.06 ft/s
Segment Time of Concentration	0.272 hours

Segment #2: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	835.00 ft
Manning's n	0.012
Slope	0.012 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	7.08 ft/s
Segment Time of Concentration	0.033 hours

Segment #3: TR-55 Sheet Flow	
Hydraulic Length	41.00 ft
Manning's n	0.013
Slope	0.005 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.58 ft/s
Segment Time of Concentration	0.020 hours

Segment #4: TR-55 Channel Flow	
Flow Area	12.8 ft²
Hydraulic Length	255.00 ft
Manning's n	0.030
Slope	0.032 ft/ft
Wetted Perimeter	13.49 ft
Average Velocity	8.56 ft/s
Segment Time of Concentration	0.008 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.333 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	47.00 ft
Manning's n	0.240
Slope	0.067 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.16 ft/s
Segment Time of Concentration	0.080 hours

Segment #2: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	685.00 ft
Manning's n	0.012
Slope	0.060 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	15.84 ft/s
Segment Time of Concentration	0.012 hours

Segment #3: TR-55 Sheet Flow	
Hydraulic Length	35.00 ft
Manning's n	0.013
Slope	0.066 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	1.57 ft/s
Segment Time of Concentration	0.006 hours

Segment #4: TR-55 Channel Flow	
Flow Area	12.8 ft²
Hydraulic Length	65.00 ft
Manning's n	0.030
Slope	0.045 ft/ft
Wetted Perimeter	13.49 ft
Average Velocity	10.15 ft/s
Segment Time of Concentration	0.002 hours

Segment #5: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	275.00 ft
Manning's n	0.012
Slope	0.007 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	5.47 ft/s
Segment Time of Concentration	0.014 hours

Segment #6: TR-55 Channel Flow

Flow Area	12.8 ft²
Hydraulic Length	235.00 ft
Manning's n	0.030
Slope	0.040 ft/ft
Wetted Perimeter	13.49 ft
Average Velocity	9.57 ft/s
Segment Time of Concentration	0.007 hours

Segment #7: TR-55 Channel Flow	
Flow Area	1.8 ft²
Hydraulic Length	235.00 ft
Manning's n	0.012
Slope	0.143 ft/ft
Wetted Perimeter	4.71 ft
Average Velocity	24.73 ft/s
Segment Time of Concentration	0.003 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.124 hours

==== SCS Channel Flow

Tc =

```
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600
```

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =

```
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
```

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.010 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.06 ft/s
Segment Time of Concentration	0.473 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	2,840.00 ft
Is Paved?	False
Slope	0.036 ft/ft
Average Velocity	3.06 ft/s
Segment Time of Concentration	0.258 hours

Segment #3: TR-55 Channel Flow	
Flow Area	18.0 ft^2
Hydraulic Length	5,670.00 ft
Manning's n	0.040
Slope	0.006 ft/ft
Wetted Perimeter	13.20 ft
Average Velocity	3.55 ft/s
Segment Time of Concentration	0.444 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.175 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.400
Slope	0.019 ft/ft
2 Year 24 Hour Depth	3.2 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.366 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	930.00 ft
Is Paved?	False
Slope	0.021 ft/ft
Average Velocity	2.34 ft/s
Segment Time of Concentration	0.110 hours

Segment #3: TR-55 Channel Flow	
Flow Area	5.0 ft²
Hydraulic Length	1,925.00 ft
Manning's n	0.050
Slope	0.044 ft/ft
Wetted Perimeter	6.83 ft
Average Velocity	5.08 ft/s
Segment Time of Concentration	0.105 hours

Segment #4: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,591.00 ft
Is Paved?	False
Slope	0.017 ft/ft
Average Velocity	2.10 ft/s
Segment Time of Concentration	0.210 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.792 hours

==== SCS Channel Flow

Tc =
R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:
R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =
Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:
V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =
(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:
Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Subsection: Runoff CN-Area
Label: Post A1

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	895,027	0.0	0.0	98.000
Impervious Areas - Gravel (w/ right-of-way) - Soil D	91.000	19,907	0.0	0.0	91.000
Water	100.000	527,860	0.0	0.0	100.000
Woods - good - Soil D	77.000	24,115,818	0.0	0.0	77.000
Woods - good - Soil C	70.000	982,017	0.0	0.0	70.000
Pasture, grassland, or range - good - Soil D	80.000	5,687,499	0.0	0.0	80.000
Residential Districts - 1/3 acre - Soil D	86.000	3,676,420	0.0	0.0	86.000
Residential Districts - 1/3 acre - Soil C	81.000	673,917	0.0	0.0	81.000
Residential Districts - 1/3 acre - Soil B	72.000	220,065	0.0	0.0	72.000
Residential Districts - 1 acre - Soil D	84.000	964,331	0.0	0.0	84.000
Residential Districts - 1 acre - Soil A	51.000	272,076	0.0	0.0	51.000
Brush - brush, weed, grass mix - good - Soil D	73.000	9,737,097	0.0	0.0	73.000
Pasture, grassland, or range - good - Soil C	74.000	424,492	0.0	0.0	74.000
Residential Districts - 1/2 acre - Soil D	85.000	1,413,522	0.0	0.0	85.000
Brush - brush, weed, grass mix - good - Soil C	65.000	156,990	0.0	0.0	65.000
New Impervious Areas	98.000	57,937	0.0	0.0	98.000
New Gravel Area	91.000	87,871	0.0	0.0	91.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	39,145	0.0	0.0	80.000
Meadow - cont. grass (non grazed) - ---- - Soil C	71.000	127,740	0.0	0.0	71.000
Meadow - cont. grass (non grazed) - ---- - Soil D	78.000	551,146	0.0	0.0	78.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	50,630,877	(N/A)	(N/A)	77.934

Subsection: Runoff CN-Area
Label: Post A2

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	111,848	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	52,205	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	164,053	(N/A)	(N/A)	92.272

Subsection: Runoff CN-Area
Label: Post A2b

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	50,743	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	152,240	0.0	0.0	80.000
Existing Impervious	98.000	6,750	0.0	0.0	98.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	209,733	(N/A)	(N/A)	84.934

Subsection: Runoff CN-Area
Label: Post A3

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	215,125	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	46,297	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	261,422	(N/A)	(N/A)	94.812

Subsection: Runoff CN-Area
Label: Post A4

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	225,777	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	53,454	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	279,231	(N/A)	(N/A)	94.554

Subsection: Runoff CN-Area
Label: Post A5

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	271,863	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	71,332	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	343,195	(N/A)	(N/A)	94.259

Subsection: Runoff CN-Area
Label: Post A8

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	152,269	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	94,463	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	246,732	(N/A)	(N/A)	91.109

Subsection: Runoff CN-Area
Label: Post A9

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	351,091	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	197,474	0.0	0.0	80.000
Water	100.000	439	0.0	0.0	100.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	549,004	(N/A)	(N/A)	91.527

Subsection: Runoff CN-Area
Label: Post B1

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	31,363	0.0	0.0	98.000
Water	100.000	109,815	0.0	0.0	100.000
Brush - brush, weed, grass mix - good - Soil D	73.000	1,402,400	0.0	0.0	73.000
Woods - good - Soil D	77.000	1,998,091	0.0	0.0	77.000
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	201,590	0.0	0.0	98.000
Impervious Areas - Gravel (w/ right-of-way) - Soil D	91.000	4,298	0.0	0.0	91.000
Meadow - cont. grass (non grazed) - ---- - Soil D	78.000	389,602	0.0	0.0	78.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	78,340	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	4,215,499	(N/A)	(N/A)	77.591

Subsection: Runoff CN-Area
Label: Post B10

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	172,454	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	49,077	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	221,531	(N/A)	(N/A)	94.012

Subsection: Runoff CN-Area
Label: Post B2

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	26,261	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	35,647	0.0	0.0	80.000
Woods - good - Soil D	77.000	12,121	0.0	0.0	77.000
Brush - brush, weed, grass mix - good - Soil D	73.000	16,742	0.0	0.0	73.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	90,771	(N/A)	(N/A)	83.516

Subsection: Runoff CN-Area
Label: Post B3

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	25,513	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	40,896	0.0	0.0	80.000
Woods - good - Soil D	77.000	14,596	0.0	0.0	77.000
Brush - brush, weed, grass mix - good - Soil D	73.000	15,925	0.0	0.0	73.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	96,930	(N/A)	(N/A)	83.136

Subsection: Runoff CN-Area
Label: Post B4

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	19,381	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	46,868	0.0	0.0	80.000
Woods - good - Soil D	77.000	41,665	0.0	0.0	77.000
Brush - brush, weed, grass mix - good - Soil D	73.000	5,442	0.0	0.0	73.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	113,356	(N/A)	(N/A)	81.639

Subsection: Runoff CN-Area
Label: Post B5

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	30,504	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	48,071	0.0	0.0	80.000
Woods - good - Soil D	77.000	126,405	0.0	0.0	77.000
Brush - brush, weed, grass mix - good - Soil D	73.000	9,842	0.0	0.0	73.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	214,822	(N/A)	(N/A)	80.470

Subsection: Runoff CN-Area
Label: Post B6

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	136,329	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	119,767	0.0	0.0	80.000
Woods - good - Soil D	77.000	27,016	0.0	0.0	77.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	283,112	(N/A)	(N/A)	88.381

Subsection: Runoff CN-Area
Label: Post B7

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	539,964	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	309,246	0.0	0.0	80.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil C	74.000	107,765	0.0	0.0	74.000
Water	100.000	10,400	0.0	0.0	100.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	967,375	(N/A)	(N/A)	89.594

Subsection: Runoff CN-Area
Label: Post B8

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	142,136	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	139,250	0.0	0.0	80.000
Water	100.000	14,473	0.0	0.0	100.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	295,859	(N/A)	(N/A)	89.626

Subsection: Runoff CN-Area
Label: Post B9

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	169,192	0.0	0.0	98.000
Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - Soil D	80.000	219,465	0.0	0.0	80.000
Water	100.000	1,903	0.0	0.0	100.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	390,560	(N/A)	(N/A)	87.895

Subsection: Runoff CN-Area
Label: Pre A

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	895,027	0.0	0.0	98.000
Impervious Areas - Gravel (w/ right-of-way) - Soil D	91.000	57,238	0.0	0.0	91.000
Water	100.000	527,860	0.0	0.0	100.000
Woods - good - Soil D	77.000	26,244,726	0.0	0.0	77.000
Woods - good - Soil C	70.000	1,228,392	0.0	0.0	70.000
Pasture, grassland, or range - good - Soil D	80.000	5,838,913	0.0	0.0	80.000
Residential Districts - 1/3 acre - Soil D	86.000	3,676,420	0.0	0.0	86.000
Residential Districts - 1/3 acre - Soil C	81.000	673,917	0.0	0.0	81.000
Residential Districts - 1/3 acre - Soil B	72.000	220,065	0.0	0.0	72.000
Residential Districts - 1 acre - Soil D	84.000	964,331	0.0	0.0	84.000
Residential Districts - 1 acre - Soil A	51.000	272,076	0.0	0.0	51.000
Brush - brush, weed, grass mix - good - Soil D	73.000	10,384,573	0.0	0.0	73.000
Pasture, grassland, or range - good - Soil C	74.000	424,492	0.0	0.0	74.000
Residential Districts - 1/2 acre - Soil D	85.000	1,413,522	0.0	0.0	85.000
Brush - brush, weed, grass mix - good - Soil C	65.000	156,990	0.0	0.0	65.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	52,978,543	(N/A)	(N/A)	77.786

Subsection: Runoff CN-Area
Label: Pre B

Return Event: 1 years
Storm Event: 1-Year

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft²)	C (%)	UC (%)	Adjusted CN
Impervious Areas - Paved parking lots, roofs, driveways, Streets and roads - Soil D	98.000	108,072	0.0	0.0	98.000
Water	100.000	109,815	0.0	0.0	100.000
Brush - brush, weed, grass mix - good - Soil D	73.000	2,353,460	0.0	0.0	73.000
Woods - good - Soil D	77.000	3,865,035	0.0	0.0	77.000
Woods - good - Soil C	70.000	171,321	0.0	0.0	70.000
Pasture, grassland, or range - good - Soil D	80.000	573,598	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	7,181,302	(N/A)	(N/A)	76.429

Subsection: Unit Hydrograph Summary
Label: Post A1

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	50,630,877 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	405.27 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.850 hours
Flow (Peak Interpolated Output)	404.61 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	50,630,877 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.9 in
Runoff Volume (Pervious)	85.895 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	85.896 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,121.22 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Post A1

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	50,630,877 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	1,202.35 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.850 hours
Flow (Peak Interpolated Output)	1,198.74 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	50,630,877 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	241.419 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	241.416 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,121.22 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Post A1

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	50,630,877 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	2,758.67 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.800 hours
Flow (Peak Interpolated Output)	2,752.81 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	50,630,877 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.8 in
Runoff Volume (Pervious)	558.101 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	558.092 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,121.22 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Post A2

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	164,053 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	6.97 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	6.97 ft³/s

Drainage Area	
SCS CN (Composite)	92.000
Area (User Defined)	164,053 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.8 in
Runoff Volume (Pervious)	0.575 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.575 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	51.21 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A2

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	164,053 ft²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	13.95 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	13.95 ft³/s
Drainage Area	
SCS CN (Composite)	92.000
Area (User Defined)	164,053 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.8 in
Runoff Volume (Pervious)	1.204 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.204 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	51.21 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A2

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	164,053 ft²
Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	25.93 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	25.93 ft³/s
Drainage Area	
SCS CN (Composite)	92.000
Area (User Defined)	164,053 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.4 in
Runoff Volume (Pervious)	2.335 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.335 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	51.21 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A2b

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.117 hours
Area (User Defined)	209,733 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.112 hours
Flow (Peak, Computed)	6.31 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	6.23 ft³/s

Drainage Area	
SCS CN (Composite)	85.000
Area (User Defined)	209,733 ft²
Maximum Retention (Pervious)	1.8 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.3 in
Runoff Volume (Pervious)	0.521 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.521 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.117 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	46.78 ft³/s
Unit peak time, Tp	0.078 hours
Unit receding limb, Tr	0.311 hours
Total unit time, Tb	0.389 hours

Subsection: Unit Hydrograph Summary
Label: Post A2b

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.117 hours
Area (User Defined)	209,733 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.112 hours
Flow (Peak, Computed)	14.94 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	14.84 ft³/s

Drainage Area	
SCS CN (Composite)	85.000
Area (User Defined)	209,733 ft²
Maximum Retention (Pervious)	1.8 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.1 in
Runoff Volume (Pervious)	1.255 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.255 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.117 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	46.78 ft³/s
Unit peak time, Tp	0.078 hours
Unit receding limb, Tr	0.311 hours
Total unit time, Tb	0.389 hours

Subsection: Unit Hydrograph Summary
Label: Post A2b

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.117 hours
Area (User Defined)	209,733 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.112 hours
Flow (Peak, Computed)	30.33 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	30.22 ft³/s

Drainage Area	
SCS CN (Composite)	85.000
Area (User Defined)	209,733 ft²
Maximum Retention (Pervious)	1.8 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.6 in
Runoff Volume (Pervious)	2.648 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.648 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.117 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	46.78 ft³/s
Unit peak time, Tp	0.078 hours
Unit receding limb, Tr	0.311 hours
Total unit time, Tb	0.389 hours

Subsection: Unit Hydrograph Summary
Label: Post A3

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.104 hours
Area (User Defined)	261,422 ft²

Computational Time Increment	0.014 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	12.14 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	12.14 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	261,422 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	1.055 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.054 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.104 hours
Computational Time Increment	0.014 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.49 ft³/s
Unit peak time, Tp	0.069 hours
Unit receding limb, Tr	0.277 hours
Total unit time, Tb	0.346 hours

Subsection: Unit Hydrograph Summary
Label: Post A3

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.104 hours
Area (User Defined)	261,422 ft²

Computational Time Increment	0.014 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	22.98 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	22.98 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	261,422 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	2.082 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.081 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.104 hours
Computational Time Increment	0.014 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.49 ft³/s
Unit peak time, Tp	0.069 hours
Unit receding limb, Tr	0.277 hours
Total unit time, Tb	0.346 hours

Subsection: Unit Hydrograph Summary
Label: Post A3

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.104 hours
Area (User Defined)	261,422 ft²

Computational Time Increment	0.014 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	41.64 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	41.63 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	261,422 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.8 in
Runoff Volume (Pervious)	3.901 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.901 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.104 hours
Computational Time Increment	0.014 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.49 ft³/s
Unit peak time, Tp	0.069 hours
Unit receding limb, Tr	0.277 hours
Total unit time, Tb	0.346 hours

Subsection: Unit Hydrograph Summary
Label: Post A4

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	279,231 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	13.14 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	13.14 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	279,231 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	1.126 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.126 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	87.16 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A4

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	279,231 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	24.81 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	24.81 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	279,231 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	2.223 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.223 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	87.16 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A4

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	279,231 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	44.92 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	44.92 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	279,231 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.8 in
Runoff Volume (Pervious)	4.167 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.167 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	87.16 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A5

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	343,195 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	15.65 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	15.65 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	343,195 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	1.322 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.322 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	107.12 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A5

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	343,195 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	30.10 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	30.10 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	343,195 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	2.660 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.660 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	107.12 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A5

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.083 hours
Area (User Defined)	343,195 ft²

Computational Time Increment	0.011 hours
Time to Peak (Computed)	12.100 hours
Flow (Peak, Computed)	54.93 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	54.93 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	343,195 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.7 in
Runoff Volume (Pervious)	5.042 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	5.042 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.083 hours
Computational Time Increment	0.011 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	107.12 ft³/s
Unit peak time, Tp	0.056 hours
Unit receding limb, Tr	0.222 hours
Total unit time, Tb	0.278 hours

Subsection: Unit Hydrograph Summary
Label: Post A6

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.129 hours
Area (User Defined)	323,064 ft²

Computational Time Increment	0.017 hours
Time to Peak (Computed)	12.120 hours
Flow (Peak, Computed)	14.69 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	14.62 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	323,064 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.1 in
Runoff Volume (Pervious)	1.303 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.303 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.129 hours
Computational Time Increment	0.017 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.27 ft³/s
Unit peak time, Tp	0.086 hours
Unit receding limb, Tr	0.343 hours
Total unit time, Tb	0.429 hours

Subsection: Unit Hydrograph Summary
Label: Post A6

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.129 hours
Area (User Defined)	323,064 ft²

Computational Time Increment	0.017 hours
Time to Peak (Computed)	12.120 hours
Flow (Peak, Computed)	27.82 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	27.75 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	323,064 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.2 in
Runoff Volume (Pervious)	2.572 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.572 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.129 hours
Computational Time Increment	0.017 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.27 ft³/s
Unit peak time, Tp	0.086 hours
Unit receding limb, Tr	0.343 hours
Total unit time, Tb	0.429 hours

Subsection: Unit Hydrograph Summary
Label: Post A6

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.129 hours
Area (User Defined)	323,064 ft²

Computational Time Increment	0.017 hours
Time to Peak (Computed)	12.103 hours
Flow (Peak, Computed)	50.43 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	50.33 ft³/s

Drainage Area	
SCS CN (Composite)	95.000
Area (User Defined)	323,064 ft²
Maximum Retention (Pervious)	0.5 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.8 in
Runoff Volume (Pervious)	4.821 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.821 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.129 hours
Computational Time Increment	0.017 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	65.27 ft³/s
Unit peak time, Tp	0.086 hours
Unit receding limb, Tr	0.343 hours
Total unit time, Tb	0.429 hours

Subsection: Unit Hydrograph Summary
Label: Post A7

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.095 hours
Area (User Defined)	261,647 ft²

Computational Time Increment	0.013 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	12.58 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	12.58 ft³/s

Drainage Area	
SCS CN (Composite)	96.000
Area (User Defined)	261,647 ft²
Maximum Retention (Pervious)	0.4 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.2 in
Runoff Volume (Pervious)	1.105 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.105 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.095 hours
Computational Time Increment	0.013 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	71.91 ft³/s
Unit peak time, Tp	0.063 hours
Unit receding limb, Tr	0.252 hours
Total unit time, Tb	0.315 hours

Subsection: Unit Hydrograph Summary
Label: Post A7

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.095 hours
Area (User Defined)	261,647 ft²

Computational Time Increment	0.013 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	23.40 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	23.39 ft³/s

Drainage Area	
SCS CN (Composite)	96.000
Area (User Defined)	261,647 ft²
Maximum Retention (Pervious)	0.4 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.3 in
Runoff Volume (Pervious)	2.139 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.140 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.095 hours
Computational Time Increment	0.013 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	71.91 ft³/s
Unit peak time, Tp	0.063 hours
Unit receding limb, Tr	0.252 hours
Total unit time, Tb	0.315 hours

Subsection: Unit Hydrograph Summary
Label: Post A7

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.095 hours
Area (User Defined)	261,647 ft²

Computational Time Increment	0.013 hours
Time to Peak (Computed)	12.101 hours
Flow (Peak, Computed)	42.07 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	42.06 ft³/s

Drainage Area	
SCS CN (Composite)	96.000
Area (User Defined)	261,647 ft²
Maximum Retention (Pervious)	0.4 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.9 in
Runoff Volume (Pervious)	3.964 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.964 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.095 hours
Computational Time Increment	0.013 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	71.91 ft³/s
Unit peak time, Tp	0.063 hours
Unit receding limb, Tr	0.252 hours
Total unit time, Tb	0.315 hours

Subsection: Unit Hydrograph Summary
Label: Post A8

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.386 hours
Area (User Defined)	246,732 ft²

Computational Time Increment	0.051 hours
Time to Peak (Computed)	12.245 hours
Flow (Peak, Computed)	7.17 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	7.16 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	246,732 ft²
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.7 in
Runoff Volume (Pervious)	0.825 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.825 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.386 hours
Computational Time Increment	0.051 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.63 ft³/s
Unit peak time, Tp	0.257 hours
Unit receding limb, Tr	1.029 hours
Total unit time, Tb	1.286 hours

Subsection: Unit Hydrograph Summary
Label: Post A8

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.386 hours
Area (User Defined)	246,732 ft²

Computational Time Increment	0.051 hours
Time to Peak (Computed)	12.245 hours
Flow (Peak, Computed)	14.91 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	14.90 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	246,732 ft²
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.7 in
Runoff Volume (Pervious)	1.761 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.761 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.386 hours
Computational Time Increment	0.051 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.63 ft³/s
Unit peak time, Tp	0.257 hours
Unit receding limb, Tr	1.029 hours
Total unit time, Tb	1.286 hours

Subsection: Unit Hydrograph Summary
Label: Post A8

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.386 hours
Area (User Defined)	246,732 ft²

Computational Time Increment	0.051 hours
Time to Peak (Computed)	12.245 hours
Flow (Peak, Computed)	28.27 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	28.23 ft³/s

Drainage Area	
SCS CN (Composite)	91.000
Area (User Defined)	246,732 ft²
Maximum Retention (Pervious)	1.0 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.3 in
Runoff Volume (Pervious)	3.455 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.456 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.386 hours
Computational Time Increment	0.051 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.63 ft³/s
Unit peak time, Tp	0.257 hours
Unit receding limb, Tr	1.029 hours
Total unit time, Tb	1.286 hours

Subsection: Unit Hydrograph Summary
Label: Post A9

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.293 hours
Area (User Defined)	549,004 ft²

Computational Time Increment	0.039 hours
Time to Peak (Computed)	12.205 hours
Flow (Peak, Computed)	18.49 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	18.43 ft³/s

Drainage Area	
SCS CN (Compesite)	92.000
Area (User Defined)	549,004 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.8 in
Runoff Volume (Pervious)	1.925 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.925 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.293 hours
Computational Time Increment	0.039 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	48.67 ft³/s
Unit peak time, Tp	0.196 hours
Unit receding limb, Tr	0.782 hours
Total unit time, Tb	0.978 hours

Subsection: Unit Hydrograph Summary
Label: Post A9

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.293 hours
Area (User Defined)	549,004 ft²

Computational Time Increment	0.039 hours
Time to Peak (Computed)	12.205 hours
Flow (Peak, Computed)	37.45 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	37.35 ft³/s

Drainage Area	
SCS CN (Composite)	92.000
Area (User Defined)	549,004 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.8 in
Runoff Volume (Pervious)	4.028 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.028 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.293 hours
Computational Time Increment	0.039 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	48.67 ft³/s
Unit peak time, Tp	0.196 hours
Unit receding limb, Tr	0.782 hours
Total unit time, Tb	0.978 hours

Subsection: Unit Hydrograph Summary
Label: Post A9

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.293 hours
Area (User Defined)	549,004 ft²

Computational Time Increment	0.039 hours
Time to Peak (Computed)	12.205 hours
Flow (Peak, Computed)	70.03 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	69.89 ft³/s

Drainage Area	
SCS CN (Composite)	92.000
Area (User Defined)	549,004 ft²
Maximum Retention (Pervious)	0.9 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.4 in
Runoff Volume (Pervious)	7.814 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	7.814 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.293 hours
Computational Time Increment	0.039 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	48.67 ft³/s
Unit peak time, Tp	0.196 hours
Unit receding limb, Tr	0.782 hours
Total unit time, Tb	0.978 hours

Subsection: Unit Hydrograph Summary
Label: Post B1

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.793 hours
Area (User Defined)	4,215,499 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.587 hours
Flow (Peak, Computed)	42.64 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.600 hours
Flow (Peak Interpolated Output)	42.48 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	4,215,499 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.9 in
Runoff Volume (Pervious)	7.152 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	7.151 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.793 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	138.22 ft³/s
Unit peak time, Tp	0.529 hours
Unit receding limb, Tr	2.115 hours
Total unit time, Tb	2.644 hours

Subsection: Unit Hydrograph Summary
Label: Post B1

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.793 hours
Area (User Defined)	4,215,499 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.587 hours
Flow (Peak, Computed)	125.64 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.550 hours
Flow (Peak Interpolated Output)	124.86 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	4,215,499 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	20.100 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	20.098 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.793 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	138.22 ft³/s
Unit peak time, Tp	0.529 hours
Unit receding limb, Tr	2.115 hours
Total unit time, Tb	2.644 hours

Subsection: Unit Hydrograph Summary
Label: Post B1

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.793 hours
Area (User Defined)	4,215,499 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.587 hours
Flow (Peak, Computed)	286.99 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.550 hours
Flow (Peak Interpolated Output)	286.81 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	4,215,499 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.8 in
Runoff Volume (Pervious)	46.467 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	46.462 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.793 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	138.22 ft³/s
Unit peak time, Tp	0.529 hours
Unit receding limb, Tr	2.115 hours
Total unit time, Tb	2.644 hours

Subsection: Unit Hydrograph Summary
Label: Post B10

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.328 hours
Area (User Defined)	221,531 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.216 hours
Flow (Peak, Computed)	7.75 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	7.65 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	221,531 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	0.853 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.853 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.328 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	17.55 ft³/s
Unit peak time, Tp	0.219 hours
Unit receding limb, Tr	0.876 hours
Total unit time, Tb	1.095 hours

Subsection: Unit Hydrograph Summary
Label: Post B10

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.328 hours
Area (User Defined)	221,531 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.216 hours
Flow (Peak, Computed)	15.05 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	14.87 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	221,531 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.1 in
Runoff Volume (Pervious)	1.717 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.717 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.328 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	17.55 ft³/s
Unit peak time, Tp	0.219 hours
Unit receding limb, Tr	0.876 hours
Total unit time, Tb	1.095 hours

Subsection: Unit Hydrograph Summary
Label: Post B10

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.328 hours
Area (User Defined)	221,531 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.216 hours
Flow (Peak, Computed)	27.60 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	27.29 ft³/s

Drainage Area	
SCS CN (Composite)	94.000
Area (User Defined)	221,531 ft²
Maximum Retention (Pervious)	0.6 in
Maximum Retention (Pervious, 20 percent)	0.1 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.7 in
Runoff Volume (Pervious)	3.255 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.254 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.328 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	17.55 ft³/s
Unit peak time, Tp	0.219 hours
Unit receding limb, Tr	0.876 hours
Total unit time, Tb	1.095 hours

Subsection: Unit Hydrograph Summary
Label: Post B2

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.141 hours
Area (User Defined)	90,771 ft²

Computational Time Increment	0.019 hours
Time to Peak (Computed)	12.135 hours
Flow (Peak, Computed)	2.52 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	2.47 ft³/s

Drainage Area	
SCS CN (Composite)	84.000
Area (User Defined)	90,771 ft²
Maximum Retention (Pervious)	1.9 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	0.214 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.214 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.141 hours
Computational Time Increment	0.019 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.79 ft³/s
Unit peak time, Tp	0.094 hours
Unit receding limb, Tr	0.375 hours
Total unit time, Tb	0.469 hours

Subsection: Unit Hydrograph Summary
Label: Post B2

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.141 hours
Area (User Defined)	90,771 ft²

Computational Time Increment	0.019 hours
Time to Peak (Computed)	12.116 hours
Flow (Peak, Computed)	6.13 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	6.04 ft³/s

Drainage Area	
SCS CN (Composite)	84.000
Area (User Defined)	90,771 ft²
Maximum Retention (Pervious)	1.9 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.0 in
Runoff Volume (Pervious)	0.527 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.527 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.141 hours
Computational Time Increment	0.019 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.79 ft³/s
Unit peak time, Tp	0.094 hours
Unit receding limb, Tr	0.375 hours
Total unit time, Tb	0.469 hours

Subsection: Unit Hydrograph Summary
Label: Post B2

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.141 hours
Area (User Defined)	90,771 ft²

Computational Time Increment	0.019 hours
Time to Peak (Computed)	12.116 hours
Flow (Peak, Computed)	12.67 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	12.54 ft³/s

Drainage Area	
SCS CN (Composite)	84.000
Area (User Defined)	90,771 ft²
Maximum Retention (Pervious)	1.9 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.5 in
Runoff Volume (Pervious)	1.125 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.125 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.141 hours
Computational Time Increment	0.019 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	16.79 ft³/s
Unit peak time, Tp	0.094 hours
Unit receding limb, Tr	0.375 hours
Total unit time, Tb	0.469 hours

Subsection: Unit Hydrograph Summary
Label: Post B3

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.232 hours
Area (User Defined)	96,930 ft²

Computational Time Increment	0.031 hours
Time to Peak (Computed)	12.176 hours
Flow (Peak, Computed)	2.25 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	2.22 ft³/s

Drainage Area	
SCS CN (Compesite)	83.000
Area (User Defined)	96,930 ft²
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.2 in
Runoff Volume (Pervious)	0.217 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.217 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.232 hours
Computational Time Increment	0.031 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.88 ft³/s
Unit peak time, Tp	0.155 hours
Unit receding limb, Tr	0.618 hours
Total unit time, Tb	0.773 hours

Subsection: Unit Hydrograph Summary
Label: Post B3

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.232 hours
Area (User Defined)	96,930 ft²

Computational Time Increment	0.031 hours
Time to Peak (Computed)	12.176 hours
Flow (Peak, Computed)	5.69 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	5.63 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	96,930 ft²
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.9 in
Runoff Volume (Pervious)	0.545 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.545 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.232 hours
Computational Time Increment	0.031 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.88 ft³/s
Unit peak time, Tp	0.155 hours
Unit receding limb, Tr	0.618 hours
Total unit time, Tb	0.773 hours

Subsection: Unit Hydrograph Summary
Label: Post B3

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.232 hours
Area (User Defined)	96,930 ft²

Computational Time Increment	0.031 hours
Time to Peak (Computed)	12.176 hours
Flow (Peak, Computed)	11.97 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	11.91 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	96,930 ft²
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.4 in
Runoff Volume (Pervious)	1.179 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.179 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.232 hours
Computational Time Increment	0.031 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	10.88 ft³/s
Unit peak time, Tp	0.155 hours
Unit receding limb, Tr	0.618 hours
Total unit time, Tb	0.773 hours

Subsection: Unit Hydrograph Summary
Label: Post B4

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.186 hours
Area (User Defined)	113,356 ft²

Computational Time Increment	0.025 hours
Time to Peak (Computed)	12.158 hours
Flow (Peak, Computed)	2.64 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	2.63 ft³/s

Drainage Area	
SCS CN (Composite)	82.000
Area (User Defined)	113,356 ft²
Maximum Retention (Pervious)	2.2 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.1 in
Runoff Volume (Pervious)	0.241 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.241 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.186 hours
Computational Time Increment	0.025 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	15.84 ft³/s
Unit peak time, Tp	0.124 hours
Unit receding limb, Tr	0.496 hours
Total unit time, Tb	0.620 hours

Subsection: Unit Hydrograph Summary
Label: Post B4

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.186 hours
Area (User Defined)	113,356 ft²

Computational Time Increment	0.025 hours
Time to Peak (Computed)	12.158 hours
Flow (Peak, Computed)	6.81 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	6.81 ft³/s

Drainage Area	
SCS CN (Composite)	82.000
Area (User Defined)	113,356 ft²
Maximum Retention (Pervious)	2.2 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.8 in
Runoff Volume (Pervious)	0.618 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.618 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.186 hours
Computational Time Increment	0.025 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	15.84 ft³/s
Unit peak time, Tp	0.124 hours
Unit receding limb, Tr	0.496 hours
Total unit time, Tb	0.620 hours

Subsection: Unit Hydrograph Summary
Label: Post B4

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.186 hours
Area (User Defined)	113,356 ft²

Computational Time Increment	0.025 hours
Time to Peak (Computed)	12.133 hours
Flow (Peak, Computed)	14.58 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	14.51 ft³/s

Drainage Area	
SCS CN (Composite)	82.000
Area (User Defined)	113,356 ft²
Maximum Retention (Pervious)	2.2 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.2 in
Runoff Volume (Pervious)	1.353 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.353 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.186 hours
Computational Time Increment	0.025 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	15.84 ft³/s
Unit peak time, Tp	0.124 hours
Unit receding limb, Tr	0.496 hours
Total unit time, Tb	0.620 hours

Subsection: Unit Hydrograph Summary
Label: Post B5

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.218 hours
Area (User Defined)	214,822 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.183 hours
Flow (Peak, Computed)	4.24 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	4.17 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	214,822 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.0 in
Runoff Volume (Pervious)	0.409 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.409 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.218 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	25.62 ft³/s
Unit peak time, Tp	0.145 hours
Unit receding limb, Tr	0.582 hours
Total unit time, Tb	0.727 hours

Subsection: Unit Hydrograph Summary
Label: Post B5

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.218 hours
Area (User Defined)	214,822 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.154 hours
Flow (Peak, Computed)	11.67 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	11.62 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	214,822 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.7 in
Runoff Volume (Pervious)	1.096 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.096 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.218 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	25.62 ft³/s
Unit peak time, Tp	0.145 hours
Unit receding limb, Tr	0.582 hours
Total unit time, Tb	0.727 hours

Subsection: Unit Hydrograph Summary
Label: Post B5

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.218 hours
Area (User Defined)	214,822 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.154 hours
Flow (Peak, Computed)	25.82 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	25.74 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	214,822 ft²
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.0 in
Runoff Volume (Pervious)	2.466 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.466 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.218 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	25.62 ft³/s
Unit peak time, Tp	0.145 hours
Unit receding limb, Tr	0.582 hours
Total unit time, Tb	0.727 hours

Subsection: Unit Hydrograph Summary
Label: Post B6

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.116 hours
Area (User Defined)	283,112 ft²
Computational Time Increment	0.015 hours
Time to Peak (Computed)	12.110 hours
Flow (Peak, Computed)	9.87 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	9.78 ft³/s
Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	283,112 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	0.818 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.818 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.116 hours
Computational Time Increment	0.015 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	63.40 ft³/s
Unit peak time, Tp	0.077 hours
Unit receding limb, Tr	0.310 hours
Total unit time, Tb	0.387 hours

Subsection: Unit Hydrograph Summary
Label: Post B6

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.116 hours
Area (User Defined)	283,112 ft²
Computational Time Increment	0.015 hours
Time to Peak (Computed)	12.110 hours
Flow (Peak, Computed)	21.72 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	21.61 ft³/s
Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	283,112 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in
Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.4 in
Runoff Volume (Pervious)	1.854 ac-ft
Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.854 ac-ft
SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.116 hours
Computational Time Increment	0.015 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	63.40 ft³/s
Unit peak time, Tp	0.077 hours
Unit receding limb, Tr	0.310 hours
Total unit time, Tb	0.387 hours

Subsection: Unit Hydrograph Summary
Label: Post B6

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.116 hours
Area (User Defined)	283,112 ft²

Computational Time Increment	0.015 hours
Time to Peak (Computed)	12.110 hours
Flow (Peak, Computed)	42.36 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	42.24 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	283,112 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	3.769 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.769 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.116 hours
Computational Time Increment	0.015 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	63.40 ft³/s
Unit peak time, Tp	0.077 hours
Unit receding limb, Tr	0.310 hours
Total unit time, Tb	0.387 hours

Subsection: Unit Hydrograph Summary
Label: Post B7

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.219 hours
Area (User Defined)	967,375 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.154 hours
Flow (Peak, Computed)	32.68 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	32.53 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	967,375 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.7 in
Runoff Volume (Pervious)	3.082 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.082 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.219 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	114.83 ft³/s
Unit peak time, Tp	0.146 hours
Unit receding limb, Tr	0.584 hours
Total unit time, Tb	0.730 hours

Subsection: Unit Hydrograph Summary
Label: Post B7

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.219 hours
Area (User Defined)	967,375 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.154 hours
Flow (Peak, Computed)	69.26 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	69.00 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	967,375 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	6.710 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	6.710 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.219 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	114.83 ft³/s
Unit peak time, Tp	0.146 hours
Unit receding limb, Tr	0.584 hours
Total unit time, Tb	0.730 hours

Subsection: Unit Hydrograph Summary
Label: Post B7

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.219 hours
Area (User Defined)	967,375 ft²

Computational Time Increment	0.029 hours
Time to Peak (Computed)	12.154 hours
Flow (Peak, Computed)	132.50 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.150 hours
Flow (Peak Interpolated Output)	132.10 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	967,375 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.2 in
Runoff Volume (Pervious)	13.324 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	13.323 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.219 hours
Computational Time Increment	0.029 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	114.83 ft³/s
Unit peak time, Tp	0.146 hours
Unit receding limb, Tr	0.584 hours
Total unit time, Tb	0.730 hours

Subsection: Unit Hydrograph Summary
Label: Post B8

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.333 hours
Area (User Defined)	295,859 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.242 hours
Flow (Peak, Computed)	8.73 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	8.68 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	295,859 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.7 in
Runoff Volume (Pervious)	0.943 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	0.943 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.333 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	23.13 ft³/s
Unit peak time, Tp	0.222 hours
Unit receding limb, Tr	0.887 hours
Total unit time, Tb	1.109 hours

Subsection: Unit Hydrograph Summary
Label: Post B8

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.333 hours
Area (User Defined)	295,859 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.242 hours
Flow (Peak, Computed)	18.50 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.250 hours
Flow (Peak Interpolated Output)	18.36 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	295,859 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	2.052 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.053 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.333 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	23.13 ft³/s
Unit peak time, Tp	0.222 hours
Unit receding limb, Tr	0.887 hours
Total unit time, Tb	1.109 hours

Subsection: Unit Hydrograph Summary
Label: Post B8

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.333 hours
Area (User Defined)	295,859 ft²

Computational Time Increment	0.044 hours
Time to Peak (Computed)	12.242 hours
Flow (Peak, Computed)	35.39 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.200 hours
Flow (Peak Interpolated Output)	35.26 ft³/s

Drainage Area	
SCS CN (Composite)	90.000
Area (User Defined)	295,859 ft²
Maximum Retention (Pervious)	1.1 in
Maximum Retention (Pervious, 20 percent)	0.2 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.2 in
Runoff Volume (Pervious)	4.075 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.076 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.333 hours
Computational Time Increment	0.044 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	23.13 ft³/s
Unit peak time, Tp	0.222 hours
Unit receding limb, Tr	0.887 hours
Total unit time, Tb	1.109 hours

Subsection: Unit Hydrograph Summary
Label: Post B9

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.124 hours
Area (User Defined)	390,560 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.121 hours
Flow (Peak, Computed)	13.52 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	13.35 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	390,560 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.5 in
Runoff Volume (Pervious)	1.129 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.129 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.124 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	82.14 ft³/s
Unit peak time, Tp	0.082 hours
Unit receding limb, Tr	0.330 hours
Total unit time, Tb	0.412 hours

Subsection: Unit Hydrograph Summary
Label: Post B9

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.124 hours
Area (User Defined)	390,560 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.121 hours
Flow (Peak, Computed)	29.70 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	29.55 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	390,560 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.4 in
Runoff Volume (Pervious)	2.557 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.557 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.124 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	82.14 ft³/s
Unit peak time, Tp	0.082 hours
Unit receding limb, Tr	0.330 hours
Total unit time, Tb	0.412 hours

Subsection: Unit Hydrograph Summary
Label: Post B9

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.124 hours
Area (User Defined)	390,560 ft²

Computational Time Increment	0.016 hours
Time to Peak (Computed)	12.104 hours
Flow (Peak, Computed)	58.00 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.100 hours
Flow (Peak Interpolated Output)	57.83 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	390,560 ft²
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	7.0 in
Runoff Volume (Pervious)	5.200 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	5.200 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.124 hours
Computational Time Increment	0.016 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	82.14 ft³/s
Unit peak time, Tp	0.082 hours
Unit receding limb, Tr	0.330 hours
Total unit time, Tb	0.412 hours

Subsection: Unit Hydrograph Summary
Label: Pre A

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	52,978,543 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	424.06 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.850 hours
Flow (Peak Interpolated Output)	423.37 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	52,978,543 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.9 in
Runoff Volume (Pervious)	89.878 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	89.879 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,173.21 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Pre A

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	52,978,543 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	1,258.10 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.850 hours
Flow (Peak Interpolated Output)	1,254.33 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	52,978,543 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.5 in
Runoff Volume (Pervious)	252.613 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	252.611 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,173.21 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Pre A

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	1.175 hours
Area (User Defined)	52,978,543 ft²

Computational Time Increment	0.157 hours
Time to Peak (Computed)	12.842 hours
Flow (Peak, Computed)	2,886.59 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.800 hours
Flow (Peak Interpolated Output)	2,880.46 ft³/s

Drainage Area	
SCS CN (Composite)	78.000
Area (User Defined)	52,978,543 ft²
Maximum Retention (Pervious)	2.8 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.8 in
Runoff Volume (Pervious)	583.979 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	583.970 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	1.175 hours
Computational Time Increment	0.157 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	1,173.21 ft³/s
Unit peak time, Tp	0.783 hours
Unit receding limb, Tr	3.132 hours
Total unit time, Tb	3.915 hours

Subsection: Unit Hydrograph Summary
Label: Pre B

Return Event: 1 years
Storm Event: 1-Year

Storm Event	1-Year
Return Event	1 years
Duration	48.000 hours
Depth	2.7 in
Time of Concentration (Composite)	0.792 hours
Area (User Defined)	7,181,302 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.563 hours
Flow (Peak, Computed)	62.50 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.600 hours
Flow (Peak Interpolated Output)	62.42 ft³/s

Drainage Area	
SCS CN (Composite)	76.000
Area (User Defined)	7,181,302 ft²
Maximum Retention (Pervious)	3.2 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.8 in
Runoff Volume (Pervious)	10.813 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	10.813 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.792 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	235.92 ft³/s
Unit peak time, Tp	0.528 hours
Unit receding limb, Tr	2.111 hours
Total unit time, Tb	2.639 hours

Subsection: Unit Hydrograph Summary
Label: Pre B

Return Event: 10 years
Storm Event: 10-Year

Storm Event	10-Year
Return Event	10 years
Duration	48.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.792 hours
Area (User Defined)	7,181,302 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.563 hours
Flow (Peak, Computed)	199.71 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.550 hours
Flow (Peak Interpolated Output)	198.75 ft³/s

Drainage Area	
SCS CN (Composite)	76.000
Area (User Defined)	7,181,302 ft²
Maximum Retention (Pervious)	3.2 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.3 in
Runoff Volume (Pervious)	31.913 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	31.915 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.792 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	235.92 ft³/s
Unit peak time, Tp	0.528 hours
Unit receding limb, Tr	2.111 hours
Total unit time, Tb	2.639 hours

Subsection: Unit Hydrograph Summary
Label: Pre B

Return Event: 100 years
Storm Event: 100-Year

Storm Event	100-Year
Return Event	100 years
Duration	48.000 hours
Depth	8.4 in
Time of Concentration (Composite)	0.792 hours
Area (User Defined)	7,181,302 ft²

Computational Time Increment	0.106 hours
Time to Peak (Computed)	12.563 hours
Flow (Peak, Computed)	474.30 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.550 hours
Flow (Peak Interpolated Output)	473.09 ft³/s

Drainage Area	
SCS CN (Composite)	76.000
Area (User Defined)	7,181,302 ft²
Maximum Retention (Pervious)	3.2 in
Maximum Retention (Pervious, 20 percent)	0.6 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.5 in
Runoff Volume (Pervious)	75.880 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	75.886 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.792 hours
Computational Time Increment	0.106 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670
Unit peak, qp	235.92 ft³/s
Unit peak time, Tp	0.528 hours
Unit receding limb, Tr	2.111 hours
Total unit time, Tb	2.639 hours

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B5)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.063 ft/ft
Manning's n	0.050
Invert (Upstream)	497.40 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
497.40	0.0	0.00	0.00	0.0	0.00	0.00	0.0
497.41	0.1	0.01	0.35	0.0	4.04	4.04	0.1
497.44	0.5	0.14	0.86	0.2	4.16	4.18	0.5
497.48	1.0	0.45	1.34	0.3	4.32	4.36	0.9
497.52	1.4	0.88	1.74	0.5	4.48	4.54	1.4
497.56	1.9	1.43	2.07	0.7	4.64	4.72	1.8
497.60	2.4	2.09	2.38	0.9	4.80	4.89	2.2
497.64	2.9	2.85	2.65	1.1	4.96	5.07	2.6
497.68	3.4	3.71	2.91	1.3	5.12	5.25	3.0
497.72	3.8	4.67	3.14	1.5	5.28	5.43	3.4
497.76	4.3	5.72	3.37	1.7	5.44	5.61	3.7
497.80	4.8	6.87	3.58	1.9	5.60	5.79	4.1
497.84	5.3	8.11	3.78	2.1	5.76	5.97	4.5
497.88	5.8	9.44	3.97	2.4	5.92	6.15	4.8
497.92	6.2	10.87	4.15	2.6	6.08	6.33	5.2
497.96	6.7	12.40	4.32	2.9	6.24	6.50	5.5
498.00	7.2	14.01	4.49	3.1	6.40	6.68	5.9
498.04	7.7	15.73	4.65	3.4	6.56	6.86	6.2
498.08	8.2	17.54	4.81	3.6	6.72	7.04	6.5
498.12	8.6	19.45	4.96	3.9	6.88	7.22	6.8
498.16	9.1	21.45	5.11	4.2	7.04	7.40	7.2
498.20	9.6	23.55	5.26	4.5	7.20	7.58	7.5
498.24	10.1	25.76	5.40	4.8	7.36	7.76	7.8
498.28	10.6	28.06	5.54	5.1	7.52	7.94	8.1
498.32	11.0	30.46	5.67	5.4	7.68	8.11	8.4
498.36	11.5	32.97	5.80	5.7	7.84	8.29	8.7
498.40	12.0	35.58	5.93	6.0	8.00	8.47	9.0
498.44	12.5	38.30	6.06	6.3	8.16	8.65	9.3
498.48	13.0	41.11	6.18	6.7	8.32	8.83	9.6
498.52	13.4	44.04	6.30	7.0	8.48	9.01	9.9
498.56	13.9	47.07	6.42	7.3	8.64	9.19	10.2
498.60	14.4	50.22	6.54	7.7	8.80	9.37	10.5
498.64	14.9	53.47	6.65	8.0	8.96	9.55	10.8
498.68	15.4	56.83	6.77	8.4	9.12	9.72	11.0
498.72	15.8	60.30	6.88	8.8	9.28	9.90	11.3
498.76	16.3	63.89	6.99	9.1	9.44	10.08	11.6
498.80	16.8	67.59	7.10	9.5	9.60	10.26	11.9
498.84	17.3	71.41	7.21	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B5)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
498.88	17.8	75.34	7.31	10.3	9.92	10.62	12.5
498.92	18.2	79.39	7.42	10.7	10.08	10.80	12.7
498.96	18.7	83.56	7.52	11.1	10.24	10.98	13.0
499.00	19.2	87.85	7.63	11.5	10.40	11.16	13.3
499.04	19.7	92.25	7.73	11.9	10.56	11.33	13.6
499.08	20.2	96.79	7.83	12.4	10.72	11.51	13.8
499.12	20.6	101.44	7.93	12.8	10.88	11.69	14.1
499.16	21.1	106.22	8.03	13.2	11.04	11.87	14.4
499.20	21.6	111.12	8.12	13.7	11.20	12.05	14.7
499.24	22.1	116.15	8.22	14.1	11.36	12.23	14.9
499.28	22.6	121.30	8.31	14.6	11.52	12.41	15.2
499.32	23.0	126.59	8.41	15.1	11.68	12.59	15.5
499.36	23.5	132.00	8.50	15.5	11.84	12.77	15.7
499.40	24.0	137.54	8.60	16.0	12.00	12.94	16.0

Froude No.
0.000
0.610
0.765
0.853
0.908
0.948
0.979
1.005
1.026
1.045
1.062
1.077
1.090
1.103
1.114
1.124
1.134
1.143
1.152
1.160
1.168
1.175
1.182
1.189
1.195
1.201
1.207
1.213
1.218
1.224
1.229
1.234

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B5)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
1.239
1.244
1.248
1.253
1.257
1.261
1.265
1.269
1.273
1.277
1.281
1.285
1.289
1.292
1.296
1.299
1.303
1.306
1.309
1.313

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B3)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.012 ft/ft
Manning's n	0.050
Invert (Upstream)	439.60 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
439.60	0.0	0.00	0.00	0.0	0.00	0.00	0.0
439.61	0.1	0.01	0.15	0.0	4.04	4.04	0.1
439.64	0.5	0.06	0.37	0.2	4.16	4.18	0.5
439.68	1.0	0.20	0.59	0.3	4.32	4.36	0.9
439.72	1.4	0.39	0.76	0.5	4.48	4.54	1.4
439.76	1.9	0.63	0.91	0.7	4.64	4.72	1.8
439.80	2.4	0.91	1.04	0.9	4.80	4.89	2.2
439.84	2.9	1.24	1.16	1.1	4.96	5.07	2.6
439.88	3.4	1.62	1.27	1.3	5.12	5.25	3.0
439.92	3.8	2.04	1.37	1.5	5.28	5.43	3.4
439.96	4.3	2.49	1.47	1.7	5.44	5.61	3.7
440.00	4.8	2.99	1.56	1.9	5.60	5.79	4.1
440.04	5.3	3.54	1.65	2.1	5.76	5.97	4.5
440.08	5.8	4.12	1.73	2.4	5.92	6.15	4.8
440.12	6.2	4.74	1.81	2.6	6.08	6.33	5.2
440.16	6.7	5.41	1.89	2.9	6.24	6.50	5.5
440.20	7.2	6.11	1.96	3.1	6.40	6.68	5.9
440.24	7.7	6.86	2.03	3.4	6.56	6.86	6.2
440.28	8.2	7.65	2.10	3.6	6.72	7.04	6.5
440.32	8.6	8.48	2.17	3.9	6.88	7.22	6.8
440.36	9.1	9.36	2.23	4.2	7.04	7.40	7.2
440.40	9.6	10.27	2.29	4.5	7.20	7.58	7.5
440.44	10.1	11.23	2.35	4.8	7.36	7.76	7.8
440.48	10.6	12.24	2.41	5.1	7.52	7.94	8.1
440.52	11.0	13.29	2.47	5.4	7.68	8.11	8.4
440.56	11.5	14.38	2.53	5.7	7.84	8.29	8.7
440.60	12.0	15.52	2.59	6.0	8.00	8.47	9.0
440.64	12.5	16.70	2.64	6.3	8.16	8.65	9.3
440.68	13.0	17.93	2.70	6.7	8.32	8.83	9.6
440.72	13.4	19.21	2.75	7.0	8.48	9.01	9.9
440.76	13.9	20.53	2.80	7.3	8.64	9.19	10.2
440.80	14.4	21.90	2.85	7.7	8.80	9.37	10.5
440.84	14.9	23.32	2.90	8.0	8.96	9.55	10.8
440.88	15.4	24.79	2.95	8.4	9.12	9.72	11.0
440.92	15.8	26.30	3.00	8.8	9.28	9.90	11.3
440.96	16.3	27.87	3.05	9.1	9.44	10.08	11.6
441.00	16.8	29.48	3.10	9.5	9.60	10.26	11.9
441.04	17.3	31.15	3.14	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B3)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
441.08	17.8	32.86	3.19	10.3	9.92	10.62	12.5
441.12	18.2	34.63	3.24	10.7	10.08	10.80	12.7
441.16	18.7	36.45	3.28	11.1	10.24	10.98	13.0
441.20	19.2	38.32	3.33	11.5	10.40	11.16	13.3
441.24	19.7	40.24	3.37	11.9	10.56	11.33	13.6
441.28	20.2	42.21	3.41	12.4	10.72	11.51	13.8
441.32	20.6	44.24	3.46	12.8	10.88	11.69	14.1
441.36	21.1	46.33	3.50	13.2	11.04	11.87	14.4
441.40	21.6	48.47	3.54	13.7	11.20	12.05	14.7
441.44	22.1	50.66	3.58	14.1	11.36	12.23	14.9
441.48	22.6	52.91	3.63	14.6	11.52	12.41	15.2
441.52	23.0	55.21	3.67	15.1	11.68	12.59	15.5
441.56	23.5	57.57	3.71	15.5	11.84	12.77	15.7
441.60	24.0	59.99	3.75	16.0	12.00	12.94	16.0

Froude No.
0.000
0.266
0.334
0.372
0.396
0.413
0.427
0.438
0.448
0.456
0.463
0.470
0.476
0.481
0.486
0.490
0.495
0.499
0.502
0.506
0.509
0.513
0.516
0.518
0.521
0.524
0.527
0.529
0.531
0.534
0.536
0.538

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B3)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.540
0.542
0.544
0.546
0.548
0.550
0.552
0.554
0.555
0.557
0.559
0.560
0.562
0.564
0.565
0.567
0.568
0.570
0.571
0.572

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B6)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.039 ft/ft
Manning's n	0.050
Invert (Upstream)	534.00 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
534.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
534.01	0.1	0.01	0.27	0.0	4.04	4.04	0.1
534.04	0.5	0.11	0.67	0.2	4.16	4.18	0.5
534.08	1.0	0.35	1.05	0.3	4.32	4.36	0.9
534.12	1.4	0.69	1.36	0.5	4.48	4.54	1.4
534.16	1.9	1.12	1.62	0.7	4.64	4.72	1.8
534.20	2.4	1.64	1.86	0.9	4.80	4.89	2.2
534.24	2.9	2.23	2.07	1.1	4.96	5.07	2.6
534.28	3.4	2.90	2.27	1.3	5.12	5.25	3.0
534.32	3.8	3.65	2.46	1.5	5.28	5.43	3.4
534.36	4.3	4.47	2.63	1.7	5.44	5.61	3.7
534.40	4.8	5.37	2.79	1.9	5.60	5.79	4.1
534.44	5.3	6.34	2.95	2.1	5.76	5.97	4.5
534.48	5.8	7.38	3.10	2.4	5.92	6.15	4.8
534.52	6.2	8.50	3.24	2.6	6.08	6.33	5.2
534.56	6.7	9.69	3.38	2.9	6.24	6.50	5.5
534.60	7.2	10.95	3.51	3.1	6.40	6.68	5.9
534.64	7.7	12.29	3.64	3.4	6.56	6.86	6.2
534.68	8.2	13.71	3.76	3.6	6.72	7.04	6.5
534.72	8.6	15.20	3.88	3.9	6.88	7.22	6.8
534.76	9.1	16.76	4.00	4.2	7.04	7.40	7.2
534.80	9.6	18.41	4.11	4.5	7.20	7.58	7.5
534.84	10.1	20.13	4.22	4.8	7.36	7.76	7.8
534.88	10.6	21.93	4.33	5.1	7.52	7.94	8.1
534.92	11.0	23.81	4.43	5.4	7.68	8.11	8.4
534.96	11.5	25.77	4.53	5.7	7.84	8.29	8.7
535.00	12.0	27.81	4.63	6.0	8.00	8.47	9.0
535.04	12.5	29.93	4.73	6.3	8.16	8.65	9.3
535.08	13.0	32.13	4.83	6.7	8.32	8.83	9.6
535.12	13.4	34.42	4.92	7.0	8.48	9.01	9.9
535.16	13.9	36.79	5.02	7.3	8.64	9.19	10.2
535.20	14.4	39.25	5.11	7.7	8.80	9.37	10.5
535.24	14.9	41.79	5.20	8.0	8.96	9.55	10.8
535.28	15.4	44.41	5.29	8.4	9.12	9.72	11.0
535.32	15.8	47.13	5.38	8.8	9.28	9.90	11.3
535.36	16.3	49.93	5.46	9.1	9.44	10.08	11.6
535.40	16.8	52.82	5.55	9.5	9.60	10.26	11.9
535.44	17.3	55.81	5.63	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B6)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
535.48	17.8	58.88	5.72	10.3	9.92	10.62	12.5
535.52	18.2	62.05	5.80	10.7	10.08	10.80	12.7
535.56	18.7	65.30	5.88	11.1	10.24	10.98	13.0
535.60	19.2	68.65	5.96	11.5	10.40	11.16	13.3
535.64	19.7	72.10	6.04	11.9	10.56	11.33	13.6
535.68	20.2	75.64	6.12	12.4	10.72	11.51	13.8
535.72	20.6	79.28	6.20	12.8	10.88	11.69	14.1
535.76	21.1	83.01	6.27	13.2	11.04	11.87	14.4
535.80	21.6	86.84	6.35	13.7	11.20	12.05	14.7
535.84	22.1	90.77	6.42	14.1	11.36	12.23	14.9
535.88	22.6	94.80	6.50	14.6	11.52	12.41	15.2
535.92	23.0	98.93	6.57	15.1	11.68	12.59	15.5
535.96	23.5	103.16	6.65	15.5	11.84	12.77	15.7
536.00	24.0	107.49	6.72	16.0	12.00	12.94	16.0

Froude No.
0.000
0.477
0.598
0.667
0.710
0.741
0.765
0.785
0.802
0.817
0.830
0.842
0.852
0.862
0.871
0.879
0.886
0.894
0.900
0.907
0.913
0.918
0.924
0.929
0.934
0.939
0.943
0.948
0.952
0.956
0.960
0.964

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B6)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.968
0.972
0.975
0.979
0.982
0.986
0.989
0.992
0.995
0.998
1.001
1.004
1.007
1.010
1.013
1.015
1.018
1.021
1.023
1.026

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B7)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.040 ft/ft
Manning's n	0.050
Invert (Upstream)	459.60 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
459.60	0.0	0.00	0.00	0.0	0.00	0.00	0.0
459.61	0.1	0.01	0.27	0.0	4.04	4.04	0.1
459.64	0.5	0.11	0.68	0.2	4.16	4.18	0.5
459.68	1.0	0.35	1.06	0.3	4.32	4.36	0.9
459.72	1.4	0.70	1.37	0.5	4.48	4.54	1.4
459.76	1.9	1.14	1.64	0.7	4.64	4.72	1.8
459.80	2.4	1.66	1.88	0.9	4.80	4.89	2.2
459.84	2.9	2.26	2.10	1.1	4.96	5.07	2.6
459.88	3.4	2.94	2.30	1.3	5.12	5.25	3.0
459.92	3.8	3.70	2.49	1.5	5.28	5.43	3.4
459.96	4.3	4.53	2.67	1.7	5.44	5.61	3.7
460.00	4.8	5.44	2.83	1.9	5.60	5.79	4.1
460.04	5.3	6.42	2.99	2.1	5.76	5.97	4.5
460.08	5.8	7.48	3.14	2.4	5.92	6.15	4.8
460.12	6.2	8.61	3.29	2.6	6.08	6.33	5.2
460.16	6.7	9.82	3.42	2.9	6.24	6.50	5.5
460.20	7.2	11.10	3.56	3.1	6.40	6.68	5.9
460.24	7.7	12.46	3.69	3.4	6.56	6.86	6.2
460.28	8.2	13.89	3.81	3.6	6.72	7.04	6.5
460.32	8.6	15.40	3.93	3.9	6.88	7.22	6.8
460.36	9.1	16.99	4.05	4.2	7.04	7.40	7.2
460.40	9.6	18.66	4.16	4.5	7.20	7.58	7.5
460.44	10.1	20.40	4.28	4.8	7.36	7.76	7.8
460.48	10.6	22.23	4.39	5.1	7.52	7.94	8.1
460.52	11.0	24.13	4.49	5.4	7.68	8.11	8.4
460.56	11.5	26.12	4.60	5.7	7.84	8.29	8.7
460.60	12.0	28.18	4.70	6.0	8.00	8.47	9.0
460.64	12.5	30.33	4.80	6.3	8.16	8.65	9.3
460.68	13.0	32.57	4.90	6.7	8.32	8.83	9.6
460.72	13.4	34.89	4.99	7.0	8.48	9.01	9.9
460.76	13.9	37.29	5.09	7.3	8.64	9.19	10.2
460.80	14.4	39.78	5.18	7.7	8.80	9.37	10.5
460.84	14.9	42.35	5.27	8.0	8.96	9.55	10.8
460.88	15.4	45.02	5.36	8.4	9.12	9.72	11.0
460.92	15.8	47.77	5.45	8.8	9.28	9.90	11.3
460.96	16.3	50.61	5.54	9.1	9.44	10.08	11.6
461.00	16.8	53.54	5.62	9.5	9.60	10.26	11.9
461.04	17.3	56.56	5.71	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B7)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
461.08	17.8	59.68	5.79	10.3	9.92	10.62	12.5
461.12	18.2	62.89	5.88	10.7	10.08	10.80	12.7
461.16	18.7	66.19	5.96	11.1	10.24	10.98	13.0
461.20	19.2	69.59	6.04	11.5	10.40	11.16	13.3
461.24	19.7	73.08	6.12	11.9	10.56	11.33	13.6
461.28	20.2	76.67	6.20	12.4	10.72	11.51	13.8
461.32	20.6	80.35	6.28	12.8	10.88	11.69	14.1
461.36	21.1	84.14	6.36	13.2	11.04	11.87	14.4
461.40	21.6	88.02	6.43	13.7	11.20	12.05	14.7
461.44	22.1	92.00	6.51	14.1	11.36	12.23	14.9
461.48	22.6	96.09	6.59	14.6	11.52	12.41	15.2
461.52	23.0	100.27	6.66	15.1	11.68	12.59	15.5
461.56	23.5	104.56	6.74	15.5	11.84	12.77	15.7
461.60	24.0	108.95	6.81	16.0	12.00	12.94	16.0

Froude No.
0.000
0.483
0.606
0.676
0.719
0.751
0.775
0.796
0.813
0.828
0.841
0.853
0.864
0.873
0.882
0.891
0.898
0.906
0.912
0.919
0.925
0.931
0.936
0.942
0.947
0.952
0.956
0.961
0.965
0.969
0.973
0.977

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B7)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.981
0.985
0.989
0.992
0.996
0.999
1.002
1.006
1.009
1.012
1.015
1.018
1.021
1.024
1.026
1.029
1.032
1.034
1.037
1.040

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B8)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.019 ft/ft
Manning's n	0.050
Invert (Upstream)	443.00 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
443.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
443.01	0.1	0.01	0.19	0.0	4.04	4.04	0.1
443.04	0.5	0.08	0.47	0.2	4.16	4.18	0.5
443.08	1.0	0.25	0.74	0.3	4.32	4.36	0.9
443.12	1.4	0.48	0.95	0.5	4.48	4.54	1.4
443.16	1.9	0.79	1.14	0.7	4.64	4.72	1.8
443.20	2.4	1.15	1.30	0.9	4.80	4.89	2.2
443.24	2.9	1.57	1.46	1.1	4.96	5.07	2.6
443.28	3.4	2.04	1.60	1.3	5.12	5.25	3.0
443.32	3.8	2.56	1.72	1.5	5.28	5.43	3.4
443.36	4.3	3.14	1.85	1.7	5.44	5.61	3.7
443.40	4.8	3.77	1.96	1.9	5.60	5.79	4.1
443.44	5.3	4.45	2.07	2.1	5.76	5.97	4.5
443.48	5.8	5.18	2.18	2.4	5.92	6.15	4.8
443.52	6.2	5.96	2.28	2.6	6.08	6.33	5.2
443.56	6.7	6.80	2.37	2.9	6.24	6.50	5.5
443.60	7.2	7.69	2.46	3.1	6.40	6.68	5.9
443.64	7.7	8.63	2.55	3.4	6.56	6.86	6.2
443.68	8.2	9.62	2.64	3.6	6.72	7.04	6.5
443.72	8.6	10.67	2.72	3.9	6.88	7.22	6.8
443.76	9.1	11.77	2.81	4.2	7.04	7.40	7.2
443.80	9.6	12.92	2.88	4.5	7.20	7.58	7.5
443.84	10.1	14.13	2.96	4.8	7.36	7.76	7.8
443.88	10.6	15.40	3.04	5.1	7.52	7.94	8.1
443.92	11.0	16.71	3.11	5.4	7.68	8.11	8.4
443.96	11.5	18.09	3.18	5.7	7.84	8.29	8.7
444.00	12.0	19.52	3.25	6.0	8.00	8.47	9.0
444.04	12.5	21.01	3.32	6.3	8.16	8.65	9.3
444.08	13.0	22.56	3.39	6.7	8.32	8.83	9.6
444.12	13.4	24.16	3.46	7.0	8.48	9.01	9.9
444.16	13.9	25.83	3.52	7.3	8.64	9.19	10.2
444.20	14.4	27.55	3.59	7.7	8.80	9.37	10.5
444.24	14.9	29.34	3.65	8.0	8.96	9.55	10.8
444.28	15.4	31.18	3.71	8.4	9.12	9.72	11.0
444.32	15.8	33.09	3.77	8.8	9.28	9.90	11.3
444.36	16.3	35.05	3.84	9.1	9.44	10.08	11.6
444.40	16.8	37.08	3.90	9.5	9.60	10.26	11.9
444.44	17.3	39.18	3.95	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B8)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
444.48	17.8	41.34	4.01	10.3	9.92	10.62	12.5
444.52	18.2	43.56	4.07	10.7	10.08	10.80	12.7
444.56	18.7	45.84	4.13	11.1	10.24	10.98	13.0
444.60	19.2	48.20	4.18	11.5	10.40	11.16	13.3
444.64	19.7	50.62	4.24	11.9	10.56	11.33	13.6
444.68	20.2	53.10	4.29	12.4	10.72	11.51	13.8
444.72	20.6	55.65	4.35	12.8	10.88	11.69	14.1
444.76	21.1	58.28	4.40	13.2	11.04	11.87	14.4
444.80	21.6	60.96	4.46	13.7	11.20	12.05	14.7
444.84	22.1	63.72	4.51	14.1	11.36	12.23	14.9
444.88	22.6	66.55	4.56	14.6	11.52	12.41	15.2
444.92	23.0	69.45	4.61	15.1	11.68	12.59	15.5
444.96	23.5	72.42	4.67	15.5	11.84	12.77	15.7
445.00	24.0	75.46	4.72	16.0	12.00	12.94	16.0

Froude No.
0.000
0.335
0.420
0.468
0.498
0.520
0.537
0.551
0.563
0.573
0.583
0.591
0.598
0.605
0.611
0.617
0.622
0.627
0.632
0.636
0.641
0.645
0.649
0.652
0.656
0.659
0.662
0.665
0.668
0.671
0.674
0.677

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B8)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.680
0.682
0.685
0.687
0.690
0.692
0.694
0.696
0.699
0.701
0.703
0.705
0.707
0.709
0.711
0.713
0.715
0.717
0.718
0.720

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B2)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.012 ft/ft
Manning's n	0.050
Invert (Upstream)	437.80 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
437.80	0.0	0.00	0.00	0.0	0.00	0.00	0.0
437.81	0.1	0.01	0.15	0.0	4.04	4.04	0.1
437.84	0.5	0.06	0.38	0.2	4.16	4.18	0.5
437.88	1.0	0.20	0.60	0.3	4.32	4.36	0.9
437.92	1.4	0.39	0.77	0.5	4.48	4.54	1.4
437.96	1.9	0.64	0.92	0.7	4.64	4.72	1.8
438.00	2.4	0.93	1.05	0.9	4.80	4.89	2.2
438.04	2.9	1.26	1.18	1.1	4.96	5.07	2.6
438.08	3.4	1.64	1.29	1.3	5.12	5.25	3.0
438.12	3.8	2.07	1.39	1.5	5.28	5.43	3.4
438.16	4.3	2.53	1.49	1.7	5.44	5.61	3.7
438.20	4.8	3.04	1.58	1.9	5.60	5.79	4.1
438.24	5.3	3.59	1.67	2.1	5.76	5.97	4.5
438.28	5.8	4.18	1.76	2.4	5.92	6.15	4.8
438.32	6.2	4.82	1.84	2.6	6.08	6.33	5.2
438.36	6.7	5.49	1.92	2.9	6.24	6.50	5.5
438.40	7.2	6.21	1.99	3.1	6.40	6.68	5.9
438.44	7.7	6.97	2.06	3.4	6.56	6.86	6.2
438.48	8.2	7.77	2.13	3.6	6.72	7.04	6.5
438.52	8.6	8.62	2.20	3.9	6.88	7.22	6.8
438.56	9.1	9.50	2.27	4.2	7.04	7.40	7.2
438.60	9.6	10.44	2.33	4.5	7.20	7.58	7.5
438.64	10.1	11.41	2.39	4.8	7.36	7.76	7.8
438.68	10.6	12.43	2.45	5.1	7.52	7.94	8.1
438.72	11.0	13.50	2.51	5.4	7.68	8.11	8.4
438.76	11.5	14.61	2.57	5.7	7.84	8.29	8.7
438.80	12.0	15.76	2.63	6.0	8.00	8.47	9.0
438.84	12.5	16.97	2.68	6.3	8.16	8.65	9.3
438.88	13.0	18.22	2.74	6.7	8.32	8.83	9.6
438.92	13.4	19.51	2.79	7.0	8.48	9.01	9.9
438.96	13.9	20.86	2.84	7.3	8.64	9.19	10.2
439.00	14.4	22.25	2.90	7.7	8.80	9.37	10.5
439.04	14.9	23.69	2.95	8.0	8.96	9.55	10.8
439.08	15.4	25.18	3.00	8.4	9.12	9.72	11.0
439.12	15.8	26.72	3.05	8.8	9.28	9.90	11.3
439.16	16.3	28.31	3.10	9.1	9.44	10.08	11.6
439.20	16.8	29.95	3.15	9.5	9.60	10.26	11.9
439.24	17.3	31.64	3.19	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B2)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
439.28	17.8	33.38	3.24	10.3	9.92	10.62	12.5
439.32	18.2	35.17	3.29	10.7	10.08	10.80	12.7
439.36	18.7	37.02	3.33	11.1	10.24	10.98	13.0
439.40	19.2	38.92	3.38	11.5	10.40	11.16	13.3
439.44	19.7	40.87	3.42	11.9	10.56	11.33	13.6
439.48	20.2	42.88	3.47	12.4	10.72	11.51	13.8
439.52	20.6	44.94	3.51	12.8	10.88	11.69	14.1
439.56	21.1	47.06	3.56	13.2	11.04	11.87	14.4
439.60	21.6	49.23	3.60	13.7	11.20	12.05	14.7
439.64	22.1	51.46	3.64	14.1	11.36	12.23	14.9
439.68	22.6	53.74	3.68	14.6	11.52	12.41	15.2
439.72	23.0	56.08	3.73	15.1	11.68	12.59	15.5
439.76	23.5	58.48	3.77	15.5	11.84	12.77	15.7
439.80	24.0	60.94	3.81	16.0	12.00	12.94	16.0

Froude No.
0.000
0.270
0.339
0.378
0.402
0.420
0.434
0.445
0.455
0.463
0.470
0.477
0.483
0.488
0.493
0.498
0.502
0.507
0.510
0.514
0.517
0.521
0.524
0.527
0.529
0.532
0.535
0.537
0.540
0.542
0.544
0.547

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B2)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.549
0.551
0.553
0.555
0.557
0.559
0.561
0.562
0.564
0.566
0.568
0.569
0.571
0.572
0.574
0.576
0.577
0.579
0.580
0.581

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B4)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.027 ft/ft
Manning's n	0.050
Invert (Upstream)	456.40 ft
Bottom Width	4.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
456.40	0.0	0.00	0.00	0.0	0.00	0.00	0.0
456.41	0.1	0.01	0.22	0.0	4.04	4.04	0.1
456.44	0.5	0.09	0.56	0.2	4.16	4.18	0.5
456.48	1.0	0.29	0.87	0.3	4.32	4.36	0.9
456.52	1.4	0.57	1.13	0.5	4.48	4.54	1.4
456.56	1.9	0.93	1.35	0.7	4.64	4.72	1.8
456.60	2.4	1.36	1.55	0.9	4.80	4.89	2.2
456.64	2.9	1.85	1.73	1.1	4.96	5.07	2.6
456.68	3.4	2.41	1.89	1.3	5.12	5.25	3.0
456.72	3.8	3.04	2.04	1.5	5.28	5.43	3.4
456.76	4.3	3.72	2.19	1.7	5.44	5.61	3.7
456.80	4.8	4.46	2.33	1.9	5.60	5.79	4.1
456.84	5.3	5.27	2.45	2.1	5.76	5.97	4.5
456.88	5.8	6.14	2.58	2.4	5.92	6.15	4.8
456.92	6.2	7.07	2.70	2.6	6.08	6.33	5.2
456.96	6.7	8.06	2.81	2.9	6.24	6.50	5.5
457.00	7.2	9.11	2.92	3.1	6.40	6.68	5.9
457.04	7.7	10.23	3.03	3.4	6.56	6.86	6.2
457.08	8.2	11.40	3.13	3.6	6.72	7.04	6.5
457.12	8.6	12.64	3.23	3.9	6.88	7.22	6.8
457.16	9.1	13.95	3.32	4.2	7.04	7.40	7.2
457.20	9.6	15.31	3.42	4.5	7.20	7.58	7.5
457.24	10.1	16.75	3.51	4.8	7.36	7.76	7.8
457.28	10.6	18.24	3.60	5.1	7.52	7.94	8.1
457.32	11.0	19.81	3.69	5.4	7.68	8.11	8.4
457.36	11.5	21.44	3.77	5.7	7.84	8.29	8.7
457.40	12.0	23.13	3.86	6.0	8.00	8.47	9.0
457.44	12.5	24.90	3.94	6.3	8.16	8.65	9.3
457.48	13.0	26.73	4.02	6.7	8.32	8.83	9.6
457.52	13.4	28.64	4.10	7.0	8.48	9.01	9.9
457.56	13.9	30.61	4.17	7.3	8.64	9.19	10.2
457.60	14.4	32.65	4.25	7.7	8.80	9.37	10.5
457.64	14.9	34.76	4.33	8.0	8.96	9.55	10.8
457.68	15.4	36.95	4.40	8.4	9.12	9.72	11.0
457.72	15.8	39.21	4.47	8.8	9.28	9.90	11.3
457.76	16.3	41.54	4.55	9.1	9.44	10.08	11.6
457.80	16.8	43.95	4.62	9.5	9.60	10.26	11.9
457.84	17.3	46.43	4.69	9.9	9.76	10.44	12.2

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B4)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
457.88	17.8	48.99	4.76	10.3	9.92	10.62	12.5
457.92	18.2	51.62	4.82	10.7	10.08	10.80	12.7
457.96	18.7	54.33	4.89	11.1	10.24	10.98	13.0
458.00	19.2	57.12	4.96	11.5	10.40	11.16	13.3
458.04	19.7	59.98	5.02	11.9	10.56	11.33	13.6
458.08	20.2	62.93	5.09	12.4	10.72	11.51	13.8
458.12	20.6	65.96	5.15	12.8	10.88	11.69	14.1
458.16	21.1	69.06	5.22	13.2	11.04	11.87	14.4
458.20	21.6	72.25	5.28	13.7	11.20	12.05	14.7
458.24	22.1	75.52	5.34	14.1	11.36	12.23	14.9
458.28	22.6	78.87	5.41	14.6	11.52	12.41	15.2
458.32	23.0	82.31	5.47	15.1	11.68	12.59	15.5
458.36	23.5	85.83	5.53	15.5	11.84	12.77	15.7
458.40	24.0	89.43	5.59	16.0	12.00	12.94	16.0

Froude No.
0.000
0.396
0.497
0.555
0.590
0.616
0.637
0.653
0.667
0.680
0.690
0.700
0.709
0.717
0.724
0.731
0.737
0.743
0.749
0.754
0.759
0.764
0.769
0.773
0.777
0.781
0.785
0.789
0.792
0.796
0.799
0.802

Subsection: Trapezoidal Channel.
Label: On-Site Stream (R-B4)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.805
0.809
0.812
0.814
0.817
0.820
0.823
0.825
0.828
0.831
0.833
0.835
0.838
0.840
0.842
0.845
0.847
0.849
0.851
0.853

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3c)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.011 ft/ft
Manning's n	0.040
Invert (Upstream)	409.30 ft
Bottom Width	17.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
409.30	0.0	0.00	0.00	0.0	0.00	0.00	0.0
409.31	0.1	0.03	0.18	0.2	17.04	17.04	0.1
409.36	0.7	0.62	0.61	1.0	17.24	17.27	0.7
409.42	1.4	1.98	0.96	2.1	17.48	17.54	1.4
409.48	2.2	3.89	1.24	3.1	17.72	17.80	2.1
409.54	2.9	6.29	1.50	4.2	17.96	18.07	2.8
409.60	3.6	9.14	1.73	5.3	18.20	18.34	3.5
409.66	4.3	12.41	1.95	6.4	18.44	18.61	4.2
409.72	5.0	16.07	2.14	7.5	18.68	18.88	4.8
409.78	5.8	20.11	2.33	8.6	18.92	19.15	5.5
409.84	6.5	24.52	2.51	9.8	19.16	19.41	6.1
409.90	7.2	29.28	2.68	10.9	19.40	19.68	6.8
409.96	7.9	34.39	2.84	12.1	19.64	19.95	7.4
410.02	8.6	39.83	3.00	13.3	19.88	20.22	8.0
410.08	9.4	45.61	3.15	14.5	20.12	20.49	8.6
410.14	10.1	51.71	3.30	15.7	20.36	20.76	9.2
410.20	10.8	58.14	3.44	16.9	20.60	21.02	9.9
410.26	11.5	64.88	3.57	18.2	20.84	21.29	10.5
410.32	12.2	71.93	3.70	19.4	21.08	21.56	11.1
410.38	13.0	79.30	3.83	20.7	21.32	21.83	11.6
410.44	13.7	86.97	3.96	22.0	21.56	22.10	12.2
410.50	14.4	94.95	4.08	23.3	21.80	22.37	12.8
410.56	15.1	103.24	4.20	24.6	22.04	22.63	13.4
410.62	15.8	111.82	4.31	25.9	22.28	22.90	14.0
410.68	16.6	120.71	4.43	27.3	22.52	23.17	14.5
410.74	17.3	129.89	4.54	28.6	22.76	23.44	15.1
410.80	18.0	139.38	4.65	30.0	23.00	23.71	15.7
410.86	18.7	149.16	4.75	31.4	23.24	23.98	16.2
410.92	19.4	159.24	4.86	32.8	23.48	24.24	16.8
410.98	20.2	169.62	4.96	34.2	23.72	24.51	17.3
411.04	20.9	180.29	5.06	35.6	23.96	24.78	17.8
411.10	21.6	191.26	5.16	37.1	24.20	25.05	18.4
411.16	22.3	202.53	5.26	38.5	24.44	25.32	18.9
411.22	23.0	214.09	5.35	40.0	24.68	25.59	19.5
411.28	23.8	225.94	5.44	41.5	24.92	25.85	20.0
411.34	24.5	238.09	5.54	43.0	25.16	26.12	20.5
411.40	25.2	250.54	5.63	44.5	25.40	26.39	21.0
411.46	25.9	263.29	5.72	46.1	25.64	26.66	21.6

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3c)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
411.52	26.6	276.33	5.81	47.6	25.88	26.93	22.1
411.58	27.4	289.66	5.89	49.2	26.12	27.20	22.6
411.64	28.1	303.30	5.98	50.7	26.36	27.46	23.1
411.70	28.8	317.23	6.06	52.3	26.60	27.73	23.6
411.76	29.5	331.46	6.15	53.9	26.84	28.00	24.1
411.82	30.2	345.99	6.23	55.5	27.08	28.27	24.6
411.88	31.0	360.83	6.31	57.2	27.32	28.54	25.1
411.94	31.7	375.96	6.39	58.8	27.56	28.81	25.6
412.00	32.4	391.39	6.47	60.5	27.80	29.07	26.1
412.06	33.1	407.12	6.55	62.2	28.04	29.34	26.6
412.12	33.8	423.16	6.63	63.8	28.28	29.61	27.1
412.18	34.6	439.50	6.70	65.5	28.52	29.88	27.6
412.24	35.3	456.14	6.78	67.3	28.76	30.15	28.1
412.30	36.0	473.09	6.86	69.0	29.00	30.42	28.6

Froude No.
0.000
0.325
0.437
0.490
0.523
0.547
0.567
0.583
0.597
0.609
0.620
0.630
0.639
0.647
0.655
0.662
0.668
0.675
0.680
0.686
0.691
0.696
0.700
0.705
0.709
0.713
0.717
0.721
0.725
0.728
0.731
0.735

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3c)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.738
0.741
0.744
0.747
0.749
0.752
0.755
0.757
0.760
0.762
0.765
0.767
0.769
0.771
0.773
0.776
0.778
0.780
0.782
0.784

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3b)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.023 ft/ft
Manning's n	0.040
Invert (Upstream)	419.00 ft
Bottom Width	17.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
419.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
419.01	0.1	0.04	0.26	0.2	17.04	17.04	0.1
419.06	0.7	0.88	0.86	1.0	17.24	17.27	0.7
419.12	1.4	2.81	1.36	2.1	17.48	17.54	1.4
419.18	2.2	5.53	1.77	3.1	17.72	17.80	2.1
419.24	2.9	8.95	2.13	4.2	17.96	18.07	2.8
419.30	3.6	13.00	2.46	5.3	18.20	18.34	3.5
419.36	4.3	17.64	2.77	6.4	18.44	18.61	4.2
419.42	5.0	22.85	3.05	7.5	18.68	18.88	4.8
419.48	5.8	28.59	3.32	8.6	18.92	19.15	5.5
419.54	6.5	34.85	3.57	9.8	19.16	19.41	6.1
419.60	7.2	41.62	3.81	10.9	19.40	19.68	6.8
419.66	7.9	48.88	4.04	12.1	19.64	19.95	7.4
419.72	8.6	56.62	4.26	13.3	19.88	20.22	8.0
419.78	9.4	64.84	4.48	14.5	20.12	20.49	8.6
419.84	10.1	73.51	4.68	15.7	20.36	20.76	9.2
419.90	10.8	82.64	4.88	16.9	20.60	21.02	9.9
419.96	11.5	92.23	5.08	18.2	20.84	21.29	10.5
420.02	12.2	102.26	5.27	19.4	21.08	21.56	11.1
420.08	13.0	112.73	5.45	20.7	21.32	21.83	11.6
420.14	13.7	123.64	5.63	22.0	21.56	22.10	12.2
420.20	14.4	134.98	5.80	23.3	21.80	22.37	12.8
420.26	15.1	146.76	5.97	24.6	22.04	22.63	13.4
420.32	15.8	158.96	6.13	25.9	22.28	22.90	14.0
420.38	16.6	171.59	6.29	27.3	22.52	23.17	14.5
420.44	17.3	184.65	6.45	28.6	22.76	23.44	15.1
420.50	18.0	198.14	6.60	30.0	23.00	23.71	15.7
420.56	18.7	212.04	6.76	31.4	23.24	23.98	16.2
420.62	19.4	226.37	6.90	32.8	23.48	24.24	16.8
420.68	20.2	241.12	7.05	34.2	23.72	24.51	17.3
420.74	20.9	256.30	7.19	35.6	23.96	24.78	17.8
420.80	21.6	271.89	7.33	37.1	24.20	25.05	18.4
420.86	22.3	287.90	7.47	38.5	24.44	25.32	18.9
420.92	23.0	304.34	7.61	40.0	24.68	25.59	19.5
420.98	23.8	321.19	7.74	41.5	24.92	25.85	20.0
421.04	24.5	338.47	7.87	43.0	25.16	26.12	20.5
421.10	25.2	356.16	8.00	44.5	25.40	26.39	21.0
421.16	25.9	374.28	8.13	46.1	25.64	26.66	21.6

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3b)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
421.22	26.6	392.82	8.25	47.6	25.88	26.93	22.1
421.28	27.4	411.78	8.38	49.2	26.12	27.20	22.6
421.34	28.1	431.16	8.50	50.7	26.36	27.46	23.1
421.40	28.8	450.97	8.62	52.3	26.60	27.73	23.6
421.46	29.5	471.20	8.74	53.9	26.84	28.00	24.1
421.52	30.2	491.85	8.86	55.5	27.08	28.27	24.6
421.58	31.0	512.93	8.97	57.2	27.32	28.54	25.1
421.64	31.7	534.44	9.09	58.8	27.56	28.81	25.6
421.70	32.4	556.38	9.20	60.5	27.80	29.07	26.1
421.76	33.1	578.75	9.31	62.2	28.04	29.34	26.6
421.82	33.8	601.54	9.42	63.8	28.28	29.61	27.1
421.88	34.6	624.77	9.53	65.5	28.52	29.88	27.6
421.94	35.3	648.43	9.64	67.3	28.76	30.15	28.1
422.00	36.0	672.52	9.75	69.0	29.00	30.42	28.6

Froude No.
0.000
0.462
0.621
0.696
0.743
0.778
0.806
0.829
0.849
0.866
0.882
0.896
0.908
0.920
0.931
0.941
0.950
0.959
0.967
0.975
0.982
0.989
0.996
1.002
1.008
1.014
1.020
1.025
1.030
1.035
1.040
1.044

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A3b)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
1.049
1.053
1.057
1.061
1.065
1.069
1.073
1.077
1.080
1.084
1.087
1.090
1.093
1.097
1.100
1.103
1.106
1.108
1.111
1.114

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.002 ft/ft
Manning's n	0.040
Invert (Upstream)	403.30 ft
Bottom Width	17.00 ft
Right Side Slope	2.000 H:V
Left Side Slope	2.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
403.30	0.0	0.00	0.00	0.0	0.00	0.00	0.0
403.31	0.1	0.01	0.08	0.2	17.04	17.04	0.1
403.36	0.7	0.27	0.26	1.0	17.24	17.27	0.7
403.42	1.4	0.85	0.41	2.1	17.48	17.54	1.4
403.48	2.2	1.68	0.54	3.1	17.72	17.80	2.1
403.54	2.9	2.72	0.65	4.2	17.96	18.07	2.8
403.60	3.6	3.95	0.75	5.3	18.20	18.34	3.5
403.66	4.3	5.36	0.84	6.4	18.44	18.61	4.2
403.72	5.0	6.94	0.93	7.5	18.68	18.88	4.8
403.78	5.8	8.69	1.01	8.6	18.92	19.15	5.5
403.84	6.5	10.59	1.08	9.8	19.16	19.41	6.1
403.90	7.2	12.65	1.16	10.9	19.40	19.68	6.8
403.96	7.9	14.85	1.23	12.1	19.64	19.95	7.4
404.02	8.6	17.20	1.30	13.3	19.88	20.22	8.0
404.08	9.4	19.70	1.36	14.5	20.12	20.49	8.6
404.14	10.1	22.33	1.42	15.7	20.36	20.76	9.2
404.20	10.8	25.11	1.48	16.9	20.60	21.02	9.9
404.26	11.5	28.02	1.54	18.2	20.84	21.29	10.5
404.32	12.2	31.07	1.60	19.4	21.08	21.56	11.1
404.38	13.0	34.25	1.66	20.7	21.32	21.83	11.6
404.44	13.7	37.56	1.71	22.0	21.56	22.10	12.2
404.50	14.4	41.01	1.76	23.3	21.80	22.37	12.8
404.56	15.1	44.59	1.81	24.6	22.04	22.63	13.4
404.62	15.8	48.30	1.86	25.9	22.28	22.90	14.0
404.68	16.6	52.14	1.91	27.3	22.52	23.17	14.5
404.74	17.3	56.10	1.96	28.6	22.76	23.44	15.1
404.80	18.0	60.20	2.01	30.0	23.00	23.71	15.7
404.86	18.7	64.43	2.05	31.4	23.24	23.98	16.2
404.92	19.4	68.78	2.10	32.8	23.48	24.24	16.8
404.98	20.2	73.26	2.14	34.2	23.72	24.51	17.3
405.04	20.9	77.87	2.19	35.6	23.96	24.78	17.8
405.10	21.6	82.61	2.23	37.1	24.20	25.05	18.4
405.16	22.3	87.47	2.27	38.5	24.44	25.32	18.9
405.22	23.0	92.47	2.31	40.0	24.68	25.59	19.5
405.28	23.8	97.59	2.35	41.5	24.92	25.85	20.0
405.34	24.5	102.84	2.39	43.0	25.16	26.12	20.5
405.40	25.2	108.21	2.43	44.5	25.40	26.39	21.0
405.46	25.9	113.72	2.47	46.1	25.64	26.66	21.6

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
405.52	26.6	119.35	2.51	47.6	25.88	26.93	22.1
405.58	27.4	125.11	2.55	49.2	26.12	27.20	22.6
405.64	28.1	131.00	2.58	50.7	26.36	27.46	23.1
405.70	28.8	137.02	2.62	52.3	26.60	27.73	23.6
405.76	29.5	143.16	2.65	53.9	26.84	28.00	24.1
405.82	30.2	149.44	2.69	55.5	27.08	28.27	24.6
405.88	31.0	155.84	2.73	57.2	27.32	28.54	25.1
405.94	31.7	162.38	2.76	58.8	27.56	28.81	25.6
406.00	32.4	169.04	2.80	60.5	27.80	29.07	26.1
406.06	33.1	175.84	2.83	62.2	28.04	29.34	26.6
406.12	33.8	182.77	2.86	63.8	28.28	29.61	27.1
406.18	34.6	189.82	2.90	65.5	28.52	29.88	27.6
406.24	35.3	197.01	2.93	67.3	28.76	30.15	28.1
406.30	36.0	204.33	2.96	69.0	29.00	30.42	28.6

Froude No.
0.000
0.140
0.189
0.211
0.226
0.236
0.245
0.252
0.258
0.263
0.268
0.272
0.276
0.280
0.283
0.286
0.289
0.291
0.294
0.296
0.298
0.301
0.303
0.304
0.306
0.308
0.310
0.311
0.313
0.314
0.316
0.317

Subsection: Trapezoidal Channel.
Label: Otterkill Creek (R-A)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.319
0.320
0.321
0.322
0.324
0.325
0.326
0.327
0.328
0.329
0.330
0.331
0.332
0.333
0.334
0.335
0.336
0.337
0.338
0.338

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-B10)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.050 ft/ft
Manning's n	0.240
Invert (Upstream)	453.00 ft
Bottom Width	50.00 ft
Right Side Slope	5.000 H:V
Left Side Slope	5.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
453.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
453.01	0.1	0.06	0.13	0.5	50.10	50.10	0.1
453.04	0.5	0.65	0.32	2.0	50.40	50.41	0.5
453.08	1.0	2.05	0.51	4.0	50.80	50.82	1.0
453.12	1.4	4.04	0.66	6.1	51.20	51.22	1.4
453.16	1.9	6.53	0.80	8.1	51.60	51.63	1.9
453.20	2.4	9.48	0.93	10.2	52.00	52.04	2.4
453.24	2.9	12.87	1.05	12.3	52.40	52.45	2.8
453.28	3.4	16.66	1.16	14.4	52.80	52.86	3.3
453.32	3.8	20.84	1.26	16.5	53.20	53.26	3.7
453.36	4.3	25.40	1.36	18.6	53.60	53.67	4.2
453.40	4.8	30.32	1.46	20.8	54.00	54.08	4.6
453.44	5.3	35.58	1.55	23.0	54.40	54.49	5.1
453.48	5.8	41.19	1.64	25.2	54.80	54.90	5.5
453.52	6.2	47.14	1.72	27.4	55.20	55.30	5.9
453.56	6.7	53.41	1.81	29.6	55.60	55.71	6.4
453.60	7.2	60.01	1.89	31.8	56.00	56.12	6.8
453.64	7.7	66.92	1.97	34.0	56.40	56.53	7.2
453.68	8.2	74.14	2.04	36.3	56.80	56.93	7.7
453.72	8.6	81.67	2.12	38.6	57.20	57.34	8.1
453.76	9.1	89.51	2.19	40.9	57.60	57.75	8.5
453.80	9.6	97.64	2.26	43.2	58.00	58.16	8.9
453.84	10.1	106.07	2.33	45.5	58.40	58.57	9.4
453.88	10.6	114.80	2.40	47.9	58.80	58.97	9.8
453.92	11.0	123.81	2.46	50.2	59.20	59.38	10.2
453.96	11.5	133.12	2.53	52.6	59.60	59.79	10.6
454.00	12.0	142.71	2.59	55.0	60.00	60.20	11.0
454.04	12.5	152.59	2.66	57.4	60.40	60.61	11.4
454.08	13.0	162.75	2.72	59.8	60.80	61.01	11.8
454.12	13.4	173.19	2.78	62.3	61.20	61.42	12.2
454.16	13.9	183.91	2.84	64.7	61.60	61.83	12.6
454.20	14.4	194.90	2.90	67.2	62.00	62.24	13.0
454.24	14.9	206.18	2.96	69.7	62.40	62.65	13.4
454.28	15.4	217.73	3.02	72.2	62.80	63.05	13.8
454.32	15.8	229.55	3.07	74.7	63.20	63.46	14.2
454.36	16.3	241.65	3.13	77.2	63.60	63.87	14.6
454.40	16.8	254.02	3.18	79.8	64.00	64.28	15.0
454.44	17.3	266.67	3.24	82.4	64.40	64.69	15.3

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-B10)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
454.48	17.8	279.58	3.29	85.0	64.80	65.09	15.7
454.52	18.2	292.76	3.34	87.6	65.20	65.50	16.1
454.56	18.7	306.22	3.40	90.2	65.60	65.91	16.5
454.60	19.2	319.94	3.45	92.8	66.00	66.32	16.9
454.64	19.7	333.93	3.50	95.4	66.40	66.72	17.2
454.68	20.2	348.19	3.55	98.1	66.80	67.13	17.6
454.72	20.6	362.72	3.60	100.8	67.20	67.54	18.0
454.76	21.1	377.52	3.65	103.5	67.60	67.95	18.4
454.80	21.6	392.58	3.70	106.2	68.00	68.36	18.7
454.84	22.1	407.91	3.74	108.9	68.40	68.76	19.1
454.88	22.6	423.51	3.79	111.7	68.80	69.17	19.5
454.92	23.0	439.37	3.84	114.4	69.20	69.58	19.8
454.96	23.5	455.50	3.89	117.2	69.60	69.99	20.2
455.00	24.0	471.89	3.93	120.0	70.00	70.40	20.6

Froude No.
0.000
0.225
0.284
0.318
0.340
0.357
0.370
0.381
0.391
0.399
0.407
0.414
0.420
0.426
0.432
0.437
0.441
0.446
0.450
0.454
0.458
0.462
0.465
0.469
0.472
0.475
0.478
0.481
0.483
0.486
0.489
0.491

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-B10)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.494
0.496
0.498
0.500
0.503
0.505
0.507
0.509
0.511
0.513
0.514
0.516
0.518
0.520
0.521
0.523
0.525
0.526
0.528
0.530

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-A89)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.048 ft/ft
Manning's n	0.240
Invert (Upstream)	460.00 ft
Bottom Width	50.00 ft
Right Side Slope	5.000 H:V
Left Side Slope	5.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
460.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
460.01	0.1	0.06	0.13	0.5	50.10	50.10	0.1
460.04	0.5	0.63	0.32	2.0	50.40	50.41	0.5
460.08	1.0	2.01	0.50	4.0	50.80	50.82	1.0
460.12	1.4	3.96	0.65	6.1	51.20	51.22	1.4
460.16	1.9	6.41	0.79	8.1	51.60	51.63	1.9
460.20	2.4	9.30	0.91	10.2	52.00	52.04	2.4
460.24	2.9	12.62	1.03	12.3	52.40	52.45	2.8
460.28	3.4	16.34	1.14	14.4	52.80	52.86	3.3
460.32	3.8	20.44	1.24	16.5	53.20	53.26	3.7
460.36	4.3	24.91	1.34	18.6	53.60	53.67	4.2
460.40	4.8	29.73	1.43	20.8	54.00	54.08	4.6
460.44	5.3	34.90	1.52	23.0	54.40	54.49	5.1
460.48	5.8	40.40	1.61	25.2	54.80	54.90	5.5
460.52	6.2	46.24	1.69	27.4	55.20	55.30	5.9
460.56	6.7	52.39	1.77	29.6	55.60	55.71	6.4
460.60	7.2	58.86	1.85	31.8	56.00	56.12	6.8
460.64	7.7	65.64	1.93	34.0	56.40	56.53	7.2
460.68	8.2	72.72	2.00	36.3	56.80	56.93	7.7
460.72	8.6	80.11	2.08	38.6	57.20	57.34	8.1
460.76	9.1	87.79	2.15	40.9	57.60	57.75	8.5
460.80	9.6	95.77	2.22	43.2	58.00	58.16	8.9
460.84	10.1	104.04	2.29	45.5	58.40	58.57	9.4
460.88	10.6	112.60	2.35	47.9	58.80	58.97	9.8
460.92	11.0	121.44	2.42	50.2	59.20	59.38	10.2
460.96	11.5	130.57	2.48	52.6	59.60	59.79	10.6
461.00	12.0	139.97	2.54	55.0	60.00	60.20	11.0
461.04	12.5	149.66	2.61	57.4	60.40	60.61	11.4
461.08	13.0	159.63	2.67	59.8	60.80	61.01	11.8
461.12	13.4	169.87	2.73	62.3	61.20	61.42	12.2
461.16	13.9	180.38	2.79	64.7	61.60	61.83	12.6
461.20	14.4	191.17	2.84	67.2	62.00	62.24	13.0
461.24	14.9	202.23	2.90	69.7	62.40	62.65	13.4
461.28	15.4	213.55	2.96	72.2	62.80	63.05	13.8
461.32	15.8	225.15	3.01	74.7	63.20	63.46	14.2
461.36	16.3	237.02	3.07	77.2	63.60	63.87	14.6
461.40	16.8	249.15	3.12	79.8	64.00	64.28	15.0
461.44	17.3	261.55	3.18	82.4	64.40	64.69	15.3

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-A89)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft^3/s)	Velocity (ft/s)	Area (ft^2)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
461.48	17.8	274.22	3.23	85.0	64.80	65.09	15.7
461.52	18.2	287.15	3.28	87.6	65.20	65.50	16.1
461.56	18.7	300.35	3.33	90.2	65.60	65.91	16.5
461.60	19.2	313.81	3.38	92.8	66.00	66.32	16.9
461.64	19.7	327.53	3.43	95.4	66.40	66.72	17.2
461.68	20.2	341.52	3.48	98.1	66.80	67.13	17.6
461.72	20.6	355.77	3.53	100.8	67.20	67.54	18.0
461.76	21.1	370.28	3.58	103.5	67.60	67.95	18.4
461.80	21.6	385.05	3.63	106.2	68.00	68.36	18.7
461.84	22.1	400.09	3.67	108.9	68.40	68.76	19.1
461.88	22.6	415.39	3.72	111.7	68.80	69.17	19.5
461.92	23.0	430.94	3.77	114.4	69.20	69.58	19.8
461.96	23.5	446.76	3.81	117.2	69.60	69.99	20.2
462.00	24.0	462.84	3.86	120.0	70.00	70.40	20.6

Froude No.
0.000
0.221
0.278
0.312
0.334
0.350
0.363
0.374
0.383
0.392
0.399
0.406
0.412
0.418
0.423
0.428
0.433
0.437
0.442
0.446
0.449
0.453
0.456
0.460
0.463
0.466
0.469
0.471
0.474
0.477
0.479
0.482

Subsection: Trapezoidal Channel.
Label: Sheet Flow (R-A89)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.484
0.486
0.489
0.491
0.493
0.495
0.497
0.499
0.501
0.503
0.505
0.506
0.508
0.510
0.511
0.513
0.515
0.516
0.518
0.519

Subsection: Trapezoidal Channel.
Label: Sheet Flow (Reach A2)

Return Event: 1 years
Storm Event: 1-Year

Trapezoidal Channel.	
Slope	0.063 ft/ft
Manning's n	0.240
Invert (Upstream)	423.00 ft
Bottom Width	50.00 ft
Right Side Slope	5.000 H:V
Left Side Slope	5.000 H:V

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
423.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0
423.01	0.1	0.07	0.14	0.5	50.10	50.10	0.1
423.04	0.5	0.73	0.36	2.0	50.40	50.41	0.5
423.08	1.0	2.32	0.58	4.0	50.80	50.82	1.0
423.12	1.4	4.57	0.75	6.1	51.20	51.22	1.4
423.16	1.9	7.39	0.91	8.1	51.60	51.63	1.9
423.20	2.4	10.73	1.05	10.2	52.00	52.04	2.4
423.24	2.9	14.56	1.19	12.3	52.40	52.45	2.8
423.28	3.4	18.85	1.31	14.4	52.80	52.86	3.3
423.32	3.8	23.58	1.43	16.5	53.20	53.26	3.7
423.36	4.3	28.74	1.54	18.6	53.60	53.67	4.2
423.40	4.8	34.30	1.65	20.8	54.00	54.08	4.6
423.44	5.3	40.26	1.75	23.0	54.40	54.49	5.1
423.48	5.8	46.61	1.85	25.2	54.80	54.90	5.5
423.52	6.2	53.34	1.95	27.4	55.20	55.30	5.9
423.56	6.7	60.44	2.04	29.6	55.60	55.71	6.4
423.60	7.2	67.90	2.14	31.8	56.00	56.12	6.8
423.64	7.7	75.72	2.22	34.0	56.40	56.53	7.2
423.68	8.2	83.90	2.31	36.3	56.80	56.93	7.7
423.72	8.6	92.42	2.39	38.6	57.20	57.34	8.1
423.76	9.1	101.28	2.48	40.9	57.60	57.75	8.5
423.80	9.6	110.49	2.56	43.2	58.00	58.16	8.9
423.84	10.1	120.03	2.64	45.5	58.40	58.57	9.4
423.88	10.6	129.90	2.71	47.9	58.80	58.97	9.8
423.92	11.0	140.10	2.79	50.2	59.20	59.38	10.2
423.96	11.5	150.63	2.86	52.6	59.60	59.79	10.6
424.00	12.0	161.48	2.94	55.0	60.00	60.20	11.0
424.04	12.5	172.66	3.01	57.4	60.40	60.61	11.4
424.08	13.0	184.15	3.08	59.8	60.80	61.01	11.8
424.12	13.4	195.97	3.15	62.3	61.20	61.42	12.2
424.16	13.9	208.10	3.21	64.7	61.60	61.83	12.6
424.20	14.4	220.54	3.28	67.2	62.00	62.24	13.0
424.24	14.9	233.30	3.35	69.7	62.40	62.65	13.4
424.28	15.4	246.37	3.41	72.2	62.80	63.05	13.8
424.32	15.8	259.75	3.48	74.7	63.20	63.46	14.2
424.36	16.3	273.44	3.54	77.2	63.60	63.87	14.6
424.40	16.8	287.44	3.60	79.8	64.00	64.28	15.0
424.44	17.3	301.74	3.66	82.4	64.40	64.69	15.3

Subsection: Trapezoidal Channel.
Label: Sheet Flow (Reach A2)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Elevation (ft)	Depth (in)	Flow (ft³/s)	Velocity (ft/s)	Area (ft²)	Top Width (ft)	Wetted Perimeter (ft)	Head (in)
424.48	17.8	316.35	3.72	85.0	64.80	65.09	15.7
424.52	18.2	331.27	3.78	87.6	65.20	65.50	16.1
424.56	18.7	346.50	3.84	90.2	65.60	65.91	16.5
424.60	19.2	362.03	3.90	92.8	66.00	66.32	16.9
424.64	19.7	377.86	3.96	95.4	66.40	66.72	17.2
424.68	20.2	393.99	4.02	98.1	66.80	67.13	17.6
424.72	20.6	410.43	4.07	100.8	67.20	67.54	18.0
424.76	21.1	427.17	4.13	103.5	67.60	67.95	18.4
424.80	21.6	444.22	4.18	106.2	68.00	68.36	18.7
424.84	22.1	461.56	4.24	108.9	68.40	68.76	19.1
424.88	22.6	479.21	4.29	111.7	68.80	69.17	19.5
424.92	23.0	497.16	4.34	114.4	69.20	69.58	19.8
424.96	23.5	515.41	4.40	117.2	69.60	69.99	20.2
425.00	24.0	533.96	4.45	120.0	70.00	70.40	20.6

Froude No.
0.000
0.255
0.321
0.360
0.385
0.404
0.419
0.431
0.442
0.452
0.461
0.468
0.476
0.482
0.488
0.494
0.500
0.505
0.509
0.514
0.518
0.522
0.526
0.530
0.534
0.537
0.541
0.544
0.547
0.550
0.553
0.556

Subsection: Trapezoidal Channel.
Label: Sheet Flow (Reach A2)

Return Event: 1 years
Storm Event: 1-Year

Solution to Mannings Open Channel Flow Equation
(Computed values are based on normal depth.)

Trapezoidal Cross Section

Froude No.
0.558
0.561
0.564
0.566
0.569
0.571
0.573
0.576
0.578
0.580
0.582
0.584
0.586
0.588
0.590
0.592
0.594
0.596
0.597
0.599

Subsection: Elevation-Area Volume Curve
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft^2)	Area (ft^2)	A1+A2+sqr (A1*A2) (ft^2)	Volume (ac-ft)	Volume (Total) (ac-ft)
423.00	0.0	3,040	0	0.000	0.000
425.90	0.0	3,040	9,120	0.202	0.202
426.00	0.0	15,200	25,038	0.019	0.222
429.00	0.0	24,300	58,719	1.348	1.570

Subsection: Elevation-Area Volume Curve
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
569.00	0.0	1,660	0	0.000	0.000
571.90	0.0	1,660	4,980	0.111	0.111
572.00	0.0	8,300	13,672	0.010	0.121
575.00	0.0	14,980	34,431	0.790	0.911

Subsection: Elevation-Area Volume Curve
Label: Bio B2

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
444.00	0.0	476	0	0.000	0.000
446.90	0.0	476	1,428	0.032	0.032
447.00	0.0	2,380	3,920	0.003	0.035
449.00	0.0	7,400	13,977	0.214	0.249

Subsection: Elevation-Area Volume Curve
Label: Bio B3

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
454.00	0.0	570	0	0.000	0.000
456.90	0.0	570	1,710	0.038	0.038
457.00	0.0	2,850	4,695	0.004	0.042
459.00	0.0	6,180	13,227	0.202	0.244

Subsection: Elevation-Area Volume Curve
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
484.50	0.0	362	0	0.000	0.000
487.40	0.0	362	1,086	0.024	0.024
487.50	0.0	1,810	2,981	0.002	0.026
490.00	0.0	4,332	8,942	0.171	0.197

Subsection: Elevation-Area Volume Curve
Label: Bio B6

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
538.00	0.0	1,522	0	0.000	0.000
540.90	0.0	1,522	4,566	0.101	0.101
541.00	0.0	7,610	12,535	0.010	0.111
544.00	0.0	13,400	31,108	0.714	0.825

Subsection: Elevation-Area Volume Curve
Label: Bio B7

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
466.00	0.0	5,920	0	0.000	0.000
468.90	0.0	5,920	17,760	0.394	0.394
469.00	0.0	29,600	48,758	0.037	0.431
471.00	0.0	35,516	97,539	1.493	1.924

Subsection: Elevation-Area Volume Curve
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft^2)	Area (ft^2)	A1+A2+sqr (A1*A2) (ft^2)	Volume (ac-ft)	Volume (Total) (ac-ft)
490.00	0.0	1,060	0	0.000	0.000
492.90	0.0	1,060	3,180	0.071	0.071
493.00	0.0	5,300	8,730	0.007	0.077
498.00	0.0	11,080	24,043	0.920	0.997

Subsection: Elevation-Area Volume Curve
Label: Bio/Sand A9

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft^2)	Area (ft^2)	A1+A2+sqr (A1*A2) (ft^2)	Volume (ac-ft)	Volume (Total) (ac-ft)
545.50	0.0	1,672	0	0.000	0.000
548.90	0.0	1,672	5,016	0.131	0.131
549.00	0.0	2,280	5,904	0.005	0.135
549.50	0.0	7,600	14,043	0.054	0.189
552.50	0.0	15,034	33,323	0.765	0.954
553.50	0.0	22,400	55,785	0.427	1.381

Subsection: Elevation-Area Volume Curve
Label: Existing Pond

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
423.60	0.0	15	0	0.000	0.000
426.00	0.0	1,183	1,331	0.024	0.024
427.42	0.0	99,914	111,969	1.217	1.241
428.00	0.0	177,856	411,075	1.824	3.066
430.00	0.0	338,817	762,153	11.664	14.730
432.00	0.0	574,540	1,354,564	20.731	35.461

Subsection: Elevation-Area Volume Curve
Label: Existing Wetland

Return Event: 1 years
Storm Event: 1-Year

Elevation (ft)	Planimeter (ft²)	Area (ft²)	A1+A2+sqr (A1*A2) (ft²)	Volume (ac-ft)	Volume (Total) (ac-ft)
398.60	0.0	15	0	0.000	0.000
400.00	0.0	49,029	49,902	0.535	0.535
402.00	0.0	924,426	1,186,349	18.157	18.691
404.00	0.0	2,356,075	4,756,312	72.793	91.484
406.00	0.0	2,902,287	7,873,320	120.498	211.982
408.00	0.0	3,636,662	9,787,739	149.797	361.779

Subsection: Storage Chamber System
Label: UG A3

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft³/ft)
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14
3.83	0.10
3.92	0.06
4.00	0.03

Storage Chamber			
Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)	
Chamber System Invert	495.75 ft
Chamber System Rows	8
Chambers per Row	90
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in
Chamber System Includes Header?	False

Subsection: Storage Chamber System
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
ID	355	Notes	Created on 19 Dec 2011. Check with manufacturer for updates.
Label	Recharger (R) 902HD		

Subsection: Storage Chamber System
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
Effective Length	3.62 ft	Manufacturer	CULTEC
Section Length Varies?	False	Default Spacing	0.75 ft

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft³/ft)
0.00	0.00
0.08	0.50
0.17	0.49
0.25	0.49
0.33	0.48
0.42	0.48
0.50	0.48
0.58	0.48
0.67	0.47
0.75	0.47
0.83	0.47
0.92	0.47
1.00	0.46
1.08	0.46
1.17	0.46
1.25	0.46
1.33	0.45
1.42	0.45
1.50	0.44
1.58	0.44
1.67	0.43
1.75	0.43
1.83	0.42
1.92	0.42
2.00	0.41
2.08	0.41
2.17	0.40
2.25	0.39
2.33	0.39
2.42	0.38
2.50	0.37
2.58	0.36
2.67	0.35
2.75	0.34
2.83	0.33
2.92	0.32
3.00	0.31
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14

Subsection: Storage Chamber System
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
3.83	0.10
3.92	0.06
4.00	0.03

Storage Chamber

Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)

Chamber System Invert	500.65 ft
Chamber System Rows	8
Chambers per Row	90
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in
Chamber System Includes Header?	False

Subsection: Storage Chamber System
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber

ID	355	Notes	Created on 19 Dec 2011. Check with manufacturer for updates.
Label	Recharger (R) 902HD		

Storage Chamber

Effective Length	3.62 ft	Manufacturer	CULTEC
Section Length Varies?	False	Default Spacing	0.75 ft

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)

Subsection: Storage Chamber System
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
0.00	0.00
0.08	0.50
0.17	0.49
0.25	0.49
0.33	0.48
0.42	0.48
0.50	0.48
0.58	0.48
0.67	0.47
0.75	0.47
0.83	0.47
0.92	0.47
1.00	0.46
1.08	0.46
1.17	0.46
1.25	0.46
1.33	0.45
1.42	0.45
1.50	0.44
1.58	0.44
1.67	0.43
1.75	0.43
1.83	0.42
1.92	0.42
2.00	0.41
2.08	0.41
2.17	0.40
2.25	0.39
2.33	0.39
2.42	0.38
2.50	0.37
2.58	0.36
2.67	0.35
2.75	0.34
2.83	0.33
2.92	0.32
3.00	0.31
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14
3.83	0.10
3.92	0.06
4.00	0.03

Subsection: Storage Chamber System
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)	
Chamber System Invert	547.85 ft
Chamber System Rows	8
Chambers per Row	100
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in
Chamber System Includes Header?	False

Subsection: Storage Chamber System
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
ID	355	Notes	Created on 19 Dec 2011. Check with manufacturer for updates.
Label	Recharger (R) 902HD		

Storage Chamber			
Effective Length	3.62 ft	Manufacturer	CULTEC
Section Length Varies?	False	Default Spacing	0.75 ft

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
0.00	0.00
0.08	0.50
0.17	0.49
0.25	0.49
0.33	0.48
0.42	0.48
0.50	0.48
0.58	0.48
0.67	0.47

Subsection: Storage Chamber System
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
0.75	0.47
0.83	0.47
0.92	0.47
1.00	0.46
1.08	0.46
1.17	0.46
1.25	0.46
1.33	0.45
1.42	0.45
1.50	0.44
1.58	0.44
1.67	0.43
1.75	0.43
1.83	0.42
1.92	0.42
2.00	0.41
2.08	0.41
2.17	0.40
2.25	0.39
2.33	0.39
2.42	0.38
2.50	0.37
2.58	0.36
2.67	0.35
2.75	0.34
2.83	0.33
2.92	0.32
3.00	0.31
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14
3.83	0.10
3.92	0.06
4.00	0.03

Storage Chamber			
Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)	
Chamber System Invert	565.85 ft
Chamber System Rows	9

Subsection: Storage Chamber System
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber (Pond)	
Chambers per Row	100
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in
Chamber System Includes Header?	False

Subsection: Storage Chamber System
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
ID	355	Notes	Created on 19 Dec 2011. Check with manufacturer for updates.
Label	Recharger (R) 902HD		

Storage Chamber			
Effective Length	3.62 ft	Manufacturer	CULTEC
Section Length Varies?	False	Default Spacing	0.75 ft

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
0.00	0.00
0.08	0.50
0.17	0.49
0.25	0.49
0.33	0.48
0.42	0.48
0.50	0.48
0.58	0.48
0.67	0.47
0.75	0.47
0.83	0.47
0.92	0.47
1.00	0.46
1.08	0.46
1.17	0.46
1.25	0.46

Subsection: Storage Chamber System
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
1.33	0.45
1.42	0.45
1.50	0.44
1.58	0.44
1.67	0.43
1.75	0.43
1.83	0.42
1.92	0.42
2.00	0.41
2.08	0.41
2.17	0.40
2.25	0.39
2.33	0.39
2.42	0.38
2.50	0.37
2.58	0.36
2.67	0.35
2.75	0.34
2.83	0.33
2.92	0.32
3.00	0.31
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14
3.83	0.10
3.92	0.06
4.00	0.03

Storage Chamber			
Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)	
Chamber System Invert	584.35 ft
Chamber System Rows	9
Chambers per Row	90
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in

Subsection: Storage Chamber System
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber (Pond)	
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in
Chamber System Includes Header?	False

Subsection: Storage Chamber System
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber			
ID	355	Notes	Created on 19 Dec 2011. Check with manufacturer for updates.
Label	Recharger (R) 902HD		

Storage Chamber			
Effective Length	3.62 ft	Manufacturer	CULTEC
Section Length Varies?	False	Default Spacing	0.75 ft

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
0.00	0.00
0.08	0.50
0.17	0.49
0.25	0.49
0.33	0.48
0.42	0.48
0.50	0.48
0.58	0.48
0.67	0.47
0.75	0.47
0.83	0.47
0.92	0.47
1.00	0.46
1.08	0.46
1.17	0.46
1.25	0.46
1.33	0.45
1.42	0.45
1.50	0.44
1.58	0.44
1.67	0.43
1.75	0.43

Subsection: Storage Chamber System
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Depth-Incremental Volume Per Unit Length Curve

Depth (ft)	Incremental Volume Per Unit Length (ft^3/ft)
1.83	0.42
1.92	0.42
2.00	0.41
2.08	0.41
2.17	0.40
2.25	0.39
2.33	0.39
2.42	0.38
2.50	0.37
2.58	0.36
2.67	0.35
2.75	0.34
2.83	0.33
2.92	0.32
3.00	0.31
3.08	0.30
3.17	0.28
3.25	0.27
3.33	0.25
3.42	0.24
3.50	0.22
3.58	0.20
3.67	0.17
3.75	0.14
3.83	0.10
3.92	0.06
4.00	0.03

Storage Chamber			
Storage Chamber Type	Incremental Volume Per Unit Length	Maximum Width	6.50 ft

Storage Chamber (Pond)	
Chamber System Invert	462.50 ft
Chamber System Rows	8
Chambers per Row	39
Chamber System Fill Void Space	40.0 %
Chamber System Row Spacing	9.0 in
Chamber System Side Fill	12.0 in
Chamber System Fill Cover Depth	12.0 in
Chamber System Fill Base Depth	9.0 in
Chamber System Fill Side Slope	0.000 H:V
Chamber System End Fill	12.0 in

Subsection: Storage Chamber System
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Storage Chamber (Pond)	
Chamber System Includes Header?	False

Subsection: Outlet Input Data
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	423.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	429.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	Riser	Forward	TW	427.50	429.00
Orifice-Circular	Orifice 1	Forward	TW	426.50	429.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Riser Structure Type: Inlet Box	
Number of Openings	1
Elevation	427.50 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	426.50 ft
Orifice Diameter	5.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
423.00	0.00	(N/A)	0.00
423.50	0.00	(N/A)	0.00
424.00	0.00	(N/A)	0.00
424.50	0.00	(N/A)	0.00
425.00	0.00	(N/A)	0.00
425.50	0.00	(N/A)	0.00
426.00	0.00	(N/A)	0.00
426.50	0.00	(N/A)	0.00
427.00	0.00	(N/A)	0.00
427.50	0.00	(N/A)	0.00
428.00	14.85	(N/A)	0.00
428.50	42.00	(N/A)	0.00
429.00	72.21	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
HW & TW < Inv.El.=427.500
Weir: H =0ft
Weir: H =0.5ft
Weir: H =1ft
Orifice: H =1.50; Riser orifice equation controlling.

Subsection: Individual Outlet Curves
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
423.00	0.00	(N/A)	0.00
423.50	0.00	(N/A)	0.00
424.00	0.00	(N/A)	0.00
424.50	0.00	(N/A)	0.00
425.00	0.00	(N/A)	0.00
425.50	0.00	(N/A)	0.00
426.00	0.00	(N/A)	0.00
426.50	0.00	(N/A)	0.00
427.00	0.35	(N/A)	0.00
427.50	0.58	(N/A)	0.00
428.00	0.75	(N/A)	0.00
428.50	0.88	(N/A)	0.00
429.00	0.99	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.29
H =.79
H =1.29
H =1.79
H =2.29

Subsection: Composite Rating Curve
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
423.00	0.00	(N/A)	0.00
423.50	0.00	(N/A)	0.00
424.00	0.00	(N/A)	0.00
424.50	0.00	(N/A)	0.00
425.00	0.00	(N/A)	0.00
425.50	0.00	(N/A)	0.00
426.00	0.00	(N/A)	0.00
426.50	0.00	(N/A)	0.00
427.00	0.35	(N/A)	0.00
427.50	0.58	(N/A)	0.00
428.00	15.60	(N/A)	0.00
428.50	42.88	(N/A)	0.00
429.00	73.20	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Riser + Orifice 1
Riser + Orifice 1
Riser + Orifice 1
Riser + Orifice 1

Subsection: Outlet Input Data
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	569.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	575.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	Riser	Forward	TW	574.00	575.00
Orifice-Circular	Orifice 1	Forward	TW	572.50	575.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Riser Structure Type: Inlet Box	
Number of Openings	1
Elevation	574.00 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	572.50 ft
Orifice Diameter	3.75 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
569.00	0.00	(N/A)	0.00
569.50	0.00	(N/A)	0.00
570.00	0.00	(N/A)	0.00
570.50	0.00	(N/A)	0.00
571.00	0.00	(N/A)	0.00
571.50	0.00	(N/A)	0.00
572.00	0.00	(N/A)	0.00
572.50	0.00	(N/A)	0.00
573.00	0.00	(N/A)	0.00
573.50	0.00	(N/A)	0.00
574.00	0.00	(N/A)	0.00
574.50	14.85	(N/A)	0.00
575.00	42.00	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
HW & TW < Inv.El.=574.000
Weir: H =0ft
Weir: H =0.5ft
Weir: H =1ft

Subsection: Individual Outlet Curves
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
569.00	0.00	(N/A)	0.00
569.50	0.00	(N/A)	0.00
570.00	0.00	(N/A)	0.00
570.50	0.00	(N/A)	0.00
571.00	0.00	(N/A)	0.00
571.50	0.00	(N/A)	0.00
572.00	0.00	(N/A)	0.00
572.50	0.00	(N/A)	0.00
573.00	0.22	(N/A)	0.00
573.50	0.34	(N/A)	0.00
574.00	0.43	(N/A)	0.00
574.50	0.50	(N/A)	0.00
575.00	0.57	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.34
H =.84
H =1.34
H =1.84
H =2.34

Subsection: Composite Rating Curve
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
569.00	0.00	(N/A)	0.00
569.50	0.00	(N/A)	0.00
570.00	0.00	(N/A)	0.00
570.50	0.00	(N/A)	0.00
571.00	0.00	(N/A)	0.00
571.50	0.00	(N/A)	0.00
572.00	0.00	(N/A)	0.00
572.50	0.00	(N/A)	0.00
573.00	0.22	(N/A)	0.00
573.50	0.34	(N/A)	0.00
574.00	0.43	(N/A)	0.00
574.50	15.35	(N/A)	0.00
575.00	42.57	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Riser + Orifice 1
Riser + Orifice 1
Riser + Orifice 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	545.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	553.50 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	Riser 1	Forward	TW	552.00	553.50
Orifice-Circular	Orifice 1	Forward	TW	550.00	553.50
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	552.00 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	550.00 ft
Orifice Diameter	6.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio A9

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 1 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
545.50	0.00	(N/A)	0.00
546.00	0.00	(N/A)	0.00
546.50	0.00	(N/A)	0.00
547.00	0.00	(N/A)	0.00
547.50	0.00	(N/A)	0.00
548.00	0.00	(N/A)	0.00
548.50	0.00	(N/A)	0.00
549.00	0.00	(N/A)	0.00
549.50	0.00	(N/A)	0.00
550.00	0.00	(N/A)	0.00
550.50	0.00	(N/A)	0.00
551.00	0.00	(N/A)	0.00
551.50	0.00	(N/A)	0.00
552.00	0.00	(N/A)	0.00
552.50	14.85	(N/A)	0.00
553.00	42.00	(N/A)	0.00
553.50	72.21	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
HW & TW < Inv.El.=552.000
Weir: H =0ft
Weir: H =0.5ft
Weir: H =1ft
Orifice: H =1.50; Riser orifice equation controlling.

Subsection: Individual Outlet Curves
Label: Bio A9

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
545.50	0.00	(N/A)	0.00
546.00	0.00	(N/A)	0.00
546.50	0.00	(N/A)	0.00
547.00	0.00	(N/A)	0.00
547.50	0.00	(N/A)	0.00
548.00	0.00	(N/A)	0.00
548.50	0.00	(N/A)	0.00
549.00	0.00	(N/A)	0.00
549.50	0.00	(N/A)	0.00
550.00	0.00	(N/A)	0.00
550.50	0.47	(N/A)	0.00
551.00	0.82	(N/A)	0.00
551.50	1.06	(N/A)	0.00
552.00	1.25	(N/A)	0.00
552.50	1.42	(N/A)	0.00
553.00	1.57	(N/A)	0.00
553.50	1.70	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.25
H =.75
H =1.25
H =1.75
H =2.25
H =2.75
H =3.25

Subsection: Composite Rating Curve
Label: Bio A9

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
545.50	0.00	(N/A)	0.00
546.00	0.00	(N/A)	0.00
546.50	0.00	(N/A)	0.00
547.00	0.00	(N/A)	0.00
547.50	0.00	(N/A)	0.00
548.00	0.00	(N/A)	0.00
548.50	0.00	(N/A)	0.00
549.00	0.00	(N/A)	0.00
549.50	0.00	(N/A)	0.00
550.00	0.00	(N/A)	0.00
550.50	0.47	(N/A)	0.00
551.00	0.82	(N/A)	0.00
551.50	1.06	(N/A)	0.00
552.00	1.25	(N/A)	0.00
552.50	16.27	(N/A)	0.00
553.00	43.57	(N/A)	0.00
553.50	73.91	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Riser 1 + Orifice 1
Riser 1 + Orifice 1
Riser 1 + Orifice 1
Riser 1 + Orifice 1

Subsection: Outlet Input Data
Label: Bio B2

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	444.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	449.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	Riser	Forward	TW	448.30	449.00
Orifice-Circular	Orifice 1	Forward	TW	447.50	449.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Individual Outlet Curves
Label: Bio B3

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
454.00	0.00	(N/A)	0.00
454.50	0.00	(N/A)	0.00
455.00	0.00	(N/A)	0.00
455.50	0.00	(N/A)	0.00
456.00	0.00	(N/A)	0.00
456.50	0.00	(N/A)	0.00
457.00	0.00	(N/A)	0.00
457.50	0.00	(N/A)	0.00
458.00	0.00	(N/A)	0.00
458.25	0.00	(N/A)	0.00
458.50	5.25	(N/A)	0.00
459.00	27.28	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
HW & TW < Inv.El.=458.250
Weir: H =0ft
Weir: H =0.25ft
Weir: H =0.75ft

Subsection: Individual Outlet Curves
Label: Bio B3

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
454.00	0.00	(N/A)	0.00
454.50	0.00	(N/A)	0.00
455.00	0.00	(N/A)	0.00
455.50	0.00	(N/A)	0.00
456.00	0.00	(N/A)	0.00
456.50	0.00	(N/A)	0.00
457.00	0.00	(N/A)	0.00
457.50	0.00	(N/A)	0.00
458.00	0.08	(N/A)	0.00
458.25	0.11	(N/A)	0.00
458.50	0.13	(N/A)	0.00
459.00	0.16	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.41
H =.66
H =.91
H =1.41

Subsection: Composite Rating Curve
Label: Bio B3

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
454.00	0.00	(N/A)	0.00
454.50	0.00	(N/A)	0.00
455.00	0.00	(N/A)	0.00
455.50	0.00	(N/A)	0.00
456.00	0.00	(N/A)	0.00
456.50	0.00	(N/A)	0.00
457.00	0.00	(N/A)	0.00
457.50	0.00	(N/A)	0.00
458.00	0.08	(N/A)	0.00
458.25	0.11	(N/A)	0.00
458.50	5.38	(N/A)	0.00
459.00	27.44	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Riser + Orifice 1
Riser + Orifice 1
Riser + Orifice 1

Subsection: Outlet Input Data
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	484.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	490.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	488.00	490.00
Inlet Box	Riser 1	Forward	TW	489.60	490.00
Inlet Box	Riser 2	Forward	TW	489.60	490.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	489.60 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	488.00 ft
Orifice Diameter	1.90 in
Orifice Coefficient	0.600

Structure ID: Riser 2 Structure Type: Inlet Box	
Number of Openings	1
Elevation	489.60 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s

Convergence Tolerances	
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 1 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
484.50	0.00	(N/A)	0.00
485.00	0.00	(N/A)	0.00
485.50	0.00	(N/A)	0.00
486.00	0.00	(N/A)	0.00
486.50	0.00	(N/A)	0.00
487.00	0.00	(N/A)	0.00
487.50	0.00	(N/A)	0.00
488.00	0.00	(N/A)	0.00
488.50	0.00	(N/A)	0.00
489.00	0.00	(N/A)	0.00
489.50	0.00	(N/A)	0.00
489.60	0.00	(N/A)	0.00
490.00	10.63	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
Weir: H =0ft
Weir: H =0.4ft

Subsection: Individual Outlet Curves
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
484.50	0.00	(N/A)	0.00
485.00	0.00	(N/A)	0.00
485.50	0.00	(N/A)	0.00
486.00	0.00	(N/A)	0.00
486.50	0.00	(N/A)	0.00
487.00	0.00	(N/A)	0.00
487.50	0.00	(N/A)	0.00
488.00	0.00	(N/A)	0.00
488.50	0.06	(N/A)	0.00
489.00	0.09	(N/A)	0.00
489.50	0.11	(N/A)	0.00
489.60	0.12	(N/A)	0.00
490.00	0.13	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.42
H =.92
H =1.42
H =1.52
H =1.92

Subsection: Individual Outlet Curves
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 2 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
484.50	0.00	(N/A)	0.00
485.00	0.00	(N/A)	0.00
485.50	0.00	(N/A)	0.00
486.00	0.00	(N/A)	0.00
486.50	0.00	(N/A)	0.00
487.00	0.00	(N/A)	0.00
487.50	0.00	(N/A)	0.00
488.00	0.00	(N/A)	0.00
488.50	0.00	(N/A)	0.00
489.00	0.00	(N/A)	0.00
489.50	0.00	(N/A)	0.00
489.60	0.00	(N/A)	0.00
490.00	10.63	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
HW & TW < Inv.El.=489.600
Weir: H =0ft
Weir: H =0.4ft

Subsection: Composite Rating Curve
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
484.50	0.00	(N/A)	0.00
485.00	0.00	(N/A)	0.00
485.50	0.00	(N/A)	0.00
486.00	0.00	(N/A)	0.00
486.50	0.00	(N/A)	0.00
487.00	0.00	(N/A)	0.00
487.50	0.00	(N/A)	0.00
488.00	0.00	(N/A)	0.00
488.50	0.06	(N/A)	0.00
489.00	0.09	(N/A)	0.00
489.50	0.11	(N/A)	0.00
489.60	0.12	(N/A)	0.00
490.00	21.38	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Riser 1 + Riser 2
Orifice 1 + Riser 1 + Riser 2

Requested Pond Water Surface Elevations	
Minimum (Headwater)	538.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	544.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	Riser	Forward	TW	543.10	544.00
Orifice-Circular	Orifice 1	Forward	TW	541.50	544.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser Structure Type: Inlet Box	
Number of Openings	1
Elevation	543.10 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	541.50 ft
Orifice Diameter	3.60 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio B6

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
538.00	0.00	(N/A)	0.00
538.50	0.00	(N/A)	0.00
539.00	0.00	(N/A)	0.00
539.50	0.00	(N/A)	0.00
540.00	0.00	(N/A)	0.00
540.50	0.00	(N/A)	0.00
541.00	0.00	(N/A)	0.00
541.50	0.00	(N/A)	0.00
542.00	0.00	(N/A)	0.00
542.50	0.00	(N/A)	0.00
543.00	0.00	(N/A)	0.00
543.10	0.00	(N/A)	0.00
543.50	10.63	(N/A)	0.00
544.00	35.86	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
HW & TW < Inv.El.=543.100
Weir: H =0ft
Weir: H =0.4ft
Weir: H =0.9ft

Subsection: Individual Outlet Curves
Label: Bio B6

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
538.00	0.00	(N/A)	0.00
538.50	0.00	(N/A)	0.00
539.00	0.00	(N/A)	0.00
539.50	0.00	(N/A)	0.00
540.00	0.00	(N/A)	0.00
540.50	0.00	(N/A)	0.00
541.00	0.00	(N/A)	0.00
541.50	0.00	(N/A)	0.00
542.00	0.20	(N/A)	0.00
542.50	0.31	(N/A)	0.00
543.00	0.40	(N/A)	0.00
543.10	0.41	(N/A)	0.00
543.50	0.46	(N/A)	0.00
544.00	0.52	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.35
H =.85
H =1.35
H =1.45
H =1.85
H =2.35

Subsection: Composite Rating Curve
Label: Bio B6

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
538.00	0.00	(N/A)	0.00
538.50	0.00	(N/A)	0.00
539.00	0.00	(N/A)	0.00
539.50	0.00	(N/A)	0.00
540.00	0.00	(N/A)	0.00
540.50	0.00	(N/A)	0.00
541.00	0.00	(N/A)	0.00
541.50	0.00	(N/A)	0.00
542.00	0.20	(N/A)	0.00
542.50	0.31	(N/A)	0.00
543.00	0.40	(N/A)	0.00
543.10	0.41	(N/A)	0.00
543.50	11.09	(N/A)	0.00
544.00	36.38	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Riser + Orifice 1
Riser + Orifice 1
Riser + Orifice 1

Subsection: Outlet Input Data
Label: Bio B7

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	466.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	471.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir	Forward	TW	469.50	471.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	469.50 ft
Weir Length	15.00 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	30
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

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir (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)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
468.00	0.00	(N/A)	0.00
468.50	0.00	(N/A)	0.00
469.00	0.00	(N/A)	0.00
469.50	0.00	(N/A)	0.00
470.00	15.80	(N/A)	0.00
470.50	44.40	(N/A)	0.00
471.00	81.02	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=15.80;
H=1.00; Htw=.00; Qfree=44.40;
H=1.50; Htw=.00; Qfree=81.02;

Subsection: Composite Rating Curve
Label: Bio B7

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
468.00	0.00	(N/A)	0.00
468.50	0.00	(N/A)	0.00
469.00	0.00	(N/A)	0.00
469.50	0.00	(N/A)	0.00
470.00	15.80	(N/A)	0.00
470.50	44.40	(N/A)	0.00
471.00	81.02	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Weir
Weir
Weir
Weir

Subsection: Outlet Input Data
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	490.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	498.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	493.50	498.00
Inlet Box	Riser 1	Forward	TW	497.10	498.00
Inlet Box	Riser 2	Forward	TW	497.10	498.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	497.10 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	493.50 ft
Orifice Diameter	3.25 in
Orifice Coefficient	0.600

Structure ID: Riser 2 Structure Type: Inlet Box	
Number of Openings	1
Elevation	497.10 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s

Convergence Tolerances	
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 1 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
490.00	0.00	(N/A)	0.00
490.50	0.00	(N/A)	0.00
491.00	0.00	(N/A)	0.00
491.50	0.00	(N/A)	0.00
492.00	0.00	(N/A)	0.00
492.50	0.00	(N/A)	0.00
493.00	0.00	(N/A)	0.00
493.50	0.00	(N/A)	0.00
494.00	0.00	(N/A)	0.00
494.50	0.00	(N/A)	0.00
495.00	0.00	(N/A)	0.00
495.50	0.00	(N/A)	0.00
496.00	0.00	(N/A)	0.00
496.50	0.00	(N/A)	0.00
497.00	0.00	(N/A)	0.00
497.10	0.00	(N/A)	0.00
497.50	10.63	(N/A)	0.00
498.00	35.86	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
Weir: H =0ft
Weir: H =0.4ft
Weir: H =0.9ft

Subsection: Individual Outlet Curves
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
490.00	0.00	(N/A)	0.00
490.50	0.00	(N/A)	0.00
491.00	0.00	(N/A)	0.00
491.50	0.00	(N/A)	0.00
492.00	0.00	(N/A)	0.00
492.50	0.00	(N/A)	0.00
493.00	0.00	(N/A)	0.00
493.50	0.00	(N/A)	0.00
494.00	0.17	(N/A)	0.00
494.50	0.26	(N/A)	0.00
495.00	0.32	(N/A)	0.00
495.50	0.38	(N/A)	0.00
496.00	0.43	(N/A)	0.00
496.50	0.47	(N/A)	0.00
497.00	0.51	(N/A)	0.00
497.10	0.52	(N/A)	0.00
497.50	0.55	(N/A)	0.00
498.00	0.58	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
H =.36
H =.86
H =1.36
H =1.86
H =2.36
H =2.86
H =3.36
H =3.46
H =3.86
H =4.36

Subsection: Individual Outlet Curves
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 2 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
490.00	0.00	(N/A)	0.00
490.50	0.00	(N/A)	0.00
491.00	0.00	(N/A)	0.00
491.50	0.00	(N/A)	0.00
492.00	0.00	(N/A)	0.00
492.50	0.00	(N/A)	0.00
493.00	0.00	(N/A)	0.00
493.50	0.00	(N/A)	0.00
494.00	0.00	(N/A)	0.00
494.50	0.00	(N/A)	0.00
495.00	0.00	(N/A)	0.00
495.50	0.00	(N/A)	0.00
496.00	0.00	(N/A)	0.00
496.50	0.00	(N/A)	0.00
497.00	0.00	(N/A)	0.00
497.10	0.00	(N/A)	0.00
497.50	10.63	(N/A)	0.00
498.00	35.86	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
HW & TW < Inv.El.=497.100
Weir: H =0ft
Weir: H =0.4ft
Weir: H =0.9ft

Subsection: Composite Rating Curve
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
490.00	0.00	(N/A)	0.00
490.50	0.00	(N/A)	0.00
491.00	0.00	(N/A)	0.00
491.50	0.00	(N/A)	0.00
492.00	0.00	(N/A)	0.00
492.50	0.00	(N/A)	0.00
493.00	0.00	(N/A)	0.00
493.50	0.00	(N/A)	0.00
494.00	0.17	(N/A)	0.00
494.50	0.26	(N/A)	0.00
495.00	0.32	(N/A)	0.00
495.50	0.38	(N/A)	0.00
496.00	0.43	(N/A)	0.00
496.50	0.47	(N/A)	0.00
497.00	0.51	(N/A)	0.00
497.10	0.52	(N/A)	0.00
497.50	21.80	(N/A)	0.00
498.00	72.30	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Riser 1 + Riser 2
Orifice 1 + Riser 1 + Riser 2
Orifice 1 + Riser 1 + Riser 2

Requested Pond Water Surface Elevations	
Minimum (Headwater)	423.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	432.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Circular	Culvert	Forward	TW	423.60	432.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	48.00 in
Length	75.00 ft
Length (Computed Barrel)	75.01 ft
Slope (Computed)	0.017 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.700
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0210
M	1.3300
C	0.0463
Y	0.7500
T1 ratio (HW/D)	1.163
T2 ratio (HW/D)	1.503
Slope Correction Factor	0.700

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	428.25 ft	T1 Flow	87.96 ft³/s
T2 Elevation	429.61 ft	T2 Flow	100.53 ft³/s

Subsection: Outlet Input Data
Label: Existing Pond Out

Return Event: 1 years
Storm Event: 1-Year

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

Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
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: Existing Pond Out

Return Event: 1 years
Storm Event: 1-Year

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

Mannings open channel maximum capacity: 203.42 ft^3/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)
423.60	0.00	(N/A)	0.00
424.10	1.22	(N/A)	0.00
424.60	4.75	(N/A)	0.00
425.10	10.36	(N/A)	0.00
425.60	17.79	(N/A)	0.00
426.10	26.80	(N/A)	0.00
426.60	37.16	(N/A)	0.00
427.10	48.52	(N/A)	0.00
427.60	60.64	(N/A)	0.00
428.10	73.14	(N/A)	0.00
428.60	85.87	(N/A)	0.00
429.10	98.44	(N/A)	0.00
429.60	100.51	(N/A)	0.00
430.10	108.50	(N/A)	0.00
430.60	116.09	(N/A)	0.00
431.10	123.21	(N/A)	0.00
431.60	129.96	(N/A)	0.00
432.00	135.09	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .107ft
Dcr= .317ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .218ft
Dcr= .630ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .331ft
Dcr= .938ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .448ft
Dcr= 1.239ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .569ft
Dcr= 1.532ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .697ft
Dcr= 1.816ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .831ft
Dcr= 2.089ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .973ft
Dcr= 2.347ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= 1.124ft
Dcr= 2.587ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= 1.289ft
Dcr= 2.809ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= 1.466ft
Dcr= 3.007ft  CRIT.DEPTH Hev= .00ft
INLET CONTROL...  Transition: HW
=6.00
INLET CONTROL...  Submerged:  HW
=6.50
```

Subsection: Individual Outlet Curves
Label: Existing Pond Out

Return Event: 1 years
Storm Event: 1-Year

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

Mannings open channel maximum capacity: 203.42 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

INLET CONTROL... Submerged: HW =7.00
INLET CONTROL... Submerged: HW =7.50
INLET CONTROL... Submerged: HW =8.00
INLET CONTROL... Submerged: HW =8.40

Subsection: Outlet Input Data
Label: Existing Wetland Out

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	398.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	408.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Culvert-Box	Culvert	Forward	TW	398.60	408.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Culvert Structure Type: Culvert-Box	
Number of Barrels	1
Width	13.00 ft
Height	7.50 ft
Length	155.00 ft
Length (Computed Barrel)	155.00 ft
Slope (Computed)	0.003 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.500
Kb	0.002
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)	1.177
T2 ratio (HW/D)	1.364
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	407.42 ft	T1 Flow	934.55 ft³/s
T2 Elevation	408.83 ft	T2 Flow	1,068.06 ft³/s

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Existing Wetland Out

Return Event: 1 years
Storm Event: 1-Year

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

Mannings open channel maximum capacity: 1,454.14 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
398.60	0.00	(N/A)	0.00
399.10	11.53	(N/A)	0.00
399.60	31.85	(N/A)	0.00
400.10	58.54	(N/A)	0.00
400.60	90.03	(N/A)	0.00
401.10	125.88	(N/A)	0.00
401.60	165.59	(N/A)	0.00
402.10	208.54	(N/A)	0.00
402.60	254.76	(N/A)	0.00
403.10	304.12	(N/A)	0.00
403.60	356.11	(N/A)	0.00
404.10	410.95	(N/A)	0.00
404.60	468.13	(N/A)	0.00
405.10	527.77	(N/A)	0.00
405.60	590.02	(N/A)	0.00
406.10	654.12	(N/A)	0.00
406.60	720.69	(N/A)	0.00
407.10	789.42	(N/A)	0.00
407.60	860.01	(N/A)	0.00
408.00	917.86	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
BACKWATER CONTROL.. Vh= .126ft
hwDI= .311ft Lbw= 155.0ft
Hev= .00ft
CRIT.DEPTH CONTROL Vh= .286ft
Dcr= .571ft HJUMP IN PIPE
Hev= .00ft
CRIT.DEPTH CONTROL Vh= .429ft
Dcr= .857ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .571ft
Dcr= 1.142ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .714ft
Dcr= 1.428ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .857ft
Dcr= 1.715ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.000ft
Dcr= 2.000ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.143ft
Dcr= 2.285ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.286ft
Dcr= 2.572ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.429ft
Dcr= 2.857ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.572ft
Dcr= 3.143ft CRIT.DEPTH Hev= .00ft
```


Subsection: Individual Outlet Curves
Label: Existing Wetland Out

Return Event: 1 years
Storm Event: 1-Year

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

Mannings open channel maximum capacity: 1,454.14 ft³/s
Upstream ID = (Pond Water Surface)
Downstream ID = Tailwater (Pond Outfall)

Computation Messages

```
CRIT.DEPTH CONTROL Vh= 1.714ft
Dcr= 3.429ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 1.857ft
Dcr= 3.714ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.000ft
Dcr= 4.001ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.143ft
Dcr= 4.285ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.286ft
Dcr= 4.571ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.429ft
Dcr= 4.857ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.571ft
Dcr= 5.143ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= 2.685ft
Dcr= 5.371ft CRIT.DEPTH Hev= .00ft
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	426.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	438.50 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	428.68	438.50
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	428.68 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A2

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
426.50	0.00	(N/A)	0.00
427.00	0.00	(N/A)	0.00
427.50	0.00	(N/A)	0.00
428.00	0.00	(N/A)	0.00
428.50	0.00	(N/A)	0.00
428.68	0.00	(N/A)	0.00
429.00	0.60	(N/A)	0.00
429.50	3.78	(N/A)	0.00
430.00	9.40	(N/A)	0.00
430.50	16.99	(N/A)	0.00
431.00	26.16	(N/A)	0.00
431.50	36.38	(N/A)	0.00
432.00	45.90	(N/A)	0.00
432.50	51.82	(N/A)	0.00
433.00	57.13	(N/A)	0.00
433.50	61.99	(N/A)	0.00
434.00	66.49	(N/A)	0.00
434.50	70.71	(N/A)	0.00
435.00	74.69	(N/A)	0.00
435.50	78.47	(N/A)	0.00
436.00	82.08	(N/A)	0.00
436.50	85.53	(N/A)	0.00
437.00	88.85	(N/A)	0.00
437.50	92.05	(N/A)	0.00
438.00	95.14	(N/A)	0.00
438.50	98.13	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .081ft
Dcr= .239ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .212ft
Dcr= .607ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .352ft
Dcr= .969ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .502ft
Dcr= 1.318ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .668ft
Dcr= 1.652ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .858ft
Dcr= 1.961ft   CRIT.DEPTH Hev= .00ft
H =1.82
```


Subsection: Individual Outlet Curves
Label: H-A2

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

```
H =2.32
H =2.82
H =3.32
H =3.82
H =4.32
H =4.82
H =5.32
H =5.82
H =6.32
H =6.82
H =7.32
H =7.82
H =8.32
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	496.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	503.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	498.47	503.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	498.47 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A3

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
496.50	0.00	(N/A)	0.00
497.00	0.00	(N/A)	0.00
497.50	0.00	(N/A)	0.00
498.00	0.00	(N/A)	0.00
498.47	0.00	(N/A)	0.00
498.50	0.01	(N/A)	0.00
499.00	1.62	(N/A)	0.00
499.50	5.86	(N/A)	0.00
500.00	12.37	(N/A)	0.00
500.50	20.67	(N/A)	0.00
501.00	30.36	(N/A)	0.00
501.50	42.08	(N/A)	0.00
502.00	48.47	(N/A)	0.00
502.50	54.11	(N/A)	0.00
503.00	59.22	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .006ft
Dcr= .023ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .135ft
Dcr= .394ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .270ft
Dcr= .760ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .413ft
Dcr= 1.117ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .569ft
Dcr= 1.460ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .745ft
Dcr= 1.785ft CRIT.DEPTH Hev= .00ft
H =1.53
H =2.03
H =2.53
H =3.03

Subsection: Outlet Input Data
Label: H-A4

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	501.40 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	507.90 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	503.56	508.90
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: H-A4

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	503.56 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: H-A4

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
501.40	0.00	(N/A)	0.00
501.90	0.00	(N/A)	0.00
502.40	0.00	(N/A)	0.00
502.90	0.00	(N/A)	0.00
503.40	0.00	(N/A)	0.00
503.56	0.00	(N/A)	0.00
503.90	0.68	(N/A)	0.00
504.40	3.97	(N/A)	0.00
504.90	9.64	(N/A)	0.00
505.40	17.33	(N/A)	0.00
505.90	26.53	(N/A)	0.00
506.40	36.83	(N/A)	0.00
506.90	46.15	(N/A)	0.00
507.40	52.04	(N/A)	0.00
507.90	57.33	(N/A)	0.00
508.40	62.18	(N/A)	0.00
508.90	66.67	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .086ft
Dcr= .254ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .218ft
Dcr= .622ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .357ft
Dcr= .982ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .508ft
Dcr= 1.332ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .675ft
Dcr= 1.664ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .866ft
Dcr= 1.974ft  CRIT.DEPTH Hev= .00ft
H =1.84
H =2.34
H =2.84
H =3.34
H =3.84
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	548.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	559.10 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	551.30	559.10
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	551.30 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A5

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
548.60	0.00	(N/A)	0.00
549.10	0.00	(N/A)	0.00
549.60	0.00	(N/A)	0.00
550.10	0.00	(N/A)	0.00
550.60	0.00	(N/A)	0.00
551.10	0.00	(N/A)	0.00
551.30	0.00	(N/A)	0.00
551.60	0.53	(N/A)	0.00
552.10	3.61	(N/A)	0.00
552.60	9.11	(N/A)	0.00
553.10	16.64	(N/A)	0.00
553.60	25.76	(N/A)	0.00
554.10	35.97	(N/A)	0.00
554.60	45.64	(N/A)	0.00
555.10	51.60	(N/A)	0.00
555.60	56.93	(N/A)	0.00
556.10	61.80	(N/A)	0.00
556.60	66.32	(N/A)	0.00
557.10	70.55	(N/A)	0.00
557.60	74.54	(N/A)	0.00
558.10	78.32	(N/A)	0.00
558.60	81.93	(N/A)	0.00
559.10	85.39	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .076ft
Dcr= .224ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .207ft
Dcr= .593ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .346ft
Dcr= .954ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .495ft
Dcr= 1.304ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .661ft
Dcr= 1.639ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .850ft
Dcr= 1.950ft CRIT.DEPTH Hev= .00ft
H =1.80
H =2.30
H =2.80

Subsection: Individual Outlet Curves
Label: H-A5

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =3.30
H =3.80
H =4.30
H =4.80
H =5.30
H =5.80
H =6.30

Requested Pond Water Surface Elevations	
Minimum (Headwater)	566.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	575.10 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	569.07	575.10
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	569.07 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A6

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
566.60	0.00	(N/A)	0.00
567.10	0.00	(N/A)	0.00
567.60	0.00	(N/A)	0.00
568.10	0.00	(N/A)	0.00
568.60	0.00	(N/A)	0.00
569.07	0.00	(N/A)	0.00
569.10	0.01	(N/A)	0.00
569.60	1.62	(N/A)	0.00
570.10	5.86	(N/A)	0.00
570.60	12.37	(N/A)	0.00
571.10	20.67	(N/A)	0.00
571.60	30.36	(N/A)	0.00
572.10	42.08	(N/A)	0.00
572.60	48.47	(N/A)	0.00
573.10	54.11	(N/A)	0.00
573.60	59.22	(N/A)	0.00
574.10	63.92	(N/A)	0.00
574.60	68.30	(N/A)	0.00
575.10	72.41	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .006ft
Dcr= .023ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .135ft
Dcr= .394ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .270ft
Dcr= .760ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .413ft
Dcr= 1.117ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .569ft
Dcr= 1.460ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .745ft
Dcr= 1.785ft  CRIT.DEPTH Hev= .00ft
H =1.53
H =2.03
H =2.53
H =3.03
H =3.53
H =4.03
H =4.53
```


Subsection: Outlet Input Data
Label: H-A7

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	585.10 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	591.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	587.16	591.60
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: H-A7

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	587.16 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A7

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
585.10	0.00	(N/A)	0.00
585.60	0.00	(N/A)	0.00
586.10	0.00	(N/A)	0.00
586.60	0.00	(N/A)	0.00
587.10	0.00	(N/A)	0.00
587.16	0.00	(N/A)	0.00
587.60	1.13	(N/A)	0.00
588.10	4.92	(N/A)	0.00
588.60	11.05	(N/A)	0.00
589.10	19.08	(N/A)	0.00
589.60	28.52	(N/A)	0.00
590.10	38.94	(N/A)	0.00
590.60	47.39	(N/A)	0.00
591.10	53.14	(N/A)	0.00
591.60	58.33	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .112ft
Dcr= .329ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .245ft
Dcr= .695ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .387ft
Dcr= 1.054ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .541ft
Dcr= 1.400ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .711ft
Dcr= 1.728ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .908ft
Dcr= 2.031ft  CRIT.DEPTH Hev= .00ft
H =1.94
H =2.44
H =2.94
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	549.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	562.70 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	549.50	562.70
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	549.50 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-A9

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
549.50	0.00	(N/A)	0.00
550.00	1.44	(N/A)	0.00
550.50	5.55	(N/A)	0.00
551.00	11.92	(N/A)	0.00
551.50	20.14	(N/A)	0.00
552.00	29.75	(N/A)	0.00
552.50	41.67	(N/A)	0.00
553.00	48.11	(N/A)	0.00
553.50	53.79	(N/A)	0.00
554.00	58.93	(N/A)	0.00
554.50	63.65	(N/A)	0.00
555.00	68.04	(N/A)	0.00
555.50	72.17	(N/A)	0.00
556.00	76.07	(N/A)	0.00
556.50	79.79	(N/A)	0.00
557.00	83.33	(N/A)	0.00
557.50	86.74	(N/A)	0.00
558.00	90.01	(N/A)	0.00
558.50	93.17	(N/A)	0.00
559.00	96.23	(N/A)	0.00
559.50	99.19	(N/A)	0.00
560.00	102.06	(N/A)	0.00
560.50	104.86	(N/A)	0.00
561.00	107.58	(N/A)	0.00
561.50	110.24	(N/A)	0.00
562.00	112.84	(N/A)	0.00
562.50	115.37	(N/A)	0.00
562.70	116.37	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .127ft
Dcr= .372ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .262ft
Dcr= .739ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .404ft
Dcr= 1.096ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .560ft
Dcr= 1.441ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .733ft
Dcr= 1.767ft  CRIT.DEPTH Hev= .00ft
H =1.50
H =2.00
H =2.50
H =3.00
H =3.50
H =4.00
```


Subsection: Individual Outlet Curves
Label: H-A9

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

```
H =4.50
H =5.00
H =5.50
H =6.00
H =6.50
H =7.00
H =7.50
H =8.00
H =8.50
H =9.00
H =9.50
H =10.00
H =10.50
H =11.00
H =11.50
H =11.70
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	463.25 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	473.25 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	464.81	473.25
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	464.81 ft
Orifice Diameter	24.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-B10

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
463.25	0.00	(N/A)	0.00
463.75	0.00	(N/A)	0.00
464.25	0.00	(N/A)	0.00
464.75	0.00	(N/A)	0.00
464.81	0.00	(N/A)	0.00
465.25	0.90	(N/A)	0.00
465.75	3.85	(N/A)	0.00
466.25	8.37	(N/A)	0.00
466.75	13.91	(N/A)	0.00
467.25	18.14	(N/A)	0.00
467.75	21.06	(N/A)	0.00
468.25	23.62	(N/A)	0.00
468.75	25.93	(N/A)	0.00
469.25	28.04	(N/A)	0.00
469.75	30.01	(N/A)	0.00
470.25	31.86	(N/A)	0.00
470.75	33.61	(N/A)	0.00
471.25	35.27	(N/A)	0.00
471.75	36.85	(N/A)	0.00
472.25	38.37	(N/A)	0.00
472.75	39.83	(N/A)	0.00
473.25	41.24	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .113ft
Dcr= .326ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .252ft
Dcr= .688ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .409ft
Dcr= 1.031ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .597ft
Dcr= 1.343ft CRIT.DEPTH Hev= .00ft
H =1.44
H =1.94
H =2.44
H =2.94
H =3.44
H =3.94
H =4.44
H =4.94
H =5.44

Subsection: Individual Outlet Curves
Label: H-B10

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =5.94
H =6.44
H =6.94
H =7.44

Requested Pond Water Surface Elevations	
Minimum (Headwater)	542.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	552.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	544.07	552.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	544.07 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: H-B6

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
542.00	0.00	(N/A)	0.00
542.50	0.00	(N/A)	0.00
543.00	0.00	(N/A)	0.00
543.50	0.00	(N/A)	0.00
544.00	0.00	(N/A)	0.00
544.07	0.00	(N/A)	0.00
544.50	1.08	(N/A)	0.00
545.00	4.82	(N/A)	0.00
545.50	10.91	(N/A)	0.00
546.00	18.88	(N/A)	0.00
546.50	28.32	(N/A)	0.00
547.00	38.74	(N/A)	0.00
547.50	47.26	(N/A)	0.00
548.00	53.03	(N/A)	0.00
548.50	58.24	(N/A)	0.00
549.00	63.01	(N/A)	0.00
549.50	67.44	(N/A)	0.00
550.00	71.61	(N/A)	0.00
550.50	75.54	(N/A)	0.00
551.00	79.28	(N/A)	0.00
551.50	82.85	(N/A)	0.00
552.00	86.27	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .109ft
Dcr= .321ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .242ft
Dcr= .687ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .384ft
Dcr= 1.046ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .537ft
Dcr= 1.393ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .707ft
Dcr= 1.722ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .904ft
Dcr= 2.026ft CRIT.DEPTH Hev= .00ft
H =1.93
H =2.43
H =2.93
H =3.43
H =3.93

Subsection: Individual Outlet Curves
Label: H-B6

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =4.43
H =4.93
H =5.43
H =5.93
H =6.43

Requested Pond Water Surface Elevations	
Minimum (Headwater)	467.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	470.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir	Forward	TW	469.50	471.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Weir Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	469.50 ft
Weir Length	20.00 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	30
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: H-B7

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
468.00	0.00	(N/A)	0.00
468.50	0.00	(N/A)	0.00
469.00	0.00	(N/A)	0.00
469.50	0.00	(N/A)	0.00
470.00	21.11	(N/A)	0.00
470.50	59.40	(N/A)	0.00
471.00	108.57	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
HW & TW below Inv.El.=469.500
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=21.11;
H=1.00; Htw=.00; Qfree=59.40;
H=1.50; Htw=.00; Qfree=108.57;

Subsection: Outlet Input Data
Label: H-B9

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	542.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	550.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	544.21	552.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: H-B9

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	544.21 ft
Orifice Diameter	36.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: H-B9

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
542.00	0.00	(N/A)	0.00
542.50	0.00	(N/A)	0.00
543.00	0.00	(N/A)	0.00
543.50	0.00	(N/A)	0.00
544.00	0.00	(N/A)	0.00
544.21	0.00	(N/A)	0.00
544.50	0.49	(N/A)	0.00
545.00	3.52	(N/A)	0.00
545.50	8.99	(N/A)	0.00
546.00	16.48	(N/A)	0.00
546.50	25.55	(N/A)	0.00
547.00	35.77	(N/A)	0.00
547.50	45.52	(N/A)	0.00
548.00	51.48	(N/A)	0.00
548.50	56.83	(N/A)	0.00
549.00	61.71	(N/A)	0.00
549.50	66.23	(N/A)	0.00
550.00	70.47	(N/A)	0.00
550.50	74.46	(N/A)	0.00
551.00	78.25	(N/A)	0.00
551.50	81.86	(N/A)	0.00
552.00	85.33	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .073ft
Dcr= .216ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .204ft
Dcr= .585ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .343ft
Dcr= .947ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .492ft
Dcr= 1.297ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .657ft
Dcr= 1.632ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .846ft
Dcr= 1.944ft  CRIT.DEPTH Hev= .00ft
H =1.79
H =2.29
H =2.79
H =3.29
H =3.79
```

Subsection: Individual Outlet Curves
Label: H-B9

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =4.29
H =4.79
H =5.29
H =5.79
H =6.29

Subsection: Outlet Input Data
Label: L-A2

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	426.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	438.50 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	426.50	438.50
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-A2

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	426.50 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A2

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
426.50	0.00	(N/A)	0.00
427.00	1.07	(N/A)	0.00
427.50	3.96	(N/A)	0.00
428.00	8.10	(N/A)	0.00
428.50	12.28	(N/A)	0.00
429.00	14.76	(N/A)	0.00
429.50	16.88	(N/A)	0.00
430.00	18.76	(N/A)	0.00
430.50	20.46	(N/A)	0.00
431.00	22.04	(N/A)	0.00
431.50	23.51	(N/A)	0.00
432.00	24.90	(N/A)	0.00
432.50	26.21	(N/A)	0.00
433.00	27.46	(N/A)	0.00
433.50	28.65	(N/A)	0.00
434.00	29.80	(N/A)	0.00
434.50	30.90	(N/A)	0.00
435.00	31.97	(N/A)	0.00
435.50	33.00	(N/A)	0.00
436.00	34.00	(N/A)	0.00
436.50	34.97	(N/A)	0.00
437.00	35.92	(N/A)	0.00
437.50	36.84	(N/A)	0.00
438.00	37.74	(N/A)	0.00
438.50	38.61	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft   CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
H =6.13
H =6.63
```

Subsection: Individual Outlet Curves
Label: L-A2

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =7.13
H =7.63
H =8.13
H =8.63
H =9.13
H =9.63
H =10.13
H =10.63
H =11.13

Subsection: Outlet Input Data
Label: L-A3

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	496.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	503.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	496.50	503.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-A3

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	496.50 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A3

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
496.50	0.00	(N/A)	0.00
497.00	1.07	(N/A)	0.00
497.50	3.96	(N/A)	0.00
498.00	8.10	(N/A)	0.00
498.50	12.28	(N/A)	0.00
499.00	14.76	(N/A)	0.00
499.50	16.88	(N/A)	0.00
500.00	18.76	(N/A)	0.00
500.50	20.46	(N/A)	0.00
501.00	22.04	(N/A)	0.00
501.50	23.51	(N/A)	0.00
502.00	24.90	(N/A)	0.00
502.50	26.21	(N/A)	0.00
503.00	27.46	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft  CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	501.40 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	507.90 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	501.40	508.90
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	501.40 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A4

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
501.40	0.00	(N/A)	0.00
501.90	1.07	(N/A)	0.00
502.40	3.96	(N/A)	0.00
502.90	8.10	(N/A)	0.00
503.40	12.28	(N/A)	0.00
503.90	14.76	(N/A)	0.00
504.40	16.88	(N/A)	0.00
504.90	18.76	(N/A)	0.00
505.40	20.46	(N/A)	0.00
505.90	22.04	(N/A)	0.00
506.40	23.51	(N/A)	0.00
506.90	24.90	(N/A)	0.00
507.40	26.21	(N/A)	0.00
507.90	27.46	(N/A)	0.00
508.40	28.65	(N/A)	0.00
508.90	29.80	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft   CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
H =6.13
H =6.63
```


Subsection: Outlet Input Data
Label: L-A5

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	548.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	559.10 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	548.60	559.10
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-A5

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	548.60 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A5

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
548.60	0.00	(N/A)	0.00
549.10	1.07	(N/A)	0.00
549.60	3.96	(N/A)	0.00
550.10	8.10	(N/A)	0.00
550.60	12.28	(N/A)	0.00
551.10	14.76	(N/A)	0.00
551.60	16.88	(N/A)	0.00
552.10	18.76	(N/A)	0.00
552.60	20.46	(N/A)	0.00
553.10	22.04	(N/A)	0.00
553.60	23.51	(N/A)	0.00
554.10	24.90	(N/A)	0.00
554.60	26.21	(N/A)	0.00
555.10	27.46	(N/A)	0.00
555.60	28.65	(N/A)	0.00
556.10	29.80	(N/A)	0.00
556.60	30.90	(N/A)	0.00
557.10	31.97	(N/A)	0.00
557.60	33.00	(N/A)	0.00
558.10	34.00	(N/A)	0.00
558.60	34.97	(N/A)	0.00
559.10	35.92	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft   CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
H =6.13
H =6.63
H =7.13
H =7.63
H =8.13
```

Subsection: Individual Outlet Curves
Label: L-A5

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =8.63
H =9.13
H =9.63

Subsection: Outlet Input Data
Label: L-A6

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	566.60 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	575.10 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	566.60	575.10
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-A6

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	566.60 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A6

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
566.60	0.00	(N/A)	0.00
567.10	1.07	(N/A)	0.00
567.60	3.96	(N/A)	0.00
568.10	8.10	(N/A)	0.00
568.60	12.28	(N/A)	0.00
569.10	14.76	(N/A)	0.00
569.60	16.88	(N/A)	0.00
570.10	18.76	(N/A)	0.00
570.60	20.46	(N/A)	0.00
571.10	22.04	(N/A)	0.00
571.60	23.51	(N/A)	0.00
572.10	24.90	(N/A)	0.00
572.60	26.21	(N/A)	0.00
573.10	27.46	(N/A)	0.00
573.60	28.65	(N/A)	0.00
574.10	29.80	(N/A)	0.00
574.60	30.90	(N/A)	0.00
575.10	31.97	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft  CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
H =6.13
H =6.63
H =7.13
H =7.63
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	585.10 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	591.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	585.10	591.60
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	585.10 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A7

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
585.10	0.00	(N/A)	0.00
585.60	1.07	(N/A)	0.00
586.10	3.96	(N/A)	0.00
586.60	8.10	(N/A)	0.00
587.10	12.28	(N/A)	0.00
587.60	14.76	(N/A)	0.00
588.10	16.88	(N/A)	0.00
588.60	18.76	(N/A)	0.00
589.10	20.46	(N/A)	0.00
589.60	22.04	(N/A)	0.00
590.10	23.51	(N/A)	0.00
590.60	24.90	(N/A)	0.00
591.10	26.21	(N/A)	0.00
591.60	27.46	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft  CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
```


Subsection: Outlet Input Data
Label: L-A9

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	549.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	562.70 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	549.50	562.70
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-A9

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	549.50 ft
Orifice Diameter	18.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-A9

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
549.50	0.00	(N/A)	0.00
550.00	0.98	(N/A)	0.00
550.50	3.55	(N/A)	0.00
551.00	7.37	(N/A)	0.00
551.50	9.51	(N/A)	0.00
552.00	11.25	(N/A)	0.00
552.50	12.76	(N/A)	0.00
553.00	14.10	(N/A)	0.00
553.50	15.33	(N/A)	0.00
554.00	16.47	(N/A)	0.00
554.50	17.53	(N/A)	0.00
555.00	18.54	(N/A)	0.00
555.50	19.49	(N/A)	0.00
556.00	20.40	(N/A)	0.00
556.50	21.26	(N/A)	0.00
557.00	22.10	(N/A)	0.00
557.50	22.90	(N/A)	0.00
558.00	23.68	(N/A)	0.00
558.50	24.43	(N/A)	0.00
559.00	25.16	(N/A)	0.00
559.50	25.87	(N/A)	0.00
560.00	26.56	(N/A)	0.00
560.50	27.23	(N/A)	0.00
561.00	27.89	(N/A)	0.00
561.50	28.53	(N/A)	0.00
562.00	29.15	(N/A)	0.00
562.50	29.77	(N/A)	0.00
562.70	30.01	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .369ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .279ft
Dcr= .720ft  CRIT.DEPTH Hev= .00ft
H =.75
H =1.25
H =1.75
H =2.25
H =2.75
H =3.25
H =3.75
H =4.25
H =4.75
H =5.25
H =5.75
```

Subsection: Individual Outlet Curves
Label: L-A9

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

H =6.25
H =6.75
H =7.25
H =7.75
H =8.25
H =8.75
H =9.25
H =9.75
H =10.25
H =10.75
H =11.25
H =11.75
H =12.25
H =12.45

Subsection: Outlet Input Data
Label: L-B10

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	463.25 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	473.25 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	463.25	473.25
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-B10

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	463.25 ft
Orifice Diameter	18.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-B10

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
463.25	0.00	(N/A)	0.00
463.75	0.98	(N/A)	0.00
464.25	3.55	(N/A)	0.00
464.75	7.37	(N/A)	0.00
465.25	9.51	(N/A)	0.00
465.75	11.25	(N/A)	0.00
466.25	12.76	(N/A)	0.00
466.75	14.10	(N/A)	0.00
467.25	15.33	(N/A)	0.00
467.75	16.47	(N/A)	0.00
468.25	17.53	(N/A)	0.00
468.75	18.54	(N/A)	0.00
469.25	19.49	(N/A)	0.00
469.75	20.40	(N/A)	0.00
470.25	21.26	(N/A)	0.00
470.75	22.10	(N/A)	0.00
471.25	22.90	(N/A)	0.00
471.75	23.68	(N/A)	0.00
472.25	24.43	(N/A)	0.00
472.75	25.16	(N/A)	0.00
473.25	25.87	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .369ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .279ft
Dcr= .720ft  CRIT.DEPTH Hev= .00ft
H =.75
H =1.25
H =1.75
H =2.25
H =2.75
H =3.25
H =3.75
H =4.25
H =4.75
H =5.25
H =5.75
H =6.25
H =6.75
H =7.25
H =7.75
H =8.25
H =8.75
H =9.25
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	542.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	550.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	542.00	552.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	542.00 ft
Orifice Diameter	18.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-B6

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
542.00	0.00	(N/A)	0.00
542.50	0.98	(N/A)	0.00
543.00	3.55	(N/A)	0.00
543.50	7.37	(N/A)	0.00
544.00	9.51	(N/A)	0.00
544.50	11.25	(N/A)	0.00
545.00	12.76	(N/A)	0.00
545.50	14.10	(N/A)	0.00
546.00	15.33	(N/A)	0.00
546.50	16.47	(N/A)	0.00
547.00	17.53	(N/A)	0.00
547.50	18.54	(N/A)	0.00
548.00	19.49	(N/A)	0.00
548.50	20.40	(N/A)	0.00
549.00	21.26	(N/A)	0.00
549.50	22.10	(N/A)	0.00
550.00	22.90	(N/A)	0.00
550.50	23.68	(N/A)	0.00
551.00	24.43	(N/A)	0.00
551.50	25.16	(N/A)	0.00
552.00	25.87	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .369ft  CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .279ft
Dcr= .720ft  CRIT.DEPTH Hev= .00ft
H =.75
H =1.25
H =1.75
H =2.25
H =2.75
H =3.25
H =3.75
H =4.25
H =4.75
H =5.25
H =5.75
H =6.25
H =6.75
H =7.25
H =7.75
H =8.25
H =8.75
H =9.25
```


Subsection: Outlet Input Data
Label: L-B7

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	467.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	470.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Rectangular Weir	Weir	Forward	TW	469.00	471.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: L-B7

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Weir Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	469.00 ft
Weir Length	20.00 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	30
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: L-B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir (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)
468.00	0.00	(N/A)	0.00
468.50	0.00	(N/A)	0.00
469.00	0.00	(N/A)	0.00
469.50	21.11	(N/A)	0.00
470.00	59.40	(N/A)	0.00
470.50	108.57	(N/A)	0.00
471.00	166.31	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=469.000
HW & TW below Inv.El.=469.000
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=21.11;
H=1.00; Htw=.00; Qfree=59.40;
H=1.50; Htw=.00; Qfree=108.57;
H=2.00; Htw=.00; Qfree=166.31;

Requested Pond Water Surface Elevations	
Minimum (Headwater)	542.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	550.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice	Forward	TW	542.00	552.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	542.00 ft
Orifice Diameter	21.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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: L-B9

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
542.00	0.00	(N/A)	0.00
542.50	1.07	(N/A)	0.00
543.00	3.96	(N/A)	0.00
543.50	8.10	(N/A)	0.00
544.00	12.28	(N/A)	0.00
544.50	14.76	(N/A)	0.00
545.00	16.88	(N/A)	0.00
545.50	18.76	(N/A)	0.00
546.00	20.46	(N/A)	0.00
546.50	22.04	(N/A)	0.00
547.00	23.51	(N/A)	0.00
547.50	24.90	(N/A)	0.00
548.00	26.21	(N/A)	0.00
548.50	27.46	(N/A)	0.00
549.00	28.65	(N/A)	0.00
549.50	29.80	(N/A)	0.00
550.00	30.90	(N/A)	0.00
550.50	31.97	(N/A)	0.00
551.00	33.00	(N/A)	0.00
551.50	34.00	(N/A)	0.00
552.00	34.97	(N/A)	0.00

Computation Messages

```
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .130ft
Dcr= .370ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .273ft
Dcr= .726ft   CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL  Vh= .443ft
Dcr= 1.056ft   CRIT.DEPTH Hev= .00ft
H =1.13
H =1.63
H =2.13
H =2.63
H =3.13
H =3.63
H =4.13
H =4.63
H =5.13
H =5.63
H =6.13
H =6.63
H =7.13
H =7.63
H =8.13
H =8.63
```


Subsection: Individual Outlet Curves
Label: L-B9

Return Event: 1 years
Storm Event: 1-Year

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

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

Computation Messages

```
H =9.13
```

Requested Pond Water Surface Elevations	
Minimum (Headwater)	458.00 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	471.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 2	Forward	TW	464.30	471.00
Inlet Box	Riser 1	Forward	TW	469.10	471.00
Orifice-Circular	Orifice 1	Forward	TW	462.00	471.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Riser 1 Structure Type: Inlet Box	
Number of Openings	1
Elevation	469.10 ft
Orifice Area	12.3 ft²
Orifice Coefficient	0.600
Weir Length	14.00 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	True

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	462.00 ft
Orifice Diameter	8.25 in
Orifice Coefficient	0.600

Structure ID: Orifice 2 Structure Type: Orifice-Circular	
Number of Openings	2
Elevation	464.30 ft
Orifice Diameter	11.00 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 1 (Inlet Box)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.00	(N/A)	0.00
458.50	0.00	(N/A)	0.00
459.00	0.00	(N/A)	0.00
459.50	0.00	(N/A)	0.00
460.00	0.00	(N/A)	0.00
460.50	0.00	(N/A)	0.00
461.00	0.00	(N/A)	0.00
461.50	0.00	(N/A)	0.00
462.00	0.00	(N/A)	0.00
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.30	0.00	(N/A)	0.00
464.50	0.00	(N/A)	0.00
465.00	0.00	(N/A)	0.00
465.50	0.00	(N/A)	0.00
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.50	0.00	(N/A)	0.00
468.00	0.00	(N/A)	0.00
468.50	0.00	(N/A)	0.00
469.00	0.00	(N/A)	0.00
469.10	0.00	(N/A)	0.00
469.50	10.63	(N/A)	0.00
470.00	35.86	(N/A)	0.00
470.50	69.57	(N/A)	0.00
471.00	81.27	(N/A)	0.00

Computation Messages

HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Riser 1 (Inlet Box)

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

Computation Messages

HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
HW & TW < Inv.El.=469.100
Weir: H =0ft
Weir: H =0.4ft
Weir: H =0.9ft
Weir: H =1.4ft
Orifice: H =1.90; Riser orifice equation controlling.

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.00	(N/A)	0.00
458.50	0.00	(N/A)	0.00
459.00	0.00	(N/A)	0.00
459.50	0.00	(N/A)	0.00
460.00	0.00	(N/A)	0.00
460.50	0.00	(N/A)	0.00
461.00	0.00	(N/A)	0.00
461.50	0.00	(N/A)	0.00
462.00	0.00	(N/A)	0.00
462.50	0.59	(N/A)	0.00
463.00	1.45	(N/A)	0.00
463.50	1.92	(N/A)	0.00
464.00	2.30	(N/A)	0.00
464.30	2.50	(N/A)	0.00
464.50	2.62	(N/A)	0.00
465.00	2.91	(N/A)	0.00
465.50	3.17	(N/A)	0.00
466.00	3.42	(N/A)	0.00
466.50	3.64	(N/A)	0.00
467.00	3.86	(N/A)	0.00
467.50	4.06	(N/A)	0.00
468.00	4.25	(N/A)	0.00
468.50	4.43	(N/A)	0.00
469.00	4.61	(N/A)	0.00
469.10	4.64	(N/A)	0.00
469.50	4.78	(N/A)	0.00
470.00	4.94	(N/A)	0.00
470.50	5.10	(N/A)	0.00
471.00	5.26	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .142ft
Dcr= .358ft CRIT.DEPTH Hev= .00ft
H =.66
H =1.16
H =1.66
H =1.96

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Computation Messages

H =2.16
H =2.66
H =3.16
H =3.66
H =4.16
H =4.66
H =5.16
H =5.66
H =6.16
H =6.66
H =6.76
H =7.16
H =7.66
H =8.16
H =8.66

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 2 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.00	(N/A)	0.00
458.50	0.00	(N/A)	0.00
459.00	0.00	(N/A)	0.00
459.50	0.00	(N/A)	0.00
460.00	0.00	(N/A)	0.00
460.50	0.00	(N/A)	0.00
461.00	0.00	(N/A)	0.00
461.50	0.00	(N/A)	0.00
462.00	0.00	(N/A)	0.00
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.30	0.00	(N/A)	0.00
464.50	0.25	(N/A)	0.00
465.00	2.64	(N/A)	0.00
465.50	5.47	(N/A)	0.00
466.00	7.08	(N/A)	0.00
466.50	8.38	(N/A)	0.00
467.00	9.51	(N/A)	0.00
467.50	10.52	(N/A)	0.00
468.00	11.44	(N/A)	0.00
468.50	12.29	(N/A)	0.00
469.00	13.08	(N/A)	0.00
469.10	13.24	(N/A)	0.00
469.50	13.83	(N/A)	0.00
470.00	14.54	(N/A)	0.00
470.50	15.22	(N/A)	0.00
471.00	15.87	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El

Subsection: Individual Outlet Curves
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 2 (Orifice-Circular)

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

Computation Messages

CRIT.DEPTH CONTROL Vh= .051ft
Dcr= .149ft CRIT.DEPTH Hev= .00ft
CRIT.DEPTH CONTROL Vh= .201ft
Dcr= .499ft CRIT.DEPTH Hev= .00ft
H =.74
H =1.24
H =1.74
H =2.24
H =2.74
H =3.24
H =3.74
H =4.24
H =4.34
H =4.74
H =5.24
H =5.74
H =6.24

Subsection: Composite Rating Curve
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
458.00	0.00	(N/A)	0.00
458.50	0.00	(N/A)	0.00
459.00	0.00	(N/A)	0.00
459.50	0.00	(N/A)	0.00
460.00	0.00	(N/A)	0.00
460.50	0.00	(N/A)	0.00
461.00	0.00	(N/A)	0.00
461.50	0.00	(N/A)	0.00
462.00	0.00	(N/A)	0.00
462.50	0.59	(N/A)	0.00
463.00	1.45	(N/A)	0.00
463.50	1.92	(N/A)	0.00
464.00	2.30	(N/A)	0.00
464.30	2.50	(N/A)	0.00
464.50	2.88	(N/A)	0.00
465.00	5.55	(N/A)	0.00
465.50	8.65	(N/A)	0.00
466.00	10.50	(N/A)	0.00
466.50	12.03	(N/A)	0.00
467.00	13.37	(N/A)	0.00
467.50	14.58	(N/A)	0.00
468.00	15.69	(N/A)	0.00
468.50	16.72	(N/A)	0.00
469.00	17.69	(N/A)	0.00
469.10	17.88	(N/A)	0.00
469.50	29.24	(N/A)	0.00
470.00	55.35	(N/A)	0.00
470.50	89.90	(N/A)	0.00
471.00	102.40	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1

Subsection: Composite Rating Curve
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Contributing Structures

Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Orifice 1
Orifice 2 + Riser 1 + Orifice 1
Orifice 2 + Riser 1 + Orifice 1
Orifice 2 + Riser 1 + Orifice 1
Orifice 2 + Riser 1 + Orifice 1
Orifice 2 + Riser 1 + Orifice 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	495.75 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	501.50 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	497.50	501.50
Rectangular Weir	Weir 1	Forward	TW	500.15	501.50
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	497.50 ft
Orifice Diameter	5.25 in
Orifice Coefficient	0.600

Structure ID: Weir 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	500.15 ft
Weir Length	3.00 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	30
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: UG A3

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
495.75	0.00	(N/A)	0.00
496.25	0.00	(N/A)	0.00
496.75	0.00	(N/A)	0.00
497.25	0.00	(N/A)	0.00
497.50	0.00	(N/A)	0.00
497.75	0.12	(N/A)	0.00
498.25	0.53	(N/A)	0.00
498.75	0.73	(N/A)	0.00
499.25	0.90	(N/A)	0.00
499.75	1.03	(N/A)	0.00
500.15	1.13	(N/A)	0.00
500.25	1.15	(N/A)	0.00
500.75	1.26	(N/A)	0.00
501.25	1.36	(N/A)	0.00
501.50	1.41	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .069ft
Dcr= .182ft CRIT.DEPTH Hev= .00ft
H =.53
H =1.03
H =1.53
H =2.03
H =2.43
H =2.53
H =3.03
H =3.53
H =3.78

Subsection: Individual Outlet Curves
Label: UG A3

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir 1 (Rectangular Weir)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
495.75	0.00	(N/A)	0.00
496.25	0.00	(N/A)	0.00
496.75	0.00	(N/A)	0.00
497.25	0.00	(N/A)	0.00
497.50	0.00	(N/A)	0.00
497.75	0.00	(N/A)	0.00
498.25	0.00	(N/A)	0.00
498.75	0.00	(N/A)	0.00
499.25	0.00	(N/A)	0.00
499.75	0.00	(N/A)	0.00
500.15	0.00	(N/A)	0.00
500.25	0.28	(N/A)	0.00
500.75	4.02	(N/A)	0.00
501.25	9.62	(N/A)	0.00
501.50	12.85	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
HW & TW below Inv.El.=500.150
H=.00; Htw=.00; Qfree=.00;
H=.10; Htw=.00; Qfree=.28;
H=.60; Htw=.00; Qfree=4.02;
H=1.10; Htw=.00; Qfree=9.62;
H=1.35; Htw=.00; Qfree=12.85;

Subsection: Composite Rating Curve
Label: UG A3

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
495.75	0.00	(N/A)	0.00
496.25	0.00	(N/A)	0.00
496.75	0.00	(N/A)	0.00
497.25	0.00	(N/A)	0.00
497.50	0.00	(N/A)	0.00
497.75	0.12	(N/A)	0.00
498.25	0.53	(N/A)	0.00
498.75	0.73	(N/A)	0.00
499.25	0.90	(N/A)	0.00
499.75	1.03	(N/A)	0.00
500.15	1.13	(N/A)	0.00
500.25	1.43	(N/A)	0.00
500.75	5.28	(N/A)	0.00
501.25	10.98	(N/A)	0.00
501.50	14.25	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1

Subsection: Outlet Input Data
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	500.65 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	506.40 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	502.40	506.40
Rectangular Weir	Weir 1	Forward	TW	505.05	506.40
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	502.40 ft
Orifice Diameter	5.25 in
Orifice Coefficient	0.600

Structure ID: Weir 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	505.05 ft
Weir Length	3.75 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	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
500.65	0.00	(N/A)	0.00
501.15	0.00	(N/A)	0.00
501.65	0.00	(N/A)	0.00
502.15	0.00	(N/A)	0.00
502.40	0.00	(N/A)	0.00
502.65	0.12	(N/A)	0.00
503.15	0.53	(N/A)	0.00
503.65	0.73	(N/A)	0.00
504.15	0.90	(N/A)	0.00
504.65	1.03	(N/A)	0.00
505.05	1.13	(N/A)	0.00
505.15	1.15	(N/A)	0.00
505.65	1.26	(N/A)	0.00
506.15	1.36	(N/A)	0.00
506.40	1.41	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .069ft
Dcr= .182ft  CRIT.DEPTH Hev= .00ft
H =.53
H =1.03
H =1.53
H =2.03
H =2.43
H =2.53
H =3.03
H =3.53
H =3.78
```

Subsection: Individual Outlet Curves
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir 1 (Rectangular Weir)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
500.65	0.00	(N/A)	0.00
501.15	0.00	(N/A)	0.00
501.65	0.00	(N/A)	0.00
502.15	0.00	(N/A)	0.00
502.40	0.00	(N/A)	0.00
502.65	0.00	(N/A)	0.00
503.15	0.00	(N/A)	0.00
503.65	0.00	(N/A)	0.00
504.15	0.00	(N/A)	0.00
504.65	0.00	(N/A)	0.00
505.05	0.00	(N/A)	0.00
505.15	0.35	(N/A)	0.00
505.65	5.06	(N/A)	0.00
506.15	12.22	(N/A)	0.00
506.40	16.38	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
HW & TW below Inv.El.=505.050
H=.00; Htw=.00; Qfree=.00;
H=.10; Htw=.00; Qfree=.35;
H=.60; Htw=.00; Qfree=5.06;
H=1.10; Htw=.00; Qfree=12.22;
H=1.35; Htw=.00; Qfree=16.38;

Subsection: Composite Rating Curve
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
500.65	0.00	(N/A)	0.00
501.15	0.00	(N/A)	0.00
501.65	0.00	(N/A)	0.00
502.15	0.00	(N/A)	0.00
502.40	0.00	(N/A)	0.00
502.65	0.12	(N/A)	0.00
503.15	0.53	(N/A)	0.00
503.65	0.73	(N/A)	0.00
504.15	0.90	(N/A)	0.00
504.65	1.03	(N/A)	0.00
505.05	1.13	(N/A)	0.00
505.15	1.51	(N/A)	0.00
505.65	6.32	(N/A)	0.00
506.15	13.58	(N/A)	0.00
506.40	17.78	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	547.85 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	553.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	549.60	553.60
Rectangular Weir	Weir 1	Forward	TW	552.00	553.60
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	549.60 ft
Orifice Diameter	5.50 in
Orifice Coefficient	0.600

Structure ID: Weir 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	552.00 ft
Weir Length	3.50 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	30
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: UG A5

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
547.85	0.00	(N/A)	0.00
548.35	0.00	(N/A)	0.00
548.85	0.00	(N/A)	0.00
549.35	0.00	(N/A)	0.00
549.60	0.00	(N/A)	0.00
549.85	0.13	(N/A)	0.00
550.35	0.57	(N/A)	0.00
550.85	0.80	(N/A)	0.00
551.35	0.98	(N/A)	0.00
551.85	1.13	(N/A)	0.00
552.00	1.17	(N/A)	0.00
552.35	1.26	(N/A)	0.00
552.85	1.38	(N/A)	0.00
553.35	1.49	(N/A)	0.00
553.60	1.54	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .068ft
Dcr= .183ft CRIT.DEPTH Hev= .00ft
H =.52
H =1.02
H =1.52
H =2.02
H =2.17
H =2.52
H =3.02
H =3.52
H =3.77

Subsection: Individual Outlet Curves
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir 1 (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)
547.85	0.00	(N/A)	0.00
548.35	0.00	(N/A)	0.00
548.85	0.00	(N/A)	0.00
549.35	0.00	(N/A)	0.00
549.60	0.00	(N/A)	0.00
549.85	0.00	(N/A)	0.00
550.35	0.00	(N/A)	0.00
550.85	0.00	(N/A)	0.00
551.35	0.00	(N/A)	0.00
551.85	0.00	(N/A)	0.00
552.00	0.00	(N/A)	0.00
552.35	2.13	(N/A)	0.00
552.85	7.83	(N/A)	0.00
553.35	15.20	(N/A)	0.00
553.60	19.31	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
HW & TW below Inv.El.=552.000
H=.00; Htw=.00; Qfree=.00;
H=.35; Htw=.00; Qfree=2.13;
H=.85; Htw=.00; Qfree=7.83;
H=1.35; Htw=.00; Qfree=15.20;
H=1.60; Htw=.00; Qfree=19.31;

Subsection: Composite Rating Curve
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
547.85	0.00	(N/A)	0.00
548.35	0.00	(N/A)	0.00
548.85	0.00	(N/A)	0.00
549.35	0.00	(N/A)	0.00
549.60	0.00	(N/A)	0.00
549.85	0.13	(N/A)	0.00
550.35	0.57	(N/A)	0.00
550.85	0.80	(N/A)	0.00
551.35	0.98	(N/A)	0.00
551.85	1.13	(N/A)	0.00
552.00	1.17	(N/A)	0.00
552.35	3.39	(N/A)	0.00
552.85	9.21	(N/A)	0.00
553.35	16.69	(N/A)	0.00
553.60	20.85	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1

Subsection: Outlet Input Data
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	565.85 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	571.60 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	567.60	571.60
Rectangular Weir	Weir 1	Forward	TW	570.25	571.60
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	567.60 ft
Orifice Diameter	6.25 in
Orifice Coefficient	0.600

Structure ID: Weir 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	570.25 ft
Weir Length	3.25 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	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
565.85	0.00	(N/A)	0.00
566.35	0.00	(N/A)	0.00
566.85	0.00	(N/A)	0.00
567.35	0.00	(N/A)	0.00
567.60	0.00	(N/A)	0.00
567.85	0.14	(N/A)	0.00
568.35	0.72	(N/A)	0.00
568.85	1.02	(N/A)	0.00
569.35	1.25	(N/A)	0.00
569.85	1.45	(N/A)	0.00
570.25	1.59	(N/A)	0.00
570.35	1.62	(N/A)	0.00
570.85	1.77	(N/A)	0.00
571.35	1.92	(N/A)	0.00
571.60	1.98	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .067ft
Dcr= .183ft  CRIT.DEPTH Hev= .00ft
H =.49
H =.99
H =1.49
H =1.99
H =2.39
H =2.49
H =2.99
H =3.49
H =3.74
```

Subsection: Individual Outlet Curves
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir 1 (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)
565.85	0.00	(N/A)	0.00
566.35	0.00	(N/A)	0.00
566.85	0.00	(N/A)	0.00
567.35	0.00	(N/A)	0.00
567.60	0.00	(N/A)	0.00
567.85	0.00	(N/A)	0.00
568.35	0.00	(N/A)	0.00
568.85	0.00	(N/A)	0.00
569.35	0.00	(N/A)	0.00
569.85	0.00	(N/A)	0.00
570.25	0.00	(N/A)	0.00
570.35	0.31	(N/A)	0.00
570.85	4.36	(N/A)	0.00
571.35	10.49	(N/A)	0.00
571.60	14.02	(N/A)	0.00

Computation Messages

HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
HW & TW below Inv.El.=570.250
H=.00; Htw=.00; Qfree=.00;
H=.10; Htw=.00; Qfree=.31;
H=.60; Htw=.00; Qfree=4.36;
H=1.10; Htw=.00; Qfree=10.49;
H=1.35; Htw=.00; Qfree=14.02;

Subsection: Composite Rating Curve
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
565.85	0.00	(N/A)	0.00
566.35	0.00	(N/A)	0.00
566.85	0.00	(N/A)	0.00
567.35	0.00	(N/A)	0.00
567.60	0.00	(N/A)	0.00
567.85	0.14	(N/A)	0.00
568.35	0.72	(N/A)	0.00
568.85	1.02	(N/A)	0.00
569.35	1.25	(N/A)	0.00
569.85	1.45	(N/A)	0.00
570.25	1.59	(N/A)	0.00
570.35	1.92	(N/A)	0.00
570.85	6.14	(N/A)	0.00
571.35	12.40	(N/A)	0.00
571.60	16.01	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1

Requested Pond Water Surface Elevations	
Minimum (Headwater)	584.35 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	590.10 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	586.10	590.10
Rectangular Weir	Weir 1	Forward	TW	589.00	590.10
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	586.10 ft
Orifice Diameter	6.00 in
Orifice Coefficient	0.600

Structure ID: Weir 1 Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	589.00 ft
Weir Length	3.00 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	30
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: UG A7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
584.35	0.00	(N/A)	0.00
584.85	0.00	(N/A)	0.00
585.35	0.00	(N/A)	0.00
585.85	0.00	(N/A)	0.00
586.10	0.00	(N/A)	0.00
586.35	0.13	(N/A)	0.00
586.85	0.67	(N/A)	0.00
587.35	0.95	(N/A)	0.00
587.85	1.16	(N/A)	0.00
588.35	1.34	(N/A)	0.00
588.85	1.49	(N/A)	0.00
589.00	1.54	(N/A)	0.00
589.35	1.64	(N/A)	0.00
589.85	1.77	(N/A)	0.00
590.10	1.83	(N/A)	0.00

Computation Messages

```
HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL  Vh= .067ft
Dcr= .183ft  CRIT.DEPTH Hev= .00ft
H =.50
H =1.00
H =1.50
H =2.00
H =2.50
H =2.65
H =3.00
H =3.50
H =3.75
```


Subsection: Individual Outlet Curves
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Weir 1 (Rectangular Weir)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
584.35	0.00	(N/A)	0.00
584.85	0.00	(N/A)	0.00
585.35	0.00	(N/A)	0.00
585.85	0.00	(N/A)	0.00
586.10	0.00	(N/A)	0.00
586.35	0.00	(N/A)	0.00
586.85	0.00	(N/A)	0.00
587.35	0.00	(N/A)	0.00
587.85	0.00	(N/A)	0.00
588.35	0.00	(N/A)	0.00
588.85	0.00	(N/A)	0.00
589.00	0.00	(N/A)	0.00
589.35	1.82	(N/A)	0.00
589.85	6.65	(N/A)	0.00
590.10	9.62	(N/A)	0.00

Computation Messages

```
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
HW & TW below Inv.El.=589.000
H=.00; Htw=.00; Qfree=.00;
H=.35; Htw=.00; Qfree=1.82;
H=.85; Htw=.00; Qfree=6.65;
H=1.10; Htw=.00; Qfree=9.62;
```

Subsection: Composite Rating Curve
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
584.35	0.00	(N/A)	0.00
584.85	0.00	(N/A)	0.00
585.35	0.00	(N/A)	0.00
585.85	0.00	(N/A)	0.00
586.10	0.00	(N/A)	0.00
586.35	0.13	(N/A)	0.00
586.85	0.67	(N/A)	0.00
587.35	0.95	(N/A)	0.00
587.85	1.16	(N/A)	0.00
588.35	1.34	(N/A)	0.00
588.85	1.49	(N/A)	0.00
589.00	1.54	(N/A)	0.00
589.35	3.46	(N/A)	0.00
589.85	8.42	(N/A)	0.00
590.10	11.45	(N/A)	0.00

Contributing Structures
None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1
Orifice 1 + Weir 1

Subsection: Outlet Input Data
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Requested Pond Water Surface Elevations	
Minimum (Headwater)	462.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	468.25 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Orifice 1	Forward	TW	464.25	468.25
Rectangular Weir	Weir	Forward	TW	467.00	468.25
Tailwater Settings	Tailwater			(N/A)	(N/A)

Subsection: Outlet Input Data
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Structure ID: Weir Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	467.00 ft
Weir Length	4.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: Orifice 1 Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	464.25 ft
Orifice Diameter	3.25 in
Orifice Coefficient	0.600

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

Convergence Tolerances	
Maximum Iterations	30
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 ft³/s
Flow Tolerance (Maximum)	10.000 ft³/s

Subsection: Individual Outlet Curves
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

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

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.25	0.00	(N/A)	0.00
464.50	0.00	(N/A)	0.00
465.00	0.00	(N/A)	0.00
465.50	0.00	(N/A)	0.00
466.00	0.00	(N/A)	0.00
466.50	0.00	(N/A)	0.00
467.00	0.00	(N/A)	0.00
467.50	4.14	(N/A)	0.00
468.00	11.40	(N/A)	0.00
468.25	15.72	(N/A)	0.00

Computation Messages

```
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
HW & TW below Inv.El.=467.000
H=.00; Htw=.00; Qfree=.00;
H=.50; Htw=.00; Qfree=4.14;
H=1.00; Htw=.00; Qfree=11.40;
H=1.25; Htw=.00; Qfree=15.72;
```

Subsection: Individual Outlet Curves
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

RATING TABLE FOR ONE OUTLET TYPE
Structure ID = Orifice 1 (Orifice-Circular)

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

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.25	0.00	(N/A)	0.00
464.50	0.09	(N/A)	0.00
465.00	0.22	(N/A)	0.00
465.50	0.29	(N/A)	0.00
466.00	0.35	(N/A)	0.00
466.50	0.40	(N/A)	0.00
467.00	0.45	(N/A)	0.00
467.50	0.49	(N/A)	0.00
468.00	0.53	(N/A)	0.00
468.25	0.55	(N/A)	0.00

Computation Messages

HW & TW below invert
HW & TW below invert
HW & TW below invert
HW & TW below invert
Upstream HW & DNstream TW < Inv.El
CRIT.DEPTH CONTROL Vh= .076ft
Dcr= .173ft CRIT.DEPTH Hev= .00ft
H =.61
H =1.11
H =1.61
H =2.11
H =2.61
H =3.11
H =3.61
H =3.86

Subsection: Composite Rating Curve
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft³/s)	Tailwater Elevation (ft)	Convergence Error (ft)
462.50	0.00	(N/A)	0.00
463.00	0.00	(N/A)	0.00
463.50	0.00	(N/A)	0.00
464.00	0.00	(N/A)	0.00
464.25	0.00	(N/A)	0.00
464.50	0.09	(N/A)	0.00
465.00	0.22	(N/A)	0.00
465.50	0.29	(N/A)	0.00
466.00	0.35	(N/A)	0.00
466.50	0.40	(N/A)	0.00
467.00	0.45	(N/A)	0.00
467.50	4.63	(N/A)	0.00
468.00	11.93	(N/A)	0.00
468.25	16.27	(N/A)	0.00

Contributing Structures

None Contributing
None Contributing
None Contributing
None Contributing
None Contributing
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1
Orifice 1 + Weir
Orifice 1 + Weir
Orifice 1 + Weir
Orifice 1 + Weir

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio A2

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	423.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
423.00	0.00	0.000	3,040	0.00	0.00	0.00
423.50	0.00	0.035	3,040	0.00	0.00	16.89
424.00	0.00	0.070	3,040	0.00	0.00	33.78
424.50	0.00	0.105	3,040	0.00	0.00	50.67
425.00	0.00	0.140	3,040	0.00	0.00	67.56
425.50	0.00	0.174	3,040	0.00	0.00	84.44
426.00	0.00	0.222	15,200	0.00	0.00	107.23
426.50	0.00	0.404	16,569	0.00	0.00	195.45
427.00	0.35	0.602	17,997	0.00	0.35	291.79
427.50	0.58	0.817	19,484	0.00	0.58	396.11
428.00	15.60	1.050	21,031	0.00	15.60	523.64
428.50	42.88	1.300	22,636	0.00	42.88	672.19
429.00	73.20	1.570	24,300	0.00	73.20	832.86

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio A8

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	569.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
569.00	0.00	0.000	1,660	0.00	0.00	0.00
569.50	0.00	0.019	1,660	0.00	0.00	9.22
570.00	0.00	0.038	1,660	0.00	0.00	18.44
570.50	0.00	0.057	1,660	0.00	0.00	27.67
571.00	0.00	0.076	1,660	0.00	0.00	36.89
571.50	0.00	0.095	1,660	0.00	0.00	46.11
572.00	0.00	0.121	8,300	0.00	0.00	58.55
572.50	0.00	0.222	9,277	0.00	0.00	107.35
573.00	0.22	0.334	10,309	0.00	0.22	161.95
573.50	0.34	0.459	11,395	0.00	0.34	222.34
574.00	0.43	0.596	12,536	0.00	0.43	288.88
574.50	15.35	0.747	13,731	0.00	15.35	376.74
575.00	42.57	0.911	14,980	0.00	42.57	483.68

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B2

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	444.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
444.00	0.00	0.000	476	0.00	0.00	0.00
444.50	0.00	0.005	476	0.00	0.00	2.64
445.00	0.00	0.011	476	0.00	0.00	5.29
445.50	0.00	0.016	476	0.00	0.00	7.93
446.00	0.00	0.022	476	0.00	0.00	10.58
446.50	0.00	0.027	476	0.00	0.00	13.22
447.00	0.00	0.035	2,380	0.00	0.00	16.79
447.50	0.00	0.068	3,375	0.00	0.00	32.70
448.00	0.08	0.113	4,543	0.00	0.08	54.70
448.30	0.11	0.147	5,328	0.00	0.11	71.16
448.50	3.88	0.173	5,885	0.00	3.88	87.38
449.00	24.76	0.249	7,400	0.00	24.76	145.08

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B3

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	454.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
454.00	0.00	0.000	570	0.00	0.00	0.00
454.50	0.00	0.007	570	0.00	0.00	3.17
455.00	0.00	0.013	570	0.00	0.00	6.33
455.50	0.00	0.020	570	0.00	0.00	9.50
456.00	0.00	0.026	570	0.00	0.00	12.67
456.50	0.00	0.033	570	0.00	0.00	15.83
457.00	0.00	0.042	2,850	0.00	0.00	20.11
457.50	0.00	0.078	3,563	0.00	0.00	37.88
458.00	0.08	0.124	4,356	0.00	0.08	59.93
458.25	0.11	0.150	4,782	0.00	0.11	72.64
458.50	5.38	0.179	5,228	0.00	5.38	91.81
459.00	27.44	0.244	6,180	0.00	27.44	145.52

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B4

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	484.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
484.50	0.00	0.000	362	0.00	0.00	0.00
485.00	0.00	0.004	362	0.00	0.00	2.01
485.50	0.00	0.008	362	0.00	0.00	4.02
486.00	0.00	0.012	362	0.00	0.00	6.03
486.50	0.00	0.017	362	0.00	0.00	8.04
487.00	0.00	0.021	362	0.00	0.00	10.06
487.50	0.00	0.026	1,810	0.00	0.00	12.77
488.00	0.00	0.050	2,228	0.00	0.00	23.96
488.50	0.06	0.078	2,689	0.00	0.06	37.66
489.00	0.09	0.111	3,193	0.00	0.09	54.01
489.50	0.11	0.151	3,741	0.00	0.11	73.27
489.60	0.12	0.160	3,856	0.00	0.12	77.50
490.00	21.38	0.197	4,332	0.00	21.38	116.95

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B6

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	538.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
538.00	0.00	0.000	1,522	0.00	0.00	0.00
538.50	0.00	0.017	1,522	0.00	0.00	8.46
539.00	0.00	0.035	1,522	0.00	0.00	16.91
539.50	0.00	0.052	1,522	0.00	0.00	25.37
540.00	0.00	0.070	1,522	0.00	0.00	33.82
540.50	0.00	0.087	1,522	0.00	0.00	42.28
541.00	0.00	0.111	7,610	0.00	0.00	53.68
541.50	0.00	0.203	8,462	0.00	0.00	98.31
542.00	0.20	0.305	9,359	0.00	0.20	147.99
542.50	0.31	0.418	10,302	0.00	0.31	202.70
543.00	0.40	0.542	11,289	0.00	0.40	262.73
543.10	0.41	0.568	11,492	0.00	0.41	275.40
543.50	11.09	0.677	12,322	0.00	11.09	338.99
544.00	36.38	0.825	13,400	0.00	36.38	435.71

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B7

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	466.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
466.00	0.00	0.000	5,920	0.00	0.00	0.00
466.50	0.00	0.068	5,920	0.00	0.00	32.89
467.00	0.00	0.136	5,920	0.00	0.00	65.78
467.50	0.00	0.204	5,920	0.00	0.00	98.67
468.00	0.00	0.272	5,920	0.00	0.00	131.56
468.50	0.00	0.340	5,920	0.00	0.00	164.44
469.00	0.00	0.431	29,600	0.00	0.00	208.81
469.50	0.00	0.779	31,029	0.00	0.00	377.21
470.00	15.80	1.144	32,491	0.00	15.80	569.44
470.50	44.40	1.525	33,987	0.00	44.40	782.68
471.00	81.02	1.924	35,516	0.00	81.02	1,012.34

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio B9

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	490.00 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
490.00	0.00	0.000	1,060	0.00	0.00	0.00
490.50	0.00	0.012	1,060	0.00	0.00	5.89
491.00	0.00	0.024	1,060	0.00	0.00	11.78
491.50	0.00	0.037	1,060	0.00	0.00	17.67
492.00	0.00	0.049	1,060	0.00	0.00	23.56
492.50	0.00	0.061	1,060	0.00	0.00	29.44
493.00	0.00	0.077	5,300	0.00	0.00	37.39
493.50	0.00	0.141	5,783	0.00	0.00	68.17
494.00	0.17	0.210	6,287	0.00	0.17	101.85
494.50	0.26	0.285	6,813	0.00	0.26	138.32
495.00	0.32	0.367	7,359	0.00	0.32	177.75
495.50	0.38	0.454	7,927	0.00	0.38	220.25
496.00	0.43	0.549	8,515	0.00	0.43	265.96
496.50	0.47	0.650	9,125	0.00	0.47	314.99
497.00	0.51	0.758	9,755	0.00	0.51	367.47
497.10	0.52	0.781	9,884	0.00	0.52	378.39
497.50	21.80	0.874	10,407	0.00	21.80	444.75
498.00	72.30	0.997	11,080	0.00	72.30	554.93

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Bio/Sand A9

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	545.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
545.50	0.00	0.000	1,672	0.00	0.00	0.00
546.00	0.00	0.019	1,672	0.00	0.00	9.29
546.50	0.00	0.038	1,672	0.00	0.00	18.58
547.00	0.00	0.058	1,672	0.00	0.00	27.87
547.50	0.00	0.077	1,672	0.00	0.00	37.16
548.00	0.00	0.096	1,672	0.00	0.00	46.44
548.50	0.00	0.115	1,672	0.00	0.00	55.73
549.00	0.00	0.135	2,280	0.00	0.00	65.35
549.50	0.00	0.189	7,600	0.00	0.00	91.36
550.00	0.00	0.282	8,665	0.00	0.00	136.50
550.50	0.47	0.388	9,799	0.00	0.47	188.23
551.00	0.82	0.507	11,003	0.00	0.82	246.33
551.50	1.06	0.641	12,277	0.00	1.06	311.20
552.00	1.25	0.789	13,621	0.00	1.25	383.30
552.50	16.27	0.954	15,034	0.00	16.27	477.88
553.00	43.57	1.146	18,534	0.00	43.57	598.26
553.50	73.91	1.381	22,400	0.00	73.91	742.14

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Existing Pond

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	423.60 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
423.60	0.00	0.000	15	0.00	0.00	0.00
424.10	1.22	0.001	105	0.00	1.22	1.52
424.60	4.75	0.003	275	0.00	4.75	6.07
425.10	10.36	0.007	527	0.00	10.36	13.86
425.60	17.79	0.015	859	0.00	17.79	25.10
426.10	26.80	0.029	2,941	0.00	26.80	40.85
426.60	37.16	0.162	23,538	0.00	37.16	115.66
427.10	48.52	0.645	63,812	0.00	48.52	360.55
427.60	60.64	1.698	121,714	0.00	60.64	882.61
428.10	73.14	3.482	184,683	0.00	73.14	1,758.30
428.60	85.87	5.805	220,745	0.00	85.87	2,895.73
429.10	98.44	8.562	260,021	0.00	98.44	4,242.27
429.60	100.51	11.787	302,511	0.00	100.51	5,805.43
430.10	108.50	15.520	349,133	0.00	108.50	7,620.02
430.60	116.09	19.833	403,036	0.00	116.09	9,715.17
431.10	123.21	24.787	460,806	0.00	123.21	12,120.07
431.60	129.96	30.426	522,445	0.00	129.96	14,856.28
432.00	135.09	35.461	574,540	0.00	135.09	17,298.24

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Existing Wetland

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	398.60 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
398.60	0.00	0.000	15	0.00	0.00	0.00
399.10	11.53	0.027	6,654	0.00	11.53	24.46
399.60	31.85	0.199	25,366	0.00	31.85	128.13
400.10	58.54	0.667	66,785	0.00	58.54	381.38
400.60	90.03	2.113	196,638	0.00	90.03	1,112.91
401.10	125.88	5.443	394,950	0.00	125.88	2,760.36
401.60	165.59	11.442	661,720	0.00	165.59	5,703.56
402.10	208.54	20.877	980,387	0.00	208.54	10,313.13
402.60	254.76	33.839	1,284,856	0.00	254.76	16,632.66
403.10	304.12	50.531	1,630,435	0.00	304.12	24,761.02
403.60	356.11	71.426	2,017,124	0.00	356.11	34,926.09
404.10	410.95	96.923	2,382,034	0.00	410.95	47,321.67
404.60	468.13	125.019	2,513,965	0.00	468.13	60,977.21
405.10	527.77	154.649	2,649,451	0.00	527.77	75,378.02
405.60	590.02	185.855	2,788,493	0.00	590.02	90,544.03
406.10	654.12	218.685	2,937,041	0.00	654.12	106,497.52
406.60	720.69	253.407	3,113,912	0.00	720.69	123,369.89
407.10	789.42	290.190	3,295,954	0.00	789.42	141,241.41
407.60	860.01	329.092	3,483,168	0.00	860.01	160,140.50
408.00	917.86	361.779	3,636,662	0.00	917.86	176,018.97

Subsection: Elevation-Volume-Flow Table (Pond)
Label: Pond B7

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.00 ft
Volume (Initial)	1.567 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
458.00	0.00	0.000	12,931	0.00	0.00	0.00
458.50	0.00	0.153	13,804	0.00	0.00	74.25
459.00	0.00	0.317	14,705	0.00	0.00	153.43
459.50	0.00	0.491	15,635	0.00	0.00	237.70
460.00	0.00	0.676	16,594	0.00	0.00	327.21
460.50	0.00	0.872	17,581	0.00	0.00	422.13
461.00	0.00	1.080	18,596	0.00	0.00	522.60
461.50	0.00	1.299	19,640	0.00	0.00	628.80
462.00	0.00	1.567	33,941	0.00	0.00	758.43
462.50	0.59	1.965	35,435	0.00	0.59	951.72
463.00	1.45	2.381	36,961	0.00	1.45	1,153.66
463.50	1.92	2.814	38,519	0.00	1.92	1,363.78
464.00	2.30	3.265	40,109	0.00	2.30	1,582.56
464.30	2.50	3.545	41,079	0.00	2.50	1,718.07
464.50	2.88	3.735	41,732	0.00	2.88	1,810.46
465.00	5.55	4.223	43,387	0.00	5.55	2,049.56
465.50	8.65	4.731	45,073	0.00	8.65	2,298.36
466.00	10.50	5.258	46,792	0.00	10.50	2,555.38
466.50	12.03	5.805	48,544	0.00	12.03	2,821.72
467.00	13.37	6.373	50,327	0.00	13.37	3,097.68
467.50	14.58	6.961	52,143	0.00	14.58	3,383.51
468.00	15.69	7.570	53,990	0.00	15.69	3,679.42
468.50	16.72	8.200	55,870	0.00	16.72	3,985.61
469.00	17.69	8.852	57,782	0.00	17.69	4,302.27
469.10	17.88	8.986	58,168	0.00	17.88	4,366.87
469.50	29.24	9.527	59,726	0.00	29.24	4,640.21
470.00	55.35	10.224	61,703	0.00	55.35	5,003.61
470.50	89.90	10.943	63,711	0.00	89.90	5,386.52
471.00	102.40	11.686	65,752	0.00	102.40	5,758.62

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG A3

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	495.75 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
495.75	0.00	0.000	0	0.00	0.00	0.00
496.25	0.00	0.089	0	0.00	0.00	43.16
496.75	0.00	0.231	0	0.00	0.00	112.00
497.25	0.00	0.423	0	0.00	0.00	204.90
497.50	0.00	0.518	0	0.00	0.00	250.60
497.75	0.12	0.612	0	0.00	0.12	296.42
498.25	0.53	0.796	0	0.00	0.53	385.96
498.75	0.73	0.974	0	0.00	0.73	472.01
499.25	0.90	1.141	0	0.00	0.90	553.33
499.75	1.03	1.296	0	0.00	1.03	628.07
500.15	1.13	1.402	0	0.00	1.13	679.62
500.25	1.43	1.428	0	0.00	1.43	692.79
500.75	5.28	1.524	0	0.00	5.28	743.05
501.25	10.98	1.613	0	0.00	10.98	791.91
501.50	14.25	1.658	0	0.00	14.25	816.76

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG A4

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	500.65 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
500.65	0.00	0.000	0	0.00	0.00	0.00
501.15	0.00	0.089	0	0.00	0.00	43.16
501.65	0.00	0.231	0	0.00	0.00	112.00
502.15	0.00	0.423	0	0.00	0.00	204.90
502.40	0.00	0.518	0	0.00	0.00	250.60
502.65	0.12	0.612	0	0.00	0.12	296.42
503.15	0.53	0.796	0	0.00	0.53	385.96
503.65	0.73	0.974	0	0.00	0.73	472.01
504.15	0.90	1.141	0	0.00	0.90	553.33
504.65	1.03	1.296	0	0.00	1.03	628.07
505.05	1.13	1.402	0	0.00	1.13	679.62
505.15	1.51	1.428	0	0.00	1.51	692.86
505.65	6.32	1.524	0	0.00	6.32	744.09
506.15	13.58	1.613	0	0.00	13.58	794.51
506.40	17.78	1.658	0	0.00	17.78	820.29

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG A5

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	547.85 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
547.85	0.00	0.000	0	0.00	0.00	0.00
548.35	0.00	0.099	0	0.00	0.00	47.93
548.85	0.00	0.257	0	0.00	0.00	124.38
549.35	0.00	0.470	0	0.00	0.00	227.58
549.60	0.00	0.575	0	0.00	0.00	278.34
549.85	0.13	0.680	0	0.00	0.13	329.22
550.35	0.57	0.885	0	0.00	0.57	428.69
550.85	0.80	1.082	0	0.00	0.80	524.27
551.35	0.98	1.268	0	0.00	0.98	614.59
551.85	1.13	1.439	0	0.00	1.13	697.60
552.00	1.17	1.483	0	0.00	1.17	719.07
552.35	3.39	1.587	0	0.00	3.39	771.30
552.85	9.21	1.693	0	0.00	9.21	828.66
553.35	16.69	1.792	0	0.00	16.69	884.07
553.60	20.85	1.842	0	0.00	20.85	912.19

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG A6

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	565.85 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
565.85	0.00	0.000	0	0.00	0.00	0.00
566.35	0.00	0.111	0	0.00	0.00	53.79
566.85	0.00	0.289	0	0.00	0.00	139.68
567.35	0.00	0.528	0	0.00	0.00	255.65
567.60	0.00	0.646	0	0.00	0.00	312.69
567.85	0.14	0.764	0	0.00	0.14	369.87
568.35	0.72	0.994	0	0.00	0.72	481.71
568.85	1.02	1.215	0	0.00	1.02	589.16
569.35	1.25	1.424	0	0.00	1.25	690.68
569.85	1.45	1.617	0	0.00	1.45	783.97
570.25	1.59	1.749	0	0.00	1.59	848.30
570.35	1.92	1.783	0	0.00	1.92	864.69
570.85	6.14	1.902	0	0.00	6.14	926.76
571.35	12.40	2.013	0	0.00	12.40	986.81
571.60	16.01	2.069	0	0.00	16.01	1,017.31

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG A7

Return Event: 1 years
Storm Event: 1-Year

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	584.35 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
584.35	0.00	0.000	0	0.00	0.00	0.00
584.85	0.00	0.100	0	0.00	0.00	48.44
585.35	0.00	0.260	0	0.00	0.00	125.77
585.85	0.00	0.476	0	0.00	0.00	230.17
586.10	0.00	0.582	0	0.00	0.00	281.52
586.35	0.13	0.688	0	0.00	0.13	333.01
586.85	0.67	0.895	0	0.00	0.67	433.71
587.35	0.95	1.094	0	0.00	0.95	530.45
587.85	1.16	1.282	0	0.00	1.16	621.85
588.35	1.34	1.456	0	0.00	1.34	705.84
588.85	1.49	1.605	0	0.00	1.49	778.25
589.00	1.54	1.639	0	0.00	1.54	795.02
589.35	3.46	1.713	0	0.00	3.46	832.31
589.85	8.42	1.813	0	0.00	8.42	885.72
590.10	11.45	1.863	0	0.00	11.45	912.97

Subsection: Elevation-Volume-Flow Table (Pond)
Label: UG B10

Return Event: 1 years
Storm Event: 1-Year

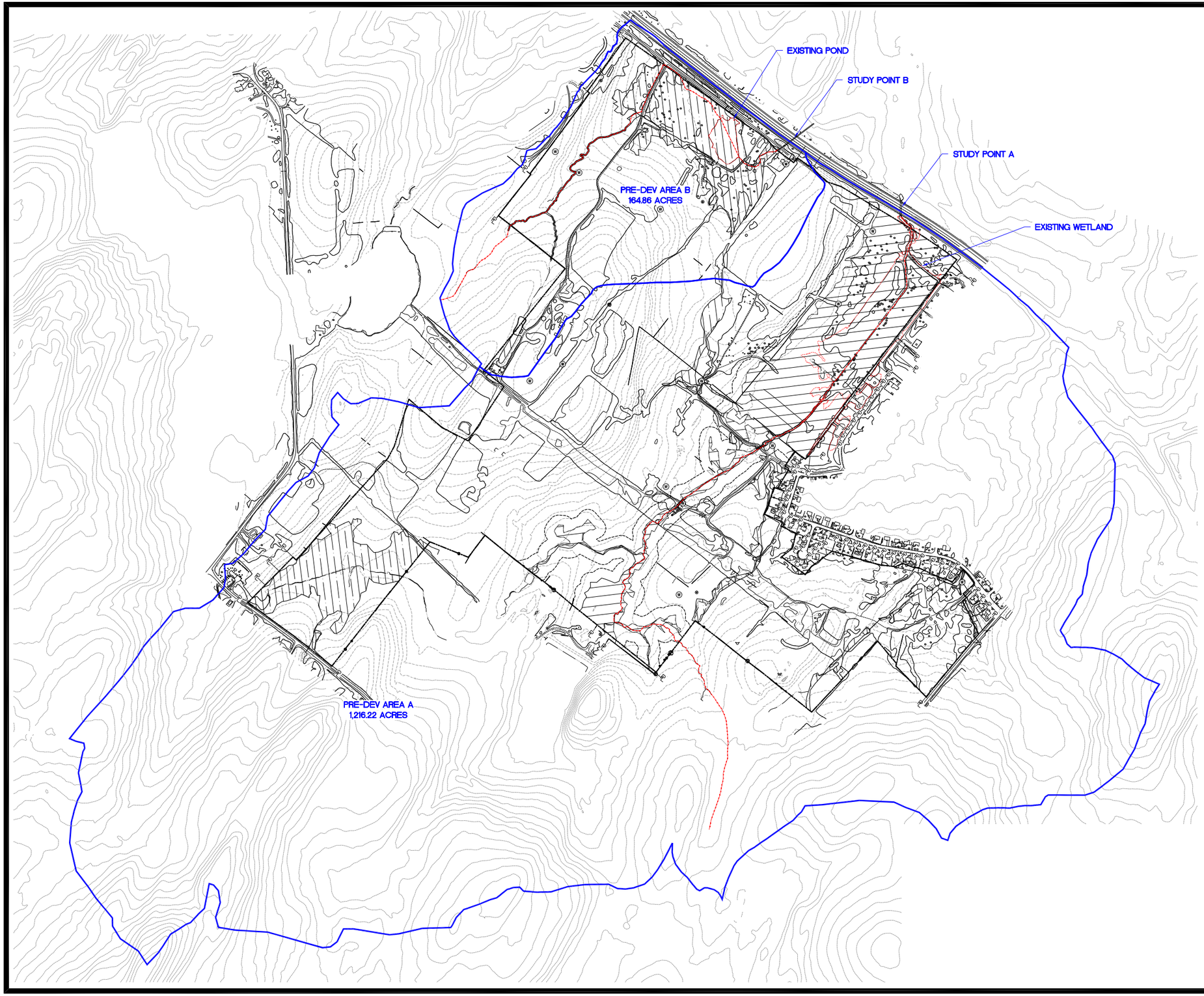
Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	462.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Elevation (ft)	Outflow (ft³/s)	Storage (ac-ft)	Area (ft²)	Infiltration (ft³/s)	Flow (Total) (ft³/s)	2S/t + O (ft³/s)
462.50	0.00	0.000	0	0.00	0.00	0.00
463.00	0.00	0.039	0	0.00	0.00	18.85
463.50	0.00	0.101	0	0.00	0.00	48.83
464.00	0.00	0.184	0	0.00	0.00	89.24
464.25	0.00	0.225	0	0.00	0.00	109.11
464.50	0.09	0.267	0	0.00	0.09	129.08
465.00	0.22	0.347	0	0.00	0.22	167.98
465.50	0.29	0.424	0	0.00	0.29	205.41
466.00	0.35	0.497	0	0.00	0.35	240.79
466.50	0.40	0.564	0	0.00	0.40	273.31
467.00	0.45	0.622	0	0.00	0.45	301.38
467.50	4.63	0.664	0	0.00	4.63	325.82
468.00	11.93	0.703	0	0.00	11.93	351.97
468.25	16.27	0.722	0	0.00	16.27	365.74

APPENDIX C

PRE/POST-DEVELOPMENT DRAINAGE CONDITIONS MAPS
STORMWATER PRACTICE MAP



GRID

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Goshen, N.Y. 10924
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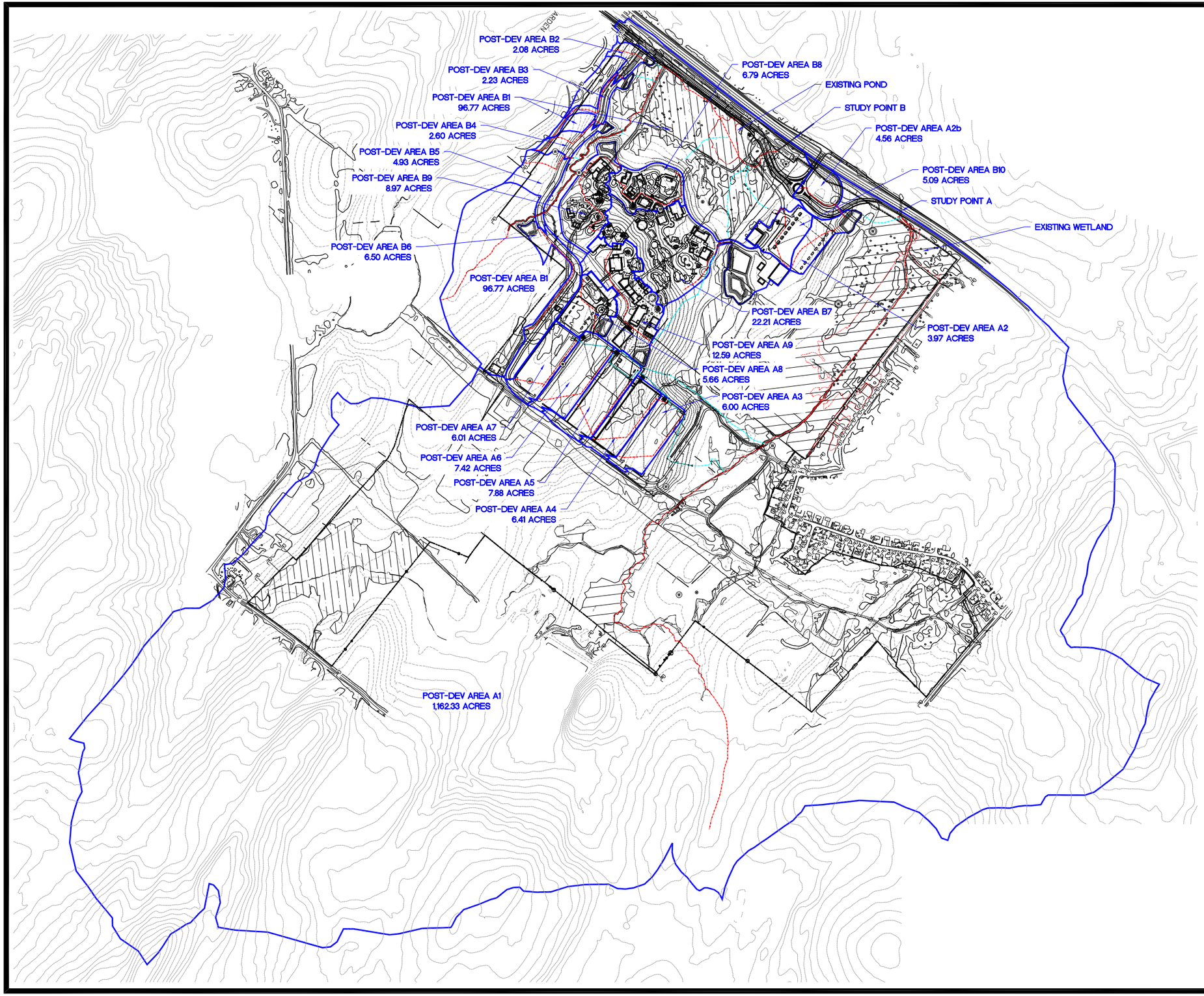
PRE-DEVELOPMENT DRAINAGE CONDITIONS MAP

LEGOLAND NEW YORK

TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

Date:	SEPTEMBER 16, 2016
Revisions:	APRIL 7, 2017
CAD File:	160042-DRAINAGE
Layout:	PRE
Sheet No.:	2 OF 5
Drawing No.:	C3D D - 16 - 0042 - 02

Drawn By:	Checked By:	Scale:	Tax Map No.:
ESR		1" = 1,000'	SEE SITE PLANS



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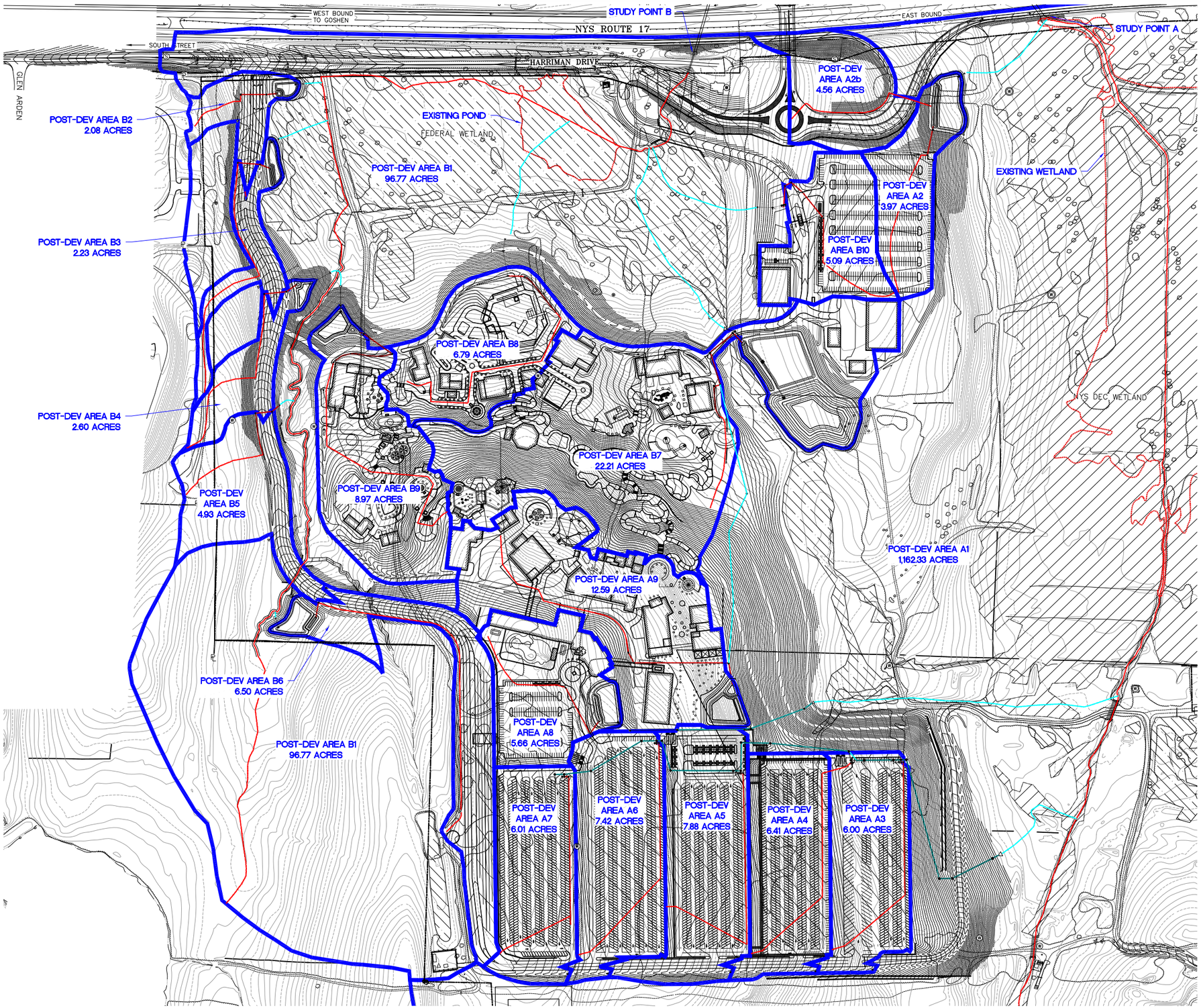
POST-DEVELOPMENT DRAINAGE CONDITIONS MAP

LEGOLAND NEW YORK

TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

Date:	SEPTEMBER 16, 2016
Revisions:	APRIL, 2017
CAD File:	160042-DRAINAGE
Layout:	POST
Sheet No.:	3 OF 5

Drawn By:	Checked By:	Scale:	Tax Map No.:	Drawing No.:
ESR		1" = 1,000'	SEE SITE PLANS	C3D D - 16 - 0042 - 03



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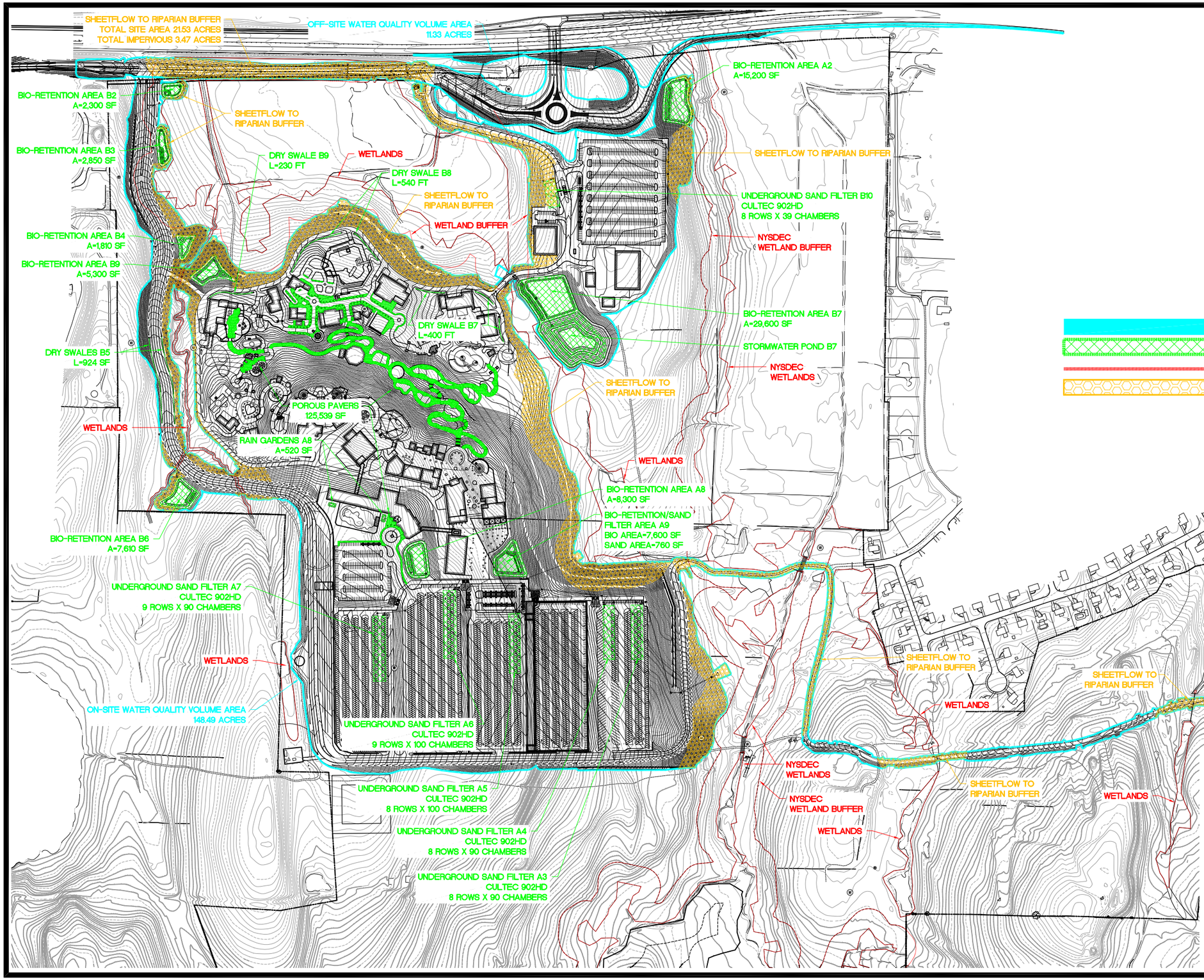
POST–DEVELOPMENT DRAINAGE CONDITIONS MAP

LEGOLAND NEW YORK

TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

Date:	SEPTEMBER 16, 2016
Revisions:	APRIL 7, 2017
CAD File:	160042–DRAINAGE
Layout:	POST 2
Sheet No.:	4 OF 5

Drawn By:	Checked By:	Scale:	Tax Map No.:	Drawing No.:
ESR		1" = 400'	SEE SITE PLANS	C3D D – 16 – 0042 – 04



LEGEND

- WATER QUALITY AREA
- STORMWATER PRACTICE
- WETLAND/NYSDEC WETLAND BUFFER
- SHEETFLOW TO RIPARIAN BUFFERS AREA

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WATER QUALITY PRACTICE MAP

LEGOLAND NEW YORK

TOWN OF GOSHEN
ORANGE COUNTY, NEW YORK

Date:	SEPTEMBER 16, 2016
Revisions:	APRIL 7, 2017
CAD File:	160042-DRAINAGE
Layout:	WQ
Sheet No.:	5 OF 5

Drawn By:	Checked By:	Scale:	Tax Map No.:	Drawing No.:
ESR		1" = 250'	SEE SITE PLANS	C3D D - 16 - 0042 - 05

LEGOLAND NEW YORK
Town of Goshen, New York

Water Quality/Runoff Reduction Volume Summary
Total Site

Required Water Quality Volume (WQv)

Drainage Area = 6,961,561 SF
Impervious Area = 3,457,630 SF
Required WQv = 389,244 CF (from water quality calc sheet)

NYSDEC requires that WQv be treated through use of Green Infrastructure Practices. These practices reduce the required WQv by reducing the drainage area or impervious area in the WQv calculation or by direct volume reduction of the required WQv. WQv treatment provided by the Green Infrastructure Practices is called Runoff Reduction Volume (RRv). The project must provide a minimum amount of WQv treatment in the Green Infrastructure Practices based on the Hydrologic Soil Group at the site.

Runoff Reduction/Water Quality Treatment Practices	RRv Deductions			WQv Treatment Volume (CF)
	Drainage Area (SF)	Impervious Area (SF)	Volume (CF)	
Sheetflow to Riparian Buffers or Filter Strips (Area Based Deduction) Notes: Portions of Harriman Drive, emergency access, & perimeter grading throughout project. Total Drainage Area to Buffers = **937,825** SF Impervious Area Draining to Buffers = **150,950** SF	937,825	150,950		
Tree Planting/Tree Pit (Area Based Deduction) Notes: Based on preliminary landscaping plan. Number of Roadside Proposed Trees = 880 Impervious Area Reduction (100 SF/Tree)= **88,000** SF		88,000		
Rain Garden (Volume Based Deduction) Notes: Rain gardens for hotel roof. Rain Garden Water Quality Volume = **468** CF (from rain garden calc sheet)			468	
Porous Pavers (Area Based Deduction) Notes: Pavers in theme park and hotel areas. Area of Porous Pavers = **125,539** SF (from pavement calc sheet)		125,539		
Standard SMP - Dry Swale (Volume Based Deduction) Notes: Dry swales around park perimeter and portion of park entrance road. Total Dry Swale Treatment Capacity = 19,345 CF (from dry swale calc sheet) Maximum Deduction Allowed = **3,869** CF Deduction = 20% Remaining Treatment is standard WQv = **15,476** CF			3,869	15,476

LEGOLAND NEW YORK
Town of Goshen, New York

Standard SMP - Bio-Retention Areas (Volume Based Deduction) Notes: 9 bio-retention areas throughout project. Total Bio. Area Treatment Capacity = **118,878** CF (from bio calc sheet) Maximum Deduction Allowed = **47,551** CF Deduction = 40% Remaining Treatment is standard WQv = **71,327** CF			47,551	71,327
Standard SMP - Underground Sand Filtration Areas (Volume Based Deduction) Notes: 6 underground sand filters for parking areas and portion of back of house, no RRv provided. Total UG Treatment Capacity = **166,748** CF (from sand filter calc sheet)				166,748
Standard SMP - Surface Sand Filter (Volume Based Deduction) Notes: 1 surface sand filter combined with bio area, no RRv provided. Total Sand Filter Treatment Capacity = **5,553** CF (from sand filter calc sheet)				5,553
Standard SMP - Stormwater Pond (Volume Based Deduction) Notes: Micropool stormwater pond, no RRv provided. Stormwater Pond Water Quality Volume = **66,208** CF (from pond calc sheet)				66,208
Total	937,825	364,489	51,888	325,311

Provided Runoff Reduction Volume Calculation

Drainage Area =	6,961,561	SF
- Drainage Area Deduction =	937,825	SF
New Drainage Area =	6,023,736	SF
Impervious Area =	3,457,630	SF
- Impervious Area Deduction =	364,489	SF
New Impervious Area =	3,093,141	SF
New Drainage Area =	6,023,736	
New Impervious Area =	3,093,141	
New Rv =	0.51	
Reduced WQv =	347,064	CF
- Volume Deduction =	51,888	CF
Reduced WQv =	295,176	CF

Provided RRv = Original WQv - Reduced WQv

Provided RRv = 94,068 CF

Required Water Quality Volume (WQv) =	**389,244**	**CF**
Provided Runoff Reduction Volume (RRv) =	**94,068**	**CF**
Provided Water Quality Volume (WQv) =	**325,311**	**CF**
Total Provided RRv and WQv =	**419,379**	**CF**

LEGOLAND NEW YORK
Town of Goshen, New York

Minimum Required Runoff Reduction Volume Treatment

$$\text{Minimum RRv} = \frac{P*Rv*Ai}{12}$$

P = 1.35 inch

Rv = 0.05+0.009*I (I=100%)

Ai (Impervious for Runoff Reduction) =	S* Aic	
Aic (New Impervious Cover) =	3,457,630	SF
Specific Reduction Factor (HSG C) =	0.206	
Ai =	712,272	SF

Minimum RRv =	**76,124**	**CF**
Provided RRv =	**94,068**	**CF**
Provided RRv is Greater than the Minimum.		

Specific Reduction Factor Calculation

HSG	Reduction Factor	Percent of Site	Weighted Reduction Factor
A	0.55	0.00%	0.000
B	0.40	0.00%	0.000
C	0.30	6.00%	0.018
D	0.20	94.00%	0.188
			0.206

Lanc and Tully Engineering, P.C.

Project Name: LEGOLAND New York - Total Site (includes road work in front of site)
Project Location: Town of Goshen, New York

Water Quality Volume Calculation:

$$WQv = \frac{(P) * (Rv) * (A)}{12}$$

$$Rv = 0.05 + 0.009(I)$$

WQv = Water Quality Volume (ac-ft)
P = 90% Rainfall Event (in)
Rv = Runoff Coefficient
I = % impervious of the site
A = Area of the site (Contributing Acreage)

Impervious Acreage	=	79.376	Acres
Contributing Site Area	=	159.815	Acres
I (% Impervious)	=	49.7	%
Runoff Coefficient (Rv)	=	0.50	
90% Rainfall Event		P	1.35 *Rainfall from NYSDEC SWM Figure 4.1
Site Area (Contributing)		A	159.815

REQUIRED WATER QUALITY VOLUME	=	8.936	AC-FT
		389,244	CU-FT

APPENDIX D

CALCULATIONS:
WATER QUALITY/RUNOFF REDUCTION VOLUME
CHANNEL PROTECTION VOLUME
STORMWATER PRACTICE DESIGN

LEGOLAND NEW YORK
Town of Goshen, New York
Channel Protection Volume Orifice Sizing

Total CPv = Channel Protection Volume

Qo = Average Outflow discharge, CPv/24 hr*60 min* 60 sec

h = head at orifice centerline, ft

C = Orifice Coefficient = 0.6

g = 32.2, ft^/s

A = Qo/C*sqrt(2*g*h)

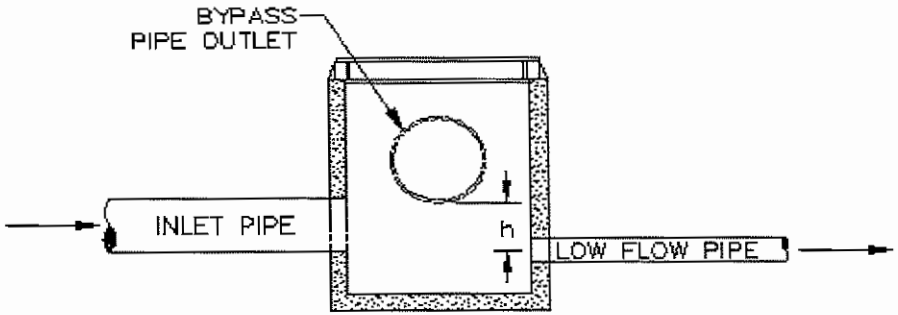
Area	Practice	Total CPv (Ac.-FT)	Total CPv (CF)	Qo (CFS)	1-Year Peak Water Surface El.	Orifice Invert	Orifice Diameter (in)	Average Flowrate (CFS)
A2	Bio A2	0.575	25,047	0.55	427.37	426.50	5	0.53
A2b	Bio A2	0.521	22,695					
A3	UG A3	1.054	45,912	0.53	498.20	497.50	5.25	0.50
A4	UG A4	1.126	49,049	0.57	503.21	502.40	5.25	0.56
A5	UG A5	1.322	57,586	0.67	550.51	549.60	5.5	0.66
A6	UG A6	1.303	56,759	0.66	568.27	567.60	6.25	0.66
A7	UG A7	1.105	48,134	0.56	586.69	586.10	6	0.55
A8	Bio A8	0.825	35,937	0.42	573.90	572.50	3.75	0.41
B2	Bio B2	0.214	9,322	0.11	448.25	447.50	2.25	0.11
B3	Bio B3	0.217	9,453	0.11	458.21	457.50	2.25	0.10
B4	Bio B4	0.241	10,498	0.12	489.58	488.00	1.9	0.12
B6	Bio B6	0.818	35,632	0.41	543.05	541.50	3.6	0.40
B7	Pond B7*	3.082	218,105	2.52	464.27	462.00	8.25	2.48
A9		1.925						
B9	Bio B9	1.129	49,179	0.57	497.05	493.50	3.25	0.51
B10	UG B10	0.853	37,157	0.43	466.79	464.25	3.25	0.43
Total			710,464					

* Includes flow from bio-retention area A9 and watershed A9

LEGOLAND NEW YORK
Town of Goshen, New York

Diversion Structure Design

Low flow pipe sized using orifice equation



Q = CA*sqrt(2gh)

Q = Low Flow Pipe discharge, CFS
h = head at orifice centerline, ft
C = Orifice Coefficient = 0.6
g = 32.2, ft^/s

SMP Downstream	Watershed Area	1-Year Storm Flowrate (CFS)	WQ Storm Flowrate (CFS)	Low Flow Pipe Diameter (in.)	Low Flow Pipe Invert	Minimum h (FT)
Bio A2	A2, A2b	13.20		21	426.50	1.3004
UG A3	A3	12.14		21	496.50	1.0999
UG A4	A4	13.14		21	501.40	1.2886
UG A5	A5	15.65		21	548.60	1.8279
UG A6	A6	14.62		21	566.60	1.5952
UG A7	A7	12.58		21	585.10	1.1811
Bio A8	A8	7.16				
Bio B5	B5					
Bio B6	B6	9.78		18	542.00	1.3225
Bio B7	B7	32.53				
Bio B8	B8	8.68				
Bio B9	B9	13.35		21	542.00	1.3301
Bio B10	B10	7.65		18	463.25	0.8092

LEGOLAND NEW YORK
Town of Goshen, New York

Underground Sand Filtration Area Water Quality Volume and Design

Filtration Area Characteristics

Af = (WQv x df)/(k (hf+df) tf)

Af =	surface area of filter bed, sf	
df =	filter media depth, ft	
k =	infiltration rate, ft/day	3.5
hf =	average water height, ft	0.50
tf =	bed drain time, days	1.67

Area I.D.	Sand Filter Chamber Row Length (LF)	Filter Bed Area* (SF)	Filter Bed Depth (FT)	Underdrain Inv. El.	Bed El. (Top of Sand)	Top of UG System El.	Lowest Outlet El.	Provided Water Quality Volume (CF)	Provided Pre-Treatment (CF)	Total Provided Treatment (CF)	Required 75% WQ Ponding (CF)	Capacity of Ponding** (CF)
A3	325	2,113	1	494.25	495.75	501.50	497.50	18,521	8,863	27,384	13,891	21,125
A4	325	2,113	1	499.15	500.65	506.40	502.40	18,521	8,863	27,384	13,891	21,125
A5	362	2,353	1	546.35	547.85	553.60	549.60	20,630	9,872	30,502	15,472	23,530
A6	362	2,353	1	564.35	565.85	571.60	567.60	20,630	9,872	30,502	15,472	23,530
A7	325	2,113	1	582.85	584.35	590.10	586.10	18,521	8,863	27,384	13,891	21,125
B10	280	1,820	1	461.00	462.50	468.25	464.25	15,957	7,636	23,592	11,968	18,200
Total										166,748		

* Filter bed width is 6.5' under chamber row

** First 2 rows of system will drain through sand filter to underdrain

Separator Row (Pre-Treatment)

Geotextile wrapped separator row to provide water quality pre-treatment.

Volume of chamber and surrounding stone from manufacturer cut sheets.

Area I.D.	Chamber Row Length (LF)	Chamber and Stone Volume /LF (CF/FT)	Total Volume of Separator Row (CF)	Required Pre-Treatment Volume (25%) (CF)
A3	325	27.27	8,863	4,630
A4	325	27.27	8,863	4,630
A5	362	27.27	9,872	5,157
A6	362	27.27	9,872	5,157
A7	325	27.27	8,863	4,630
B10	280	27.27	7,636	3,989

Filtration Area Underdrain System Length

L = 10% Af/W

Area I.D.	Filter Bed Area (SF)	10% of Filter Area (SF)	Width of Pipe Bed (FT)	Required Underdrain Length (FT)	Provided Underdrain Length (FT)
A3	2,113	211	6.0	35	325
A4	2,113	211	6.0	35	325
A5	2,353	235	6.0	39	362
A6	2,353	235	6.0	39	362
A7	2,113	211	6.0	35	325
B10	1,820	182	6.0	30	280

LEGOLAND NEW YORK
Town of Goshen, New York

Bio-Retention Area Water Quality Volume and Design

Bio-Retention Area Characteristics

Af = (WQv x df)/(k (hf+df) tf)

Af = surface area of filter bed, sf
df = filter bed depth, ft
k = media permeability, ft/day 0.5
hf = average water height, ft 0.25
tf = bed drain time, days 2

Area I.D.	Filter Bed Area (SF)	Filter Bed Depth (FT)	Underdrain Inv. El.	Bed El.	Berm El.	First Orifice/Riser El.	Provided Water Quality Volume (CF)	Provided Pre-Treatment (CF)	Total Provided Treatment (CF)	Required 75% WQ Ponding (CF)	Capacity of Ponding (CF)
A2	15,200	2.5	423.00	426.00	429.00	426.50	16,720	5,609	22,329	12,540	13,421
A8	8,300	2.5	569.00	572.00	575.00	572.50	9,130	3,798	12,928	6,848	8,124
A9	7,600	2.5	546.50	549.50	552.50	550.00	8,360	3,860	12,220	6,270	7,813
B2	2,300	2.5	444.00	447.00	449.00	447.50	2,530	756	3,286	1,898	1,983
B3	2,850	2.5	454.00	457.00	459.00	457.50	3,135	1,232	4,367	2,351	2,787
B4	1,810	2.5	484.50	487.50	490.00	488.00	1,991	633	2,624	1,493	1,620
B6	7,610	2.5	538.00	541.00	544.00	541.50	8,371	2,405	10,776	6,278	6,338
B7	29,500	2.5	466.00	469.00	470.00	469.50	32,450	9,993	42,443	24,338	25,210
B9	5,300	2.5	490.00	493.00	498.00	493.50	5,830	2,076	7,906	4,373	4,843
Total									118,878		

Bio-Retention Area Underdrain System Length

L = 10% Af/W

Area I.D.	Filter Bed Area (SF)	10% of Filter Area (SF)	Width (FT)	Required Underdrain Length (FT)	Provided Underdrain Length (FT)
A2	15,200	1,520	4.0	380	TBD
A8	8,300	830	5.0	166	TBD
A9	7,600	760	5.0	152	TBD
B2	2,300	230	4.0	58	TBD
B3	2,850	285	5.0	57	TBD
B4	1,810	181	6.0	30	TBD
B6	7,610	761	8.0	95	TBD
B7	29,500	2,950	9.0	328	TBD
B9	6,300	630	11.0	57	TBD

Forebay Water Quality Volume (Pre-Treatment)

Area I.D.	Bottom Area (SF)	Top Area (SF)	Depth (FT)	Required Pre-Treatment Volume (25%) (CF)
A2	304	3,435	3	4,180
A8	172	2,360	3	2,283
A9	640	1,933	3	1,490
B2	166	590	2	633
B3	132	1,100	2	784
B4	113	520	2	498
B6	186	1,417	3	2,093
B7	1,457	5,205	3	8,113
B9	142	1,242	3	1,458

LEGOLAND NEW YORK
Town of Goshen, New York

Dry Swale Water Quality Volume

d = filter media depth 2.5
n = media porosity 0.2
Slope = must be less than 4%

Swale I.D.	Swale Dimensions						Provided Water Quality Volume (CF)	Provided Pre-Treatment (CF)	Total Provided Treatment (CF)
	Length (FT)	Depth (FT)	Side Slope (y:1)	Bottom Width (SF)	Underdrain Volume (SF)	Flow Area (SF)			
B5	924	1	3.0	3	1.5	6	6,930	832	7,762
B7	400	1	3.0	4	2	7	3,600	360	3,960
B8	540	1	3.0	4	2	7	4,860	486	5,346
B9	230	1	3.0	4	2	7	2,070	207	2,277
Total	2,094								19,345

Gravel Diaphragm Water Quality Volume

n = stone porosity 0.4

Gravel Diaphragm I.D.	Length (FT)	Width (FT)	Depth (FT)	Volume (CF)	Required Pre-Treatment Volume (10%) (CF)	Quality Pre-Treatment Volume (CF)
B5	924	1.5	1.5	832	693	832
B7	400	1.5	1.5	360	360	360
B8	540	1.5	1.5	486	486	486
B9	230	1.5	1.5	207	207	207

LEGOLAND NEW YORK
Town of Goshen, New York

Porous Pavers Water Quality Volume and Design

n = stone porosity 0.4
90% Rainfall = 1.35

Area I.D.	Impervious Area (SF)	Runoff Coefficient	Provided Water Quality Volume (CF)
A8	7,192	0.950	769
B7	62,943	0.950	6,727
B8	41,914	0.950	4,480
B9	13,490	0.950	1,442
Total	125,539		13,417

LEGOLAND NEW YORK
Town of Goshen, New York

Rain Garden Design

V=Asm*Dsm*ndl+Adl+Ddl+ndl+Asm*Dp

Vdl=	volume of drainage layer (CF)		Vsm=	volume of soil media (CF)	
Adl=	area of drainage layer (SF)		Asm=	area of soil media (SF)	
Ddl=	depth of drainage layer (FT)	0.5	Dsm=	depth of soil media (FT)	1
ndl=	drainage layer porosity	0.4	nsm=	soil media porosity	0.2
Dp=	ponding depth (ft)	0.5			

Area I.D.	Bed El.	Berm El.	Riser El.	Rain Garden Area (SF)	Vsm (CF)	Vdl (CF)	Volume of Ponding (CF)	Provided Treatment Volume (CF)
A8	TBD	TBD	TBD	260	52	52	130	234
A8	TBD	TBD	TBD	260	52	52	130	234
Total								468

LEGOLAND NEW YORK
Town of Goshen, New York

Surface Sand Filter Area Water Quality Volume and Design

Surface Sand Filter Area Characteristics

Af = (WQv x df)/(k (hf+df) tf)

Af = surface area of filter bed, sf
df = filter bed depth, ft
k = media permeability, ft/day 3.5
hf = average water height, ft 0.50
tf = bed drain time, days 1.67

Area I.D.	Filter Bed Area (SF)	Filter Bed Depth (FT)	Underdrain Inv. El.	Bed El.	Berm El.	First Orifice/Riser El.	Provided Water Quality Volume (CF)	Provided Pre-Treatment (CF)	Total Provided Treatment (CF)	Required 75% WQ Ponding (CF)	Capacity of Ponding* (CF)
A9	760	2	546.50	549.00	552.50	550.00	5,553		5,553	4,165	1,078
Total									5,553		

* Ponding directly over sand filter bed. Volume over bio-retention area A9 can be added to this number.

Surface Sand Filter Area Underdrain System Length

L = 10% Af/W

Area I.D.	Filter Bed Area (SF)	10% of Filter Area (SF)	Width (FT)	Required Underdrain Length (FT)	Provided Underdrain Length (FT)
A9	760	76	5.0	15	TBD

APPENDIX E

EXCERPTS FROM THE "NY STATE STORMWATER DESIGN MANUAL"
CONSTRUCTION SPECIFICATIONS

Appendix C: Construction Standards and Specifications

C.1 Pond Construction Standards/Specifications

These specifications are generally appropriate to all earthen ponds, and are adapted from NRCS Pond Code 378. This document is available at http://www.dec.state.ny.us/website/dow/toolbox/tools.html. Practitioners should always consult the New York State Department of Environmental Conservation – Dam Safety Division for the most recent guidance. All references to ASTM and AASHTO specifications apply to the most recent version.

C.3 Construction Specifications for Bioretention, Sand Filters and Open Channels

Sand Filter Specifications

Material Specifications for Sand Filters

The allowable materials for sand filter construction are detailed in Table 1.

Sand Filter Testing Specifications

Underground sand filters, facilities within sensitive groundwater aquifers, and filters designed to serve urban hot spots are to be tested for water tightness prior to placement of filter layers. Entrances and exits should be plugged and the system completely filled with water to demonstrate water tightness.

All overflow weirs, multiple orifices and flow distribution slots to be field-tested as to verify adequate distribution of flows.

Sand Filter Construction Specifications

Provide sufficient maintenance access; 12-foot-wide road with legally recorded easement. Vegetated access slopes to be a maximum of 10%; gravel slopes to 15%; paved slopes to 25%.

Absolutely no runoff is to enter the filter until all contributing drainage areas have been stabilized.

Surface of filter bed to be *completely level.*

All sand filters should be clearly delineated with signs so that they may be located when maintenance is due.

Surface sand filters shall be planted with appropriate grasses as specified in your local NRCS Standards and Specifications guidance.

Pocket sand filters (and residential bioretention facilities treating areas larger than an acre) shall be sized with an ornamental stone window covering approximately 10% of the filter area. This surface shall be 2" to 5" size stone on top of a pea gravel layer (3/4 inch stone) approximately 4 to 6" of pea gravel.

Table C-1 Sand Filter Material Specifications

Parameter	Specification	Size	Notes
Sand	Clean AASHTO M-6 or ASTM C-33 concrete sand	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. "Rock dust" cannot be substituted for sand.
Peat	Ash content: < 15% PH range: 5.2 to 4.9 Loose bulk density 0.12 to 0.15 g/cc	n/a	The material must be Reed-Sedge Hemic Peat, shredded, uncompacted, uniform, and clean.
Underdrain Gravel	AASHTO M-43 No. 67	0.25" to 0.75"	
Geotextile Fabric (if required)	ASTM D-751 (puncture strength - 125 lb.) ASTM D-1117 (Mullen Burst Strength - 400 psi) ASTM D-1682 (Tensile Strength - 300 lb.)	0.08" thick equivalent opening size of #80 sieve	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to separate sand filter layers.
Impermeable Liner (if required)	ASTM D 751 (thickness) ASTM D 412 (tensile strength 1,100 lb., elongation 200%) ASTM D 624 (Tear resistance - 150 lb./in) ASTM D 471 (water adsorption: +8 to -2% mass)	30mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
Underdrain Piping	ASTM D-1785 or AASHTO M-278	6" rigid schedule 40 PVC	3/8" perf. 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
Concrete (Cast-in-place)	See local DOT Standards and Specs. f=c = 3500 psi, normal weight, air-entrained; re-inforcing to meet ASTM 615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a licensed professional structural engineer.
Concrete (pre-cast)	per pre-cast manufacturer	n/a	SEE ABOVE NOTE
Non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM A123

Specifications for Bioretention

Material Specifications

The allowable materials to be used in bioretention area are detailed in Table G.2.

Planting Soil

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of noxious weeds.

The planting soil shall be tested and shall meet the following criteria:

pH range	5.2 - 7.0
organic matter	1.5 - 4%
magnesium	35 lb./ac
phosphorus P_2O_5	75 lb./ac
potassium K_2O	85 lb./ac
soluble salts	not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

Compaction

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before back filling the required sand layer. Pump any ponded water before preparing (rototilling) base.

When back filling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When back filling the bioretention facility, place soil in lifts 12" or greater. Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials by hand or with light equipment such as a compact loader or a dozer/loader with marsh tracks.

Plant Installation

Mulch around individual plants only. Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

The plant root ball should be planted so $1/8^{th}$ of the ball is above final grade surface.

Root stock of the plant material shall be kept moist during transport and on-site storage. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" X 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed shall be tilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch is used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

Underdrains

Under drains to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of under drain pipes not terminating in an observation well shall be capped.

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

Miscellaneous

The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

Table C.2 Materials Specifications for Bioretention

Parameter	Specification	Size	Notes
Plantings	see your local NRCS Standards and Specifications guidance.	n/a	plantings are site-specific
Planting Soil [4= deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
Mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM D 448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
Geotextile	Class "C" apparent opening size (ASTM-D-4751) grab tensile strength (ASTM-D-4632) burst strength (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43. No. 67.	0.25" to 0.75"	
underdrain piping	ASTM D 1785 or AASHTO M-278	6" rigid schedule 40 PVC	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	See local DOT Standards and Specs.; f=c = 3500 psi. @ 28 days, normal weight, air-entrained; re-inforcing to meet ASTM 615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) *not using previously approved State or local standards* requires design drawings sealed and approved by a licensed professional structural engineer.
sand [1= deep]	AASHTO M-6 or ASTM C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

Specifications for Open Channels and Filter Strips

Material Specifications
The recommended construction materials for open channels and filter strips are detailed in Table G.3.

Dry Swales

Roto-till soil/gravel interface approximately 6" to avoid a sharp soil/gravel interface.

Permeable soil mixture (20" to 30" deep) should meet the bioretention planting soil specifications.

Check dams, if required, shall be placed as specified.

System to have 6" of freeboard, minimum.

Side slopes to be 3:1 minimum; (4:1 or greater preferred).

No gravel or perforated pipe is to be placed under driveways.

Bottom of facility to be above the seasonably high water table.

Seed with flood/drought resistant grasses; see your local NRCS Standards and Specifications guidance.

Longitudinal slope to be 1 to 2%, maximum [up to 5% with check dams].

Bottom width to be 8'= maximum to avoid braiding; larger widths may be used if proper berming is supplied. Width to be 2'= minimum.

Wet Swales
Follow above information for dry swales, with the following exceptions: the seasonally high water table may inundate the swale; but not above the design bottom of the channel [NOTE: if the water table is stable within the channel; the WQv storage may start at this point]

Excavate into undisturbed soils; do not use an underdrain system.

Filter Strips

Construct pea gravel diaphragms 12" wide, minimum, and 24" deep minimum.

Pervious berms to be a sand/gravel mix (35-60% sand, 30-55% silt, and 10-25% gravel). Berms to have overflow weirs with 6 inch minimum avilable head.

Slope range to be 2% minimum to 6% maximum.

Table C.3 Open Vegetated Swale and Filter Strip Materials Specifications

Parameter	Specification	Size	Notes
Dry swale soil	USCS; ML, SM, SC	n/a	soil with a higher percent organic content is preferred
Dry Swale sand	ASTM C-33 fine aggregate concrete sand	0.02" to 0.04"	
Check Dam (pressure treated)	AWPA Standard C6	6" by 6" or 8" by 8"	*do not* coat with creosote; embed at least 3= into side slopes
Check Dam (natural wood)	Black Locust, Red Mulberry, Cedars, Catalpa, White Oak, Chestnut Oak, Black Walnut	6" to 12" diameter; notch as necessary	*do not* use the following, as these species have a predisposition towards rot: Ash, Beech, Birch, Elm, Hackberry, hemlock, Hickories, Maples, Red and Black Oak, Pines, Poplar, Spruce, Sweetgum, Willow
Filter Strip sand/gravel pervious berm	sand: per dry swale sand gravel; AASHTO M-43 No. 57	sand: 0.02" to 0.04" gravel: 2" to 1"	mix with approximately 25% loan soil to support grass cover crop; see Bioretention planting soil notes for more detail.
pea gravel diaphragm and curtain drain	ASTM D 448	varies (No. 6) or (1/8" to 3/8")	use clean bank-run gravel
under drain gravel	AASHTO M-43 No. 67	0.25" to 0.75"	
under drain	ASTM D -1785 or AASHTO M-278	6" rigid Schedule 40 PVC	3/8" perf. @ 6" o.c.; 4 holes per row
Geotextile	See local DOT Standards and Specs	n/a	
rip rap	per local DOT criteria	size per New York State DOT requirements based on 10-year design flows	

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Ultra high capacity stormwater chamber

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- Minimize cost by maximizing storage volume in a given footprint
- Optimal for replacing large diameter pipe, concrete structures and crate systems
- Shorter length for easier handling
- Stockpiles neatly on site in condensed area
- Features internal manifold for efficiency, design flexibility and cost-effectiveness

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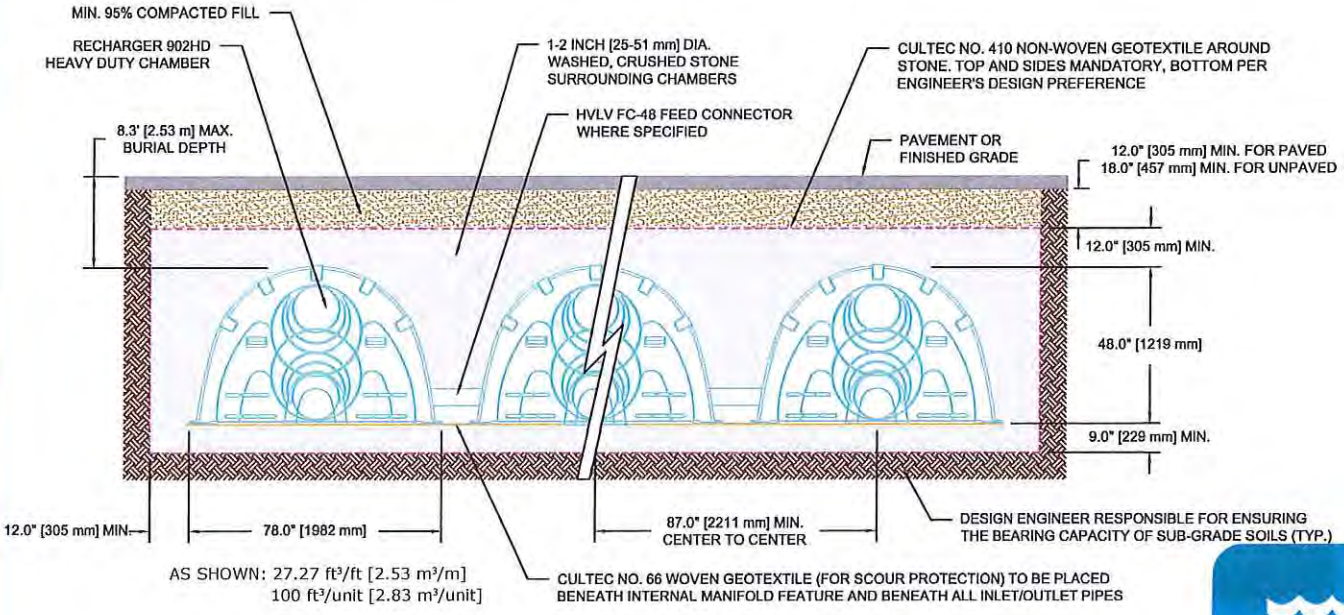
CULTEC Recharger® 902HD

Recharger 902HD Chamber	
Size (L x W x H)	4.10' x 78" x 48" 1.25 m x 1981 mm x 1219 mm
Installed Length	3.67' 1.12 m
Length Adjustment per Row - with two end caps installed	1.03' 0.31 m
Length Adjustment per Row - when not using end caps	0.44' 0.133 m
Chamber Storage	17.66 ft^3/ft 1.64 m^3/m 64.75 $ft^3/unit$ 1.84 $m^3/unit$
Min. Installed Storage	27.27 ft^3/ft 2.53 m^3/m 100 $ft^3/unit$ 2.83 $m^3/unit$
Min. Area Required	26.58 ft^2 2.47 m^2
Min. Center-to-Center Spacing	7.25' 2.21 m
Max. Allowable Cover	8.3' 2.53 m
Max. Allowable O.D. in Side Portal	11.5" 292 mm
Compatible Feed Connector	HVLV FC-48 Feed Connector

Recharger 902HD End Cap	
Size (L x W x H)	9.7" x 78" x 48.5" 246 mm x 1982 mm x 1231 mm
Installed Length	6.2" 157 mm
End Cap Storage	5.34 ft^3/ft 0.50 m^3/m 2.76 $ft^3/unit$ 0.08 $m^3/unit$
Min. Installed Storage	19.88 ft^3/ft 1.85 m^3/m 10.28 $ft^3/unit$ 0.96 $m^3/unit$
Max. Inlet Opening	24" 600 mm



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APPENDIX F

STANDARD CONSTRUCTION INSPECTION FORMS
STANDARD MAINTENANCE INSPECTION FORMS

Stormwater/Wetland Pond Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Pre-Construction/Materials and Equipment		
Pre-construction meeting		
Pipe and appurtenances on-site prior to construction and dimensions checked		
1. Material (including protective coating, if specified)		
2. Diameter		
3. Dimensions of metal riser or pre-cast concrete outlet structure		
4. Required dimensions between water control structures (orifices, weirs, etc.) are in accordance with approved plans		
5. Barrel stub for prefabricated pipe structures at proper angle for design barrel slope		
6. Number and dimensions of prefabricated anti-seep collars		
7. Watertight connectors and gaskets		
8. Outlet drain valve		
Project benchmark near pond site		
Equipment for temporary de-watering		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
2. Subgrade Preparation		
Area beneath embankment stripped of all vegetation, topsoil, and organic matter		
3. Pipe Spillway Installation		
Method of installation detailed on plans		
A. Bed preparation		
Installation trench excavated with specified side slopes		
Stable, uniform, dry subgrade of relatively impervious material (If subgrade is wet, contractor shall have defined steps before proceeding with installation)		
Invert at proper elevation and grade		
B. Pipe placement		
Metal / plastic pipe		
1. Watertight connectors and gaskets properly installed		
2. Anti-seep collars properly spaced and having watertight connections to pipe		
3. Backfill placed and tamped by hand under "haunches" of pipe		
4. Remaining backfill placed in max. 8 inch lifts using small power tamping equipment until 2 feet cover over pipe is reached		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
3. Pipe Spillway Installation		
Concrete pipe		
1. Pipe set on blocks or concrete slab for pouring of low cradle		
2. Pipe installed with rubber gasket joints with no spalling in gasket interface area		
3. Excavation for lower half of anti-seep collar(s) with reinforcing steel set		
4. Entire area where anti-seep collar(s) will come in contact with pipe coated with mastic or other approved waterproof sealant		
5. Low cradle and bottom half of anti-seep collar installed as monolithic pour and of an approved mix		
6. Upper half of anti-seep collar(s) formed with reinforcing steel set		
7. Concrete for collar of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
8. Forms stripped and collar inspected for honeycomb prior to backfilling. Parge if necessary.		
C. Backfilling		
Fill placed in maximum 8 inch lifts		
Backfill taken minimum 2 feet above top of anti-seep collar elevation before traversing with heavy equipment		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
4. Riser / Outlet Structure Installation		
Riser located within embankment		
A. Metal riser		
Riser base excavated or formed on stable subgrade to design dimensions		
Set on blocks to design elevations and plumbed		
Reinforcing bars placed at right angles and projecting into sides of riser		
Concrete poured so as to fill inside of riser to invert of barrel		
B. Pre-cast concrete structure		
Dry and stable subgrade		
Riser base set to design elevation		
If more than one section, no spalling in gasket interface area; gasket or approved caulking material placed securely		
Watertight and structurally sound collar or gasket joint where structure connects to pipe spillway		
C. Poured concrete structure		
Footing excavated or formed on stable subgrade, to design dimensions with reinforcing steel set		
Structure formed to design dimensions, with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
Forms stripped & inspected for "honeycomb" prior to backfilling; parge if necessary		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Embankment Construction		
Fill material		
Compaction		
Embankment		
1. Fill placed in specified lifts and compacted with appropriate equipment		
2. Constructed to design cross-section, side slopes and top width		
3. Constructed to design elevation plus allowance for settlement		
6. Impounded Area Construction		
Excavated / graded to design contours and side slopes		
Inlet pipes have adequate outfall protection		
Forebay(s)		
Pond benches		
7. Earth Emergency Spillway Construction		
Spillway located in cut or structurally stabilized with riprap, gabions, concrete, etc.		
Excavated to proper cross-section, side slopes and bottom width		
Entrance channel, crest, and exit channel constructed to design grades and elevations		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
8. Outlet Protection		
A. End section		
Securely in place and properly backfilled		
B. Endwall		
Footing excavated or formed on stable subgrade, to design dimensions and reinforcing steel set, if specified		
Endwall formed to design dimensions with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing, if necessary)		
Forms stripped and structure inspected for "honeycomb" prior to backfilling; parge if necessary		
C. Riprap apron / channel		
Apron / channel excavated to design cross-section with proper transition to existing ground		
Filter fabric in place		
Stone sized as per plan and uniformly place at the thickness specified		
9. Vegetative Stabilization		
Approved seed mixture or sod		
Proper surface preparation and required soil amendments		
Excelsior mat or other stabilization, as per plan		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
10. Miscellaneous		
Drain for ponds having a permanent pool		
Trash rack / anti-vortex device secured to outlet structure		
Trash protection for low flow pipes, orifices, etc.		
Fencing (when required)		
Access road		
Set aside for clean-out maintenance		
11. Stormwater Wetlands		
Adequate water balance		
Variety of depth zones present		
Approved pondscaping plan in place Reinforcement budget for additional plantings		
Plants and materials ordered 6 months prior to construction		
Construction planned to allow for adequate planting and establishment of plant community (April-June planting window)		
Wetland buffer area preserved to maximum extent possible		

Comments:

Actions to be Taken:

Sand/Organic Filter System Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Pre-construction		
Pre-construction meeting		
Runoff diverted		
Facility area cleared		
Facility location staked out		
2. Excavation		
Size and location		
Side slopes stable		
Foundation cleared of debris		
If designed as exfilter, excavation does not compact subsoils		
Foundation area compacted		
3. Structural Components		
Dimensions and materials		
Forms adequately sized		
Concrete meets standards		
Prefabricated joints sealed		
Underdrains (size, materials)		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Completed Facility Components		
24 hour water filled test		
Contributing area stabilized		
Filter material per specification		
Underdrains installed to grade		
Flow diversion structure properly installed		
Pretreatment devices properly installed		
Level overflow weirs, multiple orifices, distribution slots		
5. Final Inspection		
Dimensions		
Surface completely level		
Structural components		
Proper outlet		
Ensure that site is properly stabilized before flow is directed to the structure.		

Comments:

Actions to be Taken:

Bioretention Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility area cleared		
If designed as exfilter, soil testing for permeability		
Facility location staked out		
2. Excavation		
Size and location		
Lateral slopes completely level		
If designed as exfilter, ensure that excavation does not compact susoils.		
Longitudinal slopes within design range		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
3. Structural Components		
Stone diaphragm installed correctly		
Outlets installed correctly		
Underdrain		
Pretreatment devices installed		
Soil bed composition and texture		
4. Vegetation		
Complies with planting specs		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
5. Final Inspection		
Dimensions		
Proper stone diaphragm		
Proper outlet		
Soil/ filter bed permeability testing		
Effective stand of vegetation and stabilization		
Construction generated sediments removed		
Contributing watershed stabilized before flow is diverted to the practice		

Comments:

Actions to be Taken:

Open Channel System Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility location staked out		
2. Excavation		
Size and location		
Side slope stable		
Soil permeability		
Groundwater / bedrock		
Lateral slopes completely level		
Longitudinal slopes within design range		
Excavation does not compact subsoils		
3. Check dams		
Dimensions		
Spacing		
Materials		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Structural Components		
Underdrain installed correctly		
Inflow installed correctly		
Pretreatment devices installed		
5. Vegetation		
Complies with planting specifications		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
6. Final inspection		
Dimensions		
Check dams		
Proper outlet		
Effective stand of vegetation and stabilization		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

BIO-RETENTION AREA
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site:	NYSDEC SPDES Permit No.:
Site Location:	Bio-Retention Area ID:
Date:	Time:
Weather:	
Inspector:	

Section B: Debris Cleanout

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Bioretention and contributing areas clean of debris	☐	☐	☐	
2.No dumping of yard waste or trash into practice	☐	☐	☐	
3.Litter (branches, etc.) have been removed	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section C: Vegetation

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Plant height	☐	☐	☐	
2.Fertilized per specifications	☐	☐	☐	
3.No placement or growth of inappropriate plants	☐	☐	☐	
4.Grass height not greater than 6 inches	☐	☐	☐	
5.No evidence of erosion	☐	☐	☐	
6. Other (specify)	☐	☐	☐	

Section D: Check Dams/Energy Dissipaters/Outlet Structure

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of sediment buildup	☐	☐	☐	
2.Sumps should not be more than 50% full of sediment	☐	☐	☐	
3.No evidence of erosion at downstream toe of strncture	☐	☐	☐	
4. Integrity of structure	☐	☐	☐	
5. Cleaning necessary	☐	☐	☐	
6. Other (Specify)	☐	☐	☐	

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BIO-RETENTION AREA
MAINTENANCE AND INSPECTION CHECKLIST

Section E: Dewatering

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Dewaters between storms within 2 days	☐	☐	☐	
2.No evidence of standing water	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section F: Sediment Deposition/Pre-Treatment

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Sediments should not be >1" deep	☐	☐	☐	
2. Gravel Diaphragm Condition	☐	☐	☐	
3. Grass Filter Condition	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section G: Outlet/Overflow Spillway

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Good Condition, no need for repair	☐	☐	☐	
2.No evidence of erosion	☐	☐	☐	
3.No evidence of any blockages	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section H: Integrity of Filter Bed

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Filter bed has not been blocked or filled inappropriately	☐	☐	☐	
2.Other (specify)	☐	☐	☐	

Section I: Comments

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Section J: Actions Required

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_____

Lanc & Tully Engineering and Surveying, P.C.
Goshen, NY 10924
Phone: (845)294-3700 Fax: (845)294-8609 E-Mail: eng@lanctully.com

UNDERGROUND SAND FILTRATION SYSTEM
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site:	NYSDEC SPDES Permit No.:
Site Location:	Area ID:
Date:	Time:
Weather:	
Inspector:	

Do not enter the system unless properly trained, equipped and qualified to enter a confined space as identified by local occupational safety and health regulations.

Section B: Debris Cleanout

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Filter area and contributing areas clean of debris	☐	☐	☐	
2. Facility clean of debris	☐	☐	☐	
3.Inlets/trash racks and outlets clear of debris	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section C: Filter Bed Condition

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of filter surface clogging	☐	☐	☐	
2.Filter bed drains within 48 hours of storm	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section D: Vegetation

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Contributing drainage area stabilized	☐	☐	☐	
2. No evidence of erosion in contributing areas	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section E: Water Retention

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Water quantity areas temporarily holding water during storms	☐	☐	☐	
2.No evidence of leakage	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

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UNDERGROUND SAND FILTRATION SYSTEM
MAINTENANCE AND INSPECTION CHECKLIST

Section F: Sediment Deposition

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Sediments should not be >1" deep in filter bed area	☐	☐	☐	
2. Isolation row not more than half full of sediments	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section G: Structural Components

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of structural deterioration	☐	☐	☐	
2.Any grates are in good condition	☐	☐	☐	
3. No evidence of erosion (if draining into a natural channel)	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section H: Outlet/Overflow Spillway

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Good Condition, no need for repairs	☐	☐	☐	
2.No evidence of erosion (if draining into a natural channel)	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section I: Overall Function of Facility

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Evidence of flow bypassing facility	☐	☐	☐	
2.No noticeable odors outside of facility	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section J: Comments

_____

_____

_____

_____

Section K: Actions Required

_____

_____

_____

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SAND/ORGANIC FILTER
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site:	NYSDEC SPDES Permit No.:
Site Location:	Filter Area ID:
Date:	Time:
Weather:	
Inspector:	

Section B: Debris Cleanout

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Filter area and contributing areas clean of debris	☐	☐	☐	
2.Filtration facility clean of debris	☐	☐	☐	
3.Inlet and outlets clear of debris	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section C: Oil and Grease

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of filter surface clogging	☐	☐	☐	
2.Activities in drainage area minimize oil and grease entry	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section D: Vegetation

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Contributing drainage area stabilized	☐	☐	☐	
2. No evidence of erosion	☐	☐	☐	
3. Area mowed and clippings removed	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section E: Water Retention Where Required

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Water holding chambers at normal pool	☐	☐	☐	
2.No evidence of leakage	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

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SAND/ORGANIC FILTER
MAINTENANCE AND INSPECTION CHECKLIST

Section F: Sediment Deposition

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Sediments should not be >1" deep	☐	☐	☐	
2. Sedimentation chamber not more than half full of sediments	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section G: Structural Components

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of structural deterioration	☐	☐	☐	
2.Any grates are in good condition	☐	☐	☐	
3. No evidence of erosion (if draining into a natural channel)	☐	☐	☐	
4. Other (specify)	☐	☐	☐	

Section H: Outlet/Overflow Spillway

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Good Condition, no need for repairs	☐	☐	☐	
2.No evidence of erosion (if draining into a natural channel)	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section I: Overall Function of Facility

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Evidence of flow bypassing facility	☐	☐	☐	
2.No noticeable odors outside of facility	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section J: Comments

_____

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Section K: Actions Required

_____

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_____

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Goshen, NY 10924
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STORMWATER POND
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site: Wallkill Gardens	NYSDEC SPDES Permit No.: NYR10Q792
Site Location: Town of Wallkill, NY	Stormwater Pond ID:
Date:	Time:
Weather:	
Inspector:	

Section B: Embankment and emergency spillway

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Vegetation and ground cover adequate	☐	☐	☐	
2. Embankment erosion	☐	☐	☐	
3. Animal burrows	☐	☐	☐	
4. Unauthorized planting	☐	☐	☐	
5. Cracking, bulging, or sliding of berm	☐	☐	☐	
a. Upstream face	☐	☐	☐	
b. Downstream face	☐	☐	☐	
c. At or beyond toe downstream	☐	☐	☐	
upstream	☐	☐	☐	
d. Emergency spillway	☐	☐	☐	
6. Pond, toe & chimney drains clear and functioning	☐	☐	☐	
7. Seeps/leaks on downstream face	☐	☐	☐	
8. Slope protection or riprap failure	☐	☐	☐	
9. Emergency spillway clear of obstructions and debris	☐	☐	☐	
10. Other (specify)	☐	☐	☐	

Section C: Outlet Structure

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Pipe Type: Size Reinforced concrete ____ Corrugated metal ____ HDPE ____	☐	☐	☐	
2.Low flow orifice obstructed	☐	☐	☐	
3. Low flow trash rack. a. Debris removal necessary	☐	☐	☐	

b. Corrosion	☐	☐	☐	
4. Weir trash rack maintenance a. Debris removal necessary	☐	☐	☐	
b. Corrosion	☐	☐	☐	
5. Excessive sediment accumulation inside outlet structure	☐	☐	☐	
6. Concrete/masonry condition outlet structure and barrels a. cracks or displacement	☐	☐	☐	
b. Minor spalling (<1")	☐	☐	☐	
c. Major spalling (rebars exposed)	☐	☐	☐	
d. Joint failures	☐	☐	☐	
e. Water tightness	☐	☐	☐	
7. Pipe condition	☐	☐	☐	
8. Coutrol valve a. Operation/exercised	☐	☐	☐	
9. Pond drain valve a. Operation/exercised	☐	☐	☐	
10. Chained/locked	☐	☐	☐	
11. Outfall channels functioning	☐	☐	☐	
12. Other (specify)	☐	☐	☐	

Section D: Permanent Pool

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Undesirable vegetative growth	☐	☐	☐	
2. Floating or floatable debris removal required	☐	☐	☐	
3. Visible pollution	☐	☐	☐	
4. Shoreline problem	☐	☐	☐	
5. Other (specify)	☐	☐	☐	

Section E: Sediment Forebays

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Sedimentation noted	☐	☐	☐	
2. Sediment cleanout required (depth <50% design depth)	☐	☐	☐	
3.Other (specify)	☐	☐	☐	

STORMWATER POND
MAINTENANCE AND INSPECTION CHECKLIST

Section F: Dry Pond Areas

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Vegetation Adequate	☐	☐	☐	
2. Undesirable vegetative growth	☐	☐	☐	
3. Undesirable woody vegetation	☐	☐	☐	
4. Low flow channels clear of obstructions	☐	☐	☐	
5. Standing water or wet areas	☐	☐	☐	
6. Sediment and/or trash accumulation	☐	☐	☐	
7. Other (specify)	☐	☐	☐	

Section G: Condition of Outfalls

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Riprap failures	☐	☐	☐	
2. Slope erosion	☐	☐	☐	
3. Storm drain pipes condition	☐	☐	☐	
4. Endwalls/Headwalls	☐	☐	☐	
5. Other (specify)	☐	☐	☐	

Section H: Other (Misc.)

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1. Any Encroachment on pond, wetland or easement area	☐	☐	☐	
2. Complaints from residents	☐	☐	☐	
3. Aesthetics a. Grass growing required	☐	☐	☐	
b. Vandalism Repairs needed	☐	☐	☐	
c. Other (specify)	☐	☐	☐	
4. Conditions of maintenance access routes	☐	☐	☐	
5. Any public hazards (specify)	☐	☐	☐	

STORMWATER POND
MAINTENANCE AND INSPECTION CHECKLIST

Section I: Comments

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Section J: Actions Required

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OPEN CHANNEL (SWALE)
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site:	NYSDEC SPDES Permit No.:
Site Location:	Open Channel ID:
Date:	Time:
Weather:	
Inspector:	

Section B: Debris Cleanout

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Contributing areas clean of debris	☐	☐	☐	
2. Other (specify)	☐	☐	☐	

Section C: Check Dams or Energy Dissipators

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.No evidence of flow outside swale line	☐	☐	☐	
2.No evidence of erosion within swale	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section D: Vegetation

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Mowing done when needed	☐	☐	☐	
2.Minimum mowing depth not exceeded 6"-8"	☐	☐	☐	
3.No evidence of erosion	☐	☐	☐	
4.Fertilized per specification	☐	☐	☐	
5. Other (specify)	☐	☐	☐	

Section E: Dewatering

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Dewaters between storms	☐	☐	☐	
2. Other (specify)	☐	☐	☐	

Section F: Sediment Deposition

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Clean of sediment	☐	☐	☐	
2. Other (specify)	☐	☐	☐	

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OPEN CHANNEL (SWALE)
MAINTENANCE AND INSPECTION CHECKLIST

Section G: Outlet/Overflow Spillway

Maintenance Item	Satisfactory	Unsatisfactory	N/A	Comments
1.Good Condition, no need for repair	☐	☐	☐	
2.No evidence of erosion	☐	☐	☐	
3. Other (specify)	☐	☐	☐	

Section H: Comments

_____
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Section I: Actions Required

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CATCH BASIN
MAINTENANCE AND INSPECTION CHECKLIST

Section A: General Information

Site:	NYSDEC SPDES Permit No.:
Site Location:	
Date:	Time:
Weather:	
Inspector:	

Section B: Catch Basin Conditions

CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	

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CATCH BASIN
MAINTENANCE AND INSPECTION CHECKLIST

CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB No. Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	
CB ID. CB Location:	□Standing Water □Cleaning Necessary □ Sump □Trash/debris □Repairs Necessary □Pipe Damage □Sediment □Grate Damaged □Structure Damaged
Notes:	

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APPENDIX G

NOTICE OF INTENT
NOTICE OF TERMINATION
MS4 SWPPP ACCEPTANCE

0806372691

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR ☐☐☐☐☐☐
(for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-

RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR **MUST SIGN FORM**

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street

○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing)

4

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- O FOREST
- O PASTURE/OPEN LAND
- O CULTIVATED LAND
- O SINGLE FAMILY HOME
- O SINGLE FAMILY SUBDIVISION
- O TOWN HOME RESIDENTIAL
- O MULTIFAMILY RESIDENTIAL
- O INSTITUTIONAL/SCHOOL
- O INDUSTRIAL
- O COMMERCIAL
- O ROAD/HIGHWAY
- O RECREATIONAL/SPORTS FIELD
- O BIKE PATH/TRAIL
- O LINEAR UTILITY
- O PARKING LOT
- O OTHER

Post-Development Future Land Use

- O SINGLE FAMILY HOME
- O SINGLE FAMILY SUBDIVISION — Number of Lots
- O TOWN HOME RESIDENTIAL
- O MULTIFAMILY RESIDENTIAL
- O INSTITUTIONAL/SCHOOL
- O INDUSTRIAL
- O COMMERCIAL
- O MUNICIPAL
- O ROAD/HIGHWAY
- O RECREATIONAL/SPORTS FIELD
- O BIKE PATH/TRAIL
- O LINEAR UTILITY (water, sewer, gas, etc.)
- O PARKING LOT
- O CLEARING/GRADING ONLY
- O DEMOLITION, NO REDEVELOPMENT
- O WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- O OTHER

***Note:** for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area
.	.	.	.

5. Do you plan to disturb more than 5 acres of soil at any one time? O **Yes** O **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D
%	%	%	%

7. Is this a phased project? O **Yes** O **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date / / – **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-15-002? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-15-002? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-15-002. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- O **Preservation of Undisturbed Areas**
- O **Preservation of Buffers**
- O **Reduction of Clearing and Grading**
- O **Locating Development in Less Sensitive Areas**
- O **Roadway Reduction**
- O **Sidewalk Reduction**
- O **Driveway Reduction**
- O **Cul-de-sac Reduction**
- O **Building Footprint Reduction**
- O **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

O All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

O Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

[ ][ ][ ].[ ][ ][ ] **acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area (acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1) ...	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4) ..	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs
(DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area (acres)
○ Hydrodynamic	___.___
○ Wet Vault	___.___
○ Media Filter	___.___
○ Other _____	___.___

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name _____

Manufacturer _____

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

___.___ acre-feet

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ Yes ○ No

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

___.___ acre-feet

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ Yes ○ No

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). [ ][ ][ ].[ ][ ][ ]

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

[ ][ ][ ].[ ][ ][ ] **acre-feet**

CPv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

[ ][ ][ ].[ ][ ][ ] CFS

Post-development

[ ][ ][ ].[ ][ ][ ] CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development

[ ][ ][ ].[ ][ ][ ] CFS

Post-development

[ ][ ][ ].[ ][ ][ ] CFS

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- O Air Pollution Control
- O Coastal Erosion
- O Hazardous Waste
- O Long Island Wells
- O Mined Land Reclamation
- O Solid Waste
- O Navigable Waters Protection / Article 15
- O Water Quality Certificate
- O Dam Safety
- O Water Supply
- O Freshwater Wetlands/Article 24
- O Tidal Wetlands
- O Wild, Scenic and Recreational Rivers
- O Stream Bed or Bank Protection / Article 15
- O Endangered or Threatened Species(Incidental Take Permit)
- O Individual SPDES
- O SPDES Multi-Sector GP N Y R
- O Other
- O None

41. Does this project require a US Army Corps of Engineers Wetland Permit? O **Yes** O **No**
If Yes, Indicate Size of Impact. .

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? O **Yes** O **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? O **Yes** O **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. N Y R

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date / /

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued	
VII. Qualified Inspector Certification - Final Stabilization:	
I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):	
I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:
IX. Owner or Operator Certification	
I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.	
Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4:
12. MS4 SPDES Permit Identification Number: NYR20A _____
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

APPENDIX H

CONSTRUCTION SITE LOG BOOK
CONTRACTOR'S CERTIFICATION FORM

APPENDIX F
CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

I. Pre-Construction Meeting Documents
   a. Preamble to Site Assessment and Inspections
   b. Pre-Construction Site Assessment Checklist

II. Construction Duration Inspections
   a. Directions
   b. Modification to the SWPPP

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____

Permit No. _____ **Date of Authorization** _____

Name of Operator _____

Prime Contractor _____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector[1] conduct an assessment of the site prior to the commencement of construction[2] and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization[3] using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist
(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

[ ] [ ] [ ] Has a Notice of Intent been filed with the NYS Department of Conservation?
[ ] [ ] [ ] Is the SWPPP on-site? Where?_____
[ ] [ ] [ ] Is the Plan current? What is the latest revision date?_____
[ ] [ ] [ ] Is a copy of the NOI (with brief description) onsite? Where?_____
[ ] [ ] [ ] Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

[ ] [ ] [ ] Are construction limits clearly flagged or fenced?
[ ] [ ] [ ] Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas snitable for filter strips, especially in perimeter areas, have been flagged for protection.
[ ] [ ] [ ] Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

[ ] [ ] [ ] Clean stormwater runoff has been diverted from areas to be disturbed.
[ ] [ ] [ ] Bodies of water located either on site or in the vicinity of the site have been identified and protected.
[ ] [ ] [ ] Appropriate practices to protect on-site or downstream surface water are installed.
[ ] [ ] [ ] Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
[ ] [ ] [ ] Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
[ ] [ ] [ ] Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Perimeter Sediment Controls

Yes No NA

[ ] [ ] [ ] Silt fence material and installation comply with the standard drawing and specifications.
[ ] [ ] [ ] Silt fences are installed at appropriate spacing intervals
[ ] [ ] [ ] Sediment/detention basin was installed as first land disturbing activity.
[ ] [ ] [ ] Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

[ ] [ ] [ ] The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
[ ] [ ] [ ] The plan is contained in the SWPPP on page _____
[ ] [ ] [ ] Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Inspector (print name)	**Date of Inspection**
Qualified Inspector (print name)	**Qualified Inspector Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA
[ ] [ ] [ ] Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] All disturbance is within the limits of the approved plans.
[ ] [ ] [ ] Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA
[ ] [ ] [ ] Is construction site litter and debris appropriately managed?
[ ] [ ] [ ] Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ] [ ] [ ] Is construction impacting the adjacent property?
[ ] [ ] [ ] Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA
[ ] [ ] [ ] Maximum diameter pipes necessary to span creek without dredging are installed.
[ ] [ ] [ ] Installed non-woven geotextile fabric beneath approaches.
[ ] [ ] [ ] Is fill composed of aggregate (no earth or soil)?
[ ] [ ] [ ] Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes No NA
[ ] [ ] [ ] Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ] [ ] [ ] Clean water from upstream pool is being pumped to the downstream pool.
[ ] [ ] [ ] Sediment laden water from work area is being discharged to a silt-trapping device.
[ ] [ ] [ ] Constructed upstream berm with one-foot minimum freeboard.

2. Flow Spreader

Yes No NA
[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ] [ ] [ ] Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA
[ ] [ ] [ ] Installed per plan with minimum side slopes 2H:1V or flatter.
[ ] [ ] [ ] Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ] [ ] [ ] Sediment-laden runoff directed to sediment trapping structure

Runoff Control Practices (continued)

4. Stone Check Dam

Yes No NA

[ ] [ ] [ ] Is channel stable? (flow is not eroding soil underneath or around the structure).
[ ] [ ] [ ] Check is in good condition (rocks in place and no permanent pools behind the structure).
[ ] [ ] [ ] Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

[ ] [ ] [ ] Installed per plan.
[ ] [ ] [ ] Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

[ ] [ ] [ ] Stockpiles are stabilized with vegetation and/or mulch.
[ ] [ ] [ ] Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

[ ] [ ] [ ] Temporary seedings and mulch have been applied to idle areas.
[ ] [ ] [ ] 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Stabilized Construction Entrance

Yes No NA

[ ] [ ] [ ] Stone is clean enough to effectively remove mud from vehicles.
[ ] [ ] [ ] Installed per standards and specifications?
[ ] [ ] [ ] Does all traffic use the stabilized entrance to enter and leave site?
[ ] [ ] [ ] Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes No NA

[ ] [ ] [ ] Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ] [ ] [ ] Joints constructed by wrapping the two ends together for continuous support.
[ ] [ ] [ ] Fabric buried 6 inches minimum.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes No NA

[ ] [ ] [ ] Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ] [ ] [ ] Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ] [ ] [ ] Drainage area is 1acre or less.
[ ] [ ] [ ] Excavated area is 900 cubic feet.
[ ] [ ] [ ] Excavated side slopes should be 2:1.
[ ] [ ] [ ] 2" x 4" frame is constructed and structurally sound.
[ ] [ ] [ ] Posts 3-foot maximum spacing between posts.
[ ] [ ] [ ] Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ] [ ] [ ] Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation ___% of design capacity.

4. Temporary Sediment Trap

Yes No NA

[ ] [ ] [ ] Outlet structure is constructed per the approved plan or drawing.
[ ] [ ] [ ] Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is ___% of design capacity.

5. Temporary Sediment Basin

Yes No NA

[ ] [ ] [ ] Basin and outlet structure constructed per the approved plan.
[ ] [ ] [ ] Basin side slopes are stabilized with seed/mulch.
[ ] [ ] [ ] Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:

Contractor/Subcontractor Certification Statement

Site Name:_____

Site Address:_____

In accordance with Part III.A.6 of the General Permit GP-0-15-002, all contractors and subcontractors identified in the SWPPP shall sign a copy of the following certification statement before undertaking any construction activity at the site identified in the SWPPP.

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Contractor Name: _____

Contractor Address: _____

Contractor Phone Number: _____

Name (please print): _____ **Title:** _____

Signature: _____ **Date:** _____

Contractor/Subcontractor SWPPP Responsibilities

The above reference contractor/subcontractor is responsible for the following elements of the SWPPP:

APPENDIX I

PIPE SIZING

Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Apr 4 2017

Culvert 1

Invert Elev Dn (ft)	= 547.00
Pipe Length (ft)	= 119.00
Slope (%)	= 9.66
Invert Elev Up (ft)	= 558.50
Rise (in)	= 36.0
Shape	= Box
Span (in)	= 36.0
No. Barrels	= 1
n-Value	= 0.030
Culvert Type	= Flared Wingwalls
Culvert Entrance	= 30D to 75D wingwall flares
Coeff. K,M,c,Y,k	= 0.026, 1, 0.0347, 0.81, 0.4

Embankment

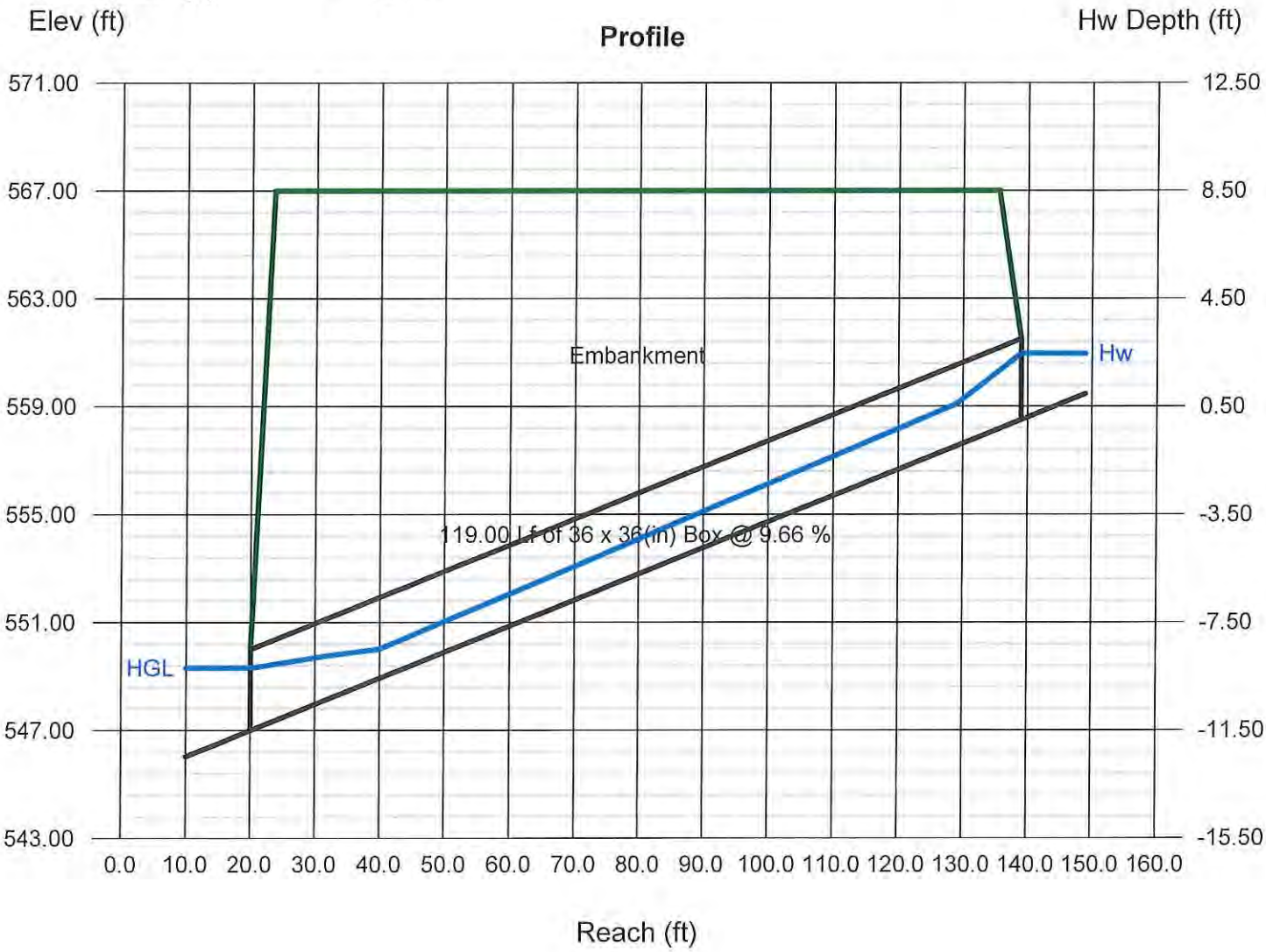
Top Elevation (ft)	= 567.00
Top Width (ft)	= 112.00
Crest Width (ft)	= 10.00

Calculations

Qmin (cfs)	= 35.00
Qmax (cfs)	= 35.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 35.00
Qpipe (cfs)	= 35.00
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 5.05
Veloc Up (ft/s)	= 7.22
HGL Dn (ft)	= 549.31
HGL Up (ft)	= 560.12
Hw Elev (ft)	= 560.96
Hw/D (ft)	= 0.82
Flow Regime	= Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Apr 4 2017

Culvert 2

Invert Elev Dn (ft)	= 530.50
Pipe Length (ft)	= 96.00
Slope (%)	= 2.34
Invert Elev Up (ft)	= 532.75
Rise (in)	= 36.0
Shape	= Box
Span (in)	= 36.0
No. Barrels	= 1
n-Value	= 0.030
Culvert Type	= Flared Wingwalls
Culvert Entrance	= 30D to 75D wingwall flares
Coeff. K,M,c,Y,k	= 0.026, 1, 0.0347, 0.81, 0.4

Embankment

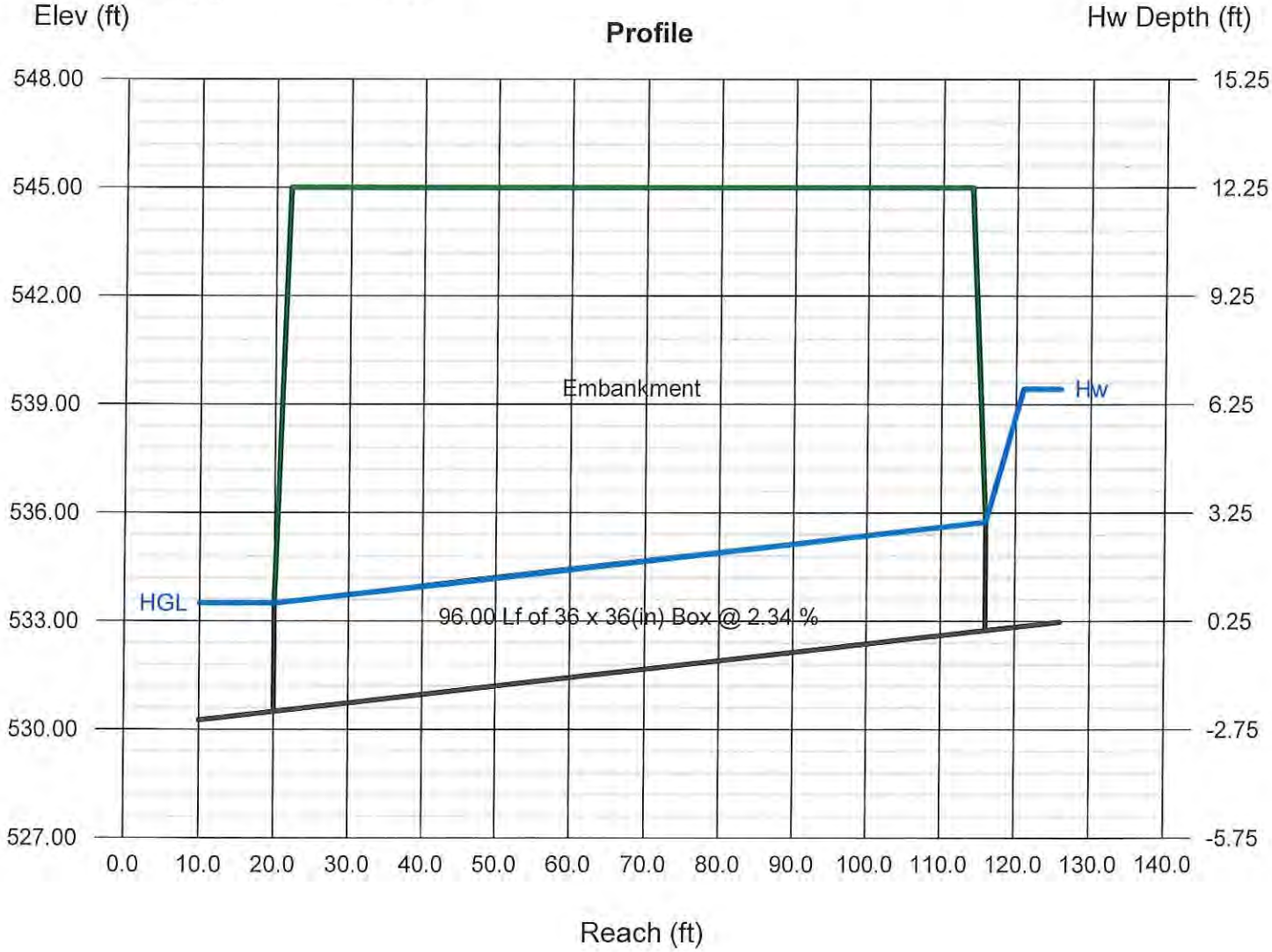
Top Elevation (ft)	= 545.00
Top Width (ft)	= 92.00
Crest Width (ft)	= 10.00

Calculations

Qmin (cfs)	= 100.00
Qmax (cfs)	= 100.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 100.00
Qpipe (cfs)	= 100.00
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 11.11
Veloc Up (ft/s)	= 11.11
HGL Dn (ft)	= 533.50
HGL Up (ft)	= 535.75
Hw Elev (ft)	= 539.43
Hw/D (ft)	= 2.23
Flow Regime	= Inlet Control



Culvert Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Apr 6 2017

Culvert 3

Invert Elev Dn (ft)	= 475.75
Pipe Length (ft)	= 126.00
Slope (%)	= 7.74
Invert Elev Up (ft)	= 485.50
Rise (in)	= 36.0
Shape	= Box
Span (in)	= 48.0
No. Barrels	= 1
n-Value	= 0.030
Culvert Type	= Flared Wingwalls
Culvert Entrance	= 30D to 75D wingwall flares
Coeff. K,M,c,Y,k	= 0.026, 1, 0.0347, 0.81, 0.4

Embankment

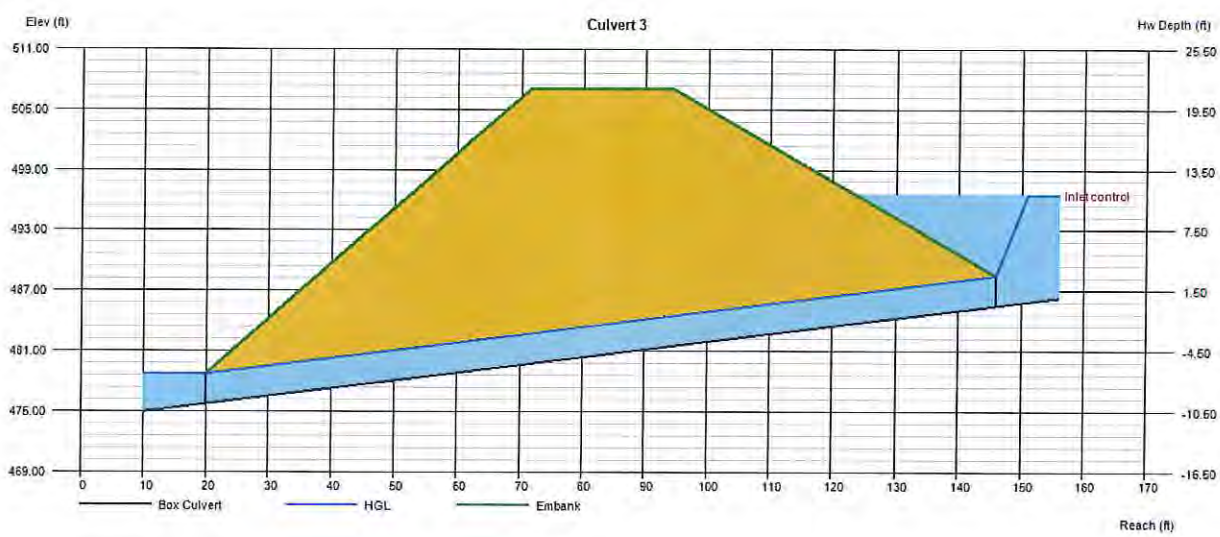
Top Elevation (ft)	= 507.00
Top Width (ft)	= 23.00
Crest Width (ft)	= 10.00

Calculations

Qmin (cfs)	= 190.00
Qmax (cfs)	= 190.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 190.00
Qpipe (cfs)	= 190.00
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 15.83
Veloc Up (ft/s)	= 15.83
HGL Dn (ft)	= 478.75
HGL Up (ft)	= 488.50
Hw Elev (ft)	= 496.51
Hw/D (ft)	= 3.67
Flow Regime	= Inlet Control



APPENDIX J

SITE PLANS
(ATTACHED)