Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

July 9, 2018

Ms. Barbara Barhydt
Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

Subject: Application for Level III Site Plan Application
90 Johnson Road
Tax Map 214A/Block A/Lot 1

Dear Barbara:

On behalf of **Transport Leasing Corp.** (Applicant), our office is pleased to provide the accompanying package of submission materials for a Level III Site Plan Application. This submission package is intended to meet the City's Level III Site Plan Submission requirements as outlined in the Level III Site Plan Checklist as well as Section 14-526 of the Code of Ordinances.

PROJECT OVERVIEW

Transport Leasing Corp. proposes to construct an expansion of their existing 17,482 SF office/warehouse building with an additional 22,064± SF to increase the building capacity for a Class A Office space within the 2.66 acres of land located at 90 Johnson Road. The site is currently in the B4 Commercial Business Zone. The building is currently occupied by Charter Communications (aka Spectrum or Time Warner Cable) and they use the space for both office and warehouse functions. Charter will shift these programs to other building space they already occupy on the City Line Drive Campus, if the applicant successfully leases the space to another office user.

Existing Site

Proposed Site

The development will also include new parking lot construction and ancillary site improvements including electrical utility upgrades, drainage etc., for the site. Approximately 3,500 SF of the existing building will be demolished to make way for some parking area on the north end of the site. The following is a summary of the existing and proposed building spaces:

Description	Size (SF)
Existing Ground Level	20,135
Existing Mezzanine	4,114
Total Existing	24,249
Proposed Ground Level	17,262
Proposed Mezzanine	4,757
Proposed Second Level	10,246
Proposed Third level	10,246
Total Proposed	42,511
Net Increase	18,262

Right, Title or Interest

The project site is currently owned by Transport Leasing Corp. and consists of 2.67 acres of land that is included in the City of Portland's Tax Assessors records as Tax Map 214A/Block A/Lots A001 and A003 and included in the June 2014 Subdivision Plan Prepared by Owen Haskell, Inc. A copy of the deed is included in Attachment B. The land has been under common ownership for a long period of time and includes City Line Drive, which is a private way, also owned and maintained by the Applicant.

Zoning Assessment

The project is located in the B4 Commercial Corridor Zone and the proposed general office use identified as an allowable use.

PERMITTED USES

- *General, business and professional offices*

➢ The following dimensional requirements apply in the B4 Commercial Corridor Zone with the applicable as provided information for the proposed layout:

B4 Space and Bulk Dimensional Requirements		
Dimensional Requirements	**Required**	**Provided**
Minimum Lot Size	10,000 SF	202,554 SF
Minimum Street Frontage	60'	447.82'
Minimum Front Yard	20'	41'±
Minimum Side Yard	12'	77'±
Minimum Rear Yard	20'	278'±
Minimum Lot Width	60'	448'±

B4 Space and Bulk Dimensional Requirements		
Maximum Building Height	65'	57"-5'±
Maximum Impervious Surface Ratio	80%	45.7%
Maximum Floor Area Ratio	0.65	0.34
Parking Spaces (1 spaces/400 SF)[1]	95	188

SHORELAND ZONING

The site is not located within the Shoreland Zoning District.

Existing development in the area includes the following:

- Charter Communications occupies the existing building at Lot 7.
- Lobsters Now occupies space within the existing building at 54 City Line Drive. The East Coast Christian Church also continues to control leased area within the 54 City line Drive building although they are not currently occupying the space.
- Canteen Services and SiteOne Landscape supply occupy space at 70 City Line Drive.
- The Portland Jetport and Department of Human Services are located east of the site along the Jetport Boulevard.
- Signalized access at the intersection of Johnson Road, Skyway Drive and the Jetport Boulevard is the primary connection to the Turnpike and points south in South Portland.

The Zoning Assessment table is included in Attachment C to this submission.

PROPOSED DEVELOPMENT

The development program includes the following components:

- Expansion of the remaining 17,234 SF building to include a 1,574 SF addition on the first floor; and
- Construction of a second and third floor to include 10,245 + SF of space on each level for a total of 20,490 SF.
- Vehicular access and circulation throughout the site will be from City Line Drive and Johnson Road. Left turns are prohibited from City Line Drive onto Johnson Road and there is a raised island in Johnson Road prohibiting this movement. Southbound traffic from the site or traffic to/from the Turnpike will typically flow thru the signalized intersection. Local traffic from Johnson Road will also use the signalized intersection or may turn left or right in/out of the proposed parking area, as the proposed access drives are located beyond the median island in Johnson Road.

[1] See Section 14-332 (j)

A total of 188 spaces will be provided for the project with six ADA spaces. This will provide a ratio of 5 spaces per 1,000 SF GLA as is typically required for Class A professional office space in the Portland region.

The site improvements include new parking area construction to consist primarily of porous asphalt pavement. Most of the existing parking area along City Line Drive and near Johnson Road will be rebuilt to make slight grades adjustments and to also provide a new pavement surface. Drainage patterns in the existing parking areas will remain basically unchanged. The new parking area will drain runoff to an existing municipal drainage system in Johnson Road, which ultimately conveys runoff northerly along Johnson Road and Congress Street to a culvert outlet located on Congress Street, opposite the cemetery entrance. From this point a natural drainage tributary conveys any water to the Stroudwater River and ultimately the Fore River. The proposed porous asphalt parking area will consist of materials that will provide both water quality treatment and stormwater runoff storage and control. This approach is nearly identical to the pavement section that was constructed at the Department of Human Services site off Jetport Boulevard, in South Portland, in 2014. The design of that porous pavement section was reviewed and approved by the Maine Department of Environmental Protection and the City of South Portland.

Department of Human Services – South Portland, ME
(Porous asphalt areas appear darker in the image and regular asphalt areas, primarily in the access drives, appear lighter in color. Source – Google™)

WAIVER REQUESTS

The table is included in Attachment D.

FINANCIAL CAPACITY

The Applicant has the means at its disposal for financing the proposed project. A letter from Bangor Savings Bank is included in Attachment E.

A breakdown of the preliminary project cost includes the following:

- Site Work <$900,000
- Structures $3,000,000+

These values are considered preliminary and approximate and are subject to change as actual contractor pricing is obtained. The applicant has owned and managed the property for greater than 30 years and they have maintained a tenant relationship with Charter/Time Warner Cable for greater than 15 years. The applicant should be considered as more than able to financial support the project.

TECHNICAL CAPACITY

The applicant has retained a highly-qualified team of professionals to undertake planning, permitting and design tasks on this project. Services will be provided by the following companies and their respective team leaders

Civil Engineer	Stephen R. Bushey, P.E. Stantec Consulting Services, Inc. 482 Payne Road Scarborough, ME 04074 (207) 887-3478 – Work (207) 756-9359– Cell stephen.bushey@stantec.com
Surveyor	Owen Haskell, Inc. John Swan 390 US Route 1 Falmouth, ME 04105 (207) 774-0424 – Work jswan@owenhaskell.com
Architect	Alpha Architects 17 Chestnut Street Portland, ME 04101 (207) 761-9500 Mark@alphaarchitects.com
Lighting/Electrical	Bartlett Design Inc. 942 Washington Street Bath, ME 04530 (207) 443-5447

The team of consultants retained has expertise and experience in the design of similar commercial projects. Resumes of key personnel for development team can be provided upon request.

The Applicant also has significant experience in the development and management of commercial projects having managed Transport Leasing for many years and specifically, owned and managed all of the property off City Line Drive over the course of several decades. The applicant should be considered an exemplary landlord and landowner, who have owned and managed commercial property in the Portland region highly successfully. They also own locally, commercial properties in Scarborough at 95 Pleasant Hill Road and Muzzy Road, among others.

STATE AND FEDERAL PERMITS

The project as presented does not require any additional Federal or State level site permits.

CLOSURE

Accompanying this cover letter are the following materials to complete Tab 1 – General Application Documents:

- Attachment A: Level III Site Plan Application Completed Checklist
- Attachment B: Right, Title and Interest
- Attachment C: Zoning Assessment
- Attachment D: Waiver Requests
- Attachment E: Financial Capability

In addition to the information listed above, we are also providing the following materials with our submission:

- Tab 2 – Transportation
- Tab 3 – Environmental and Landscape Features
- Tab 4 – Environmental and Stormwater
- Tab 5 – Public Infrastructure and Safety
- Tab 6 – Site Design
- Tab 7 – Construction Management Plan
- Plan Sheets

On behalf of the Transport Leasing Corp., we look forward to your continued assistance on the project and we look forward to the next available workshop meeting with the Planning Board. As is required, once we complete the Planning Board workshop, the applicant will be conducting a Public Informational Meeting. We anticipate this meeting will be conducted prior to the Public Hearing.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Tel: 207-887-3478
Stephen.bushey@stantec.com

Attachments

c: Mark Sanborn, Transport Leasing Corp.

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ATTACHMENT A

LEVEL III APPLICATION SUBMISSION CHECKLIST

Portland, Maine — Yes. Life's good here.

Planning & Urban Development Department

LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Submit each Tab as one PDF file and bookmark the items as noted below

Please confirm by electronically checking the boxes to the left

Tab 1 – General Application Documents

Checklist	Items to be Provided
Yes ✔ NA ☐ Plan ☐	PROJECT DESCRIPTION • Cover Letter with detailed project description
Yes ✔ NA ☐ Plan ☐	COMPLETED CHECKLIST – LEVEL III APPLICATION
Yes ✔ NA ☐ Plan ☐	RIGHT, TITLE AND INTEREST • Deeds, leases, or purchase and sales agreements
Yes ☐ NA ✔ Plan ☐	EVIDENCE OF STATE OR FEDERAL APPROVALS, if applicable • Permits or letters of non-jurisdiction, if applicable
Yes ✔ NA ☐ Plan ☐	ZONING ASSESSMENT • Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☐ NA ☐ Plan ✔	EXISTING &/OR PROPOSED EASEMENTS OR COVENANTS, if applicable • Evidence of existing easements and any proposed easements
Yes ✔ NA ☐ Plan ☐	WAIVER REQUESTS • Written request for waiver describing request and reason. Waiver Table
Yes ✔ NA ☐ Plan ☐	FINANCIAL CAPABILITY • Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ✔ NA ☐ Plan ☐	TECHNICAL CAPABILITY • Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN STANDARDS AND SUBMISSION CHECKLIST

Provide assessment of compliance with standards and include supplemental documentation, as applicable.

Submit each Tab as one PDF file and bookmark the items as noted below

Tab 2 - TRANSPORTATION

Check list	Assess/Provide/Document:
Yes NA Plan ☐ ☐ ✔	**Transportation Analysis- Traffic Impact (14-526 (a) 1)** • Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts • Traffic Impact Study (Technical Manual, Section 1) if applicable
Yes NA Plan ☐ ☐ ✔	**Access and Circulation (14-526 (a) 2 a)** • Access and internal circulation, addressing ADA access • Access and egress impacts on traffic flows • Description and use of drive-up features, if applicable
Yes NA Plan ✔ ☐ ☐	**Loading and Servicing (14-526 (a) 2 b)** • Loading and servicing needs, route and travel way geometrics for deliveries • Turning templates for delivery vehicles, if applicable
Yes NA Plan ☐ ☐ ✔	**Sidewalks (14-526 (a) 2 c)** • Sidewalks and condition along street frontages and internal walkways • Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
Yes NA Plan ✔ ☐ ☐	**Public Transit (14-526 (a) 3), if applicable** • Existing available transit services • Proposed site plan design details, such as easement, pad base, and shelter
Yes NA Plan ☐ ☐ ✔	**Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c)** • Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements • Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
Yes NA Plan ☐ ☐ ✔	**Bicycle Parking (14-526 (a) 4 b)** • Address bicycle parking requirements and identify locations on-site • Construction details for bike racks (Technical Manual, Section 1)
Yes NA Plan ☐ ☐ ✔	**Snow Storage (14-526 (a) 4 d)** • Management plan for snow removal and locate snow storage areas on plan
Yes NA Plan ☐ ✔ ☐	**Traffic Demand Management (TDM) (14-526 (a) 5), if applicable** • Develop TDM with Trip Reduction Targets and Strategies

Tab 3 - ENVIRONMENTAL AND LANDSCAPE FEATURES	
Check list	Assess/Provide/Document:
Yes NA Plan ☐ ✔ ☐	**Preservation of Significant Natural Features (14-526 (b) 1), if applicable** • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
Yes NA Plan ☐ ☐ ✔	**Landscaping and Landscape Preservation (14-526 (b) 2 a)** • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
Yes NA Plan ☐ ✔ ☐	**Site Landscaping (14-526 (b) 2 b)** • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes NA Plan ☐ ☐ ✔	**Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable** • Landscaped islands within parking areas (Technical Manual, Section 4)
Yes NA Plan ☐ ☐ ✔	**Street Trees (14-526 (b) 2 b iii)** • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
Tab 4 - ENVIRONMENTAL AND STORMWATER	
Check list	Assess/Provide/Document:
Yes NA Plan ✔ ☐ ☐	**Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a)** • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

Tab 5 - PUBLIC INFRASTRUCTURE AND SAFETY	
Check list	Assess/Provide/Document:
Yes NA Plan ☐ ✔ ☐	**Consistency with City Master Plans (14-526 (c) 1)** • Identify consistency with master plans • Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes NA Plan ✔ ☐ ✔	**Public Safety and Fire Prevention (14-526 (c))** • Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) • Emergency vehicle access • Address consistency with public safety standards (Technical Manual, Section 3) • Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Yes NA Plan ✔ ☐ ✔	**Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)** • Electrical services, including providing underground services • Identify existing and proposed connections for public utilities and required public utility upgrades • Sewer line connections are required, if there is a main within 200 feet • Proposed solid waste management facilities on-site and management for the site • Written evidence of the ability to serve from utility companies, as applicable
Tab 6 - SITE DESIGN	
Check list	Assess/Provide/Document:
Yes NA Plan ✔ ☐ ✔	**Massing, Ventilations and Wind Impact (14-526 (d) 1)** • Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable • Bulk, location or height impacts on adjoining structures • Identify and locate HVAC equipment and venting away from public spaces and residential properties • Identify screening and manufacturing specifications for noise, if applicable
Yes NA Plan ☐ ✔ ☐	**Shadows (14-526 (d) 2), if applicable** • Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes NA Plan ☐ ☐ ✔	**Snow and Ice Loading (14-526 (d) 3)** • Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes NA Plan ☐ ☐ ✔	**View Corridors (14-526 (d) 4), if applicable** • Protection of designated view corridors (Portland Design Manual, Appendix 1)

Yes	NA	Plan	
	✔		**Historic Resources (14-526 (d) 5), if applicable** • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
✔		✔	**Exterior Lighting (14-526 (d) 6)** • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
	✔		**Noise and Vibration (14-526 (d) 7)** • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
		✔	**Signage and Wayfinding (14-526 (d) 8), if applicable** • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
	✔		**Zone Related Design Standards (14-526 (d) 5)** • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples

Tab 7 - Construction Management Plan

Check list			
Yes	NA	Plan	**Construction Management Plan** • Construction Management Document and Plan
✔			

Level II and Level III Site Plan Checklist

Please upload the following drawings with the listed details into e-Plan

☑ **RECENT BOUNDARY SURVEY** (stamped by Maine Licensed Surveyor)

Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

☑ **Existing Conditions**

- Approximate location of structures on abutting property
- Topography
- Locate water courses
- Delineate wetlands
- Zone lines

☑ **Proposed Site Plan**

- Ground floor area, and grade elevations for all buildings

☑ **Access, Circulation, and Parking**

- Streets and intersections adjacent to site , any proposed geometric modifications
- Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- Location and dimensions of proposed loading areas
- Existing and proposed transit infrastructure with dimensions/ engineering specifications
- Location of vehicle and bicycle parking with dimensions and engineering specifications

☑ **Site Considerations**

- Identify snow storage areas
- Location of fire hydrants
- Location of solid waste management facilities

☑ **UTILITY PLAN** including:

- Existing utilities on site and within public streets
- Location, sizing, and directional flows of all existing and proposed utilities
- Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- Electric utility infrastructure

☑	**GRADING and DRAINAGE PLAN** including:
	• Existing grades and drainage • Proposed grades • Proposed stormwater management meeting Technical Manual (Section 5) standards • Location and proposed alteration of a water course • Preservation or alteration of wetlands
☑	**EROSION CONTROL**
	• Must be in compliance with Technical Manual, Section 5
☐	**LANDSCAPE PLAN** including:
	• Existing vegetation to be preserved and preservation measures • Proposed landscaping and buffers • Planting schedule
☐	**RECORDING PLAT**, if applicable
	• IF SUBDIVISION: Must be in compliance with requirements of Section 14-496 (b)
☑	**ARCHITECTURAL PLANS & RENDERINGS** including:
	• Exterior building elevations, color renderings, illustrations of all sides • Location and dimensions of all existing & proposed HVAC & mechanical equipment, all proposed screening • Provide context drawings, if applicable (Design Manual, page 1) • Floor plans

Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

I, Steve Bushey, P.E. of Stantec, hereby certify that a Neighborhood Meeting was held on Thursday, August 16, 2018 at 5:00 P.M. at the development site at 90 Johnson Road, Portland, Maine for the proposed project located at 90 Johnson Road, Portland, Maine.

I also certify that on Friday, August 3, 2018 (which is at least ten (10) days prior to the Neighborhood Meeting) invitations were mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 500 feet of the proposed development or within 1,000 feet of a proposed industrial subdivision or industrial zone change.

2. Residents on the "interested parties" list.

Signed,

Stephen Bushey, P.E.

August 17, 2018
Date

Attached to this certification are:

1. Copy of the invitation sent
2. Sign-in sheet
3. Meeting minutes

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Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

August 3, 2018

Dear Neighbor:

Please join us for a Neighborhood Meeting to discuss the proposed expansion of the existing office/warehouse building at 90 Johnson Rod in Portland, Maine. The project includes interior renovations and an additional 22,064± SF of multi-story Class A Office Space.

Meeting Location:	**Conference Room (look for signs)** **90 Johnson Road** **Portland, Maine**
Meeting Date:	**Thursday, August 16, 2018**
Meeting Time:	**5:00 PM**

The City Code requires that property owners within 500 feet (except notices must be sent to property owners within 1,000 feet for industrial zoning map amendments and industrial subdivisions) of the proposed development and residents on an "interested parties list", be invited to participate in a neighborhood meeting in advance of our appearances before the Portland Planning Board for a Workshop and Public Hearing, as they consider the Level III Site Plan Application that has been submitted. A sign-in sheet will be circulated and minutes of the meeting will be taken. Both the sign-in sheet and minutes will be submitted to the Planning Board. The meeting will last no more than 30-45 minutes.

If you have any questions, please feel free to contact Steve Bushey, P.E. at 207-883-3355.

Sincerely,

STANTEC CONSULTING SERVICES, INC.

Stephen R. Bushey, P.E.
Associate

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Note: Under Section 14-32(C) and 14-525 of the City Code of Ordinances, an applicant for a Level III development, subdivision of over five lots/units, or zone change is required to hold a neighborhood meeting within three weeks of submitting a preliminary application or two weeks of submitting a final site plan application, if a preliminary plan was not submitted. The neighborhood meeting must be held at least seven days prior to the Planning Board public hearing on the proposal. Should you wish to offer additional comments on this proposed development, you may contact the Planning Division at 874-8721 or send written correspondence to the Planning and Urban Development Department, Planning Division 4th Floor, 389 Congress Street, Portland, ME 04101 or by email to: bab@portlandmaine.gov

ABUTTERS LIST FROM CITY OF PORTLAND - 90 JOHNSON ROAD PROPERTY - PL-000232-2018

PROPERTY OWNER	OWNER ADDRESS	CITY	STATE	ZIP
Brooklawn Memorial Pk	2002 Congress St	Portland	ME	04102
City Of Portland	389 Congress St	Portland	ME	04101
Maine Turnpike Authority	430 Riverside St	Portland	ME	04103
State Of Maine	16 State House Station	Augusta	ME	04333
Temple Beth El	400 Deering Ave	Portland	ME	04103
Transport Leasing Corp	58 Lowell Junction Rd	Andover	MA	01810

INTERESTED PARTIES LIST FROM CITY OF PORTLAND - 100 FORE STREET PROPERTY

First Name	Last Name	Company Name	Street Number	Street Name	City	State	Zip
Anthony	Donovan		27	Riverview Street	Portland	ME	04102
Barbara	Wood		125	Emery Street	Portland	ME	04102
Chris	Castelsky	Fairpoint Communications	521	East Morehead Street	Charlotte	NC	28202
David	Nowlin		215	Oxford Street	Portland	ME	04102
Deb	Keenan		28	Dorothy Street	Portland	ME	04103
Devon	Platte		26	North Street, #3	Portland	ME	04101
Edward	Suslovic	District 3	46	Kenwood Street	Portland	ME	04103
		Greater Portland Council of Governments	970	Baxter Blvd., 2nd Floor	Portland	ME	04103
Henry	Leclair		209	Range Road	Windham	ME	03087
Janice	Carpenter		9	W. Commonwealth Drive	Portland	ME	04103
Jennifer	Munson	City of Portland	389	Congress Street	Portland	ME	04101
Jesse	Thompson	Kaplan Thompson Architects	424	Fore Street	Portland	ME	04101
John	Leavitt	NE Regional Council of Carpenters	68	Bishop Street, Unit 1	Portland	ME	04103
Len	Anderson		543	Allen Avenue	Portland	ME	04103
Lynn	Clarkson		145	Marlborough Road	Portland	ME	04103
Mary	Griffity		6	E. Prom, Unit #2	Portland	ME	04103
Vahan	Tufankijan	Seaside Healthcare	850	Baxter Boulevard	Portland	ME	04103
Nancy	Bartlett			PO Box 7965	Portland	ME	04112
Pam	Burnside		64	Lester Drive	Portland	ME	04103
Paul	Dubois		1915	Congress Street	Portland	ME	04102
Peggy	Morin		66	Farnham Street	Portland	ME	04101
Philip	Haughey		1660	Soldiers Field Road	Boston	MA	02135
James	Sterling	Portland Society of Architects		PO Box 7305	Portland	ME	04112
Priscilla	LaVallee		190	US Route 1, Unit 2	Falmouth	ME	04105
Rebecca	Halla	Waste Management of Maine	2000	Forest Avenue	Portland	ME	04103
REP Benjami	Dudley III	District 30	9	Ponce Street	Portland	ME	04101
REP Glenn	Cummings	District 37	24	Nevens Street	Portland	ME	04103
Robert	Hains		1369	Hilltop Drive	Naples	FL`	34103

Neighborhood Meeting Sign-In Sheet
Project: 90 Johnson Road, Portland, Maine

Date: August 16, 2018
Time: 5:00 PM
Location: Conference Room, 90 Johnson Road, Portland, Maine

Name	Company	Telephone No.	Email Address
Steve Bushey	STANTEC	207-807-3478	482 Payne Road Scarboro
Laura Hoddy	Bangor Savings Bank	207-571-2127	280 Fore Street, Portland
MARK H SANBORN	TLC	207-650-9506	95 PLEASANT HILL RD SCARBO. ME
Dwight Stanborn	TLC		

Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

MEETING MINUTES

Project: **90 Johnson Road, Portland, Maine**

Job #: **210801617**

Date: **August 16, 2018 at 5:00 PM**

Location: **Conference Room, 90 Johnson Road, Portland, Maine**

Subject: **Neighborhood Meeting**

Attendees: **Please see attached sign-in sheet**

In accordance with the City of Portland Planning Board Requirements, Transport Leasing Corp. and Stantec conducted a Neighborhood Meeting for the proposed expansion of their existing 17,482 SF office/warehouse building with an additional 22,064 SF of Class A office space. The meeting was held on Thursday, August 16, 2018 at 5:00 P.M. Please see the attached meeting sign-in sheet for a list of people who attended the meeting.

It was a brief meeting as only representatives of the Owner attended the meeting. There were zero (0) abutters or members of the public at the meeting. No questions were asked.

Prepared by Steve Bushey

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TAB 7
Construction Management Plan
90 Johnson Road Office Building
Transport Leasing Corp.

This document and its subsequent attachments comprise The Construction Management Plan being submitted to the City of Portland for the 90 Johnson Road Office Building project at 90 Johnson Road. The Construction Management Plan contains information pertaining to the overall planning and coordination of the project.

The project involves the renovations and construction of a building expansion that will add 18,262 SF of building space onto an existing 24,249 SF building. The expansion includes an increase in building height to add two levels of office space above an existing structure. A portion of the upper level expansion will extend beyond the existing building footprint and be column supported. Site improvements include new porous pavement parking, utilities, and yard work.

A. Construction Management Principles

The impact of this project on the public will be minimized via the following construction management principles:

- The construction zone for the building will be fully secured with hard barriers/fencing preventing any access into the site by the public. Barriers are <u>not</u> expected to extend into the Public R.O.W.
- All construction activities will occur within the construction barriers/fencing to ensure the public is never exposed to any risks caused by the activities.
- There will be an onsite staging and unloading area for all deliveries which will prevent any impacts caused by offsite staging of trucks.
- All deliveries will be coordinated and scheduled to ensure that there is no offsite queuing required in Johnson Road or City Line Drive. The Owner plans to schedule as many deliveries as possible in the early morning to limit impact on the surrounding area.
- All construction activities will occur within normal daytime working hours to minimize impacts to the surrounding area.

B. Development Review of Construction Management Plan

The Owner will use a site-specific safety program for all team members who work on the construction site. The public will not be put at risk at any point throughout this project, as all work will be completed within the fenced off jobsite. At no point of the project will the public have access to this job site. Minimizing impacts to areas surrounding the building/construction site will be a primary consideration in the process.

The Planning Authority and the Department of Public Works have the right to seek revisions to an approved Construction Management Plan or require a condition of approval that states an applicant shall coordinate a project's construction schedule with the timing of nearby construction activity, in order to avoid cumulative impacts on a neighborhood. Such a condition may involve a delay in commencement of construction, if necessary.

C. Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits

All fees, permits, and guarantees will be paid/issued prior to construction commencing.

This project will require no anticipated public street openings for utility tie-ins. If found to be necessary, all required permits will be requested and granted by the Department of Public Works prior to any street openings occurring. MUTCD plans will be submitted to and approved by the City of Portland for any traffic disruptions caused by street openings or interruptions to Johnson Road or Jetport Boulevard traffic. City Line Drive is a private way owned and maintained by the applicant.

D. Construction Administration and Communication

The contact person for all construction activities for the project will be:

Mark Sanborn
207.650.9506
mark@abcorental.com

Temporary signage will be posted onsite with additional contact information for the contractor.

E. Construction Schedule

The preliminary construction schedule for the project starts in Fall 2018 and runs through Spring 2019.

All construction activities will be completed during daytime hours, there will be no need for night work. All deliveries for this project will also occur during normal daytime hours.

F. Security & Public Safety

See the Site Plans for fencing and barriers to be used to isolate the construction site from the public. All gates into the project may have Knox locking devices to allow for emergency access.

The fire safety program onsite will consist of the following:

- Fire extinguishers placed throughout the construction site for the duration of the project.

- The new fire alarm system installation will be ongoing throughout the project duration.
- All team members will be briefed on the emergency evacuation plan for the project site prior to starting work.

G. Construction Permitting and Traffic Control Plans

1. Construction Activity in Public Streets: This project will not require street openings on Johnson Road.

2. Sewer: This building will need to connect to the public sewer system via an existing on site service connection. All required permits will be submitted for and approved by the Sewer Connection Clerk at the Department of Public Works or City of South Portland Water Resource Protection Department.

3. Traffic Control Plans: There will be periods of time throughout the project where construction activity may impact the existing public street system although this is expected to be very limited. Prior to any interruptions, a MUTCD plan will be created and submitted to the City for approval. The MUTCD will ensure that traffic and safe passage for the public is maintained in a satisfactory manner.

H. Site Management and Controls

The following actions will be taken by the Owner as regular site management and control activities:

- Construction site signage will be provided, installed, and maintained by the Owner throughout the duration of the project.
- Access to the site will be controlled.
- Trash and debris will be removed from site via a construction dumpster which will be changed out as needed on a regular basis.
- Street cleaning will not be required on a regular basis, but if it is deemed necessary the Owner will coordinate the cleaning of any excess dirt that has resulted from construction activities.
- Onsite snow removal will be the Owner's responsibility.

I. Erosion Control and Preservation of Trees

Erosion control measures will be installed onsite prior to any work commencing. A complete erosion control plan will be put together and reviewed with the City at the preconstruction meeting. Some of the measures that will be taken are utilization of silt fences to protect to surrounding area from any silt run off from the site. The control measures will be maintained daily and inspected weekly or after any major rain event. The inspections will be documented for review by the City of Portland, Maine Department of Environmental Protection, or the U.S. Environmental Protection Agency.

All stored materials onsite will be located away from any trees or vegetation.

J. Construction Staging Area

All trucks will be unloaded within the construction site's footprint to avoid impacts on public traffic. An offsite marshalling area will not be required for this project. All materials will be stored onsite and, in a manner, to avoid impacts to site operations and emergency vehicle access to the property.

K. Parking During Construction

Construction parking will be provided onsite. No parking of construction vehicles will be allowed in the Johnson Road R.O.W.

L. Special Measures as Necessary

There will be no special measures necessary for this project.

Please do not hesitate to contact the applicant with any comments, questions, or concerns regarding the Johnson Road project and subsequent Construction Management Plan.

TAB 3 – ENVIRONMENTAL AND LANDSCAPE FEATURES

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 3 and Section 14-526 of the ordinance.

(b) Environmental Quality Standards

Preservation of Significant Natural Features (14-526 (b) 1), if applicable

- *Trees, plants, habitats listed on State or Federal list of endangered or threatened*
- *High and moderate value waterfowl and wading habitat*
- *Aquifers on Casco Bay Islands*
- *Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains)*
- *Proposed preservation areas and protection measures*
- *Documentation from environmental consultants, determinations from applicable state agencies*

1. *Preservation of Significant Natural Features:*

   a. The existing site retains no prominent significant natural features therefore no issue related to the preservation of these features applies.

   b. Not applicable.

Landscaping and Landscape Preservation (14-526 (b) 2 a)

- *Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4)*
- *Protection measures of existing vegetation during construction*
- *Protection measures within Shoreland Zone, if applicable*

2. *Landscaping and Landscape Prevention:*

   a. Landscape Preservation.

      (i) Landscaping has been provided for on the site plan. This include perimeter tree plantings to supplement existing landscaping, primarily along the Johnson Road frontage. Where necessary, the owners will provide grass cover to stabilize non-gravel or non-paved surfaces and add a few street trees for landscaping.

      (ii) Not applicable.

      (iii) Protection measures will be made for existing vegetation during construction.

      (iv) The Applicant will request a waiver from this standard.

Landscaping and Landscape Preservation (14-526 (b) 2 b)

a. *Screening and buffering of service areas and between non-residential and residential uses*
b. *Planting plans with plant schedule and sizes*

2. *Landscaping and Landscape Prevention:*

b. *Site Landscaping:*

(i) Landscaped Buffers:

(a) There are no service or loading areas observable from nearby sidewalks or residential properties.

(b) The development is not subject to zoning setbacks or buffering requirements.

(c) Not applicable.

(d) Not applicable.

Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable

- *Landscaped islands within parking areas (Technical Manual, Section 4)*

2. *Landscaping and Landscape Preservation:*

a. Site Landscaping.

(ii) Parking Lot Landscaping:

a) thru d) Parking lot landscaping has been provided for on the site plans. Included in the landscaping are 34 trees and 34 shrubs and various perennial planting beds.

Street Trees (14-526 (b) 2 b iii)

- Existing Heritage or Feature Trees on site and measures to preserve
- Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable

2. *Landscaping and Landscape Preservation:*

b. Site Landscaping.

(iii) Street Trees:

(a) Five Zelkova Street trees are proposed along the Johnson Road frontage.

TAB 4 – ENVIRONMENTAL AND STORMWATER

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 4 and Section 14-526 of the ordinance.

(b) Environmental Quality Standards

Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a)

- *Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable*
- *Erosion control plan and measures*
- *Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable*
- *Subsurface sanitary sewage disposal and groundwater protection*

3. *Water Quality, Stormwater Management and Erosion Control:*

   a. *Stormwater:*

      (i) The project site is currently developed with an existing building and parking area. A full stormwater management report has been prepared to address the development's pre and post development stormwater quantity and quality conditions.

      (ii) An Erosion & Sediment Control Plan has been prepared and is included with this submission.

      (iii) Not applicable

      (iv) See the Stormwater Management Report attached to this narrative for further information.

Stantec Consulting Services Inc.
482 Payne Road, Scarborough Court, Scarborough, ME 04074

July 16, 2018

Capt. Chris Pirone
City of Portland Fire Department
380 Congress Street
Portland, Maine 04101

Subject: 90 Johnson Road
Fire Safety Checklist

Dear Capt. Pirone:

In accordance with instructions in the City's Level III Site Plan and Subdivision Review packet, please find enclosed the drawings necessary for your review of the proposed building expansion on 90 Johnson Road this includes building renovations to the existing building to increase building capacity for Class A office space. As part of the building design, the architect will retain a third-party Fire Protection Engineer to review NFPA 101. We have listed each item in your checklist below, followed by our response.

1. *Name, address, telephone number of applicant.*

   Transport Leasing Corp.
   Attn: Mark Sanborn
   PO Box 11054
   Portland, ME 04104

2. *Name, address, telephone number of architect/contractor.*

   Alpha Architects
   17 Chestnut Street
   Portland, ME 04101
   207.761.9500
   Attn: Mark Sengelmann

3. *Proposed uses of any structures (NFPA and IBC classification).*

Building	NFPA/IBC Classification	Sprinkler
Office Building - Existing	A2- Business	No Existing To be installed as part of renovations
Warehouse	S2- Storage	No Existing To be installed as part of renovations

*Systems designed to meet NFPA

4. *Square footage of all structures (total and per story).*

Building	Footprint Area (SF)
Existing 1st Floor & Mezzanine	24,249
Proposed 1st Floor & Mezzanine	22,019
Proposed 2nd and 3rd Floor (each)	10,246
Total GLA Proposed	**42,511**

5. *Elevation of all structures.*

   Architectural building elevations accompany this letter and they show the various locations of door openings, etc. around the building perimeter.

6. *Proposed fire protection of all structures.*

   The existing building does not have a sprinkler system. A 6" fire service line and new sprinkler system are proposed as part of the renovations and building addition mechanical system improvements.

7. *Hydrant locations.*

   A hydrant is currently accessible currently in front of the site entrance at the entrance of City Line Drive.

8. *Water main(s) size and location.*

   There is currently a single domestic water service to the existing building from the twelve-inch main in Johnson Road. There is also a 12" main in City Line Drive and the new Fire sprinkler service will tap off that main.

9. *Access to all structures (min. 2 sides).*

   The accompanying site plan depicts the site's access conditions that include access to two or more sides of the buildings.

10. *A code summary shall be included referencing NFPA 1 and all fire department technical standards.*

<u>NFPA 1 – Chapter 18 Fire Department Access and Water Supply</u>

18.2 Fire Department Access:

The project access conditions include multiple driveways off City Line Drive and Johnson Road. The driveways will be greater than 24 feet in width which satisfies NFPA 1 18.2.3.4.1.1 that requires a minimum width of 20 ft.

Per NFPA 1 – Chapter 18.2.3.2.2.1, all first story floors shall be located not more than 450 ft. from a Fire Department access road.

<u>City of Portland Technical Manual – Section 3 Public Safety</u>

3.4.1 Every dead-end roadway more than one hundred fifty (150') feet in length shall provide a turnaround at the closed end. Turnarounds shall be designed to facilitate future street connectivity and shall always be designed to the right (refer to Figure I-5).

Supporting Evidence: Not applicable.

3.4.2 Where possible, developments shall provide access for Fire Department vehicles to at least two sides of all structures. Access may be from streets, access roads, emergency access lanes, or parking areas.

Supporting Evidence: As depicted on the Site Plan, the proposed building layout provides for a minimum two-sided access to the structure.

3.4.3 Building setbacks, where required by zoning, shall be adequate to allow for emergency vehicle access and related emergency response activities and shall be evaluated based on the following factors:

- *Building Height.*
- *Building Occupancy.*
- *Construction Type.*
- *Impediments to the Structures.*
- *Safety Features Provided.*

Supporting Evidence: The proposed development layout has contemplated emergency access conditions and provides for safe and efficient access along the public and private streets for emergency vehicles.

3.4.4. Fire Dept. access roads shall extend to within 50' of an exterior door providing access to the interior of the structure.

Supporting Evidence: All buildings in the Jetport Business Park will be provided with an exterior entrance door that will be within 50' of a Fire Department access route.

3.4.5. Site access shall provide a minimum of nine (9) feet clearance height to accommodate ambulance access.

Supporting Evidence: A minimum of 9 feet vertical clearance will be provided below any overhead signage or utilities entering the site. Generally speaking, all utilities will be underground.

3.4.6. Elevators shall be sized to accommodate an 80 x 24-inch stretcher.

Supporting Evidence: The proposed elevator will be designed to satisfy this requirement.

3.4.7. All structures are required to display the assigned street number. Numbers shall be clearly visible from the public right of way.

Supporting Evidence: Currently, the project location is 90 Johnson Road. The applicant will work with the City's Public Services Division to confirm that this will remain the street address to meet City standards.

If you need any further information regarding this review, please contact our office.

Regards,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Tel: 207-887-3478
Stephen.bushey@stantec.com

Attachments

c: Planning Authority

V:\2108\active\210801617\civil\admin\permitting\local\level 3 site plan\ltr_pirone_firedept_20180716.docx

ATTACHMENT E

FINANCIAL CAPACITY

June 14, 2018

Portland Planning Authority
4th Floor City Hall
Portland, Maine 04101

RE: Transport Leasing Corp - Financial Capability Support Letter

To Whom It May Concern:

On behalf of Bangor Savings Bank, I am pleased to provide this letter of support for Transport Leasing Corp. Based on our prior experience with Transport Leasing Corp and its principals, Mark and H. Scott Sanborn, we believe that they have the experience and wherewithal to finance the re-development of commercial real estate projects in the local market.

While this letter of support is not a commitment to lend, Bangor Savings Bank would welcome the opportunity to be a resource to Transport Leasing Corp for financing necessary in connection with new development projects. Transport Leasing Corp, Mark Sanborn and H. Scott Sanborn are highly valued clients of Bangor Savings Bank. All accounts are in good standing and being handled in a professional and satisfactory manner.

Please feel free to call me (207-571-2127) if I can be of assistance in any way.

Yours truly,

Laura Huddy

Laura Huddy
Senior Vice President
Commercial Lending Group

TAB 5 – PUBLIC INFRASTRUCTURE AND SAFETY

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 5 and Section 14-526 of the ordinance.

(c) Public Infrastructure and Community Safety Standards.

Consistency with City Master Plans (14-526 (c) 1)

- *Identify consistency with master plans*
- *Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable*

1. *Consistency with City Master Plans:*

    a. The project has been designed to be consistent with the City's Zoning Ordinance and off-site infrastructure plans. The site benefits from existing infrastructure to the existing building. The expansion will involve the installation of a sprinkler system to the building which involves a new fire supply water main off the PWD main in City Line drive. The existing building has a sanitary sewer service and the flows from the site ultimately discharge to the South Portland municipal wastewater collection, conveyance and treatment systems, per an inter-municipal agreement.

    b. Sanitary sewer flows from the development will go to the South Portland WWTP per an intra-municipal agreement.

Public Safety and Fire Prevention (14-526 (c) 2)

- *Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3)*
- *Emergency vehicle access*
- *Address consistency with public safety standards (Technical Manual, Section 3)*
- *Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist*

2. *Public Safety and Fire Prevention:*

    a. The site has been designed to promote a safe and welcoming office environment.

    b. The site provides access from Johnson Road, City Line Drive and the Jetport Boulevard for emergency vehicles.

    c. There is an existing fire hydrant located at the entrance of City Line Drive off Johnson Road. The existing office building will be fully sprinklered. The proposed expansion will also be sprinklered according to NFPA regulations.

    d. A summary letter to Chief Pirone is included at the end of this section.

Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)

- *Electrical services, including providing underground services*
- *Identify existing and proposed connections for public utilities and required public utility upgrades*
- *Sewer line connections are required, if there is a main within 200 feet*

- *Proposed solid waste management facilities on-site and management for the site*
- *Written evidence of the ability to serve from utility companies, as applicable*

There are existing electrical water, sewer, and gas services to the property from mains located in the abutting streets. Our office has contacted all governing utility agencies and companies and will continue to coordinate the provision of new or updated services, as required throughout the design and construction phases of the project. The following sections outline current conditions and anticipated improvements associated with each system.

Electricity Supply/Communications

Bartlett Design has contacted Central Maine Power Company (CMP) regarding their ability to provide service to the site. Currently, there is overhead service to the existing building. The current proposal is to extend underground services to a new pad mount transformer to service the building. The applicant will continue to coordinate provision of power to the site with CMP. Similarly, communications and cable service will be coordinated with Consolidated and Charter.

Water

There is currently a single domestic water service to the existing building from the twelve-inch main in Johnson Road. The water fire service for the new office building will be run from the 12" main in City Line Drive. The size and locations of any new services will be confirmed once the detailed plumbing needs can be assessed. We are coordinating with the PWD on the service requirements. Once this has been established, a copy of the information will be submitted to the Planning Office.

Wastewater Disposal

There is an existing private sanitary sewer service from Johnson Road which the project site currently ties into.

Natural Gas

There is a gas main located within Johnson Road and City Line Drive and there is a service connection to the existing building. The applicant expects to have natural gas service into the expanded building.

Solid Waste

A solid waste collection and storage area will be provided with adequate capacity for the needs of the development. The owner will contract with a waste removal vendor as part of the onsite management of waste collection and recycling.

Ability to serve letters will be forwarded to the planning office upon receipt.

ATTACHMENT B

RIGHT, TITLE & INTEREST

A Release Deed from 68 Johnson Road, LLC to Transport Leasing Corp. was executed on February 8, 2018 for the subject property. The Release Deed included in this attachment was recorded in the Cumberland County Registry of Deeds as Book 34659; page 201. Transport Leasing Corp has owned parcel at CBL 214A A001001 since the late 1960's and the lot is identified on the Third Amended Subdivision plan CCRD Book 214, page 211.

DLN #1001840020952

RELEASE DEED

68 JOHNSON ROAD, LLC, a Maine limited liability company with a place of business in Scarborough, Maine, ("Grantor") in consideration of one dollar and other valuable consideration paid, releases to **TRANSPORT LEASING CORP.**, a Maine corporation with a mailing address of 95 Pleasant Hill Road, Scarborough, Maine 04074 ("Grantee") the land in the City of Portland, County of Cumberland and State of Maine and more specifically described as:

> Beginning at the northerly corner of the within described lot on Johnson Street; thence southwesterly along Johnson Street one hundred ninety-six (196) feet to a stake; thence at right angles to Johnson Street two hundred twenty-two and two tenths (222.2) feet southeasterly to a stake; thence northeasterly at right angles to the last mentioned line and parallel to said Johnson Street one hundred ninety-six (196) feet to land now or formerly of Lewis Skillings heirs; thence along the line of land now or formerly of said Skillings heirs two hundred twenty-two and two tenths (222.2) feet to the road at the point of beginning.
>
> The property is subject to a Notice of Layout and Taking by the State of Maine Department of Transportation recorded on October 24, 2000 in the Cumberland County Registry of Deeds in Book 15801, Page 296.
>
> Being the same premises conveyed to the grantor herein by deed from Warren C. Weeks and Anne T. Weeks dated September 15, 2009 and recorded in the Cumberland County Registry of Deeds in Book 27253, Page 38.

Also releasing to said Grantee, all of Grantor's right, title and interest in and to all air rights, water rights and any easements, rights-of-way or other interests in, on, under or to any land, highway, alley, street or right-of-way abutting or adjoining, the above described parcel.

IN WITNESS WHEREOF, the said Mark H. Sanborn, as Vice President of Transport Leasing Corp., the sole member of 68 Johnson Road, LLC has hereunto set his hand this 8th day of February, 2018.

Witness

68 JOHNSON ROAD, LLC,
a Maine limited liability company

By: TRANSPORT LEASING CORP.,
a Maine corporation
Its: Sole Member

By:
Name: MARK H SANBORN
Its: VICE PRESIDENT

DOC :7093 BK:34653 PG:202
RECEIVED - RECORDED, CUMBERLAND COUNTY REGISTER OF DEEDS
02/14/2018, 08:24:33A
Register of Deeds Nancy A. Lane E-RECORDED

STATE OF Maine
COUNTY OF Cumberland

February 8, 2018

Then personally appeared the above-named Mark H. Sanborn, as Vice President of Transport Leasing Corp., the sole member of 68 Johnson Road, LLC and acknowledged the foregoing instrument to be his free act and deed in said capacity, and the free act and deed of said company.

Before me,

Eben Adams

~~Notary Public~~ Attorney at Law

Eben Adams

Typed or printed name of person taking acknowledgment

TAB 6 – SITE DESIGN

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 6 and Section 14-526 of the ordinance.

(d) Site Design Standards.

Massing, Ventilations and Wind Impact (14-526 (d) 1)

- *Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable.*
- *Bulk, location or height impacts on adjoining structures*
- *Identify and locate HVAC equipment and venting away from public spaces and residential properties*
- *Identify screening and manufacturing specifications for noise, if applicable*

1. *Massing, Ventilation and Wind Impact:*

    a. The project proposes reuse of part of an existing building as office space. The 57'-5" building height will be within the allowed height standards of 65'. The project will not result in any significant changes to the wind environment proximate to the site specifically as the site is located to the airfield which is a significantly large open expanse.

    b. The bulk location and height of the proposed building expansion is consistent with the B4 requirements and there are no nearby developed lots that may be negatively impacted. The applicant owns the nearby buildings and they are seeking to improve their overall property to best and highest use, as much as possible.

    c. HVAC venting, if necessary, will be directed through rooftop units and will not impact any adjacent public spaces.

Shadows (14-526 (d) 2), if applicable

- Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)

2. *Shadows:*

    a. The proposed building at the site will not cast significant shadows onto neighboring properties, or block access to direct sunlight for structures utilizing solar energy. The Site Layout Plan and Grading and Drainage Plan show the proposed site improvements and their relationships to property lines. The grading plan shows the relative elevations of the building with respect to elevations along the property lines. The nearest building is located greater than 100 feet away from the site.

Snow and Ice Loading (14-526 (d) 3)

- *Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways.*

3. *Snow and Ice Loading:*

    a. The proposed building has been designed and located such that accumulated snow and ice will not fall onto adjacent properties or public ways.

View Corridors (14-526 (d) 4), if applicable

- *Protection of designated view corridors (Portland Design Manual, Appendix 1)*

4. *View Corridors:*

    a. The project entails reuse of the existing office building and expansion. There will be no significant changes to view corridors offered to adjacent properties. Nearby land uses include a cemetery and the airfield runway. Views from the nearby Maine DHHS Building are buffered by a forested area between the properties.

Historic Resources (14-526 (d) 5), if applicable

- *Identify developments within Historic Districts or affecting Designated Landmarks*
- *Certificate of Appropriateness or other evidence*
- *Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required*
- *Address preservation and documentation of Archaeological Resources*

5. *Historic Resources:*

    a. The development is not located in a historic district, historic landscape district or City designated landmark.

    b. The development is not located adjacent to or within 100 feet of a designated landmark, historic district, or historic landscape district.

    c. There are no known archaeological resources on the site

Exterior Lighting (14-526 (d) 6)

- *Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12)*
- *Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)*

6. *Exterior Lighting:*

    a. Site Lighting

        (i) All new exterior lighting at the site will be full cutoff LED with no light emitted above the horizontal plane, and in accordance with Section 12

of the Technical Manual. Bartlett Design has completed a site lighting plans that are contained as part of the submission drawings.

b. Architectural and Specialty Lighting

(i) Not applicable to the project.

c. Street Lighting

(i) There are existing street lights along Johnson Road and City Line Drive. No changes are currently contemplated to the existing street light conditions.

Noise and Vibration (14-526 (d) 7)

- *Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements*

7. *Noise and Vibration:*

The project noise levels will be designed to meet the permitted levels as outlined in the B4 Zone. All HVAC and mechanical equipment is proposed to be mounted on the roof, or otherwise ground mounted and concealed from nearby properties. The property is located adjacent the Portland International Jetport, thus noise and vibration are considered a low priority relative to the adjacent land use.

Signage and Wayfinding (14-526 (d) 8), if applicable

- *Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff*
- *Proposed commercial and directional signage on site*

8. *Signage and Wayfinding:*

a. All street and wayfinding signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.

(i) The project is not located in a historic district or subject to Article IX.

(ii) Proposed commercial signage is still being designed and subject to a condition of approval.

(iii) All street and wayfinding signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.

Zone Related Design Standards (14-526 (d) 9)

- Address Historic Preservation Design Review, if applicable
- Address any applicable design review standards by zone

- Address submission requirements from Design Manual, page 1, addressing neighborhood context
- Description of exterior materials, color, finish, and samples

9. *Zoning Related Design Standards:*

    a. The site is located in the B4 zone and there are no specific design standards that apply as outlined in Section 14-526 d.9.

STORMWATER MANAGEMENT REPORT

90 JOHNSON ROAD PROPERTY
90 JOHNSON ROAD
PORTLAND, MAINE

PREPARED FOR

TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810

PREPARED BY

STANTEC CONSULTING SERVICES, INC.
482 PAYNE ROAD
SCARBOROUGH, MAINE 04074
(207) 883-3355

JULY 2018

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Attachments

Attachment A – Predevelopment Watershed Plan
Attachment B – Post Development Watershed Plan
Attachment C – Predevelopment HydroCAD Computations
Attachment D – Post Development HydroCAD Computations
Attachment E – Water Quality Treatment Summary
Attachment F – Drawdown Computations
Attachment G – Redevelopment Computation
Attachment H – Stormwater Operations & Maintenance Manual

1.0 INTRODUCTION

Stantec Consulting Services, Inc. has been retained to prepare the following Stormwater Management analysis for the building and site expansion project at 90 Johnson Road in Portland, ME.

This Stormwater Management analysis has been prepared in accordance with Section 5 – Portland Stormwater Management of the City of Portland Technical Manual, last revised July 26, 2016. As required within Section 5, this project meets the Basic, General, and Flooding Standards as described in the Maine Department of Environmental Protection (MaineDEP) Chapter 500 Rules for Stormwater Management.

The purpose of this analysis is to identify what measures will be implemented to provide stormwater management for the proposed development specifically for water quality improvement, water quantity control, and erosion and sedimentation control. The analysis was prepared to ensure that the development will not result in any adverse effects to the environment, any natural resources, or to properties located downstream of the project site.

2.0 EXISTING SITE CONDITIONS

The project site, located at 90 Johnson Road, is approximately 2.67 acres and is comprised of two properties identified as Lot 1 and 3 on Map 214-A of the City of Portland Assessor's Map (1.68 and 0.99 acres respectively). The site is currently occupied by an approximately 20,260 SF single story building which houses Spectrum offices and warehouse space. The building is surrounded by parking and access drives with a total of 41 parking spaces currently provided. The adjacent property at 68 Johnson Road was historically occupied by a single-family home but has since been demolished several years ago and the property is currently a grassed lot.

The breakdown of the existing lot coverage is summarized in the table below.

Table 1
Existing Lot Coverage Summary

	Lot 1(90 Johnson)	Lot 3 (68 Johnson)
Roof (sf)	20,260	0
Other Impervious (sf)	34,784	285
Landscaped (sf)	18,137	38,251
Wooded (sf)	0	4,588
Total	73,181 SF (1.68 ac)	43,124 SF (0.99 ac)

A portion of the site's drainage is handled through a series of catch basins and storm drain pipes that discharge to a hydrodynamic separator and then to a vegetated underdrained soil filter. The grassed lot sheet flows towards the Brooklawn Cemetery with runoff being captured in two existing catch basins. All stormwater runoff from the site ultimately outlets to a public storm drain system within Johnson Road and Congress Street[1]. The Congress Street system outfalls

[1] See Congress Street & Johnson Road of Unum HO-3 Offsite Traffic Improvement plans by Sebago Technics, City Archive 00731_003__005 date 06-22-98

opposite the Cemetery entrance on Congress Street and is tributary to the Stroudwater and the Fore River. Per the Soils Conservation Service (SCS) Medium Intensity Soils mapping the site consists of Scantic, Lyman-Tunbridge, and Woodbridge soil groups. These are classified as Hydrologic Soil Group C and D.

3.0 PROPOSED SITE CONDITIONS

The proposed development includes the renovations and expansion of the existing Spectrum office/warehouse building. Spectrum occupies other building space on City Line Drive and may consolidate their operations. The applicant is seeking to update the building at 90 Johnson Road to Class A office space. The existing building will be renovated including a vertical expansion to go from one story to three stories. The existing parking area and drive will also be redeveloped into a more functional layout for the expanded use. The undeveloped grassed lot at 68 Johnson Road will include new development of a parking area and associated stormwater management and landscaping. A total of 188 parking spaces are proposed across the properties. Stormwater management will primarily be in the form of porous pavement within the new parking area. The porous pavement is intended to be much like the porous pavement installed at the nearby State of Maine DHHS building off the Jetport Boulevard. Proposed land coverage of the two lots is summarized in the table below:

Table 2
Proposed Lot Coverage Summary

	Lot 1	Lot 3
Roof (sf)	21,398	0
Other Impervious (sf)	41,153	35,521
Landscaped (sf)	10,630	6,785
Wooded (sf)	0	818
Total	73,181 SF	43,124 SF

Drainage patterns on site mostly remain the same in the post development condition. The portion of the project consisting of redevelopment continues to primarily drain to the existing vegetated underdrained filter adjacent to the project. The area that sheet flows to towards the cemetery property consists of the majority of the new parking area and is handled through porous pavement. This area will be drained through a series of subsurface underdrain pipes and it will discharge into the public storm drain system within Johnson Road.

The porous pavement section, as detailed in the plans, will contain the following materials section:

- 3” Porous Asphalt
- Choker Course Aggregate – Variable Thickness from 4” to 19”
- 12” Reservoir Course of 1.5” to 3” Crushed Stone
- 4” Filter Course
- 12” MDOT Type B aggregate course with collection underdrain.

4.0 REFERENCES

The following reference sources were used in preparation of the stormwater analysis:

1. *Stormwater Management for Maine Volume III – BMP Technical Design Manual*, MaineDEP
2. HydroCAD Stormwater Modeling Software, Version 10.00, build 20
3. *MaineDEP Erosion and Sediment Maine Erosion and Sediment Control BMP's,* October 2016 revision
4. *MaineDEP Chapter 500 Rules for Stormwater Management, June 2014 revision*
5. *Section 5 of the City of Portland Technical Manual Portland Stormwater Management*, July 2016 revision
6. *Chapter XX and XX of the City of Portland Code of Ordinances*
7. *U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey*

5.0 METHOD OF ANALYSIS

The hydrologic analysis for predevelopment and post development conditions has been conducted based upon the methodology contained in the USDA Soil Conservation Service's Technical Releases Nos. 20 and 55 (SCS TR-20 and TR-55). For Caribou, Maine, a 24-hour SCS Type II storm distribution was used for the analysis using the following storm frequencies and rainfall amounts:

Table 3
Hydrologic Analysis Parameters

Storm Event	24-Hour Rainfall
2-Year Storm	3.1 inches
10-Year Storm	4.6 inches
25-Year Storm	5.8 inches

The HydroCAD computer program was used in the analysis. This program allows critical points of the watershed to be analyzed using the SCS TR-20 methodology to calculate the anticipated conditions at these points. Drainage areas are defined with runoff curve numbers, times of concentration and travel time data based on methods outlined in the USDA TR-55 Manual. To assess storage and kinematic effects of runoff, the model uses reservoirs and pipes to imitate actual conditions. Specific hydrologic characteristics including travel times, storage capacity, and the effects of hydraulic head are considered for analysis with this program.

To model the watersheds, the drainage system is represented by a network consisting of three basic components:

- **Subcatchment:** A relatively homogenous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph.
- **Reach:** A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.
- **Pond:** A pond, swamp, dam, or other impoundment which fills with water from one or more sources and empties in a manner determined by a weir, culvert

or other device(s) at its outlet. A pond may empty into a reach or into another pond. The outflow of each pond is also determined by a hydrograph routing calculation.

6.0 EROSION AND SEDIMENTATION CONTROL (BASIC STANDARD)

Erosion and sedimentation control (ESC) will be accomplished for this project through the application of various temporary construction and permanent ESC BMPs as described in the MaineDEP Erosion and Sediment Control BMP Manual. BMPs proposed include but are not limited to the following:

- Stabilized construction entrance
- Siltation fence
- Temporary construction inlet protection
- Slope stabilization

The contractor will also be required to employ ESC BMPs for any on site material stockpiles as well as any areas left denuded for extended periods of time during construction.

The ESC plan for this project adheres to the requirements detailed in Appendix A of MaineDEP's Chapter 500 Rules for Stormwater Management.

7.0 WATER QUALITY MEASURES (GENERAL STANDARD)

The proposed development includes Stormwater BMPs to provide water quality treatment to onsite runoff as required within the General Standard of MaineDEP's Chapter 500 Rules for Stormwater Management. A portion of the project, described as Lot 1 above, is currently developed with an existing building and associated site features. Therefore, the rules for Redevelopment Projects as described in section 4.C.(2)(d)(i) of Chapter 500 have been applied to this portion of the project. The table below summarizes the redevelopment calculation and establishes the treatment level required for redevelopment activity within the project.

Redevelopment Treatment Summary	
Total Redevelopment Area (ac)	1.68
Existing Impact Rating	4.55
Proposed Impact Rating	4.65
Existing Ranked Impact	2.71
Proposed Ranked Impact	2.77
Resultant Ranked Impact Change	0.06
Redeveloped Area Treatment Designation (Site Law Project)	**60%**

The area described as Lot 3 is considered undeveloped since it has not been maintained and is essentially a meadow in the predevelopment condition. All development on this portion of the project will be considered new development and section 4.C.(2)(a)(i) of Chapter 500 defines the required treatment level.

All BMPs for this project have been designed per the MaineDEP Stormwater BMP Design Manual and previously MaineDEP accepted design measures for Porous surfaces. BMPs included in this project as well as their respective design criteria used are as follows:

Vegetated Underdrained Soil Filter: The existing filter adjacent to the site was originally designed to handle 2.5 acres of impervious area. The portion of the site that has been redeveloped remains tributary to the filter, but the total impervious area to the filter from the site has been reduced. For predevelopment conditions approximately 1.16 acres of impervious area drained to the filter. Approximately 1.03 acres of impervious area will drain to the filter in post development conditions. Therefore, the original design has been determined to be adequate without any modifications.

Manmade Porous Surfaces (Porous Pavement): Four areas constructed of porous pavement have been proposed for this project. The entire area is intended to be a direct entry system in order to provide enough storage within the reservoir layer for flood control. The only run-on provided will be from landscaped areas onto porous sections. The surface and associated section have been designed to the following criteria to provide water quality treatment to runoff:

- Treatment Volume: Storage of a 1" rainfall event has been provided for in the reservoir layer which consists of 12 inches of ¾" crushed stone with an assumed porosity of 40%.
- Minimum Surface Area: The surface area required for porous pavement is 20% of tributary impervious area.
- Drawdown Time: The WQV is required to be released over a 24-48 hour period. This criterion will be met by providing an orifice at the end of each collection pipe system.
- Storage for Flood Control: Storage for a 24 hour 25 year frequency storm event should be provided to meet flooding standards. This will be provided within the reservoir section and will be controlled through a 6" overflow pipe.

The two BMPs described above have been designed per MaineDEP's BMP Design Manual to meet all requirements established within MaineDEP's Chapter 500 Rules for Stormwater Management to meet the General Standard.

The table below summarizes the treatment levels provided for both redevelopment activities and new development for the proposed project.

Table 4
Treatment Summary

Description	Required	Provided
Treated New Impervious (%)	95%	98.77%
Treated New Developed (%)	80%	93.83%
Treated Redeveloped Impervious (%)	N/A	90.51%
Treated Redeveloped Developed (%)	60%	85.49%

8.0 STORMWATER MANAGEMENT FOR FLOOD CONTROL (FLOODING STANDARD)

The stormwater system for this project, consisting of the porous pavement reservoir layer has been designed to provide detention, and in turn, reduce peak discharge rates from stormwater runoff. Specifically, the 2, 10, and 25-year storm events have been analyzed for this project. Table 1 in Section 5 above summarizes rainfall amounts for each of the storm events analyzed. Table 2 below summarizes peak discharge rates for each storm event for the predevelopment and post development conditions:

Table 5
Comparison of Peak Discharge Rates at Point of Interest 1

Storm Event & Condition	POI 1 (cfs)	POI 2 (cfs)
2-Yr Predevelopment	1.36	2.31
2-Yr Post Development	0.09	2.19
Change in 2-Yr Peak Discharge Rate	**-1.27**	**-0.12**
10-Yr Predevelopment	2.77	3.91
10-Yr Post Development	0.19	3.35
Change in 10-Yr Peak Discharge Rate	**-2.58**	**-0.56**
25-Yr Predevelopment	3.96	6.04
25-Yr Post Development	0.27	5.11
Change in 25-Yr Peak Discharge Rate	**-3.69**	**-0.93**

Peak discharge rates for each storm event have been decreased from predevelopment to post development conditions for this project. Therefore, the Flooding Standard has been met.

9.0 MAINTENANCE AND GOOD HOUSEKEEPING MEASURES

The owner or the owner's representative will be responsible for maintenance of all permanent stormwater conveyance and treatment systems constructed as part of this project. Inspection, maintenance, and housekeeping action will adhere to Appendix B of MaineDEP's Chapter 500 Rules for Stormwater Management and includes but is not limited to:

- Inspection of infrastructure at regular intervals as established within Appendix B.
- Removal and proper disposal of sediment build up in conveyance systems and BMPs. This will include regular sweeping and vacuuming of the porous pavement surfaces.
- Replacement of any BMP or portion of BMP that is not operating correctly
- Proper documentation of all maintenance activity

The erosion and sediment control plan and maintenance plan have been established to meet the Basic Standard.

10.0 CONCLUSION

The stormwater management system for the proposed development will mitigate negative effects due to stormwater runoff generated from the development by reducing peak discharge rates, improving water quality of stormwater runoff

discharged from the project site, and eliminating potential erosion and sedimentation due to the development. As a result there will be no adverse effects to downstream conveyance systems of properties due to stormwater runoff from this project.

11.0 ATTACHMENTS

Attachment A – Predevelopment Watershed Plan

Attachment B – Post Development Watershed Plan

Attachment C – Predevelopment HydroCAD Computations

Attachment D – Post Development HydroCAD Computations

Attachment E – Water Quality Treatment Summary

Attachment F – Drawdown Computations

Attachment G – Redevelopment Computation

Attachment H – Stormwater Operations & Maintenance Manual

ATTACHMENT A

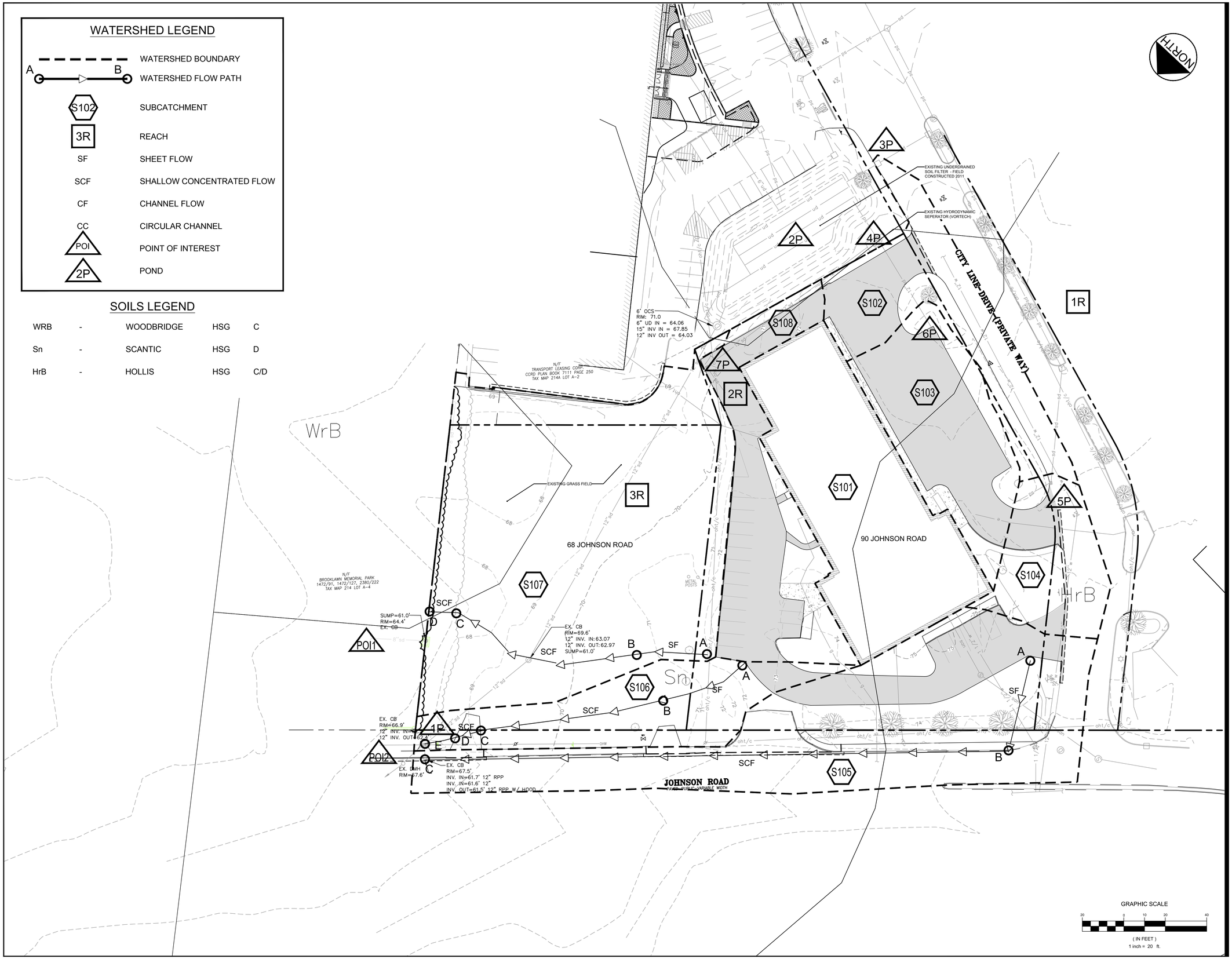
PREDEVELOPMENT WATERSHED PLAN

WATERSHED LEGEND

A — B	WATERSHED BOUNDARY
	WATERSHED FLOW PATH
S102	SUBCATCHMENT
3R	REACH
SF	SHEET FLOW
SCF	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
CC	CIRCULAR CHANNEL
POI	POINT OF INTEREST
2P	POND

SOILS LEGEND

WRB	-	WOODBRIDGE	HSG	C
Sn	-	SCANTIC	HSG	D
HrB	-	HOLLIS	HSG	C/D



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Stantec

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Revision		By	Appd.	YY.MM.DD
2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	SRB	18.07.09
1	SUBMITTED FOR OWNER REVIEW	PBF	SRB	18.05.22

File Name:	PBF	SRB	SRB	18.05.22
	DWN.	CHKD.	DSGN.	DATE

Permit-Seal

STATE OF MAINE
STEPHEN R. BUSHEY
07-09-18
LICENSED
PROFESSIONAL ENGINEER

Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title

PREDEVELOPMENT WATERSHED PLAN

Project No. 210801617

Scale N.T.S.

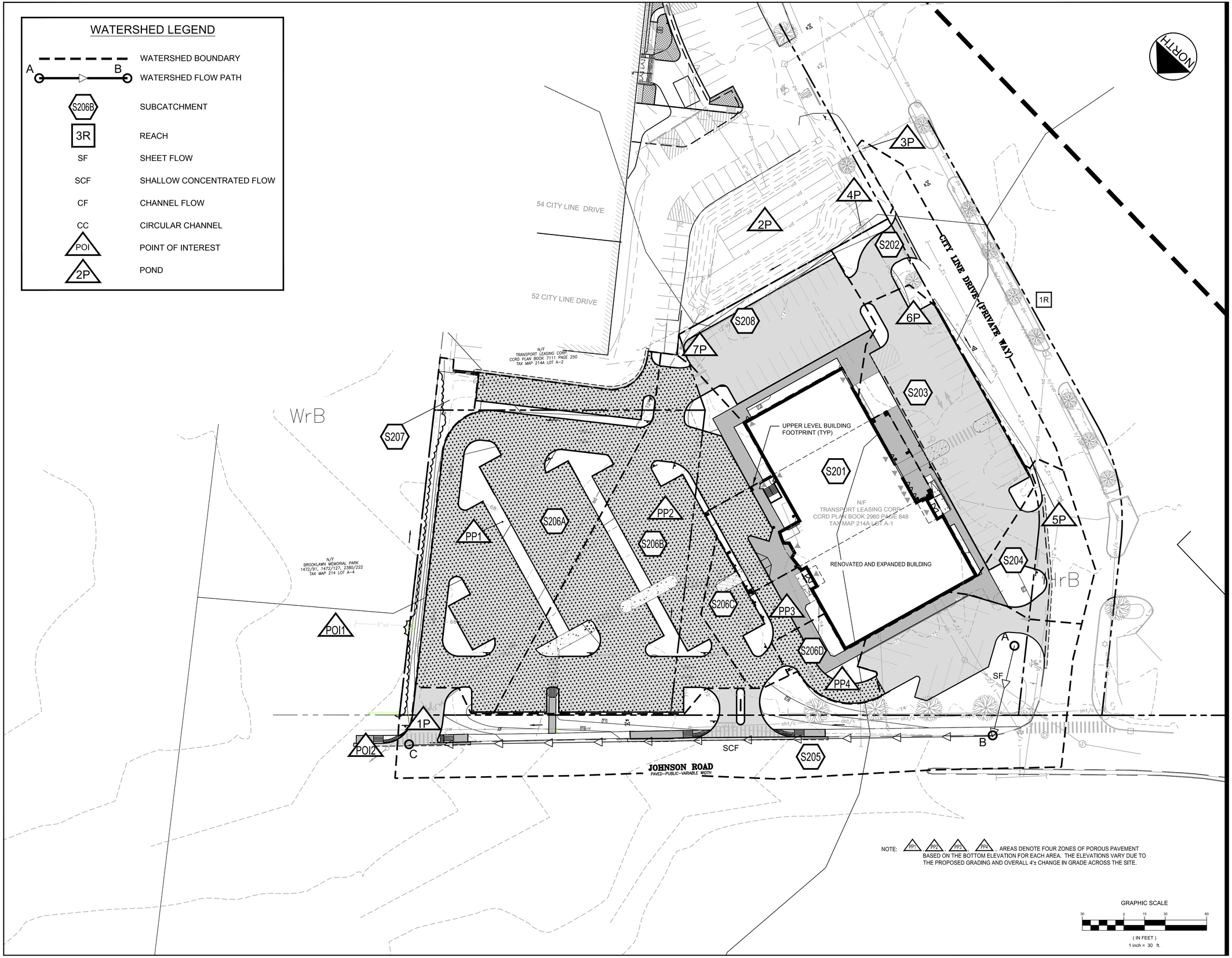
Sheet C-11.0

ATTACHMENT B

POST DEVELOPMENT WATERSHED PLAN

WATERSHED LEGEND

	WATERSHED BOUNDARY
A — B	WATERSHED FLOW PATH
S206B	SUBCATCHMENT
3R	REACH
SF	SHEET FLOW
SCF	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
CC	CIRCULAR CHANNEL
POI	POINT OF INTEREST
2P	POND



NOTE: PP1 PP2 PP3 PP4 AREAS DENOTE FOUR ZONES OF POROUS PAVEMENT BASED ON THE BOTTOM ELEVATION FOR EACH AREA. THE ELEVATIONS VARY DUE TO THE PROPOSED GRADING AND OVERALL 4'± CHANGE IN GRADE ACROSS THE SITE.

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30 ft.

Stantec

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PROFESSIONAL ENGINEER

Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

POST DEVELOPMENT WATERSHED PLAN

Project No. 210801617

Scale 1" = 30'

Sheet C-12.0

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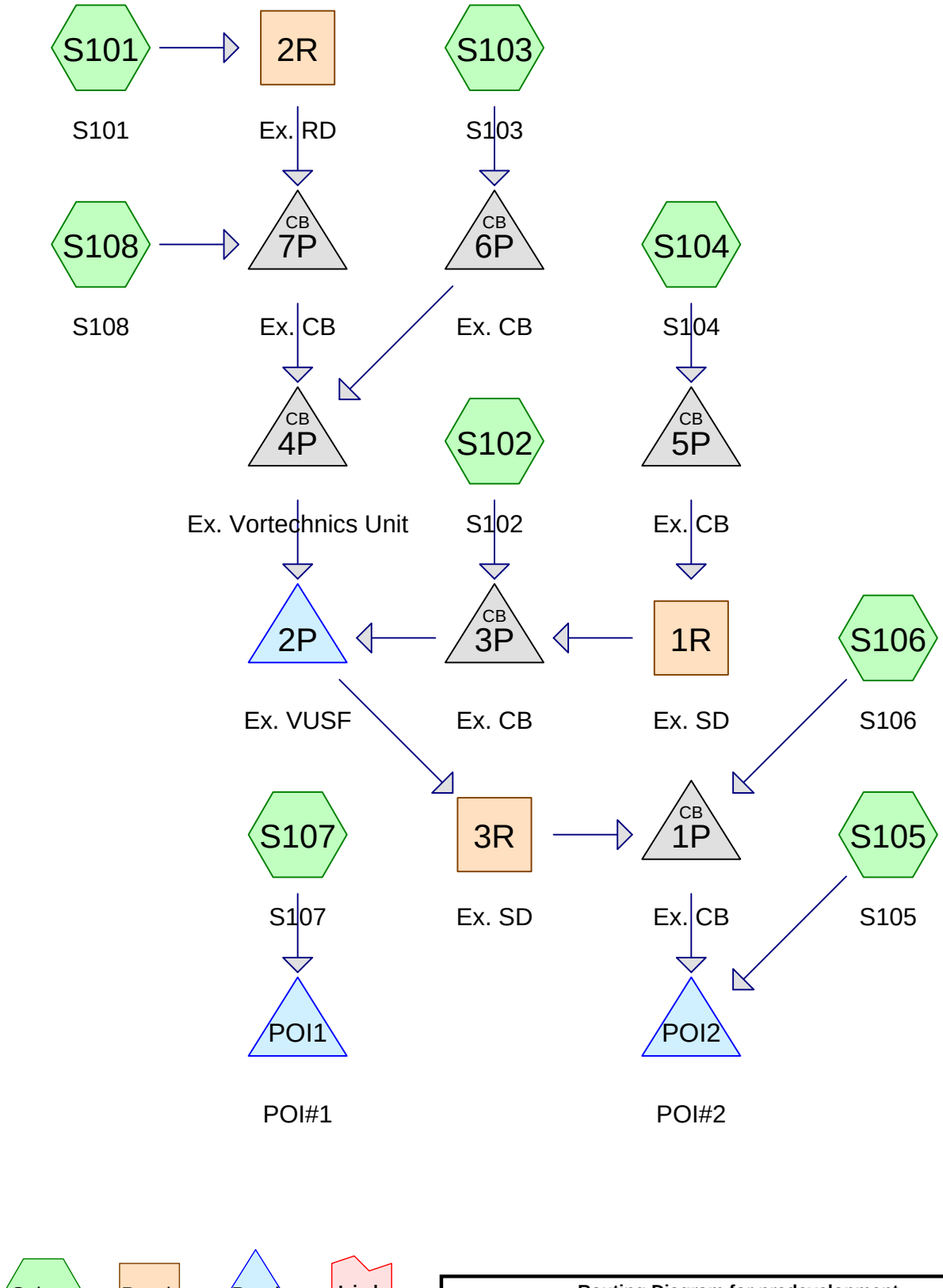
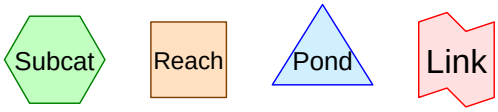
ATTACHMENT C

PREDEVELOPMENT HYDROCAD COMPUTATIONS





Routing Diagram for predevelopment
Prepared by Stantec Consulting Services, Inc., Printed 7/2/2018
HydroCAD® 10.00-20 s/n 00734 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.145	79	50-75% Grass cover, Fair, HSG C (S105)
0.049	84	50-75% Grass cover, Fair, HSG D (S105)
0.248	74	>75% Grass cover, Good, HSG C (S102, S103, S104, S107, S108)
1.124	80	>75% Grass cover, Good, HSG D (S102, S103, S106, S107, S108)
0.643	98	Paved parking, HSG C (S102, S103, S104, S105, S108)
0.794	98	Paved parking, HSG D (S102, S103, S105, S106, S108)
0.192	98	Roofs, HSG C (S101)
0.273	98	Roofs, HSG D (S101)
0.066	70	Woods, Good, HSG C (S107)
0.040	77	Woods, Good, HSG D (S106, S107)
3.573	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.293	HSG C	S101, S102, S103, S104, S105, S107, S108
2.280	HSG D	S101, S102, S103, S105, S106, S107, S108
0.000	Other	
3.573		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.145	0.049	0.000	0.194	50-75% Grass cover, Fair	S105
0.000	0.000	0.248	1.124	0.000	1.372	>75% Grass cover, Good	S102, S103, S104, S106, S107, S108
0.000	0.000	0.643	0.794	0.000	1.437	Paved parking	S102, S103, S104, S105, S106, S108
0.000	0.000	0.192	0.273	0.000	0.465	Roofs	S101
0.000	0.000	0.066	0.040	0.000	0.105	Woods, Good	S106, S107
0.000	**0.000**	**1.293**	**2.280**	**0.000**	**3.573**	**TOTAL AREA**	

Summary for Subcatchment S101: S101

Runoff = 1.41 cfs @ 12.07 hrs, Volume= 0.111 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

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

Summary for Subcatchment S102: S102

Runoff = 0.76 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

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

Summary for Subcatchment S103: S103

Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

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

Summary for Subcatchment S104: S104

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

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

Summary for Subcatchment S105: S105

Runoff = 1.71 cfs @ 12.14 hrs, Volume= 0.146 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C** Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 0.41 cfs @ 12.13 hrs, Volume= 0.033 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		**Shallow Concentrated Flow, C to D** Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		**Shallow Concentrated Flow, D to E** Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.063 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

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

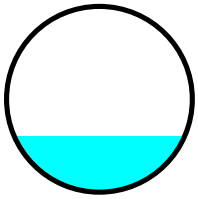
Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 2.76" for 2-Yr event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af
Outflow = 0.50 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 3%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.57 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.9 min

Peak Storage= 19 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



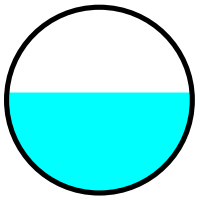
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac,100.00% Impervious, Inflow Depth = 2.87" for 2-Yr event
Inflow = 1.41 cfs @ 12.07 hrs, Volume= 0.111 af
Outflow = 1.38 cfs @ 12.08 hrs, Volume= 0.111 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 1.0 min

Peak Storage= 27 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



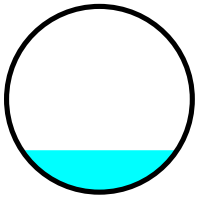
Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 2.59" for 2-Yr event
Inflow = 0.28 cfs @ 13.58 hrs, Volume= 0.327 af
Outflow = 0.28 cfs @ 13.60 hrs, Volume= 0.327 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.11 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.58 fps, Avg. Travel Time= 1.0 min

Peak Storage= 12 cf @ 13.59 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 2.42" for 2-Yr event
Inflow = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af
Outflow = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min
Primary = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.84' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.13 hrs HW=62.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.59 cfs @ 1.78 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 2.59" for 2-Yr event
Inflow = 4.25 cfs @ 12.08 hrs, Volume= 0.327 af
Outflow = 0.28 cfs @ 13.58 hrs, Volume= 0.327 af, Atten= 93%, Lag= 90.3 min
Primary = 0.28 cfs @ 13.58 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.99' @ 13.58 hrs Surf.Area= 5,495 sf Storage= 6,804 cf

Plug-Flow detention time= 290.7 min calculated for 0.327 af (100% of inflow)
Center-of-Mass det. time= 290.6 min (1,066.3 - 775.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=0.28 cfs @ 13.58 hrs HW=67.99' (Free Discharge)
└─**1=Culvert** (Passes 0.28 cfs of 3.93 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.27 fps)
  │ └─**3=Orifice/Grate** (Passes 0.07 cfs of 0.09 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.21 cfs @ 9.44 fps)
    └─**5=Exfiltration** (Passes 0.21 cfs of 0.31 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area =	0.448 ac,	84.88% Impervious,	Inflow Depth =	2.57"	for 2-Yr event
Inflow =	1.25 cfs @	12.08 hrs,	Volume=	0.096 af	
Outflow =	1.25 cfs @	12.08 hrs,	Volume=	0.096 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.25 cfs @	12.08 hrs,	Volume=	0.096 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.09' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.21 cfs @ 12.08 hrs HW=67.08' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.21 cfs @ 2.58 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area =	1.067 ac,	88.02% Impervious,	Inflow Depth =	2.60"	for 2-Yr event
Inflow =	3.00 cfs @	12.08 hrs,	Volume=	0.231 af	
Outflow =	3.00 cfs @	12.08 hrs,	Volume=	0.231 af,	Atten= 0%, Lag= 0.0 min
Primary =	3.00 cfs @	12.08 hrs,	Volume=	0.231 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.15' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.91 cfs @ 12.08 hrs HW=68.10' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.91 cfs @ 3.70 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 2.76" for 2-Yr event
Inflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af
Outflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.95' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.07 hrs HW=68.94' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.50 cfs @ 1.70 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 2.45" for 2-Yr event
Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af
Outflow = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.40' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.07 hrs HW=67.39' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.75 cfs @ 2.26 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 2.66" for 2-Yr event
Inflow = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af
Outflow = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
Primary = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.41' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.16 cfs @ 12.08 hrs HW=68.35' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.16 cfs @ 2.75 fps)

Summary for Pond POI1: POI#1

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-Yr event
Inflow = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af
Primary = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 2.40" for 2-Yr event
Inflow = 2.31 cfs @ 12.14 hrs, Volume= 0.505 af
Primary = 2.31 cfs @ 12.14 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S101: S101

Runoff = 2.10 cfs @ 12.07 hrs, Volume= 0.169 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

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

Summary for Subcatchment S102: S102

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.089 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

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

Summary for Subcatchment S103: S103

Runoff = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

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

Summary for Subcatchment S104: S104

Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

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

Summary for Subcatchment S105: S105

Runoff = 2.70 cfs @ 12.14 hrs, Volume= 0.236 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C** Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 0.78 cfs @ 12.12 hrs, Volume= 0.061 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		**Shallow Concentrated Flow, C to D** Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		**Shallow Concentrated Flow, D to E** Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 1.35 cfs @ 12.07 hrs, Volume= 0.101 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

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

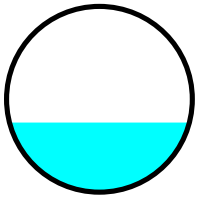
Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 4.25" for 10-Yr event
Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.76 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 1.7 min

Peak Storage= 25 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



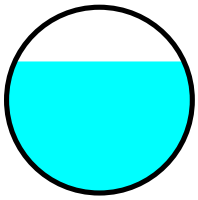
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac,100.00% Impervious, Inflow Depth = 4.36" for 10-Yr event
Inflow = 2.10 cfs @ 12.07 hrs, Volume= 0.169 af
Outflow = 2.06 cfs @ 12.08 hrs, Volume= 0.169 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

Peak Storage= 37 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



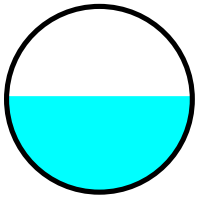
Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 4.07" for 10-Yr event
Inflow = 1.33 cfs @ 12.50 hrs, Volume= 0.514 af
Outflow = 1.33 cfs @ 12.51 hrs, Volume= 0.514 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.73 fps, Avg. Travel Time= 0.9 min

Peak Storage= 38 cf @ 12.51 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 3.86" for 10-Yr event
Inflow = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af
Outflow = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 63.19' @ 12.43 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.43 hrs HW=63.19' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.59 cfs @ 2.39 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 4.07" for 10-Yr event
Inflow = 6.53 cfs @ 12.08 hrs, Volume= 0.514 af
Outflow = 1.33 cfs @ 12.50 hrs, Volume= 0.514 af, Atten= 80%, Lag= 25.4 min
Primary = 1.33 cfs @ 12.50 hrs, Volume= 0.514 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.47' @ 12.50 hrs Surf.Area= 6,141 sf Storage= 9,611 cf

Plug-Flow detention time= 239.4 min calculated for 0.513 af (100% of inflow)
Center-of-Mass det. time= 239.6 min (1,005.1 - 765.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=1.33 cfs @ 12.50 hrs HW=68.47' (Free Discharge)
└─**1=Culvert** (Passes 1.33 cfs of 4.17 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.11 cfs @ 2.68 fps)
  │ └─**3=Orifice/Grate** (Passes 1.11 cfs of 1.63 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.22 cfs @ 10.02 fps)
    └─**5=Exfiltration** (Passes 0.22 cfs of 0.34 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area =	0.448 ac,	84.88% Impervious,	Inflow Depth =	4.04"	for 10-Yr event
Inflow =	1.92 cfs @	12.08 hrs,	Volume=	0.151 af	
Outflow =	1.92 cfs @	12.08 hrs,	Volume=	0.151 af,	Atten= 0%, Lag= 0.0 min
Primary =	1.92 cfs @	12.08 hrs,	Volume=	0.151 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.27' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.86 cfs @ 12.08 hrs HW=67.25' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.86 cfs @ 2.95 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area =	1.067 ac,	88.02% Impervious,	Inflow Depth =	4.08"	for 10-Yr event
Inflow =	4.61 cfs @	12.08 hrs,	Volume=	0.362 af	
Outflow =	4.61 cfs @	12.08 hrs,	Volume=	0.362 af,	Atten= 0%, Lag= 0.0 min
Primary =	4.61 cfs @	12.08 hrs,	Volume=	0.362 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.46' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.46 cfs @ 12.08 hrs HW=69.34' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.46 cfs @ 5.68 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 4.25" for 10-Yr event
Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.05' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.07 hrs HW=69.04' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.75 cfs @ 1.90 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 3.91" for 10-Yr event
Inflow = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af
Outflow = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.58' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.07 hrs HW=67.56' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.17 cfs @ 2.54 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 4.14" for 10-Yr event
Inflow = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af
Outflow = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
Primary = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.46' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.29 cfs @ 12.08 hrs HW=69.35' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.29 cfs @ 4.20 fps)

Summary for Pond POI1: POI#1

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-Yr event
Inflow = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af
Primary = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 3.85" for 10-Yr event
Inflow = 3.91 cfs @ 12.16 hrs, Volume= 0.811 af
Primary = 3.91 cfs @ 12.16 hrs, Volume= 0.811 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment S101: S101

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.216 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

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

Summary for Subcatchment S102: S102

Runoff = 1.52 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

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

Summary for Subcatchment S103: S103

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

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

Summary for Subcatchment S104: S104

Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

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

Summary for Subcatchment S105: S105

Runoff = 3.48 cfs @ 12.14 hrs, Volume= 0.309 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C** Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		**Shallow Concentrated Flow, C to D** Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		**Shallow Concentrated Flow, D to E** Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		**Shallow Concentrated Flow, B to C** Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		**Shallow Concentrated Flow, C to D** Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 1.75 cfs @ 12.07 hrs, Volume= 0.133 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

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

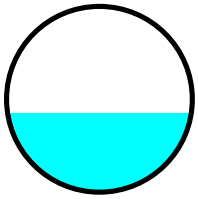
Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 5.44" for 25-Yr event
Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af
Outflow = 0.96 cfs @ 12.09 hrs, Volume= 0.079 af, Atten= 3%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.02 fps, Avg. Travel Time= 1.5 min

Peak Storage= 30 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



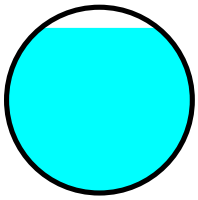
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac,100.00% Impervious, Inflow Depth = 5.56" for 25-Yr event
Inflow = 2.66 cfs @ 12.07 hrs, Volume= 0.216 af
Outflow = 2.61 cfs @ 12.08 hrs, Volume= 0.216 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 0.8 min

Peak Storage= 47 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



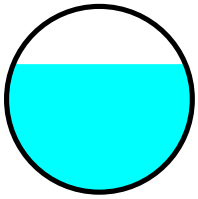
Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 5.26" for 25-Yr event
Inflow = 2.06 cfs @ 12.45 hrs, Volume= 0.664 af
Outflow = 2.06 cfs @ 12.46 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.58 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 0.9 min

Peak Storage= 54 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.69'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 5.04" for 25-Yr event
Inflow = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af
Outflow = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af, Atten= 0%, Lag= 0.0 min
Primary = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 63.67' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.62 cfs @ 12.20 hrs HW=63.67' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.62 cfs @ 3.33 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 5.26" for 25-Yr event
Inflow = 8.34 cfs @ 12.08 hrs, Volume= 0.664 af
Outflow = 2.06 cfs @ 12.45 hrs, Volume= 0.664 af, Atten= 75%, Lag= 22.4 min
Primary = 2.06 cfs @ 12.45 hrs, Volume= 0.664 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.85' @ 12.45 hrs Surf.Area= 6,645 sf Storage= 12,013 cf

Plug-Flow detention time= 213.0 min calculated for 0.663 af (100% of inflow)
Center-of-Mass det. time= 213.3 min (973.4 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=2.06 cfs @ 12.45 hrs HW=68.85' (Free Discharge)
└─**1=Culvert** (Passes 2.06 cfs of 4.34 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.84 cfs @ 3.73 fps)
  │ └─**3=Orifice/Grate** (Passes 1.84 cfs of 3.56 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.23 cfs @ 10.44 fps)
    └─**5=Exfiltration** (Passes 0.23 cfs of 0.37 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.448 ac, 84.88% Impervious, Inflow Depth = 5.23" for 25-Yr event
Inflow = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af
Outflow = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
Primary = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.41' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.38 cfs @ 12.08 hrs HW=67.39' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 2.38 cfs @ 3.22 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area = 1.067 ac, 88.02% Impervious, Inflow Depth = 5.27" for 25-Yr event
Inflow = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af
Outflow = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min
Primary = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 70.95' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.70 cfs @ 12.08 hrs HW=70.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.70 cfs @ 7.25 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 5.44" for 25-Yr event
Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af
Outflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min
Primary = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.13' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.95 cfs @ 12.07 hrs HW=69.12' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.95 cfs @ 2.04 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 5.10" for 25-Yr event
Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af
Outflow = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
Primary = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.71' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.51 cfs @ 12.07 hrs HW=67.69' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.51 cfs @ 2.70 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 5.33" for 25-Yr event
Inflow = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af
Outflow = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Primary = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 70.61' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.20 cfs @ 12.08 hrs HW=70.45' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.20 cfs @ 5.34 fps)

Summary for Pond POI1: POI#1

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-Yr event
Inflow = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af
Primary = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

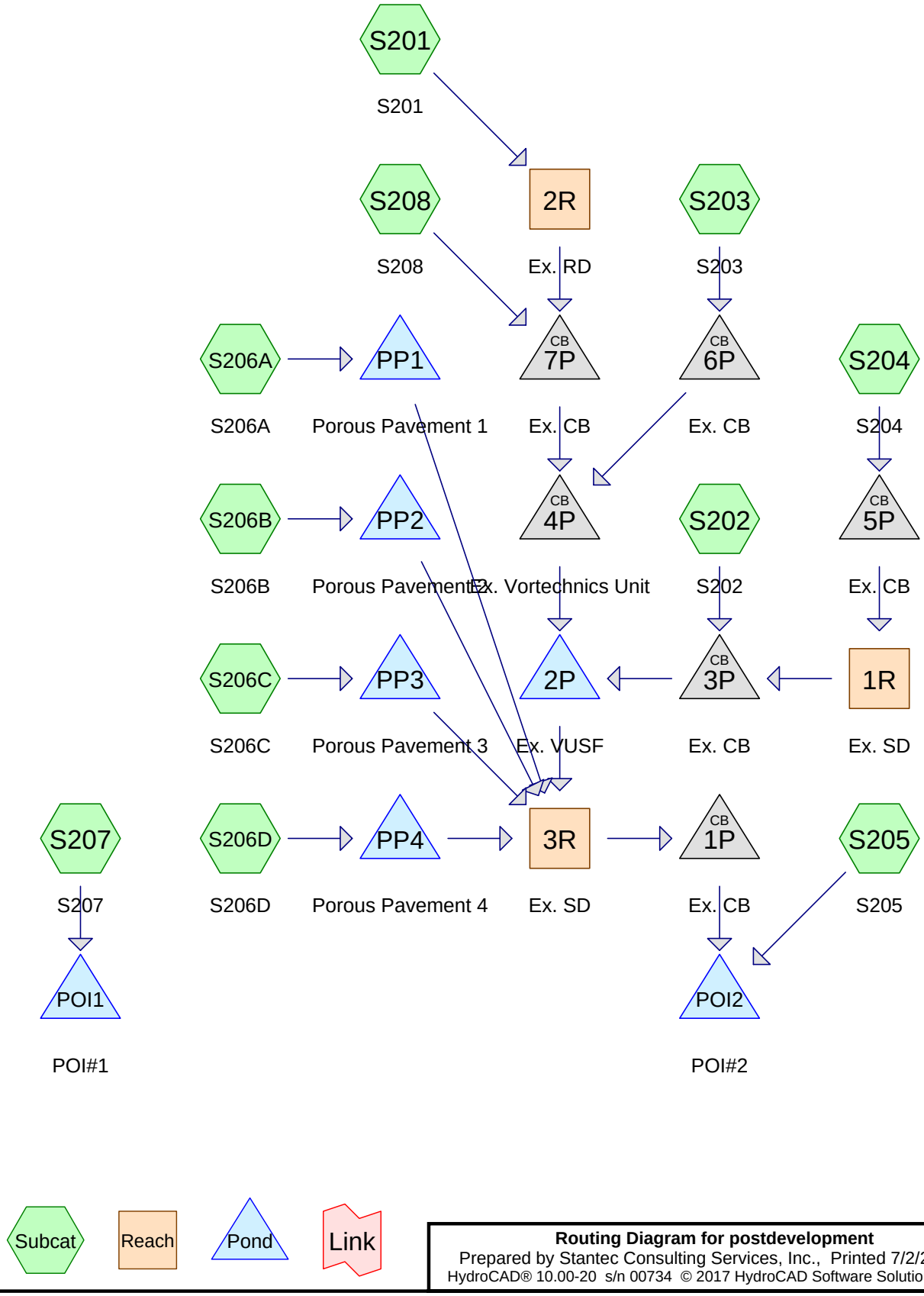
Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 5.02" for 25-Yr event
Inflow = 6.04 cfs @ 12.16 hrs, Volume= 1.058 af
Primary = 6.04 cfs @ 12.16 hrs, Volume= 1.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

ATTACHMENT D

POST DEVELOPMENT HYDROCAD COMPUTATIONS



Routing Diagram for postdevelopment
Prepared by Stantec Consulting Services, Inc., Printed 7/2/2018
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.254	74	>75% Grass cover, Good, HSG C (S202, S203, S204, S205, S206A, S206D, S207, S208)
0.366	80	>75% Grass cover, Good, HSG D (S202, S203, S205, S206A, S206B, S206C, S206D, S207, S208)
0.802	98	Paved parking, HSG C (S202, S203, S204, S205, S206A, S206D, S208)
1.640	98	Paved parking, HSG D (S202, S203, S205, S206A, S206B, S206C, S206D, S208)
0.210	98	Roofs, HSG C (S201)
0.282	98	Roofs, HSG D (S201)
0.014	70	Woods, Good, HSG C (S207)
0.005	77	Woods, Good, HSG D (S207)
3.573	**94**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.280	HSG C	S201, S202, S203, S204, S205, S206A, S206D, S207, S208
2.294	HSG D	S201, S202, S203, S205, S206A, S206B, S206C, S206D, S207, S208
0.000	Other	
3.573		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.254	0.366	0.000	0.621	>75% Grass cover, Good	S202, S203, S204, S205, S206A, S206B, S206C, S206D, S207, S208
0.000	0.000	0.802	1.640	0.000	2.442	Paved parking	S202, S203, S204, S205, S206A, S206B, S206C, S206D, S208
0.000	0.000	0.210	0.282	0.000	0.491	Roofs	S201
0.000	0.000	0.014	0.005	0.000	0.019	Woods, Good	S207
0.000	**0.000**	**1.280**	**2.294**	**0.000**	**3.573**	**TOTAL AREA**	

Summary for Subcatchment S201: S201

Runoff = 1.49 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

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

Summary for Subcatchment S202: S202

Runoff = 0.56 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

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

Summary for Subcatchment S203: S203

Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

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

Summary for Subcatchment S204: S204

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

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

Summary for Subcatchment S205: S205

Runoff = 1.78 cfs @ 12.14 hrs, Volume= 0.150 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B**
					Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C**
					Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 1.64 cfs @ 12.07 hrs, Volume= 0.123 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

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

Summary for Subcatchment S206B: S206B

Runoff = 1.69 cfs @ 12.07 hrs, Volume= 0.128 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

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

Summary for Subcatchment S206C: S206C

Runoff = 0.31 cfs @ 12.07 hrs, Volume= 0.024 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

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

Summary for Subcatchment S206D: S206D

Runoff = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

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

Summary for Subcatchment S207: S207

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

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

Summary for Subcatchment S208: S208

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

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

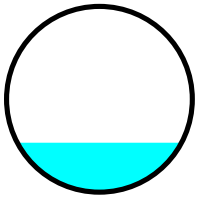
Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 2.45" for 2-Yr event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Atten= 3%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.40 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 2.0 min

Peak Storage= 16 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



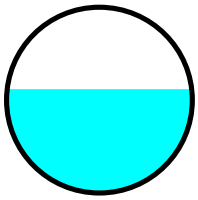
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac,100.00% Impervious, Inflow Depth = 2.87" for 2-Yr event
Inflow = 1.49 cfs @ 12.07 hrs, Volume= 0.117 af
Outflow = 1.46 cfs @ 12.08 hrs, Volume= 0.117 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 0.9 min

Peak Storage= 28 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



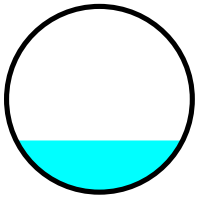
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 2.60" for 2-Yr event
Inflow = 0.42 cfs @ 12.80 hrs, Volume= 0.586 af
Outflow = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 1.0 min

Peak Storage= 17 cf @ 12.80 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 2.60" for 2-Yr event
Inflow = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af
Outflow = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min
Primary = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.77' @ 12.80 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.80 hrs HW=62.77' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.42 cfs @ 1.63 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 2.65" for 2-Yr event
Inflow = 3.89 cfs @ 12.08 hrs, Volume= 0.302 af
Outflow = 0.21 cfs @ 14.00 hrs, Volume= 0.302 af, Atten= 95%, Lag= 115.4 min
Primary = 0.21 cfs @ 14.00 hrs, Volume= 0.302 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.90' @ 14.00 hrs Surf.Area= 5,381 sf Storage= 6,305 cf

Plug-Flow detention time= 283.6 min calculated for 0.302 af (100% of inflow)
Center-of-Mass det. time= 283.6 min (1,055.1 - 771.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=0.21 cfs @ 14.00 hrs HW=67.90' (Free Discharge)
└─**1=Culvert** (Passes 0.21 cfs of 3.89 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.74 fps)
  │ └─**3=Orifice/Grate** (Passes 0.01 cfs of 0.01 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.20 cfs @ 9.33 fps)
    └─**5=Exfiltration** (Passes 0.20 cfs of 0.30 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area =	0.360 ac,	76.58% Impervious,	Inflow Depth =	2.33"	for 2-Yr event
Inflow =	0.94 cfs @	12.08 hrs,	Volume=	0.070 af	
Outflow =	0.94 cfs @	12.08 hrs,	Volume=	0.070 af,	Atten= 0%, Lag= 0.0 min
Primary =	0.94 cfs @	12.08 hrs,	Volume=	0.070 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.00' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.91 cfs @ 12.08 hrs HW=66.99' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.91 cfs @ 2.38 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area =	1.010 ac,	95.43% Impervious,	Inflow Depth =	2.76"	for 2-Yr event
Inflow =	2.95 cfs @	12.08 hrs,	Volume=	0.233 af	
Outflow =	2.95 cfs @	12.08 hrs,	Volume=	0.233 af,	Atten= 0%, Lag= 0.0 min
Primary =	2.95 cfs @	12.08 hrs,	Volume=	0.233 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.13' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.86 cfs @ 12.08 hrs HW=68.08' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 2.45" for 2-Yr event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.90' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.07 hrs HW=68.89' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.39 cfs @ 1.59 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 2.76" for 2-Yr event
Inflow = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af
Outflow = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.44' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.07 hrs HW=67.42' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.83 cfs @ 2.32 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 2.77" for 2-Yr event
Inflow = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af
Outflow = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
Primary = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.32' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.03 cfs @ 12.08 hrs HW=68.27' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.03 cfs @ 2.59 fps)

Summary for Pond POI1: POI#1

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 1.03" for 2-Yr event
Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af
Primary = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 2.52" for 2-Yr event
Inflow = 2.19 cfs @ 12.14 hrs, Volume= 0.736 af
Primary = 2.19 cfs @ 12.14 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 2.55" for 2-Yr event
Inflow = 1.64 cfs @ 12.07 hrs, Volume= 0.123 af
Outflow = 0.04 cfs @ 17.10 hrs, Volume= 0.117 af, Atten= 98%, Lag= 301.7 min
Primary = 0.04 cfs @ 17.10 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.24' @ 17.10 hrs Surf.Area= 20,887 sf Storage= 3,548 cf

Plug-Flow detention time= 891.1 min calculated for 0.117 af (96% of inflow)
Center-of-Mass det. time= 867.6 min (1,648.6 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 4	67.82'	**3.000 in/hr Exfiltration over Surface area above 66.65'** Excluded Surface area = 0 sf
#3	Primary	68.32'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	66.65'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.04 cfs @ 17.10 hrs HW=68.24' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 6.73 fps)
  - **4=Orifice/Grate** (Passes 0.04 cfs of 1.10 cfs potential flow)
    - **2=Exfiltration** (Passes 0.04 cfs of 1.45 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 2.65" for 2-Yr event
Inflow = 1.69 cfs @ 12.07 hrs, Volume= 0.128 af
Outflow = 0.05 cfs @ 15.75 hrs, Volume= 0.128 af, Atten= 97%, Lag= 221.0 min
Primary = 0.05 cfs @ 15.75 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.75' @ 15.75 hrs Surf.Area= 20,435 sf Storage= 3,291 cf

Plug-Flow detention time= 585.8 min calculated for 0.128 af (100% of inflow)
Center-of-Mass det. time= 586.1 min (1,360.2 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	69.35'	**3.000 in/hr Exfiltration over Surface area above 68.18'** Excluded Surface area = 0 sf
#3	Primary	69.85'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	68.18'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.05 cfs @ 15.75 hrs HW=69.75' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 6.73 fps)
  - **4=Orifice/Grate** (Passes 0.05 cfs of 1.09 cfs potential flow)
    - **2=Exfiltration** (Passes 0.05 cfs of 1.42 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 2.65" for 2-Yr event
Inflow = 0.31 cfs @ 12.07 hrs, Volume= 0.024 af
Outflow = 0.06 cfs @ 12.50 hrs, Volume= 0.024 af, Atten= 80%, Lag= 25.6 min
Primary = 0.06 cfs @ 12.50 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 70.50' @ 12.50 hrs Surf.Area= 5,149 sf Storage= 266 cf

Plug-Flow detention time= 25.8 min calculated for 0.024 af (100% of inflow)
Center-of-Mass det. time= 25.8 min (799.8 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	70.37'	**3.000 in/hr Exfiltration over Surface area above 69.20'** Excluded Surface area = 0 sf
#3	Primary	70.87'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	69.20'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.50 hrs HW=70.50' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.91 fps)
  - **4=Orifice/Grate** (Passes 0.06 cfs of 0.97 cfs potential flow)
    - **2=Exfiltration** (Passes 0.06 cfs of 0.36 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 2.55" for 2-Yr event
Inflow = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af
Outflow = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af, Atten= 61%, Lag= 13.4 min
Primary = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 71.40' @ 12.29 hrs Surf.Area= 1,473 sf Storage= 73 cf

Plug-Flow detention time= 5.0 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 5.0 min (786.1 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	71.28'	**3.000 in/hr Exfiltration over Surface area above 70.11'**
			Excluded Surface area = 0 sf
#3	Primary	71.78'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	70.11'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.07 cfs @ 12.29 hrs HW=71.40' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 9.14 fps)
  - **4=Orifice/Grate** (Passes 0.07 cfs of 0.97 cfs potential flow)
    - **2=Exfiltration** (Passes 0.07 cfs of 0.10 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment S201: S201

Runoff = 2.22 cfs @ 12.07 hrs, Volume= 0.179 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

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

Summary for Subcatchment S202: S202

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 0.066 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

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

Summary for Subcatchment S203: S203

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

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

Summary for Subcatchment S204: S204

Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

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

Summary for Subcatchment S205: S205

Runoff = 2.85 cfs @ 12.14 hrs, Volume= 0.246 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B** Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C** Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 2.53 cfs @ 12.07 hrs, Volume= 0.194 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

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

Summary for Subcatchment S206B: S206B

Runoff = 2.57 cfs @ 12.07 hrs, Volume= 0.200 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

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

Summary for Subcatchment S206C: S206C

Runoff = 0.48 cfs @ 12.07 hrs, Volume= 0.037 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

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

Summary for Subcatchment S206D: S206D

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

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

Summary for Subcatchment S207: S207

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

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

Summary for Subcatchment S208: S208

Runoff = 1.00 cfs @ 12.07 hrs, Volume= 0.077 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

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

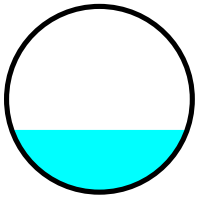
Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 3.91" for 10-Yr event
Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 1.8 min

Peak Storage= 22 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



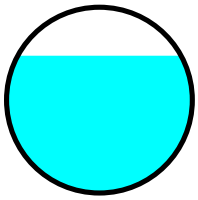
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac,100.00% Impervious, Inflow Depth = 4.36" for 10-Yr event
Inflow = 2.22 cfs @ 12.07 hrs, Volume= 0.179 af
Outflow = 2.18 cfs @ 12.08 hrs, Volume= 0.179 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.8 min

Peak Storage= 39 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



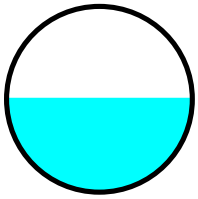
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 3.96" for 10-Yr event
Inflow = 1.29 cfs @ 12.55 hrs, Volume= 0.891 af
Outflow = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.9 min

Peak Storage= 38 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 3.96" for 10-Yr event
Inflow = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af
Outflow = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 63.09' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.57 hrs HW=63.09' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.29 cfs @ 2.23 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 4.13" for 10-Yr event
Inflow = 5.94 cfs @ 12.08 hrs, Volume= 0.471 af
Outflow = 1.04 cfs @ 12.53 hrs, Volume= 0.471 af, Atten= 83%, Lag= 27.4 min
Primary = 1.04 cfs @ 12.53 hrs, Volume= 0.471 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.36' @ 12.53 hrs Surf.Area= 5,996 sf Storage= 8,954 cf

Plug-Flow detention time= 248.1 min calculated for 0.471 af (100% of inflow)
Center-of-Mass det. time= 248.2 min (1,010.1 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=1.04 cfs @ 12.53 hrs HW=68.36' (Free Discharge)
└─**1=Culvert** (Passes 1.04 cfs of 4.11 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.82 cfs @ 2.44 fps)
  │ └─**3=Orifice/Grate** (Passes 0.82 cfs of 1.15 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.22 cfs @ 9.89 fps)
    └─**5=Exfiltration** (Passes 0.22 cfs of 0.33 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.360 ac, 76.58% Impervious, Inflow Depth = 3.79" for 10-Yr event
Inflow = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af
Outflow = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.15' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.44 cfs @ 12.08 hrs HW=67.14' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.44 cfs @ 2.72 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area = 1.010 ac, 95.43% Impervious, Inflow Depth = 4.25" for 10-Yr event
Inflow = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af
Outflow = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.0 min
Primary = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.31' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.31 cfs @ 12.08 hrs HW=69.19' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.31 cfs @ 5.49 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 3.91" for 10-Yr event
Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af
Outflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.00' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.07 hrs HW=68.99' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.61 cfs @ 1.79 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 4.25" for 10-Yr event
Inflow = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af
Outflow = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
Primary = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.61' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.25 cfs @ 12.07 hrs HW=67.59' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.25 cfs @ 2.58 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 4.26" for 10-Yr event
Inflow = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af
Outflow = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af, Atten= 0%, Lag= 0.0 min
Primary = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.21' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.08 hrs HW=69.12' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.07 cfs @ 3.91 fps)

Summary for Pond POI1: POI#1

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 2.13" for 10-Yr event
Inflow = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af
Primary = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 3.90" for 10-Yr event
Inflow = 3.35 cfs @ 12.15 hrs, Volume= 1.137 af
Primary = 3.35 cfs @ 12.15 hrs, Volume= 1.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 4.02" for 10-Yr event
Inflow = 2.53 cfs @ 12.07 hrs, Volume= 0.194 af
Outflow = 0.10 cfs @ 14.97 hrs, Volume= 0.161 af, Atten= 96%, Lag= 174.0 min
Primary = 0.10 cfs @ 14.97 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.47' @ 14.97 hrs Surf.Area= 20,887 sf Storage= 5,411 cf

Plug-Flow detention time= 780.7 min calculated for 0.160 af (83% of inflow)
Center-of-Mass det. time= 712.8 min (1,482.3 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 4	67.82'	**3.000 in/hr Exfiltration over Surface area above 66.65'** Excluded Surface area = 0 sf
#3	Primary	68.32'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	66.65'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.10 cfs @ 14.97 hrs HW=68.47' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.10 fps)
  - **4=Orifice/Grate** (Passes 0.04 cfs of 1.18 cfs potential flow)
    - **2=Exfiltration** (Passes 0.04 cfs of 1.45 cfs potential flow)
- **3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.31 fps)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 4.14" for 10-Yr event
Inflow = 2.57 cfs @ 12.07 hrs, Volume= 0.200 af
Outflow = 0.11 cfs @ 14.71 hrs, Volume= 0.200 af, Atten= 96%, Lag= 158.1 min
Primary = 0.11 cfs @ 14.71 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.99' @ 14.71 hrs Surf.Area= 20,435 sf Storage= 5,209 cf

Plug-Flow detention time= 727.0 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time= 726.8 min (1,490.3 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	69.35'	**3.000 in/hr Exfiltration over Surface area above 68.18'** Excluded Surface area = 0 sf
#3	Primary	69.85'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	68.18'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.11 cfs @ 14.71 hrs HW=69.99' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.12 fps)
  - **4=Orifice/Grate** (Passes 0.06 cfs of 1.18 cfs potential flow)
    - **2=Exfiltration** (Passes 0.06 cfs of 1.42 cfs potential flow)
- **3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.26 fps)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 4.14" for 10-Yr event
Inflow = 0.48 cfs @ 12.07 hrs, Volume= 0.037 af
Outflow = 0.06 cfs @ 12.59 hrs, Volume= 0.037 af, Atten= 87%, Lag= 31.4 min
Primary = 0.06 cfs @ 12.59 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 70.61' @ 12.59 hrs Surf.Area= 5,149 sf Storage= 501 cf

Plug-Flow detention time= 51.6 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 51.6 min (815.1 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	70.37'	**3.000 in/hr Exfiltration over Surface area above 69.20'** Excluded Surface area = 0 sf
#3	Primary	70.87'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	69.20'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.59 hrs HW=70.61' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 8.08 fps)
  - **4=Orifice/Grate** (Passes 0.06 cfs of 1.02 cfs potential flow)
    - **2=Exfiltration** (Passes 0.06 cfs of 0.36 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 4.02" for 10-Yr event
Inflow = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af
Outflow = 0.07 cfs @ 12.43 hrs, Volume= 0.022 af, Atten= 74%, Lag= 21.4 min
Primary = 0.07 cfs @ 12.43 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 71.59' @ 12.43 hrs Surf.Area= 1,473 sf Storage= 184 cf

Plug-Flow detention time= 12.5 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 12.5 min (782.0 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	71.28'	**3.000 in/hr Exfiltration over Surface area above 70.11'**
			Excluded Surface area = 0 sf
#3	Primary	71.78'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	70.11'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.07 cfs @ 12.43 hrs HW=71.59' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 9.38 fps)
  └─**4=Orifice/Grate** (Passes 0.07 cfs of 1.05 cfs potential flow)
    └─**2=Exfiltration** (Passes 0.07 cfs of 0.10 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Subcatchment S201: S201

Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.228 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

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

Summary for Subcatchment S202: S202

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 0.087 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

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

Summary for Subcatchment S203: S203

Runoff = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

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

Summary for Subcatchment S204: S204

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

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

Summary for Subcatchment S205: S205

Runoff = 3.69 cfs @ 12.14 hrs, Volume= 0.325 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		**Sheet Flow, A to B**
					Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		**Shallow Concentrated Flow, B to C**
					Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 3.23 cfs @ 12.07 hrs, Volume= 0.251 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

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

Summary for Subcatchment S206B: S206B

Runoff = 3.27 cfs @ 12.07 hrs, Volume= 0.257 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

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

Summary for Subcatchment S206C: S206C

Runoff = 0.61 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

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

Summary for Subcatchment S206D: S206D

Runoff = 0.36 cfs @ 12.07 hrs, Volume= 0.028 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

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

Summary for Subcatchment S207: S207

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

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

Summary for Subcatchment S208: S208

Runoff = 1.28 cfs @ 12.07 hrs, Volume= 0.099 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

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

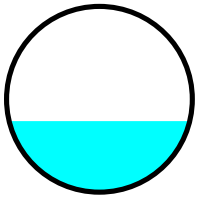
Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 5.10" for 25-Yr event
Inflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.79 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 3%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.96 fps, Avg. Travel Time= 1.7 min

Peak Storage= 26 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'



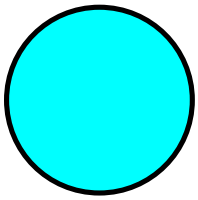
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac,100.00% Impervious, Inflow Depth = 5.56" for 25-Yr event
Inflow = 2.81 cfs @ 12.07 hrs, Volume= 0.228 af
Outflow = 2.46 cfs @ 12.10 hrs, Volume= 0.228 af, Atten= 12%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.57 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.8 min

Peak Storage= 51 cf @ 12.08 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.46 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 63.0' Slope= 0.0048 '/'
Inlet Invert= 67.20', Outlet Invert= 66.90'



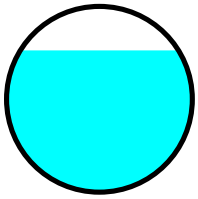
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 5.13" for 25-Yr event
Inflow = 2.34 cfs @ 12.52 hrs, Volume= 1.155 af
Outflow = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 0.8 min

Peak Storage= 60 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.76'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 94.0' Slope= 0.0050 '/'
Inlet Invert= 62.97', Outlet Invert= 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 5.13" for 25-Yr event
Inflow = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af
Outflow = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af, Atten= 0%, Lag= 0.0 min
Primary = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 63.51' @ 12.53 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	**12.0" Round Culvert** L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.34 cfs @ 12.53 hrs HW=63.51' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.34 cfs @ 2.97 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 5.32" for 25-Yr event
Inflow = 7.26 cfs @ 12.08 hrs, Volume= 0.607 af
Outflow = 1.81 cfs @ 12.46 hrs, Volume= 0.607 af, Atten= 75%, Lag= 22.9 min
Primary = 1.81 cfs @ 12.46 hrs, Volume= 0.607 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.70' @ 12.46 hrs Surf.Area= 6,443 sf Storage= 11,029 cf

Plug-Flow detention time= 220.5 min calculated for 0.607 af (100% of inflow)
Center-of-Mass det. time= 220.7 min (977.6 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	**12.0" Round Culvert** L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	**9.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	67.85'	**15.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	64.06'	**2.0" Vert. Orifice/Grate** C= 0.600
#5	Device 4	66.50'	**2.410 in/hr Exfiltration over Surface area above 64.06'** Excluded Surface area = 0 sf

Primary OutFlow Max=1.81 cfs @ 12.46 hrs HW=68.70' (Free Discharge)
└─**1=Culvert** (Passes 1.81 cfs of 4.27 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 3.23 fps)
  │ └─**3=Orifice/Grate** (Passes 1.59 cfs of 2.77 cfs potential flow)
  └─**4=Orifice/Grate** (Orifice Controls 0.22 cfs @ 10.27 fps)
    └─**5=Exfiltration** (Passes 0.22 cfs of 0.36 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.360 ac, 76.58% Impervious, Inflow Depth = 4.96" for 25-Yr event
Inflow = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af
Outflow = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min
Primary = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.27' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	**12.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.86 cfs @ 12.08 hrs HW=67.25' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 1.86 cfs @ 2.95 fps)

Summary for Pond 4P: Ex. Vortechnics Unit

Inflow Area = 1.010 ac, 95.43% Impervious, Inflow Depth = 5.45" for 25-Yr event
Inflow = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af
Outflow = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af, Atten= 0%, Lag= 0.0 min
Primary = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 70.37' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.24 cfs @ 12.07 hrs HW=70.19' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.24 cfs @ 6.68 fps)

Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 5.10" for 25-Yr event
Inflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
Primary = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.06' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	**12.0" Round Culvert** L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.07 hrs HW=69.05' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.78 cfs @ 1.92 fps)

Summary for Pond 6P: Ex. CB

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 5.44" for 25-Yr event
Inflow = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af
Outflow = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
Primary = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 67.75' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	**12.0" Round Culvert** L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.07 hrs HW=67.72' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.59 cfs @ 2.74 fps)

Summary for Pond 7P: Ex. CB

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 5.45" for 25-Yr event
Inflow = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af
Outflow = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
Primary = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 69.82' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	**12.0" Round Culvert** L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.66 cfs @ 12.08 hrs HW=69.77' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.66 cfs @ 4.66 fps)

Summary for Pond POI1: POI#1

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 3.11" for 25-Yr event
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af
Primary = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 5.07" for 25-Yr event
Inflow = 5.11 cfs @ 12.17 hrs, Volume= 1.479 af
Primary = 5.11 cfs @ 12.17 hrs, Volume= 1.479 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 5.21" for 25-Yr event
Inflow = 3.23 cfs @ 12.07 hrs, Volume= 0.251 af
Outflow = 0.23 cfs @ 13.27 hrs, Volume= 0.215 af, Atten= 93%, Lag= 71.8 min
Primary = 0.23 cfs @ 13.27 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 68.59' @ 13.27 hrs Surf.Area= 20,887 sf Storage= 6,415 cf

Plug-Flow detention time= 635.6 min calculated for 0.215 af (86% of inflow)
Center-of-Mass det. time= 573.1 min (1,336.6 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 4	67.82'	**3.000 in/hr Exfiltration over Surface area above 66.65'** Excluded Surface area = 0 sf
#3	Primary	68.32'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	66.65'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.23 cfs @ 13.27 hrs HW=68.59' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.30 fps)
  - **4=Orifice/Grate** (Passes 0.04 cfs of 1.23 cfs potential flow)
    - **2=Exfiltration** (Passes 0.04 cfs of 1.45 cfs potential flow)
- **3=Orifice/Grate** (Orifice Controls 0.19 cfs @ 1.76 fps)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 5.33" for 25-Yr event
Inflow = 3.27 cfs @ 12.07 hrs, Volume= 0.257 af
Outflow = 0.24 cfs @ 13.14 hrs, Volume= 0.257 af, Atten= 93%, Lag= 64.4 min
Primary = 0.24 cfs @ 13.14 hrs, Volume= 0.257 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 70.11' @ 13.14 hrs Surf.Area= 20,435 sf Storage= 6,241 cf

Plug-Flow detention time= 629.7 min calculated for 0.257 af (100% of inflow)
Center-of-Mass det. time= 627.8 min (1,385.9 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	69.35'	**3.000 in/hr Exfiltration over Surface area above 68.18'** Excluded Surface area = 0 sf
#3	Primary	69.85'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	68.18'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.24 cfs @ 13.14 hrs HW=70.11' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.32 fps)
  - **4=Orifice/Grate** (Passes 0.06 cfs of 1.23 cfs potential flow)
    - **2=Exfiltration** (Passes 0.06 cfs of 1.42 cfs potential flow)
- **3=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.75 fps)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 5.33" for 25-Yr event
Inflow = 0.61 cfs @ 12.07 hrs, Volume= 0.048 af
Outflow = 0.06 cfs @ 12.75 hrs, Volume= 0.048 af, Atten= 89%, Lag= 40.8 min
Primary = 0.06 cfs @ 12.75 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 70.71' @ 12.75 hrs Surf.Area= 5,149 sf Storage= 701 cf

Plug-Flow detention time= 75.6 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 75.6 min (833.6 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	70.37'	**3.000 in/hr Exfiltration over Surface area above 69.20'** Excluded Surface area = 0 sf
#3	Primary	70.87'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	69.20'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.75 hrs HW=70.71' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 8.21 fps)
  - **4=Orifice/Grate** (Passes 0.06 cfs of 1.06 cfs potential flow)
    - **2=Exfiltration** (Passes 0.06 cfs of 0.36 cfs potential flow)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 5.21" for 25-Yr event
Inflow = 0.36 cfs @ 12.07 hrs, Volume= 0.028 af
Outflow = 0.08 cfs @ 12.48 hrs, Volume= 0.028 af, Atten= 79%, Lag= 24.8 min
Primary = 0.08 cfs @ 12.48 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 71.77' @ 12.48 hrs Surf.Area= 1,473 sf Storage= 287 cf

Plug-Flow detention time= 20.1 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 20.1 min (783.7 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	**1.2" Vert. Orifice/Grate** C= 0.600
#2	Device 4	71.28'	**3.000 in/hr Exfiltration over Surface area above 70.11'**
			Excluded Surface area = 0 sf
#3	Primary	71.78'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	70.11'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.08 cfs @ 12.48 hrs HW=71.77' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 9.59 fps)
  └─**4=Orifice/Grate** (Passes 0.08 cfs of 1.12 cfs potential flow)
    └─**2=Exfiltration** (Passes 0.08 cfs of 0.10 cfs potential flow)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

ATTACHMENT E

WATER QUALITY TREATMENT SUMMARY

90 Johnson Road Stormwater Management Summary

Subarea ID	New Development			Redevelopment			Treated New Impervious Area (sf)	Treated New Landscaped Area (sf)	Treated Redeveloped Impervious Area (sf)	Treated Redeveloped Landscaped Area (sf)
	Impervious Area (sf)	Landscaped Area (sf)	Total Developed Area (sf)	Impervious Area (sf)	Landscaped Area (sf)	Total Redeveloped Area (sf)				
S201	0	0	0	21,396	0	21,396	0	0	21,396	0
S202	0	0	0	1,320	1,105	2,425	0	0	1,320	1,105
S203	0	0	0	12,093	507	12,600	0	0	12,093	507
S204	0	0	0	1,993	807	2,800	0	0	1,993	807
S208	0	0	0	8,477	1,476	9,953	0	0	8,477	1,476
S205	478	0	478	5,999	4,692	10,691	0	0	0	0
S206A	20,887	4,263	25,150	0	0	0	20,887	4,263	0	0
S206B	16,595	2,382	18,977	5,529	749	6,278	16,595	2,382	5,529	749
S206C	0	0	0	4,184	517	4,701	0	0	4,184	517
S206D	0	0	0	2,419	409	2,828	0	0	2,419	409
S207	0	2,424	2,424	0	0	0	0	0	0	0
Total (sf)	**37,960**	**9,069**	**47,029**	**63,410**	**10,262**	**73,672**	**37,482**	**6,645**	**57,411**	**5,570**
Total (ac)	**0.87**	**0.21**	**1.08**	**1.46**	**0.24**	**1.69**	**0.86**	**0.15**	**1.32**	**0.13**

BMP Summary

Subarea ID	Treatment Method	Water Quality Volume Required (cf)	Water Quality Volume Provided (cf)	BMP Surface Area Required (sf)	BMP Surface Area Provided (sf)
S201 S202 S203 S204 S208	Existing Vegetated Underdrained Filter	3,903	4,801	2,342	3,670
S205	Untreated	N/A	N/A	N/A	N/A
S206A	Porous Pavement 1	1,883	4,177	N/A	20,887
S206B	Porous Pavement 2	1,948	4,087	N/A	20,435
S206C	Porous Pavement 3	366	1,030	N/A	5,149
S206D	Porous Pavement 4	215	295	N/A	1,473

Treatment Summary

	Required	Provided
Treated New Impervious (%)	95%	98.74%
Treated New Developed (%)	80%	93.83%
Treated Redev Impervious (%)	N/A	90.54%
Treated Redev Developed (%)	60%	85.49%

ATTACHMENT F

DRAWDOWN COMPUTATIONS

Drawdown Calculation - Porous Pavement #1

Orifice Diameter =1 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
68.32	0.50	20,887	20887.00	0.25	2088.70	1.67	0.0339	61625.73	17.118
68.07	0.25	20,887	20887.00	0.25	2088.70	1.42	0.0312	66841.31	18.567
67.82	0.00	20,887	0.00	0.00	0.00	1.17	0.0284	0.00	0.000
								TOTAL	***35.685***

Orifice Formula	**CA (2gh)$^{1/2}$**	
Orifice Diameter:	**1**	inch
A:	0.005454	sq.ft
Filter Thickness:	1.167	feet
g:	32.174	ft/s^2
C:	0.6	Orifice/Grate

Drawdown Calculation - Porous Pavement #2, #3, & #4

Orifice Diameter =1.25 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
69.85	0.50	27,057	27057.00	0.25	2705.70	1.67	0.0530	51091.15	14.192
69.60	0.25	27,057	27057.00	0.25	2705.70	1.42	0.0488	55415.15	15.393
69.35	0.00	27,057	0.00	0.00	0.00	1.17	0.0443	0.00	0.000
								TOTAL	***29.585***

Orifice Formula	**CA (2gh)$^{1/2}$**	
Orifice Diameter:	**1.25**	inch
A:	0.008522	sq.ft
Filter Thickness:	1.167	feet
g:	32.174	ft/s^2
C:	0.6	Orifice/Grate

ATTACHMENT G

REDEVELOPMENT COMPUTATIONS

Redevelopment Treatment Calculation						
	Existing Condition			Proposed Condition		
Pollutant Ranking	Area (sf)	Area (ac)	Impact Rating	Area (sf)	Area (ac)	Impact Rating
0	0	0	0	0	0	0
1	0	0	0	0	0.00	0.00
2	21,615	0.50	0.99	18,240	0.42	0.84
3	51,943	1.19	3.58	55,318	1.27	3.81
4	0	0.00	0.00	0	0.00	0.00
5	0	0	0	0	0	0
Total	**73,558**	**1.69**	**4.57**	**73,558**	**1.69**	**4.65**

Redevelopment Treatment Summary	
Total Redevelopment Area (ac)	1.69
Existing Impact Rating	4.57
Proposed Impact Rating	4.65
Existing Ranked Impact	2.71
Proposed Ranked Impact	2.75
Resultant Ranked Impact Change	0.05
Redeveloped Area Treatment	**60%**

ATTACHMENT H

STORMWATER OPERATIONS & MAINTENANCE MANUAL

OPERATION AND MAINTENANCE MANUAL FOR STORMWATER MANAGEMENT AND RELATED STORMWATER FACILITIES

90 JOHNSON ROAD PROPERTY
90 JOHNSON ROAD
PORTLAND, MAINE

PREPARED FOR

TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810

PREPARED BY

STANTEC CONSULTING SERVICES, INC.
482 PAYNE ROAD
SCARBOROUGH, MAINE 04074
(207) 883-3355

JULY 2018

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APPENDICES

Appendix A – Sample Inspection Logs

Appendix B – Permits for Project

Appendix C – Summary Checklist for Inspection and Maintenance

I. INTRODUCTION

Relatively complex stormwater management facilities are commonly installed in development projects including, commercial facilities, and many other developments. The complexity and goals of these systems vary with the nature of the receiving water, as well as the type of development. Runoff from developed areas of the project, including rooftops, paved, or lawn areas typically contain materials that can impact the receiving waters. Source control and the installation of bio-retention facilities and pervious surfaces are often combined with pretreatment measures or vegetated buffer strips. Other best management practices are also among the options that can significantly reduce the non-point pollution discharge from the developed area. These measures are particularly important to projects in the watersheds of sensitive water bodies, or projects with potential impacts to groundwater. With the increased cost of land and development, there is an increased tendency to construct portions of the stormwater management systems underground.

The effectiveness of water quality management provisions and other components of the stormwater management system are dependent on their design, upkeep, and maintenance to assure they meet their intended function over an extended period of years. It is critical that the stormwater management facilities are regularly inspected, and that maintenance is performed on an as-needed basis. It must also be recognized that the effectiveness of these facilities, and their maintenance requirements, are related to the stormwater drainage facilities that collect and transport the flow to the ponds, infiltration galleries, and other treatment measures. Thus, maintenance should be directed to the total system, not just the collection system or primary stormwater management facility.

The purpose of this document is to define, in detail, the inspection and maintenance requirements deemed necessary to assure that the stormwater management facilities function as intended when they were designed. Subsequent sections identify individual maintenance items, give a brief commentary of the function and need for the item, a description of the work required, and a suggested frequency of accomplishment. While the suggested programs and schedules must be adapted to specific projects, the material presented should provide guidance for a successful long-term program for operation and maintenance. Certain facilities, specifically the potential water quality volume storage or treatment measures such as bio-retention cells and pervious surfaces are not intended to be placed in service until the tributary catchment area has the permanent cover in place and any contributing turf areas have achieved a 90% catch of vegetation (i.e. established).

A. GUIDELINES OVERVIEW

A summary of the individual components of stormwater management facilities for this project has been prepared. The format used in the summary is as follows:

Preface: A general description of what function/benefit the element is intended to provide. This is a short summary and not intended to provide the design basis, which can be found in other sources.

Inspection: This section provides the inspection requirements for the individual component.

Maintenance: The section provides general information on the routine maintenance requirements of this element.

Frequency: This section outlines the best judgment of the designer on the system to the frequency of maintenance.

Comments: This section provides any particular comment on the site-specific features of this element. This is a summary only. The owner/operator should review the design drawings and documents carefully to understand the particular elements of the project. The end of this section should allow the owner/operator to make notes on the specific program. This may include the selected maintenance procedure, cross-references to applicable design drawings, etc.

A list of the individual inspection/maintenance elements is provided in the table of contents. The guidelines are proposed for initial use with adjustments made as appropriate based upon specific project experience.

This report includes the Operation and Maintenance requirements for any potential BMP identified in the Stormwater Management Report for this project.

B. RESPONSIBLE PARTY

The responsible party for operation and maintenance of the stormwater and other site infrastructure will be Transport Leasing Corp., or their agents or assigns.

II. PROJECT OVERVIEW

Key permits issued (or applied for) on the project include:

- MaineDEP Stormwater Permit through the City of Portland Delegated Authority
- City of Portland Level III Site plan and Subdivision Review

A copy of the permits and Stormwater Management Report should be appended to this manual as Appendix B. The Owner/Operator of the stormwater management system should review these permits for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

The applicant has retained Stantec for civil engineering for the development project. Stantec has prepared the design for the stormwater management facilities and may be contacted at:

Stantec
482 Payne Road
Scarborough, ME 04074
(207) 887.3478

It is recommended the preparer of the plan be contacted with any particular questions on the design intent or similar issues.

The applicable plans and design documents which apply to the project are:

1. Civil Site Plans Prepared by Stantec.
2. The Erosion Control/Sedimentation Control Plan for the project.
3. The Stormwater Management Plan for the project.

A copy of these documents should be retained with this manual.

The proposed design includes pervious pavement and stormwater conveyance lines. There are existing inlets, manholes, outlet control structures, conveyance lines, pretreatment devices, and a vegetated filter that will be utilized for stormwater management for the proposed project.

III. STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS

The following narratives describe the inspection/maintenance provisions for the Stormwater Management system. These O&M procedures will complement scheduled sweeping of the parking lots which is anticipated to occur at least twice per year. Proper O&M is necessary to make sure the system will provide its intended purpose of conveying runoff, removing a substantial amount of the suspended solids, and other contaminants in the stormwater runoff.

A. STORMWATER INLETS

Preface: The success of any stormwater facility relies on the ability to intercept stormwater runoff at the design locations. Stormwater inlets may include catch basins, open culverts, culverts with bar screens, roof scuppers, plaza scuppers, trench drains, and field inlets. Inlets exist throughout the proposed systems.

Inspection: The inspection of inlet points will need to be coordinated with other maintenance items, these include:

- Landscape services
- Building maintenance areas
- Grounds maintenance

The key elements of the inspection are to assure the inlet entry point is clear of debris and will allow the intended water entry.

Maintenance: The key maintenance is the removal of any blockage which restricts the entry of stormwater to the inlet. The removed material should be taken out of the area of the inlet and placed where it will not reenter the runoff collection system. Snow should be removed from inlets

on parking lots or plaza areas. Grass clippings and leaves should be bagged and removed particularly near the yard inlets near the buildings.

Frequency: All inlets should be inspected on a quarterly basis, and after/during significant storm events.

Maintenance Personnel: The maintenance personnel will perform the normal maintenance/ inspections of the inlets and tributary drainage system.

Comments: Maintenance of inlets is critical on this project.

B. TRIBUTARY DRAINAGE SYSTEM

Preface: Stormwater from most of the project will be directed through a conveyance system which transports the flow to a public system within Johnson Road. This conveyance system will be principally overland flow and/or infiltration through porous pavement that discharges to piped drain systems. Most of the sediment is carried by the drainage system is intended to be trapped near the inlets or in pretreatment devices such as an existing Vortechnics hydrodynamic separator. Maintenance of this system can play a key role in the long-term maintenance costs and the effectiveness of the onsite systems.

Inspection: The tributary drainage system should be periodically inspected to assure that it is operating as intended, and that its carrying capacity has not been diminished by accumulations of debris and sediment or other hydraulic impediments. On piped systems, the inlets must be inspected to ensure the rims are set at the proper elevation to optimize flow entry and are not clogged with debris. The inlet catch basins will be equipped with sumps and hooded outlets which will remove gross floatables and large sediment particles from the flow stream. These must be cleaned on an as-needed basis.

The level of sediment in the sumps or hydrodynamic separator should be checked to assure their effectiveness. Pipelines connecting the inlets should be checked to determine if siltation is occurring. This will be most critical on drain lines laid at minimal slopes. This can usually be accomplished by a light and mirror procedure.

Maintenance: Maintenance of the storm drainage system must assure that it continues to serve its design function on a long-term basis, and that its operation does not transport excessive sedimentation to any downstream BMP or the receiving waters. Elevations on the rim of catch basins should be adjusted as needed to assure optimal water entry. Depending on the frost susceptibility of the soil, the rims may become elevated over time causing flow to circumvent the inlet. If a temporary filter bag has been designated for the inlet during construction, silt or other deleterious materials, can significantly reduce capacity and the bags should be removed with the sediment and replaced during construction. Catch basin cleaning would normally be accomplished with vacuum trucks contracted as a maintenance service for the Development. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline is observed, it should be removed. This may be accomplished by hydraulic flushing, or by mechanical means. If hydraulic flushing is used the downstream conditions should be analyzed.

Frequency: The piped drainage system should be inspected on an annual basis. Adjustment of inlet rim elevations should be on an as needed basis. Cleaning catch basin sumps, hydrodynamic separator, and pipelines will depend on the rate of accumulation.

Maintenance/Inspection Responsibility:

Maintenance Personnel: A hired 3rd party maintenance crew as retained by the applicant, their agents or assigns.

Special Services: The owner may elect to contract with an independent agent for cleaning of catch basins, sumps, and pipelines. Remedial source control measures may be performed by the owner or an outside service depending upon the nature of the particular situation.

Comments: Maintenance of inlets and catch basins is of utmost importance to the project to avoid unintended release of sediments or related materials in the runoff flow stream.

C. POROUS PAVEMENT

Preface: The porous pavement collects stormwater runoff from the surface before passing it through a treatment section and discharging into a closed drainage system.

Inspection: The pavement should be inspected regularly to ensure that the surface is not clogged, and that runoff can pass freely through the porous section. The asphalt surface must be inspected for integrity and to ensure rutting or deformation of the surface is minimized.

Maintenance: Any debris should be removed from the pavement surface. If the porous pavement area is holding water in excess of 48-72 hours corrective action is needed. To correct a standing water problem, the following remedial actions are recommended:

1. Vacuum any sediment or debris from the pavement surface on a semi-annual basis
2. Ensure the underdrain system is not clogged with any silt or other materials.
3. Ensure that the porous pavement can pass water freely and drain quickly while handling large amounts of water.

Frequency: The porous pavement should be inspected and vacuumed semi-annually and maintained as needed.

Maintenance/Inspection Responsibility: The Owner or an outside agent is responsible for inspection and maintenance of the porous pavement areas.

D. WATER QUALITY FILTERS (ABOVE GROUND)

Preface: The soil filter is an underdrain system with multi-media aggregates. This section is applicable to the existing underdrained grass soil filter.

Inspection: The soil filter can be inspected visually. A good time for inspection is within one day of a substantial rain event.

Maintenance: The procedures for maintenance are as follows:

Inlets

Inlets to each soil filter area should be kept open and in good working condition. This is particularly important around curb breaks and pavement edges. These locations should be marked on the roadway at the completion of construction to allow for winter snow dam removal. All eroded areas should be repaired.

Initial Turf Maintenance (when applicable)

Grassed soil filters should be allowed to develop for one full growing season post-construction prior to their first mowing or replacement of vegetation. This allows for natural re-seeding of grass seed mixes and establishment of a healthy stand of grass or plant materials.

Long-Term Turf Maintenance (when applicable)

It is preferable to only mow grassed soil filters two to three times per year. While grassed soil filters can be mown during routine lawn maintenance, excessive mowing reduces the viability of grasses and grass roots and can over-compact the surface layer of the soil filter media.

Large Debris

Large debris, trash etc. within the ponding area should be removed on a routine basis.

Erosion in the Soil Filter Area

Any eroded areas should be repaired as soon as practicable.

Weeds in the Soil Filter Area

Periodic weeding of the soil filter area may be necessary, particularly in the landscaped soil filters. Hand weeding is required as the use of herbicides is not recommended.

Surface Mulch Layer (when applicable)

Areas devoid of mulch should be re-mulched by hand. Every year, in the spring, a fresh layer of mulch should be added to the soil filter area.

Sedimentation (or Clogging) of Soil Filter Area

If the soil filter area is holding water for a period longer than 48-72 hours, the soil mix has, more than likely, become clogged with sediment and/or the underdrains have clogged. To correct a standing water problem, the following remedial actions are recommended:

1. Evaluate the drainage area to the soil filter area to identify any potential sources of sediment, such as an erosive condition, that may be contributing to the clogging of the device. If a source is identified, it is recommended that that source be eliminated to the fullest extent practicable before proceeding with the remaining recommendations provided below.
2. Flush the underdrains. Use cleanouts to flush the underdrains. Sediment in the drains may be preventing the soil mix from draining. Make sure to provide a way to capture any flushed sediment before it enters the stream environment or storm drain system downstream of the device. If, after flushing the underdrains, the device continues to hold water, the soil mix may be contaminated. As such, following the guidelines provided below is recommended.
3. Gage the extent of soil contamination. To do this, it is recommended that one or more test pits be dug with a shovel and that the soil layer be evaluated for contamination. Once the levels of contamination have been determined (for example, the top 4" of soil appears to be contaminated), it is recommended that you proceed with the remaining remedial actions.
4. Harvest the plants (when applicable). Care should be taken in the removal and temporary storage of the plants so that as many as possible can be harvested for replanting in the soil filter area once the functioning of the device has been restored sufficiently.
5. Remove the mulch layer.
6. Remove the top few inches of contaminated soil plus an additional 2-inch of soil and replace the removed soil with a clean soil mix in accordance with the soil mix specification applicable to the particular soil filter area.
7. Monitor the functioning of the soil filter area during the next two to three rain events. If the device appears to be draining as intended (e.g., there is no standing water 48-72 following a rain event), proceed with the remaining remedial actions. If the area continues to hold standing

water, then the entire soil filter area soil mix and the underdrains may need to be removed and replaced. Reuse of any undamaged underdrains may be possible once they have been cleaned thoroughly.

8. Replant the harvested plants and replace any plants that were rendered unusable during or following their removal from the soil filter area.
9. Replace the removed mulch layer with fresh mulch.
10. Water the plants in the soil filter for the next two or more weeks unless there is sufficient rainfall. This will help the plants to re-establish themselves.

Frequency: The water quality filter should be inspected semi-annually and maintained as needed.

Applicability: The development has one existing filter.

Snow storage within the filters should be prohibited by Maintenance Personnel.

E. LITTER

Litter should be removed as a matter of course by workers and as part of the grounds maintenance contract.

F. SUMMARY CHECKLIST

The above described inspection and maintenance items have been summarized on a checklist attached hereto as Appendix C.

IV. PROGRAM ADMINISTRATION

A. GENERAL

A reliable administrative structure must be established to assure implementation of the maintenance programs described in the foregoing section. Key factors that must be considered in establishing a responsive administrative structure include:

1. Administrative body must be responsible for long-term operation and maintenance of the facilities.

2. Administrative body must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.

3. The administrative body must have a responsible administrator to manage the inspection and maintenance programs.

4. The administrative body must have the staff to accomplish the inspection and maintenance programs or must have authority to contract for the required services.

5. The administrative body must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.

6. A qualified post construction inspector shall be retained by the Owner. His duties shall include preparing schedules for the Owner's maintenance, summarizing the results of this maintenance and preparing an annual report on the operation, maintenance, and repair of the stormwater system which must be copied to the City. (The Owner shall be responsible for retaining a separate entity to perform maintenance which cannot be performed by the management of building and property grounds.) This person shall also participate in troubleshooting of the stormwater management system if a problem develops.

If any of the above criteria cannot be met by the entity assigned inspection and maintenance responsibilities, it is likely that the system will fail to meet its water quality objectives at some point during its life. While each of the above criteria may be met by a variety of formats, it is critical to clearly establish the assigned administrative body in a responsible and sustainable manner.

B. RECORD KEEPING

Records of all inspections and maintenance work accomplished must be kept and maintained to document facility operations. These records should be filed and retained for a minimum 5-year time span. The filing system should be capable of ready retrieval of data for periodic reviews by appropriate regulatory bodies. Where possible, copies of such records should also be filed with the designated primary regulatory agency for their review for compliance with permit conditions. Typical inspection and maintenance record forms are attached hereto as Appendix B.

C. CONTRACT SERVICES

In some instances, or at specific times, the Maintenance Personnel may not have the staff to conduct the required inspection and/or maintenance programs as outlined in this document. In such cases, the work should be accomplished on a contractual basis with a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be formal, well written legal document which clearly defines the services to be provided, the contractual conditions that will apply, and detailed payment schedules. Liability insurance should be required in all contracts.

APPENDIX A

Sample Inspection Logs

90 JOHNSON ROAD
PORTLAND, MAINE

STORMWATER MANAGEMENT
WATER QUALITY STORAGE OR WET POND
ANNUAL INSPECTION & MAINTENANCE LOG

FACILITY:		**YEAR:**	
LOCATION:		**CONTRACTOR:**	
FUNCTION:		**INSPECTOR:**	
DATE OF INSPECTION:			
ITEM IDENTIFICATION	**DESCRIPTION OF CONDITIONS**	**MAINTENANCE ACCOMPLISHED**	**DATE OF MAINTENANCE**
GENERAL COMMENTS:			

SAMPLE

90 JOHNSON ROAD
PORTLAND, MAINE

STORMWATER MANAGEMENT
SEMI-ANNUAL INSPECTION & MAINTENANCE LOG

SEMI-ANNUAL INSPECT 1.2	FACILITY:
DATE:	LOCATION:
INSPECTOR:	FUNCTION:
SURFACE CONDITION:	
OUTLET CONDITION	

DEVICE/STRUCTURE	EST. DEPTH SED.	REMOVED? Y/N	EST. VOL. CY	WHERE DISPOSED OF	STRUCTURAL CONDITION

CONTROL STRUCTURE:
DESCRIBE CONDITIONS FOUND & MAINTENANCE ACCOMPLISHED:

APPENDIX B

Permits for Project

(To be Added at a Subsequent Time)

APPENDIX C

Summary Checklist
Inspection and Maintenance

Stormwater Management System Maintenance Program Summary Checklist						
		Frequency				
Item	**Commentary**	**Monthly**	**Quarterly**	**Semi-Annual**	**Annual**	**Long Term**
Stormwater Inlets	Stormwater inlets allow flow entry from a surface swale to a piped system. Entry may or may not be equipped with a bar rack. Inspect entry for debris accumulation. Remove debris to allow unimpeded entry. Lawn clippings and leaves should be removed from yard areas.		X		X Clearing	
Tributary Drainage System	Inspect to assure that the carrying capacity has not been diminished by debris, sediment or other hydraulic impediments.				X	
Porous Pavement	Pavement areas should be inspected and vacuumed semi-annually and maintained as needed.			X		
Water Quality Filters	Filters should be inspected semi-annually and maintained as needed. **Snow storage within the filter should be prohibited by Maintenance Personnel.**			X		
Litter	Litter should be removed daily.					

TAB 2 – TRANSPORTATION

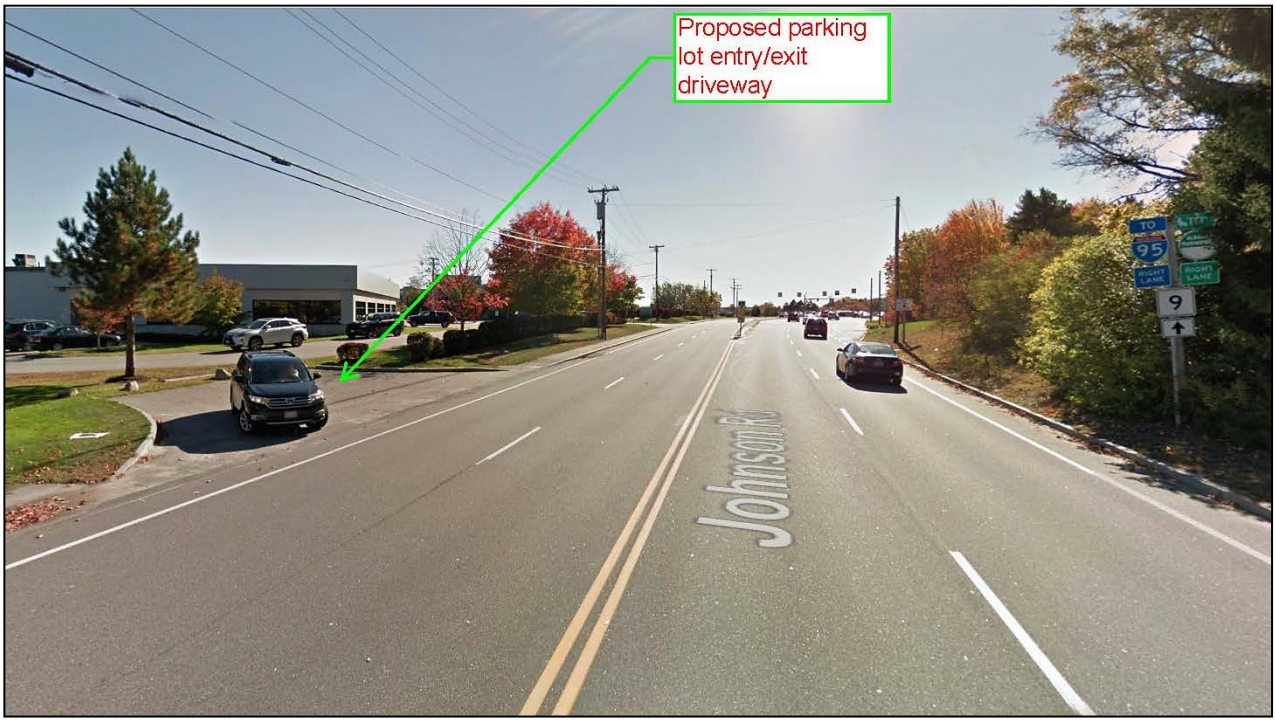
TRAFFIC

The following is a description of existing and proposed access conditions in the site vicinity:

- The intersection of Johnson Road, Skyway Drive and Jetport Boulevard is fully signalized. Site generated traffic from points west (Gorham/Westbrook) likely uses the intersection to access Jetport Boulevard and the private City Line Drive to access the site.

- The intersection of City Line Drive and Jetport Boulevard is Stop Sign controlled on the City Line Drive leg. Exiting traffic may turn left or right. Eastbound traffic on Jetport Boulevard may turn left into City Line Drive from a center lane and there is a by-pass lane for Jetport bound traffic to continue straight thru, thus minimizing delays on the Jetport Boulevard.

- Site generated traffic from South Portland and Scarborough can turn right onto Jetport Boulevard to access City Line Drive or turn right onto City Line Drive off Johnson Road. This traffic may also turn right into the proposed driveway entrance into the parking area to be constructed at the 68 Johnson Road property. This entrance will utilize an existing curb opening on Johnson Road.



Existing Curb Opening on Johnson Road

Traffic to South Portland/Scarborough will be primarily directed to the signalized intersection where there is a stand-alone left turn lane for SB vehicles onto Johnson Road.

As currently configured exiting vehicles from the proposed parking lot may also turn left onto Johnson Road SB as there are two travels lanes in Johnson Road in this area. City line Drive cannot be used to turn left onto Johnson Road as there is an existing median island prohibiting this movement.

Existing Directional Sign on City Line Drive

- Traffic from Congress Street (intown Portland or Westbrook) could turn left into the proposed parking lot entrance off Johnson Road or proceed to the signalized intersection to turn left onto Jetport Boulevard and onto City Line Drive. Traffic from the north (intown Portland) may also simply turn onto International Parkway at the Congress Street intersection and potentially travel to City Line Drive from the Jetport Direction.

- Exiting traffic from the proposed parking lot, intending to go northbound to Congress Street may also use a proposed exit only drive to be located at an existing curb opening at the far north end of the property. This exiting lane will allow right turn only exiting movements.

Existing Curb Opening to Become Right Turn Only Exit

- The METRO Route #5 travels on Jetport Boulevard in the vicinity of the site. There are bus shelters on both sides of the Boulevard (outbound at DHHS and inbound near the Skyway/Johnson/Jetport Boulevard intersection (runway side of the road).

- The proposed building expansion and parking lot will result in an increase of approximately 18,262 SF of space. The following is an estimate of the additional trip generation attributable to the building expansion, assuming that a similar trip generation will apply for that portion of the building that already exists:

Description	Average Rate[1]	Estimated Additional Trips
AM Peak Hour	1.55 /1,000 SFGFA	28 trips
PM Peak Hour	1.49 / 1,000 SFGFA	27 trips

Jetport Boulevard Inbound Bus Shelter (Metro Route 5)

The South Portland Bus service Route 24 goes thru the intersection of Maine Mall Road/Western Ave (near Burlington Coat Factory)

Vicinity Map

[1] Per ITE Trip Generation 7th Edition LUC 710

Section 14-526. Site Plan Standards.

The following statements are provided in accordance with the submission checklist Tab 2 and Section 14-526 of the ordinance.

(a) Transportation Standards

Transportation Analysis – Traffic Impact (14-526 (a) 1)

- *Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts*
- *Traffic Impact Study (Technical Manual, Section 1) if applicable*

1. *Impact on Surrounding Street Systems:*

   The development will fit in with the existing street system as it will continue to use the existing access locations off Johnson Road and City Line Drive. Based on the limited intensity of use, the project is expected to have an insignificant impact on traffic in the neighborhood. Vehicle and loading circulation to the building are accounted for on the plan.

2. *Traffic Impact Study*

   A full traffic impact study has not been completed at this time on the basis that the proposed trip generation and existing robust access conditions do not warrant a study in our opinion. Much of the site is currently developed and in the past has generated traffic into the surrounding street system. The current tenant, Charter Communications, has decreased operations and staffing at the project location, thus in the more recent period, site generated traffic has decreased.

Access and Circulation (14-526 (a) 2 a)

- *Access and internal circulation, addressing ADA access*
- *Access and egress impacts on traffic flows*
- *Description and use of drive-up features, if applicable*

3. *Access and Circulation:*

   a. *Site Access and Circulation.*

      (i) Access to the site is provided by a single two way driveway along Johnson Road and two full driveways along City Line Drive. A single right turn only exit drive will also be provided on Johnson Road. One original site curb cut on Johnson Road will be closed. Based on the primary parking field layout towards the north side of the site, we believe that adequate site access and circulation is provided.

      (ii) Access and egress have been designed to avoid conflict with existing turning movements and traffic flows.

(iii) The site does not feature drive up services as mentioned in this requirement.

(iv) Site access has been designed so as not to impede potential future connection to adjacent streets.

Loading and Servicing (14-526 (a) 2 b)

- *Loading and servicing needs, route and travel way geometrics for deliveries*
- *Turning templates for delivery vehicles, if applicable*

2. *Access and Circulation:*

   b. *Loading and Servicing:*

      (i) Adequate provisions are made at the site for periodic loading from panel trucks to service two overhead doors at the ground level. The site provides clear area in front of the solid waste enclosures for servicing and loading vehicles.

Sidewalks (14-526 (a) 2 c)

- *Sidewalks and condition along street frontages and internal walkways*
- *Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)*

2. *Access and Circulation:*

   c. *Sidewalks:*

      (i) The site benefits from an existing sidewalk system along Johnson Road and the Jetport Boulevard. Based on the lower traffic volumes on City Line Drive, it is not felt that a sidewalk is necessary along this route. The building improvements include a sidewalk along the perimeter of the building space and at the main building entrances.

Public Transit (14-526 (a) 3), if applicable

- *Existing available transit services*
- *Proposed site plan design details, such as easement, pad base, and shelter*

3. *Public Transit Access.*

   a. The proposed project is not residential

   b. Two transit shelters are located less than ¼ mile from the site each.

   c. The two transit shelters are located on the Jetport Boulevard sidewalk.

   d. A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.

Off-Street Parking: Vehicle & Motorcycle/Scooter (14-526 (a) 4 a and c)

- *Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements*
- *Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan*

4. *Parking.*

   a. *Location and Required Number of Vehicle Parking Spaces.*

      (i) Off-street parking is provided on the site to accommodate the proposed uses. Parking supply exceeds that which is required by the code for office use.

      (ii) The Applicant has not prepared a TDM strategy, as it is not applicable until a defined tenant is in place.

      (iii) The Applicant proposes the amount of parking which is appropriate for the anticipated uses of this site.

      (iv) Parking spaces and aisles have been designed to meet the dimensional requirements of the Technical Manual.

      (v) All parking lots will be paved.

   c. *Motorcycles and Scooter Parking.*

      (i) Two spaces are provided for motorcycle/scooter parking.

Bicycle Parking (14-526 (a) 4 b)

- *Address bicycle parking requirements and identify locations on-site*
- *Construction details for bike racks (Technical Manual, Section 1)*

4. *Parking.*

   b. *Location and Required Number of Bicycle Parking Spaces.*

      (i) Bicycle parking for up to ten bikes is identified on the plan. Based on a parking count of 188 spaces at least 24 bicycle spaces are required.
      (ii) The applicant is requesting a waiver to provide only 10 bike spaces when 24 are required.

Snow Storage (14-526 (a) 4 d)

- *Management plan for snow removal and locate snow storage areas on plans*

4. *Parking.*

   d. *Snow Storage.*

      (i) Snow storage management will employ two strategies:

         a. Limited snow storage of the parking areas (this will suffice for small storm events and temporary storage only).
         b. Snow removal and off-site disposal. The applicant owns all the land off City Line Drive and they have ample area to store snow as necessary on the property.

Traffic Demand Management (TDM) (14-526 (a) 5), if applicable

- *Develop TDM with Trip Reduction Targets and Strategies*

5. *Transportation Demand Management (TDM).*

   a. The applicant has not completed a TDM plan as they do not currently have a tenant for the proposed office space. Once a tenant is identified they will work with the tenant to identify and implement possible TDM strategies. The site's proximity to transit is an advantage as is the access to the Turnpike and regional transportation corridors.

ATTACHMENT C

ZONING ASSESSMENT

See attached Zoning Analysis Table and additional information provided in cover letter.

ZONING ANALYSIS Relevant Zone(s) B4-Commercial Corridor Zone

All Projects:

	Required	Proposed
Lot Size	10,000 SF	202,554 SF
Area Per Dwelling Unit	N/A	N/A
Minimum Street Frontage	60'	447.82'
Front Yard Minimum	20'	41'
Front Yard Maximum	N/A	N/A
Rear Yard	20'	278'
Yard Right	12'	77'
Yard Left	12'	273'
Side Street Setback	12'	N/A
Step Back	N/A	N/A
Maximum Lot Coverage	N/A	N/A
Minimum Lot Coverage	N/A	N/A
Maximum Height	65'	57'-5"
Open Space	N/A	N/A
Maximum Impervious Area	80%	45.7%
Pavement Setback	N/A	N/A
Floor Area Ratio	0.65	0.34
Off Street Parking Spaces	99	188
Loading Bays	1	0
Other 1		
Other 2		
Other 3		

Planned Residential Unit Developments (PRUD) Requirements

NOT APPLICABLE

	Required	Proposed
Minimum Lot Size		
Minimum Lot Area per Dwelling		
Maximum # Units per Building		
Maximum Building Length		
Maximum Accessory Building Length		
Minimum Setbacks		
Minimum Building Separation		
Minimum Open Space		

Affordable Housing Density Bonuses (if applicable)

	Bonus Increase or Decrease	Maximum Allowable With Bonus	Proposed
Density			
Height			
Setback Reduction			
Recreation Space			
Maximum Accessory Building Length			
Minimum Setbacks			
Minimum Building Separation			
Minimum Open Space			
Explanatory Text 1 (optional):			
Explanatory Text 2 (optional):			
Explanatory Text 3 (optional):			

ATTACHMENT D

WAIVER REQUESTS

Standard to be Waived: Cite Ordinance or Technical Manual Standard	**Cite Standard Language:** Cite specific language of applicable Ordinance or Technical Manual Standard	**Waiver Being Sought:** Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	**Justification for Waiver:** Address specific waiver criteria, if applicable, and document reasons for the waiver request.
14-526 Site Plan Standards *(a) Transportation Standards* *3. Public Transit Access:*	*d. Waiver: All or some of this standard may be waived if the Reviewing Authority determines one or more of the following:* *(i) That some or all of the required improvements cannot reasonably be made due to site constraints and/or insufficient right of way width; or* *(ii) That the development is not anticipated to generate public transit usage due to particular characteristics or proposed use of the development.*	A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.	Two transit shelters are located less than ¼ mile from the site each and the two transit shelters are located on the Jetport Boulevard sidewalk. A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.
14-526 Site Plan Standards *(a) Transportation Standards* *4. Parking:* *b. Location and Required Number of Bicycle Parking Spaces*	*ii. Waiver: The reviewing authority may reduce the required number of bicycle parking spaces if it is determined, based on evidence submitted by the applicant, that the proposed development is expected to generate reduced demand for bicycle parking due to characteristics or uses such as elderly or disabled persons housing or industrial uses located in outlying areas.*	The applicant is requesting a waiver to provide only 10 bike spaces when 24 are required.	Bicycle parking for up to ten bikes is identified on the plan. Based on a parking count of 188 spaces at least 24 bicycle spaces are required.

14-526 Site Plan Standards *(b) Environmental Quality Standards* *2. Landscaping and Landscape Preservation:* *a. Landscape Preservation*	(iv) Waiver: Where the applicant can demonstrate that preservation of existing vegetation would compromise development of the site, the Reviewing Authority may permit the substitution of replacement landscaping in other areas of the site, and/or a financial contribution to the City of Portland Tree Fund for an amount proportionate to the cost of trees removed, as described below: (a) For each tree required to be preserved that is removed and is greater than 16" in caliper DBH, two (2) replacement trees of a species identified on the City of Portland Recommended Tree List shall be planted on the site as detailed in Section 4 of the Technical Manual). (b) For each tree required to be preserved that is removed and is between ten (10) and sixteen (16) inch DBH, one (1) replacement tree of a species identified on the City of Portland Recommended Tree List shall be planted on the site as detailed in Section 4 of the Technical Manual). (c) Where the planting of replacement trees on the site is not feasible, the applicant shall contribute an amount proportionate to the cost of required replacement trees to the City of Portland Tree Fund, as detailed in Section 4 of the Technical Manual.		Landscaping has been provided for on the site plan. This includes perimeter tree plantings to supplement existing landscaping, primarily along the Johnson Road frontage. Where necessary, the owners will provide grass cover to stabilize non-gravel or non-paved surfaces and add a few street trees for landscaping. Protection measures will be made for existing vegetation during construction.

Stantec Consulting Services Inc.
482 Payne Road, Scarborough Court, Scarborough, ME 04074

July 9, 2018

Mr. Pat Cloutier
Water Resource Protection Director
City of South Portland
PO Box 9422-111 Waterman Drive
South Portland, Maine 04106

Subject: Proposed Building Expansion
90 Johnson Road, Portland, Maine
Request for Ability to Serve Letter

Dear Pat:

Transport Leasing Corp. have retained our office to prepare site plans and assist with permitting for a building expansion on their property (Map 214A, Block A, Lots 001 & 003) in the City of Portland. The existing 24,249 SF building has been leased by Charter Communications (aka Time Warner Cable) for a long period of time, however that lease condition is soon running out. The existing building contains a combination of office and warehouse space. The owner is now seeking to complete renovations and additions to the building that would increase the gross leasable area to around 42,500 SF of Class A office space. This will involve second and third level building addition space as well as new parking lot development. We understand that the existing building is presently serviced by a sanitary line that connects to a line in Johnson Road that ultimately ties into the South Portland municipal system.

On behalf of the developer, we are requesting a letter affirming that the proposed project can continue to be served by the municipal sewer system that we understand is part of the City of South Portland collection system.

The project will consist of interior renovations to the existing building that currently has a total size of approximately 22,019 square feet. Additional office space of approximately 20,492 SF will be added to the building. A tenant has not yet been determined however it is predicted that the employee count will be approximately 125 persons to 150 persons. Assuming 20 gpd/employee[1], the estimated flow is 3,000 gpd. We are not aware of the historic water use and wastewater generation for the site but assume the proposed activity will result in an increase to wastewater generation. A copy of the site plan has been attached to this letter for reference. The PWD records indicate a domestic water service line off Johnson Road currently serving this building. We understand at least one 4" or 6" sanitary sewer service line serves the building. The existing building's utility services will remain and continue in their current use and capacity. Based on a limited increase in daily activity and peak use we trust that the existing sewer system has adequate capacity to continue to serve this project. We have submitted our Site Plan Application to the City of Portland Planning Authority and would appreciate your attention to this request in a timely manner.

If you need any further information regarding this review, please contact our office.

Regards,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Tel: 207-887-3478
Stephen.bushey@stantec.com

Attachments

c: Portland Planning Authority

V:\2108\active\210801617\civil\admin\permitting\local\level 3 site plan\ltr_Cloutier wastewater 20180709.docx

[1] *See Table 4C Design Flows for other Facilities from Maine Subsurface Disposal Rules*

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services,
55 Portland Street,
Portland, Maine 04101-2991

Bradley Roland, P.E.
Water Resources Division

Date: June 26, 2018

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 90 Johnson Road

Chart Block Lot Number: Tax Map 214A/Block A/Lots A001 &A003

Proposed Use: Office Building
Previous Use: Rail Yard
Existing Sanitary Flows: _____GPD
Existing Process Flows: _____GPD
Description and location of City sewer that is to receive the proposed building sewer lateral.

_____

_____

Site Category	
Commercial *(see part 4 below)*	X
Industrial *(complete part 5 below)*	
Governmental	
Residential	
Other *(specify)*	

Clearly, indicate the proposed connections, on the submitted plans.

2. Please, Submit Contact Information.

City Planner's Name: Barbara Barhydt Phone: 207-874-8725
Owner/Developer Name: Transport Leasing Corp. - Mark Sanborn
Owner/Developer Address: PO Box 11054 - Portland, ME 04104
Phone: 207-774-1067 Fax: E-mail: mark@abcorental.com
Engineering Consultant Name: Stephen Bushey, P.E.
Engineering Consultant Address: Stantec, 482 Payne Rd, Scarborough, ME 04074
Phone: 207-887-3478 Fax: 207-883-3376 E-mail: stephen.bushey@stantec.com

Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review.

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: _____ GPD
Peaking Factor/ Peak Times: Not Applicable
Specify the source of design guidelines: *(i.e.__"Handbook of Subsurface Wastewater Disposal in Maine," __ "Plumbers and Pipe Fitters Calculation Manual," X Portland Water District Records, Other (specify)* _____

Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet.

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values: Not Applicable

Size of External Grease Interceptor: _____

Retention Time: _____

Peaking Factor/ Peak Times: _____

Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet.

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: Not Applicable GPD

Do you currently hold Federal or State discharge permits? Yes ____ No ____

Is the process wastewater termed categorical under CFR 40? Yes ____ No ____

OSHA Standard Industrial Code (SIC): *(http://www.osha.gov/oshstats/sicser.html)*

Peaking Factor/Peak Process Times: _____

Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps.

Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided, or attached, as a separate sheet.

Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

September 5, 2018

Ms. Barbara Barhydt/Ms. Shukria Wiar
Planning and Development Department
City of Portland
389 Congress Street
Portland, ME 04101-3509

Subject: 90 Johnson Road
Applicant – Transport Leasing Corp.
Preliminary Traffic Comments from Tom Errico Dated August 24, 2018 and Engineering comments from Lauren Swett dated August 28, 2018
Letter of Response #1

Dear Barbara:

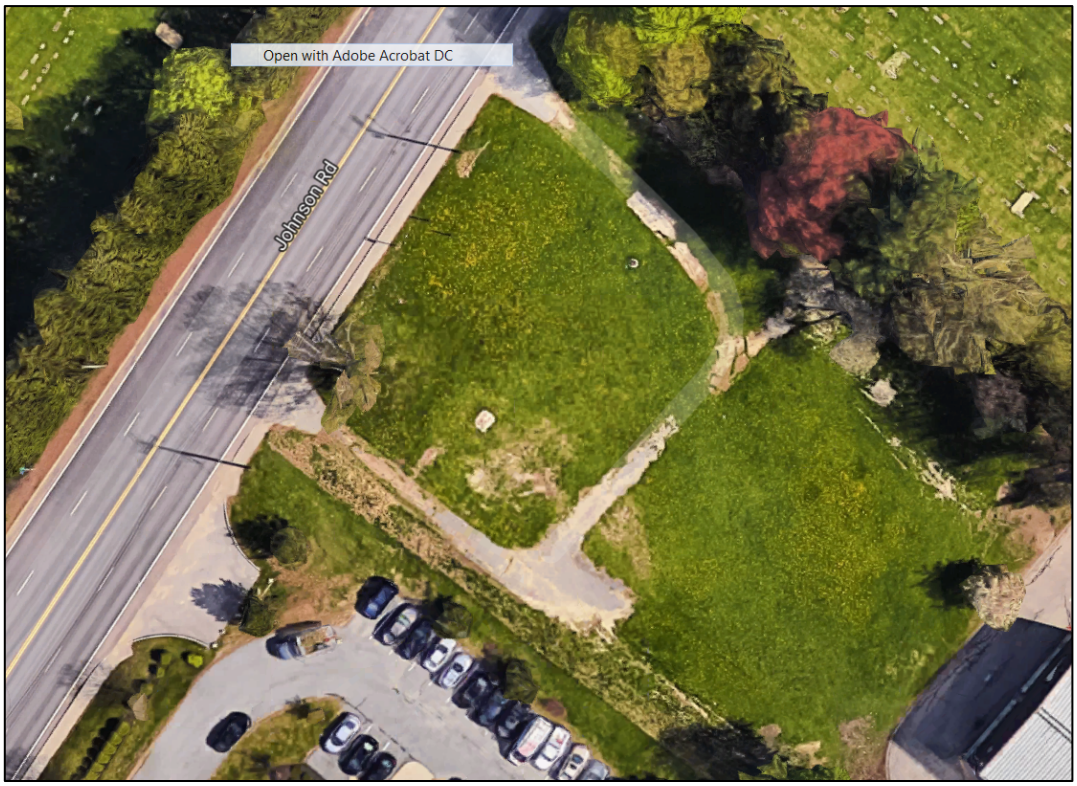
On behalf of Transport Leasing Corp. (Applicant), Stantec has received and reviewed the comments from Tom Errico dated August 24, 2018 and Lauren Swett dated August 28, 2018 associated with the proposed above referenced project. For ease of reference, we have repeated the comments below in *italics* followed by our responses.

PRELIMINARY TRAFFIC COMMENTS FROM TOM ERRICO DATED AUGUST 24, 2018

- *The Applicant will be required to conduct a traffic impact study for the project. The key issue to be evaluated is the creation of a full movement driveway on Johnson Road, which has historically experienced safety problems. I would suggest that we schedule a meeting to identify the specific scope of the study.*

  Response:

  We are amenable to an immediate meeting to discuss the driveways. We note that the proposed driveways are already in existence but are not active, as shown in the image below. We are also interested in understanding the scope of study that is necessary for the proposed development. The owner/applicant is currently seeking approvals for the proposed building expansion, although they do not have a specific user/tenant(s) on board at this time. They will not construct the building expansion until they have sufficient tenant(s) in place to support the development. They will however construct the proposed parking lot as soon as the site plan approval is in place. A short-term use of the parking area is proposed that involves using the lot for supplemental long-term parking at the Jetport. The owner has held discussions with Jetport representatives and there appears to be a need for additional long-term parking capacity. The owner is amenable to discussing the use of the lot and how that might be controlled if necessary until the actual building expansion takes place.



- *The Applicant should provide information in support of the two driveways on Johnson Road. This item would be part of the traffic study.*

  Response:

  The two driveways currently exist, and it is the applicant's goal simply to begin their use. A third existing driveway to the former house at 68 Johnson Road will be eliminated from the site and the curb opening closed and new sidewalk constructed. Given the nature of the proposed parking lot the more easterly opening would function as a full movement driveway allowing both left and right turn entering and exiting movements. We note that the City Line driveway intersection with Johnson Road allows only right turn in and out movements, as there is an existing raised median in City Line Drive, prohibiting left turns in/out at that intersection.

- *I am concerned about the internal intersection near the main Johnson Road driveway. The Study would need to confirm vehicle backups into Johnson Road will not occur.*

  Response:

  If there is a concern about left turns into the proposed easterly driveway from Johnson Road, the applicant is amenable to modifying the driveway to allow only right turns in, thus any approaching traffic on eastbound Johnson Road will be required to proceed to the traffic signal at Jetport Blvd and turn left onto the Blvd and proceed to the City Line drive intersection.

- *The Applicant did provide a trip generation estimate and that projection seems inconsistent with the amount of parking provided. Trip generation methods will be discussed at the suggested scoping meeting.*

  Response:

  The following estimates are derived from the 10th Edition ITE Trip Generation manual and are associated only with the 22,064 SF building addition:

Land Use Category	Trips – Weekday Avg (equation)	Trips – AM Peak Hour Avg (Equation)	Trips – PM Peak Hour Avg (Equation)
710 General Office	215 (245)	26 (47)	25 (27)
715 Single Tenant Office Building	248 (NA)	39 (54)	38 (62)
770 Business Park	274 (950)	9 (NA)	9 (NA)

  We note that the existing building has been occupied for many years and the long-term tenant has been Spectrum (aka Time Warner Cable (TWC)). TWC occupies the building with various uses, including offices, call-center, training and warehouse space. TWC may or may not continue its tenancy in the building. Currently they have a lease period that remains in effect for another 4.5 years.

- *Parking lot aisle widths do not meet City standards and the Applicant shall provide supporting documentation as part of a formal request for a waiver.*

  Response:

  The applicant requests a waiver of the Technical Standards under Section 1.14 Transportation Systems and Street Design requiring drive aisles to be 24' wide. The applicant is requesting the drive aisles be constructed at 22' wide. The parking lots will be low turnover and the frequency of vehicle movements is expected to be low, unlike in a retail or other high turnover location. The placement of longitudinal landscape islands to separate the parking modules also allows for vehicles to extend into the full depth of the parking spaces, thus minimizing the amount of vehicular overhang into the drive aisles and thereby supporting the narrower drive aisle width in our opinion.

- *Although not required by City ordinance, in my professional opinion a sidewalk on City Line Drive to Jetport Boulevard is needed to provide a safe walking connection to the sidewalk on Jetport Boulevard. I have observed pedestrians walking on City Line Drive, particularly during mid-day time periods.*

  Response:

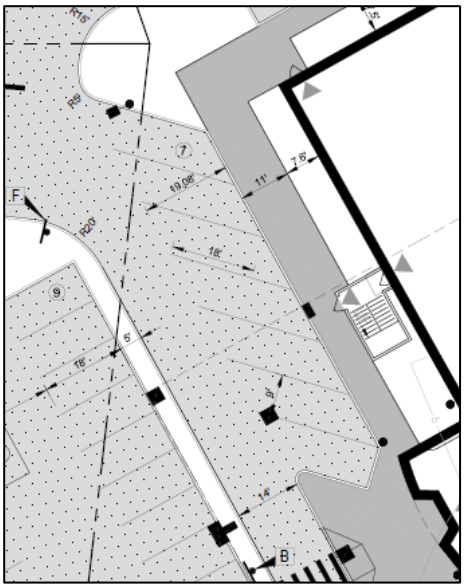
  City Line Drive is an existing private drive that is approximately 40 feet wide or greater for most of its length. There are curbed islands on the south side of the drive and an uncurbed edge of pavement on the north side of the drive. There are existing sidewalk ramps at

the Johnson Road intersection, associated with the Johnson Road sidewalk. The Johnson Road sidewalk extends to the intersection of Jetport Boulevard/Skyway Drive and Johnson Road, where there are pedestrian crossing signals associated with the traffic signal system. These allow sidewalk users to cross to the south side of Jetport Boulevard where a sidewalk runs the length of Jetport Boulevard to the Jetport. There is no sidewalk on the north side of Jetport Boulevard, thus any sidewalk extending to the City Line Drive/Jetport Boulevard intersection would require a midblock cross walk of Jetport Boulevard, which we consider less desirable than the pedestrian signal-controlled crossing at the Johnson Road signalized intersection. In addition, City Line Drive has a large number of curb or driveway openings along its length, thus the opportunity for any traditional raised sidewalk condition is minimized. As noted in the comment, pedestrians do frequently simply walk along the edge of City Line Drive and at a 40' road width, the paved surface seems to have ample area to accommodate the infrequent vehicle movement and pedestrian movements. The traffic volume on City Line Drive is low, thus, like many low volume road systems, pedestrian use along the road edge is considered acceptable and a low safety hazard in our opinion. For these reasons we believe that a sidewalk along this private drive is not necessary.

- *The site plan notes back in angle parking on the north side of the building. Dimensions should be provided for these spaces and confirmation that this is the parking configuration proposed.*

  Response:

  The reverse entry angled parking is dimensioned as shown below. It is the applicant's intent to have vehicles reverse into these parking spaces as this is becoming more common for users to park vehicles in this manner. It is considered a safety measure that helps reduce vehicle conflict for parked vehicles needing to reverse into any oncoming vehicles in the drive aisle, when leaving their parking space.



- *The Applicant should provide information on parking and circulation interaction with the abutting 52 City Line Drive site.*

  Response:

  The abutting site at 52 City Line Drive contains warehouse space and Maine Lobster Now, an online lobster processor and shipping company. The warehouse and Maine Lobster Now are both very low traffic volume producers. Maine Lobster Now has less than 20 employees and their hours of operation are typically 7 a.m. to 8 p.m. Maine Lobster also uses the warehouse area of the building for storage. 52 City Line Drive was previously used by The East Point Christian Church for worship services on Sundays, however that use is no longer active at this location, since they have relocated to Clarks Pond.

STORMWATER COMMENTS FROM LAUREN SWETT, WOODARD & CURRAN DATED AUGUST 28, 2018

- *Portions of the project area are located within the Long Creek Urban Impaired Stream Watershed. The Urban Impaired Stream Standard should be addressed.*

  Response:

  The Owner/Applicant has previously made improvements to the site, the private way (City Line Drive) and the adjacent lot to ensure that stormwater discharge is not tributary to the Long Creek Watershed. The area that previously was within the watershed is now piped to a grassed underdrained soil filter that discharges to the public storm drain system in Johnson Road, which ultimately outfalls into the Stroudwater River and then into the Fore River. All new development will maintain existing drainage patterns and therefore will also be tributary to the Stroudwater River and Fore River and not within the Long Creek watershed.

- *The HydroCAD model for the porous pavement sections includes varied-sized vertical orifices. Provide details of the structures/pipes showing the installation of these orifices. Maintenance of the orifices should be specifically addressed within the Operations and Maintenance Manual.*

  Response:

  Details describing orifice installation have been added to Plan Sheet C-8.2. A section regarding orifice maintenance has been added into the Operations and Maintenance Manual that accompanies this response letter.

- *It is noted that some of the pipes within the porous pavement system have less than 3 feet of cover and may be susceptible to freezing. That said, the entire stormwater system will be impacted by freezing conditions, and snow/ice cover. The Applicant should provide some discussion of where stormwater flow will go in the event that the system is frozen or clogged and ensure that it will not have an impact on adjacent properties and building.*

Response:

The porous section is designed as a granular section and should promote drainage. Therefore, it should not be impacted by freezing conditions. Examples of this type of design functioning properly can be observed throughout the region, with an example as close by as the State of Maine DHS building located off Jetport Boulevard.

- *There is a small amount of snow storage provided adjacent to the porous pavement parking. This space is immediately next to the abutting cemetery property which appears to have trees along it's boundary. The snow storage includes some areas of proposed steep slope. Snow clearing will be important to the functionality of the stormwater system. It is anticipated that snow removal will be required.*

Response:

The owner typically maintains the yard areas in the winter, otherwise an outside entity will be hired to maintain the parking lot, including snow removal. The maintenance of the proposed development will likely be included in the maintenance program that has been taking place at the existing property for many years. In severe cases there may be the need to move snow from the property. Snow storage will not occur on any adjoining property not owned by the applicant.

- *The Applicant shall submit letters to request utility capacity and response letters confirming ability to serve the proposed development and adequacy of the existing sewer service should be submitted to the City upon receipt. It is noted that the project is serviced by sewer from the City of South Portland.*

Response:

The City of South Portland has provided the accompanying letter indicating their capacity to continue to provide sanitary wastewater treatment.

- *A stormwater maintenance agreement with the City of Portland will be required.*

Response:

The accompanying draft Stormwater Maintenance agreement is offered for your review. If acceptable a final document will be executed and recorded.

If you have any questions with the information being submitted, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Phone: (207) 887-3478
Fax: (207) 883-3376
stephen.bushey@stantec.com

c: Mark Sanborn, Transport Leasing Corp.

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Stantec Consulting Services Inc.
482 Payne Road Scarborough Court, Scarborough ME 04074-8929

September 20, 2018

Ms. Barbara Barhydt/Ms. Shukria Wiar
Planning and Development Department
City of Portland
389 Congress Street
Portland, ME 04101-3509

Subject: 90 Johnson Road
Applicant – Transport Leasing Corp.
Supplemental Information
Letter of Response #2

Dear Shukria and Barbara:

On behalf of Transport Leasing Corp. (Applicant), Stantec has prepared the accompanying revised phasing plans reflecting the applicant's objectives. Basically, the proposal is as follows:

- Phase 1 work which the applicant is seeking to commence immediately, involves the construction of 85 parking spaces to be primarily located on the property at 68 Johnson Road. This is a former residential house lot that currently lies vacant. The parking lot will be constructed to provide for overflow parking capacity for the Portland Jetport. We are in the process of obtaining written evidence from Paul Bradbury outlining the Jetport's need for available parking near the Jetport, to accommodate for peak periods and ongoing construction that may temporarily displace long and short-term passenger parking, rental company parking etc. During peak periods it has been necessary in the past to have long-term and PWM employee parking provided at the City-owned property off the end of District Road off outer Congress Street. The accompanying phase 1 plan depicts the construction of 85 parking spaces that will be accessed from Johnson Road from the existing curb opening located just northeast of the City Line Drive/Johnson Road intersection. A right turn exit only driveway will also be provided. This exit only is located within an existing curb opening that served the former residence at the property. The parking lot will not be connected to the existing uses off City Line Drive during this Phase.

  Because the parking lot will be used for only interim Jetport overflow parking we believe that no further traffic analysis is required for this development phase. The lot will be maintained by Transport Leasing and its use will be limited to only use by the Jetport until such time that the Building expansion in Phase 2 occurs. As outlined in the original submission materials, the parking lot will be constructed as a porous pavement surface, like the Dept of Human Services site nearby, and the drainage associated with the lot will ultimately flow into the Johnson Road storm drain system that ultimately discharges to the Stroudwater River, off Congress Street east of the site.

- Phase 2 will consist of the building expansion and renovations to the existing building at 90 Johnson Road. At this time there is no specific tenant associated with this building work, so the timing of this possible expansion is unknown. The applicant is

amenable to preparing a full traffic study and if necessary a Traffic Movement Permit once a tenant user(s) is identified and in advance of the applicant seeking a Building permit. They are aware that this may require reappearing before the Planning Board. We are also aware that the City may revisit access conditions including the drives off Johnson Road as well as site access from City Line Drive at that time. Ultimately it remains the applicant's goal to continue full service use of the existing southerly Johnson Road Drive and allow for right turn exiting movement from the existing northerly drive off Johnson Road. Once a tenant(s) is identified it will be possible to evaluate the overall Johnson Road access conditions then also including the placement of the existing median, the City Line Drive connection/operations, and the Jetport Boulevard signalized intersection.

On behalf of Transport Leasing, we must emphasize the importance of the Phase 1 construction timing. The owner has Shaw Bros. Construction prepared to commence the work immediately, thus it is imperative that at least the Phase 1 approval be granted as expeditiously as possible. We appreciate the City's willingness to assist in that regard.

If you have any questions with the information being submitted, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Phone: (207) 887-3478
Fax: (207) 883-3376
stephen.bushey@stantec.com

c: Mark Sanborn, Transport Leasing Corp.

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Portland International Jetport

You're on your way.

Paul H. Bradbury, P.E.
Airport Director

Zachary R. Sundquist, A.A.E.
Assistant Airport Director

September 20, 2018

Mark Sanborn
TLC Property Management
58 Lowell Junction Road
Andover, MA 01810

Dear Mr. Sanborn:

The Portland International Jetport has seen significant passenger growth this year of 13.6% year to date with record passenger volumes from April through August. August alone was up 25.4% over last year, setting an all-time single month record of 255,330 total arriving/departing passengers.

I mention this passenger growth relative to our recent conversation of your plans to develop a private parking lot near the airport campus along Jetport Boulevard this fall. You noted this lot would not be immediately occupied under your development plans. Our passenger growth has caused some on campus parking capacity constraints that we are now working to address. We will be opening our discount parking lot on District Road full time this fall to increase available parking. Your proposed lot could provide welcome additional parking capacity for the Jetport in the short term. The location is ideal since our discount lot shuttle operation already passes this site on the way to District Road.

I look forward to discussing this opportunity further as your project is developed.

Best regards,

Paul Bradbury
Airport Director
Portland International Jetport

cc: Stephen Bushey, Stantec Consulting