295-G-1 2015-222

134 Warren Ave.

Academy for Active learners

Delta Realty

RANSOM
Consulting, Inc.

Consulting
Engineers
and Scientists

February 19, 2016

Project 151.06127

Ms. Shukria Wiar, Planner
City of Portland, Planning Division
389 Congress Street, 4th Floor
Portland, Maine 04103

RE: Response to Comments
Level II Site Plan Application
Academy for Active Learners
134 Warren Avenue
Portland, Maine

Dear Shukria:

Ransom Consulting, Inc. (Ransom), on behalf of our client, Delta Realty, is providing the responses below to the City staff's comments. For clarity, the comment is bolded and the response provided unbolded.

Comments Submitted by: Shukria Wiar/Planning on 02/12/2016

We recommend that the dumpsters be screened. The fence is a chain linked and this does not qualify for adequate screening.

Comments Submitted by: David Margolis-Pineo/Engineering DPS on 2/9/2016

1. **City Technical Standards require the back of the sidewalk to be place along the street right of way (property line). This allows for a greater esplanade area. Please move the sidewalk to reflect this requirement.**

Response: The sidewalk was placed to align with the existing sidewalk in front of Keeley's. This proposed sidewalk has been revised to be at the property line with an area of adjustment to connect with the adjacent sidewalk. This is shown on C-100

2. **This area of Warren Ave is under a Street Moratorium until October 12, 2016. Savings can be realized if utility and curbing cuts can be avoided until after that date.**

Response: As was stated in the previous response to comments, it is intended that utility and curb cuts will be made after the moratorium has expired.

400 Commercial Street, Suite 404, Portland, Maine 04101, Tel (207) 772-2891, Fax (207) 772-3248
Pease International Tradeport, 112 Corporate Drive, Portsmouth, New Hampshire 03801, Tel (603) 436-1490
12 Kent Way, Suite 100, Byfield, Massachusetts 01922, Tel (978) 465-1822
2127 Hamilton Avenue, Hamilton, New Jersey 08619, Tel (609) 584-0090
60 Valley Street, Building F, Suite 106, Providence, Rhode Island 02909, Tel (401) 433-2160

www.ransomenv.com

3. **For a six inch sewer lateral, the installation of a manhole is not required at the sewer main. Cutting in a wye connection or a "Core-n-tee" is allowed.**

Response: The manhole structure has been removed. However, since the existing sewer has been identified as vitrified clay, a PVC wye connection will be placed in the line rather than attempting a Core-n-Tee. Refer to C-101.

4. **Is the proposed 1" water lateral adequate for fire protection?**

Response: A fire suppression system is not required and therefore the 1" line is for domestic water service only.

5. **Please add Note to Plan C-105 stating that "All construction within the street right of way shall meet City of Portland Technical Manual standards." Please note that some of the plan details do not reflect City standards.**

Response: A note has been added to Sheet C-105.

Comments Submitted by: David Senus/Civil Engineering on 1/8/2016

1) **In accordance with Section 5 of the City of Portland Technical Manual, a Level II development project is required to submit a stormwater management plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules, including conformance with the Basic, General, and Flooding Standards. We offer the following comments:**
   a) **Basic Standards: The Applicant has provided plans, notes, and details that address erosion and sediment control requirements, inspection and maintenance requirements, and good housekeeping practices in general accordance with Appendix A, B, & C of MaineDEP Chapter 500; however, the following additional items should be noted on the plan:**
      i. **The plans should include a location for a stabilized construction entrance, and a detail should be provided.**
      ii. **Outlet protection should be shown/noted for the two 4" foundation drain outlets.**

Response: Sheet C-102 has been revised to show a stabilized construction entrance and the detail has been added to Sheet C-103.

   b) **General Standards: The Applicant proposes to provide water quality treatment for 98% of the proposed new impervious area (12,329 SF) and 84% of the overall developed area through the use of roof drip edge filters and underdrained soil filters. The proposed BMP's provide an acceptable means of treatment for the site under the General Standards.**

Response: No response required.

   c) **Flooding Standard: The Applicant proposes to manage the rate of stormwater discharge from the site through the use of a subsurface R-Tank storage system. The Pre/Post Development stormwater management model indicates that the proposed R-Tank system will manage the post-development discharge rate to a level that is near or below the pre-development condition, meeting the requirements of the Flooding Standard.**

Response: No response required.

2) **The Applicant has shown evidence of requesting confirmation of capacity to serve the water and sewer needs for the proposed development from the Portland Water District and the**

Portland Department of Public Works, respectively, and has noted that confirmation from each will be forwarded upon receipt.
Response: No response required.

3) **The Utility Plan (Sheet C-101) indicates that a new sewer manhole will be installed in Warren Avenue at the 6" sewer service connection. Unless specifically requested by Public Works, City standard would be to connect to the sewer main by means of a wye, tee/wye, Inserta-Tee or similar approved method (Technical Manual 2.6.7).**
Response: The manhole has been removed and a wye connection has been added to Sheet C-101.

4) **The original submittal included a 4" water service for domestic water and fire protection. The new plans only show a 1" domestic water service. Does the building not include a fire suppression system?**
Response: A fire suppression system is not required for this building and therefore only the 1" domestic water is proposed.

5) **The following details should be revised to City Standard Details:**
   a) **Trench Repair (Technical Manual detail II-12)**
   b) **Bituminous Sidewalk (Technical Manual detail I-12)**
Response: Sheet C-103 has been revised to reflect the changes.

6) **Will the R-Tank system include an impervious liner system? Current details on sheet C-104 indicate "impermeable liner if required".**
Response: An impervious liner system is not required, however, a non-woven geotextile will be used to segregate the system stone from adjacent soil materials. The detail on Sheet C-104 has been revised.

7) **The Landscaping Plan (L-101) indicates 7 viburnum trees and 3 flowering maple trees along the edge of the underdrained soil filter. Will these trees be installed on the backslope of the filter system? Are these tree species tolerant of the soil conditions that may be present at these locations (saturated soils and droughty soils with salt exposure)?**
Response: Yes, the trees are to be placed on the backslope of the filter system. The trees selected are tolerant of the saturated soils. The Landscape Plan, L-101 has been revised.

The enclosed application materials, responses and revised plans are being submitted to address the above comments. Should you have any questions or concerns, please feel free to contact me at 207 772-2891.

Sincerely,

RANSOM CONSULTING, INC.

Stephen J. Bradstreet, P.E.
Principal/Senior Project Manager

SJB:mpm

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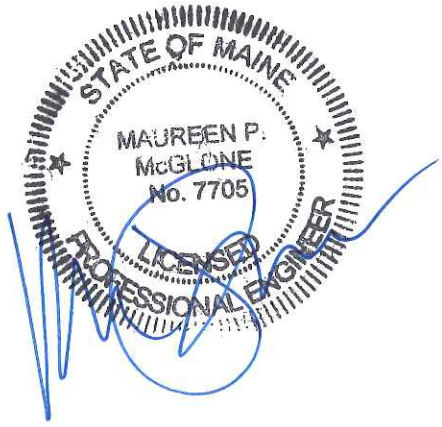
Engineers
and Scientists

Academy for Active Learners
Stormwater Management Report



Date:	December 01, 2015; Revised 1/29/16; Revised 02/19/16
To:	Academy for Active Learners
From:	Maureen P. McGlone, P.E.
Peer Review:	Stephen J. Bradstreet, P.E.
Location:	134 Warren Avenue, Portland, Maine

List of Appendices:

Appendix A: Post Construction Stormwater Compliance Requirements
Appendix B: Stormwater BMP Inspection and Maintenance Requirements
Appendix C: Stormwater Quality Calculations
Appendix D: Pre Development Hydro CAD Calculations
Appendix E: Post Development Hydro CAD Calculations

Existing Conditions:

The site is a 56,622 SF (1.30 acre) lot located on the south side of Warren Avenue, adjacent to Keeley's Catering. The parcel is rectangular in shape and is primarily vegetated (wooded/scrub brush) on the southern 1/2 of the site and gravel parking with some grass on the northern 1/2 of the site adjacent to Warren Avenue. The northern portion is currently being used as overflow parking for Keeley's Catering and is fairly flat but sloping gently in a southerly direction. The more wooded southern portion of the site includes a steep bank sloping to the railroad tracks south of the site. Stormwater runoff from the site flows down the embankment then off-site and onto the rear of the abutting Keeley property (shown on the Pre-Development Plan as Analysis Point A). A portion of the site slopes in an easterly direction. Stormwater runoff from this area of the site flows across the eastern properly line to an abutting property (shown on the Pre-Development Plan as Analysis Point B), but eventually heads south, then back west across the southern portion of this site toward Analysis Point A. This stormwater management report evaluates both Analysis Points A and B.

Proposed Development:

The applicant, Delta Realty, proposes to construct a 1 story daycare building with a playground. The site will have 31 total parking spaces (including accessible parking), a playground, and landscaped areas. The proposed building, pavement and sidewalk areas will increase the impervious area (gravel parking lot) from 16,575 SF to 24,404 SF.

Stormwater Management – Basic Standards:

Erosion and sedimentation control measures are detailed within the design plans. Good housekeeping practices will be in accordance with Maine DEP Best Management Practices. A post construction stormwater management plan is provided in *Appendix A*. Stormwater BMP inspection and maintenance requirements are provided in *Appendix B*.

Stormwater Management – Quality (General Standards):

The existing site is currently a mix of grass and vegetated (wooded/scrub brush) with a gravel parking area (16,575 SF) which is considered impervious surface. The City of Portland has identified 19,416 SF of impervious surface on the site in its evaluation for the stormwater fee; however, it would appear from GIS mapping that a portion of that area is actually on an adjacent property. The site currently drains to the southwest corner of the property which then drains onto the adjacent Keeley property. The site's proposed impervious area is now 24,404 SF, which is a difference of 7,829 SF. There are multiple water quality treatment systems on-site with capacity to treat 35, 588 SF of the site's developed area; 20,201 SF of which is impervious surface.

The site design incorporates a roof dripline filter system along the rear of the building. This system will capture roof runoff and is comprised of a 42-inch thick x 5-foot wide layer of 3/4" crushed stone running along the length of the building. Beneath the stone is a 12-inch thick structural backfill layer for filtration of the roof runoff. A 6-inch perforated underdrain pipe sits in stone above the foundation footer and discharges to an R-Tank system below the parking area that will be used for detention during larger storm events. A Nyloplast structure with beehive grate is connected to the discharge piping and will capture bypass volume from the larger storm events for storage. A grass underdrained soil filter is included on the western edge of the parking area for treatment of a portion of the parking lot runoff. The grass channel includes an 18-inch thick soil filter over a 14-inch thick layer of course sand with a 6-inch perforated underdrain pipe. A Nyloplast structure with beehive grate is connected to the underdrain discharge piping and transports volume from the larger storms to the R-Tank detention system. Lastly, a 3-foot wide x 27-inch thick stone underdrained filter (construction similar to the roof dripline) is being proposed on the south edge of the parking lot to capture and treat runoff from the remainder of the parking area. A Nyloplast structure is included to connect the system to the R-Tanks during larger storm events. Calculations have been included in *Appendix C.*

Stormwater Management – Quantity (Flooding Standards):

The use of the R-Tanks has been included to facilitate on-site detention of the stormwater so that runoff approximates the pre-development conditions. The proposed detention system connects all three treatment systems and is sited beneath the pavement in the rear of the building. Stormwater from the R-Tanks will flow into an outlet control structure that will control the flow with orifices and a weir. The stormwater then discharges to a rip rap slope and down the embankment to follow the current drainage path to the southwest corner of the site. During larger storm events the Nyloplast structures identified above will collect the additional stormwater and direct it into the R-Tank system for detention.

Hydraulic Analysis:

Stormwater runoff calculations for quantity were made using the HydroCAD 10.0 computer program, which is based on the Soil Conservation Service's TR-20 methodology. Runoff hydrographs are generated based on a standard Type III 24 hour storm. Calculations using Hydro CAD for Pre- and Post-Development conditions are included in *Appendix D* and *Appendix E*, respectively.

Six storm events were modeled as follows:

1. 1" storm: The 1" storm event was analyzed to simulate a heavy weather event that would typically happen multiple times over a given year and may impact the CSO frequency and volume.
2. 1.6" storm: The 1.6" storm event was analyzed to simulate a heavy weather event that would typically happen multiple times over a given year. The 1.6" storm is being used to determine stormwater credits as part of the City's Stormwater Impact fee.
3. 2-year frequency flood event: 3.10" rainfall
4. 10-year frequency flood event: 4.60" rainfall
5. 25-year frequency flood event: 5.80" rainfall
6. 100-year frequency flood event: 8.10" rainfall

Runoff Curve numbers were determined based on land coverage and hydro-geological soil type B. Times of concentration were developed based on runoff flow paths for each subarea and shown on the Pre and Post-Development plans. A minimum Tc of 6 minutes was set in the HydroCAD model.

Peak runoff flow rates and runoff volumes are provided at the analysis point, which is identified on the Pre and Post-Development plans.

Storm Event	PRE-Development Peak Runoff RATES cubic feet per second (CFS)	PRE-Development Peak Runoff RATES cubic feet per second (CFS)
	Analysis Point A	Analysis Point B
1" Storm	0.03*	0.00
1.6" Storm	0.26	0.05
2 Year Frequency Storm	1.36	0.25
10 Year Frequency Storm	2.70	0.50
25 Year Frequency Storm	3.84	0.71
100 Year Frequency Storm	6.09	1.12

Storm Event	POST-Development Peak Runoff RATES cubic feet per second (CFS)	POST-Development Peak Runoff RATES cubic feet per second (CFS)
	Analysis Point A	Analysis Point B
1" Storm	0.05*	0.00
1.6" Storm	0.30	0.00
2 Year Frequency Storm	1.30	0.11
10 Year Frequency Storm	2.22	0.30
25 Year Frequency Storm	2.95	0.47
100 Year Frequency Storm	4.60	0.85

Storm Event	PRE-Development Runoff VOLUMES acre feet (AF) volume of water 1' deep over one acre	PRE-Development Runoff VOLUMES acre feet (AF) volume of water 1' deep over one acre
	Analysis Point A	Analysis Point B
1" Storm	0.003	0.00
1.6" Storm	0.018	0.003
2 Year Frequency Storm	0.087	0.013
10 Year Frequency Storm	0.177	0.027
25 Year Frequency Storm	0.256	0.040
100 Year Frequency Storm	0.419	0.065

Storm Event	POST-Development Runoff VOLUMES acre feet (AF) volume of water 1' deep over one acre	POST-Development Runoff VOLUMES acre feet (AF) volume of water 1' deep over one acre
	Analysis Point A	Analysis Point B
1" Storm	0.008	0.00
1.6" Storm	0.027	0.001
2 Year Frequency Storm	0.101	0.007
10 Year Frequency Storm	0.195	0.018
25 Year Frequency Storm	0.278	0.029
100 Year Frequency Storm	0.446	0.052

*It should be noted that while the 1-inch storm was evaluated using HydroCAD, the program does not consider the attenuation during filtration through the water quality treatment systems used. Add

While the model indicates slight increases in the more frequent storms, these increases are statistically insignificant. Overall, the total stormwater runoff from the site has decreased between the pre- and post-development conditions.

APPENDIX A

Post Construction Stormwater Compliance Requirements

Academy for Active Learners
134 Warren Avenue
Portland, Maine

Ransom Consulting, Inc.
Project 151.06127

Academy for Active Learners Post-Construction Stormwater Compliance Requirements

The Applicant shall maintain the BMPs in accordance with the approved plan and shall demonstrate compliance with the plan as follows:

(a) *Inspections.* The owner or operator of a BMP shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

(b) *Maintenance and repair.* If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the department of public services ("DPS") in the annual report.

(c) *Annual report.* The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification to DPS in a form provided by DPS, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance or repair, including the record of the deficiency and corrective action(s) taken.

(d) *Filing fee.* Any persons required to file and annual certification under this section shall include with the annual certification a filing fee established by DPS to pay the administrative and technical costs of review of the annual certification.

(e) *Right of entry.* In order to determine compliance with this article and with the post-construction stormwater management plan, DPS may enter upon property at reasonable hours with the consent of the owner, occupant or agent to inspect the BMPs.

APPENDIX B

Stormwater BMP Inspection and Maintenance Log

Academy for Active Learners
134 Warren Avenue
Portland, Maine

Ransom Consulting, Inc.
Project 151.06127

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Academy for Active Learners
Stormwater Inspection and Maintenance Plan

Inspection and Maintenance Contract:

Long-term inspection and maintenance by a DEP approved stormwater maintenance inspector shall be regularly provided under a five-year binding inspection and maintenance contract that must be renewed prior to contract expiration. A legal agreement shall be established with responsibility for inspection and maintenance and should list specific maintenance responsibilities (including timetables) as well as provide for funding for the long-term inspection and maintenance. Debris and sediment buildup shall be removed from the forebay, basin, stone filter, or paver system as needed.

Inspection schedule:

During the first year of operation, filtration BMPs shall be inspected twice annually and following major storm events. Thereafter, the filter should be inspected every six months to ensure that it is draining within 48 hours following a 1-inch storm. Additionally, a storm that fills the system to overflow should be monitored to confirm in drains in no less than 36 hours and within 60 hours.

Vegetated Soil Filter:

Maintenance criteria for the vegetated soil filter are as follows:

- Debris and sediment buildup shall be removed from the vegetated soil filter system as needed. The removed sediments should be disposed in an appropriate manner.
- Mowing of the grassed basin can occur semi-annually to a height of no less than 6 inches. If mowing is desired only hand-held or push-mowers shall be used (no tractors).
- Any bare areas or erosion rills shall be repaired with new media filter or sandy loam then seeded and mulched. Fertilization of the filter area should be avoided unless abslolutely necessary to establish vegetation.
- Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary. Add new mulch only as necessary.

- Maintaining good grass cover will minimize clogging with fine sediments and if ponding exceeds 48 hours, the top of the filter bed must be tilled to reestablish the soil's filtration capacity.
- Should water pond on the surface of the filter bed for longer than 72 hours, the top several inches of the filter shall be replaced with fresh material. The removed material shall be disposed properly.

R-Tank Stormwater Detention:

Inspection and Maintenance of the R-Tank shall be in accordance with the manufacturer's recommended practices to provide the performance required by the design. The R-Tank system includes inspection ports and maintenance ports, each of which has a cover at the surface. A visual inspection of all ports should be used to determine the depth of sediments deposited in the R-Tank system. The system should be back-flushed once the sediment accumulation has reached the manufacturer's limits. Once removed, sediment-laden water must be disposed of properly.

Roof Dripline Filter:

The roof dripline filter bed is part of the stormwater management plan and requires maintenance similar to the vegetated soil filter basin. Debris and sediment buildup shall be removed from the stone filter bed system as needed and shall be properly disposed. The filter bed must not be paved over or altered in any way.

Parking Lot Stone Filter:

The parking lot stone filter bed is part of the stormwater management plan and requires maintenance similar to the vegetated soil filter basin. Debris and sediment buildup shall be removed from the stone filter bed system as needed and shall be properly disposed. The filter bed must not be paved over or altered in any way.

Academy for Active Learners: Stormwater BMP Inspection Log

The City of Portland, ME requires ongoing annual inspections to ensure the proper maintenance and operation of stormwater management facilities. Inspections must be conducted by third parties qualified by the City.

A. General Information

Use only one Cover Sheet per site with as many specific structural BMP Inspection Report attachments as needed. Attach required color digital photos of site, structures and devices as applicable with captions.

Project Name:	**Academy for Active Learners**	**Inspection Date:**	
Parcel Map, Block and Lot:		**Current Weather:**	
BMP Owner:	**Delta Realty**	**Date / Amount Last Precip:**	
Owner Mailing Address:	**380 Warren Avenue** **Portland, Maine**		
Owner Phone #:		**3PI Mailing Address:**	
Owner Email:		**Inspector Name:**	
		Inspector Phone #:	
		Inspector Email:	

B. Inspection Report Attachments

Please document the number of each structural BMP type found at this site in the blank spaces provided below. Use additional Attachments if / as needed and submit all Attachments together with the Cover Sheet as a single report.

BMP Type	Number BMPs at site
Vegetated Areas	1
Stormdrain Outlets	1
Stormdrain Structures: Overflow Control and Catch Basin	6
Stone Fiters	2
R-Tank Subsurface Detention System	1

Other (describe	

C. Inspection Results

FAIL** ☐

** If any one item on an Inspection Report attachment is coded as "Work Needed" then entire BMP fails inspection.

** If a site has multiple BMPs and one fails inspection, mark as "Fail" until all BMPs pass inspection.

Note: Applicable BMP Inspection Reports and confirmatory color digital photos summarizing required repairs must be submitted to the City following completion of the preliminary inspection. A re-inspection and certification must be completed within 60 days of the failed preliminary report. It is recommended that the inspector be part of the repair / maintenance process to ensure that repairs are performed properly.

PASS ☐

Note: a qualified professional (as determined by the City) must sign below and include all applicable Inspection Report attachments and confirmatory digital color photos with captions.

D. Professional Certification (as qualified by City of Portland Stormwater Program Coordinator)

To be completed only when all BMPs at this site are functioning as designed with no outstanding maintenance issues.

I, _____, as a duly qualified third party inspector attest that a thorough inspection has been completed for ALL applicable BMPs that are associated with this particular site. All inspected structural BMPs are performing as designed and intended and are in compliance with the provisions of the City Portland's Standards

Signature: _____

Date: _____

Form Adapted from the City of South Portland's Annual Structural BMP Inspection Report Cover Sheet

Owner: Delta Realty	**Operator:**
Location & Parcel Id:	**Inspector:**
	Date:

General Information	**Observations**
Inspection duration (hours)	
Days since last precipitation	
Quantity of last precipitation (in)	
Type of inspection	
Storm event	
Current weather	
Photos taken	☐ Yes ☐ No ☐ NA
Nearby natural resources	☐ Yes ☐ No ☐ NA
Copy of ESC plan	☐ Yes ☐ No ☐ NA
MEDEP Permit # (*if applicable*)	
General info notes	

Vegetated Areas	**Observations**
Condition of slopes and embankment is good	☐ Yes ☐ No ☐ NA
No bare areas (< 90% covered) with sparse growth	☐ Yes ☐ No ☐ NA
Armored areas have no rill erosion or the flow diverted to onsite areas can withstand concentrated flows	☐ Yes ☐ No ☐ NA
Vegetated area notes	

Stormdrain outlets	**Observations**
Accumulated sediments and debris at the outlet and within the conduit have been removed.	☐ Yes ☐ No ☐ NA
Erosion damage at the outlet have been repaired	☐ Yes ☐ No ☐ NA
Outlet notes	

Stormdrain Structures (Require inspection TWICE per year)	**Observations**
Accumulated sediments from inflow channels, pipes and sumps between basins have been removed and legally disposed of.	☐ Yes ☐ No ☐ NA
Floating debris and floating oils have been removed.	☐ Yes ☐ No ☐ NA
Debris and Sediment Removed From Outlet Control Structure	☐ Yes ☐ No ☐ NA

Other Comments	**Observations**
Corrective action needed	☐ Yes ☐ No ☐ NA
If corrective action in needed, please explain detail	
Verbal notification provided to responsible party	☐ Yes ☐ No
Verbal notification contact	
Follow up required	☐ Yes ☐ No
Final comment notes	

Photos (*use additional pages as needed*)

Review Notes
Date Reviewed: Reviewed by: Date entered: Date edited: Edited by:

APPENDIX C

Stormwater Quality Calculations

Academy of Active Learners
134 Warren Avenue
Portland, Maine

Ransom Consulting, Inc.
Project 151.06127

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Byfield, Massachusetts 978-465-1822
Providence, Rhode Island 401-433-2160
Portsmouth, New Hampshire 603-436-1490
Portland, Maine 207-772-2891
Hamilton, New Jersey 609-584-0090

PROJECT NO. 151.0612.1 SITE Warren Ave Day Care
SHEET NO. 1 OF
CALCULATED BY MPM DATE 11/30/15
CHECKED BY SJB DATE Rev. 1/25/16 Rev. 2/17/16
SCALE N/A

Objective: Quality and Quantity Requirements

Existing conditions

HSG => BgB or HrB (map 81)

Belgrade: very fine sandy loam 0-8%
or Hollis: fine sandy loam 3-8%

both are moderately well drained
assume site is "B" soils

Lot size: 56,622 sf. ① 49,090 ② 7,532

(impervious) gravel parking: ~~11,800~~ 16,575 sf ① (Refer to page 11)

wooded slope: 6406 sf] 8915 sf ①
wooded dump: 2509 sf]

thick understory: 6403 sf ①

<50% sparse grass: 29,504 sf ① ~~21,981~~ 17197 sf ② 7523

① Tc path:

sheet	A-B	30	S=0.017	
	B-C	104	S=0.005	
	~~A-B~~ C-D	~~178~~ 38'	~~S=0.018~~ S=0.01	~~sheet~~ shallow
	~~D-E~~ B-C	33	S=0.17	shallow
	~~E-F~~ C-D	17	S=0.26	shallow
	~~F-G~~ D-E	181	S=0.02	shallow

Refer to Page 12

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Providence, Rhode Island 401-433-2160
Portsmouth, New Hampshire 603-436-1490
Portland, Maine 207-772-2891
Hamilton, New Jersey 609-584-0090

PROJECT NO. 15.06127 SITE Warren Ave
SHEET NO. 1A OF Daycare
CALCULATED BY MPM DATE 1/25/16
CHECKED BY SJB DATE
SCALE N/A

② Tc Path: A-B 25' S=0.10 Sheet
B-C 40' S=0.0375 Sheet

Post - Development Revisions (from page 3)

Subcatchment #4 Total: 14129 sf
imp. = 275
non imp. = 13854

Subcatchment #5 Total: 7523 sf
imp. = 0
non imp = 7523 sf

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Providence, Rhode Island 401-433-2160
Portsmouth, New Hampshire 603-436-1490
Portland, Maine 207-772-2891
Hamilton, New Jersey 609-584-0090

PROJECT NO. 151.0612.1 SITE Warren Ave
SHEET NO. 2 OF Daycare
CALCULATED BY MPM DATE 11/30
CHECKED BY JCB DATE Rev. 1/26/16
SCALE N/A

Storm Events: Type III 24hr. 2-yr => 3.10"

10-yr => 4.6"

25-yr => 5.8"

(B) 100-yr => 8.1"

Rev. 1/25/16
Rev. 2/17/16
See Sheet 2A

	Pre A	Post		
1" storm	0.01 ✓	~~0.01~~ 0.02	0.00	0.00
1.6" storm	~~0.17~~ 0.14	~~0.17~~ 0.15	0.05	0.00
2-yr storm	~~1.0~~ 0.87	~~1.02~~ 0.95	0.25	0.11
10 yr storm	~~2.08~~ 1.80	~~2.02~~ 1.54	0.50	0.30
25 yr storm	~~3.01~~ 2.61	~~2.60~~ 2.47	0.71	0.47
100 yr storm	~~4.85~~ 4.21	~~3.98~~ 3.64	1.12	0.85

Developed Area = 42550 sf

Undeveloped Area = 56,622 - 42550 = 14,072 sf

Draining to Street (driveway) imp. = 415 sf

Subcatchment 1: Total = 8450 sf
imp. = 8013
non imp = 437 sf

Subcatchment 2: Total = 11,395 sf
imp = 6,287 sf
non imp = 5,108 sf

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Hamilton, New Jersey 609-584-0090

PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. ~~13~~ 24 OF
CALCULATED BY MPM DATE 2/17/16
CHECKED BY DATE
SCALE NTS

Storm Events

	Existing	12x20 R-Tanks	5x5 Stormtech
1"	0.03 cfs	0.05	0.07
1.6"	0.26 cfs	0.30	0.31
2-yr	1.36 cfs	1.30	1.26
10-yr	2.70 cfs	2.22	2.19
25-yr	3.84 cfs	2.95	2.93
100 yr	6.09 cfs	4.60	4.49

System size

Using same stone invert

47'x51' area — R-Tank is 1.5 units high

57'x51' area — Stormtech is 740 (30" high)

] Both work w/ Parking Buildup

Rtank uses 61 cy stone

Stormtech uses 81.5 cy stone

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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 3 OF Daycare
CALCULATED BY MPM DATE 11/30/15
CHECKED BY JGB DATE ~~Rev. 1/26/16~~
SCALE N/A

Rev. 2/17/16

Subcatchment 3: Total = 14710 sf
imp. = 9414
non imp. = 5296

Subcatchment 4: ~~Total = 21,652 sf~~
~~imp. = 275~~
~~non imp. = 21,377 sf~~

Revised see sheet 1A

Total impervious: 24,404 sf

Total (developed) non-imp. = 42,550 sf - 24,404 sf
= 18,146 sf

Existing imp. = ~~11800~~ 16575 sf ∴ new imp. = 24,404 - ~~11,800~~ 16575
= ~~12604~~ 7829 sf

Impervious left untreated = 275 sf

% ~~new~~ impervious treated: ~~12,604~~ 7829 - 275 = ~~12329/12604~~ 7554/7829
= ~~98%~~ 96% > 95% okay

Impervious area treated by ~~Roof~~ drip edge
= 7908 sf > new imperv.
∴ 100% new imp. treated

Untreated landscaped: 2012 sf
" paved : 275 sf
Total untreated: 2287 sf

Revised on 2/17/16

% Treated Developed Area: 42,550 - 2287 =
40263/42550 = 95% > 80

allowed 8510 sf untreated

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PROJECT NO. 151.0621 SITE Warren Ave
SHEET NO. 4 OF Daycare
CALCULATED BY MPM DATE 11/30/15
CHECKED BY SJB DATE Rev. 1/26/16
SCALE N/A

INPUT FOR HYDROCAD:

SUBCATCH 1: (8450sf) Impervious/Roof 8013sf

Remaining is drip edg 437sf
(assume CN=30)

Subcatch 2: (11,395 sf) Impervious/parking = 6287
CN=98

drip strip = 420 sf
(CN=30)

developed (grass) >75% = 1650sf

Remaining/wooded = 3038sf

Subcatch 3: (14,710 sf) impervious/parking = 9414

Grass >75% = 4835sf

Remaining/wooded = 461 sf

Revised 1/25/16
See sheet 5A

Subcatch 4: (21,652 sf) Grass : 7692

Playground : 11065 sf

Woods 2620sf

Impervious 275

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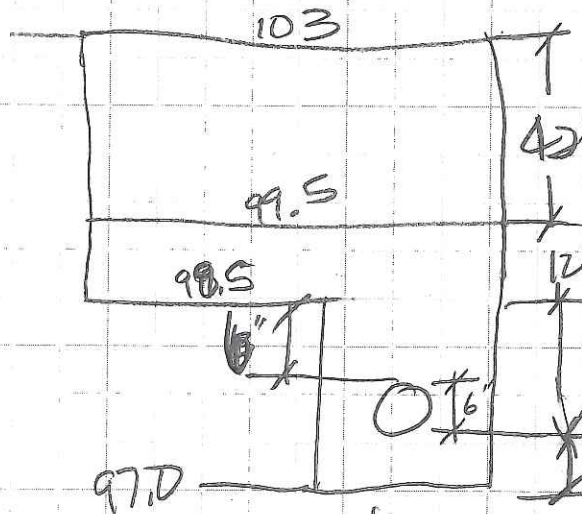
PROJECT NO. 151.0612-1 SITE Warren Ave
SHEET NO. 5 OF Day care
CALCULATED BY MPM DATE 11/30
CHECKED BY SJB DATE Rev. 1/26/16
SCALE N/A

Revised 1/25/16
See Sheet 5A

Subcatch #4 Tc path (all others direct @6min)

A-B	120'	S=0.002	sheet / grass
B-C	125'	S=0.004	shallow / wood chips
C-D	47'	S=0.07	shallow / grass
D-E	23'	S=0.20	shallow / woods
E-F	177'	S=0.02	shallow / woods

Pond / Reach 12": 6" HDPE solid l= 25'
Nyloplast ⇒ R Tanks



Roof Line Drip edge

Inv. @ R Tanks
=96.0
∴ S= 0.06 ft/ft
~~0.05~~ 50

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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 5A OF Daycare
CALCULATED BY HPM DATE 1/25/16
CHECKED BY DJS DATE Rev. 1/26/16
SCALE N/A

Subcatch 4: (14129)
Grass 6046 sf >75% grass
Playground: 5262 sf CN=69 wood chips
Woods 2547 sf
Impervious: 275 sf unconnected pave

Tc PATH (all others direct = 6min)

A-B:	110'	S=0.002	sheet/grass
B-C:	49'	S=5.01	shallow/wood chips
C-D:	29'	S=0.10	shallow/grass
D-E:	10'	S=0.40	shallow/woods
E-F:	199'	S=0.015	shallow/woods

Subcatch 5: (7523)
Grass: 1647 sf
Playgroud: 5803 sf CN=69 wood
Woods: 73 sf CN=

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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 6 OF Rag cave
CALCULATED BY MPM DATE 11/30/15
CHECKED BY SJB DATE Rev. 1/26/16
SCALE N/A

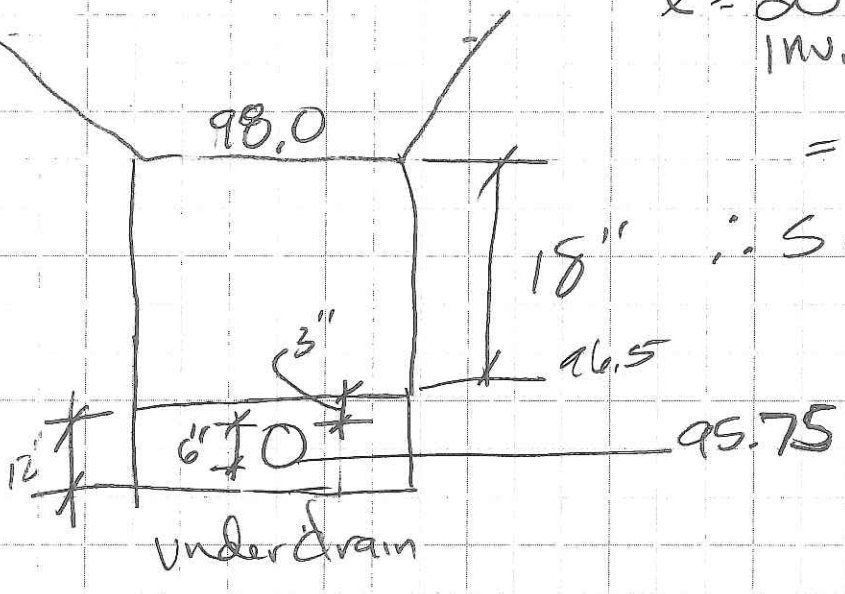
Pond/Reach 2R: Underdrain pipe to Nyloplast w/ 6" solid to R tanks

Nyloplast

$\ell = 20'$

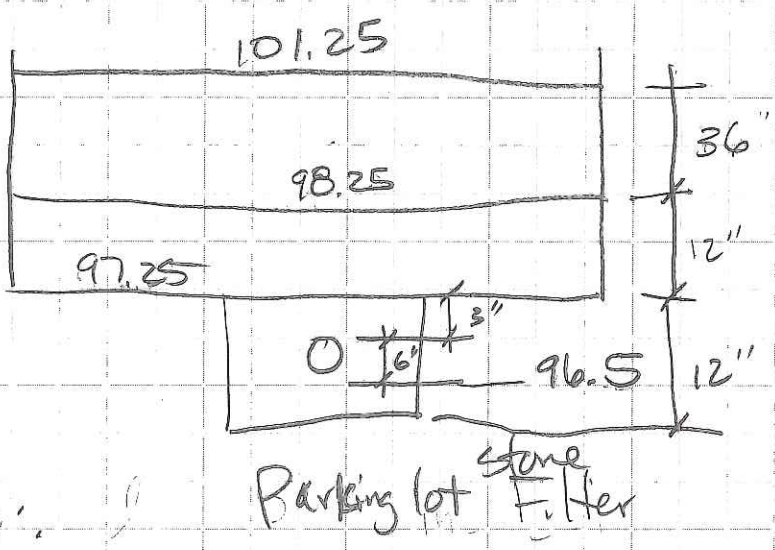
Inv. in @ R tanks = 95.25

$\therefore S = 0.025$



Pond/Reach 3R:

Nyloplast



6" HDPE solid.

$\ell = 10'$ Inv. in @ R tanks = 96.0 $\therefore S = 0.05$

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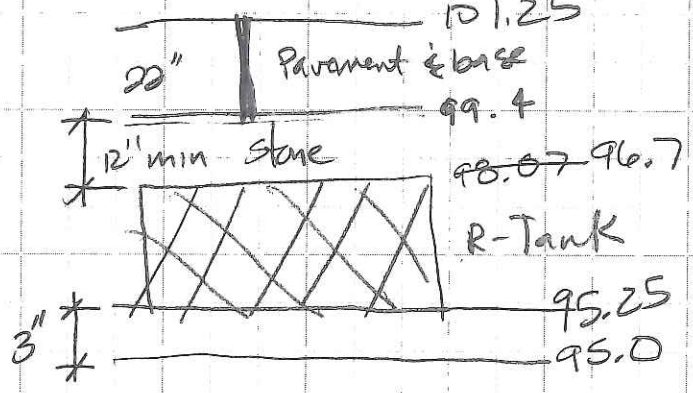
PROJECT NO. 151.0612.1 SITE Warren Ave
SHEET NO. 7 OF Daycare
CALCULATED BY MPM DATE 12/1/15
CHECKED BY SJS DATE Rev. 1/26/16
SCALE N/A

R Tank System:

Lowest point in parking lot = 101.25
Lowest invert in = 95.25 (from #2)

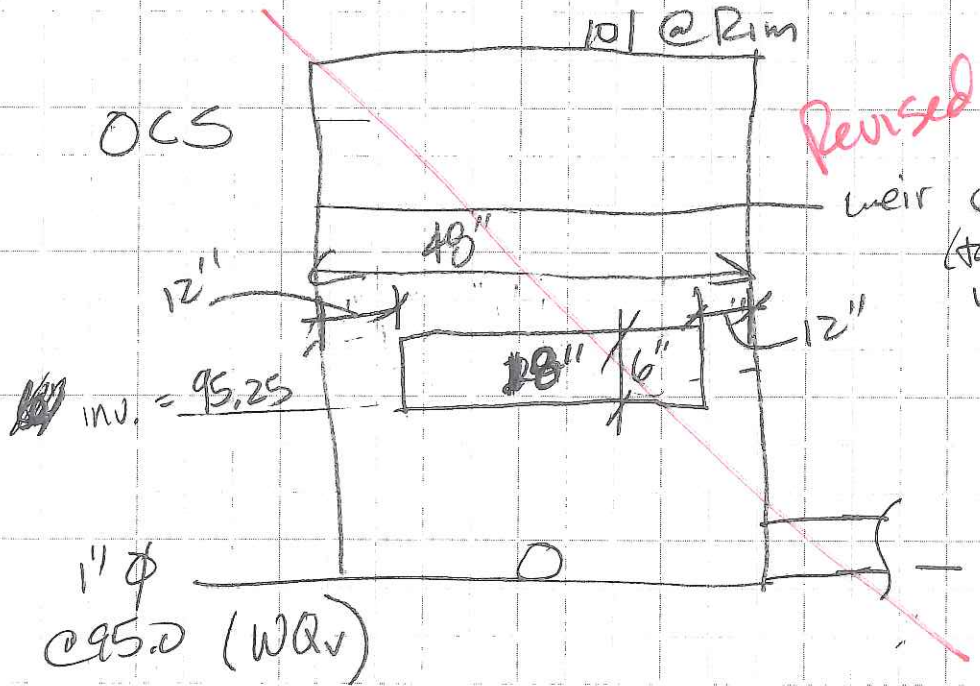
using ~~double~~ single tanks



W = 15.75"
L = 28.15"
h = ~~33.86~~ (2.82')
= 17.32 (1.44')

outlet to OCS: 95.25 out
95.0 in @ OCS

L = 25'



Revised see sheet 7A

(top of R Tank = 96.7 w/ 12" stone above)

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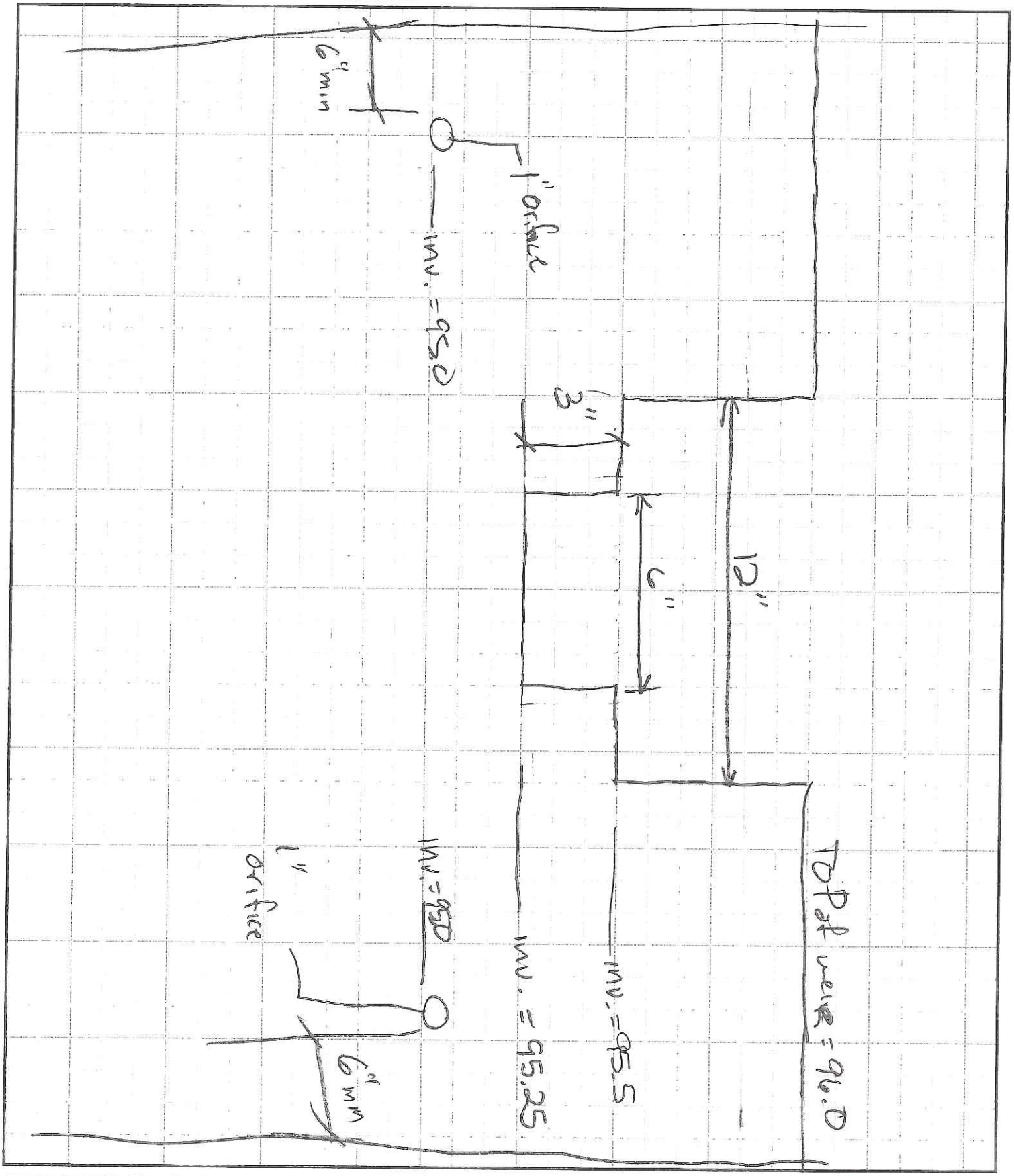
PROJECT NO. 151.0427 SITE Warren Ave
SHEET NO. 7A OF Daycare
CALCULATED BY MPM DATE 11/27/16
CHECKED BY SJB DATE
SCALE NTS



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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 8 OF Daycare
CALCULATED BY MPM DATE 12/1/15
CHECKED BY SJB DATE Rev. 1/26/16
SCALE

TREATMENT CALCS:

→ ROOF DRIPLINE FILTER (Subcatch #1)

Treatment Volume = 7085sf x 1/12 = 659cf

Assuming 40% voids - Required storage volume =

659cf / 0.4 = 1647.5cf

Surface area of treatment = 550sf

1647.5 / 550 = 2.99' = 36" ⇒ using a 42" deep stone bed is okay

∴ a 6" depression around beehive for larger storms is available

→ Stone drip for parking lot: (Subcatch #2)

Contributing area (all impervious) = 6287sf

6287 x 1/12 = 524cf assuming 40% voids

524/0.4 = 1310cf

Surface area of treatment = 585sf

Reqd depth = 1310/585 = 2.24ft.

= 27" ∴ 36" is okay ; a beehive depression works

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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 9 OF Daycare
CALCULATED BY MPM DATE 12/1/15
CHECKED BY SJB DATE Rev. 1/26/16
SCALE N/A

→ Grass Underdrain filter: Treatment Area

1" over impervious + 0.4" over landscaped

Impervious = 9414 sf × 1/12 = 784.5 cf

Landscaped = 3500 sf × .4/12 = 116.5 cf

901 cf

Minimum filter bed area = 5% imp + 2% land

9414 sf (0.05) = 470.7

+ 3500 sf (0.02) = 70

471 +/- sf

Surface area of treatment @ 6" deep =

(polyline) 1151 sf × 0.5'

= 575.5 cf < 901 cf

∴ swale does not treat entire area

Amount of impervious treated in subcatch #1 & 2 =

7908 sf + 6287 sf = 14195 sf > 12,604 sf (amount of new imp.) 100% treatment

then this only effects the amount of developed area treatment.

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PROJECT NO. 151.0613 SITE Leaven Ave
SHEET NO. 10 OF Daycare
CALCULATED BY MPM DATE 12/1/15
CHECKED BY SJS DATE Rev. 1/26/16
SCALE N/A Rev. 2/17/16

Calculate area treated by grassed swale

Assume % is applicable ∴ 575cf / 901cf

= 63.8%

Impervious area = 9414 (0.638) = 6006sf x 1'/12 = 500.5cf

Landscaped: 3500 (0.638) = 2233sf x 0.9'/12 = 74.4cf

575 +/-

≤ 575.5

okay

Amount untreated:

Impervious: 9414 - 6006 = 3408 sf
Landscaped: 3500 - 2233 = 1267sf

4675sf
+ 2287 (prev. untreated)
6962

Recalculate
Treated developed % =

42,550 sf - 6962sf

= 35588 / 42500 = 84% > 80%

∴ okay

total impervious
Area treated
7900 + 6307 + 6006 = 20,201

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PROJECT NO. 15106127 SITE Warren Ave
SHEET NO. 11 OF
CALCULATED BY MPM DATE 2/17/16
CHECKED BY DATE
SCALE NTS

Objective: Re-evaluate existing condition

- after review of City storm water fee program, City evaluated the lot to have 19,416sf of impervious surface. However, the City's basis was a GIS photo which appears to have the PL in the Keeley's parking lot. ∴ at least 2450 sf is not on this property ⇒ 19416 - 2500sf = 16916sf is more likely. Using the GIS photo, the existing landmarks, and the existing survey the limits of gravel were revised. ACAD polyline overlay resulting area = 16575sf ∴ this is very reasonable

All of the increased impervious surface is w/in the existing subcatchment ①

Revisions to page 1 calcs for existing condition inputs to HydroCAD

Property Owner Information:

11A

Name and Mailing Address	Property Location	Land Use	No. of Units
DELTA REATLY LLC 380 WARREN AVE PORTLAND ME 04103	134 WARREN AVE	PARKING LOTS	1

Impervious Area Information:

Building Impervious Area (Square Feet):	0
Surface Impervious Area (Square Feet):	19416
Total Impervious Area (Square Feet):	19416
Total Property Billing Units:	16
Total Property Monthly Stormwater Service Charge $6.00 per month:	$ 96

Note: Condominium owners must divide the total property billing units by the number of condominium units to calculate their monthly billing units. When calculating the total monthly billing units of a parcel of land condominium owners will have their monthly bill EQUALLY divided among all the condominium owners of a parcel of land. At the written request of all the condominium owners of a parcel of land, the division of total monthly billing units may be adjusted.

Click Here to try and search again.


11B
WARREN AVE
295 G001
295 G003
295 H001
295
City of Portland GIS
11B

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PROJECT NO. 151.06127 SITE Warren Ave
SHEET NO. 12 OF
CALCULATED BY DATE 2/17/16
CHECKED BY DATE
SCALE NTS

Subcatch #1: 49,090sf total
(unchanged size)

impervious gravel parking: 16575

wooded: 8915sf (same)

thick understory: 6403sf (same)

<50% sparse grass: 17197sf

t_c path A-B short grass, sheet flow
30' S=0.017

B-C across gravel shallow
104' S=0.005

C-D short grass sheet flow
38' S=0.018

D-E (same as B-C prev.)
33'; S=0.17 shallow

E-F (same as prev. C-D)
17'; S=0.26 shallow

F-G (same as prev. D-E)
161'; S=0.02 shallow

APPENDIX D

Pre-Development Stormwater Calculations

Academy for Active Learners
134 Warren Avenue
Portland, Maine

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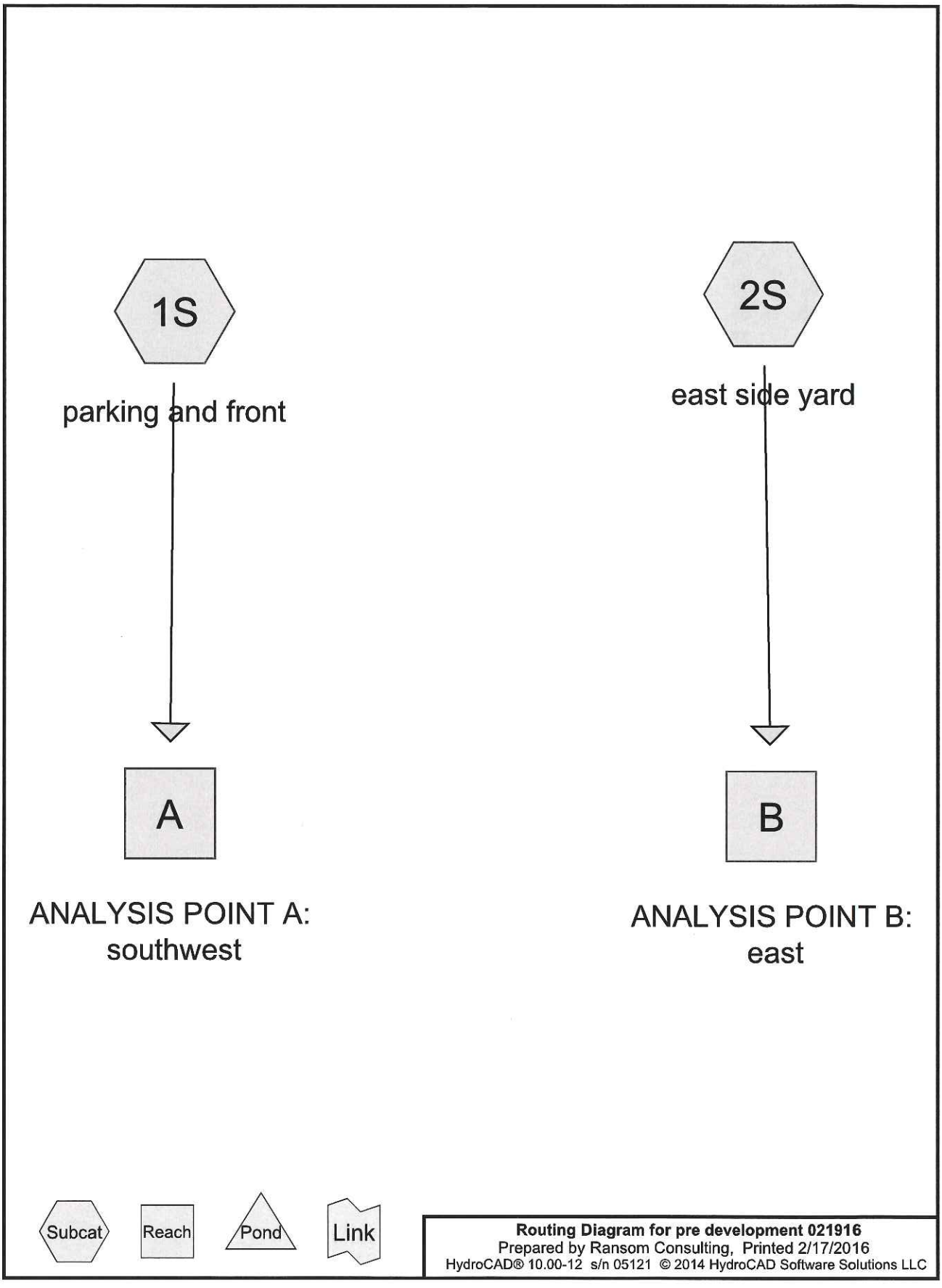
Project 151.06127


1S
parking and front
2S
east side yard
A
B
ANALYSIS POINT A:
southwest
ANALYSIS POINT B:
east
Subcat
Reach
Pond
Link
Routing Diagram for pre development 021916
Prepared by Ransom Consulting, Printed 2/17/2016
HydroCAD® 10.00-12 s/n 05121 © 2014 HydroCAD Software Solutions LLC

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.919	HSG B	1S, 2S
0.000	HSG C	
0.000	HSG D	
0.381	Other	1S
1.300		**TOTAL AREA**

Time span=3.00-15.00 hrs, dt=0.01 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: parking and front Runoff Area=49,090 sf 33.76% Impervious Runoff Depth>0.03"
Flow Length=403' Tc=11.6 min CN=79 Runoff=0.03 cfs 0.003 af

Subcatchment2S: east side yard Runoff Area=7,523 sf 0.00% Impervious Runoff Depth>0.03"
Tc=6.0 min CN=79 Runoff=0.00 cfs 0.000 af

Reach A: ANALYSISPOINT A: southwest Inflow=0.03 cfs 0.003 af
Outflow=0.03 cfs 0.003 af

Reach B: ANALYSISPOINT B: east Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 1.300 ac Runoff Volume = 0.004 af Average Runoff Depth = 0.03"
70.72% Pervious = 0.919 ac 29.28% Impervious = 0.381 ac

Summary for Reach A: ANALYSIS POINT A: southwest

Inflow Area = 1.127 ac, 33.76% Impervious, Inflow Depth > 0.03" for 1-inch event
Inflow = 0.03 cfs @ 12.44 hrs, Volume= 0.003 af
Outflow = 0.03 cfs @ 12.44 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: ANALYSIS POINT B: east

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 0.03" for 1-inch event
Inflow = 0.00 cfs @ 12.35 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 12.35 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Subcatchment 1S: parking and front

Runoff = 0.26 cfs @ 12.19 hrs, Volume= 0.018 af, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 1.6-inch Rainfall=1.60"

	Area (sf)	CN	Description
*	16,575	98	Gravel parking lot
	17,197	79	<50% Grass cover, Poor, HSG B
	6,403	56	Brush, Fair, HSG B
	8,915	60	Woods, Fair, HSG B
	49,090	79	Weighted Average
	32,515		66.24% Pervious Area
	16,575		33.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	30	0.0170	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
2.2	104	0.0050	0.77		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.00"
0.7	38	0.0180	0.94		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.2	33	0.1700	2.89		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.2600	2.55		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
4.3	181	0.0200	0.71		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
11.6	403	Total			

Summary for Subcatchment 2S: east side yard

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.003 af, Depth> 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 1.6-inch Rainfall=1.60"

Area (sf)	CN	Description
7,523	79	<50% Grass cover, Poor, HSG B
7,523		100.00% Pervious Area

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

Time span=3.00-15.00 hrs, dt=0.01 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: parking and front Runoff Area=49,090 sf 33.76% Impervious Runoff Depth>0.92"
Flow Length=403' Tc=11.6 min CN=79 Runoff=1.36 cfs 0.087 af

Subcatchment2S: east side yard Runoff Area=7,523 sf 0.00% Impervious Runoff Depth>0.93"
Tc=6.0 min CN=79 Runoff=0.25 cfs 0.013 af

Reach A: ANALYSISPOINT A: southwest Inflow=1.36 cfs 0.087 af
Outflow=1.36 cfs 0.087 af

Reach B: ANALYSISPOINT B: east Inflow=0.25 cfs 0.013 af
Outflow=0.25 cfs 0.013 af

Total Runoff Area = 1.300 ac Runoff Volume = 0.100 af Average Runoff Depth = 0.92"
70.72% Pervious = 0.919 ac 29.28% Impervious = 0.381 ac

Summary for Reach A: ANALYSIS POINT A: southwest

Inflow Area = 1.127 ac, 33.76% Impervious, Inflow Depth > 0.92" for 2-Year event
Inflow = 1.36 cfs @ 12.17 hrs, Volume= 0.087 af
Outflow = 1.36 cfs @ 12.17 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: ANALYSIS POINT B: east

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 0.93" for 2-Year event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.25 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Subcatchment 1S: parking and front

Runoff = 2.70 cfs @ 12.16 hrs, Volume= 0.177 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
*	16,575	98	Gravel parking lot
	17,197	79	<50% Grass cover, Poor, HSG B
	6,403	56	Brush, Fair, HSG B
	8,915	60	Woods, Fair, HSG B
	49,090	79	Weighted Average
	32,515		66.24% Pervious Area
	16,575		33.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	30	0.0170	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
2.2	104	0.0050	0.77		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.00"
0.7	38	0.0180	0.94		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.2	33	0.1700	2.89		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.2600	2.55		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
4.3	181	0.0200	0.71		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
11.6	403	Total			

Summary for Subcatchment 2S: east side yard

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

Area (sf)	CN	Description
7,523	79	<50% Grass cover, Poor, HSG B
7,523		100.00% Pervious Area

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

Time span=3.00-15.00 hrs, dt=0.01 hrs, 1201 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: parking and front Runoff Area=49,090 sf 33.76% Impervious Runoff Depth>2.73"
Flow Length=403' Tc=11.6 min CN=79 Runoff=3.84 cfs 0.256 af

Subcatchment2S: east side yard Runoff Area=7,523 sf 0.00% Impervious Runoff Depth>2.75"
Tc=6.0 min CN=79 Runoff=0.71 cfs 0.040 af

Reach A: ANALYSISPOINT A: southwest Inflow=3.84 cfs 0.256 af
Outflow=3.84 cfs 0.256 af

Reach B: ANALYSISPOINT B: east Inflow=0.71 cfs 0.040 af
Outflow=0.71 cfs 0.040 af

Total Runoff Area = 1.300 ac Runoff Volume = 0.296 af Average Runoff Depth = 2.73"
70.72% Pervious = 0.919 ac 29.28% Impervious = 0.381 ac

Summary for Reach A: ANALYSIS POINT A: southwest

Inflow Area = 1.127 ac, 33.76% Impervious, Inflow Depth > 2.73" for 25-Year event
Inflow = 3.84 cfs @ 12.16 hrs, Volume= 0.256 af
Outflow = 3.84 cfs @ 12.16 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: ANALYSIS POINT B: east

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 2.75" for 25-Year event
Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 0.71 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs / 2

Summary for Subcatchment 1S: parking and front

Runoff = 6.09 cfs @ 12.16 hrs, Volume= 0.419 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.10"

	Area (sf)	CN	Description
*	16,575	98	Gravel parking lot
	17,197	79	<50% Grass cover, Poor, HSG B
	6,403	56	Brush, Fair, HSG B
	8,915	60	Woods, Fair, HSG B
	49,090	79	Weighted Average
	32,515		66.24% Pervious Area
	16,575		33.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	30	0.0170	0.12		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
2.2	104	0.0050	0.77		**Sheet Flow, B-C** Smooth surfaces n= 0.011 P2= 3.00"
0.7	38	0.0180	0.94		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.2	33	0.1700	2.89		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.1	17	0.2600	2.55		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
4.3	181	0.0200	0.71		**Shallow Concentrated Flow, F-G** Woodland Kv= 5.0 fps
11.6	403	Total			

Summary for Subcatchment 2S: east side yard

Runoff = 1.12 cfs @ 12.09 hrs, Volume= 0.065 af, Depth> 4.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-15.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.10"

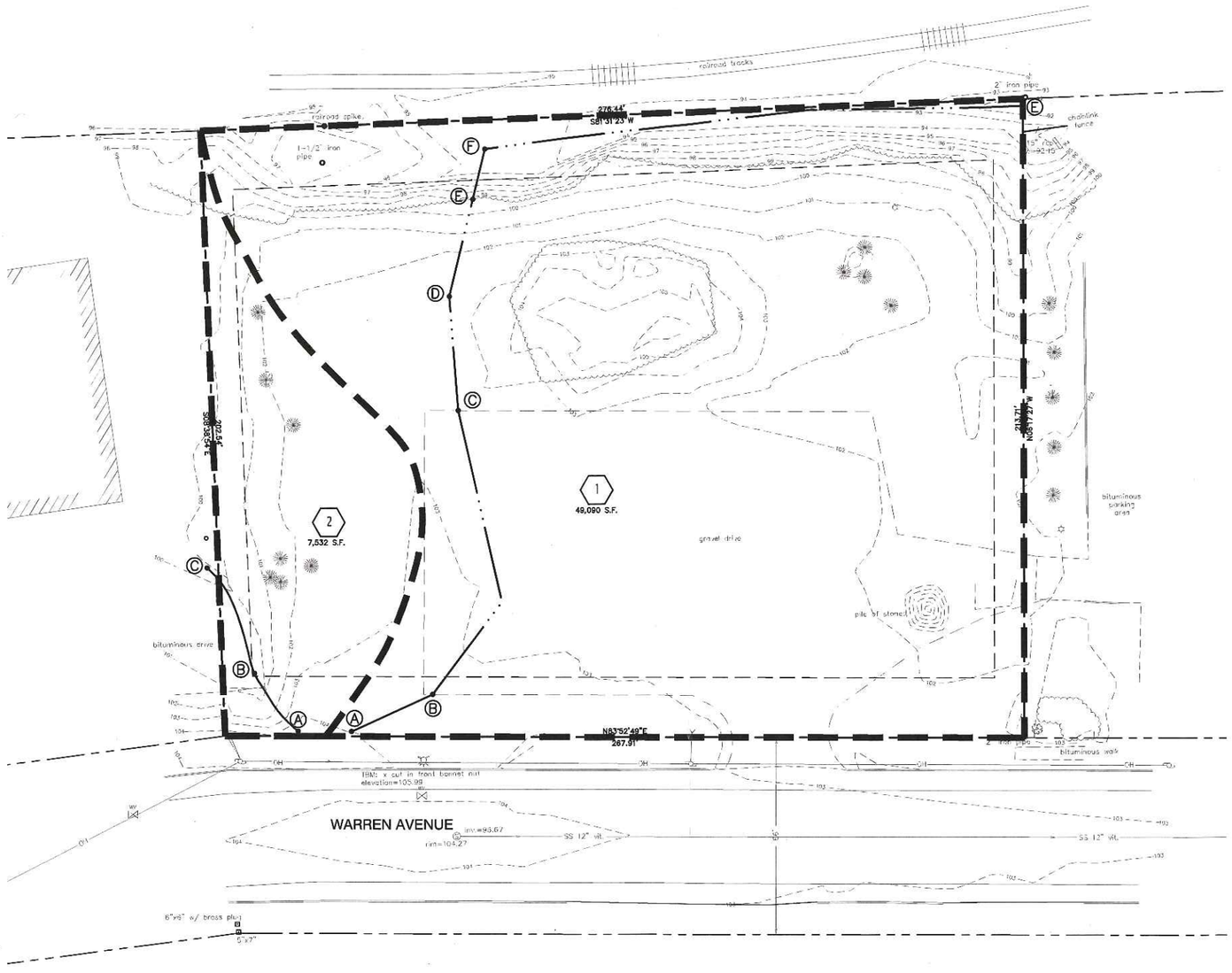
Area (sf)	CN	Description
7,523	79	<50% Grass cover, Poor, HSG B
7,523		100.00% Pervious Area

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

NORTH

GENERAL NOTES:

1. SITE AREA: 56,622 SF OR 1.30 ACRES
2. IMPERVIOUS AREA: 16,575 S.F. GRAVEL PARKING
3. LANDSCAPED AREA: 40,047 S.F. GRASS AND WOODLAND



SCALE

0 10 20 40

SCALE in FEET
1"=20'

DRAINAGE LEGEND

- 4S — SUBCATCHMENT LABEL
- 4P — POND LABEL
- 3R — REACH LABEL
- REACH PATH
- B — TIME OF CONCENTRATION (TC) PATH
- SUBCATCHMENT DIVIDE
- SOIL BOUNDARY
- POA#1 — POINT OF ANALYSIS

Site:

PROPOSED BUILDING ACADEMY FOR ACTIVE LEARNERS

134 WARREN AVENUE
PORTLAND, MAINE

Prepared for:

DELTA REALTY
380 WARREN AVENUE
PORTLAND, MAINE

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400 Commercial Street, Suite 404
Portland, ME 04101
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Fax (207) 772-3248
www.ransomenv.com

PRE-DEVELOPMENT STORMWATER PLAN

No.	Revision/Issue	Date
C	RESPONSE TO CITY COMMENTS	02/19/16
B	RESPONSE TO CITY COMMENTS	01/25/16
A	PRELIMINARY REVIEW	12/01/15

Design by: MPM	Checked by: SJB
Drawn by: JAR	Approved by: SJB
Project: 151.06127	Date: OCTOBER 2015

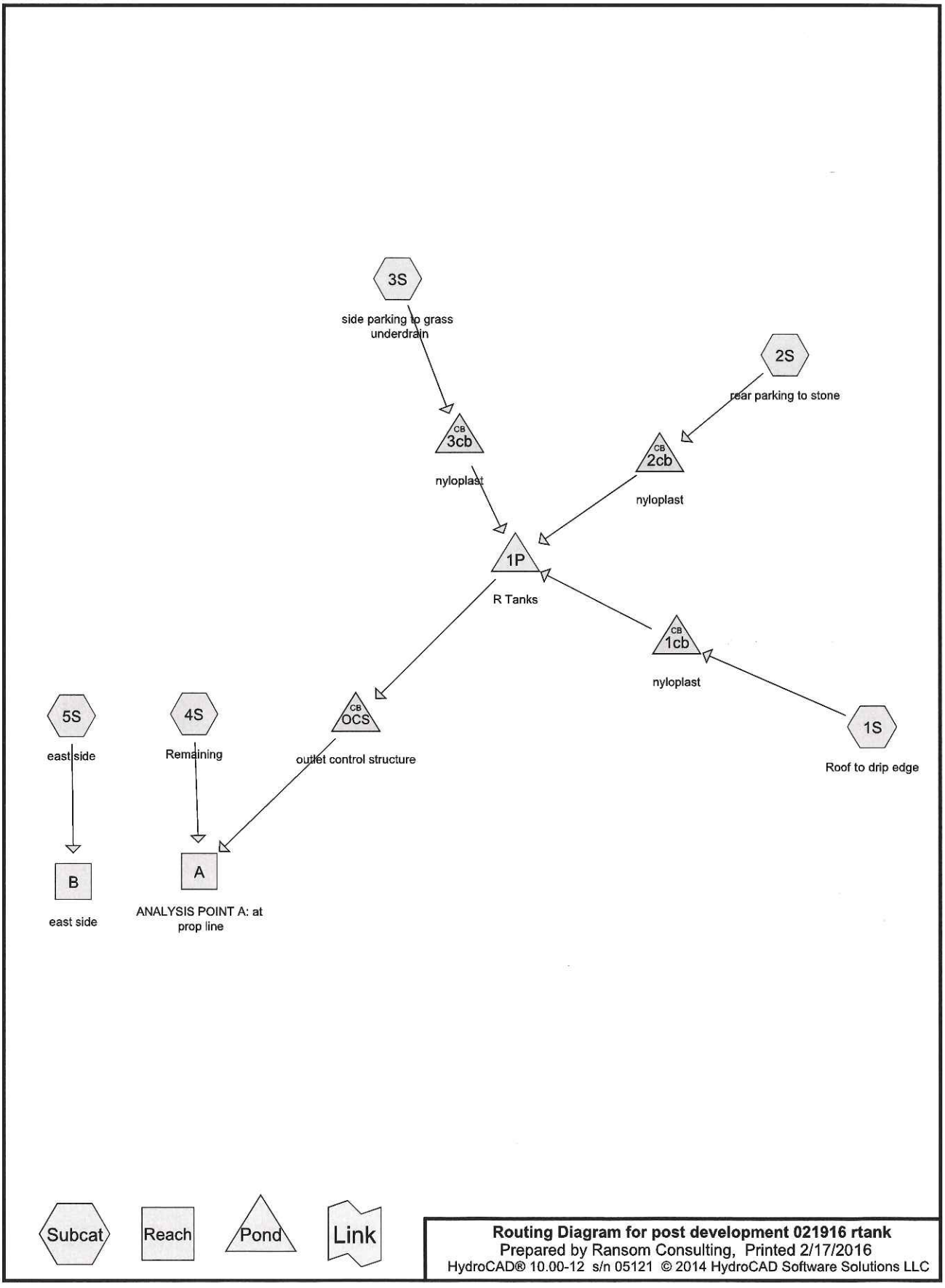
Sheet No: SWP-100

APPENDIX E

Post-Development Stormwater Calculations

Academy for Active Learners
134 Warren Avenue
Portland, Maine

Ransom Consulting, Inc.
Project 151.06127



Routing Diagram for post development 021916 rtank
Prepared by Ransom Consulting, Printed 2/17/2016

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.872	HSG B	1S, 2S, 3S, 4S, 5S
0.000	HSG C	
0.000	HSG D	
0.418	Other	1S, 2S, 4S, 5S
1.290		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1cb	97.50	96.00	25.0	0.0600	0.013	6.0	0.0	0.0
2	1P	95.25	94.75	25.0	0.0200	0.013	12.0	0.0	0.0
3	2cb	95.75	95.25	20.0	0.0250	0.013	6.0	0.0	0.0
4	3cb	97.25	96.75	10.0	0.0500	0.013	6.0	0.0	0.0

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-inch Rainfall=1.00"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 0.01 cfs @ 12.35 hrs, Volume= 0.001 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-inch Rainfall=1.00"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 0.04 cfs @ 12.12 hrs, Volume= 0.003 af, Depth> 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-inch Rainfall=1.00"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 0.09" for 1-inch event
Inflow = 0.05 cfs @ 12.50 hrs, Volume= 0.008 af
Outflow = 0.05 cfs @ 12.50 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1-inch event
Inflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 0.43" for 1-inch event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.007 af
Outflow = 0.11 cfs @ 12.09 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.09 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.70' @ 12.09 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=97.70' TW=95.28' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.53 fps)

Primary OutFlow Max=0.01 cfs @ 12.35 hrs HW=95.80' TW=95.39' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.01 cfs @ 0.74 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 0.11" for 1-inch event
Inflow = 0.04 cfs @ 12.12 hrs, Volume= 0.003 af
Outflow = 0.04 cfs @ 12.12 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 12.12 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.37' @ 12.12 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.04 cfs @ 12.12 hrs HW=97.37' TW=95.30' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.04 cfs @ 1.16 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 0.13" for 1-inch event
Inflow = 0.05 cfs @ 12.50 hrs, Volume= 0.008 af
Outflow = 0.05 cfs @ 12.50 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.05 cfs @ 12.50 hrs, Volume= 0.008 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.31' @ 12.50 hrs
Flood Elev= 100.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=0.05 cfs @ 12.50 hrs HW=95.31' TW=0.00' (Dynamic Tailwater)
├─**1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
├─**2=Orifice/Grate** (Controls 0.00 cfs)
├─**3=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.80 fps)
└─**4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 2.50 fps)

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 0.23 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1.6-inch Rainfall=1.60"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 0.07 cfs @ 12.11 hrs, Volume= 0.005 af, Depth> 0.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1.6-inch Rainfall=1.60"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.011 af, Depth> 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 1.6-inch Rainfall=1.60"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 0.30" for 1.6-inch event
Inflow = 0.30 cfs @ 12.22 hrs, Volume= 0.027 af
Outflow = 0.30 cfs @ 12.22 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 0.04" for 1.6-inch event
Inflow = 0.00 cfs @ 12.46 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 12.46 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 0.89" for 1.6-inch event
Inflow = 0.23 cfs @ 12.09 hrs, Volume= 0.014 af
Outflow = 0.23 cfs @ 12.09 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.23 cfs @ 12.09 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.80' @ 12.09 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.23 cfs @ 12.09 hrs HW=97.80' TW=95.55' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.23 cfs @ 1.87 fps)

Primary OutFlow Max=0.07 cfs @ 12.11 hrs HW=95.91' TW=95.59' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.07 cfs @ 1.36 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 0.39" for 1.6-inch event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.18 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.10 hrs, Volume= 0.011 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.51' @ 12.10 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.17 cfs @ 12.10 hrs HW=97.51' TW=95.57' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.17 cfs @ 1.72 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 0.41" for 1.6-inch event
Inflow = 0.30 cfs @ 12.22 hrs, Volume= 0.027 af
Outflow = 0.30 cfs @ 12.22 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
Primary = 0.30 cfs @ 12.22 hrs, Volume= 0.027 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.54' @ 12.22 hrs
Flood Elev= 100.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=0.30 cfs @ 12.22 hrs HW=95.54' TW=0.00' (Dynamic Tailwater)
├─**1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
├─**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 0.63 fps)
├─**3=Orifice/Grate** (Orifice Controls 0.24 cfs @ 1.89 fps)
└─**4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 3.39 fps)

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 0.038 af, Depth> 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 1.09" for 2-Year event
Inflow = 1.30 cfs @ 12.16 hrs, Volume= 0.101 af
Outflow = 1.30 cfs @ 12.16 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 0.50" for 2-Year event
Inflow = 0.11 cfs @ 12.11 hrs, Volume= 0.007 af
Outflow = 0.11 cfs @ 12.11 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 2.17" for 2-Year event
Inflow = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af
Outflow = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.08 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.07' @ 12.08 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.53 cfs @ 12.08 hrs HW=98.07' TW=96.04' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.53 cfs @ 2.72 fps)

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=96.28' TW=96.06' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.38 cfs @ 2.26 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 1.36" for 2-Year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.95' @ 12.09 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.63 cfs @ 12.09 hrs HW=97.95' TW=96.06' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.63 cfs @ 3.22 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 1.39" for 2-Year event
Inflow = 1.29 cfs @ 12.16 hrs, Volume= 0.092 af
Outflow = 1.29 cfs @ 12.16 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
Primary = 1.29 cfs @ 12.16 hrs, Volume= 0.092 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.90' @ 12.16 hrs
Flood Elev= 100.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=1.29 cfs @ 12.16 hrs HW=95.90' TW=0.00' (Dynamic Tailwater)
├**1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
├**2=Orifice/Grate** (Orifice Controls 0.81 cfs @ 2.03 fps)
├**3=Orifice/Grate** (Orifice Controls 0.43 cfs @ 3.48 fps)
└**4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 4.46 fps)

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 0.83 cfs @ 12.08 hrs, Volume= 0.057 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 0.071 af, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 2.10" for 10-Year event
Inflow = 2.22 cfs @ 12.15 hrs, Volume= 0.195 af
Outflow = 2.22 cfs @ 12.15 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 1.25" for 10-Year event
Inflow = 0.30 cfs @ 12.10 hrs, Volume= 0.018 af
Outflow = 0.30 cfs @ 12.10 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 3.50" for 10-Year event
Inflow = 0.83 cfs @ 12.08 hrs, Volume= 0.057 af
Outflow = 0.83 cfs @ 12.08 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.08 hrs, Volume= 0.057 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.52' @ 12.08 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.83 cfs @ 12.08 hrs HW=98.52' TW=96.43' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.83 cfs @ 4.23 fps)

Primary OutFlow Max=0.75 cfs @ 12.09 hrs HW=97.16' TW=96.46' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.75 cfs @ 3.84 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 2.53" for 10-Year event
Inflow = 1.15 cfs @ 12.09 hrs, Volume= 0.071 af
Outflow = 1.15 cfs @ 12.09 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.09 hrs, Volume= 0.071 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.97' @ 12.09 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.14 cfs @ 12.09 hrs HW=98.97' TW=96.45' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.14 cfs @ 5.83 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 2.55" for 10-Year event
Inflow = 2.15 cfs @ 12.15 hrs, Volume= 0.169 af
Outflow = 2.15 cfs @ 12.15 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min
Primary = 2.15 cfs @ 12.15 hrs, Volume= 0.169 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.07' @ 12.15 hrs
Flood Elev= 100.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=2.15 cfs @ 12.15 hrs HW=96.07' TW=0.00' (Dynamic Tailwater)
├─**1=Sharp-Crested Rectangular Weir**(Weir Controls 0.26 cfs @ 0.89 fps)
├─**2=Orifice/Grate** (Orifice Controls 1.33 cfs @ 2.66 fps)
├─**3=Orifice/Grate** (Orifice Controls 0.50 cfs @ 4.02 fps)
└─**4=Orifice/Grate** (Orifice Controls 0.05 cfs @ 4.89 fps)

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 1.07 cfs @ 12.08 hrs, Volume= 0.074 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 1.07 cfs @ 12.09 hrs, Volume= 0.066 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 1.57 cfs @ 12.09 hrs, Volume= 0.099 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 2.98" for 25-Year event
Inflow = 2.95 cfs @ 12.16 hrs, Volume= 0.278 af
Outflow = 2.95 cfs @ 12.16 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 1.99" for 25-Year event
Inflow = 0.47 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.47 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 4.57" for 25-Year event
Inflow = 1.07 cfs @ 12.08 hrs, Volume= 0.074 af
Outflow = 1.07 cfs @ 12.08 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.08 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 99.03' @ 12.08 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.07 cfs @ 12.08 hrs HW=99.02' TW=96.76' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.07 cfs @ 5.43 fps)

Primary OutFlow Max=1.07 cfs @ 12.09 hrs HW=98.21' TW=96.79' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.07 cfs @ 5.45 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 3.51" for 25-Year event
Inflow = 1.57 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.57 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min
Primary = 1.57 cfs @ 12.09 hrs, Volume= 0.099 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 100.24' @ 12.09 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.56 cfs @ 12.09 hrs HW=100.24' TW=96.78' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.56 cfs @ 7.96 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 3.53" for 25-Year event
Inflow = 2.79 cfs @ 12.15 hrs, Volume= 0.233 af
Outflow = 2.79 cfs @ 12.15 hrs, Volume= 0.233 af, Atten= 0%, Lag= 0.0 min
Primary = 2.79 cfs @ 12.15 hrs, Volume= 0.233 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.15' @ 12.15 hrs
Flood Elev= 100.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=2.79 cfs @ 12.15 hrs HW=96.15' TW=0.00' (Dynamic Tailwater)
├**1=Sharp-Crested Rectangular Weir**(Weir Controls 0.72 cfs @ 1.25 fps)
├**2=Orifice/Grate** (Orifice Controls 1.49 cfs @ 2.97 fps)
├**3=Orifice/Grate** (Orifice Controls 0.53 cfs @ 4.22 fps)
└**4=Orifice/Grate** (Orifice Controls 0.06 cfs @ 5.06 fps)

Summary for Subcatchment 1S: Roof to drip edge

Runoff = 1.52 cfs @ 12.08 hrs, Volume= 0.107 af, Depth> 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.10"

	Area (sf)	CN	Description
	8,013	98	Unconnected pavement, HSG B
*	437	30	drip edge stone
	8,450	94	Weighted Average
	437		5.17% Pervious Area
	8,013		94.83% Impervious Area
	8,013		100.00% Unconnected

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

Summary for Subcatchment 2S: rear parking to stone

Runoff = 1.69 cfs @ 12.09 hrs, Volume= 0.107 af, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.10"

	Area (sf)	CN	Description
	6,287	98	Paved parking & roofs
	1,650	61	>75% Grass cover, Good, HSG B
*	420	30	drip strip
	3,038	55	Woods, Good, HSG B
	11,395	79	Weighted Average
	5,108		44.83% Pervious Area
	6,287		55.17% Impervious Area

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

Summary for Subcatchment 3S: side parking to grass underdrain

Runoff = 2.37 cfs @ 12.09 hrs, Volume= 0.154 af, Depth> 5.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.10"

	Area (sf)	CN	Description
	1,647	61	>75% Grass cover, Good, HSG B
*	5,803	69	playground wood chips
	73	55	Woods, Good, HSG B
	7,523	67	Weighted Average
	7,523		100.00% Pervious Area

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

Summary for Reach A: ANALYSIS POINT A: at prop line

Inflow Area = 1.118 ac, 49.27% Impervious, Inflow Depth > 4.79" for 100-Year event
Inflow = 4.60 cfs @ 12.16 hrs, Volume= 0.446 af
Outflow = 4.60 cfs @ 12.16 hrs, Volume= 0.446 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Reach B: east side

Inflow Area = 0.173 ac, 0.00% Impervious, Inflow Depth > 3.59" for 100-Year event
Inflow = 0.85 cfs @ 12.09 hrs, Volume= 0.052 af
Outflow = 0.85 cfs @ 12.09 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2

Summary for Pond 1cb: nyloplast

Inflow Area = 0.194 ac, 94.83% Impervious, Inflow Depth > 6.64" for 100-Year event
Inflow = 1.52 cfs @ 12.08 hrs, Volume= 0.107 af
Outflow = 1.52 cfs @ 12.08 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Primary = 1.52 cfs @ 12.08 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 100.98' @ 12.10 hrs
Flood Elev= 103.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0" Round Culvert** L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 96.00' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=1.51 cfs @ 12.08 hrs HW=100.77' TW=97.56' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.51 cfs @ 7.70 fps)

Primary OutFlow Max=1.69 cfs @ 12.09 hrs HW=101.17' TW=97.62' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.69 cfs @ 8.62 fps)

Summary for Pond 3cb: nyloplast

Inflow Area = 0.338 ac, 64.00% Impervious, Inflow Depth > 5.47" for 100-Year event
Inflow = 2.37 cfs @ 12.09 hrs, Volume= 0.154 af
Outflow = 2.37 cfs @ 12.09 hrs, Volume= 0.154 af, Atten= 0%, Lag= 0.0 min
Primary = 2.37 cfs @ 12.09 hrs, Volume= 0.154 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 104.00' @ 12.10 hrs
Flood Elev= 98.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	97.25'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 97.25' / 96.75' S= 0.0500 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=2.37 cfs @ 12.09 hrs HW=103.88' TW=97.60' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.37 cfs @ 12.07 fps)

Summary for Pond OCS: outlet control structure

Inflow Area = 0.793 ac, 68.63% Impervious, Inflow Depth > 5.48" for 100-Year event
Inflow = 4.27 cfs @ 12.15 hrs, Volume= 0.362 af
Outflow = 4.27 cfs @ 12.15 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
Primary = 4.27 cfs @ 12.15 hrs, Volume= 0.362 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-17.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.28' @ 12.15 hrs
Flood Elev= 100.00'

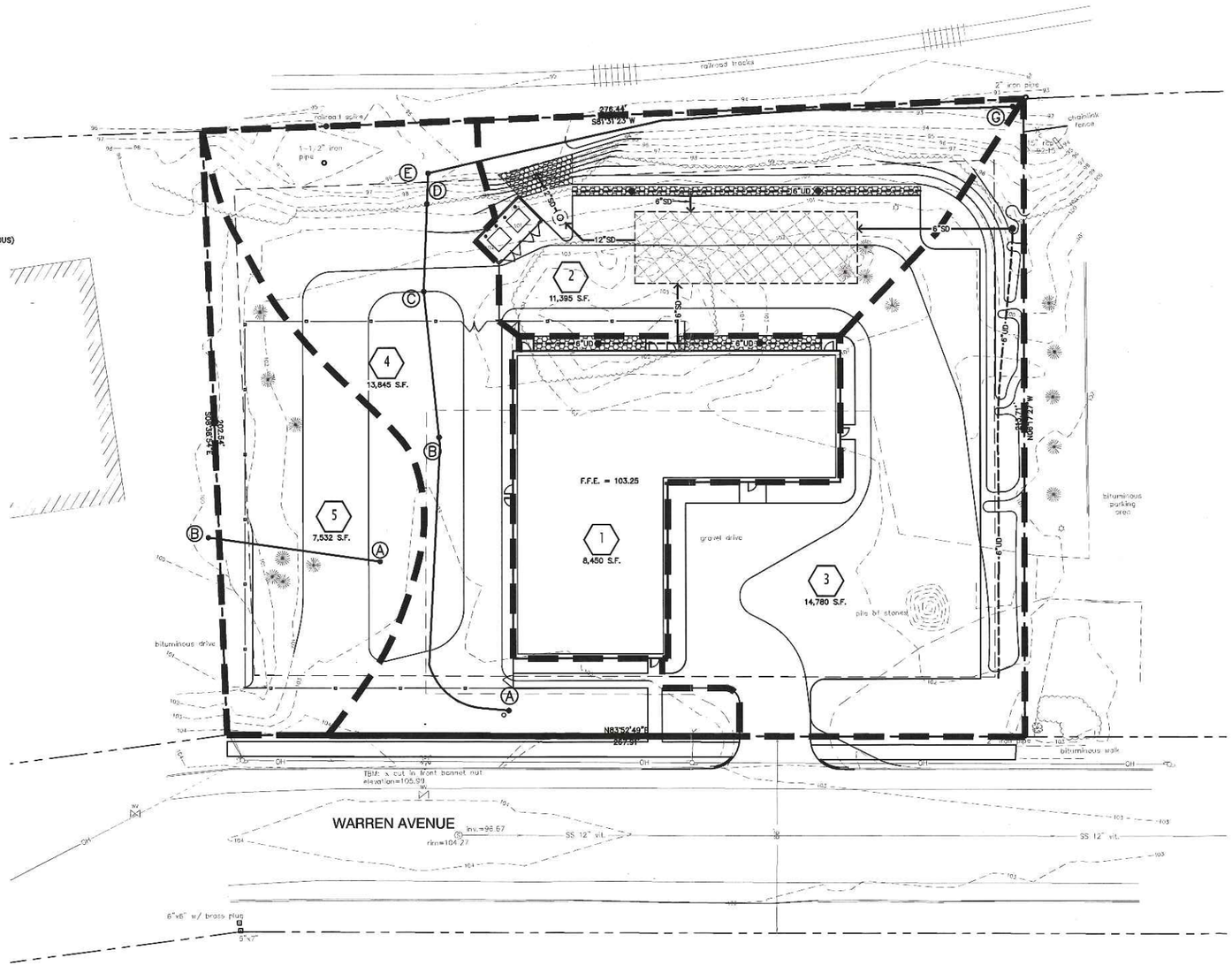
Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	95.50'	**12.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Primary	95.25'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Primary	95.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600

Primary OutFlow Max=4.26 cfs @ 12.15 hrs HW=96.28' TW=0.00' (Dynamic Tailwater)
↑—**1=Sharp-Crested Rectangular Weir**(Weir Controls 1.90 cfs @ 1.73 fps)
—**2=Orifice/Grate** (Orifice Controls 1.73 cfs @ 3.47 fps)
—**3=Orifice/Grate** (Orifice Controls 0.57 cfs @ 4.57 fps)
—**4=Orifice/Grate** (Orifice Controls 0.06 cfs @ 5.36 fps)

NORTH

GENERAL NOTES:

1. SITE AREA: 56,622 SF OR 1.30 ACRES
2. IMPERVIOUS AREA:
   - SUBCATCHMENT 1: 8,013 S.F. BUILDING/PAVING
   - SUBCATCHMENT 2: 6,287 S.F.
   - SUBCATCHMENT 3: 9,414 S.F.
   - SUBCATCHMENT 4: 275 S.F.
   - SUBCATCHMENT 5: 0 S.F.
   - DRIVEWAY: 415 S.F.
3. LANDSCAPED AREA:
   - SUBCATCHMENT 1: 437 S.F.
   - SUBCATCHMENT 2: 5,108 S.F.
   - SUBCATCHMENT 3: 5,296 S.F.
   - SUBCATCHMENT 4: 13,845 S.F.
   - SUBCATCHMENT 5: 7,532 S.F.
4. DEVELOPED AREA: 42,550 S.F. (24,404 S.F. IMPERVIOUS; 18,146 S.F. NON-IMPERVIOUS)
5. TREATMENT OF IMPERVIOUS AREA:
   - TOTAL NEW IMPERVIOUS = 7,604 S.F.
   - TREATED IMPERVIOUS = 20,201 S.F.
   - % TREATED = 100% > 95%
6. TREATMENT OF DEVELOPED AREA:
   - TOTAL DEVELOPED AREA = 42,550 S.F.
   - TREATED DEVELOPED = 35,588 S.F.
   - UNTREATED DEVELOPED = 6,962 S.F.
   - % TREATED = 84% > 80%



DRAINAGE LEGEND

- 3.2S — SUBCATCHMENT LABEL
- 4.1P — POND LABEL
- 3.1R — REACH LABEL
- REACH PATH
- (B) — TIME OF CONCENTRATION (TC) PATH
- SUBCATCHMENT DIVIDE
- SOIL BOUNDARY
- AP 1 — ANALYSIS POINT
- DIRECTION OF FLOW

SCALE

0 10 20 40

SCALE In FEET
1"=20'

Site:
PROPOSED BUILDING ACADEMY FOR ACTIVE LEARNERS
134 WARREN AVENUE
PORTLAND, MAINE

Prepared for:
DELTA REALTY
380 WARREN AVENUE
PORTLAND, MAINE

STATE OF MAINE
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POST-DEVELOPMENT STORMWATER PLAN

No.	Revision/Issue	Date
C	RESPONSE TO CITY COMMENTS	02/19/16
B	RESPONSE TO CITY COMMENTS	01/25/16
A	PRELIMINARY REVIEW	12/01/15

Design by: MPM	Checked by: SJB
Drawn by: JAR	Approved by: SJB
Project: 151.06127	Date: OCTOBER 2015

Sheet No:
SWP-101
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