

WAIVER REQUEST – RICHARDSON CROSSING *Revised 11.06.09*

Zoning Bylaw 5 Dimensional Regulations

As necessary to allow the creation of four lots. Waiver of lot area, frontage, yard setbacks and lot width.

Zoning Bylaw 3.8.1.5 Accessory Use Regulations-Common Driveway

Waiver of required special permit from Planning Board for common drive serving 6 or less lots which are not in compliance with requirements a through q.

Zoning Bylaw 3.8.1.5c Accessory Use Regulations-Common Driveway

To allow the driveway to have a slope of 8 to percent within 50 feet of Central Street instead of the 5 percent maximum allowed. The increase in grade will not substantially decrease stopping distances and will decrease the extent of site grading required.

Zoning Bylaw 3.8.1.5f Accessory Use Regulations-Common Driveway

To eliminate the provision of an access and utility easement ***for the entire common drive including the SU30 vehicle turnaround beyond the end of the common drive.***

Further to allow a lesser shoulder width than the required 3 foot specified in section 3.8.1.5 m

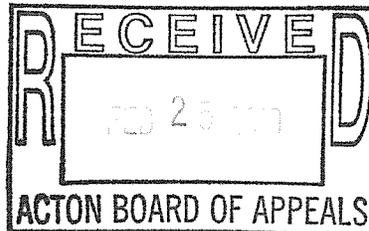
Zoning Bylaw 3.8.1.5 o Accessory Use Regulations-Common Driveway

Waiver of constructing a sidewalk along the Central Street frontage as there is already a sidewalk on the opposite side of the

Richardson Crossing LLC.
30 Nagog Park Drive, Suite 225
Acton, MA 01720
978-263-0428 Phone / 978-263-0447 Fax

February 24, 2010

Zoning Board of Appeals
Town of Acton
132 Main Street
Acton, MA 01720



RE: 113 Central Street / Richardson Crossing LLC

Dear Members of the Board:

In regard to the proposed Title V septic systems for our proposed Chapter 40B development in consultation with the health department staff, we suggest the following Condition:

CONDITION

The Applicant shall comply with all Title V requirements.

The Applicant's preference is to install a common septic system shared by all four (4) homes with the operation and maintenance of this common septic system controlled through a Homeowners Association consisting of the four fee simple lots. Approval of the common septic system and its control through a Homeowners Association shall be subject to all components of Title V 310CMR 15.400 under the purview of local BOH and DEP.

If such approvals as outlined in the paragraph above cannot be obtained, the Applicant shall install a common system for all four (4) units with the operation and maintenance of this common septic system controlled through a Condominium Association consisting of all four (4) units. Approval of the common septic system and its operation and maintenance through a Condominium Association shall be subject to all components of Title V 310CMR 15.400 under the purview of local BOH and DEP.

Respectfully requested,

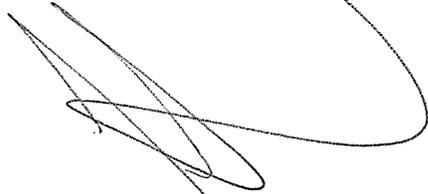
Richardson Crossing LLC by
Jim D'Agostine
Manager

CC: Doug Halley, BOH Town of Acton

✓

Westchester Company, Inc.
30 Nagog Park Drive Suite 225
Acton, MA 01720

Westchester Company Inc hereby agrees to assign all rights in the real estate located at 113 Central Street, Acton, MA, as described in a deed Recorded in the Middlesex South Registry of Deeds Book 48077, Page 483, to Richardson Crossing LLC.

A handwritten signature in black ink, appearing to read "Julian James D'Agostine III". The signature is written in a cursive style with a large loop at the end.

Julian James D'Agostine III
Westchester Company, Inc.

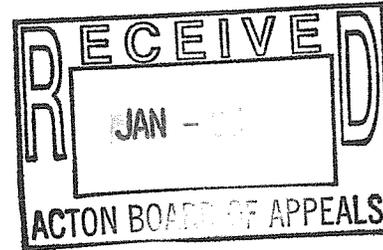


PO Box 666, 97 Great Road, Suite 6
Acton, MA 01720
Phone: 978-263-3666 Fax: 978-635-0218
actonsurvey@actonsurvey.com

ASE 6729W161

January 6, 2010

Acton Zoning Board of Appeals
472 Main Street
Acton, MA 01720



Re: Richardson Crossing – Hearing 09-06
113 Central Street

Dear Board Members:

The purpose of this letter is to describe the revisions made to the Plans for Richardson Crossing in response to comments made at the Public Hearing and Town Staff comments.

Visual Impact

House 111 will be orientated to facilitate access from the common driveway and as a result the back of the house will be seen from Central Street. We are enclosing a copy of the rear façade of the Unit 1 at Marsh View, which is the mirror image of house 111.

The basement wall on the rear and garage side of the house will be wood framed and sided and trimmed with the same materials as the first and second floors.

House 111 will be located 42 feet from and 7 feet above the pavement of Central Street and these offsets will diminish the view

Houses with rear facades facing streets are an exception, but are present elsewhere in Acton. As examples we point to 2 Joseph Reed Lane that is viewed across the Duck Pond from Massachusetts Avenue. The three houses to the west of 2 Joseph Reed face on the Cedar Terrace common driveway and have their backs to Massachusetts Avenue. The house across from 2 Joseph Reed has its back to Deacon Hunt Drive.

Our client has instructed us to delay the creation and presentation of the requested street view of the site.

Landscape

The word topsoil has been changed to loam and we have added a note concerning the preparation of the base for sod.

✓ /

Existing Conditions Plan

The locations of the septic system and water line have been added to the Existing Conditions Plan.

Record Plan

Reference to the Covenants and Restrictions has been added to the Record Plan as have the Zoning Classification.

Easements

The necessary easements have been added to the Record Plan.

Tree Lost Analysis

We have calculated the existing area of woods to be 29,800 square feet or 70 percent of the site and 4,500 square feet of woods, or an area equal to 10 percent of the site, will remain as woods.

Individual trees along the perimeter of the site might be preserved.

Stormwater Management System

This office presented calculations pertaining to the adequacy of the storm drains serving the upper set of catch basins to the Engineering Department on January 5th. These calculations were performed in response to the Engineering IDC of December 15, 2009.

The performance of soil evaluations for the design of the stormwater management system is not required by regulations or guidelines for this site.

At Richardson Crossing substantial grading of the site will be required to allow for access to the site in conformance with acceptable practice in Acton to be achieved. As a result of the required grading the surface of the site has been lowered to be near the estimated high groundwater table and interceptor and foundation drains are proposed to lower the groundwater to protect homes and infrastructure and allow the proposed recharge facilities to be effective.

The installation of the interceptor drains negated the need for soil evaluations as the information obtained is not required for design purposes.

Obtaining estimated high groundwater table elevations at some of the recharge sites will require personnel to enter excavations as deep as twelve feet.

The throat elevations of the drainage structures have been lowered 0.1 feet.

Certifications

All plans have been endorsed by a Registered Professional Land Survey even though the endorsement is not required by State Law or Regulations or common practice.

Summary

It is our understanding that the plans have been revised as required by comments received to date and we will make every effort to revise the plans prior to the next hearing if we receive request for revisions in a timely manner.

We are happy to meet with the Staff to discuss this matter.

Very truly yours,



Mark T. Donohoe, PE
for:
Acton Survey & Engineering, Inc.

cc: Robinson Crossing, LLC

BYDATE

SUBJECT

SHEET NO. OF.....

CHKD. BYDATE

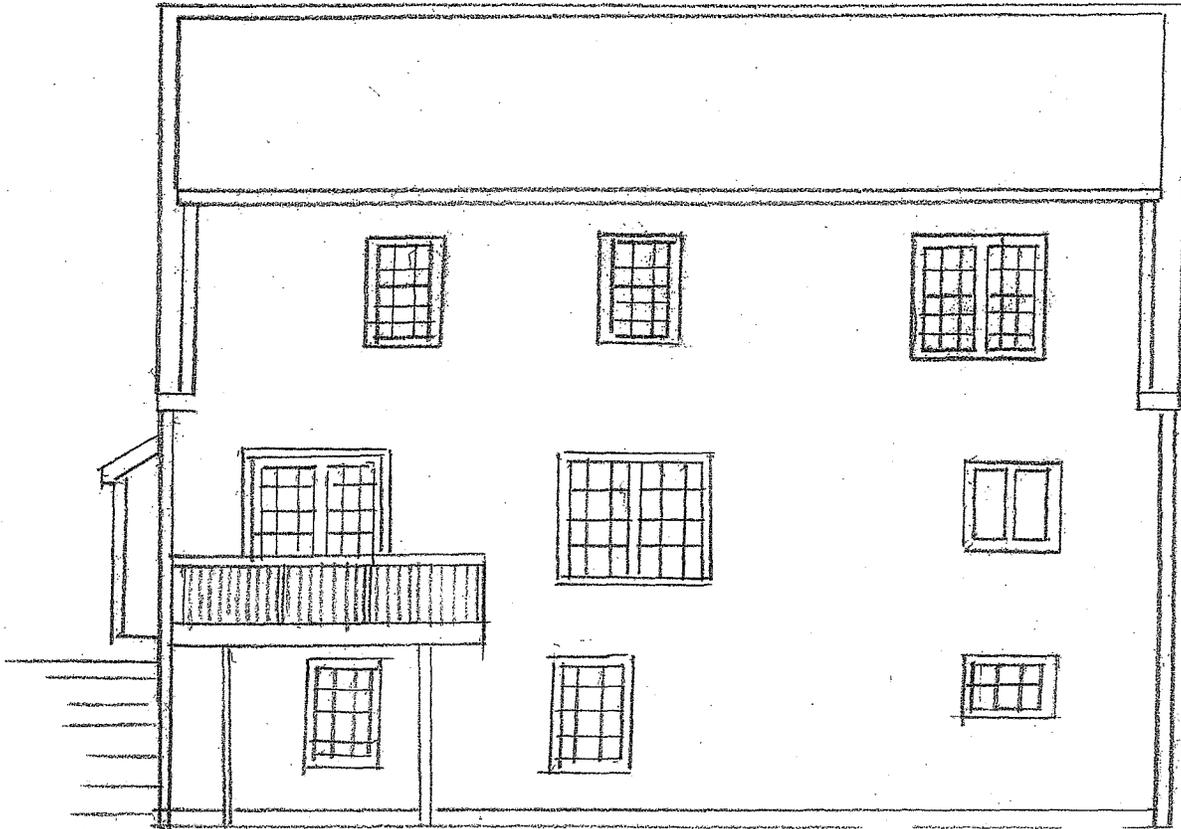
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JOB NO.

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Rear Façade Unit 1 Marsh View - 1/8" = 1'

NOTE - 111 Central Street at Robinson Crossing

Is mirror image

Note: Facades are illustrative only, having
been prepared by site engineer



Acton Survey & Engineering, Inc.

P.O. Box 666 97 Great Rd. Suite 6
Acton, MA 01720-0666
(978) 263-3666 Fax (978) 635-0218
Email: actonsurvey@verizon.net

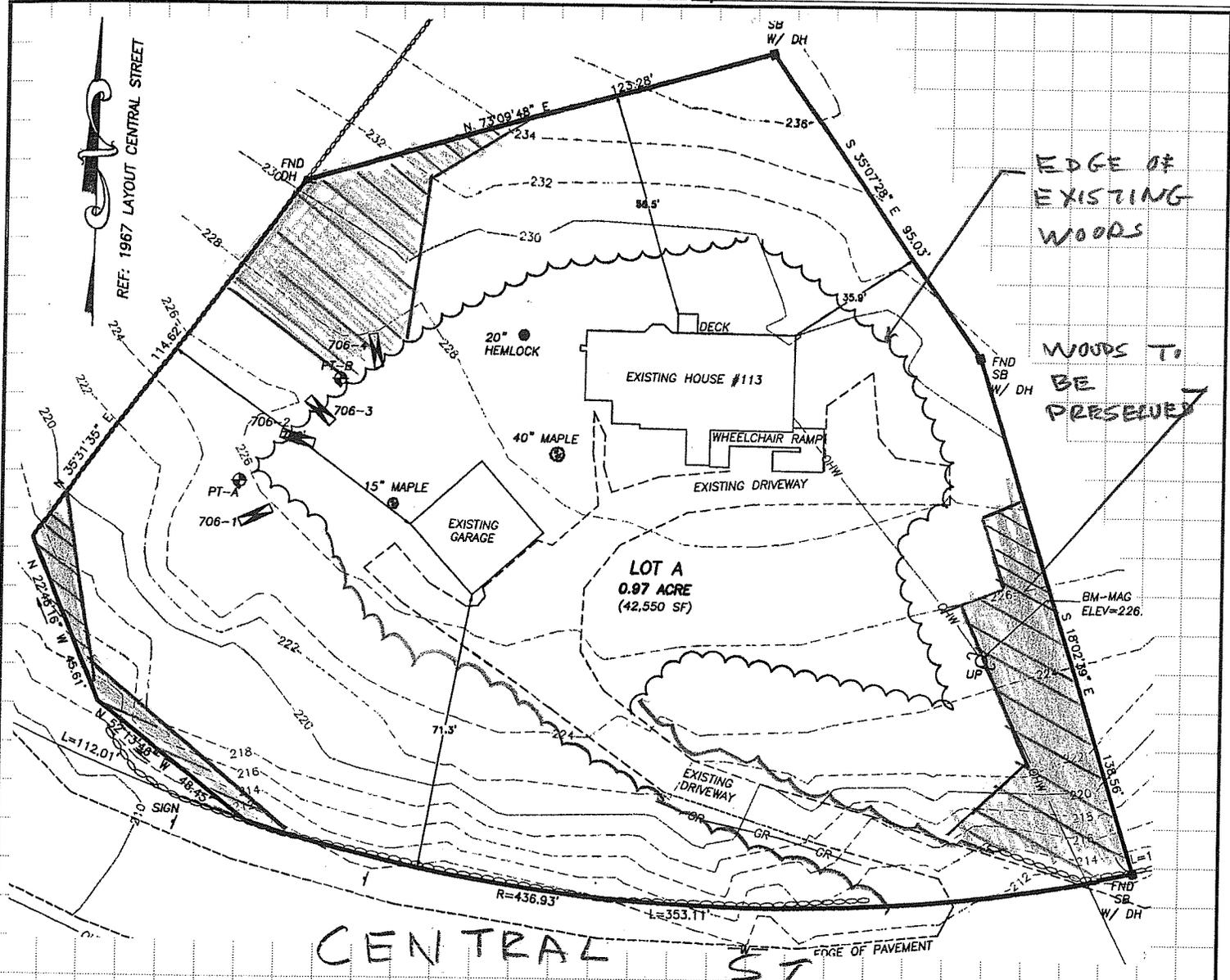
JOB RICHARDSON CROSSING 6729

SHEET NO. 1 OF 1

CALCULATED BY MTD DATE 1-5-10

CHECKED BY _____ DATE _____

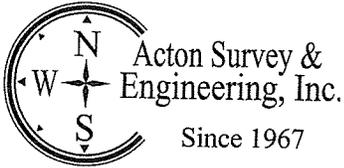
SCALE 1" = 40'



CENTRAL ST.

TREE LOST ANALYSIS

EXISTING WOOD AREA	≈ 29,800 SF
PROPOSED WOODS	≈ 4,500 SF
PERCENT OF SITE WOODED	
EXISTING	70%
PROPOSED	10%



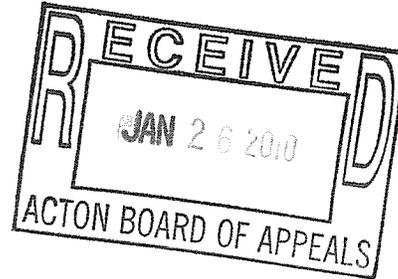
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actonsurvey@actonsurvey.com

ASE 6729W161

January 19, 2010

Acton Zoning Board of Appeals
472 Main Street
Acton, MA 01720

Re: Richardson Crossing – Hearing 09-06
113 Central Street



Dear Board Members:

The purpose of this letter to inform the Board of revisions to the plans for Richardson Crossing made in response to the Engineering Departments IDC of January 14, 2010 and our meeting with Cory York earlier today.

Documentation of Soil Conditions – Verification of Adequacy of Drainage System

We agree with the Engineering Department's request that the soil and groundwater conditions encountered during construction are documented and if found at variance with the design parameters utilized, the stormwater management system must be redesigned to accommodate any deficiencies.

We do not expect that any revisions will be required as the design of the stormwater management system was designed utilizing standard criteria and when judgments were necessary they were made conservatively.

The following conditions are recommended to be incorporated into the approval or if you wish, we will place them directly on the plans along with any revisions you desire.

SOIL EVALUATIONS

Prior to or during the construction process the following soil evaluations shall be performed.

1. A minimum of four soil evaluations shall be made along the interceptor drain parallel to the rear property line along with a report stating the adequacy of the interceptor drain to intercept and lower groundwater so that it will not have a detrimental impact on the homes and infrastructure.
2. A minimum of one soil evaluation along the interceptor drain behind house 115.
3. A soil evaluation shall be made near [not in] each of the house recharge systems.
4. A soil evaluation shall be made adjacent to the recharge systems 1, 2 & 3.

The Engineering Department shall be notified two workdays in advance of the time of the soil evaluations.

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The evaluations shall be performed by a Professional Engineer and a report of the results and any conclusions and recommendations shall be presented to the Engineering Department within two working days of the evaluations.

PLAN REVISIONS

If as a result of the soil evaluations or other site observations revisions to the stormwater management system are found necessary or recommended, the proposed changes shall be included in the report submitted to the Engineering Department. The Engineering Department shall approve or disapprove in writing with specific reasons for disapproval within two working days, unless otherwise agreed to by the site developer.

AS-BUILT PLAN

An As-Built plan showing the entire drainage system including all footing drains shall be submitted prior to occupancy of any units. The plan shall include the horizontal location of all pipes and necessary inverts and include details of all components of the drainage system and recommended Operation and Maintenance procedures.

The soil evaluations shall also be included on the As-Built Plan.

Revisions to Stormwater Drainage Collection System

The elevations of the catch basin throats have been corrected and we have revised the detail of the interconnection between the basins on the opposite sides of the driveways and the requisite elevations have been added to the site plan.

Summary

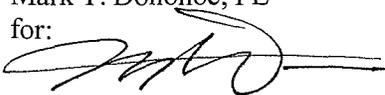
The revisions to the drainage system was presented to and given verbal approval by the Engineering Department earlier today and it is our understanding that all technical issues regarding this project are now satisfied.

Six full and reduced scale copies of the plans that have been revised are enclosed. The plans have not been endorsed by a Professional Land Surveyor as persons registered as such were not present in the Acton office today. Plans endorsed by a PLS will be forwarded to the Board prior to the public hearing.

We will make every effort to respond to other comments pertaining to our design of the project, if received in a timely manner.

Thank you for the considerations given to this project.

Very truly yours,
Mark T. Donohoe, PE
for:

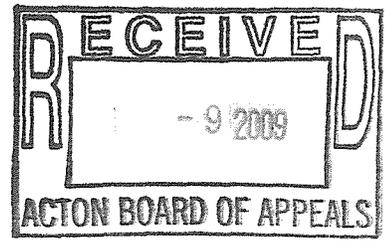


Acton Survey & Engineering, Inc.



cc: Richardson Crossing, LLC

Acton Survey & Engineering, Inc.
P.O. Box 666, 97 Great Rd. #6, Acton, MA 01720
Phone: (978) 263-3666 Fax: (978) 635-0218
Email: actonsurvey@actonsurvey.com



**Richardson Crossing LLC
30 Nagog Park Drive Suite 225
Acton, MA 01720**

November 6, 2009

Zoning Board of Appeals
Town of Acton
472 Main Street
Acton, MA 01720

Re: Hearing # 09-04 Comprehensive Permit 113 Central Street

Members of the Board:

Revised plans along with a cover memo from Acton Survey & Engineering, covering the technical issues raised in planning and engineering department memos have been submitted for staff review.

Attached is a revised development schedule with new date of June 30, 2010.

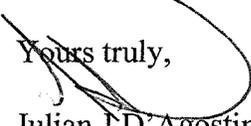
The original list of waivers submitted has been expanded to cover issues related to the common drive standards. A revised version is included.

The legal documents have been revised to add language about maintenance of the storm water drainage system. A revised copy is included. Detailed specifics will be provided by the design engineer and added as Exhibit B.

Richardson Crossing LLC will arrange a payment schedule with the Treasurer/collector to deal with any delinquent taxes on the property.

Finally in Town counsel's initial comments the relationship between Westchester and Richardson Crossing LLC was questioned. Town Counsel is correct in his assumptions. Richardson Crossing LLC was created by the Westchester for the sole purpose of building this project. It is the intent to transfer ownership from Westchester Company to the LLC. See attached.

Yours truly,


Julian J D Agostine III
Manager
Richardson Crossing LLC

Richardson Crossing memo 110609

COMPREHENSIVE PERMIT DEVELOPMENT SCHEDULE

	Phase 1	Phase 2	Phase 3	Total
Projected completion date:	6/30/2010			6/30/2010
Number of affordable units:	1			
Number of market units:	3			
Subtotal by phase:	4			4

For the last development phase, or if only one development phase is proposed, suggest below a building permit schedule by which affordable units will be completed. Generally, the Board will allow a staggered completion of market rate and affordable units but requires the completion of all affordable units before the issuance of the last building permit(s) in the project.

There is one affordable unit. We propose to complete all buildings at the same time, including the affordable unit.

**DECLARATION OF COMMON DRIVEWAY COVENANT SHARED MAINTENANCE
AGREEMENT CONCERNING THE SEWAGE DISPOSAL SYSTEM, AND
RESTRICTIVE COVENANTS AND CONDITIONS FOR RICHARDSON'S CROSSING,
ACTON, MASSACHUSETTS**

I. Creation

(A) The undersigned, Richardson's Crossing, LLC, a Massachusetts Limited Liability Company, having a place of business at 411 Massachusetts Avenue, Suite 304, Acton, Massachusetts 01720 (the "Declarant"), being the sole owner of the land with the buildings thereon with the post office address of 113 Central Street, Acton, Middlesex County, Massachusetts, as described on a plan entitled "Site Development Plan Richard Crossing" (hereinafter the "Plan") which is recorded simultaneously herewith and hereby incorporated herein by this reference and made a part hereof, does hereby, create this Declaration of Common Driveway Covenant and Shared Maintenance Agreement concerning the Sewage Disposal System.

(B) The purpose of this document is to document is to establish the respective rights and responsibilities of the parties relative to the Declarant and the future owners of Lots 1,2,3, and 4 as they relate to the both the common driveway known Richardson Way as shown on the plan and the sewage disposal system.

(C) Every Owner of Lots 1,2,3, and 4 by the acceptance of a deed to a Lot within Richardson Crossing hereby consents for himself, his heirs, administrators, executors, successors and assigns and all other persons claiming by, through or under him (including the holder of any mortgage or other encumbrance) or any other party whatsoever, to the terms and provisions of this document.

(D) Further, the Lot Owner(s) shall be responsible for the proper maintenance, repair, and replacement of Richardson Way and the Sewage Disposal System and all portions and/or components of the same.

(E) All Lot Owners hereunder, in addition to any covenants set forth herein, shall be bound by the terms and conditions of the Town of Acton Zoning Board of Appeals Comprehensive Permit and Certificate of Action Relative to _____ Development dated _____ and recorded with the _____ Registry of Deeds at Book _____, Page ____.

(F) Neither the Declarant nor any of the future Lot owners shall Petition the Town of Acton for acceptance of the Driveway as a public way. In addition, no lot owner shall request that the Town of Acton perform snow plowing, maintenance, or any services associated with the Driveway.

II. Description of Land

(A) Common Driveway: The common driveway known as Richardson Way is shown on the Plan. The purpose of the common driveway is to provide access to Lots 1,2,3,and 4. Also located within Richardson Way will be easements for various utilities including but not limited to electric, telephone, cable, and septic lines which will access the sewage disposal system.

(B) Declarant's Right of Access: The Declarant hereby expressly reserves to itself and its successors-in-title and their nominees, for a period three (3) years from the date of the last Lot sold in Richardson Crossing the easement, license, right and privilege to pass and repass by vehicle and on foot in, upon, over Richardson Way for all purposes including, but not limited to, transportation of construction materials in order to complete construction work on any of the Lots. Nothing in this paragraph shall be deemed to create any rights in the general public.

(C) Declarant's Right to Grant Easements: The Declarant reserves the exclusive right to grant easements over, under, through and across Lots 1,2,3, and 4 for the purpose of installing shared sewage disposal system and such other equipment as may be necessary for the installation and operation of the same. The Declarant further reserves the right to unilaterally grant to the Town of Acton and/or any of its Boards, Assigns and/or Designees (the "Town") any easement the Declarant deems necessary, in its sole discretion, to complete the development contemplated hereunder, included any requested access rights to the sewage disposal system.

(D) Common Rights to Use Richardson Way: The Declarant further reserves the right and easement, in common with the individual Lot owners thereto, to use any and all roadways and walkways located upon the Land for all purposes for which roadways are commonly used in the Town of Acton, including, without limitation, the right and easement to bring construction vehicles and equipment over any such roadways.

(E) Declarant's Rights During Construction: The Declarant further reserves the right and easement for the benefit of the Declarant as well as their agents, servants, employees, contractors, workmen, work crews, successors and assigns to (a) further grant easements across the Land upon terms and conditions similar to those contained herein, to the extent reasonably necessary or convenient to further development; (b) restrict the use of the Land, including but not limited to the sewage disposal system; (c) park vehicles used in connection with construction work or sales and marketing upon the land hereunder; and (d) in general do all things necessary or desirable in order to construct and complete all the improvements located on any of the Lots.

The easements described hereunder shall be deemed to run with the Land and shall burden the Land and shall obligate and inure to the benefit of the owners and occupants of the Land hereunder as well as any adjoining land thereto.

Said easements may be assigned, transferred, sold and/or conveyed by the Declarant, to any entity, including but not limited to, the owner(s) of the abutting land.

(F) Each Lot Owner shall have an easement in common with the Owners of the other Lots to use all pipes, wires, flues, ducts, conduits, and plumbing lines for the purpose of obtaining access to the same in conjunction with sewage disposal system. The unit owners, pursuant to a vote of 51% of the Lot owners shall have a right of access to each Unit to inspect the same, to remove violations therefrom and to maintain, repair or replace any portions of the Common Areas and Facilities contained therein or elsewhere in the Buildings.

III. Care and Maintenance of the Sewage Disposal System

A. **General Description** All future owners of Lots 1,2,3, and 4 hereby acknowledge that their properties shall be serviced by common sewage disposal system which is created pursuant to 310 CMR 15.00 (commonly referred to as Title 5). The owners of Lots 109, 111, 113, and 115 take their property subject to and accordance with the provisions of that certain document entitled, Grant of Title 5 Covenant and Easement which is recorded simultaneously herewith. To the extent that this is a conflict between the terms and provisions of this document and the Grant of Title 5 Covenant and Easement shall govern.

B. **Location of the Sewage Disposal System** The common sewage disposal system is shown on the Plan and is labeled "Sewage Disposal" the area shall also include that portion of land labeled "Reserves" , finally there is an area labeled "sewage disposal easement area." The last mentioned area is intended to provide access to the sewage disposal system. The system shall also include all pipes constituting the sewer collection system and their related appurtenances and easements for sewer lines and other appurtenances relating thereto.

C. **Components of the Sewage Disposal System** The components of the On-Site Subsurface Sewage Disposal System, which is hereby defined as follows: leaching areas to be constructed on the Common Areas, together with all pipes, conduits, controls, ducts, plumbing, cables, equipment and other facilities for the furnishing of on-site subsurface sewage disposal service and all sewer and drainage pipes, on-site subsurface sewage disposal tanks, and sewer disposal systems, tanks, leaching field and all appurtenances thereto located within the areas labeled on the plan. The on-site subsurface sewage disposal system shall serve the all four Lots.

D. **Care of the Sewage Disposal System** The responsibilities for the care and maintenance of the system are set forth in the Grant of Title 5 Covenant and Easement. Additional reference is made to the decision by the Acton Board of Health dated _____, and recorded

simultaneously herewith.

E. Easements In addition, all Lot owners shall have an easement to go in, upon, over and under all parts of the Sewage Disposal Easement area for the purposes of the operation, use, maintenance, repair and replacement of the on-site subsurface sewage disposal system. Notwithstanding the foregoing, it shall be the sole responsibility of each Lot Owner to maintain, repair and replace all elements of the on-site subsurface sewage disposal system located within their Lot and serving their Lot exclusively. All components that are not located exclusively on each Lot shall be deemed to be owned in common as a part of the sewage disposal system.

The owners of Lots 1,2,3, and 4, with the approval of the Board of Health of the Town of Acton, shall have the right at any time and from time to time to change the location of any portion of the on-site subsurface sewage disposal system, with unanimous consent of all Lot owners.

F. Care of Parcel A All lot owners shall a joint responsibility for the care and maintenance of the lawn are located on Parcel A as shown on the above described plan.

IV. Care and Maintenance of Richardson Way and Storm Drainage System

A. The owners of Lots 1,2, 3, and 4 shown the Plans shall bear the joint responsibility, subject to their percentage interest as set forth in Exhibit A of maintenance, repairs, reconstruction, and snow plowing of the common driveway known as Richardson Way and each of the aforesaid lots shall bear its proportionate share of the responsibility and expenses as listed in Exhibit A, of the maintenance and repair, including any necessary reconstruction thereof, and the expense of snowplowing and driveway repairs, in order to maintain said common driveway in a good and passable condition.

B. The owners of Lots 1,2, 3, and 4 shown the Plans shall bear the joint responsibility, subject to their percentage interest as set forth in Exhibit A, of maintenance, operation of the storm drainage system subject to a system operation and maintenance schedule as set forth in Exhibit B.

C. Any necessary maintenance, repair or reconstruction of said common driveway shall be carried out so that the products of erosion as a result thereof shall not be carried into the storm drainage system.

D. The Declarant and its contractors shall have the right and easement to enter upon either Richardson Way or the sewage disposal area with workers, vehicles, machinery and equipment for purposes of constructing, erecting, installing, operating, maintaining, repairing, modifying, rebuilding, replacing, relocating and removing structures and their appurtenances, utilities of every character, as the Declarant shall deem necessary or desirable to complete the development of the four units. This easement shall include the right to store within Richardson Way, temporary structures, vehicles, machinery, equipment and materials used or to be used in connection with said development work for such periods of time as shall be conveniently required

for said development work. The Declarant further reserves the right and easement, in common with the Lot Owners thereto, to use any and all roadways and walkways located upon the Land for all purposes for which roadways are commonly used in the Town of Acton including, without limitation, the right and easement to bring construction vehicles and equipment over any such roadways.

E. The owners of Lots shall restrict their use of the common driveway to that of ingress and egress to Central Street and shall not impede the passage of foot or vehicular traffic on said common driveway by parking upon it. The use of the common driveway shall be restricted to foot and private passenger vehicles or vehicles driven by guest and business invites and such vehicles as are necessary to maintain and repair said common driveway as provided above.

F. The Declarant and future owners, their successors and assigns, hereby agree that they shall, from time to time, if necessary, amend the foregoing agreement and covenant so as to have same conform with any applicable requirements of the Town of Acton any other governmental claiming authority or jurisdiction over and upon said common driveway so as to permit said common driveway to be used to service the lots hereinbefore referenced.

G. The Declarant, for itself, its successors and assigns, agrees to fully construct the common driveway on or before _____, except for one (1) resurfacing of which will be completed at Declarant's expense, in accordance with all applicable local, state rules, regulations, by-laws, laws and the like, so that said common driveway can be fully used as the sole access for Lots 1, 2, 3 and 4.

H. Each Buyer of market rate Lots shall make an initial capital contribution of \$____ upon its purchase of the lot, shown on the aforesaid easement plan, which contribution shall be held in an interest bearing account for the benefit of the Richard Crossing Driveway and Sewage Disposal Fund. Said account(s) shall be established and controlled by Declarant, so long as it is the owner of at least one lot in the subdivision. After such time the account shall be controlled by the four unit owners. Thereafter the Lot owners agree to make quarterly payment of \$____. The Lot owners acknowledge that this payment is only an estimate of the future expenses associated with the care and maintenance of the sewage disposal system and Richardson Way.

I. Assessments for maintenance, improvements, (including capital improvements), repair or reconstruction of the common driveway, and septic system as shown on said plan, shall be made by Richard Crossing, LLC, so long as it is owner of at least one lot shown on the plan. Thereafter, Assessments shall be voted on by the Lot Owners, which lot owners may make an assessment so long as same is approved by a majority vote of all lot owners. The voter's interest shall be based upon each lot owner's proportionate share of said assessments shall be paid quarterly into the aforesaid account without limiting any of the provisions of any of the agreements, covenants, restrictions, easements or conditions hereinbefore set forth or referred to in this deed, by acceptance and recording of this deed the Grantee acknowledges that the

aforesaid agreements, covenants, restrictions, easements conditions shall not only run with the land hereby, but also the Grantee, its successors and assigns, agree to comply with the provisions of said easements, covenants, restrictions, easements or conditions and the Grantee, its successors and assigns, agree to hold the Grantor, its successors or assigns, harmless and indemnify them in full from any and all liabilities or obligations which may arise out of or on account of any violation or failure to comply with any provision or any of said agreements, covenants, restrictions, easements or conditions set forth or referred to in this deed.

V. General Operation of this Agreement

A. Establishment of the Lot Owners Interest and Management

The beneficiaries of this agreement shall be the Lot Owners within Richardson Crossing. Each Lot owner's beneficial interest is set forth in Exhibit A. The beneficial interest of each Lot shall be held and exercised as a whole and shall not be divided among several Owners of any such Lot. To that end, whenever any of said Lot is owned of record by more than one person, the several Owners of such Lot shall: (i) determine and designate which one of such Owners shall be authorized and entitled to cast votes, execute instruments, and otherwise exercise the rights appertaining to such Lot.

B. Meetings:

The Lot Owners shall meet annually. The date of the annual meeting shall be the second Saturday in February at 10:00 AM. Other meetings may be called by any Lot Owner, provided, however, that written notice of each meeting shall be given at least five (5) days before such meeting to each Lot owner. A majority of the Lot owners shall constitute a quorum at all meetings.

At the Annual Meeting of the Lot Owners, the Lot Owners shall submit reports of the management and finances of the Richardson Way. The report shall include a summary of the costs associated with the care and maintenance of Richardson Way. There also shall be a report concerning the sewage disposal system. Whenever at any meeting the Lot Owners proposes to submit to the Lot Owners any matter with respect to which approval of or action by the Lot Owners is necessary or appropriate, the notice of such meeting shall state and reasonably specify such matter. A quorum of Lot Owners shall consist of a majority in interest of Lot Owners. Unless set forth otherwise hereunder, any action taken at such meeting, at which a quorum has been established, shall only require a vote of plurality of the beneficial interest of Lot Owners in attendance at the same.

Any Lot Owner may, at any time, waive notice of any meeting in writing and such waiver shall be deemed equivalent to the giving of such notice. Attendance by a Lot Owner without objection to lack of notice at any meeting shall constitute a waiver of notice.

Any action taken by unanimous written consent of all of the Lot Owners shall be fully valid

as though taken at a meeting.

C. **Notices to Lot Owners.**

Every notice to any Lot Owner required under the provisions hereof, shall be deemed sufficient and binding if a written or printed copy of such notice shall be given by leaving such notice with him at his residence in the Richardson Way, by mailing it, postage prepaid, addressed to such Lot Owner at least five (5) days prior to the date fixed for the happening of the matter, thing or event of which such notice is given.

D. Inspection of Books - Reports to Lot Owners

The Lot owners shall keep detailed records of their actions, minutes of their meetings, and financial records and books of accounts, including a chronological listing of receipts and expenditures, as well as a separate account for each Lot, which among other things, shall contain the amount of each assessment of Common Expenses against such Lot, the date when due, the amounts paid thereon, and the balance remaining unpaid. All of the foregoing records, accounts and documents shall be available for inspection by all Lot Owners, their authorized agents, and lenders, mortgagees, holders, insurers and guarantors of any mortgage on any Lot at all reasonable times. "Available" shall mean available for inspection, upon request, during normal business hours or under other reasonable circumstances.

E. Checks and Notes.

The Lot Owners, at the time of the annual meeting, shall appoint one of the Lot Owners to have authority to sign checks and deal with all financial matters associated with Richardson Way.

F. Amendment to this Agreement

(A) This document may be amended by; (i) vote of the Owners of Lots entitled to not less than seventy-five percent (75%) of the undivided interests as set forth in Exhibit A. Any such amendment shall be effective when an instrument in writing, signed and acknowledged in proper form for recording by the Lot owners approving the change to this document, who certify under oath in such instrument that the amendment has been approved by the requisite vote of the Lot Owners, and provided that the document is duly recorded in the Middlesex South Registry of Deeds, provided, however that:

- (i) No such instrument shall be of any force or effect unless and until the same has been recorded in the Middlesex South Registry of Deeds within six (6) months after the requisite vote of the Lot Owners;
- (ii) No such instrument shall be inconsistent with any decision issued by any municipal board or entity of the Town of Acton.

(B) Notwithstanding anything to the contrary herein, so long as the Declarant owns any Lot within Richardson Crossing, the Declarant reserves the right, at any time and from time to time, to unilaterally amend this document for the following purposes:

- (i). to meet the requirements of any governmental or quasi-governmental body or agency including, but not limited to, the Town of Acton, or any of its boards, bodies or agencies;
- (ii). or the requirements of any insurance company or insurance underwriting office or organization, or the requirements of Federal National Mortgage Association, Federal Home Loan Mortgage Corporation, Massachusetts Housing Finance Agency, the secondary mortgage market, or any lender; or
- (iii). To induce any such agencies or entities to make, purchase, sell, insure or guarantee first mortgages covering the ownership of a Unit; or
- (iv). to correct typographical, mathematical, clerical or scrivener's errors, or to cure any ambiguity, inconsistency or formal defect or omission in this document or any supplement or amendment thereto, including without limitation, the correction of measurements appearing on any plan recorded in connection with the road and sewage disposal system; or

All Lot Owners and mortgagees shall be deemed to have consented to any such amendments by the Declarant.

- (i) The Declarant shall have the right and easement in accordance with any decision by the Town of Acton to construct, erect and install on the Land in such locations as the Declarant shall in the exercise of its discretion determine to be appropriate or desirable:
 - (a) Roads, driveways, decks, garages, exterior parking spaces and parking areas, walks and paths;
 - (b) New or additional fences or decorative barriers or enclosures, and other structures of every character;
 - (c) The Declarant further reserves the right to unilaterally grant to the Town of Acton and/or any of its Boards, Assigns and/or Designees (the "Town") any easement the Declarant deems necessary, in its sole discretion, to complete the Development contemplated hereunder.

The Declarant further reserves the right to unilaterally grant to the Town of Acton and/or any of its Boards, Assigns and/or Designees (the "Town") any easement the Declarant deems necessary, in its sole discretion, to complete the development contemplated hereunder.

The easements described hereunder shall be deemed to run with the Land and shall burden the Land and shall obligate and inure to the benefit of the Owners and occupants of the Land hereunder as well as any adjoining land thereto.

Said easements may be assigned, transferred, sold and/or conveyed by the

Declarant, to any entity including, but not limited to, the owner(s) of the abutting land.

(G) Enforcement of Payment Obligations

If any owner, his heirs, successors or assigns, shall fail or refuse at any time to bear such responsibility and make payment, and such failure or refusal shall continue for thirty days after written notice by registered mail, return receipt requested, has been delivered to said owner, his heirs, successors and assigns, the Grantor, or any other lot owner, shall have the right forthwith to bring suit at law or in equity against such owner, his heirs, successors or assigns by suit commenced in the Superior Court or District Court or any other court of the Commonwealth with appropriate jurisdiction and collect and enforce the same as in any other actions, and such right to sue shall exist on every successive default in such payments. Any owner who shall file suit to enforce this covenant shall be entitled to reasonable attorneys' fee incurred in such enforcement. The provisions of this paragraph shall be governed and controlled by the terms and provisions of Massachusetts General Laws Chapter 183 A. All rights and remedies afforded under Massachusetts General Laws Chapter 183 A relative to the collection of outstanding fees shall be available and applicable to any outstanding and unpaid fees.

(F) Certification of Payment of Outstanding Fees

At the time of the transfer of any of the Lots, the owner of said lot shall be responsible for obtaining certification that all fees associated with this agreement have been paid. The form used to confirm payment shall be the same form commonly used for condominiums pursuant to Massachusetts General Laws Chapter 183 A, Section 6. The Declarant shall have the authority to sign this document until such time as it has conveyed all Lots. After this period, the Lot owners shall be required to obtain the consent of greater than 51% of the Lot owners.

VI. POWERS OF THE LOT OWNERS

The Lot Owners shall have all power necessary for the administration of the affairs of the Richardson Way and the sewage disposal system and, provided they obtain consent of those entitled to a 51% vote of the beneficial interest as set forth in Exhibit A, they may do any and all acts necessary or desirable for the administration of the affairs of Richardson Way, and the sewage disposal system. Such powers and duties of the Trustees shall include, but shall not be limited to, the following:

- a. Operation, care, upkeep and maintenance of Richardson Way and the sewage disposal system;
- b. Determination of the Common Expenses required for operation of the same;
- c. Collection of the Common Expenses from the Lot Owners;
- d. Employment and dismissal of the personnel necessary or advisable for maintenance and operation;

- e. Opening of bank accounts and designating the signatories required therefore;
- f. Making of repairs, additions and improvements to, or alterations or restoration of, the sewage disposal system and Richardson Way
- g. Conducting litigation as to any course of action involving either Richardson Way or the sewage disposal system.
- h. Granting permits, licenses and easements over Richardson Way and the sewage disposal system and other purposes reasonably necessary or useful for the proper maintenance or operation of the development;
- i. Enforcing obligations of the Lot Owners, allocating income and expenses, and to do anything and everything else necessary and proper for sound management.

VII. COMMON RESTRICTIONS AND COVENANTS APPLICABLE TO ALL LOTS

WHEREAS, the Declarant desires to provide for the preservation of the values and amenities of the Development and, to this end, desires to subject the Lots to the covenants and restrictions hereinafter set forth, each and all of which is and are for the benefit of the Subdivision and each Lot owner thereof.

NOW THEREFORE, the Declarant and its heirs, successors, grantees and assigns hereby agree that the Lots, are and shall be held, transferred, sold, conveyed, inherited and occupied subject to and with the benefit of the covenants and restrictions hereinafter set forth, which covenants and restrictions shall run with the Lots in perpetuity.

1. Use. Each Lot shall be subject to the terms and conditions of all terms and conditions established by the Town of Acton including but not limited to the Comprehensive Permit.

2. Miscellaneous Restrictions. With regard to any Lot located within the Subdivision, the following shall apply:

A. No business, trade or profession shall be conducted on or from any Lot. However, an office may be maintained in the dwelling located on a Lot if such office use is limited solely to the Lot owner's use. No business, trade or profession signage shall be allowed.

B. No horses or barnyard animals shall be stabled or maintained on any Lot. This restriction does not, however, apply to dogs, cats, birds, or household pets that are reasonable in number, and shall not cause a nuisance to the neighborhood.

C. Clotheslines, poles, outside television antennae, radio aerials and satellite dishes shall be located on or near the dwelling in such a way as to minimize their visibility from any public street and abutting lots.

D. No trailers, campers, mobile homes, boats, or other recreational vehicles, non-operative or unregistered automobiles, trucks, machinery, supplies, materials or equipment of any kind shall be stored on a Lot, unless same are stored wholly within the dwelling or garage.

E. Homeowners to maintain their yard in well-cared for condition which at a minimum shall include cutting the grass regularly, maintaining all plants including shrubs trimmed and yard free of junk or clutter.

3. Enforcement of Covenants. These covenants are enforceable by a majority of the Lot Owners acting by way of majority vote. Failure to enforce the within Covenants shall in no way be deemed as a waiver by any benefited party to enforce the rights included herewith at a subsequent time.

4. Modification or Termination of Restrictions. For so long as the Declarant owns at least one Lot, it reserves the right to unilaterally, and without the consent of any owner of any other Lot located with the Subdivision modify, amend, change, or terminate any or all of the restrictions and covenants as herein contained; provided, however, that any such modification, amendment, change or termination shall not apply to any Lots located within the Subdivision which have previously been conveyed.

5. Indemnification. Any person who violates or otherwise fails to comply with these Covenants and Restrictions shall be liable to the person who seeks enforcement of the Covenants and Restrictions for all losses, costs and expenses (including reasonable attorney's fees) incurred by the party entitled to indemnification in connection with the enforcement of these Restrictions. Invalidity of anyone of these Covenants by judgment or court order, shall in no way affect any of the other provisions that shall remain in full force and effect.

6. In carrying out its duties pursuant to these Covenants, the Declarant, or its grantees or assigns, shall not be liable for any act it takes or refuses to take, as long as said act is made in good faith.

VII Invalidity

The invalidity of any provision of this document shall not be deemed to impair or affect in any manner the validity, enforceability or effect of the remainder of this document, and in such event, all of the provisions of this document shall continue in full force and effect as if such invalid provision had never been included herein.

IX. Waiver

No provision contained in this document shall be deemed to have been abrogated or waived by reason of any failure to enforce the same, irrespective of the number of violations or breaches which may occur.

X. Captions

The captions herein are inserted only as a matter of convenience and for reference, and in no way define, limit or describe the scope of this document or the intent of any provisions hereof.

XI. Enforcement

This Master Deed is set forth to comply with the requirements of Chapter 183A of the General Laws of the Commonwealth of Massachusetts. In case any of the provisions stated above conflict with the provisions of said statute, the provisions of said statute shall control.

XII. Continuing Obligations of the Lot Owners

Reference is made to the Town of Acton Zoning Board of Appeals Comprehensive Permit and Certificate of Action Relative to _____ Development dated _____ and recorded with the Middlesex South District Registry of Deeds at Book _____, Page _____ (the "Decision"). The Lot Owners shall be subject to and bound by the terms and conditions of the Comprehensive Permit Decision. Further, to the extent that there is a continuing obligation set forth in either of these documents, these obligations, once any of the site work which has been constructed by the Declarant for the same.

EXECUTED as an instrument under seal this _____ day of _____, 20__.

RICHARDSON'S CROSSING, LLC
By: Julian J. D'Agostine III, Its Managing Member

COMMONWEALTH OF MASSACHUSETTS

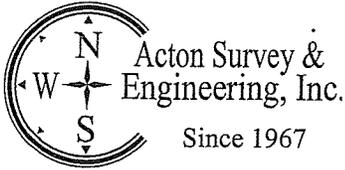
_____, ss: _____, 20__

On this _____ day of _____, 20__, before me, the undersigned notary public, personally appeared Julian J. D'Agostine III, proved to me through satisfactory evidence of identification, which was drivers license, 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 the Managing Member of Richardson's Crossing, LLC.

Official signature and seal of notary
My Commission Expires: _____

EXHIBIT "A"

LOT DESIGNATION	PROPORTIONATE INTEREST OF UNIT IN COMMON AREAS AND FACILITIES
1	
2	
3	
4	



PO Box 666, 97 Great Road, Suite 6
Acton, MA 01720
Phone: 978-263-3666 Fax: 978-635-0218
actonsurvey@actonsurvey.com

November 2, 2009

ASE 6729

Acton Zoning Board of Appeals
472 Main Street
Acton, MA 01720

Re: Richardson Crossing – Hearing 09-06⁰⁴
113 Central Street

Dear Board Members:

The purpose of this letter is to provide you with information requested by or to respond to comments contained in the Planning and Engineering Departments' Interdepartmental Communications issued in regard to the plans revised on September 29, 2009.

Our responses will be limited to those necessary and will utilize the numbering system of those communications.

Planning Department

Item 3: The Floor Area Ratios have been calculated using the Gross Floor Areas, which do not include the garages. The resulting Floor Area Ratio is different than that defined in the Zoning Bylaw, which is based on Net Floor Area [see 1.3.9].

Item 6: The trees selected for planting at this site are generally drought resistant but could be adversely impacted by periods of prolonged drought if they are under stress due to other factors, such as just having been transplanted.

The use of drought resistant grasses remains as being recommended, as sod is not available with drought resistant grass, and seeding with such grasses under certain conditions may not allow sufficient grass cover to be established to prevent erosion.

Item c: We believe that the use of the driveway to provide pedestrian access to Parcel A for the residents of the two homes not directly abutting Parcel A is appropriate.

At the request of our client, the easement has been widened from 20 to 30 feet.

We do not see a need for a providing a cross country path given the expected limited use of Parcel A and hopeful congeniality between neighbors. Parcel A is also accessible from Central Street.

✓

This office has completed surveys of the property and a new property plan showing the dimensions of the Lots and easements has been prepared. The easements include an access easement for the common pump chamber serving houses 109 and 111.

Item d: The Record Plan (Sheet 3 of 9) is noted as being "Draft," and all covenants and restrictions pertaining to the property will be added upon their receipt from our client's attorneys.

The Record Plan shows a division of the property and a place for signature by the Planning Board.

Item e: The zoning classifications and the yard setbacks are shown on other plans [Master Plan and Record Plan]. We believe the inclusion of this data on the Site Development Plan (Sheet 5 of 9) would decrease the clarity of the plan and detract from its purpose.

A waiver is requested from the strict compliance with Rules Section 3.14.5.2 and 3.14.5.4 if necessary.

A note requiring the conversion of the street sign to an address sign has been added to the Site Development Plan.

Item f: This office has completed the property survey and the Record Plan shows the correct property data.

Item g: The completion date listed in Section 6 of the Application must be corrected by other persons other than this office.

Item h: The payment of delinquent taxes is to be by persons other than this office.

Item i: This item summarizes the items that are significant in the reviewer's opinion and our responses are:

- This office has now completed property and topographic surveys and states that the data shown on the plans is correct.
- We believe that with the exception of Item "e," the plans have been revised as required by Staff.
- The comment concerning payment of taxes is understood.

Engineering Department

Item 3: This office has scheduled an appointment with the Board of Health to witness additional soil evaluations in the area of the soil absorption system on November 2, 2009, and soil evaluations will be performed in the areas of recharge systems 1, 2, and 3. The other systems are being provided for roof recharge and are in the vicinity of existing site features that should not be disturbed for this purpose.

Item 6: The requested information has been added to the plans.

Item 8: A detail of a polyethylene barrier has been added to the plans on sheet 5/7.

Item 12: The perimeter survey has been completed and the plans are based on surveys by this office.

Item 13: All survey monumentation recovered is shown on the plans.

Item 16: Note 7, under Existing Facilities, has been added to the Site Development Plan (sheet 5 of 9), requiring the removal and disposal of the exiting subsurface sewage disposal system.

Item 18: All written agreements are to be prepared by persons other than this office.

Item 24: All existing utilities are to be disconnected and abandoned as required by the utility companies.

Item 27: A note has been added to the Site Development Plan requiring the relocation of the Rail Road Crossing sign in compliance with its owner's requirements. If the owner desires for the sign to be replaced it will be done.

Board of Health

Plans detailing the design and construction of the subsurface sewage disposal system have been submitted to the Board of Health and additional subsurface explorations are scheduled for November 2, 2009.

Plans detailing the subsurface sewage disposal system are being submitted with the previously submitted plans.

Landscaping

Our client has instructed us to include the planting of ten large evergreens and the installation of approximately 68 feet of fence on the property to the east of the site.

Side and Rear Yard Offsets

The division of the property into individual lots has resulted in Side and Rear Yard offsets from internal property lines that are less than those stipulated in the Table of Standard Dimensional Regulations. Please accept this letter as our client's request for a waiver, if they have not done so.

The Front, Side, and Rear Yard offsets measured from property lines shared with properties abutting the site conform to the Zoning Bylaw.

Common Driveway

Please accept this letter as a request for a waiver from the requirements of 3.8.1.5(c) to allow the Common Driveway to have a slope of 8 to 9 percent within 50 feet of Central Street, if this waiver has not been previously requested.

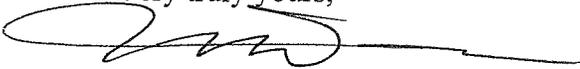
The Engineering Department's initial Interdepartmental Communication stated that they found the proposed alignment acceptable.

A waiver is also required from 3.8.1.5(m) to decrease the width of the gravel base under the driveway shoulders from 3 feet to 1 foot as the common driveway width is proposed to be 18 feet as compared to the 12 feet required by 3.8.1.5(l). The additional gravel base is to provide support in case vehicles stray from the driveway and the widening of the driveway eliminates the need for the gravel base.

If prior to the continued public hearing the Board or Town Staff should require additional information or copies of plans please notify us.

We are happy to meet with the Staff to discuss this matter.

Very truly yours,



Mark T. Donohoe, PE
for:
Acton Survey & Engineering, Inc.

cc: Robinson Crossing, LLC



PO Box 666, 97 Great Road, Suite 6
Acton, MA 01720
Phone: 978-263-3666 Fax: 978-635-0218
actonsurvey@actonsurvey.com

September 29, 2009

Acton Zoning Board of Appeals
472 Main Street
Acton, MA 01720

Re: Richardson Crossing- Hearing 09-06
113 Central Street
6729

Dear Board Members:

The purpose of this letter is to respond to communications to the Board concerning the proposed development of the property at 113 Central Street, consisting of four single-family homes served by a common driveway and subsurface sewage disposal system.

Without performing actual on-the-ground instrument surveys, this office, appropriately, did not take responsibility for the accuracy of the data shown on plans prepared by other firms, even though we found the information acceptable for design purposes.

Our client has now authorized this office to undertake the necessary surveys and they should be completed prior to the continued hearing. The performance of these surveys will allow this office to verify construction.

For simplicity and ease of reference we will answer each Interdepartmental Communication [IDC] separately.

Acton Water District

The water services to each of the houses have been denoted to be 1 inch HDPE [High Density Polyethylene].

Board of Health

Additional soil evaluations and percolation tests will be performed if required as condition, of achieving a permit from the Board of Health.

We note that the four soil evaluations and two percolation tests performed indicate the uniform soil conditions expected on a drumlin. The explorations, while being confined to the area along the existing tree line, are within 30 feet of all portions of the soil absorption system.

Transportation Advisory Committee

We believe that the provision of a pull off area for a future shuttle bus is premature and that if such a pull off area is to be provided, it would best be located near the entrance to the Dover Heights Apartments.

Engineering Department

1. It is our understanding that rights of access and utility connections will be provided in a Master Deed.
2. No comment necessary.
3. A 12 foot deep groundwater interceptor drain is shown to be proposed at the top of the slope along the northern property line to eliminate the perched groundwater that typically occurs on drumlins. Groundwater movement is slow, and based on published information from the Soil Conservation Service [now NRCS], a flow of less than 0.1 cubic foot per second is expected. The proposed recharge facilities will be able to handle this incidental flow.
4. As noted in the drainage calculations, the pre- and post-development drainage calculations treat the entire site as the drainage area.
5. The stormwater management system has been revised to include additional recharge works near Central Street and so that the peak rate of runoff for the 10-year storm event is attenuated, as required by the Subdivision Rules and Regulations [8.2.3]. Substantiating calculations are attached and show that the 10-year peak rate of runoff is decreased from 2.18 to 1.48 cubic feet per second after development. There is also a decrease in the volume of runoff.
6. The requested sizing calculations are enclosed, and as should be expected due to the size of the project, the drainage system has been designed more as a matter of easing maintenance than of hydraulic capacity.
7. A table has been added to the site plan listing the relevant elevations and sizes for the drainage structures.
8. The recharge systems are located below the surface of the ground on the outside face of the wall, negating the need for a barrier.
9. This office has been authorized to undertake the necessary property surveys.
10. No comment necessary.
11. The house numbers on Lots 3 & 4 have been interchanged.

12. The necessary surveys have been authorized.
13. The Recordable Plan will be prepared to Registry of Deeds Standards.
14. The Recordable Plan will be prepared to Registry of Deeds Standards.
15. The Affordable Unit is labeled on the Plans.
16. A note has been added to the plan stating that the existing structures, driveway, subsurface sewage disposal system, water service, and utilities are to be removed.
17. No comment necessary.
18. It is our understanding that the legal documents will include maintenance requirements for all common areas and facilities, including driveways and both the subsurface sewage disposal system and stormwater management system.
19. The sight distances from the proposed driveway have been added to the plan, and exceed 210 feet, which is adequate for vehicles traveling at 45 miles per hour on Central Street [AASHTO]. The posted speed limit for this portion of Central Street is 25 miles per hour. The grading at the new driveway has been "flared" to increase the visibility of the driveway. The Common Driveway requirements established under 3.8.1.5 require sight distances beyond those established by national and State criteria and please accept this letter as our client's request for a waiver from Zoning Bylaw 3.8.1.5 to allow the Common Driveway to be constructed as shown.
20. The existing driveway is to be removed and a note has been added to the plan indicating that a new berm is to be placed along the edge of pavement where the existing driveway entered Central Street. The existing driveway is at grade and it is unknown if the wall existed when the driveway was installed. We see no propose for constructing a wall in this area.
21. The driveway detail has been revised as suggested.
22. The Fire Chief has no comment on the project and we believe that a SU-30 vehicle can enter and exit the site without traveling over grass.
23. No comment necessary.
24. A note has been added stating that all utilities shall be removed as required by the appropriate utility company.
25. A cleanout detail has been added.
26. The project sign location has been added to the plan.

27. The Railroad Crossing sign will be relocated as required by its owner.

Acton Fire Chief

No comment necessary.

Conservation Commission

No comment necessary.

Acton Community Housing Corporation

No comment necessary.

Acton Planning Department

We offer the following in regard to the footnotes contained in the Project Evaluation Summary.

1. No comment necessary.
2. No comment necessary.
3. This office has not received updated architectural plans and cannot compute the required data. However, we note that among other things, building service areas are exempted by 1.3.8.
4. No comment necessary.
5. The relatively flat area at the gable ends of three of the units and the rear yard of the unit parallel to Central Street allow for play equipment, and the area of the proposed primary subsurface sewage disposal system is available for playing catch.
6. Drought resistant grasses were recommended, as an irrigation system is not proposed.
7. The project was designed to be in keeping with the intent of the Town of Acton's standards and good practice.
8. No comment necessary.

Other Comments

- a. The Engineering and Fire Departments appear to be in acceptance of the driveway design.
- b. Richardson Way has been added to the plans to the extent that it does not unduly interfere with the primary purpose of the plans.
- c. An easement for access to Parcel A has been added to the Recordable Plan as suggested and a second easement has been added at the front of houses 109 & 111 to allow maintenance of the common pump chamber.
- d. The Recordable Plan will be revised as suggested upon receipt of all Covenants and Restrictions.
- e. Sheet 5 will be revised as suggested.
- f. The property description will be corrected as necessary upon the completion of property surveys by this office.
- g. Our client will provide the Board with a new completion date.
- h. No comment necessary by this office.
- i. No comment necessary.

Municipal Properties

The size of plantings are now indicated on the plans.

Public Hearing Comments

In response to certain comments made at the public hearing we offer the following:

We have included an orthophoto obtained from the MassGIS Website that we have amended to show the proposed houses and driveway in relationship to the environs of the site.

Runoff from roofs and paved areas of the Dover Heights Apartments are collected and disposed of by the complex's drainage system resulting in, essentially, no external area being tributary to the site. The runoff reported by the homeowners located to the east of the site is due to the presence of an area above their driveways which is tributary to their properties.

The proposed interceptor drain has been added to further insure that stormwater is properly controlled on the site and to protect the proposed homes and driveway.

It is our understanding that our client will work with the owner of 107 Central Street to provide additional screening.

We have revised the plans to show the location of garages, front doors, walkways and proposed decks or a patio. It is our understanding that our client may alter the dimensions of some of the decks.

Miscellaneous

If upon review this letter and the accompanying materials are found to be inadequate, we will make every effort to rectify the data prior to the public hearing if notified by Town staff in a timely manner.

We would be happy to meet with staff to provide them with additional information if they believe that this is best.

Thank you any consideration you may give to the contents of this letter.

Very truly yours,
Mark T. Donohoe, PE



for:
Acton Survey & Engineering, Inc.

cc: Richardson Crossing, LLC

Cheryl Frazier

From: Louise A. Maher [louise.a.maher@verizon.net]
Sent: Wednesday, November 18, 2009 8:01 PM
To: Board of Appeals
Subject: Zoning board of appeals, Zoning enforcement officer

To Kenneth Kozik and Scott Mutch,

At the last meeting about the 93 Central and 113 Central Street project, there was no acknowledgement about our request for a fence on our property line at 42 Tuttle Drive. This was discussed with the builder with both my husband and I, and our neighbors, the Friends at 40 Tuttle drive during a walk around the project site with the builders. I am concerned that our request was ignored and I would like some written documentation from the builders and the zoning board regarding this request. We did not think the plantings would provide an adequate noise, light and visual barrier especially during the construction phase. Please forward this letter to the appropriate parties and let me know what the next step should be.

Sincerely,

Louise A. Maher, Edward F. Maher
42 Tuttle Drive

Cheryl Frazier

From: K. Kozik [kiplaw@earthlink.net]
Sent: Wednesday, November 18, 2009 8:22 PM
To: Scott Mutch; Cheryl Frazier
Subject: Fw: Zoning board of appeals, Zoning enforcement officer

Not sure how to answer this one other than to place her email in the file with the permit application.

Thanks,
Ken

-----Forwarded Message-----

>From: "Louise A. Maher" <louise.a.maher@verizon.net>
>Sent: Nov 18, 2009 8:00 PM
>To: zba@acton-ma.gov
>Subject: Zoning board of appeals, Zoning enforcement officer
>
>To Kenneth Kozik and Scott Mutch,
>
>At the last meeting about the 93 Central and 113 Central Street
>project, there was no acknowledgement about our request for a fence on
>our property line at 42 Tuttle Drive. This was discussed with the
>builder with both my husband and I, and our neighbors, the Friends at
>40 Tuttle drive during a walk around the project site with the
>builders. I am concerned that our request was ignored and I would like
>some written documentation from the builders and the zoning board
>regarding this request. We did not think the plantings would provide an
>adequate noise, light and visual barrier especially during the
>construction phase. Please forward this letter to the appropriate parties and let me know
what the next step should be.
>
>Sincerely,
>
>Louise A. Maher, Edward F. Maher
>42 Tuttle Drive
>
>

Cheryl Frazier

From: Matthew Liebman [m.liebman@comcast.net]
Sent: Monday, September 14, 2009 8:15 AM
To: Planning Department; Building Department
Cc: Green Advisory Board; Design Review Board; Land Stewardship Committee; Conservation Commission; Natural Resources Department
Subject: Developments at 93 and 113 Central Street

My name is Matt Liebman and I live on Tuttle Drive. I am writing this email to the Building and Planning departments because the ZBA does not appear to have an email address. I hope that you can pass this along to the members of the ZBA. I am concerned about two pending 40b developments at 93 and 113 Central Street. There is a hearing tonight (which I cannot attend) about these projects. These developments may have adverse effects on conservation land, wetlands habitat, water quality and quality of life in our neighborhood. As I am sure you are aware, like most people, we certainly promote affordable housing in Acton, but the tradeoffs of more growth (i.e. build four houses to get one affordable house) is unsustainable in our community and other communities. A different model is clearly needed. This is a good case in point. These developments will put 8 new houses in a small watershed that the Board of Health has identified as a concern for groundwater quality. There are three to four wetlands and at least two vernal pools (or pools with strong vernal pool characteristics) either abutting or very close to these developments. Scientific research has shown that at least a 100 foot (and probably over 200 feet) horizontal setback is needed to protect these critical habitats. There is also conservation land (Pacy Land) directly abutting one of the projects, and efforts to protect this land are stymied as more development encircles it and fragments it. The Land Stewardship Committee is actively promoting a trail in this land as well. Finally, although I have not seen the design of these houses, there is no evidence that they will be "green". The lots at 93 Central are ideal for a solar roof and in this day of critical global climate change, with efforts by the town to reduce our carbon footprint, it would be a shame if the town allows 8 new houses with little effort to limit carbon emissions.

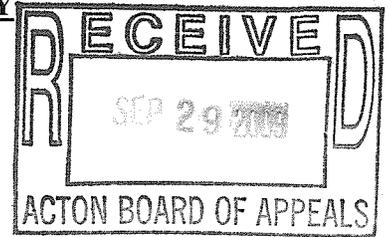
As you know, the 40b development allows some circumvention of local bylaws. But you have the power to maintain those laws too! It's important to remember that these parcels are not in areas targeted in the town for 40b development. I have worked hard over the years to establish improved setbacks to wetlands in Acton, to protect our natural resources. As I have seen in the last few years in my neighborhood, I am continually disappointed that insufficient effort is made to develop our town in a sustainable fashion.

Thank you.

Matthew Liebman
m.liebman@comcast.net
978-635-9652

STORMWATER MANAGEMENT SUMMARY

RICHARDSON CROSSING
113 Central Street, Acton, MA
6729
June 19, 2009
Revised September 21, 2009



EXISTING RUNOFF PATTERNS

The site is located on the northerly side of Central Street immediately to the east of the intersection of Central Street and the Commuter Rail train tracks and currently consists of a single family residence with a detached garage. The property is bounded on the north by an apartment complex located at 117 Central Street and on the eastern and southern property lines by residential properties.

There are no wetland resource areas located on the property and the site is located above the 500 year flood zone elevation as referenced on FIRM Map, Community Panel 250176-0003 C, dated January 6, 1988. Topography at the site slopes gently to moderately from a high elevation located in the northern portion of the property to a low elevation along the property frontage adjacent to Central Street. Surface characteristics of the property are mostly wooded, with small amounts of grassy lawn surfaces and impervious surfaces consisting of roof and a driveway.

Currently surface runoff collects and flows in a north to south direction towards Central Street. There are no point source discharges.

SURFICIAL GEOLOGY

The site is shown to be located on a drumlin (USGS 1948) and soils consisted of till soils containing ground rock fragments ranging from silt size particles to boulders.

STORMWATER MANAGEMENT SYSTEM

The proposed stormwater collection system for the project consists of a series of deep sump hooded catch basins, interceptor drains, piping/cleanout network and subsurface recharge areas. The stormwater collection system and recharge areas have been sized accordingly to collect, store and recharge the projected increase in runoff volume at the site for a 10-year Type III storm event (see Recharge for Post-Development Drainage calculation sheet). There is a slight increase in the rate of runoff for the proposed project, however the increase is minimal and should have no impact on downstream flooding.

The stormwater management system utilizes areas known to be suitable for subsurface recharge for the recharge chambers which were selected to allow the design of a stormwater management system that could increase recharge to the local aquifer, minimize the impacts of stormwater runoff as well as providing water quality treatment for runoff from the proposed driveway area.

STORMWATER MANAGEMENT SUMMARY

RICHARDSON CROSSING
113 Central Street, Acton, MA
6729

June 19, 2009

Revised September 21, 2009

The proposed stormwater management system collects surface runoff through the deep sump hooded catch basins and from the interceptor trenches located on the site and recharges runoff on-site. Overflow occurring from the recharge areas exceeding storage volumes for storm events exceeding a 10 year storm discharge through the overflow pipe network at Central Street as currently occurs at the site.

RESULTS OF STORMWATER MODEL

As shown by the following results of the Recharge for Post-Development Drainage calculation sheet and information from the HydroCad computer analysis; insignificant increases in the rate and volume of runoff occur and should have no effect on down stream flooding effects.

METHODOLOGY FOR STORMWATER CALCULATIONS

Calculations were performed based on TR-20 methods with a computer model created with the use of HydroCAD software [Version 8].

A complete data sheets for the model is included as well as the results of the HydroCAD modeling.

STORMWATER MANAGEMENT SUMMARY

RICHARDSON CROSSING
113 Central Street, Acton, MA
6729

June 19, 2009

Revised September 21, 2009

September 21, 2009 ADDENDUM

To

Stormwater Management Summary

Additional subsurface recharge chambers have been added to the site's stormwater management system in order to more effectively attenuate the peak flowrate and volume of stormwater runoff for the various storm events. The plans have been revised to show the additional chambers, and the HydroCAD computer model was used to analyze the modified design. The results of the updated HydroCAD model are tabulated below.

STORM FREQ	PRE Q (cfs)	POST Q (cfs)	Δ Q (cfs)	PRE Vol (acre-ft)	POST Vol (acre-ft)	Δ Vol (acre-ft)
2	1.11	0.28	-0.83	0.090	0.001	-0.089
10	2.18	1.48	-0.70	0.173	0.026	-0.147
25	2.82	3.65	0.83	0.225	0.298	0.073
100	3.82	4.22	0.40	0.306	0.215	-0.091

The post-development peak flowrate and volume of runoff have been reduced for both the 2-year and 10-year storms, relative to pre-development conditions. This complies with the Town of Acton's Subdivision Rules and Regulations.

Insignificant post-development increases in the rate and volume of runoff occur for the 25-year and 100-year storms, with the exception of the 100-year runoff volume, which decreases. These increases should have virtually no effect on downstream flooding.

Complete data sheets for the HydroCAD model are included.



Acton Survey & Engineering, Inc.

P.O. Box 666 97 Great Rd. Suite 6
Acton, MA 01720-0666
(978) 263-3666 Fax (978) 635-0218
Email: actonsurvey@verizon.net

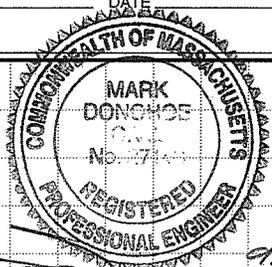
JOB RICHARDSON CROSSING 6729

SHEET NO. 1 OF

CALCULATED BY MTD DATE 9-27-09

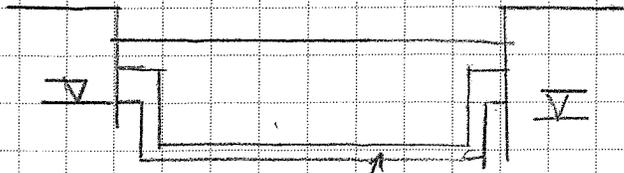
CHECKED BY DATE

SCALE HYDRAULICS



9-28-9

CATCH BASIN CONNECTION



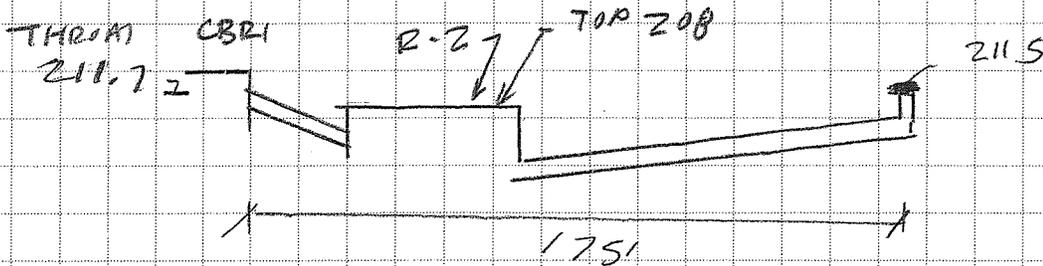
± 0.25' ELEVATION DIFFERENCE

SAY 30' 8" SDR 35 PVC
C = 140

USE HAZEN WILLIAMS FORMULA
VIA FLOWMASTER PROGRAM

Q = 1.75 CFS OK ~~2~~ Q₂₅ FOR SITE
= 37 CFS

DISCHARGE @ OLD DRIVEWAY

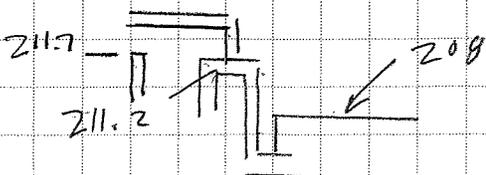


HAZEN-WILLIAMS

Q = 0.5 CFS

8" BASIN TO RECHARGE

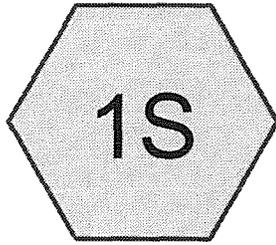
TYPICAL



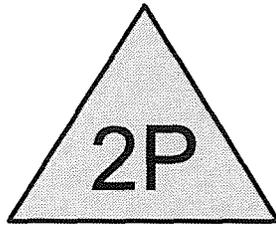
3.07' 3.2" W/O BASIN SURCHARGE

SAY 10' OF 8" SDR 35 PVC

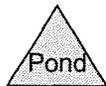
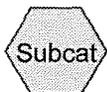
W/3.2" 11.3 CFS W/3.5 12.2 CFS OK



ENTIRE SITE



CENTRAL STREET



6729-PRE

Type III 24-hr Middlesex 002 yr Rainfall=3.10"

Prepared by Acton Survey & Engineering

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 1S: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>1.10"

Flow Length=228' Tc=11.4 min CN=78 Runoff=1.11 cfs 0.090 af

Pond 2P: CENTRAL STREET

Inflow=1.11 cfs 0.090 af

Primary=1.11 cfs 0.090 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.090 af Average Runoff Depth = 1.10"

85.02% Pervious Area = 0.830 ac 14.98% Impervious Area = 0.146 ac

Subcatchment 1S: ENTIRE SITE

Runoff = 1.11 cfs @ 12.17 hrs, Volume= 0.090 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr Middlesex 002 yr Rainfall=3.10"

Area (sf)	CN	Description
6,372	98	Paved parking & roofs
25,393	73	Woods, Fair, HSG C
10,771	79	50-75% Grass cover, Fair, HSG C
42,536	78	Weighted Average
36,164		Pervious Area
6,372		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		Sheet Flow, Through woods Woods: Light underbrush n= 0.400 P2= 3.10"
4.3	50	0.0400	0.19		Sheet Flow, Through lawn Grass: Short n= 0.150 P2= 3.10"
0.7	55	0.0400	1.40		Shallow Concentrated Flow, Through lawn Short Grass Pasture Kv= 7.0 fps
0.5	73	0.2200	2.35		Shallow Concentrated Flow, Through woods Woodland Kv= 5.0 fps
11.4	228	Total			

Pond 2P: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth > 1.10" for Middlesex 002 yr event
 Inflow = 1.11 cfs @ 12.17 hrs, Volume= 0.090 af
 Primary = 1.11 cfs @ 12.17 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

6729-PRE

Type III 24-hr Middlesex 010 yr Rainfall=4.50"

Prepared by Acton Survey & Engineering

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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 1S: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>2.13"

Flow Length=228' Tc=11.4 min CN=78 Runoff=2.18 cfs 0.173 af

Pond 2P: CENTRAL STREET

Inflow=2.18 cfs 0.173 af

Primary=2.18 cfs 0.173 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.173 af Average Runoff Depth = 2.13"

85.02% Pervious Area = 0.830 ac 14.98% Impervious Area = 0.146 ac

Subcatchment 1S: ENTIRE SITE

Runoff = 2.18 cfs @ 12.16 hrs, Volume= 0.173 af, Depth > 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Middlesex 010 yr Rainfall=4.50"

Area (sf)	CN	Description
6,372	98	Paved parking & roofs
25,393	73	Woods, Fair, HSG C
10,771	79	50-75% Grass cover, Fair, HSG C
42,536	78	Weighted Average
36,164		Pervious Area
6,372		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		Sheet Flow, Through woods Woods: Light underbrush n= 0.400 P2= 3.10"
4.3	50	0.0400	0.19		Sheet Flow, Through lawn Grass: Short n= 0.150 P2= 3.10"
0.7	55	0.0400	1.40		Shallow Concentrated Flow, Through lawn Short Grass Pasture Kv= 7.0 fps
0.5	73	0.2200	2.35		Shallow Concentrated Flow, Through woods Woodland Kv= 5.0 fps
11.4	228	Total			

Pond 2P: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth > 2.13" for Middlesex 010 yr event

Inflow = 2.18 cfs @ 12.16 hrs, Volume= 0.173 af

Primary = 2.18 cfs @ 12.16 hrs, Volume= 0.173 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

6729-PRE

Type III 24-hr Middlesex 025 yr Rainfall=5.30"

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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 1S: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>2.76"

Flow Length=228' Tc=11.4 min CN=78 Runoff=2.82 cfs 0.225 af

Pond 2P: CENTRAL STREET

Inflow=2.82 cfs 0.225 af

Primary=2.82 cfs 0.225 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.225 af Average Runoff Depth = 2.76"

85.02% Pervious Area = 0.830 ac 14.98% Impervious Area = 0.146 ac

Subcatchment 1S: ENTIRE SITE

Runoff = 2.82 cfs @ 12.16 hrs, Volume= 0.225 af, Depth > 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr Middlesex 025 yr Rainfall=5.30"

Area (sf)	CN	Description
6,372	98	Paved parking & roofs
25,393	73	Woods, Fair, HSG C
10,771	79	50-75% Grass cover, Fair, HSG C
42,536	78	Weighted Average
36,164		Pervious Area
6,372		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		Sheet Flow, Through woods Woods: Light underbrush n= 0.400 P2= 3.10"
4.3	50	0.0400	0.19		Sheet Flow, Through lawn Grass: Short n= 0.150 P2= 3.10"
0.7	55	0.0400	1.40		Shallow Concentrated Flow, Through lawn Short Grass Pasture Kv= 7.0 fps
0.5	73	0.2200	2.35		Shallow Concentrated Flow, Through woods Woodland Kv= 5.0 fps
11.4	228	Total			

Pond 2P: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth > 2.76" for Middlesex 025 yr event
 Inflow = 2.82 cfs @ 12.16 hrs, Volume= 0.225 af
 Primary = 2.82 cfs @ 12.16 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

6729-PRE

Type III 24-hr Middlesex 100 yr Rainfall=6.50"

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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 1S: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>3.76"

Flow Length=228' Tc=11.4 min CN=78 Runoff=3.82 cfs 0.306 af

Pond 2P: CENTRAL STREET

Inflow=3.82 cfs 0.306 af

Primary=3.82 cfs 0.306 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.306 af Average Runoff Depth = 3.76"

85.02% Pervious Area = 0.830 ac 14.98% Impervious Area = 0.146 ac

Subcatchment 1S: ENTIRE SITE

Runoff = 3.82 cfs @ 12.16 hrs, Volume= 0.306 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr Middlesex 100 yr Rainfall=6.50"

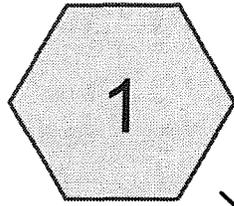
Area (sf)	CN	Description
6,372	98	Paved parking & roofs
25,393	73	Woods, Fair, HSG C
10,771	79	50-75% Grass cover, Fair, HSG C
42,536	78	Weighted Average
36,164		Pervious Area
6,372		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		Sheet Flow, Through woods Woods: Light underbrush n= 0.400 P2= 3.10"
4.3	50	0.0400	0.19		Sheet Flow, Through lawn Grass: Short n= 0.150 P2= 3.10"
0.7	55	0.0400	1.40		Shallow Concentrated Flow, Through lawn Short Grass Pasture Kv= 7.0 fps
0.5	73	0.2200	2.35		Shallow Concentrated Flow, Through woods Woodland Kv= 5.0 fps
11.4	228	Total			

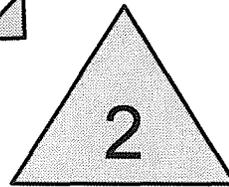
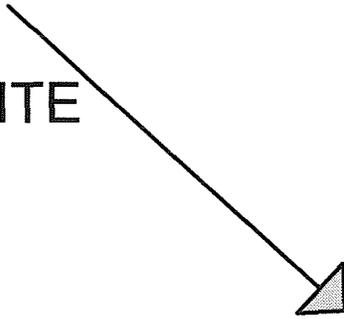
Pond 2P: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth > 3.76" for Middlesex 100 yr event
 Inflow = 3.82 cfs @ 12.16 hrs, Volume= 0.306 af
 Primary = 3.82 cfs @ 12.16 hrs, Volume= 0.306 af, Atten= 0%, Lag= 0.0 min

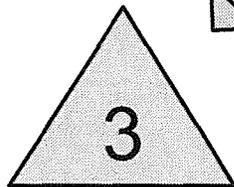
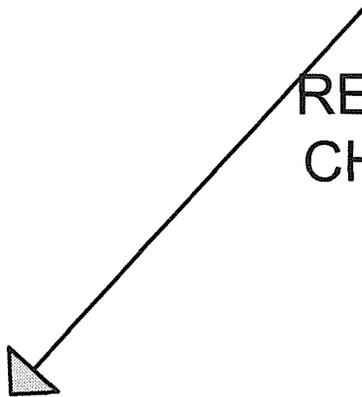
Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



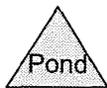
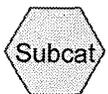
ENTIRE SITE



RECHARGE
CHAMBERS



CENTRAL STREET



Drainage Diagram for 6729-POST

Prepared by Acton Survey & Engineering 9/30/2009
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6729-POST

Type III 24-hr Middlesex 002 yr Rainfall=3.10"

Prepared by Acton Survey & Engineering

Page 2

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9/30/2009

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 1: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>1.35"

Tc=10.0 min CN=82 Runoff=1.43 cfs 0.110 af

Pond 2: RECHARGE CHAMBERS

Peak Elev=2.06' Storage=1,349 cf Inflow=1.43 cfs 0.110 af

Discarded=0.03 cfs 0.024 af Primary=0.28 cfs 0.001 af Outflow=0.31 cfs 0.025 af

Pond 3: CENTRAL STREET

Inflow=0.28 cfs 0.001 af

Primary=0.28 cfs 0.001 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.110 af Average Runoff Depth = 1.35"

68.29% Pervious Area = 0.667 ac 31.71% Impervious Area = 0.310 ac

Subcatchment 1: ENTIRE SITE

Runoff = 1.43 cfs @ 12.15 hrs, Volume= 0.110 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Middlesex 002 yr Rainfall=3.10"

Area (sf)	CN	Description
13,488	98	Paved parking & roofs
29,048	74	>75% Grass cover, Good, HSG C
42,536	82	Weighted Average
29,048		Pervious Area
13,488		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, over entire site

Pond 2: RECHARGE CHAMBERS

Inflow Area = 0.976 ac, Inflow Depth > 1.35" for Middlesex 002 yr event
 Inflow = 1.43 cfs @ 12.15 hrs, Volume= 0.110 af
 Outflow = 0.31 cfs @ 12.20 hrs, Volume= 0.025 af, Atten= 78%, Lag= 3.4 min
 Discarded = 0.03 cfs @ 10.65 hrs, Volume= 0.024 af
 Primary = 0.28 cfs @ 12.20 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 4
 Peak Elev= 2.06' @ 12.20 hrs Surf.Area= 1,222 sf Storage= 1,349 cf

Plug-Flow detention time= 189.9 min calculated for 0.025 af (23% of inflow)
 Center-of-Mass det. time= 87.7 min (890.7 - 803.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	763 cf	26.00'W x 47.00'L x 2.04'H Prismaoid 2,493 cf Overall - 586 cf Embedded = 1,907 cf x 40.0% Voids
#2	0.50'	586 cf	32.1"W x 12.0"H x 7.50'L Cultec C-100 x 42 Inside #1
		1,349 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	2.04'	47.0' long x 13.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Discarded OutFlow Max=0.03 cfs @ 10.65 hrs HW=0.02' (Free Discharge)
 ↗1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.23 cfs @ 12.20 hrs HW=2.06' (Free Discharge)
 ↗2=Broad-Crested Rectangular Weir (Weir Controls 0.23 cfs @ 0.32 fps)

Pond 3: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth = 0.02" for Middlesex 002 yr event
Inflow = 0.28 cfs @ 12.20 hrs, Volume= 0.001 af
Primary = 0.28 cfs @ 12.20 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

6729-POST

Type III 24-hr Middlesex 010 yr Rainfall=4.50"

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9/30/2009

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 1: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>2.46"
Tc=10.0 min CN=82 Runoff=2.60 cfs 0.200 af

Pond 2: RECHARGE CHAMBERS

Peak Elev=2.09' Storage=1,349 cf Inflow=2.60 cfs 0.200 af
Discarded=0.03 cfs 0.027 af Primary=1.48 cfs 0.026 af Outflow=1.50 cfs 0.053 af

Pond 3: CENTRAL STREET

Inflow=1.48 cfs 0.026 af
Primary=1.48 cfs 0.026 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.200 af Average Runoff Depth = 2.46"
68.29% Pervious Area = 0.667 ac 31.71% Impervious Area = 0.310 ac

Subcatchment 1: ENTIRE SITE

Runoff = 2.60 cfs @ 12.14 hrs, Volume= 0.200 af, Depth> 2.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Middlesex 010 yr Rainfall=4.50"

Area (sf)	CN	Description
13,488	98	Paved parking & roofs
29,048	74	>75% Grass cover, Good, HSG C
42,536	82	Weighted Average
29,048		Pervious Area
13,488		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, over entire site

Pond 2: RECHARGE CHAMBERS

Inflow Area = 0.976 ac, Inflow Depth > 2.46" for Middlesex 010 yr event
 Inflow = 2.60 cfs @ 12.14 hrs, Volume= 0.200 af
 Outflow = 1.50 cfs @ 12.14 hrs, Volume= 0.053 af, Atten= 42%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 9.30 hrs, Volume= 0.027 af
 Primary = 1.48 cfs @ 12.14 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 4
 Peak Elev= 2.09' @ 12.14 hrs Surf.Area= 1,222 sf Storage= 1,349 cf

Plug-Flow detention time= 108.6 min calculated for 0.053 af (27% of inflow)
 Center-of-Mass det. time= 5.8 min (795.1 - 789.3)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	763 cf	26.00'W x 47.00'L x 2.04'H Prismatic 2,493 cf Overall - 586 cf Embedded = 1,907 cf x 40.0% Voids
#2	0.50'	586 cf	32.1"W x 12.0"H x 7.50'L Cultec C-100 x 42 Inside #1
		1,349 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	2.04'	47.0' long x 13.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Discarded OutFlow Max=0.03 cfs @ 9.30 hrs HW=0.02' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=1.43 cfs @ 12.14 hrs HW=2.09' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 1.43 cfs @ 0.59 fps)

Pond 3: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth = 0.32" for Middlesex 010 yr event
Inflow = 1.48 cfs @ 12.14 hrs, Volume= 0.026 af
Primary = 1.48 cfs @ 12.14 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr Middlesex 025 yr Rainfall=5.30"

Prepared by Acton Survey & Engineering

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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 1: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>3.14"

Tc=10.0 min CN=82 Runoff=3.30 cfs 0.255 af

Pond 2: RECHARGE CHAMBERS

Peak Elev=2.14' Storage=1,349 cf Inflow=3.30 cfs 0.255 af

Discarded=0.03 cfs 0.029 af Primary=3.65 cfs 0.298 af Outflow=3.68 cfs 0.327 af

Pond 3: CENTRAL STREET

Inflow=3.65 cfs 0.298 af

Primary=3.65 cfs 0.298 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.255 af Average Runoff Depth = 3.14"

68.29% Pervious Area = 0.667 ac 31.71% Impervious Area = 0.310 ac

Subcatchment 1: ENTIRE SITE

Runoff = 3.30 cfs @ 12.14 hrs, Volume= 0.255 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Middlesex 025 yr Rainfall=5.30"

Area (sf)	CN	Description
13,488	98	Paved parking & roofs
29,048	74	>75% Grass cover, Good, HSG C
42,536	82	Weighted Average
29,048		Pervious Area
13,488		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, over entire site

Pond 2: RECHARGE CHAMBERS

Inflow Area = 0.976 ac, Inflow Depth > 3.14" for Middlesex 025 yr event
 Inflow = 3.30 cfs @ 12.14 hrs, Volume= 0.255 af
 Outflow = 3.68 cfs @ 12.14 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 8.70 hrs, Volume= 0.029 af
 Primary = 3.65 cfs @ 12.14 hrs, Volume= 0.298 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 4
 Peak Elev= 2.14' @ 12.14 hrs Surf.Area= 1,222 sf Storage= 1,349 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 32.7 min (816.4 - 783.7)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	763 cf	26.00'W x 47.00'L x 2.04'H Prismaoid 2,493 cf Overall - 586 cf Embedded = 1,907 cf x 40.0% Voids
#2	0.50'	586 cf	32.1"W x 12.0"H x 7.50'L Cultec C-100 x 42 Inside #1
		1,349 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	2.04'	47.0' long x 13.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Discarded OutFlow Max=0.03 cfs @ 8.70 hrs HW=0.02' (Free Discharge)
 ↗1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=3.60 cfs @ 12.14 hrs HW=2.14' (Free Discharge)
 ↗2=Broad-Crested Rectangular Weir (Weir Controls 3.60 cfs @ 0.80 fps)

Pond 3: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth > 3.66" for Middlesex 025 yr event
Inflow = 3.65 cfs @ 12.14 hrs, Volume= 0.298 af
Primary = 3.65 cfs @ 12.14 hrs, Volume= 0.298 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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 1: ENTIRE SITE

Runoff Area=42,536 sf Runoff Depth>4.18"
Tc=10.0 min CN=82 Runoff=4.35 cfs 0.340 af

Pond 2: RECHARGE CHAMBERS

Peak Elev=2.15' Storage=1,349 cf Inflow=4.35 cfs 0.340 af
Discarded=0.03 cfs 0.031 af Primary=4.22 cfs 0.215 af Outflow=4.25 cfs 0.246 af

Pond 3: CENTRAL STREET

Inflow=4.22 cfs 0.215 af
Primary=4.22 cfs 0.215 af

Total Runoff Area = 0.976 ac Runoff Volume = 0.340 af Average Runoff Depth = 4.18"
68.29% Pervious Area = 0.667 ac 31.71% Impervious Area = 0.310 ac

Subcatchment 1: ENTIRE SITE

Runoff = 4.35 cfs @ 12.14 hrs, Volume= 0.340 af, Depth> 4.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Middlesex 100 yr Rainfall=6.50"

Area (sf)	CN	Description
13,488	98	Paved parking & roofs
29,048	74	>75% Grass cover, Good, HSG C
42,536	82	Weighted Average
29,048		Pervious Area
13,488		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, over entire site

Pond 2: RECHARGE CHAMBERS

Inflow Area = 0.976 ac, Inflow Depth > 4.18" for Middlesex 100 yr event
 Inflow = 4.35 cfs @ 12.14 hrs, Volume= 0.340 af
 Outflow = 4.25 cfs @ 12.14 hrs, Volume= 0.246 af, Atten= 2%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 7.90 hrs, Volume= 0.031 af
 Primary = 4.22 cfs @ 12.14 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 4
 Peak Elev= 2.15' @ 12.14 hrs Surf.Area= 1,222 sf Storage= 1,349 cf

Plug-Flow detention time= 46.0 min calculated for 0.246 af (72% of inflow)
 Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	763 cf	26.00'W x 47.00'L x 2.04'H Prismatic 2,493 cf Overall - 586 cf Embedded = 1,907 cf x 40.0% Voids
#2	0.50'	586 cf	32.1"W x 12.0"H x 7.50'L Cultec C-100 x 42 Inside #1
		1,349 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	2.04'	47.0' long x 13.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Discarded OutFlow Max=0.03 cfs @ 7.90 hrs HW=0.02' (Free Discharge)
 ↗1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=4.15 cfs @ 12.14 hrs HW=2.14' (Free Discharge)
 ↗2=Broad-Crested Rectangular Weir (Weir Controls 4.15 cfs @ 0.84 fps)

Pond 3: CENTRAL STREET

Inflow Area = 0.976 ac, Inflow Depth = 2.64" for Middlesex 100 yr event
Inflow = 4.22 cfs @ 12.14 hrs, Volume= 0.215 af
Primary = 4.22 cfs @ 12.14 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs