UNIVERSITY STATION PHASE 2 LLC
C/O NEW ENGLAND DEVELOPMENT
75 Park Plaza, Third Floor
Boston, Massachusetts 02116

March 26, 2019

Planning Board
Town of Westwood
50 Carby Street
Westwood, MA 02090
Attention: Abigail McCabe, Town Planner

Office of the Town Clerk
580 High Street
Westwood, MA 02090
Attention: Dottie Powers, Town Clerk

Re: University Station – Application for Master Development Plan Special Permit (the "**Application**")
University Avenue Mixed Use District, Westwood, Massachusetts

Dear Planning Board and Town Clerk:

On behalf of University Station Phase 2 LLC (the "**Applicant**"), we are pleased to submit the enclosed Application in connection with the University Station project (the "**Project**") located within the University Avenue Mixed Use District ("**UAMUD**") in Westwood. Pursuant to Sections 9.7.12.14 and 10.3 of the Zoning Bylaw of the Town of Westwood (the "**Zoning Bylaw**"), the Applicant respectfully requests the Planning Board's approval of a Master Development Plan Special Permit (the "**Special Permit**") for certain proposed modifications to the Master Development Plan approved at the Special Town Meeting on May 6, 2013, as modified by the Modified Master Development Plan approved by the Planning Board on April 11, 2017 (as so modified, the "**Master Development Plan**").

The modifications requested pursuant to the Application consist of revisions to the site layout depicted on the Master Development Plan, as shown on the Modified Master Development Plan prepared by Tetra Tech dated February 20, 2019, enclosed with the Application (the "**Modified Master Development Plan**"). The proposed changes affect approximately 11.4 acres located along the southern and eastern sides of Station Drive, shown within Development Area A on the Modified Master Development Plan, including modifications to the configuration of two office buildings, parking area and open space. These changes are summarized in a Table included with this submission, which compares the conceptual development program for Development Area A from the current Master Development Plan, to the program shown on the proposed Modified Master Development Plan.

The Modified Master Development Plan is consistent with, and will not alter or otherwise affect, the existing Project Development Review ("**PDR**") approvals and Conformance Determinations previously issued for the Project. At this time, the overall development program for the Project remains approximately 2.1 million square feet, as originally proposed when the Master Development Plan was approved in 2013. The Applicant reserves, and recognizes that the Project remains subject to, the maximum gross floor area limitations for each category of use as noted in the original Master Development Plan; however, this submission includes updated reports, which recognize that any such further development would require additional review from the Planning Board.

The enclosed Application addresses the requirements set forth in the Zoning Bylaw and the Planning Board's Rules and Regulations for the UAMUD. As detailed in the Application, the Modified Master Development Plan may be approved by the Planning Board pursuant to Sections 9.7.12.14 and 10.3 of the Zoning Bylaw because the modifications do not trigger any applicable thresholds, do not have any adverse effects on the Town or UAMUD, and there are no increased traffic or parking impacts attributable to the modifications. Per the request of the Town, we are electronically submitting this Application via the Town's website. The enclosed Application includes:

- Project Information Form, which provides a summary of basic information about the Modified Master Development Plan and the Applicant;

- Summary Tables, including:
    - a comparison of the current development program for Development Area A to the conceptual program depicted on the current Master Development Plan; and
    - an update showing the current status of the Project's buildout in accordance with the Master Development Plan;

- Narrative Statement describing the criteria for approval of a Master Development Plan Special Permit and how the Modified Master Development Plan meets such criteria;

- Plans showing the proposed changes; and

- Updates to Technical Reports filed with the Master Development Plan, including a Memorandum from Tetra Tech, confirming the revised development program's utility services, stormwater management practices, landscape and open space, sustainability, and air quality mitigation strategies remain consistent with the original Master Development Plan.

Approval of the Master Development Plan Special Permit will support the Applicant's continued efforts to attract new businesses, services, and other amenities to the Town of Westwood. Based on continued discussions with potential tenants, the revised layout is anticipated to accelerate the buildout of the Project's commercial components. The revised layout continues to provide access to open spaces, pedestrian connectivity, and many of the

features that promote development that is functionally integrated with surrounding uses, and provides appropriate access to public transportation infrastructure.

We look forward to reviewing this Application with the Planning Board at its next available meeting. In the meantime, feel free to contact the Applicant or its attorneys using the contact information on the attached Project Information Form if you have any questions or need any additional information.

Thank you.

Yours sincerely,

UNIVERSITY STATION PHASE 2 LLC
By Its Attorney

By:_____
Brian Dugdale, Esq.

cc: Paul Cincotta, New England Development
Nathan Cheal, TetraTech

Application for Master Development Plan Special Permit

UNIVERSITY STATION
MASTER DEVELOPMENT PLAN

within the University Avenue Mixed Use District

Submitted to Westwood Planning Board by University Station Phase 2 LLC

March 26, 2019

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Tab 6: Updates to Technical Reports – Memorandum re: University Station – Modified Master Development Plan, Updated Drainage and Utility Summary, from Tetra Tech to Town of Westwood Planning Board, dated February 20, 2019

Tab 1:
Project Information Form and Signature Page

General application information for the Applicant and project:

Name of Applicant:	University Station Phase 2 LLC
Address of Applicant:	c/o New England Development 75 Park Plaza, Third Floor Boston, Massachusetts 02116
Contact information for Applicant:	Name: Paul Cincotta Title: Project Manager Phone: (617) 243-7841 Email: pcincotta@nedevelopment.com Name: Brian W. Dugdale, Esq. Title: Attorney for the Applicant Phone: (617) 574-6532 Email: bdugdale@goulstonstorrs.com
Owner (if other than the Applicant):	N/A
Contact information for Owner:	N/A
Description of project site:	This application (this "**Application**") proposes changes affecting approximately 11.4 acres located along the southern and eastern sides of Station Drive, shown within Development Area A on the plan entitled, "Modified Master Development Plan" prepared by Tetra Tech dated February 20, 2019, enclosed with this Application (the "**Modified Master Development Plan**"). The Modified Master Development Plan updates the Master Development Plan approved at Special Town Meeting on May 6, 2013, as modified by the plan entitled, "Modified Master Development Plan" prepared by Tetra Tech dated November 22, 2016, and approved by the Planning Board on April 11, 2017 (the "**Master Development Plan**").
Description of proposed development:	The Modified Master Development Plan proposes to configure the layout of Development Area A to reflect "Building 1" (the "**Office Building**") as a 4-story building containing approximately 100,000 square feet of office use and "Building 2" as a 3-story building containing approximately 45,000 square feet of office use, along with associated parking,

	circulation and other site improvements. The Modified Master Development Plan does not significantly change the proposed building and site layout shown on the existing Master Development Plan, or increase or otherwise affect the maximum gross floor area limitations for any category of use, which are applicable to the Project as a whole. The Modified Master Development Plan does not create any adverse effects that would outweigh its beneficial impacts to the Town or UAMUD. Descriptions of the Project and the proposed changes to the Master Development Plan are more fully set forth in the Summary Table behind Tab 2, and the Narrative Statement behind Tab 3.
Description of proposed parking:	No changes are proposed to the Project's Parking Schedule. The Modified Master Development Plan includes revisions to the layout of parking areas within Development Area A.
Waivers from Rules and Regulations requested:	Per request of Town staff, waiver from the requirement in Section 5.3 of the UAMUD Rules and Regulations to submit 15 paper copies of the enclosed application.
Supporting application materials:	Please see the foregoing Table of Contents, Summary Table, Narrative Statement, Plans and Updates to Technical Reports provided with this Application.
Application fee:	$1,000 (delivered under separate cover)

Signature of the Applicant:

UNIVERSITY STATION PHASE 2 LLC,
by its Attorney

By:_____
Brian W. Dugdale, Esq.

Date: March 26, 2019

Tab 2:

Summary Table 1
Master Development Plan Status Update

STATUS OF DEVELOPMENT – MASTER DEVELOPMENT PLAN[1]		
Use Category	***Master Development Plan***	***Constructed or Approved to Date***
Retail/Service; Restaurant/ Entertainment	750,000 SF	681,000 SF
Office/R&D[2]	325,000 SF	120,000 SF
Residential[3]	650,000 SF (650 Units)	498,000 SF (450 Units)
Hotel/Commercial Lodging[4]	115,000 SF (160 Rooms)	75,000 SF (130 Rooms)
Assisted Living[5]	110,000 SF (100 Units)	60,000 SF (64 Units)
Total	1,950,000 SF	1,394,000 SF

[1] For informational purposes only. All values set forth herein are approximate and subject to change as design plans progress. The bulk and dimensional controls, design requirements, and other applicable criteria set forth in the Master Development Plan (as approved) and Section 9.7 of the Zoning Bylaw of the Town of Westwood shall govern further development. The overall approved floor area of approximately 2.1 million square feet and the attendant breakdown by use category remains unchanged.

[2] This limitation may be increased up to 550,000 square feet in accordance with Section 9.7.12.13(a) of the Zoning Bylaw.

[3] Up to 350 residential units are allowed as of right. An additional 300 residential units are allowed by Special Permit from the Planning Board in accordance with Section 9.7.4.5.4 of the Zoning Bylaw. To date, 350 residential units have been approved pursuant to a Conformance Determination issued for Core Development Area 1, and such units have been constructed. An additional 100 residential units have been approved for development pursuant to a Special Permit dated March 22, 2018, and the Planning Board issued a PDR approval on March 22, 2018. The additional 200 residential units will require issuance of a Special Permit(s).

[4] The Planning Board issued a PDR approval for a hotel within Development Area B containing 130 rooms, which has been constructed as of the date of this Application. An additional 30 rooms are allowed within the UAMUD, consistent with the Master Development Plan.

[5] The Planning Board issued a PDR approval for an assisted living facility within Development Area B containing 64 units. The facility is constructed and open. An additional 36 units may be approved within the UAMUD, consistent with the Master Development Plan.

Summary Table 2
Comparison of Existing and Modified Development Area A

CONCEPTUAL DEVELOPMENT PLAN FOR DEVELOPMENT AREA A[6]			
Criteria		***Master Development Plan Concept***	***Proposed Modified Master Development Plan Concept***
Building Height		Up to 70 Ft.*	Up to 70 Ft.*
Development Program	***Office/R&D***	225,000 SF	145,000 ** SF
	Parking	Approx. 900 Spaces	Approx. 700 Spaces

* In no event shall the height of a building exceed one hundred seventy-eight and one-half (178½) feet above the North American Vertical Datum of 1988 (NAVD88)
** The Applicant reserves the right to develop the remaining 80,000 square feet of Office/R&D use allowed in this Development Area A as set forth in the Master Development Plan.

[6] For informational purposes only. All values set forth herein are approximate and subject to change as design plans progress. The bulk and dimensional controls, design requirements, and other applicable criteria set forth in the Master Development Plan (as approved) and Section 9.7 of the Zoning Bylaw of the Town of Westwood shall govern development within Development Area A. The overall approved 2.1 million square feet and the attendant breakdown by use category remains unchanged.

Tab 3:

Narrative Statement

For the reasons set forth below, University Station Phase 2 LLC (the "**Applicant**"), respectfully requests that the Planning Board of the Town of Westwood (the "**Town**") approves this Master Development Plan Special Permit for certain changes to the University Avenue Mixed Use District ("**UAMUD**") Master Development Plan, adopted by the Town at a Special Town Meeting on May 6, 2013, as modified by the plan entitled, "Modified Master Development Plan" prepared by Tetra Tech dated November 22, 2016, and approved by the Planning Board on April 11, 2017 (the "**Master Development Plan**"), pursuant to Sections 9.7.12.14 and 10.3 of the Zoning Bylaw of the Town of Westwood (the "**Zoning Bylaw**").[7]

1. BACKGROUND

The Master Development Plan, including all supporting materials filed in connection with its approval, depicts, describes and regulates development of the University Station project (the "**Project**") within the UAMUD. The Master Development Plan establishes the allowed uses and the approximate layout and configuration of buildings, parking areas, internal driveways and other site features areas.[8] As currently approved, the Master Development Plans allows for the total development of up to 650 residences,[9] 100 assisted living/memory care units, 750,000 square feet of retail, approximately 325,000 square feet of office and research and development space, and 160 hotel rooms, subject to the requirements and standards set forth in Section 9.7 of the Zoning Bylaw. Since completion of its construction in fall of 2015, the Project's first phase, which includes a mix of retail, restaurants, housing, and a fitness center, has operated as a successful example of a carefully-planned mixed use project.

On April 11, 2017, the Planning Board voted to approve certain modifications to the Master Development Plan to: (i) update depictions of Development Area B and Core Development Area B and Core Development Area 3 to show the actual location of buildings previously approved by the Planning Board pursuant to the Conformance Determination and Project Development Review ("**PDR**") procedures set forth in Section 9.7.12.2 of the Zoning Bylaw; and (ii) revise the proposed configuration of buildings, parking areas, open space, and other site features for portions of Development Area B that had not yet undergone PDR approval. These modifications were intended to facilitate the continued buildout of the undeveloped portions of Development Area B. Since the Planning Board approved the Master Development Plan modification, such buildout has achieved a number of milestones, including:

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[7] Capitalized terms used but not defined herein shall have the meanings ascribed to them in the Zoning Bylaw.
[8] The Master Development Plan states that "building location, parking, layout and site details are approximate in the Development Areas, subject to final design."
[9] Development in excess of 350 residential units requires issuance of a Special Permit from Planning Board.

- Issuance of a PDR approval on May 26, 2017, for development of 80,000 square foot medical office facility within a portion of Development Area B (the "**Brigham PDR Approval**"). Construction of the facility's first building, containing approximately 30,000 square feet of medical office space and an urgent care clinic, has been completed and opened for business in the fall of 2018.

- Issuance of a Special Permit and PDR approval on March 22, 2018, for development of 100 residential condominium units within two buildings within a portion of Development Area B (the "**Pulte Approval**"). Construction pursuant to the Pulte Approval is underway and initial occupancy is anticipated in the fall of 2019.

- Issuance of a PDR approval on February 26, 2019, for development of a 40,000 square foot office building within a portion of Development Area B (the "**Meketa PDR Approval**").

As set forth below, the Applicant proposes to modify the proposed configuration of two office buildings and parking areas within Development Area A as depicted on the Modified Master Development Plan. This modification is intended to accelerate build-out of this portion of the Project.

2. PROPOSED MODIFICATION

The current Master Development Plan depicts three office buildings within Development Area A. To advance development and attract tenants, the Applicant proposes a revised layout that will better serve the needs of potential office tenants. The proposed modification, which is shown on the Modified Master Development Plan, would replace three previously-proposed office buildings in Development Area A with two office buildings, a 4-story office building (shown as "Building 1" on the Modified Master Development Plan containing approximately 100,000 square feet) and a 3-story office building (shown as "Building 2" on the Modified Master Development Plan containing approximately 45,000 square feet). The parking and traffic circulation layout in Development Area A has also been adjusted to reflect this reconfiguration.

The Modified Master Development Plan will continue to provide a mix of uses and site features that are consistent with the overall design and implementation of the Project. If approved by the Planning Board, the Master Development Plan Special Permit will not: (i) increase the total amount of development permitted at the Project; (ii) alter which uses are allowed within any development area; (iii) modify the bulk and dimensional, parking, performance and design standards, or other regulations applicable to development within the UAMUD as set forth in Section 9.7 of the Zoning Bylaw; or (iv) result in any adverse effects that outweigh the beneficial impacts to the Town or UAMUD.

Included at Tab 2 to this Application are tables summarizing the conceptual development program for Development Area A and for the Project as a whole, broken down by use category. As summarized on such tables, completion of the conceptual development program within Development Area A, as depicted on the Modified Master Development Plan, would result in no

material changes to the impacts that would be anticipated to result from the current Master Development Plan. As further detailed below, the proposed modification is consistent with the special permit criteria set forth in Section 10.3.3 of the Zoning Bylaw and the overall design requirements and standards for the UAMUD set forth in Section 9.7.11 of the Zoning Bylaw, and may be approved by the Planning Board pursuant to Sections 9.7.12.14 and 10.3 of the Zoning Bylaw.

3. PLANNING BOARD REVIEW OF SPECIAL PERMIT

A. Special Permit Requirements

In accordance with Section 9.7.12.14 of the Zoning Bylaw, the Planning Board may approve a Master Development Plan Special Permit pursuant to Section 10.3 of the Zoning Bylaw "upon its written determination that the adverse effects of the proposed [modification] will not outweigh its beneficial impacts to the Town or the neighborhood, in view of the particular characteristics of the site, and of the proposal in relation to that site." In making its determination the Planning Board shall consider each of the following factors, which are briefly addressed below.

- **Social, economic or community needs which are served by the proposal**. As further addressed herein, the proposed modifications are intended to allow for an accelerated completion of the commercial components within Development Area A of the UAMUD. This will allow for greater economic growth within the UAMUD and for the Town generally. Such growth will also increase tax revenues generated by the Project.

- **Traffic flow and safety, including parking and loading**. As further addressed below in the discussion of traffic, parking and loading performance standards that are applicable within the UAMUD, the layout and vehicular and non-vehicular system of circulation depicted on the Modified Master Development Plan has been designed to comply with the engineering, performance and safety standards set forth in Sections 9.7.11.5-7 of the Zoning Bylaw. Project-specific parking and loading details will be provided as part of Project Development Review packages, and will comply with the standards set forth in Section 9.7.11 of the Zoning Bylaw.

- **Adequacy of utilities and other public services**. As further addressed below in the discussion of utility and public service standards that are applicable within the UAMUD, the Modified Master Development Plan does not include any material changes to the Project's proposed utility infrastructure. The materials included with this Application and referenced below demonstrate and confirm that all proposed utility connections will continue to adhere to the requirements of Section 9.7.11.3.

- **Neighborhood character, aesthetics and social structures**. As further addressed below, the Modified Master Development Plan does not change or otherwise affect the building design and visual mitigation criteria set forth in Sections 9.7.11.1 and 9.7.11.2 of the Zoning Bylaw. Building details will be reviewed for compliance with such requirements during the PDR process. In addition and in accordance with Section 9.7.11.13 of the Zoning Bylaw, the Master Development Plan provides for visually and physically accessible open space available for public use. The Modified Master Development Plan does not include any material changes to the Project's proposed common areas or public gathering areas. Employees and visitor to the Office Building will continue to have access to adjacent public gathering areas and common spaces, including, without limitation, the public plaza within the Project's core retail area, and the nearby Gateway Park.

- **Impacts on the natural environment**. As further addressed below, the Modified Master Development Plan includes stormwater infrastructure designed "to minimize the impact to the Dedham/Westwood Water District water supply and distribution system, consistent with previous University Station commitments." The Updates to Technical Reports also include updated stormwater calculations, confirming that the stormwater management practices proposed for Development Area A have been developed in accordance with the original University Station Stormwater Management Report, last revised March 22, 2013. In addition, the Modified Master Development Plan does not alter or otherwise affect energy efficiency, sustainability, air quality, waste management, and water efficiency criteria set forth in Sections 9.7.11.11-12, 14 and 18 of the Zoning Bylaw and the related studies submitted with the Master Development Plan in 2013.

- **Potential fiscal impact, including impact on Town services, tax base and employment**. The overall development program for the Project remains approximately 2.1 million square feet, as originally proposed when the Master Development Plan was approved in 2013. The Applicant reserves, and recognizes that the Project remains subject to, the maximum gross floor area limitations for each category of use as noted in the original Master Development Plan. The current in-place level of development (including the 100-unit Pulte residential project currently under construction) represents approximately sixty percent (60%) of the total build-out of 2.1 million square feet, but is already generating, on an annual basis, approximately $1.5 million more in real estate taxes than the $7 million that were estimated for full build-out in connection with the initial Master Development Plan approval in 2013. The proposed reconfiguration of commercial uses within Development Area A will only accelerate the realization of additional net-positive fiscal benefits from the Project.

B. <u>UAMUD Performance and Design Standards.</u>

In addition to the above-described factors that are outlined in Section 10.3 of the Zoning Bylaw, Sections 17.3 and 7.5 of the UAMUD Rules and Regulations require the Applicant to submit with its special permit application plans and materials, including a narrative explaining how such modification to the Master Development Plan meets all of the applicable design and

performance standards set forth in Section 9.7.11 of the Zoning Bylaw. The Modified Master Development Plan conforms to all applicable UAMUD requirements and standards set forth in Section 9.7 of the Zoning Bylaw. These requirements include use regulations, bulk and dimensional limitations, Water Resource Protection Overlay District ("**WRPOD**") requirements, parking, and design standards, which are briefly addressed below.

(i) **Use Requirements** – The uses set forth on the Modified Master Development Plan are consistent with those set forth on the Master Development Plan.

(ii) **Bulk and Dimensional Requirements** – The Modified Master Development Plan complies with the bulk and dimensional requirements set forth in Section 9.7 of the Zoning Bylaw as follows:

- ***Floor Area Ratio*** – The entire Project is subject to a maximum FAR of 1.0. See Paragraph C, below, which confirms the Project, as shown on the Modified Master Development Plan, will continue to comply with this limitation.

- ***Gross Floor Area Limitations*** – The Master Development Plan and Zoning Bylaw limit the amount of gross floor area that may be dedicated to each Use Type on a Project-wide basis. Any development pursuant to the Modified Master Development Plan would continue to be subject to the same limits.

- ***Height*** – Individual buildings depicted on the Modified Master Development Plan will continue to be subject to height limits applicable to the pertinent Development Area. No changes to such limits are proposed.

- ***Minimum Lot Area and Frontage*** – Within the UAMUD, lots must have a minimum lot area of 15,000 square feet, and 50 feet of frontage at the street line. Development pursuant to the Modified Master Development Plan will continue to be subject to, and no changes are proposed to, such requirements.

(iii) **Residential Use Requirements** – Any buildings proposed to include Residential Use(s) must be developed in accordance with the requirements and limitations set forth in Section 9.7.4.5 of the Zoning Bylaw. The Modified Master Development Plan does not include any changes to the proposed residential uses, otherwise the Project's conformance to the provisions of Section 9.7.4.5 of the Zoning Bylaw.

(iv) **WRPOD Requirements** – Any development located within the Water Resource Protection Overlay District ("**WRPOD**") must conform to the WRPOD requirements set forth in Section 9.7.5 of the Zoning Bylaw, which include regulations related to drainage, storage of hazardous materials, snow removal, vegetation, impervious areas, and other matters related to the protection of the Town's water resources. Included with the Updates to Technical Reports at Tab 6 is a memorandum from Tetra Tech, which confirms the Modified Master Development Plan includes stormwater infrastructure designed "to minimize the impact to the Dedham/Westwood Water

District water supply and distribution system, consistent with previous University Station commitments."

(v) **Parking and Loading Standards** – The parking depicted on the Master Development Plan conforms to the requirements of Section 9.7.8 of the Bylaw, and no changes to the Parking Schedule (as defined in Section 9.7.8.1 of the Zoning Bylaw) are proposed. The Master Development Plan includes minor changes to the proposed parking layout and circulation within Development Area A to conform to the revised layout and configuration of the Office Building. Site-specific parking requirements may be established by the Planning Board during the PDR process. No changes to the UAMUD parking requirements and standards are proposed.

(vi) **Signage** – The Modified Master Development Plan does not alter or otherwise affect the Project's existing signage and its adherence to the requirements of Section 9.7.10 of the Zoning Bylaw.

(vii) **Building Design/Screening** – The Modified Master Development Plan does not change or otherwise affect the building design and visual mitigation criteria set forth in Sections 9.7.11.1 and 9.7.11.2 of the Zoning Bylaw. Building details will be reviewed for compliance with such requirements during the PDR process.

(viii) **Utilities** – The Modified Master Development Plan does not include any material changes to the Project's proposed utility infrastructure. Grading and utility plans are included with the Plans located behind Tab 5, and a memorandum from Tetra Tech is included with the Updates to Technical Reports at Tab 6, which demonstrate and confirm that all proposed utility connections will continue to adhere to the requirements of Section 9.7.11.3.

(ix) **Land Use and Common Areas/Public Gathering Areas** – In accordance with Section 9.7.11.13 of the Zoning Bylaw, the Master Development Plan provides for visually and physically accessible open space available for public use. The Modified Master Development Plan does not include any material changes to the Project's proposed common areas or public gathering areas. Employees and visitor to the Office Building will continue to have access to adjacent public gathering areas and common spaces, including, without limitation, the public plaza within the Project's core retail area, and the nearby Gateway Park.

(x) **Street Design/Circulation/Traffic Impact/Public Safety** – The layout and vehicular and non-vehicular system of circulation depicted on the Modified Master Development Plan has been designed to comply with the engineering, performance and safety standards set forth in Sections 9.7.11.5-7 of the Zoning Bylaw. As shown in more detail on Plans included behind Tab 5, the revised interior and access drives and pedestrian pathways have been designed in accordance with all applicable engineering and safety standards, with sufficient capacity to accommodate trip generation and turning movements allowing for adequate access by public safety vehicles and maintenance equipment, creating "a comprehensive, interconnected, safe

and efficient system of circulation that incorporates varied transportation modes, both vehicular and non-vehicular." As part of the University Station planning process, a Traffic Impact Study dated November 2012 (the "**November 2012 TIS**"), and supporting memoranda addressing comments raised by the Town's traffic peer review consultant were submitted to and approved by the Town. These documents included detailed traffic impact analyses and a comprehensive transportation improvement program, the elements of which are designed to accommodate the Project within the confines of the transportation infrastructure. The Master Development Plan approved by the Town in 2013 (the "**2013 Plan**") that was the basis for the November 2012 TIS contemplated office uses within Development Area A, in excess of the amount proposed by this submittal. Pedestrian and vehicular access to Development A as shown on the Modified Master Development Plan is consistent with the access shown on the 2013 Plan. The Modified Master Development Plan will have no material impact on the traffic pattern or volume projections set forth in the November 2012 TIS. As a result, no further traffic analysis is warranted, and no additional roadway, intersection or traffic control improvements are required to support the modified Master Development Plan.

Furthermore, the Modified Master Development Plan will not materially change the Project's layout or street design and will not increase the projected vehicle trips. The Project's proposed parking and traffic impacts were fully studied when the original Master Development Plan was approved in 2013. The scope of development within Development Area A, as conceptually depicted on the Modified Master Development Plan does not materially affect the traffic and parking impacts that were anticipated to result from the 2013 Plan, as set forth in the November 2012 TIS. As shown in the Summary Tables behind Tab 2, this Application does not propose to alter either the total proposed scope of development or the scope of development within any particular Use Type. The Modified Master Development Plan proposes no changes to the Project's overall Parking Schedule (as defined in Section 9.7.8.1 of the Zoning Bylaw) or to the UAMUD parking requirements and standards that are proposed. Specific parking demands will continue to be reviewed by the Planning Board during the PDR process for each individual building, in accordance with Section 9.7.8.1 of the Zoning Bylaw.

(xi) **Water Quality and Stormwater Management** – Included with the Updates to Technical Reports at Tab 6 is a memorandum from Tetra Tech, which confirms the Modified Master Development Plan includes stormwater infrastructure designed "to minimize the impact to the Dedham/Westwood Water District water supply and distribution system, consistent with previous University Station commitments." The Updates to Technical Reports also include updated stormwater calculations, confirming that the stormwater management practices proposed for Development Area A have been developed in accordance with the original University Station Stormwater Management Report, last revised March 22, 2013.

The Modified Master Development Plan will not adversely affect the storm water quality of the Project. Detailed stormwater calculations will continue to be provided as part of the project-specific PDR process.

(xii) **Outdoor Lighting** – The Modified Master Development Plan does not change or otherwise affect the outdoor lighting criteria set forth in Section 9.7.11.9 of the Zoning Bylaw. Outdoor lighting details will be reviewed for compliance with such requirements during the PDR approval process.

(xiii) **Mix of Use** – The Modified Master Development Plan does not alter the overall mix of uses proposed for Development Area A or the Project as a whole. The proposed mix of uses will continue to provide for a beneficial mix of commercial and non-commercial uses, with varying peak hours for parking and traffic generation.

(xiv) **Environmental Impacts and Sustainability** – The Modified Master Development Plan does not alter or otherwise affect energy efficiency, sustainability, air quality, waste management, and water efficiency criteria set forth in Sections 9.7.11.11-12, 14 and 18 of the Zoning Bylaw and the related studies submitted with the Master Development Plan in 2013.

(xv) **Spill Prevention and Response** – The portion of the Project affected by the proposed modification is subject to a site-wide Operations and Maintenance Plan dated as of November 13, 2013, which was approved by the Planning Board as required by Section 9.7.11.17 of the Zoning Bylaw.

Based on the foregoing, the proposed Master Development Plan Special Permit will advance, and will not materially and adversely affect the Town or UAMUD, including the overall design and implementation of the Project. As set forth above, the proposed modification to the Master Development Plan will serve the social, economic and surrounding community needs and has been developed with careful consideration of traffic flow and safety needs within the UAMUD. The Modified Master Development Plan continues to provide adequate utilities and conform to the standards and requirements set forth in Section 9.7.11 of the Zoning Bylaw. The Project will continue to adhere to all applicable energy efficiency, water conservation, sustainability and stormwater management commitments and requirements. The configuration of the Office Building within Development Area A will promote the continued development of the Project, without materially affecting the overall design and implementation planned for the Project, which will remain consistent with the surrounding UAMUD neighborhood characteristics.

At this time, the overall development program for the Project remains approximately 2.1 million square feet, as originally proposed when the Master Development Plan was approved in 2013. The Applicant reserves, and recognizes that the Project remains subject to, the maximum gross floor area limitations for each category of use as noted in the original Master Development Plan. The Applicant respectfully submits that the Modified Master Development Plan satisfies the special permit criteria set forth in Section 10.3.3 of the Zoning Bylaw and the applicable design and performance standards set forth in Section 9.7.11 of the Zoning Bylaw, and,

therefore, the Planning Board should approve the requested Master Development Plan Special Permit.

Tab 4:
List of Required Permits and Permits Obtained

Permits Obtained:

- Town Meeting approval of Zoning Bylaw Section 9.7 – *on file with Town Clerk*
- Town Meeting approval of University Avenue Mixed Use District Master Development Plan, as modified by the Planning Board on April 11, 2017 – *on file with Town Clerk*
- Development Agreement with the Town of Westwood – *on file with the Town Clerk*
- MEPA Certificate from the Secretary of Energy and Environmental Affairs – *on file with the Town Clerk*
- Order of Conditions from the Westwood Conservation Commission – *on file with the Town Clerk*

Permits To Be Obtained:

- Master Development Plan Special Permit

Tab 5:
Project Plans

The following plans are being provided under separate cover:

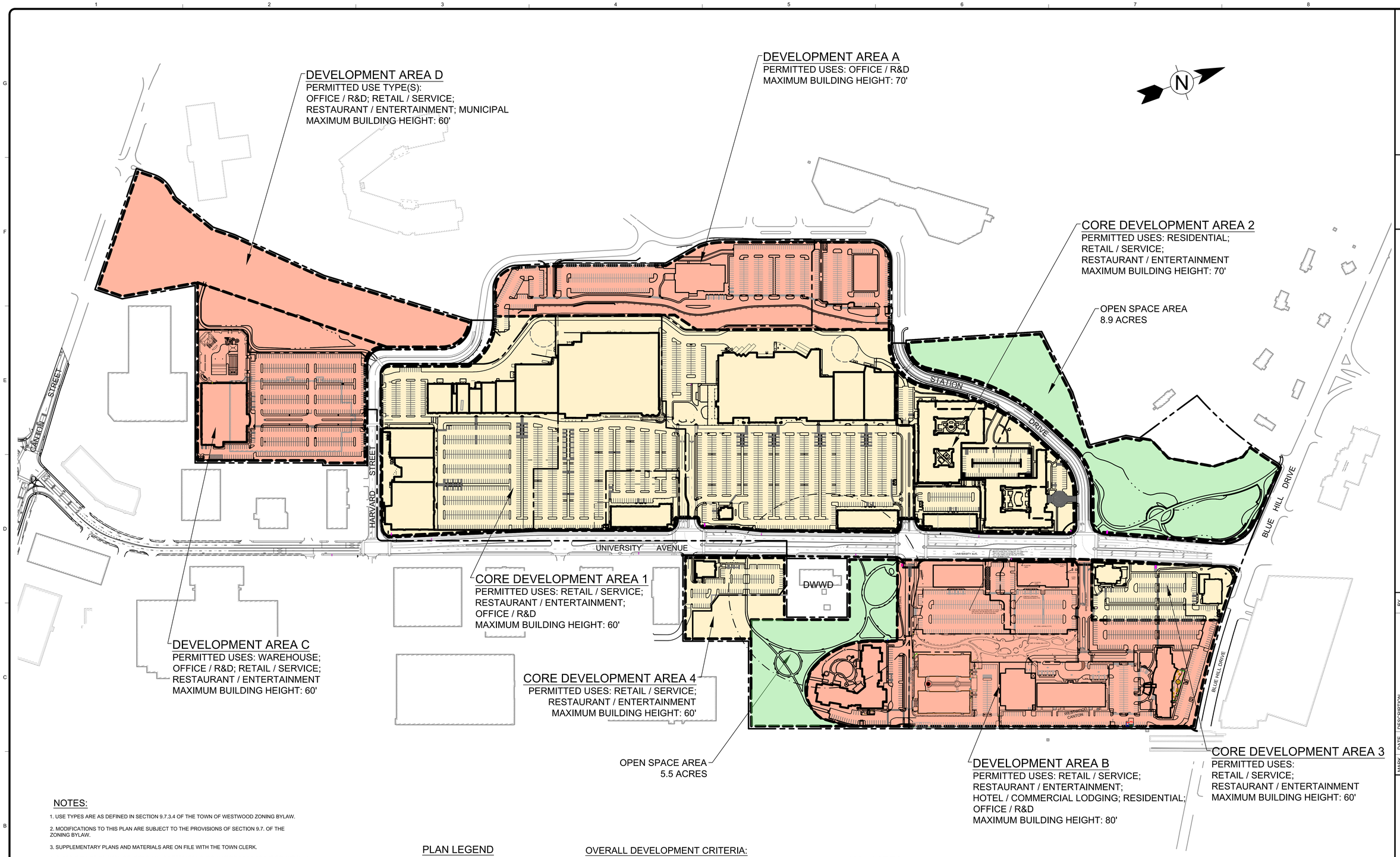
1. "Modified Master Development Plan" prepared by Tetra Tech dated February 20, 2019 (Sheet C-101) (the "**Modified Master Development Plan**")

2. "Phase II Master Site Layout Plan" prepared by Tetra Tech dated February 20, 2019 (Sheet C-900)

3. "Phase II Master Site Grading and Drainage Plan" prepared by Tetra Tech dated February 20, 2019 (Sheet C-901)

4. "Phase II Master Site Utility Plan" prepared by Tetra Tech dated February 20, 2019 (Sheet C-902)

5. "Landscape Master Plan" (Development Area A enlargement) prepared by Shadley Associates dated February 20, 2019 (Sheet L-100)



NOTES:

1. USE TYPES ARE AS DEFINED IN SECTION 9.7.3.4 OF THE TOWN OF WESTWOOD ZONING BYLAW.
2. MODIFICATIONS TO THIS PLAN ARE SUBJECT TO THE PROVISIONS OF SECTION 9.7. OF THE ZONING BYLAW.
3. SUPPLEMENTARY PLANS AND MATERIALS ARE ON FILE WITH THE TOWN CLERK.
4. SUBDIVISION OR DIVISION OF LOTS SHALL BE EFFECTED PURSUANT TO 9.7.7.5 OF THE ZONING BYLAW.
5. BUILDING AND LAYOUT MODIFICATIONS AND SUBSTITUTIONS ARE PERMITTED PURSUANT TO THE PROVISIONS OF SECTION 9.7.11 OF THE ZONING BYLAW.
6. BUILDING LOCATION, PARKING, LAYOUT AND SITE DETAILS ARE APPROXIMATE IN THE DEVELOPMENT AREAS, SUBJECT TO FINAL DESIGN AND THE PROVISIONS OF SECTION 9.7.11 OF THE ZONING BYLAW.
7. INFRASTRUCTURE AND UTILITIES WILL BE INSTALLED TO SUPPORT THE DEVELOPMENT AND MAY BE INCLUDED IN ANY OF THE DEVELOPMENT AREAS.
8. TO THE EXTENT THE PROVISIONS OF SECTION 9.7 OF THE BYLAW CONFLICT WITH THIS PLAN, THE PLAN GOVERNS.
9. PARKING MAY BE SHARED IN AREAS WITH MULTIPLE USERS; PARKING LOT LANDSCAPING/LAYOUT/BUFFERING SHALL BE SUBSTANTIALLY AS SHOWN, SUBJECT TO ALLOWED BUILDING AND SITE RECONFIGURATION.
10. FINAL PUBLIC ROADWAY LAYOUT SUBJECT TO THE ACCEPTANCE BY THE TOWN OF WESTWOOD.
11. HEIGHT MAY BE INCREASED TO 120' BY SPECIAL PERMIT IN DEVELOPMENT AREA B.
12. CORE DEVELOPMENT AREAS INCLUDE OPEN SPACE USE AREAS.

PLAN LEGEND

- OPEN SPACE AREAS
- DEVELOPMENT AREAS A, B, C & D
- CORE DEVELOPMENT AREAS 1, 2, 3 & 4

OVERALL DEVELOPMENT CRITERIA:

DEVELOPMENT LOT AREA	130± ACRES
BUILDING PROGRAM:	
-RETAIL/SERVICE; RESTAURANT/ENTERTAINMENT	750,000 S.F.
-OFFICE / R&D	325,000 S.F.
-RESIDENTIAL	650 UNITS
-HOTEL / COMMERCIAL LODGING	
-HOTEL	160 ROOMS
-ASSISTED LIVING	100 UNITS
MAXIMUM FLOOR AREA RATIO:	1.0

PARKING SPACES SHOWN:

±6,020 SPACES

SHOWN FOR ILLUSTRATIVE PURPOSES ONLY SUBJECT TO CHANGE PER ACTUAL TENANCY IN ACCORDANCE WITH SECTION 9.7.8.1.

0 75' 150' 300'
SCALE: 1" = 150'

TETRA TECH
www.tetratech.com
100 Nickerson Road
Marlborough, MA 01752
PHONE: (508) 786-2200 FAX: (508) 786-2201

MARK	DATE	DESCRIPTION	BY
1	12/11/12	Draft Master Development Plan	N.H.C.
2	11/30/12	Revised Site Development Plans	N.H.C.
3	03/22/13	Revised Site Development Plans	N.H.C.
4	11/22/16	Modified Development Area B	N.H.C.
5	12/20/18	Modified Development Area B	N.H.C.
6	2/20/19	Modified Development Area A	T.A.B.

Client: University Station Phase II
Proj. Loc.: Westwood, MA

University Avenue Mixed Use District

Modified Master Development Plan

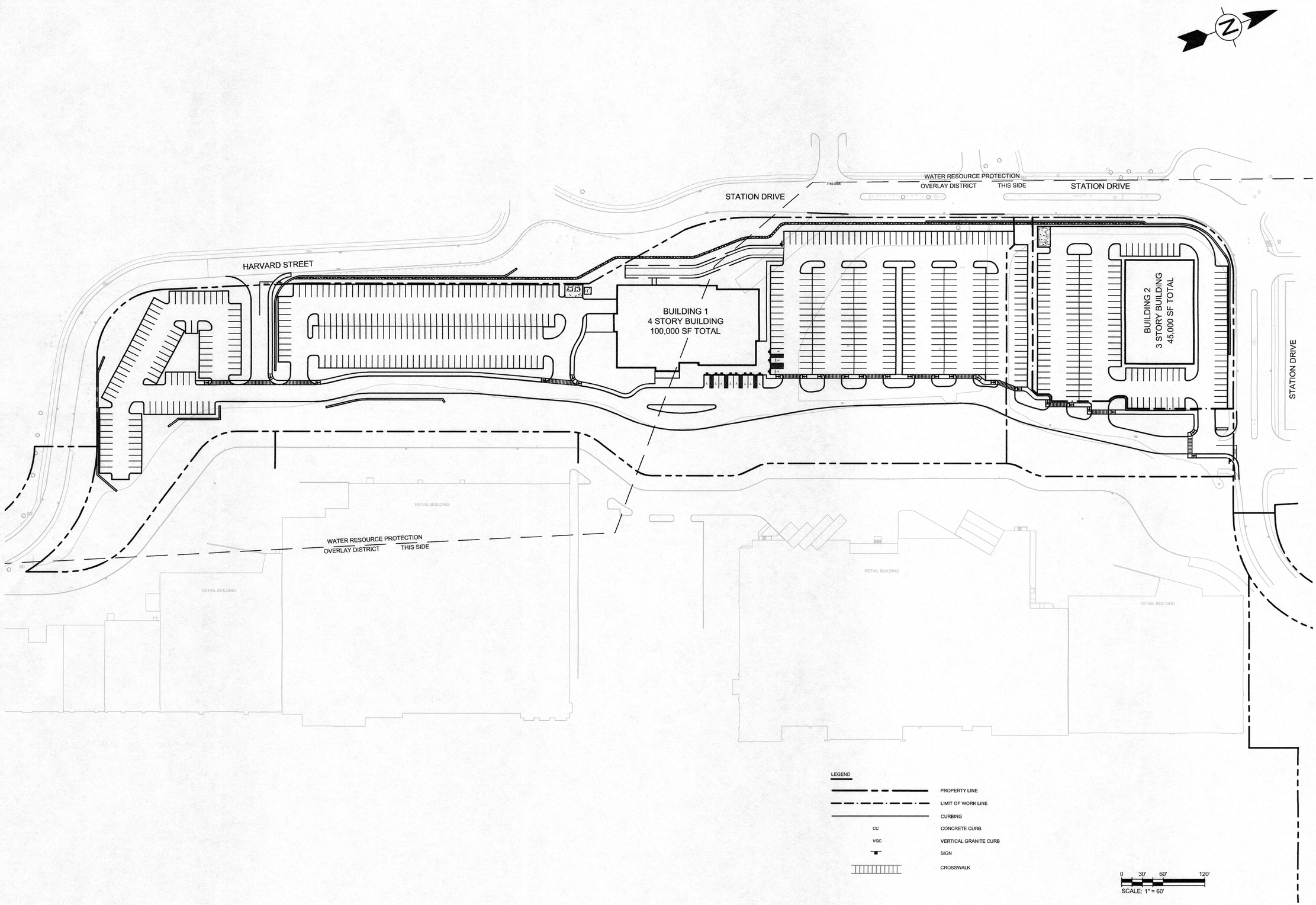
Project No.:	127-3659-12003
Designed By:	N.H.C.
Drawn By:	J.V.B./S.C.V.
Checked By:	N.H.C./R.F.D.

C-101

Copyright: Tetra Tech

Bar Measures 1 inch

2/20/2019 10:50:28 AM - P:\3659\143-3659-16003\CAD\SHEETFILES\UPPER CAMPUS\MASTER DEVELOPMENT PLANS\C-101 MASTER DEVELOPMENT PLAN BUILDING AREAS.DWG - BOOTHBY, THOMAS



Wed Feb 20 13:49:01 2019 - P:\3659\143-3659-16003\CAD\SHEETFILES\UPPER CAMPUS\MASTER DEVELOPMENT PLANS\C-900 - PHASE II MASTER SITE LAYOUT PLAN.DWG - BOOTHBY, THOMAS

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COMMONWEALTH OF MASSACHUSETTS
NATHAN H. CHEAL
NO. 46052
CIVIL
REGISTERED PROFESSIONAL ENGINEER
2/20/2019

MARK	DATE	DESCRIPTION	BY
1	2/20/19	Modified Master Development Plan	T.A.B.

Client: University Station Phase II
Proj. Loc.: Westwood, MA

University Station - Proposed Office
Development Area A of the University Station
Master Development Plan

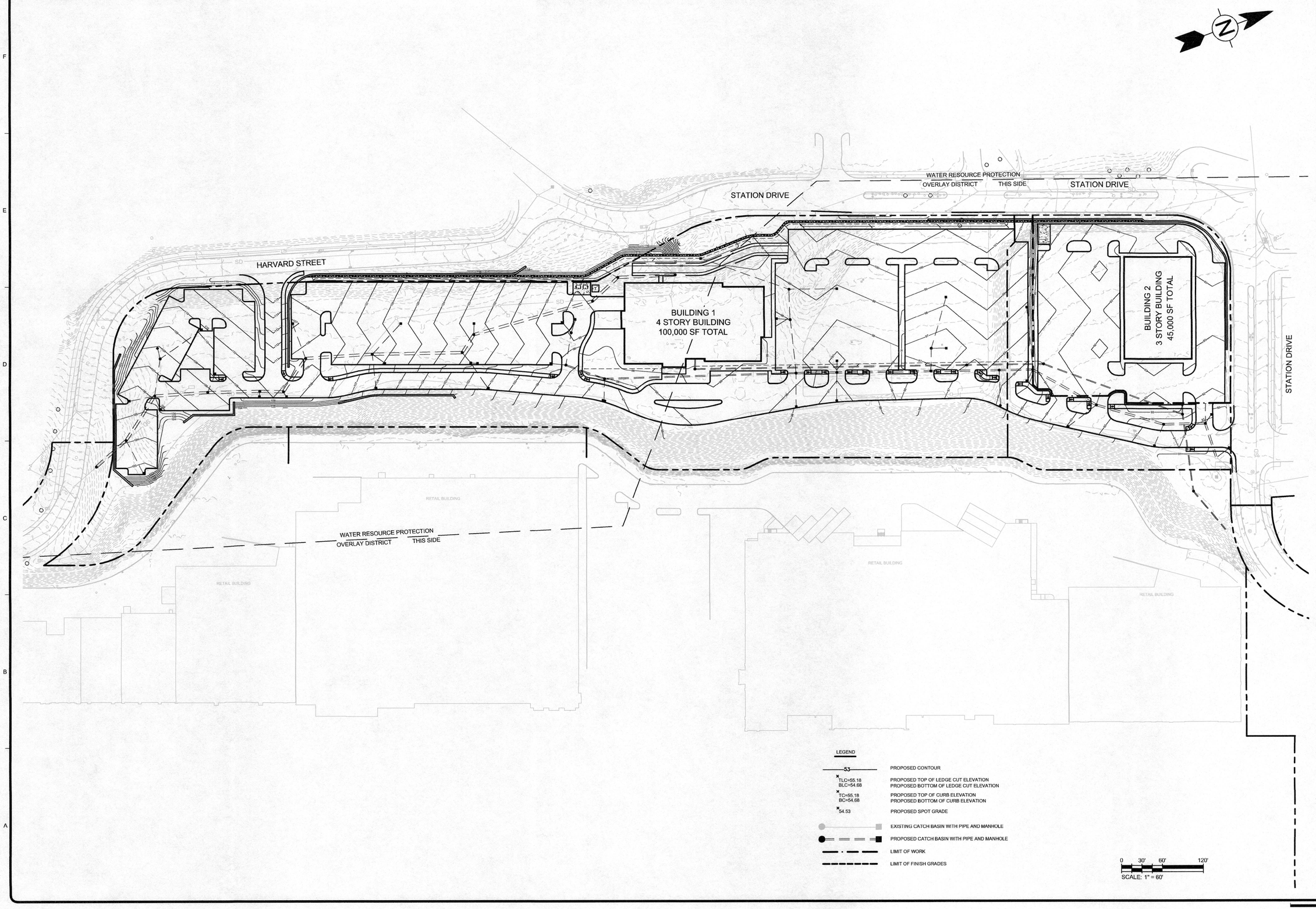
Phase II Master Site Layout Plan

Project No.:	143-3659-16003
Designed By:	N.H.C.
Drawn By:	T.A.B. / J.L.P.
Checked By:	N.H.C.

C-900

Copyright: Tetra Tech

Bar Measures 1 inch



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COMMONWEALTH OF MASSACHUSETTS
NATHAN H. CHEAL
NO. 49969
CIVIL
PROFESSIONAL ENGINEER
2/20/2019

MARK	DATE	DESCRIPTION	BY
1	2/20/19	Modified Master Development Plan	J.L.P.

Client: University Station Phase II
Proj. Loc: Westwood, MA

University Station - Proposed Office
Development Area A of the University Station
Master Development Plan

Phase II Master Site Grading and Drainage Plan

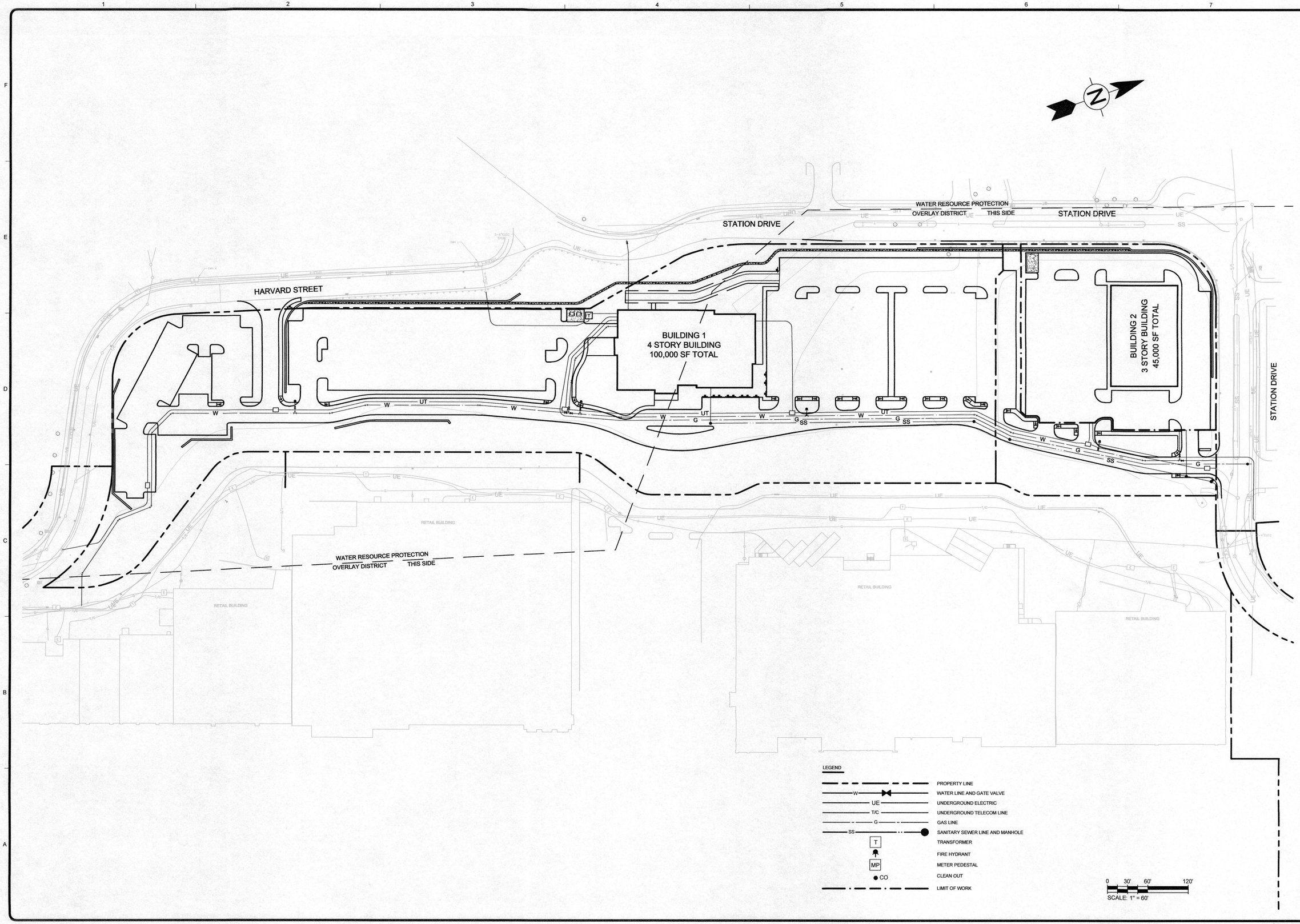
Project No.:	143-3659-16003
Designed By:	N.H.C.
Drawn By:	T.A.B. / J.L.P.
Checked By:	N.H.C

C-901

Copyright: Tetra Tech

Bar Measures 1 inch

Wed Feb 20 13:46:36 2019 - P:\3659\143-3659-16003\CAD\SHEETFILES\UPPER CAMPUS\MASTER DEVELOPMENT PLANS\C-901 PHASE II MASTER SITE GRADING AND DRAINAGE PLAN.DWG - BOOTHBY THOMAS



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COMMONWEALTH OF MASSACHUSETTS
NATHAN V. CHIBAL
NO. 49052
CIVIL
REGISTERED PROFESSIONAL ENGINEER
2/20/19

MARK	DATE	DESCRIPTION	BY
1	2/20/19	Modified Master Development Plan	J.L.P.

Client: University Station Phase II
Proj. Loc.: Westwood, MA

University Station - Proposed Office
Development Area A of the University Station
Master Development Plan

Phase II Master Site Utility Plan

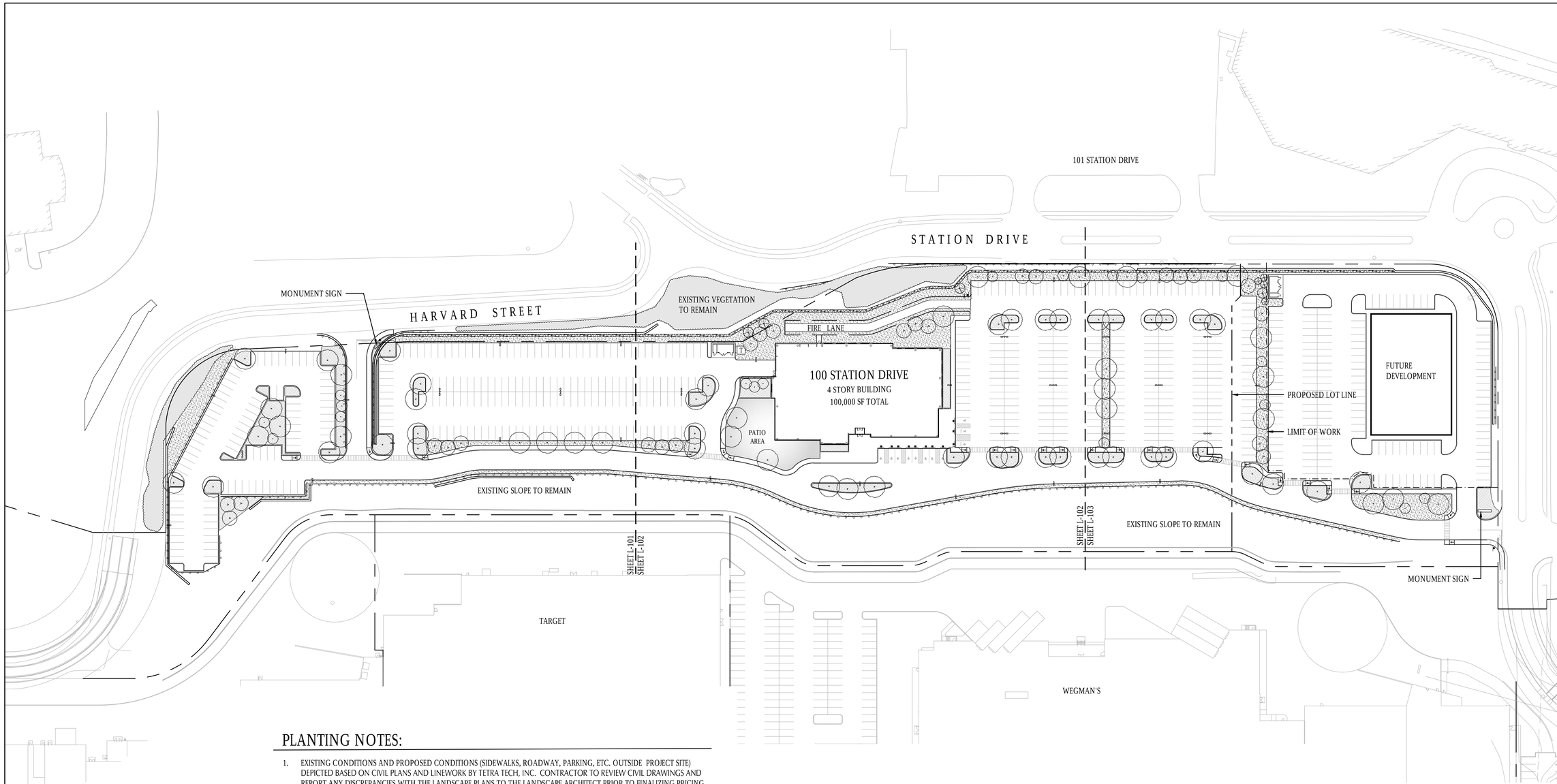
Project No.:	143-3659-16003
Designed By:	N.H.C.
Drawn By:	T.A.B. / J.L.P.
Checked By:	N.H.C

C-902

Copyright: Tetra Tech

Bar Measures 1 inch

Wed Feb 20 13:54:43 2019 - P:\3659\143-3659-16003\CAD\SHEETFILES\UPPER CAMPUS\MASTER DEVELOPMENT PLANS\C-902 - PHASE II MASTER SITE UTILITY PLAN.DWG - BOOTHBY, THOMAS



PLANTING NOTES:

1. EXISTING CONDITIONS AND PROPOSED CONDITIONS (SIDEWALKS, ROADWAY, PARKING, ETC. OUTSIDE PROJECT SITE) DEPICTED BASED ON CIVIL PLANS AND LINEWORK BY TETRA TECH, INC. CONTRACTOR TO REVIEW CIVIL DRAWINGS AND REPORT ANY DISCREPANCIES WITH THE LANDSCAPE PLANS TO THE LANDSCAPE ARCHITECT PRIOR TO FINALIZING PRICING AND BEFORE ANY CONSTRUCTION.
2. EXISTING PLANT MATERIAL TO REMAIN TO BE PROTECTED THROUGHOUT THE CONSTRUCTION. ANY DAMAGED PLANTS TO BE REPLACED IN KIND.
3. LOCATE AND VERIFY ALL EXISTING UTILITY LINES PRIOR TO PLANTING AND REPORT ANY CONFLICTS TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.
4. ALL NEW PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY.
5. ALL NEW WOODY STEM PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN, UNLESS OTHERWISE NOTED ON THE PLANT LIST.
6. THE CONTRACTOR SHALL SUPPLY NEW PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWINGS. IF DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS DRAWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE PLANT LIST, THE PLANTING PLAN SHALL GOVERN.
7. NO PLANT MATERIAL SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING. PLANTS SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS THEY BORE TO FINISHED GRADE BEFORE BEING DUG IN THE NURSERY. PRIOR TO PLANTING, REMOVE THE TOP OF THE BURLAP AND CONFIRM THAT PLANT ROOT CROWNS ARE NOT COVERED BY SOIL FROM THE NURSERY.
8. STAKE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF PLANTING.
9. ALL AREAS DISTURBED BY CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE THE LIMIT OF WORK SHALL BE LOAMED AND SEEDED AS SPECIFIED, UNLESS OTHERWISE DIRECTED BY THE OWNER'S REPRESENTATIVE.
10. ALL AREAS TO BE SEEDED SHALL RECEIVE SOIL PREPARATION AS SPECIFIED PRIOR TO SEEDING, UNLESS OTHERWISE NOTED ON THE PLAN.
11. ALL NEW PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE YEAR FROM TIME OF WRITTEN ACCEPTANCE OF THE PROJECT.
12. ALL LANDSCAPE AREAS ARE TO BE IRRIGATED EXCEPT FOR THE INTERNAL LANDSCAPE ISLANDS WITHIN THE PARKING AREAS. REFER TO IRRIGATION DIAGRAM FOR EXTENTS OF AREAS TO BE IRRIGATED.
13. THE CLEANING OF CATCH BASIN SUMPS IS REQUIRED FOLLOWING CONSTRUCTION AND ACCORDING TO ANY OPERATIONS AND MAINTENANCE PLAN FOR THE OVERALL UAMUD PROJECT AND THE PDR DEVELOPMENT.
14. THE USE OF CONSTRUCTION MACHINERY IS RESTRICTED TO THE HOURS PERMITTED IN THE TOWN OF WESTWOOD GENERAL BYLAWS, ARTICLE 10 SECTION 24.

PLANTING LEGEND

SYMBOL	DESCRIPTION
	TREES
	SHRUBS, GROUNDCOVERS, PERENNIALS, & ORNAMENTAL GRASSES
	TURFGRASS LAWN AREA
	RETAINING WALL (SEE CIVIL PLANS)
	GUARD RAIL (SEE CIVIL PLANS)
	LIGHT POLES (SHOWN FOR COORDINATION ONLY, SEE ELECTRICAL PLANS)

0 60' 120' 180'

NORTH

University Station Phase 2, LLC

c/o New England Development
75 Park Plaza
Boston, MA 02116

Shadley Associates
Landscape Architects / Site Planning Consultants
1730 Massachusetts Ave. • P 781.652.8809
Lexington, MA 02420 • F 781.862.2687
www.shadleyassociates.com

REVISIONS

NO.	DESCRIPTION	DATE

STAMP:

MASSACHUSETTS JAMES P. SHADLEY NO. 993 REGISTERED LANDSCAPE ARCHITECT

University Station Phase II

100 Station Drive
Westwood, MA 01821

PDR FILING
NOT FOR CONSTRUCTION

SA PROJECT NUMBER: 18054.0.00

SCALE: 1" = 60'
DRAWN BY: SW / JPG
REVIEWED BY: JPG / JPS

DATE: FEBRUARY 20, 2019

SHEET TITLE:

LANDSCAPE PLAN

SHEET NUMBER:

L-100

File Name: US-Gilzene_L-100.dwg

Tab 6:
Updates to Technical Reports

1. Memorandum re: University Station – Modified Master Development Plan, Updated Drainage and Utility Summary, from Tetra Tech to Town of Westwood Planning Board, dated February 20, 2019.

TETRA TECH

MEMO

To:	Town of Westwood Planning Board
Cc:	
From:	Tetra Tech
Date:	February 20, 2019
Subject:	University Station - Modified Master Development Plan Updated Drainage and Utlity Summary

This technical memorandum has been updated to in support of the minor modification to the Master Development Plan associated with Development Area A. Uses within Development Area A remain consistent with the original Master Development Plan. As shown on the modified Master Development Plan, Office is the proposed use.

The sections below provide discussions on utility services, stormwater management practices, landscape and open space, sustainability strategies, air quality, and noise mitigation strategies.

Utilities

Water Service: Consistent with the original Master Plan, water to Development Area A will be supplied by the Dedham/Westwood Water District from their White Lodge Water Treatment Plant located on University Avenue, adjacent University Station. Domestic water service will connect to the Dedham main service system. Fire service connections are available off of the Westwood high services system.

Currently two 8-inch main lines have been constructed to Development Area A off of the Dedham main service. An 8-inch main was extended into Development Area A from Station Drive. An additional 8-inch main was extended to Development Area A from the Core Development Area 1. The existing 8-inch main lines will be looped with a new 8-inch main constructed through Development Area A.

Protection of Dedham Westwood Water District Wells

To minimize the impact to the Dedham/Westwood Water District water supply and distribution system, consistent with previous University Station commitments, Development Area A has incorporated the following mitigation measures:

- Clean, roof stormwater recharge to replenish the aquifer. Roof stormwater will be directed to a subsurface infiltration system located in Core Development Area 1.
- All stormwater infiltration structures will continue to be located outside of the Zone I.
- Stormwater runoff from parking areas and driveway in Development Area A will be routed through deep sump hooded catch basins, Stormceptor Water Quality Units and surface Detention Basins.
- Landscape irrigation with non-potable water combined with using drought tolerate, hardy native plant species.
- Implementation of water conservation practices.

Infrastructure Northeast
Marlborough Technology Park, 100 Nickerson Road, Marlborough, MA 01752
Tel 508.786.2200 Fax 508.786.2201 tetratech.com

- Monitoring wells that were previously installed within the Zone I as well as additional monitoring wells, in locations agreed upon with the Dedham-Westwood Water District, will be monitored in accordance the provisions of the previously issued Water Resource Protection District Special Permit.
- No new sanitary sewer manholes are proposed within the Zone I as part of work associated with Development Area A.

Wastewater Service: Consistent with the original Master Plan, wastewater generated by Development Area A will be directed to the municipal sewers in Station Drive and University Avenue. As indicated in the original Master Plan documents, the municipal sewer in University Avenue flows to south and is discharged into the MWRA interceptor system and conveyed to the MWRA's Deer Island Treatment Plant. In previous Master Plan documents and MEPA filings it had been documented that there would be sufficient capacity in the existing downstream system to receive the projected wastewater flows from the University Station project. As indicated in the latest MEPA documents, the project currently holds a sewer connection permit authorizing up to 453,000 gallons per day of wastewater, although actual flows are anticipated to be much less.

There are two 8-inch gravity sewer mains that have been constructed to serve Development Area A. Within the driveway from Station Drive, an 8-inch gravity main was constructed into Development Area A. From Harvard Street, an 8-inch gravity main was also extended in to Development Area A. Additional sewer main construction within public ways is not anticipated for Development Area A at this time. Only on-site mains and service laterals will need to be extended to buildings within Development Area A.

There will not be any sewer mains or manholes constructed within a Zone 1 to serve Development Area A.

Users within the modified Development Area A will be subject to the provisions of the Sewer Operations and Maintenance Plan as previously prepared.

Electric Service: Electrical service will be provided by Eversource from Station Drive and/or Harvard Street by means of an underground ductbanks. The location of transformers will be developed as individual building designs advance and will be adequately screened consistent with Master Development Plan requirements.

Gas Service: Gas service will be provided by Eversource from its main line in Station Drive by way of a new main constructed in the common driveway in Development Area A. Actual gas pressure requirements will be determined as individual building designs are advanced.

Telephone and Cable Service: Telephone cable service will be provided by AT&T, Verizon and Comcast from Station Drive and Harvard Street by means of an underground duct bank in the common driveways serving Development Area B. This arrangement is consistent with the Master Development Plan.

Stormwater Management:

The stormwater management practices proposed for Development Area A have been developed in accordance with the original Stormwater Management Report, last revised March 22, 2013. In support of this minor Master Plan modification, the Stormwater Management discussion and supporting calculations will be limited to Point of Analysis 1, 2 and 3, as portions of Development Area A drains to these various study points.

As part of the March 22, 2013 Master Plan, Tetra Tech prepared drainage calculations for the entire University Station stormwater management system. The stormwater management system consists of deep sump hooded catch basins, Stormceptors, two wet detention basins and eight subsurface infiltration systems.

Updated drainage calculations have been prepared for the Point of Analysis (POA) that had subcatchments affected by the proposed development within Development A. Consistent with prior submissions, revised drainage calculations have been prepared for POA 1, 2 and 3. Subcatchment 23 within POA 1 represents the parking areas

in the south end of Development Area A and drains Basin 30. Subcatchment 5 represents the parking areas in the the north portions of Development Area A and drains to Basins 52.1 and 52.2. These basins discharge to POA 2 and 3. The building roof areas associated with Development Area A, subcatchment 61, drains to Infiltration Basin 10, located beneath the retail parking lot in Core Development Area 1. Infiltration Basin 10 discharges to POA 2.

Basin 30, Basin 52.1 and 52.2 and Infiltration Basin 10 were all constructed as part of the Core Development Area 1 and the roadway construction. All basins were sized to receive stormwater runoff from the Development Area A. Tetra Tech has updated these drainage calculations to reflect the Development Area A layout. Below is a summary demonstrating compliance with Stormwater Management and consistency with the commitments of the Master Plan.

Stormwater Management Standards

Standard 1: No New Untreated Discharges

No point discharges of untreated stormwater to resource areas are proposed. Stormwater quality controls remain consistent with Master Plan and includes street sweeping, deep-sump, hooded catch basins, and water quality structures.

Standard 2: Peak Rate Attenuation

Stormwater runoff from the proposed site discharges to Point of Analysis (POA) 1, 2 and 3. Runoff from the southern portion of the site (S23) drains to the south and into Surface Stormwater Basin 30, prior to discharging to POA1. Runoff from the northern portion of the site (S5) drains north to Surface Stormwater Basin 52.1 and 52.2. These basins discharge to POA2 and POA3. Roof runoff (S61) will be collected and piped to Infiltration Basin 10P. Basin 10 discharges to POA2.

An updated hydrologic analysis for the Point of Analysis 1, 2 and 3 has been provided, which demonstrates that there will be no increase in peak run-off discharge rates to Point of Analysis 4 for the 2-, 10-, 25-, or 100-year storms.

Point of Analysis	2-Year Storm (cfs)			10-Year Storm (cfs)			25-Year Storm (cfs)			100-Year Storm (cfs)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
POA1	55.01	25.48	-29.53	94.84	46.47	-48.37	121.91	64.08	-57.83	147.36	91.11	-56.25
POA2	135.04	62.82	-72.22	220.44	125.80	-94.64	256.30	168.13	-88.17	263.47	217.19	-46.28
POA3	23.67	17.61	-6.06	68.46	35.49	32.97	91.66	51.55	-40.11	135.36	75.28	-60.08

*cfs = cubic feet per second

Standard 3: Recharge

The Stormwater Management System as approved as part of the March 22, 2013 Master Plan provided for 8 subsurface infiltration systems to provide groundwater recharge. The Master Plan did not call for any recharge systems to constructed within Development Area A. However, consistent with the Master Plan, all the roof runoff from Development Area A will be directed to the subsurface GeoStorage infiltration system (Basin 10). Calculations have been provided to demonstrate that the recharge system has adequate capacity to handle all design storm events.

Standard # 4 – TSS Removal (Stormwater Quality)

Best Management Practices (BMPs) are proposed for the remaining undeveloped portion of Development Area B and will provide water quality. The following BMPs are proposed: roadway sweeping, deep sump, hooded catch basins, and water quality structures.

Street Sweeping: The proposed design incorporates street sweeping as a BMP to control the amount of sediment that enters the drainage system. Street sweeping will be conducted on a monthly average, with a regenerative air type sweeper. In accordance with the MADEP Stormwater Management Policy, a 5 percent TSS removal rate is credited for this BMP.

Deep Sump, Hooded Catch Basins: All proposed catch basins will be deep sump, hooded catchbasins, which will serve to trap sediment and floatables before entering the drainage system. Sumps will be four-foot deep. Inlets should be inspected and, if necessary, cleaned a minimum of two (2) times per year. Sediments and hydrocarbons shall be properly handled and disposed of, in accordance with local, state, and federal requirements. All catch basins will be installed with sediment sumps and oil hoods. In accordance with the MADEP Standards, a 25 percent TSS removal rate is credited for this BMP.

Water Quality Structures: Proprietary water quality structures (Stormceptors) are proposed to treat runoff from paved portions of the project area. The structures will be located at the end of drainage systems before the parking lot runoff enters into one of the infiltration systems. A 75% TSS removal rate will be selected for discharges to underground infiltration systems. The Stormceptor water quality structures will be sized to adequately treat the 1" water quality volume equivalent flow rate, consistent with MADEP requirements.

Sub-Surface Stormwater Infiltration Systems: A sub-surface infiltration gallery was previously designed and constructed and will recharge stormwater to groundwater resources from the building roof areas within Development Area A. The system consists of a large, single, open chamber that is surrounded by crushed stone and filter fabric. This infiltration system is proposed beneath the parking lot located in Core Development Area 1. All runoff entering this infiltration galley is limited to clean roof runoff.

Stormwater Basin/Wetlands System Design (Constructed Stormwater Wetlands): Two surface stormwater management areas were previously to mitigate the stormwater flows associated with POA1 and POA3. The design and construction of these surface basins provides a significant improvement in the overall quality of the stormwater runoff directed towards the Neponset River at these locations. The two surface stormwater basins were modeled after a Basin/Wetland System design, as described in the Constructed Stormwater Wetlands section of the MA DEP Stormwater Handbook. The multi cell configurations consists of a forebay, rip rap spillway which disperses runoff through a low and high marsh system. The advantages with the basin/wetland include a decreased potential for downstream flooding and erosion at the receiving water and improved water quality by achieving a higher pollutant removal rate, removing suspended solids, metals and dissolved nutrients.

A significant concern in the design of the stormwater management system is adequate stormwater quality treatment adjacent to the Dedham Westwood Water District Municipal wells. There will be no infiltration structures within 400 feet of any wellhead. In all areas contributing to the underground infiltrations systems, a pavement sweeping program will be implemented that will reduce potential for sediment and other contaminants from entering the drainage system. Catch basins with deep sumps and hoods (as well as "Don't Dump" plaques) will remove sediments while trapping any floatable contaminants. Stormceptors will also provide for additional sediment and floatable pollutant removals. A Stormwater Operation and Maintenance Plan was developed for University Station, which will be implement post construction in Development Area A.

Standard # 5 – Higher Pollutant Load

The entire Project is classified as use that will generate higher pollutant loads and is subject to the requirements of Standard 5, including pretreatment of stormwater. In accordance with these standards, the stormwater management system for Point of Analysis 1, 2 and 3 will be designed to achieve a TSS removal rate of greater than 80% which exceeds the rate required under the MADEP Stormwater Management Policy. All runoff directed to infiltration systems from Development Area A shall be from building roof tops. Consistent with MADEP Stormwater Management Standards, the Stormceptor water quality structures proposed as part of the project area stormwater management system have been sized to treat the equivalent flow rate for the 1" water quality volume.

Standard # 6 – Protection of Critical Areas

The project site is located within the Zone II wellhead protection area, which is a critical area as defined by MADEP. The MADEP Stormwater Management Policy sets forth certain requirements and specific BMP's that should be considered for projects within a Zone II. The University Station project adheres to the requirements for a project within a critical area by utilizing specific strategies and BMP's which are described in the March 2013 Stormwater Management Report. Specifically clean roof runoff is directed to a subsurface infiltration system.

Standard # 7 –Project Type

Although this Project is a mix of new development and redevelopment, the stormwater management system has been designed to meet the all the standards for a new development.

Standard # 8 – Erosion / Sediment Control Plan

Construction will disturb more than 1 acre of land and therefore will be covered by a NPDES Construction General Permit.

Standard # 9 – Operation / Maintenance Plan

The Operations and Maintenance (O&M) Plan will be provided under separate cover and shall conform to the approved Operation and Maintenance Plan developed for University Station.

Standard # 10 – Illicit Discharges

The Stormwater Management System has been designed such that prior to stormwater runoff discharging from the site, it is treated through a series of best management practices. To the Engineer's knowledge, there are no known or designed non-stormwater discharges that are or will be connected to the stormwater collection system that would convey pollutants directly to groundwater or surface waters.

Water Quality

As discussed in the Stormwater Management narrative, the stormwater management system has been designed in accordance with the "Critical Areas" standards in the Massachusetts Department of Environmental Protection Stormwater Management Policy. Specifically, all stormwater collected from pavement areas will be routed through deep sump hooded catch basins and Stormceptors sized to remove 75% TSS prior to discharging into an surface detention basin. In addition to the stormwater quality measures discussed above, any proposed uses with provisions for emergency power shall comply with Section 9.3.7.5 of the bylaw.

Landscape Architecture and Open Space

The proposed landscape for Development Area A shall designed to be consistent and compatible with adjacent uses at University Station. The density of plantings will be consistent with the adjacent parcels, thus blending the

Project to create a seamless and uniform environment. Particular attention will be paid to the design of other site landscaping items such as signage, lighting, fencing, and entry signage. The proposed above grade utilities (such as transformers, generators, etc.) areas will be adequately screened with either fencing and/or trees and shrubs. Drought tolerant, native material will be used so that irrigation needs for this Project are minimized.

Development Area A will have access to the various open space areas and amenities constructed within University Station. Pedestrian paths provide access to the Gateway Park, the Linear Park within Development Area B and the Well Head Park. Pedestrian paths are also available to the various restaurant and retail facilities within University Station.

Site Lighting

Site lighting within Development Area A shall be designed in substantial conformance with the Site Lighting plans dated April 17, 2013. Minimum and maximum light levels as well as uniformity ratios shall be in accordance with Table #1 – Lighting Standards by Roadway Type, submitted as part of the original Master Plan documentation.

Sustainability and Greenhouse Gas Strategies and Initiatives

The Town of Westwood has adopted the Massachusetts Stretch Building Code. By adhering to the Stretch Code, the proposed buildings within Development Area B will continue to result in energy conservation of 20% or more as compared to current baseline building code requirements. In addition, University Station has embarked on an aggressive strategy to build and operate facilities that are environmentally responsible. The entire development team, including LEED-certified architects, engineers, and construction personnel, strive to incorporate high-efficiency and eco-friendly features into buildings during the design and construction phase and during building operations. Specific strategies and initiatives may include the following:

<u>Site Strategies</u>

- *Pollution prevention during construction:* To minimize the amount of construction debris that enters streams and waterways and to protect the environment from pollution, future applicants will adhere to the requirements of the U.S. EPA Stormwater Construction General Permit.

<u>Water Efficiency</u>

- *Water use reduction:* By using high efficiency, low-flow plumbing fixtures meeting the “water sense” certification, buildings within Development Area B will achieve a 20% reduction in water use.

- *Sensible landscaping practices:* By using drought-tolerant, indigenous plantings as well as drip irrigation systems and “smart” irrigation controls, a significant reduction in water consumption for landscape irrigation can be realized.

<u>Energy Conservation</u>

- *Energy efficiency:* Pursue strategies in building envelope design, mechanical systems, and electrical systems including lighting power density and energy efficient controls to achieve a reduction in energy consumption by at least 20% compared to baseline building code requirements.

- *Optimization of energy performance:* Pursue strategies such as high-efficiency light fixtures, occupant and daylight sensors to control lighting, and high-efficiency HVAC systems, the applicant is able to improve energy performance by at least 20% compared to baseline building standards.

- *Energy Performance verification:* Partner with the mechanical equipment supplier to provide commissioning to ensure systems are operating efficiently and using as little energy as possible. The engineer should confirm that systems are operating as designed.

Building Materials and Resources

- *Construction and post-consumer waste management:* Follow recycling programs during construction and upon opening that will help minimize the flow of trash into landfills and incinerators. Size refuse enclosures appropriately to accommodate the necessary trash and recycling containers.

- *Recycled content:* Incorporates building materials which are made with recycled materials where feasible. Examples of some building materials with recycled content may include roofing membrane, carpets and vinyl wall coverings.

- *Regional materials:* Incorporates building materials which are regionally manufactured where feasible to help reduce the environmental impact resulting from transportation and to help support the use of local resources. Examples of some building materials that would be procured regionally include concrete, CMU and Dryvit.

Indoor Air Quality

- *Fresh air ventilation:* Buildings shall be designed to ensure a generous flow of fresh air into the building.

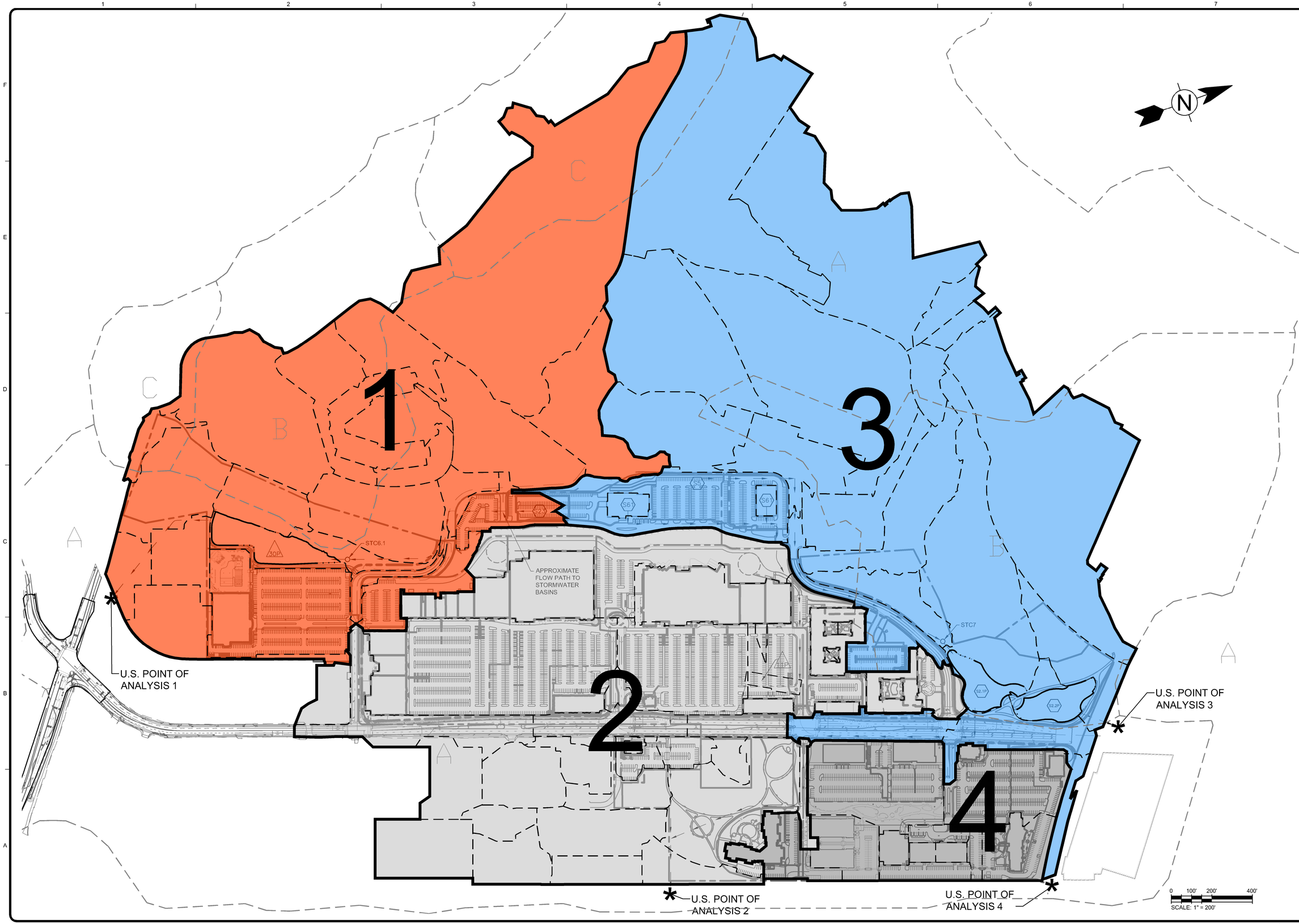
- *Low-emitting materials:* Specify and provide lower VOC (Volatile Organic Compound) building materials and products (paints, adhesives, cleaners, etc.) where feasible, in order to minimize VOC off-gassing and maintain a safer, more pleasant experience for residents, users and staff.

Air Quality and Noise Impacts

Proposed uses within Development Area A of the modified Master Development Plan are consistent with original Master Development Plan. No new uses are proposed that would result in additional adverse air quality impacts.

Similarly, noise impacts from the project are consistent with original Master Development Plan. All mechanicals will be insulated in accordance with Noise Study assumptions and unloading of deliveries will not occur between 12:00 AM and 4:00 AM. Also, Development Area A as shown on the modified Master Development Plan does not introduce any additional noise generators when compared to the original Master Development Plan.

p:\3659\143-3659-16003\docs\reports\minor modification - technical summary 02202019.docx



TETRA TECH
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MARK	DATE	DESCRIPTION	BY
1	2/20/19	PDR Submittal	T.A.B.

Client: Westwood Marketplace Holdings LLC
Proj. Loc.: University Ave, Westwood, MA

University Station - University Avenue Redevelopment

Watershed Figure

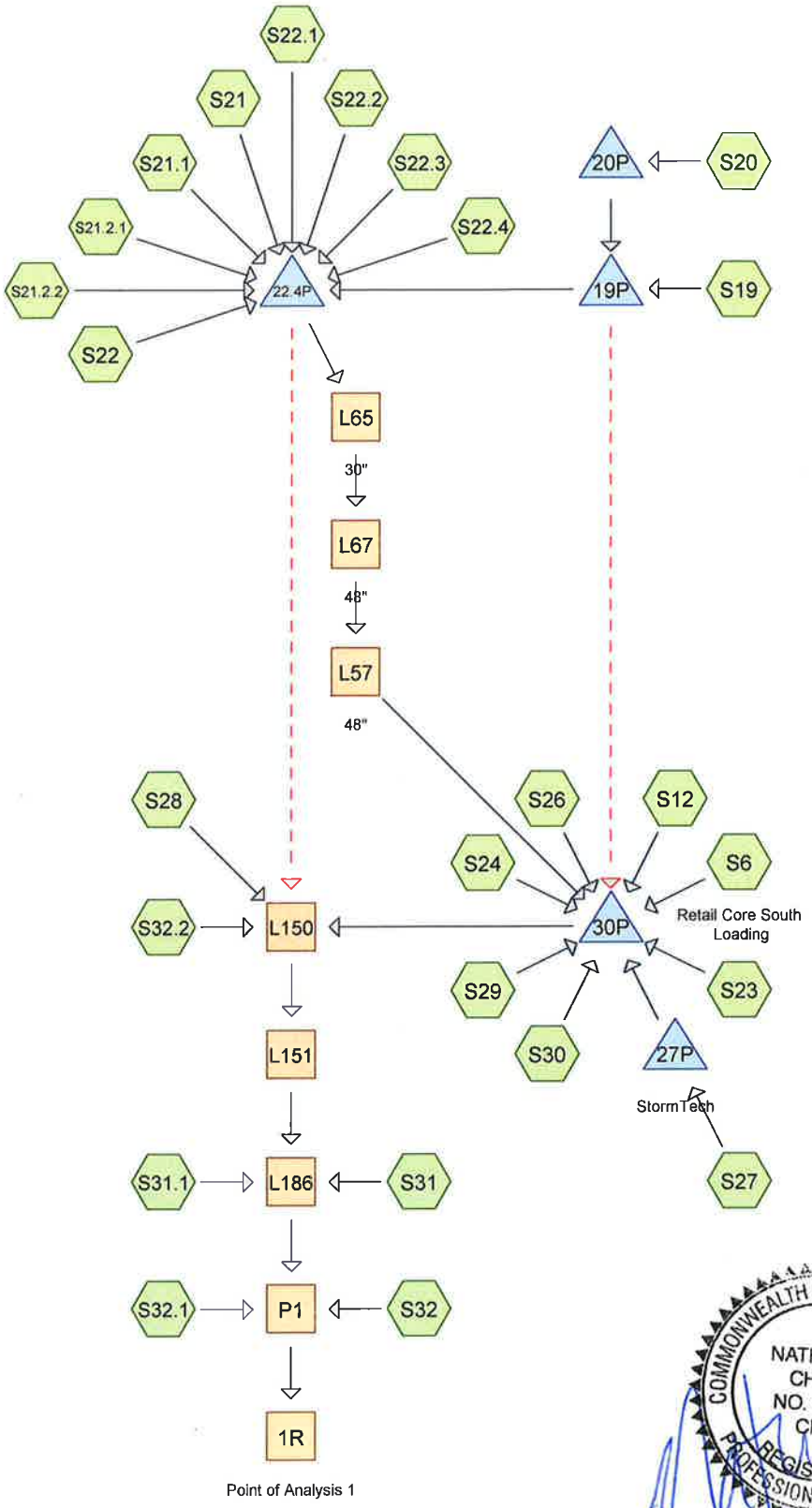
Project No.:	143-3659-16003
Designed By:	N.H.C.
Drawn By:	T.A.B.
Checked By:	N.H.C.

C-801

Copyright: Tetra Tech

Bar Measures 1 inch

Wed Feb 20 14:13:59 2019 - P:\3659\143-3659-16003\CAD\SHEETFILES\UPPER CAMPUS\FIGURES\C-801 WATERSHED FIGURE - COLORED.DWG - BOOTH-BY, THOMAS



Subcat Reach Pond Link

Routing Diagram for 3659-16003C-Proposed Conditions POA 1-01 with Stormtech

Prepared by Tetra Tech Inc, Printed 2/13/2019

HydroCAD® 10.00-17 s/n 01603 © 2016 HydroCAD Software Solutions LLC

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S12: Runoff Area=218,468 sf 13.56% Impervious Runoff Depth>0.10"
Flow Length=2,838' Tc=14.6 min CN=50 Runoff=0.10 cfs 0.042 af

Subcatchment S19: Runoff Area=25.787 ac 18.30% Impervious Runoff Depth>0.53"
Flow Length=1,620' Tc=11.2 min CN=65 Runoff=11.75 cfs 1.142 af

Subcatchment S20: Runoff Area=2.640 ac 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=8.50 cfs 0.622 af

Subcatchment S21: Runoff Area=240,167 sf 65.02% Impervious Runoff Depth>1.36"
Flow Length=1,904' Tc=12.4 min CN=81 Runoff=7.64 cfs 0.623 af

Subcatchment S21.1: Runoff Area=48,374 sf 22.82% Impervious Runoff Depth>0.35"
Flow Length=410' Tc=11.6 min CN=60 Runoff=0.25 cfs 0.033 af

Subcatchment S21.2.1: Runoff Area=4,514 sf 76.74% Impervious Runoff Depth>1.79"
Tc=5.0 min CN=87 Runoff=0.24 cfs 0.015 af

Subcatchment S21.2.2: Runoff Area=14,095 sf 0.00% Impervious Runoff Depth>0.08"
Flow Length=325' Tc=5.4 min CN=49 Runoff=0.00 cfs 0.002 af

Subcatchment S22: Runoff Area=3.230 ac 73.07% Impervious Runoff Depth>2.04"
Tc=5.0 min CN=90 Runoff=8.42 cfs 0.549 af

Subcatchment S22.1: Runoff Area=3.014 ac 68.94% Impervious Runoff Depth>1.64"
Tc=5.0 min CN=85 Runoff=6.44 cfs 0.411 af

Subcatchment S22.2: Runoff Area=2.223 ac 75.75% Impervious Runoff Depth>1.95"
Tc=5.0 min CN=89 Runoff=5.59 cfs 0.362 af

Subcatchment S22.3: Runoff Area=1.151 ac 77.85% Impervious Runoff Depth>1.79"
Tc=5.0 min CN=87 Runoff=2.68 cfs 0.172 af

Subcatchment S22.4: Runoff Area=4.963 ac 0.00% Impervious Runoff Depth>0.19"
Tc=5.0 min CN=54 Runoff=0.42 cfs 0.077 af

Subcatchment S23: Runoff Area=93,536 sf 85.64% Impervious Runoff Depth>2.03"
Flow Length=2,025' Tc=12.4 min CN=90 Runoff=4.40 cfs 0.364 af

Subcatchment S24: Runoff Area=30,487 sf 87.59% Impervious Runoff Depth>2.13"
Tc=5.0 min CN=91 Runoff=1.89 cfs 0.124 af

Subcatchment S26: Runoff Area=52,972 sf 0.00% Impervious Runoff Depth>0.12"
Tc=5.0 min CN=51 Runoff=0.05 cfs 0.012 af

Subcatchment S27: Runoff Area=313,412 sf 93.00% Impervious Runoff Depth>2.41"
Tc=5.0 min CN=94 Runoff=21.30 cfs 1.444 af

Subcatchment S28: Runoff Area=8.848 ac 68.07% Impervious Runoff Depth>1.87"
Flow Length=1,367' Tc=13.3 min CN=88 Runoff=16.37 cfs 1.376 af

Subcatchment S29: Runoff Area=103,868 sf 0.00% Impervious Runoff Depth>0.42"
Flow Length=325' Tc=6.7 min CN=62 Runoff=0.88 cfs 0.084 af

Subcatchment S30: Runoff Area=94,787 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=39 Runoff=0.00 cfs 0.000 af

Subcatchment S31: Runoff Area=196,098 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=758' Tc=9.6 min CN=48 Runoff=0.05 cfs 0.025 af

Subcatchment S31.1: Runoff Area=0.923 ac 37.59% Impervious Runoff Depth>1.42"
Flow Length=711' Tc=8.9 min CN=82 Runoff=1.50 cfs 0.110 af

Subcatchment S32: Runoff Area=1.450 ac 50.34% Impervious Runoff Depth>0.95"
Tc=5.0 min CN=74 Runoff=1.73 cfs 0.114 af

Subcatchment S32.1: Runoff Area=139,602 sf 72.25% Impervious Runoff Depth>1.49"
Tc=5.0 min CN=83 Runoff=6.26 cfs 0.399 af

Subcatchment S32.2: Runoff Area=92,791 sf 83.53% Impervious Runoff Depth>2.04"
Tc=5.0 min CN=90 Runoff=5.55 cfs 0.362 af

Subcatchment S6: Retail Core South Runoff Area=107,459 sf 58.10% Impervious Runoff Depth>1.05"
Flow Length=926' Tc=10.2 min CN=76 Runoff=2.78 cfs 0.216 af

Reach 1R: Point of Analysis 1 Inflow=25.48 cfs 5.783 af
Outflow=25.48 cfs 5.783 af

Reach L150: Avg. Flow Depth=0.82' Max Vel=2.47 fps Inflow=20.26 cfs 5.170 af
n=0.030 L=136.0' S=0.0043 '/' Capacity=654.46 cfs Outflow=20.21 cfs 5.162 af

Reach L151: Avg. Flow Depth=0.80' Max Vel=4.19 fps Inflow=20.21 cfs 5.162 af
n=0.030 L=155.0' S=0.0148 '/' Capacity=2,128.99 cfs Outflow=20.19 cfs 5.158 af

Reach L186: Avg. Flow Depth=1.22' Max Vel=2.05 fps Inflow=21.53 cfs 5.293 af
n=0.030 L=340.0' S=0.0020 '/' Capacity=279.47 cfs Outflow=21.09 cfs 5.271 af

Reach L57: 48" Avg. Flow Depth=1.21' Max Vel=5.28 fps Inflow=16.86 cfs 3.746 af
48.0" Round Pipe n=0.014 L=446.0' S=0.0041 '/' Capacity=85.21 cfs Outflow=16.85 cfs 3.741 af

Reach L65: 30" Avg. Flow Depth=0.58' Max Vel=19.47 fps Inflow=16.86 cfs 3.748 af
30.0" Round Pipe n=0.014 L=104.0' S=0.1394 '/' Capacity=142.22 cfs Outflow=16.86 cfs 3.748 af

Reach L67: 48" Avg. Flow Depth=0.98' Max Vel=7.05 fps Inflow=16.86 cfs 3.748 af
48.0" Round Pipe n=0.014 L=185.0' S=0.0092 '/' Capacity=127.86 cfs Outflow=16.86 cfs 3.746 af

Reach P1: Avg. Flow Depth=0.40' Max Vel=5.35 fps Inflow=25.48 cfs 5.784 af
n=0.030 L=46.0' S=0.0435 '/' Capacity=407.83 cfs Outflow=25.48 cfs 5.783 af

Pond 19P: Peak Elev=139.24' Storage=1,665 cf Inflow=18.46 cfs 1.762 af
Primary=9.85 cfs 1.587 af Secondary=7.08 cfs 0.172 af Outflow=16.93 cfs 1.759 af

Pond 20P: Peak Elev=167.45' Storage=2,838 cf Inflow=8.50 cfs 0.622 af
24.0" Round Culvert n=0.014 L=293.0' S=0.0819 '/' Outflow=10.03 cfs 0.620 af

Pond 22.4P: Peak Elev=73.99' Storage=35,624 cf Inflow=38.17 cfs 3.831 af
Primary=16.86 cfs 3.748 af Secondary=0.00 cfs 0.000 af Outflow=16.86 cfs 3.748 af

Pond 27P: StormTech Peak Elev=49.92' Storage=17,845 cf Inflow=21.30 cfs 1.444 af
Discarded=3.59 cfs 1.443 af Primary=0.00 cfs 0.000 af Outflow=3.59 cfs 1.443 af

Pond 30P: Peak Elev=50.85' Storage=97,907 cf Inflow=29.33 cfs 4.756 af
Primary=8.70 cfs 3.432 af Tertiary=0.00 cfs 0.000 af Outflow=8.70 cfs 3.432 af

Total Runoff Area = 94.418 ac Runoff Volume = 8.681 af Average Runoff Depth = 1.10"
56.84% Pervious = 53.670 ac 43.16% Impervious = 40.747 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S12: Runoff Area=218,468 sf 13.56% Impervious Runoff Depth>0.46"
Flow Length=2,838' Tc=14.6 min CN=50 Runoff=1.33 cfs 0.193 af

Subcatchment S19: Runoff Area=25.787 ac 18.30% Impervious Runoff Depth>1.26"
Flow Length=1,620' Tc=11.2 min CN=65 Runoff=32.84 cfs 2.715 af

Subcatchment S20: Runoff Area=2.640 ac 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=12.29 cfs 0.916 af

Subcatchment S21: Runoff Area=240,167 sf 65.02% Impervious Runoff Depth>2.45"
Flow Length=1,904' Tc=12.4 min CN=81 Runoff=13.84 cfs 1.127 af

Subcatchment S21.1: Runoff Area=48,374 sf 22.82% Impervious Runoff Depth>0.96"
Flow Length=410' Tc=11.6 min CN=60 Runoff=0.99 cfs 0.089 af

Subcatchment S21.2.1: Runoff Area=4,514 sf 76.74% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=87 Runoff=0.40 cfs 0.026 af

Subcatchment S21.2.2: Runoff Area=14,095 sf 0.00% Impervious Runoff Depth>0.42"
Flow Length=325' Tc=5.4 min CN=49 Runoff=0.09 cfs 0.011 af

Subcatchment S22: Runoff Area=3.230 ac 73.07% Impervious Runoff Depth>3.30"
Tc=5.0 min CN=90 Runoff=13.29 cfs 0.888 af

Subcatchment S22.1: Runoff Area=3.014 ac 68.94% Impervious Runoff Depth>2.82"
Tc=5.0 min CN=85 Runoff=10.92 cfs 0.707 af

Subcatchment S22.2: Runoff Area=2.223 ac 75.75% Impervious Runoff Depth>3.20"
Tc=5.0 min CN=89 Runoff=8.94 cfs 0.592 af

Subcatchment S22.3: Runoff Area=1.151 ac 77.85% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=87 Runoff=4.40 cfs 0.288 af

Subcatchment S22.4: Runoff Area=4.963 ac 0.00% Impervious Runoff Depth>0.65"
Tc=5.0 min CN=54 Runoff=3.13 cfs 0.268 af

Subcatchment S23: Runoff Area=93,536 sf 85.64% Impervious Runoff Depth>3.29"
Flow Length=2,025' Tc=12.4 min CN=90 Runoff=6.96 cfs 0.589 af

Subcatchment S24: Runoff Area=30,487 sf 87.59% Impervious Runoff Depth>3.40"
Tc=5.0 min CN=91 Runoff=2.94 cfs 0.198 af

Subcatchment S26: Runoff Area=52,972 sf 0.00% Impervious Runoff Depth>0.51"
Tc=5.0 min CN=51 Runoff=0.50 cfs 0.051 af

Subcatchment S27: Runoff Area=313,412 sf 93.00% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=94 Runoff=31.98 cfs 2.227 af

Subcatchment S28: Runoff Area=8.848 ac 68.07% Impervious Runoff Depth>3.09"
Flow Length=1,367' Tc=13.3 min CN=88 Runoff=26.61 cfs 2.281 af

Subcatchment S29: Runoff Area=103,868 sf 0.00% Impervious Runoff Depth>1.08"
Flow Length=325' Tc=6.7 min CN=62 Runoff=2.93 cfs 0.215 af

Subcatchment S30: Runoff Area=94,787 sf 0.00% Impervious Runoff Depth>0.10"
Tc=5.0 min CN=39 Runoff=0.04 cfs 0.017 af

Subcatchment S31: Runoff Area=196,098 sf 0.00% Impervious Runoff Depth>0.38"
Flow Length=758' Tc=9.6 min CN=48 Runoff=0.93 cfs 0.142 af

Subcatchment S31.1: Runoff Area=0.923 ac 37.59% Impervious Runoff Depth>2.54"
Flow Length=711' Tc=8.9 min CN=82 Runoff=2.67 cfs 0.196 af

Subcatchment S32: Runoff Area=1.450 ac 50.34% Impervious Runoff Depth>1.89"
Tc=5.0 min CN=74 Runoff=3.58 cfs 0.229 af

Subcatchment S32.1: Runoff Area=139,602 sf 72.25% Impervious Runoff Depth>2.63"
Tc=5.0 min CN=83 Runoff=10.94 cfs 0.704 af

Subcatchment S32.2: Runoff Area=92,791 sf 83.53% Impervious Runoff Depth>3.30"
Tc=5.0 min CN=90 Runoff=8.76 cfs 0.585 af

Subcatchment S6: Retail Core South Runoff Area=107,459 sf 58.10% Impervious Runoff Depth>2.04"
Flow Length=926' Tc=10.2 min CN=76 Runoff=5.52 cfs 0.420 af

Reach 1R: Point of Analysis 1 Inflow=46.47 cfs 11.650 af
Outflow=46.47 cfs 11.650 af

Reach L150: Avg. Flow Depth=1.15' Max Vel=2.98 fps Inflow=36.61 cfs 10.427 af
n=0.030 L=136.0' S=0.0043 '/' Capacity=654.46 cfs Outflow=36.56 cfs 10.417 af

Reach L151: Avg. Flow Depth=1.10' Max Vel=4.95 fps Inflow=36.56 cfs 10.417 af
n=0.030 L=155.0' S=0.0148 '/' Capacity=2,128.99 cfs Outflow=36.54 cfs 10.411 af

Reach L186: Avg. Flow Depth=1.70' Max Vel=2.45 fps Inflow=39.54 cfs 10.749 af
n=0.030 L=340.0' S=0.0020 '/' Capacity=279.47 cfs Outflow=39.06 cfs 10.719 af

Reach L57: 48" Avg. Flow Depth=1.38' Max Vel=5.67 fps Inflow=21.73 cfs 6.634 af
48.0" Round Pipe n=0.014 L=446.0' S=0.0041 '/' Capacity=85.21 cfs Outflow=21.73 cfs 6.626 af

Reach L65: 30" Avg. Flow Depth=0.66' Max Vel=20.95 fps Inflow=21.73 cfs 6.637 af
30.0" Round Pipe n=0.014 L=104.0' S=0.1394 '/' Capacity=142.22 cfs Outflow=21.73 cfs 6.637 af

Reach L67: 48" Avg. Flow Depth=1.12' Max Vel=7.59 fps Inflow=21.73 cfs 6.637 af
48.0" Round Pipe n=0.014 L=185.0' S=0.0092 '/' Capacity=127.86 cfs Outflow=21.73 cfs 6.634 af

Reach P1: Avg. Flow Depth=0.58' Max Vel=6.73 fps Inflow=46.47 cfs 11.651 af
n=0.030 L=46.0' S=0.0435 '/' Capacity=407.83 cfs Outflow=46.47 cfs 11.650 af

Pond 19P: Peak Elev=139.58' Storage=2,473 cf Inflow=41.66 cfs 3.627 af
Primary=13.38 cfs 2.755 af Secondary=27.15 cfs 0.867 af Outflow=40.53 cfs 3.622 af

Pond 20P: Peak Elev=167.78' Storage=2,838 cf Inflow=12.29 cfs 0.916 af
24.0" Round Culvert n=0.014 L=293.0' S=0.0819 '/' Outflow=13.38 cfs 0.912 af

Pond 22.4P: Peak Elev=75.40' Storage=70,524 cf Inflow=64.38 cfs 6.752 af
Primary=21.73 cfs 6.637 af Secondary=0.00 cfs 0.000 af Outflow=21.73 cfs 6.637 af

Pond 27P: StormTech Peak Elev=51.58' Storage=32,835 cf Inflow=31.98 cfs 2.227 af
Discarded=3.71 cfs 2.228 af Primary=0.00 cfs 0.000 af Outflow=3.71 cfs 2.228 af

Pond 30P: Peak Elev=51.67' Storage=146,260 cf Inflow=63.66 cfs 9.177 af
Primary=20.56 cfs 7.561 af Tertiary=0.00 cfs 0.000 af Outflow=20.56 cfs 7.561 af

Total Runoff Area = 94.418 ac Runoff Volume = 15.675 af Average Runoff Depth = 1.99"
56.84% Pervious = 53.670 ac 43.16% Impervious = 40.747 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S12: Runoff Area=218,468 sf 13.56% Impervious Runoff Depth>0.80"
Flow Length=2,838' Tc=14.6 min CN=50 Runoff=2.91 cfs 0.333 af

Subcatchment S19: Runoff Area=25.787 ac 18.30% Impervious Runoff Depth>1.82"
Flow Length=1,620' Tc=11.2 min CN=65 Runoff=48.85 cfs 3.917 af

Subcatchment S20: Runoff Area=2.640 ac 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=14.73 cfs 1.105 af

Subcatchment S21: Runoff Area=240,167 sf 65.02% Impervious Runoff Depth>3.21"
Flow Length=1,904' Tc=12.4 min CN=81 Runoff=17.99 cfs 1.474 af

Subcatchment S21.1: Runoff Area=48,374 sf 22.82% Impervious Runoff Depth>1.45"
Flow Length=410' Tc=11.6 min CN=60 Runoff=1.59 cfs 0.134 af

Subcatchment S21.2.1: Runoff Area=4,514 sf 76.74% Impervious Runoff Depth>3.81"
Tc=5.0 min CN=87 Runoff=0.50 cfs 0.033 af

Subcatchment S21.2.2: Runoff Area=14,095 sf 0.00% Impervious Runoff Depth>0.74"
Flow Length=325' Tc=5.4 min CN=49 Runoff=0.22 cfs 0.020 af

Subcatchment S22: Runoff Area=3.230 ac 73.07% Impervious Runoff Depth>4.13"
Tc=5.0 min CN=90 Runoff=16.40 cfs 1.111 af

Subcatchment S22.1: Runoff Area=3.014 ac 68.94% Impervious Runoff Depth>3.61"
Tc=5.0 min CN=85 Runoff=13.83 cfs 0.906 af

Subcatchment S22.2: Runoff Area=2.223 ac 75.75% Impervious Runoff Depth>4.02"
Tc=5.0 min CN=89 Runoff=11.09 cfs 0.745 af

Subcatchment S22.3: Runoff Area=1.151 ac 77.85% Impervious Runoff Depth>3.81"
Tc=5.0 min CN=87 Runoff=5.52 cfs 0.366 af

Subcatchment S22.4: Runoff Area=4.963 ac 0.00% Impervious Runoff Depth>1.05"
Tc=5.0 min CN=54 Runoff=5.88 cfs 0.433 af

Subcatchment S23: Runoff Area=93,536 sf 85.64% Impervious Runoff Depth>4.12"
Flow Length=2,025' Tc=12.4 min CN=90 Runoff=8.59 cfs 0.737 af

Subcatchment S24: Runoff Area=30,487 sf 87.59% Impervious Runoff Depth>4.23"
Tc=5.0 min CN=91 Runoff=3.61 cfs 0.247 af

Subcatchment S26: Runoff Area=52,972 sf 0.00% Impervious Runoff Depth>0.86"
Tc=5.0 min CN=51 Runoff=1.08 cfs 0.087 af

Subcatchment S27: Runoff Area=313,412 sf 93.00% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=94 Runoff=38.77 cfs 2.736 af

Subcatchment S28: Runoff Area=8.848 ac 68.07% Impervious Runoff Depth>3.91"
Flow Length=1,367' Tc=13.3 min CN=88 Runoff=33.21 cfs 2.880 af

Subcatchment S29: Runoff Area=103,868 sf 0.00% Impervious Runoff Depth>1.60"
Flow Length=325' Tc=6.7 min CN=62 Runoff=4.52 cfs 0.318 af

Subcatchment S30: Runoff Area=94,787 sf 0.00% Impervious Runoff Depth>0.26"
Tc=5.0 min CN=39 Runoff=0.21 cfs 0.046 af

Subcatchment S31: Runoff Area=196,098 sf 0.00% Impervious Runoff Depth>0.68"
Flow Length=758' Tc=9.6 min CN=48 Runoff=2.31 cfs 0.257 af

Subcatchment S31.1: Runoff Area=0.923 ac 37.59% Impervious Runoff Depth>3.31"
Flow Length=711' Tc=8.9 min CN=82 Runoff=3.44 cfs 0.254 af

Subcatchment S32: Runoff Area=1.450 ac 50.34% Impervious Runoff Depth>2.57"
Tc=5.0 min CN=74 Runoff=4.87 cfs 0.311 af

Subcatchment S32.1: Runoff Area=139,602 sf 72.25% Impervious Runoff Depth>3.41"
Tc=5.0 min CN=83 Runoff=14.03 cfs 0.910 af

Subcatchment S32.2: Runoff Area=92,791 sf 83.53% Impervious Runoff Depth>4.13"
Tc=5.0 min CN=90 Runoff=10.82 cfs 0.732 af

Subcatchment S6: Retail Core South Runoff Area=107,459 sf 58.10% Impervious Runoff Depth>2.74"
Flow Length=926' Tc=10.2 min CN=76 Runoff=7.42 cfs 0.564 af

Reach 1R: Point of Analysis 1 Inflow=64.08 cfs 16.047 af
Outflow=64.08 cfs 16.047 af

Reach L150: Avg. Flow Depth=1.37' Max Vel=3.28 fps Inflow=50.45 cfs 14.371 af
n=0.030 L=136.0' S=0.0043 '/' Capacity=654.46 cfs Outflow=50.39 cfs 14.359 af

Reach L151: Avg. Flow Depth=1.29' Max Vel=5.40 fps Inflow=50.39 cfs 14.359 af
n=0.030 L=155.0' S=0.0148 '/' Capacity=2,128.99 cfs Outflow=50.37 cfs 14.352 af

Reach L186: Avg. Flow Depth=2.03' Max Vel=2.69 fps Inflow=55.31 cfs 14.863 af
n=0.030 L=340.0' S=0.0020 '/' Capacity=279.47 cfs Outflow=54.82 cfs 14.829 af

Reach L57: 48" Avg. Flow Depth=1.46' Max Vel=5.84 fps Inflow=24.26 cfs 8.587 af
48.0" Round Pipe n=0.014 L=446.0' S=0.0041 '/' Capacity=85.21 cfs Outflow=24.26 cfs 8.578 af

Reach L65: 30" Avg. Flow Depth=0.70' Max Vel=21.62 fps Inflow=24.26 cfs 8.591 af
30.0" Round Pipe n=0.014 L=104.0' S=0.1394 '/' Capacity=142.22 cfs Outflow=24.26 cfs 8.590 af

Reach L67: 48" Avg. Flow Depth=1.18' Max Vel=7.83 fps Inflow=24.26 cfs 8.590 af
48.0" Round Pipe n=0.014 L=185.0' S=0.0092 '/' Capacity=127.86 cfs Outflow=24.26 cfs 8.587 af

Reach P1: Avg. Flow Depth=0.70' Max Vel=7.59 fps Inflow=64.08 cfs 16.050 af
n=0.030 L=46.0' S=0.0435 '/' Capacity=407.83 cfs Outflow=64.08 cfs 16.047 af

Pond 19P: Peak Elev=139.79' Storage=3,075 cf Inflow=58.49 cfs 5.018 af
Primary=15.10 cfs 3.504 af Secondary=42.99 cfs 1.507 af Outflow=58.09 cfs 5.012 af

Pond 20P: Peak Elev=167.98' Storage=2,838 cf Inflow=14.73 cfs 1.105 af
24.0" Round Culvert n=0.014 L=293.0' S=0.0819 '/' Outflow=15.02 cfs 1.100 af

Pond 22.4P: Peak Elev=76.26' Storage=96,371 cf Inflow=82.00 cfs 8.725 af
Primary=24.26 cfs 8.591 af Secondary=0.00 cfs 0.000 af Outflow=24.26 cfs 8.591 af

Pond 27P: StormTech Peak Elev=52.51' Storage=40,137 cf Inflow=38.77 cfs 2.736 af
Discarded=3.78 cfs 2.616 af Primary=3.74 cfs 0.121 af Outflow=7.52 cfs 2.736 af

Pond 30P: Peak Elev=52.20' Storage=178,448 cf Inflow=88.92 cfs 12.538 af
Primary=31.10 cfs 10.758 af Tertiary=0.00 cfs 0.000 af Outflow=31.10 cfs 10.758 af

Total Runoff Area = 94.418 ac Runoff Volume = 20.655 af Average Runoff Depth = 2.63"
56.84% Pervious = 53.670 ac 43.16% Impervious = 40.747 ac

Summary for Subcatchment S12:

Runoff = 2.91 cfs @ 12.25 hrs, Volume= 0.333 af, Depth> 0.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
188,847	43	Woods/grass comb., Fair, HSG A
22,303	98	Paved parking, HSG A
7,318	98	Roofs, HSG A
218,468	50	Weighted Average
188,847		86.44% Pervious Area
29,621		13.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0200	0.17		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
2.6	727	0.0830	4.64		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.4	258	0.0430	10.14	12.44	**Pipe Channel, 15" RCP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.014
0.1	44	0.0205	7.90	13.97	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
1.7	1,709	0.0257	17.02	213.83	**Pipe Channel, 48" RCP** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.014
14.6	2,838	Total			

Summary for Subcatchment S19:

Runoff = 48.85 cfs @ 12.16 hrs, Volume= 3.917 af, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
11.180	43	Woods/grass comb., Fair, HSG A
0.637	65	Woods/grass comb., Fair, HSG B
9.250	76	Woods/grass comb., Fair, HSG C
3.215	98	Paved parking, HSG A
1.505	98	Roofs, HSG A
25.787	65	Weighted Average
21.067		81.70% Pervious Area
4.720		18.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
2.5	1,420	0.0200	9.46	29.71	**Pipe Channel, Pipe** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
0.4	100	0.0600	3.94		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
11.2	1,620	Total			

Summary for Subcatchment S20:

Runoff = 14.73 cfs @ 12.07 hrs, Volume= 1.105 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.640	98	Roofs, HSG A
2.640		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S21:

Runoff = 17.99 cfs @ 12.17 hrs, Volume= 1.474 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
84,005	49	50-75% Grass cover, Fair, HSG A
156,162	98	Paved parking, HSG A
240,167	81	Weighted Average
84,005		34.98% Pervious Area
156,162		65.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	61	0.0660	0.11		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	388	0.0310	3.57		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
1.5	1,215	0.0300	13.51	42.45	**Pipe Channel, 24" Pipe** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
0.1	240	0.0969	28.18	138.32	**Pipe Channel, 24" Pipe** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.012
12.4	1,904	Total			

Summary for Subcatchment S21.1:

Runoff = 1.59 cfs @ 12.18 hrs, Volume= 0.134 af, Depth> 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
37,334	49	50-75% Grass cover, Fair, HSG A
11,040	98	Paved parking, HSG A
48,374	60	Weighted Average
37,334		77.18% Pervious Area
11,040		22.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	170	0.0865	4.74		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	140	0.1015	24.72	121.34	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.014
11.6	410	Total			

Summary for Subcatchment S21.2.1:

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.033 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
1,050	49	50-75% Grass cover, Fair, HSG A
3,464	98	Paved parking, HSG A
4,514	87	Weighted Average
1,050		23.26% Pervious Area
3,464		76.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S21.2.2:

Runoff = 0.22 cfs @ 12.11 hrs, Volume= 0.020 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
14,095	49	50-75% Grass cover, Fair, HSG A
14,095		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	100	0.1200	0.35		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
0.4	118	0.0932	4.92		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.1	30	0.0890	6.06		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.1	77	0.0837	12.19	9.57	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
5.4	325	Total			

Summary for Subcatchment S22:

Runoff = 16.40 cfs @ 12.07 hrs, Volume= 1.111 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.870	69	50-75% Grass cover, Fair, HSG B
2.360	98	Paved parking, HSG A
3.230	90	Weighted Average
0.870		26.93% Pervious Area
2.360		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S22.1:

Runoff = 13.83 cfs @ 12.07 hrs, Volume= 0.906 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.611	49	50-75% Grass cover, Fair, HSG A
0.325	69	50-75% Grass cover, Fair, HSG B
2.078	98	Paved parking, HSG A
3.014	85	Weighted Average
0.936		31.06% Pervious Area
2.078		68.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S22.2:

Runoff = 11.09 cfs @ 12.07 hrs, Volume= 0.745 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.167	49	50-75% Grass cover, Fair, HSG A
0.372	69	50-75% Grass cover, Fair, HSG B
1.684	98	Paved parking, HSG A
2.223	89	Weighted Average
0.539		24.25% Pervious Area
1.684		75.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S22.3:

Runoff = 5.52 cfs @ 12.07 hrs, Volume= 0.366 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.237	49	50-75% Grass cover, Fair, HSG A
0.018	69	50-75% Grass cover, Fair, HSG B
0.896	98	Paved parking, HSG A
1.151	87	Weighted Average
0.255		22.15% Pervious Area
0.896		77.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S22.4:

Runoff = 5.88 cfs @ 12.09 hrs, Volume= 0.433 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.633	49	50-75% Grass cover, Fair, HSG A
1.097	69	50-75% Grass cover, Fair, HSG B
0.374	36	Woods, Fair, HSG A
0.859	60	Woods, Fair, HSG B
4.963	54	Weighted Average
4.963		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S23:

Runoff = 8.59 cfs @ 12.17 hrs, Volume= 0.737 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
3,207	49	50-75% Grass cover, Fair, HSG A
10,221	39	>75% Grass cover, Good, HSG A
80,108	98	Paved parking, HSG A
93,536	90	Weighted Average
13,428		14.36% Pervious Area
80,108		85.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.0250	0.19		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
0.9	156	0.0350	3.01		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.8	174	0.0360	3.85		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.2	40	0.0050	4.03	4.95	**Pipe Channel, 15" HDPE** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
1.5	1,555	0.0200	17.51	220.07	**Pipe Channel, 48" HDPE** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.012
12.4	2,025	Total			

Summary for Subcatchment S24:

Runoff = 3.61 cfs @ 12.07 hrs, Volume= 0.247 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
3,783	39	>75% Grass cover, Good, HSG A
26,704	98	Paved parking, HSG A
30,487	91	Weighted Average
3,783		12.41% Pervious Area
26,704		87.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S26:

Runoff = 1.08 cfs @ 12.10 hrs, Volume= 0.087 af, Depth> 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
13,334	39	>75% Grass cover, Good, HSG A
27,226	49	50-75% Grass cover, Fair, HSG A
12,412	69	50-75% Grass cover, Fair, HSG B
52,972	51	Weighted Average
52,972		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S27:

Runoff = 38.77 cfs @ 12.07 hrs, Volume= 2.736 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
21,949	39	>75% Grass cover, Good, HSG A
244,440	98	Paved parking, HSG A
47,023	98	Roofs, HSG A
313,412	94	Weighted Average
21,949		7.00% Pervious Area
291,463		93.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S28:

Runoff = 33.21 cfs @ 12.18 hrs, Volume= 2.880 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.542	49	50-75% Grass cover, Fair, HSG A
2.283	69	50-75% Grass cover, Fair, HSG B
4.704	98	Paved parking, HSG A
1.319	98	Roofs, HSG A
8.848	88	Weighted Average
2.825		31.93% Pervious Area
6.023		68.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.1400	0.17		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	67	0.2090	7.36		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
1.7	568	0.0742	5.53		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.7	160	0.0087	3.93	3.09	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
0.6	247	0.0146	6.67	11.79	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
0.2	225	0.1800	15.89	49.91	**Pipe Channel, 24" CMP** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.025 Corrugated metal
13.3	1,367	Total			

Summary for Subcatchment S29:

Runoff = 4.52 cfs @ 12.11 hrs, Volume= 0.318 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
34,191	49	50-75% Grass cover, Fair, HSG A
69,677	69	50-75% Grass cover, Fair, HSG B
103,868	62	Weighted Average
103,868		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.4500	0.27		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	225	0.2300	7.72		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
6.7	325	Total			

Summary for Subcatchment S30:

Runoff = 0.21 cfs @ 12.38 hrs, Volume= 0.046 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
94,787	39	>75% Grass cover, Good, HSG A
94,787		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S31:

Runoff = 2.31 cfs @ 12.18 hrs, Volume= 0.257 af, Depth> 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
113,326	36	Woods, Fair, HSG A
51,112	60	Woods, Fair, HSG B
31,660	73	Woods, Fair, HSG C
196,098	48	Weighted Average
196,098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.2900	0.23		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
2.2	658	0.0970	5.01		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
9.6	758	Total			

Summary for Subcatchment S31.1:

Runoff = 3.44 cfs @ 12.12 hrs, Volume= 0.254 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.035	36	Woods, Fair, HSG A
0.016	60	Woods, Fair, HSG B
0.351	73	Woods, Fair, HSG C
0.006	49	50-75% Grass cover, Fair, HSG A
0.010	69	50-75% Grass cover, Fair, HSG B
0.158	79	50-75% Grass cover, Fair, HSG C
0.347	98	Paved parking, HSG A
0.923	82	Weighted Average
0.576		62.41% Pervious Area
0.347		37.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.2800	0.22		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	57	0.1400	6.02		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
1.0	304	0.0660	5.22		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.0	15	0.0330	7.65	6.01	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
0.2	235	0.0801	24.80	175.29	**Pipe Channel, 36" RCP** 36.0" Round Area= 7.1 sf Perim= 9.4' r= 0.75' n= 0.014
8.9	711	Total			

Summary for Subcatchment S32:

Runoff = 4.87 cfs @ 12.08 hrs, Volume= 0.311 af, Depth> 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.720	49	50-75% Grass cover, Fair, HSG A
0.730	98	Paved parking, HSG A
1.450	74	Weighted Average
0.720		49.66% Pervious Area
0.730		50.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S32.1:

Runoff = 14.03 cfs @ 12.07 hrs, Volume= 0.910 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
20,061	39	>75% Grass cover, Good, HSG A
18,673	49	50-75% Grass cover, Fair, HSG A
36,099	98	Paved parking, HSG A
64,769	98	Roofs, HSG A
139,602	83	Weighted Average
38,734		27.75% Pervious Area
100,868		72.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S32.2:

Runoff = 10.82 cfs @ 12.07 hrs, Volume= 0.732 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
15,279	49	50-75% Grass cover, Fair, HSG A
29,516	98	Paved parking, HSG A
47,996	98	Roofs, HSG A
92,791	90	Weighted Average
15,279		16.47% Pervious Area
77,512		83.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S6: Retail Core South Loading

Runoff = 7.42 cfs @ 12.14 hrs, Volume= 0.564 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
24,610	49	50-75% Grass cover, Fair, HSG A
20,414	39	>75% Grass cover, Good, HSG A
62,435	98	Paved parking, HSG A
107,459	76	Weighted Average
45,024		41.90% Pervious Area
62,435		58.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	75	0.1460	0.24		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 3.20"
0.2	100	0.2700	8.37		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.9	45	0.0010	0.84	0.16	**Pipe Channel, Underdrain** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.014
4.0	706	0.0050	2.98	2.34	**Pipe Channel, 12" Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014

10.2 926 Total

Summary for Reach 1R: Point of Analysis 1

Inflow Area = 94.418 ac, 43.16% Impervious, Inflow Depth > 2.04" for 25-Year event
Inflow = 64.08 cfs @ 12.20 hrs, Volume= 16.047 af
Outflow = 64.08 cfs @ 12.20 hrs, Volume= 16.047 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

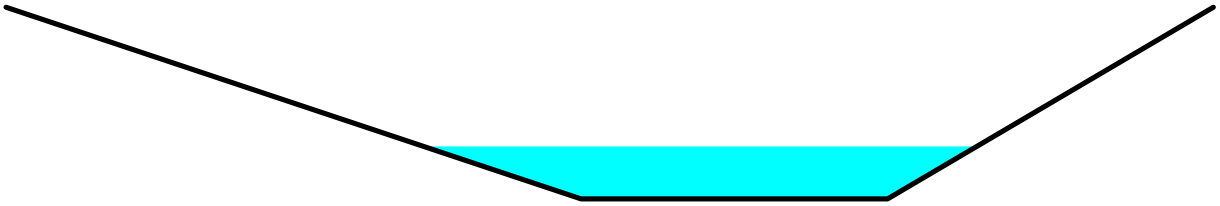
Summary for Reach L150:

Inflow Area = 84.338 ac, 44.29% Impervious, Inflow Depth > 2.04" for 25-Year event
Inflow = 50.45 cfs @ 12.19 hrs, Volume= 14.371 af
Outflow = 50.39 cfs @ 12.20 hrs, Volume= 14.359 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.28 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 1.4 min

Peak Storage= 2,088 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 5.00' Flow Area= 98.8 sf, Capacity= 654.46 cfs

8.00' x 5.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 1.7 '/' Top Width= 31.50'
Length= 136.0' Slope= 0.0043 '/'
Inlet Invert= 48.58', Outlet Invert= 48.00'



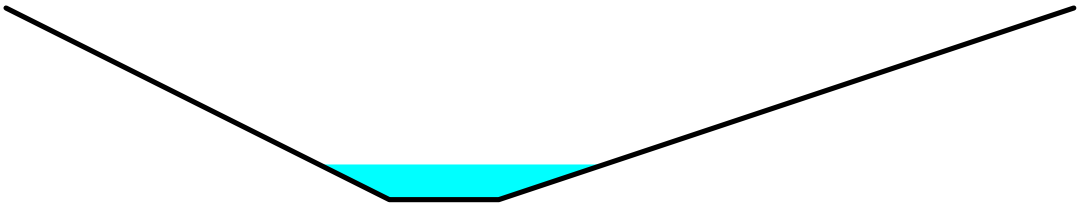
Summary for Reach L151:

Inflow Area = 84.338 ac, 44.29% Impervious, Inflow Depth > 2.04" for 25-Year event
Inflow = 50.39 cfs @ 12.20 hrs, Volume= 14.359 af
Outflow = 50.37 cfs @ 12.21 hrs, Volume= 14.352 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.40 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.78 fps, Avg. Travel Time= 0.9 min

Peak Storage= 1,445 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.29'
Bank-Full Depth= 7.00' Flow Area= 150.5 sf, Capacity= 2,128.99 cfs

4.00' x 7.00' deep channel, n= 0.030
Side Slope Z-value= 2.0 3.0 '/' Top Width= 39.00'
Length= 155.0' Slope= 0.0148 '/'
Inlet Invert= 48.00', Outlet Invert= 45.71'



Summary for Reach L186:

Inflow Area = 89.763 ac, 42.00% Impervious, Inflow Depth > 1.99" for 25-Year event
Inflow = 55.31 cfs @ 12.20 hrs, Volume= 14.863 af
Outflow = 54.82 cfs @ 12.23 hrs, Volume= 14.829 af, Atten= 1%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 4.3 min

Peak Storage= 6,930 cf @ 12.23 hrs
Average Depth at Peak Storage= 2.03'
Bank-Full Depth= 4.50' Flow Area= 67.5 sf, Capacity= 279.47 cfs

6.00' x 4.50' deep channel, n= 0.030
Side Slope Z-value= 2.0 '/' Top Width= 24.00'
Length= 340.0' Slope= 0.0020 '/'
Inlet Invert= 45.71', Outlet Invert= 45.04'

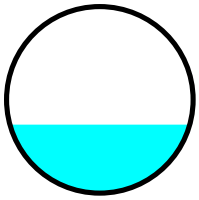
Summary for Reach L57: 48"

Inflow Area = 50.059 ac, 36.55% Impervious, Inflow Depth > 2.06" for 25-Year event
Inflow = 24.26 cfs @ 12.59 hrs, Volume= 8.587 af
Outflow = 24.26 cfs @ 12.60 hrs, Volume= 8.578 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.84 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 2.5 min

Peak Storage= 1,852 cf @ 12.60 hrs
Average Depth at Peak Storage= 1.46'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 85.21 cfs

48.0" Round Pipe
n= 0.014
Length= 446.0' Slope= 0.0041 '/'
Inlet Invert= 49.00', Outlet Invert= 47.18'



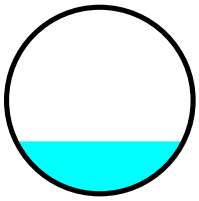
Summary for Reach L65: 30"

Inflow Area = 50.059 ac, 36.55% Impervious, Inflow Depth > 2.06" for 25-Year event
Inflow = 24.26 cfs @ 12.58 hrs, Volume= 8.591 af
Outflow = 24.26 cfs @ 12.58 hrs, Volume= 8.590 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 21.62 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 11.07 fps, Avg. Travel Time= 0.2 min

Peak Storage= 117 cf @ 12.58 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 142.22 cfs

30.0" Round Pipe
n= 0.014
Length= 104.0' Slope= 0.1394 '/'
Inlet Invert= 71.00', Outlet Invert= 56.50'



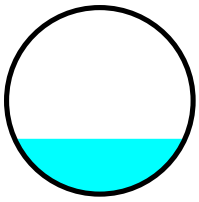
Summary for Reach L67: 48"

Inflow Area = 50.059 ac, 36.55% Impervious, Inflow Depth > 2.06" for 25-Year event
Inflow = 24.26 cfs @ 12.58 hrs, Volume= 8.590 af
Outflow = 24.26 cfs @ 12.59 hrs, Volume= 8.587 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.83 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.00 fps, Avg. Travel Time= 0.8 min

Peak Storage= 573 cf @ 12.59 hrs
Average Depth at Peak Storage= 1.18'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 127.86 cfs

48.0" Round Pipe
n= 0.014
Length= 185.0' Slope= 0.0092 '/'
Inlet Invert= 50.70', Outlet Invert= 49.00'



Summary for Reach P1:

Inflow Area = 94.418 ac, 43.16% Impervious, Inflow Depth > 2.04" for 25-Year event
Inflow = 64.08 cfs @ 12.20 hrs, Volume= 16.050 af
Outflow = 64.08 cfs @ 12.20 hrs, Volume= 16.047 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.59 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.22 fps, Avg. Travel Time= 0.2 min

Peak Storage= 388 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 2.33' Flow Area= 28.0 sf, Capacity= 407.83 cfs

12.00' x 2.33' deep channel, n= 0.030
Length= 46.0' Slope= 0.0435 '/'
Inlet Invert= 43.00', Outlet Invert= 41.00'

Summary for Pond 19P:

Inflow Area = 28.427 ac, 25.89% Impervious, Inflow Depth > 2.12" for 25-Year event
Inflow = 58.49 cfs @ 12.15 hrs, Volume= 5.018 af
Outflow = 58.09 cfs @ 12.15 hrs, Volume= 5.012 af, Atten= 1%, Lag= 0.4 min
Primary = 15.10 cfs @ 12.15 hrs, Volume= 3.504 af
Secondary = 42.99 cfs @ 12.15 hrs, Volume= 1.507 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Peak Elev= 139.79' @ 12.15 hrs Surf.Area= 2,911 sf Storage= 3,075 cf

Plug-Flow detention time= 2.0 min calculated for 5.009 af (100% of inflow)
Center-of-Mass det. time= 1.5 min (798.9 - 797.4)

Volume	Invert	Avail.Storage	Storage Description
#1	137.80'	30,987 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.80	174	0	0
138.30	860	259	259
138.80	1,546	602	860
139.30	2,232	945	1,805
139.80	2,919	1,288	3,092
140.30	3,605	1,631	4,723
140.80	4,291	1,974	6,697
141.30	4,977	2,317	9,014
141.80	5,663	2,660	11,674
148.00	567	19,313	30,987

Device	Routing	Invert	Outlet Devices
#1	Primary	137.80'	**24.0" Round Culvert** L= 612.0' Ke= 0.500 Inlet / Outlet Invert= 137.80' / 105.30' S= 0.0531 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	139.00'	**23.0' long x 18.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.10 cfs @ 12.15 hrs HW=139.79' TW=75.21' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 15.10 cfs @ 4.81 fps)

Secondary OutFlow Max=42.95 cfs @ 12.15 hrs HW=139.79' TW=50.95' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 42.95 cfs @ 2.35 fps)

Summary for Pond 20P:

Inflow Area = 2.640 ac,100.00% Impervious, Inflow Depth > 5.02" for 25-Year event
Inflow = 14.73 cfs @ 12.07 hrs, Volume= 1.105 af
Outflow = 15.02 cfs @ 12.07 hrs, Volume= 1.100 af, Atten= 0%, Lag= 0.0 min
Primary = 15.02 cfs @ 12.07 hrs, Volume= 1.100 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 167.98' @ 12.07 hrs Surf.Area= 4,356 sf Storage= 2,838 cf

Plug-Flow detention time= 11.5 min calculated for 1.100 af (100% of inflow)
Center-of-Mass det. time= 9.8 min (728.0 - 718.2)

Volume	Invert	Avail.Storage	Storage Description
#1	166.00'	2,838 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
166.00	0	0	0
166.25	2,875	359	359
166.50	3,790	833	1,193
166.75	4,225	1,002	2,194
166.90	4,356	644	2,838

Device	Routing	Invert	Outlet Devices
#1	Primary	166.00'	**24.0" Round Culvert** L= 293.0' Ke= 0.500 Inlet / Outlet Invert= 166.00' / 142.00' S= 0.0819 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf

Primary OutFlow Max=15.02 cfs @ 12.07 hrs HW=167.98' TW=139.64' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 15.02 cfs @ 4.79 fps)

Summary for Pond 22.4P:

Inflow Area = 50.059 ac, 36.55% Impervious, Inflow Depth > 2.09" for 25-Year event
Inflow = 82.00 cfs @ 12.09 hrs, Volume= 8.725 af
Outflow = 24.26 cfs @ 12.58 hrs, Volume= 8.591 af, Atten= 70%, Lag= 29.6 min
Primary = 24.26 cfs @ 12.58 hrs, Volume= 8.591 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 76.26' @ 12.58 hrs Surf.Area= 31,535 sf Storage= 96,371 cf

Plug-Flow detention time= 44.1 min calculated for 8.586 af (98% of inflow)
Center-of-Mass det. time= 38.1 min (835.1 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	71.00'	233,786 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.00	5,227	0	0
71.25	5,793	1,378	1,378
71.50	6,360	1,519	2,897
71.75	6,926	1,661	4,557
72.00	7,492	1,802	6,360
72.25	9,295	2,098	8,458
72.50	11,097	2,549	11,007
72.75	12,899	3,000	14,007
73.00	14,702	3,450	17,457
73.25	16,504	3,901	21,357
73.50	18,306	4,351	25,709
73.75	20,108	4,802	30,510
74.00	21,911	5,252	35,763
74.25	22,983	5,612	41,375
74.50	24,056	5,880	47,254
74.75	25,129	6,148	53,403
75.00	26,201	6,416	59,819
75.25	27,274	6,684	66,503
75.50	28,347	6,953	73,456
75.75	29,419	7,221	80,677
76.00	30,492	7,489	88,165
76.25	31,478	7,746	95,912
76.50	32,463	7,993	103,904
76.75	33,449	8,239	112,143
77.00	34,434	8,485	120,629
77.25	35,420	8,732	129,360
77.50	36,405	8,978	138,339
77.75	37,391	9,225	147,563
78.00	38,376	9,471	157,034
79.00	38,376	38,376	195,410
80.00	38,376	38,376	233,786

Device	Routing	Invert	Outlet Devices
#1	Secondary	79.00'	**12.0' long x 37.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	71.00'	**21.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 71.00' / 70.99' S= 0.0100 '/' Cc= 0.900 n= 0.005, Flow Area= 2.41 sf

Primary OutFlow Max=24.26 cfs @ 12.58 hrs HW=76.26' TW=71.70' (Dynamic Tailwater)
└─**2=Culvert** (Inlet Controls 24.26 cfs @ 10.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=71.00' TW=48.58' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 27P: StormTech

Inflow Area = 7.195 ac, 93.00% Impervious, Inflow Depth > 4.56" for 25-Year event
Inflow = 38.77 cfs @ 12.07 hrs, Volume= 2.736 af
Outflow = 7.52 cfs @ 12.49 hrs, Volume= 2.736 af, Atten= 81%, Lag= 25.4 min
Discarded = 3.78 cfs @ 12.49 hrs, Volume= 2.616 af
Primary = 3.74 cfs @ 12.49 hrs, Volume= 0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 52.51' @ 12.49 hrs Surf.Area= 12,066 sf Storage= 40,137 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 71.5 min (813.0 - 741.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.71'	20,564 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 81,446 cf Overall - 30,035 cf Embedded = 51,410 cf x 40.0% Voids
#2	48.46'	30,035 cf	**ADS_StormTech MC-4500 +Cap** x 274 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 12 Rows of 23 Chambers Cap Storage= +35.7 cf x 2 x 12 rows = 856.8 cf
		50,599 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.71	12,066	0	0
54.46	12,066	81,446	81,446

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.71'	**12.300 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	51.75'	**30.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=3.78 cfs @ 12.49 hrs HW=52.51' (Free Discharge)
└**1=Exfiltration** (Controls 3.78 cfs)

Primary OutFlow Max=3.73 cfs @ 12.49 hrs HW=52.51' TW=51.99' (Dynamic Tailwater)
└**2=Orifice/Grate** (Orifice Controls 3.73 cfs @ 2.97 fps)

Summary for Pond 30P:

Inflow Area = 73.360 ac, 40.28% Impervious, Inflow Depth > 2.05" for 25-Year event
Inflow = 88.92 cfs @ 12.15 hrs, Volume= 12.538 af
Outflow = 31.10 cfs @ 12.88 hrs, Volume= 10.758 af, Atten= 65%, Lag= 43.5 min
Primary = 31.10 cfs @ 12.88 hrs, Volume= 10.758 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Peak Elev= 52.20' @ 12.88 hrs Surf.Area= 62,656 sf Storage= 178,448 cf

Plug-Flow detention time= 116.4 min calculated for 10.758 af (86% of inflow)
Center-of-Mass det. time= 76.3 min (892.5 - 816.3)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	779,395 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	49,436	0	0
50.00	53,348	51,392	51,392
51.00	57,360	55,354	106,746
52.00	61,753	59,557	166,303
53.00	66,378	64,066	230,368
54.00	70,462	68,420	298,788
55.00	74,693	72,578	371,366
55.50	78,040	38,183	409,549
60.00	86,336	369,846	779,395

Device	Routing	Invert	Outlet Devices
#1	Tertiary	55.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	49.50'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 3.00 3.00 5.00
			Width (feet) 1.00 4.00 6.00 6.00
#3	Primary	49.00'	**5.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=31.10 cfs @ 12.88 hrs HW=52.20' TW=49.74' (Dynamic Tailwater)
└─**2=Custom Weir/Orifice** (Weir Controls 30.07 cfs @ 4.75 fps)
└─**3=Orifice/Grate** (Orifice Controls 1.03 cfs @ 7.55 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=49.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S12: Runoff Area=218,468 sf 13.56% Impervious Runoff Depth>1.32"
Flow Length=2,838' Tc=14.6 min CN=50 Runoff=5.54 cfs 0.550 af

Subcatchment S19: Runoff Area=25.787 ac 18.30% Impervious Runoff Depth>2.61"
Flow Length=1,620' Tc=11.2 min CN=65 Runoff=71.02 cfs 5.605 af

Subcatchment S20: Runoff Area=2.640 ac 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=17.84 cfs 1.346 af

Subcatchment S21: Runoff Area=240,167 sf 65.02% Impervious Runoff Depth>4.20"
Flow Length=1,904' Tc=12.4 min CN=81 Runoff=23.36 cfs 1.931 af

Subcatchment S21.1: Runoff Area=48,374 sf 22.82% Impervious Runoff Depth>2.15"
Flow Length=410' Tc=11.6 min CN=60 Runoff=2.44 cfs 0.199 af

Subcatchment S21.2.1: Runoff Area=4,514 sf 76.74% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=87 Runoff=0.62 cfs 0.042 af

Subcatchment S21.2.2: Runoff Area=14,095 sf 0.00% Impervious Runoff Depth>1.24"
Flow Length=325' Tc=5.4 min CN=49 Runoff=0.45 cfs 0.034 af

Subcatchment S22: Runoff Area=3.230 ac 73.07% Impervious Runoff Depth>5.19"
Tc=5.0 min CN=90 Runoff=20.35 cfs 1.398 af

Subcatchment S22.1: Runoff Area=3.014 ac 68.94% Impervious Runoff Depth>4.64"
Tc=5.0 min CN=85 Runoff=17.57 cfs 1.166 af

Subcatchment S22.2: Runoff Area=2.223 ac 75.75% Impervious Runoff Depth>5.08"
Tc=5.0 min CN=89 Runoff=13.82 cfs 0.942 af

Subcatchment S22.3: Runoff Area=1.151 ac 77.85% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=87 Runoff=6.94 cfs 0.466 af

Subcatchment S22.4: Runoff Area=4.963 ac 0.00% Impervious Runoff Depth>1.64"
Tc=5.0 min CN=54 Runoff=9.98 cfs 0.680 af

Subcatchment S23: Runoff Area=93,536 sf 85.64% Impervious Runoff Depth>5.18"
Flow Length=2,025' Tc=12.4 min CN=90 Runoff=10.67 cfs 0.928 af

Subcatchment S24: Runoff Area=30,487 sf 87.59% Impervious Runoff Depth>5.31"
Tc=5.0 min CN=91 Runoff=4.47 cfs 0.310 af

Subcatchment S26: Runoff Area=52,972 sf 0.00% Impervious Runoff Depth>1.40"
Tc=5.0 min CN=51 Runoff=2.00 cfs 0.142 af

Subcatchment S27: Runoff Area=313,412 sf 93.00% Impervious Runoff Depth>5.65"
Tc=5.0 min CN=94 Runoff=47.41 cfs 3.388 af

Subcatchment S28: Runoff Area=8.848 ac 68.07% Impervious Runoff Depth>4.96"
Flow Length=1,367' Tc=13.3 min CN=88 Runoff=41.61 cfs 3.657 af

Subcatchment S29: Runoff Area=103,868 sf 0.00% Impervious Runoff Depth>2.34"
Flow Length=325' Tc=6.7 min CN=62 Runoff=6.77 cfs 0.464 af

Subcatchment S30: Runoff Area=94,787 sf 0.00% Impervious Runoff Depth>0.55"
Tc=5.0 min CN=39 Runoff=0.68 cfs 0.100 af

Subcatchment S31: Runoff Area=196,098 sf 0.00% Impervious Runoff Depth>1.17"
Flow Length=758' Tc=9.6 min CN=48 Runoff=4.86 cfs 0.437 af

Subcatchment S31.1: Runoff Area=0.923 ac 37.59% Impervious Runoff Depth>4.31"
Flow Length=711' Tc=8.9 min CN=82 Runoff=4.44 cfs 0.332 af

Subcatchment S32: Runoff Area=1.450 ac 50.34% Impervious Runoff Depth>3.49"
Tc=5.0 min CN=74 Runoff=6.59 cfs 0.421 af

Subcatchment S32.1: Runoff Area=139,602 sf 72.25% Impervious Runoff Depth>4.42"
Tc=5.0 min CN=83 Runoff=17.99 cfs 1.182 af

Subcatchment S32.2: Runoff Area=92,791 sf 83.53% Impervious Runoff Depth>5.19"
Tc=5.0 min CN=90 Runoff=13.42 cfs 0.922 af

Subcatchment S6: Retail Core South Runoff Area=107,459 sf 58.10% Impervious Runoff Depth>3.68"
Flow Length=926' Tc=10.2 min CN=76 Runoff=9.91 cfs 0.757 af

Reach 1R: Point of Analysis 1 Inflow=91.11 cfs 22.165 af
Outflow=91.11 cfs 22.165 af

Reach L150: Avg. Flow Depth=1.67' Max Vel=3.66 fps Inflow=73.01 cfs 19.858 af
n=0.030 L=136.0' S=0.0043 '/' Capacity=654.46 cfs Outflow=72.97 cfs 19.845 af

Reach L151: Avg. Flow Depth=1.55' Max Vel=5.97 fps Inflow=72.97 cfs 19.845 af
n=0.030 L=155.0' S=0.0148 '/' Capacity=2,128.99 cfs Outflow=72.95 cfs 19.836 af

Reach L186: Avg. Flow Depth=2.46' Max Vel=2.98 fps Inflow=80.25 cfs 20.605 af
n=0.030 L=340.0' S=0.0020 '/' Capacity=279.47 cfs Outflow=79.86 cfs 20.565 af

Reach L57: 48" Avg. Flow Depth=1.55' Max Vel=6.02 fps Inflow=27.04 cfs 11.116 af
48.0" Round Pipe n=0.014 L=446.0' S=0.0041 '/' Capacity=85.21 cfs Outflow=27.04 cfs 11.105 af

Reach L65: 30" Avg. Flow Depth=0.74' Max Vel=22.30 fps Inflow=27.04 cfs 11.120 af
30.0" Round Pipe n=0.014 L=104.0' S=0.1394 '/' Capacity=142.22 cfs Outflow=27.04 cfs 11.120 af

Reach L67: 48" Avg. Flow Depth=1.25' Max Vel=8.07 fps Inflow=27.04 cfs 11.120 af
48.0" Round Pipe n=0.014 L=185.0' S=0.0092 '/' Capacity=127.86 cfs Outflow=27.04 cfs 11.116 af

Reach P1: Avg. Flow Depth=0.88' Max Vel=8.65 fps Inflow=91.11 cfs 22.168 af
n=0.030 L=46.0' S=0.0435 '/' Capacity=407.83 cfs Outflow=91.11 cfs 22.165 af

Pond 19P: Peak Elev=140.05' Storage=3,874 cf Inflow=82.59 cfs 6.947 af
Primary=16.93 cfs 4.421 af Secondary=65.40 cfs 2.517 af Outflow=82.33 cfs 6.939 af

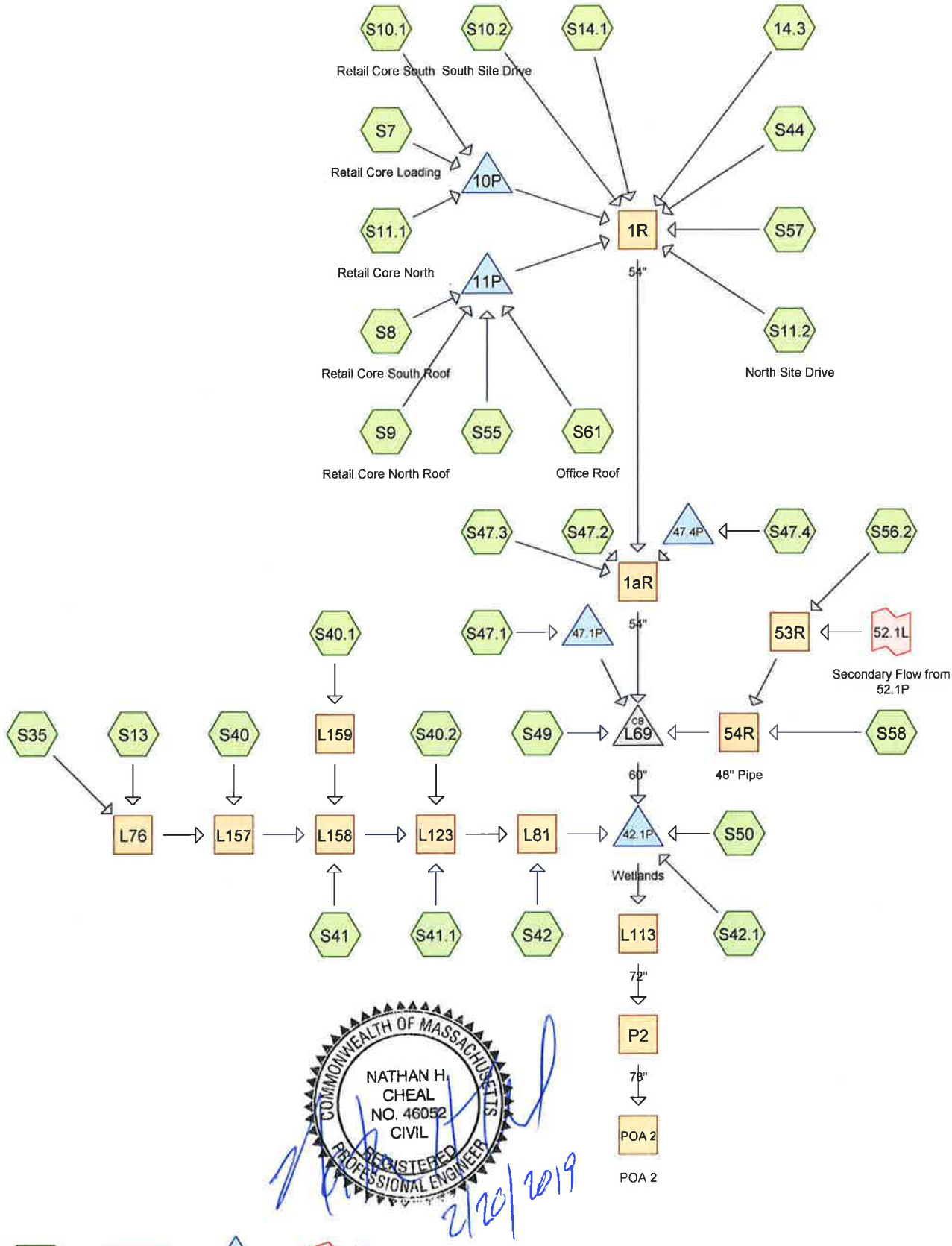
Pond 20P: Peak Elev=168.41' Storage=2,838 cf Inflow=17.84 cfs 1.346 af
24.0" Round Culvert n=0.014 L=293.0' S=0.0819 '/' Outflow=17.96 cfs 1.341 af

Pond 22.4P: Peak Elev=77.33' Storage=132,098 cf Inflow=104.69 cfs 11.279 af
Primary=27.04 cfs 11.120 af Secondary=0.00 cfs 0.000 af Outflow=27.04 cfs 11.120 af

Pond 27P: StormTech Peak Elev=53.19' Storage=44,411 cf Inflow=47.41 cfs 3.388 af
Discarded=3.83 cfs 3.007 af Primary=11.83 cfs 0.382 af Outflow=15.66 cfs 3.388 af

Pond 30P: Peak Elev=52.95' Storage=227,232 cf Inflow=127.26 cfs 17.256 af
Primary=52.55 cfs 15.278 af Tertiary=0.00 cfs 0.000 af Outflow=52.55 cfs 15.278 af

Total Runoff Area = 94.418 ac Runoff Volume = 27.400 af Average Runoff Depth = 3.48"
56.84% Pervious = 53.670 ac 43.16% Impervious = 40.747 ac



Routing Diagram for 3659-16003C-Proposed Conditions POA 2-01
Prepared by Tetra Tech Inc, Printed 2/13/2019
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Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 14.3: Runoff Area=1.261 ac 72.09% Impervious Runoff Depth>1.43"
Tc=5.0 min CN=82 Runoff=2.35 cfs 0.150 af

Subcatchment S10.1: Retail Core South Runoff Area=553,813 sf 95.19% Impervious Runoff Depth>2.51"
Tc=5.0 min CN=95 Runoff=38.63 cfs 2.657 af

Subcatchment S10.2: South Site Drive Runoff Area=19,768 sf 68.81% Impervious Runoff Depth>1.29"
Tc=5.0 min CN=80 Runoff=0.77 cfs 0.049 af

Subcatchment S11.1: Retail Core North Runoff Area=6.449 ac 93.27% Impervious Runoff Depth>2.41"
Tc=5.0 min CN=94 Runoff=19.09 cfs 1.294 af

Subcatchment S11.2: North Site Drive Runoff Area=209,831 sf 76.49% Impervious Runoff Depth>1.57"
Tc=5.0 min CN=84 Runoff=9.85 cfs 0.628 af

Subcatchment S13: Runoff Area=4.329 ac 67.82% Impervious Runoff Depth>1.23"
Tc=5.0 min CN=79 Runoff=6.93 cfs 0.444 af

Subcatchment S14.1: Runoff Area=2.247 ac 73.65% Impervious Runoff Depth>1.43"
Tc=5.0 min CN=82 Runoff=4.19 cfs 0.267 af

Subcatchment S35: Runoff Area=58,042 sf 77.81% Impervious Runoff Depth>1.79"
Tc=5.0 min CN=87 Runoff=3.10 cfs 0.199 af

Subcatchment S40: Runoff Area=2.670 ac 67.42% Impervious Runoff Depth>1.43"
Tc=5.0 min CN=82 Runoff=4.97 cfs 0.317 af

Subcatchment S40.1: Runoff Area=100,887 sf 45.60% Impervious Runoff Depth>0.77"
Flow Length=712' Tc=60.6 min CN=71 Runoff=0.84 cfs 0.149 af

Subcatchment S40.2: Runoff Area=3.200 ac 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=10.30 cfs 0.754 af

Subcatchment S41: Runoff Area=1.080 ac 55.56% Impervious Runoff Depth>1.06"
Tc=5.0 min CN=76 Runoff=1.46 cfs 0.095 af

Subcatchment S41.1: Runoff Area=2.030 ac 14.78% Impervious Runoff Depth>0.21"
Flow Length=245' Tc=18.1 min CN=55 Runoff=0.18 cfs 0.035 af

Subcatchment S42: Runoff Area=1.440 ac 73.61% Impervious Runoff Depth>1.64"
Tc=5.0 min CN=85 Runoff=3.08 cfs 0.197 af

Subcatchment S42.1: Runoff Area=78,183 sf 23.62% Impervious Runoff Depth>0.21"
Flow Length=362' Tc=11.1 min CN=55 Runoff=0.18 cfs 0.031 af

Subcatchment S44: Runoff Area=61,875 sf 92.36% Impervious Runoff Depth>2.41"
Tc=5.0 min CN=94 Runoff=4.20 cfs 0.285 af

Subcatchment S47.1: Runoff Area=81,281 sf 34.83% Impervious Runoff Depth>0.29"
Flow Length=271' Tc=11.5 min CN=58 Runoff=0.31 cfs 0.045 af

Subcatchment S47.2: Runoff Area=33,107 sf 83.86% Impervious Runoff Depth>1.87"
Tc=5.0 min CN=88 Runoff=1.84 cfs 0.119 af

Subcatchment S47.3: Runoff Area=38,241 sf 71.36% Impervious Runoff Depth>1.36"
Tc=5.0 min CN=81 Runoff=1.56 cfs 0.099 af

Subcatchment S47.4: Runoff Area=7,097 sf 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=0.52 cfs 0.038 af

Subcatchment S49: Runoff Area=3.120 ac 76.60% Impervious Runoff Depth>1.79"
Tc=5.0 min CN=87 Runoff=7.25 cfs 0.466 af

Subcatchment S50: Runoff Area=296,167 sf 9.94% Impervious Runoff Depth>0.03"
Flow Length=1,000' Tc=24.1 min CN=45 Runoff=0.04 cfs 0.016 af

Subcatchment S55: Runoff Area=3.598 ac 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=11.58 cfs 0.848 af

Subcatchment S56.2: Runoff Area=1.327 ac 54.56% Impervious Runoff Depth>1.36"
Tc=5.0 min CN=81 Runoff=2.35 cfs 0.150 af

Subcatchment S57: Runoff Area=32,640 sf 76.04% Impervious Runoff Depth>1.71"
Tc=5.0 min CN=86 Runoff=1.67 cfs 0.107 af

Subcatchment S58: Runoff Area=0.837 ac 66.79% Impervious Runoff Depth>1.17"
Tc=5.0 min CN=78 Runoff=1.27 cfs 0.082 af

Subcatchment S61: Office Roof Runoff Area=38,705 sf 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=2.86 cfs 0.209 af

Subcatchment S7: Retail Core Loading Runoff Area=317,270 sf 56.88% Impervious Runoff Depth>1.29"
Tc=5.0 min CN=80 Runoff=12.29 cfs 0.786 af

Subcatchment S8: Retail Core South Runoff Area=215,747 sf 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=15.94 cfs 1.167 af

Subcatchment S9: Retail Core North Runoff Area=190,258 sf 100.00% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=98 Runoff=14.06 cfs 1.029 af

Reach 1aR: 54" Avg. Flow Depth=1.55' Max Vel=5.63 fps Inflow=27.51 cfs 2.041 af
54.0" Round Pipe n=0.014 L=314.0' S=0.0034 '/' Capacity=107.09 cfs Outflow=27.39 cfs 2.039 af

Reach 1R: 54" Avg. Flow Depth=1.50' Max Vel=5.21 fps Inflow=24.10 cfs 1.815 af
54.0" Round Pipe n=0.014 L=167.0' S=0.0031 '/' Capacity=100.91 cfs Outflow=24.07 cfs 1.814 af

Reach 53R: Avg. Flow Depth=0.60' Max Vel=3.69 fps Inflow=4.32 cfs 0.361 af
48.0" Round Pipe n=0.014 L=249.0' S=0.0046 '/' Capacity=90.25 cfs Outflow=4.32 cfs 0.360 af

Reach 54R: 48" Pipe Avg. Flow Depth=0.62' Max Vel=3.71 fps Inflow=4.64 cfs 0.442 af
48.0" Round Pipe n=0.014 L=743.0' S=0.0044 '/' Capacity=88.35 cfs Outflow=4.58 cfs 0.441 af

Reach L113: 72" Avg. Flow Depth=1.44' Max Vel=12.05 fps Inflow=62.89 cfs 5.173 af
72.0" Round Pipe n=0.014 L=96.0' S=0.0160 '/' Capacity=498.08 cfs Outflow=62.85 cfs 5.173 af

Reach L123: Avg. Flow Depth=1.66' Max Vel=4.94 fps Inflow=25.61 cfs 1.991 af
48.0" Round Pipe n=0.014 L=700.0' S=0.0026 '/' Capacity=67.64 cfs Outflow=24.28 cfs 1.985 af

Reach L157: Avg. Flow Depth=1.56' Max Vel=3.22 fps Inflow=14.71 cfs 0.960 af
48.0" Round Pipe n=0.014 L=138.0' S=0.0012 '/' Capacity=45.42 cfs Outflow=14.60 cfs 0.959 af

Reach L158: Avg. Flow Depth=1.18' Max Vel=5.13 fps Inflow=16.10 cfs 1.203 af
48.0" Round Pipe n=0.014 L=254.0' S=0.0039 '/' Capacity=83.69 cfs Outflow=15.95 cfs 1.201 af

Reach L159: Avg. Flow Depth=0.37' Max Vel=2.10 fps Inflow=0.84 cfs 0.149 af
24.0" Round Pipe n=0.014 L=70.0' S=0.0029 '/' Capacity=11.23 cfs Outflow=0.84 cfs 0.149 af

Reach L76: Avg. Flow Depth=0.92' Max Vel=4.51 fps Inflow=10.02 cfs 0.643 af
48.0" Round Pipe n=0.014 L=355.0' S=0.0041 '/' Capacity=84.95 cfs Outflow=9.82 cfs 0.642 af

Reach L81: Avg. Flow Depth=1.22' Max Vel=7.29 fps Inflow=26.97 cfs 2.182 af
60.0" Round Pipe n=0.014 L=121.0' S=0.0074 '/' Capacity=207.41 cfs Outflow=26.93 cfs 2.181 af

Reach P2: 78" Avg. Flow Depth=1.36' Max Vel=12.44 fps Inflow=62.85 cfs 5.173 af
78.0" Round Pipe n=0.014 L=25.0' S=0.0180 '/' Capacity=653.15 cfs Outflow=62.82 cfs 5.172 af

Reach POA 2: POA 2 Inflow=62.82 cfs 5.172 af
Outflow=62.82 cfs 5.172 af

Pond 10P: Peak Elev=48.02' Storage=28,809 cf Inflow=69.97 cfs 4.736 af
Discarded=26.40 cfs 4.733 af Primary=0.00 cfs 0.000 af Outflow=26.40 cfs 4.733 af

Pond 11P: Peak Elev=51.07' Storage=28,600 cf Inflow=44.43 cfs 3.253 af
Discarded=8.26 cfs 2.922 af Primary=10.11 cfs 0.329 af Outflow=18.37 cfs 3.251 af

Pond 42.1P: Wetlands Peak Elev=39.33' Storage=2,833 cf Inflow=63.84 cfs 5.174 af
72.0" Round Culvert n=0.014 L=1.0' S=0.0100 '/' Outflow=62.89 cfs 5.173 af

Pond 47.1P: Peak Elev=42.18' Storage=1,972 cf Inflow=0.31 cfs 0.045 af
Outflow=0.00 cfs 0.000 af

Pond 47.4P: Peak Elev=50.31' Storage=478 cf Inflow=0.52 cfs 0.038 af
Discarded=0.04 cfs 0.027 af Primary=0.42 cfs 0.009 af Outflow=0.45 cfs 0.036 af

Pond L69: 60" Peak Elev=40.94' Inflow=36.98 cfs 2.945 af
60.0" Round Culvert n=0.014 L=127.0' S=0.0039 '/' Outflow=36.98 cfs 2.945 af

Link Secondary Inflow Imported from 3659-16003C-Proposed Conditions POA 3-01~Pond 52.1P.hce Inflow=3.78 cfs 0.210 af
Primary=3.78 cfs 0.210 af

Total Runoff Area = 87.144 ac Runoff Volume = 12.713 af Average Runoff Depth = 1.75"
27.31% Pervious = 23.796 ac 72.69% Impervious = 63.349 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 14.3: Runoff Area=1.261 ac 72.09% Impervious Runoff Depth>2.55"
Tc=5.0 min CN=82 Runoff=4.17 cfs 0.268 af

Subcatchment S10.1: Retail Core South Runoff Area=553,813 sf 95.19% Impervious Runoff Depth>3.82"
Tc=5.0 min CN=95 Runoff=57.36 cfs 4.051 af

Subcatchment S10.2: South Site Drive Runoff Area=19,768 sf 68.81% Impervious Runoff Depth>2.37"
Tc=5.0 min CN=80 Runoff=1.41 cfs 0.090 af

Subcatchment S11.1: Retail Core North Runoff Area=6.449 ac 93.27% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=94 Runoff=28.66 cfs 1.996 af

Subcatchment S11.2: North Site Drive Runoff Area=209,831 sf 76.49% Impervious Runoff Depth>2.72"
Tc=5.0 min CN=84 Runoff=16.95 cfs 1.094 af

Subcatchment S13: Runoff Area=4.329 ac 67.82% Impervious Runoff Depth>2.29"
Tc=5.0 min CN=79 Runoff=12.95 cfs 0.826 af

Subcatchment S14.1: Runoff Area=2.247 ac 73.65% Impervious Runoff Depth>2.55"
Tc=5.0 min CN=82 Runoff=7.43 cfs 0.477 af

Subcatchment S35: Runoff Area=58,042 sf 77.81% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=87 Runoff=5.10 cfs 0.334 af

Subcatchment S40: Runoff Area=2.670 ac 67.42% Impervious Runoff Depth>2.55"
Tc=5.0 min CN=82 Runoff=8.83 cfs 0.567 af

Subcatchment S40.1: Runoff Area=100,887 sf 45.60% Impervious Runoff Depth>1.63"
Flow Length=712' Tc=60.6 min CN=71 Runoff=1.88 cfs 0.315 af

Subcatchment S40.2: Runoff Area=3.200 ac 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=14.90 cfs 1.110 af

Subcatchment S41: Runoff Area=1.080 ac 55.56% Impervious Runoff Depth>2.05"
Tc=5.0 min CN=76 Runoff=2.89 cfs 0.184 af

Subcatchment S41.1: Runoff Area=2.030 ac 14.78% Impervious Runoff Depth>0.69"
Flow Length=245' Tc=18.1 min CN=55 Runoff=0.97 cfs 0.117 af

Subcatchment S42: Runoff Area=1.440 ac 73.61% Impervious Runoff Depth>2.82"
Tc=5.0 min CN=85 Runoff=5.22 cfs 0.338 af

Subcatchment S42.1: Runoff Area=78,183 sf 23.62% Impervious Runoff Depth>0.69"
Flow Length=362' Tc=11.1 min CN=55 Runoff=1.02 cfs 0.104 af

Subcatchment S44: Runoff Area=61,875 sf 92.36% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=94 Runoff=6.31 cfs 0.440 af

Subcatchment S47.1: Runoff Area=81,281 sf 34.83% Impervious Runoff Depth>0.85"
Flow Length=271' Tc=11.5 min CN=58 Runoff=1.41 cfs 0.132 af

Subcatchment S47.2: Runoff Area=33,107 sf 83.86% Impervious Runoff Depth>3.10"
Tc=5.0 min CN=88 Runoff=2.98 cfs 0.196 af

Subcatchment S47.3: Runoff Area=38,241 sf 71.36% Impervious Runoff Depth>2.46"
Tc=5.0 min CN=81 Runoff=2.81 cfs 0.180 af

Subcatchment S47.4: Runoff Area=7,097 sf 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=0.76 cfs 0.057 af

Subcatchment S49: Runoff Area=3.120 ac 76.60% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=87 Runoff=11.93 cfs 0.781 af

Subcatchment S50: Runoff Area=296,167 sf 9.94% Impervious Runoff Depth>0.26"
Flow Length=1,000' Tc=24.1 min CN=45 Runoff=0.65 cfs 0.150 af

Subcatchment S55: Runoff Area=3.598 ac 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=16.76 cfs 1.248 af

Subcatchment S56.2: Runoff Area=1.327 ac 54.56% Impervious Runoff Depth>2.46"
Tc=5.0 min CN=81 Runoff=4.25 cfs 0.272 af

Subcatchment S57: Runoff Area=32,640 sf 76.04% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=86 Runoff=2.79 cfs 0.182 af

Subcatchment S58: Runoff Area=0.837 ac 66.79% Impervious Runoff Depth>2.21"
Tc=5.0 min CN=78 Runoff=2.42 cfs 0.154 af

Subcatchment S61: Office Roof Runoff Area=38,705 sf 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=4.14 cfs 0.308 af

Subcatchment S7: Retail Core Loading Runoff Area=317,270 sf 56.88% Impervious Runoff Depth>2.37"
Tc=5.0 min CN=80 Runoff=22.56 cfs 1.441 af

Subcatchment S8: Retail Core South Runoff Area=215,747 sf 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=23.07 cfs 1.718 af

Subcatchment S9: Retail Core North Runoff Area=190,258 sf 100.00% Impervious Runoff Depth>4.16"
Tc=5.0 min CN=98 Runoff=20.34 cfs 1.515 af

Reach 1aR: 54" Avg. Flow Depth=2.54' Max Vel=7.06 fps Inflow=65.72 cfs 3.910 af
54.0" Round Pipe n=0.014 L=314.0' S=0.0034 '/' Capacity=107.09 cfs Outflow=65.31 cfs 3.907 af

Reach 1R: 54" Avg. Flow Depth=2.50' Max Vel=6.62 fps Inflow=60.09 cfs 3.514 af
54.0" Round Pipe n=0.014 L=167.0' S=0.0031 '/' Capacity=100.91 cfs Outflow=59.94 cfs 3.513 af

Reach 53R: Avg. Flow Depth=1.37' Max Vel=5.98 fps Inflow=22.72 cfs 3.082 af
48.0" Round Pipe n=0.014 L=249.0' S=0.0046 '/' Capacity=90.25 cfs Outflow=22.72 cfs 3.081 af

Reach 54R: 48" Pipe Avg. Flow Depth=1.40' Max Vel=5.92 fps Inflow=23.18 cfs 3.235 af
48.0" Round Pipe n=0.014 L=743.0' S=0.0044 '/' Capacity=88.35 cfs Outflow=23.15 cfs 3.234 af

Reach L113: 72" Avg. Flow Depth=2.06' Max Vel=14.69 fps Inflow=125.90 cfs 11.953 af
72.0" Round Pipe n=0.014 L=96.0' S=0.0160 '/' Capacity=498.08 cfs Outflow=125.85 cfs 11.952 af

Reach L123: Avg. Flow Depth=2.27' Max Vel=5.66 fps Inflow=43.72 cfs 3.448 af
48.0" Round Pipe n=0.014 L=700.0' S=0.0026 '/' Capacity=67.64 cfs Outflow=41.77 cfs 3.441 af

Reach L157: Avg. Flow Depth=2.19' Max Vel=3.75 fps Inflow=26.50 cfs 1.725 af
48.0" Round Pipe n=0.014 L=138.0' S=0.0012 '/' Capacity=45.42 cfs Outflow=26.33 cfs 1.724 af

Reach L158: Avg. Flow Depth=1.63' Max Vel=6.07 fps Inflow=29.45 cfs 2.223 af
48.0" Round Pipe n=0.014 L=254.0' S=0.0039 '/' Capacity=83.69 cfs Outflow=29.25 cfs 2.222 af

Reach L159: Avg. Flow Depth=0.55' Max Vel=2.65 fps Inflow=1.88 cfs 0.315 af
24.0" Round Pipe n=0.014 L=70.0' S=0.0029 '/' Capacity=11.23 cfs Outflow=1.88 cfs 0.315 af

Reach L76: Avg. Flow Depth=1.24' Max Vel=5.34 fps Inflow=18.05 cfs 1.160 af
48.0" Round Pipe n=0.014 L=355.0' S=0.0041 '/' Capacity=84.95 cfs Outflow=17.76 cfs 1.159 af

Reach L81: Avg. Flow Depth=1.61' Max Vel=8.51 fps Inflow=46.39 cfs 3.779 af
60.0" Round Pipe n=0.014 L=121.0' S=0.0074 '/' Capacity=207.41 cfs Outflow=46.33 cfs 3.778 af

Reach P2: 78" Avg. Flow Depth=1.93' Max Vel=15.21 fps Inflow=125.85 cfs 11.952 af
78.0" Round Pipe n=0.014 L=25.0' S=0.0180 '/' Capacity=653.15 cfs Outflow=125.80 cfs 11.952 af

Reach POA 2: POA 2 Inflow=125.80 cfs 11.952 af
Outflow=125.80 cfs 11.952 af

Pond 10P: Peak Elev=49.45' Storage=69,697 cf Inflow=108.55 cfs 7.489 af
Discarded=27.82 cfs 7.484 af Primary=0.00 cfs 0.000 af Outflow=27.82 cfs 7.484 af

Pond 11P: Peak Elev=52.12' Storage=37,822 cf Inflow=64.30 cfs 4.789 af
Discarded=8.67 cfs 3.822 af Primary=29.53 cfs 0.964 af Outflow=38.20 cfs 4.786 af

Pond 42.1P: Wetlands Peak Elev=40.87' Storage=9,811 cf Inflow=133.84 cfs 11.954 af
72.0" Round Culvert n=0.014 L=1.0' S=0.0100 '/' Outflow=125.90 cfs 11.953 af

Pond 47.1P: Peak Elev=42.46' Storage=5,757 cf Inflow=1.41 cfs 0.132 af
Outflow=0.00 cfs 0.000 af

Pond 47.4P: Peak Elev=50.34' Storage=493 cf Inflow=0.76 cfs 0.057 af
Discarded=0.04 cfs 0.031 af Primary=0.71 cfs 0.021 af Outflow=0.75 cfs 0.052 af

Pond L69: 60" Peak Elev=42.52' Inflow=86.91 cfs 7.922 af
60.0" Round Culvert n=0.014 L=127.0' S=0.0039 '/' Outflow=86.91 cfs 7.922 af

Link Secondary Outflow Imported from 3659-16003C-Proposed Conditions POA 3-01~Pond 52.1P.hce Inflow=22.03 cfs 2.810 af
Primary=22.03 cfs 2.810 af

Total Runoff Area = 87.144 ac Runoff Volume = 20.645 af Average Runoff Depth = 2.84"
27.31% Pervious = 23.796 ac 72.69% Impervious = 63.349 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 14.3: Runoff Area=1.261 ac 72.09% Impervious Runoff Depth>3.31"
Tc=5.0 min CN=82 Runoff=5.38 cfs 0.348 af

Subcatchment S10.1: Retail Core South Runoff Area=553,813 sf 95.19% Impervious Runoff Depth>4.68"
Tc=5.0 min CN=95 Runoff=69.29 cfs 4.954 af

Subcatchment S10.2: South Site Drive Runoff Area=19,768 sf 68.81% Impervious Runoff Depth>3.12"
Tc=5.0 min CN=80 Runoff=1.84 cfs 0.118 af

Subcatchment S11.1: Retail Core North Runoff Area=6.449 ac 93.27% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=94 Runoff=34.75 cfs 2.452 af

Subcatchment S11.2: North Site Drive Runoff Area=209,831 sf 76.49% Impervious Runoff Depth>3.51"
Tc=5.0 min CN=84 Runoff=21.60 cfs 1.408 af

Subcatchment S13: Runoff Area=4.329 ac 67.82% Impervious Runoff Depth>3.03"
Tc=5.0 min CN=79 Runoff=17.02 cfs 1.091 af

Subcatchment S14.1: Runoff Area=2.247 ac 73.65% Impervious Runoff Depth>3.31"
Tc=5.0 min CN=82 Runoff=9.59 cfs 0.620 af

Subcatchment S35: Runoff Area=58,042 sf 77.81% Impervious Runoff Depth>3.81"
Tc=5.0 min CN=87 Runoff=6.39 cfs 0.423 af

Subcatchment S40: Runoff Area=2.670 ac 67.42% Impervious Runoff Depth>3.31"
Tc=5.0 min CN=82 Runoff=11.39 cfs 0.737 af

Subcatchment S40.1: Runoff Area=100,887 sf 45.60% Impervious Runoff Depth>2.26"
Flow Length=712' Tc=60.6 min CN=71 Runoff=2.63 cfs 0.437 af

Subcatchment S40.2: Runoff Area=3.200 ac 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=17.85 cfs 1.339 af

Subcatchment S41: Runoff Area=1.080 ac 55.56% Impervious Runoff Depth>2.75"
Tc=5.0 min CN=76 Runoff=3.88 cfs 0.247 af

Subcatchment S41.1: Runoff Area=2.030 ac 14.78% Impervious Runoff Depth>1.10"
Flow Length=245' Tc=18.1 min CN=55 Runoff=1.75 cfs 0.187 af

Subcatchment S42: Runoff Area=1.440 ac 73.61% Impervious Runoff Depth>3.61"
Tc=5.0 min CN=85 Runoff=6.61 cfs 0.433 af

Subcatchment S42.1: Runoff Area=78,183 sf 23.62% Impervious Runoff Depth>1.11"
Flow Length=362' Tc=11.1 min CN=55 Runoff=1.85 cfs 0.166 af

Subcatchment S44: Runoff Area=61,875 sf 92.36% Impervious Runoff Depth>4.56"
Tc=5.0 min CN=94 Runoff=7.65 cfs 0.540 af

Subcatchment S47.1: Runoff Area=81,281 sf 34.83% Impervious Runoff Depth>1.31"
Flow Length=271' Tc=11.5 min CN=58 Runoff=2.37 cfs 0.204 af

Subcatchment S47.2: Runoff Area=33,107 sf 83.86% Impervious Runoff Depth>3.91"
Tc=5.0 min CN=88 Runoff=3.72 cfs 0.248 af

Subcatchment S47.3: Runoff Area=38,241 sf 71.36% Impervious Runoff Depth>3.21"
Tc=5.0 min CN=81 Runoff=3.65 cfs 0.235 af

Subcatchment S47.4: Runoff Area=7,097 sf 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=0.91 cfs 0.068 af

Subcatchment S49: Runoff Area=3.120 ac 76.60% Impervious Runoff Depth>3.81"
Tc=5.0 min CN=87 Runoff=14.96 cfs 0.991 af

Subcatchment S50: Runoff Area=296,167 sf 9.94% Impervious Runoff Depth>0.52"
Flow Length=1,000' Tc=24.1 min CN=45 Runoff=1.77 cfs 0.294 af

Subcatchment S55: Runoff Area=3.598 ac 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=20.07 cfs 1.505 af

Subcatchment S56.2: Runoff Area=1.327 ac 54.56% Impervious Runoff Depth>3.21"
Tc=5.0 min CN=81 Runoff=5.52 cfs 0.355 af

Subcatchment S57: Runoff Area=32,640 sf 76.04% Impervious Runoff Depth>3.71"
Tc=5.0 min CN=86 Runoff=3.52 cfs 0.232 af

Subcatchment S58: Runoff Area=0.837 ac 66.79% Impervious Runoff Depth>2.93"
Tc=5.0 min CN=78 Runoff=3.20 cfs 0.205 af

Subcatchment S61: Office Roof Runoff Area=38,705 sf 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=4.96 cfs 0.372 af

Subcatchment S7: Retail Core Loading Runoff Area=317,270 sf 56.88% Impervious Runoff Depth>3.12"
Tc=5.0 min CN=80 Runoff=29.46 cfs 1.893 af

Subcatchment S8: Retail Core South Runoff Area=215,747 sf 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=27.63 cfs 2.072 af

Subcatchment S9: Retail Core North Runoff Area=190,258 sf 100.00% Impervious Runoff Depth>5.02"
Tc=5.0 min CN=98 Runoff=24.37 cfs 1.828 af

Reach 1aR: 54" Avg. Flow Depth=3.15' Max Vel=7.54 fps Inflow=90.22 cfs 5.286 af
54.0" Round Pipe n=0.014 L=314.0' S=0.0034 '/' Capacity=107.09 cfs Outflow=89.62 cfs 5.283 af

Reach 1R: 54" Avg. Flow Depth=3.10' Max Vel=7.08 fps Inflow=82.78 cfs 4.775 af
54.0" Round Pipe n=0.014 L=167.0' S=0.0031 '/' Capacity=100.91 cfs Outflow=82.56 cfs 4.773 af

Reach 53R: Avg. Flow Depth=1.78' Max Vel=6.82 fps Inflow=36.92 cfs 5.800 af
48.0" Round Pipe n=0.014 L=249.0' S=0.0046 '/' Capacity=90.25 cfs Outflow=36.92 cfs 5.799 af

Reach 54R: 48" Pipe Avg. Flow Depth=1.81' Max Vel=6.74 fps Inflow=37.35 cfs 6.004 af
48.0" Round Pipe n=0.014 L=743.0' S=0.0044 '/' Capacity=88.35 cfs Outflow=37.34 cfs 6.002 af

Reach L113: 72" Avg. Flow Depth=2.40' Max Vel=15.90 fps Inflow=168.26 cfs 17.614 af
72.0" Round Pipe n=0.014 L=96.0' S=0.0160 '/' Capacity=498.08 cfs Outflow=168.19 cfs 17.612 af

Reach L123: Avg. Flow Depth=2.69' Max Vel=5.97 fps Inflow=55.98 cfs 4.456 af
48.0" Round Pipe n=0.014 L=700.0' S=0.0026 '/' Capacity=67.64 cfs Outflow=53.58 cfs 4.447 af

Reach L157: Avg. Flow Depth=2.59' Max Vel=3.97 fps Inflow=34.37 cfs 2.250 af
48.0" Round Pipe n=0.014 L=138.0' S=0.0012 '/' Capacity=45.42 cfs Outflow=34.15 cfs 2.248 af

Reach L158: Avg. Flow Depth=1.90' Max Vel=6.51 fps Inflow=38.42 cfs 2.932 af
48.0" Round Pipe n=0.014 L=254.0' S=0.0039 '/' Capacity=83.69 cfs Outflow=38.18 cfs 2.930 af

Reach L159: Avg. Flow Depth=0.66' Max Vel=2.92 fps Inflow=2.63 cfs 0.437 af
24.0" Round Pipe n=0.014 L=70.0' S=0.0029 '/' Capacity=11.23 cfs Outflow=2.63 cfs 0.437 af

Reach L76: Avg. Flow Depth=1.42' Max Vel=5.75 fps Inflow=23.41 cfs 1.515 af
48.0" Round Pipe n=0.014 L=355.0' S=0.0041 '/' Capacity=84.95 cfs Outflow=23.08 cfs 1.513 af

Reach L81: Avg. Flow Depth=1.83' Max Vel=9.11 fps Inflow=59.44 cfs 4.880 af
60.0" Round Pipe n=0.014 L=121.0' S=0.0074 '/' Capacity=207.41 cfs Outflow=59.36 cfs 4.879 af

Reach P2: 78" Avg. Flow Depth=2.25' Max Vel=16.49 fps Inflow=168.19 cfs 17.612 af
78.0" Round Pipe n=0.014 L=25.0' S=0.0180 '/' Capacity=653.15 cfs Outflow=168.13 cfs 17.612 af

Reach POA 2: POA 2 Inflow=168.13 cfs 17.612 af
Outflow=168.13 cfs 17.612 af

Pond 10P: Peak Elev=50.43' Storage=98,122 cf Inflow=133.48 cfs 9.299 af
Discarded=28.80 cfs 9.198 af Primary=2.47 cfs 0.096 af Outflow=31.27 cfs 9.293 af

Pond 11P: Peak Elev=52.75' Storage=43,381 cf Inflow=77.04 cfs 5.777 af
Discarded=8.92 cfs 4.360 af Primary=40.51 cfs 1.414 af Outflow=49.43 cfs 5.774 af

Pond 42.1P: Wetlands Peak Elev=41.79' Storage=18,397 cf Inflow=186.30 cfs 17.614 af
72.0" Round Culvert n=0.014 L=1.0' S=0.0100 '/' Outflow=168.26 cfs 17.614 af

Pond 47.1P: Peak Elev=42.67' Storage=8,861 cf Inflow=2.37 cfs 0.204 af
Outflow=0.00 cfs 0.000 af

Pond 47.4P: Peak Elev=50.35' Storage=500 cf Inflow=0.91 cfs 0.068 af
Discarded=0.04 cfs 0.033 af Primary=0.86 cfs 0.029 af Outflow=0.90 cfs 0.063 af

Pond L69: 60" Peak Elev=43.63' Inflow=125.28 cfs 12.275 af
60.0" Round Culvert n=0.014 L=127.0' S=0.0039 '/' Outflow=125.28 cfs 12.275 af

Link Secondary Outflow Imported from 3659-16003C-Proposed Conditions POA 3-01~Pond 52.1P.hce Inflow=36.21 cfs 5.444 af
Primary=36.21 cfs 5.444 af

Total Runoff Area = 87.144 ac Runoff Volume = 26.002 af Average Runoff Depth = 3.58"
27.31% Pervious = 23.796 ac 72.69% Impervious = 63.349 ac

Summary for Subcatchment 14.3:

Runoff = 5.38 cfs @ 12.07 hrs, Volume= 0.348 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.909	98	Paved parking, HSG A
0.352	39	>75% Grass cover, Good, HSG A
1.261	82	Weighted Average
0.352		27.91% Pervious Area
0.909		72.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S10.1: Retail Core South

Runoff = 69.29 cfs @ 12.07 hrs, Volume= 4.954 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
26,645	39	>75% Grass cover, Good, HSG A
432,316	98	Paved parking, HSG A
94,852	98	Roofs, HSG A
553,813	95	Weighted Average
26,645		4.81% Pervious Area
527,168		95.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S10.2: South Site Drive

Runoff = 1.84 cfs @ 12.07 hrs, Volume= 0.118 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
6,165	39	>75% Grass cover, Good, HSG A
13,603	98	Paved parking, HSG A
19,768	80	Weighted Average
6,165		31.19% Pervious Area
13,603		68.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S11.1: Retail Core North

Runoff = 34.75 cfs @ 12.07 hrs, Volume= 2.452 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
5.957	98	Paved parking, HSG A
0.058	98	Roofs, HSG A
0.434	39	>75% Grass cover, Good, HSG A
6.449	94	Weighted Average
0.434		6.73% Pervious Area
6.015		93.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S11.2: North Site Drive

Runoff = 21.60 cfs @ 12.07 hrs, Volume= 1.408 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
46,766	39	>75% Grass cover, Good, HSG A
2,563	61	>75% Grass cover, Good, HSG B
160,502	98	Paved parking, HSG A
209,831	84	Weighted Average
49,329		23.51% Pervious Area
160,502		76.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S13:

Runoff = 17.02 cfs @ 12.07 hrs, Volume= 1.091 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.393	39	>75% Grass cover, Good, HSG A
2.936	98	Paved parking, HSG A
4.329	79	Weighted Average
1.393		32.18% Pervious Area
2.936		67.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S14.1:

Runoff = 9.59 cfs @ 12.07 hrs, Volume= 0.620 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.592	39	>75% Grass cover, Good, HSG A
1.655	98	Paved parking, HSG A
2.247	82	Weighted Average
0.592		26.35% Pervious Area
1.655		73.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S35:

Runoff = 6.39 cfs @ 12.07 hrs, Volume= 0.423 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
12,877	49	50-75% Grass cover, Fair, HSG A
24,707	98	Paved parking, HSG A
20,458	98	Roofs, HSG A
58,042	87	Weighted Average
12,877		22.19% Pervious Area
45,165		77.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S40:

Runoff = 11.39 cfs @ 12.07 hrs, Volume= 0.737 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.870	49	50-75% Grass cover, Fair, HSG A
1.406	98	Paved parking, HSG A
0.394	98	Roofs, HSG A
2.670	82	Weighted Average
0.870		32.58% Pervious Area
1.800		67.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S40.1:

Runoff = 2.63 cfs @ 12.86 hrs, Volume= 0.437 af, Depth> 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
54,880	49	50-75% Grass cover, Fair, HSG A
46,007	98	Roofs, HSG A
100,887	71	Weighted Average
54,880		54.40% Pervious Area
46,007		45.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
53.9	100	0.0020	0.03		**Sheet Flow, Sheet**
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.1	312	0.0063	1.28		**Shallow Concentrated Flow, Shallow Conc**
					Unpaved Kv= 16.1 fps
2.6	300	0.0090	1.93		**Shallow Concentrated Flow, Shallow Conc**
					Paved Kv= 20.3 fps
60.6	712	Total			

Summary for Subcatchment S40.2:

Runoff = 17.85 cfs @ 12.07 hrs, Volume= 1.339 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
3.200	98	Roofs, HSG A
3.200		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S41:

Runoff = 3.88 cfs @ 12.08 hrs, Volume= 0.247 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.460	49	50-75% Grass cover, Fair, HSG A
0.020	36	Woods, Fair, HSG A
0.600	98	Paved parking, HSG A
1.080	76	Weighted Average
0.480		44.44% Pervious Area
0.600		55.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S41.1:

Runoff = 1.75 cfs @ 12.29 hrs, Volume= 0.187 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.510	49	50-75% Grass cover, Fair, HSG A
0.220	36	Woods, Fair, HSG A
0.294	98	Paved parking, HSG A
0.006	98	Roofs, HSG A
2.030	55	Weighted Average
1.730		85.22% Pervious Area
0.300		14.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.1	100	0.0050	0.10		**Sheet Flow, Sheet**
					Grass: Short n= 0.150 P2= 3.20"
1.0	145	0.0230	2.44		**Shallow Concentrated Flow, Shallow Conc**
					Unpaved Kv= 16.1 fps
18.1	245	Total			

Summary for Subcatchment S42:

Runoff = 6.61 cfs @ 12.07 hrs, Volume= 0.433 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.380	49	50-75% Grass cover, Fair, HSG A
0.136	98	Paved parking, HSG A
0.924	98	Roofs, HSG A
1.440	85	Weighted Average
0.380		26.39% Pervious Area
1.060		73.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S42.1:

Runoff = 1.85 cfs @ 12.17 hrs, Volume= 0.166 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
23,822	39	>75% Grass cover, Good, HSG A
35,897	43	Woods/grass comb., Fair, HSG A
18,464	98	Paved parking, HSG A
78,183	55	Weighted Average
59,719		76.38% Pervious Area
18,464		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	100	0.0500	0.25		**Sheet Flow, Sheet**
					Grass: Short n= 0.150 P2= 3.20"
4.3	262	0.0040	1.02		**Shallow Concentrated Flow, Shallow Conc**
					Unpaved Kv= 16.1 fps
11.1	362	Total			

Summary for Subcatchment S44:

Runoff = 7.65 cfs @ 12.07 hrs, Volume= 0.540 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
4,725	49	50-75% Grass cover, Fair, HSG A
31,574	98	Paved parking, HSG A
25,576	98	Roofs, HSG A
61,875	94	Weighted Average
4,725		7.64% Pervious Area
57,150		92.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S47.1:

Runoff = 2.37 cfs @ 12.18 hrs, Volume= 0.204 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
52,973	36	Woods, Fair, HSG A
15,046	98	Paved parking, HSG A
13,262	98	Water Surface, HSG A
81,281	58	Weighted Average
52,973		65.17% Pervious Area
28,308		34.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0475	0.17		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 3.20"
1.4	171	0.0160	2.04		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
11.5	271	Total			

Summary for Subcatchment S47.2:

Runoff = 3.72 cfs @ 12.07 hrs, Volume= 0.248 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
5,343	39	>75% Grass cover, Good, HSG A
27,764	98	Paved parking, HSG A
33,107	88	Weighted Average
5,343		16.14% Pervious Area
27,764		83.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S47.3:

Runoff = 3.65 cfs @ 12.07 hrs, Volume= 0.235 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
10,953	39	>75% Grass cover, Good, HSG A
27,288	98	Paved parking, HSG A
38,241	81	Weighted Average
10,953		28.64% Pervious Area
27,288		71.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S47.4:

Runoff = 0.91 cfs @ 12.07 hrs, Volume= 0.068 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
7,097	98	Roofs, HSG A
7,097		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S49:

Runoff = 14.96 cfs @ 12.07 hrs, Volume= 0.991 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.730	49	50-75% Grass cover, Fair, HSG A
1.517	98	Paved parking, HSG A
0.873	98	Roofs, HSG A
3.120	87	Weighted Average
0.730		23.40% Pervious Area
2.390		76.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S50:

Runoff = 1.77 cfs @ 12.51 hrs, Volume= 0.294 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
266,724	39	>75% Grass cover, Good, HSG A
29,443	98	Paved parking, HSG A
296,167	45	Weighted Average
266,724		90.06% Pervious Area
29,443		9.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	100	0.0570	0.18		**Sheet Flow, Sheet** Grass: Dense n= 0.240 P2= 3.20"
14.7	900	0.0040	1.02		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
24.1	1,000	Total			

Summary for Subcatchment S55:

Runoff = 20.07 cfs @ 12.07 hrs, Volume= 1.505 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (ac)	CN	Description
*	3.598	98	Roofs, HSG A
	3.598		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S56.2:

Runoff = 5.52 cfs @ 12.07 hrs, Volume= 0.355 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.724	98	Paved parking, HSG A
0.020	39	>75% Grass cover, Good, HSG A
0.583	61	>75% Grass cover, Good, HSG B
1.327	81	Weighted Average
0.603		45.44% Pervious Area
0.724		54.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S57:

Runoff = 3.52 cfs @ 12.07 hrs, Volume= 0.232 af, Depth> 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
7,822	49	50-75% Grass cover, Fair, HSG A
13,996	98	Paved parking, HSG A
10,822	98	Roofs, HSG A
32,640	86	Weighted Average
7,822		23.96% Pervious Area
24,818		76.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S58:

Runoff = 3.20 cfs @ 12.07 hrs, Volume= 0.205 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.559	98	Paved parking, HSG A
0.278	39	>75% Grass cover, Good, HSG A
0.837	78	Weighted Average
0.278		33.21% Pervious Area
0.559		66.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S61: Office Roof

Runoff = 4.96 cfs @ 12.07 hrs, Volume= 0.372 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
38,705	98	Roofs, HSG A
38,705		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S7: Retail Core Loading

Runoff = 29.46 cfs @ 12.07 hrs, Volume= 1.893 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	74,297	39	>75% Grass cover, Good, HSG A
	8,096	49	50-75% Grass cover, Fair, HSG A
	180,479	98	Paved parking, HSG A
*	54,398	80	Riprap Slope
	317,270	80	Weighted Average
	136,791		43.12% Pervious Area
	180,479		56.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S8: Retail Core South Roof

Runoff = 27.63 cfs @ 12.07 hrs, Volume= 2.072 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
215,747	98	Roofs, HSG A
215,747		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S9: Retail Core North Roof

Runoff = 24.37 cfs @ 12.07 hrs, Volume= 1.828 af, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
190,258	98	Roofs, HSG A
190,258		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

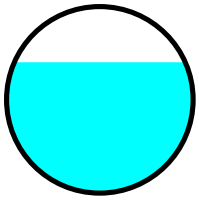
Summary for Reach 1aR: 54"

Inflow Area = 53.003 ac, 86.67% Impervious, Inflow Depth > 1.20" for 25-Year event
Inflow = 90.22 cfs @ 12.10 hrs, Volume= 5.286 af
Outflow = 89.62 cfs @ 12.11 hrs, Volume= 5.283 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.54 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 2.3 min

Peak Storage= 3,733 cf @ 12.11 hrs
Average Depth at Peak Storage= 3.15'
Bank-Full Depth= 4.50' Flow Area= 15.9 sf, Capacity= 107.09 cfs

54.0" Round Pipe
n= 0.014
Length= 314.0' Slope= 0.0034 '/'
Inlet Invert= 39.58', Outlet Invert= 38.50'



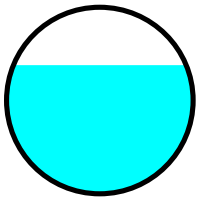
Summary for Reach 1R: 54"

Inflow Area = 51.202 ac, 86.93% Impervious, Inflow Depth > 1.12" for 25-Year event
Inflow = 82.78 cfs @ 12.10 hrs, Volume= 4.775 af
Outflow = 82.56 cfs @ 12.11 hrs, Volume= 4.773 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.08 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.06 fps, Avg. Travel Time= 1.4 min

Peak Storage= 1,948 cf @ 12.11 hrs
Average Depth at Peak Storage= 3.10'
Bank-Full Depth= 4.50' Flow Area= 15.9 sf, Capacity= 100.91 cfs

54.0" Round Pipe
n= 0.014
Length= 167.0' Slope= 0.0031 '/'
Inlet Invert= 40.09', Outlet Invert= 39.58'



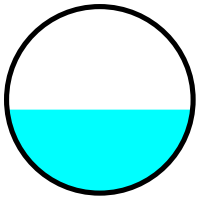
Summary for Reach 53R:

Inflow Area = 1.327 ac, 54.56% Impervious, Inflow Depth > 52.44" for 25-Year event
Inflow = 36.92 cfs @ 12.62 hrs, Volume= 5.800 af
Outflow = 36.92 cfs @ 12.63 hrs, Volume= 5.799 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.82 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 1.6 min

Peak Storage= 1,348 cf @ 12.63 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 90.25 cfs

48.0" Round Pipe
n= 0.014
Length= 249.0' Slope= 0.0046 '/'
Inlet Invert= 42.90', Outlet Invert= 41.76'



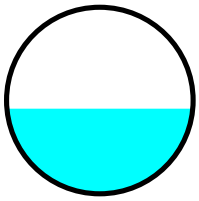
Summary for Reach 54R: 48" Pipe

Inflow Area = 2.164 ac, 59.29% Impervious, Inflow Depth > 33.29" for 25-Year event
Inflow = 37.35 cfs @ 12.62 hrs, Volume= 6.004 af
Outflow = 37.34 cfs @ 12.64 hrs, Volume= 6.002 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.74 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 4.6 min

Peak Storage= 4,119 cf @ 12.64 hrs
Average Depth at Peak Storage= 1.81'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 88.35 cfs

48.0" Round Pipe
n= 0.014
Length= 743.0' Slope= 0.0044 '/'
Inlet Invert= 41.76', Outlet Invert= 38.50'



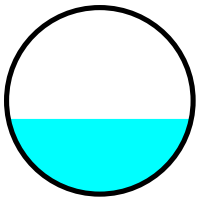
Summary for Reach L113: 72"

Inflow Area = 87.144 ac, 72.69% Impervious, Inflow Depth > 2.43" for 25-Year event
Inflow = 168.26 cfs @ 12.16 hrs, Volume= 17.614 af
Outflow = 168.19 cfs @ 12.17 hrs, Volume= 17.612 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 15.90 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 5.21 fps, Avg. Travel Time= 0.3 min

Peak Storage= 1,015 cf @ 12.17 hrs
Average Depth at Peak Storage= 2.40'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 498.08 cfs

72.0" Round Pipe
n= 0.014
Length= 96.0' Slope= 0.0160 '/'
Inlet Invert= 36.11', Outlet Invert= 34.57'



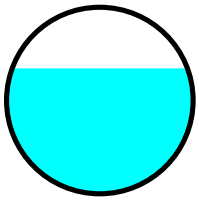
Summary for Reach L123:

Inflow Area = 16.958 ac, 64.45% Impervious, Inflow Depth > 3.15" for 25-Year event
Inflow = 55.98 cfs @ 12.09 hrs, Volume= 4.456 af
Outflow = 53.58 cfs @ 12.11 hrs, Volume= 4.447 af, Atten= 4%, Lag= 1.5 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.97 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 5.6 min

Peak Storage= 6,283 cf @ 12.11 hrs
Average Depth at Peak Storage= 2.69'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 67.64 cfs

48.0" Round Pipe
n= 0.014
Length= 700.0' Slope= 0.0026 '/'
Inlet Invert= 40.60', Outlet Invert= 38.80'



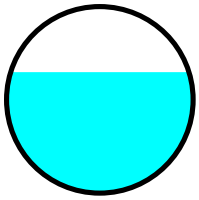
Summary for Reach L157:

Inflow Area = 8.331 ac, 69.29% Impervious, Inflow Depth > 3.24" for 25-Year event
Inflow = 34.37 cfs @ 12.08 hrs, Volume= 2.250 af
Outflow = 34.15 cfs @ 12.09 hrs, Volume= 2.248 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.97 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 1.7 min

Peak Storage= 1,188 cf @ 12.09 hrs
Average Depth at Peak Storage= 2.59'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 45.42 cfs

48.0" Round Pipe
n= 0.014
Length= 138.0' Slope= 0.0012 '/'
Inlet Invert= 41.86', Outlet Invert= 41.70'



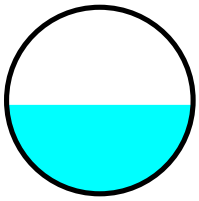
Summary for Reach L158:

Inflow Area = 11.728 ac, 63.35% Impervious, Inflow Depth > 3.00" for 25-Year event
Inflow = 38.42 cfs @ 12.09 hrs, Volume= 2.932 af
Outflow = 38.18 cfs @ 12.10 hrs, Volume= 2.930 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.51 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.33 fps, Avg. Travel Time= 1.8 min

Peak Storage= 1,490 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.90'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 83.69 cfs

48.0" Round Pipe
n= 0.014
Length= 254.0' Slope= 0.0039 '/'
Inlet Invert= 41.60', Outlet Invert= 40.60'



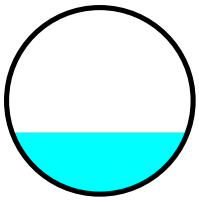
Summary for Reach L159:

Inflow Area = 2.316 ac, 45.60% Impervious, Inflow Depth > 2.26" for 25-Year event
Inflow = 2.63 cfs @ 12.86 hrs, Volume= 0.437 af
Outflow = 2.63 cfs @ 12.86 hrs, Volume= 0.437 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.92 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.8 min

Peak Storage= 63 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.66'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 11.23 cfs

24.0" Round Pipe
n= 0.014
Length= 70.0' Slope= 0.0029 '/'
Inlet Invert= 41.90', Outlet Invert= 41.70'



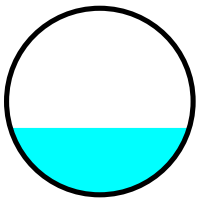
Summary for Reach L76:

Inflow Area = 5.661 ac, 70.17% Impervious, Inflow Depth > 3.21" for 25-Year event
Inflow = 23.41 cfs @ 12.07 hrs, Volume= 1.515 af
Outflow = 23.08 cfs @ 12.09 hrs, Volume= 1.513 af, Atten= 1%, Lag= 0.8 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.75 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 3.1 min

Peak Storage= 1,425 cf @ 12.09 hrs
Average Depth at Peak Storage= 1.42'
Bank-Full Depth= 4.00' Flow Area= 12.6 sf, Capacity= 84.95 cfs

48.0" Round Pipe
n= 0.014
Length= 355.0' Slope= 0.0041 '/'
Inlet Invert= 43.30', Outlet Invert= 41.86'



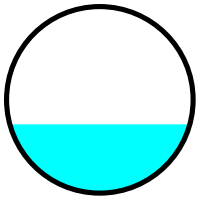
Summary for Reach L81:

Inflow Area = 18.398 ac, 65.17% Impervious, Inflow Depth > 3.18" for 25-Year event
Inflow = 59.44 cfs @ 12.11 hrs, Volume= 4.880 af
Outflow = 59.36 cfs @ 12.11 hrs, Volume= 4.879 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 9.11 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.7 min

Peak Storage= 788 cf @ 12.11 hrs
Average Depth at Peak Storage= 1.83'
Bank-Full Depth= 5.00' Flow Area= 19.6 sf, Capacity= 207.41 cfs

60.0" Round Pipe
n= 0.014
Length= 121.0' Slope= 0.0074 '/'
Inlet Invert= 38.80', Outlet Invert= 37.91'



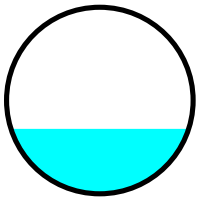
Summary for Reach P2: 78"

Inflow Area = 87.144 ac, 72.69% Impervious, Inflow Depth > 2.43" for 25-Year event
Inflow = 168.19 cfs @ 12.17 hrs, Volume= 17.612 af
Outflow = 168.13 cfs @ 12.17 hrs, Volume= 17.612 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 16.49 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.38 fps, Avg. Travel Time= 0.1 min

Peak Storage= 255 cf @ 12.17 hrs
Average Depth at Peak Storage= 2.25'
Bank-Full Depth= 6.50' Flow Area= 33.2 sf, Capacity= 653.15 cfs

78.0" Round Pipe
n= 0.014
Length= 25.0' Slope= 0.0180 '/'
Inlet Invert= 34.57', Outlet Invert= 34.12'



Summary for Reach POA 2: POA 2

Inflow Area = 87.144 ac, 72.69% Impervious, Inflow Depth > 2.43" for 25-Year event
Inflow = 168.13 cfs @ 12.17 hrs, Volume= 17.612 af
Outflow = 168.13 cfs @ 12.17 hrs, Volume= 17.612 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Summary for Pond 10P:

Inflow Area = 26.446 ac, 84.17% Impervious, Inflow Depth > 4.22" for 25-Year event
Inflow = 133.48 cfs @ 12.07 hrs, Volume= 9.299 af
Outflow = 31.27 cfs @ 12.45 hrs, Volume= 9.293 af, Atten= 77%, Lag= 22.9 min
Discarded = 28.80 cfs @ 12.45 hrs, Volume= 9.198 af
Primary = 2.47 cfs @ 12.45 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 50.43' @ 12.45 hrs Surf.Area= 61,158 sf Storage= 98,122 cf

Plug-Flow detention time= 19.6 min calculated for 9.288 af (100% of inflow)
Center-of-Mass det. time= 19.3 min (766.7 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	105,027 cf	**Custom Stage Data (Prismatic)** Listed below Inside #2
#2	47.00'	284,093 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
			815,261 cf Overall - 105,027 cf Embedded = 710,234 cf x 40.0% Voids
		389,120 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	8,079	0	0
48.00	8,079	8,079	8,079
49.00	8,079	8,079	16,158
50.00	8,079	8,079	24,237
51.00	8,079	8,079	32,316
52.00	8,079	8,079	40,395
53.00	8,079	8,079	48,474
53.67	8,079	5,413	53,887
60.00	8,079	51,140	105,027

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	57,735	0	0
48.00	58,728	58,232	58,232
49.00	59,725	59,227	117,458
50.00	60,728	60,227	177,685
51.00	61,734	61,231	238,916
52.00	62,745	62,240	301,155
53.00	63,761	63,253	364,408
53.67	64,440	42,947	407,355
60.00	64,440	407,905	815,261

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.00'	**19.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	49.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=28.80 cfs @ 12.45 hrs HW=50.43' (Free Discharge)
└─**1=Exfiltration** (Controls 28.80 cfs)

Primary OutFlow Max=2.49 cfs @ 12.45 hrs HW=50.43' (Free Discharge)
└─**2=Orifice/Grate** (Orifice Controls 2.49 cfs @ 3.28 fps)

Summary for Pond 11P:

Inflow Area =	13.807 ac,100.00% Impervious, Inflow Depth > 5.02" for 25-Year event			
Inflow =	77.04 cfs @	12.07 hrs, Volume=	5.777 af	
Outflow =	49.43 cfs @	12.15 hrs, Volume=	5.774 af, Atten= 36%, Lag= 5.1 min	
Discarded =	8.92 cfs @	12.15 hrs, Volume=	4.360 af	
Primary =	40.51 cfs @	12.15 hrs, Volume=	1.414 af	

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 52.75' @ 12.15 hrs Surf.Area= 18,930 sf Storage= 43,381 cf

Plug-Flow detention time= 14.4 min calculated for 5.771 af (100% of inflow)
Center-of-Mass det. time= 14.2 min (732.4 - 718.2)

Volume	Invert	Avail.Storage	Storage Description
#1	47.60'	28,656 cf	**Custom Stage Data (Prismatic)** Listed below Inside #2
#2	47.60'	82,866 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 235,821 cf Overall - 28,656 cf Embedded = 207,164 cf x 40.0% Voids
		111,522 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.60	2,311	0	0
48.00	2,311	924	924
49.00	2,311	2,311	3,235
50.00	2,311	2,311	5,546
51.00	2,311	2,311	7,857
52.00	2,311	2,311	10,168
53.00	2,311	2,311	12,479
54.00	2,311	2,311	14,790
55.00	2,311	2,311	17,101
55.25	2,311	578	17,679
60.00	2,311	10,977	28,656

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.60	16,274	0	0
48.00	16,476	6,550	6,550
49.00	16,984	16,730	23,280
50.00	17,496	17,240	40,520
51.00	18,013	17,755	58,274
52.00	18,535	18,274	76,548
53.00	19,061	18,798	95,346
54.00	19,592	19,327	114,673
55.00	20,127	19,860	134,532
55.25	20,261	5,049	139,581
60.00	20,261	96,240	235,821

Device	Routing	Invert	Outlet Devices
#1	Discarded	47.60'	**18.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	49.85'	**36.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=8.92 cfs @ 12.15 hrs HW=52.75' (Free Discharge)
└─**1=Exfiltration** (Controls 8.92 cfs)

Primary OutFlow Max=40.54 cfs @ 12.15 hrs HW=52.75' (Free Discharge)
└─**2=Orifice/Grate** (Orifice Controls 40.54 cfs @ 5.80 fps)

Summary for Pond 42.1P: Wetlands

Inflow Area = 87.144 ac, 72.69% Impervious, Inflow Depth > 2.43" for 25-Year event
Inflow = 186.30 cfs @ 12.11 hrs, Volume= 17.614 af
Outflow = 168.26 cfs @ 12.16 hrs, Volume= 17.614 af, Atten= 10%, Lag= 3.0 min
Primary = 168.26 cfs @ 12.16 hrs, Volume= 17.614 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 41.79' @ 12.16 hrs Surf.Area= 10,581 sf Storage= 18,397 cf

Plug-Flow detention time= 0.8 min calculated for 17.605 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (784.0 - 783.2)

Volume	Invert	Avail.Storage	Storage Description
#1	36.10'	83,475 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
36.10	0	0	0
36.56	36	8	8
37.02	71	25	33
37.52	628	175	208
38.02	1,185	453	661
38.52	1,515	675	1,336
39.02	1,845	840	2,176
39.52	2,750	1,149	3,325
40.02	3,654	1,601	4,926
40.52	6,082	2,434	7,360
41.02	8,510	3,648	11,008
41.52	9,847	4,589	15,597
42.02	11,185	5,258	20,855
42.52	12,262	5,862	26,717
43.02	13,340	6,401	33,117
43.52	14,672	7,003	40,120
44.02	16,005	7,669	47,789
44.52	17,355	8,340	56,129
45.02	18,705	9,015	65,144
46.00	18,705	18,331	83,475

Device	Routing	Invert	Outlet Devices
#1	Primary	36.11'	**72.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 36.11' / 36.10' S= 0.0100 '/' Cc= 0.900 n= 0.014, Flow Area= 28.27 sf

Primary OutFlow Max=168.15 cfs @ 12.16 hrs HW=41.79' (Free Discharge)
└─**1=Culvert** (Barrel Controls 168.15 cfs @ 7.83 fps)

Summary for Pond 47.1P:

Inflow Area = 1.866 ac, 34.83% Impervious, Inflow Depth > 1.31" for 25-Year event
Inflow = 2.37 cfs @ 12.18 hrs, Volume= 0.204 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 42.67' @ 20.00 hrs Surf.Area= 15,777 sf Storage= 8,861 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	245,602 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.00	10,588	0	0
43.00	18,307	14,448	14,448
44.00	25,585	21,946	36,394
45.00	30,645	28,115	64,509
46.00	36,838	33,742	98,250
50.00	36,838	147,352	245,602

Device	Routing	Invert	Outlet Devices
#1	Primary	47.00'	**165.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=42.00' (Free Discharge)
└─**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 47.4P:

Inflow Area = 0.163 ac,100.00% Impervious, Inflow Depth > 5.02" for 25-Year event
Inflow = 0.91 cfs @ 12.07 hrs, Volume= 0.068 af
Outflow = 0.90 cfs @ 12.08 hrs, Volume= 0.063 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.04 cfs @ 12.08 hrs, Volume= 0.033 af
Primary = 0.86 cfs @ 12.08 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 50.35' @ 12.08 hrs Surf.Area= 562 sf Storage= 500 cf

Plug-Flow detention time= 73.3 min calculated for 0.063 af (92% of inflow)
Center-of-Mass det. time= 43.2 min (761.4 - 718.2)

Volume	Invert	Avail.Storage	Storage Description
#1	49.00'	1,889 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
49.00	192	0	0
50.00	451	322	322
51.00	767	609	931
52.00	1,149	958	1,889

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.00'	**2.750 in/hr Exfiltration over Surface area**
#2	Primary	50.25'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 12.08 hrs HW=50.35' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.86 cfs @ 12.08 hrs HW=50.35' (Free Discharge)
└─**2=Orifice/Grate** (Weir Controls 0.86 cfs @ 1.05 fps)

Summary for Pond L69: 60"

Inflow Area = 60.153 ac, 83.55% Impervious, Inflow Depth > 2.45" for 25-Year event
Inflow = 125.28 cfs @ 12.11 hrs, Volume= 12.275 af
Outflow = 125.28 cfs @ 12.11 hrs, Volume= 12.275 af, Atten= 0%, Lag= 0.0 min
Primary = 125.28 cfs @ 12.11 hrs, Volume= 12.275 af

Routing by Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 43.63' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.50'	**60.0" Round Culvert** L= 127.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 38.50' / 38.00' S= 0.0039 '/' Cc= 0.900 n= 0.014, Flow Area= 19.63 sf

Primary OutFlow Max=125.09 cfs @ 12.11 hrs HW=43.62' (Free Discharge)
└─**1=Culvert** (Barrel Controls 125.09 cfs @ 7.73 fps)

Summary for Link 52.1L: Secondary Flow from 52.1P

Inflow = 36.21 cfs @ 12.63 hrs, Volume= 5.444 af
Primary = 36.21 cfs @ 12.63 hrs, Volume= 5.444 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

25-Year Secondary Outflow Imported from 3659-16003C-Proposed Conditions POA 3-01~Pond 52.1P.hce

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 14.3: Runoff Area=1.261 ac 72.09% Impervious Runoff Depth>4.32"
Tc=5.0 min CN=82 Runoff=6.94 cfs 0.454 af

Subcatchment S10.1: Retail Core South Runoff Area=553,813 sf 95.19% Impervious Runoff Depth>5.77"
Tc=5.0 min CN=95 Runoff=84.47 cfs 6.110 af

Subcatchment S10.2: South Site Drive Runoff Area=19,768 sf 68.81% Impervious Runoff Depth>4.11"
Tc=5.0 min CN=80 Runoff=2.39 cfs 0.155 af

Subcatchment S11.1: Retail Core North Runoff Area=6.449 ac 93.27% Impervious Runoff Depth>5.65"
Tc=5.0 min CN=94 Runoff=42.49 cfs 3.037 af

Subcatchment S11.2: North Site Drive Runoff Area=209,831 sf 76.49% Impervious Runoff Depth>4.53"
Tc=5.0 min CN=84 Runoff=27.57 cfs 1.819 af

Subcatchment S13: Runoff Area=4.329 ac 67.82% Impervious Runoff Depth>4.00"
Tc=5.0 min CN=79 Runoff=22.32 cfs 1.443 af

Subcatchment S14.1: Runoff Area=2.247 ac 73.65% Impervious Runoff Depth>4.32"
Tc=5.0 min CN=82 Runoff=12.37 cfs 0.808 af

Subcatchment S35: Runoff Area=58,042 sf 77.81% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=87 Runoff=8.03 cfs 0.540 af

Subcatchment S40: Runoff Area=2.670 ac 67.42% Impervious Runoff Depth>4.32"
Tc=5.0 min CN=82 Runoff=14.69 cfs 0.961 af

Subcatchment S40.1: Runoff Area=100,887 sf 45.60% Impervious Runoff Depth>3.12"
Flow Length=712' Tc=60.6 min CN=71 Runoff=3.64 cfs 0.603 af

Subcatchment S40.2: Runoff Area=3.200 ac 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=21.62 cfs 1.632 af

Subcatchment S41: Runoff Area=1.080 ac 55.56% Impervious Runoff Depth>3.69"
Tc=5.0 min CN=76 Runoff=5.18 cfs 0.332 af

Subcatchment S41.1: Runoff Area=2.030 ac 14.78% Impervious Runoff Depth>1.72"
Flow Length=245' Tc=18.1 min CN=55 Runoff=2.90 cfs 0.290 af

Subcatchment S42: Runoff Area=1.440 ac 73.61% Impervious Runoff Depth>4.64"
Tc=5.0 min CN=85 Runoff=8.39 cfs 0.557 af

Subcatchment S42.1: Runoff Area=78,183 sf 23.62% Impervious Runoff Depth>1.72"
Flow Length=362' Tc=11.1 min CN=55 Runoff=3.09 cfs 0.258 af

Subcatchment S44: Runoff Area=61,875 sf 92.36% Impervious Runoff Depth>5.65"
Tc=5.0 min CN=94 Runoff=9.36 cfs 0.669 af

Subcatchment S47.1: Runoff Area=81,281 sf 34.83% Impervious Runoff Depth>1.98"
Flow Length=271' Tc=11.5 min CN=58 Runoff=3.74 cfs 0.308 af

Subcatchment S47.2: Runoff Area=33,107 sf 83.86% Impervious Runoff Depth>4.97"
Tc=5.0 min CN=88 Runoff=4.66 cfs 0.315 af

Subcatchment S47.3: Runoff Area=38,241 sf 71.36% Impervious Runoff Depth>4.21"
Tc=5.0 min CN=81 Runoff=4.73 cfs 0.308 af

Subcatchment S47.4: Runoff Area=7,097 sf 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=1.10 cfs 0.083 af

Subcatchment S49: Runoff Area=3.120 ac 76.60% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=87 Runoff=18.81 cfs 1.264 af

Subcatchment S50: Runoff Area=296,167 sf 9.94% Impervious Runoff Depth>0.94"
Flow Length=1,000' Tc=24.1 min CN=45 Runoff=3.92 cfs 0.531 af

Subcatchment S55: Runoff Area=3.598 ac 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=24.31 cfs 1.835 af

Subcatchment S56.2: Runoff Area=1.327 ac 54.56% Impervious Runoff Depth>4.21"
Tc=5.0 min CN=81 Runoff=7.15 cfs 0.466 af

Subcatchment S57: Runoff Area=32,640 sf 76.04% Impervious Runoff Depth>4.75"
Tc=5.0 min CN=86 Runoff=4.44 cfs 0.297 af

Subcatchment S58: Runoff Area=0.837 ac 66.79% Impervious Runoff Depth>3.90"
Tc=5.0 min CN=78 Runoff=4.22 cfs 0.272 af

Subcatchment S61: Office Roof Runoff Area=38,705 sf 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=6.00 cfs 0.453 af

Subcatchment S7: Retail Core Loading Runoff Area=317,270 sf 56.88% Impervious Runoff Depth>4.11"
Tc=5.0 min CN=80 Runoff=38.41 cfs 2.492 af

Subcatchment S8: Retail Core South Runoff Area=215,747 sf 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=33.46 cfs 2.526 af

Subcatchment S9: Retail Core North Runoff Area=190,258 sf 100.00% Impervious Runoff Depth>6.12"
Tc=5.0 min CN=98 Runoff=29.51 cfs 2.227 af

Reach 1aR: 54" Avg. Flow Depth=4.16' Max Vel=7.68 fps Inflow=116.54 cfs 7.264 af
54.0" Round Pipe n=0.014 L=314.0' S=0.0034 '/' Capacity=107.09 cfs Outflow=115.07 cfs 7.260 af

Reach 1R: 54" Avg. Flow Depth=3.98' Max Vel=7.23 fps Inflow=107.12 cfs 6.602 af
54.0" Round Pipe n=0.014 L=167.0' S=0.0031 '/' Capacity=100.91 cfs Outflow=106.72 cfs 6.600 af

Reach 53R: Avg. Flow Depth=2.05' Max Vel=7.26 fps Inflow=47.11 cfs 9.508 af
48.0" Round Pipe n=0.014 L=249.0' S=0.0046 '/' Capacity=90.25 cfs Outflow=47.09 cfs 9.508 af

Reach 54R: 48" Pipe Avg. Flow Depth=2.10' Max Vel=7.18 fps Inflow=48.11 cfs 9.780 af
48.0" Round Pipe n=0.014 L=743.0' S=0.0044 '/' Capacity=88.35 cfs Outflow=48.02 cfs 9.777 af

Reach L113: 72" Avg. Flow Depth=2.77' Max Vel=17.01 fps Inflow=217.32 cfs 25.429 af
72.0" Round Pipe n=0.014 L=96.0' S=0.0160 '/' Capacity=498.08 cfs Outflow=217.24 cfs 25.428 af

Reach L123: Avg. Flow Depth=3.32' Max Vel=6.14 fps Inflow=71.87 cfs 5.795 af
48.0" Round Pipe n=0.014 L=700.0' S=0.0026 '/' Capacity=67.64 cfs Outflow=68.40 cfs 5.784 af

Reach L157: Avg. Flow Depth=3.19' Max Vel=4.12 fps Inflow=44.55 cfs 2.942 af
48.0" Round Pipe n=0.014 L=138.0' S=0.0012 '/' Capacity=45.42 cfs Outflow=44.21 cfs 2.940 af

Reach L158: Avg. Flow Depth=2.22' Max Vel=6.94 fps Inflow=50.01 cfs 3.875 af
48.0" Round Pipe n=0.014 L=254.0' S=0.0039 '/' Capacity=83.69 cfs Outflow=49.72 cfs 3.872 af

Reach L159: Avg. Flow Depth=0.78' Max Vel=3.19 fps Inflow=3.64 cfs 0.603 af
24.0" Round Pipe n=0.014 L=70.0' S=0.0029 '/' Capacity=11.23 cfs Outflow=3.63 cfs 0.603 af

Reach L76: Avg. Flow Depth=1.64' Max Vel=6.17 fps Inflow=30.35 cfs 1.983 af
48.0" Round Pipe n=0.014 L=355.0' S=0.0041 '/' Capacity=84.95 cfs Outflow=29.98 cfs 1.981 af

Reach L81: Avg. Flow Depth=2.09' Max Vel=9.73 fps Inflow=75.77 cfs 6.341 af
60.0" Round Pipe n=0.014 L=121.0' S=0.0074 '/' Capacity=207.41 cfs Outflow=75.70 cfs 6.340 af

Reach P2: 78" Avg. Flow Depth=2.58' Max Vel=17.69 fps Inflow=217.24 cfs 25.428 af
78.0" Round Pipe n=0.014 L=25.0' S=0.0180 '/' Capacity=653.15 cfs Outflow=217.19 cfs 25.428 af

Reach POA 2: POA 2 Inflow=217.19 cfs 25.428 af
Outflow=217.19 cfs 25.428 af

Pond 10P: Peak Elev=51.68' Storage=134,997 cf Inflow=165.35 cfs 11.639 af
Discarded=30.07 cfs 11.259 af Primary=4.89 cfs 0.373 af Outflow=34.97 cfs 11.632 af

Pond 11P: Peak Elev=53.57' Storage=50,838 cf Inflow=93.29 cfs 7.041 af
Discarded=9.25 cfs 5.011 af Primary=50.76 cfs 2.026 af Outflow=60.00 cfs 7.037 af

Pond 42.1P: Wetlands Peak Elev=42.87' Storage=31,077 cf Inflow=243.68 cfs 25.430 af
72.0" Round Culvert n=0.014 L=1.0' S=0.0100 '/' Outflow=217.32 cfs 25.429 af

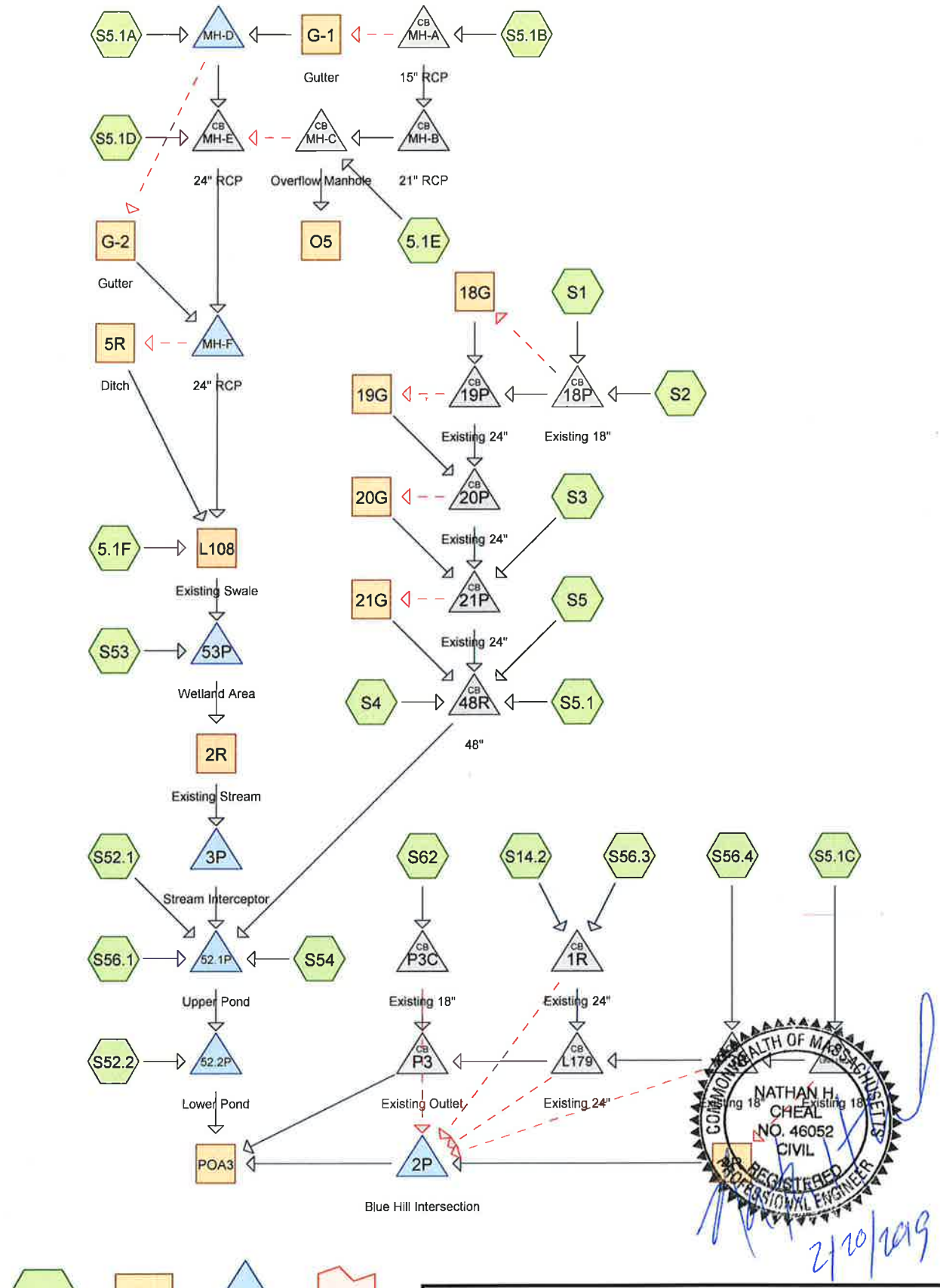
Pond 47.1P: Peak Elev=42.94' Storage=13,391 cf Inflow=3.74 cfs 0.308 af
Outflow=0.00 cfs 0.000 af

Pond 47.4P: Peak Elev=50.37' Storage=508 cf Inflow=1.10 cfs 0.083 af
Discarded=0.04 cfs 0.036 af Primary=1.05 cfs 0.041 af Outflow=1.09 cfs 0.077 af

Pond L69: 60" Peak Elev=45.23' Inflow=164.53 cfs 18.301 af
60.0" Round Culvert n=0.014 L=127.0' S=0.0039 '/' Outflow=164.53 cfs 18.301 af

Link Secondary Outflow Imported from 3659-16003C-Proposed Conditions POA 3-01~Pond 52.1P.hce Inflow=45.45 cfs 9.043 af
Primary=45.45 cfs 9.043 af

Total Runoff Area = 87.144 ac Runoff Volume = 33.044 af Average Runoff Depth = 4.55"
27.31% Pervious = 23.796 ac 72.69% Impervious = 63.349 ac



COMMONWEALTH OF MASSACHUSETTS
NATHAN H. CHEAL
NO. 46052
CIVIL
REGISTERED PROFESSIONAL ENGINEER

2/20/2019

Routing Diagram for 3659-16003C-Proposed Conditions POA 3-01
Prepared by Tetra Tech Inc, Printed 2/13/2019
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Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 5.1E: Runoff Area=31,933 sf 41.91% Impervious Runoff Depth>0.75"
Flow Length=142' Tc=7.6 min CN=70 Runoff=0.60 cfs 0.046 af

Subcatchment 5.1F: Runoff Area=1.293 ac 51.35% Impervious Runoff Depth>1.05"
Flow Length=142' Tc=7.6 min CN=76 Runoff=1.59 cfs 0.114 af

Subcatchment S1: Runoff Area=9.019 ac 3.15% Impervious Runoff Depth>0.04"
Flow Length=1,389' Tc=13.3 min CN=46 Runoff=0.07 cfs 0.030 af

Subcatchment S14.2: Runoff Area=2.483 ac 70.72% Impervious Runoff Depth>1.36"
Tc=5.0 min CN=81 Runoff=4.41 cfs 0.281 af

Subcatchment S2: Runoff Area=5.023 ac 67.65% Impervious Runoff Depth>1.29"
Flow Length=871' Tc=7.2 min CN=80 Runoff=7.83 cfs 0.541 af

Subcatchment S3: Runoff Area=3.484 ac 77.24% Impervious Runoff Depth>1.87"
Tc=5.0 min CN=88 Runoff=8.43 cfs 0.543 af

Subcatchment S4: Runoff Area=13.925 ac 10.84% Impervious Runoff Depth>0.29"
Flow Length=2,418' Tc=20.2 min CN=58 Runoff=2.07 cfs 0.336 af

Subcatchment S5: Runoff Area=6.485 ac 77.30% Impervious Runoff Depth>1.64"
Tc=5.0 min CN=85 Runoff=13.86 cfs 0.885 af

Subcatchment S5.1: Runoff Area=3.325 ac 72.60% Impervious Runoff Depth>1.87"
Flow Length=1,190' Tc=14.6 min CN=88 Runoff=5.94 cfs 0.517 af

Subcatchment S5.1A: Runoff Area=12.811 ac 9.75% Impervious Runoff Depth>0.18"
Flow Length=1,375' Tc=21.0 min CN=54 Runoff=0.89 cfs 0.196 af

Subcatchment S5.1B: Runoff Area=16.994 ac 17.91% Impervious Runoff Depth>0.45"
Flow Length=2,092' Tc=24.8 min CN=63 Runoff=4.67 cfs 0.641 af

Subcatchment S5.1C: Runoff Area=16.789 ac 19.70% Impervious Runoff Depth>0.79"
Flow Length=2,090' Tc=25.1 min CN=71 Runoff=9.59 cfs 1.101 af

Subcatchment S5.1D: Runoff Area=1.148 ac 28.92% Impervious Runoff Depth>0.46"
Flow Length=355' Tc=11.3 min CN=63 Runoff=0.41 cfs 0.044 af

Subcatchment S52.1: Runoff Area=10.899 ac 7.25% Impervious Runoff Depth>0.57"
Flow Length=1,830' Tc=19.7 min CN=66 Runoff=4.49 cfs 0.516 af

Subcatchment S52.2: Runoff Area=1.651 ac 7.21% Impervious Runoff Depth>0.49"
Flow Length=752' Tc=27.6 min CN=64 Runoff=0.49 cfs 0.067 af

Subcatchment S53: Runoff Area=5.043 ac 5.71% Impervious Runoff Depth>0.53"
Flow Length=958' Tc=15.8 min CN=65 Runoff=2.03 cfs 0.223 af

Subcatchment S54: Runoff Area=2.244 ac 15.20% Impervious Runoff Depth>0.61"
Flow Length=625' Tc=18.3 min CN=67 Runoff=1.05 cfs 0.114 af

Subcatchment S56.1: Runoff Area=3.348 ac 77.99% Impervious Runoff Depth>1.95"
Tc=5.0 min CN=89 Runoff=8.41 cfs 0.545 af

Subcatchment S56.3: Runoff Area=2.941 ac 75.52% Impervious Runoff Depth>1.64"
Tc=5.0 min CN=85 Runoff=6.29 cfs 0.402 af

Subcatchment S56.4: Runoff Area=3.182 ac 29.10% Impervious Runoff Depth>0.94"
Flow Length=626' Tc=15.1 min CN=74 Runoff=2.75 cfs 0.250 af

Subcatchment S62: Runoff Area=0.787 ac 81.70% Impervious Runoff Depth>1.79"
Tc=5.0 min CN=87 Runoff=1.83 cfs 0.117 af

Reach 2R: Existing Stream Avg. Flow Depth=0.13' Max Vel=2.18 fps Inflow=0.95 cfs 0.342 af
n=0.030 L=660.0' S=0.0364 '/' Capacity=206.03 cfs Outflow=0.95 cfs 0.339 af

Reach 4R: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=105.0' S=0.0308 '/' Capacity=135.01 cfs Outflow=0.00 cfs 0.000 af

Reach 5R: Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
x 2.00 n=0.030 L=65.0' S=0.2385 '/' Capacity=303.75 cfs Outflow=0.00 cfs 0.000 af

Reach 18G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=520.0' S=0.0263 '/' Capacity=19.67 cfs Outflow=0.00 cfs 0.000 af

Reach 19G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=340.0' S=0.0213 '/' Capacity=17.69 cfs Outflow=0.00 cfs 0.000 af

Reach 20G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=170.0' S=0.0369 '/' Capacity=23.30 cfs Outflow=0.00 cfs 0.000 af

Reach 21G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=175.0' S=0.0406 '/' Capacity=24.44 cfs Outflow=0.00 cfs 0.000 af

Reach G-1: Gutter Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
x 2.00 n=0.030 L=240.0' S=0.0304 '/' Capacity=42.29 cfs Outflow=0.00 cfs 0.000 af

Reach G-2: Gutter Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=260.0' S=0.0247 '/' Capacity=19.05 cfs Outflow=0.00 cfs 0.000 af

Reach L108: Existing Swale Avg. Flow Depth=0.03' Max Vel=1.30 fps Inflow=1.92 cfs 0.353 af
n=0.030 L=774.0' S=0.0646 '/' Capacity=1,762.00 cfs Outflow=1.60 cfs 0.349 af

Reach O5: Inflow=4.94 cfs 0.686 af
Outflow=4.94 cfs 0.686 af

Reach POA3: Inflow=17.61 cfs 5.204 af
Outflow=17.61 cfs 5.204 af

Pond 1R: Existing 24" Peak Elev=45.67' Inflow=10.69 cfs 0.683 af
Primary=10.69 cfs 0.683 af Secondary=0.00 cfs 0.000 af Outflow=10.69 cfs 0.683 af

Pond 2P: Blue Hill Intersection Peak Elev=46.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 3P: Stream Interceptor Peak Elev=48.82' Storage=11 cf Inflow=0.95 cfs 0.339 af
30.0" Round Culvert n=0.014 L=73.0' S=0.0055 '/' Outflow=0.95 cfs 0.339 af

Pond 18P: Existing 18" Peak Elev=109.00' Inflow=7.83 cfs 0.572 af
Primary=7.83 cfs 0.572 af Secondary=0.00 cfs 0.000 af Outflow=7.83 cfs 0.572 af

Pond 19P: Existing 24" Peak Elev=100.15' Inflow=7.83 cfs 0.572 af
Primary=7.83 cfs 0.572 af Secondary=0.00 cfs 0.000 af Outflow=7.83 cfs 0.572 af

Pond 20P: Existing 24" Peak Elev=96.05' Inflow=7.83 cfs 0.572 af
Primary=7.83 cfs 0.572 af Secondary=0.00 cfs 0.000 af Outflow=7.83 cfs 0.572 af

Pond 21P: Existing 24" Peak Elev=90.91' Inflow=15.91 cfs 1.115 af
Primary=15.91 cfs 1.115 af Secondary=0.00 cfs 0.000 af Outflow=15.91 cfs 1.115 af

Pond 48R: 48" Peak Elev=79.83' Inflow=33.86 cfs 2.853 af
48.0" Round Culvert n=0.014 L=1,000.0' S=0.0307 '/' Outflow=33.86 cfs 2.853 af

Pond 52.1P: Upper Pond Peak Elev=49.14' Storage=54,762 cf Inflow=43.88 cfs 4.368 af
Primary=14.15 cfs 3.656 af Secondary=3.78 cfs 0.210 af Tertiary=0.00 cfs 0.000 af Outflow=17.61 cfs 3.866 af

Pond 52.2P: Lower Pond Peak Elev=48.24' Storage=49,168 cf Inflow=14.58 cfs 3.723 af
Primary=6.60 cfs 3.053 af Tertiary=0.00 cfs 0.000 af Outflow=6.60 cfs 3.053 af

Pond 53P: Wetland Area Peak Elev=79.14' Storage=10,942 cf Inflow=3.50 cfs 0.572 af
Outflow=0.95 cfs 0.342 af

Pond L179: Existing 24" Peak Elev=44.55' Inflow=15.77 cfs 2.034 af
Primary=15.77 cfs 2.034 af Secondary=0.00 cfs 0.000 af Outflow=15.77 cfs 2.034 af

Pond LINK 110.1: Existing 18" Peak Elev=49.61' Inflow=9.59 cfs 1.101 af
Primary=9.59 cfs 1.101 af Secondary=0.00 cfs 0.000 af Outflow=9.59 cfs 1.101 af

Pond MH-A: 15" RCP Peak Elev=158.25' Inflow=4.67 cfs 0.641 af
Primary=4.67 cfs 0.641 af Secondary=0.00 cfs 0.000 af Outflow=4.67 cfs 0.641 af

Pond MH-B: 21" RCP Peak Elev=150.00' Inflow=4.67 cfs 0.641 af
21.0" Round Culvert n=0.012 L=300.0' S=0.0060 '/' Outflow=4.67 cfs 0.641 af

Pond MH-C: Overflow Manhole Peak Elev=147.51' Inflow=4.94 cfs 0.686 af
Primary=4.94 cfs 0.686 af Secondary=0.00 cfs 0.000 af Outflow=4.94 cfs 0.686 af

Pond MH-D: Peak Elev=152.99' Storage=0 cf Inflow=0.89 cfs 0.196 af
Primary=0.89 cfs 0.196 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.196 af

Pond MH-E: 24" RCP Peak Elev=148.30' Inflow=1.11 cfs 0.239 af
24.0" Round Culvert n=0.012 L=260.0' S=0.0262 '/' Outflow=1.11 cfs 0.239 af

Pond MH-F: 24" RCP Peak Elev=148.29' Storage=0 cf Inflow=1.11 cfs 0.239 af
Primary=1.11 cfs 0.239 af Secondary=0.00 cfs 0.000 af Outflow=1.11 cfs 0.239 af

Pond P3: Existing Outlet Peak Elev=43.53' Inflow=17.06 cfs 2.151 af
Primary=17.06 cfs 2.151 af Secondary=0.00 cfs 0.000 af Outflow=17.06 cfs 2.151 af

Pond P3B: Existing 18" Peak Elev=46.44' Inflow=11.72 cfs 1.351 af
Primary=11.72 cfs 1.351 af Secondary=0.00 cfs 0.000 af Outflow=11.72 cfs 1.351 af

Pond P3C: Existing 18" Peak Elev=44.15' Inflow=1.83 cfs 0.117 af
Primary=1.83 cfs 0.117 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.117 af

Total Runoff Area = 123.607 ac Runoff Volume = 7.509 af Average Runoff Depth = 0.73"
72.57% Pervious = 89.700 ac 27.43% Impervious = 33.907 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 5.1E: Runoff Area=31,933 sf 41.91% Impervious Runoff Depth>1.60"
Flow Length=142' Tc=7.6 min CN=70 Runoff=1.38 cfs 0.098 af

Subcatchment 5.1F: Runoff Area=1.293 ac 51.35% Impervious Runoff Depth>2.05"
Flow Length=142' Tc=7.6 min CN=76 Runoff=3.15 cfs 0.221 af

Subcatchment S1: Runoff Area=9.019 ac 3.15% Impervious Runoff Depth>0.30"
Flow Length=1,389' Tc=13.3 min CN=46 Runoff=1.26 cfs 0.227 af

Subcatchment S14.2: Runoff Area=2.483 ac 70.72% Impervious Runoff Depth>2.46"
Tc=5.0 min CN=81 Runoff=7.95 cfs 0.509 af

Subcatchment S2: Runoff Area=5.023 ac 67.65% Impervious Runoff Depth>2.37"
Flow Length=871' Tc=7.2 min CN=80 Runoff=14.39 cfs 0.993 af

Subcatchment S3: Runoff Area=3.484 ac 77.24% Impervious Runoff Depth>3.10"
Tc=5.0 min CN=88 Runoff=13.67 cfs 0.900 af

Subcatchment S4: Runoff Area=13.925 ac 10.84% Impervious Runoff Depth>0.85"
Flow Length=2,418' Tc=20.2 min CN=58 Runoff=8.57 cfs 0.982 af

Subcatchment S5: Runoff Area=6.485 ac 77.30% Impervious Runoff Depth>2.82"
Tc=5.0 min CN=85 Runoff=23.49 cfs 1.522 af

Subcatchment S5.1: Runoff Area=3.325 ac 72.60% Impervious Runoff Depth>3.09"
Flow Length=1,190' Tc=14.6 min CN=88 Runoff=9.66 cfs 0.857 af

Subcatchment S5.1A: Runoff Area=12.811 ac 9.75% Impervious Runoff Depth>0.64"
Flow Length=1,375' Tc=21.0 min CN=54 Runoff=5.24 cfs 0.684 af

Subcatchment S5.1B: Runoff Area=16.994 ac 17.91% Impervious Runoff Depth>1.13"
Flow Length=2,092' Tc=24.8 min CN=63 Runoff=14.02 cfs 1.602 af

Subcatchment S5.1C: Runoff Area=16.789 ac 19.70% Impervious Runoff Depth>1.66"
Flow Length=2,090' Tc=25.1 min CN=71 Runoff=21.38 cfs 2.321 af

Subcatchment S5.1D: Runoff Area=1.148 ac 28.92% Impervious Runoff Depth>1.14"
Flow Length=355' Tc=11.3 min CN=63 Runoff=1.29 cfs 0.109 af

Subcatchment S52.1: Runoff Area=10.899 ac 7.25% Impervious Runoff Depth>1.32"
Flow Length=1,830' Tc=19.7 min CN=66 Runoff=11.85 cfs 1.201 af

Subcatchment S52.2: Runoff Area=1.651 ac 7.21% Impervious Runoff Depth>1.19"
Flow Length=752' Tc=27.6 min CN=64 Runoff=1.39 cfs 0.164 af

Subcatchment S53: Runoff Area=5.043 ac 5.71% Impervious Runoff Depth>1.26"
Flow Length=958' Tc=15.8 min CN=65 Runoff=5.65 cfs 0.530 af

Subcatchment S54: Runoff Area=2.244 ac 15.20% Impervious Runoff Depth>1.39"
Flow Length=625' Tc=18.3 min CN=67 Runoff=2.66 cfs 0.260 af

Subcatchment S56.1: Runoff Area=3.348 ac 77.99% Impervious Runoff Depth>3.20"
Tc=5.0 min CN=89 Runoff=13.46 cfs 0.892 af

Subcatchment S56.3: Runoff Area=2.941 ac 75.52% Impervious Runoff Depth>2.82"
Tc=5.0 min CN=85 Runoff=10.65 cfs 0.690 af

Subcatchment S56.4: Runoff Area=3.182 ac 29.10% Impervious Runoff Depth>1.89"
Flow Length=626' Tc=15.1 min CN=74 Runoff=5.69 cfs 0.500 af

Subcatchment S62: Runoff Area=0.787 ac 81.70% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=87 Runoff=3.01 cfs 0.197 af

Reach 2R: Existing Stream Avg. Flow Depth=0.45' Max Vel=4.50 fps Inflow=9.36 cfs 1.327 af
n=0.030 L=660.0' S=0.0364 '/' Capacity=206.03 cfs Outflow=9.28 cfs 1.322 af

Reach 4R: Avg. Flow Depth=0.37' Max Vel=2.81 fps Inflow=9.89 cfs 0.296 af
n=0.030 L=105.0' S=0.0308 '/' Capacity=135.01 cfs Outflow=9.87 cfs 0.296 af

Reach 5R: Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
x 2.00 n=0.030 L=65.0' S=0.2385 '/' Capacity=303.75 cfs Outflow=0.00 cfs 0.000 af

Reach 18G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=520.0' S=0.0263 '/' Capacity=19.67 cfs Outflow=0.00 cfs 0.000 af

Reach 19G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=340.0' S=0.0213 '/' Capacity=17.69 cfs Outflow=0.00 cfs 0.000 af

Reach 20G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=170.0' S=0.0369 '/' Capacity=23.30 cfs Outflow=0.00 cfs 0.000 af

Reach 21G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=175.0' S=0.0406 '/' Capacity=24.44 cfs Outflow=0.00 cfs 0.000 af

Reach G-1: Gutter Avg. Flow Depth=0.16' Max Vel=1.59 fps Inflow=2.19 cfs 0.035 af
x 2.00 n=0.030 L=240.0' S=0.0304 '/' Capacity=42.29 cfs Outflow=2.06 cfs 0.035 af

Reach G-2: Gutter Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=260.0' S=0.0247 '/' Capacity=19.05 cfs Outflow=0.00 cfs 0.000 af

Reach L108: Existing Swale Avg. Flow Depth=0.09' Max Vel=2.50 fps Inflow=9.29 cfs 1.049 af
n=0.030 L=774.0' S=0.0646 '/' Capacity=1,762.00 cfs Outflow=8.94 cfs 1.040 af

Reach O5: Inflow=12.61 cfs 1.665 af
Outflow=12.61 cfs 1.665 af

Reach POA3: Inflow=35.49 cfs 9.019 af
Outflow=35.49 cfs 9.019 af

Pond 1R: Existing 24" Peak Elev=47.33' Inflow=18.60 cfs 1.199 af
Primary=16.60 cfs 1.125 af Secondary=11.72 cfs 0.074 af Outflow=18.60 cfs 1.199 af

Pond 2P: Blue Hill Intersection Peak Elev=47.23' Storage=11,881 cf Inflow=23.80 cfs 0.574 af
Outflow=12.33 cfs 0.447 af

Pond 3P: Stream Interceptor Peak Elev=50.73' Storage=25 cf Inflow=9.28 cfs 1.322 af
30.0" Round Culvert n=0.014 L=73.0' S=0.0055 '/' Outflow=9.30 cfs 1.322 af

Pond 18P: Existing 18" Peak Elev=111.03' Inflow=14.44 cfs 1.221 af
Primary=14.44 cfs 1.221 af Secondary=0.00 cfs 0.000 af Outflow=14.44 cfs 1.221 af

Pond 19P: Existing 24" Peak Elev=100.80' Inflow=14.44 cfs 1.221 af
Primary=14.44 cfs 1.221 af Secondary=0.00 cfs 0.000 af Outflow=14.44 cfs 1.221 af

Pond 20P: Existing 24" Peak Elev=96.70' Inflow=14.44 cfs 1.221 af
Primary=14.44 cfs 1.221 af Secondary=0.00 cfs 0.000 af Outflow=14.44 cfs 1.221 af

Pond 21P: Existing 24" Peak Elev=93.11' Inflow=27.54 cfs 2.121 af
Primary=27.54 cfs 2.121 af Secondary=0.00 cfs 0.000 af Outflow=27.54 cfs 2.121 af

Pond 48R: 48" Peak Elev=80.72' Inflow=60.23 cfs 5.482 af
48.0" Round Culvert n=0.014 L=1,000.0' S=0.0307 '/' Outflow=60.23 cfs 5.482 af

Pond 52.1P: Upper Pond Peak Elev=50.57' Storage=98,657 cf Inflow=80.23 cfs 9.157 af
Primary=17.71 cfs 5.674 af Secondary=22.03 cfs 2.810 af Tertiary=0.00 cfs 0.000 af Outflow=39.54 cfs 8.484 af

Pond 52.2P: Lower Pond Peak Elev=48.70' Storage=68,161 cf Inflow=19.09 cfs 5.838 af
Primary=9.76 cfs 4.928 af Tertiary=0.00 cfs 0.000 af Outflow=9.76 cfs 4.928 af

Pond 53P: Wetland Area Peak Elev=79.56' Storage=16,868 cf Inflow=13.07 cfs 1.570 af
Outflow=9.36 cfs 1.327 af

Pond L179: Existing 24" Peak Elev=47.27' Inflow=28.49 cfs 3.453 af
Primary=28.26 cfs 3.447 af Secondary=3.16 cfs 0.006 af Outflow=28.49 cfs 3.453 af

Pond LINK 110.1: Existing 18" Peak Elev=51.87' Inflow=21.38 cfs 2.321 af
Primary=11.51 cfs 2.025 af Secondary=9.89 cfs 0.296 af Outflow=21.38 cfs 2.321 af

Pond MH-A: 15" RCP Peak Elev=162.83' Inflow=14.02 cfs 1.602 af
Primary=11.83 cfs 1.567 af Secondary=2.19 cfs 0.035 af Outflow=14.02 cfs 1.602 af

Pond MH-B: 21" RCP Peak Elev=150.92' Inflow=11.83 cfs 1.567 af
21.0" Round Culvert n=0.012 L=300.0' S=0.0060 '/' Outflow=11.83 cfs 1.567 af

Pond MH-C: Overflow Manhole Peak Elev=148.47' Inflow=12.61 cfs 1.665 af
Primary=12.61 cfs 1.665 af Secondary=0.00 cfs 0.000 af Outflow=12.61 cfs 1.665 af

Pond MH-D: Peak Elev=152.99' Storage=0 cf Inflow=7.25 cfs 0.719 af
Primary=7.25 cfs 0.719 af Secondary=0.00 cfs 0.000 af Outflow=7.25 cfs 0.719 af

Pond MH-E: 24" RCP Peak Elev=148.72' Inflow=8.03 cfs 0.828 af
24.0" Round Culvert n=0.012 L=260.0' S=0.0262 '/' Outflow=8.03 cfs 0.828 af

Pond MH-F: 24" RCP Peak Elev=148.29' Storage=0 cf Inflow=8.03 cfs 0.828 af
Primary=8.03 cfs 0.828 af Secondary=0.00 cfs 0.000 af Outflow=8.03 cfs 0.828 af

Pond P3: Existing Outlet Peak Elev=46.11' Inflow=30.46 cfs 3.644 af
Primary=30.46 cfs 3.644 af Secondary=0.00 cfs 0.000 af Outflow=30.46 cfs 3.644 af

Pond P3B: Existing 18" Peak Elev=47.43' Inflow=17.12 cfs 2.525 af
Primary=15.11 cfs 2.328 af Secondary=12.41 cfs 0.197 af Outflow=17.12 cfs 2.525 af

Pond P3C: Existing 18" Peak Elev=46.19' Inflow=3.01 cfs 0.197 af
Primary=3.01 cfs 0.197 af Secondary=0.00 cfs 0.000 af Outflow=3.01 cfs 0.197 af

Total Runoff Area = 123.607 ac Runoff Volume = 15.460 af Average Runoff Depth = 1.50"
72.57% Pervious = 89.700 ac 27.43% Impervious = 33.907 ac

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 5.1E: Runoff Area=31,933 sf 41.91% Impervious Runoff Depth>2.23"
Flow Length=142' Tc=7.6 min CN=70 Runoff=1.94 cfs 0.136 af

Subcatchment 5.1F: Runoff Area=1.293 ac 51.35% Impervious Runoff Depth>2.75"
Flow Length=142' Tc=7.6 min CN=76 Runoff=4.23 cfs 0.296 af

Subcatchment S1: Runoff Area=9.019 ac 3.15% Impervious Runoff Depth>0.57"
Flow Length=1,389' Tc=13.3 min CN=46 Runoff=3.13 cfs 0.432 af

Subcatchment S14.2: Runoff Area=2.483 ac 70.72% Impervious Runoff Depth>3.21"
Tc=5.0 min CN=81 Runoff=10.32 cfs 0.665 af

Subcatchment S2: Runoff Area=5.023 ac 67.65% Impervious Runoff Depth>3.12"
Flow Length=871' Tc=7.2 min CN=80 Runoff=18.80 cfs 1.305 af

Subcatchment S3: Runoff Area=3.484 ac 77.24% Impervious Runoff Depth>3.91"
Tc=5.0 min CN=88 Runoff=17.05 cfs 1.137 af

Subcatchment S4: Runoff Area=13.925 ac 10.84% Impervious Runoff Depth>1.30"
Flow Length=2,418' Tc=20.2 min CN=58 Runoff=14.24 cfs 1.513 af

Subcatchment S5: Runoff Area=6.485 ac 77.30% Impervious Runoff Depth>3.61"
Tc=5.0 min CN=85 Runoff=29.77 cfs 1.950 af

Subcatchment S5.1: Runoff Area=3.325 ac 72.60% Impervious Runoff Depth>3.90"
Flow Length=1,190' Tc=14.6 min CN=88 Runoff=12.06 cfs 1.082 af

Subcatchment S5.1A: Runoff Area=12.811 ac 9.75% Impervious Runoff Depth>1.04"
Flow Length=1,375' Tc=21.0 min CN=54 Runoff=9.62 cfs 1.108 af

Subcatchment S5.1B: Runoff Area=16.994 ac 17.91% Impervious Runoff Depth>1.66"
Flow Length=2,092' Tc=24.8 min CN=63 Runoff=21.35 cfs 2.351 af

Subcatchment S5.1C: Runoff Area=16.789 ac 19.70% Impervious Runoff Depth>2.30"
Flow Length=2,090' Tc=25.1 min CN=71 Runoff=29.87 cfs 3.212 af

Subcatchment S5.1D: Runoff Area=1.148 ac 28.92% Impervious Runoff Depth>1.67"
Flow Length=355' Tc=11.3 min CN=63 Runoff=1.96 cfs 0.160 af

Subcatchment S52.1: Runoff Area=10.899 ac 7.25% Impervious Runoff Depth>1.89"
Flow Length=1,830' Tc=19.7 min CN=66 Runoff=17.43 cfs 1.720 af

Subcatchment S52.2: Runoff Area=1.651 ac 7.21% Impervious Runoff Depth>1.73"
Flow Length=752' Tc=27.6 min CN=64 Runoff=2.08 cfs 0.239 af

Subcatchment S53: Runoff Area=5.043 ac 5.71% Impervious Runoff Depth>1.82"
Flow Length=958' Tc=15.8 min CN=65 Runoff=8.40 cfs 0.765 af

Subcatchment S54: Runoff Area=2.244 ac 15.20% Impervious Runoff Depth>1.97"
Flow Length=625' Tc=18.3 min CN=67 Runoff=3.87 cfs 0.369 af

Subcatchment S56.1: Runoff Area=3.348 ac 77.99% Impervious Runoff Depth>4.02"
Tc=5.0 min CN=89 Runoff=16.70 cfs 1.121 af

Subcatchment S56.3: Runoff Area=2.941 ac 75.52% Impervious Runoff Depth>3.61"
Tc=5.0 min CN=85 Runoff=13.50 cfs 0.884 af

Subcatchment S56.4: Runoff Area=3.182 ac 29.10% Impervious Runoff Depth>2.56"
Flow Length=626' Tc=15.1 min CN=74 Runoff=7.77 cfs 0.680 af

Subcatchment S62: Runoff Area=0.787 ac 81.70% Impervious Runoff Depth>3.81"
Tc=5.0 min CN=87 Runoff=3.77 cfs 0.250 af

Reach 2R: Existing Stream Avg. Flow Depth=0.72' Max Vel=5.80 fps Inflow=23.00 cfs 2.336 af
n=0.030 L=660.0' S=0.0364 '/' Capacity=206.03 cfs Outflow=22.89 cfs 2.329 af

Reach 4R: Avg. Flow Depth=0.47' Max Vel=3.25 fps Inflow=17.76 cfs 0.654 af
n=0.030 L=105.0' S=0.0308 '/' Capacity=135.01 cfs Outflow=17.74 cfs 0.654 af

Reach 5R: Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
x 2.00 n=0.030 L=65.0' S=0.2385 '/' Capacity=303.75 cfs Outflow=0.00 cfs 0.000 af

Reach 18G: Avg. Flow Depth=0.11' Max Vel=1.13 fps Inflow=1.18 cfs 0.004 af
n=0.030 L=520.0' S=0.0263 '/' Capacity=19.67 cfs Outflow=0.33 cfs 0.004 af

Reach 19G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=340.0' S=0.0213 '/' Capacity=17.69 cfs Outflow=0.00 cfs 0.000 af

Reach 20G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=170.0' S=0.0369 '/' Capacity=23.30 cfs Outflow=0.00 cfs 0.000 af

Reach 21G: Avg. Flow Depth=0.20' Max Vel=2.09 fps Inflow=2.80 cfs 0.010 af
n=0.030 L=175.0' S=0.0406 '/' Capacity=24.44 cfs Outflow=2.02 cfs 0.010 af

Reach G-1: Gutter Avg. Flow Depth=0.28' Max Vel=2.31 fps Inflow=9.37 cfs 0.270 af
x 2.00 n=0.030 L=240.0' S=0.0304 '/' Capacity=42.29 cfs Outflow=9.25 cfs 0.270 af

Reach G-2: Gutter Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=260.0' S=0.0247 '/' Capacity=19.05 cfs Outflow=0.00 cfs 0.000 af

Reach L108: Existing Swale Avg. Flow Depth=0.15' Max Vel=3.50 fps Inflow=21.69 cfs 1.834 af
n=0.030 L=774.0' S=0.0646 '/' Capacity=1,762.00 cfs Outflow=21.25 cfs 1.822 af

Reach O5: Inflow=13.49 cfs 2.217 af
Outflow=13.49 cfs 2.217 af

Reach POA3: Inflow=51.55 cfs 11.505 af
Outflow=51.55 cfs 11.505 af

Pond 1R: Existing 24" Peak Elev=47.55' Inflow=23.82 cfs 1.549 af
Primary=15.50 cfs 1.408 af Secondary=14.39 cfs 0.142 af Outflow=23.82 cfs 1.549 af

Pond 2P: Blue Hill Intersection Peak Elev=47.30' Storage=14,623 cf Inflow=33.34 cfs 1.147 af
Outflow=24.22 cfs 1.021 af

Pond 3P: Stream Interceptor Peak Elev=52.83' Storage=41 cf Inflow=22.89 cfs 2.329 af
30.0" Round Culvert n=0.014 L=73.0' S=0.0055 '/' Outflow=22.93 cfs 2.329 af

Pond 18P: Existing 18" Peak Elev=116.19' Inflow=19.86 cfs 1.737 af
Primary=18.69 cfs 1.733 af Secondary=1.18 cfs 0.004 af Outflow=19.86 cfs 1.737 af

Pond 19P: Existing 24" Peak Elev=101.47' Inflow=18.96 cfs 1.737 af
Primary=18.96 cfs 1.737 af Secondary=0.00 cfs 0.000 af Outflow=18.96 cfs 1.737 af

Pond 20P: Existing 24" Peak Elev=97.37' Inflow=18.96 cfs 1.737 af
Primary=18.96 cfs 1.737 af Secondary=0.00 cfs 0.000 af Outflow=18.96 cfs 1.737 af

Pond 21P: Existing 24" Peak Elev=94.52' Inflow=35.65 cfs 2.873 af
Primary=32.86 cfs 2.863 af Secondary=2.80 cfs 0.010 af Outflow=35.65 cfs 2.873 af

Pond 48R: 48" Peak Elev=81.36' Inflow=78.47 cfs 7.418 af
48.0" Round Culvert n=0.014 L=1,000.0' S=0.0307 '/' Outflow=78.47 cfs 7.418 af

Pond 52.1P: Upper Pond Peak Elev=51.93' Storage=145,823 cf Inflow=105.64 cfs 12.958 af
Primary=20.98 cfs 6.745 af Secondary=36.21 cfs 5.444 af Tertiary=0.00 cfs 0.000 af Outflow=57.06 cfs 12.189 af

Pond 52.2P: Lower Pond Peak Elev=49.11' Storage=85,543 cf Inflow=22.93 cfs 6.983 af
Primary=11.86 cfs 5.941 af Tertiary=0.00 cfs 0.000 af Outflow=11.86 cfs 5.941 af

Pond 53P: Wetland Area Peak Elev=79.95' Storage=23,219 cf Inflow=27.58 cfs 2.586 af
Outflow=23.00 cfs 2.336 af

Pond L179: Existing 24" Peak Elev=47.42' Inflow=28.63 cfs 4.307 af
Primary=28.51 cfs 4.294 af Secondary=3.42 cfs 0.013 af Outflow=28.63 cfs 4.307 af

Pond LINK 110.1: Existing 18" Peak Elev=52.55' Inflow=29.87 cfs 3.212 af
Primary=12.11 cfs 2.559 af Secondary=17.76 cfs 0.654 af Outflow=29.87 cfs 3.212 af

Pond MH-A: 15" RCP Peak Elev=163.16' Inflow=21.35 cfs 2.351 af
Primary=11.98 cfs 2.081 af Secondary=9.37 cfs 0.270 af Outflow=21.35 cfs 2.351 af

Pond MH-B: 21" RCP Peak Elev=150.94' Inflow=11.98 cfs 2.081 af
21.0" Round Culvert n=0.012 L=300.0' S=0.0060 '/' Outflow=11.98 cfs 2.081 af

Pond MH-C: Overflow Manhole Peak Elev=148.61' Inflow=13.49 cfs 2.217 af
Primary=13.49 cfs 2.217 af Secondary=0.00 cfs 0.000 af Outflow=13.49 cfs 2.217 af

Pond MH-D: Peak Elev=152.99' Storage=0 cf Inflow=18.73 cfs 1.378 af
Primary=18.72 cfs 1.378 af Secondary=0.00 cfs 0.000 af Outflow=18.72 cfs 1.378 af

Pond MH-E: 24" RCP Peak Elev=150.95' Inflow=19.92 cfs 1.538 af
24.0" Round Culvert n=0.012 L=260.0' S=0.0262 '/' Outflow=19.92 cfs 1.538 af

Pond MH-F: 24" RCP Peak Elev=148.29' Storage=0 cf Inflow=19.92 cfs 1.538 af
Primary=19.92 cfs 1.538 af Secondary=0.00 cfs 0.000 af Outflow=19.92 cfs 1.538 af

Pond P3: Existing Outlet Peak Elev=46.26' Inflow=30.88 cfs 4.544 af
Primary=30.88 cfs 4.544 af Secondary=0.00 cfs 0.000 af Outflow=30.88 cfs 4.544 af

Pond P3B: Existing 18" Peak Elev=47.75' Inflow=19.45 cfs 3.238 af
Primary=15.14 cfs 2.899 af Secondary=13.84 cfs 0.339 af Outflow=19.45 cfs 3.238 af

Pond P3C: Existing 18" Peak Elev=46.36' Inflow=3.77 cfs 0.250 af
Primary=3.77 cfs 0.250 af Secondary=0.00 cfs 0.000 af Outflow=3.77 cfs 0.250 af

Total Runoff Area = 123.607 ac Runoff Volume = 21.374 af Average Runoff Depth = 2.08"
72.57% Pervious = 89.700 ac 27.43% Impervious = 33.907 ac

Summary for Subcatchment 5.1E:

Runoff = 1.94 cfs @ 12.11 hrs, Volume= 0.136 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
18,551	49	50-75% Grass cover, Fair, HSG A
9,686	98	Paved parking, HSG A
3,696	98	Roofs, HSG A
31,933	70	Weighted Average
18,551		58.09% Pervious Area
13,382		41.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0400	0.22		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
0.2	42	0.0090	4.66	3.66	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
7.6	142	Total			

Summary for Subcatchment 5.1F:

Runoff = 4.23 cfs @ 12.11 hrs, Volume= 0.296 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.612	98	Paved parking, HSG A
0.052	98	Roofs, HSG A
0.540	49	50-75% Grass cover, Fair, HSG A
0.089	69	50-75% Grass cover, Fair, HSG B
1.293	76	Weighted Average
0.629		48.65% Pervious Area
0.664		51.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0400	0.22		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
0.2	42	0.0090	4.66	3.66	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
7.6	142	Total			

Summary for Subcatchment S1:

Runoff = 3.13 cfs @ 12.31 hrs, Volume= 0.432 af, Depth> 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.167	98	Paved parking, HSG A
0.117	98	Roofs, HSG A
8.224	43	Woods/grass comb., Fair, HSG A
0.511	65	Woods/grass comb., Fair, HSG B
9.019	46	Weighted Average
8.735		96.85% Pervious Area
0.284		3.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0	100	0.0250	0.19		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
3.2	843	0.0735	4.36		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.3	69	0.0371	3.91		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.1	42	0.0119	5.33	6.54	**Pipe Channel, 15" RCP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.014
0.7	335	0.0198	7.77	13.73	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
13.3	1,389	Total			

Summary for Subcatchment S14.2:

Runoff = 10.32 cfs @ 12.07 hrs, Volume= 0.665 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.756	98	Paved parking, HSG A
0.679	39	>75% Grass cover, Good, HSG A
0.048	61	>75% Grass cover, Good, HSG B
2.483	81	Weighted Average
0.727		29.28% Pervious Area
1.756		70.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S2:

Runoff = 18.80 cfs @ 12.10 hrs, Volume= 1.305 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.902	98	Paved parking, HSG A
0.496	98	Roofs, HSG A
1.610	43	Woods/grass comb., Fair, HSG A
0.015	65	Woods/grass comb., Fair, HSG B
5.023	80	Weighted Average
1.625		32.35% Pervious Area
3.398		67.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.1100	0.34		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.20"
0.9	287	0.1220	5.62		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.5	126	0.0425	4.18		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.1	65	0.0350	7.88	6.19	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
0.6	216	0.0162	6.22	7.63	**Pipe Channel, 15" RCP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.014
0.1	77	0.0272	9.10	16.09	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
7.2	871	Total			

Summary for Subcatchment S3:

Runoff = 17.05 cfs @ 12.07 hrs, Volume= 1.137 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.262	98	Paved parking, HSG A
1.429	98	Roofs, HSG A
0.512	49	50-75% Grass cover, Fair, HSG A
0.281	69	50-75% Grass cover, Fair, HSG B
3.484	88	Weighted Average
0.793		22.76% Pervious Area
2.691		77.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S4:

Runoff = 14.24 cfs @ 12.32 hrs, Volume= 1.513 af, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.657	98	Paved parking, HSG A
0.853	98	Roofs, HSG A
9.553	49	50-75% Grass cover, Fair, HSG A
2.862	69	50-75% Grass cover, Fair, HSG B
13.925	58	Weighted Average
12.415		89.16% Pervious Area
1.510		10.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.0140	0.15		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
3.2	656	0.0460	3.45		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
1.2	340	0.0870	4.75		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
2.6	445	0.0200	2.87		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.4	191	0.0440	8.84	6.94	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
0.6	347	0.0340	9.01	11.06	**Pipe Channel, 15" RCP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.014
0.5	163	0.0092	5.29	9.36	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
0.4	176	0.0136	7.80	24.50	**Pipe Channel, 24" RCP** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014

20.2	2,418	Total

Summary for Subcatchment S5:

Runoff = 29.77 cfs @ 12.07 hrs, Volume= 1.950 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
5.013	98	Paved parking, HSG A
1.472	39	>75% Grass cover, Good, HSG A
6.485	85	Weighted Average
1.472		22.70% Pervious Area
5.013		77.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S5.1:

Runoff = 12.06 cfs @ 12.19 hrs, Volume= 1.082 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.414	98	Paved parking, HSG A
0.722	60	Woods, Fair, HSG B
0.054	49	50-75% Grass cover, Fair, HSG A
0.135	69	50-75% Grass cover, Fair, HSG B
3.325	88	Weighted Average
0.911		27.40% Pervious Area
2.414		72.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	100	0.1100	0.15		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
1.4	397	0.0910	4.86		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
1.3	320	0.0410	4.11		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.1	34	0.0090	4.00	3.14	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.014
0.5	163	0.0092	5.29	9.36	**Pipe Channel, 18" RCP** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.014
0.4	176	0.0136	7.80	24.50	**Pipe Channel, 24" RCP** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.014
14.6	1,190	Total			

Summary for Subcatchment S5.1A:

Runoff = 9.62 cfs @ 12.34 hrs, Volume= 1.108 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.595	98	Paved parking, HSG A
0.654	98	Roofs, HSG A
11.562	49	50-75% Grass cover, Fair, HSG A
12.811	54	Weighted Average
11.562		90.25% Pervious Area
1.249		9.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0100	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
7.2	1,100	0.0250	2.55		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.8	155	0.0250	3.21		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
0.1	20	0.0100	4.91	3.86	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
21.0	1,375	Total			

Summary for Subcatchment S5.1B:

Runoff = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
1.860	98	Paved parking, HSG A
1.183	98	Roofs, HSG A
10.756	49	50-75% Grass cover, Fair, HSG A
3.195	79	50-75% Grass cover, Fair, HSG C
16.994	63	Weighted Average
13.951		82.09% Pervious Area
3.043		17.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
4.2	461	0.0130	1.84		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
3.5	331	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc** Paved Kv= 20.3 fps
2.2	1,200	0.0250	9.02	11.06	**Pipe Channel, 15" RCP** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
24.8	2,092	Total			

Summary for Subcatchment S5.1C:

Runoff = 29.87 cfs @ 12.36 hrs, Volume= 3.212 af, Depth> 2.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.348	98	Paved parking, HSG A
0.959	98	Roofs, HSG A
2.795	49	50-75% Grass cover, Fair, HSG A
10.687	69	50-75% Grass cover, Fair, HSG B
16.789	71	Weighted Average
13.482		80.30% Pervious Area
3.307		19.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
8.1	590	0.0590	1.21		**Shallow Concentrated Flow, Shallow Conc** Woodland Kv= 5.0 fps
2.1	1,400	0.0500	10.99	8.63	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
25.1	2,090	Total			

Summary for Subcatchment S5.1D:

Runoff = 1.96 cfs @ 12.17 hrs, Volume= 0.160 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.268	98	Paved parking, HSG A
0.064	98	Roofs, HSG A
0.816	49	50-75% Grass cover, Fair, HSG A
1.148	63	Weighted Average
0.816		71.08% Pervious Area
0.332		28.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0200	0.17		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
1.3	210	0.0280	2.69		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
0.2	45	0.0100	4.91	3.86	**Pipe Channel, 12" RCP** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
11.3	355	Total			

Summary for Subcatchment S52.1:

Runoff = 17.43 cfs @ 12.28 hrs, Volume= 1.720 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.359	98	Paved parking, HSG A
0.431	98	Roofs, HSG A
0.440	43	Woods/grass comb., Fair, HSG A
8.363	65	Woods/grass comb., Fair, HSG B
1.306	61	>75% Grass cover, Good, HSG B
10.899	66	Weighted Average
10.109		92.75% Pervious Area
0.790		7.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0800	0.14		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
7.4	1,730	0.0580	3.88		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
19.7	1,830	Total			

Summary for Subcatchment S52.2:

Runoff = 2.08 cfs @ 12.42 hrs, Volume= 0.239 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.109	98	Paved parking, HSG A
0.010	98	Roofs, HSG A
0.316	65	Woods/grass comb., Fair, HSG B
1.216	61	>75% Grass cover, Good, HSG B
1.651	64	Weighted Average
1.532		92.79% Pervious Area
0.119		7.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	100	0.0140	0.07		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	652	0.0580	3.88		**Shallow Concentrated Flow, Shallow Conc** Unpaved Kv= 16.1 fps
27.6	752	Total			

Summary for Subcatchment S53:

Runoff = 8.40 cfs @ 12.23 hrs, Volume= 0.765 af, Depth> 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.288	98	Water Surface, HSG A
0.499	43	Woods/grass comb., Fair, HSG A
4.241	65	Woods/grass comb., Fair, HSG B
0.015	39	>75% Grass cover, Good, HSG A
5.043	65	Weighted Average
4.755		94.29% Pervious Area
0.288		5.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	100	0.1300	0.36		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 3.20"
11.2	858	0.0650	1.27		**Shallow Concentrated Flow, Shallow Conc** Woodland Kv= 5.0 fps
15.8	958	Total			

Summary for Subcatchment S54:

Runoff = 3.87 cfs @ 12.26 hrs, Volume= 0.369 af, Depth> 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.341	98	Water Surface, HSG A
0.226	43	Woods/grass comb., Fair, HSG A
1.576	65	Woods/grass comb., Fair, HSG B
0.064	39	>75% Grass cover, Good, HSG A
0.037	61	>75% Grass cover, Good, HSG B
2.244	67	Weighted Average
1.903		84.80% Pervious Area
0.341		15.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1200	0.16		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
7.8	525	0.0500	1.12		**Shallow Concentrated Flow, Shallow Conc** Woodland Kv= 5.0 fps
18.3	625	Total			

Summary for Subcatchment S56.1:

Runoff = 16.70 cfs @ 12.07 hrs, Volume= 1.121 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.611	98	Paved parking, HSG A
0.180	39	>75% Grass cover, Good, HSG A
0.557	61	>75% Grass cover, Good, HSG B
3.348	89	Weighted Average
0.737		22.01% Pervious Area
2.611		77.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S56.3:

Runoff = 13.50 cfs @ 12.07 hrs, Volume= 0.884 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
2.221	98	Paved parking, HSG A
0.473	39	>75% Grass cover, Good, HSG A
0.247	61	>75% Grass cover, Good, HSG B
2.941	85	Weighted Average
0.720		24.48% Pervious Area
2.221		75.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment S56.4:

Runoff = 7.77 cfs @ 12.21 hrs, Volume= 0.680 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.869	98	Paved parking, HSG A
0.057	98	Roofs, HSG A
1.986	65	Woods/grass comb., Fair, HSG B
0.270	61	>75% Grass cover, Good, HSG B
3.182	74	Weighted Average
2.256		70.90% Pervious Area
0.926		29.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0950	0.14		**Sheet Flow, Sheet** Woods: Light underbrush n= 0.400 P2= 3.20"
1.5	298	0.0440	3.38		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
2.1	228	0.0080	1.82		**Shallow Concentrated Flow, Paved** Paved Kv= 20.3 fps
15.1	626	Total			

Summary for Subcatchment S62:

Runoff = 3.77 cfs @ 12.07 hrs, Volume= 0.250 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (ac)	CN	Description
0.643	98	Paved parking, HSG A
0.144	39	>75% Grass cover, Good, HSG A
0.787	87	Weighted Average
0.144		18.30% Pervious Area
0.643		81.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach 2R: Existing Stream

Inflow Area = 20.295 ac, 12.48% Impervious, Inflow Depth > 1.38" for 25-Year event
Inflow = 23.00 cfs @ 12.52 hrs, Volume= 2.336 af
Outflow = 22.89 cfs @ 12.54 hrs, Volume= 2.329 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.80 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 3.7 min

Peak Storage= 2,607 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 206.03 cfs

3.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 3.5 '/' Top Width= 17.00'
Length= 660.0' Slope= 0.0364 '/'
Inlet Invert= 79.00', Outlet Invert= 55.00'

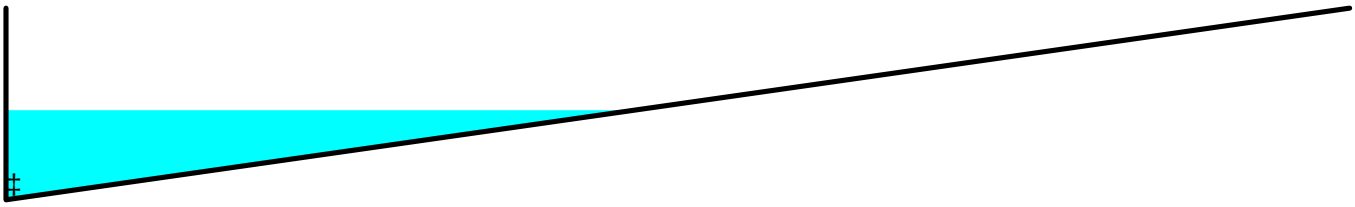
Summary for Reach 4R:

Inflow	=	17.76 cfs @	12.35 hrs,	Volume=	0.654 af
Outflow	=	17.74 cfs @	12.36 hrs,	Volume=	0.654 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.64 fps, Avg. Travel Time= 1.1 min

Peak Storage= 573 cf @ 12.36 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 135.01 cfs

0.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 50.00'
Length= 105.0' Slope= 0.0308 '/'
Inlet Invert= 51.23', Outlet Invert= 48.00'



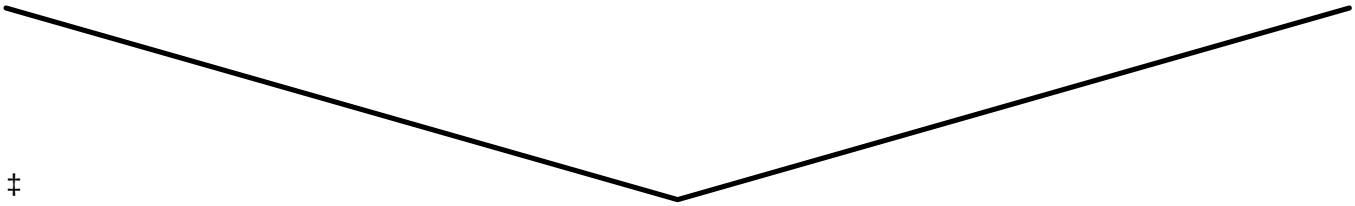
Summary for Reach 5R: Ditch

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 20.0 sf, Capacity= 303.75 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
0.00' x 1.00' deep channel, n= 0.030 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 20.00'
Length= 65.0' Slope= 0.2385 '/'
Inlet Invert= 149.79', Outlet Invert= 134.29'



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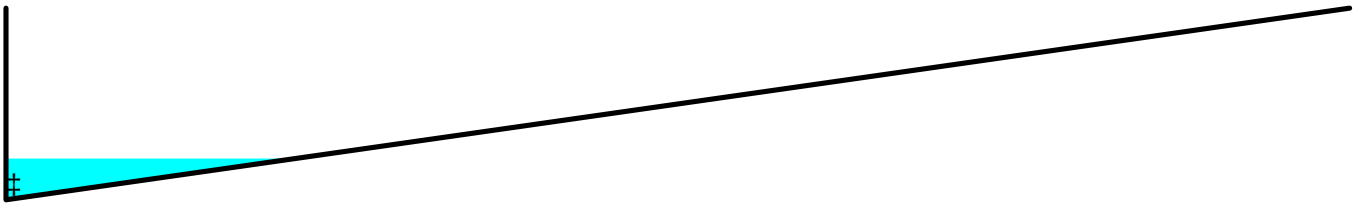
Summary for Reach 18G:

Inflow	=	1.18 cfs @	12.11 hrs,	Volume=	0.004 af
Outflow	=	0.33 cfs @	12.14 hrs,	Volume=	0.004 af, Atten= 72%, Lag= 1.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.13 fps, Min. Travel Time= 7.7 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 31.4 min

Peak Storage= 151 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 19.67 cfs

0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 520.0' Slope= 0.0263 '/'
Inlet Invert= 114.23', Outlet Invert= 100.54'



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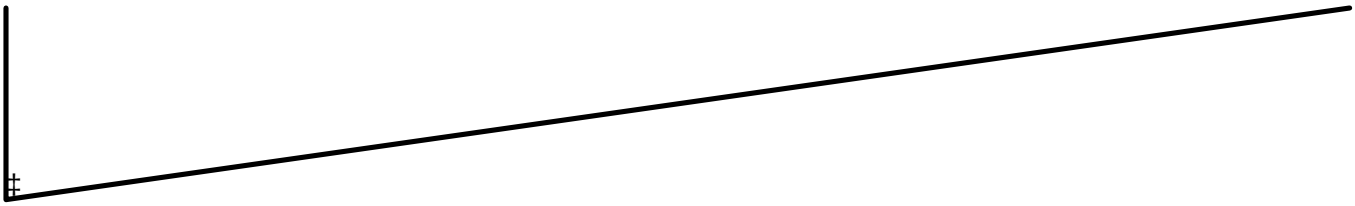
Summary for Reach 19G:

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 17.69 cfs

0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 340.0' Slope= 0.0213 '/'
Inlet Invert= 101.50', Outlet Invert= 94.26'



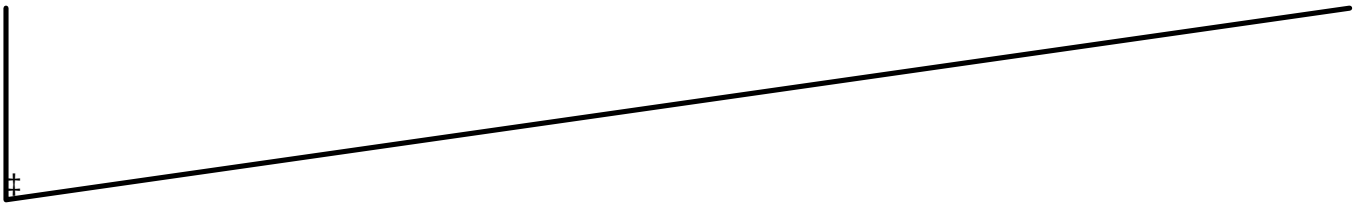
Summary for Reach 20G:

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 23.30 cfs

0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 170.0' Slope= 0.0369 '/'
Inlet Invert= 100.54', Outlet Invert= 94.26'



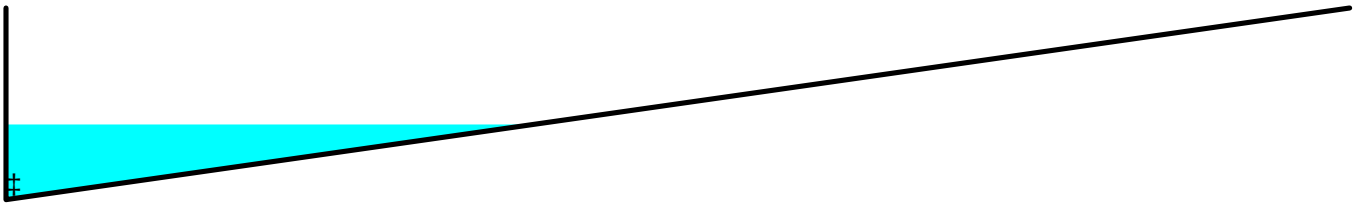
Summary for Reach 21G:

Inflow	=	2.80 cfs @	12.08 hrs,	Volume=	0.010 af
Outflow	=	2.02 cfs @	12.10 hrs,	Volume=	0.010 af, Atten= 28%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 6.7 min

Peak Storage= 168 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 24.44 cfs

0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 175.0' Slope= 0.0406 '/'
Inlet Invert= 94.26', Outlet Invert= 87.15'



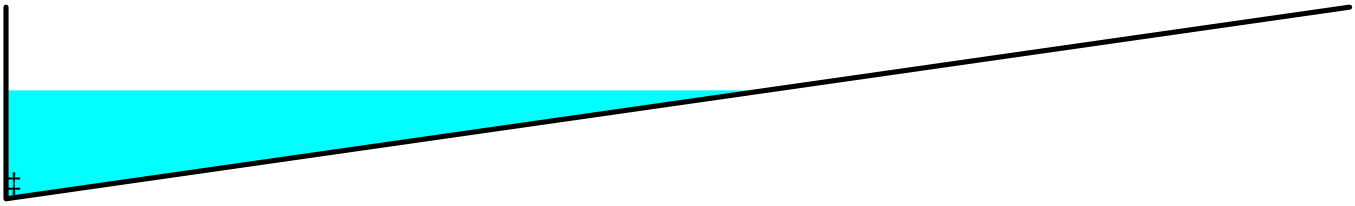
Summary for Reach G-1: Gutter

Inflow	=	9.37 cfs @	12.37 hrs,	Volume=	0.270 af
Outflow	=	9.25 cfs @	12.39 hrs,	Volume=	0.270 af, Atten= 1%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.31 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 6.4 min

Peak Storage= 959 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 42.29 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 240.0' Slope= 0.0304 '/'
Inlet Invert= 162.60', Outlet Invert= 155.30'



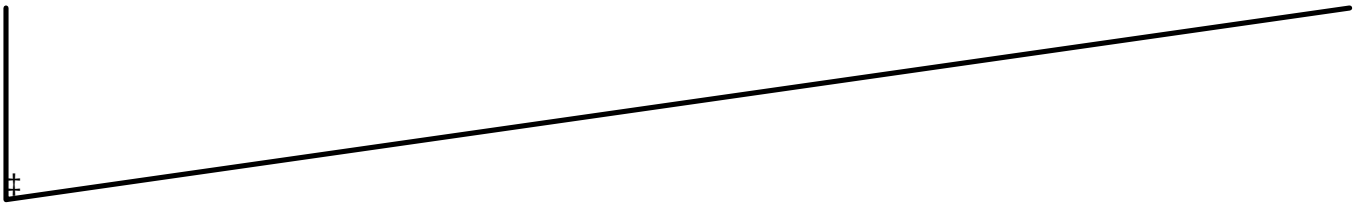
Summary for Reach G-2: Gutter

Inflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	0.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 6.3 sf, Capacity= 19.05 cfs

0.00' x 0.50' deep channel, n= 0.030
Side Slope Z-value= 0.0 50.0 '/' Top Width= 25.00'
Length= 260.0' Slope= 0.0247 '/'
Inlet Invert= 154.71', Outlet Invert= 148.29'



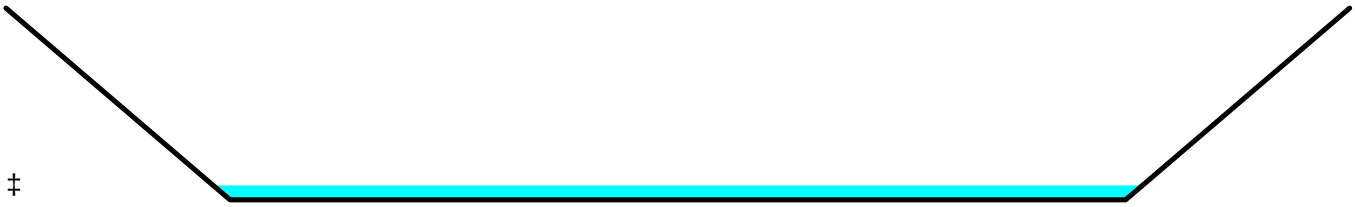
Summary for Reach L108: Existing Swale

Inflow Area = 15.252 ac, 14.72% Impervious, Inflow Depth > 1.44" for 25-Year event
Inflow = 21.69 cfs @ 12.37 hrs, Volume= 1.834 af
Outflow = 21.25 cfs @ 12.41 hrs, Volume= 1.822 af, Atten= 2%, Lag= 2.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 10.5 min

Peak Storage= 4,698 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00' Flow Area= 100.0 sf, Capacity= 1,762.00 cfs

40.00' x 2.00' deep channel, n= 0.030
Side Slope Z-value= 5.0 '/' Top Width= 60.00'
Length= 774.0' Slope= 0.0646 '/'
Inlet Invert= 132.00', Outlet Invert= 82.00'



Summary for Reach O5:

Inflow Area = 17.727 ac, 18.90% Impervious, Inflow Depth > 1.50" for 25-Year event
Inflow = 13.49 cfs @ 12.16 hrs, Volume= 2.217 af
Outflow = 13.49 cfs @ 12.16 hrs, Volume= 2.217 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Summary for Reach POA3:

Inflow Area = 105.880 ac, 28.86% Impervious, Inflow Depth > 1.30" for 25-Year event
Inflow = 51.55 cfs @ 12.29 hrs, Volume= 11.505 af
Outflow = 51.55 cfs @ 12.29 hrs, Volume= 11.505 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Summary for Pond 1R: Existing 24"

Inflow Area = 5.424 ac, 73.32% Impervious, Inflow Depth > 3.43" for 25-Year event
Inflow = 23.82 cfs @ 12.07 hrs, Volume= 1.549 af
Outflow = 23.82 cfs @ 12.07 hrs, Volume= 1.549 af, Atten= 0%, Lag= 0.0 min
Primary = 15.50 cfs @ 12.13 hrs, Volume= 1.408 af
Secondary = 14.39 cfs @ 12.09 hrs, Volume= 0.142 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 47.55' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	43.90'	**24.0" Round Culvert** L= 166.0' Ke= 0.500 Inlet / Outlet Invert= 43.90' / 41.90' S= 0.0120 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	46.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.93 cfs @ 12.13 hrs HW=47.15' TW=46.27' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 11.93 cfs @ 3.80 fps)

Secondary OutFlow Max=13.78 cfs @ 12.09 hrs HW=47.54' TW=47.03' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 13.78 cfs @ 3.44 fps)

Summary for Pond 2P: Blue Hill Intersection

Inflow = 33.34 cfs @ 12.24 hrs, Volume= 1.147 af
Outflow = 24.22 cfs @ 12.38 hrs, Volume= 1.021 af, Atten= 27%, Lag= 8.2 min
Primary = 24.22 cfs @ 12.38 hrs, Volume= 1.021 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 47.30' @ 12.38 hrs Surf.Area= 40,496 sf Storage= 14,623 cf

Plug-Flow detention time= 15.0 min calculated for 1.021 af (89% of inflow)
Center-of-Mass det. time= 12.5 min (752.1 - 739.7)

Volume	Invert	Avail.Storage	Storage Description
#1	46.50'	58,355 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.50	10	0	0
47.00	21,119	5,282	5,282
48.00	85,027	53,073	58,355

Device	Routing	Invert	Outlet Devices
#1	Primary	47.00'	**Curb, C= 3.27** Offset (feet) 0.00 140.50 231.95 323.40 493.00 Elev. (feet) 48.50 47.50 47.00 47.50 48.50

Primary OutFlow Max=24.21 cfs @ 12.38 hrs HW=47.30' TW=0.00' (Dynamic Tailwater)
└─**1=Curb** (Weir Controls 24.21 cfs @ 0.72 fps)

Summary for Pond 3P: Stream Interceptor

Inflow Area = 20.295 ac, 12.48% Impervious, Inflow Depth > 1.38" for 25-Year event
Inflow = 22.89 cfs @ 12.54 hrs, Volume= 2.329 af
Outflow = 22.93 cfs @ 12.55 hrs, Volume= 2.329 af, Atten= 0%, Lag= 0.5 min
Primary = 22.93 cfs @ 12.55 hrs, Volume= 2.329 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 52.83' @ 12.57 hrs Surf.Area= 13 sf Storage= 41 cf

Plug-Flow detention time= 0.1 min calculated for 2.329 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (848.2 - 848.2)

Volume	Invert	Avail.Storage	Storage Description
#1	47.40'	57 cf	**4.00'D x 7.60'H Vertical Cone/Cylinder** 96 cf Overall x 60.0% Voids
#2	55.00'	1,120 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,177 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	4	0	0
56.00	32	18	18
57.00	91	62	80
58.00	192	142	221
59.00	687	440	661
59.50	1,150	459	1,120

Device	Routing	Invert	Outlet Devices
#1	Primary	47.40'	**30.0" Round Culvert** L= 73.0' Ke= 0.500 Inlet / Outlet Invert= 47.40' / 47.00' S= 0.0055 '/' Cc= 0.900 n= 0.014, Flow Area= 4.91 sf

Primary OutFlow Max=22.79 cfs @ 12.55 hrs HW=52.82' TW=51.89' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 22.79 cfs @ 4.64 fps)

Summary for Pond 18P: Existing 18"

Inflow Area = 14.042 ac, 26.22% Impervious, Inflow Depth > 1.48" for 25-Year event
Inflow = 19.86 cfs @ 12.11 hrs, Volume= 1.737 af
Outflow = 19.86 cfs @ 12.11 hrs, Volume= 1.737 af, Atten= 0%, Lag= 0.0 min
Primary = 18.69 cfs @ 12.08 hrs, Volume= 1.733 af
Secondary = 1.18 cfs @ 12.11 hrs, Volume= 0.004 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Peak Elev= 116.19' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	107.40'	**18.0" Round Culvert** L= 330.0' Ke= 0.500 Inlet / Outlet Invert= 107.40' / 98.90' S= 0.0258 '/' Cc= 0.900 n= 0.014, Flow Area= 1.77 sf
#2	Secondary	116.06'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.61 cfs @ 12.08 hrs HW=116.06' TW=101.43' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 18.61 cfs @ 10.53 fps)

Secondary OutFlow Max=1.16 cfs @ 12.11 hrs HW=116.19' TW=114.31' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 1.16 cfs @ 1.16 fps)

Summary for Pond 19P: Existing 24"

Inflow Area = 14.042 ac, 26.22% Impervious, Inflow Depth > 1.48" for 25-Year event
Inflow = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af
Outflow = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af, Atten= 0%, Lag= 0.0 min
Primary = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 101.47' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	98.90'	**24.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 98.90' / 94.90' S= 0.0400 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	101.50'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.95 cfs @ 12.14 hrs HW=101.47' TW=97.37' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.95 cfs @ 6.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.90' TW=101.50' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 20P: Existing 24"

Inflow Area = 14.042 ac, 26.22% Impervious, Inflow Depth > 1.48" for 25-Year event
Inflow = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af
Outflow = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af, Atten= 0%, Lag= 0.0 min
Primary = 18.96 cfs @ 12.14 hrs, Volume= 1.737 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 97.37' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.80'	**24.0" Round Culvert** L= 165.0' Ke= 0.500 Inlet / Outlet Invert= 94.80' / 88.10' S= 0.0406 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	100.54'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.95 cfs @ 12.14 hrs HW=97.37' TW=94.23' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 18.95 cfs @ 6.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.80' TW=100.54' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond 21P: Existing 24"

Inflow Area =	17.526 ac, 36.36% Impervious, Inflow Depth > 1.97" for 25-Year event			
Inflow =	35.65 cfs @	12.08 hrs, Volume=	2.873 af	
Outflow =	35.65 cfs @	12.08 hrs, Volume=	2.873 af, Atten= 0%, Lag= 0.0 min	
Primary =	32.86 cfs @	12.08 hrs, Volume=	2.863 af	
Secondary =	2.80 cfs @	12.08 hrs, Volume=	0.010 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 94.52' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	88.80'	**24.0" Round Culvert** L= 190.0' Ke= 0.500 Inlet / Outlet Invert= 88.80' / 79.90' S= 0.0468 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	94.26'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=32.83 cfs @ 12.08 hrs HW=94.51' TW=81.34' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 32.83 cfs @ 10.45 fps)

Secondary OutFlow Max=2.42 cfs @ 12.08 hrs HW=94.51' TW=94.43' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 2.42 cfs @ 1.20 fps)

Summary for Pond 48R: 48"

Inflow Area =	41.261 ac, 37.11% Impervious, Inflow Depth > 2.16" for 25-Year event			
Inflow =	78.47 cfs @	12.10 hrs, Volume=	7.418 af	
Outflow =	78.47 cfs @	12.10 hrs, Volume=	7.418 af, Atten= 0%, Lag= 0.0 min	
Primary =	78.47 cfs @	12.10 hrs, Volume=	7.418 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 81.36' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	77.70'	**48.0" Round Culvert** L= 1,000.0' Ke= 0.500 Inlet / Outlet Invert= 77.70' / 47.00' S= 0.0307 '/' Cc= 0.900 n= 0.014, Flow Area= 12.57 sf

Primary OutFlow Max=78.40 cfs @ 12.10 hrs HW=81.36' TW=49.96' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 78.40 cfs @ 6.51 fps)

Summary for Pond 52.1P: Upper Pond

Inflow Area =	78.047 ac,	27.66% Impervious,	Inflow Depth >	1.99"	for 25-Year event
Inflow =	105.64 cfs @	12.10 hrs,	Volume=	12.958 af	
Outflow =	57.06 cfs @	12.61 hrs,	Volume=	12.189 af,	Atten= 46%, Lag= 30.5 min
Primary =	20.98 cfs @	12.54 hrs,	Volume=	6.745 af	
Secondary =	36.21 cfs @	12.63 hrs,	Volume=	5.444 af	
Tertiary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 51.93' @ 12.63 hrs Surf.Area= 36,547 sf Storage= 145,823 cf

Plug-Flow detention time= 59.9 min calculated for 12.189 af (94% of inflow)
Center-of-Mass det. time= 39.1 min (842.7 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	521,473 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	22,813	0	0
48.00	25,437	24,125	24,125
49.00	28,050	26,744	50,869
50.00	30,963	29,507	80,375
51.00	34,212	32,588	112,963
52.00	36,726	35,469	148,432
53.00	42,250	39,488	187,920
54.00	45,628	43,939	231,859
54.50	48,657	23,571	255,430
60.00	48,086	266,043	521,473

Device	Routing	Invert	Outlet Devices
#1	Primary	47.00'	**36.0" Round Culvert** L= 113.0' Ke= 0.500 Inlet / Outlet Invert= 47.00' / 46.44' S= 0.0050 '/' Cc= 0.900 n= 0.014, Flow Area= 7.07 sf
#2	Device 1	47.00'	**12.0" Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	52.70'	**46.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Secondary	45.25'	**42.0" Round Culvert** L= 371.0' Ke= 0.500 Inlet / Outlet Invert= 45.25' / 43.50' S= 0.0047 '/' Cc= 0.900 n= 0.014, Flow Area= 9.62 sf
#5	Device 4	47.20'	**42.0" Round Culvert** L= 487.0' Ke= 0.500 Inlet / Outlet Invert= 47.20' / 45.25' S= 0.0040 '/' Cc= 0.900 n= 0.014, Flow Area= 9.62 sf
#6	Device 5	48.50'	**30.0" Round Culvert X 2.00** L= 131.0' Ke= 0.500 Inlet / Outlet Invert= 48.50' / 47.96' S= 0.0041 '/' Cc= 0.900 n= 0.014, Flow Area= 4.91 sf
#7	Device 6	47.75'	**24.0" Vert. Orifice/Grate** C= 0.600

#8	Device 6	50.00'	**18.0" Vert. Orifice/Grate** C= 0.600
#9	Device 6	53.00'	**8.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#10	Tertiary	54.00'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.94 cfs @ 12.54 hrs HW=51.87' TW=48.46' (Dynamic Tailwater)
└─**1=Culvert** (Passes 20.94 cfs of 56.49 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 20.94 cfs @ 8.89 fps)
  └─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=36.21 cfs @ 12.63 hrs HW=51.93' (Free Discharge)
└─**4=Culvert** (Passes 36.21 cfs of 85.24 cfs potential flow)
  └─**5=Culvert** (Passes 36.21 cfs of 62.58 cfs potential flow)
    └─**6=Culvert** (Passes 36.21 cfs of 56.01 cfs potential flow)
      ├─**7=Orifice/Grate** (Orifice Controls 26.97 cfs @ 8.58 fps)
      ├─**8=Orifice/Grate** (Orifice Controls 9.24 cfs @ 5.23 fps)
      └─**9=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)
└─**10=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 52.2P: Lower Pond

Inflow Area =	79.698 ac, 27.23% Impervious, Inflow Depth > 1.05" for 25-Year event				
Inflow	=	22.93 cfs @	12.49 hrs, Volume=	6.983 af	
Outflow	=	11.86 cfs @	13.66 hrs, Volume=	5.941 af, Atten= 48%, Lag= 70.5 min	
Primary	=	11.86 cfs @	13.66 hrs, Volume=	5.941 af	
Tertiary	=	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 49.11' @ 13.66 hrs Surf.Area= 42,840 sf Storage= 85,543 cf

Plug-Flow detention time= 110.6 min calculated for 5.941 af (85% of inflow)
Center-of-Mass det. time= 65.6 min (938.0 - 872.4)

Volume	Invert	Avail.Storage	Storage Description
#1	47.00'	604,414 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
47.00	38,326	0	0
48.00	40,491	39,409	39,409
49.00	42,632	41,562	80,970
50.00	44,572	43,602	124,572
51.00	46,410	45,491	170,063
51.50	48,506	23,729	193,792
60.00	48,111	410,622	604,414

Device	Routing	Invert	Outlet Devices
#1	Primary	43.35'	**24.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 43.35' / 43.10' S= 0.0056 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Device 1	47.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	50.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Tertiary	51.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.86 cfs @ 13.66 hrs HW=49.11' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 11.86 cfs of 32.99 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 11.86 cfs @ 5.43 fps)
  └─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 53P: Wetland Area

Inflow Area = 20.295 ac, 12.48% Impervious, Inflow Depth > 1.53" for 25-Year event
Inflow = 27.58 cfs @ 12.38 hrs, Volume= 2.586 af
Outflow = 23.00 cfs @ 12.52 hrs, Volume= 2.336 af, Atten= 17%, Lag= 7.9 min
Primary = 23.00 cfs @ 12.52 hrs, Volume= 2.336 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 79.95' @ 12.53 hrs Surf.Area= 17,053 sf Storage= 23,219 cf

Plug-Flow detention time= 51.9 min calculated for 2.336 af (90% of inflow)
Center-of-Mass det. time= 21.6 min (846.2 - 824.7)

Volume	Invert	Avail.Storage	Storage Description
#1	77.00'	93,245 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
77.00	449	0	0
78.00	2,374	1,412	1,412
79.00	12,873	7,624	9,035
80.00	17,283	15,078	24,113
84.00	17,283	69,132	93,245

Device	Routing	Invert	Outlet Devices
#1	Primary	79.00'	**14.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=22.93 cfs @ 12.52 hrs HW=79.95' TW=79.71' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 22.93 cfs @ 1.73 fps)

Summary for Pond L179: Existing 24"

Inflow Area = 25.395 ac, 32.33% Impervious, Inflow Depth > 2.03" for 25-Year event
Inflow = 28.63 cfs @ 12.16 hrs, Volume= 4.307 af
Outflow = 28.63 cfs @ 12.16 hrs, Volume= 4.307 af, Atten= 0%, Lag= 0.0 min
Primary = 28.51 cfs @ 12.16 hrs, Volume= 4.294 af
Secondary = 3.42 cfs @ 12.20 hrs, Volume= 0.013 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 47.42' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	41.90'	**24.0" Round Culvert** L= 60.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 41.90' / 41.10' S= 0.0133 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	46.89'	**30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.78 cfs @ 12.16 hrs HW=46.71' TW=46.10' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.78 cfs @ 3.75 fps)

Secondary OutFlow Max=3.28 cfs @ 12.20 hrs HW=47.29' TW=47.24' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 3.28 cfs @ 1.05 fps)

Summary for Pond LINK 110.1: Existing 18"

Inflow Area = 16.789 ac, 19.70% Impervious, Inflow Depth > 2.30" for 25-Year event
Inflow = 29.87 cfs @ 12.36 hrs, Volume= 3.212 af
Outflow = 29.87 cfs @ 12.36 hrs, Volume= 3.212 af, Atten= 0%, Lag= 0.0 min
Primary = 12.11 cfs @ 12.36 hrs, Volume= 2.559 af
Secondary = 17.76 cfs @ 12.35 hrs, Volume= 0.654 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 52.55' @ 12.36 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	46.45'	**18.0" Round Culvert** L= 260.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 46.45' / 42.50' S= 0.0152 '/' Cc= 0.900 n= 0.014, Flow Area= 1.77 sf
#2	Secondary	51.23'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=12.11 cfs @ 12.36 hrs HW=52.54' TW=47.43' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 12.11 cfs @ 6.85 fps)

Secondary OutFlow Max=17.74 cfs @ 12.35 hrs HW=52.55' TW=51.70' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 17.74 cfs @ 4.44 fps)

Summary for Pond MH-A: 15" RCP

Inflow Area = 16.994 ac, 17.91% Impervious, Inflow Depth > 1.66" for 25-Year event
Inflow = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af
Outflow = 21.35 cfs @ 12.37 hrs, Volume= 2.351 af, Atten= 0%, Lag= 0.0 min
Primary = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af
Secondary = 9.37 cfs @ 12.37 hrs, Volume= 0.270 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 163.16' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	157.00'	**15.0" Round Culvert** L= 250.0' Ke= 0.500 Inlet / Outlet Invert= 157.00' / 149.00' S= 0.0320 '/' Cc= 0.900 n= 0.014, Flow Area= 1.23 sf
#2	Secondary	162.60'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.98 cfs @ 12.37 hrs HW=163.16' TW=150.94' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 11.98 cfs @ 9.76 fps)

Secondary OutFlow Max=9.35 cfs @ 12.37 hrs HW=163.16' TW=162.88' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Weir Controls 9.35 cfs @ 2.07 fps)

Summary for Pond MH-B: 21" RCP

Inflow Area = 16.994 ac, 17.91% Impervious, Inflow Depth > 1.47" for 25-Year event
Inflow = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af
Outflow = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af, Atten= 0%, Lag= 0.0 min
Primary = 11.98 cfs @ 12.37 hrs, Volume= 2.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 150.94' @ 12.37 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	149.00'	**21.0" Round Culvert** L= 300.0' Ke= 0.500 Inlet / Outlet Invert= 149.00' / 147.20' S= 0.0060 '/' Cc= 0.900 n= 0.012, Flow Area= 2.41 sf

Primary OutFlow Max=11.98 cfs @ 12.37 hrs HW=150.94' TW=148.51' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 11.98 cfs @ 4.98 fps)

Summary for Pond MH-C: Overflow Manhole

Inflow Area = 17.727 ac, 18.90% Impervious, Inflow Depth > 1.50" for 25-Year event
Inflow = 13.49 cfs @ 12.16 hrs, Volume= 2.217 af
Outflow = 13.49 cfs @ 12.16 hrs, Volume= 2.217 af, Atten= 0%, Lag= 0.0 min
Primary = 13.49 cfs @ 12.16 hrs, Volume= 2.217 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs

Peak Elev= 148.61' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	146.35'	**24.0" Round Culvert** L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 146.35' / 145.32' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	150.19'	**12.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 150.19' / 150.09' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=13.48 cfs @ 12.16 hrs HW=148.61' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 13.48 cfs @ 4.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=146.35' TW=145.89' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.00 cfs)

Summary for Pond MH-D:

Inflow Area =	12.811 ac,	9.75% Impervious,	Inflow Depth >	1.29"	for 25-Year event
Inflow =	18.73 cfs @	12.38 hrs,	Volume=	1.378 af	
Outflow =	18.72 cfs @	12.38 hrs,	Volume=	1.378 af,	Atten= 0%, Lag= 0.0 min
Primary =	18.72 cfs @	12.38 hrs,	Volume=	1.378 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 152.99' @ 12.38 hrs Surf.Area= 14 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 1.378 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (827.9 - 827.9)

Volume	Invert	Avail.Storage	Storage Description
#1	152.99'	89,175 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
152.99	0	0	0
154.71	14,500	12,470	12,470
160.00	14,500	76,705	89,175

Device	Routing	Invert	Outlet Devices
#1	Primary	148.04'	**24.0" Round Culvert** L= 140.0' Ke= 0.500 Inlet / Outlet Invert= 148.04' / 145.89' S= 0.0154 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	154.71'	**20.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.85 cfs @ 12.38 hrs HW=152.99' TW=150.95' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 20.85 cfs @ 6.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=152.99' TW=154.71' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond MH-E: 24" RCP

Inflow Area = 13.959 ac, 11.33% Impervious, Inflow Depth > 1.32" for 25-Year event
Inflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
Outflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af, Atten= 0%, Lag= 0.0 min
Primary = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 150.95' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	145.89'	**24.0" Round Culvert** L= 260.0' Ke= 0.500 Inlet / Outlet Invert= 145.89' / 139.09' S= 0.0262 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=19.92 cfs @ 12.38 hrs HW=150.95' TW=148.29' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 19.92 cfs @ 6.34 fps)

Summary for Pond MH-F: 24" RCP

Inflow Area = 13.959 ac, 11.33% Impervious, Inflow Depth > 1.32" for 25-Year event
Inflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
Outflow = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af, Atten= 0%, Lag= 0.0 min
Primary = 19.92 cfs @ 12.38 hrs, Volume= 1.538 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 148.29' @ 12.35 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (827.2 - 827.2)

Volume	Invert	Avail.Storage	Storage Description
#1	148.29'	8,878 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
148.29	0	0	0
149.79	810	608	608
160.00	810	8,270	8,878

Device	Routing	Invert	Outlet Devices
#1	Primary	136.51'	**24.0" Round Culvert** L= 75.0' Ke= 0.500 Inlet / Outlet Invert= 136.51' / 134.29' S= 0.0296 '/' Cc= 0.900

			n= 0.012, Flow Area= 3.14 sf
#2	Secondary	149.79'	**40.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=49.67 cfs @ 12.38 hrs HW=148.29' TW=132.15' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 49.67 cfs @ 15.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.29' TW=149.79' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P3: Existing Outlet

Inflow Area =	26.182 ac, 33.81% Impervious, Inflow Depth > 2.08" for 25-Year event			
Inflow =	30.88 cfs @	12.16 hrs, Volume=	4.544 af	
Outflow =	30.88 cfs @	12.16 hrs, Volume=	4.544 af, Atten= 0%, Lag= 0.0 min	
Primary =	30.88 cfs @	12.16 hrs, Volume=	4.544 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 46.26' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	41.10'	**24.0" Round Culvert** L= 52.0' Ke= 0.500 Inlet / Outlet Invert= 41.10' / 40.66' S= 0.0085 '/' Cc= 0.900 n= 0.014, Flow Area= 3.14 sf
#2	Secondary	45.79'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=30.30 cfs @ 12.16 hrs HW=46.11' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 30.30 cfs @ 9.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=41.10' TW=46.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond P3B: Existing 18"

Inflow Area =	19.971 ac, 21.20% Impervious, Inflow Depth > 1.95" for 25-Year event			
Inflow =	19.45 cfs @	12.23 hrs, Volume=	3.238 af	
Outflow =	19.45 cfs @	12.23 hrs, Volume=	3.238 af, Atten= 0%, Lag= 0.0 min	
Primary =	15.14 cfs @	12.19 hrs, Volume=	2.899 af	
Secondary =	13.84 cfs @	12.21 hrs, Volume=	0.339 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 47.75' @ 12.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	42.40'	**18.0" Round Culvert** L= 63.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 42.40' / 41.90' S= 0.0079 '/' Cc= 0.900

			n= 0.014, Flow Area= 1.77 sf
#2	Secondary	45.92'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=7.54 cfs @ 12.19 hrs HW=47.29' TW=46.49' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 7.54 cfs @ 4.26 fps)

Secondary OutFlow Max=12.63 cfs @ 12.21 hrs HW=47.68' TW=47.25' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Orifice Controls 12.63 cfs @ 3.16 fps)

Summary for Pond P3C: Existing 18"

Inflow Area =	0.787 ac, 81.70% Impervious, Inflow Depth > 3.81" for 25-Year event			
Inflow =	3.77 cfs @	12.07 hrs, Volume=	0.250 af	
Outflow =	3.77 cfs @	12.07 hrs, Volume=	0.250 af, Atten= 0%, Lag= 0.0 min	
Primary =	3.77 cfs @	12.07 hrs, Volume=	0.250 af	
Secondary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 46.36' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	43.38'	**18.0" Round Culvert** L= 127.0' Ke= 0.500
			Inlet / Outlet Invert= 43.38' / 41.20' S= 0.0172 '/' Cc= 0.900
			n= 0.014, Flow Area= 1.77 sf
#2	Secondary	46.77'	**30.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=44.68' TW=44.80' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=43.38' TW=46.50' (Dynamic Tailwater)
└─**2=Orifice/Grate** (Controls 0.00 cfs)

Time span=0.00-20.00 hrs, dt=0.01 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 5.1E: Runoff Area=31,933 sf 41.91% Impervious Runoff Depth>3.09"
Flow Length=142' Tc=7.6 min CN=70 Runoff=2.70 cfs 0.189 af

Subcatchment 5.1F: Runoff Area=1.293 ac 51.35% Impervious Runoff Depth>3.69"
Flow Length=142' Tc=7.6 min CN=76 Runoff=5.65 cfs 0.397 af

Subcatchment S1: Runoff Area=9.019 ac 3.15% Impervious Runoff Depth>1.02"
Flow Length=1,389' Tc=13.3 min CN=46 Runoff=7.09 cfs 0.764 af

Subcatchment S14.2: Runoff Area=2.483 ac 70.72% Impervious Runoff Depth>4.21"
Tc=5.0 min CN=81 Runoff=13.38 cfs 0.871 af

Subcatchment S2: Runoff Area=5.023 ac 67.65% Impervious Runoff Depth>4.10"
Flow Length=871' Tc=7.2 min CN=80 Runoff=24.52 cfs 1.717 af

Subcatchment S3: Runoff Area=3.484 ac 77.24% Impervious Runoff Depth>4.97"
Tc=5.0 min CN=88 Runoff=21.34 cfs 1.443 af

Subcatchment S4: Runoff Area=13.925 ac 10.84% Impervious Runoff Depth>1.97"
Flow Length=2,418' Tc=20.2 min CN=58 Runoff=22.45 cfs 2.286 af

Subcatchment S5: Runoff Area=6.485 ac 77.30% Impervious Runoff Depth>4.64"
Tc=5.0 min CN=85 Runoff=37.80 cfs 2.508 af

Subcatchment S5.1: Runoff Area=3.325 ac 72.60% Impervious Runoff Depth>4.96"
Flow Length=1,190' Tc=14.6 min CN=88 Runoff=15.11 cfs 1.374 af

Subcatchment S5.1A: Runoff Area=12.811 ac 9.75% Impervious Runoff Depth>1.63"
Flow Length=1,375' Tc=21.0 min CN=54 Runoff=16.26 cfs 1.742 af

Subcatchment S5.1B: Runoff Area=16.994 ac 17.91% Impervious Runoff Depth>2.41"
Flow Length=2,092' Tc=24.8 min CN=63 Runoff=31.60 cfs 3.413 af

Subcatchment S5.1C: Runoff Area=16.789 ac 19.70% Impervious Runoff Depth>3.17"
Flow Length=2,090' Tc=25.1 min CN=71 Runoff=41.30 cfs 4.431 af

Subcatchment S5.1D: Runoff Area=1.148 ac 28.92% Impervious Runoff Depth>2.42"
Flow Length=355' Tc=11.3 min CN=63 Runoff=2.91 cfs 0.232 af

Subcatchment S52.1: Runoff Area=10.899 ac 7.25% Impervious Runoff Depth>2.69"
Flow Length=1,830' Tc=19.7 min CN=66 Runoff=25.11 cfs 2.446 af

Subcatchment S52.2: Runoff Area=1.651 ac 7.21% Impervious Runoff Depth>2.50"
Flow Length=752' Tc=27.6 min CN=64 Runoff=3.05 cfs 0.344 af

Subcatchment S53: Runoff Area=5.043 ac 5.71% Impervious Runoff Depth>2.60"
Flow Length=958' Tc=15.8 min CN=65 Runoff=12.20 cfs 1.094 af

Subcatchment S54: Runoff Area=2.244 ac 15.20% Impervious Runoff Depth>2.79"
Flow Length=625' Tc=18.3 min CN=67 Runoff=5.52 cfs 0.522 af

Subcatchment S56.1: Runoff Area=3.348 ac 77.99% Impervious Runoff Depth>5.08"
Tc=5.0 min CN=89 Runoff=20.81 cfs 1.418 af

Subcatchment S56.3: Runoff Area=2.941 ac 75.52% Impervious Runoff Depth>4.64"
Tc=5.0 min CN=85 Runoff=17.14 cfs 1.137 af

Subcatchment S56.4: Runoff Area=3.182 ac 29.10% Impervious Runoff Depth>3.48"
Flow Length=626' Tc=15.1 min CN=74 Runoff=10.53 cfs 0.922 af

Subcatchment S62: Runoff Area=0.787 ac 81.70% Impervious Runoff Depth>4.86"
Tc=5.0 min CN=87 Runoff=4.75 cfs 0.319 af

Reach 2R: Existing Stream Avg. Flow Depth=0.82' Max Vel=6.24 fps Inflow=30.12 cfs 3.903 af
n=0.030 L=660.0' S=0.0364 '/' Capacity=206.03 cfs Outflow=30.05 cfs 3.895 af

Reach 4R: Avg. Flow Depth=0.55' Max Vel=3.64 fps Inflow=28.15 cfs 1.190 af
n=0.030 L=105.0' S=0.0308 '/' Capacity=135.01 cfs Outflow=28.00 cfs 1.190 af

Reach 5R: Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
x 2.00 n=0.030 L=65.0' S=0.2385 '/' Capacity=303.75 cfs Outflow=0.00 cfs 0.000 af

Reach 18G: Avg. Flow Depth=0.36' Max Vel=2.51 fps Inflow=10.03 cfs 0.117 af
n=0.030 L=520.0' S=0.0263 '/' Capacity=19.67 cfs Outflow=7.92 cfs 0.117 af

Reach 19G: Avg. Flow Depth=0.29' Max Vel=1.98 fps Inflow=5.10 cfs 0.058 af
n=0.030 L=340.0' S=0.0213 '/' Capacity=17.69 cfs Outflow=4.28 cfs 0.058 af

Reach 20G: Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=170.0' S=0.0369 '/' Capacity=23.30 cfs Outflow=0.00 cfs 0.000 af

Reach 21G: Avg. Flow Depth=0.32' Max Vel=2.89 fps Inflow=7.50 cfs 0.093 af
n=0.030 L=175.0' S=0.0406 '/' Capacity=24.44 cfs Outflow=7.30 cfs 0.093 af

Reach G-1: Gutter Avg. Flow Depth=0.37' Max Vel=2.78 fps Inflow=19.26 cfs 0.705 af
x 2.00 n=0.030 L=240.0' S=0.0304 '/' Capacity=42.29 cfs Outflow=19.16 cfs 0.705 af

Reach G-2: Gutter Avg. Flow Depth=0.25' Max Vel=1.91 fps Inflow=3.10 cfs 0.046 af
n=0.030 L=260.0' S=0.0247 '/' Capacity=19.05 cfs Outflow=2.93 cfs 0.046 af

Reach L108: Existing Swale Avg. Flow Depth=0.17' Max Vel=3.76 fps Inflow=41.53 cfs 3.083 af
n=0.030 L=774.0' S=0.0646 '/' Capacity=1,762.00 cfs Outflow=25.61 cfs 3.068 af

Reach O5: Inflow=14.53 cfs 2.897 af
Outflow=14.53 cfs 2.897 af

Reach POA3: Inflow=75.28 cfs 15.152 af
Outflow=75.28 cfs 15.152 af

Pond 1R: Existing 24" Peak Elev=48.07' Inflow=30.52 cfs 2.009 af
Primary=19.18 cfs 1.757 af Secondary=18.23 cfs 0.252 af Outflow=30.52 cfs 2.009 af

Pond 2P: Blue Hill Intersection Peak Elev=47.37' Storage=17,596 cf Inflow=49.29 cfs 2.012 af
Outflow=40.60 cfs 1.885 af

Pond 3P: Stream Interceptor Peak Elev=54.70' Storage=55 cf Inflow=30.05 cfs 3.895 af
30.0" Round Culvert n=0.014 L=73.0' S=0.0055 '/' Outflow=30.06 cfs 3.895 af

Pond 18P: Existing 18" Peak Elev=116.59' Inflow=28.76 cfs 2.481 af
Primary=18.80 cfs 2.364 af Secondary=10.03 cfs 0.117 af Outflow=28.76 cfs 2.481 af

Pond 19P: Existing 24" Peak Elev=101.91' Inflow=26.52 cfs 2.481 af
Primary=21.43 cfs 2.423 af Secondary=5.10 cfs 0.058 af Outflow=26.52 cfs 2.481 af

Pond 20P: Existing 24" Peak Elev=98.67' Inflow=25.64 cfs 2.481 af
Primary=25.64 cfs 2.481 af Secondary=0.00 cfs 0.000 af Outflow=25.64 cfs 2.481 af

Pond 21P: Existing 24" Peak Elev=94.77' Inflow=41.22 cfs 3.924 af
Primary=33.73 cfs 3.832 af Secondary=7.50 cfs 0.093 af Outflow=41.22 cfs 3.924 af

Pond 48R: 48" Peak Elev=82.40' Inflow=99.41 cfs 10.092 af
48.0" Round Culvert n=0.014 L=1,000.0' S=0.0307 '/' Outflow=99.41 cfs 10.092 af

Pond 52.1P: Upper Pond Peak Elev=53.10' Storage=192,239 cf Inflow=145.29 cfs 18.373 af
Primary=61.37 cfs 8.433 af Secondary=45.45 cfs 9.043 af Tertiary=0.00 cfs 0.000 af Outflow=106.82 cfs 17.476 af

Pond 52.2P: Lower Pond Peak Elev=50.07' Storage=127,774 cf Inflow=64.31 cfs 8.777 af
Primary=16.09 cfs 7.599 af Tertiary=0.00 cfs 0.000 af Outflow=16.09 cfs 7.599 af

Pond 53P: Wetland Area Peak Elev=80.12' Storage=26,129 cf Inflow=37.14 cfs 4.162 af
Outflow=30.12 cfs 3.903 af

Pond L179: Existing 24" Peak Elev=47.55' Inflow=32.30 cfs 5.363 af
Primary=27.72 cfs 5.349 af Secondary=4.59 cfs 0.013 af Outflow=32.30 cfs 5.363 af

Pond LINK 110.1: Existing 18" Peak Elev=53.92' Inflow=41.30 cfs 4.431 af
Primary=13.42 cfs 3.241 af Secondary=28.15 cfs 1.190 af Outflow=41.30 cfs 4.431 af

Pond MH-A: 15" RCP Peak Elev=163.97' Inflow=31.60 cfs 3.413 af
Primary=12.34 cfs 2.708 af Secondary=19.26 cfs 0.705 af Outflow=31.60 cfs 3.413 af

Pond MH-B: 21" RCP Peak Elev=151.01' Inflow=12.34 cfs 2.708 af
21.0" Round Culvert n=0.012 L=300.0' S=0.0060 '/' Outflow=12.34 cfs 2.708 af

Pond MH-C: Overflow Manhole Peak Elev=148.87' Inflow=14.53 cfs 2.897 af
Primary=14.53 cfs 2.897 af Secondary=0.00 cfs 0.000 af Outflow=14.53 cfs 2.897 af

Pond MH-D: Peak Elev=154.97' Storage=16,298 cf Inflow=35.08 cfs 2.447 af
Primary=36.85 cfs 2.407 af Secondary=3.10 cfs 0.046 af Outflow=39.93 cfs 2.454 af

Pond MH-E: 24" RCP Peak Elev=157.85' Inflow=37.76 cfs 2.639 af
24.0" Round Culvert n=0.012 L=260.0' S=0.0262 '/' Outflow=37.76 cfs 2.639 af

Pond MH-F: 24" RCP Peak Elev=148.29' Storage=0 cf Inflow=40.58 cfs 2.686 af
Primary=40.58 cfs 2.686 af Secondary=0.00 cfs 0.000 af Outflow=40.58 cfs 2.686 af

Pond P3: Existing Outlet Peak Elev=46.21' Inflow=30.71 cfs 5.668 af
Primary=30.71 cfs 5.668 af Secondary=0.00 cfs 0.000 af Outflow=30.71 cfs 5.668 af

Pond P3B: Existing 18" Peak Elev=48.05' Inflow=23.00 cfs 4.163 af
Primary=14.22 cfs 3.606 af Secondary=16.20 cfs 0.557 af Outflow=23.00 cfs 4.163 af

Pond P3C: Existing 18" Peak Elev=46.37' Inflow=4.75 cfs 0.319 af
Primary=4.75 cfs 0.319 af Secondary=0.00 cfs 0.000 af Outflow=4.75 cfs 0.319 af

Total Runoff Area = 123.607 ac Runoff Volume = 29.569 af Average Runoff Depth = 2.87"
72.57% Pervious = 89.700 ac 27.43% Impervious = 33.907 ac

Tetra Tech, Inc.

Project: **100,000 SF Office** By: **NHC** Date: **2/20/2019**

Location: **Westwood, MA** Chkd: **NHC** Date: **2/20/2019**

Watershed Area: **S5 Proposed Office Parking (North)**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.75	0.71	0.534	0.18
Wet Detention Basin	0.80	0.18	0.143	0.04

* Equals remaining load from previous BMP

Total TSS Removal = **96.4%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009
prepared by MADEP, Section VI Case studies.

P:\3659\143-3659-16003\SupportDocs\Calcs\Drainage\DAB_TSS_Removal_Calcs 100,000 SF Office S5.xls

Tetra Tech, Inc.

Project: **100,000 SF Office** By: **NHC** Date: **2/20/2019**

Location: **Westwood, MA** Chkd: **NHC** Date: **2/20/2019**

Watershed Area: **S23 Proposed Office Parking (South)**

TSS Removal Calculation Worksheet

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BxC)	E Remaining Load (C-D)
Street Sweeping	0.05	1.00	0.050	0.95
Deep Sump/Hooded Catchbasins	0.25	0.95	0.238	0.71
Water Quality Structures	0.75	0.71	0.534	0.18
Wet Detention Basin	0.80	0.18	0.143	0.04

* Equals remaining load from previous BMP

Total TSS Removal = **96.4%**

Source: Volume Two: Massachusetts Stormwater Handbook, Dated January 2009
prepared by MADEP, Section VI Case studies.

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Brief Stormceptor Sizing Report - STC 6.1

Project Information & Location			
Project Name	100,000 SF Office	**Project Number**	7564
City	Westwood	**State/ Province**	Massachusetts
Country	United States of America	**Date**	2/19/2019
Designer Information		**EOR Information (optional)**	
Name	Nate Cheal	**Name**	
Company	Tetra Tech	**Company**	
Phone #	508-786-2331	**Phone #**	
Email	nate.cheal@tetratech.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	STC 6.1
Target TSS Removal (%)	75
TSS Removal (%) Provided	77
Recommended Stormceptor Model	STC 2400

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	**% TSS Removal Provided**
STC 450i	63
STC 900	73
STC 1200	73
STC 1800	73
STC 2400	77
STC 3600	78
STC 4800	82
STC 6000	82
STC 7200	85
STC 11000	89
STC 13000	89
STC 16000	91
StormceptorMAX	Custom

STC 11000 PROVIDED

Sizing Details

Drainage Area	
Total Area (acres)	3.76
Imperviousness %	79.0

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective	
TSS Removal (%)	75.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	4.67

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications

Brief Stormceptor Sizing Report - STC 7

Project Information & Location			
Project Name	100,000 SF Office	**Project Number**	7564
City	Westwood	**State/ Province**	Massachusetts
Country	United States of America	**Date**	2/19/2019
Designer Information		**EOR Information (optional)**	
Name	Nate Cheal	**Name**	
Company	Tetra Tech	**Company**	
Phone #	508-786-2331	**Phone #**	
Email	nate.cheal@tetratech.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	STC 7
Target TSS Removal (%)	75
TSS Removal (%) Provided	78
Recommended Stormceptor Model	STC 7200

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary		
Stormceptor Model	**% TSS Removal Provided**	
STC 450i	48	
STC 900	60	
STC 1200	63	
STC 1800	63	
STC 2400	69	
STC 3600	69	
STC 4800	74	
STC 6000	74	
STC 7200	78	
STC 11000	82	STC 11000 PROVIDED
STC 13000	82	
STC 16000	85	
StormceptorMAX	Custom	

Sizing Details

Drainage Area	
Total Area (acres)	8.98
Imperviousness %	71.4

Rainfall	
Station Name	BLUE HILL
State/Province	Massachusetts
Station ID #	0736
Years of Records	58
Latitude	42°12'44"N
Longitude	71°6'53"W

Water Quality Objective	
TSS Removal (%)	75.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	7.96

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

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University Station - 100,000 SF Office
Westwood, MA

MaDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate

Water Quality Unit	Areas (acres)			% Impervious	Impervious Area (mi^2)	WQV (inches)	CN	Tc		qu (csm/in)	Q (cfs)	Stormceptor Model
	Impervious (A)	Pervious	Total					(min)	(hrs)			
STC-6.1	3.76	1.00	4.76	79.0%	0.0059	1.0	98	5.0	0.083	795	4.67	STC-11000
STC-7	6.41	2.57	8.98	71.4%	0.0100	1.0	98	5.0	0.083	795	7.96	STC-11000

Water Quality Flow (WQF) = Q = (qu) (A) (WQV)

Where: qu = the unit peak discharge (in csm/in)
A = impervious surface drainage area (in square miles)
WQV = water quality volume (in inches)

Notes:
1. Refer to MaDEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices, dated September 10, 2013.