LYNCH, DESIMONE & NYLEN, LLP
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JOHN M. LYNCH, P.C.
ERNEST P. DESIMONE
RICHARD A. NYLEN, JR.
STEPHEN W. DECOURCEY
SHANNON MICHAUD

OF COUNSEL

JAMES W. MURPHY
WAYNE H. SCOTT

July 17, 2015

Via Hand Delivery

Andrea J. Carlson, Town Clerk
Office of the Town Clerk
577 Bay Road
Hamilton, MA 01936

Re: Institution for Savings, ZBA Filing; 545 Bay Road, Ipswich, MA

Dear Town Clerk Carlson:

Enclosed please find an original of the following documents for filing:

1. Request for M.G.L., c. 40A, §6 findings for the change in use at the above property.

2. Site Plan Review Application for 545 Bay Road.

3. Checks made payable to the Town of Hamilton in the following amounts:
   a. Site Plan Review: $150.00
   b. Extension of a Non-Conforming Use: $75.00

4. Check made payable to The Salem News in the amount of $500.00 for publication.

5. Cover letter to ZBA Chairman.

Kindly file same.

Please contact me if you have any questions.

Thank you.

Sincerely,

Richard A. Nylen, Jr.

RAN/kad
Enclosures

cc: Zoning Board of Appeals (14 copies)
Michael J. Jones, President & CEO
Kimberly A. Rock, Executive VP/COO
Charles Nutter, AIA, LEED AP
Charles E. Wear, III, PE, LEED AP

H:\Institution for Savings\Filing Letter to Town Clerk 07-15-15.docx

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Email: RNylen@ldnllp.com

OF COUNSEL

JAMES W. MURPHY
WAYNE H. SCOTT

July 17, 2015

Via Hand Delivery

Mr. William Bowler, Chairman
Zoning Board of Appeals
577 Bay Road
Hamilton, MA 01936

Re: Institution for Savings; Request for Change in Pre-Existing, Non-Conforming Use per M.G.L. c. 40A, §6

Dear Chairman Bowler and Members of the Hamilton Zoning Board of Appeals:

This office represents the Institution for Savings with respect to its request for a change in use from the pre-existing, non-conforming use at 545 Bay Road, Hamilton, Massachusetts. The Institution for Savings has entered into an agreement to purchase land known as "Hamilton Gardens" at 545 Bay Road (the "Property") to construct a bank on the Property. Hamilton Gardens is a pre-existing, non-conforming use in the Residential District and the Institution for Savings seeks a finding pursuant to M.G.L. c. 40A, §6 from the Zoning Board of Appeals that its change in use will not negatively impact the neighborhood.

In support of this request for a finding, the Institution for Savings is also submitting an application for site plan review. The filings include the attached site plan, traffic study, architectural plans, stormwater management plan and signage.

Description of the Property

The Property is approximately 30,437 square feet in size. Hamilton Gardens, the owner, presently has a barn and garage on the south side, flower shop, greenhouse, garden center and parking on Bay Road to the west and parking to the east. The Property is devoid of vegetation except limited trees to the rear (southeast). The land has included nursery uses since 1938, pre-dating the Hamilton Zoning Bylaw. The one story garage is 371 square feet and is considered an outbuilding. The two story barn is 457 square feet and is also an outbuilding. Buildings 1 and 2 consists of the greenhouse with and the store/garden center with a footprint of 6720 square feet and a canopy extending 1,016 square feet. The total footprint is 8,564 square feet or 28% building coverage. The footprint extends into the 25 foot front yard from Bay Road and both side yard setbacks, including fencing along Bridge Street

and Bay Road. Parking on Bay Road presents difficulties to customers and vehicles travelling on Bay Road (Route 1A). There is a septic system but no stormwater management system. Landscaping is limited to the rear of the Property.

The Property is zoned R1A for residential uses.

The Institution for Savings

In 1820, prominent citizens of the City of Newburyport sent a request to the Massachusetts Legislature requesting to incorporate an institution "for the purpose of receiving money on deposit and investing the same to the best advantage of the owners thereof." On January 31, 1820, the charter was granted, creating the Institution for Savings, only the third savings bank in the Commonwealth. Opening deposits totaling $465.10 were collected on the first day.

Today, the Institution for Savings is widely recognized as one of the oldest and most stable mutual banks in the country, with assets totaling approximately $2.2 billion as of June 30, 2015. It is also the third largest mutual savings bank on the North Shore. The Institution for Savings' strong and stable reputation goes far beyond its architecturally prominent Victorian main office building built in 1870 and considered a historic landmark. The Bank has known only 16 presidents in its 195-year history, all of whom have been hired from within. This includes current President and CEO Michael J. Jones, who succeeded Mark F. Welch as President on July 1, 2010.

In recent years, the Bank has expanded on the North Shore. In 2006, it opened its first ever full-service banking office outside of Newburyport, in Salisbury. In 2007, the Bank merged with the Ipswich Co-Operative Bank, another vital community bank, and later that year opened a new retail and commercial lending center in Rowley. In 2011, the Institution for Savings opened its second Ipswich location at 112 County Road within the Powder House Village complex, followed by the opening of its seventh full-service office in Topsfield in 2013. In 2014, the Institution for Savings acquired Rockport National Bank, with four offices in Beverly and on Cape Ann. Most recently, the Bank opened a full-service office on Route 114 in Middleton. The Institution for Savings is now one of the region's strongest and largest community banks, with 12 full service offices.

The Bank prides itself on taking very good care of its employees with competitive salaries and excellent benefits. As a testament to this, the Institution for Savings in both 2013 and 2014 was named as the #1 Top Place to Work in the Medium Employer category by The Boston Globe. This was the seventh consecutive year that the Bank was named a Top Place to Work. In 2011, the Bank was named #1 Small Employer.

The vision of the Institution for Savings is to positively affect the lives of every person, business and organization within the communities it serves. Its strong reputation as community-minded is due in large part to its trustees, officers and employees who are active in their respective

communities, as well as its generous charitable giving. As a mutual savings bank, the Bank has always believed in dedicating part of its assets toward making those communities better places in which to live and work. The Institution for Savings, 2 Depot Square Ipswich and recently established Main Street Rockport Charitable Foundations are vehicles to guarantee for future generations the charitable giving that has been the Bank's hallmark since 1820. In the last five years, the Foundations collectively donated and pledged roughly $5 Million Dollars to non-profit organizations and causes, including a landmark $1.5 million to construct a new single-patient unit at Anna Jaques Hospital, more than $1 Million Dollars to support field and stadium renovation projects at Newburyport and Triton Regional High Schools, a recent $1 Million Dollar gift to Essex County Greenbelt Association for a land conservation fund, and $1.5 Million Dollars to the Ipswich Family YMCA for an aquatic center.

Another key component of the Bank's commitment to improving the quality of life for those within its communities is financial education. The Institution for Savings was the first bank in its market to offer comprehensive community-wide financial literacy programs that teach various segments of the population about the importance of solid money management skills. These programs include Teach Children to Save in the elementary schools, Think, Save, Succeed at the middle school level, Get Smart About Credit and the Credit for Life Fair in the high schools and identity theft prevention seminars to senior citizens. Additionally, the Bank underwrites and operates educational school banks within Ipswich, Newburyport, Beverly, Triton and Masconomet Regional High Schools.

The Institution for Savings offers a full menu of personal and commercial financial products and services for individuals, businesses and organizations, including deposit accounts, lending services, Internet/Mobile Banking and Bill Pay, and retirement accounts.

Ties to the Town of Hamilton

The Institution for Savings presently has three hundred seventy (370) deposit accounts totaling $26.2 Million Dollars and ninety-nine (99) loan accounts for $20 Million Dollars for the Town of Hamilton's residents in its other branches. An office in Hamilton will allow the existing customers of the Institution for Savings and new customers the convenience of banking in their hometown.

The Project

The Project will replace the four (4) multiple buildings associated with Hamilton Gardens with a single two story building with two (2) drive through lanes and a drive-up ATM. The building will have a 1,898 sq. ft. footprint and a canopy associated with the drive through lanes of 757 square feet. The architecture will reflect the neighborhood aesthetics and Bay Road buildings. The front entrance will be on Bay Road with traffic entrances and exits on both Bay Road and Bridge Street.

Traffic circulation, as shown on the site plan, has been designed to accommodate drivers entering from Bay Road and Bridge Street with twenty-four (24) parking spaces which exceeds the

number required by zoning by almost twice (13). The ATM and drive through lanes are designed at the rear of the building and will exit on Bridge Street. The dumpster and generator pad are to the rear and will be screened with fencing or plantings. The Project will be serviced by a septic system and stormwater management system. There is no stormwater management system on-site presently. Open space and landscaping with shrubs and groundcover will improve the aesthetics of the Property.

The Project Meets the Legal Standard for a Change in Use

Section 6 of the Massachusetts Zoning Act, M.G.L., c. 40A, allows changes in nonconforming uses to continue with findings by the ZBA that:

1. The resulting use reflects the nature and purpose of the non-conforming use; and
2. There is no significant difference on the quality or character of the resulting use; and
3. The resulting use will not have a detrimental effect on the neighborhood.

1. Proposed Use

In this case, the resulting use, the Institution for Savings, is a retail use, open to the public on a daily basis, similar to Hamilton Gardens. The business will be open for lesser hours weekly and will meet zoning requirements for setbacks from residential and retail neighbors as well as Bay Road and Bridge Street. The present structures are legal, non-conforming structures that do not meet the Town's zoning setback requirements.

Retail customers will use the Bank during normal hours, Monday through Wednesday 8:00 a.m. – 5:00 p.m., Thursday and Friday 8:00 a.m. – 6:00 p.m., Saturday 8:00 a.m. – noon and closed on Sunday. Use of the Institution for Savings will not impact traffic service in the neighborhood. In fact, the parking design shown on the plans is far superior from at least three public safety standpoints: 1) eliminating the wide open frontal parking within the Bay Road setback; 2) eliminating backing into Route 1A; and 3) creating additional sight distance for vehicles entering and leaving Bridge Street. The traffic study is discussed below.

2. There Will Be No Significant Difference On The Quality Or Character Of The Resulting Use

The existing use is a nursery and garden center with primary parking on busy Bay Road. The buildings are not in compliance with front yard and side yard zoning setbacks and there is little, if any, landscaping or vegetation. The existing building configuration is designed to accommodate parking and to showcase plants, urns and garden merchandise in the front of the building. The existing design lacks landscaping and presents a daily challenge to drivers entering and exiting Bridge Street due to the lack of adequate sight distance.

The quality and character of the resulting use will improve upon the existing retail use. The open parking area on Bay Road will be replaced by a single entrance and exit point setback and will include substantial landscaping. The sight distances required for safe entry onto roadways and safe stopping will be increased to a level above those established by the American Association of State Highway and Transportation Officials.

Second, the character of the Institution for Savings' business is a community resource with a smaller footprint and gross building space than Hamilton Gardens. The existing greenhouse, retail and outbuildings consist of 8,564 square feet while the bank footprint is 1,898 square feet and a canopy of 757 square feet.

Third, the Project will not generate new traffic trips. Based upon the Bank's experience, the Institute of Transportation Engineers' ("ITE") Trip Generation Manual and the distinction between new destination trips and pass by traffic, the Ron Müller & Associates traffic study concluded that vehicle trips to the Bank associated with this use will be less for weekday daily trips, Saturday daily trips and Saturday peak hour trips than that of Hamilton Gardens. As noted in the attached traffic study, the only increase from the existing use at Hamilton Gardens will be limited to 10-12 additional vehicle trips during a weekday p.m. peak hour.

The traffic study from Ron Müller & Associates pointed out the deficient sight distances associated with the Bay Road and Bridge Street intersection and studied daily vehicle patterns. The study compared the vehicle trip generation by the Bank to Hamilton Gardens and concluded that in all other times except one hour during weekday afternoons, the Bank use will create less vehicle trips. It concluded that the marginal sight distances will be increased significantly to exceed safety guidelines.

3. <u>The Proposed Use Will Have A Benefit And Not A Detrimental Effect On The Neighborhood</u>

The Institution for Savings will provide the following benefits to the neighborhood:

a. The retail use is consistent with the use of the Property for retail purposes since 1938.

b. The use is designed to return the dimensional (setback) requirements to compliance with the Zoning Bylaw.

c. The front yard setback will be further off Bay Road than Hamilton Gardens which will improve public safety with greater sight distances. The current practice of customers backing out onto busy Bay Road will end.

d. The side yard setbacks which have existing structural encroachments will be met.

e. The aesthetics associated with architectural design and landscaping are viewed as superior to the existing design and presentation.

f. Impacts to the environment will be mitigated with more open space, landscaping and a stormwater management system which does not presently exist. The landscaping plan provides substantial shrubs and groundcover throughout the site and trees to the side and rear.

g. Screening and lighting are designed to reduce potential impacts to abutters while meeting security and safety needs.

Prior Decisions on Bay Road Have Allowed A Change In Use

In 1984, the ZBA entertained a similar request for a change in use and made a finding for the property directly to the north on Bay Road. The Petitioner, Doug Trees, requested a determination that the then existing gas station be converted to a professional office. The gas station was a pre-existing, non-conforming use. Findings were made by the ZBA that the professional office would not be substantially more detrimental to the neighborhood than the existing non-conforming use. The ZBA also found that the change would cause no difference in the quality, character or degree of the previous use.

We hope that the Institution for Savings will be a welcome addition and neighbor to the Bay Road/Bridge Street neighborhood and to the Town of Hamilton. We seek approval of the change of use.

Thank you.

Sincerely,

Richard A. Nylen, Jr.

RAN/kad
Enclosures

cc: Michael J. Jones, President & CEO
Kimberly A. Rock, Executive VP/COO
Charles Nutter, AIA, LEED AP
Charles E. Wear, III, PE, LEED AP

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Email: RNylen@ldnllp.com

OF COUNSEL

JAMES W. MURPHY
WAYNE H. SCOTT

July 17, 2015

Via Hand Delivery

Mr. William Bowler, Chairman
Zoning Board of Appeals
P.O. Box 429
577 Bay Road
Hamilton, MA 01936

Re: Institution for Savings, ZBA Filing; 545 Bay Road, Ipswich, MA

Dear Chairman Bowler and Members of the Hamilton Zoning Board of Appeals:

Enclosed please find fourteen (14) copies of the following:

1. Request for M.G.L. c. 40A, §6 Findings.

2. Site Plan Application.

   a. Stormwater Report (5 copies);
   b. Traffic Report.

3. Site Plan Review; Request for Findings of Fact:

4. Application for Hearing.

5. Legal Ad Request.

6. Two (2) checks made payable to the Town of Hamilton in the following amounts:

   a. Site Plan Review: $150.00
   b. Extension of a Non-Conforming Use: $75.00

7. Check made payable to The Salem News in the amount of $500.00 for publication.

The Abutter's List has been provided under separate cover.

Kindly file same.

We look forward to a presentation before the Zoning Board of Appeals on August 5, 2015.

Thank you.

Sincerely,

Richard A. Nylen, Jr.

RAN/kad
Enclosures

cc: Michael J. Jones, President & CEO
Kimberly A. Rock, Executive VP/COO
Charles Nutter, AIA, LEED AP
Charles E. Wear, III, PE, LEED AP

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TOWN OF HAMILTON ZONING
BOARD OF APPEALS

REQUEST FOR FINDINGS OF FACT
EXTENSION OR ALTERATION OF A NON-CONFORMING USE

Date Submitted: July 17, 2015

Applicant Name: Institution for Savings

Non-Conforming Property Located at: 545 Bay Road, Ipswich, MA

Note the Existing Non-Conformity (check all that apply):

- ☐ Lot Size
- ☒ Front Yard Setback
- ☒ Side Yard Setback
- ☐ Rear Yard Setback
- ☐ Lot Coverage
- ☒ Property/Building Use
- ☐ Other: _____

Will the proposed extension or alteration meet current zoning requirements:

- ☐ Yes
- ☒ No: State non-compliance of extension/alteration

All dimensional requirements will be met. The retail use remains nonconforming.

Will the proposed extension or alteration further encroach on the existing non-conformity

- ☐ Yes: State further encroachment

- ☒ No

Applicant shall state that the extension or alteration reflects the nature and purpose of the previous use (or) that the extension or alteration is no different in kind in its effect on the neighborhood as compared with the previous use, for the following reasons:

See attached letter.

Applicant shall state that the extension or alteration will not be substantially more detrimental to the neighborhood than the existing non-conforming use or structure for the following reasons:

See attached.

Signed: _____ for Institution for Savings
Address: LYNCH, DESIMONE & WALSH LLP
10 P.O. SQUARE SUITE 970N BOSTON, MA 02109
Phone: 617-348-4500 x231

TOWN OF HAMILTON ZONING
BOARD OF APPEALS

REQUEST FOR FINDINGS OF FACT
SITE PLAN REVIEW

Date Submitted: July 17, 2015

Applicant Name: Institution for Savings c/o Michael J. Jones, President & CEO, Institution For Savings, 93 State Street, Newburyport, MA 01950; Phone: 978-462-3106

Site Plan Review for Property Located at: 545 Bay Road, Hamilton, MA

1. If the proposed is an addition or alteration to an existing building, please provide the following information:

   a. Square footage of proposed new floor area: 1,898 square feet; and 757 square foot canopy.

   b. Square footage of the current ground floor area of the existing building. (See Section 2b of the Site Plan Review By-Law for more information.): 8,564 square feet

   c. Estimated cost of proposed work: Construction price $3 million

   d. Current 100% assessed valuation of building: $642,000.00

2. How does the proposed development fit into the existing neighborhood in the following areas?

   a. Neighborhood character:

      The neighborhood includes a mixture of business, community and residential buildings and uses on the largest main road in the town of Hamilton. The Bank will be set back further than the existing buildings on-site. It will be two stories in height and aesthetically consistent with Bay Road buildings. It is designed to look like a residence to complement the existing neighborhood buildings.

   b. Scale:

      The scale of the proposed two story building is consistent with the existing neighborhood. The lot coverage with the building is less than the lot coverage of the current buildings.

   c. Appearance:

      The proposed building will replace two buildings and two outbuildings including a barn, greenhouse and garden center. The project will be set back from Bay Road and Bridge Street to meet zoning requirements with landscaping and screening. The drive through lanes are to the rear of the building. The proportions, fenestration, details, and materials are consistent with the existing neighborhood structures.

d. Natural features:

The existing property is flat without any outcroppings or dominant vegetation. The Bank project will have less building coverage and will have more open space than at present. The proposed landscaping will enhance this prominent location.

e. Use:

The proposed retail use is consistent with the existing retail use and will have less operating hours and will generate less traffic.

3. What impact will the proposed development have on:

a. Traffic circulation (both vehicular and pedestrian):

The traffic report prepared by Ron Müller of Müller & Associates has applied the appropriate sight distance and trip generation data to conclude that the use will not increase traffic trips. Except for a limited increase of one hour in the afternoon.

b. Parking:

The site plan demonstrates that there are 24 parking spaces; well in excess of the required 13 parking spaces for the project.

c. Public utilities (especially water):

The site is on municipal water and has a septic system. A stormwater drainage system is included.

d. Public safety:

Public safety will be enhanced with the project from the existing use with the creation of increased sight distance for drivers entering and exiting Bridge Street. In addition, the present backing out of spaces onto Bay Road/Route 1A will end.

e. Drainage:

The project will manage the stormwater generated by the property as shown on the site plan.

f. Abutting property owners:

The abutter's list is attached.

4. Does the plan submitted as part of this application provide for compliance with other town boards' regulations as set forth in Section 5g of the Site Plan Review By-Law, as well as with the State Handicap Access regulations?

Yes.

TOWN OF HAMILTON ZONING BOARD OF APPEALS

APPLICATION FOR ZONING BOARD OF APPEALS HEARING

To be completed by all Applicants

Date Submitted: **July 17, 2015**

Applicant Name: **Institution for Savings** Phone: **978-462-3106**

Applicant Address: **c/o Michael J. Jones, President & CEO, Institution for Savings, 93 State Street, Newburyport, MA 01950**

Applicant respectfully petitions the Board of Appeal for the following:

That he/she is seeking (check all that apply):

- ☐ **Variance: (State Type)**
- ☒ **Extension or Alteration of a Non-Conforming Use, Structure, or Lot**
- ☒ **Site Plan Review**
- ☐ **Abbreviated Site Plan Review**
- ☐ **Special Permit: (State Type)**
- ☐ **Appeal of Decision of the Building Inspector**
- ☐ **Conversion for Temporary Living Area**
- ☐ **Comprehensive Permit**
- ☐ **Other:**

Address of Property if different from Applicant Address above: **545 Bay Road**

Owner of property if different from Applicant noted above: **Hamilton Gardens, Inc.**

Note: If not the owner of the property, applicant must provide proof they are either the holder of a written option to purchase the property (or) verification they have authority to act on behalf of the owner of the property.

Zoning District: **R1A**
Existing Lot Size: **30,437**

State Briefly what structures are on the property:

Two (2) buildings and two (2) outbuildings

State in detail what the petitioner desires to do at said subject property:

Petitioner seeks to construct a bank on the property in accordance with the attached site plan.

State whether any petition as to the said premises has been submitted to this Board within the last five years. If so, give details:

No.

State if any Building Permit has been granted to said premises within the past two years. If yes, give details:

No.

Signed: Richard M. Jones for Richard M. Jones, Institution for Savings

Address: Lynch, Demoulas & Kyle, 10 P.O. Square Suite 910N Boston, MA 02109

Phone: 617-348-4500 x 231

Eagle – Tribune
Salem News
Newburyport Daily News
Gloucester Times

Request For legal Ad Notice

I understand that by signing this form I am agreeing to the cost of the legal notice to be published in the newspaper pursuant to MGL Ch. 40A, Sec. 11. Payment is required when the zoning petition received by the town.

Total amount due: $500.00 ($250.00 per notice, 2 notices)

Please make checks payable to: Salem News

Check #: 7375

**Average legal notice costs are estimated.
**Customer will either be refunded or billed when the legal notice is published.

To pay by credit card, please call Gloria Pobiedzinski, legal notice sales assistant at 978-338-2512.

Richard A Nylen Jr
Applicant/Agent Signature

7/17/15
Date

Print Name: RICHARD A. NYLEN JR on behalf of Rockhaven Savings
Address: LYNCH, DESIMONE & NYLEN, LLP
10 POST OFFICE SQ SUITE 970, BOSTON, MA 02109

Phone: 617-348-4500 ext 231

LOCUS AREA MAP

SITE DEVELOPMENT PLANS

(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)

FOR

545 BAY ROAD

LOCATED IN

SOUTH HAMILTON, MASSACHUSETTS

DATE: JULY 17, 2015

OWNER:

HAMILTON GARDENS, INC
545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS 01982

APPLICANT:

INSTITUTION FOR SAVINGS
93 STATE STREET
NEWBURYPORT, MASSACHUSETTS 01950

PREPARED BY:

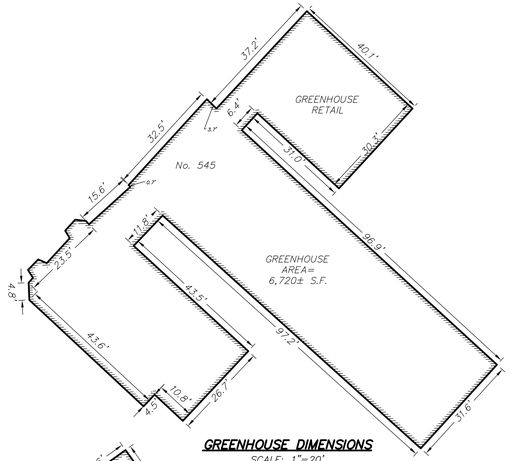
MERIDIAN ASSOCIATES

500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 299-0447

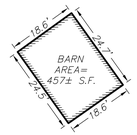
69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
TELEPHONE: (508) 871-7030

WWW.MERIDIANASSOC.COM

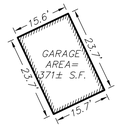
DRAWING INDEX



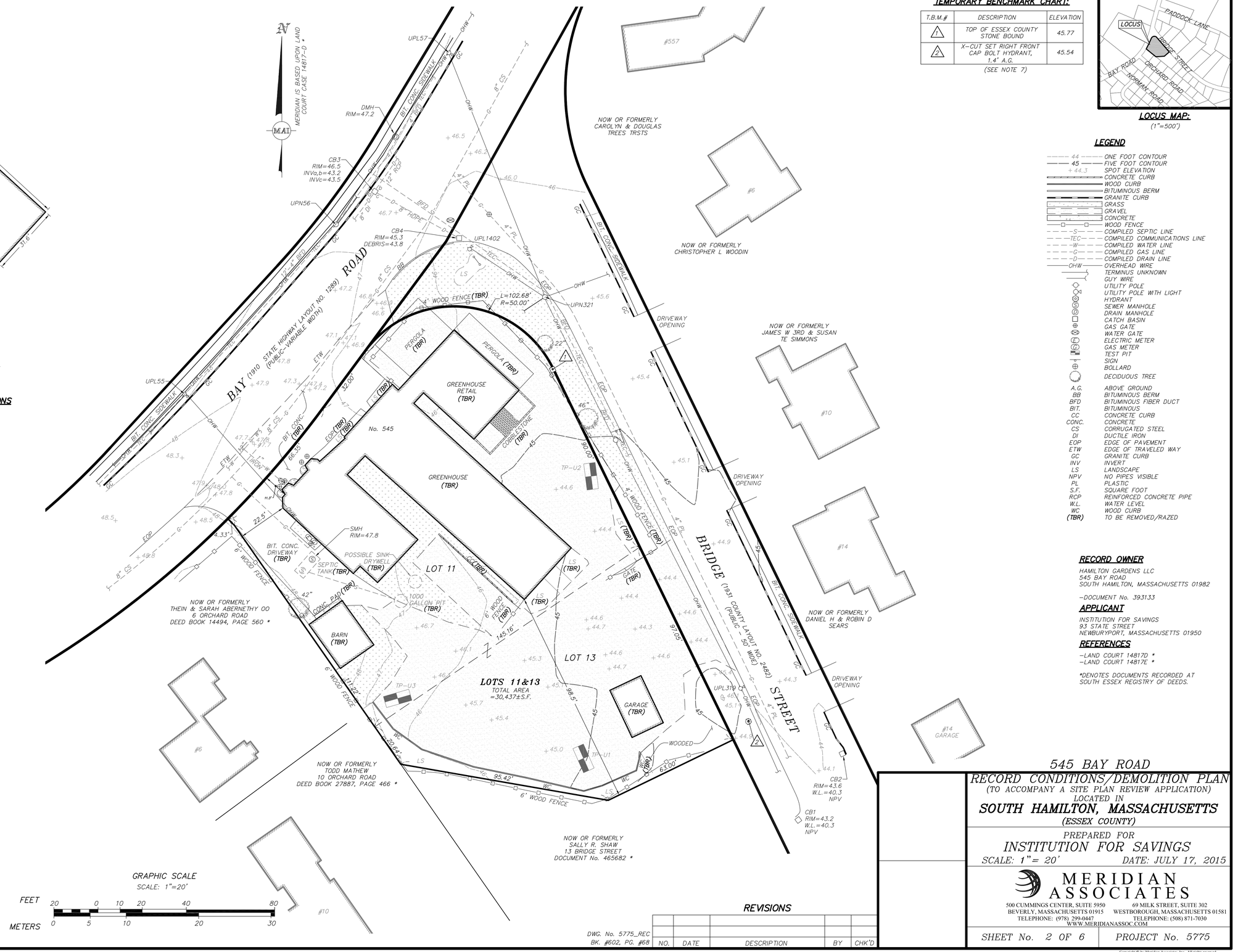
GREENHOUSE DIMENSIONS
SCALE: 1"=20'



BARN DIMENSIONS
SCALE: 1"=20'



GARAGE DIMENSIONS
SCALE: 1"=20'



TEMPORARY BENCHMARK CHART:

T.B.M.#	DESCRIPTION	ELEVATION
1	TOP OF ESSEX COUNTY STONE BOUND	45.77
2	X-CUT SET RIGHT FRONT CAP BOLT HYDRANT, 1.4' A.G.	45.54

(SEE NOTE 7)

LOCUS MAP:
(1"=500')

LEGEND

- 44 — ONE FOOT CONTOUR
- 45 — FIVE FOOT CONTOUR
- + 44.3 — SPOT ELEVATION
- CONCRETE CURB
- WOOD CURB
- BITUMINOUS BERM
- GRANITE CURB
- GRASS
- GRAVEL
- CONCRETE
- WOOD FENCE
- -S- COMPILED SEPTIC LINE
- -TEC- COMPILED COMMUNICATIONS LINE
- -W- COMPILED WATER LINE
- -G- COMPILED GAS LINE
- -D- COMPILED DRAIN LINE
- OHW OVERHEAD WIRE
- TERMINUS UNKNOWN
- GUY WIRE
- UTILITY POLE
- UTILITY POLE WITH LIGHT
- HYDRANT
- SEWER MANHOLE
- DRAIN MANHOLE
- CATCH BASIN
- GAS GATE
- WATER GATE
- ELECTRIC METER
- GAS METER
- TEST PIT
- SIGN
- BOLLARD
- DECIDUOUS TREE

A.G.	ABOVE GROUND
BB	BITUMINOUS BERM
BFD	BITUMINOUS FIBER DUCT
BIT.	BITUMINOUS
CC	CONCRETE CURB
CONC.	CONCRETE
CS	CORRUGATED STEEL
DI	DUCTILE IRON
EOP	EDGE OF PAVEMENT
ETW	EDGE OF TRAVELED WAY
GC	GRANITE CURB
INV	INVERT
LS	LANDSCAPE
NPV	NO PIPES VISIBLE
PL	PLASTIC
S.F.	SQUARE FOOT
RCP	REINFORCED CONCRETE PIPE
W.L.	WATER LEVEL
WC	WOOD CURB
(TBR)	TO BE REMOVED/RAZED

RECORD OWNER

HAMILTON GARDENS LLC
545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS 01982

-DOCUMENT No. 393133

APPLICANT

INSTITUTION FOR SAVINGS
93 STATE STREET
NEWBURYPORT, MASSACHUSETTS 01950

REFERENCES

-LAND COURT 14817D *
-LAND COURT 14817E *

*DENOTES DOCUMENTS RECORDED AT SOUTH ESSEX REGISTRY OF DEEDS.

NOTES

1. THE TOPOGRAPHY, SITE DETAIL & SURFACE IMPROVEMENTS DEPICTED HEREON WERE OBTAINED FROM AN INSTRUMENT SURVEY CONDUCTED ON THE GROUND BY MERIDIAN ASSOCIATES, INC. ON JUNE 29 & 30, 2015.
2. THE SUBJECT PROPERTIES ARE LOCATED IN THE R1A (RESIDENTIAL) ZONING DISTRICT.
3. THE SUBJECT PROPERTIES ARE DEPICTED AS LOT 37 ON TOWN OF HAMILTON ASSESSOR'S MAP 49.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED UPON A PARTIAL FIELD SURVEY AND COMPILATION OF PLANS OF RECORD. MERIDIAN ASSOCIATES, INC. DOES NOT WARRANTY NOR GUARANTEE THE LOCATION OF ALL UTILITIES DEPICTED OR NOT DEPICTED. THE CONTRACTOR, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT DIG SAFE AT 1-888-344-7233.
5. THE SUBJECT PROPERTIES ARE LOCATED IN FLOOD ZONE X (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, PER FEMA FLOOD INSURANCE RATE MAP NUMBER 25009C0426F DATED JULY 3, 2012.
6. THIS PLAN DOES NOT SHOW ANY UNRECORDED OR UNWRITTEN EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT, VISIBLE USES OF THE LAND; HOWEVER, THIS DOES NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.
7. THE ELEVATIONS DEPICTED HEREON WERE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), AS DERIVED FROM GPS OBSERVATIONS.
8. PROPERTY LINES DEPICTED HEREON ARE BASED ON COMPILED DEEDS AND PLANS OF RECORD. THIS PLAN IS NOT TO BE USED FOR THE RECONSTRUCTION OF BOUNDARY LINES OR FOR TITLE INSURANCE PURPOSES. ALL BOUNDARY LINES DEPICTED ARE APPROXIMATE ONLY. MAI DID NOT PERFORM A BOUNDARY RETRACEMENT SURVEY.

ALL UNDERGROUND UTILITY DATA REPRESENTS RECORD INFORMATION RECOVERED THROUGH RESEARCH WITHOUT SURFACE DEMARCATION NOR SUBSURFACE VERIFICATION.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

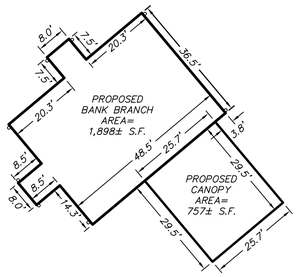
DWG. No. 5775_REC
BK. #602, PG. #68

545 BAY ROAD
RECORD CONDITIONS/DEMOLITION PLAN
(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)
LOCATED IN
SOUTH HAMILTON, MASSACHUSETTS
(ESSEX COUNTY)

PREPARED FOR
INSTITUTION FOR SAVINGS
SCALE: 1"= 20' DATE: JULY 17, 2015

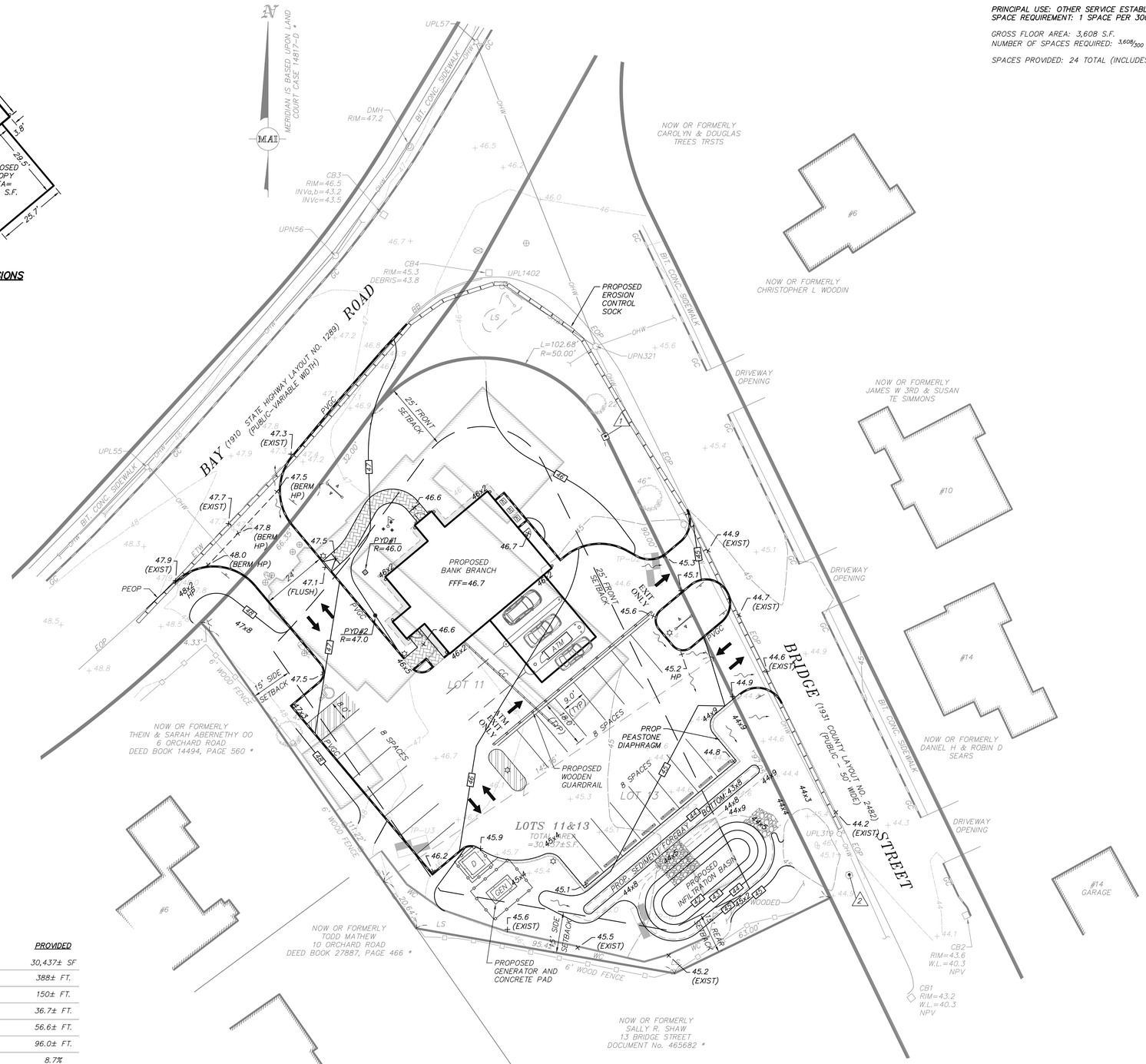
MERIDIAN ASSOCIATES
500 CUMMINGS CENTER, SUITE 5950 BEVERLY, MASSACHUSETTS 01915 TELEPHONE: (978) 299-0447
69 MILK STREET, SUITE 302 WESTBOROUGH, MASSACHUSETTS 01581 TELEPHONE: (508) 871-7030
WWW.MERIDIANASSOC.COM

SHEET No. 2 OF 6 PROJECT No. 5775



BRANCH BUILDING DIMENSIONS

SCALE: 1" = 20'



PARKING TABLE

PRINCIPAL USE: OTHER SERVICE ESTABLISHMENT
SPACE REQUIREMENT: 1 SPACE PER 300 S.F. GROSS FLOOR AREA

GROSS FLOOR AREA: 3,608 S.F.
NUMBER OF SPACES REQUIRED: $^{3,608}/_{300}$ = 13 SPACES

SPACES PROVIDED: 24 TOTAL (INCLUDES 1 HANDICAP SPACE)

PROPOSED LEGEND

45	PROPOSED CONTOUR
44x8	PROPOSED INTERMITTENT CONTOUR
44x9	PROPOSED SPOT ELEVATION
46.6	PROPOSED SPOT ELEVATION
47.7 (EXIST)	EXISTING ADDITIONAL SPOT ELEVATION
	PROPOSED GRADE DIRECTION
PYD	PROPOSED YARD DRAIN CATCHBASIN
PDMH	PROPOSED YARD DRAIN MANHOLE
	PROPOSED EROSION CONTROL SOCK
	PROPOSED WOODEN GUARDRAIL
	PROPOSED WOOD FENCING
	ZONING SETBACK LINE
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED PEASTONE DIAPHRAGM
	PROPOSED BUILDING RIVERSTONE
	PROPOSED LIGHTS
	PROPOSED SIGNAGE
AC	PROPOSED AIR CONDITIONER UNIT
	PROPOSED FLAGPOLE
	PROPOSED WHEELSTOP
	PROPOSED EXTERIOR DOORWAY
R=	RIM ELEVATION
HP	PROPOSED HIGH POINT ELEVATION
PEOP	PROPOSED EDGE OF PAVEMENT
PVGC	PROPOSED VERTICAL GRANITE CURB
(TYP)	TYPICAL
GEN	PROPOSED GENERATOR
D	PROPOSED DUMPSTER PAD

SEE RECORD CONDITIONS PLAN FOR EXISTING NOTES & LEGEND

GRAPHIC SCALE
SCALE: 1"=20'

FEET 20 0 10 20 40 80
METERS 0 5 10 20 30

RECORD OWNER

HAMILTON GARDENS LLC
545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS 01982

–DOCUMENT No. 393133

APPLICANT

INSTITUTION FOR SAVINGS
93 STATE STREET
NEWBURYPORT, MASSACHUSETTS 01950

REFERENCES

–LAND COURT 14817D *
–LAND COURT 14817E *

*DENOTES DOCUMENTS RECORDED AT SOUTH ESSEX REGISTRY OF DEEDS.

SCHEDULE OF DIMENSIONAL CONTROLS

ZONING DISTRICT: R–1A

REQUIREMENT	REQUIRED	PROVIDED
LOT AREA:	20,000 SF	30,437± SF
FRONTAGE:	125 FT.	388± FT.
LOT WIDTH:	100 FT.	150± FT.
FRONT YARD:	25 FT.*	36.7± FT.
SIDE YARD:	15 FT.	56.6± FT.
REAR YARD:	15 FT.	96.0± FT.
BUILDING LOT COVERAGE:	25%	8.7%
BUILDING HEIGHT:	35'	23'–10"

* FRONT YARD SETBACK IS DEFINED IN THE ZONING BY LAW AS THE GREATER OF 25' FROM THE STREET LINE OR 50' FROM THE STREET CENTER LINE. IN THIS CASE 25' FROM THE STREET LINE IS GREATER FOR BOTH BAY ROAD AND BRIDGE STREET.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

DWG. No. 5775–SITE
(XREF: 5775–REC)

545 BAY ROAD

PERMIT SITE GRADING PLAN

(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)
LOCATED IN
SOUTH HAMILTON, MASSACHUSETTS
(ESSEX COUNTY)

PREPARED FOR
INSTITUTION FOR SAVINGS

SCALE: 1" = 20' DATE: JULY 17, 2015

MERIDIAN ASSOCIATES
500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 299-0447
69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
TELEPHONE: (508) 871-7030
WWW.MERIDIANASSOC.COM

SHEET No. 3 OF 6 PROJECT No. 5775

RECORD OWNER

HAMILTON GARDENS LLC
545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS 01982

–DOCUMENT No. 393133

APPLICANT

INSTITUTION FOR SAVINGS
93 STATE STREET
NEWBURYPORT, MASSACHUSETTS 01950

REFERENCES

–LAND COURT 14817D *
–LAND COURT 14817E *

*DENOTES DOCUMENTS RECORDED AT SOUTH ESSEX REGISTRY OF DEEDS.

LIGHTING SCHEDULE:

☼ POLE MOUNTED LIGHT
⇙ WALL SCONCE

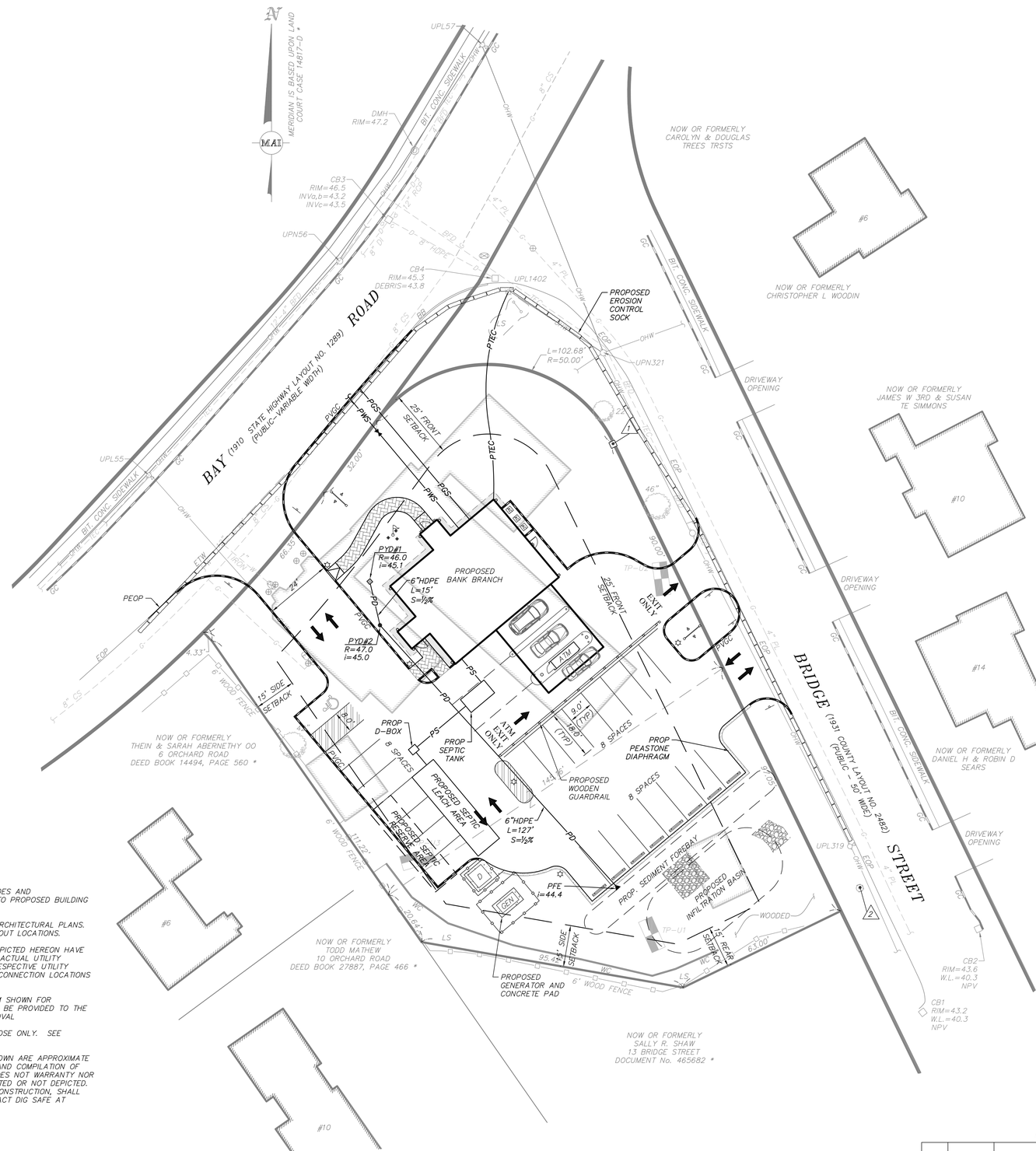
*SUN VALLEY LIGHTING COLONIAL CPA SERIES
*48W LED
*10' MOUNT HEIGHT
*SPECIFICATION: COL18–LED

▹ SIGN LIGHTS

*RAB LIGHTING RECTANGULAR LIGHT
*18W LED NEUTRAL COLOR
*GROUND MOUNT
*SPECIFICATION: FFLED18N

✦ FLAGPOLE LIGHTS

*ACUITY BRAND LIGHTING HYDREL
*12W LED
*ON GRADE FLUSH MOUNT
*SPECIFICATION: M9420



PROPOSED LEGEND

PYD	PROPOSED YARD DRAIN CATCHBASIN
PYD	PROPOSED YARD DRAIN MANHOLE
	PROPOSED EROSION CONTROL SOCK
	PROPOSED WOODEN GUARDRAIL
	PROPOSED WOOD FENCING
	ZONING SETBACK LINE
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED PEASTONE DIAPHRAGM
	PROPOSED BUILDING RIVERSTONE
R=	RIM ELEVATION
i=	INVERT ELEVATION
L=	PROPOSED PIPE LENGTH
S=	PROPOSED PIPE SLOPE
PD	PROPOSED DRAIN LINE
PS	PROPOSED SEWER LINE
PTEC	PROPOSED TELEPHONE/ELECTRIC/CABLE
PWS	PROPOSED WATER SERVICE
	PROPOSED WATER GATE
PGS	PROPOSED GAS SERVICE
PFE	PROPOSED FLARED END
	PROPOSED LIGHTS
	PROPOSED SIGNAGE
AC	PROPOSED AIR CONDITIONER UNIT
	PROPOSED FLAGPOLE
	PROPOSED WHEELSTOP
	PROPOSED EXTERIOR DOORWAY
HP	PROPOSED HIGH POINT ELEVATION
PVGC	PROPOSED VERTICAL GRANITE CURB
(TYP)	TYPICAL
D–BOX	DISTRIBUTION BOX
GEN	PROPOSED GENERATOR
D	PROPOSED DUMPSTER PAD

SEE RECORD CONDITIONS PLAN FOR EXISTING NOTES & LEGEND

GRAPHIC SCALE
SCALE: 1"=20'

FEET	20	0	10	20	40	80	
METERS	0	5	10	20	30		

UTILITY NOTES:

1. COORDINATE UTILITY CONSTRUCTION WITH ALL TRADES AND CORRESPONDING DESIGN PLANS FOR CONNECTION TO PROPOSED BUILDING AND SITE UTILITIES.
2. ROOF DRAIN OUTLETS TO BE COORDINATED WITH ARCHITECTURAL PLANS. SEE ARCHITECTURAL PLANS FOR SPECIFIC DOWNSPOUT LOCATIONS.
3. PROPOSED ELECTRIC AND UTILITY CONNECTIONS DEPICTED HEREON HAVE BEEN PROVIDED FOR SCHEMATIC PURPOSES ONLY. ACTUAL UTILITY CONFIGURATIONS SHALL BE DETERMINED BY THE RESPECTIVE UTILITY PROVIDERS, MEP SPECIFICATIONS, AND PROPOSED CONNECTION LOCATIONS PROVIDED BY THE ARCHITECT.
4. PROPOSED SUBSURFACE SEWAGE DISPOSAL SYSTEM SHOWN FOR SCHEMATIC PURPOSE ONLY. DESIGN OF SYSTEM TO BE PROVIDED TO THE TOWN OF HAMILTON BOARD OF HEALTH FOR APPROVAL
5. PROPOSED LIGHTING SHOWN FOR SCHEMATIC PURPOSE ONLY. SEE ARCHITECTURAL PLANS FOR LIGHTING CUT SHEETS.
6. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED UPON A PARTIAL FIELD SURVEY AND COMPILATION OF PLANS OF RECORD. MERIDIAN ASSOCIATES, INC. DOES NOT WARRANTY NOR GUARANTEE THE LOCATION OF ALL UTILITIES DEPICTED OR NOT DEPICTED. THE CONTRACTOR, PRIOR TO COMMENCEMENT OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UTILITIES AND CONTACT DIG SAFE AT 1–888–344–7233.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

DWG. No. 5775–SITE
(XREF: 5775–REC)

545 BAY ROAD

PERMIT SITE UTILITY PLAN

(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)
LOCATED IN
SOUTH HAMILTON, MASSACHUSETTS
(ESSEX COUNTY)

PREPARED FOR
INSTITUTION FOR SAVINGS

SCALE: 1" = 20' DATE: JULY 17, 2015

MERIDIAN ASSOCIATES
500 CUMMINGS CENTER, SUITE 5950 BEVERLY, MASSACHUSETTS 01915 TELEPHONE: (978) 299-0447
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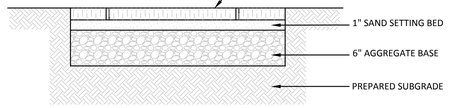
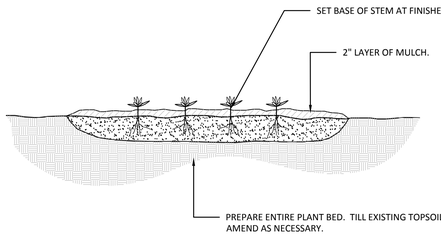
WWW.MERIDIANASSOC.COM

SHEET No. 4 OF 6 PROJECT No. 5775



BRICK PAVERS ON AGGREGATE BASE

(NOT TO SCALE)

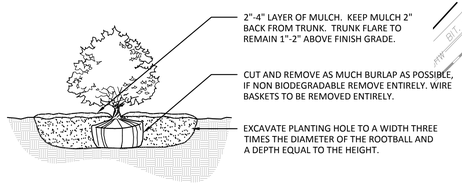


NOTE:

SPACE PLANTS EQUALLY TO PROVIDE CONSISTENT COVER OVER INDICATED PLANTING BED.

GROUNDCOVER PLANTING

(NOT TO SCALE)



NOTES:

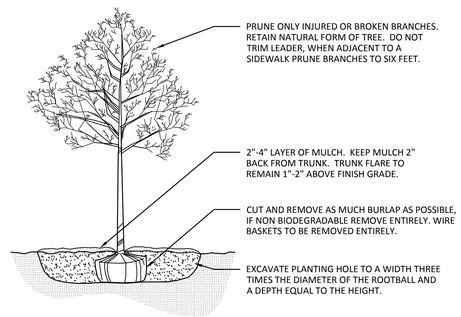
BACKFILL PLANTING HOLE WITH EXISTING SOIL AMENDED AS NECESSARY.

BACKFILL HALF THE SOIL AND WATER TO SETTLE OUT AIR POCKETS, COMPLETE BACKFILLING AND REPEAT WATERING.

IF ROOTS ARE CIRCLING THE ROOTBALL EXTERIOR, CUT ROOTS VERTICALLY IN SEVERAL PLACES PRIOR TO PLANTING.

SHRUB PLANTING

(NOT TO SCALE)



NOTES:

BACKFILL PLANTING HOLE WITH EXISTING SOIL AMENDED AS NECESSARY.

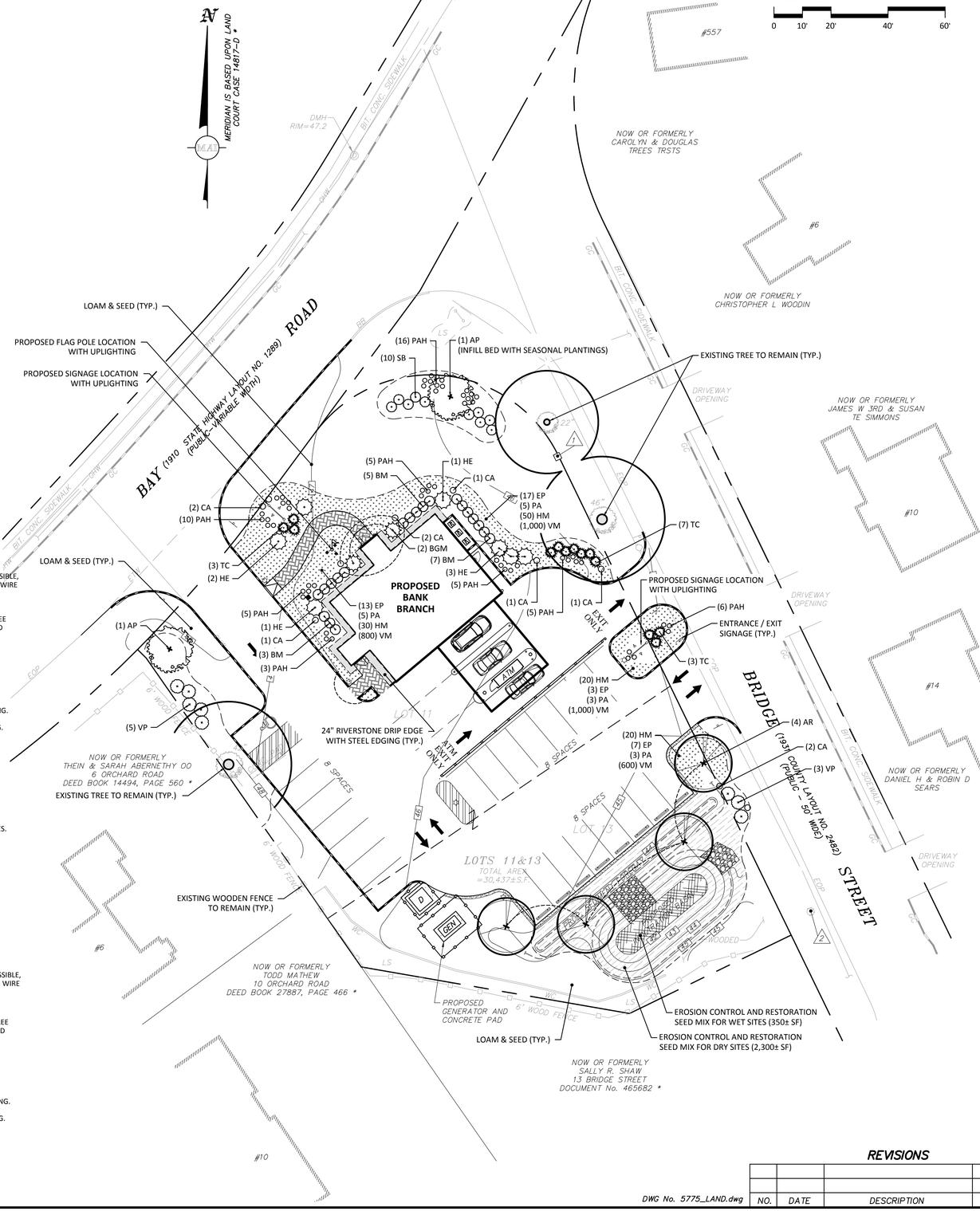
BACKFILL HALF THE SOIL AND WATER TO SETTLE OUT AIR POCKETS, COMPLETE BACKFILLING AND REPEAT WATERING.

IF ROOTS ARE CIRCLING THE ROOTBALL EXTERIOR, CUT ROOTS VERTICALLY IN SEVERAL PLACES PRIOR TO PLANTING.

ONLY STAKE TREES SITUATED ON WINDY SITES OR EXPOSED TO SUBSTANTIAL PEDESTRIAN TRAFFIC.

TREE PLANTING

(NOT TO SCALE)



LEGEND

SHADE & ORNAMENTAL TREES	PROPOSED GROUNDCOVERS / PERENNIALS
DECIDUOUS AND EVERGREEN SHRUBS	PROPOSED EROSION CONTROL / RESTORATION SEED MIX (DRY)
PROPOSED LIMIT OF LAWN AREA	PROPOSED EROSION CONTROL / RESTORATION SEED MIX (WET)

PLANT SCHEDULE

QTY	SYM	COMMON NAME	LATIN NAME	SIZE	NOTES
TREES					
2	AP	JAPANESE MAPLE	ACER PALMATUM 'BLOODGOOD'	7 - 8' HT.	FALL COLOR
4	AR	RED MAPLE	ACER RUBRUM	3 - 3.5" CAL.	FALL COLOR
SHRUBS					
20	BM	BOXWOOD	BUXUS 'WINTER GEM'	24 - 30" HT.	MATCHING
2	BGM	BOXWOOD	BUXUS 'GREEN MOUNTAIN'	30 - 36" HT.	MATCHING
7	HE	HYDRANGEA	HYDRANGEA MACROPHYLLA 'ENDLESS SUMMER'	30 - 36" HT.	FLOWERING
10	SB	SPIREA	SPIREA x BUMALDA 'ANTHONY WATERER'	18 - 24" HT.	FLOWERING
13	TC	GREENWAVE YEW	TAXUS CUSPIDATA 'GREENWAVE'	24 - 30" HT.	4' MATURE HT.
8	VP	DOUBLEFILE VIBURNUM	VIBURNUM PLICATUM TOMENTOSUM	3.5 - 4' HT.	B&B
PERENNIALS AND GROUNDCOVERS					
10	CA	CALAMAGROSTIS x ACUTIFLORA	FEATHER RED GRASS 'KARL FOERSTER'	#3 POT	C.G.
40	EP	PURPLE CONEFLOWER	ECHINACEA PURPEA	#2 POT	C.G.
120	HM	DAYLILY	HEMEROCALLIS 'HYPERIONS'	#1 POT	C.G.
16	PA	RUSSIAN SAGE	PEROVSKIA ATRIPLICIFOLIA	#2 POT	C.G.
50	PAH	FOUNTAIN GRASS	PENNISETUM ALOPECUROIDES 'HAMELN'	#1 POT	C.G.
3,400	VM	HARDY MYRTLE	VINCA MINOR	#1 POT	C.G.

LANDSCAPE NOTES

1. PLANTING MIX SHALL BE SPREAD TO A MINIMUM DEPTH OF SIX (6) INCHES AFTER SETTLING ON ALL TURFGRASS LAWN AREAS AND PLANTING BED SUBGRADE AREAS UPON COMPLETION OF FINAL GRADING. SEEDING OPERATION OR SPREADING OF TURFGRASS SOD TO BE COMPLETED IMMEDIATELY FOLLOWING THE APPLICATION OF THE PLANTING MIX OVER THE SUBGRADE.
2. SEED OR PROVIDE SOD FOR ALL TURFGRASS LAWN AREAS WITH A DROUGHT TOLERANT TURFGRASS SEED MIX (80% TALL FESCUE, 10% PERENNIAL RYEGRASS, 10% KENTUCKY BLUEGRASS).
3. ALL PLANT MATERIALS AND LAWN AREAS TO BE MAINTAINED BY LANDSCAPE CONTRACTOR UNTIL FINAL WRITTEN ACCEPTANCE IS PROVIDED TO CONTRACTOR BY OWNER OR HIS REPRESENTATIVE.
4. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR TWO YEARS FOLLOWING DATE OF FINAL WRITTEN ACCEPTANCE FROM THE OWNER OR HIS REPRESENTATIVE. DURING THIS PLANT ESTABLISHMENT PERIOD OF FIRST TWO YEARS, THE PLANTS ARE TO BE WATERED TO AN EQUIVALENT OF 1" TO 1" OF WEEKLY PRECIPITATION DURING SPRING, SUMMER AND FALL MONTHS.
5. ON-GOING LONG TERM LANDSCAPE MAINTENANCE BY THE OWNER OR HIRED CONTRACTOR SHALL CONSIST OF KEEPING THE PLANTS IN A HEALTHY GROWING CONDITION; AND SHALL INCLUDE BUT IS NOT LIMITED TO WATERING, WEEDING, CULTIVATING, RE-MULCHING, PRUNING OR REMOVAL OF DEAD MATERIAL, AND RESETTING PLANTS TO PROPER GRADES OR UPRIGHT POSITION.
6. REFER TO ELECTRICAL PLANS FOR LIGHTING INFORMATION.
7. EROSION CONTROL/RESTORATION MIX IN RIPARIAN AREA TO BE NEW ENGLAND COASTAL SALT TOLERANT GRASS MIX AS AVAILABLE FROM NEW ENGLAND WETLAND PLANTS, AMHERST, MA, WWW.NEWP.COM, OR APPROVED EQUAL AND APPLIED AND MAINTAINED PER MANUFACTURER'S RECOMMENDATIONS.
8. SPACE PLANTS AT SCALED DISTANCES SHOWN ON DRAWINGS UNLESS OTHERWISE INDICATED.
9. ANY PROPOSED SUBSTITUTION OF PLANT MATERIAL SHALL ONLY BE MADE AFTER PRIOR APPROVAL OF LANDSCAPE ARCHITECT.
10. ALL PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
11. ALL PLANTING BEDS TO BE FILLED WITH SOIL AND CROWNED ABOVE ADJACENT LAWN OR IMPROVED AREAS. ALL PLANTING BEDS TO BE MULCHED WITH AGED HARDWOOD BARK MULCH TO A DEPTH OF THREE (3) INCHES.
12. PROVIDE FIVE (5) FOOT DIAMETER MULCH CIRCLE AROUND ALL INDIVIDUAL TREE PLANTINGS AND CONTINUOUS MULCH BED AROUND SHRUB AND PERENNIAL PLANTINGS.
13. PLANT MATERIALS SHALL BEAR SAME RELATIONSHIP TO FINISH GRADE AS THEY BORE TO GRADE IN THE NURSERY.
14. REUSE EXISTING TOPSOIL ENCOUNTERED ON-SITE AND AMEND TO BELOW PARAMETERS. IF ADDITIONAL TOPSOIL IS NEEDED PROVIDE FERTILE, FRIABLE, NATURAL TOPSOIL OF LOAMY CHARACTER (FOR PLANTING MIX), WITHOUT ADMIXTURE OF SUBSOIL MATERIAL, OBTAINED FROM A WELL-DRAINED SITE, REASONABLY FREE OF CLAY, LUMPS, COARSE SANDS, STONES, PLANTS, ROOTS, STICKS AND OTHER FOREIGN MATERIALS, WITH ACIDITY RANGE OF BETWEEN PH 6.0 AND 6.8. TOPSOIL SHALL NOT BE DELIVERED OR WORKED IN A MUDDY OR FROZEN CONDITION.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

DWG No. 5775_LAND.dwg

545 BAY ROAD

PERMIT LANDSCAPE PLAN

(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)

LOCATED IN

SOUTH HAMILTON, MASSACHUSETTS

(ESSEX COUNTY)

PREPARED FOR

INSTITUTION FOR SAVINGS

SCALE: AS NOTED DATE: JULY 17, 2015

MERIDIAN ASSOCIATES

500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 299-0447

69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
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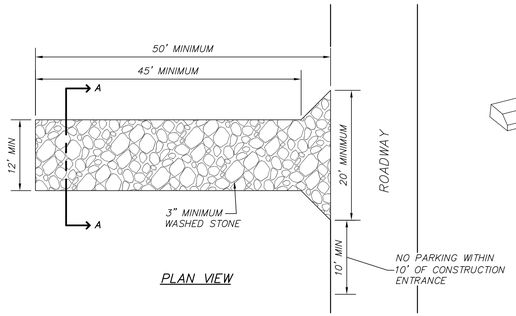
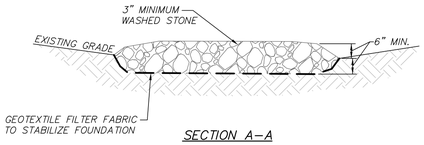
SHEET No. 5 OF 6 PROJECT No. 5775



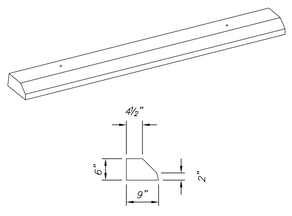
PLAN VIEW



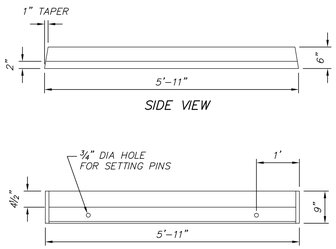
SECTION A–A

TEMPORARY STABILIZED CONSTRUCTION ENTRANCE

(NOT TO SCALE)



END VIEW



SIDE VIEW

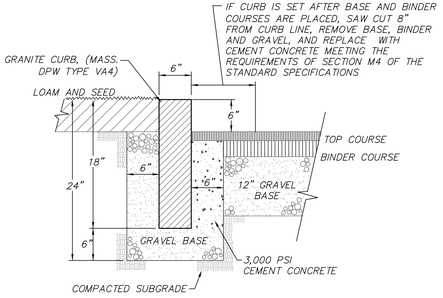
TOP VIEW

NOTES:

1. BUMPER CURBING (WHEELSTOP) SINGLE FACE, ITEM No. B–BBSF AS MANUFACTURED BY SHEA CONCRETE OR EQUAL.
2. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
3. PINS AVAILABLE FROM MANUFACTURER.
4. APPROXIMATE WEIGHT: 265LBS

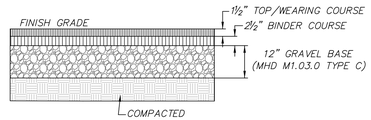
WHEELSTOP – SINGLE FACE

(NOT TO SCALE)



VERTICAL GRANITE CURB DETAIL

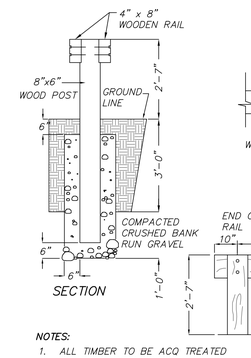
(NOT TO SCALE)



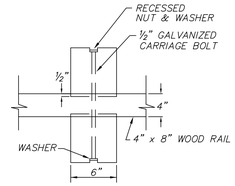
NOTE:
THE WEARING AND BINDER COURSES SHALL CONSIST OF CLASS I TYPE I–1 BITUMINOUS CONCRETE (HOT MIX ASPHALT)

BITUMINOUS CONCRETE

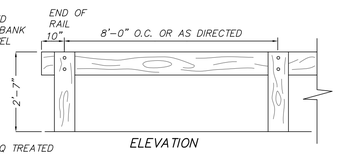
(NOT TO SCALE)



SECTION



HALF LAP JOINT



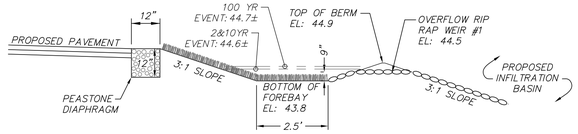
ELEVATION

NOTES:

1. ALL TIMBER TO BE ACQ TREATED SOUTHERN YELLOW PINE.
2. ALL BOLTS & NUTS SHALL BE MADE VANDAL RESISTANT.

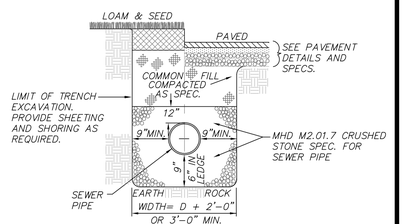
DOUBLE FACED WOODEN GUARD RAIL

(NOT TO SCALE)



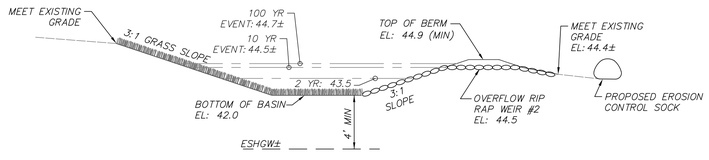
SEDIMENT FOREBAY SECTION

(NOT TO SCALE)



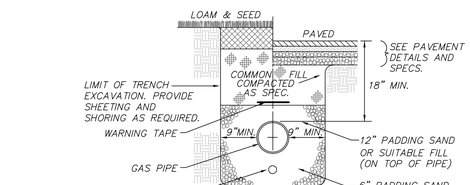
SEWER TRENCH DETAIL

(NOT TO SCALE)



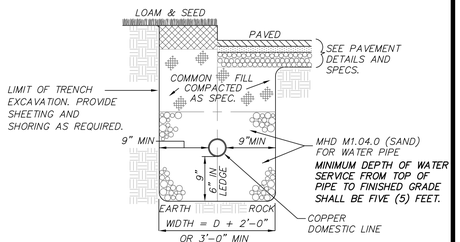
INFILTRATION BASIN SECTION

(NOT TO SCALE)



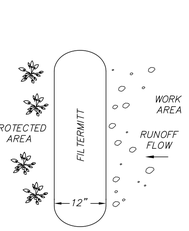
GAS TRENCH DETAIL

(NOT TO SCALE)

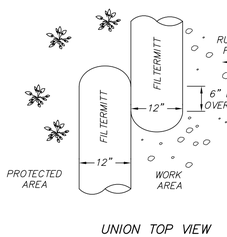


WATER SERVICE TRENCH

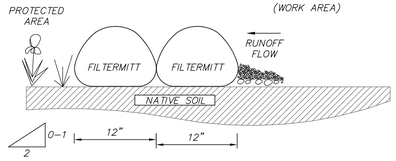
(NOT TO SCALE)



TOP VIEW



UNION TOP VIEW



UNION SECTION VIEW

FILTERMITT COMPONENTS:

OUTSIDE CASING: 100% ORGANIC HESSIAN

FILLER INGREDIENT: FIBER ROOT MULCH

- BLEND OF COARSE & FINE COMPOST & SHREDDED WOOD
- PARTICLE SIZES: 100% PASSING A 3" SCREEN; 90–100% PASSING A 1" SCREEN; 70–100% PASSING A 0.75" SCREEN; 30–75% PASSING A 0.25" SCREEN
- WEIGHT: APPROXIMATELY 850 LBS/CUYD (AVE 30 LBS/LF)

NOTE:

PROVIDE FILTERMITT EROSION CONTROL AS MANUFACTURED BY GROUNDSCAPES EXPRESS, INC P.O. BOX 737 WRENTHAM, MA. 02093 (508)–384–7140 OR EQUAL

FILTERMITT INSTALLATION:

WITH THE NEWEST TECHNOLOGY AND EQUIPMENT, SECTIONS CAN BE CONSTRUCTED ON SITE IN LENGTHS FROM 1' TO 100'.

SECTIONS CAN ALSO BE DELIVERED TO THE SITE IN LENGTHS FROM 1' TO 8'.

THE FLEXIBILITY OF FILTERMITT ALLOWS IT TO CONFORM TO ANY CONTOUR TERRAIN WHILE HOLDING A SLIGHTLY OVAL SHAPE AT 12" HIGH BY 12" WIDE.

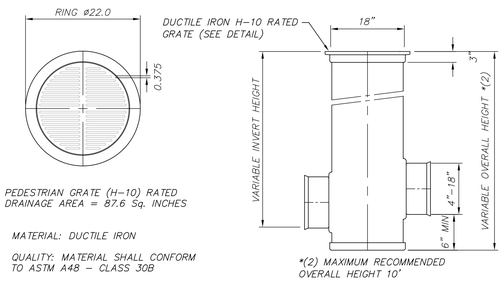
WHERE SECTION ENDS MEET, THERE SHALL BE AN OVERLAP OF 6" OR GREATER.

EROSION CONTROL SOCK – FILTERMITT DETAIL

(NOT TO SCALE)

EROSION CONTROL SEQUENCE

1. LIMITS OF CONSTRUCTION ARE TO BE STAKED OUT AS THE FIRST STEP. NO CONSTRUCTION EQUIPMENT IS ALLOWED BEYOND THE LIMITS AS STAKED. THE AREA BEYOND THE LIMITS OF CONSTRUCTION IS TO REMAIN UNDISTURBED.
2. PLACE EROSION CONTROL SOCK AT LIMITS OF CONSTRUCTION AND AT TOE OF FUTURE SLOPES AS SHOWN ON THE SITE PLANS.
3. AREAS OF DISTURBANCE TO BE KEPT TO A MINIMUM. THE AMOUNT OF TIME AN AREA IS LEFT UNSTABILIZED WILL BE KEPT TO A MINIMUM.
4. NO MORE THAN 14 DAYS AFTER CONSTRUCTION ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED ON A PORTION OF THE PROJECT, STABILIZE THAT DISTURBED AREA WITH TEMPORARY SEEDING, TEMPORARY MULCHING, SOD, HYDROSEED, JUTE NETTING, ETC. AS CONDITIONS WARRANT.
5. LEAVE TEMPORARY EROSION CONTROL IN PLACE UNTIL ALL DISTURBED AREAS ARE REVEGETATED.
6. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION AND ARE TO BE PERIODICALLY INSPECTED AND REPAIRED OR REPLACED AS NECESSARY THROUGHOUT THE PROJECT CONSTRUCTION.



PEDESTRIAN GRATE (H–10) RATED
DRAINAGE AREA = 87.6 Sq. INCHES

MATERIAL: DUCTILE IRON

QUALITY: MATERIAL SHALL CONFORM TO ASTM A48 – CLASS 30B

PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT

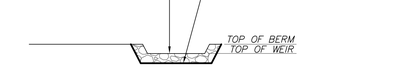
18" NYLOPLAST IRON GRATE

(NOT TO SCALE)

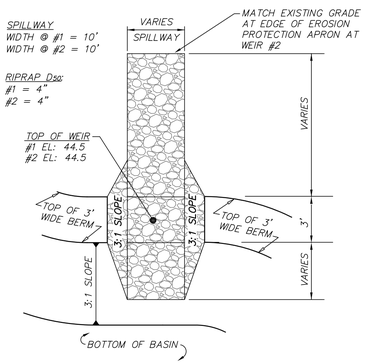
*(2) MAXIMUM RECOMMENDED OVERALL HEIGHT 10'

18" NYLOPLAST YARD DRAIN

(NOT TO SCALE)

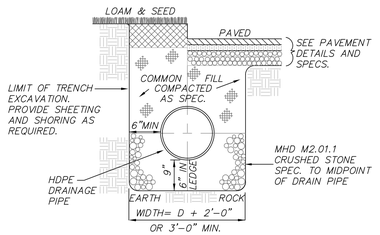


SECTION THRU WEIR



PROPOSED RIP RAP OVERFLOW WEIR OUTLET

(NOT TO SCALE)



DRAIN TRENCH

(NOT TO SCALE)

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHK'D

DWG. No. 5775–DETAIL

545 BAY ROAD

PERMIT SITE DETAILS

(TO ACCOMPANY A SITE PLAN REVIEW APPLICATION)

LOCATED IN

SOUTH HAMILTON, MASSACHUSETTS

(ESSEX COUNTY)

PREPARED FOR

INSTITUTION FOR SAVINGS

SCALE: AS NOTED DATE: JULY 17, 2015

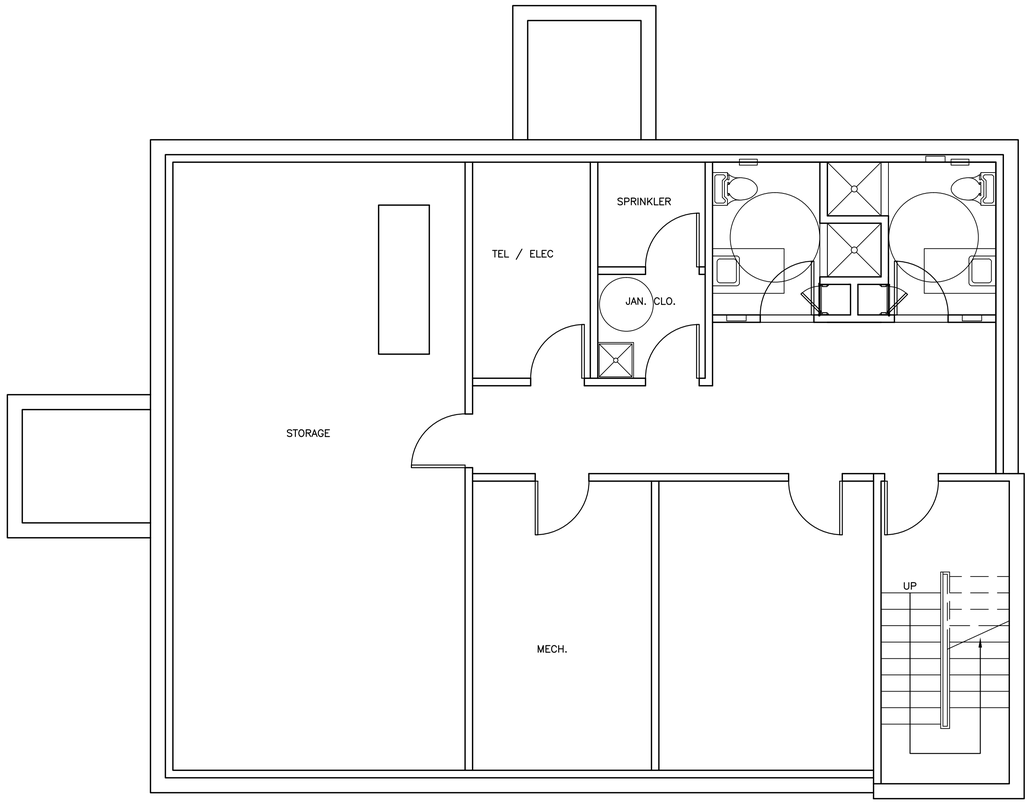
MERIDIAN ASSOCIATES

500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 299-0447

69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
TELEPHONE: (508) 871-7030

WWW.MERIDIANASSOC.COM

SHEET No. 6 OF 6 PROJECT No. 5775



1 BASEMENT FLOOR PLAN

LIST OF DRAWINGS

ARCHITECTURAL

SD 2.1 BASEMENT FLOOR PLAN
SD 2.2 FIRST FLOOR PLAN
SD 2.3 SECOND FLOOR PLAN
SD 2.4 ROOF PLAN

SD 3.1 ELEVATIONS
SD 3.2 ELEVATIONS

SD 4.1 EXISTING BUILDINGS
SD 4.2 BRANCH EXAMPLES

SD 5.1 EXTERIOR LIGHTING

SD 6.1 EXTERIOR SIGNAGE

Woodman Associates Architects

Architecture
Design
Planning

20 Inn Street
Newburyport, MA
01950 USA

978-462-9522
978-462-9523 fax
email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
BASEMENT
FLOOR PLAN

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

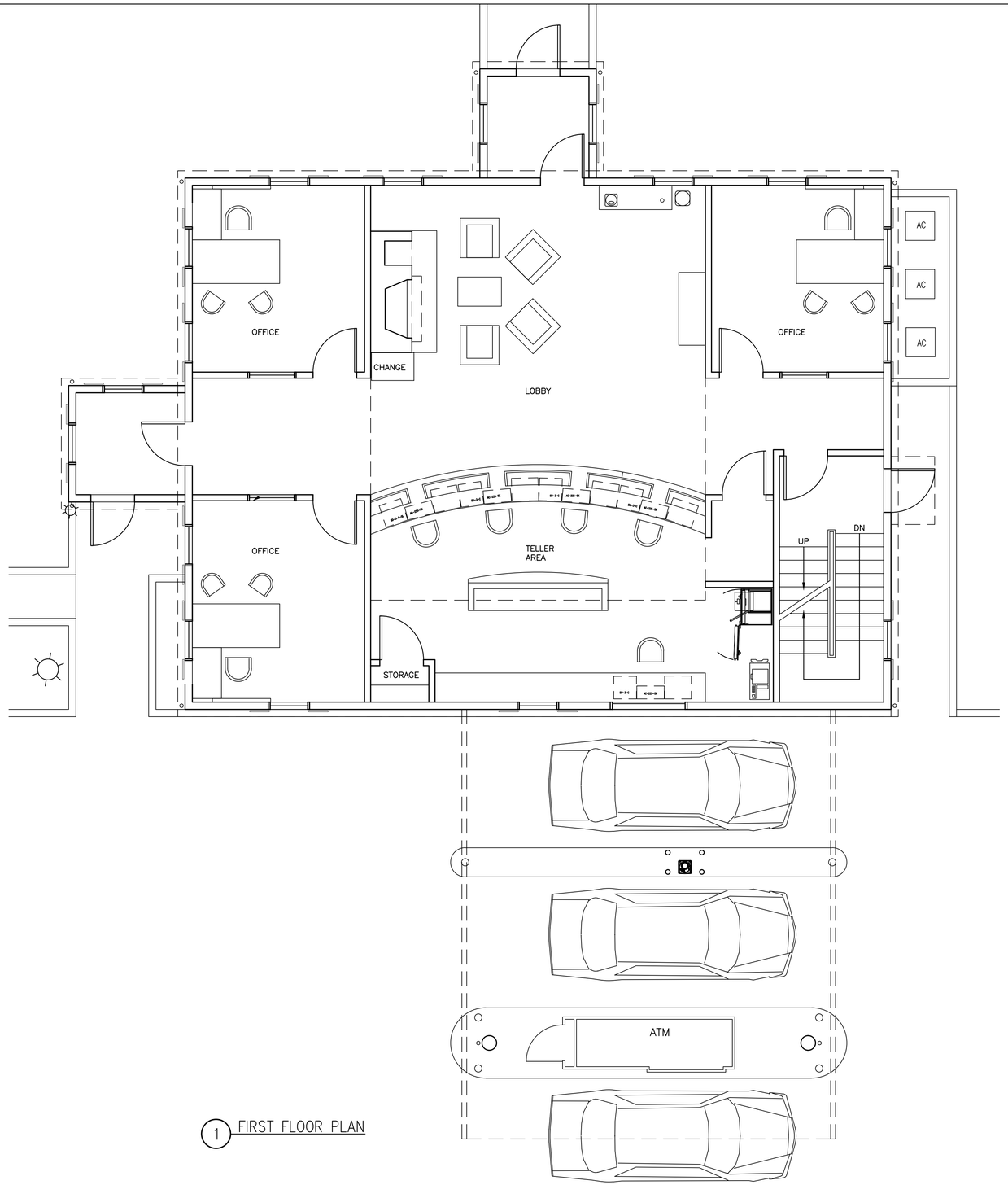
Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD2.1
Drawing No.



1 FIRST FLOOR PLAN

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01950 USA

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978-462-9523 fax
email @
WoodmanAssociates.com

Project:
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HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
FIRST
FLOOR PLAN

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

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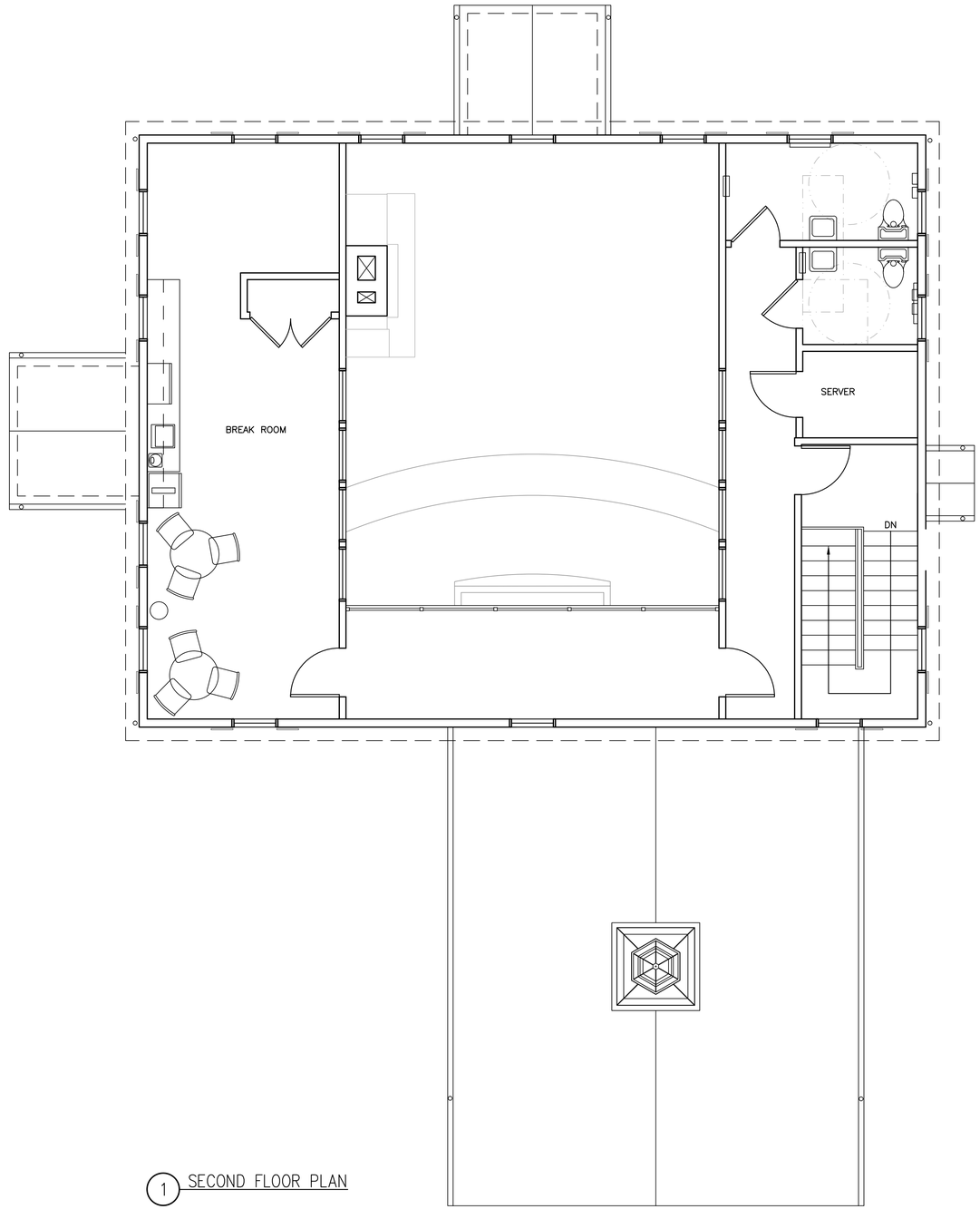
Drawing No.



1 SECOND FLOOR PLAN

Woodman Associates Architects

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Design
Planning

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Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
SECOND
FLOOR PLAN

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

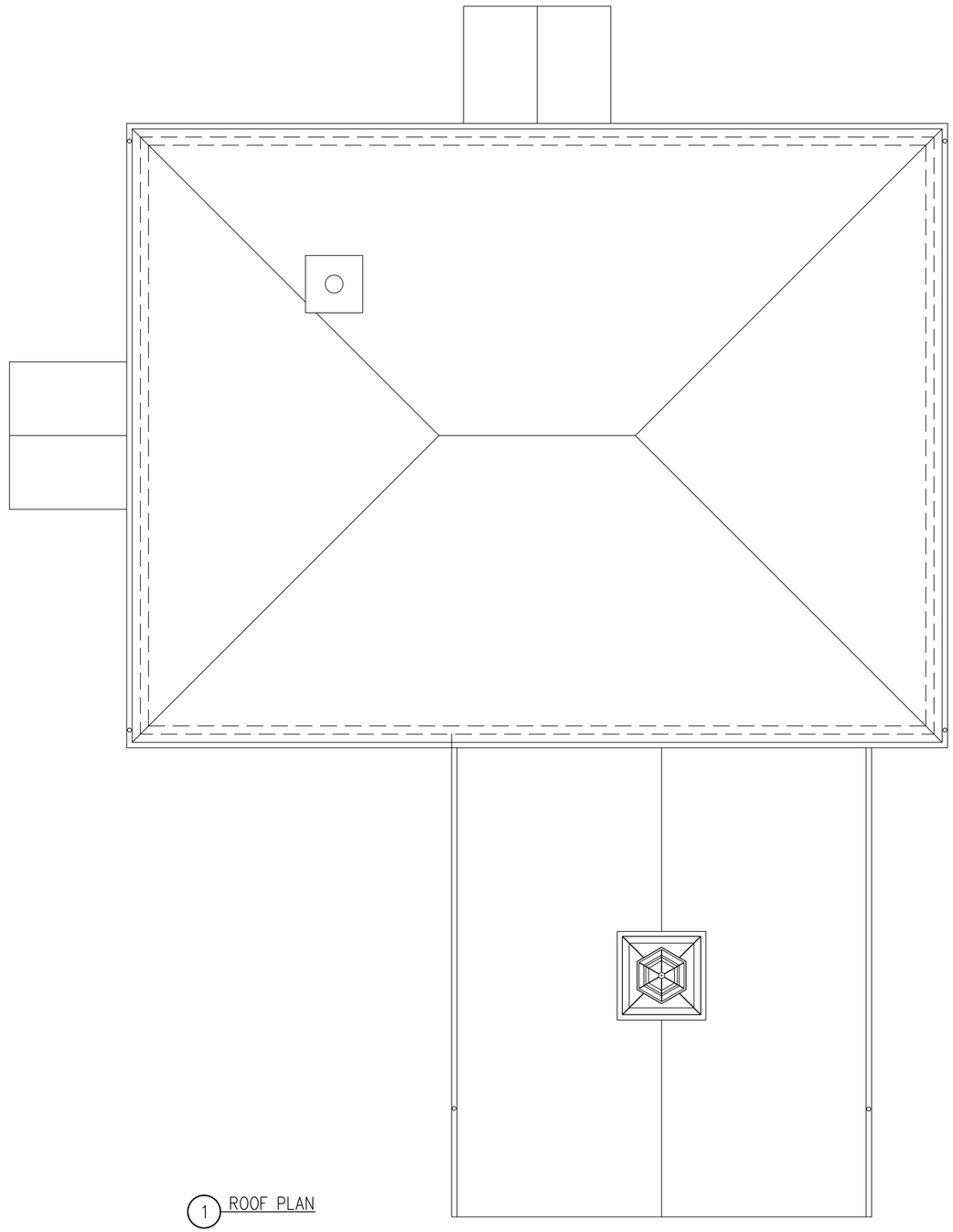
Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD2.3
Drawing No.



1 ROOF PLAN

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Planning

20 Inn Street
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978-462-9523 fax
email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
ROOF PLAN

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD2.4
Drawing No.

1 WEST ELEVATION

2 NORTH ELEVATION

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01950 USA

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email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
ELEVATIONS

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

Project No:
15006.00

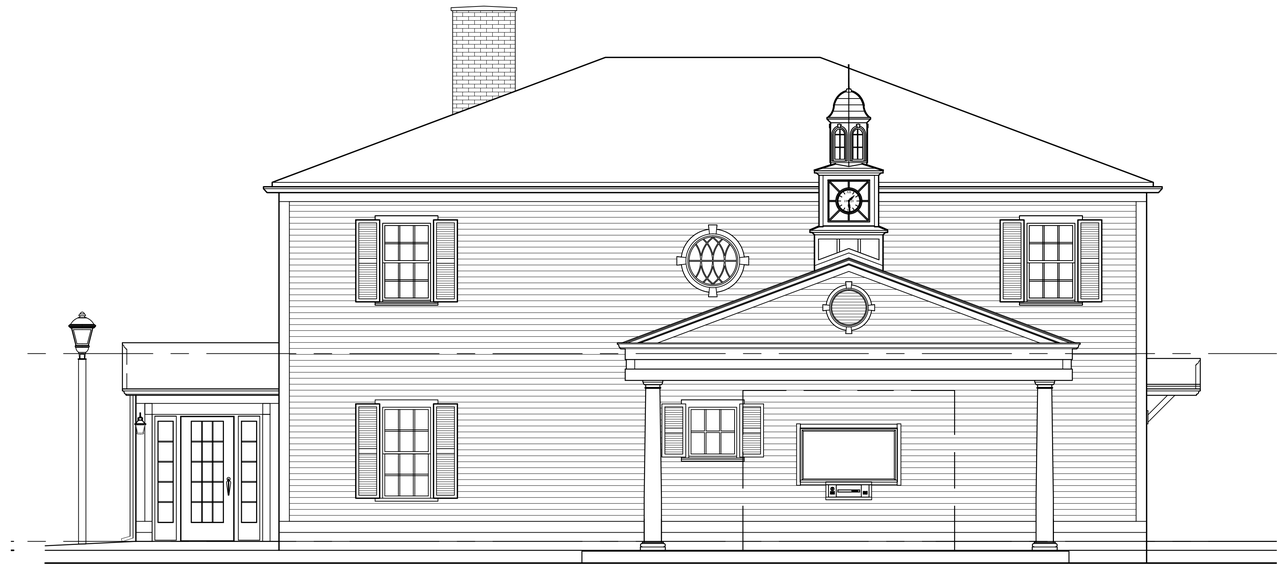
Drawn by:
CKN

Checked by:

Revisions:

SD3.1

Drawing No.



1 EAST ELEVATION

2 SOUTH ELEVATION

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Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
ELEVATIONS

Scale:
1/4"=1'-0"

Date:
7/13/15

Consultants:

Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD3.2
Drawing No.

1 VIEW FROM SOUTHWEST

2 VIEW FROM NORTH

3 VIEW FROM SOUTHEAST

4 VIEW FROM NORTHWEST

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email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
EXISTING BUILDINGS

Scale:
NONE

Date:
7/13/15

Consultants:

Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD4.1
Drawing No.

1 ROWLEY, MA

2 STOREY AVE, NEWBURPORT, MA

3 SALISBURY, MA

4 TOPSFIELD, MA

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Planning

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email @
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Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
BRANCH EXAMPLES

Scale:
NONE

Date:
7/13/15

Consultants:

Project No:
15006.00

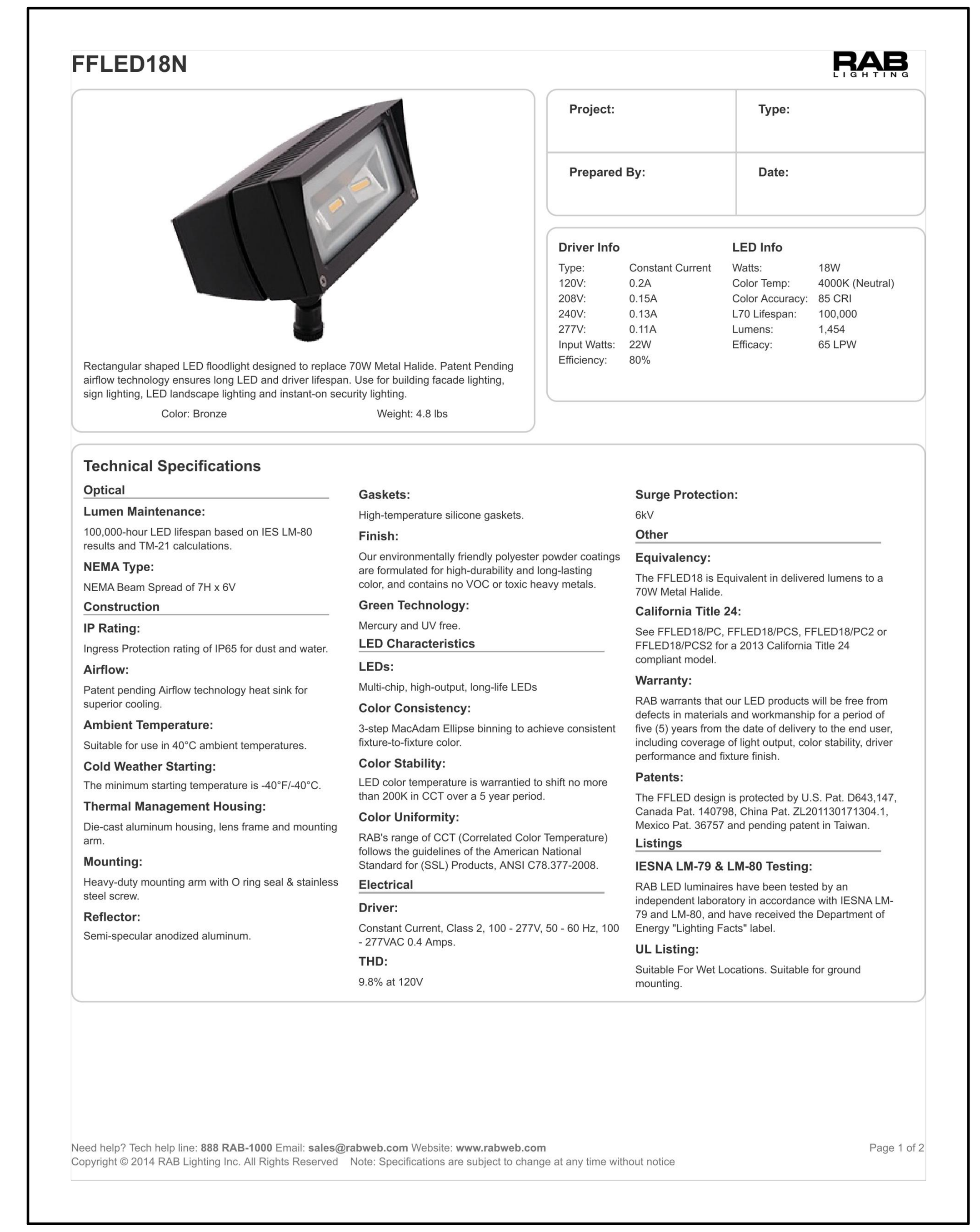
Drawn by:
CKN

Checked by:

Revisions:

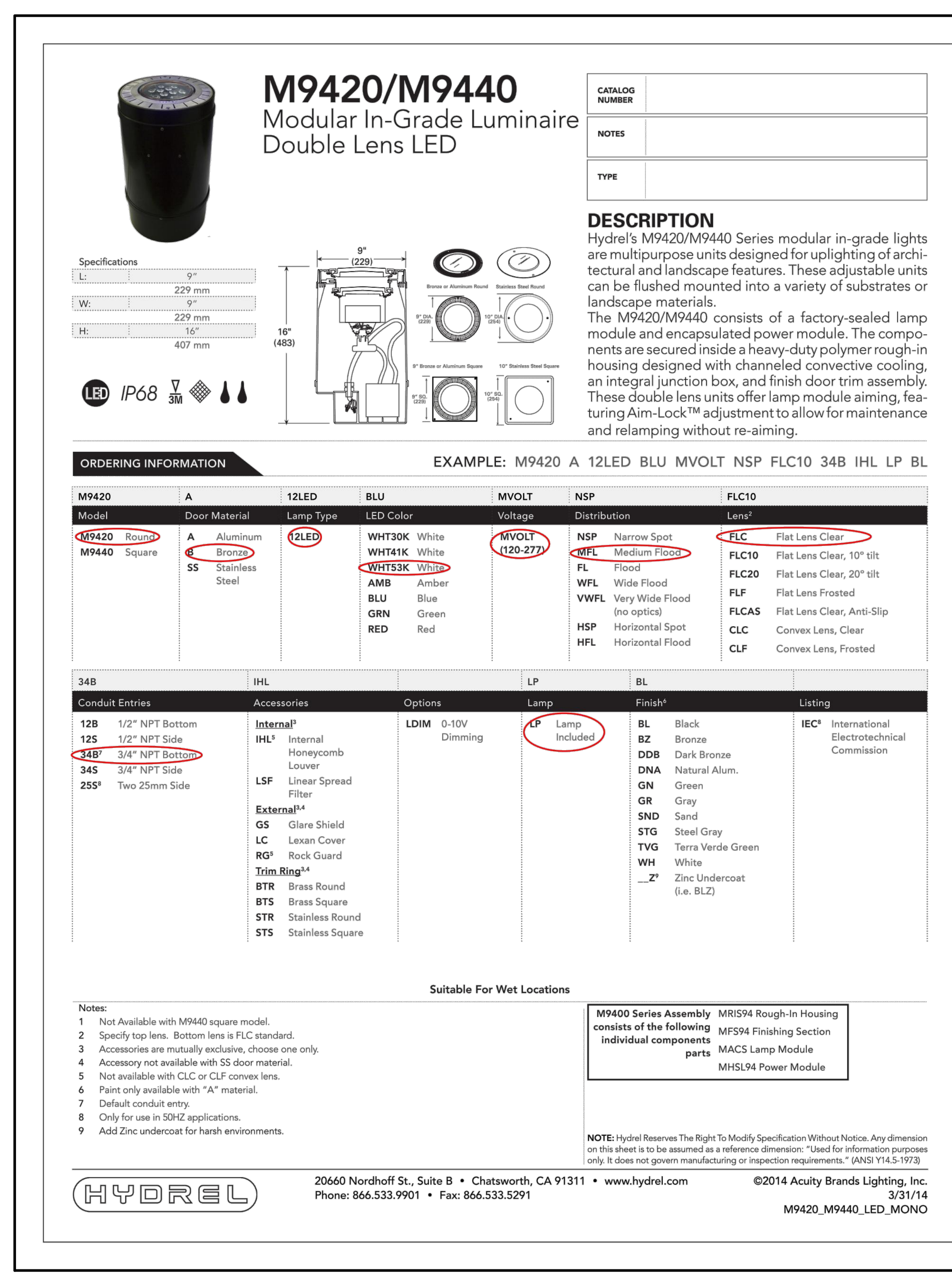
SD4.2
Drawing No.

1 POLE LIGHTS

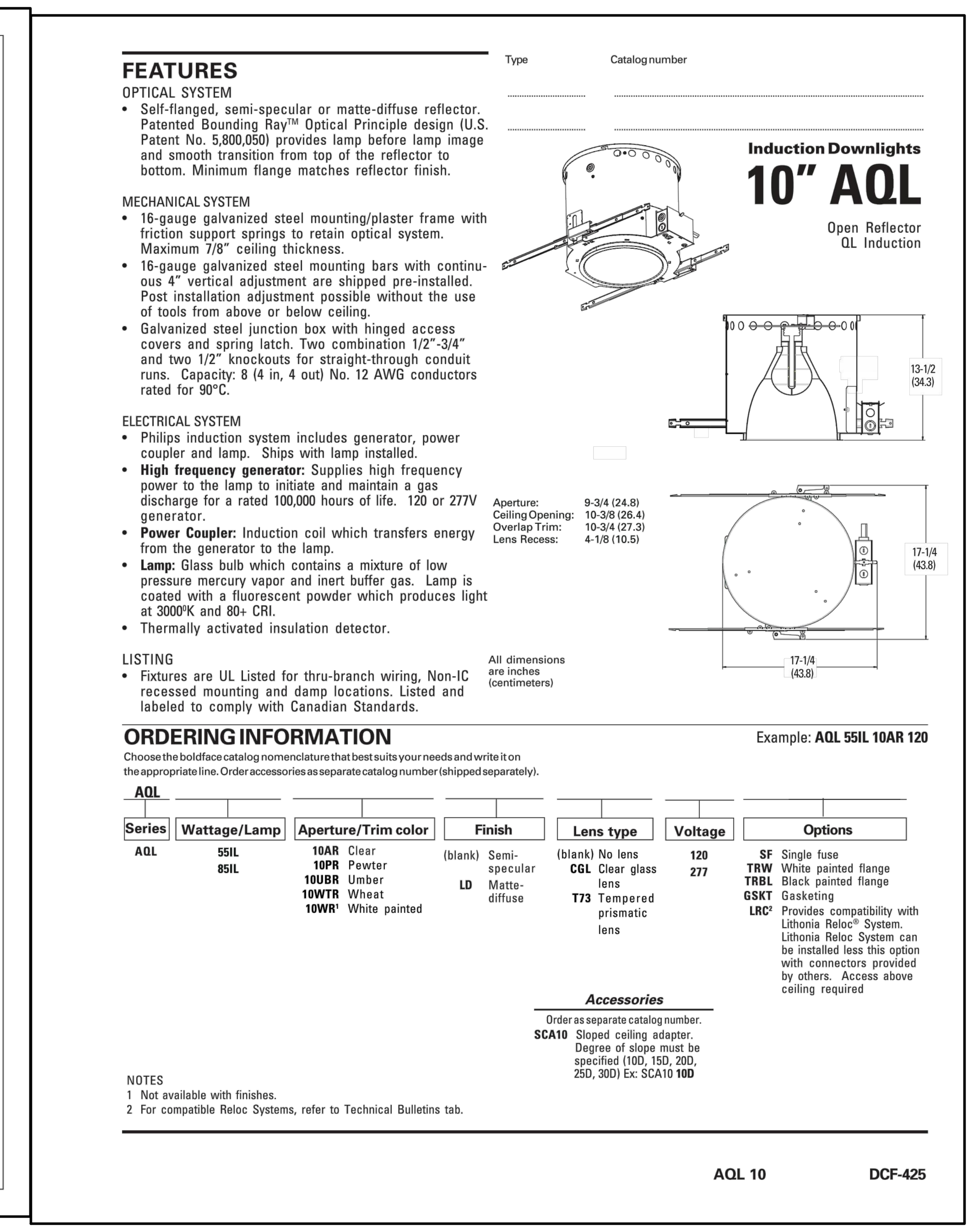


2 SIGN LIGHTS

3 DECORATIVE SCONCE AT ENTRIES



4 FLAGPOLE LIGHTS



5 DOWNLIGHTS AT CANOPIES

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01950 USA

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978-462-9523 fax
email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
EXTERIOR LIGHTING

Scale:
NONE

Date:
7/13/15

Consultants:

Project No:
15006.00

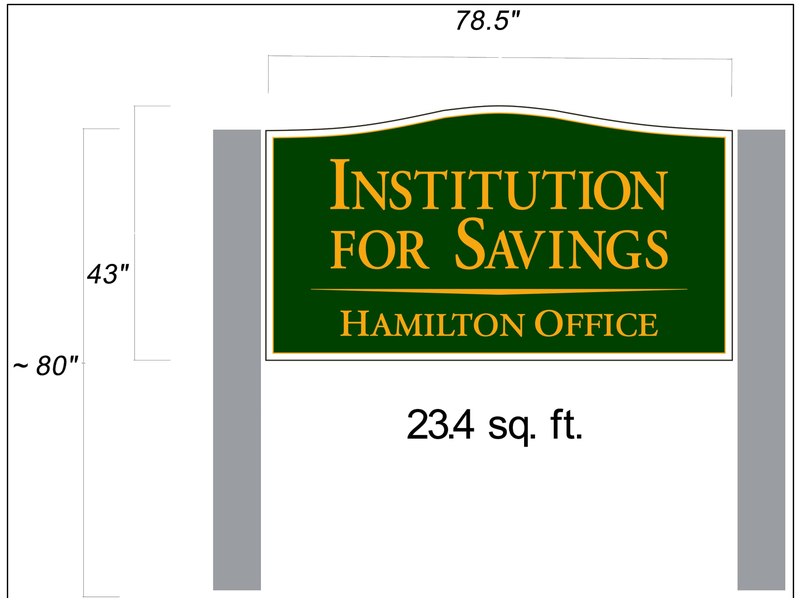
Drawn by:
CKN

Checked by:

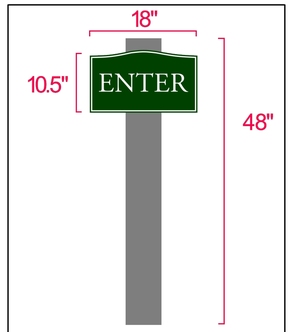
Revisions:

SD5.1
Drawing No.

Signage for Panel on ATM at rear of building
x2 - single sided
1.5" HDU 24" x 48
All 23k gold on dk green



Proposed Signs A and B
8" x 8" granite posts
18 LB HDU Sign Foam
23kt Gold Leaf
Powder Coated Steel Brackets
Stainless Steel Hardware



Single sided "Enter/Exit" signs
6"x6"x7' granite post
18 LB HDU Sign Foam
Stainless Steel Hardware
Typical

FOR SIGN LOCATIONS REFER
TO LANDSCAPE DRAWING

Woodman
Associates
Architects

Architecture
Design
Planning

20 Inn Street
Newburyport, MA
01950 USA

978-462-9522
978-462-9523 fax
email @
WoodmanAssociates.com

Project:
INSTITUTION FOR SAVINGS
HAMILTON BRANCH

Location:
545 BAY ROAD
HAMILTON, MA

Drawing Title:
EXTERIOR SIGNAGE

Scale:
1"=1'-0"

Date:
7/13/15

Consultants:

Project No:
15006.00

Drawn by:
CKN

Checked by:

Revisions:

SD6.1
Drawing No.

STORMWATER ANALYSIS AND CALCULATIONS

for

545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS

Applicant:

Institution for Savings
93 State Street
Newburyport, Massachusetts 01950

Prepared by:

Meridian Associates, Inc.
500 Cummings Center, Suite 5950
Beverly, Massachusetts 01915
(978) 299-0447

July 17, 2015

MERIDIAN ASSOCIATES

TABLE OF CONTENTS

CALCULATION METHODS

- TR 20 SCS Unit Hydrograph Procedure
- Runoff Curve Numbers
- Time of Concentration by TR55 Methodology
- Reach and Pond Rating by the Storage-Indication Method
- Manning Equation

SOURCE OF DATA

- Technical Report No. 20
- Technical Report No. 55
- Technical Paper No. 40
- Partial Field Survey by MAI
- Massachusetts Stormwater Management Handbook, February 2008

REPORT SUMMARY:

Calculation Objectives

The objective of these calculations is to document that the proposed project described in the Stormwater Management Report does not result in an increase of offsite rates of runoff or flooding down gradient of the site. The analysis is separated into existing and proposed conditions. Watershed plans have been incorporated into this report to depict existing and proposed watershed areas.

Selection of Storm Events

The storm events have been compiled from the Soil Conservation Service Technical Report No. 55 and the U.S. Department of Commerce Technical Paper No. 40. Rainfall frequency data has been provided as follows:

Frequency (Years)	Rainfall [24-Hour Event (inches)]
2	3.1
10	4.5
100	6.5

Classification of Soils

Drainage classes have been established based on soil maps provided by U.S. Department of Agriculture Soil Conservation Service as well as onsite soil testing. Soil maps and descriptions are part of "Soil Survey of Essex County, Southern Part". According to NRCS, the following soil type and hydrologic group are delineated within the limit of the hydrologic study (see appendix for NRCS map):

254A: Merrimac - parent material consisting of stratified gravel to very gravelly sand - hydrologic soil group A

Hydrologic soil groups are assigned to each soil type by NRCS based on their potential rate of water infiltration. Group A soils typically have a high infiltration rate when thoroughly wet and consist of deep well drained sands or gravelly sands. Soil testing performed on the locus property confirm the presence of sands and gravelly sands.

Existing Conditions Overview

The locus property is comprised of approximately 0.7 ± acres located at 545 Bay Road in Hamilton, Ma. The property is located at the corner of Bay Road and Bridge Street and is surrounded by residential properties. There are no wetlands or waters within 100' of the project property lines. As such, the project does not fall under the Wetlands Protection Act (WPA). However, as part of good engineering practice, the project has been designed to meet the requirements of the WPA and MA Stormwater Management Handbook.

The project site is currently occupied by Hamilton Gardens consisting of a greenhouse with attached retail space and office/plant preparation space, accessory barn, accessory garage, stone exterior display spaces and combination bituminous and gravel parking areas. Topography consists of mild slopes ranging from 1% to 5% directing stormwater from Bay Road in a southeasterly direction towards the rear of the property.

For the purpose of analyzing existing and proposed stormwater runoff, two design points have been designated for comparison. The design points selected are two existing catchbasins within Bay Road and Bridge Street. Two (2) subcatchment areas have been delineated based on topography.

Existing Design Point and Subcatchment Areas:

Design Point #1 selected is existing CB1 located within Bridge Street. Subcatchment #1 is the sole contributor to this design point. The subcatchment area consists of the majority of the locus property as well as a portion of Bridge Street. Stormwater flows overland through the locus in a southeasterly direction towards the connecting driveway to Bridge Street. Flow from Bridge Street and the locus then culminate at design point #1.

Design Point #2 has been selected as existing catchbasin CB4 located at the intersection of Bay Road and Bridge Street. Subcatchment #2 contributes stormwater flow to this design point. This subcatchment area consists of a portion of the existing driveway along Bay Road as well as a portion of Bay Road. Stormwater flows overland from the high point of both areas and culminates at design point #2.

Proposed Conditions Overview

The applicant is proposing to demolish the existing buildings and construct a single bank branch building. An associated driveway ranging from Bay Road to Bridge Street is also proposed along with associated parking areas and bank drive thru.

Stormwater Management:

This proposal utilizes low impact development strategies for stormwater management. These strategies eliminate the need for structural main components and direct stormwater to pervious surfaces modeled after natural hydrologic features. Incorporated into this design is a sediment forebay and surface infiltration facility for treatment and recharge of stormwater. Design strategies for the stormwater systems follow methods from the Massachusetts Stormwater Handbook.

Surface Infiltration Basin:

An infiltration basin is a stormwater runoff impoundment constructed over permeable soils which can provide storage and exfiltration of the required recharge volume. Mitigation of stormwater peak flows as well as treatment of the required water quality volume is also provided. The basin is comprised of a flat bottom and side slopes stabilized with a dense turf of

water tolerant grass capable of surviving in both wet and dry conditions. This BMP achieves a TSS removal rate of 80%.

Sediment Forebay:

A sediment forebay is an excavated depression with earthen sides and stone weir outlet utilized to slow incoming stormwater runoff and facilitating the gravity separation of suspended solids. The sediment forebay side slopes and bottom are stabilized with water tolerant turf grass capable of surviving in both wet and dry conditions. This BMP is used in conjunction with the infiltration basin for primary TSS removal and is not assigned a separate credit in this instance. Utilized for pretreatment calculations, the forebay achieves a TSS removal rate of 25%.

Proposed Design Points and Subcatchment Areas

The design points #1 and #2 remain the same in the existing and proposed conditions consisting of CB1 in Bridge Street and CB4 located at the intersection of Bay Road and Bridge Street respectively. The project has been divided into 3 subcatchment areas directing stormwater into one of the two design points.

Two of the subcatchment areas contribute stormwater flow to design point #1. Subcatchment #10 is comprised of the southwest portion of the project divided by topography. Stormwater from this subcatchment area is directed overland through the proposed parking lot, onto a peastone diaphragm level spreader and into a sediment forebay before discharging to a proposed infiltration basin. Excess stormwater from the infiltration basin exits via overflow stone weir overland through lawn to Bridge Street and design point #1.

Subcatchment #11 is comprised of the eastern portion of the locus property as well as a portion of Bridge Street. Stormwater flow from this subcatchment area flows overland from the front yard of the bank toward Bridge Street. Overland flow from Bridge Street is directed into design point #1.

Subcatchment #20 is the sole contributor to design point #2. This subcatchment area falls in a very similar location to existing subcatchment #2 and consists of a limited portion of the entry driveway along Bay Road as well as a portion of Bay Road. Stormwater flows overland from the high point of both areas and culminates at design point #2.

Summary of Flows at All Design Points (CFS)

A detailed analysis of existing and proposed subcatchment areas, ponds, and reaches is included in the HydroCAD analysis section of this report.

Design Point #1:

	2-Year 24-Hour Storm Event	10-Year 24-Hour Storm Event	100-Year 24-Hour Storm Event
Existing	1.3 CFS	2.5 CFS	4.5 CFS
Proposed	0.2 CFS	0.5 CFS	2.9 CFS

Design Point #2:

	2-Year 24-Hour Storm Event	10-Year 24-Hour Storm Event	100-Year 24-Hour Storm Event
Existing	0.2 CFS	0.3 CFS	0.5 CFS
Proposed	0.2 CFS	0.3 CFS	0.5 CFS

Conclusion

The calculations indicate peaks have been met or reduced for the 2-year, 10-year, and 100-year storm events. We can therefore anticipate no adverse impacts or downstream flooding with the completion of this project. In addition the design provides for the required TSS removal and recharge volumes required by the MA DEP Stormwater Management Requirements.

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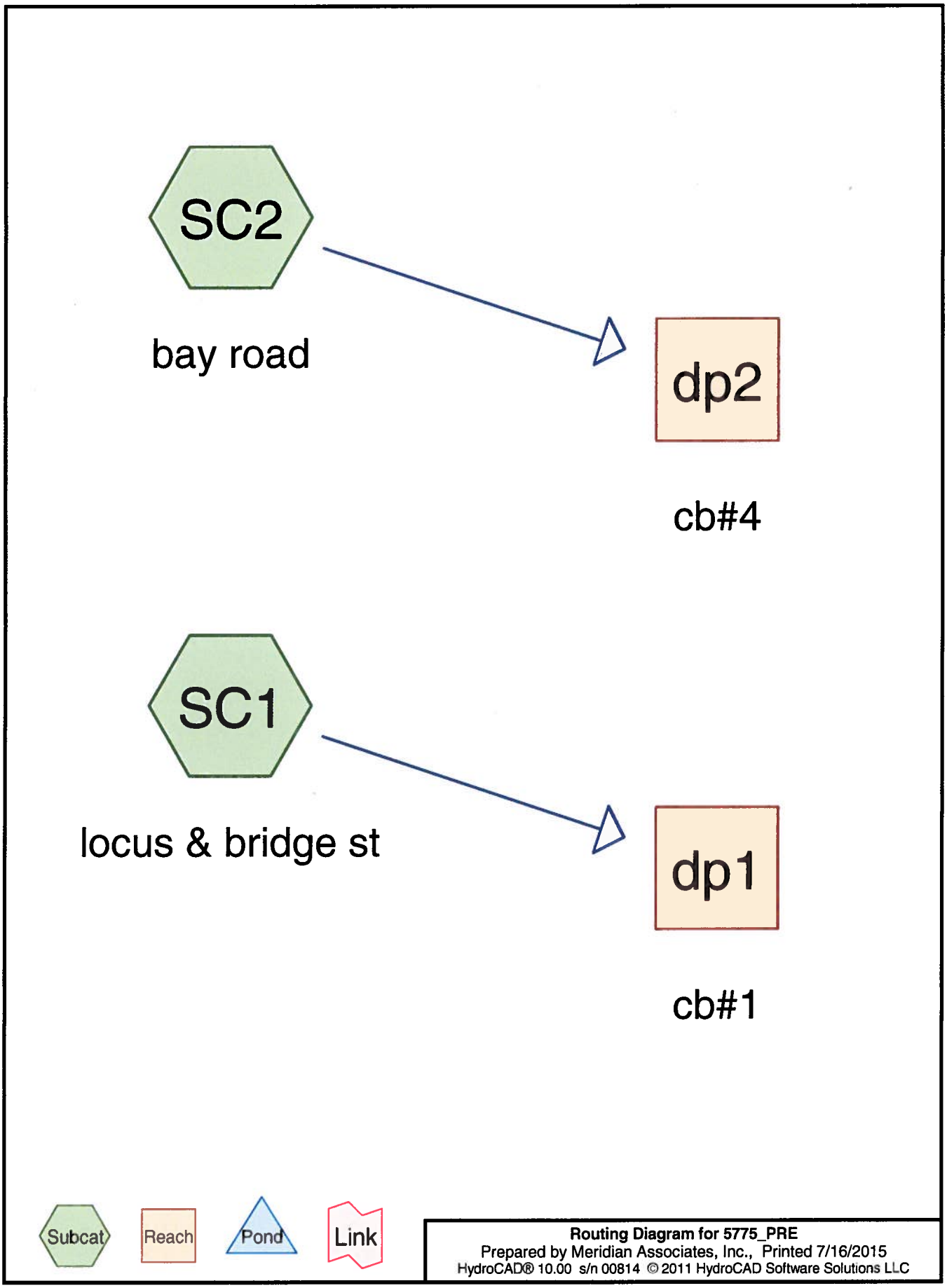
EXISTING CONDITIONS
WATERSHED ROUTING DIAGRAM



Routing Diagram for 5775_PRE
Prepared by Meridian Associates, Inc., Printed 7/16/2015

EXISTING CONDITIONS
2-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment SC1: locus & bridge st

Runoff = 1.3 cfs @ 12.10 hrs, Volume= 0.09 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	17,670	98	impervious area
	16,475	76	Gravel roads, HSG A
	1,370	30	Woods, Good, HSG A
	7,825	39	>75% Grass cover, Good, HSG A
	43,340	77	Weighted Average
	25,670		59.23% Pervious Area
	17,670		40.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow, high point driveway** Smooth surfaces n= 0.011 P2= 3.10"
0.8	130	0.0160	2.6		**Shallow Concentrated Flow, overland driveway** Paved Kv= 20.3 fps
3.3	116	0.0070	0.6		**Shallow Concentrated Flow, overland grass** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0070	1.3		**Shallow Concentrated Flow, gravel drive** Unpaved Kv= 16.1 fps
0.6	83	0.0120	2.2		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
6.3	436	Total			

Summary for Subcatchment SC2: bay road

Runoff = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af, Depth> 2.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	3,365	98	impervious area
	65	39	>75% Grass cover, Good, HSG A
	3,430	97	Weighted Average
	65		1.90% Pervious Area
	3,365		98.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0250	1.1		**Sheet Flow, high point bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.6	30	0.0100	0.8		**Sheet Flow, gutterline bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.7	118	0.0180	2.7		**Shallow Concentrated Flow, gutter line bay to cb** Paved Kv= 20.3 fps
4.4					**Direct Entry, minimum tc**
6.0	168	Total			

Summary for Reach dp1: cb#1

Inflow Area = 0.995 ac, 40.77% Impervious, Inflow Depth > 1.14" for 2 yr event
Inflow = 1.3 cfs @ 12.10 hrs, Volume= 0.09 af
Outflow = 1.3 cfs @ 12.10 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.079 ac, 98.10% Impervious, Inflow Depth > 2.76" for 2 yr event
Inflow = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af
Outflow = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

EXISTING CONDITIONS
10-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment SC1: locus & bridge st

Runoff = 2.5 cfs @ 12.09 hrs, Volume= 0.18 af, Depth> 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	17,670	98	impervious area
	16,475	76	Gravel roads, HSG A
	1,370	30	Woods, Good, HSG A
	7,825	39	>75% Grass cover, Good, HSG A
	43,340	77	Weighted Average
	25,670		59.23% Pervious Area
	17,670		40.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow, high point driveway** Smooth surfaces n= 0.011 P2= 3.10"
0.8	130	0.0160	2.6		**Shallow Concentrated Flow, overland driveway** Paved Kv= 20.3 fps
3.3	116	0.0070	0.6		**Shallow Concentrated Flow, overland grass** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0070	1.3		**Shallow Concentrated Flow, gravel drive** Unpaved Kv= 16.1 fps
0.6	83	0.0120	2.2		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
6.3	436	Total			

Summary for Subcatchment SC2: bay road

Runoff = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	3,365	98	impervious area
	65	39	>75% Grass cover, Good, HSG A
	3,430	97	Weighted Average
	65		1.90% Pervious Area
	3,365		98.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0250	1.1		**Sheet Flow, high point bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.6	30	0.0100	0.8		**Sheet Flow, gutterline bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.7	118	0.0180	2.7		**Shallow Concentrated Flow, gutter line bay to cb** Paved Kv= 20.3 fps
4.4					**Direct Entry, minimum tc**
6.0	168	Total			

Summary for Reach dp1: cb#1

Inflow Area = 0.995 ac, 40.77% Impervious, Inflow Depth > 2.21" for 10 yr event
Inflow = 2.5 cfs @ 12.09 hrs, Volume= 0.18 af
Outflow = 2.5 cfs @ 12.09 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.079 ac, 98.10% Impervious, Inflow Depth > 4.15" for 10 yr event
Inflow = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af
Outflow = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

EXISTING CONDITIONS
100-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment SC1: locus & bridge st

Runoff = 4.5 cfs @ 12.09 hrs, Volume= 0.32 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=6.50"

	Area (sf)	CN	Description
*	17,670	98	impervious area
	16,475	76	Gravel roads, HSG A
	1,370	30	Woods, Good, HSG A
	7,825	39	>75% Grass cover, Good, HSG A
	43,340	77	Weighted Average
	25,670		59.23% Pervious Area
	17,670		40.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow, high point driveway** Smooth surfaces n= 0.011 P2= 3.10"
0.8	130	0.0160	2.6		**Shallow Concentrated Flow, overland driveway** Paved Kv= 20.3 fps
3.3	116	0.0070	0.6		**Shallow Concentrated Flow, overland grass** Short Grass Pasture Kv= 7.0 fps
0.7	57	0.0070	1.3		**Shallow Concentrated Flow, gravel drive** Unpaved Kv= 16.1 fps
0.6	83	0.0120	2.2		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
6.3	436	Total			

Summary for Subcatchment SC2: bay road

Runoff = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af, Depth> 6.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=6.50"

	Area (sf)	CN	Description
*	3,365	98	impervious area
	65	39	>75% Grass cover, Good, HSG A
	3,430	97	Weighted Average
	65		1.90% Pervious Area
	3,365		98.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	20	0.0250	1.1		**Sheet Flow, high point bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.6	30	0.0100	0.8		**Sheet Flow, gutterline bay road** Smooth surfaces n= 0.011 P2= 3.10"
0.7	118	0.0180	2.7		**Shallow Concentrated Flow, gutter line bay to cb** Paved Kv= 20.3 fps
4.4					**Direct Entry, minimum tc**
6.0	168	Total			

Summary for Reach dp1: cb#1

Inflow Area = 0.995 ac, 40.77% Impervious, Inflow Depth > 3.91" for 100 yr event
Inflow = 4.5 cfs @ 12.09 hrs, Volume= 0.32 af
Outflow = 4.5 cfs @ 12.09 hrs, Volume= 0.32 af, Atten= 0%, Lag= 0.0 min

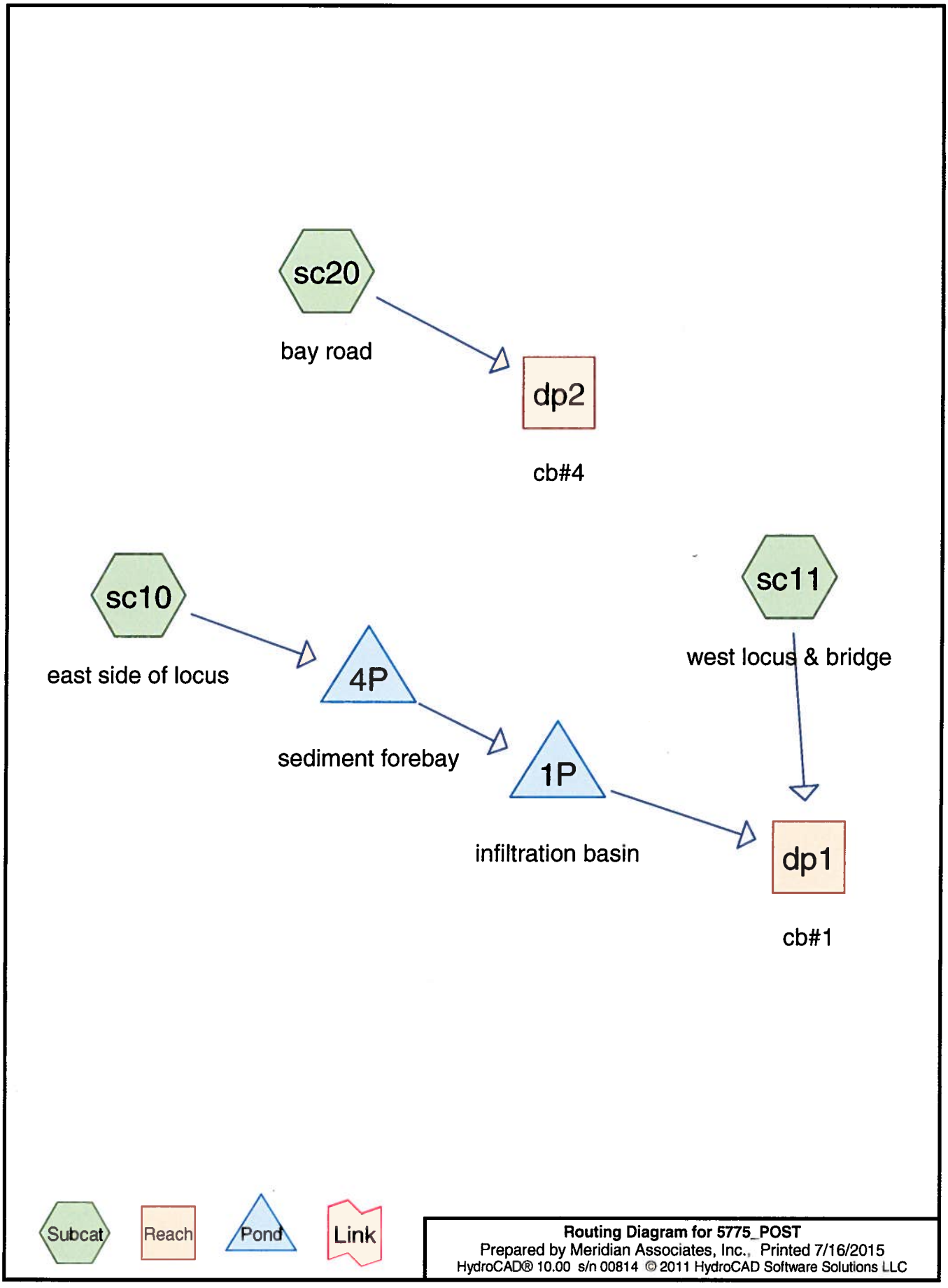
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.079 ac, 98.10% Impervious, Inflow Depth > 6.14" for 100 yr event
Inflow = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af
Outflow = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

PROPOSED CONDITIONS
WATERSHED ROUTING DIAGRAM



Routing Diagram for 5775_POST
Prepared by Meridian Associates, Inc., Printed 7/16/2015

PROPOSED CONDITIONS
2-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment sc10: east side of locus

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	14,360	98	impervious area
	130	30	Woods, Good, HSG A
	8,685	39	>75% Grass cover, Good, HSG A
*	625	98	infil basin bottom
*	140	72	stone area
	23,940	76	Weighted Average
	8,955		37.41% Pervious Area
	14,985		62.59% Impervious Area

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

Summary for Subcatchment sc11: west locus & bridge

Runoff = 0.2 cfs @ 12.16 hrs, Volume= 0.02 af, Depth> 0.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	8,350	98	impervious area
	775	30	Woods, Good, HSG A
	10,065	39	>75% Grass cover, Good, HSG A
	19,190	64	Weighted Average
	10,840		56.49% Pervious Area
	8,350		43.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0260	0.2		**Sheet Flow, high point by bay road** Grass: Short n= 0.150 P2= 3.10"
2.4	114	0.0130	0.8		**Shallow Concentrated Flow, overland lawn to bridge** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0090	1.9		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
9.2	358	Total			

Summary for Subcatchment sc20: bay road

Runoff = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.10"

	Area (sf)	CN	Description
*	3,350	98	impervious area
	125	39	>75% Grass cover, Good, HSG A
	3,475	96	Weighted Average
	125		3.60% Pervious Area
	3,350		96.40% Impervious Area

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

Summary for Reach dp1: cb#1

Inflow Area = 0.990 ac, 54.10% Impervious, Inflow Depth > 0.23" for 2 yr event
Inflow = 0.2 cfs @ 12.16 hrs, Volume= 0.02 af
Outflow = 0.2 cfs @ 12.16 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.080 ac, 96.40% Impervious, Inflow Depth > 2.65" for 2 yr event
Inflow = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af
Outflow = 0.2 cfs @ 12.08 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: infiltration basin

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 0.94" for 2 yr event
Inflow = 0.7 cfs @ 12.11 hrs, Volume= 0.04 af
Outflow = 0.0 cfs @ 14.68 hrs, Volume= 0.04 af, Atten= 93%, Lag= 153.8 min
Discarded = 0.0 cfs @ 14.68 hrs, Volume= 0.04 af
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 43.50' @ 14.68 hrs Surf.Area= 789 sf Storage= 822 cf

Plug-Flow detention time= 227.7 min calculated for 0.04 af (89% of inflow)
Center-of-Mass det. time= 177.7 min (1,057.8 - 880.1)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	2,171 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.00	335	90.0	0	0	335
43.00	625	110.0	473	473	669
44.00	975	125.0	794	1,266	973
44.80	1,295	140.0	905	2,171	1,306

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**2.410 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.0 cfs @ 14.68 hrs HW=43.50' (Free Discharge)
↳**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=42.00' TW=0.00' (Dynamic Tailwater)
↳**2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond 4P: sediment forebay

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 1.08" for 2 yr event
Inflow = 0.7 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.7 cfs @ 12.11 hrs, Volume= 0.04 af, Atten= 3%, Lag= 1.2 min
Primary = 0.7 cfs @ 12.11 hrs, Volume= 0.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 44.59' @ 12.11 hrs Surf.Area= 663 sf Storage= 327 cf

Plug-Flow detention time= 81.7 min calculated for 0.04 af (87% of inflow)
Center-of-Mass det. time= 23.5 min (880.1 - 856.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.80'	568 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.80	200	165.0	0	0	200
44.00	300	170.0	50	50	337
44.80	825	205.0	433	482	1,393
44.90	885	205.0	85	568	1,413

Device	Routing	Invert	Outlet Devices
#1	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.7 cfs @ 12.11 hrs HW=44.59' TW=42.37' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.7 cfs @ 0.7 fps)

PROPOSED CONDITIONS
10-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment sc10: east side of locus

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 0.10 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	14,360	98	impervious area
	130	30	Woods, Good, HSG A
	8,685	39	>75% Grass cover, Good, HSG A
*	625	98	infil basin bottom
*	140	72	stone area
	23,940	76	Weighted Average
	8,955		37.41% Pervious Area
	14,985		62.59% Impervious Area

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

Summary for Subcatchment sc11: west locus & bridge

Runoff = 0.5 cfs @ 12.14 hrs, Volume= 0.05 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	8,350	98	impervious area
	775	30	Woods, Good, HSG A
	10,065	39	>75% Grass cover, Good, HSG A
	19,190	64	Weighted Average
	10,840		56.49% Pervious Area
	8,350		43.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0260	0.2		**Sheet Flow, high point by bay road** Grass: Short n= 0.150 P2= 3.10"
2.4	114	0.0130	0.8		**Shallow Concentrated Flow, overland lawn to bridge** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0090	1.9		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
9.2	358	Total			

Summary for Subcatchment sc20: bay road

Runoff = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af, Depth> 4.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	3,350	98	impervious area
	125	39	>75% Grass cover, Good, HSG A
	3,475	96	Weighted Average
	125		3.60% Pervious Area
	3,350		96.40% Impervious Area

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

Summary for Reach dp1: cb#1

Inflow Area = 0.990 ac, 54.10% Impervious, Inflow Depth > 0.67" for 10 yr event
Inflow = 0.5 cfs @ 12.14 hrs, Volume= 0.06 af
Outflow = 0.5 cfs @ 12.14 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.080 ac, 96.40% Impervious, Inflow Depth > 4.03" for 10 yr event
Inflow = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af
Outflow = 0.3 cfs @ 12.08 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: infiltration basin

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 1.99" for 10 yr event
Inflow = 1.3 cfs @ 12.11 hrs, Volume= 0.09 af
Outflow = 0.2 cfs @ 12.80 hrs, Volume= 0.07 af, Atten= 87%, Lag= 41.9 min
Discarded = 0.1 cfs @ 12.80 hrs, Volume= 0.06 af
Primary = 0.1 cfs @ 12.80 hrs, Volume= 0.01 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 44.53' @ 12.80 hrs Surf.Area= 1,181 sf Storage= 1,834 cf

Plug-Flow detention time= 262.7 min calculated for 0.07 af (76% of inflow)
Center-of-Mass det. time= 174.8 min (1,025.4 - 850.5)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	2,171 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.00	335	90.0	0	0	335
43.00	625	110.0	473	473	669
44.00	975	125.0	794	1,266	973
44.80	1,295	140.0	905	2,171	1,306

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**2.410 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.1 cfs @ 12.80 hrs HW=44.53' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.1 cfs @ 12.80 hrs HW=44.53' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 0.1 cfs @ 0.4 fps)

Summary for Pond 4P: sediment forebay

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 2.13" for 10 yr event
Inflow = 1.4 cfs @ 12.09 hrs, Volume= 0.10 af
Outflow = 1.3 cfs @ 12.11 hrs, Volume= 0.09 af, Atten= 2%, Lag= 0.9 min
Primary = 1.3 cfs @ 12.11 hrs, Volume= 0.09 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 44.65' @ 12.11 hrs Surf.Area= 705 sf Storage= 366 cf

Plug-Flow detention time= 47.7 min calculated for 0.09 af (94% of inflow)
Center-of-Mass det. time= 13.9 min (850.5 - 836.6)

Volume	Invert	Avail.Storage	Storage Description
#1	43.80'	568 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.80	200	165.0	0	0	200
44.00	300	170.0	50	50	337
44.80	825	205.0	433	482	1,393
44.90	885	205.0	85	568	1,413

Device	Routing	Invert	Outlet Devices
#1	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.3 cfs @ 12.11 hrs HW=44.65' TW=43.41' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.3 cfs @ 0.9 fps)

PROPOSED CONDITIONS
100-YEAR 24-HOUR STORM EVENT ANALYSIS

Summary for Subcatchment sc10: east side of locus

Runoff = 2.5 cfs @ 12.09 hrs, Volume= 0.17 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=6.50"

	Area (sf)	CN	Description
*	14,360	98	impervious area
	130	30	Woods, Good, HSG A
	8,685	39	>75% Grass cover, Good, HSG A
*	625	98	infil basin bottom
*	140	72	stone area
	23,940	76	Weighted Average
	8,955		37.41% Pervious Area
	14,985		62.59% Impervious Area

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

Summary for Subcatchment sc11: west locus & bridge

Runoff = 1.2 cfs @ 12.13 hrs, Volume= 0.10 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=6.50"

	Area (sf)	CN	Description
*	8,350	98	impervious area
	775	30	Woods, Good, HSG A
	10,065	39	>75% Grass cover, Good, HSG A
	19,190	64	Weighted Average
	10,840		56.49% Pervious Area
	8,350		43.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0260	0.2		**Sheet Flow, high point by bay road** Grass: Short n= 0.150 P2= 3.10"
2.4	114	0.0130	0.8		**Shallow Concentrated Flow, overland lawn to bridge** Short Grass Pasture Kv= 7.0 fps
1.7	194	0.0090	1.9		**Shallow Concentrated Flow, bridge to cb** Paved Kv= 20.3 fps
9.2	358	Total			

Summary for Subcatchment sc20: bay road

Runoff = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af, Depth> 6.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=6.50"

	Area (sf)	CN	Description
*	3,350	98	impervious area
	125	39	>75% Grass cover, Good, HSG A
	3,475	96	Weighted Average
	125		3.60% Pervious Area
	3,350		96.40% Impervious Area

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

Summary for Reach dp1: cb#1

Inflow Area = 0.990 ac, 54.10% Impervious, Inflow Depth > 2.04" for 100 yr event
Inflow = 2.9 cfs @ 12.16 hrs, Volume= 0.17 af
Outflow = 2.9 cfs @ 12.16 hrs, Volume= 0.17 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Reach dp2: cb#4

Inflow Area = 0.080 ac, 96.40% Impervious, Inflow Depth > 6.02" for 100 yr event
Inflow = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af
Outflow = 0.5 cfs @ 12.08 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: infiltration basin

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 3.67" for 100 yr event
Inflow = 2.4 cfs @ 12.10 hrs, Volume= 0.17 af
Outflow = 1.8 cfs @ 12.16 hrs, Volume= 0.14 af, Atten= 25%, Lag= 4.0 min
Discarded = 0.1 cfs @ 12.16 hrs, Volume= 0.07 af
Primary = 1.8 cfs @ 12.16 hrs, Volume= 0.07 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 44.68' @ 12.16 hrs Surf.Area= 1,242 sf Storage= 2,014 cf

Plug-Flow detention time= 146.3 min calculated for 0.14 af (82% of inflow)
Center-of-Mass det. time= 75.5 min (905.9 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	42.00'	2,171 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.00	335	90.0	0	0	335
43.00	625	110.0	473	473	669
44.00	975	125.0	794	1,266	973
44.80	1,295	140.0	905	2,171	1,306

Device	Routing	Invert	Outlet Devices
#1	Discarded	42.00'	**2.410 in/hr Exfiltration over Wetted area** Phase-In= 0.01'
#2	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.1 cfs @ 12.16 hrs HW=44.68' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.8 cfs @ 12.16 hrs HW=44.68' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 1.8 cfs @ 1.0 fps)

Summary for Pond 4P: sediment forebay

Inflow Area = 0.550 ac, 62.59% Impervious, Inflow Depth > 3.81" for 100 yr event
Inflow = 2.5 cfs @ 12.09 hrs, Volume= 0.17 af
Outflow = 2.4 cfs @ 12.10 hrs, Volume= 0.17 af, Atten= 1%, Lag= 0.5 min
Primary = 2.4 cfs @ 12.10 hrs, Volume= 0.17 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 44.74' @ 12.15 hrs Surf.Area= 773 sf Storage= 431 cf

Plug-Flow detention time= 31.0 min calculated for 0.17 af (96% of inflow)
Center-of-Mass det. time= 10.6 min (830.4 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	43.80'	568 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.80	200	165.0	0	0	200
44.00	300	170.0	50	50	337
44.80	825	205.0	433	482	1,393
44.90	885	205.0	85	568	1,413

Device	Routing	Invert	Outlet Devices
#1	Primary	44.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50

Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66
2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.4 cfs @ 12.10 hrs HW=44.72' TW=44.52' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.4 cfs @ 1.1 fps)

APPENDIX

Hydrologic Soil Group—Essex County, Massachusetts, Southern Part
(545 Bay Rd)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Essex County, Massachusetts, Southern Part
Survey Area Data: Version 11, Sep 19, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 29, 2014—Sep 19, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Essex County, Massachusetts, Southern Part (MA606)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
32A	Wareham loamy sand, 0 to 3 percent slopes	A/D	1.6	8.8%
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	A	13.1	69.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	1.3	7.1%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	A	0.8	4.4%
254D	Merrimac fine sandy loam, 15 to 25 percent slopes	A	0.6	3.1%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	A	1.3	6.9%
Totals for Area of Interest			**18.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

CONSTRUCTION PERIOD POLLUTION PREVENTION PLAN FOR A PROPOSED STORMWATER MANAGEMENT SYSTEM

Located at

545 BAY ROAD
SOUTH HAMILTON, MASSACHUSETTS

Applicant:

Institution for Savings
93 State Street
Newburyport, Massachusetts 01950

Prepared by:

Meridian Associates, Inc.
500 Cummings Center, Suite 5950
Beverly, Massachusetts 01915
(978) 299-0447

July 17, 2015

Project Name: 545 Bay Road
South Hamilton, Massachusetts

Owner Name: Hamilton Gardens, Inc.
545 Bay Road
South Hamilton, Massachusetts 01982

Party Responsible for Maintenance: Institution for Savings
93 State Street
Newburyport, Massachusetts 01950
Contact: Kimberly A. Rock, 978-462-3106

Project Description:

The locus property is comprised of approximately 0.7 ± acres located at 545 Bay Road in Hamilton, Ma. The property is located at the corner of Bay Road and Bridge Street and is surrounded by residential properties. There are no wetlands or waters within 100' of the project property lines.

The project site is currently occupied by Hamilton Gardens consisting of a greenhouse with attached retail space and office/plant preparation space, accessory barn, accessory garage, stone exterior display spaces and combination bituminous and gravel parking areas. Topography consists of mild slopes ranging from 1% to 5% directing stormwater from Bay Road in a southeasterly direction towards the rear of the property.

The applicant is proposing to demolish the existing buildings and construct a single bank branch building. An associated driveway ranging from Bay Road to Bridge Street is also proposed along with associated parking areas and bank drive thru.

Erosion and Sedimentation Control Measures During Construction Activities

Erosion Control Sock

Erosion Control Socks are proposed to be installed, as shown on the site plan, around the perimeter of the redevelopment. The barriers are burlap fabric mitts filled with compost blends and shall be installed prior to the commencement of any work on-site and in accordance with the design plans. An additional supply of socks shall be on-site to replace and/or repair socks that have been disturbed. The lines of socks shall be inspected and maintained on a weekly basis during construction. Deposited sediments shall be removed when the level of deposition reaches approximately one-half the height of the Erosion Control Sock.

Storm Drain Inlet Protection

A temporary storm inlet protection filter will be placed within catchbasins CB1 and CB4 as shown on the site plans. The purpose of the filter is to prevent the inflow of sediments into the closed drainage system. The filter shall remain in place until a permanent vegetative cover is established and the transport of sediment is no longer visibly apparent. The filter shall be inspected and maintained on a weekly basis and after every storm of 0.25 inches or more of rainfall/precipitation.

Surface Stabilization

The surface of all disturbed areas shall be stabilized during and after construction as soon as practical but no more than fourteen (14) days after construction activity has temporarily or permanently ceased on that portion of the site. Temporary measures shall be taken during construction to prevent erosion and siltation. No construction sediment shall be allowed to enter any infiltration systems. All disturbed slopes will be stabilized with a permanent vegetative cover. Stabilization netting or tackifier applied with hydroseeding shall be used on all slopes 3:1 or greater. Some or all of the following measures will be utilized on this project as conditions may warrant.

a. Temporary Seeding
b. Temporary Mulching
c. Permanent Seeding
d. Placement of Sod
e. Hydroseeding
f. Placement of Hay
g. Placement of Jute Netting

Street Sweeping

Any sediment tracked onto public right-of-ways shall be swept at the end of each working day.

Surface Infiltration Basin

The Surface Infiltration Basin shall be checked weekly and after major storm events during construction for rilling, erosion, and debris removal. Avoid compaction of the parent material by working from the edge of the area proposed as the location of the Surface Infiltration Basin.

Sediment Forebay

Sediment forebay to be checked weekly and after major storm events for erosion, rilling, trash, and debris removal. After construction of the basins, stabilize the floor and side slopes of the basins with a dense turf of water tolerant grass. Use low maintenance, rapidly germinating grasses such as fescues. No runoff shall be directed to the basins until the bottom and side slopes are fully stabilized.

Interim Erosion Control

Additional erosion control measures shall be implemented as conditions warrant during construction or as directed by the owner or owner's representative.

Construction Entrance

Install the construction entrance as shown on the plans. The entrance should be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic topdressing with additional stone. Inspect entrance/exit pad and sediment disposal area weekly and after heavy rains or heavy use. Remove mud and sediment tracked or washed onto public roads immediately. Mud and soil particles will eventually clog the voids in the gravel and the effectiveness of the gravel pad will not be satisfactory. When this occurs, the pad should be top dressed with new stone. Complete replacement of the pad may be necessary when the pad becomes

completely clogged. Reshape pad as needed for drainage and runoff control. Repair any broken road pavement immediately.

Topsoil Stockpile

Locate the topsoil stockpile so it does not interfere with work on the site. Side slopes of the stockpile should not exceed 2:1. Surround all stockpiles with silt fence or erosion control socks.

Outlet Protection

Inspect rip rap outlet structures after heavy rains for erosion at sides and ends of apron and for stone displacement. Rock may need to be added if sediment builds up in the pore spaces of the outlet pad. Make repairs immediately using appropriate stone sizes. Do not place stones above finished grade.

Removal

When construction is complete, the contractor shall remove all siltation devices after re-vegetation of disturbed areas and after written approval from the project engineer.

Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover

- All materials on site will be stored inside in a neat, orderly, manner in their appropriate containers with the original manufacturer's label. Appropriate cover of materials shall be provided to prevent these chemicals from contact with rainwater.
- Only store enough material necessary. Whenever possible, all of a product shall be used up before disposing of container
- Manufacturer, local, and State recommendations for proper use and disposal shall be followed.

Construction Vehicles & Equipment

- At the end of each work day, all construction vehicles shall be parked within the project limit of work.
- All fueling and maintenance of vehicles and equipment shall be performed outside resource buffer zones. Storage, handling and disposal of fuels and liquids in relation to construction vehicles and equipment shall be conducted in compliance with National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities (CGP) 2012 Section 2.3.

Spill prevention and response plans

- Spill Control Practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) CGP 2012.
- Clean up spills immediately, using dry cleanup methods where possible and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.
- Spill kits shall be readily available onsite during construction.

Provisions for maintenance of lawns, gardens, and other landscaped areas

- Refer to landscape plans for maintenance of planted areas.

Requirements for storage and use of fertilizers, herbicides and pesticides

- Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to

storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
- Do not fertilize before a rainstorm.
- Consider using organic fertilizers. They release nutrients more slowly.
- Pesticides shall be applied on lawns and gardens only when necessary and applied only in the minimum amounts recommended by the manufacturer.

Provisions for solid waste management
- All solid waste shall be disposed of or recycled in accordance with local town regulations.

Snow disposal and plowing
- Snow shall be plowed and stored on gravel, grass, or other permeable surfaces to allow filtration to occur.
- Once snow melts all sand salt and debris shall be extracted from surface and properly disposed of.
- Snow shall not be disposed of in any wetland resource area or waterbody.
- Avoid disposing snow on top of existing storm drain catchbasins or within infiltration basin.

STORMWATER MANAGEMENT - CONSTRUCTION PHASE

INSPECTION SCHEDULE AND EVALUATION CHECKLIST

PROJECT LOCATION: 545 Bay Road, South Hamilton, Massachusetts

Major Event = Rainstorm of ¼-inch or more

Inspection Date	Inspector	Area Inspected	Best Management Practice (yes/no)	Required Inspection Frequency if BMP	Comments	Recommendation	Follow-up Inspection Required (yes/no)
		Erosion Control Sock	No	Weekly and After Major Storm Events			
		Storm Drain Inlet Protection	Yes	Weekly and After Major Storm Events			
		Surface Infiltration Basin	Yes	Weekly and After Major Storm Events			
		Sediment Forebay	Yes	Weekly and After Major Storm Events			
		Construction Entrance	Yes	Weekly and After Major Storm Events			
		Soil Stockpile Area	No	Weekly and After Major Storm Events			
		Outlet Protection	Yes	Weekly and After Major Storm Events			

(1) Refer to the Massachusetts Stormwater Handbook, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.

(2) Inspections to be conducted by a qualified professional knowledgeable in the principles & practice of erosion and sediment controls and pollution prevention

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

Other notes: (Include deviations from: Con. Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

Stormwater Control Manager: _____

OPERATION AND LONG TERM MAINTENANCE PLAN

Located at

545 BAY ROAD SOUTH HAMILTON, MASSACHUSETTS

Applicant:

Institution for Savings
93 State Street
Newburyport, Massachusetts 01950

Prepared by:

Meridian Associates, Inc.
500 Cummings Center, Suite 5950
Beverly, Massachusetts 01915
(978) 299-0447

July 17, 2015

Project Name: 545 Bay Road
South Hamilton, Massachusetts

Owner Name: Hamilton Gardens, Inc.
545 Bay Road
South Hamilton, Massachusetts 01982

Party Responsible for Maintenance: Institution for Savings
93 State Street
Newburyport, Massachusetts 01950
Contact: Kimberly A. Rock, 978-462-3106

Project Description:

The locus property is comprised of approximately 0.7 ± acres located at 545 Bay Road in Hamilton, Ma. The property is located at the corner of Bay Road and Bridge Street and is surrounded by residential properties. There are no wetlands or waters within 100' of the project property lines.

The project site is currently occupied by Hamilton Gardens consisting of a greenhouse with attached retail space and office/plant preparation space, accessory barn, accessory garage, stone exterior display spaces and combination bituminous and gravel parking areas. Topography consists of mild slopes ranging from 1% to 5% directing stormwater from Bay Road in a southeasterly direction towards the rear of the property.

The applicant is proposing to demolish the existing buildings and construct a single bank branch building. An associated driveway ranging from Bay Road to Bridge Street is also proposed along with associated parking areas and bank drive thru.

Inspection and Maintenance Measures After Construction

Erosion Control

Eroded sediments can adversely affect the performance of the stormwater management system. Eroding or barren areas should be immediately re-vegetated.

Infiltration Basin

Once the basin is in use, inspect after every major storm (a storm that is equal or greater than the 2 year 24 hour storm of 3.1") for the first few months to ensure it is stabilized and functioning properly. Subsequently, inspect the infiltration basin at least twice per year. Important items to check during the inspection include cracking, erosion, leakage in the embankments, tree growth on the embankments, condition of riprap, sediment accumulation and the health of all turf.

Twice a year mow the side slopes and basin bottom. Remove grass clippings and accumulated organic matter to prevent an impervious organic mat from forming. Remove trash and debris at the same time. Use deep tilling to break up clogged surfaces and revegetate immediately.

Remove sediment from the basin as necessary but wait until the floor of the basin is thoroughly dry. Use light equipment to remove the top layer so as to not compact the underlying soil. Deeply till the remaining soil and revegetate as soon as possible.

The grassed areas immediately at the discharge point and down-slope of the rip-rap shall be inspected after major storm events, or at minimum twice per year. These locations will be subject to concentrated flows and therefore may be prone to erosion and the formation of "gulleys" or channels. If any "gulleys" or channels are observed, they should immediately be repaired by installing sod and reseeding with grass. These areas shall be reseeded until a stable groundcover is established.

Debris and Litter Removal

Trash may collect in the BMP's, potentially causing clogging of the facilities. All debris and litter shall be removed when necessary, and after each storm event.

Sediment Forebay

Maintenance of the sediment forebay is important to prevent resuspension of accumulated sediments. Inspect and clean the sediment forebay two times a year to remove accumulated sediment. During inspection, check for rilling or gullying and repair as needed. Remove any trash or debris. After removing sediment, replace any vegetation damaged during the clean out by either reseeding or resodding. When reseeding, incorporate practices such as hydroseeding with tackifier or blanket to ensure no scour occurs while seeds develop roots. Keep grass mowed no lower than 3-4 inches.

Outlet Protection

Inspect rip rap outlet structures after heavy rains for erosion at sides and ends of apron and for stone displacement. Rock may need to be added if sediment builds up in the pore spaces of the outlet pad. Make repairs immediately using appropriate stone sizes. Do not place stones above finished grade.

Good Housekeeping Practices (in accordance with Standard 10 of the Stormwater Management Handbook to prevent illicit discharges)

Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover

- All materials on site will be stored inside in a neat, orderly, manner in their appropriate containers with the original manufacturer's label.
- Only store enough material necessary. Whenever possible, all of a product shall be used up before disposing of container
- Manufacturer, local, and State recommendations for proper use and disposal shall be followed.

Vehicle washing controls

- A commercial car wash shall be used when possible. Car washes treat and/or recycle water.
- Cars shall be washed on gravel, grass, or other permeable surfaces to allow filtration to occur.
- Use biodegradable soaps.
- A water hose with a nozzle that automatically turns off when left unattended.

Requirements for routine inspection and maintenance of stormwater BMPs

- See Inspection and Maintenance Measures after Construction.

Spill prevention and response plans

- Spill Control Practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan (SWPPP)

Provisions for maintenance of lawns, gardens, and other landscaped areas

- Grass shall not be cut shorter than 3 inches.
- Use low volume water approaches such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems.
- The use of mulch shall be utilized where possible. Mulch helps retain water and prevents erosion.
- Weed, cultivate, re-mulch, prune or remove dead material, and re-set plants to proper grades or upright position, as necessary.

Requirements for storage and use of fertilizers, herbicides and pesticides

- Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
- Do not fertilize before a rainstorm.
- Consider using organic fertilizers. They release nutrients more slowly.
- Pesticides shall be applied on lawns and gardens only when necessary and applied only in the minimum amounts recommended by the manufacturer.

Pet waste management

- Scoop up and seal pet wastes in a plastic bag. Dispose of properly, in the garbage.

Provisions for operation and management of septic systems

- Follow requirements of Massachusetts Title V and Town of Hamilton Board of Health Regulations.

Provisions for solid waste management

- All solid waste shall be disposed of or recycled in accordance with local town regulations.

Snow disposal and plowing plans relative to Wetland Resource Area

- Snow shall be plowed and stored on gravel, grass, or other permeable surfaces to allow filtration to occur.
- Once snow melts all sand salt and debris shall be extracted from surface and properly disposed of.
- Snow shall not be disposed of in any wetland resource area or waterbody.
- Avoid disposing snow within infiltration basin.

Winter Road Salt and/or Sand use and storage restrictions

- Salt storage piles shall be covered at all times.
- The amount of road salt applied should be regulated to prevent over salting of roadways and increasing runoff concentrations. Alternative materials, such as sand or gravel, should be used in especially sensitive areas.

Roadway and Parking Lot sweeping schedule

- Pavement sweeping shall be conducted at a frequency of not less than once per year
- Removal of any accumulated sand, grit, and debris from driveway after the snow melts shall be completed shortly after snow melts for the season.

Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL

- Not Applicable

Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan

- To be determined by the owner.

List of Emergency contacts for implementing Long-Term Pollution Prevention Plan

- To be determined by the owner.

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STORMWATER MANAGEMENT
POST-CONSTRUCTION PHASE

INSPECTION SCHEDULE AND EVALUATION CHECKLIST

PROJECT LOCATION: 545 Bay Road, South Hamilton, Massachusetts

Inspection Date	Inspector	Area Inspected	Best Management Practice (yes/no)	Required Inspection Frequency if BMP	Recommendation	Follow-up Inspection Required (yes/no)
		Infiltration Basin	Yes	Monthly (Trash removal) Twice a year (General maintenance)		
		Sediment Forebay	Yes	First months after construction then Twice a year (Mow as necessary)		
		Outlet Protection	Yes	Inspect with Infiltration Basin		

Comments: _____

_____

_____

_____

(1) Refer to the Massachusetts Stormwater Handbook, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.

(2) Inspections to be conducted by a qualified professional knowledgeable in the principles & practice of erosion and sediment controls and pollution prevention

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.
Other notes: (Include deviations from: Con. Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

Stormwater Control Manager: _____

SOIL NOTE

THE SOIL DESIGNATIONS WITHIN THE LOCUS PROPERTY SUBCATCHMENT LIMITS HAVE BEEN DELINEATED BY USDA NATURAL RESOURCES CONSERVATION SERVICE. THE ENTIRE PROPERTY HAS BEEN DELINEATED AS SOIL TYPE 254A–MERRIMAC SANDS. THIS SOIL TYPE HAS A HYDROLOGIC SOIL GROUP RATING OF A.

LEGEND

- SC#1 — SUBCATCHMENT AREA
- DP#1 — DESIGN POINT
- OVERLAND FLOW LINE
- OVERLAND FLOW DIRECTION

GRAPHIC SCALE

SCALE: 1"=20'

10 0 10 20 40

N

MERIDIAN IS BASED UPON LAND COURT CASE 14817–D *

BAY (1910 STATE HIGHWAY LAYOUT NO. 1280) ROAD (PUBLIC – VARIABLE WIDTH)

BRIDGE STREET (1931 COUNTY LAYOUT NO. 2482) (PUBLIC – 50' WIDE)

DP#2

DP#1

SC#1

SC#2

LOT 11

LOT 13

LOTS 11&13
TOTAL AREA
=30,437±S.F.

No. 545

GREENHOUSE RETAIL

GREENHOUSE

BARN

GARAGE

SEPTIC TANK

POSSIBLE SINK-DRYWELL

1000 GALLON PIT

CONC. PAD

BIT. CONC. DRIVEWAY

BIT. CONC. SIDEWALK

WOOD FENCE

PERGOLA

COBBLESTONE

DRIVEWAY OPENING

CB3
RIM=46.5
INVa,b=43.2
INVc=43.5

CB4
RIM=45.3
DEBRIS=43.8

SMH
RIM=47.8

CB2
RIM=43.6
W.L.=40.3
NPV

NOW OR FORMERLY
THEIN & SARAH ABERNETHY OO
6 ORCHARD ROAD
DEED BOOK 14494, PAGE 560 *

NOW OR FORMERLY
TODD MATHEW
10 ORCHARD ROAD
DEED BOOK 27887, PAGE 466 *

NOW OR FORMERLY
DANIEL H & ROBIN D
SEARS

#6

#14

DATE	DESCRIPTION	BY
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EXISTING CONDITIONS WATERSHED PLAN

LOCATED IN
HAMILTON, MASSACHUSETTS
ASSESSORS MAP 49, LOT 37
545 BAY ROAD
PREPARED FOR
INSTITUTION FOR SAVINGS

MERIDIAN ASSOCIATES
500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 922-8031
69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
TELEPHONE: (508) 871-7030
WWW.MERIDIANASSOC.COM

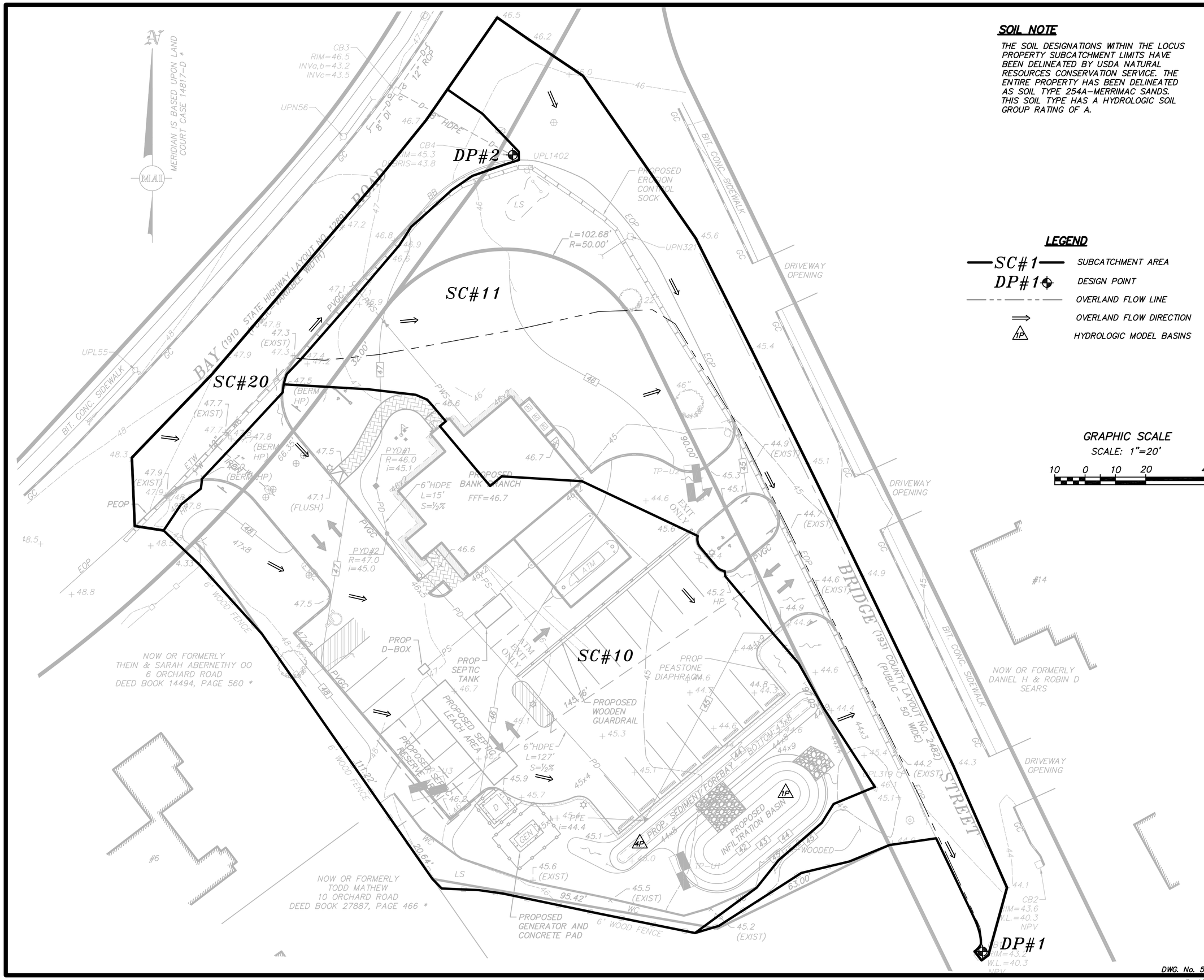
DATE: JULY 17, 2015

SCALE: 1" = 20'

SHEET No. 1 OF 2

PROJECT No. 5775

DWG. No. 5775–PRE



SOIL NOTE

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LEGEND

- SC#1 — SUBCATCHMENT AREA
- DP#1 — DESIGN POINT
- OVERLAND FLOW LINE
- OVERLAND FLOW DIRECTION
- HYDROLOGIC MODEL BASINS

GRAPHIC SCALE

SCALE: 1"=20'

10 0 10 20 40

DATE	DESCRIPTION	BY
---	---	---

PROPOSED CONDITIONS WATERSHED PLAN

LOCATED IN
HAMILTON, MASSACHUSETTS
ASSESSORS MAP 49, LOT 37
545 BAY ROAD
PREPARED FOR
INSTITUTION FOR SAVINGS

MERIDIAN ASSOCIATES
500 CUMMINGS CENTER, SUITE 5950
BEVERLY, MASSACHUSETTS 01915
TELEPHONE: (978) 922-8031
69 MILK STREET, SUITE 302
WESTBOROUGH, MASSACHUSETTS 01581
TELEPHONE: (508) 871-7030
WWW.MERIDIANASSOC.COM

DATE: JULY 17, 2015

SCALE: 1" = 20'

SHEET No. 2 OF 2

PROJECT No. 5775

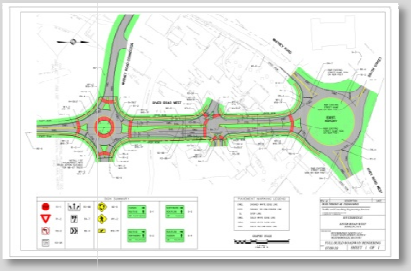
DWG. No. 5775-POST

Ron Müller & Associates
Traffic Engineering and Consulting Services

56 Teresa Road
Hopkinton, MA 01748
Tel.: (508) 395-1576
Fax: (508) 435-2481
www.RonMullerAssociates.com

Quality

Traffic Assessment



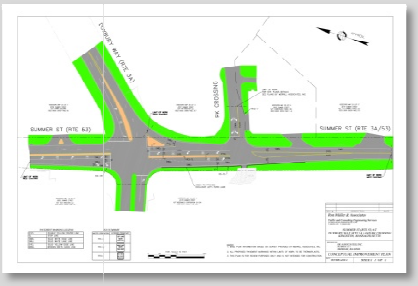
Proposed Bank
Hamilton, Massachusetts

Accuracy

Prepared for:

Institution for Savings
93 State Street
Newburyport, MA 01950

Integrity



July 14, 2015

Ron Müller & Associates
Traffic Engineering and Consulting Services

56 Teresa Road
Hopkinton, MA 01748
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Fax: (508) 435-2481
www.RonMullerAssociates.com

Traffic Assessment

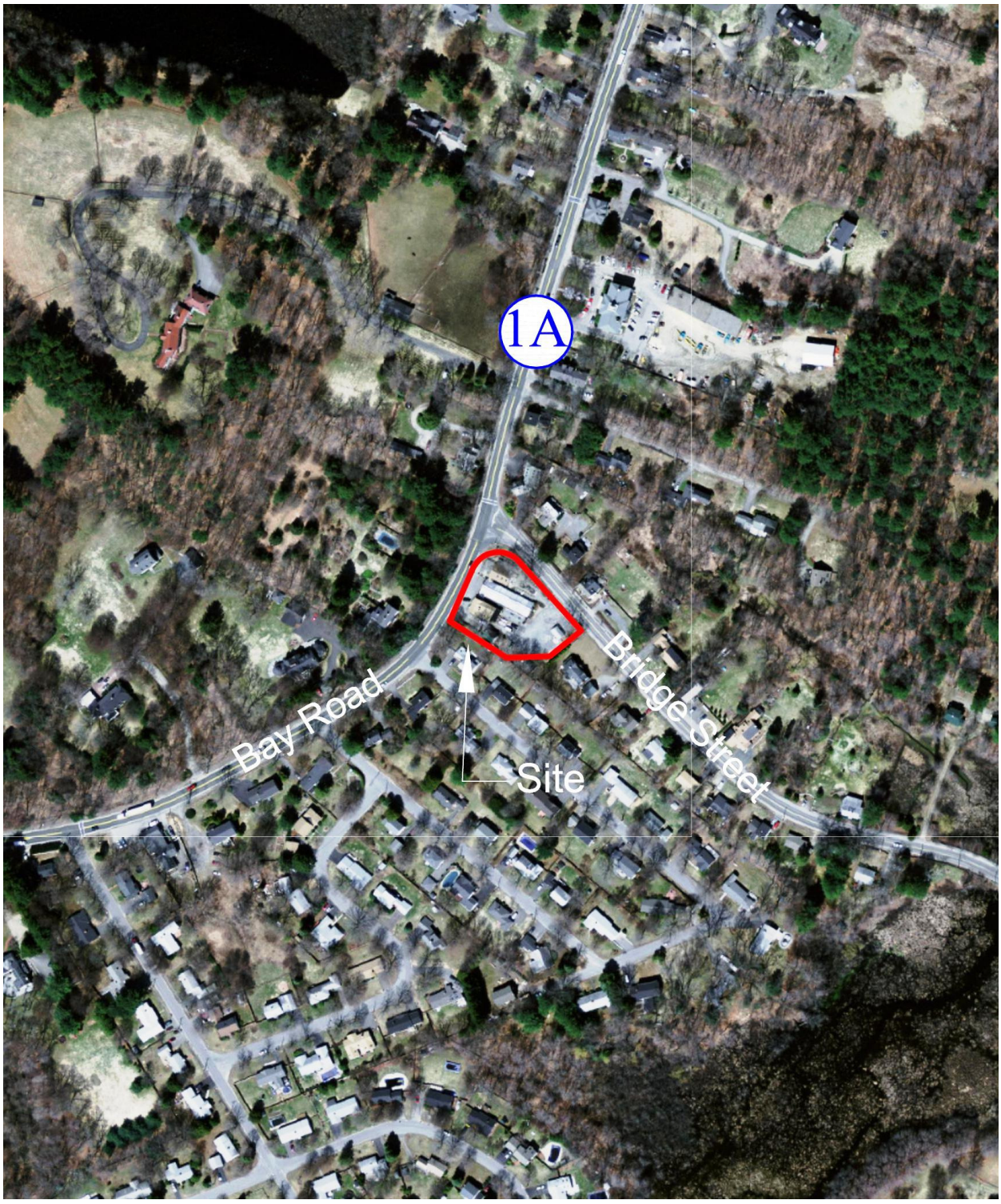
To:	Ms. Kim Rock, Executive VP Institution for Savings 93 State Street Newburyport, MA 01950	Reg:	Proposed Bank Bay Road at Bridge Street Hamilton, MA
		Date:	July 14, 2015
From:	Ron Müller, P.E., Principal	Project #:	15031

INTRODUCTION

Ron Müller & Associates (RMA) has conducted this Traffic Assessment for the development of an approximately 3,600 square foot Institution for Savings bank with two drive-through teller lanes and one drive-up automated teller machine (ATM) to be located in the southeast corner of the Bay Road (Route 1A) and Bridge Street intersection in Hamilton, Massachusetts. A total of 24 on-site parking spaces are proposed to service the bank. The site presently contains Hamilton Gardens, an approximately 7,180 square foot greenhouse, nursery and retail shop. Access to the site is currently provided via a wide-open curb cut on Route 1A that is used for parking along the building front and a large curb cut on Bridge Street. As proposed, both of these curb cuts will be significantly narrowed to provide a 24-foot wide driveway on Route 1A and a 24-foot wide driveway on Bridge Street. There will also be a separate 14-foot wide driveway on Bridge Street for traffic exiting the drive-through teller and ATM lanes. The site location in relation to the surrounding roadways is shown on Figure 1.

This memorandum has been prepared to assess the safety of the proposed site driveways, estimate the traffic generation characteristics of the project, provide an assessment of the drive-through queue and parking impacts, and make recommendations to mitigate/minimize these impacts. As documented in this report, the proposed bank is expected to generate less traffic than the existing business on a typical Saturday. During the peak weekday hour (Friday afternoon), the bank will result in a minimal increase in traffic. The proposed driveway modifications will provide better controlled access to/from the site and eliminate the need for vehicles to back out onto the state highway. Sight lines from the proposed driveway locations will meet minimum design requirements assuming the clearing of roadside vegetation along the Bridge Street frontage.

Figure 1
Site Location Map



Based on empirical drive-through queue and parking data observed at other Institution for Savings banks, ample queue storage will be provided for the teller lanes. The queue storage at the ATM lane may be exceeded during peak times (Saturday mornings) and temporarily block on-site circulation.

VEHICLE SPEEDS

Speed measurements were conducted along Route 1A and along Bridge Street adjacent to the site to determine the minimum sight distance requirements, which are based on the speed of traffic. Speeds were recorded by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time is recorded using a stop watch and the speed is derived by dividing the elapsed time into the measured distance between checkpoints. The results of the speed measurements are summarized in Table 1 and the speed data are provided in the Appendix.

Table 1
Observed Travel Speeds [a]

Location/Direction	Posted Speed Limit	Average Speed	85th Percentile Speed [b]
Route 1A adjacent to the Site:			
Northbound	35	33	36
Southbound	35	26	31
Bridge St. adjacent to the Site:			
Eastbound	30	23	26
Westbound	30	28	30

[a] In miles per hour (mph).
[b] Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 1, travel speeds along Route 1A and Bridge Street adjacent to the site were observed to be consistent with, or slightly below the posted speed limit. This is likely the result of police presence and enforcement within the area during the data collection effort. These observed and posted speed limits were used to determine minimum sight line requirements.

SIGHT DISTANCE

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway locations to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)[1]. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Department of Transportation (MassDOT) and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

[1] *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

The available SSD and ISD at the proposed site driveway locations were measured and compared to minimum requirements as established by AASHTO. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted as presented in the previous section. Based on both the posted speed limits and the observed speeds, the SSD and ISD requirements at these intersections were calculated. The required minimum sight distances for each speed are compared to the available distances, as shown in Table 2.

Table 2
Sight Distance Summary

	Intersection Sight Distance (feet)		
Location/Direction	Measured	Minimum Required [a]	Desirable [b]
Route 1A at Site Drive:			
North of intersection	400+	260	390
South of Intersection	390	260	390
Bridge Street at Site Drive:			
East of intersection	400+	200	335
West of intersection	220	165	335
Bridge Street at Drive-Thru Exit:			
East of intersection	400+	200	335
West of intersection	180	165	335

[a] Values based on AASHTO SSD requirements for vehicles driving at the observed 85th percentile speed of 36 mph. On Bridge Street, values based on AASHTO SSD requirements for vehicles driving at the observed 85th percentile speeds of 26 mph eastbound and 30 mph westbound.
[b] Values based on AASHTO ISD requirements for posted speed limit of 35 mph on Route 1A and 30 mph on Bridge Street.

As shown in Table 2, ample sight distances will exist at the proposed site driveway locations exceeding the minimum requirements. Clearing of existing roadside vegetation along the site frontage on Bridge Street is required to achieve the measured values presented in the table. The desirable sight distances are met at all locations except to the west of the Bridge Street driveways due to the proximity of the intersection with Route 1A. However, vehicles turning onto Bridge Street will be doing so at much slower speeds than assumed in the sight distance calculations and adequate sight lines are therefore provided. It is recommended that all proposed landscaping, fences, signs, and any other obstructions along the site frontage be kept low to the ground (less than 3 feet above street level within the sight triangles as defined by AASHTO) or set back sufficiently so as not to impede sight distances for drivers exiting the site.

TRIP GENERATION

The traffic to be generated by the proposed bank was estimated using both the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[2] and empirical trip generation data collected at two exiting Institution for Savings banks located in Rowley and Salisbury, Massachusetts. While the bank will be 3,600 square feet in size, only approximately 3,000 square feet will be usable space as the second floor is partially open to the ground floor. Therefore, and to be consistent with the trip rate calculations used for the Rowley and Salisbury sites, a 3,000 square foot bank building was assumed for trip-generation purposes. Table 3 summarizes the comparison using the ITE and empirical rates for the proposed bank facility and all trip generation calculations are provided in the Appendix.

Table 3
Bank Traffic Generation

Time Period	ITE Trip Generation Estimate [a]	Empirical Data Generation Estimate [b]
Weekday Daily	440	NA[c]
Weekday PM Peak Hour		
Enter	37	35
Exit	36	37
Total	73	72
Saturday Daily	260	NA
Saturday Peak Hour		
Enter	40	45
Exit	39	45
Total	79	90

[a] ITE Land Use Code 912 (Drive-In Bank) trip rates applied to 3,000 sf.
[b] Based on actual driveway counts conducted at the existing Rowley (3,100 sf) and Salisbury (3,620 sf) banks on Friday February 10 and Saturday February 11, 2012 and the resulting trip rates applied to 3,000 sf.
[c] Data not collected.

As shown in the table, the trips calculated using the ITE data correlate very well with the empirical data collected at the existing Institution for Savings banks. Since the empirical rates were slightly higher during the Saturday peak hour, the empirical data were used to estimate traffic generation for the new bank. Accordingly, the proposed bank is expected to generate 72 peak hour vehicle trips (35 entering and 37 exiting) during the Friday PM peak hour (one hour

[2] *Trip Generation Manual, 9th Edition;* Institute of Transportation Engineers; Washington, DC, 2012.

between 3:00 and 6:00 PM) and 90 trips (45 entering and 45 exiting) during the Saturday morning peak hour (one hour between 9:00 AM and 12:00 PM).

The site is currently occupied by the Hamilton Gardens greenhouse and nursery and generating traffic. Since the current operation at the greenhouse has been reduced in scale over previous years, the traffic that could be generated by the existing business was estimated using ITE Land Use Code 817 (Nursery/Garden Center). The resulting change in traffic from re-use of the property is shown in Table 4.

Table 4
Trip Generation Comparison

Time Period	Existing Greenhouse [a]	Proposed Bank [b]	Change
Weekday Daily	490	440	-50
Weekday PM Peak Hour			
Enter	25	35	+10
Exit	25	37	+12
Total	50	72	+22
Saturday Daily	960	260	-700
Saturday Peak Hour			
Enter	72	45	-27
Exit	72	45	-27
Total	144	90	-54

[a] ITE Land Use Code 817 (Nursery/Garden Center) trip rates applied to 7,180 sf.
[b] From Table 3.

As shown in this comparison, the proposed bank will generally generate less traffic than the existing business, particularly on Saturdays. Only during the weekday PM peak hour is there an expected increase in traffic at the site of 22 vehicle trips (10 entering cars and 12 exiting). Once distributed onto Route 1A both north and south of the site as well as on Bridge Street, the resulting volume increases during the PM peak hour will be negligible.

Furthermore, not all vehicle trips generated by a bank represent *new* trips on the surrounding roadway system. Studies have shown that for bank developments, a substantial portion of the site-generated vehicle trips are already present in the adjacent passing stream of traffic (referred to as pass-by traffic) or are diverted from another route to the proposed site. Based on information published in the ITE *Trip Generation Handbook*, surveys conducted nationwide indicate that, on average, pass-by traffic can account for 47 percent of the traffic generated by drive-in banks. By comparison, it is expected that a nursery and garden center is predominantly a destination use, meaning that most of the trips are primary trips and not pass-by. It is therefore

reasonable to assume that the proposed bank will generate fewer destination trips to the site during all time periods than the existing business.

DRIVE-THROUGH OPERATION

Vehicle queues were observed at the drive-through teller and drive-up ATM facilities at the Institution for Savings sites in Rowley and Salisbury, Massachusetts. The drive-through queue data are provided in the Appendix. From these observations, it was determined that during the Friday PM time period (3:00 to 6:00 PM), which represents the busiest weekday time period for a bank, the average queues at the drive-up teller and ATM lanes were approximately one vehicle and the maximum queues were 2 vehicles. During the Saturday morning time period (9:00 AM to 12:00 PM), the average queues were less than 2 vehicles and the maximum queues at both lanes were 4 vehicles. It should be noted that the Rowley site provided two teller lanes and one ATM lane, whereas the Salisbury site contained only one teller lane and one ATM lane. At the Rowley site, which has the same number of teller lanes as the proposed site, a maximum queue of 2 vehicles was observed at the teller lanes. Accordingly, it is expected that the proposed bank will experience an average queue of one vehicle in each of the drive-through lanes and a maximum queue of 2 vehicles at the teller lanes and 4 vehicles at the ATM lane.

Based on the site plan prepared by Meridian Associates, Inc., each of the drive-through lanes can accommodate 3 vehicles in queue. Ample storage is therefore provided for the teller lanes. At the ATM lane, the presence of a fourth vehicle in queue would temporarily block on-site circulation. However, this situation would only occur during peak times (Saturday mornings).

PARKING

Customer parking data were also collected at the Rowley and Salisbury sites during the Friday PM and Saturday morning time periods and these data are also provided in the Appendix. Based on the counts, the Rowley site experienced a maximum customer parking demand of 7 spaces with an average of 3 spaces. The Salisbury site experienced a maximum customer parking demand of 8 spaces with an average of also 3 spaces.

As shown on the site plan prepared by Meridian Associates, Inc., a total of 24 parking spaces are proposed on site. Based on projections by the Institution for Savings, a maximum of 6 employees will be at the site at any one time. Therefore, it is expected that a maximum of 14 spaces will be occupied at any one time and more than adequate on-site parking will be provided.

SITE ACCESS

Access to the site is currently provided via an approximately 130-foot wide curb cut on Route 1A used for parking along the building front and an approximately 50-foot wide curb cut on Bridge Street. As proposed, both of these curb cuts will be closed and a defined 24-foot wide driveway with 20-foot corner radii will be constructed on Route 1A and a 24-foot wide driveway with 10-foot corner radii will be provided on Bridge Street. In addition, a separate 14-foot wide exit-only driveway will be constructed on Bridge Street for the drive-up teller and ATM lanes.

Route 1A is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT) and a Highway Access Permit application will need to be made to the MassDOT District 4 office. MassDOT generally requires commercial driveways to provide 30-foot corner radii. However, MassDOT also states that the design of the driveway should be based on the largest vehicle expected to use the site. In the case of the proposed bank, the largest vehicle to access the site would be a single-unit truck. The proposed driveway design can accommodate this design vehicle without requiring a truck to cross the centerline of Route 1A. The design of the proposed Bridge Street driveways is sufficient to accommodate passenger vehicles.

It is recommended that both full access/egress driveways be striped to provide a double yellow centerline and a stop line at the intersections with the adjacent streets and STOP (R1-1) signs should be placed adjacent to the stop lines at both driveways. The exit-only driveway for the teller lanes should be striped with a stop line across the entire driveway and a STOP-sign installed adjacent to the stop line. DO NOT ENTER (R5-1) signs should be posted on both sides of the exit-only driveway and facing Bridge Street traffic.

CONCLUSIONS

The proposed 3,000 square foot Institution for Savings bank with two drive-through teller lanes and one drive-up automated teller machine (ATM) will generate less traffic on Saturdays than the existing Hamilton Gardens greenhouse and nursery. During the weekday peak hour (Friday afternoon), the bank will generate 22 vehicle trips (10 entering cars and 12 exiting) more than the existing business. However, nearly half of a bank's business is drawn from the traffic already on the adjacent streets, whereas traffic to a greenhouse is predominantly destination traffic. It is therefore reasonable to assume that the proposed bank will generate fewer destination trips to the site during all time periods than the existing business.

Access to the site is currently provided via a wide-open curb cut on Route 1A that is used for parking along the building front and a large curb cut on Bridge Street. As proposed, both of these curb cuts will be closed and a new 24-foot wide driveway will be constructed on Route 1A and a new 24-foot wide driveway will be constructed on Bridge Street. In addition, a 14-foot wide exit-only driveway will be provided on Bridge Street for the drive-through teller and ATM

lanes. These changes will provide better controlled access to/from the site and eliminate the need for vehicles to back out onto the state highway. The driveway design is sufficient to accommodate single-unit trucks, which are the largest vehicles expected to use the site. A MassDOT Highway Access Permit will be required for access to Route 1A. It is recommended that centerline striping, stop lines, and STOP signs be installed on all driveways and DO NOT ENTER signs be installed at the exit-only driveway facing Bridge Street traffic.

Vehicle speeds were measured along the adjacent roadways and were found to be consistent with or lower than the posted speed limits of 35 mph on Route 1A and 30 mph on Bridge Street. Based on the observed and posted speed limits, sight lines from the proposed driveway locations will exceed minimum design requirements and safe operation can therefore be expected. Recommendations are described in this report including the clearing of existing roadside vegetation along the Bridge Street site frontage and keeping any proposed landscaping, fences, signs, or other obstructions along the site frontages low to the ground (less than 3 feet above street level within the sight triangles) or set back sufficiently so as not to impede sight distances for drivers exiting the site.

Based on drive-through queue counts collected at existing Institution for Savings banks, ample queue storage (3 cars) will be provided at the teller lanes to accommodate observed maximum queues (2 cars). The queue storage at the drive-up ATM lane (3 cars) is sufficient to accommodate the observed average queues (2 cars). The observed maximum queue of 4 cars at the ATM lane would temporarily block on-site circulation. However, this situation would only occur during peak times (Saturday mornings) and given the number of parking spaces provided, a motorist also has the option to park and use the walk-up ATM inside the bank instead.

Based on parking demand counts collected at existing Institution for Savings banks, it is expected that a maximum of 14 spaces will be occupied at any one time. A total of 24 parking spaces are proposed on-site and more than adequate parking will therefore be provided.

APPENDIX

Vehicle Speed Data
Trip Generation Worksheets
Drive-Through Queue and Parking Studies

Ron Müller & Associates

Traffic Engineering and Consulting Services
56 Teresa Road, Hopkinton, MA 01748
(508) 395-1576

SPOT SPEED DATA

Location:	Bay Road (adjacent to site), Hamilton	Date:	7/9/2015
Study Distance:	100 feet	Time:	4:30 PM
Weather:	Sunny	Speed Limit:	35 mph

		Northbound			Southbound		
Time (sec)	Speed (mph)	Number	Cum.	Percent	Number	Cum.	Percent
4.0	17.0		0	0%	4	4	10%
3.9	17.5		0	0%		4	10%
3.8	17.9		0	0%	2	6	15%
3.7	18.4		0	0%	1	7	18%
3.6	18.9		0	0%	1	8	20%
3.5	19.5		0	0%		8	20%
3.4	20.1		0	0%	1	9	23%
3.3	20.7		0	0%		9	23%
3.2	21.3		0	0%		9	23%
3.1	22.0		0	0%		9	23%
3.0	22.7		0	0%	1	10	25%
2.9	23.5		0	0%		10	25%
2.8	24.4	1	1	3%	3	13	33%
2.7	25.3	1	2	5%	5	18	45%
2.6	26.2	1	3	8%	2	20	50%
2.5	27.3	2	5	13%	3	23	58%
2.4	28.4		5	13%	5	28	70%
2.3	29.6	7	12	30%	4	32	80%
2.2	31.0	4	16	40%	5	37	93%
2.1	32.5	7	23	58%	1	38	95%
2.0	34.1	6	29	73%	2	40	100%
1.9	35.9	6	35	88%		40	100%
1.8	37.9	1	36	90%		40	100%
1.7	40.1	4	40	100%		40	100%
1.6	42.6		40	100%		40	100%
1.5	45.5		40	100%		40	100%
1.4	48.7		40	100%		40	100%
1.3	52.4		40	100%		40	100%
1.2	56.8		40	100%		40	100%
1.1	62.0		40	100%		40	100%
1.0	68.2		40	100%		40	100%
	TOTAL:	40			40		
Avg. Speed:			**33 mph**			**26 mph**	
85th % Speed:			**36 mph**			**31 mph**	

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SPOT SPEED DATA

Location:	Bridge Street (adjacent to site), Hamilton	Date:	7/9/2015
Study Distance:	100 feet	Time:	5:30 PM
Weather:	Sunny	Speed Limit:	30 mph

		Westbound			Eastbound		
Time (sec)	Speed (mph)	Number	Cum.	Percent	Number	Cum.	Percent
4.0	17.0		0	0%		0	0%
3.9	17.5		0	0%		0	0%
3.8	17.9		0	0%	1	1	5%
3.7	18.4		0	0%	1	2	10%
3.6	18.9		0	0%		2	10%
3.5	19.5	1	1	5%		2	10%
3.4	20.1		1	5%	1	3	15%
3.3	20.7		1	5%	2	5	25%
3.2	21.3		1	5%	2	7	35%
3.1	22.0		1	5%	2	9	45%
3.0	22.7		1	5%	2	11	55%
2.9	23.5		1	5%	3	14	70%
2.8	24.4		1	5%	2	16	80%
2.7	25.3	3	4	20%	1	17	85%
2.6	26.2	2	6	30%	1	18	90%
2.5	27.3	2	8	40%	1	19	95%
2.4	28.4	2	10	50%	1	20	100%
2.3	29.6	7	17	85%		20	100%
2.2	31.0	3	20	100%		20	100%
2.1	32.5		20	100%		20	100%
2.0	34.1		20	100%		20	100%
1.9	35.9		20	100%		20	100%
1.8	37.9		20	100%		20	100%
1.7	40.1		20	100%		20	100%
1.6	42.6		20	100%		20	100%
1.5	45.5		20	100%		20	100%
1.4	48.7		20	100%		20	100%
1.3	52.4		20	100%		20	100%
1.2	56.8		20	100%		20	100%
1.1	62.0		20	100%		20	100%
1.0	68.2		20	100%		20	100%
	TOTAL:	20			20		
Avg. Speed:			**28 mph**			**23 mph**	
85th % Speed:			**30 mph**			**26 mph**	

Institute of Transportation Engineers (ITE); 9th Edition

Land Use Code (LUC) 912 - Drive-In Bank

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 3.000

AVERAGE WEEKDAY DAILY

T = 148.15 * (X)
T = 444.45
T = 440 vehicle trips
with 50% (220 vpd) entering and 50% (220 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 12.08 * (X)
T = 36.24
T = 36 vehicle trips
with 57% (21 vph) entering and 43% (15 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 24.30 * (X)
T = 72.90
T = 73 vehicle trips
with 50% (37 vph) entering and 50% (36 vph) exiting.

SATURDAY DAILY

T = 86.32 * (X)
T = 258.96
T = 260 vehicle trips
with 50% (130 vpd) entering and 50% (130 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 26.31 * (X)
T = 78.93
T = 79 vehicle trips
with 51% (40 vph) entering and 49% (39 vph) exiting.

Institute of Transportation Engineers (ITE); 9th Edition
Land Use Code (LUC) 817 - Nursery (Garden Center)

Average Vehicle Trips Ends vs: 1,000 Gross Square Feet of Floor Area
Independent Variable (X): 7.180 ksf

AVERAGE WEEKDAY DAILY
T = 68.10 * (X)
T = 488.96
T = 490 vehicle trips
with 50% (245 vpd) entering and 50% (245 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC
T = 2.43 * (X)
T = 17.45
T = 17 vehicle trips
with 52% (9 vph) entering and 48% (8 vph) exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC
T = 6.94 * (X)
T = 49.83
T = 50 vehicle trips
with 49% (25 vph) entering and 51% (25 vph) exiting.

AVERAGE SATURDAY DAILY
T = 133.31 * (X)
T = 957.17
T = 960 vehicle trips
with 50% (480 vpd) entering and 50% (480 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR
T = 20.06 * (X)
T = 144.03
T = 144 vehicle trips
with 50% (72 vph) entering and 53% (72 vph) exiting.

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Bank Traffic, Drive-Thru, and Parking Count

Counted By: Susan Lincoln

Location: Institution for Savings Rowley, MA

Date: 2/10/2012 Friday

No. of Cars Parked at Beginning of Count: 15

Weather: Clear

No. of Employees Parked: 13 (includes 2 bank examiners)

	Total Bank Traffic				Drive-Thru Queues			
Time	In	Out	Total	Hour Total	Teller Lane 1 Max Queue	Teller Lane 2 Max Queue	ATM Max Queue	Customer Parking Demand
3:00 - 3:15	6	5	11		1	0	1	3
3:15 - 3:30	7	5	12		1	0	1	5
3:30 - 3:45	8	9	17		2	0	1	1
3:45 - 4:00	7	12	19	59	0	1	1	2
4:00 - 4:15	4	3	7	55	1	0	2	2
4:15 - 4:30	15	11	26	69	1	1	1	7
4:30 - 4:45	10	15	25	77	1	0	1	2
4:45 - 5:00	6	6	12	70	1	0	0	3
5:00 - 5:15	5	11	16	79	1	1	0	0
5:15 - 5:30	2	2	4	57	1	0	1	0
5:30 - 5:45	3	2	5	37	0	0	1	0
5:45 - 6:00	5	4	9	34	1	0	1	1

Peak Hour	In	Out	Total
4:15-5:15	36	43	79

Max Queue	Max Queue	Max Queue	Peak Parking Demand
2	1	2	7

Trip Rate at	In	Out	Total
3.100 ksf	11.61	13.87	25.48

Avg Queue	Avg Queue	Avg Queue	Avg Parking Demand
1.1	1.0	1.1	2.2

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Bank Traffic, Drive-Thru, and Parking Count

Counted By: Susan Lincoln

Location: Institution for Savings
Rowley, MA

Date: 2/11/2012 Saturday

No. of Cars Parked at Beginning of Count: 6

Weather: Cloudy, light drizzle

No. of Employees Parked: 6

	Total Bank Traffic				Drive-Thru Queues			
Time	In	Out	Total	Hour Total	Teller Lane 1 Max Queue	Teller Lane 2 Max Queue	ATM Max Queue	Customer Parking Demand
9:00 - 9:15	7	6	13		0	0	1	1
9:15 - 9:30	7	8	15		1	1	1	0
9:30 - 9:45	9	7	16		2	1	1	2
9:45 - 10:00	8	8	16	60	2	0	1	1
10:00 - 10:15	6	7	13	60	1	0	1	1
10:15 - 10:30	4	3	7	52	1	0	1	1
10:30 - 10:45	10	8	18	54	2	1	1	1
10:45 - 11:00	13	14	27	65	1	1	1	3
11:00 - 11:15	6	7	13	65	2	0	1	2
11:15 - 11:30	5	7	12	70	1	1	0	0
11:30 - 11:45	12	9	21	73	1	0	4	3
11:45 - 12:00	11	12	23	69	1	0	1	2

Peak Hour	In	Out	Total
10:45 - 11:45	36	37	73

Max Queue	Max Queue	Max Queue	Peak Parking Demand
2	1	4	3

Trip Rate at	In	Out	Total
3.100 ksf	11.61	11.94	23.55

Avg Queue	Avg Queue	Avg Queue	Avg Parking Demand
1.3	1.0	1.2	1.4

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Bank Traffic, Drive-Thru, and Parking Count

Counted By: Josh Eby

Location: Institution for Savings
Salisbury, MA

Date: 2/10/2012 Friday

No. of Cars Parked at Beginning of Count: 8

Weather: Clear

No. of Employees Parked: 6

	Total Bank Traffic				Drive-Thru Queues			
Time	In	Out	Total	Hour Total	Teller Lane 1 Max Queue	Teller Lane 2 Max Queue	ATM Max Queue	Customer Parking Demand
3:00 - 3:15	12	14	26		1		1	2
3:15 - 3:30	8	10	18		1		1	1
3:30 - 3:45	7	3	10		1		1	1
3:45 - 4:00	9	12	21	75	1		1	2
4:00 - 4:15	2	4	6	55	1		1	0
4:15 - 4:30	6	4	10	47	0		1	1
4:30 - 4:45	11	12	23	60	1		1	0
4:45 - 5:00	10	7	17	56	1		1	1
5:00 - 5:15	13	12	25	75	1		1	3
5:15 - 5:30	9	8	17	82	1		1	2
5:30 - 5:45	8	6	14	73	1		1	2
5:45 - 6:00	5	9	14	70	1		1	0

Peak Hour	In	Out	Total
4:30 - 5:30	43	39	82

Max Queue	Max Queue	Max Queue	Peak Parking Demand
1		1	3

Trip Rate at	In	Out	Total
3.620 ksf	11.88	10.77	22.65

Avg Queue	Avg Queue	Avg Queue	Avg Parking Demand
1.0		1.0	1.3

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Bank Traffic, Drive-Thru, and Parking Count

Counted By: Josh Eby

Location: Institution for Savings, Salisbury, MA

Date: 2/11/2012 Saturday

No. of Cars Parked at Beginning of Count: 8

Weather: Cloudy

No. of Employees Parked: 6

	Total Bank Traffic				Drive-Thru Queues			
Time	In	Out	Total	Hour Total	Teller Lane 1 Max Queue	Teller Lane 2 Max Queue	ATM Max Queue	Customer Parking Demand
9:00 - 9:15	14	12	26		2		2	1
9:15 - 9:30	6	4	10		0		2	3
9:30 - 9:45	13	13	26		2		3	2
9:45 - 10:00	7	7	14	76	0		1	1
10:00 - 10:15	11	13	24	74	2		2	2
10:15 - 10:30	12	14	26	90	1		3	0
10:30 - 10:45	8	6	14	78	1		2	2
10:45 - 11:00	10	9	19	83	4		2	1
11:00 - 11:15	17	13	30	89	2		2	8
11:15 - 11:30	15	17	32	95	3		2	4
11:30 - 11:45	21	17	38	119	2		2	8
11:45 - 12:00	14	19	33	133	3		2	2

Peak Hour	In	Out	Total	Max Queue	Max Queue	Max Queue	Peak Parking Demand
11:00 - 12:00	67	66	133	4		3	8

Trip Rate at	In	Out	Total	Avg Queue	Avg Queue	Avg Queue	Avg Parking Demand
3.620 ksf	18.51	18.23	36.74	1.5		1.5	2.8