



PORTLAND MAINE

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Planning & Urban Development Department
Penny St. Louis Littell, Director

Planning Division
Alexander Jaegerman, Director

SEPTEMBER 24, 2010

TRANSPORT LEASING CORPORATION
ATTENTION: MARK SANBORN
35 BRADLEY DRIVE
WESTBROOK, ME 04092

DELUCA- HOFFMAN ASSOCIATES, INC
ATTENTION: STEVE BUSHEY, PE
778 MAIN STREET
SOUTH PORTLAND, ME 04106

Project Name: City Line Drive- 54; Amendment to Site Plan
Drainage Improvements
Project ID: 10-99600011
CBL: 214A- A-002-001
Project Address: 54 CITY LINE DRIVE
Planner Shukria Wiar

Dear Mr. Sanborn;

On September 24, 2010, the Portland Planning Authority approved your amended plan for drainage improvements, which includes the construction of an underdrain soil filter and drainage pipe connecting to the municipal drainage system at 54 City Line Drive. The Planning Authority reviewed the proposal for conformance with the standards of the Site Plan Ordinance.

STANDARD CONDITIONS OF APPROVAL

Please note the following standard conditions of approval and requirements for all approved site plans:

1. The site shall be developed and maintained as depicted in the site plan and the written submission of the applicant. Modification of any approved site plan or alteration of a parcel which was the subject of site plan approval after May 20, 1974, shall require the prior approval of a revised site plan by the Planning Board or the planning authority pursuant to the terms of this Article V, Site Plan Ordinance of the Portland's Land Use Code.
2. The above approvals do not constitute approval of building plans, which must be reviewed and approved by the City of Portland's Inspection Division.
3. The applicant must comply with the conditions of Chapter 32 Stormwater including Article III. Post-Construction Stormwater Management, which specifies the annual inspections and reporting requirements. The developer/contractor/subcontractor must comply with conditions of the construction stormwater management plan and sediment & erosion control plan based on our standards and state guidelines.

4. A performance guarantee covering the site improvements as well as an inspection fee payment of 2.0% of the guarantee amount and seven (7) final sets of plans must be submitted to and approved by the Planning Division and Public Services Dept. prior to the release of a building permit, street opening permit or certificate of occupancy for site plans.
5. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. Requests to extend approvals must be received before the expiration date.
6. Final sets of plans shall be submitted digitally to the Planning Division, on a CD or DVD, in AutoCAD format (*.dwg), release AutoCAD 2005 or greater.
7. A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.
8. Prior to construction, a pre-construction meeting shall be held at the project site with the contractor, development review coordinator, Public Service's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the pre-construction meeting.
9. If work will occur within the public right-of-way such as utilities, curb, sidewalk and driveway construction, a street opening permit(s) is required for your site. Please contact Carol Merritt at 874-8300, ext. 8828. (Only excavators licensed by the City of Portland are eligible.)

Philip DiPierro, Development Review Coordinator, must be notified five (5) working days prior to date required for final site inspection. The Development Review Coordinator can be reached at 874-8632. Please make allowances for completion of site plan requirements determined to be incomplete or defective during the inspection. This is essential as all site plan requirements must be completed and approved by the Development Review Coordinator prior to issuance of a Certificate of Occupancy. Please schedule any property closing with these requirements in mind.

If you have any questions, please contact Shukria Wiar at 756-8083 or shukriaw@portlandmaine.gov.

Sincerely,

Alex Jaegerman
(33)

Alex Jaegerman
Director

Attachments:

1. Performance Guarantee Packet

Electronic Distribution:

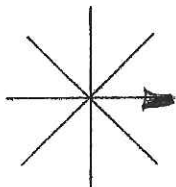
Penny St. Louis Littell, Director of Planning and Urban Development
Alexander Jaegerman, Planning Division Director
Barbara Barhydt, Development Review Services Manager
Shukria Wiar, Planner
Philip DiPierro, Development Review Coordinator
Marge Schmuckal, Zoning Administrator

Tammy Munson, Inspections Division Director
Gayle Guertin, Inspections Division
Lannie Dobson, Inspections Division
Michael Bobinsky, Public Services Director
Kathi Earley, Public Services
Bill Clark, Public Services
David Margolis-Pineo, Deputy City Engineer
Matt Doughty, Public Services
John Low, Public Services
Jane Ward, Public Services
Keith Gautreau, Fire
Jeff Tarling, City Arborist
Tom Errico, TY Lin
Dan Goyette, Woodard & Curran
Assessor's Office
Approval Letter File

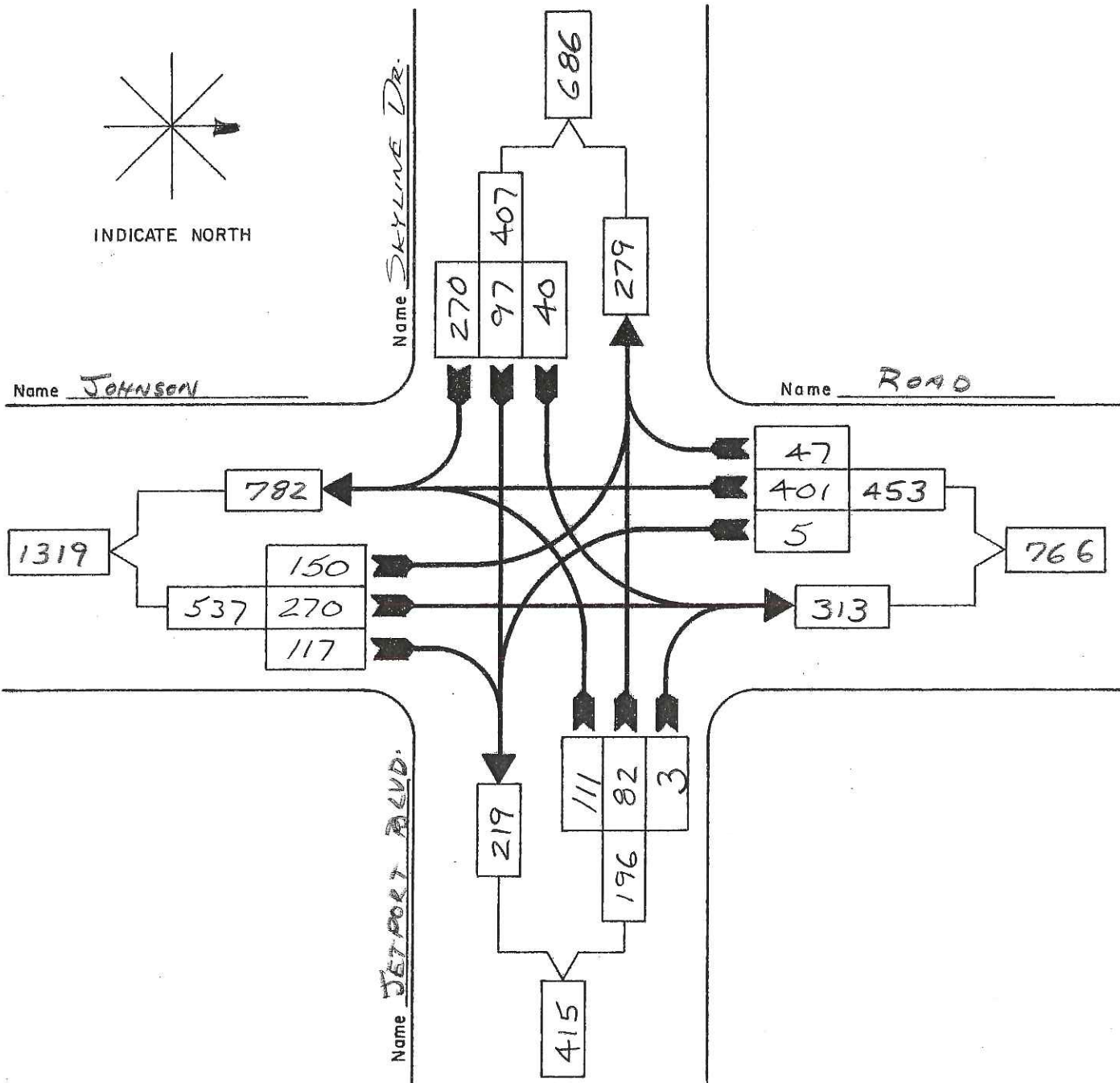
VEHICLE VOLUME COUNT GRAPHIC SUMMARY SHEET

Intersection of JOHNSON RD., JETPORT BLVD. & SKYLINE DR. Date 5-16-2010

Weather SUNNY Road Surface Condition DRY Time 11:00 AM to 12:00 AM



INDICATE NORTH



Remarks:

JOB NO. _____

**INTERSECTION PLAN
WITH NUMBERED MOVEMENTS:**

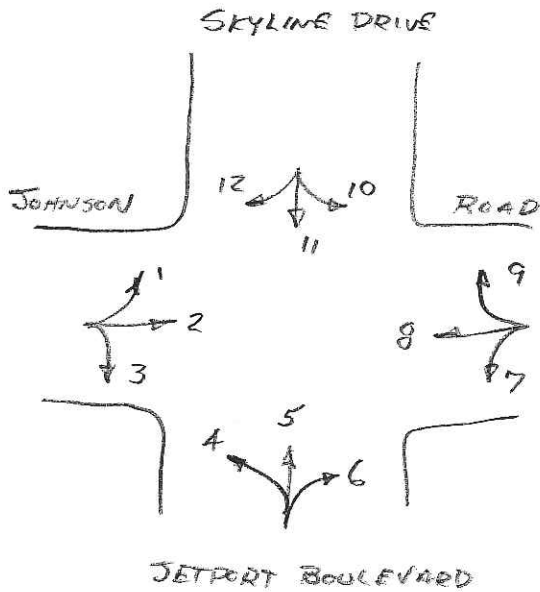
INTERSECTION JOHNSON RD, JETPORT BLVD. & SKYLINE DR.

DATE 5-16-2010

DAY OF WEEK SUNDAY

WEATHER SUNNY

REMARKS:



**COUNT SUMMARY
MOVEMENT**

	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
10 :00													
10 :15	26	55	29	12	12	1	2	62	8	9	27	46	289
10 :15													
10 :30	23	52	26	28	15	0	2	76	9	9	35	54	329
10 :30													
10 :45	30	52	34	23	14	1	2	80	7	13	42	57	355
10 :45													
11 :00	30	53	46	28	14	1	1	94	9	11	35	53	375
11 :00													
11 :15	27	61	33	25	16	0	1	83	8	13	33	58	358
11 :15													
11 :30	36	66	27	39	30	2	1	108	14	9	21	81	434
11 :30													
11 :45	47	58	28	27	19	0	1	92	13	7	22	71	395
11 :45													
12 :00	40	85	29	20	17	1	2	118	12	11	21	60	416
12 :00													
12 :00													
12 :00													
12 :00													
12 :00													

PEAK HOUR COUNT

TIME: 11:00 TO: 12:00

150	270	117	111	82	3	5	401	47	40	97	270	
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DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS

778 MAIN STREET
SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207 775 1121
FAX 207 879 0896

- SITE PLANNING AND DESIGN
- ROADWAY DESIGN
- ENVIRONMENTAL ENGINEERING
- PERMITTING
- AIRPORT ENGINEERING
- CONSTRUCTION ADMINISTRATION
- LANDSCAPE ARCHITECTURE

May 14, 2010

Mr. Brad Weeks
Water Resource Protection Engineer
City of South Portland
PO Box 9422-111 Waterman Drive
South Portland, Maine 04106

**Subject: Proposed Change of Use
54-58 City Line Drive, Portland, Maine
Request for Ability to Serve Letter**

Dear Brad:

Our office has been retained by Transport Leasing Corp. to prepare site plans and assist with permitting for a change of use on their property (Map 214A, Block A, Lot 002) in the City of Portland. The existing building was formerly leased by DHL Express Services. The proposed use will be the East Point Christian Church who proposes to lease about 15,000 SF or 3/4's of the building for the purpose of holding Sunday/Holiday services. 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 with a total size of approximately 6,000 square feet. A copy of the site plan has been attached to this letter for reference. The PWD records indicate a domestic and a fire service line off City Line Drive currently serve this building. We understand at least one 6" sanitary sewer service line serves the building. The applicant proposes to install a new restroom in the remaining industrial space and a small lift station would be installed to serve this restroom. The lift station would connect to the buildings interior plumbing lines, so no new exterior sewer lines will be required. The existing building's utility services will remain and continue in their current use and capacity. Based on limited daily activity and peak use during Sunday periods, 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 have any questions concerning this request, please contact me.

Sincerely,

DeLUCA-HOFFMAN ASSOCIATES, INC.

Stephen R. Bushey, P.E.
Senior Engineer

SRB/smk/JN2885.03/Weeks-05-14-10-Wastewater

Enclosures: Site Plan

C: Shukria Wier, City of Portland



DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS

778 MAIN STREET
SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207 775 1121
FAX 207 879 0896

- SITE PLANNING AND DESIGN
- ROADWAY DESIGN
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- LANDSCAPE ARCHITECTURE

July 29, 2010

Ms. Barbara Barhydt
Portland Planning Authority
City of Portland
389 Congress Street
Portland, ME 04101

**Subject: Site Plan Amendment Application
Transport Leasing Corp.
Drainage Modifications at 52-58 City Line Drive**

Dear Barbara:

On behalf of Transport Leasing Corp., DeLuca Hoffman Associates, Inc. is pleased to submit the accompanying submission package associated with their proposal to perform drainage modifications on their property at 52-58 City Line Drive. The project site contains a single story structure of approximately 20,720 SF that was recently approved for a change of use to allow the East Point Christian Church to use the building as a place of worship. The applicant is now proposing to complete land grading improvements and drainage measures that will basically redirect approximately 3.88 acres of their surrounding property out of the Long Creek watershed.

The drainage work includes the following:

- The development of a small underdrained soil filter field to provide water quality treatment and quantity control.
- Installation of two drainage structures that will act as control devices to control the flow and direction of runoff conveyed through the new basin.
- The extension of a 12" storm drain pipe from the lot to an existing catch basin located off Johnson Road. A core hole will be required to make the connection into the existing structure. The proposed storm drain pipe will cross the property at 68 Johnson Road, which is also controlled by the applicant under the name of 68 Johnson Road LLC.
- Installation of multiple drainage structures to capture runoff that currently sheets across paved surfaces within a portion of the privately owned City Line Drive and the adjacent properties, all of which are owned by Transport Leasing Inc.

The Johnson Road system collects and conveys stormwater runoff from Johnson Road and portions of the adjacent properties and discharges this runoff at a 30" outfall pipe located off the west side of Congress Street nearly opposite the Brooklawn Cemetery facilities. The runoff discharged by the Johnson Road System ultimately drains to an unnamed tributary of the Stroudwater River as shown on the accompanying figures. We have performed a hydraulic analysis of the existing system and we have determined that the system has the capacity to accept the additional runoff from the redirected drainage area for up to a 10 year storm event. The

Ms. Barbara Barhydt
July 28, 2010
Page 2

accompanying calculations contained in Attachment A to this submission package outline the basic analysis that was performed.

The objective of the new drainage measures is to redirect stormwater runoff to the existing Johnson Road drainage system and out of the Long Creek Watershed. As you are aware, properties within the Long Creek watershed have been involved with the Long Creek Watershed Management Plan. Transport Leasing Inc. owns over 7 acres of property within the watershed and they are currently participating in the Plan with coverage under the General Permit. Because of their properties proximity to the watershed boundary, we have determined it is possible to complete improvements that would effectively remove about 3.88 acres of land area from the watershed for rainfall events up to a 10 year storm and redirect this runoff to Johnson Road. The applicant's expectation is that the removal of this contributing area from the Long Creek watershed will relieve Transport Leasing Inc. from the annual fee assessment they are currently paying for the property as a member of the Restoration Plan.

The project site is identified as Lot 002 on City of Portland Assessors Map 214A. The site is 1.95 acres in size according to the Amended Subdivision Plan recorded in the CCRD Plan Book 199, Page 530. The site is located in the B4 Commercial corridor according to the City's Zoning Map. Based on the zoning requirements in the B4 District, it appears that the lot will remain in conformance with all zoning dimensional requirements.

We have previously met with David Pineo and Douglas Roncarati, Jr. of the City's Public Services Division to discuss the proposed drainage improvements. At that meeting, it was recommended that if the drainage improvements were to occur it would be necessary to provide some level of stormwater treatment prior to the introduction of the redirected runoff into the Johnson Road system. To meet this requirement we have designed a small underdrained soil filter field that will serve to provide both water quality treatment functions and a small level of quantity control for the runoff. Runoff entering the field will either pass through the soil filter media at the base of the field and/or it will be conveyed through a new 12" storm drain pipe that will be installed from the basin across the 68 Johnson Road property to an existing catch basin located off Johnson Road, just at the corner of the applicant's property. Based on the capacity of the existing Johnson Road drainage system, we have found that runoff peak values up to a 10 year storm can be redirected to the system. During greater rainfall events, a portion of the runoff captured in the proposed basin will basically remain in the watershed and be conveyed through a secondary (overflow) drainage pipe that would tie into the existing onsite drainage system that will continue to discharge into the Long Creek Watershed.

During a brief discussion with Mr. Jeff Dennis of the Maine Department of Environmental Protection he confirmed that the 10 year storm is the minimum he would want to qualify the area as removed from the Long Creek Watershed. Concurrently with this application to the City, we are contacting the Long Creek Watershed Management District to advise them of this application and to seek their concurrence with the overall design objective.

The proposed development activity will result in less than 1 acre of disturbed area and less than 1 acre of new impervious surface on the site; therefore, the site development is not subject to a Maine Department of Environmental Protection Stormwater Permit, nor does the activity qualify for coverage under the Maine Construction General Permit (MCGP). The project will not involve any building modifications nor will any additional impervious area be created on the site.

The Applicant is seeking a Site Plan amendment approval from the Planning Authority to allow the proposed drainage improvements and to allow the redirection and introduction of stormwater flows to the City's Street system in Johnson Road.

The following statements are provided in accordance with Section 14-525 (c):

- (1) The proposed use includes onsite drainage modifications to create a stormwater management basin and new drainage conveyance line that will redirect stormwater runoff to the City's Johnson Road drainage system.
- (2) The project parcel is 85,153 SF in size (1.95 acre). The existing impervious surfaces occupy approximately 73% of the site. No changes to the site's impervious conditions are proposed.
- (3) No easements or burdens currently exist on the project site. The site plan depicts a reserved right-of-way for access from the adjacent property at 68 Johnson Road since it is the applicant's intention to allow cross access to that lot in the future if necessary. The applicant also owns the 68 Johnson Road property. As the applicant owns the 68 Johnson Road site no formal drainage easement for the 12" storm drain is currently proposed.
- (4) The project will generate no significant construction related solid waste or debris.
- (5) The existing building is currently served by public water and sewer services. The project does not involve changes to any of the utility systems serving the existing buildings.
- (6) The project involves drainage modifications that will involve the collection and conveyance of stormwater runoff from approximately 3.88 acres of area and redirecting the flow to the existing drainage system in Johnson Road. The existing drainage path for this area basically directs runoff towards Jetport Blvd. and the Long Creek Watershed. The improvements will result in the 3.88 acre area being removed from the Long Creek Watershed for up to a 10 year storm. A portion of the runoff from the area during a rain event higher than the 10 year storm will continue to discharge to the Long Creek Watershed.
- (7) The applicant is seeking to construct the improvements immediately upon approval by the Planning Authority. They would like to start construction in August for completion of the work by October.
- (8) The project is subject to a Site Plan amendment review by the Portland Planning Authority.

Ms. Barbara Barhydt
July 28, 2010
Page 4

- (9) The applicant has previously provided evidence of their financial capacity related to their proposed work on the building. We trust that the Maine Bank & Trust letter of April 27, 2010 is sufficient as evidence of the applicant financial standing and their ability to undertake the proposed work.
- (10) A copy of the Amended Subdivision plan recorded in the CCRD accompanies this application in support of the applicant's ownership of the property.
- (11) The site contains no unusual natural areas, wildlife or fisheries habitats or archaeological sites.
- (12) DeLuca-Hoffman Associates, Inc. can provide CADD.DXF files to the City upon final approval of the plan.
- (13) The proposed project will generate only a modest amount of recyclable materials. The existing topsoil will be removed and recycled for reuse as surface stabilization material.

We trust these statements and the supporting application plans and materials satisfy the City's requirements and we look forward to Planning Authority review and approval of the project. Please contact this office with any staff questions and concerns.

Sincerely,

DeLUCA-HOFFMAN ASSOCIATES, INC.



Stephen R. Bushey, P.E., C.P.E.S.C.

SRB/smk/JN2885.02/redirect drainage project/Barhydt-7-28-10

Enclosures: Minor Site Plans (Full size and 11x17)
Required Fees (\$250 Site Plan Amendment)
U.S.G.S. Map
Tax Map 214A
Minor Site Plan Application
Minor Site Plan Checklist

C: Mark Sanborn, Transport Leasing Corp.



Development Review Application PORTLAND, MAINE

Department of Planning and Urban Development,
Planning Division and Planning Board

PROJECT NAME: Drainage Improvements

PROPOSED DEVELOPMENT ADDRESS:

52-58 City Line Drive, Portland, Maine

PROJECT DESCRIPTION:

The Applicant proposes drainage improvements including the construction of an underdrained soil filter field and drainage pipe connecting to the municipal drainage system in Johnson Road.

CHART/BLOCK/LOT: 214A / A / 002

CONTACT INFORMATION:

APPLICANT

Name: Transport Leasing Corp.

Address: 35 Bradley Drive
Westbrook, ME

Zip Code: 04092

Work #: 207-856-6045

Cell #: _____

Fax #: _____

Home: _____

E-mail: _____

PROPERTY OWNER

Name: Lot 002 - Same as Applicant

Address: _____

Zip Code: _____

Work #: _____

Cell #: _____

Fax #: _____

Home: _____

E-mail: _____

BILLING ADDRESS

Name: Same as Applicant

Address: _____

Zip: _____

Work #: _____

Cell #: _____

Fax #: _____

Home: _____

E-mail: _____

~As applicable, please include additional contact information on the next page~

AGENT/REPRESENTATIVE

Name: DeLuca-Hoffman Associates, Inc.
Address: Attn: Steve Bushey, P.E.
778 Main Street, South Portland, ME
Zip Code: 04106
Work #: 207-775-1121
Cell #: _____
Fax #: 207-879-0896
Home: _____
E-mail: sbushey@delucahoffman.com

ENGINEER

Name: DeLuca-Hoffman Associates, Inc.
Address: Attn: Steve Bushey, P.E.
778 Main Street, South Portland, ME
Zip Code: 04106
Work #: 207-775-1121
Cell #: _____
Fax #: 207-879-0896
Home: _____
E-mail: sbushey@delucahoffman.com

ARCHITECT

Name: _____
Address: _____

Zip Code: _____
Work #: _____
Cell #: _____
Fax #: _____
Home: _____
E-mail: _____

CONSULTANT

Name: N/A
Address: _____

Zip Code: _____
Work #: _____
Cell #: _____
Fax #: _____
Home: _____
E-mail: _____

SURVEYOR

Name: N/A
Address: _____

Zip Code: _____
Work #: _____
Cell #: _____
Fax #: _____
Home: _____
E-mail: _____

ATTORNEY

Name: N/A
Address: _____

Zip Code: _____
Work #: _____
Cell #: _____
Fax #: _____
Home: _____
E-mail: _____

APPLICATION FEE:

Check all reviews that apply. Payment may be made in cash or check to the City of Portland.

<p>Major Development (more than 10,000 sq. ft.)</p> <p><input type="checkbox"/> Under 50,000 sq. ft. (\$500.00)</p> <p><input type="checkbox"/> 50,000 - 100,000 sq. ft. (\$1,000.00)</p> <p><input type="checkbox"/> Parking Lots over 100 spaces (\$1,000.00)</p> <p><input type="checkbox"/> 100,000 - 200,000 sq. ft. (\$2,000.00)</p> <p><input type="checkbox"/> 200,000 - 300,000 sq. ft. (\$3,000.00)</p> <p><input type="checkbox"/> Over 300,000 sq. ft. (\$5,000.00)</p> <p><input type="checkbox"/> After-the-fact Review (\$1,000.00 plus applicable application fee)</p>	<p>Plan Amendments</p> <p><input checked="" type="checkbox"/> Planning Staff Review (\$250.00)</p> <p><input type="checkbox"/> Planning Board Review (\$500.00)</p> <p>Subdivision</p> <p><input type="checkbox"/> Subdivision (\$500.00) + amount of lots _____ (\$25.00 per lot) \$ _____ + (applicable Major site plan fee)</p>
<p>Minor Site Plan Review</p> <p><input type="checkbox"/> Less than 10,000 sq. ft. (\$400.00)</p> <p><input type="checkbox"/> After-the-fact Review (\$1,000.00 plus applicable application fee)</p>	<p>Other Reviews</p> <p><input type="checkbox"/> Site Location of Development (\$3,000.00) (except for residential projects which shall be \$200.00 per lot _____)</p> <p><input type="checkbox"/> Traffic Movement (\$1,000.00)</p> <p><input type="checkbox"/> Storm water Quality (\$250.00)</p> <p><input type="checkbox"/> Section 14-403 Review (\$400.00 + \$25.00 per lot)</p> <p><input type="checkbox"/> Other _____</p>

DEVELOPMENT REVIEW APPLICATION SUBMISSION

Submissions shall include seven (7) packets with folded plans containing the following materials:

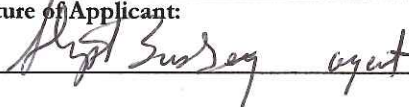
1. Seven (7) full size site plans that must be folded.
2. Application form that is completed and signed.
3. Cover letter stating the nature of the project.
4. All Written Submittals (Sec. 14-525 2. (c), including evidence of right, title and interest.
5. A stamped standard boundary survey prepared by a registered land surveyor at a scale not less than one inch to 100 feet.
6. Plans and maps based upon the boundary survey and containing the information found in the attached sample plan checklist.
7. Copy of the checklist completed for the proposal listing the material contained in the submitted application.
8. One (1) set of plans reduced to 11 x 17.

Refer to the application checklist (page 9) for a detailed list of submittal requirements.

Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14), which includes the Subdivision Ordinance (Section 14-491) and the Site Plan Ordinance (Section 14-521). Portland's Land Use Code is on the City's web site: www.portlandmaine.gov Copies of the ordinances may be purchased through the Planning Division.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Planning Authority and Code Enforcement's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for site review only; a Performance Guarantee, Inspection Fee, Building Permit Application and associated fees will be required prior to construction.

<p>Signature of Applicant:</p> 	<p>Date:</p> <p>7/21/16</p>
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PROJECT DATA

The following information is required where applicable, in order complete the application

Total Site Area Lot 002, 85,153 sq. ft.
 Proposed Total Disturbed Area of the Site < 5,000 sq. ft.
(If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with DEP and a Stormwater Management Permit, Chapter 500, with the City of Portland)

IMPERVIOUS SURFACE AREA

Proposed Total Paved Area 0 sq. ft.
 Existing Total Impervious Area 62,161 sq. ft.
 Proposed Total Impervious Area 62,161 sq. ft.
 Proposed Impervious Net Change 0 sq. ft.

BUILDING AREA

Existing Building Footprint 20,720 sq. ft.
 Proposed Building Footprint ---- sq. ft.
 Proposed Building Footprint Net change 0 sq. ft.
 Existing Total Building Floor Area 20,720 sq. ft.
 Proposed Total Building Floor Area ---- sq. ft.
 Proposed Building Floor Area Net Change 0 sq. ft.
 New Building No (yes or no)

ZONING

Existing B4
 Proposed, if applicable ----

LAND USE

Existing Industrial/Warehouse/Place of Assembly
 Proposed N/A

RESIDENTIAL, IF APPLICABLE

Proposed Number of Affordable Housing Units N/A
 Proposed Number of Residential Units to be Demolished _____
 Existing Number of Residential Units _____
 Proposed Number of Residential Units _____
 Subdivision, Proposed Number of Lots _____

PARKING SPACES

Existing Number of Parking Spaces 78
 Proposed Number of Parking Spaces 0
 Number of Handicapped Parking Spaces 4
 Proposed Total Parking Spaces No change

BICYCLE PARKING SPACES

Existing Number of Bicycle Parking Spaces 2
 Proposed Number of Bicycle Parking Spaces 0
 Total Bicycle Parking Spaces 2

ESTIMATED COST OF PROJECT

\$50,000

Please answer the following with a Yes/No response on all that apply to the proposed development

Institutional	<u>N</u>	Change of Use	<u>N</u>
Parking Lot	<u>N</u>	Design Review	<u>N</u>
Manufacturing	<u>N</u>	Flood Plain Review	<u>N</u>
Office	<u>N</u>	Historic Preservation	<u>N</u>
Residential	<u>N</u>	Housing Replacement	<u>N</u>
Retail/Business	<u>N</u>	14-403 Street Review	<u>N</u>
Warehouse	<u>N</u>	Shoreland	<u>N</u>
Single Family Dwelling	<u>N</u>	Site Location	<u>N</u>
2 Family Dwelling	<u>N</u>	Stormwater Quality	<u>Y</u>
Multi-Family Dwelling	<u>N</u>	Traffic Movement	<u>N</u>
B-3 Ped Activity Review	<u>N</u>	Zoning Variance	<u>N</u> (or date)
Change of Use	<u>N</u>	Historic Dist./Landmark	<u>N</u>
		Off Site Parking	<u>N</u>

Site Plan Checklist

Portland, Maine

Department of Planning and Urban Development, Planning Division and Planning Board

Drainage Improvements - 52-58 City Line Drive, Portland, Maine

Project Name, Address of Project

Application Number

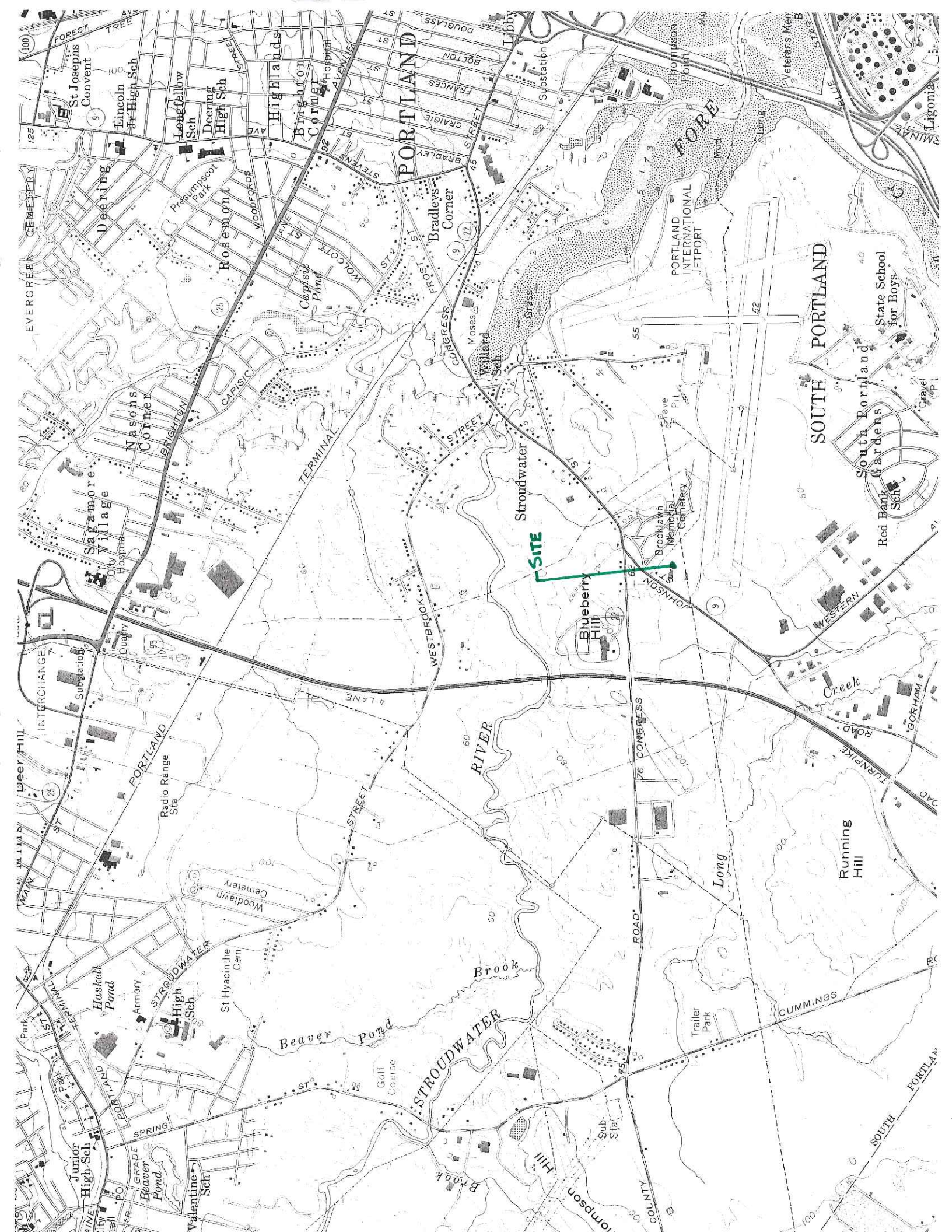
(The form is to be completed by the Applicant or Designated Representative)

Check Submitted	Required Information	Section 14-525 (b,c)																																																																																																																											
<table border="0" style="width: 100%;"> <tr> <td style="width: 15%;">Applicant</td> <td style="width: 15%;">Staff</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td>_____</td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>N/A</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> <tr> <td><u>X</u></td> <td>_____</td> <td></td> </tr> </table>	Applicant	Staff		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>N/A</u>	_____		<u>N/A</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>N/A</u>	_____		<u>N/A</u>	_____		<u>N/A</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>N/A</u>	_____		_____	_____		_____	_____		_____	_____		_____	_____		_____	_____		_____	_____		_____	_____		<u>N/A</u>	_____		<u>N/A</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>N/A</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<u>X</u>	_____		<p>Standard boundary survey (stamped by a registered surveyor, at a scale of not less than 1 inch to 100 feet and including:</p> <p>Name and address of applicant and name of proposed development</p> <ul style="list-style-type: none"> * Scale and north points * Boundaries of the site * Total land area of site * Topography - existing and proposed (2 feet intervals or less) <p>Plans based on the boundary survey including:</p> <ul style="list-style-type: none"> * Existing soil conditions * Location of water courses, wetlands, marshes, rock outcroppings and wooded areas * Location, ground floor area and grade elevations of building and other structures existing and proposed, elevation drawings of exterior facades, and materials to be used * Approx location of buildings or other structures on parcels abutting the site and a zoning summary of applicable dimensional standards (<u>example page 11 of packet</u>) * Location of on-site waste receptacles * Public utilities * Water and sewer mains * Culverts, drains, existing and proposed, showing size and directions of flows * Location and dimensions, and ownership of easements, public or private rights-of-way, both existing and proposed * Location and dimensions of on-site pedestrian and vehicular access ways * Parking areas * Loading facilities * Design of ingress and egress of vehicles to and from the site onto public streets * Curb and sidewalks <p>Landscape plan showing:</p> <ul style="list-style-type: none"> * Location of existing vegetation and proposed vegetation * Type of vegetation * Quantity of plantings * Size of proposed landscaping * Existing areas to be preserved * Preservation measures to be employed * Details of planting and preservation specifications * Location and dimensions of all fencing and screening <p>Location and intensity of outdoor lighting system</p> <p>Location of fire hydrants, existing and proposed (<u>refer to Fire Department checklist – page 11</u>)</p> <p>Written statements to include:</p> <ul style="list-style-type: none"> * Description of proposed uses to be located on site * Quantity and type of residential, if any * Total land area of the site * Total floor area, total disturbed area and ground coverage of each proposed Building and structure * General summary of existing and proposed easements or other burdens * Type, quantity and method of handling solid waste disposal * Applicant's evaluation or evidence of availability of off-site public facilities, including sewer, water and streets (<u>refer to the wastewater capacity application – page 12</u>) * Description of existing surface drainage and a proposed stormwater management plan or description of measures to control surface runoff. 	<p>1</p> <p>a</p> <p>b</p> <p>c</p> <p>d</p> <p>e</p> <p>2</p> <p>a</p> <p>b</p> <p>c</p> <p>d</p> <p>e</p> <p>c</p> <p>c</p> <p>f</p> <p>g</p> <p>g</p> <p>g</p> <p>g</p> <p>g</p> <p>h</p> <p>h</p> <p>h</p> <p>h</p> <p>h</p> <p>h</p> <p>h</p> <p>h</p> <p>i</p> <p>j</p> <p>k</p> <p>c</p> <p>cl</p> <p>cl</p> <p>c2</p> <p>c2</p> <p>c3</p> <p>c4</p> <p>c5</p> <p>c6</p>
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<u>X</u>	_____	* An estimate of the time period required for completion of the development	7
<u>X</u>	_____	* A list of all state and federal regulatory approvals to which the development may be subject to. the status of any pending applications, anticipated timeframe for obtaining such permits, or letters of non-jurisdiction.	8
<u>X</u>	_____	* Evidence of financial and technical capability to undertake and complete the development including a letter from a responsible financial institution stating that it has reviewed the planned development and would seriously consider financing it when approved.	
<u>X</u>	_____	* Evidence of applicant's right title or interest, including deeds, leases, purchase options or other documentation.	
<u>N/A</u>	_____	* A description of any unusual natural areas, wildlife and fisheries habitats, or archaeological sites located on or near the site.	
<u>X</u>	_____	A jpeg or pdf of the proposed site plan, if available.	
<u>X</u>	_____	Final sets of the approved plans shall be submitted digitally to the Planning Division, on a CD or DVD, in AutoCAD format (*.dwg), release AutoCAD 2005 or greater.	

Note: Depending on the size and scope of the proposed development, the Planning Board or Planning Authority may request additional information, including (but not limited to):

- | | |
|---|---|
| - drainage patterns and facilities | - an environmental impact study |
| - erosion and sedimentation controls to be used during construction | - a sun shadow study |
| - a parking and/or traffic study | - a study of particulates and any other noxious emissions |
| - a wind impact analysis | - a noise study |



1
Book 711 Page 250 KNOW ALL MEN BY THESE PRESENTS,

11991

350
V THAT TRANSPORT SALES, INC., a corporation organized and existing under the laws of the State of Maine of Portland and located at ⁵⁵⁰440 Forest Avenue in the County of Cumberland and State of Maine in consideration of One Dollar (\$1.00) and other valuable considerations paid by TRANSPORT LEASING CORP., a Maine corporation with a place of business in Portland, County of Cumberland and State of Maine and whose mailing address is 550 Forest Avenue, Portland, Maine 04101, the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said TRANSPORT LEASING CORP., its successors and assigns forever:

A certain lot or parcel of land situated in Portland, together with any buildings thereon, in the County of Cumberland and State of Maine, lying easterly of the Johnson Road, so-called, and being Lot 4 as shown on Plan captioned "Plan of Land in Portland & South Portland, Maine, for Transport Leasing Corp." dated April 22, 1979, as revised and as recorded in Cumberland County Registry of Deeds in Plan Book 139, Page 69, containing 32,753 square feet, more or less.

Being a portion of the premises described in a deed from Sanborn's Motor Express, Inc., to Transport Leasing Corp. dated June 6, 1966, recorded in said Registry of Deeds in Book 2960, Page 848.

Also conveying a right of way and easement for ingress and egress by foot and vehicle, and for all utilities, in and over a Private Right of Way shown on said Plan by and between said Lot 4 and said Johnson Road, so-called.

By the acceptance of this deed, the Grantee herein covenants and agrees to pay its proportionate share of all maintenance and snow removal costs for the road located in and on said Private Right of Way.

Being the same premises described in a deed from Transport Leasing Corp. to Transport Sales, Inc., dated December 5, 1983, and recorded in said Registry of Deeds in Book 6348, Page 191.

TO HAVE AND TO HOLD the same together with all the

Transport Leasing Corp., its successors and assigns, to its own use and behoof forever.

AND the said Grantor Corporation does covenant with the said Transport Leasing Corp., its successors and assigns, that it will warrant and forever defend the premises to Transport Leasing Corp., the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

IN WITNESS WHEREOF, the said Transport Sales, Inc., has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Chester F. Adams, its President thereunto duly authorized, this 25th day of MARCH in the year one thousand nine hundred and eighty-six.

SIGNED, SEALED AND DELIVERED
In Presence Of

Sharon A. Dulas

TRANSPORT SALES, INC.

By: Chester F. Adams

Print: Chester F. Adams

Its: President

STATE OF MAINE
CUMBERLAND, SS.

March 25, , 1986

Then personally appeared before me the above-named Chester F. Adams, Pres. of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of the said Corporation.

Before me,

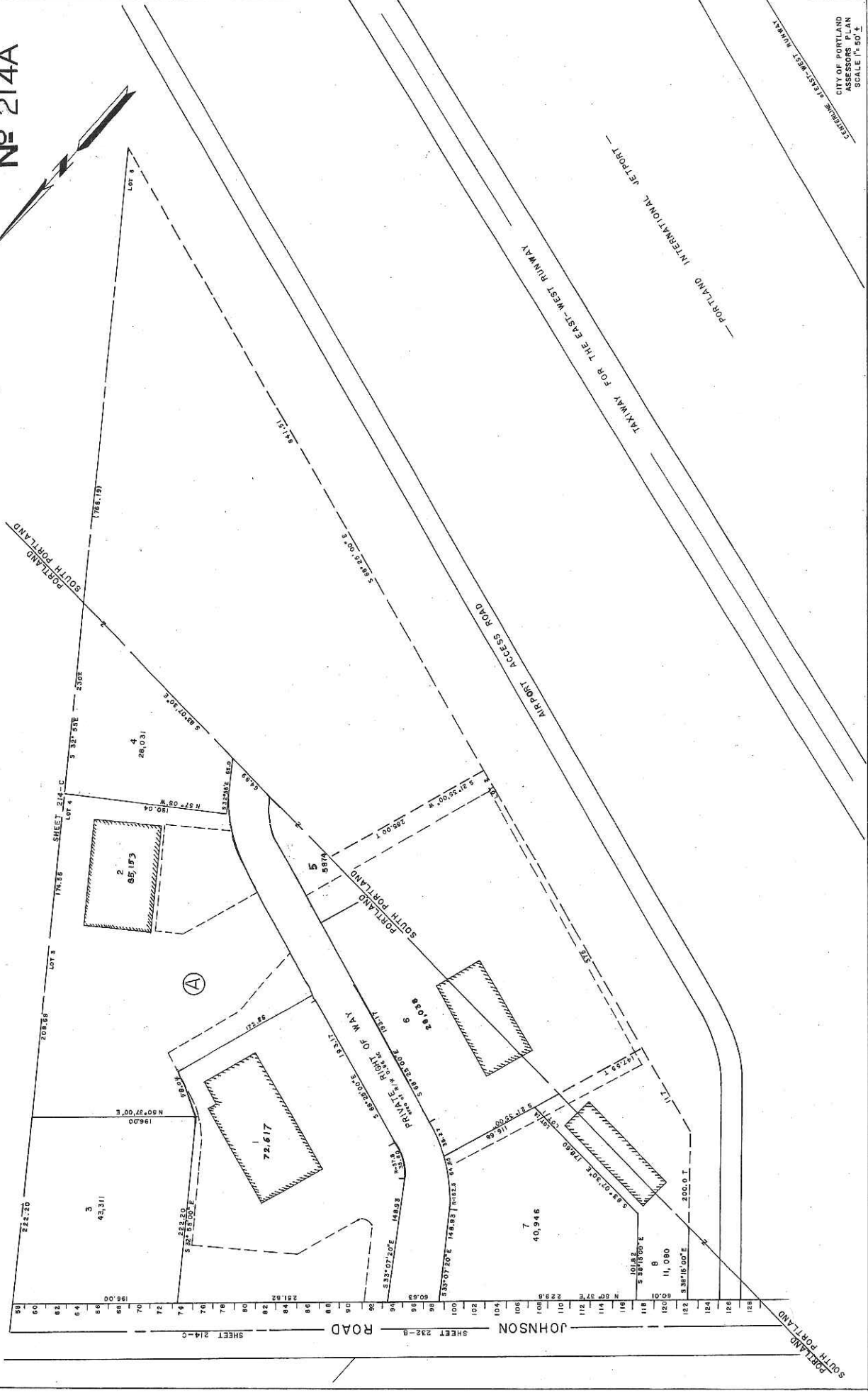
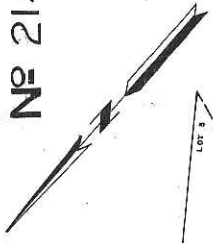
Alli Lee
Notary Public

Print: Alli Lee

My Commission expires: 7.17.89

REAL

№ 214A



CITY OF PORTLAND
 ASSESSORS PLAN
 SCALE 1" = 50' ±
 REVISED 12-18-73

GENERAL EAST-WEST AIRWAY

PORTLAND INTERNATIONAL AIRPORT

TRUNKWAY FOR THE EAST-WEST RUNWAY

AIRPORT ACCESS ROAD

PORTLAND SOUTH PORTLAND

PRIMA FIDELITY RIGHT OF WAY

PORTLAND SOUTH PORTLAND

JOHNSON ROAD

PORTLAND SOUTH PORTLAND

SHEET 214-C SHEET 232-B SHEET 214-B



View of proposed basin from City Line Drive



#52 - #58 City Line Drive building background



View of proposed basin area



View of existing catch basin off Johnson Road



View of 68 Johnson Road – future parking area.

WATER QUALITY COMPUTATIONS AND HGL ANALYSIS

PROJECT: JN 2885.02
#52-#58 City Line Drive

Task:

Task No. 1 is to determine water quality treatment parameters for proposed water quality treatment basin to be constructed at #52-58 City Line Drive. The basin is to be constructed to collect stormwater runoff from approximately 3.88 acres of existing area. The basin shall be constructed as an underdrained soil filter field to provide a measure of water quality treatment prior to discharge to the existing storm drain system in Johnson Road. Task No. 2 is to perform a Hydraulic Grade Line Analysis of the existing drainage system in Johnson Road to determine available capacity to accept additional flow from redirected area off City Line Drive.

Reference:

1. Plans by DeLuca-Hoffman Associates, Inc. for properties along City Line Drive.
2. Aerial mapping and topography provided by the City of Portland.
3. Record plans on file with the City of Portland Associated with a plan set titled "UNUM HD-3 Offsite Traffic Improvement" Plan & Profiles, prepared by Sebago Technics, dated June 1998.

Assumptions:

1. The basis of the existing conditions used for the analysis of capacity for the Johnson Road drainage system is primarily the design drawings by Sebago Technics for UNUM, prepared in 1998. All existing pipe sizes are based on these plans. It was noted during our cursory reconnaissance that some structures may have not been installed per plan, however, this had not been accounted for in the analysis. The watershed boundaries depicted on the accompanying plans are approximate and are based on a cursory review of conditions.

Modify Software:

1. Hydro CAD Stormwater Modeling System, Version 8.50, Applied Micro Computer Systems.
2. Hydra Flow Storm Sewers 2005, Version 11.0.0.1 by Intelisolue used for modeling pipe flow hydraulics including hydraulic grade line determination and pipe capacity.

Complications:

Task No. 1: Water Quality Treatment Basin

1. Water Quality Treatment volume based on Maine DEP Best Management Practices (BMP) manual –
2. Theoretical Water Quality volume is based on treating 1" times the subcatchment's impervious area and 0.4" times the subcatchment's landscaped area.

Impervious area – 2.75 acres which include 1.37 acres at 90 Johnson Road that are currently treated by a Vortechnic Hydrodynamic Separator.

Landscape Area – 1.13 acres.

Applying credit for Pretreatment (25% reduction in WQV) yields the following:

$$\begin{aligned} 1.38 \text{ acres} \times 43,560 \times \frac{1''}{12} &= 5,009 \text{ CF} \\ 1.37 \text{ acres} \times 43,560 \times \frac{1''}{12} \times 0.75 &= 3,729 \text{ CF} \\ 1.13 \text{ acres} \times 43,560 \times \frac{0.4''}{12} &= \underline{1,640 \text{ CF}} \\ \text{Total WQV} &= 10,378 \text{ CF} \end{aligned}$$

3. Volume Provided by Proposed Basin:

Bottom of treatment cell	=	66.5'
12" outlet @ Elevation	=	67.85'
WQV depth	=	1.35'
WQV (Per HydroCad)	=	6,900 CF which is less than required, therefore determine what level of treatment will be provided.

4. Determine Actual WQV converted into rainfall depth treated for 0.5"/impervious area + 0.2"/Landscape area

$$\begin{aligned} \text{WQV required} = 1.38 \text{ acres} \times 43,560 \times \frac{0.5''}{12} &= 2,504 \text{ CF} \\ 1.37 \text{ acres} \times 43,560 \times \frac{0.5''}{12} \times 0.75 &= 1,864 \text{ CF} \\ 1.13 \times 43,560 \times \frac{0.2''}{12} &= 820 \text{ CF} \\ \text{Total} &= 5,188 \text{ CF} \end{aligned}$$

WQV provided > WQV required: OK

For 0.6"/impervious acre + 0.25"/landscape acres

$$\begin{aligned} \text{WQV required} = 1.38 \text{ acres} \times 43,560 \times \frac{0.6''}{12} &= 3,005 \text{ CF} \\ 1.37 \text{ acres} \times 43,560 \times \frac{0.6''}{12} \times 0.75 &= 2,237 \text{ CF} \\ 1.13 \times 43,560 \times \frac{0.25''}{12} &= 984 \text{ CF} \\ \text{Total} &= 6,226 \text{ CF} \end{aligned}$$

WQV provided > WQV required: OK

Conclusions:

The proposed underdrained soil filter will not provide a water quality treatment volume to meet the 1"/impervious acre and 0.4"/landscape area standard; however, it has adequate volume to treat at least 0.6"/impervious acre and 0.25"/landscape area.

Task No. 2: Hydraulic Grade Line Analysis of Existing System

1. Use Rational Method Q – CIA to determine approximate flow values to each catch basin within the system. The accompanying Table 1 provides estimated drainage areas, curve number and rainfall intensities for the 10-year and 25-year storm.
2. The total drainage area for the Johnson Road system was estimated to be about 14.33 acres.
3. Rainfall Intensity Values are based on the IDF curve for Portland, Maine (see attached). A 5 minute time of concentration was used for all catch basins except for the 3 structures in front of the Temple Beth El Cemetery off Johnson Road, where a 20 minute time of concentration value was used to determine I_{25} .
4. The Hydra flow storm savers computer program was used to determine a Hydraulic grade line for existing and proposed conditions. The proposed conditions assume a peak flow of 3.27 cfs being introduced into the Johnson Road system.

Conclusions:

A peak flow of 3.27 cfs results during a 25-year storm event. Based on the Hydra flow analysis the introduction of an additional 3.27 cfs will not result in a significant impact to the HGL of the existing Johnson Road drainage system.

7/28/2010
Johnson Road Storm Drain
Rational Method estimation of flow

C-Values		$T_c = 5 \text{ min.}$	$T_c = 20 \text{ min.}$	
Lawn	0.25	I_p	3.9	2.2
Cemetery	0.15	I_{10}	5.3	3.15
Asphalt	0.90	I_{25}	6.2	3.65
Woods	0.25			

Use $T_c = 20 \text{ min.}$ for subareas 16b, 15b, & 14b associated with Cemetery

Structure ID (sf)	Pavement Area (sf)	Grass area (sf)	Total Area (acres)	Weighted C	$Q_{25}=CIA$	25 year Cumulative flow (cfs)	$Q_{10}=CIA$	10 year Cumulative flow (cfs)	25 year cumulative flow with Redirected area (cfs)
16a	4825	755	0.13	0.81	0.64		0.55		3.91
16b	14328	79560	2.16	0.26	2.08	2.73	1.80	2.35	6
DMH 16									
15a	6525	999	0.17	0.81	0.87		0.74		
15b	16560	51372	1.56	0.33	1.89		1.64		
DMH 15						5.49		4.73	8.76
14a	6588	1512	0.19	0.78	0.90		0.77		
14b	6500	121732	2.94	0.19	2.02		1.74		
DMH 14						8.41		7.24	11.68
13a	2000	8168	0.23	0.38	0.55		0.47		
13b	5976		0.14	0.90	0.77		0.65		
DMH 13						9.72		8.36	12.99
4a		9360	0.21	0.25	0.33		0.28		
4b	9900	16552	0.58	0.50	1.82		1.56		
5a	6516	5148	0.27	0.61	1.02	2.15	0.87	1.84	
5b	5976		0.14	0.90	0.77		0.65		
6a	8136	3060	0.26	0.72	1.15	3.94	0.98	3.37	
6b	9792		0.22	0.90	1.25	6.34	1.07	5.42	
7a	7500	4452	0.27	0.66	1.12		0.96		
7b	11988		0.28	0.90	1.54		1.31	7.69	
8	6500	4840	0.28	0.62	1.00	9.00	0.85		
DMH 8						19.02		16.31	22.29
9a	9324	23580	0.76	0.43	2.03		1.74		
9b	7500	852	0.19	0.83	0.99		0.85		
DMH 9						22.04		18.89	25.31
field inlet to CB 8		8388	0.19	0.25	0.30		0.26		
field inlet to DMH 10		31032	0.71	0.25	1.10		0.94		
DMH 10						23.15		20.09	26.42
11a	9396		0.22	0.90	1.20		1.03		
11b	13392	43812	1.31	0.40	3.27		2.80		
field inlet to 11a	4500	14040	0.43	0.41	1.06		0.92		
DMH 11						28.70		24.84	31.97
12a	5688		0.13	0.90	0.73		0.62		
12b	7308	9324	0.38	0.54	1.27		1.06		
Total Area			14.33 acres			Outlet Flow from DMH 12			
						30.70 CFS		26.55 CFS	33.97 CFS

**City Line Drive Redirected area - Portland, Maine
PROPOSED VUF #1 DRAWDOWN CALCULATIONS**

Stage Elev.	Surf. Area	Inc. Vol	Cum. Vol
64.16	3,100 ft ²	0,000 ft ³	0,000 ft ³
65	3,100 ft ²	2,604 ft ³	2,604 ft ³
66	3,100 ft ²	5,704 ft ³	5,704 ft ³
66.5	3,100 ft ²	4,650 ft ³	7,254 ft ³
67	3,792 ft ²	6,892 ft ³	9,496 ft ³
68	5,168 ft ²	4,480 ft ³	13,976 ft ³
69	7,008 ft ²	6,088 ft ³	20,064 ft ³

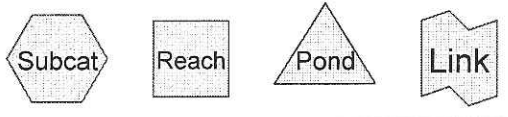
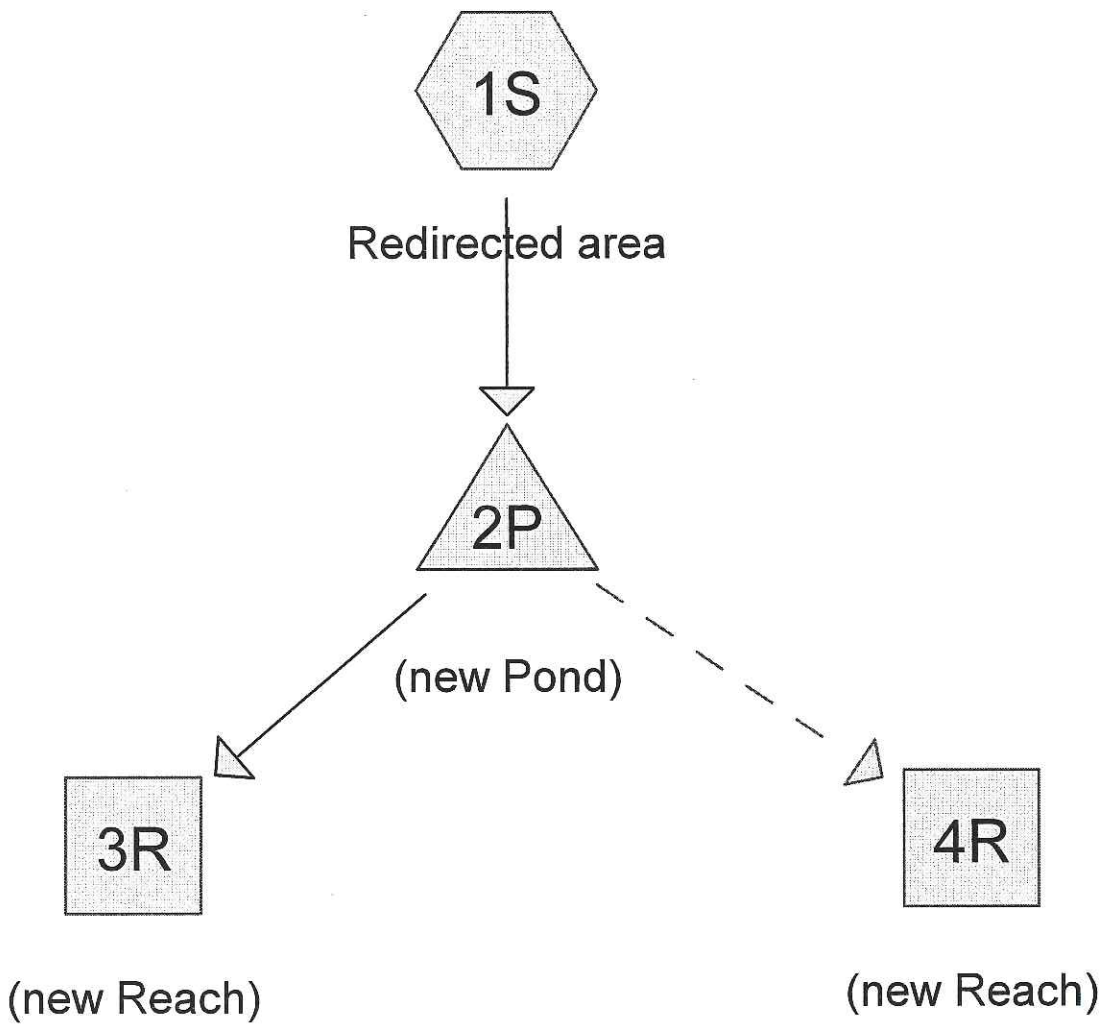
Orifice Eqn: $t = (2A / (Ca^2g)) (h_1^{3/2} - h_2^{3/2})$

Discharge Coefficient C = 0.62
 Orifice Size = 2.00 in
 Orifice Size = 0.17 ft
 Cross sectional Area of Orifice (a) = 0.022 ft²
 Vessel (A) = 3100 ft²
 Orifice Centerline Elevation = 64.41

← USE 2" orifice in OUTLET CONTROL STRUCTURE

t (sec)	Stage Elevation	Starting Water Level Above Orifice (h1)	Ending Water Level Above Orifice (h2)	Pond Area	t (hrs)
0.00 sec	65.00	0.59 ft	0.59 ft	3100 ft ²	0.00 hrs
28149.67 sec	66.00	1.59 ft	0.59 ft	3,100 ft ²	7.82 hrs
19899.51 sec	67.00	2.59 ft	1.59 ft	3,100 ft ²	5.53 hrs
41485.45 sec	67.85	3.44 ft	1.59 ft	3,792 ft ²	11.52 hrs
Total Drawdown Time					24.87 hrs

← > 24 hrs ∴ OK



Drainage Diagram for Redirect Drainage area #2
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Redirect Drainage area #2

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.130	74	Lawn C Soils (1S)
2.750	98	Impervious area (roof and pavement) (1S)
3.880		TOTAL AREA

Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 2 year Rainfall=3.00"

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Time span=3.00-36.00 hrs, dt=0.15 hrs, 221 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Redirected area Runoff Area=3.880 ac 70.88% Impervious Runoff Depth=2.07"
Tc=20.0 min CN=91 Runoff=6.08 cfs 0.670 af

Reach 3R: (new Reach) Avg. Depth=0.61' Max Vel=3.48 fps Inflow=1.75 cfs 0.670 af
D=12.0" n=0.011 L=273.0' S=0.0036 '/ Capacity=2.54 cfs Outflow=1.74 cfs 0.670 af

Reach 4R: (new Reach) Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
D=12.0" n=0.011 L=50.0' S=0.0054 '/ Capacity=3.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: (new Pond) Peak Elev=68.66' Storage=12,609 cf Inflow=6.08 cfs 0.670 af
Primary=1.75 cfs 0.670 af Secondary=0.00 cfs 0.000 af Outflow=1.75 cfs 0.670 af

Total Runoff Area = 3.880 ac Runoff Volume = 0.670 af Average Runoff Depth = 2.07"
29.12% Pervious = 1.130 ac 70.88% Impervious = 2.750 ac

Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 2 year Rainfall=3.00"

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Summary for Subcatchment 1S: Redirected area

Runoff = 6.08 cfs @ 12.29 hrs, Volume= 0.670 af, Depth= 2.07"

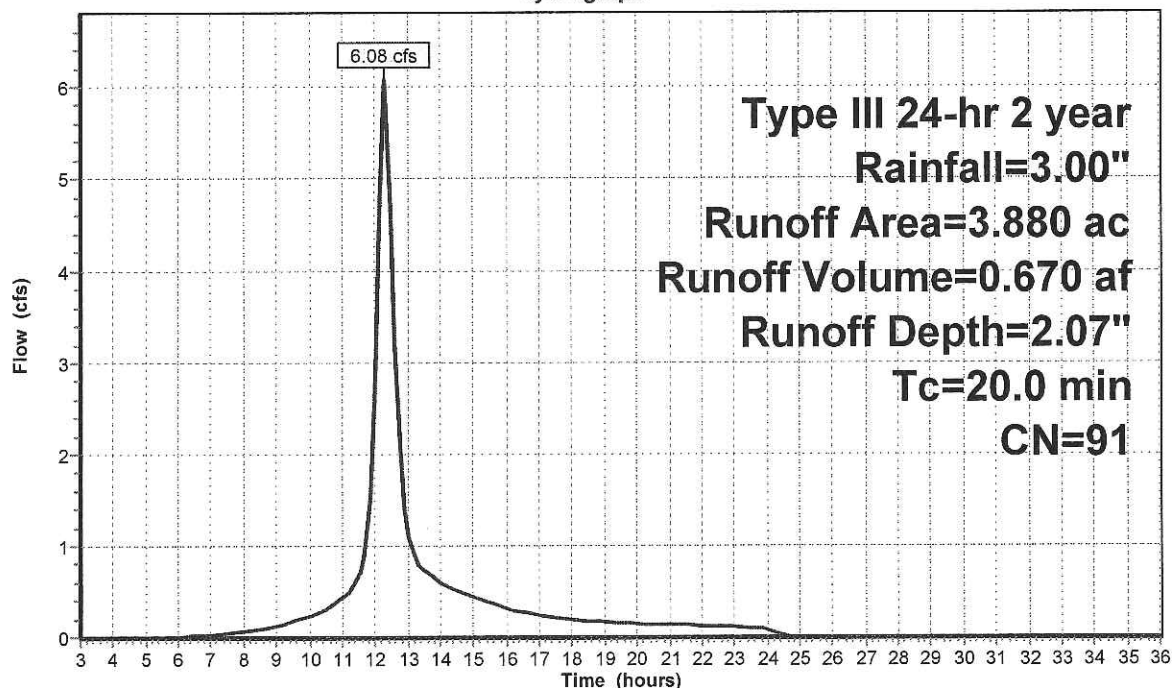
Runoff by SCS TR-20 method, UH=SCS, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
Type III 24-hr 2 year Rainfall=3.00"

Area (ac)	CN	Description
* 2.750	98	Impervious area (roof and pavement)
* 1.130	74	Lawn C Soils
3.880	91	Weighted Average
1.130		Pervious Area
2.750		Impervious Area

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

Subcatchment 1S: Redirected area

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 2 year Rainfall=3.00"

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Summary for Reach 3R: (new Reach)

[52] Hint: Inlet/Outlet conditions not evaluated

[79] Warning: Submerged Pond 2P Primary device # 1 by 0.67'

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth = 2.07" for 2 year event
Inflow = 1.75 cfs @ 12.82 hrs, Volume= 0.670 af
Outflow = 1.74 cfs @ 12.90 hrs, Volume= 0.670 af, Atten= 0%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs

Max. Velocity= 3.48 fps, Min. Travel Time= 1.3 min

Avg. Velocity = 1.86 fps, Avg. Travel Time= 2.4 min

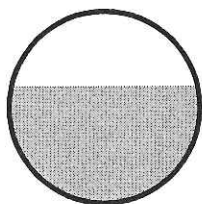
Peak Storage= 137 cf @ 12.88 hrs, Average Depth at Peak Storage= 0.61'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.011

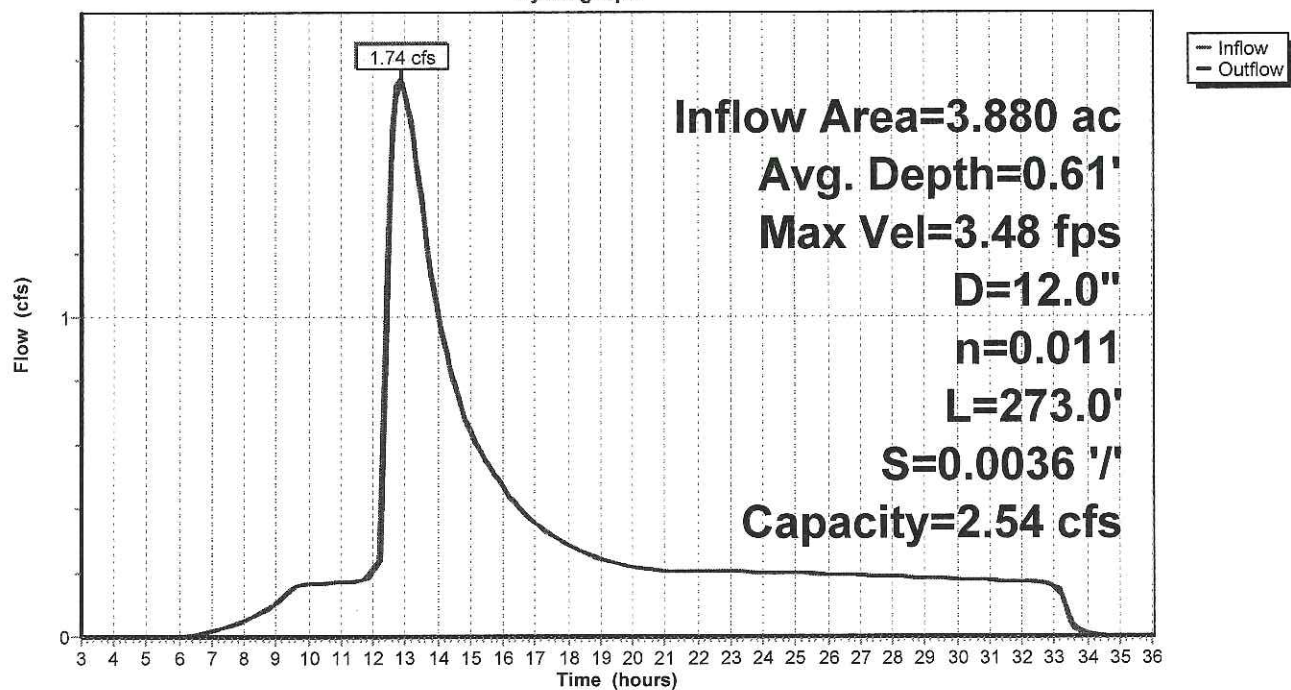
Length= 273.0' Slope= 0.0036 '/'

Inlet Invert= 64.06', Outlet Invert= 63.07'



Reach 3R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 2 year Rainfall=3.00"

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Summary for Reach 4R: (new Reach)

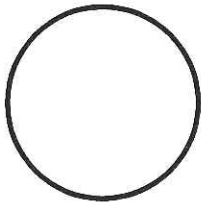
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

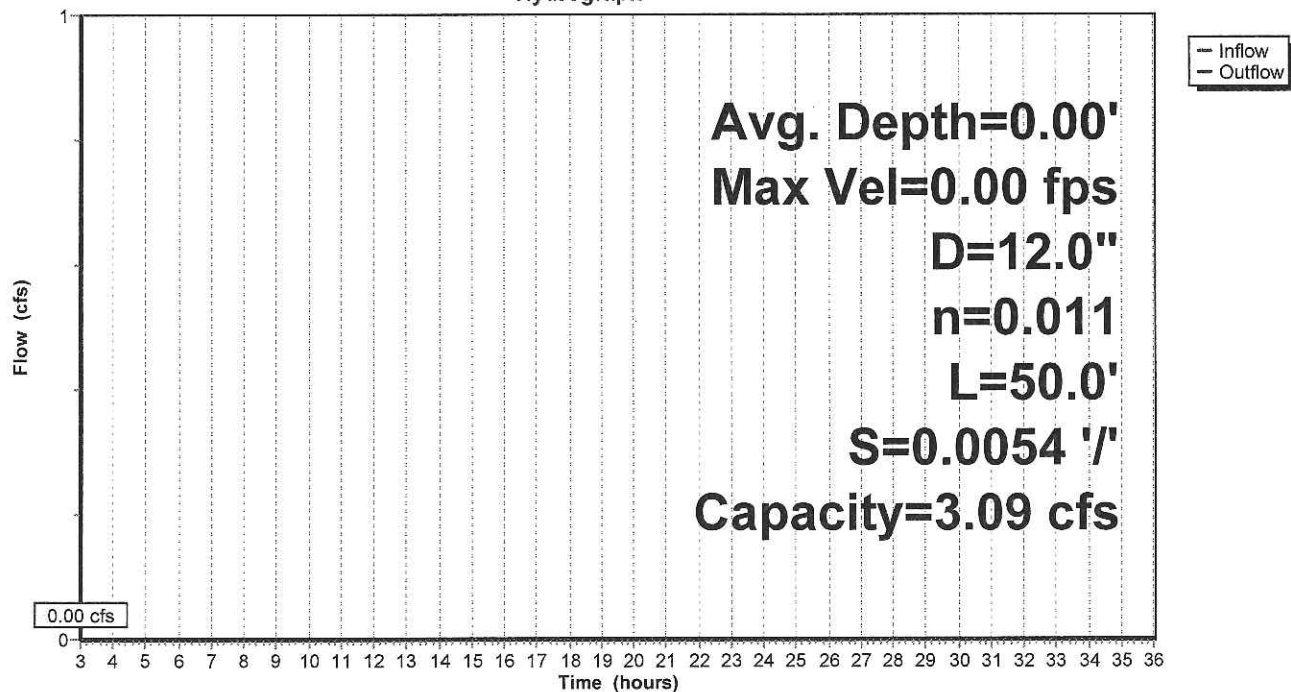
Peak Storage= 0 cf @ 3.00 hrs, Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.09 cfs

12.0" Diameter Pipe, n= 0.011
Length= 50.0' Slope= 0.0054 '/'
Inlet Invert= 66.40', Outlet Invert= 66.13'



Reach 4R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Summary for Pond 2P: (new Pond)

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth = 2.07" for 2 year event
 Inflow = 6.08 cfs @ 12.29 hrs, Volume= 0.670 af
 Outflow = 1.75 cfs @ 12.82 hrs, Volume= 0.670 af, Atten= 71%, Lag= 31.8 min
 Primary = 1.75 cfs @ 12.82 hrs, Volume= 0.670 af
 Secondary = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
 Peak Elev= 68.66' @ 12.82 hrs Surf.Area= 7,732 sf Storage= 12,609 cf

Plug-Flow detention time= 264.7 min calculated for 0.670 af (100% of inflow)
 Center-of-Mass det. time= 264.5 min (1,082.4 - 817.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	27,011 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,968	0	0
67.00	4,868	2,209	2,209
68.00	6,556	5,712	7,921
69.00	8,348	7,452	15,373
70.00	14,928	11,638	27,011

Device	Routing	Invert	Outlet Devices
#1	Primary	64.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Secondary	69.70'	0.21' x 0.21' Horiz. Orifice/Grate X 36.00 Limited to weir flow C= 0.600
#4	Secondary	69.90'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.73 cfs @ 12.82 hrs HW=68.65' (Free Discharge)

- ↑1=Orifice/Grate (Orifice Controls 0.22 cfs @ 10.29 fps)
- ↓2=Orifice/Grate (Orifice Controls 1.50 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 3.00 hrs HW=66.50' (Free Discharge)

- ↑3=Orifice/Grate (Controls 0.00 cfs)
- ↓4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Redirect Drainage area #2

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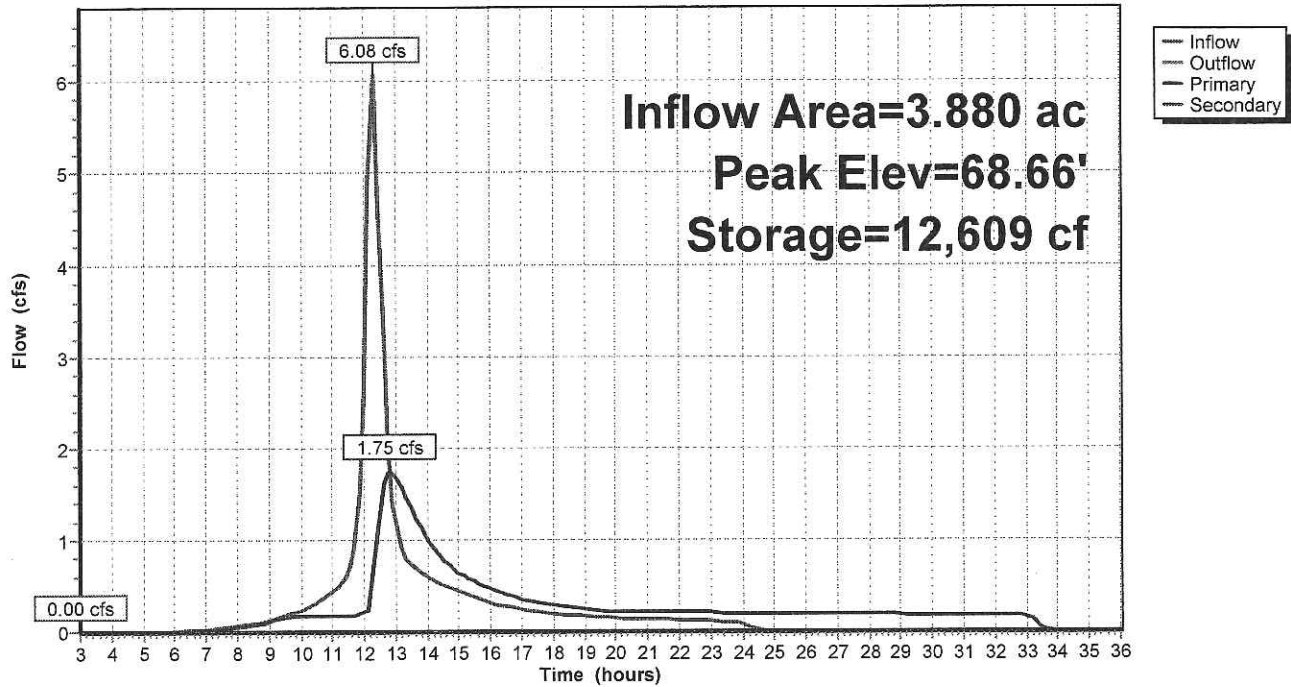
Redirect Drainage Area - City Line Drive
Type III 24-hr 2 year Rainfall=3.00"

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Pond 2P: (new Pond)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive

Type III 24-hr 10 year Rainfall=4.70"

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Time span=3.00-36.00 hrs, dt=0.15 hrs, 221 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Redirected area

Runoff Area=3.880 ac 70.88% Impervious Runoff Depth=3.69"

Tc=20.0 min CN=91 Runoff=10.57 cfs 1.194 af

Reach 3R: (new Reach)

Avg. Depth=1.00' Max Vel=3.66 fps Inflow=3.07 cfs 1.194 af

D=12.0" n=0.011 L=273.0' S=0.0036 '/ Capacity=2.54 cfs Outflow=2.70 cfs 1.193 af

Reach 4R: (new Reach)

Avg. Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af

D=12.0" n=0.011 L=50.0' S=0.0054 '/ Capacity=3.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: (new Pond)

Peak Elev=69.66' Storage=22,347 cf Inflow=10.57 cfs 1.194 af

Primary=3.07 cfs 1.194 af Secondary=0.00 cfs 0.000 af Outflow=3.07 cfs 1.194 af

Total Runoff Area = 3.880 ac Runoff Volume = 1.194 af Average Runoff Depth = 3.69"
29.12% Pervious = 1.130 ac 70.88% Impervious = 2.750 ac

Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
 Type III 24-hr 10 year Rainfall=4.70"

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Summary for Subcatchment 1S: Redirected area

Runoff = 10.57 cfs @ 12.29 hrs, Volume= 1.194 af, Depth= 3.69"

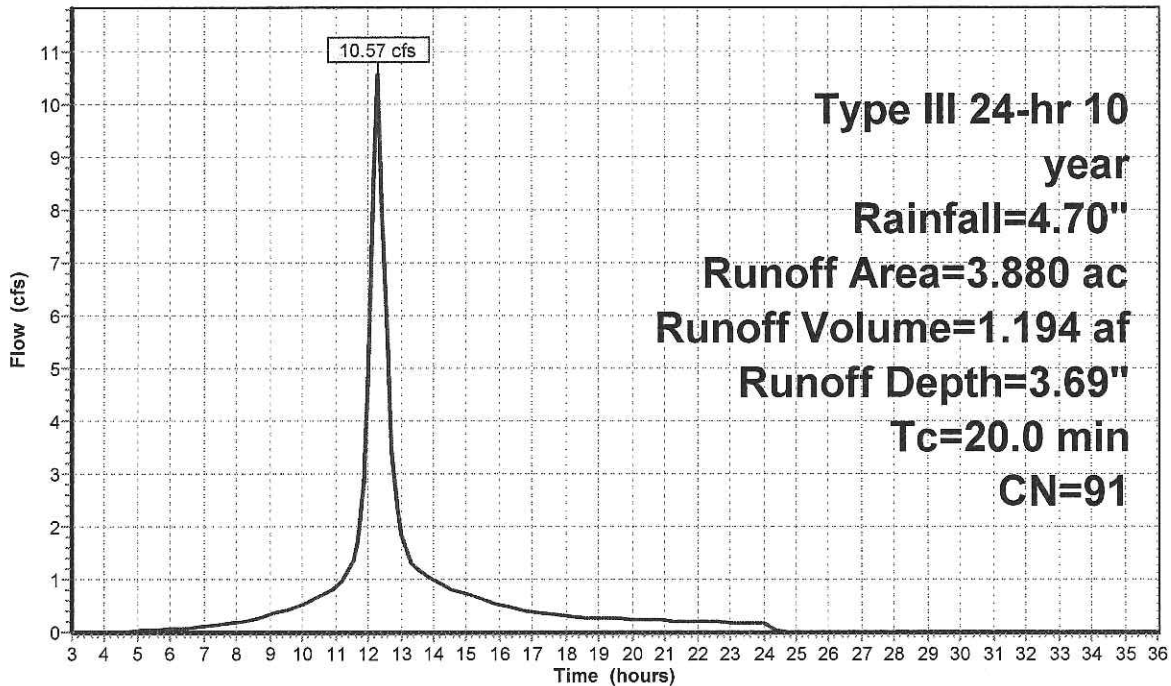
Runoff by SCS TR-20 method, UH=SCS, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
 Type III 24-hr 10 year Rainfall=4.70"

Area (ac)	CN	Description
* 2.750	98	Impervious area (roof and pavement)
* 1.130	74	Lawn C Soils
3.880	91	Weighted Average
1.130		Pervious Area
2.750		Impervious Area

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

Subcatchment 1S: Redirected area

Hydrograph



Runoff

Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive

Type III 24-hr 10 year Rainfall=4.70"

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Summary for Reach 3R: (new Reach)

[52] Hint: Inlet/Outlet conditions not evaluated

[55] Hint: Peak inflow is 121% of Manning's capacity

[76] Warning: Detained 0.041 af (Pond w/culvert advised)

[79] Warning: Submerged Pond 2P Primary device # 1 by 1.06'

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth > 3.69" for 10 year event
Inflow = 3.07 cfs @ 12.81 hrs, Volume= 1.194 af
Outflow = 2.70 cfs @ 12.50 hrs, Volume= 1.193 af, Atten= 12%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs

Max. Velocity= 3.66 fps, Min. Travel Time= 1.2 min

Avg. Velocity = 2.02 fps, Avg. Travel Time= 2.2 min

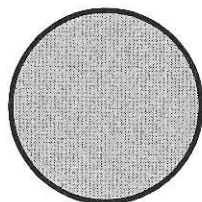
Peak Storage= 214 cf @ 12.60 hrs, Average Depth at Peak Storage= 1.00'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.011

Length= 273.0' Slope= 0.0036 1'

Inlet Invert= 64.06', Outlet Invert= 63.07'



Redirect Drainage area #2

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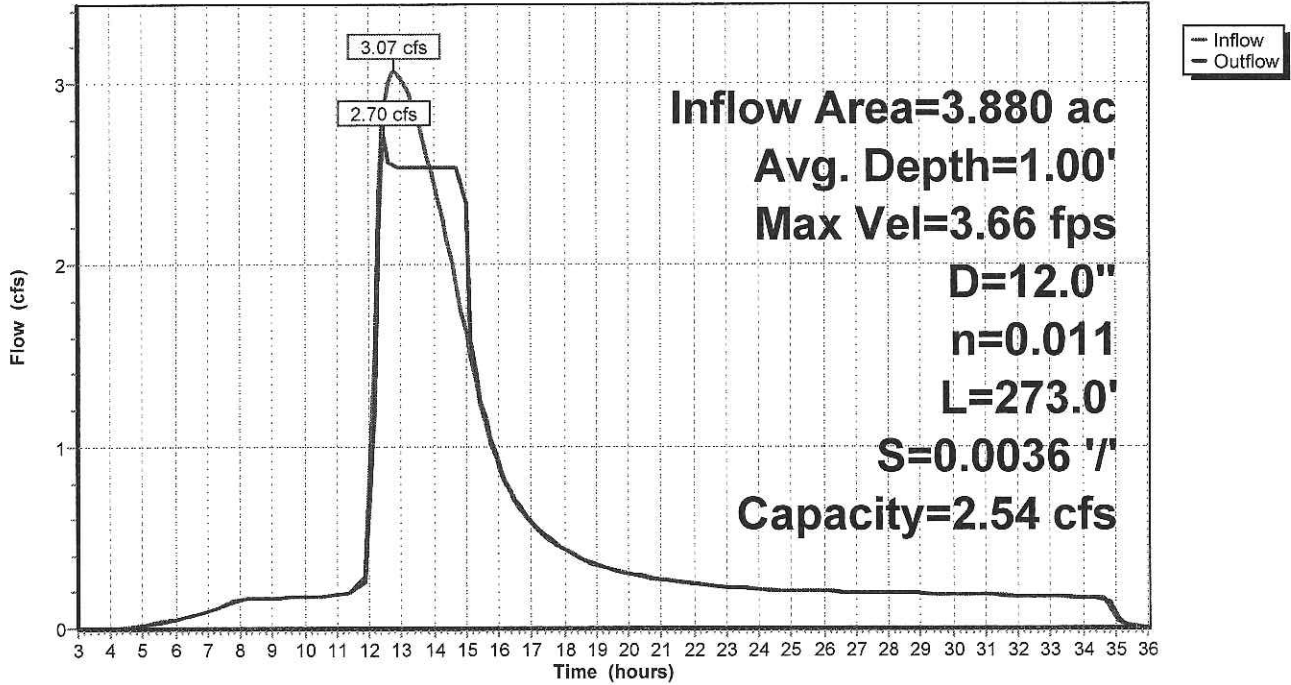
Redirect Drainage Area - City Line Drive
Type III 24-hr 10 year Rainfall=4.70"

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Reach 3R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 10 year Rainfall=4.70"

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Summary for Reach 4R: (new Reach)

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

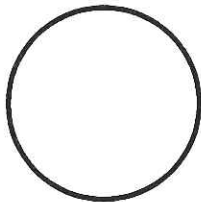
Peak Storage= 0 cf @ 3.00 hrs, Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.09 cfs

12.0" Diameter Pipe, n= 0.011

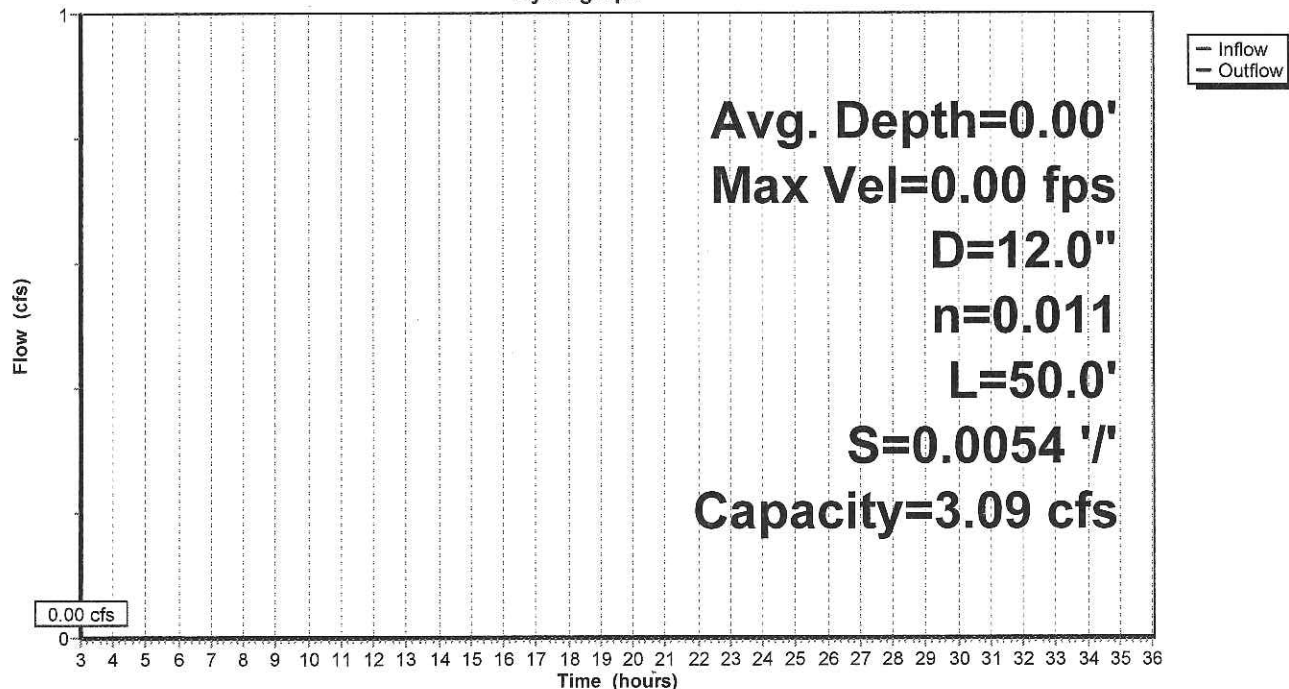
Length= 50.0' Slope= 0.0054 '/'

Inlet Invert= 66.40', Outlet Invert= 66.13'



Reach 4R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Summary for Pond 2P: (new Pond)

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth = 3.69" for 10 year event
 Inflow = 10.57 cfs @ 12.29 hrs, Volume= 1.194 af
 Outflow = 3.07 cfs @ 12.81 hrs, Volume= 1.194 af, Atten= 71%, Lag= 31.2 min
 Primary = 3.07 cfs @ 12.81 hrs, Volume= 1.194 af
 Secondary = 0.00 cfs @ 3.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
 Peak Elev= 69.66' @ 12.81 hrs Surf.Area= 12,707 sf Storage= 22,347 cf

Plug-Flow detention time= 202.1 min calculated for 1.194 af (100% of inflow)
 Center-of-Mass det. time= 202.0 min (1,003.9 - 801.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	27,011 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,968	0	0
67.00	4,868	2,209	2,209
68.00	6,556	5,712	7,921
69.00	8,348	7,452	15,373
70.00	14,928	11,638	27,011

Device	Routing	Invert	Outlet Devices
#1	Primary	64.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Secondary	69.70'	0.21' x 0.21' Horiz. Orifice/Grate X 36.00 Limited to weir flow C= 0.600
#4	Secondary	69.90'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.06 cfs @ 12.81 hrs HW=69.65' (Free Discharge)

- └1=Orifice/Grate (Orifice Controls 0.25 cfs @ 11.36 fps)
- └2=Orifice/Grate (Orifice Controls 2.81 cfs @ 5.71 fps)

Secondary OutFlow Max=0.00 cfs @ 3.00 hrs HW=66.50' (Free Discharge)

- └3=Orifice/Grate (Controls 0.00 cfs)
- └4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Redirect Drainage area #2

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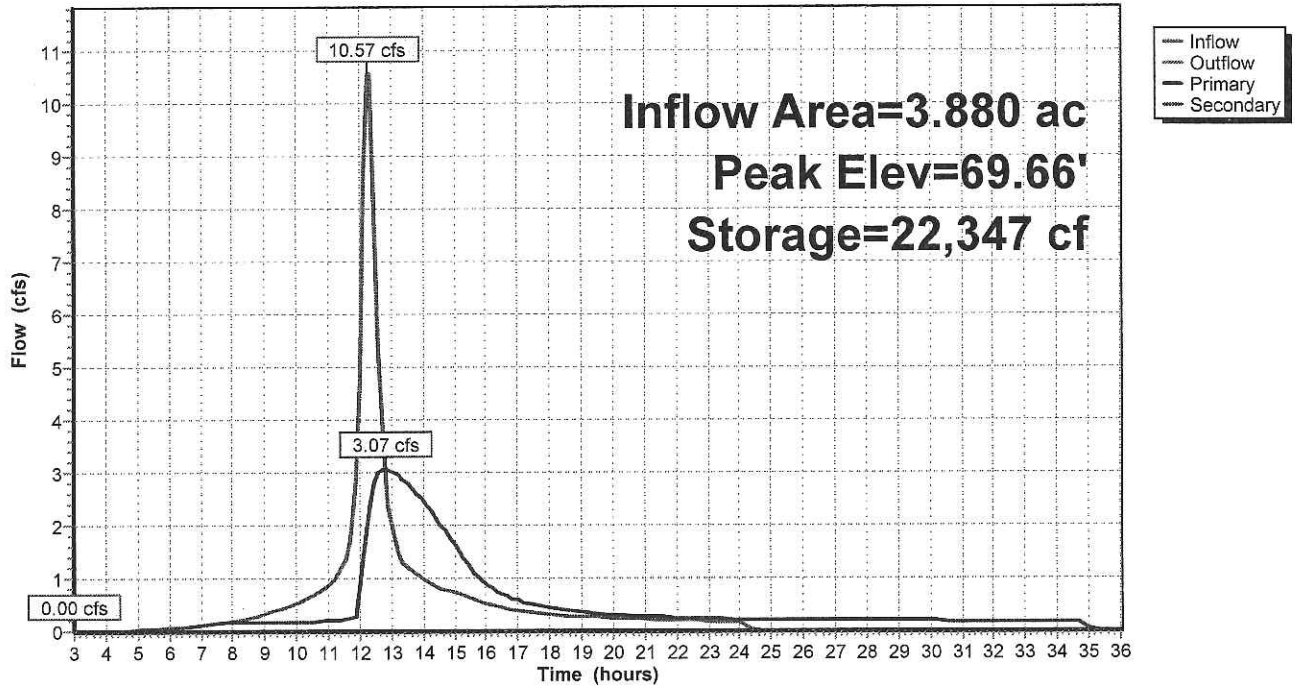
Redirect Drainage Area - City Line Drive
Type III 24-hr 10 year Rainfall=4.70"

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Pond 2P: (new Pond)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

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Time span=3.00-36.00 hrs, dt=0.15 hrs, 221 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Redirected area

Runoff Area=3.880 ac 70.88% Impervious Runoff Depth=4.47"
Tc=20.0 min CN=91 Runoff=12.66 cfs 1.445 af

Reach 3R: (new Reach)

Avg. Depth=1.00' Max Vel=3.66 fps Inflow=3.27 cfs 1.344 af
D=12.0" n=0.011 L=273.0' S=0.0036 '/' Capacity=2.54 cfs Outflow=2.69 cfs 1.344 af

Reach 4R: (new Reach)

Avg. Depth=0.83' Max Vel=4.49 fps Inflow=3.18 cfs 0.101 af
D=12.0" n=0.011 L=50.0' S=0.0054 '/' Capacity=3.09 cfs Outflow=3.15 cfs 0.101 af

Pond 2P: (new Pond)

Peak Elev=69.86' Storage=25,027 cf Inflow=12.66 cfs 1.445 af
Primary=3.27 cfs 1.344 af Secondary=3.18 cfs 0.101 af Outflow=6.44 cfs 1.445 af

Total Runoff Area = 3.880 ac Runoff Volume = 1.445 af Average Runoff Depth = 4.47"
29.12% Pervious = 1.130 ac 70.88% Impervious = 2.750 ac

Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

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Summary for Subcatchment 1S: Redirected area

Runoff = 12.66 cfs @ 12.29 hrs, Volume= 1.445 af, Depth= 4.47"

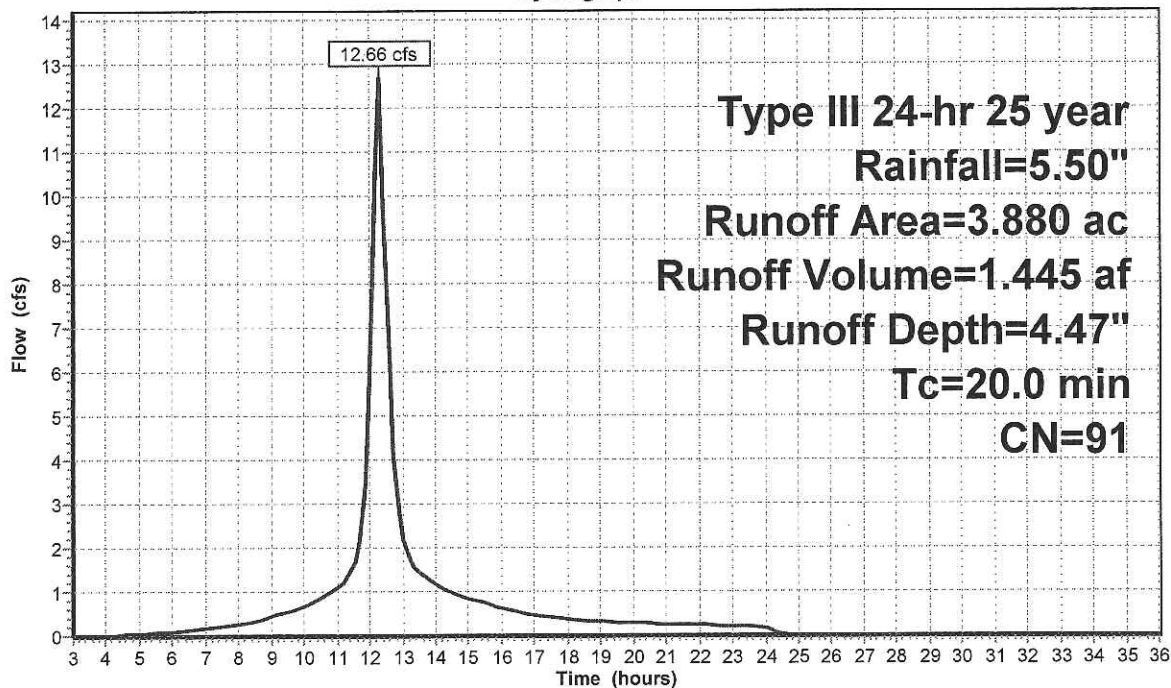
Runoff by SCS TR-20 method, UH=SCS, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (ac)	CN	Description
* 2.750	98	Impervious area (roof and pavement)
* 1.130	74	Lawn C Soils
3.880	91	Weighted Average
1.130		Pervious Area
2.750		Impervious Area

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

Subcatchment 1S: Redirected area

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

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Summary for Reach 3R: (new Reach)

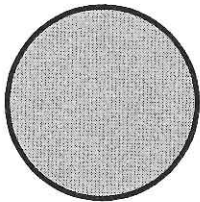
- [52] Hint: Inlet/Outlet conditions not evaluated
- [55] Hint: Peak inflow is 129% of Manning's capacity
- [76] Warning: Detained 0.067 af (Pond w/culvert advised)
- [79] Warning: Submerged Pond 2P Primary device # 1 by 1.06'

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth > 4.16" for 25 year event
Inflow = 3.27 cfs @ 12.64 hrs, Volume= 1.344 af
Outflow = 2.69 cfs @ 12.36 hrs, Volume= 1.344 af, Atten= 18%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 2.2 min

Peak Storage= 214 cf @ 12.45 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.011
Length= 273.0' Slope= 0.0036 '/'
Inlet Invert= 64.06', Outlet Invert= 63.07'



Redirect Drainage area #2

Prepared by Deluca-Hoffman Associates, Inc

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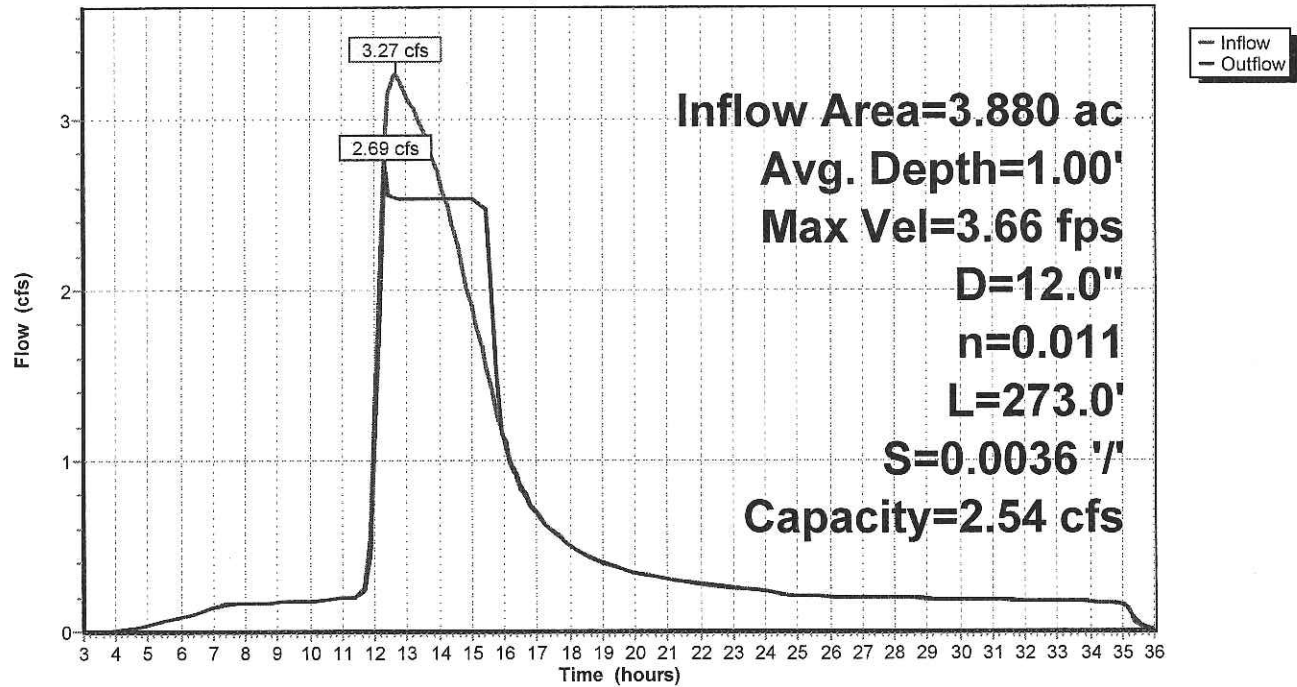
Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

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Reach 3R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive

Type III 24-hr 25 year Rainfall=5.50"

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Summary for Reach 4R: (new Reach)

[52] Hint: Inlet/Outlet conditions not evaluated

[55] Hint: Peak inflow is 103% of Manning's capacity

Inflow = 3.18 cfs @ 12.65 hrs, Volume= 0.101 af
Outflow = 3.15 cfs @ 12.66 hrs, Volume= 0.101 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs

Max. Velocity= 4.49 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 3.55 fps, Avg. Travel Time= 0.2 min

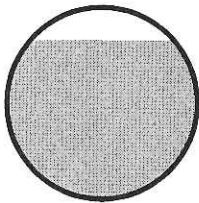
Peak Storage= 35 cf @ 12.65 hrs, Average Depth at Peak Storage= 0.83'

Bank-Full Depth= 1.00', Capacity at Bank-Full= 3.09 cfs

12.0" Diameter Pipe, n= 0.011

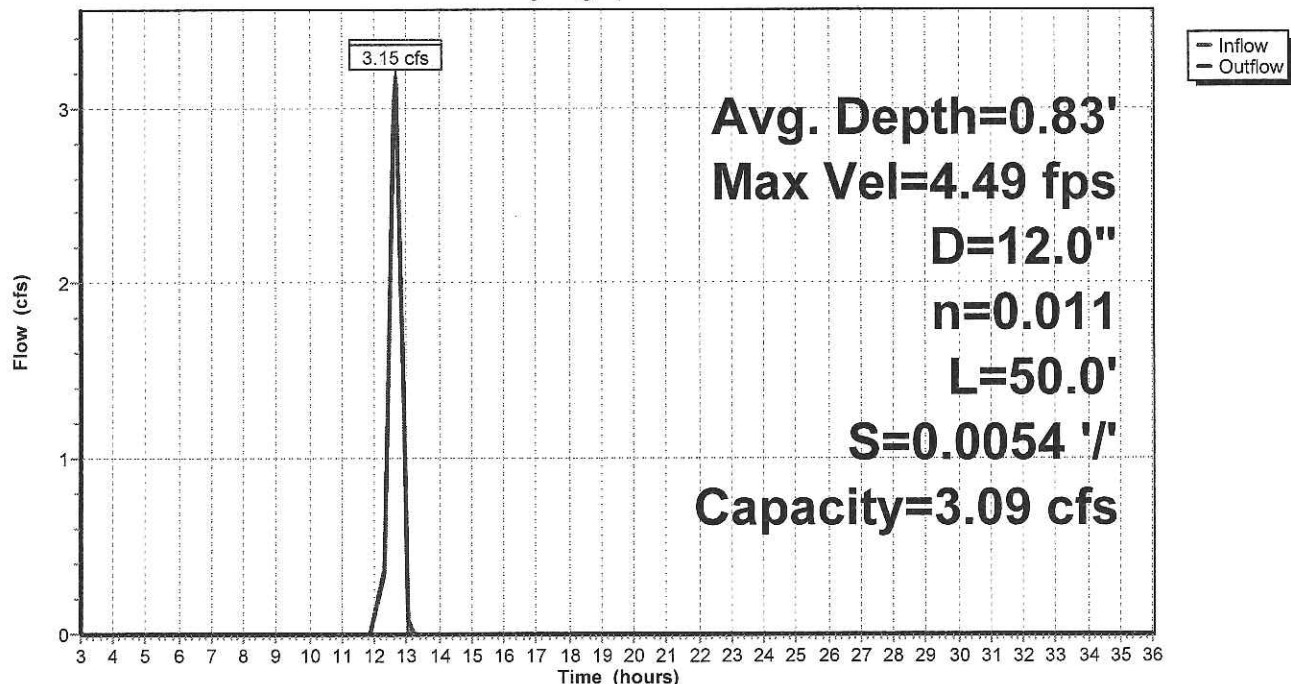
Length= 50.0' Slope= 0.0054 1'

Inlet Invert= 66.40', Outlet Invert= 66.13'



Reach 4R: (new Reach)

Hydrograph



Redirect Drainage area #2

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Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

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Summary for Pond 2P: (new Pond)

Inflow Area = 3.880 ac, 70.88% Impervious, Inflow Depth = 4.47" for 25 year event
 Inflow = 12.66 cfs @ 12.29 hrs, Volume= 1.445 af
 Outflow = 6.44 cfs @ 12.65 hrs, Volume= 1.445 af, Atten= 49%, Lag= 21.9 min
 Primary = 3.27 cfs @ 12.64 hrs, Volume= 1.344 af
 Secondary = 3.18 cfs @ 12.65 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 3.00-36.00 hrs, dt= 0.15 hrs
 Peak Elev= 69.86' @ 12.64 hrs Surf.Area= 14,026 sf Storage= 25,027 cf

Plug-Flow detention time= 179.3 min calculated for 1.438 af (100% of inflow)
 Center-of-Mass det. time= 181.5 min (978.2 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	27,011 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,968	0	0
67.00	4,868	2,209	2,209
68.00	6,556	5,712	7,921
69.00	8,348	7,452	15,373
70.00	14,928	11,638	27,011

Device	Routing	Invert	Outlet Devices
#1	Primary	64.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Secondary	69.70'	0.21' x 0.21' Horiz. Orifice/Grate X 36.00 Limited to weir flow C= 0.600
#4	Secondary	69.90'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.25 cfs @ 12.64 hrs HW=69.85' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.25 cfs @ 11.56 fps)

2=Orifice/Grate (Orifice Controls 3.00 cfs @ 6.10 fps)

Secondary OutFlow Max=2.92 cfs @ 12.65 hrs HW=69.85' (Free Discharge)

3=Orifice/Grate (Orifice Controls 2.92 cfs @ 1.84 fps)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Redirect Drainage area #2

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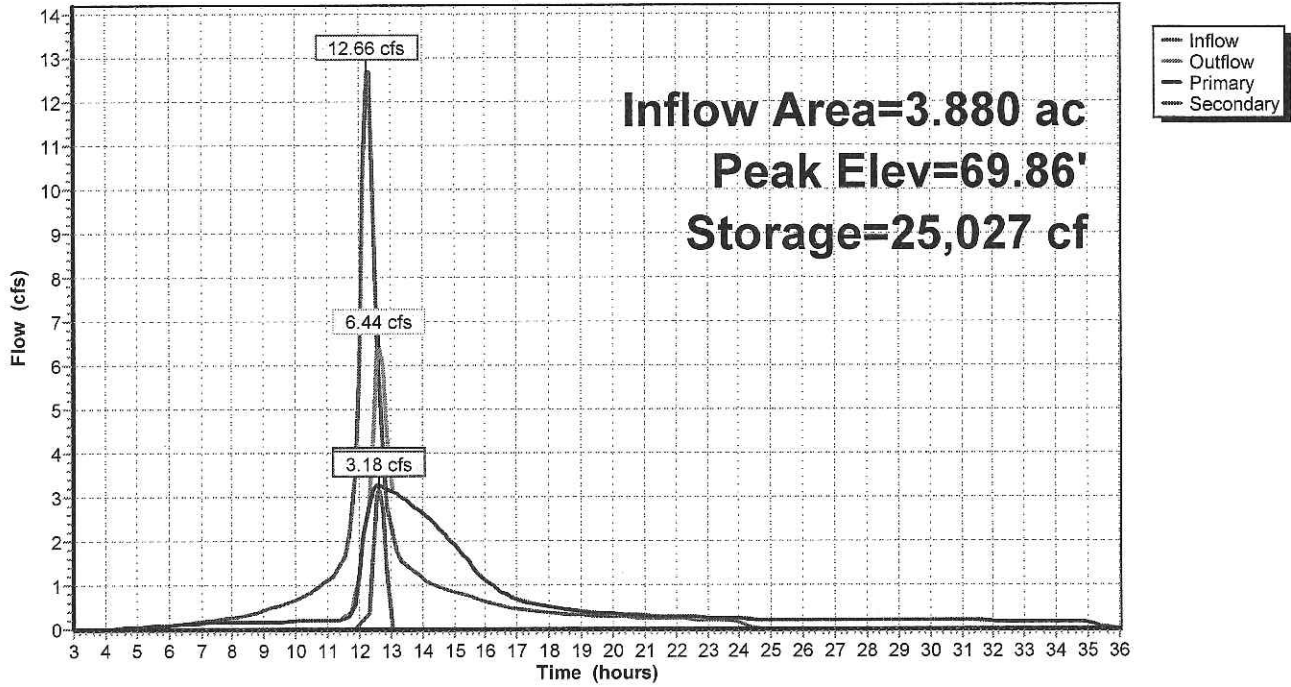
Redirect Drainage Area - City Line Drive
Type III 24-hr 25 year Rainfall=5.50"

Printed 7/30/2010

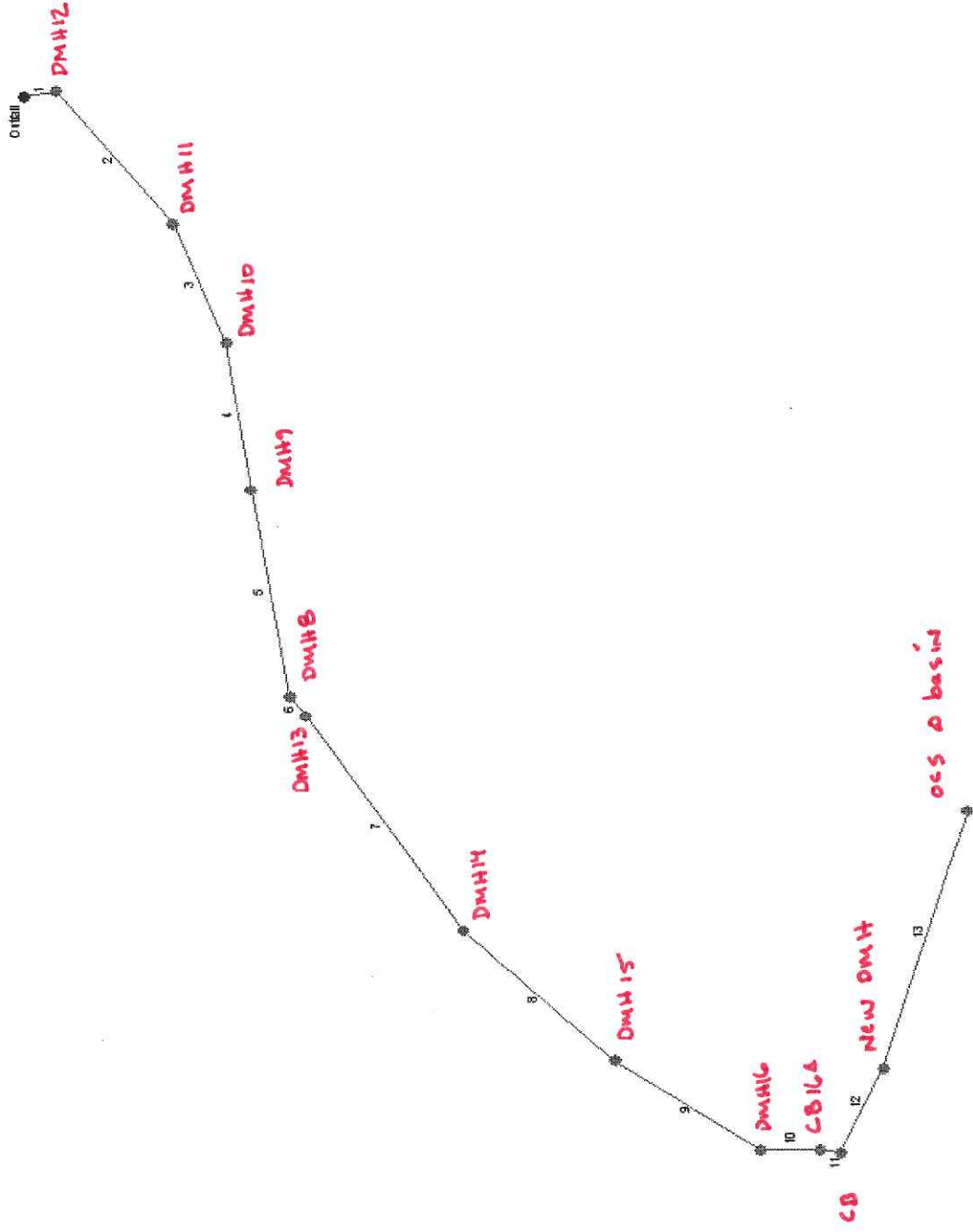
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Pond 2P: (new Pond)

Hydrograph



Hydraflow Plan View



Project File: Trail Run 3 with redirected area -25 year storm.stm

No. Lines: 13

07-30-2010

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data							Line ID	
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert EI Dn (ft)	Line slope (%)	Invert EI Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)		Inlet/ Rim EI (ft)
1	End	30.5	81.2	MH	33.97	0.00	0.00	5.0	48.00	0.72	48.22	30	Cir	0.012	0.89	54.96	outfall pipe
2	1	172.5	60.0	MH	31.97	0.00	0.00	5.0	48.32	0.48	49.15	30	Cir	0.012	0.34	57.00	DMH 11 to DMH 12
3	2	131.0	16.7	MH	26.42	0.00	0.00	5.0	49.50	0.48	50.13	27	Cir	0.012	0.28	56.76	dmh 10 - dmh 11
4	3	151.0	13.5	MH	25.31	0.00	0.00	5.0	50.48	0.97	51.95	24	Cir	0.012	0.15	59.09	dmh 9 - dmh 10
5	4	212.5	-0.8	MH	22.29	0.00	0.00	5.0	52.05	0.97	54.12	24	Cir	0.012	0.52	61.80	dmh 8 - dmh 9
6	5	25.6	-27.7	MH	12.99	0.00	0.00	5.0	54.72	1.17	55.02	18	Cir	0.012	0.15	62.35	dmh 13-dmh 8
7	6	262.0	3.4	MH	11.68	0.00	0.00	5.0	55.12	0.69	56.93	18	Cir	0.012	0.27	63.86	dmh 14 - dmh 13
8	7	193.0	-13.1	MH	8.76	0.00	0.00	5.0	57.28	0.98	59.17	15	Cir	0.012	0.19	66.55	dmh 15 - dmh 14
9	8	162.0	-9.1	MH	6.00	0.00	0.00	5.0	59.27	0.78	60.53	15	Cir	0.012	0.62	67.88	dmh 16 - dmh 15
10	9	55.0	-34.6	MH	3.91	0.00	0.00	5.0	60.85	0.75	61.26	12	Cir	0.012	0.21	67.54	CB 16A - DMH 16
11	10	19.0	10.0	MH	3.37	0.00	0.00	5.0	61.36	0.74	61.50	12	Cir	0.012	0.97	66.90	CB - cb 16a
12	11	94.0	-74.4	MH	3.27	0.00	0.00	0.0	62.50	0.50	62.97	12	Cir	0.012	0.18	70.00	New MH to Ex. CB
13	12	273.0	-8.3	MH	3.27	0.00	0.00	0.0	63.07	0.36	64.06	12	Cir	0.012	1.00	71.00	OCS to new Manhole

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1	outfall pipe	33.97	30 c	30.5	48.00	48.22	0.721	50.50*	51.06*	n/a	51.82 i	End
2	DMH 11 to DMH 12	31.97	30 c	172.5	48.32	49.15	0.481	51.82*	52.71*	0.22	52.93	1
3	dmh 10 - dmh 11	26.42	27 c	131.0	49.50	50.13	0.481	52.93*	53.75*	0.19	53.94	2
4	dmh 9 - dmh 10	25.31	24 c	151.0	50.48	51.95	0.974	53.94*	54.85*	n/a	55.86 i	3
5	dmh 8 - dmh 9	22.29	24 c	212.5	52.05	54.12	0.974	55.86*	57.62*	0.41	58.03	4
6	dmh 13-dmh 8	12.99	18 c	25.6	54.72	55.02	1.174	58.03*	58.36*	0.13	58.49	5
7	dmh 14 - dmh 13	11.68	18 c	262.0	55.12	56.93	0.691	58.65*	61.41*	0.18	61.60	6
8	dmh 15 - dmh 14	8.76	15 c	193.0	57.28	59.17	0.979	61.60*	64.62*	0.15	64.77	7
9	dmh 16 - dmh 15	6.00	15 c	162.0	59.27	60.53	0.778	65.19*	66.39*	0.23	66.62	8
10	CB 16A - DMH 16	3.91	12 c	55.0	60.85	61.26	0.745	66.62*	67.18*	0.08	67.26	9
11	CB - cb 16a	3.37	12 c	19.0	61.36	61.50	0.737	67.36*	67.51*	0.28	67.78	10
12	New MH to Ex. CB	3.27	12 c	94.0	62.50	62.97	0.500	67.80*	68.48*	0.05	68.53	11
13	OCS to new Manhol	3.27	12 c	273.0	63.07	64.06	0.363	68.53*	70.49*	0.27	70.76	12

Project File: Trail Run 3 with redirected area -25 year storm.stm

Number of lines: 13

Run Date: 07-30-2010

NOTES: c = cir; e = ellip; b = box; Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; i - Inlet control.

Storm Sewer Tabulation

Station Line	To Line	Len (ft)	Drng Area		Rnoff coeff (C)	Area x C		Tc		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
			Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	30.5	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	33.97	37.73	6.94	30	0.72	48.22	48.00	51.06	50.50	54.96	0.00	outfall pipe
2	1	172.5	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	31.97	30.82	6.51	30	0.48	49.15	48.32	52.71	51.82	57.00	54.96	DMH 11 to DMH
3	2	131.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	26.42	23.26	6.65	27	0.48	50.13	49.50	53.75	52.93	56.76	57.00	dmh 10 - dmh 11
4	3	151.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	25.31	24.18	8.06	24	0.97	51.95	50.48	54.85	53.94	59.09	56.76	dmh 9 - dmh 10
5	4	212.5	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	22.29	24.18	7.10	24	0.97	54.12	52.05	57.62	55.86	61.80	59.09	dmh 8 - dmh 9
6	5	25.6	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	12.99	12.32	7.35	18	1.17	55.02	54.72	58.36	58.03	62.35	61.80	dmh 13-dmh 8
7	6	262.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	11.68	9.46	6.61	18	0.69	56.93	55.12	61.41	58.65	63.86	62.35	dmh 14 - dmh 13
8	7	193.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	8.76	6.92	7.14	15	0.98	59.17	57.28	64.62	61.60	66.55	63.86	dmh 15 - dmh 14
9	8	162.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	6.00	6.17	4.89	15	0.78	60.53	59.27	66.39	65.19	67.88	66.55	dmh 16 - dmh 15
10	9	55.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	3.91	3.33	4.98	12	0.75	61.26	60.85	67.18	66.62	67.54	67.88	CB 16A - DMH 1
11	10	19.0	0.00	0.00	0.00	0.00	0.00	5.0	5.0	0.0	3.37	3.31	4.29	12	0.74	61.50	61.36	67.51	67.36	66.90	67.54	CB - cb 16a
12	11	94.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.27	2.73	4.16	12	0.50	62.97	62.50	68.48	67.80	70.00	66.90	New MH to Ex. C
13	12	273.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.27	2.32	4.16	12	0.36	64.06	63.07	70.49	68.53	71.00	70.00	OCS to new Man

Project File: Trail Run 3 with redirected area -25 year storm.stm

Number of lines: 13

Run Date: 07-30-2010

NOTES: Intensity = 74.67 / (Inlet time + 12.60) ^ 0.86; Return period = 25 Yrs. ; Pipe travel time suppressed.

Hydraulic Grade Line Computations

Line	Size (in)	Q (cfs)	Downstream								Len (ft)	Upstream								JL coeff (K)	Minor loss (ft)		
			Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)		Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)			Ave Sf (%)	Energy loss (ft)
1	30	33.97	48.00	50.50	2.50	4.91	6.92	0.74	51.24	n/a	30.5	48.22	51.06i	2.44	4.88	6.96	0.75	51.82i	n/a	n/a	-0.182	0.89	n/a
2	30	31.97	48.32	51.82	2.50	4.91	6.51	0.66	52.48	0.518	173	49.15	52.71	2.50	4.91	6.51	0.66	53.37	0.518	0.518	0.893	0.34	0.22
3	27	26.42	49.50	52.93	2.25	3.98	6.65	0.69	53.62	0.621	131	50.13	53.75	2.25	3.98	6.64	0.69	54.43	0.620	0.620	0.813	0.28	0.19
4	24	25.31	50.48	53.94	2.00	3.14	8.06	1.01	54.95	n/a	151	51.95	54.85i	2.00	3.14	8.06	1.01	55.86i	n/a	n/a	-0.095	0.15	n/a
5	24	22.29	52.05	55.86	2.00	3.14	7.10	0.78	56.65	0.828	213	54.12	57.62	2.00	3.14	7.10	0.78	58.41	0.828	0.828	1.759	0.52	0.41
6	18	12.99	54.72	58.03	1.50	1.77	7.35	0.84	58.87	1.304	25.6	55.02	58.36	1.50	1.77	7.35	0.84	59.20	1.304	1.304	0.333	0.15	0.13
7	18	11.68	55.12	58.65	1.50	1.77	6.61	0.68	59.33	1.055	262	56.93	61.41	1.50	1.77	6.61	0.68	62.09	1.054	1.054	2.762	0.27	0.18
8	15	8.76	57.28	61.60	1.25	1.23	7.14	0.79	62.39	1.569	193	59.17	64.62	1.25	1.23	7.14	0.79	65.42	1.568	1.568	3.027	0.19	0.15
9	15	6.00	59.27	65.19	1.25	1.23	4.89	0.37	65.57	0.736	162	60.53	66.39	1.25	1.23	4.89	0.37	66.76	0.736	0.736	1.192	0.62	0.23
10	12	3.91	60.85	66.62	1.00	0.79	4.98	0.39	67.00	1.028	55.0	61.26	67.18	1.00	0.79	4.98	0.39	67.57	1.027	1.027	0.565	0.21	0.08
11	12	3.37	61.36	67.36	1.00	0.79	4.29	0.29	67.65	0.763	19.0	61.50	67.51	1.00	0.79	4.29	0.29	67.79	0.763	0.763	0.145	0.97	0.28
12	12	3.27	62.50	67.80	1.00	0.79	4.16	0.27	68.07	0.719	94.0	62.97	68.48	1.00	0.79	4.16	0.27	68.75	0.718	0.719	0.675	0.18	0.05
13	12	3.27	63.07	68.53	1.00	0.79	4.16	0.27	68.80	0.719	273	64.06	70.49	1.00	0.79	4.16	0.27	70.76	0.718	0.719	1.962	1.00	0.27

Project File: Trail Run 3 with redirected area -25 year storm.stm

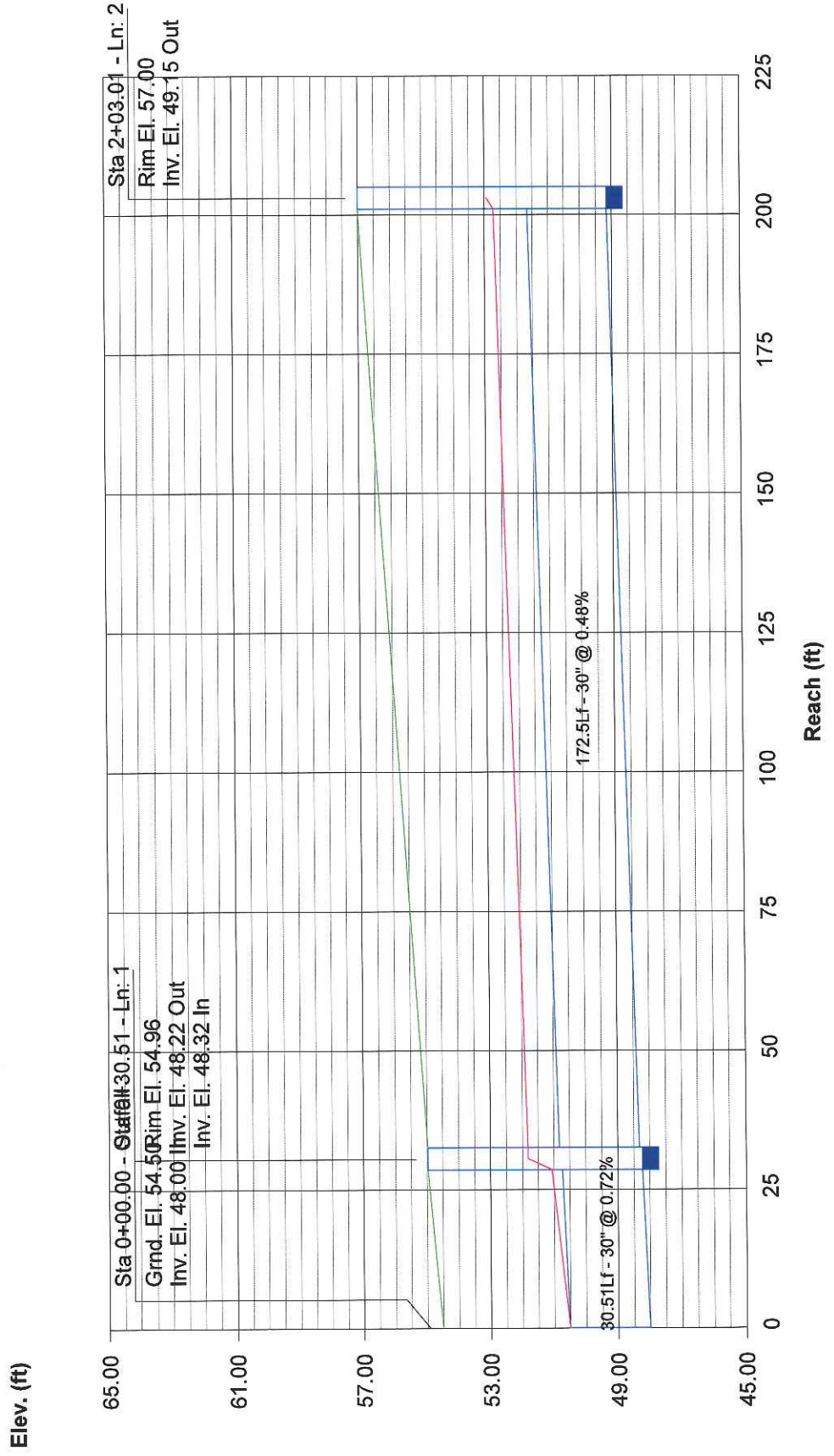
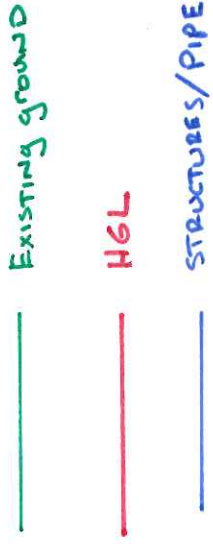
Number of lines: 13

Run Date: 07-30-2010

Notes: ; i-Inlet control.

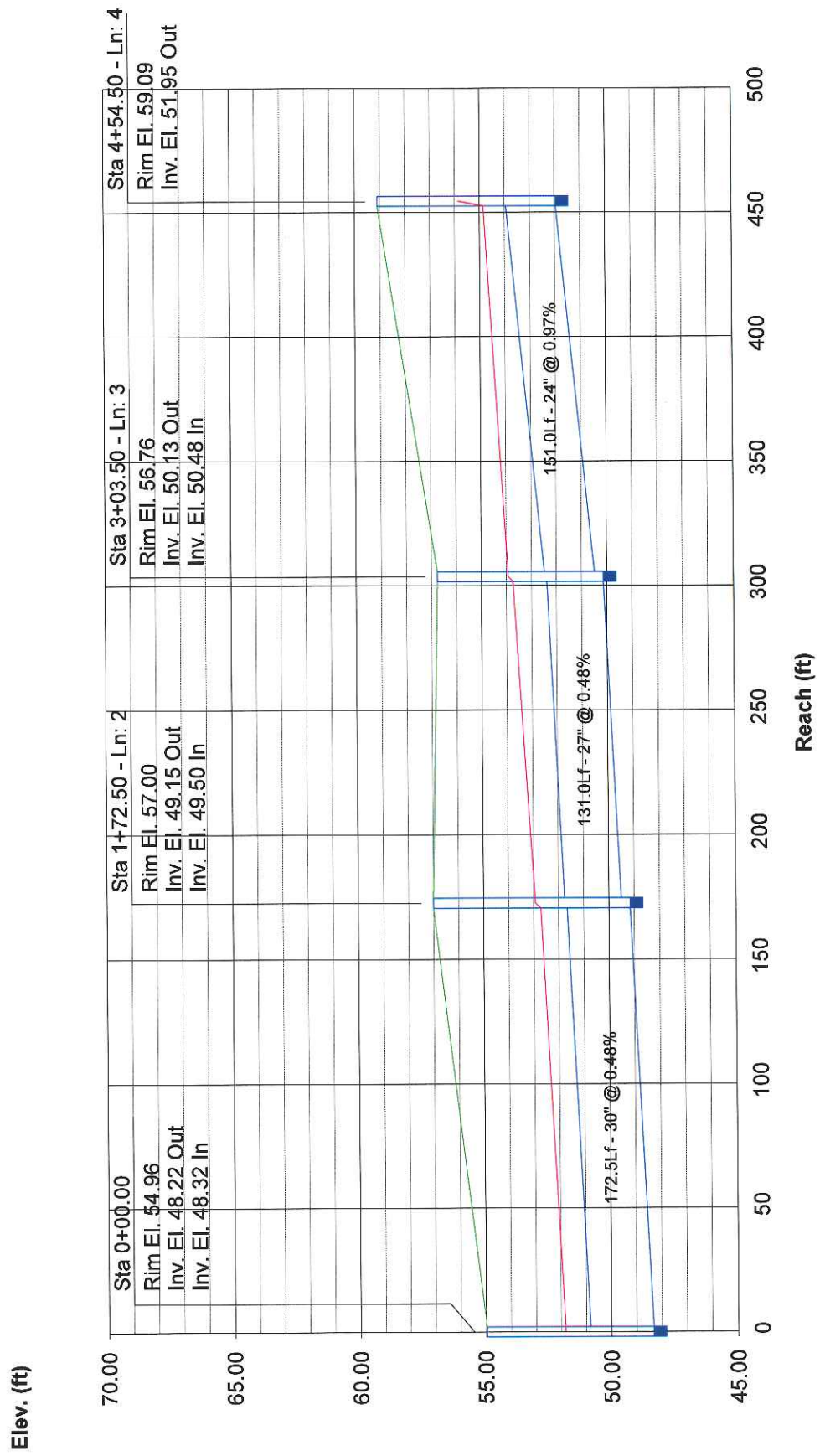
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



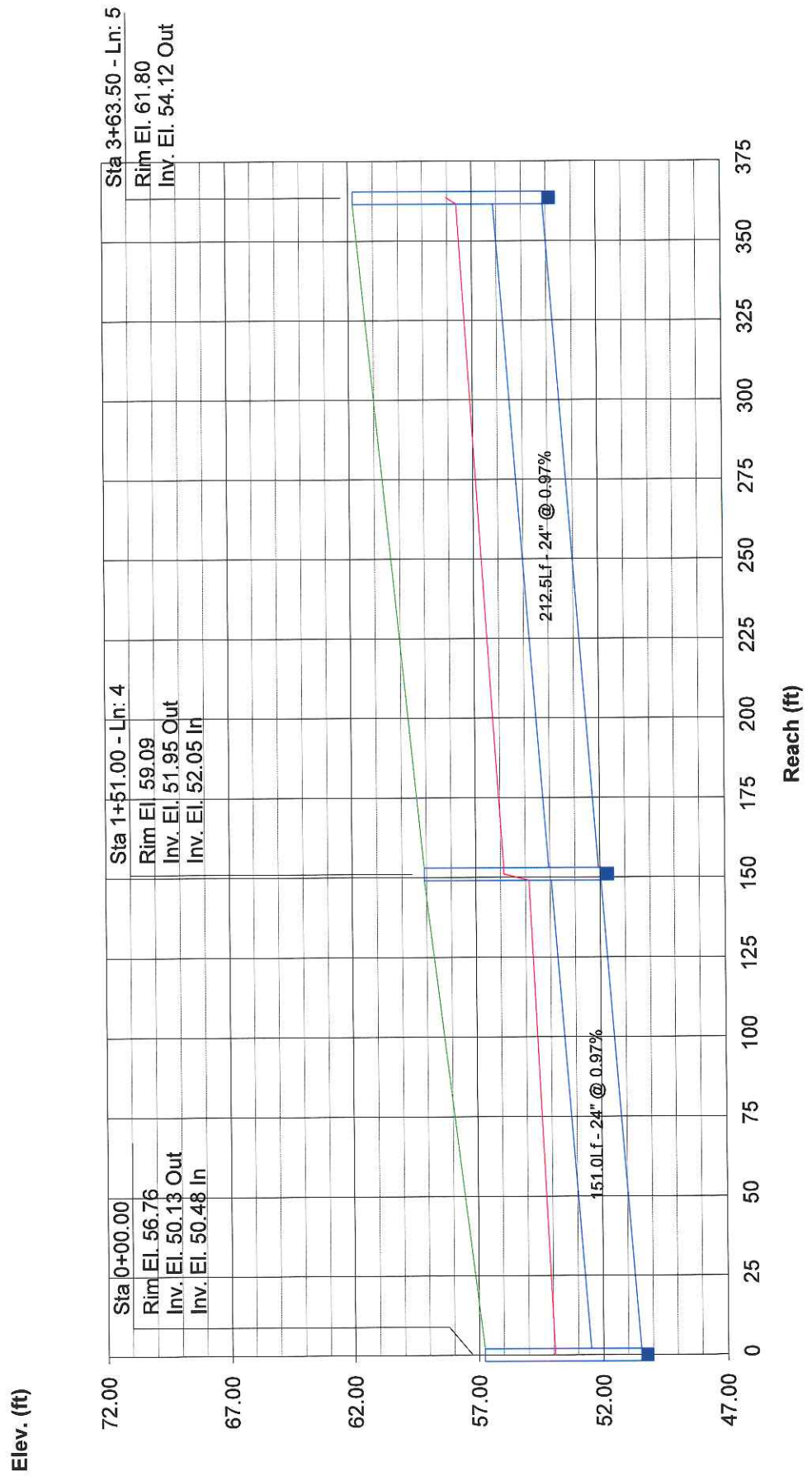
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



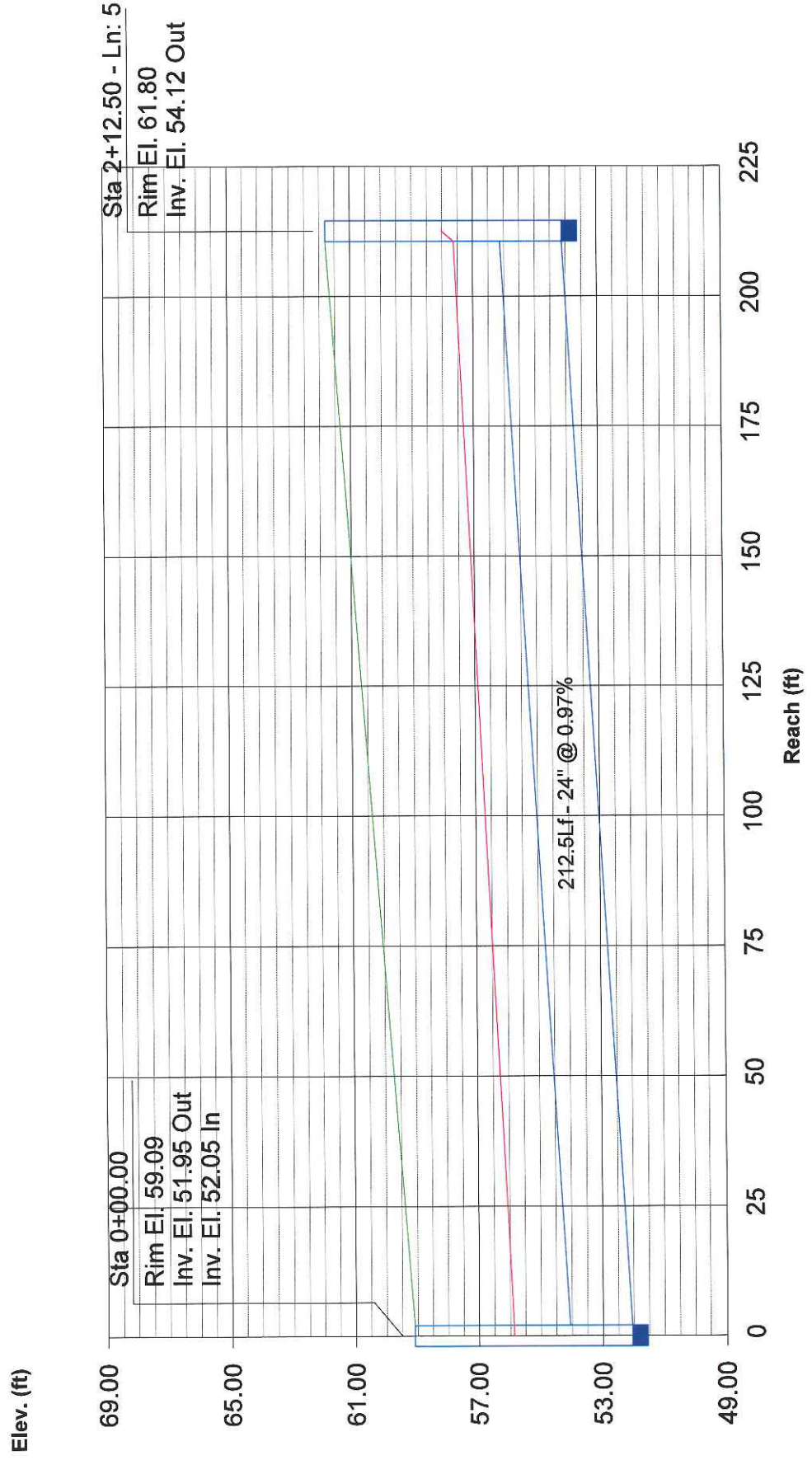
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



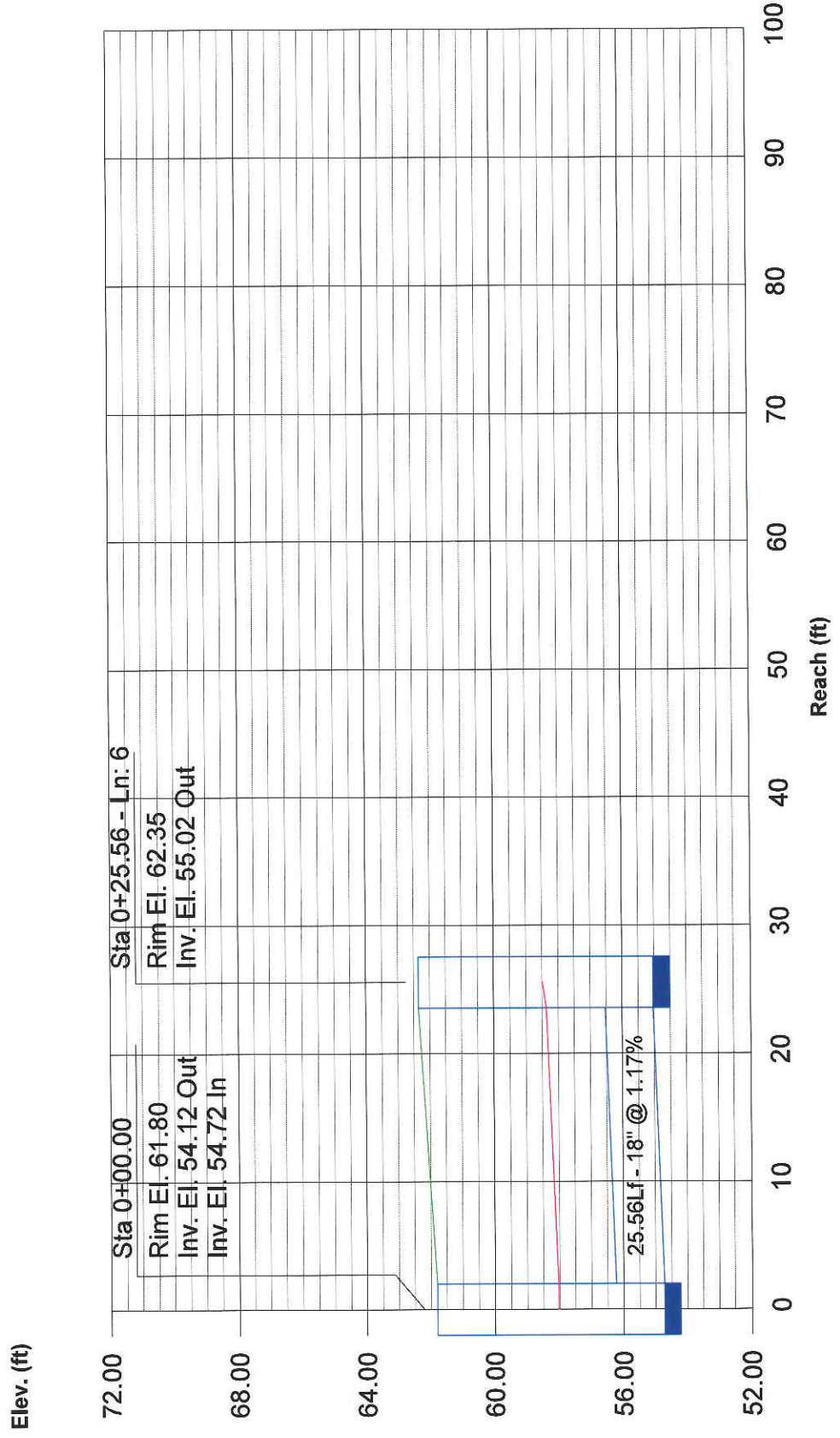
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



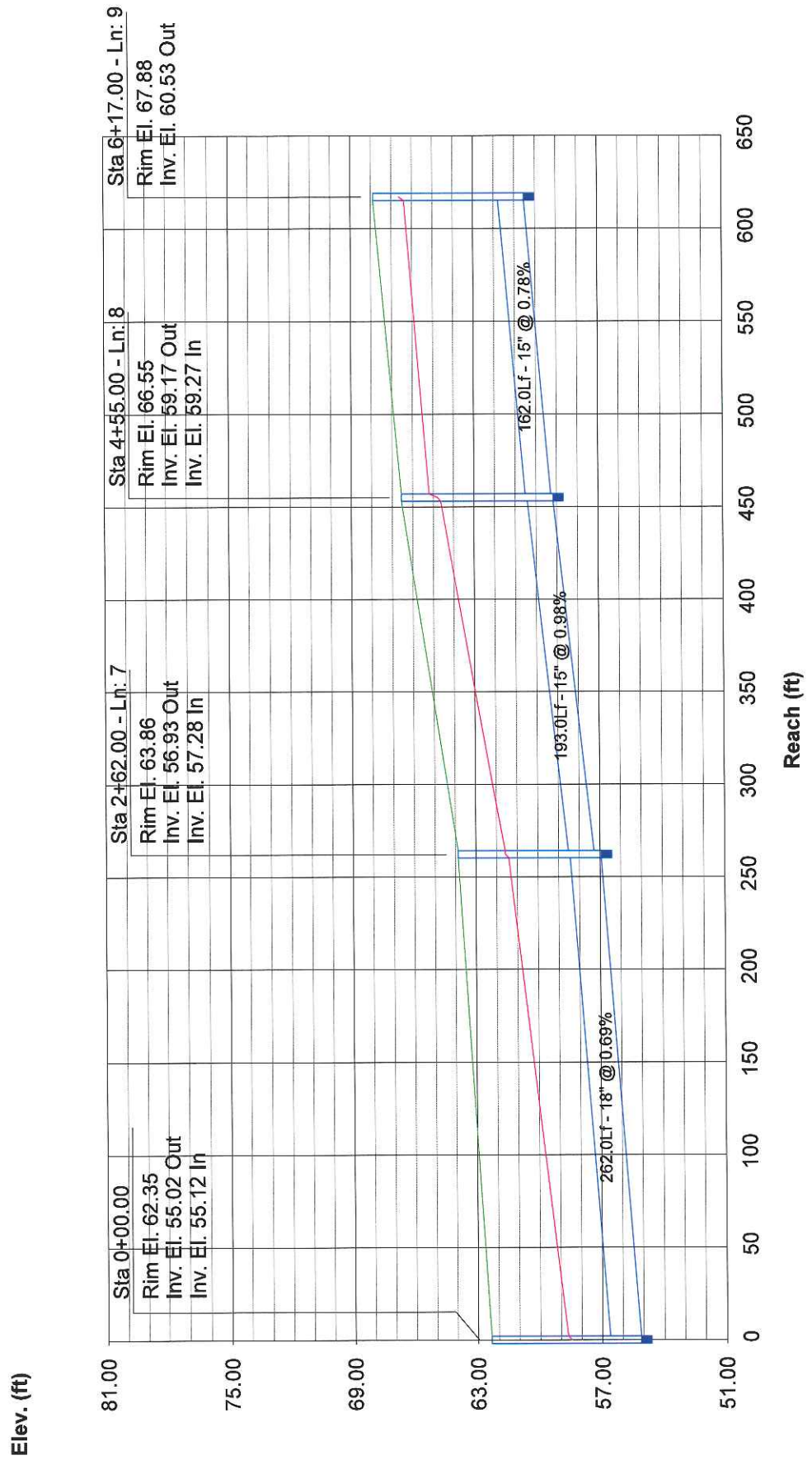
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -2.5 year storm.stm



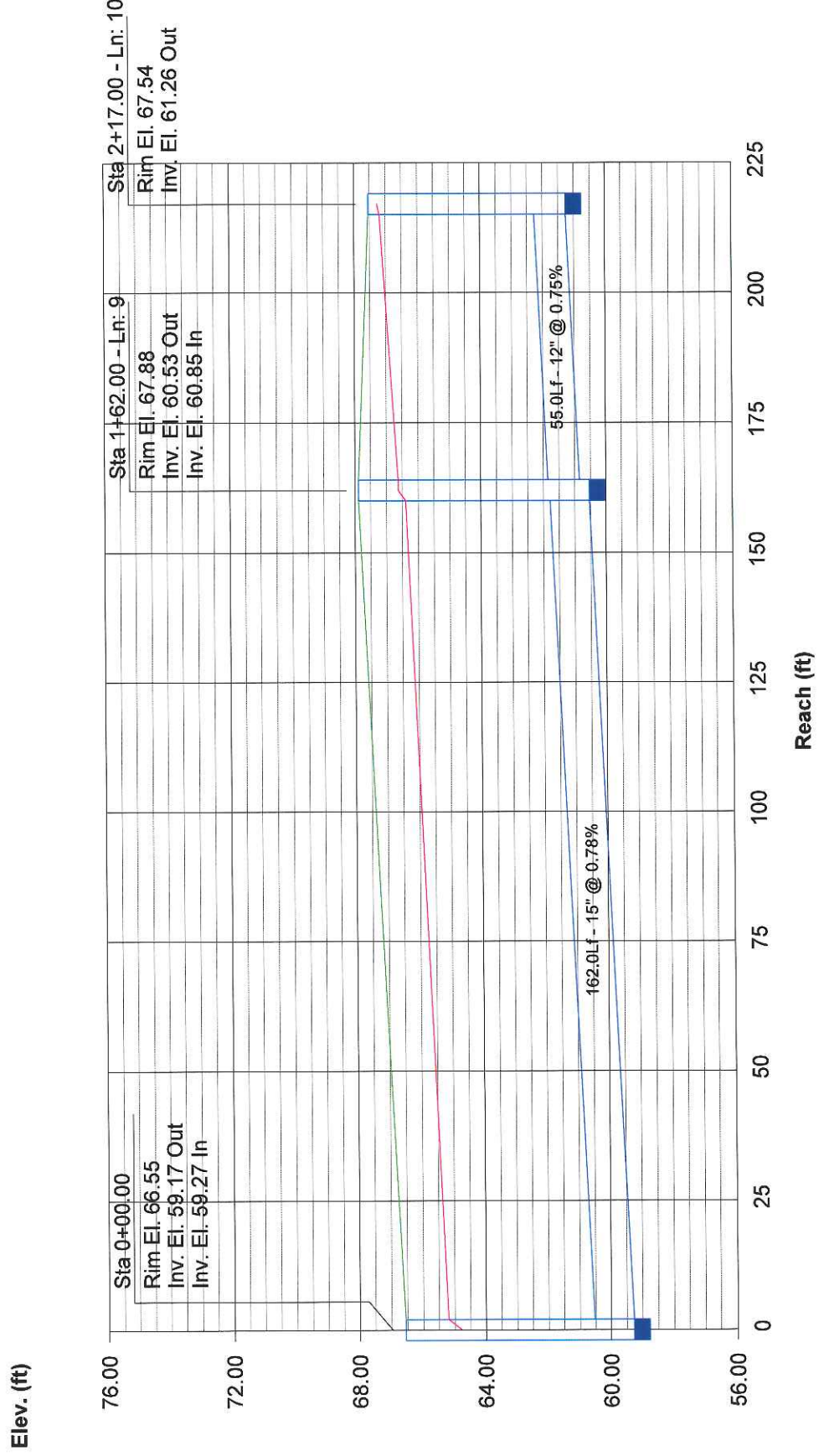
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



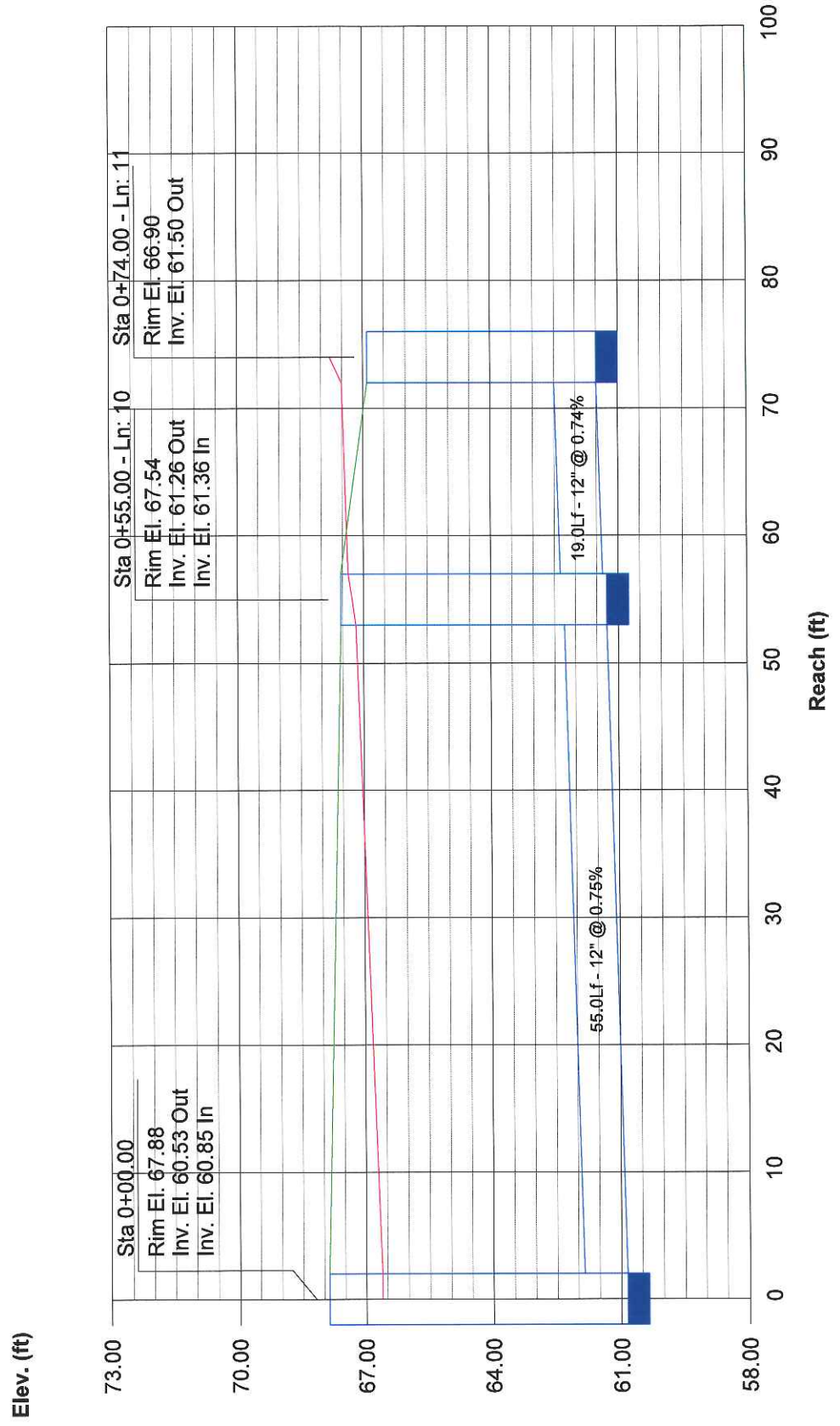
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



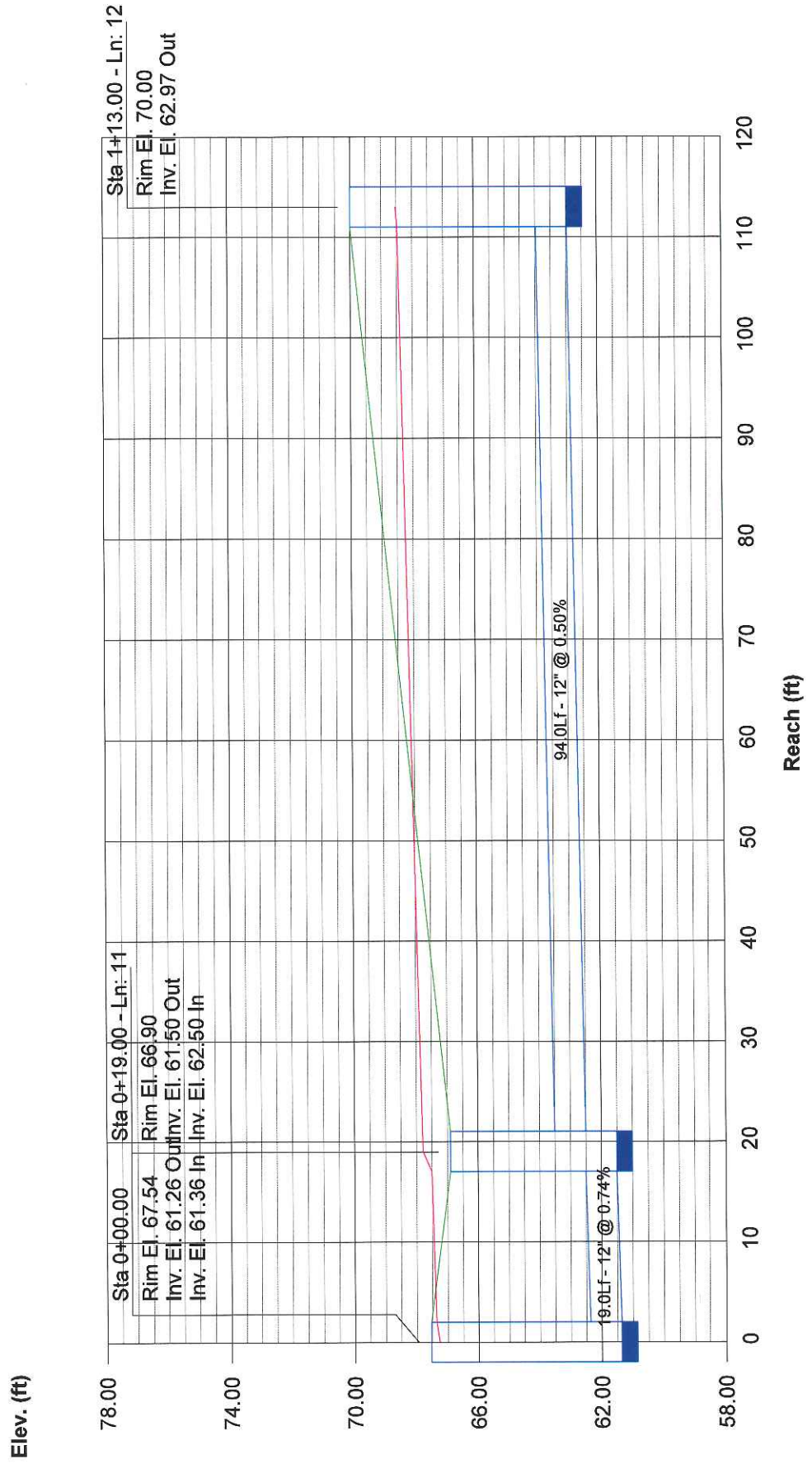
Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm



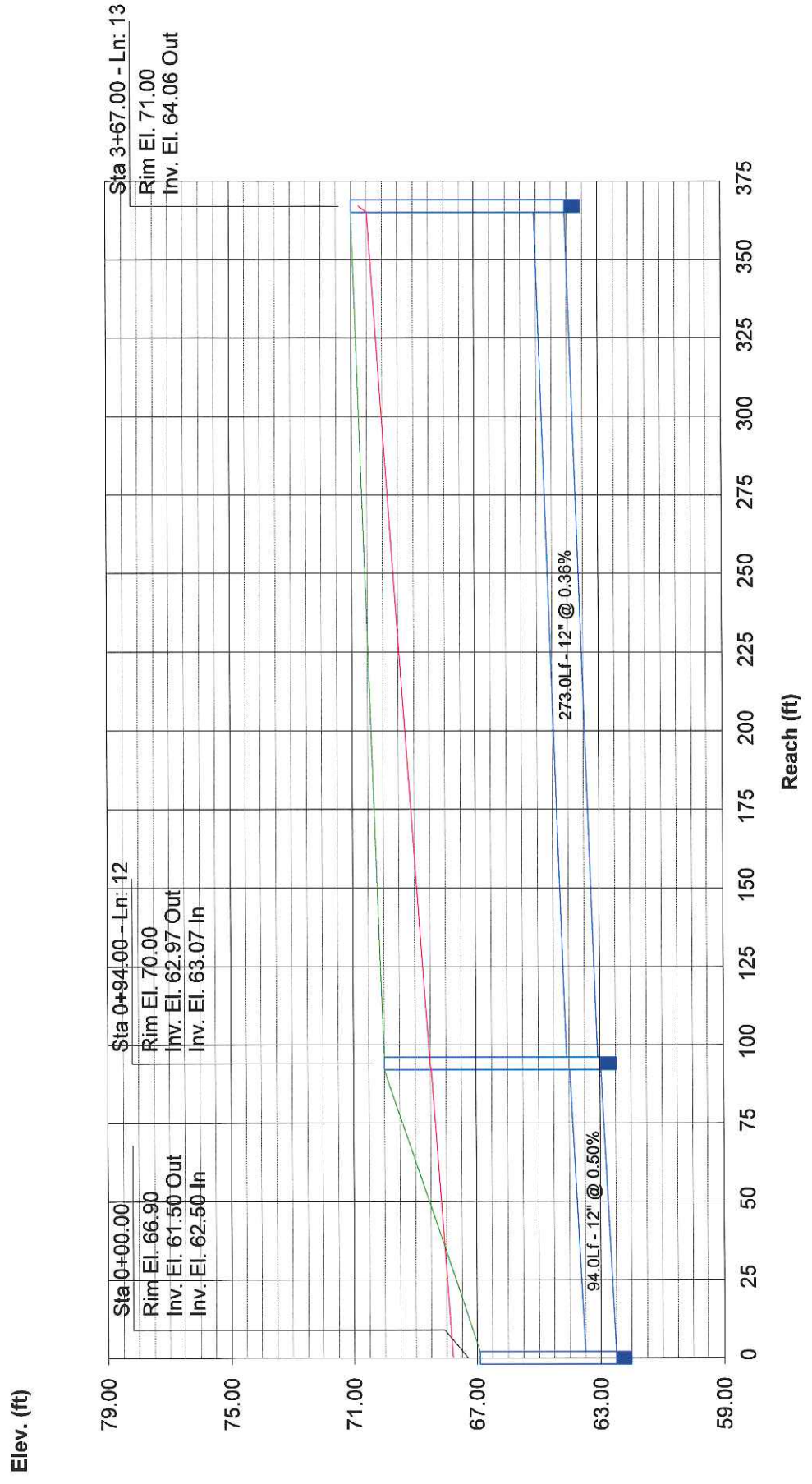
Storm Sewer Profile

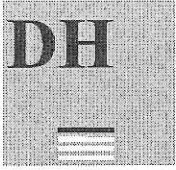
Proj. file: Trail Run 3 with redirected area -25 year storm.stm



Storm Sewer Profile

Proj. file: Trail Run 3 with redirected area -25 year storm.stm





DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS

778 MAIN STREET
SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207 775 1121
FAX 207 879 0896

- SITE PLANNING AND DESIGN
- ROADWAY DESIGN
- ENVIRONMENTAL ENGINEERING
- PERMITTING
- AIRPORT ENGINEERING
- CONSTRUCTION ADMINISTRATION
- LANDSCAPE ARCHITECTURE

September 17, 2010

Ms. Shukria Wiar
Portland Planning Department
4th Floor City Hall
Congress Street
Portland, Maine 04101

**RE: 52-58 City Line Drive
Drainage Improvements**

Dear Shukria:

We have received the August 13, 2010 memo from David Margolis-Pineo regarding our application to perform drainage improvements at the subject location. There are several comments within the memo that require additional information from this office. These comments and our supporting responses are offered below for your consideration.

The following comments are supplied by Doug Roncarati with slight editing from David Margolis-Pineo:

Comment: I thank the applicant for their willingness to include an under drain soil filter in the proposed drainage plan that will treat runoff from the existing parking lot for volumes up to a 10-year storm. The soil filter should provide a greater level of stormwater runoff treatment than currently exists, regardless to which watershed it is sent. However, the 30" storm drain in Congress Street that the applicant plans to connect discharges to the tributary (near the Congress Street culvert), which flows through the UNUM campus and River's Edge Drive on its way to the Stroudwater River. Since approximately four additional acres are being added to this drainage system, the applicant is requested to evaluate the existing tributary and downstream drainage structures have the capacity to handle the increased volumes without causing flooding or degradation of the stream channel?

Response: DeLuca-Hoffman Associates, Inc. has reviewed the downstream conditions from the point of discharge for the 30" outfall down to the Stroudwater River. The 30" outfall basically discharges on the north side of Congress Street into an unnamed tributary of the Stroudwater River. At Congress Street there is also a 36" culvert that conveys flow from the tributary area between Congress Street and the Jetport. This includes much of the Brooklawn Cemetery property. The area immediately downstream of Congress Street is characterized by a marshy area generally bordered by Congress Street and the UNUM access road. The UNUM access road is located approximately 330 feet downstream and this crossing consists of twin 42" culverts. The access road grade at this location is approximately 5 feet above the invert of the twin 42" pipes. Based on our visual review of the crossing, there appears to be no evidence that

the UNUM access road has overtopped and the existing culverts appear to have more than adequate capacity and storage upstream on their inlets.

Further downstream and behind the Elks Club facility there is a short length of 48" culvert within the tributary channel. Most of the open channel is characterized by a well defined channel that is 3 - 4 feet wide with incised sides. The tributary continues to flow northerly towards the Stroudwater River and crosses only one remaining street at Rivers Edge Drive. There is an existing 60" culvert within a well defined, deep channel at the Rivers Edge Drive crossing. The 60" culvert invert is greater than 13 feet below the street grade, thus we observed no evidence that the street has ever overtopped. Throughout its length, we have found the downstream tributary corridor is heavily stabilized with vegetation. Based on the size and apparent capacity of each of the downstream culverts and the well defined channel conditions for the tributary, we foresee no capacity issues related to the small amount of additional flow that will be redirected to the watershed.

Comment: The applicant is a participating member of the Long Creek Watershed Management District and proposes to remove its discharge to the watershed during some rain events (up to 10-year storm), but still discharge to the watershed during heavy rain events. For this reason, the applicant and city should seek formal review of the proposed drainage plans and written comments from the Long Creek Watershed Management District.

Response: DeLuca-Hoffman Associates, Inc. has contacted Chris Baldwin and Tamara Lee Pinard of the District regarding the proposal. Mr. Baldwin has conferred with Jeff Dennis of the MDEP and they are in agreement that the proposal's objective for removal of impervious area from the Longcreek watershed is acceptable. Ms. Pinard has issued the attached letter outlining the District's general endorsement of the proposal based on their acceptance of the Maine DEP as being the responsible approval authority for the proposal.

Comment: It is my understanding that under the Long Creek General Permit, the Maine DEP makes the final determination regarding an applicant's proposal to reduce their amount of impervious surface area below the permit threshold, thereby freeing the applicant of its permit obligations. The applicant and city should seek formal review of the proposed drainage plans and written comments from the Maine DEP.

Response: We have contacted Jeff Dennis of the Maine DEP and he has issued an email on 9/2/10 to Doug Roncarti of the City, as follows:

Doug,

Please read the e-mail below. I suspect you're familiar with this proposal. Chris Baldwin and I met Steve on site yesterday to discuss this proposed diversion of some of the Transport Leasing impervious area to the Stroudwater watershed via Portland's storm sewer system. I've talked about it with Don Witherill and we're okay with the idea of considering this acreage no longer in the Long Creek watershed even though some of the runoff from storm's exceeding the 10 year event will go to Long Creek and not to the Stroudwater. Sometime in the next week or two we will be sending Steve a letter formally confirming this, but he wanted me to let you know about it so you could pass it on to the planners who are dealing with the project so that they can proceed. Thanks.

Ms. Shukria Wiar
September 20, 2010
Page 3

We are currently awaiting a formal letter from Mr. Dennis regarding his findings on the proposal. We trust that this information satisfactorily addresses Mr. Roncarti's comment. We will forward Mr. Dennis's letter to you upon receipt.

Comment: Should the application be approved, the owner/operator must provide a maintenance and inspection plan for the stormwater management system and otherwise comply with all aspects of Chapter 32 of the city ordinance including Article III.

Response: With respect to the management of the proposed facilities, the applicant will follow the accompanying Maintenance and Inspection plan.

We trust that these responses adequately address the staff comments on the proposal and we look forward to your approval and authorization to commence the work as soon as possible.

If you have any questions please call this office.

Sincerely,

DeLuca-Hoffman Associates, Inc.



Stephen Bushey, PE
Senior Engineer

SRB/jpf/JN2885.03/Drainage Improvements/Wiar 09-16-10

Attachment

c: Mark Sanborn, Transport Leasing

**STORMWATER MANAGEMENT SYSTEM
INSPECTION AND MAINTENANCE MANUAL FOR
STORMWATER MANAGEMENT AND RELATED STORMWATER
FACILITIES**

**52-58 CITY LINE DRIVE
PORTLAND, MAINE**

Prepared for

**TRANSPORT LEASING CORP
WESTBROOK, Maine 04092**

Prepared by

**DeLuca-Hoffman Associates, Inc.
778 Main Street, Suite 8
South Portland, Maine 04106
(207) 775-1121**

SEPTEMBER 2010

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APPENDICES

- Appendix A Stormwater Management Systems Inspection & Maintenance Program
- Appendix B Sample Inspection Logs
- Appendix C Permits for Project

I. Introduction

Stormwater management facilities are commonly installed in development projects such as the proposed parking lot at City Line Drive in Portland, Maine. 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 including paved or lawn areas contains a number of contaminants. This runoff can contain a significant amount of non-point contaminants, which can have an adverse impact on the receiving waters. Source control and the installation of conveyance systems and filtration measures and mechanical measures, many times combined with pretreatment measures including vegetated buffer strips and other measures, can significantly reduce the non-point pollutant discharge from the developed area. These measures are particularly important to projects in sensitive water bodies.

The effectiveness of water quality management provisions and other components of the stormwater management system is 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 inspected regularly, 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 treatment measures. Thus, maintenance should be directed to the total system. The City of Portland Stormwater regulations now require an annual inspection report.

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 on a long-term basis. Subsequent sections identify individual maintenance items, give a brief commentary on the function of 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.

Guidelines Layout

A summary of the individual components of the proposed stormwater management facilities 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 of the system as to the frequency of maintenance.

Outcomes: Stormwater facilities maintenance is performed to meet desired outcomes. Desired maintenance outcomes are specified for each drainage feature or activity. They include maintaining performance and appearance of the facility, and the need to prevent maintenance work itself from becoming a pollutant source or damaging habitat.

The Water Quality Outcomes are:

- O1 Avoid or minimize sediment and pollutant discharges from the work area
- O2 Prevent parking areas, roads, drainage systems, facilities and property from becoming pollutant sources
- O3 Avoid or minimize vegetation removal
- O4 Preserve native plants

The Infrastructure Maintenance Outcomes are:

- O5 Protect public safety and health
- O6 Prevent catastrophic infrastructure failures
- O7 Maintain or restore the intended infrastructure function
- O8 Prevent or reduce flooding
- O9 Protect infrastructure
- O10 Meet public expectations for aesthetics

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 for 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 applicable to the 68 Johnson Road site is provided in the table of contents.

Special Facilities Maintenance Requirements

This manual provides a set of minimum standards and practices for maintaining stormwater facilities. Manufactured stormwater facilities such as proprietary water quality treatment/detention units often have maintenance requirements and manuals specified or written by the manufacturer.

Manufacturer or Designer's Maintenance Manuals

Where the manufacturer's manuals or plans provide an equal or greater level of maintenance and water quality protection, they shall be followed by the owner. These individual maintenance plans, specifications, or manuals must be approved by the reviewing agencies.

II. Project Overview

Key permits or approvals issued (or applied for) on the project include:

- City of Portland Site Plan Review and Approval

The Site Plan Approval permit application pending for the project contains the design information for the stormwater systems.

A copy of this permit should be appended to this manual as Appendix C. The owner/operator of the stormwater management systems should review this permit for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

DeLuca-Hoffman Associates, Inc. been retained as a subconsultant by Transport Leasing Corp. to prepare the design for the stormwater management facilities and may be contacted at:

DeLuca-Hoffman Associates, Inc.
778 Main Street, Suite 8
South Portland, Maine 04106
(207) 775-1121

It is recommended that the preparer of the plan be contacted with any particular questions on the design intent or similar issues.

The applicable plans/design documents which apply to the project are:

1. Civil/Site Development Plans: Permit Set prepared by DeLuca-Hoffman Associates, Inc.
2. The Erosion & Sedimentation Control plan for the project.
3. The Stormwater Management plan for the project.

A copy of these documents should be retained with the manual.

The manual is intended for general guidance. However, any substituted deviations from the manual should be reviewed with respect to provisions of Appendix A.

Generally, runoff flows across the site are conveyed by mostly an open conveyance system consisting of grassed and paved surfaces draining to existing catch basins. After construction, the site will contain an underdrained soil filter that will collect runoff from the site and discharge flow to an outlet control structure that will then discharge to the existing closed municipal drainage system in Johnson Road. The area of interest will ultimately be tributary to an unnamed stream that flows to the Stroudwater River. Best Management Practices (BMPs) are warranted for the project. We note that the Stroudwater River is not on the MeDEP Non-Attainment List for Rivers and Streams.

III. Standard Inspection/Maintenance Descriptions

A. Tributary Drainage System

Preface: Stormwater from portions of the site will be directed to conveyance systems which transport the flow to the filtration basin and then to the nearby drainage system. These conveyance systems consist of open grassed and paved surfaces and a piped drain system, or a combination of the two. Maintenance of this system can play a major role in the long-term maintenance costs and the effectiveness of the stormwater system.

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 leaves or other debris. The inlet basins are normally equipped with sumps which will remove large sediment particles from the flow stream.

The level of sediment in the sumps 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.

In some projects most of the stormwater is carried in open swales, channels or ditches. These conveyance channels may be rip rapped or vegetated, depending on the gradient and expected flow velocities. These facilities must be inspected to ensure debris or sedimentation does not reduce their carrying capacity. Excess vegetative growth must also be noted. The surface protection for the channels, either stone or vegetation, must be inspected to ensure its integrity. Any areas subject to erosion should be noted.

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 detention pond, 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. When the sump in an inlet reaches two thirds of its volume, the sediment should be removed. This will typically be every 1 to 3 years, depending on the tributary drainage area and the amount of sand utilized for winter ice control. Catch basin cleaning would normally be accomplished with vacuum trucks under contract. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline exceeds 20% of the diameter of the pipe, 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. In general, a sump or sediment trap should be used where it can be

flushed into the detention pond, since it will reduce pond volume and hasten the time when it must be cleaned.

Vegetated ditches or swales should be mowed at least monthly during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any vegetation cut in the ditch area should be removed from the site. Any areas where the vegetation fails will be subject to erosion and should be repaired and revegetated. Any riprap that becomes displaced should be replaced and chinked to assure its stability.

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 and pipelines will depend on the rate of accumulation. Typically, catch basin sumps should be cleaned on a 1-to-3 year cycle. Pipeline cleaning schedules will be more variable. Open, vegetated swales should be mowed at least monthly during the growing season. Debris should be removed as required to maintain hydraulic capacity.

Maintenance/Inspection Responsibility:

Maintenance Personnel: Transport Leasing Corp. personnel or hired subcontractors will perform the scheduled maintenance/inspection.

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 is critical on this project.

B. Vegetated Swales

Preface: Vegetated swales are often used to convey stormwater. Swales can be intended to be:

1. Mowed and maintained
2. Reverted to wetlands
3. Naturalized

Inspection: Swales should be inspected for erosion and sedimentation.

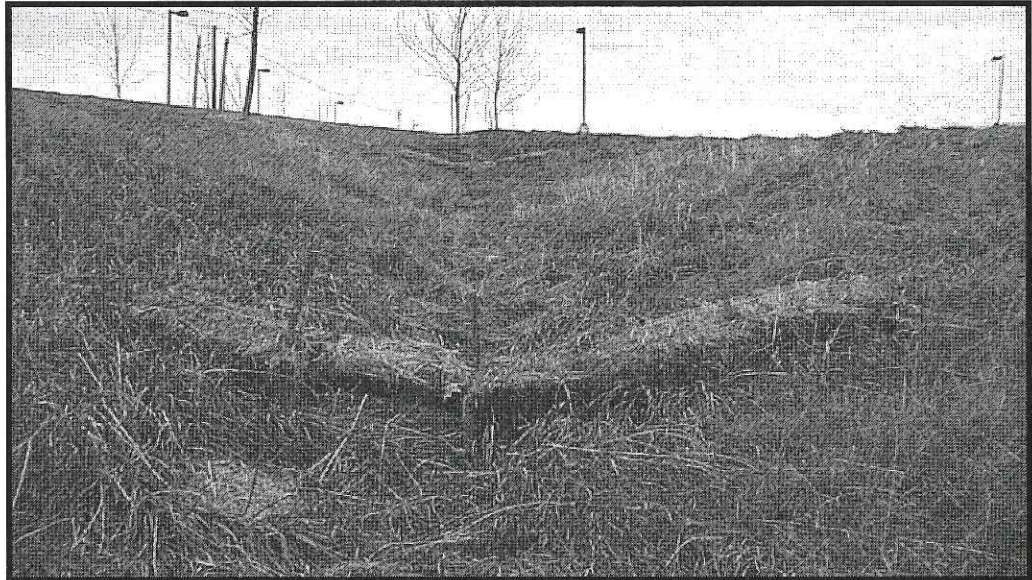
Maintenance: Eroded or silted channels need to be repaired when discovered. If erosion is a problem, the swale design should be examined. Likewise, if siltation is a continued problem, the upgradient conditions should be assessed.

Frequency: It is recommended vegetated swales be inspected quarterly until vegetation is established and a year after installation. Thereafter, if no problems have been noticed, the frequency can be increased to one year.

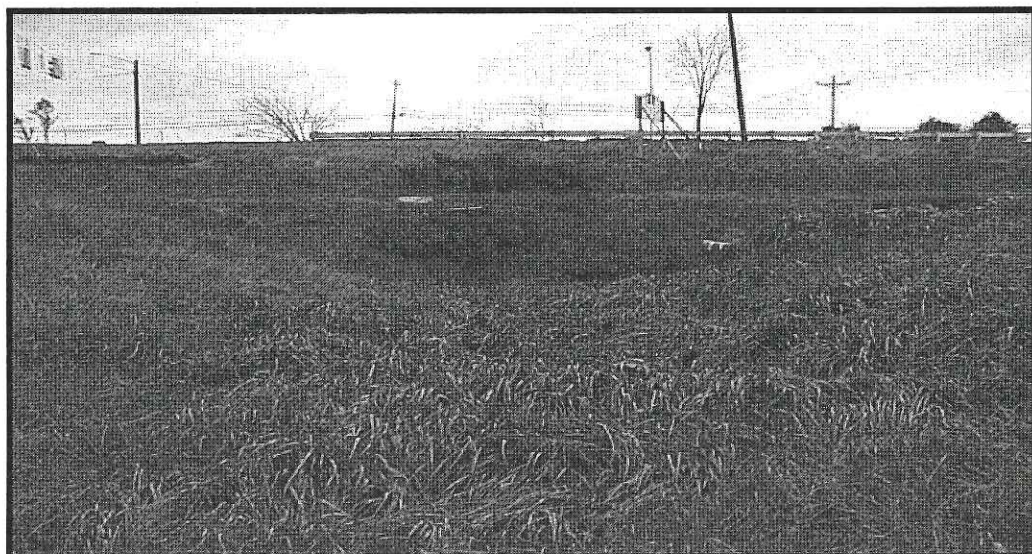
Design Guidelines: The vegetated swale should consider channel cover at the time of concentration as well as several years after construction.

Design computations should state the assumed channel of vegetation and provide the basis for the Manning's or other roughness coefficient and for design.

Applicability: The project site has a vegetated swale, as well as open channel systems. Drainage/maintenance rights should be secured over major watercourses.



VEGETATED SWALE WITH HAY BALE CHECK DAM TO REDUCE VELOCITIES UNDER CONSTRUCTION



A WELL STABILIZED VEGETATED SWALE SHOWS LITTLE SIGN OF EROSION VELOCITIES OR FLOWS. THIS SWALE ALSO FUNCTIONS AS A POND SPILLWAY

C. Low Impact Development (LID) (Underdrained Soil Filter Fields)

Preface: A Low Impact Development (LID) constructed BMP will be constructed to provide treatment of runoff flows during storm events generated from portions of impervious surfaces as well as grassed surfaces within the proposed development site.

The purpose of the LID area will be to capture and provide treatment through filtration for runoff flows during storm events. Larger rainfall events greater than the 10 year storm will flood the filter and bypass the filter through the overflow. After a hard rain, the filtration basin will be surcharged and take 24 to 36 hours to drain. The LID areas mimic natural conditions for treatment of stormwater runoff. The LID area will consist of an underdrained filter media bed with underdrain system.

For storm events creating peak runoff rates exceeding the storage capacity of the filtration basin, the excess runoff simply overflows into an overflow pipe system that will convey runoff away from the site.

Inspection/Monitoring: The general growth and well being of the vegetation associated with the filtration basins should be monitored. A photographic record of growth may be useful. The evidence of failure or restricted performance would be stressed vegetation and extended drawdown periods for the filter. The filtration basins should be inspected formally twice a year. Formal inspection should include checking the underdrain outfall, inspecting the ground surface near the pipe or inlets to the filter to check for evidence of sediment, and inspection of the bottom areas for matting and unwanted vegetative litter.

Maintenance: Maintenance will include annual sediment and debris removal, mulch replacement and trimming and weeding as necessary. **The vegetation on the surface of the filter bed should be maintained as a high stand of non-woody vegetation (similar to meadow or hayfield). To achieve and maintain this condition, the vegetation in the bed should be mowed no more than twice per year to a vegetation height no less than six inches. Mowing of the filter field should be done using push mowers/cutters or hand-held trimmers that will not compact the surface of the filter bed.** Judgment must be used to determine a proper balance between desirable growth levels and excessive growth. This will be gained by experience. If excessive growth is observed it should be cut back and removed on an annual basis. The mulch and surface of the filter is slow, the filter media and plants may need to be replaced. Aeration is recommended as a first step but if this is unsuccessful the filter may need to be reconstructed.

Removal of excessive growth should be accomplished in the late fall or early winter. The material can sometimes be composted, particularly if the municipality operates such a facility.

Frequency: Inspect and document vegetation growth and sediment accumulation annually in late summer or early fall at the end of the growing season.

Removal of Cutting: Cuttings of undesirable excessive vegetation should be removed and composted or otherwise disposed of.

Comments: The Owner desires to encourage filtration of runoff flows. Removal and/or cutting of vegetation shall be limited to the circumstances above and shall be done solely to maintain proper function of the overall stormwater management system. Long-term maintenance of the systems may involve the removal and replacement of the filter media. This determination will be based on the filter media's ability to hold and treat runoff for a 24-to-48-hour period.

D. Pavement Sweeping

Preface: Pavement sweeping is performed to remove sand and litter from access drives, parking lots, and curb gutters. Pavement sweeping also reduces dust during dry weather. Pavement sweeping is also a storm sewer maintenance practice because it limits sediment washed into stormwater facilities. Water quality practices for pavement sweeping focus on sediment disposal. Reducing the amount of sediment washed into nearby soils filters and other facilities can save money because sweeping is generally cheaper than removing sediment from facilities. Pavement sweeping also helps protect facilities from clogging with sediment. These activities shall also include the clean up and removal of trash and sediments within any snow storage areas. Snow piles typically will become a depository of debris and parking lot sanding sediments. These areas must be cleaned and seasonally maintained.

Maintenance: Sweep the site if it will help keep sediment from storm sewers or water bodies. Sweeping is especially useful for cleaning up work areas. Snow storage areas shall be maintained for landscaping coverage and repaired as necessary.

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with federal, state, and local regulations.

Sweepings should be disposed of as solid waste or under a program permitted by the City of Portland.

Frequency: Sweeping and snow storage area cleaning and maintenance should occur every spring and when necessary as dust or sediments build up on the site due to construction activity or seasonal sanding activity. Multiple spring sweeping activities may be required to avoid loss of sediments to the soils filters.

Maintenance/Inspection Responsibility: Inspection personnel retained by the Owner.

Comments: N/A

Outcomes:

O1	Avoid and/or minimize sediment and pollutant discharges from the work area during construction activities
O2	Prevent parking areas, roads, drainage systems, permanent stabilization measures, facilities and property from becoming pollutant sources both during construction activities and over an extended period of time
O5	Protect public safety and health
O10	Meet public expectations for aesthetics

E. Summary Checklist

The above described inspection and maintenance items have been summarized on a checklist attached hereto as Appendix A.

IV. Program Administration

A. General

A reliable administrative structure must be established by Transport Leasing Corp. 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. Transport Leasing Corp. must be responsible for long-term operation and maintenance of the facilities.
2. Transport Leasing Corp. must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.
3. Transport Leasing Corp. must have a responsible administrator to manage the inspection and maintenance programs.
4. Transport Leasing Corp. must have the staff to accomplish the inspection and maintenance programs, or must have authority to contract for the required services.
5. Transport Leasing Corp. must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.

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. Transport Leasing Corp. 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 they have 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. Typical inspection and maintenance record forms are attached hereto as Appendix B.

C. Contract Services

Transport Leasing Corp. personnel or hired subcontractors will perform the scheduled maintenance/inspection programs as outlined in this document. Hired subcontractors should perform work to be accomplished on a contractual basis and be a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be a 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.

Undoubtedly, each administrative body will prepare the actual service contract and procurement procedures to fit the needs for the project.

APPENDIX A

Stormwater Management Systems Inspection & Maintenance Program

**Stormwater Management System
Maintenance Program
Summary Checklist**

Item	Commentary	Frequency			
		Monthly	Semi-Annual	Annual	Long-Term
Tributary Drainage System	Open swales/ditches, piped drain system or combined. Check for accumulation of debris/sediment or excess vegetation. Remove sediment when it exceeds 20% of pipe diameter.	X Mow swales in summer		X Drain-age system	X 1 to 3 years catch basin sumps
Vegetated Swales	Eroded or silted channels need to be repaired when discovered. If erosion is a problem, the swale design should be examined. Likewise, if siltation is a continuing problem, the upgradient conditions should be assessed.	Quarterly until established		At 1 year; annually	
Low Impact Development (LID)	Maintenance to include annual sediment and debris removal, mulch replacement and trimming and weeding as necessary. Judgment must be used to determine a proper balance between desirable growth levels and excessive growth.			X	
Pavement Sweeping	Sweep the site if it will help keep sediment from storm sewers or water bodies. Sweeping is especially useful for cleaning up work areas. Snow storage areas shall be maintained for landscaping coverage and repaired as necessary.			X Spring	

APPENDIX B

Sample Inspection Logs

City Line Drive – Portland, Maine

STORMWATER MANAGEMENT SYSTEM
ANNUAL INSPECTION & MAINTENANCE LOG

FACILITY:		YEAR:	
LOCATION:		CONTRACTOR:	
FUNCTION:		INSPECTOR:	
DATE OF INSPECTION:			
ITEM IDENTIFICATION	DESCRIPTION OF CONDITIONS	MAINTENANCE ACCOMPLISHED	DATE OF MAINTENANCE
VEGETATION			
BERMS			
EMERGENCY OVERFLOW			
SUBSURFACE STORMWATER MANAGEMENT SYSTEM			
GENERAL COMMENTS:			

City Line Drive – Portland, Maine

STORMWATER MANAGEMENT
RETENTION/DETENTION POND
& SUBSURFACE STORMWATER MANAGEMENT SYSTEM
MONTHLY INSPECTION & MAINTENANCE LOG

FACILITY:		YEAR:					
LOCATION:		CONTRACTOR:					
FUNCTION:							
MONTH	DAY	INSPECTOR	WATER DEPTH	OVERFLOW WEIR		WEIR CONDITION	
				CLEAR	DEBRIS		
JANUARY							
FEBRUARY							
MARCH							
APRIL							
MAY							
JUNE							
JULY							
AUGUST							
SEPTEMBER							
OCTOBER							
NOVEMBER							
DECEMBER							
LIST SPECIAL MAINTENANCE UNDERTAKEN:							

City Line Drive – Portland, Maine

STORMWATER MANAGEMENT
RETENTION/DETENTION POND
& SUBSURFACE STORMWATER MANAGEMENT SYSTEM
SEMI-ANNUAL INSPECTION & MAINTENANCE LOG

SEMI-ANNUAL INSPECT 1.2	
DATE:	FACILITY:
INSPECTOR:	LOCATION:
WEIR CONDITION:	FUNCTION:
OUTLET CONDITION	

FORE BAY SUMP/Isolator Row	EST. DEPTH SED.	REMOVED? Y/N	EST. VOL. CY	WHERE DISPOSED OF	STRUCTURAL CONDITION

CONTROL STRUCTURE:
DESCRIBE CONDITIONS FOUND & MAINTENANCE ACCOMPLISHED:

APPENDIX C

Permits for Project

To be added at a subsequent time

Steve Bushey

From: Dennis, Jeff [Jeff.Dennis@maine.gov]
Sent: Monday, September 20, 2010 11:46 AM
To: Steve Bushey
Cc: msanborn34@hotmail.com; Chris Baldwin; Witherill, Donald T; Kale, Donald; Tamara Lee Pinard; Doug Roncarati
Subject: RE: City Line Drive-Transport Leasing Corp. Drainage modifications

Steve,

The purpose of this e-mail is to confirm that the department is in fact amenable to your proposal for modifications to the stormwater system on some of Transport Leasing's City Line Drive parcels. Our understanding is that you propose to accomplish the following:

- The development of a small underdrained soil filter field to provide water quality treatment and quantity control.
- Installation of two drainage structures that will act as control devices to control the flow and direction of runoff conveyed through the new basin.
- The extension of a 12" storm drain pipe from the lot to an existing catch basin located off Johnson Road. A core hole will be required to make the connection into the existing structure. The proposed storm drain pipe will cross the property at 68 Johnson Road, which is also controlled by the applicant under the name of 68 Johnson Road LLC.
- Installation of multiple drainage structures to capture runoff that currently sheets across paved surfaces within a portion of the privately owned City Line Drive and the adjacent properties, all of which are owned by Transport Leasing Inc.

We understand that the result of these modifications will be to divert nearly all of the stormwater runoff that drains from a portion of Transport Leasing's impervious area, out of the Long Creek watershed and into the Portland storm sewer system that eventually drains to the Stroudwater River. We further understand that the system will be designed and constructed so that all of the runoff from storms up to and including the magnitude and intensity of the modeled 10 yr storm event will be treated and diverted to the Stroudwater from this area, but that a portion of the runoff from storms with greater magnitude and intensity than the modeled 10 year storm may still drain to Long Creek.

We think that the resulting extremely infrequent discharge of stormwater to Long Creek from the diverted impervious area will not negatively affect our efforts to restore the stream, and that the diversion of the large majority of stormwater from this area out of the watershed will benefit the stream. We therefore agree that, once we receive documentation that the construction has been completed and an accurate as built measurement of the diverted impervious area is made, we will reduce the impervious area for which Transport Leasing is responsible under the General Permit by the amount that is diverted and will notify the Long Creek Management District of that reduction.

If you have any questions, please give me a call.

Jeff

Jeff Dennis

9/21/2010

LONG CREEK WATERSHED MANAGEMENT DISTRICT

c/o CCSWCD • 35 Main Street, Suite 3 • Windham • Maine • 04062

9/14/2010

Steve Bushey
Deluca Hoffman
778 Main Street Suite 8
South Portland, Maine 04106

Dear Steve,

As requested, I am sending you this letter as a written statement of our acceptance of DEP as the regulatory entity that needs to make the determination regarding the designation status of the Transport Leasing site on City Line Drive that currently has a proposal in to the City of Portland.

I spoke with Jeff Dennis last Friday, September 10th, and he explained that DEP is going to reduce the impervious surface for the site and will issue a revised determination letter to Transport Leasing once the changes have been made to the property.

The Participating Landowner Agreement provides for the following:

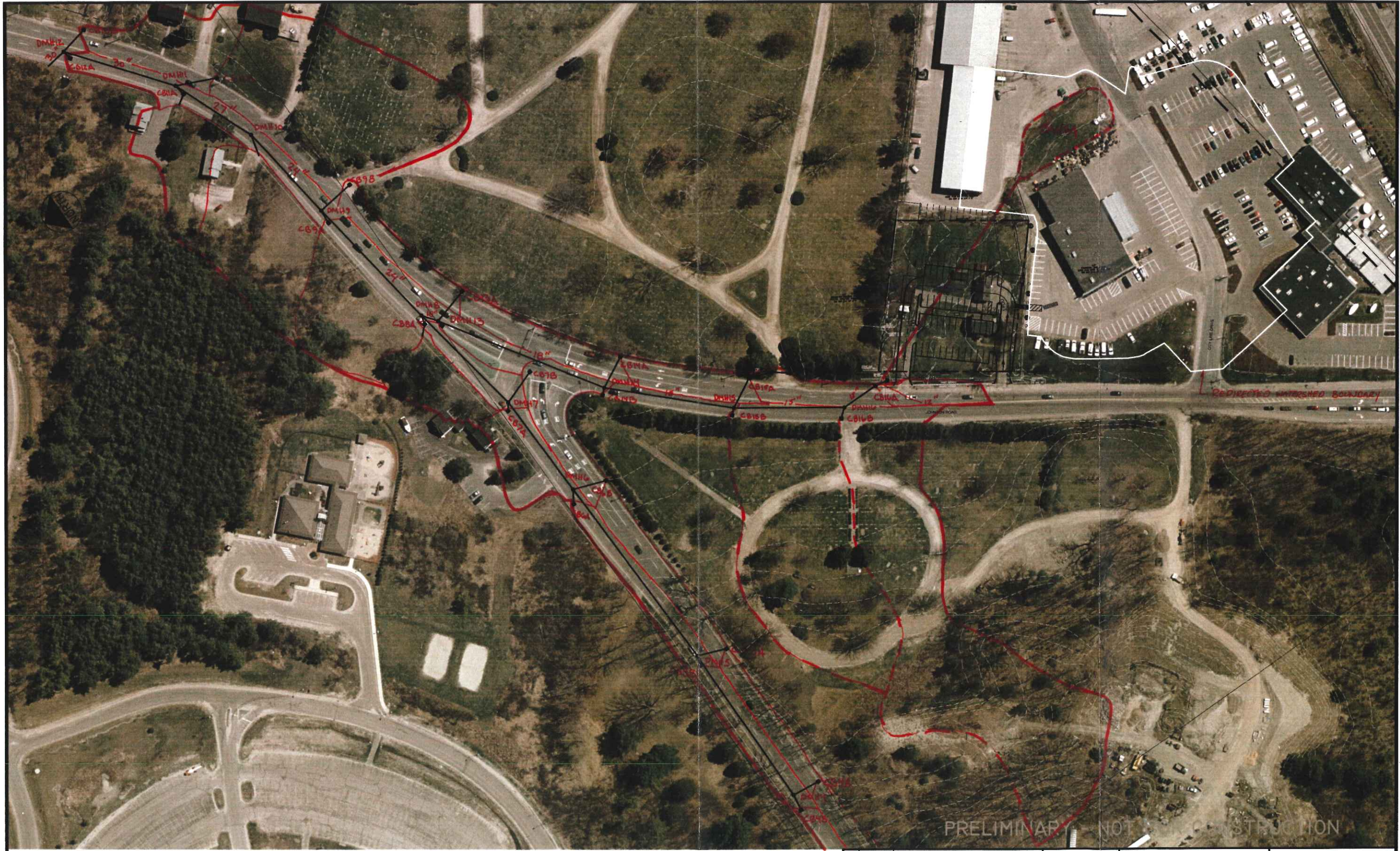
Section 5. (c) "Adjustment of Participating Landowner's Percentage. On or by each April 1, the Executive Director shall adjust the Participating Landowner's Percentage to account for any changes, as determined by DEP, based on the definitions contained in the General Permit, in Impervious Surface or Impervious Area from which there is a Designated Discharge among the Parcels owned by the Participating Landowners and for any new participation and termination of participation in the District."

Do not hesitate to contact me if you have any questions.

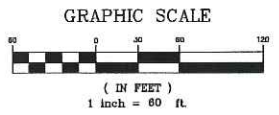
Best regards,



Tamara Lee Pinard
Executive Director



— EXISTING WATER SHED BOUNDARY



REV	DATE	DESCRIPTION	REVISIONS
1	12.29.09	SITE PLAN APPLICATION TO CITY OF PORTLAND	

PROJECT
JOHNSON ROAD PROPERTY
TAX MAP 214A, LOT A-3

SHEET TITLE
SITE LAYOUT PLAN

OWNER
68 JOHNSON ROAD LLC
CCRD BOOK 27253, PAGE 038

DH DeLUCA-HOFFMAN ASSOCIATES, INC.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN: CMW DATE: NOV 2009
DESIGNED: SRB SCALE: 1" = 20'
CHECKED: SRB JOB NO. 2885.02
FILE NAME: 288502-SITE LAYOUT
SHEET 5.0