

16-G-13

2005-0122

61 Monument St.
Site Improvements
William O'Brien

on Spreadsheet

**CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
Planning Copy**

2005-0122

Application I. D. Number

6/8/2005

Application Date

Site Improvements

Project Name/Description

O'brien William T

Applicant

61 Monument St , Portland , ME 04101

Applicant's Mailing Address

61 - 61 Monument St, Portland, Maine

Address of Proposed Site

016 G013001

Assessor's Reference: Chart-Block-Lot

Consultant/Agent

Agent Ph: _____ Agent Fax: _____

Applicant or Agent Daytime Telephone, Fax

Proposed Development (check all that apply): New Building Building Addition Change Of Use Residential Office Retail
 Manufacturing Warehouse/Distribution Parking Lot Other (specify) _____

3,231 s.f.

Proposed Building square Feet or # of Units

Acreage of Site

R6

Zoning

Check Review Required:

- | | | | |
|----------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------|--------------------------------------------------|
| <input checked="" type="checkbox"/> Site Plan
(major/minor) | <input type="checkbox"/> Subdivision
of lots _____ | <input type="checkbox"/> PAD Review | <input type="checkbox"/> 14-403 Streets Review |
| <input type="checkbox"/> Flood Hazard | <input type="checkbox"/> Shoreland | <input type="checkbox"/> Historic Preservation | <input type="checkbox"/> DEP Local Certification |
| <input type="checkbox"/> Zoning Conditional
Use (ZBA/PB) | <input type="checkbox"/> Zoning Variance | | <input type="checkbox"/> Other _____ |

Fees Paid: Site Pla \$400.00 Subdivision _____ Engineer Review _____ Date 6/9/2005

Planning Approval Status:

Reviewer _____

- Approved Approved w/Conditions
See Attached Denied

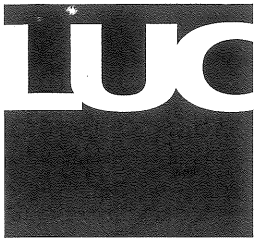
Approval Date _____ Approval Expiration _____ Extension to _____ Additional Sheets
Attached

OK to Issue Building Permit _____
signature _____ date _____

Performance Guarantee Required* Not Required

* No building permit may be issued until a performance guarantee has been submitted as indicated below

- | | | | |
|-------------------------------------------------------------|----------------|----------------------------------------------------|-----------------|
| <input type="checkbox"/> Performance Guarantee Accepted | _____ | _____ | _____ |
| | date | amount | expiration date |
| <input type="checkbox"/> Inspection Fee Paid | _____ | _____ | |
| | date | amount | |
| <input type="checkbox"/> Building Permit Issue | _____ | | |
| | date | | |
| <input type="checkbox"/> Performance Guarantee Reduced | _____ | _____ | _____ |
| | date | remaining balance | signature |
| <input type="checkbox"/> Temporary Certificate of Occupancy | _____ | <input type="checkbox"/> Conditions (See Attached) | _____ |
| | date | | expiration date |
| <input type="checkbox"/> Final Inspection | _____ | _____ | |
| | date | signature | |
| <input type="checkbox"/> Certificate Of Occupancy | _____ | | |
| | date | | |
| <input type="checkbox"/> Performance Guarantee Released | _____ | _____ | |
| | date | signature | |
| <input type="checkbox"/> Defect Guarantee Submitted | _____ | _____ | _____ |
| | submitted date | amount | expiration date |
| <input type="checkbox"/> Defect Guarantee Released | _____ | _____ | |
| | date | signature | |



Land Use Consultants, Inc.

TRANSMITTAL

e n g i n e e r s
p l a n n e r s
l a n d s c a p e
a r c h i t e c t s

To:	Ms. Margaret Schmuckal	Date:	June 8, 2005
From:	David A. Scott, EIT	Job. No.	4050
Phone:		Project:	61 Monument Street Parking & Site Improvements
Fax:		Pages:	1
Re:	Minor Site Plan Submission	cc:	File Copy

Ms. Margaret Schmuckal,

On behalf of William T. O'Brien, LUC is please to submit the enclosed site plan application and plan set for Parking and Site Improvements at 61 Monument Street for minor site plan review.

The enclosures include (9) copies of:

- Application Package
- Plan Set
- Application Review Fee - Check for \$400.00

Please call should you have any questions.

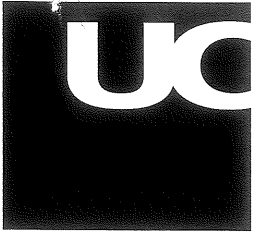
Sincerely,

David Scott

CC: William T. O'Brien

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PORTLAND, MAINE 04103

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fax (207) 878 · 0201
landuse@landuseinc.net



**Land Use Consultants,
Inc.**

*e n g i n e e r s
p l a n n e r s
l a n d s c a p e
a r c h i t e c t s*

Memo

To:	Jim Seymour Sebago Technics, Review Coord.	Date:	8/02/05
From:	David Scott, Project Engineer	Job. No.	4361
Phone:		Project:	61 Monument Street
Fax:		Pages:	1
Re:	Minor Site Plan Review Comments, Dated July 28, 2005	cc:	Ethan Macomber-Boxer City of Portland, Planner William O'Brien, Owner/Contractor

Jim,

Ethan forwarded your review comments and asked me to contact you to discuss the project's background and design considerations. I have also responded to some of the comments. Given the size of this project and its limited budget as well as everyone's schedules, it would be great if we could address your concerns informally.

The conceptual design of the project was based on feedback from the City. I spoke to Brad Royland on September 1st, 2004 about the parking constraints and what to do with the stormwater runoff. He asked me to consider using a vortex valve to restrict flow into the City's sewer but agreed that for such a small lot the City would look favorably at an alternative design that utilized underground storage/recharge and did not connect to the City's sewer since that was the existing course for stormwater. Brad did express concern about infiltration properties of the soils. I have been onsite during two significant rain events to observe existing runoff. Minimal sheet flow and good infiltration was observed, which indicated that recharge would be possible.

I did consider connecting an overflow from the proposed detention system to the City's sewer but thought that it would only be effective if the sewer were not running full. The detention system has been sized for the 25-yr event so it's unlikely that this would be the case.

I also met with Sara Hopkins to discuss a conceptual site plan layout and spoke about the driveway width to both she and Marjorie Schmuckall (September 13th, 2004). The outcome of the discussion was that the 20-ft width requirement was intended to provide simultaneous entering/exit, which could be waived given; the width of the isle between the residence and existing stone retaining wall is barely

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20-ft. A mature lilac buffer a stone retaining wall exists between the abutter. The stone wall and lilac tree buffer would need to be removed and it would be not be possible to provide a buffer other than fencing, which may have safety consequences; and, given the size of the lot and use, the simultaneous entering/exiting scenario would unlikely be a regular occurrence or that inconvenient.

With regards to circulation, the proposed design includes parking stalls that are 9-ft. wide by 19-ft long and there is a 24-ft isle between the end of the parking stall and existing building. These are standard dimensions for typical parking lot circulation other than for the last stall, which would have difficulty backing out with the proposed location of the turn-around. This can be improved by moving the turn-around from the center of the parking lot so that is adjacent to the existing garage (see attached). No stall markings were shown as the owner/contractor wanted to have the option of using pavers (depending on availability) and believes that unit dedication can be worked out amongst the tenants and himself (he is one of the tenants). Cape Cod curbing was not considered, which is common with residential drives and parking lots. Seepage along the foundation should not occur due to grading. There is an existing buffer that exists between abutters and the proposed parking lot. The owner will be responsible for snow clearing and removal.

The maximum street grade is 8%, which was used as a design basis for the driveway. The CB can be moved alongside the retaining wall so that the wall will provide gutter flow to the CB - see attached. The plan has been revised to include installation of a stabilized construction entrance and temporary silt sack in the proposed CB. Notes have been added to address removal of sediment from sidewalks and streets as well as dust control. Details for the entrance and stone wall have been added.

We hope that this clarifies the issues identified in the review. I look forward to working with you to obtain an approval.

Sincerely,

David Scott

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From: James Seymour <jseymour@sebagotechnics.com>
To: 'David Scott' <dscott@landuseinc.net>, <jseymour@sebagotechnics.com>
Date: 8/4/05 2:11:09 PM
Subject: RE: Monument Street Driveway / Parking Lot

David,

Thanks for the response. While I agree that tying into the combined system is not what the City wants or even mandates, infiltration could pose problems unforeseeable as well. Here is what I hashed out with Eric Labelle, City Engineer.

1. Follow DEP Guidelines for Infiltration Trench design with soils test pits to verify conditions down to the elevation where the chambers will be laying at. (This is spelled out in the DEP Manual)
2. Provide proof the catch basin will act as an overflow, (flow slip when the system fails, or is full) Estimate the size storm this could occur under typical conditions.
3. Re-route the foundation/ wall drains away from the street and driveway apron either tie into the Cb on-site or design wall with seepage joints. The City does not want concentrated flow on the sidewalk apron.
4. Spacing as shown now is acceptable, off street parking in residential zones requires either curbs, wheel stops, fencing or landscaping at parking limits. The spacing and movements look acceptable now with the turnaround re-located.
5. I still feel the apron should be wider and taper to the desired width 12 feet. A slight taper of the walls first section at the ROW would be best, for sight distance, and easier turning access.
6. The slopes on the driveway could be built steeper to provide a small level area to collect runoff at the catch basin. Driveways in Portland have often exceeded 10 % grade, though anything greater than 15% becomes difficult.

Please call me to discuss if you have other questions, discussion, or input. I realize it is not a huge area/site but our experience is that tight and old neighborhoods can easily have impacting issues with runoff, groundwater, and grading without much effort. We are open to discussions and findings for alternative runoff collection methods and design for this system and others.

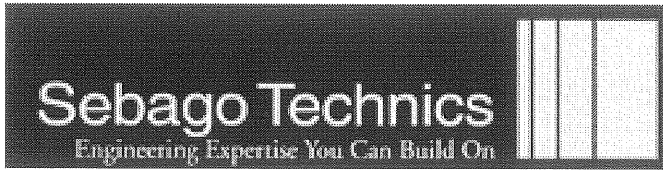
Jim Seymour P.E.
Sebago Technics Inc
(207) 856-0277 x 277

> -----Original Message-----

> From: David Scott [SMTP:dscott@landuseinc.net]
> Sent: Wednesday, August 03, 2005 12:28 PM
> To: jseymour@sebagotechnics.com
> Cc: 'Ethan Boxer-Macomber'
> Subject: RE: Monument Street Driveway / Parking Lot
>

> Jim,
>
> Please find attached our response to your review comments.
>
> Sincerely,
>
> David Scott
> Land Use Consultants
> PH:207-878-3313
> Fax: 207-878-0201
>
> -----Original Message-----
> From: Ethan Boxer-Macomber [mailto:EBM@portlandmaine.gov]
> Sent: Friday, July 29, 2005 11:04 AM
> To: dscott@landuseinc.net
> Cc: jseymour@sebagotechnics.com
> Subject: Monument Street Driveway / Parking Lot
>
>
> Dave-
> As per our conversation, attached please find the comments generated by
> the
> City's consulting civil engineer, Jim Seymour.
>
> Let's touch base once you've had a chance to review these.
>
> Best regards,
>
> Ethan Boxer-Macomber, AICP
> Planner
> City of Portland Planning Division
> 389 Congress Street
> Portland, ME 04101
>
> Tel: 207.756.8083
> Fax: 207.756.8258
> << File: 4050 REV GRADING.pdf >> << File: 08-02-05-Review response.doc
> >>

CC: 'Ethan Boxer-Macomber' <EBM@portlandmaine.gov>



05P122

TO: Ethan Macomber Boxer – Planner
FROM: Jim Seymour – Development Review Coordinator, Sebago Technics, Inc.
RE: William O’Brien – Parking & Site Improvements
61 Monument Street, Portland, ME
DATE: July 28, 2005

Sebago Technics has reviewed the minor Site Plan Package (dated 6/03/05) prepared by Land Use Consultants for the proposed Parking & Site Improvements to be located at 61 Monument Street for William O’Brien TFH Architects. The following comments are submitted in outline format for the upcoming workshop review:

1. **Stormwater Management**

- A. **Background:** The existing rear of the property is previously undeveloped and currently used as a backyard; therefore some increase in stormwater runoff is anticipated as a result of the proposed project. Runoff from the project site has been graded and flow towards Monument Street. The applicant has proposed setting a catch basin to assist collection of drainage and store in an underground detention/recharge system. The foundation underdrains will tie into a pipe system that will discharge over the driveway apron onto Monument Street.
- B. **Concerns:** The area is extremely confined and grading is moderately steep making collection difficult and construction challenging. The following is a punch list of items we feel shall require additional design information and consideration.
- Soil test pit data for subsurface information under the detention system is needed
 - The catch basin shall be corrected for elevation and set in a more level area to collect runoff to avoid surface flow slipping.
 - An overflow pipe from the detention system shall be installed to also pickup the 4-in. retaining wall underdrain and tie into the combined sewer system.
 - We recommend Cape Cod curbing along the rear parking edge per parking standards and against the building foundation in the rear to avoid runoff weepage into the basement.
 - There appears no space available for snow storage. How will it be handled?

- When the overflow is designed the applicant shall obtain a standard drainage maintenance agreement with the City.

2. **Road Access/Circulation**

- A. Proposed drive aisles off Monument Street are 12 feet wide (City Standards are 20ft) and the applicant has proposed outside parking areas in the rear which access and turnaround in the rear. We recommended that the applicant show the turning radius/movement that will be required to enter or back out of the spaces along the Church's lot, given the narrow aisle, and limited spacing we feel that this could be problematic even for compact cars (more so in the winter). It appears a difficult maneuver but may be allowed if it can be proven.
- B. The parking should be controlled with proper unit dedication or space markings. The parking lot/spaces must be curbed to prevent parking from crossing over the property line per Off Street parking standards. We recommended some kind of a visual buffer between the parking lot and abutters' lot.
- C. We recommend that the driveway apron be widened to 20 feet from the street taper down to 16 feet for at least one car space distance from the street pavement edge, and then taper to the requested driveway width.
- D. New granite tip-downs and granite curb will be installed, for the new driveway opening. The driveway entrance has been widened to 24 feet, with handicap ramps and sidewalk meeting City Specifications.
- E. A bollard shall be installed on the building corner for protection from vehicles.
- F. The turnaround area could be reduced in width to 10 or 12 feet in width to reduce pavement area.

3. **Grading/Erosion Control**

- A. The plan submission includes a no BMP measures on the project for the site construction and soil disturbance when it occurs. BMPs shall be noted and illustrated on the detail plans, but some additional measures should be considered such as pavement cleaning and sweeping from tracked soils during construction.
- B. The grades established on the parking lot are consistently 8%. We recommend that the front driveway access be steepened to 10%-12% to create a level area for catch basin runoff collection.
- C. Finish foundation elevations are shown on the drawings for the proposed building. How do these elevations compared with the proposed driveway

grades? Will frost penetration or exposure to the winter conditions compromise the existing foundation wall's condition?

4. Utility Installation/Location

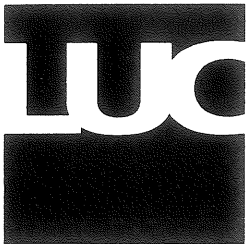
- A. The retaining/foundation drain and sewer connection shall be constructed such that both pipes wye into one pipe at the street line and only one connection are made into the Combined Sewer pipe. We recommend a back flow valve/preventer on the drain to assure no backups flood the detention system.

5. General

- A. The planning staff will review the site lighting plan and the landscaping plan.
- B. Current details for street infrastructure repairs/improvements have been shown and noted to be in accordance with City Technical Design Standards.
- C. Parking lot and driveway typical cross section details are acceptable.
- D. Typical fence details are 1 not shown.
- E. A note shall be added discussing snow removals methods or easement from abutter if acceptable. Snow storage on the lot seems unlikely possible.
- F. The applicant will need to address concerns about construction mobilization and preparation of the site.

Overall this looks like suitable development for the lot and neighborhood, however there are still some concerns about the confined access for parking and construction. We recommend a safety overflow pipe for the system to tie into the City System and have questions about subsurface conditions. With some more details and data we feel a design can be completed to approve this parking lot. We feel until these items have been addressed, that we cannot grant approval. Please contact our office with any questions.

JRS:jrs



Land Use Consultants Inc.

p l a n n e r s
e n g i n e e r s
l a n d s c a p e
a r c h i t e c t s

David A. Kamila PE
Frederic J. Licht PE
Thomas N. Emery RLA
J. David Haynes RLA

June 2, 2005

4050

Ms. Margaret Schmuckal
Inspections Services Office
3rd Floor, Room 315
Portland City Hall
389 Congress Street
Portland, Me 04101

**Minor Site Plan Review-Parking & Site Improvements
61 Monument Street, Portland, ME 04101**

Dear Ms. Schmuckal:

On behalf of Mr. William T. O'Brien, we are pleased to present the enclosed materials for Site Plan Review. Please find enclosed, nine (9) copies of the following:

- Site Plan Review Application-Minor Development
- Site Plan Submission Checklist
- Stormwater Report
- Full Size Site Plans Set, dated May 26, 2005
- Application Fee

Existing Conditions:

The subject property is located at 61 Monument Street in Portland Maine. The 8,300 ft.² +/- lot has approximately 82.6-ft. of frontage on Monument Street and is situated in the R-6 Residential Zone. The lot includes a 1,550 ft.² 3-story multi-family building and 570 ft.²-detached garage. The cover page photograph shows the lot as viewed from Monument Street. The photograph depicts the 3-story building and side yard with Lilac bushes and concrete retaining wall along the front of the lot. Currently, the lot consists 2,960 ft.² (36%) of impervious area; including the building, garage, garage drive and walks; and, 5,340 ft.² (64%) of pervious yard area (grass, trees and bushes). The lot is serviced by public water and sewer in Monument Street. Stormwater is combined with sewer via inlets located approximately 150-ft. west of the property at the intersection of Monument Street and Kellog Street. The lot has average slopes of 5% from the north portion of the rear yard towards the west side yard to the front retaining along Monument Street. Drainage from the site follows the topography of the yard infiltrating and potentially flowing to the west abutter in larger storm events.

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f a x (207) 878 · 0201
email: landuse@landuseinc.net

Proposed Site Improvements:

The applicant is proposing to provide a 12-ft wide access drive to a (6)-space parking area with turn-around located at the rear of the building. An existing 3-ft. high concrete retaining wall along Monument Street currently prevents access to the rear of the property (see attached photograph). The site improvements include removing the wall and grading from Monument Street to the proposed parking area at a grade of approximately 8%. In order to keep the existing Lilacs that provide an attractive buffer along the west property line, a proprietary 3.7-ft gravity retaining wall system is proposed along both sides of the drive.

Should you have any questions or require any additional information, please do not hesitate to contact me.

Sincerely,

David A. Scott, EI
Civil Project Engineer

cc: William O'Brien

City of Portland Site Plan Application

If you or the property owner owes real estate taxes, personal property taxes or user charges on any property within the City of Portland, payment arrangements must be made before permit applications can be received by the Inspections Dept.

Address of Proposed Development: 61 Monument Street		Zone: R6
Total Square Footage of Proposed Structure: Driveway + Parking Lot = 3,231 ft. ²		Square Footage of Lot: 8,372
Tax Assessor's Chart, Block & Lot: Chart 16 Block G Lot 13	Property owner, mailing address: William O'Brien, 61 Monument Street Portland, Maine 04101	Telephone: (207) 730-0126
Consultant/Agent, mailing address phone & contact person : Land Use Consultants, Inc. Attn: David A. Scott, EI 966 Riverside Street Portland, ME 04103 (207)878-3313	Applicant name, mailing address & telephone: Same as Property Owner	Project name: O'Brien Site Improvements

Proposed Development (check all that apply)
 New Building Building Addition Change of Use Residential Office Retail Manufacturing
 Warehouse/Distribution Parking lot
 Subdivision (\$500) + amount of lots _____ @ (\$25.00 per lot) \$ _____
 Site Location of Development (\$3,000)
 (except for residential projects which shall be \$200.00 per lot \$ _____)
 Traffic Movement \$1,000 Stormwater Quality (\$250.00)
 Section 14-403 Review (\$400.00) + \$25.00 per lot
 Other _____

Major Development (more than 10,000 sq. ft.)
 Under 50,000 sq.ft. (\$500.00)
 50,000 – 100,000 sq.ft (\$1,000.00)
 Parking Lots over 100 spaces (\$1,000.00)
 100,000 – 200,000 sq.ft (\$2,000.00)
 200,000 – 300,000 sq.ft (3,000.00)
 Over 300,000 sq.ft (\$5,000.00)
 After-the-fact Review (\$1,000.00 + applicable application fee)

Minor Site Plan Review
 Less than 10,000 sq.ft (\$400.00)
 After-the-fact Review (\$1,000.00 + applicable application fee)

Plan Amendments
 Planning Staff Review (\$250.00)
 Planning Board Review (\$500.00)



-Please see next page-

Who billing will be sent to: William O'Brien
Mailing address: 61 Monument Street
 Portland, Maine 04101

Submittals shall include (9) separate folded packets of the following:

- a. copy of application
- b. cover letter stating the nature of the project
- c. site plan containing the information found in the attached sample plans check list

Amendment to Plans: Amendment applications should include 6 separate packets of the above (a, b, and c)

ALL PLANS MUST BE FOLDED NEATLY AND IN PACKET FORM

Section 14-522 of the Zoning Ordinance outlines the process; copies are available at the counter at .50 per page (8.5 x11) you may also visit the web site: [ci.portland.me.us.chapter 14](http://ci.portland.me.us.chapter14)

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 applications issued, I certify that the Code Official'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.

Signature of applicant: <i>William J O'Neil</i>	Date: <i>6 3 05</i>
-------------------------------------------------	---------------------

This application is for site review ONLY, a building Permit application and associated fees will be required prior to construction.

Development in Portland

The City of Portland has instituted the following fees to recover the costs of reviewing development proposals under the Site Plan and Subdivision ordinances: application fee; engineering fee; and inspection fee. Performance and defect guarantees are also required by ordinance to cover all site work proposed.

The **Application Fee** covers general planning and administrative processing costs, and is paid at the time of applications.

The Planning Division is required to send notices to neighbors upon receipt of an application and prior to public meetings. The applicant will be billed for mailing and advertisement costs. Applicants for development will be charged and Engineering Review Fee. This fee is charged by the Planning Division for review of on-site improvements of a civil engineering nature, such as storm water management as well as the engineering analysis of related improvements within the public right-of-way, such as public streets and utility connections, as assessed by the Department of Public Works. The Engineering Review fee must be paid before a building permit can be issued. Monthly invoices are sent out by the Planning Division on a monthly basis to cover engineering costs.

A **Performance Guarantee** will be required following approval of development plans. This guarantee covers all required improvements within the public right-of-way, plus certain site improvements such as landscaping, paving and drainage improvements. The Planning Division will provide a cost estimate form for figuring the amount of the performance guarantee, as well as sample form letters to be filled out by a financial institution.

An **Inspection Fee** must also be submitted to cover inspections to ensure that sites are developed in accordance with the approved plan. The inspection fee is 2.0% of the performance guarantee amount, or as assess by the planning or public works engineer. The minimum inspection fee is \$300 for development, unless no site improvements are proposed. Public Works inspects work within the City right-of-way and Planning inspects work within the site including pipe-laying and connections. (The contractor must work with inspectors to coordinate timely inspections, and should provide adequate notice before inspections, especially in the case of final inspection.)

Upon completion of a development project, the performance guarantee is released, and a **Defect Guarantee** in the amount of 10% of the performance guarantee must be provided. The Defect Guarantee will be released after a year.

Other reimbursements to the City include actual or apportioned costs for advertising and mailed notices. All fees shall be paid prior to the issuance of any building permit.

For more information on the fees or review process, please call the Planning Division at 874-8719 or 874-8721.

**CITY OF PORTLAND, MAINE
SITE PLAN CHECKLIST**

O'Brien Site Improvements, 61 Monument Street
Project Name, Address of Project

I.d. Number

Submitted () & Date	Item	Required Information	Section 14-525 (b,c)
✓	(1)	Standard boundary survey (stamped by a registered surveyor, at a scale of not less than 1 inch to 100 feet and including:	1
✓	(2)	Name and address of applicant and name of proposed development	a
✓	(3)	Scale and north points	b
✓	(4)	Boundaries of the site	c
✓	(5)	Total land area of site	d
✓	(6)	Topography - existing and proposed (2 feet intervals or less)	e
_____	(7)	Plans based on the boundary survey including:	2
see comments	(8)	Existing soil conditions	a
n/a	(9)	Location of water courses, marshes, rock outcroppings and wooded areas	b
✓	(10)	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	c
not surveyed	(11)	Approximate location of buildings or other structures on parcels abutting the sited	e
n/a	(12)	Location of on-site waste receptacles	e
✓	(13)	Public utilities	e
✓	(14)	Water and sewer mains	e
✓	(15)	Culverts, drains, existing and proposed, showing size and directions of flows	e
✓	(16)	Location and dimensions, and ownership of easements, public or private rights-of-way, both existing and proposed	f
✓	(17)	Location and dimensions of on-site pedestrian and vehicular accessways	g
✓	(18)	Parking areas	g
n/a	(19)	Loading facilities	g
✓	(20)	Design of ingress and egress of vehicles to and from the site onto public streets	g
_____	(21)	Curb and sidewalks	g
n/a	(22)	Landscape plan showing:	h
✓	(23)	Location of existing proposed vegetation	h
_____	(24)	Type of vegetation	h
_____	(25)	Quantity of plantings	h
_____	(26)	Size of proposed landscaping	h
_____	(27)	Existing areas to be preserved	h
_____	(28)	Preservation measures to be employed	h
_____	(29)	Details of planting and preservation specifications	h
✓	(30)	Location and dimensions of all fencing and screening	i
_____	(31)	Location and intensity of outdoor lighting system	j
✓	(32)	Location of fire hydrants, existing and proposed	k
✓	(33)	Written statement	c
✓	(34)	Description of proposed uses to be located on site	l
✓	(35)	Quantity and type of residential, if any	l
✓	(36)	Total land area of the site	b2
n/a	(37)	Total floor area and ground coverage of each proposed building and structure	b2
none	(38)	General summary of existing and proposed easements or other burdens	b2
n/a	(39)	Method of handling solid waste disposal	c3

<u>n/a</u>	(40)	Applicant's evaluation of availability of off-site public facilities, including sewer, water and streets	5
<u>√</u>	(41)	Description of any problems of drainage or topography, or a representation that there are none	6
<u>√</u>	(42)	An estimate of the time period required for completion of tile development	7
<u>none</u>	(43)	A list of all state and federal regulatory approvals to which the development may be subject	8
<u>none</u>	(44)	The status of any pending applications	8
<u>2-6 wks</u>	(45)	Anticipated timeframe for obtaining such permits	h8
<u>n/a</u>	(46)	A letter of non jurisdiction	h8
<u>upon approval</u>	(47)	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.	

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

Other comments:

Soils: H1B-Hinckley gravelly sandy loam, 3 to 8 percent slopes. Rapid permeability

WILLIAM T. O'BRIEN
207-730-0126
51 MONUMENT STREET
PORTLAND, ME 04101

1308

62-150/112

6 3 05

DATE

PAY TO THE ORDER OF CITY OF PORTLAND

\$ 400 ⁰⁰/₁₀₀

DOLLARS

Four Hundred

1

MAINE BANK & TRUST

a maine bank for maine people.

FOR 61 Monmouth Park Lot App William T O'Brien

⑆011201500⑆ 0023938 01⑆ 01308

**STORMWATER MANAGEMENT REPORT
PARKING & SITE IMPROVEMENTS
PORTLAND, MAINE**

I. INTRODUCTION

GENERAL

Mr. William T. O'Brien of Portland, Maine is proposing to provide off street parking for an 8,300 ft.² +/- lot located at 61 Monument Street in Portland, Maine. Currently, the lot includes a 1,550 ft.² 3-story multi-family building and 570 ft.² detached garage. The applicant is proposing to provide a 12-ft wide access drive to a (6)-space parking area with turn-around located at the rear of the building. An existing 3-ft. high concrete retaining wall along Monument Street currently prevents access to the rear of the property (see attached photograph). The site improvements include removing the wall and grading from Monument Street to the proposed parking area at a grade of approximately 8%. In order to keep the existing Lilacs that provide an attractive buffer along the west property line, a proprietary gravity retaining wall system is proposed along both sides of the drive.

EXISTING SITE CHARACTERISTICS

The site has 82.6-ft. frontage on Monument Street and is surrounded by abutting properties of similar size and use. Currently, the 8,300 ft.² lot consists 2,960 ft.² of imperviousness; including the building, garage, garage drive and walks; and, 5,340 ft.² of pervious yard area.

The Cumberland County Soil Conservation Service (SCS) Medium Intensity Soil Survey maps were used to delineate the soil type boundaries in this area. Soils have been mapped as predominantly Hinckley (H1B) gravelly sand-loam having rapid permeability characteristics.

II. DESIGN CRITERIA AND REFERENCES

GENERAL

The stormwater analysis and design of this project is based upon sound engineering and conservation practices such as those specified in the SCS TR-20 methodology, The Maine Erosion and Sedimentation Control BMP Handbook, Best Management Practices and the requirements of the City of Portland. Pre- and Post-Development Drainage Plans were not provided due to the simplicity of the site and associated model.

The SCS-Type III, 24-hour storm event for the Cumberland SE area was used for this analysis, using rainfall data for the 2-year, 10-year and 25-year design storms.

HYDROLOGY MODEL

The "HydroCAD Stormwater Modeling System" computer program by Applied Microcomputer Systems of Chocura, New Hampshire (Version 7.0) was used to analyze this project's runoff. This widely accepted program is essentially a derivative of the USDA SCS TR-20 Hydrologic Method.

III. STORMWATER ANALYSIS AND DESIGN SPECIFICS

GENERAL

The applicant proposes to control post-development runoff from the site by installing a stormwater subsurface detention/recharge system. This on-site stormwater management system will provide enough detention for storing the additional volume of runoff resulting from increasing the impervious surface area. A small amount of runoff will not be captured by the detentions/recharge system, which will result in a minor net increase in runoff from the site assuming that no runoff leaves the site for the pre-developed conditions. The Subcatchment and details are indicated on the watershed diagram submitted with the HydroCAD computations.

EXISTING CONDITIONS

The lot's existing drainage area is approximately 0.191 acres. Approximately 36% of this area is impervious and the remaining 64% is pervious, consisting of lawn, shrubs and trees. The weighted average CN is 85. The time-of-concentration was based on a flow path starting in the North corner of the lot and ending at the retaining wall along Monument Street. The total runoff from the lot with existing conditions is 0.28 cfs, 0.53 cfs and 0.66 cfs for the 2 year, 10 year and 25 year storm events respectively. However, for the purposes of the being conservative, it is assumed that the runoff volume naturally recharges so that there is no runoff generated from the lot.

DEVELOPED CONDITIONS

For modeling with site improvements, the lot was divided into two drainage areas shown as 1S and 2S with 1S draining to the proposed sub-surface detention/recharge system. The area described by 2S accounts for runoff from the proposed drive that is not conveyed into the detention/recharge system. Including the area of the proposed drive, the site improvements increase the impervious area from 36% to 85%. The pervious area is decreased from 64% to 15%, which results in an average weighted CN of 95. The applicant proposes to provide a subsurface detention/recharge system to prevent pre-development flows from exceeding post-development flows for the three design storms. This detention/recharge system is modeled as 1P in the HydroCAD program. Total storage volume provided by the detention/recharge system is 1,609 ft.³. The analysis indicates that a storage volume of 1,155 ft.³ is required for the 25-year storm event.

Since the detention/recharge system captures the runoff volume from the area described by 1S, the total runoff from the lot with site improvements is only that generated by portion of the drive not captured by the detention/recharge system, or 2S. The minor net increase of runoff from the site is 0.8 cfs, 0.13 cfs and 0.15 cfs for the 2 year, 10 year and 25 year storm events.

IV. CALCULATIONS AND RESULTS

Results of the pre-development and post-development calculations are indicated in the Summary Table below, which illustrates the total combined runoff from the site is insignificantly increased for the 2 year, 10 year and 25 year storms.

No significant adverse impacts are expected to adjacent properties since the runoff from the site are equal or below existing conditions. The results of this analysis indicate that the proposed detention system will adequately control runoff with little environmental impacts.

PARKING & SITE IMPROVEMENTS DRAINAGE REPORT SUMMARY TABLE						
STUDY POINT (OUTFALL)	2 YEAR STORM (cfs)		10 YEAR STORM (cfs)		25 YEAR STORM (cfs)	
	<i>Existing</i>	Developed	<i>Existing</i>	Developed	<i>Existing</i>	Developed
36" Outfall	0	0.8	0	0.13	0	0.15

V. STORMWATER QUALITY BEST MANAGEMENT PRACTICES

The proposed development is under 1 acre of new impervious area and is not required to meet the standards of the Maine Stormwater Management Law pursuant to 38 M.R.S.A. § 420-D.1, *Standards*, and Chapter 500 for stormwater quantity. However, stormwater quality is provided by the “Isolator Row”, which is a row of chambers that is wrapped in filter fabric. This prevents sediment and associated pollutants from entering the remaining system. Details of the detention/recharge system including Isolator Row are provided in the plan set.

VI. SUMMARY AND CONCLUSION

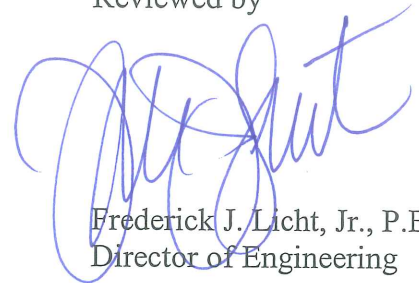
The proposed site improvements have been designed with a subsurface detention/recharge system that prevents any significant net increase in runoff from the site that result from the improvements. This site as detailed on the accompanying plans should safely detain the design storms and should not create any adverse environmental impacts, either on or off site.

Prepared by



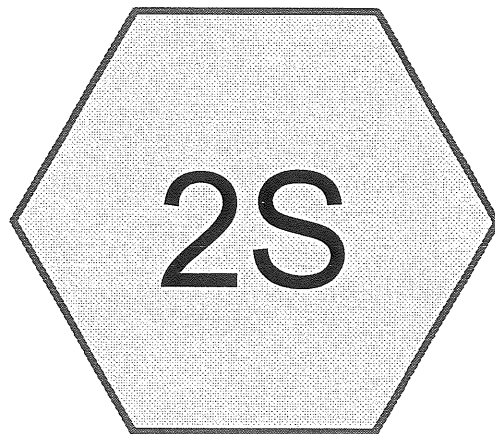
David A. Scott, EI
Civil Project Engineer

Reviewed by

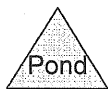


Frederick J. Licht, Jr., P.E.
Director of Engineering





Pre-Dev. Lot



pre

Type III 24-hr 2 year Rainfall=3.00"

Prepared by Land Use Consultants, Inc.

Page 2

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 2S: Pre-Dev. Lot

Runoff Area=8,320 sf Runoff Depth=1.47"

Flow Length=152' Tc=13.7 min CN=85 Runoff=0.28 cfs 0.023 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.023 af Average Runoff Depth = 1.47"

pre

Type III 24-hr 2 year Rainfall=3.00"

Prepared by Land Use Consultants, Inc.

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5/25/05

Subcatchment 2S: Pre-Dev. Lot

Runoff = 0.28 cfs @ 12.19 hrs, Volume= 0.023 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.00"

Area (sf)	CN	Description
2,962	98	Paved parking & roofs
2,178	79	50-75% Grass cover, Fair, HSG C
3,180	76	Woods/grass comb., Fair, HSG C
8,320	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	81	0.0100	0.1		Sheet Flow, Yard-Street Grass: Short n= 0.150 P2= 3.00"
2.4	71	0.0100	0.5		Shallow Concentrated Flow, B.yd-street Woodland Kv= 5.0 fps
13.7	152	Total			

pre

Type III 24-hr 10 year Rainfall=4.70"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 2S: Pre-Dev. Lot

Runoff Area=8,320 sf Runoff Depth=2.90"

Flow Length=152' Tc=13.7 min CN=85 Runoff=0.53 cfs 0.046 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.046 af Average Runoff Depth = 2.90"

pre

Type III 24-hr 10 year Rainfall=4.70"

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Subcatchment 2S: Pre-Dev. Lot

Runoff = 0.53 cfs @ 12.19 hrs, Volume= 0.046 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
2,962	98	Paved parking & roofs
2,178	79	50-75% Grass cover, Fair, HSG C
3,180	76	Woods/grass comb., Fair, HSG C
8,320	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	81	0.0100	0.1		Sheet Flow, Yard-Street Grass: Short n= 0.150 P2= 3.00"
2.4	71	0.0100	0.5		Shallow Concentrated Flow, B.yd-street Woodland Kv= 5.0 fps
13.7	152	Total			

pre

Type III 24-hr 25 year Rainfall=5.50"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 2S: Pre-Dev. Lot

Runoff Area=8,320 sf Runoff Depth=3.60"

Flow Length=152' Tc=13.7 min CN=85 Runoff=0.66 cfs 0.057 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.057 af Average Runoff Depth = 3.60"

pre

Type III 24-hr 25 year Rainfall=5.50"

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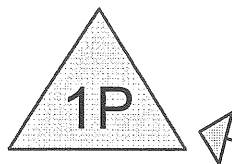
Subcatchment 2S: Pre-Dev. Lot

Runoff = 0.66 cfs @ 12.19 hrs, Volume= 0.057 af, Depth= 3.60"

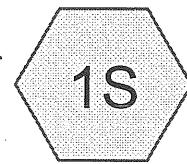
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
2,962	98	Paved parking & roofs
2,178	79	50-75% Grass cover, Fair, HSG C
3,180	76	Woods/grass comb., Fair, HSG C
8,320	85	Weighted Average

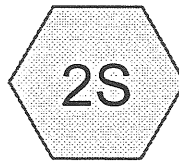
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	81	0.0100	0.1		Sheet Flow, Yard-Street Grass: Short n= 0.150 P2= 3.00"
2.4	71	0.0100	0.5		Shallow Concentrated Flow, B.yd-street Woodland Kv= 5.0 fps
13.7	152	Total			



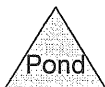
Stormtech



Post-Dev. Lot



drive



post

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Type III 24-hr 2 year Rainfall=3.00"

Page 2

5/25/05

Time span=0.50-24.00 hrs, dt=0.01 hrs, 2351 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S: Post-Dev. Lot

Runoff Area=7,317 sf Runoff Depth=2.45"
Flow Length=65' Tc=0.5 min CN=95 Runoff=0.55 cfs 0.034 af

Subcatchment 2S: drive

Runoff Area=1,002 sf Runoff Depth=2.77"
Flow Length=55' Tc=0.4 min CN=98 Runoff=0.08 cfs 0.005 af

Pond 1P: Stormtech

Peak Elev=132.08' Storage=476 cf Inflow=0.55 cfs 0.034 af
Outflow=0.06 cfs 0.034 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.040 af Average Runoff Depth = 2.49"

post

Type III 24-hr 2 year Rainfall=3.00"

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5/25/05

Subcatchment 1S: Post-Dev. Lot

Runoff = 0.55 cfs @ 12.01 hrs, Volume= 0.034 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.00"

Area (sf)	CN	Description
6,098	98	Paved parking & roofs
871	79	50-75% Grass cover, Fair, HSG C
348	76	Woods/grass comb., Fair, HSG C
7,317	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	65	0.0800	2.1		Sheet Flow, Bk-yard Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: drive

Runoff = 0.08 cfs @ 12.01 hrs, Volume= 0.005 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.00"

Area (sf)	CN	Description
1,002	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	55	0.0800	2.1		Sheet Flow, To Monument St. Smooth surfaces n= 0.011 P2= 3.00"

Pond 1P: Stormtech

Inflow Area = 0.168 ac, Inflow Depth = 2.45" for 2 year event
 Inflow = 0.55 cfs @ 12.01 hrs, Volume= 0.034 af
 Outflow = 0.06 cfs @ 12.49 hrs, Volume= 0.034 af, Atten= 88%, Lag= 29.1 min
 Discarded = 0.06 cfs @ 12.49 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 132.08' @ 12.49 hrs Surf.Area= 910 sf Storage= 476 cf
 Plug-Flow detention time= 51.2 min calculated for 0.034 af (100% of inflow)
 Center-of-Mass det. time= 50.8 min (828.7 - 777.9)

post

Type III 24-hr 2 year Rainfall=3.00"

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5/25/05

#	Invert	Avail.Storage	Storage Description
1	131.00'	1,255 cf	23.00'W x 34.00'L x 3.50'H Excavation Z=1.0 3,492 cf Overall - 354 cf Embedded = 3,139 cf x 40.0% Voids
2	131.60'	354 cf	28.9"W x 16.0"H x 7.12'L StormTech SC-310 x 24 Inside #1
		1,609 cf	Total Available Storage

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	0.004000 fpm Exfiltration over entire Wetted area

Discarded OutFlow Max=0.06 cfs @ 12.49 hrs HW=132.08' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.06 cfs)

post

Type III 24-hr 10 year Rainfall=4.70"

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Time span=0.50-24.00 hrs, dt=0.01 hrs, 2351 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S: Post-Dev. Lot

Runoff Area=7,317 sf Runoff Depth=4.12"

Flow Length=65' Tc=0.5 min CN=95 Runoff=0.90 cfs 0.058 af

Subcatchment 2S: drive

Runoff Area=1,002 sf Runoff Depth=4.46"

Flow Length=55' Tc=0.4 min CN=98 Runoff=0.13 cfs 0.009 af

Pond 1P: Stormtech

Peak Elev=132.98' Storage=927 cf Inflow=0.90 cfs 0.058 af

Outflow=0.07 cfs 0.058 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.066 af Average Runoff Depth = 4.16"

post

Type III 24-hr 10 year Rainfall=4.70"

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Subcatchment 1S: Post-Dev. Lot

Runoff = 0.90 cfs @ 12.01 hrs, Volume= 0.058 af, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
6,098	98	Paved parking & roofs
871	79	50-75% Grass cover, Fair, HSG C
348	76	Woods/grass comb., Fair, HSG C
7,317	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	65	0.0800	2.1		Sheet Flow, Bk-yard Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: drive

Runoff = 0.13 cfs @ 12.01 hrs, Volume= 0.009 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.70"

Area (sf)	CN	Description
1,002	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	55	0.0800	2.1		Sheet Flow, To Monument St. Smooth surfaces n= 0.011 P2= 3.00"

Pond 1P: Stormtech

Inflow Area = 0.168 ac, Inflow Depth = 4.12" for 10 year event
 Inflow = 0.90 cfs @ 12.01 hrs, Volume= 0.058 af
 Outflow = 0.07 cfs @ 12.76 hrs, Volume= 0.058 af, Atten= 92%, Lag= 45.0 min
 Discarded = 0.07 cfs @ 12.76 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 132.98' @ 12.76 hrs Surf.Area= 1,024 sf Storage= 927 cf
 Plug-Flow detention time= 99.1 min calculated for 0.058 af (100% of inflow)
 Center-of-Mass det. time= 98.7 min (863.5 - 764.8)

post

Type III 24-hr 10 year Rainfall=4.70"

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5/25/05

#	Invert	Avail.Storage	Storage Description
1	131.00'	1,255 cf	23.00'W x 34.00'L x 3.50'H Excavation Z=1.0 3,492 cf Overall - 354 cf Embedded = 3,139 cf x 40.0% Voids
2	131.60'	354 cf	28.9"W x 16.0"H x 7.12'L StormTech SC-310 x 24 Inside #1
		1,609 cf	Total Available Storage

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	0.004000 fpm Exfiltration over entire Wetted area

Discarded OutFlow Max=0.07 cfs @ 12.76 hrs HW=132.98' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.07 cfs)

post

Type III 24-hr 25 year Rainfall=5.50"

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Time span=0.50-24.00 hrs, dt=0.01 hrs, 2351 points

Runoff by SCS TR-20 method, UH=SCS

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

Subcatchment 1S: Post-Dev. Lot

Runoff Area=7,317 sf Runoff Depth=4.92"

Flow Length=65' Tc=0.5 min CN=95 Runoff=1.07 cfs 0.069 af

Subcatchment 2S: drive

Runoff Area=1,002 sf Runoff Depth=5.26"

Flow Length=55' Tc=0.4 min CN=98 Runoff=0.15 cfs 0.010 af

Pond 1P: Stormtech

Peak Elev=133.52' Storage=1,155 cf Inflow=1.07 cfs 0.069 af

Outflow=0.08 cfs 0.069 af

Total Runoff Area = 0.191 ac Runoff Volume = 0.079 af Average Runoff Depth = 4.96"

post

Type III 24-hr 25 year Rainfall=5.50"

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Subcatchment 1S: Post-Dev. Lot

Runoff = 1.07 cfs @ 12.01 hrs, Volume= 0.069 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
6,098	98	Paved parking & roofs
871	79	50-75% Grass cover, Fair, HSG C
348	76	Woods/grass comb., Fair, HSG C
7,317	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	65	0.0800	2.1		Sheet Flow, Bk-yard Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment 2S: drive

Runoff = 0.15 cfs @ 12.01 hrs, Volume= 0.010 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.50"

Area (sf)	CN	Description
1,002	98	Paved parking & roofs

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	55	0.0800	2.1		Sheet Flow, To Monument St. Smooth surfaces n= 0.011 P2= 3.00"

Pond 1P: Stormtech

Inflow Area = 0.168 ac, Inflow Depth = 4.92" for 25 year event
 Inflow = 1.07 cfs @ 12.01 hrs, Volume= 0.069 af
 Outflow = 0.08 cfs @ 12.84 hrs, Volume= 0.069 af, Atten= 92%, Lag= 49.6 min
 Discarded = 0.08 cfs @ 12.84 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.50-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 133.52' @ 12.84 hrs Surf.Area= 1,095 sf Storage= 1,155 cf
 Plug-Flow detention time= 119.5 min calculated for 0.069 af (100% of inflow)
 Center-of-Mass det. time= 119.1 min (879.8 - 760.7)

post

Type III 24-hr 25 year Rainfall=5.50"

Prepared by Land Use Consultants, Inc.

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#	Invert	Avail.Storage	Storage Description
1	131.00'	1,255 cf	23.00'W x 34.00'L x 3.50'H Excavation Z=1.0 3,492 cf Overall - 354 cf Embedded = 3,139 cf x 40.0% Voids
2	131.60'	354 cf	28.9"W x 16.0"H x 7.12'L StormTech SC-310 x 24 Inside #1
		1,609 cf	Total Available Storage

#	Routing	Invert	Outlet Devices
1	Discarded	0.00'	0.004000 fpm Exfiltration over entire Wetted area

Discarded OutFlow Max=0.08 cfs @ 12.84 hrs HW=133.52' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.08 cfs)