

Stamski and McNary, Inc.
Engineering - Planning - Surveying
80 Harris Street Acton, MA 01720 (978) 263-8585

Notice of Intent

Under the Massachusetts Wetland Protection Act,
G.L. c. 131, s. 40

for

**442 Massachusetts Ave.
Acton, MA 01720**



Applicant: 442 Massachusetts Ave., LLC.
P.O. Box 2350
69 Great Road
Acton, MA 01720

Owner: Margot Grallert
442 Massachusetts Ave.
Acton, MA 01720

Date: October 16, 2008

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Notice of Intent - WPA Form 3



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Provided by MassDEP:

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number

Document Transaction Number

Acton

City/Town

Important:
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
 Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

442 Massachusetts Avenue Acton 01720
 a. Street Address b. City/Town c. Zip Code
 Latitude and Longitude: 42° 28' 30" N 71° 27' 25" W
 d. Latitude e. Longitude
Map F-2 120
 f. Assessors Map/Plat Number g. Parcel /Lot Number

2. Applicant:

442 Massachusetts Ave, LLC Acton MA 01720
 a. First Name b. Last Name c. Organization e. City/Town f. State g. Zip Code
P.O. Box 2350, 69 Great Road
 d. Street Address
(978) 263 2989 (978) 263-0403 actonmgt@verizon.net
 h. Phone Number i. Fax Number j. Email Address

3. Property owner (required if different from applicant): Check if more than one owner

Margot Grallert
 a. First Name b. Last Name
 c. Organization
442 Massachusetts Ave
 d. Street Address
Acton MA 01720
 e. City/Town f. State g. Zip Code
(978) 263-3611
 h. Phone Number i. Fax Number j. Email address

4. Representative (if any):

George Dimakarakos
 a. First Name b. Last Name
Stamski and McNary, Inc.
 c. Company
80 Harris St.
 d. Street Address
Acton MA 01720
 e. City/Town f. State g. Zip Code
(978) 263-8585 (978) 263-9883 gd@stamskiandmcnary.com
 h. Phone Number i. Fax Number j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$1,050 \$512.50 \$537.50
 a. Total Fee Paid b. State Fee Paid c. City/Town Fee Paid



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A. General Information (continued)

6. General Project Description:

The site currently consists of a single family dwelling. The proposed project is a affordable housing project consisting of one existing single family dwelling and three proposed townhomes. The work within 100' buffer zone includes the proposed 3-unit multifamily dwelling, associated driveway, and grading.

7a. Project Type Checklist:

- | | |
|---|---|
| 1. <input type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Limited Project Driveway Crossing | 4. <input type="checkbox"/> Commercial/Industrial |
| 5. <input type="checkbox"/> Dock/Pier | 6. <input type="checkbox"/> Utilities |
| 7. <input type="checkbox"/> Coastal Engineering Structure | 8. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) |
| 9. <input type="checkbox"/> Transportation | 10. <input checked="" type="checkbox"/> Other |

7b. Is any portion of the proposed activity eligible to be treated as a limited project subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. Yes No If yes, describe which limited project applies to this project:

2. Limited Project

8. Property recorded at the Registry of Deeds for:

Middlesex South District Deeds

a. County

13461

c. Book

b. Certificate # (if registered land)

487

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. linear feet 3. cubic yards dredged	2. linear feet



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet _____ 3. cubic feet of flood storage lost _____	2. square feet _____ 4. cubic feet replaced _____
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet _____ 2. cubic feet of flood storage lost _____	3. cubic feet replaced _____
f. <input type="checkbox"/> Riverfront Area	1. Name of Waterway (if available) _____	

2. Width of Riverfront Area (check one):

- 25 ft. - Designated Densely Developed Areas only
- 100 ft. - New agricultural projects only
- 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? Yes No

6. Was the lot where the activity is proposed created prior to August 1, 1996? Yes No

3. Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet _____ 2. cubic yards dredged _____	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet _____	2. cubic yards beach nourishment _____
e. <input type="checkbox"/> Coastal Dunes	1. square feet _____	2. cubic yards dune nourishment _____

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.



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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	_____	
	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	_____	
	1. square feet	
h. <input type="checkbox"/> Salt Marshes	_____	_____
	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	_____	
	1. square feet	

	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	_____	
	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	

	1. cubic yards dredged	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	_____	
	1. square feet	
4. <input type="checkbox"/> Restoration/Enhancement	If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.	

_____ a. square feet of BVW

_____ b. square feet of Salt Marsh

C. Other Applicable Standards and Requirements

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to <http://www.mass.gov/dfwele/dfw/nhosp/nhregmap.htm>.

a. Yes No **If yes, include proof of mailing or hand delivery of NOI to:**

**Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
Route 135, North Drive
Westborough, MA 01581**

b. Date of map _____

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.C, and include requested materials with this Notice of Intent (NOI); OR complete Section C.1.d, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*



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MassDEP File Number _____

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C. Other Applicable Standards and Requirements (cont'd)

1. c. Submit Supplemental Information for Endangered Species Review *

1. Percentage/acreage of property to be altered:

(a) within wetland Resource Area

_____ percentage/acreage

(b) outside Resource Area

_____ percentage/acreage

2. Assessor's Map or right-of-way plan of site

3. Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) Photographs representative of the site

(c) MESA filing fee (fee information available at:
<http://www.mass.gov/dfwele/dfw/nhesp/nhenvmesa.htm>)

Make check payable to "Natural Heritage & Endangered Species Fund" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

(d) Vegetation cover type map of site

(e) Project plans showing Priority & Estimated Habitat boundaries

d. OR Check One of the Following

1. Project is exempt from MESA review.

Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, <http://www.mass.gov/dfwele/dfw/nhesp/nhenvexemptions.htm>; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. Separate MESA review ongoing.

a. NHESP Tracking Number _____

b. Date submitted to NHESP _____

3. Separate MESA review completed.

Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

* Some projects not in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see www.nhosp.org regulatory review tab). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



Massachusetts Department of Environmental Protection
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C. Other Applicable Standards and Requirements (cont'd)

2. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. Not applicable – project is in inland resource area only

b. Yes No If yes, include proof of mailing or hand delivery of NOI to either:

South Shore - Cohasset to Rhode Island, and the Cape & Islands:

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
838 South Rodney French Blvd.
New Bedford, MA 02744

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

3. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. Yes No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC

4. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. Yes No

5. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

a. Yes No

6. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

2. A portion of the site constitutes redevelopment

3. Proprietary BMPs are included in the Stormwater Management System.

b. No. Check why the project is exempt:

1. Single-family house

2. Emergency road repair

3. Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

Online Users:
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D. Additional Information

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

- 1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
- 2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.
- 3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
- 4. List the titles and dates for all plans and other materials submitted with this NOI.

Comprehensive Permit Plan for Lalli Terrace (4 Sheets)

a. Plan Title

Stanski and McNary, Inc. &
Kim Ahern Landscape Architects

August 14, 2008

d. Final Revision Date

Joseph March, P.E., P.L.S. & Kim Ahern

c. Signed and Stamped by

1"=20'

e. Scale

f. Additional Plan or Document Title

g. Date

- 5. If there is more than one property owner, please attach a list of these property owners not listed on this form.
- 6. Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
- 7. Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
- 8. Attach NOI Wetland Fee Transmittal Form
- 9. Attach Stormwater Report, if needed.

E. Fees

- 1. Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

1047

2. Municipal Check Number

1046

4. State Check Number

442 Massachusetts Avenue, LLC

6. Payor name on check: First Name

10/14/08

3. Check date

10/14/08

5. Check date

442 Massachusetts Avenue, LLC

7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

<i>Stephen D. Steinberg</i>	10/10/08
1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a copy of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

NOI Wetland Fee Transmittal Form



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important:
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Applicant:

a. First Name _____ b. Last Name _____
 442 Massachusetts Avenue, LLC
 c. Organization _____
 PO Box 2350, 69 Great Road
 d. Mailing Address _____
 Acton _____ MA _____ 01720
 e. City/Town _____ f. State _____ g. Zip Code _____
 (978) 263-2989 (978) 263-0403 actonmgt@verizon.net
 h. Phone Number _____ i. Fax Number _____ j. Email Address _____

2. Property Owner (if different):

Margot _____ Grallert _____
 a. First Name _____ b. Last Name _____

 c. Organization _____
 442 Massachusetts Avenue
 d. Mailing Address _____
 Acton _____ MA _____ 01720
 e. City/Town _____ f. State _____ g. Zip Code _____
 (978) 263-3611 _____
 h. Phone Number _____ i. Fax Number _____ j. Email Address _____

3. Project Location:

442 Massachusetts Avenue _____
 a. Street Address _____ b. City/Town _____

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

The fee should be calculated using the following six-step process and worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

Certified Abutters List / Affidavit / Notice to Abutters



Town of Acton
 472 Main Street
 Acton, MA 01720
 Telephone (978) 264-9622
 Fax (978) 264-9630

Brian McMullen
 Assistant Assessor

Locus: 442 MASS AVE
 Parcel ID: F2-120

Location	Parcel ID	Owner	Co-Owner	Mailing Address	City	ST	Zip
441 MASS AV	F2-109	ACTON-BOXBORO REG SCHOOL DIST		472 MAIN STREET	ACTON	MA	01720
456 MASS AV	F2-117	FINNEGAN JOSEPH P	FINNEGAN KATHLEEN T	456 MASS. AVE	ACTON	MA	01720
448 MASS AV	F2-118	TANG YANHUA	LIU QING	448 MASS AV	ACTON	MA	01720
446 MASS AV	F2-119	NIMMER JEREMY		446 MASS AV	ACTON	MA	01720
143 PROSPECT ST	F2-126	TOWEY SEAN T	TOWEY MARCIA A	143 PROSPECT ST	ACTON	MA	01720
139 PROSPECT ST	F2-129	SPENCER MARY ELIZABETH	C/O BLANCHARD PLACE LLC	411 MASS AVENUE STE 304	ACTON	MA	01720
252 MAIN ST REAR	F2-129-1	STOP & SHOP SUPERMARKET CO	1385 HANCOCK STREET	REAL ESTATE TAX DEPARTMENT	QUINCY	MA	02169

The owner of land sharing a common boundary or corner with the site of the proposed activity (100 feet) in any direction, including land located directly across a street, way, creek, river, stream, brook or canal. The above are as they appear on the most recent applicable taxes.

Kimberly D. Hoyt
 5-Aug-08 Updated
 90-Jan-08

Kimberly Hoyt
 Assessing Clerk
 Acton Assessors Office

AFFIDAVIT OF SERVICES
Under the Massachusetts Wetlands Protection Act
(to be submitted to the Massachusetts Department of
Environmental Protection and the Conservation Commission
when filing a Notice of Intent)

I, George Dimakarakos, hereby certify under the pains and penalties of perjury that on 10/16/08 I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the DEP Guide to Abutter Notification dated April 8, 1994, in connection with the following matter:

A Notice of Intent filed under the Massachusetts
Wetlands Protection Act by 442 Massachusetts
Avenue, LLC with the Acton Conservation
Commission for property located at 442
Massachusetts Avenue.

The form of the notification, and a list of the abutters to whom it was given and their addresses, are attached to this Affidavit of Service.

Name:

George Dimakarakos

Date: 10/16/08

NOTIFICATION TO ABUTTERS
UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 you are hereby notified of the following:

The Applicant: 442 Massachusetts Avenue, LLC
Address: P.O.Box 2350; Acton, MA 01720 Phone: (978) 263-2989

has filed a Notice of Intent with the Acton Conservation Commission seeking permission to remove, fill, dredge or alter an Area Subject to Protection under the Wetlands Protection Act .

Applicant's Representative: Stanski and McNary, Inc.
Address: 80 Harris Street; Acton MA 01720 Phone: (978) 263-8585

The address of the property where the activity is proposed: 442 Massachusetts Ave.

Town Atlas Plate/Map: F-2 Parcel/Lot: 120

Project Description: The site currently contains a single family dwelling. The proposal is an affordable housing project consisting of one existing single family dwelling and three proposed townhomes. The work within 100' buffer zone includes the proposed 3-unit multifamily dwelling, associated driveway, and grading.

Copies of the Notice of Intent may be examined at the Conservation Office, Acton Town Hall, 472 Main Street, Acton. Between the hours of 8:00 A.M. and 4:30 P.M. Monday through Friday. For more information please call the Conservation Office at 978-264-9631.

A Public Hearing will be held at the Acton Town Hall, 472 Main Street, on Wednesday,
November 5, 2008 at 7:30 P.M.
(date)

The notice of the public hearing, will be published at least five (5) days in advance in the *Beacon* newspaper or *Metrowest Daily News*.

NOTE: You may also contact your local conservation commission or the nearest Department of Environmental Protection Regional Office for the information about this application or, the Wetlands Protection Act. Acton is in the Central Region. To contact DEP, call:

*Central Region: 508-792-7650
Southeast Region: 508-946-2700

Northeast Region: 978-694-3200
Western Region: 413-784-1100

Attachment A
Project Narrative

PROJECT NARRATIVE

442 Massachusetts Avenue

Existing Conditions

The site consists of approximately 0.66 acres of land located in the Residence 2 zoning district. The site has one single-family dwelling on the property. There are mature trees located along all sides of the site providing privacy to the lot. There is a wetland to the south of the property. The remaining property is open space, specifically lawn and typical landscaping.

Under current conditions, runoff from the entire site runs off uncontrolled to the wetlands located to the south of the lot. All runoff from the wetlands then enters a 12" culvert pipe. There is a vernal pool within the wetland but it is upstream of the 12" Culvert, i.e. site runoff does not affect the vernal pool.

Bordering Vegetated Wetlands

There is approximately 3 square feet of Bordering Vegetated Wetland (BVW) located on site. The BVW boundaries were field delineated by B & C Associates and confirmed by the Acton Conservation Commission in an Order of Resource Delineation dated: March 7, 2008 (attached).

Proposed Site Conditions

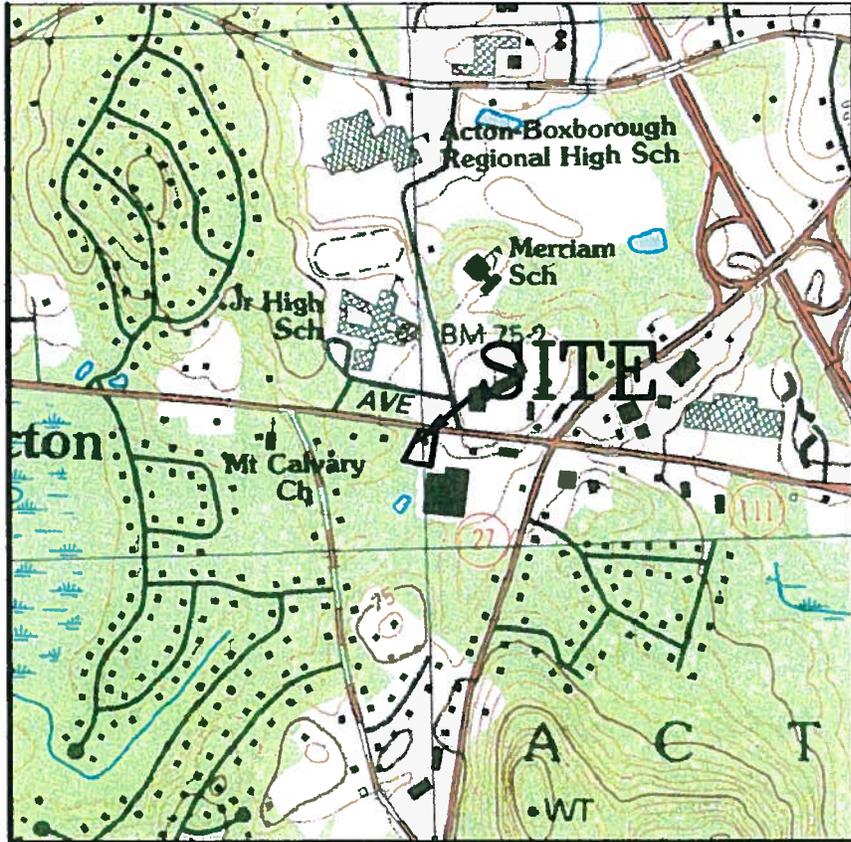
The proposed project is an affordable housing project under MGL CH 40B consisting of one existing single family dwelling and three proposed townhomes. This project will be reviewed by the Acton Zoning Board of Appeals for all local permits including any required by the Acton Wetland Bylaw. This Notice of Intent has been filed in accordance with the Massachusetts Wetland Protection Act. The work within 100' buffer zone includes the proposed 3-unit multifamily dwelling, associated driveway, and grading.

Runoff from the northern portion of the site will now be directed to subsurface drainage, providing recharge for the site. Runoff from the remaining area of the site will runoff paved surfaces through vegetated buffer strips prior to reaching the wetland.

Buffer Zone

The BVW projects a 100 foot Buffer Zone onto the site. Virtually all of the Buffer Zone consists of lawn and woods for the existing site. The Buffer Zone also contains an abandoned leaching field that will be removed. The work within 100' buffer zone for the proposed project includes a 3-unit multifamily dwelling, associated driveway, and grading.

Attachment B
U.S.G.S. Map



LOCUS PLAN

SCALE: 1" = 1,200'



Attachment C
Order of Resource Area Delineation
DEP FILE # 85-988



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 4B – Order of Resource Area Delineation

85-988

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by DEP

A. General Information

From: ACTON
1. Conservation Commission

2. This Issuance is for (check one):

- a. Order of Resource Area Delineation Only
- b. Order of Resource Area Delineation Subject to Simplified Review
 - 1. Not Subject to Stormwater Policy
 - 2. Subject to Stormwater Policy
- c. Amended Order of Resource Area Delineation

3. To: Applicant:

Stephen Steinberg Acton Management, Inc.
a. First Name b. Last Name c. Company
PO Box 2350
d. Mailing Address
Acton MA 01720
e. City/Town f. State g. Zip Code

4. Property Owner (if different from applicant):

Margot A. Grallert
a. First Name b. Last Name c. Company
442 Massachusetts Avenue
d. Mailing Address
Acton MA 01720
e. City/Town f. State g. Zip Code

5. Project Location:

442 Massachusetts Avenue Acton
a. Street Address b. City/Town
F-2 120
c. Assessors Map/Plat Number d. Parcel/Lot Number
Latitude and Longitude (**note:** electronic filers will click for GIS locator): 42°28'28" 72°27'25"
e. Latitude f. Longitude

6. Dates: February 7, 2008 March 5, 2008 March 5, 2008
a. Date Notice of Intent filed b. Date Public Hearing Closed c. Date of Issuance

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

Abb. Notice of Resource Area Delineation Plan January 22, 2008
a. Title b. Date
c. Title d. Date



WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable):

a. **Accurate:** The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. Bordering Vegetated Wetlands
2. Other Resource Area(s), specifically:

b. **Modified:** The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

1. Bordering Vegetated Wetlands
2. Other Resource Area(s), specifically:

c. **Inaccurate:** The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. Bordering Vegetated Wetlands
2. Other Resource Area(s), specifically:

3. The boundaries were determined to be inaccurate because:



WPA Form 4B – Order of Resource Area Delineation

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C. Simplified Buffer Zone Review

Work within the Buffer Zone pursuant to the Simplified Review (310 CMR 10.02) requires that you must comply with the following conditions. If your project does not meet these requirements, you are required to either file a Determination of Applicability or Notice of Intent or take other corrective measures as directed by the Conservation Commission.

Simplified Review Conditions:

Work conducted under Simplified Review requires the following:

1. No work of any kind shall occur within any wetland resource areas including Riverfront Area and Bordering Land Subject to Flooding.
2. The inner 0-to-50-foot wide area from the delineated wetland boundary that has a Buffer Zone shall not be disturbed by any work associated with this project, including placement of any stormwater management components.
3. No work shall occur in the Buffer Zone bordering an Outstanding Resource Water (e.g., certified vernal pool, public water supply reservoir or tributary), as defined in 314 CMR 4.00 or border coastal resource areas at 310 CMR 10.25-10.35.
4. No work shall occur in the Buffer Zone adjacent to wetland resources with estimated wildlife habitat (which is identified on the most recent Estimated Habitat Map of State-listed Rare Wetlands Wildlife).
5. Erosion and Sedimentation controls shall be installed and maintained at the 50-foot Buffer Zone line or limit of work (whichever is a greater distance from the resource area) to protect resource areas during construction.
6. If the project is subject to the Massachusetts Stormwater Policy, all work shall be conducted in conformance with an approved Stormwater Management Plan.
7. The Buffer Zone does not contain a slope greater than an average of 15% at its steepest gradient across the 100-foot Buffer Zone.
8. The amount of new impervious surface, in combination with existing impervious surfaces, shall not exceed 40% of the Buffer Zone between 50 and 100 feet.
9. No work is allowed, and no additional NOI or RDA shall be filed, for any work within the 0-to-50-foot Buffer Zone during the three-year term of an Order associated with this application.
10. Prior to any work being undertaken pursuant to this Order, the wetland resource boundary shall be flagged; all boundary delineation flagging should be maintained for the term of the Order.
11. If stormwater management structures are proposed in the Buffer Zone, the stormwater management structures shall be maintained as required in the Stormwater Plan. Such maintenance constitutes an ongoing condition and is not subject to further permitting requirements.
12. If this ORAD involves work as part of a Simplified Review, the ORAD shall be recorded at the Registry of Deeds prior to the commencement of work per the requirements of Section F.
13. Prior to proceeding with any work under Simplified Review, applicants are required to provide written notice to the Commission one week prior to commencing any work.
14. If work authorized under Simplified Review is commenced, no work is allowed, and no additional NOI or RDA may be filed, for any work within the 0-to-50-foot buffer zone during the term of an ORAD associated with this application. If work authorized under Simplified Review is **not** commenced, then future NOIs or RDAs may be filed for work within the 0-to-50-foot portion of the buffer zone.

--End of Conditions--



WPA Form 4B – Order of Resource Area Delineation

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C. Simplified Buffer Zone Review (cont.)

Stormwater Applicability

- 1. The project is not subject to the Stormwater Policy.
- 2. The project is subject to the Stormwater Policy and the Stormwater Plan included for the project complies with all stormwater standards.

Ineligibility Determinations

Site Conditions: The applicant is not eligible for Simplified Buffer Zone review and must file a Request for Determination of Applicability or Notice of Intent prior to any work because:

- 3. Work is within the Buffer Zone of a Coastal Resource Area as defined at 310 CMR 10.25-10.35.
- 4. The Buffer Zone contains existing slopes greater than an average of 15%.
- 5. Buffer Zone contains estimated rare wildlife habitat.¹
- 6. The site borders an Outstanding Resource Water.²

Stormwater

- 7. The project is subject to the Stormwater Policy and the applicant has not submitted sufficient information to demonstrate compliance with the Stormwater Management Policy. Prior to any work, the applicant must submit plans showing compliance with the standards in the Stormwater Policy, the location of the work, the amount of impervious surface, and the location of erosion controls, to the Commission for its concurrence. (See instructions to ANRAD Form 4A.) The following necessary stormwater information was not submitted by the applicant:

a. _____

- 8. The project is subject to the Stormwater Policy but the project does not comply with one or more of the stormwater standards (specify which standard(s) not met).

a. Standard # _____ :

b. Standard # _____ :

- 9. Impervious surface exceeds 40% of the area of the Buffer Zone between 50 and 100 feet from the resource area.
- 10. The applicant did not submit plans depicting adequate erosion and sedimentation controls located at the limit of work or at least 50 feet from any resource areas, whichever will be greater.
- 11. Work is proposed within 50 feet of a resource area.

Notice to Commission

Any applicant proposing to proceed under Simplified Buffer Zone Review, as specified in 310 CMR 10.02, must provide written notice to the Commission one week prior to any work.

¹ Identified on the most recent Estimated Habitat Map of State-listed Rare Wetlands Wildlife of the Natural Heritage and Endangered Species Program.

² Certified Vernal Pools, public water supplies, or inland ACECs as identified in 314 CMR 4.00.



D. Findings

This Order of Resource Area Delineation determines that the Stormwater Plan, if applicable, and the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

If the Abbreviated Notice of Resource Area Delineation was filed as Simplified Review for a Buffer Zone project, the applicant has certified that any work associated with the proposed project meets all eligibility requirements for Simplified Review listed in Section C of this Order. Any work that does not comply with the Simplified Review requirements will require a Notice of Intent or Request for Determination of Applicability.

The applicant is responsible for promptly requesting a Certificate of Compliance following completion of any work allowed pursuant to a Simplified Review or no later than three years from the date of the Order of Resource Area Delineation unless the Order is extended.

Failure to comply with the conditions of this Order is grounds for the Conservation Commission or the Department to take enforcement action.

This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see <http://www.mass.gov/dep/about/region/findyour.htm>).

E. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant. Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order or Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, § 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.



WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

F. Signatures and Notary Acknowledgement

Please indicate the number of members who will sign this form:

1 Number of Signers

[Signature]
Signature of Conservation Commission Member

1 Number of Signers

[Signature]
Signature of Conservation Commission Member

[Signature]
Signature of Conservation Commission Member

[Signature]
Signature of Conservation Commission Member

This Order is valid for three years from the date of issuance.

This Order is issued to the applicant and the property owner (if different) as follows:

by hand delivery on

Date

by certified mail, return receipt requested on

Date

3/7/2008

Notary Acknowledgement

Commonwealth of Massachusetts County of

Middlesex South

On this fifth Day of

March Month

2008 Year

Before me, the undersigned Notary Public, personally appeared

Terence MacKand
Name of Document Signer

proved to me through satisfactory evidence of identification, which was/were

KNOWN TO ME

Description of evidence of identification

to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he/she signed it voluntarily for its stated purpose.

As member of

ACTON
City/Town

Conservation Commission

[Signature]
Signature of Notary Public

Andrea H. Ristine

Printed Name of Notary Public

February 27, 2009

My Commission Expires (Date)

Place notary seal and/or any stamp above



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 4B – Order of Resource Area Delineation

85-988

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by DEP

G. Recording Information

If this Order is issued for purposes of Resource Area Delineation only, this Order should NOT be recorded.

If this Order of Resource Area Delineation is issued as part of a Simplified Review, this Order must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on Page 6 of this form shall be submitted to the Conservation Commission listed below.

ACTON

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

ACTON

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

442 Massachusetts Avenue, Acton

Project Location

85-988

DEP File Number

Has been recorded at the Registry of Deeds of:

Middlesex South

County

Book

Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Attachment D
Massachusetts Natural Heritage Atlas 12th Edition

Priority Habitats and Estimated Habitats - Effective October 1, 2006
Priority Habitats for use with the MA Endangered Species Act Regulations (321 CMR 10)
Estimated Habitats for use with the MA Wetlands Protection Act Regulations (310 CMR 10)
Administered by the Natural Heritage & Endangered Species Program website: www.nhesp.org



Attachment E
Drainage Calculations
&
Water Balance

DRAINAGE CALCULATIONS

TABLE OF CONTENTS

Narrative

Hydrology & Drainage Maps

Infiltration Trench Sizing

Soil Evaluations

Narrative

STORMWATER MANAGEMENT

The site is located at 442 Massachusetts Avenue in Acton, Massachusetts, and is approximately 0.7 acres in size. The site presently contains an single family dwelling and appurtenances. Virtually the entire site is developed as a yard for the house.

The Natural Resources Conservation Service (N.R.C.S.) soil survey report for Middlesex County and associated soil maps for Acton indicate that soils on site consist of Charlton-Hollis-Rock Outcrop Complex and Udorthents. These soils have been assigned to Hydrologic Groups B which is consistent with onsite soil testing.

Pre-Development

Virtually the entire site is developed with a single family house, appurtenances and yard area. The site drains to a Bordering Vegetated Wetland (BVW) just off the property to the south. The wetland drains to a culvert under the K-Mart parking lot to the east. The BVW contains a certified vernal pool, but it is hydraulically upstream of the area that collects the runoff from this site. There are no stormwater BMP's on the existing site.

Post-Development

The fully developed site will consist of the existing single family house and 3 new townhouse units that will be located in one new building. The developed site will also contain a new driveway, walkway and other appurtenances. Runoff from the site will continue to flow to the BVW to the south of the site. A subsurface infiltration system will mitigate runoff and promote infiltration.

COMPLIANCE WITH DEP STORMWATER MANAGEMENT STANDARDS

The project is subject to the DEP Stormwater Management Standards since there are point source discharges within jurisdictional areas of the Wetlands Protection Act. The Acton Board of Appeals' Rules and Regulations for Comprehensive Permits require attenuation of peak runoff rates. Also, the Stormwater Management Standards do not apply to multi-family housing developments with four or fewer units, provided that there are no stormwater discharges that may potentially affect a critical area. There are no stormwater discharges associated with the project and the site drains to a point hydraulically downgradient of the certified vernal pool within the BVW to the south of the property, therefore the stormwater management standards do not apply to this project.

Post-Development Peak Discharge: The Rules and Regulations for Comprehensive Permits require attenuation of peak runoff rates for up to the 10-year design storm and require that there is no serious flood hazard for the 100-year storm. Attenuation of peak discharge rates has been accomplished by using a subsurface infiltration trench. Overland flow from a portion of the site will be collected by a deep sump hooded catch basin then conveyed to a subsurface infiltration trench comprised of plastic chambers and crushed stone. The following table summarizes pre- and post development peak rates of runoff for the project.

Peak Runoff Discharge Rate Summary

2 year storm		10 year storm		100 year storm	
Pre-Development	Post-Development	Pre-Development	Post-Development	Pre-Development	Post-Development
0.29 cfs	0.28 cfs	0.90 cfs	0.68 cfs	1.95 cfs	1.31 cfs

As noted in the table, post-development rates of runoff from all of the storm events are less than those under pre-development conditions. Detailed calculations are attached.

Groundwater Recharge/Water Balance Calculations: The Comprehensive Permit regulations require that an annual hydrologic water balance be prepared and included in the drainage calculations. Section 3.11 contains detailed calculations indicating that annual recharge rates are balanced on the site after construction with the use of the subsurface infiltration trench.

Erosion and Sedimentation Controls

In general, erosion and sediment controls are incorporated into the project design to prevent erosion, control sediment movement, and stabilize exposed and disturbed soils during construction. Temporary erosion and sedimentation controls include minimizing areas of exposed soil, directing and controlling runoff, and rapidly stabilizing exposed areas. Prior to the commencement of construction, trenched siltation fences and haybales will be placed down gradient of all work areas. Stockpiled soils will be contained within siltation fence or staked haybales. Soils left exposed for extended periods of time will be mulched and seeded for temporary vegetative cover. Following construction, exposed areas will be permanently vegetated with appropriate ground cover.

Erosion and sedimentation control measures will be maintained throughout all phases of construction. Inspections will be made regularly and after rainfalls exceeding 0.5 inches in a 24-hour period during construction. The contractor will be required to inspect erosion and sedimentation control measures at the end of each workday, when precipitation is forecast, and after each rainfall. All measures will be inspected prior to each weekend and the contractor will replace and repair any malfunctioning or damaged controls measures including vegetative stabilization as necessary. Long-term erosion and sedimentation control will be realized through the use of the Best Management Practices described previously. Areas where soils have been disturbed will be loamed and vegetated with lawn, trees, and shrubs.

Operations and Maintenance Plan

The implementation, inspection, and repair of the erosion controls are the responsibility of the site contractor during construction. The inspection and operation of the storm water management system upon completion of construction is the responsibility of the owner. The Operations and Maintenance Plan is provided on the site plan.

Design Basis

1. The United States Department of Agriculture Natural Resource Conservation Service (N.R.C.S.) TR55 methodology was used to determine off-site rates of runoff.
2. The twenty-four hour rainfall, taken from N.R.C.S. publications, is 6.4 inches for the 100-year storm, 4.5 inches for the 10-year storm, and 3.1 inches for the 2-year storm event.
3. The hydrologic calculations were performed using the computer program: "Hydraflow Hydrographs 2007", by Intelisolve.
4. The soil types of the site were taken from the N.R.C.S. Soil Survey Map for Acton.
5. Estimated Seasonal High Water Table (E.S.H.W.T.) was determined by on-site soil evaluations.

Hydrology & Drainage Maps

PRE-DEVELOPMENT

SMH 182 DMH DMH
 RIM=227.65' RIM=227.15' RIM=227.24' RIM=226.81'
 INV.=219.45' (RECORD) INV.=224.32' INV.=224.34' INV.=221.88'

MASSACHUSETTS AVENUE (RTE. 111)

APPROXIMATE LOCATION OF EXISTING SEWER SERVICE STUB (LOCATION & ELEVATION TO BE FIELD VERIFIED)

12" CMP PAVEMENT

PAVEMENT

20' WIDE DRAIN EASEMENT

PAVED DRIVEWAY

656

#442

WOODED

LAWN

BOULDER

1038

WOODED



PRE-DEVELOPMENT DRAINAGE MAP
 IN
 ACTON, MASSACHUSETTS
 (MIDDLESEX COUNTY)
 FOR: 442 MASSACHUSETTS AVENUE, LLC
 SCALE: 1"=40' AUGUST 15, 2008
 STANSKI AND MCNARY, INC.
 20 HANCOCK STREET ACTON, MASSACHUSETTS
 ZONING: ZONING - PLANNING - SURVEYING
 25 50 100 150 200 FT.

SM-1033 4283 PREL.dwg

EDGE OF PAVEMENT AT BASE OF SNOWBANK

ANALYSIS POINT A
 LIMIT OF BORDERING VEGETATED WETLANDS AS DELINEATED BY B & C ASSOCIATES

SUBCATCHMENT AREA
 2 - 10.0 AC
 0.88 AC

SOIL TYPE KEY

- 1038 CHARLTON-HOLLS-ROCK OUTCROP COMPLEX
- 656 WOODHURST-URBAN LAND COMPLEX

LEGEND

- PROPOSED SUBCATCHMENT
- SUBCATCHMENT NUMBER
- TRAVEL PATH THROUGH SUBCATCHMENT (T)
- HYDRAULIC SOIL BOUNDARIES (FROM SDS MAP)
- TRAILLINE
- STONEWALL
- EXTERNAL CONDUIT
- EXTERNAL CONDUIT
- EDGE OF SURROUNDING VEGETATED WETLANDS
- SET FLAG
- FENCE
- WELL

UTILITY NOTES

ALL UNDERGROUND UTILITIES SHOWN WERE COMPILED ACCORDING TO THE RECORD DRAWINGS AND FIELD SURVEY DATA. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD BEFORE CONSTRUCTION. EXISTING UTILITIES ARE SHOWN AS DOTTED LINES. COMPANY, PUBLIC AND PRIVATE, MUST BE CONTACTED INCLUDING OWNERS AND CONTRACTORS FOR ANY UTILITIES NOT SHOWN ON THIS PLAN. SEE THE DRAWINGS FOR THE LOCATION OF UTILITIES. THE LOCATION OF UTILITIES MUST BE VERIFIED IN THE FIELD BEFORE CONSTRUCTION. THE LOCATION OF UTILITIES MUST BE VERIFIED IN THE FIELD BEFORE CONSTRUCTION. THE LOCATION OF UTILITIES MUST BE VERIFIED IN THE FIELD BEFORE CONSTRUCTION.

Worksheet 3: Time of Concentration (Tc) or travel time (Tt)

SM-4293

Project: LALLI TERRACE By TJR Date 08/08/08

Location: 442 MASSACHUSETTS AVE Checked _____ Date _____

Circle one: Present Developed Subcatchment 1
 Circle one: Tc Tt through subarea

Sheet flow (Applicable to Tc only)

1. Surface Description (table 3-1)
2. Mannings roughness coeff., n (table 3-1)
3. Flow length, L (total L <= 300 ft)
4. Two-yr 24-hr rainfall, P2
5. Land Slope, s
6. $Tt = 0.007 (nL)^{0.8} / (P2^{0.5} s^{0.4})$ Compute Tt

Segment ID	A-B	B-C	
	Woods	Grass	
	0.4	0.24	
ft	25	25	
in	3.1	3.1	
ft/ft	0.04	0.08	
hr	0.09		0.09

Shallow concentrated Flow

7. Surface Description (paved or unpaved)
8. Flow Length, L
9. Watercourse slope, s
10. Average Velocity, V (figure 3-1)
11. $Tt = L / 3600V$ Compute Tt

Segment ID	C-D		
	Unpaved		
ft	122		
ft/ft	0.06		
ft/s	3.90		
hr	0.01		0.01

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, pw
14. Hydraulic radius, $r=a/wp$ Compute r
15. Channel Slope, s
16. Manning's roughness coeff., n
17. $V = 1.49 r^{2/3} s^{1/2} / n$ Compute V
18. Flow length, L
19. $Tt = L / 3600V$ Compute Tt

Segment ID			
sf			
ft			
ft			
ft/ft			
ft/s			
ft			
hr			0.00

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

hr	0.10
min	6.0

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.285	2	726	1,187	—	—	—	PRE - SUBC 1

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

PRE - SUBC 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.285 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 1,187 cuft
Drainage area	= 0.690 ac	Curve number	= 63.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 3.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow
(min cfs)

724 0.276
726 0.285 <<

...End

Hydrograph Summary Report

Hydraflow Hydrographs by Intellisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.900	2	724	2,942	—	—	—	PRE - SUBC 1
4293 HYRDO PRE.gpw					Return Period: 10 Year		Thursday, Sep 11, 2008		

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

PRE - SUBC 1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.900 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,187 cuft
Drainage area	=	0.690 ac	Curve number	=	63.8
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.0 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow
(min cfs)

724 0.900 <<
726 0.859

...End

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.953	2	724	5,951	—	—	—	PRE - SUBC 1
4293 HYRDO PRE.gpw					Return Period: 100 Year		Thursday, Sep 11, 2008		

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

PRE - SUBC 1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.953 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,187 cuft
Drainage area	= 0.690 ac	Curve number	= 63.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow (min cfs)

722	1.759
724	1.953 <<
726	1.814

...End

POST-DEVELOPMENT

Worksheet 3: Time of Concentration (Tc) or travel time (Tt)

SM-4293

Project: LALLI TERRACE By TJR Date 08/11/08

Location: 442 MASSACHUSETTS AVE Checked _____ Date _____

Circle one: Present Developed Subcatchment 1A
 Circle one: Tc Tt through _____
 subarea _____

Sheet flow (Applicable to Tc only)

1. Surface Description (table 3-1)
2. Mannings roughness coeff., n (table 3-1)
3. Flow length, L (total L <= 300 ft)
4. Two-yr 24-hr rainfall, P2
5. Land Slope, s
6. $Tt = 0.007 (nL)^{0.8} / (P2^{0.5} s^{0.4})$ Compute Tt

Segment ID	A-B	B-C	
1. Surface Description	Woods	Grass	
2. Mannings roughness coeff., n	0.24	0.24	
3. Flow length, L	25	25	
4. Two-yr 24-hr rainfall, P2	3.1	3.1	
5. Land Slope, s	0.04	0.07	
6. Compute Tt	0.09		0.09

Shallow concentrated Flow

7. Surface Description (paved or unpaved)
8. Flow Length, L
9. Watercourse slope, s
10. Average Velocity, V (figure 3-1)
11. $Tt = L / 3600V$ Compute Tt

Segment ID	A-B	B-C	
7. Surface Description	Unpaved		
8. Flow Length, L	14		
9. Watercourse slope, s	0.04		
10. Average Velocity, V	1.60		
11. Compute Tt	0.01		0.01

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, pw
14. Hydraulic radius, $r = a/wp$ Compute r
15. Channel Slope, s
16. Manning's roughness coeff., n
17. $V = 1.49 r^{2/3} s^{1/2} / n$ Compute V
18. Flow length, L
19. $Tt = L / 3600V$ Compute Tt
20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

Segment ID	A-B	B-C	
12. Cross sectional flow area, a			
13. Wetted perimeter, pw			
14. Hydraulic radius, r			
15. Channel Slope, s			
16. Manning's roughness coeff., n			
17. Compute V			
18. Flow length, L			
19. Compute Tt			0.00
20. Watershed or subarea Tc or Tt			0.10
			6.0

(210-VI-TR-55, Second Ed., June 1986)

Rainfall, P (24-hour)..... in	3.1	4.5	6.4
Runoff, Q..... in			

(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

Runoff, Q..... cf	0	0	0
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D-2 (210-VI-TR-55, Second Ed., June 1986)

Worksheet 2: Runoff curve number and runoff

SM-4293

Project: LALLI TERRACE By TJR Date 08/12/08

Location: 442 MASSACHUSETTS AVE Checked _____ Date _____

Circle one: Present Developed Subcatchment 1B

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition: percent impervious: unconnected/connected impervious area ratio)	CN 1/			Area Acres	Product of CN x Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
CHARLTON UDORTHENTS B	Impervious	98			0.10	9.80
CHARLTON UDORTHENTS B	Open Spaces, good condition	61			0.20	12.08
CHARLTON UDORTHENTS B	Woods, good condition	55			0.07	3.85
Totals =					0.37	25.73

1/ Use only one CN source per line.

$$CN \text{ (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{25.73}{0.37} = 69.91 ; \text{ Use CN} = \boxed{69.9}$$

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency..... yr	2	10	100
Rainfall, P (24-hour)..... in	3.1	4.6	6.4
Runoff, Q..... in	0.77	1.74	3.12

(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

Runoff, Q..... cf	1024	2322	4164
-------------------	------	------	------

D-2

(210-VI-TR-55, Second Ed., June 1986)

Worksheet 3: Time of Concentration (Tc) or travel time (Tt)

SM-4293

Project: LALLI TERRACE By TJR Date 08/11/08

Location: 442 MASSACHUSETTS AVE Checked _____ Date _____

Circle one: Present Developed Subcatchment 1B
 Circle one: Tc Tt through subarea _____

Sheet flow (Applicable to Tc only)

1. Surface Description (table 3-1)
2. Mannings roughness coeff., n (table 3-1)
3. Flow length, L (total L <= 300 ft)
4. Two-yr 24-hr rainfall, P2
5. Land Slope, s
6. $Tt = 0.007 (nL)^{0.8} / (P2^{0.5} s^{0.4})$ Compute Tt

Segment ID	ASP		
	GRASS		
	0.24		
ft	50		
in	3.1		
ft/ft	0.06		
hr	0.09		0.09

Shallow concentrated Flow

7. Surface Description (paved or unpaved)
8. Flow Length, L
9. Watercourse slope, s
10. Average Velocity, V (figure 3-1)
11. $Tt = L / 3600V$ Compute Tt

Segment ID	B-C		
	Unpaved		
ft	156		
ft/ft	0.07		
ft/s	4.00		
hr	0.01		0.01

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, pw
14. Hydraulic radius, $r = a/wp$ Compute r
15. Channel Slope, s
16. Manning's roughness coeff., n
17. $V = 1.49 r^{2/3} s^{1/2} / n$ Compute V
18. Flow length, L
19. $Tt = L / 3600V$ Compute Tt

Segment ID			
sf			
ft			
ft			
ft/ft			
ft/s			
ft			
hr			0.00

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

hr	0.10
min	6.0

(210-VI-TR-55, Second Ed., June 1986)

Rainfall, P (24-hour)..... in	3.1	4.5	6.4
Runoff, Q..... in			

(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

Runoff, Q..... cf	0	0	0
-------------------	---	---	---

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.364	2	724	1,136	—	—	—	POST - SUBC 1A (TO AREA DRAI
2	SCS Runoff	0.284	2	724	964	—	—	—	POST SUBC 1B (TO WETLANDS)

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

POST - SUBC 1A (TO AREA DRAIN)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.364 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,136 cuft
Drainage area	=	0.320 ac	Curve number	=	75.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.0 min
Total precip.	=	3.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time – Outflow
(min cfs)

724 0.364 <<
726 0.342

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 2

POST SUBC 1B (TO WETLANDS)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.284 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 964 cuft
Drainage area	= 0.370 ac	Curve number	= 69.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 3.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time – Outflow (min cfs)

724	0.284 <<
726	0.274

...End

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.752	2	724	2,259	—	—	—	POST - SUBC 1A (TO AREA DRAI POST SUBC 1B (TO WETLANDS))
2	SCS Runoff	0.682	2	724	2,098	—	—	—	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

POST - SUBC 1A (TO AREA DRAIN)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.752 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,136 cuft
Drainage area	=	0.320 ac	Curve number	=	75.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.0 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.

Time -- Outflow (min cfs)

722	0.685
724	0.752 <<
726	0.692

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 2

POST SUBC 1B (TO WETLANDS)

Hydrograph type	= SCS Runoff	Peak discharge	= 0.682 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 964 cuft
Drainage area	= 0.370 ac	Curve number	= 69.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 4.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow (min cfs)

724	0.682 <<
726	0.637

...End

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.331	2	724	3,981	—	—	—	POST - SUBC 1A (TO AREA DRAI
2	SCS Runoff	1.310	2	724	3,924	—	—	—	POST SUBC 1B (TO WETLANDS)

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 1

POST - SUBC 1A (TO AREA DRAIN)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.331 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,136 cuft
Drainage area	= 0.320 ac	Curve number	= 75.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow (min cfs)

722	1.230
724	1.331 <<
726	1.210

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2

Thursday, Sep 11, 2008

Hyd. No. 2

POST SUBC 1B (TO WETLANDS)

Hydrograph type	= SCS Runoff	Peak discharge	= 1.310 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 964 cuft
Drainage area	= 0.370 ac	Curve number	= 69.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 6.0 min
Total precip.	= 6.40 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Discharge Table

(Printed values >= 90.00% of Qp.)

Time -- Outflow (min cfs)

722	1.198
724	1.310 <<
726	1.201

...End

Infiltration Trench Sizing

STAMSKI AND McNARY, INC.
 80 Harris Street
 ACTON, MASSACHUSETTS 01720
 TEL (978) 263-8585
 FAX (978) 263-9883

JOB 4293
 SHEET NO. 1 OF _____
 CALCULATED BY GD DATE 8/15/08
 CHECKED BY _____ DATE _____
 SCALE _____

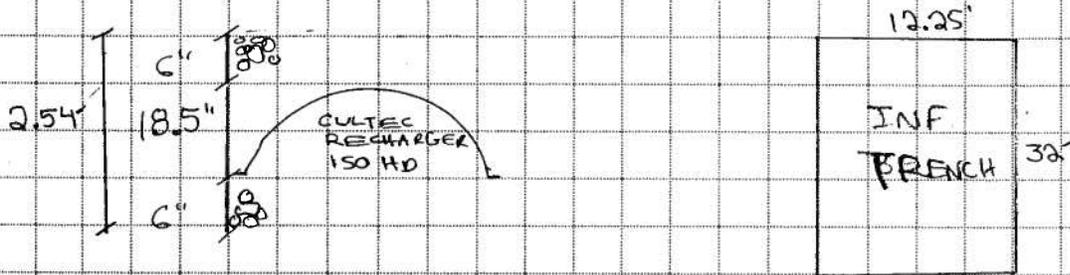
INFILTRATION TRENCH SIZING

100 YEAR STORM VOLUME = 3,981 CF

PERCOLATION RATE = $\frac{3 \text{ min}}{1 \text{ in}}$ ∴ K = 7.06 FT/DAY (W/F.S. = 2)

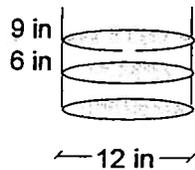
SEE CALC NEXT SHEET

3,981 CF × $\frac{1 \text{ DAY}}{7.06 \text{ FT}}$ = 563 SF REQUIRED FOR INFILTRATION



INF AREA PROVIDED = BOTTOM AREA + SIDEWALL
 = (12.25 × 32) + [2(12.25) + 2(32)] 2.54
 = 392 + 225
 = 617 SF > 563 SF OK

CONVERSION OF PERCOLATION RATE TO PERMEABILITY



$$\begin{aligned}\text{bottom area} &= \pi \times r^2 = 0.785 \text{ sf} \\ \text{avg sidewall area} &= 2 \times \pi \times r \times 7.5 = 1.9625 \text{ sf} \\ \text{Total avg area} &= 2.7475 \text{ sf}\end{aligned}$$

$$\text{volume infiltrated} = 0.0628 \text{ cf}$$

$$\text{percolation rate} = 2.33 \text{ min/in} = 0.001618 \text{ day/in}$$

$$Q = A (K_i) t; \quad i=1, \quad Q=\text{Vol}, \quad A=\text{area}, \quad K=\text{permeability coefficient}$$

$$K = Q / A t i = \boxed{14.13 \text{ ft/day}}$$

$$\text{w/ Factor of Safety of 2} = \boxed{7.06 \text{ ft/day}}$$

Soil Evaluations



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (minimum of two holes required at every proposed disposal area)

Deep Observation Hole A: 8/20/08 2:00 SUNNY 70's
Date Time Weather

1. Deep Observation Hole Logs

Deep Hole Number 1 Ground Elevation at Surface of Hole 220.5

Location (Identify on Plan)

2. Land Use:

YARD
(e.g. woodland, agricultural field, vacant lot, etc.)
LAWN

FEW
Surface Stones

5-8
Slope (%)

Vegetation

Landform

ON SLOPE
Position on landscape (attach sheet)

3. Distances from: Open Water Body

Drainage Way

Possible Wet Area 95

Property Line
feet

Drinking Water Well
feet

Other
feet

4. Parent Material:

ABLATION FILL

Unsuitable Materials Present: Yes No

If Yes: Disturbed Soil Fill Material Impervious Layer(s) Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No

If Yes: Depth Weeping from Pit Depth Standing Water in Hole

Estimated Depth to High Groundwater: 49" + < 26.4
Inches elevation



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

Deep Observation Hole A: Deep Hole Number: 1

Depth (In.)	Soil Horizon/Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR3/3		-		SL			M	F	
12	B	10YR5/6		-		LS			M	F	
49"	C	2.5Y5/4		-		LS	5	5	M	F	

Additional Notes: (VERY WET SUMMER - NEAR SPRING GW CONDITIONS)



Commonwealth of Massachusetts
 City/Town of
Percolation Test
 Form 12

Percolation test results must be submitted with the Soil Suitability Assessment for On-site Sewage Disposal. DEP has provided this form for use by local Boards of Health. Other forms may be used, but the information must be substantially the same as that provided here. Before using this form, check with the local Board of Health to determine the form they use.

Important:
 When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Site Information

MARGOT GRALLERT
 Owner Name
442 MASS. AVE
 Street Address or Lot #
ACON MA 01720
 City/Town State Zip Code

 Contact Person (if different from Owner) Telephone Number

B. Test Results

	Date	Time	Date	Time
Observation Hole #				
Depth of Perc		<u>49"</u>		
Start Pre-Soak		<u>2:08</u>		
End Pre-Soak		<u>2:23</u>		
Time at 12"		<u>2:23</u>		
Time at 9"		<u>2:29</u>		
Time at 6"		<u>2:36</u>		
Time (9"-6")		<u>7</u>		
Rate (Min./Inch)		<u>2.33</u>		

Test Passed: Test Failed: Test Passed: Test Failed:
GEORGE DIMAKARAKOS ; STAMSKI AND McNARY INC.
 Test Performed By:

Witnessed By:

Comments:

WATER BALANCE CALCULATIONS

Project: Lalli Terrace
Acton, MA

By: GD

Date 09/15/08

Job: SM-4293

WATER BALANCE CALCULATIONS

PRE-DEVELOPMENT:

Stormwater:

Subcatchment 1:

A= 0.69 AC; CN=63.8
FROM GRAPH 1: ANNUAL INFILTRATION = 18.1" @ CN=63.8
18.8 in x 0.69 ac x 43,560 sf/ac x 1 ft /12 in = 47,088 cf infiltrated / year

TOTAL PRE-DEVELOPMENT INFILTRATION = stormwater infiltration = 47,088 cf infiltrated / year

POST-DEVELOPMENT:

Stormwater:

Subcatchment 1A:

A= 0.32 AC; CN=75.3
FROM FIGURE 1: ANNUAL INFILTRATION = 16.2" @ CN=75.3
16.2 in x 0.32 ac x 43,560 sf/ac x 1 ft /12 in = 18,818 cf infiltrated / year

Subcatchment 1B:

A= 0.37 AC; CN=69.9
FROM FIGURE 1: ANNUAL INFILTRATION = 17.4" @ CN=69.9
17.4 in x 0.37 ac x 43,560 sf/ac x 1 ft /12 in = 23,370 cf infiltrated / year

Infiltration Trench 1:

Contributing Subcatchments: 1A Area = 0.32 Ac.
Infiltration trench designed for 100 yar storm
From Figure 2, 100% of storms <= 2.6 inches
Drainage Area to basin (sf)= 13,939
CN= 75.3

P(in) = 2.6 inches
S=1000/CN-10= 3.28
RUNOFF Q(IN)=(P-0.2S)^2/(P+0.8S)= 0.72 inches

FROM FIGURE 1: ANNUAL RUNOFF = 5"(0.42") @ CN=75.3

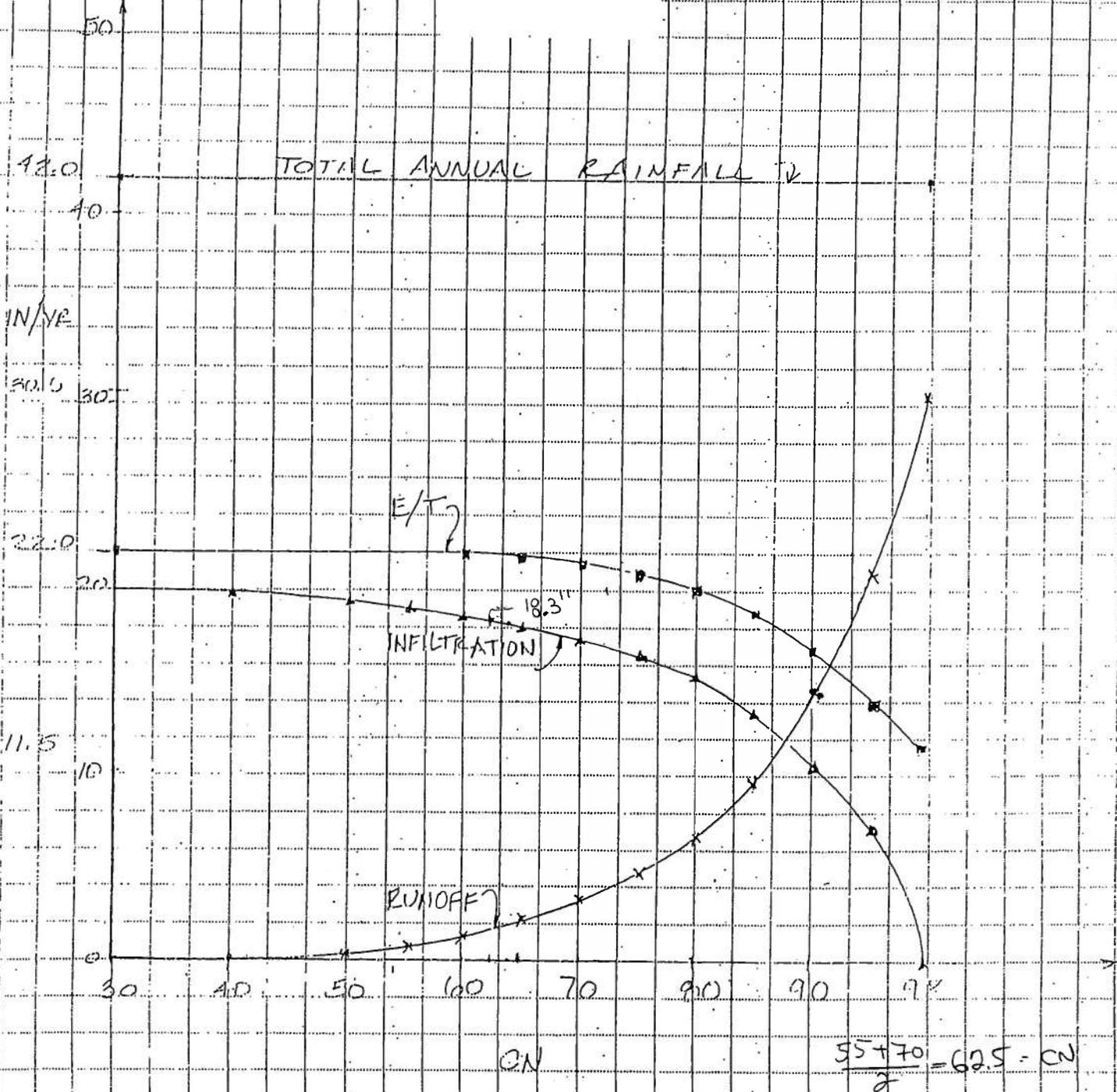
Runoff infiltrated = 13,939 sf x 0.42 ft = 5,808 CF

POST-DEVELOPMENT INFILTRATION = 47,996 cf infiltrated/year > 47,088 cf infiltrated/year

STAMSKI AND McNARY, INC.
 80 Harris Street
 ACTON, MASSACHUSETTS 01720
 TEL (978) 263-8585
 FAX (978) 263-9883

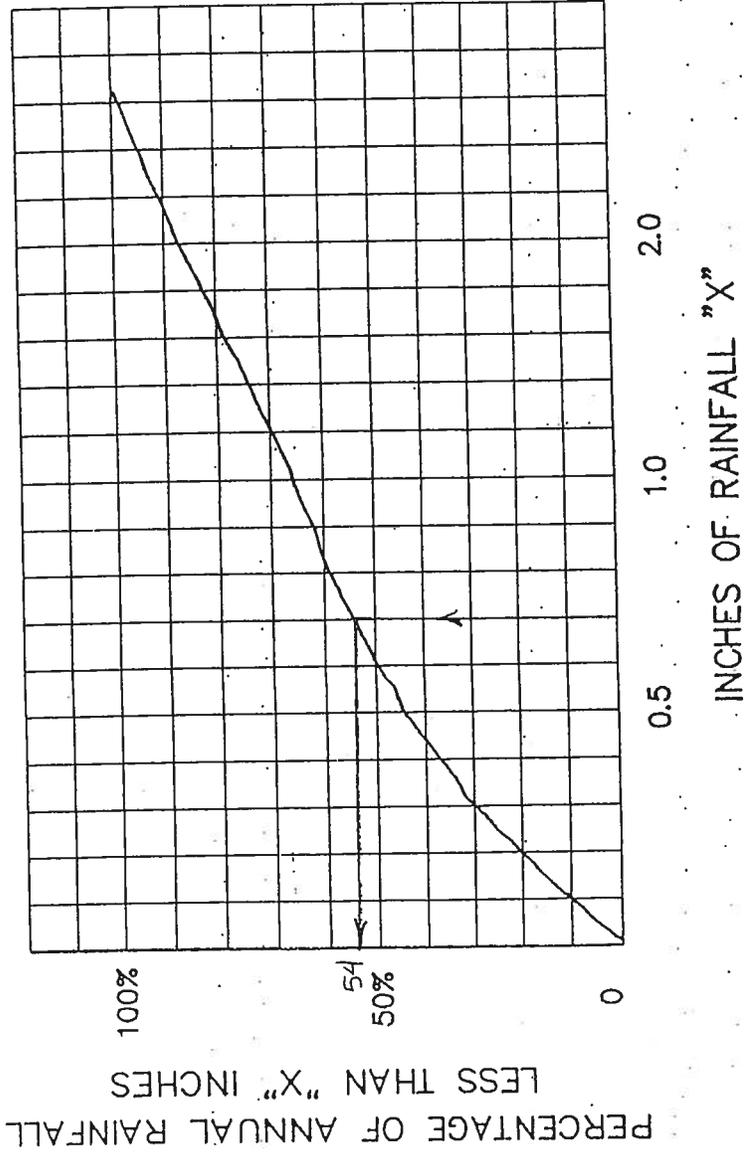
JOB _____
 SHEET NO. _____ OF _____
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SCALE _____

Figure 1



NOTE: GRAPH COMPILED FROM DATA FURNISHED BY NOAA (1954-1986)
 (SEE REPORT FROM STAMSKI & McNARY, INC.)

Figure 2



Compiled data published by the National Oceanic and Atmospheric Administration (N.O.A.A.) for 1984 through 1988

Attachment F
Comprehensive Permit Plan for Lalli Terrace
Sheets 1 thru 4